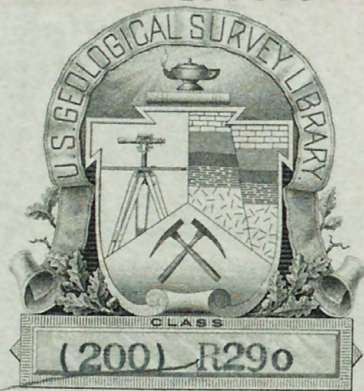


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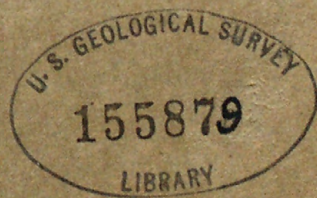
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UNITED STATES
DEPARTMENT OF THE INTERIOR
U.S. GEOLOGICAL SURVEY



[Reports - Open file series]

STRATIGRAPHIC SECTIONS OF THE PHOSPHORIA
FORMATION MEASURED AND SAMPLED IN 1951

by

T. M. Cheney, J. A. Peterson, M. A. Warner,
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This report is preliminary and has not
been edited or reviewed for conformity
with U. S. Geological Survey standards
and nomenclature.

MINERAL DEPOSITS BRANCH
Spokane, Washington July, 1952

OPEN FILE

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INTRODUCTION

The first four of a series of reports giving detailed stratigraphic sections and analyses of samples of the Phosphoria formation in the western phosphate field as described and sampled by the U. S. Geological Survey will soon be published as Circulars 208 through 211. Because of the needs of industry for many of these data during the 1951 field season, and owing to unavoidable delays attendant on publication, the tabular data prepared for these four and for two additional circulars /, as yet unnumbered, were

McKelvey, Swanson, R. W., and O'Malley, F. W., et al, Stratigraphic sections of the Phosphoria formation in Idaho (3 reports), Montana, Wyoming, and Utah; U. S. Geol. Survey open file reports, 1951.

released on open file without texts or maps last year. These six reports constitute a summary of all the sampling done by the U. S. Geological Survey in the western phosphate field during 1947 and 1948.

The analytical returns on the samples collected during 1949, 1950, and 1951 were incomplete at that time. However, in keeping with the objectives outlined above, abstracts of the stratigraphic units and P_2O_5 and acid insoluble analyses of the phosphatic parts of the sections measured and sampled during 1949 and 1950 were released on open file as two reports so that early use might be made of the most important economic data collected during this field work. This is a similar report covering the 1951 field season data. The data in these three open file reports are being prepared for publication in circulars like the six reports mentioned above.

These reports, as well as others referred to, are placed on open file at the offices of the U. S. Geological Survey in Washington, D. C.; Spokane, Washington; Salt Lake City, Utah; and Montpelier, Idaho (open from May to October), and at the offices of the Idaho Bureau of Mines and Geology, Moscow, Idaho; the Montana Bureau of Mines and Geology, Butte, Montana; the Wyoming Geological Survey, Laramie, Wyoming; and the University of Utah, Salt Lake City, Utah.

NORTH BOULDER CREEK, MONTANA, LOT NUMBER 1364

Phosphoria formation measured and sampled in natural exposure on north side of road in NE $\frac{1}{4}$ sec. 4, T. 2 N., R. 2 W., Jefferson County, Montana. Beds strike N. 20° W. and dip 45° NE. Section measured by R. F. Gosman and sampled by J. A. Peterson in August 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Ellis formation--basal bed only</u>					
Je-1	Conglomerate	N.S.	1.8	---	---
<u>Phosphoria formation</u>					
P-30	Quartzite	N.S.	0.8	---	---
P-29	Chert	N.S.	7.2	---	---
P-28	Chert, sandy	N.S.	0.9	---	---
P-27	Mudstone, cherty	N.S.	1.4	---	---
P-26	Chert	N.S.	2.8	---	---
P-25	Quartzite	N.S.	0.7	---	---
P-24	Mudstone, cherty	N.S.	1.2	---	---
P-23	Chert and cherty mudstone	N.S.	5.8	---	---
P-22	Chert, phosphatic	5533-RFG	0.8	16.4	52.5
P-21	Mudstone, cherty	N.S.	0.8	---	---
P-20	Chert, phosphatic	5532-RFG	0.4	14.1	59.0
P-19	Mudstone, cherty	N.S.	2.0	---	---
P-18	Chert	5531-RFG	0.3	4.3	83.4
P-17	Covered	N.S.	19.0	---	---
P-16	Quartzite	N.S.	5.4	---	---
P-15	Chert and quartzite	N.S.	6.3	---	---
P-14	Quartzite, cherty	N.S.	5.6	---	---
P-13	Chert, sandy	N.S.	5.0	---	---
P-12	Sandstone, argillaceous	N.S.	20.0	---	---
P-11	Dolomite, sandy	N.S.	2.7	---	---
P-10	Mudstone	N.S.	0.6	---	---
P- 9	Sandstone, argillaceous, calcareous	N.S.	0.4	---	---
P- 8	Mudstone, sandy	N.S.	1.6	---	---
P- 7	Sandstone, calcareous	N.S.	4.3	---	---
P- 6	Mudstone and sandstone	N.S.	4.7	---	---
P- 5	Sandstone	N.S.	0.7	---	---
P- 4	Quartzite	N.S.	2.3	---	---
P- 3	Mudstone, sandy, and calcareous sandstone	N.S.	3.2	---	---
P- 2	Quartzite and calcareous sandstone	N.S.	2.0	---	---

