

CORE DRILLING PROJECT
PEYTON CREEK PHOSPHATE AREA
ARKANSAS

FINAL REPORT - PHASE II



Arkansas **GEOLOGICAL COMMISSION**
STATE CAPITOL ■ LITTLE ROCK, ARKANSAS

NORMAN F. WILLIAMS
STATE GEOLOGIST

January 15, 1965

MEMORANDUM

To: Chief, Technical Projects Division
Area Redevelopment Administration
U. S. Department of Commerce
Washington 25, D. C.

Subject: Supplemental Conclusions to the Final Report Phase II
Contract No. Cc-6098

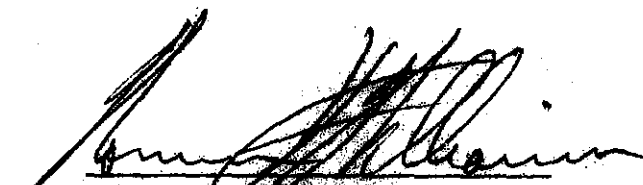
It is our conclusion that the drilling and other testing accomplished under the program carried out in the subject contract with your agency was adequate to establish the limits of the phosphate deposit being investigated. Since we were given to understand that the total tonnage to be required for the Mississippi Chemical Company to justify construction of a phosphoric acid or elemental phosphorus plant would have to be about three times as great as that proven by our drilling; we further conclude that the reserves present in the subject deposit are not adequate to justify the further consideration of Mississippi Chemical Company for a plant of the size they projected in their original discussions.

The Peyton Creek Phosphate Mining Company is currently producing some rock from this deposit and fine grinding it so that it can be sold for application as raw rock phosphate for appropriate agricultural purposes. The potential for an operation of this type can not be accurately established at this time since certain market and transportation considerations have not been completely explored. It is possible that a small but continuing and profitable operation of this type can be supported by the market and raw material presently known to be available.

We have been informed that additional investigations have been started and further investigations are contemplated for the purpose of establishing whether or not this material can be beneficiated to the degree necessary to make the product useable as feed for fertilizer plants in the State. It is our understanding that this work is being sponsored by the Peyton Creek Phosphate Mining Company. If these tests

show that the material can be beneficiated to a satisfactory grade at a low enough price to make it competitive with material now being shipped in from Florida, there is a substantial market available in Arkansas and a larger operation could be supplied, over the period required for the amortization of investment, by the reserves proven by the drilling and testing carried on as a part of our project under the subject contract.

Copies of this report will be kept on file by the State for inspection by interested parties.



Norman F. Williams

FINAL REPORT - PHASE II

ARA CONTRACT - Cc-6098

CORE DRILLING PROJECT
PEYTON CREEK PHOSPHATE AREA
ARKANSAS

FINAL REPORT - PHASE II
CORE DRILLING PROJECT - PEYTON CREEK PHOSPHATE AREA
SEARCY VAN-BUREN COUNTIES, ARKANSAS

INTRODUCTION:

Core drilling of the phosphate rock deposits in the Peyton Creek area of Searcy and Van Buren Counties, Arkansas has been conducted in two phases under the A.R.A. assistance program. During the first phase, October 1963 to January 1964, a total of eight holes was drilled at the Marshall deposit in Searcy County and six holes at the Ferguson deposit in Van Buren County. The results of the Phase I drilling are included in a prior report dated February 1964.

On completion of the first phase it was decided that further testing of the Marshall deposit was unjustified, and that the Phase II drilling should be used to extend the known reserves in the Ferguson deposit. The contract for the Phase II core drilling was let on April 2, 1964 to the E. J. Longyear Company of Minneapolis, Minnesota. Drilling was begun on May 1, 1964 and terminated on October 2, 1964 with the completion of nine core holes. This report summarizes the results of the Phase II drilling.

DRILLING OPERATIONS:

One Longyear core drill was utilized in the project on an eight-hour day, six-day work week basis.

The drilling contractor elected to use wire-line coring methods down to the ore zone and standard NX coring equipment for the ore interval. The result was that except for the upper few feet of hole that was drilled for setting surface casing, there was a continuous core sample for practically the full depth of each hole. Core recovery within

the ore zone itself was consistently well above the specified 85 percent in all drill holes.

SAMPLING AND ASSAYING:

In most of the drill holes the phosphate rock occurred as a single, fairly uniform layer. In holes 5-8, 10 and 11, however, the phosphate zone was made up of two or more layers of varying grade. Each of these layers was sampled and analyzed individually and the results appear in the table of chemical analyses. In the sampling process the cores were split, one half being sent to the laboratory for chemical analysis, and the remaining half returned to its proper sequence in the core box for a permanent reference. In addition adequate footages of core were retained to provide information on floor and roof conditions. All these cores are currently in storage at the office of the Peyton Creek Phosphate Mining Company at Leslie, Arkansas. All chemical analyses of the cores were made in Arkansas Geological Commission laboratory at Little Rock. Pulps of all the samples have been retained in the event check analyses are desired. Only the P₂O₅ content of the core samples was run to permit the laboratory to keep up with the drilling. Assays of the core samples are shown both on the table of analyses and on the stratigraphic logs of the individual drill holes.

RADIOACTIVE LOGGING:

As in the Phase I drilling, gamma ray logs were run in as many of the holes as possible to make certain that no important phosphate beds were overlooked in the core examination. Arrangements were made with the Water Resources Branch of the U. S. Geological Survey to use their truck-mounted logging equipment on a rental basis.