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P- 1	Mudstone, calcareous	N.S.	6.3	--	--
Total thickness of Phosphoria formation			116.2		
<u>Quadrant formation--top bed only</u>					
Q- 1	Quartzite	N.S.	2.5 †	--	--

THREE FORKS, MONTANA, LOT NUMBER 1356

Phosphoria formation measured and sampled in natural exposure at north end of Milligan Canyon about 300 feet east of Willow Creek road, sec. 24, T. 2 N., R. 1 W., Jefferson Canyon, Montana. Beds strike N. 80° E. and dip 25° N. Section measured by J. A. Peterson and sampled by R. F. Gosman in June 1951. Samples analyzed for P_2O_5 and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P_2O_5	ACID INSOLUBLE
<u>Ellis formation--basal bed only</u>					
Je-1	Conglomerate; fos. col. no. 12698	N.S.	N.M.	--	--
<u>Phosphoria formation</u>					
P-29	Quartzite	N.S.	1.0	--	--
P-28	Mudstone, cherty	N.S.	6.2	--	--
P-27	Phosphate rock, cherty	5405-JAP	0.2	18.8	44.7
P-26	Chert	N.S.	2.3	--	--
P-25	Mudstone, phosphatic	N.S.	0.1	--	--
P-24	Limestone	N.S.	0.9	--	--
P-23	Chert	N.S.	0.3	--	--
P-22	Phosphate rock, argillaceous	5404-JAP	0.3	20.2	44.7
P-21	Mudstone, cherty	N.S.	0.7	--	--
P-20	Phosphate rock, cherty, sandy	5403-JAP	0.3	18.9	43.4
P-19	Chert and dolomite	N.S.	7.0	--	--
P-18	Chert	N.S.	1.0	--	--
P-17	Chert	N.S.	1.5	--	--
P-16	Chert and limestone	N.S.	3.5	--	--
P-15	Chert, phosphatic	5402-JAP	0.5	10.9	64.0
P-14	Phosphate rock, argillaceous	5401-JAP	0.5	23.7	35.7
P-13	Dolomite	N.S.	2.5	--	--
P-12	Chert	N.S.	7.3	--	--
P-11	Chert, phosphatic	5400-JAP	1.6	16.3	50.0
P-10	Dolomite	N.S.	1.5	--	--
P-9	Sandstone and dolomite	N.S.	3.5	--	--
P-8	Limestone and chert	N.S.	26.3	--	--
P-7	Sandstone and quartzite	N.S.	4.3	--	--
P-6	Limestone and chert	N.S.	21.3	--	--
P-5	Dolomite, cherty	N.S.	7.0	--	--
P-4	Quartzite	N.S.	1.5	--	--
P-3	Dolomite	N.S.	2.3	--	--
P-2	Quartzite	N.S.	0.9	--	--
P-1	Mudstone, calcareous	N.S.	1.7	--	--
Total thickness of Phosphoria formation			108.0		

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
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Quadrant formation--top bed only

Q-1	Quartzite	N.S.	N.M.	--	--
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LOGAN, MONTANA, LOT NUMBER 1367