FERGUSON DEPOSIT

CHEMICAL ANALYSES OF PHASE II CORE SAMPLES

Hole No.	Sample No.	DEPTH INTERVAL(Ft.)			PERCENT	COMPOSITE	
		From	To	Interval	P ₂ O ₅	Thickness	Percent P ₂ O ₅
S-7	1	372.6	379.3	6.7	16.3		
S-8	1	387.8	390.3	2.5	11.0	9'	23.7
	2	390.3	396.5	6.2	28.8		
S-9	1	391.5	402.7	11.2	18.4		
S-10	1	412.0	414.2	2.2	22.1	12'	19.2
	4	414.2	415.3	1.1	3.4		
	2	415.3	424.3	9.0	20.5		
	3	433.7	438.2	4.5	1.1		
S-11	1	366.5	369.7	3.2	14.6	7'	16.5
	2	369.7	373.2	3.5	18.3		
S-12	1	401.6	408.9	7.3	17.5		
S-13	1	454.3	455.3	1.0	21.2		
S-14	1	452.1	454.6	2.5	11.6		
S-15	1	378.2	383.1	4.9	12.4		

Of the nine holes drilled during Phase II an attempt was made to log all but Hole S-14 which did not have surface casing left in it. Of the remaining eight holes only four (Holes S-7, 8, 10 and 13) were logged in their entirety because of difficulties in re-entering the drill holes. Reproductions of the lower portions of the logs of these four holes appear in the Appendix.

The gamma ray logs of these holes accurately verified the phosphate layers that had previously been visually logged in the core, and they also verified that no phosphate layers had been overlooked in the core examination.

THE FERGUSON DEPOSIT:

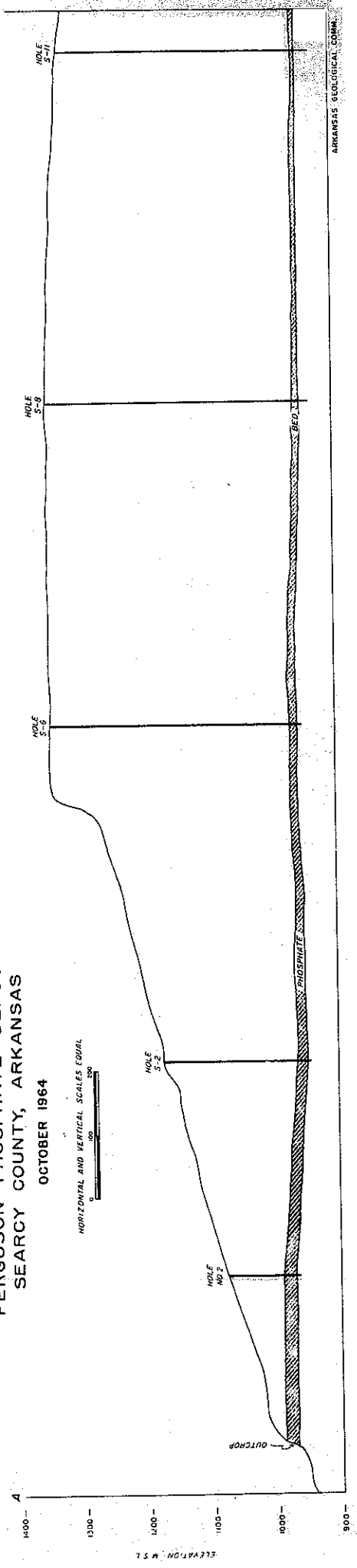
Phase I drilling established that the phosphate rock trends southward from the outcrop, and the Phase II drilling determined the extent of this trend. The nine holes drilled during Phase II revealed that the deposit has a tongue-like shape and extends southward a distance of about 2700 feet from the outcrop. The shape of the orebody suggests that it may have been deposited in a bay or estuary.

The sequence of sandstone and shales overlying the phosphate rock as well as the sandstone bed enclosing it could be readily correlated in all the drill holes. From a study of the drill cores it appears that the phosphate was deposited along with the enclosing sandstone in topographic lows, i. e. basins and channels in the Pitkin land surface.

The age of the phosphate rock is probably Mississippian, and it lies at or near the base of what the U. S. Geological Survey has designated as the Cane Hill formation in this area.

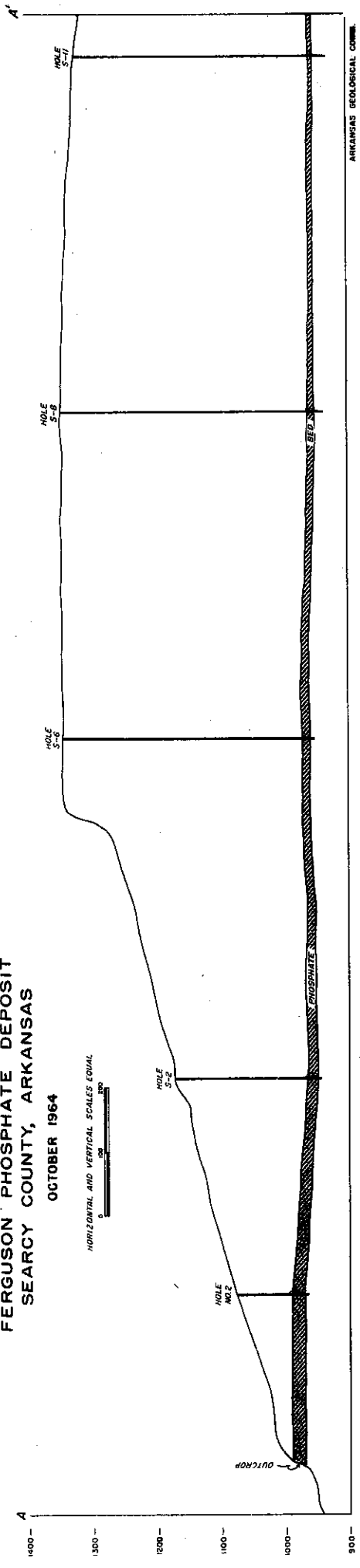
The phosphate rock cored in the Phase II drilling is essentially the same in composition and texture as that found in previous drilling and along the outcrop. It has the

CROSS SECTION A-A'
FERGUSON PHOSPHATE DEPOSIT
SEARCY COUNTY, ARKANSAS
OCTOBER 1964



CROSS SECTION A-A'
FERGUSON PHOSPHATE DEPOSIT
SEARCY COUNTY, ARKANSAS

OCTOBER 1964



ARKANSAS GEOLOGICAL COMMISSION

characteristic oolitic texture, calcite cement, carbonized wood fragments, pyrite, and varying amounts of quartz sand. The variations in grade are due primarily to the degree of dilution of the rock with sand grains.

ORE RESERVES - FERGUSON DEPOSIT:

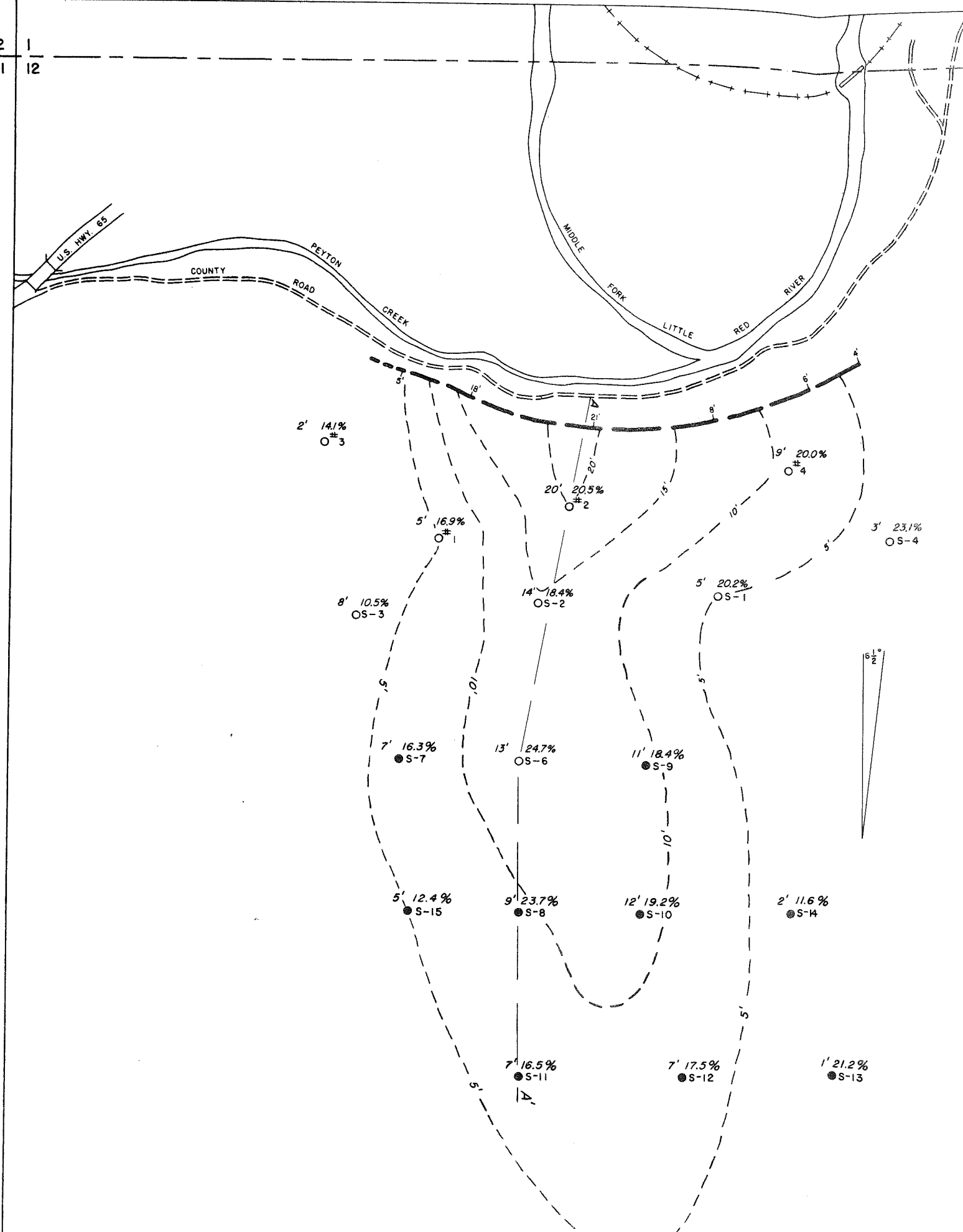
Ore reserve estimates were made using the phosphate isopachs shown on the map and the average-end-area method of computation. A minimum thickness of five feet and an average grade of 19 percent P_2O_5 was established for the estimate. A unit weight of 192 pounds/cu.ft. was computed for the phosphate rock by determining the specific gravity of the core from Hole S-6. Utilizing the above factors the Ferguson deposit contains 2,800,000 short tons of phosphate rock averaging 19 percent P_2O_5 and occurring in a bed five feet or greater in thickness. It should be noted that this is a gross tonnage figure and makes no allowance for mining losses.

2 1
11 12

R. 15 W. R. 14 W.

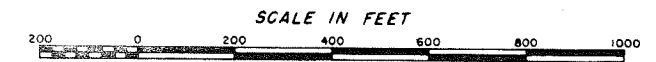
SEARCY COUNTY
VAN BUREN COUNTY

1 6
12 7



1' 13.3%
OS-5

**DRILLING MAP
OF THE
FERGUSON PHOSPHATE DEPOSIT
OCT, 1964**



- EXPLANATION**
- #4 1961 Drill Hole
 - S-2 Phase 1 Drill Hole A.R.A
 - S-10 Phase 2 Drill Hole A.R.A.
 - 3' 23.1% Thickness & Grade of Phosphate in core holes.
 - - - 15' Phosphate isopach.
 - ▬▬▬ 6' Phosphate outcrops showing exposed thicknesses