Phosphoria formation measured and sampled along ridge on east side of road, sec. 26, T. 2 N., R. 2 E., about 1 mile northwest of Logan, Montana. Beds strike N. 70° E. and dip 20° N. Section measured by R. W. Swanson and J. A. Peterson and sampled by Swanson in September 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Ellis formation--basal bed only</u>					
Je-1	Conglomerate	N.S.	N.M.	--	--
<u>Phosphoria formation--top contact approximately located</u>					
P-23	Sandstone, quartzitic	N.S.	17.0	--	--
P-22	Quartzite	N.S.	4.6	--	--
P-21	Quartzite	N.S.	13.2	--	--
P-20	Sandstone, quartzitic	N.S.	6.0	--	--
P-19	Limestone, chert, and sandstone	N.S.	2.5	--	--
P-18	Chert and mudstone	N.S.	2.0	--	--
P-17	Limestone and chert	N.S.	2.0	--	--
P-16	Mudstone, calcareous, and chert	5593-RWS	1.5	1.4	72.7
P-15	Chert and calcareous mudstone	5592-RWS	1.9	0.9	68.8
P-14	Mudstone, calcareous, and chert	5591-RWS	1.7	1.3	62.4
P-13	Quartzite	N.S.	1.2	--	--
P-12	Chert and limestone	N.S.	5.8	--	--
P-11	Quartzite, phosphatic	N.S.	1.1	--	--
P-10	Limestone and quartzite	N.S.	1.1	--	--
P-9	Chert and quartzite	N.S.	1.6	--	--
P-8	Chert and quartzite	N.S.	0.9	--	--
P-7	Mudstone, calcareous	N.S.	1.1	--	--
P-6	Dolomite, argillaceous	N.S.	0.7	--	--
P-5	Mudstone, calcareous	N.S.	1.0	--	--
P-4	Limestone, argillaceous	N.S.	1.3	--	--
P-3	Limestone, cherty	N.S.	1.3	--	--
P-2	Quartzite, cherty; fos. col. no. 12699	N.S.	1.5	--	--
P-1	Sandstone, calcareous, quartzitic	N.S.	2.9	--	--
Total thickness of Phosphoria formation			73.9		

JEFFERSON CANYON, MONTANA, LOT NUMBER 1355

Phosphoria formation measured and sampled in natural exposure and hand trench about 200 feet above river on west side of Jefferson Canyon in SE $\frac{1}{4}$ sec. 13, T. 1 N., R. 3 W., Madison County, Montana. Beds strike N. 45° E. and dip 45° NW. Section measured by J. A. Peterson and sampled by R. F. Gosman in June 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Ellis formation--basal bed only</u>					
Je-1	Sandstone, conglomeratic	N.S.	5.0	--	--
<u>Phosphoria formation</u>					
P-31	Chert	N.S.	1.5	--	--
P-30	Quartzite and chert	N.S.	10.5	--	--
P-29	Chert and quartzite	N.S.	1.9	--	--
P-28	Chert and mudstone	N.S.	1.2	--	--
P-27	Chert	N.S.	7.8	--	--
P-26	Quartzite	N.S.	1.0	--	--
P-25	Chert	N.S.	2.0	--	--
P-24	Quartzite and phosphatic (?) quartzite	N.S.	3.6	--	--
P-23	Chert, sandy	N.S.	0.5	--	--
P-22	Quartzite	N.S.	2.8	--	--
P-21	Quartzite and chert	N.S.	7.1	--	--
P-20	Sandstone, phosphatic	5384-JAP	0.3	18.6	48.4
P-19	Chert	N.S.	2.9	--	--
P-18	Phosphate rock, cherty	5383-JAP	0.5	18.2	45.0
P-17	Chert	N.S.	1.8	--	--
P-16	Chert, phosphatic	5382-JAP	0.5	15.5	53.6
P-15	Chert	N.S.	0.7	--	--
P-14	Chert, phosphatic	5381-JAP	0.6	17.5	46.8
P-13	Limestone and chert	N.S.	1.7	--	--
P-12	Chert and cherty dolomite	N.S.	10.4	--	--
P-11	Mudstone, phosphatic	5380-JAP	0.5	8.9	64.3
P-10	Chert, argillaceous	5379-JAP	3.6	2.0	75.0
P-9	Phosphate rock, cherty	5378-JAP	0.9	22.1	31.9
P-8	Mudstone, cherty	5377-JAP	3.5	1.1	64.0
P-7	Phosphate rock, argillaceous	5376-JAP	0.9	24.7	32.4
P-6	Mudstone	5375-JAP	0.4	1.7	72.1
P-5	Chert	N.S.	6.3	--	--
P-4	Quartzite; fos. col. no. 12693	5374-JAP	1.3	7.3	77.9
P-3	Mudstone	N.S.	0.5	--	--

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P- 2	Sandstone, conglomeratic, phosphatic	N.S.	0.5	--	--
P- 1	Sandstone, chert, and conglomerate	N.S.	13.5	--	--
Total thickness of Phosphoria formation			91.2		

Quadrant formation--top bed only

Q- 2	Dolomite	N.S.	N.M.	--	--
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SAPPINGTON CANYON, MONTANA, LOT NUMBER 1357