T. 13
N.

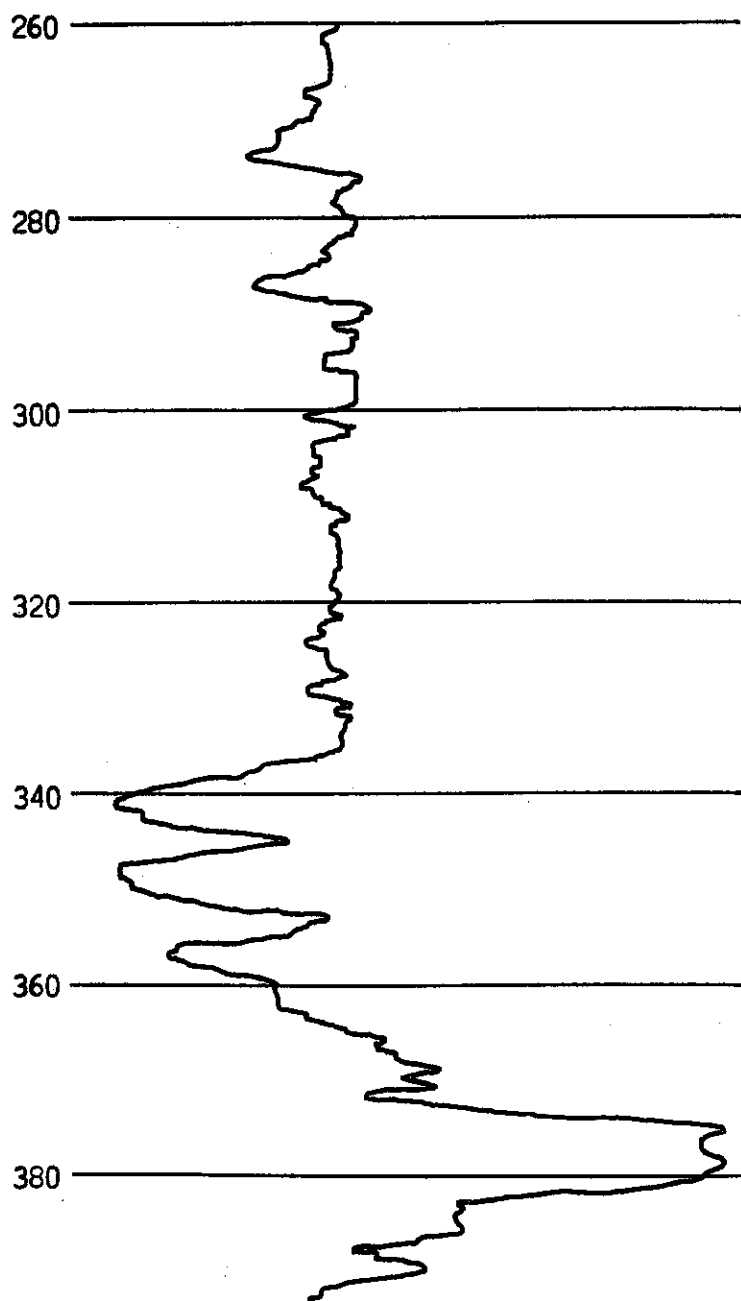
APPENDIX A

GAMMA RAY LOGS OF SELECTED DRILL HOLES

A.R.A. Phosphate Drilling Prospect
 Searcy - Van Buren County, Arkansas

GAMMA RAY LOG

Hole No.	S-7
T. D.	390
Surface Elevation (msl)	1344
G. R. Scale	.025
Logging Speed	15 ft./min
Date Logged	Dec. 3, 1964

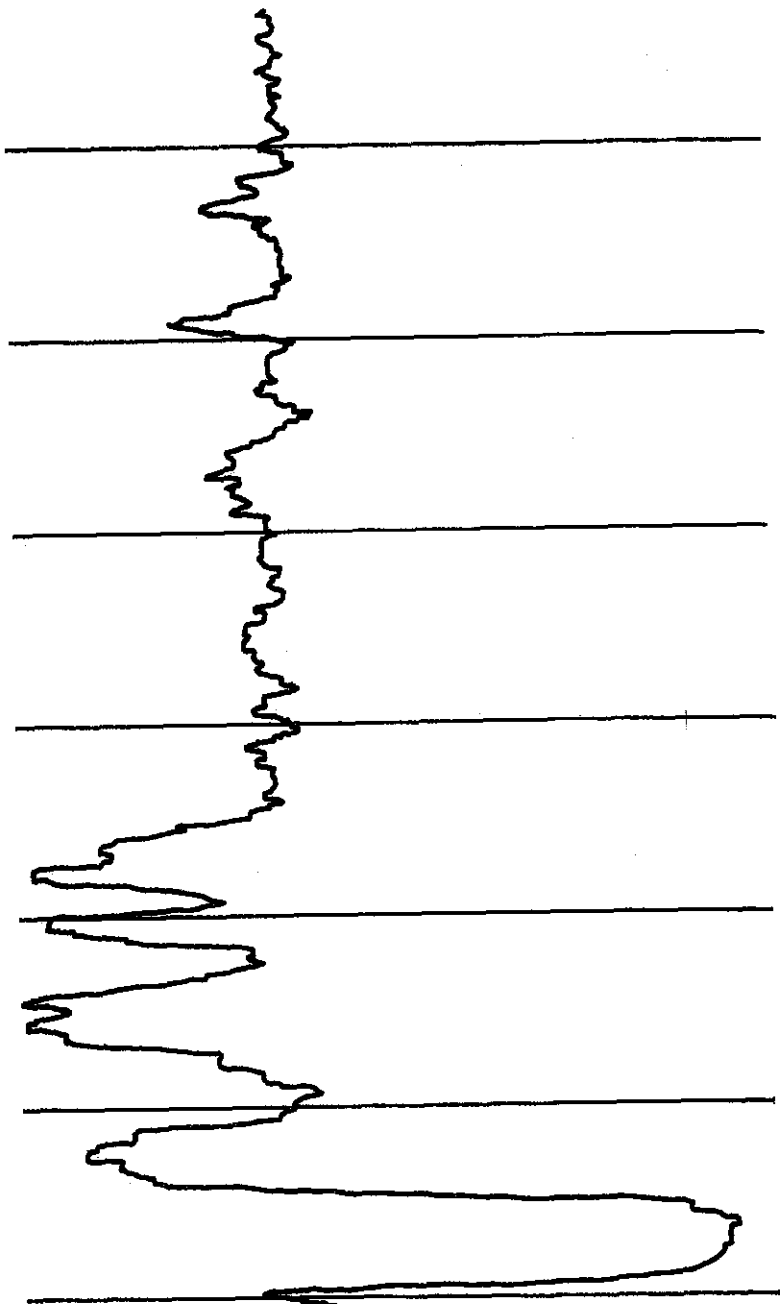


Phosphate Thickness In Feet	Percent P ₂ O ₅
6.7	16.3

A.R.A. Phosphate Drilling Prospect
Searcy - Van Buren County, Arkansas

GAMMA RAY LOG

Hole No.	S-8
T. D.	412
Surface Elevation (msl)	1347
G. R. Scale	.025
Logging Speed	15 ft./min
Date Logged	Dec. 3, 1964



Phosphate Thickness
In Feet

Percent
P₂O₅

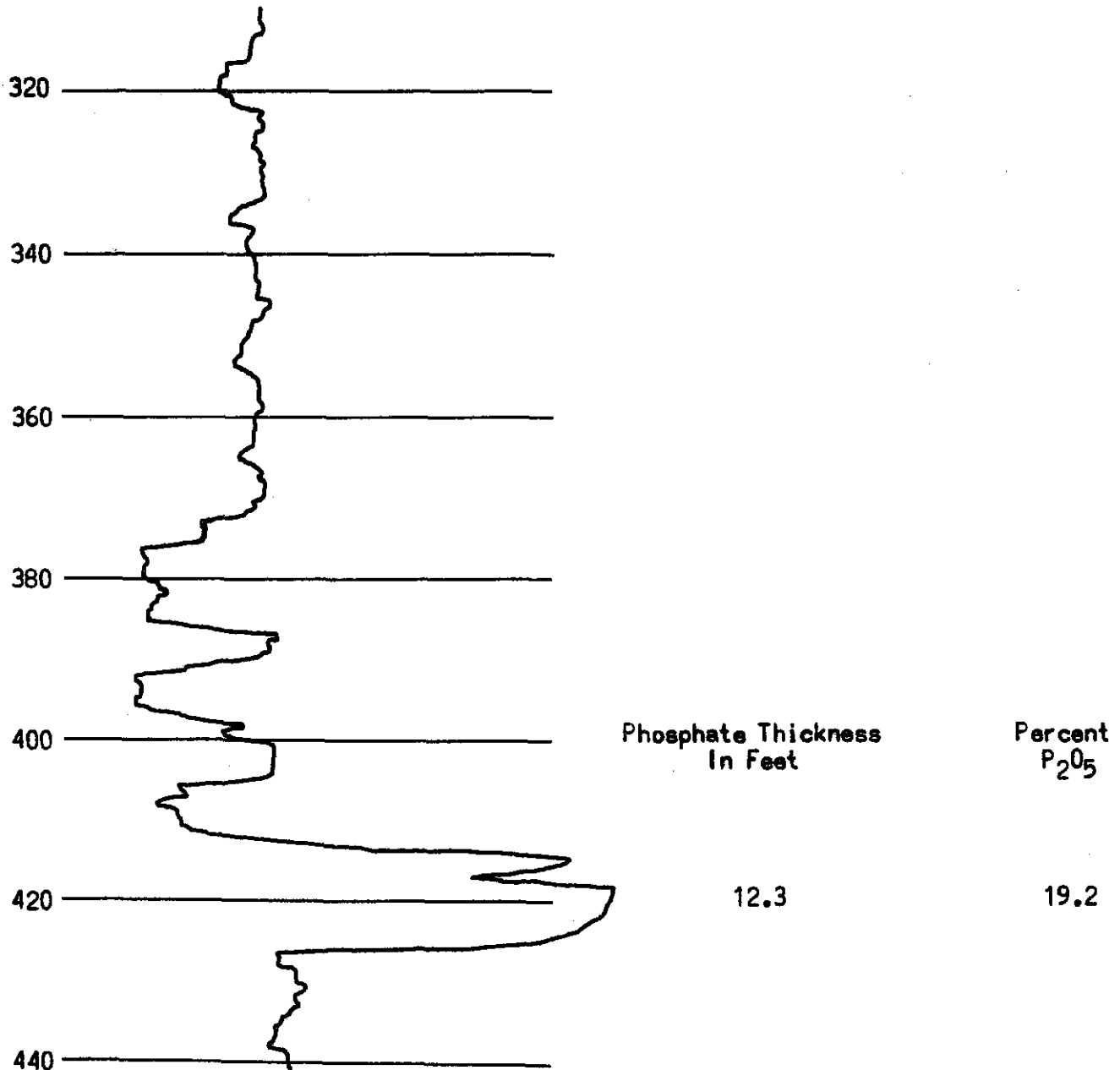
8.7

23.7

A.R.A. Phosphate Drilling Prospect
Searcy - Van Buren County, Arkansas

GAMMA RAY LOG

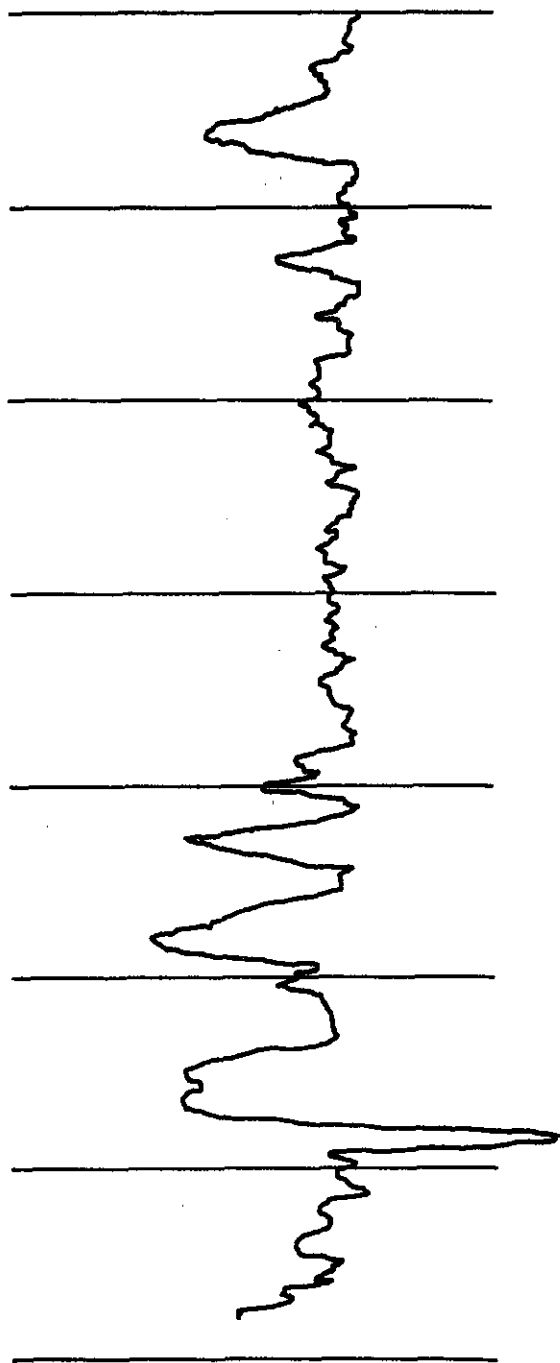
Hole No.	S-10
T.D.	438.5
Surface Elevation (msl)	1377
G. R. Scale	.025
Logging Speed	15 ft./min
Date Logged	Dec. 3, 1964



A.R.A. Phosphate Drilling Prospect
Searcy - Van Buren County, Arkansas

GAMMA RAY LOG

Hole No.	S-13
T.D.	473.3
Surface Elevation (msl)	1435
G. R. Scale	.025
Logging Speed	15 ft./min
Date Logged	Dec. 3, 1964



Phosphate Thickness
In Feet

Percent
P₂O₅

1.0

21.2

APPENDIX B

STRATIGRAPHIC LOGS OF CORE DRILL HOLES

A.R.A. PHOSPHATE DRILLING PROJECT
VAN BUREN COUNTY, ARKANSAS
STRATIGRAPHIC LOG

HOLE NO. S-8 LOCATION NE 1/4, SW 1/4, Sec 12, T13N, R15W, Van Buren, Co.
 PAGE 1 OF 2 DATE 5/28/64 6/6/64 COLLAR ELEV. 1347 NOTES BY D.F.H. & O.A.W.

LITHOLOGIC NOTES		
DEPTH	PROFILE	DESCRIPTION
0-11'		soil and weathered sandstone
11-64.7'		sandstone; buff, weathered, massive porous, slightly friable
64.7'-85.8'		sandstone; gray massive, a few mica flakes
85.8'-89.2'		alternating thin layers of gray sandstone and black shale (mostly shale)
89.2'-164'		Black clay shale; with thin streaks of gray siltstone
164'-184.8'		black clay shale
184.8'-239.3'		siltstone; gray with numerous thin black shale partings
239.3'-280.5'		black clay shale (4" trash zone at 241', scattered 1/2" siderite lenses; 3" trash zone at 250.5'; 6" Trash zone at 274.5', 2" fossiliferous limestone at 277.2')
280.5'-282.6'		Black clay shale with alternating layers of gray siltstone and nodules of siderite
282.6'-283.3'		black clay shale
283.3'-285.8'		gray siltstone
285.8'-295.0'		black clay shale
295.0'-296.5'		gray siltstone
296.5'-297'		black clay shale
297'-297.5'		limestone; coarse-grained fossiliferous, dark gray
297.5'-348.0'		black clay shale; scattered siderite lenses and fossiliferous seams
348.0'-349.3'		siltstone; gray, irregularly banded
349.3'-354.4'		sandstone; gray, massive
		0.3' interbedded shale at 351.3'
354.4'-355.6'		siltstone; finely-banded, gray
355.6'-356.8'		black clay shale

BORING NOTES				
DEPTH		INTERV	CORE RECOV	% RECOV
FROM	TO			
0	11	11	Rock Bit	
11	381	370	NX Wireline	
381	411	30	Standard	NX
Note: Core Recovery Was essentially 100% from 11' to T.D.				

SAMPLING NOTES				
DEPTH		INTERV	SAMPLE NUMBER	% P ₂ O ₅
FROM	TO			
387.8	390.3	2.5	S-8-1	11.0
390.3	396.5	6.2	S-8-2	28.8
Note: Weighted Average analysis on samples S-8-1 & 2 (interval 387.8-396.5) = 23.7 % P ₂ O ₅				

PHASE II
A.R.A. PHOSPHATE DRILLING PROJECT
VAN BUREN COUNTY, ARKANSAS
STRATIGRAPHIC LOG

HOLE NO. S-9 LOCATION SE 1/4, NW 1/4 Sec. 12 T13N, R15W, Van Buren, Co.
PAGE 1 OF 3 DATE 5/15/64 5/27/64 COLLAR ELEV. 1359 NOTES BY DFH, OAW, RJS

LITHOLOGIC NOTES		
DEPTH	PROFILE	DESCRIPTION
0-15'		soil and soft sandstone
15'-22'		black shale with interbedded light gray sandstone stringers
22'-73'		sandstone: weathered, buff medium grained well sorted subangular to subrounded massive - unweathered zone 8' thick at 68'
73'-95'		sandstone; light gray unweathered fine to medium grained - stylolitic partings filled with bituminous material - massive bedded
95'-181'		black shale - numerous light gray sandstone partings and blebs
181'-204'		black fissile shale - no sandstone partings
204'-204.3'		sandy conglomerate
204.3'-204.7'		siderite
204.7'-205.2'		sideritic sandstone; blebs and streaks of light gray sandstone
205.2'-243.0'		sandstone; light gray, fine grained, with dark argillaceous partings stylolitic in part. more argillaceous partings in bottom 4 feet. conglomeratic zone at 240'.
243.0'-284.0'		shale; black, fissile, micaceous no sandstone partings 6" fossil debris at 248'. 2" dark gray dense fossiliferous limestone at 262.0'. 3" fossil debris at 264.0' scattered thin siderite pebbles at 268'-270'. 3" of fossil limestone debris, some pyrite at 278'. One foot of fossiliferous limestone debris at 281'.
284'-286'		black shale as above with thin sand beds up to 2" thick
286'-289'		sandstone: light gray, fine grained subangular to subrounded with carbonized wood fragments

BORING NOTES				
DEPTH		INTERV.	CORE RECOV.	% RECOV.
FROM	TO			
0	9	9	Rock	Bit
0	386	377	NX	Wireline
386	426	40	Standard	NX
			Core	
Note:				
Core Recovery				
From 9' to T.D.				
was essentially				
100%				

SAMPLING NOTES				
DEPTH		INTERV.	SAMPLE NUMBER	% 205
FROM	TO			
391.5'	402.7'	11.2	S-9-1	18.4

PHASE 11
A.R.A. PHOSPHATE DRILLING PROJECT
VAN BUREN COUNTY, ARKANSAS

STRATIGRAPHIC LOG

HOLE NO. S-10 LOCATION NE 1/4, SW 1/4, Sec. 12 T13N, R15W, Van Buren Co.
 PAGE 1 OF 2 DATE 6/9/64 COLLAR ELEV. 1376.8 NOTES BY DFH
6/20/64

LITHOLOGIC NOTES		
DEPTH	PROFILE	DESCRIPTION
0-10'		clay, and weathered shale
10'-37'		black clay shale; interbedded buff sandstone in bottom foot
37'-80'		sandstone; brown friable punky
80'-109.2'		sandstone; coarse grained gray with brown weathered streaks in the upper 5 feet
109.2'-213.7'		black clay shale, top 5 feet has sandstone interbedded
213.7'-214.1'		sandy conglomerate
214.1'-218.3'		conglomeratic zone with interbedded black shale and gray sandstone
218.3'-259.4'		sandstone; gray, fine-grained numerous thin shale partings
259.4'-312.9		black clay shale thin gray sandstone layers in top 5 feet
312.9'-315.6'		gray siltstone
315.6'-316.4'		black clay shale
316.4'-317.4'		siltstone; gray, finely banded
317.4'-321.4'		black shale-coarse grained fossiliferous and conglomeratic
321.4'-371.0'		black clay shale with siderite nodules, narrow fossil trash zones scattered thin gray siltstone layers
371.0'-374.4'		siltstone; gray, finely banded with some black shale partings
374.4'-385.5'		sandstone; gray, massive with stylolitic partings
385.5'-389.3'		black clay shale with large siderite nodules
389.3'-396.7'		siltstone; gray, massive to finely banded
396.7'-399.5'		alternating layers of gray and black siltstone and black clay shale
399.5'-403.3'		black clay shale with siderite nodules

BORING NOTES				
DEPTH		INTERV.	CORE RECOVER.	% RECOVER.
FROM	TO			
0	9	9	Rock Bit	
9	400	391	NX Wireline	
400	440	40	Standard NX	
Note: Core Recovery from 9'-440' was essentially 100 %				

SAMPLING NOTES					%
DEPTH		INTERV.	SAMPLE NUMBER		P ₂ O ₅
FROM	TO				
412.0	414.2	2.2	S-10-1		22.1
414.2	415.3	1.1	S-10-4		3.4
415.3	424.3	9.0	S-10-2		20.5
433.7	438.2	4.5	S-10-3		1.1
Note: Weighted average Analysis for the interval 412.0' - 424.3' (Samples 1, 4 & 2) is 19.2% P ₂ O ₅					

PHASE II - A.R.A. PHOSPHATE DRILLING PROJECT
VAN BUREN COUNTY, ARK.

STRATIGRAPHIC LOG

HOLE NO. S-11 LOCATION NE 1/4 SW 1/4 Sec 12 T13N R15W Van Buren County
PAGE 1 OF 1 DATE 9-24-64 COLLAR ELEV. 1321.9 NOTES BY TJF, DFH

LITHOLOGIC NOTES	
DEPTH	DESCRIPTION
0-10'	Weathered sandstone
10-42'	Sandstone; reddish buff medium grained sub angular quartz sandstone limonite cement, traces of glauconite, compact, slightly micaceous
42-63'	Sandstone; very light gray, fine to medium grained sub angular grains. Local red buff splotches near top. Local thin irregular partings of mica and shale. Compact.
63-164.5'	Shale; dark gray with thin stringers of very light gray fine grained sandstone; 104.5-105' very sandy interval - very little sandstone in the lower 12' of this interval
164.5-213'	Sandstone; very light gray fine grained, abundant paper thin partings of slightly micaceous shale
213-342'	Shale; dark gray with scattered stringers of sand & fossils; 221'-222' dark gray crinoidal limestone; 235.5'-236' fossiliferous limestone conglomerate; 263.0'-264.0' sandy; 274.0'-275.5' sandy; 275.5'-276' fossiliferous conglomeratic limestone; 328'-331', 336'-338' fine grained crossbedded quartz sandstone with stylolitic shale partings; 338'-338.7' crinoidal sandstone conglomerate with large siderite pebbles
342-350.2'	Sandstone; gray, massive
350.2-358.0'	Clay shale; black, with large siderite nodules
358.0-358.7'	Siltstone; gray with thin black shale partings
358.7-366.5'	Sandstone; dark gray fine grained with a few stylolitic partings
366.5-369.7'	Sandstone; gray with abundant oolitic seams
369.7-373.2'	Phosphorite; upper 2' slightly sandy, bottom 0.2' conglomeratic, numerous shaly partings coated with pyrite and bituminous material
373.2-381.6'	Sandstone; gray, fine grained massive, lower 2' has interbedded black clay shale
381.6-393.8'	Black clay shale; thin gray sandstone partings in upper 4'
393.8-394.0'	Limestone; black, fossiliferous, oolitic coarse grained

BORING NOTES				
DEPTH		INTERV	CORE RECOV.	% RECOV.
FROM	TO			
0	10	10	Rock Bit	
10	354	344	NX Wireline	
354	394	40	Standard NX	
Note: core recovery from 10' - 394' was essentially 100%.				

SAMPLING NOTES				
DEPTH		INTERV	SAMPLE NUMBER	% P ₂ O ₅
FROM	TO			
366.5	369.7	3.2	S-11-1	14.6
369.7	373.2	3.5	S-11-2	18.3
Note: Weighted average analysis of samples S-11-1 & 2 = 16.5% P ₂ O ₅				

PHASE II - A.R.A. PHOSPHATE DRILLING PROJECT
VAN BUREN COUNTY, ARK.

STRATIGRAPHIC LOG

HOLE NO. S-13 LOCATION NW 1/4 SE 1/4 Sec 12 T13N R15W Van Buren County
PAGE 1 OF 2 DATE 8-13-64 COLLAR ELEV. 1435.8 NOTES BY DFH

LITHOLOGIC NOTES		
DEPTH	PROFILE	DESCRIPTION
0-12'		Weathered sandstone and soil
12-23.5'		Sandstone; gray medium grained, stained brown along joints
23.5-29.5'		Sandstone; brown, porous, vuggy friable
29.5-82.8'		Black clay shale; siderite lenses, thin streaks and partings of gray sandstone
82.8-126'		Sandstone; massive, brown medium grained
126-154.3'		Sandstone; gray, medium grained, massive, some interbedded black shale in bottom 6'
154.3-252.5'		Black clay shale; numerous paper thin gray sandstone partings, few scattered siderite lenses, gray sandstone 192.4-194.4'
252.5-252.7'		Conglomerate
252.7-299.5'		Sandstone; fine grained, brownish gray, slightly micaceous, thin black shale partings
299.5-300.2'		Conglomerate
300.2-349.6'		Black clay shale; scattered siderite lenses; fossil trash zones at 311.0-311.6', 325.2-325.5', and 341.4-341.7'
349.6-353.9'		Sandstone; gray with breccia zone at 351'
353.9-363'		Black clay shale with some large siderite nodules
363-364.5'		Sandstone; gray with some shale streaks and siderite nodules
364.5-414'		Black clay shale with few siderite nodules, crinoidal limestone 365.3-365.7, fossil trash zone 377.9-378.5, several other narrower fossil trash zones
414-417'		Interbedded gray and black sandstone and black shale
417-418.5'		Sandstone; gray
418.5-422.6'		Black clay shale
422.6-425.8'		Sandstone; gray
425.8-430.2'		Black clay shale with siderite nodules
430.2-436'		Sandstone; gray massive lower 1.5' finely banded
436-438.8'		Interbedded black clay shale and gray and black sandstone
438.8-445.2'		Black clay shale with 1" to 2" siderite nodules

BORING NOTES				
DEPTH		INTERV.	CORE RECOV.	% RECOV.
FROM	TO			
0	12	12	Rock Bit	
12	444	432	NX Wireline	
444	474	30	Standard	NX
Note: core recovery essentially 100% from 12' to T.D.				

SAMPLING NOTES				
DEPTH		INTERV.	SAMPLE NUMBER	% P ₂ O ₅
FROM	TO			
454.3	455.3	1.0	S-13-1	21.2

PHASE II - A.R.A. PHOSPHATE DRILLING PROJECT
VAN BUREN COUNTY, ARK.

STRATIGRAPHIC LOG

HOLE NO. S-15 LOCATION N1/4 SW1/4 Sec 12 T13N R15W Van Buren County
PAGE 1 OF 2 DATE 10-2-84 COLLAR ELEV. 1329.2 NOTES BY DFH

LITHOLOGIC NOTES		
DEPTH	PROFILE	DESCRIPTION
0-10'		Weathered sandstone
10-52.5'		Sandstone; brown weathered massive medium grained
52.5-77.8'		Sandstone; gray compact slightly micaceous medium grained
77.8-179.7'		Black shale; numerous gray sandstone seams, some 3/4" siderite lenses
179.7-179.9'		Sandstone conglomerate
179.9-230.2'		Sandstone; gray, medium grained, numerous wavy thin black shale partings
230.2-232.4'		Black clay shale
232.4-235.3'		Sandstone conglomerate with siderite pebbles
235.3-273'		Black clay shale with several fossil trash zones
273-275.5'		Interbedded black clay shale and gray sandstone
275.5-279.4'		Gray sandstone
279.4-289.7'		Black clay shale with siderite lenses
289.7-291'		Interbedded gray sandstone and black shale (mostly sandstone)
291-339.1'		Black clay shale; 6" fossiliferous zone at 291.5', several narrow fossil trash zones, numerous siderite lenses
339.1-340.5'		Wavy gray siltstone
340.5-346.3'		Sandstone; gray, compact fine-grained; lower part has stylolitic shale partings
346.3-347.2'		Black clay shale
347.2-347.9'		Gray sandstone
347.9-349.2'		Black clay shale
349.2-353.9'		Sandstone; gray with numerous black shale partings
353.9-356.9'		Black clay shale; siderite nodules, bottom 1' silty
356.9-364'		Sandstone; gray, compact, medium-grained, bottom part finely banded
364-367'		Alternating black shale and gray and black siltstone
367-372.8'		Black clay shale
372.8-376.7'		Sandstone; brownish gray fine-grained compact with bituminous partings
376.7-378.2'		Sandstone; gray with thin black shale partings

BORING NOTES				
DEPTH		INTERV.	CORE RECOV.	% RECOV.
FROM	TO			
0	10	10	Rock B	
10	371	361	MX Wir	
371	401	30	Standar	
Note: Core recovery from 10' to TD was essentially 100%.				

SAMPLING NOTES			
DEPTH		INTERV.	SAMPLE NUMBER
FROM	TO		
378.2	383.1	4.9	S-15-1