Phosphoria formation measured and sampled in natural exposure along ridge on east side of Jefferson River in sec. 25, T. 1 N., R. 2 W., Gallatin County, Montana. Beds strike N. 80° W. and dip 44° N. Section measured by J. A. Peterson and sampled by R. F. Gosman in July 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Ellis formation--basal bed only</u>					
Je-1	Mudstone, calcareous	N.S.	1.1	--	--
<u>Phosphoria formation</u>					
P-41	Quartzite	N.S.	0.9	--	--
P-40	Sandstone, calcareous, conglomeratic	N.S.	3.0	--	--
P-39	Chert	N.S.	6.5	--	--
P-38	Quartzite, calcareous	N.S.	1.3	--	--
P-37	Chert and sandstone	N.S.	6.9	--	--
P-36	Quartzite, calcareous	N.S.	1.6	--	--
P-35	Chert	N.S.	2.4	--	--
P-34	Quartzite, calcareous	N.S.	3.5	--	--
P-33	Sandstone, calcareous; fos. col. no. 12697	N.S.	6.2	--	--
P-32	Sandstone, calcareous	N.S.	9.3	--	--
P-31	Chert	N.S.	16.0	--	--
P-30	Dolomite, argillaceous	N.S.	1.3	--	--
P-29	Dolomite, argillaceous, and chert	N.S.	6.9	--	--
P-28	Chert	N.S.	2.7	--	--
P-27	Phosphate rock, argillaceous	5483-JAP	0.2	23.0	34.9
P-26	Chert and mudstone	N.S.	3.0	--	--
P-25	Mudstone, phosphatic	5482-JAP	0.2	16.1	47.3
P-24	Mudstone and chert	N.S.	8.0	--	--
P-23	Mudstone	5481-JAP	1.8	2.0	73.6
P-22	Phosphate rock, argillaceous	5480-JAP	0.5	25.3	30.8
P-21	Limestone	5479-JAP	1.2	1.2	6.0
P-20	Phosphate rock, argillaceous, and mudstone	5478-JAP	0.3	17.4	30.7
P-19	Phosphate rock, argillaceous	5477-JAP	0.2	29.1	18.8
P-18	Mudstone, phosphatic	5476-JAP	0.3	8.3	48.7
P-17	Phosphate rock, argillaceous	5475-JAP	1.1	26.8	18.3
P-16	Mudstone, phosphatic, calcareous	5474-JAP	0.5	11.4	30.3
P-15	Mudstone	5473-JAP	0.4	6.8	57.7
P-14	Mudstone	5472-JAP	0.7	4.6	64.7

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P-13	Phosphate rock, argillaceous	5471-JAP	0.3	18.3	38.9
P-12	Mudstone	5470-JAP	2.3	1.5	72.3
P-11	Mudstone, phosphatic	5469-JAP	0.5	11.5	59.0
P-10	Limestone	N.S.	0.9		
P- 9	Chert	N.S.	0.7		
P- 8	Quartzite, calcareous	N.S.	3.0		
P- 7	Chert and dolomite	N.S.	9.5		
P- 6	Dolomite, sandy	N.S.	1.3		
P- 5	Chert and calcareous quartzite	N.S.	6.5		
P- 4	Dolomite, argillaceous	N.S.	6.9		
P- 3	Dolomite, conglomeratic	N.S.	0.5		
P- 2	Dolomite and chert	N.S.	11.2		
P- 1	Sandstone, calcareous	N.S.	16.0		
Total thickness of Phosphoria formation			146.5		
<u>Quadrant formation--top bed only</u>					
Q- 3	Sandstone, calcareous, cherty	N.S.	6.0		

SOUTH BOULDER CREEK, MONTANA, LOT NUMBER 1365

Phosphoria formation measured and sampled in hand trench and natural exposure about 200 feet above and west of Jack Creek in NW¹/₄ sec. 10, T. 1 S., R. 3 W., Madison County, Montana. Beds strike E-W and dip 35° N. Section measured by J. A. Peterson and sampled by R. F. Gosman in August 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Ellis formation--basal bed only</u>					
Je-1	Sandstone, calcareous	N.S.	3.0	--	--
<u>Phosphoria formation</u>					
P-25	Covered (sandstone float in pit)	N.S.	7.0	--	--
P-24	Chert	N.S.	8.3	--	--
P-23	Quartzite, calcareous, phosphatic	N.S.	1.0	--	--
P-22	Chert	N.S.	11.0	--	--
P-21	Mudstone, phosphatic	5569-JAP	0.4	14.4	59.9
P-20	Mudstone, dolomitic	N.S.	1.6	--	--
P-19	Chert, phosphatic	5568-JAP	0.4	16.6	52.5
P-18	Chert	N.S.	0.7	--	--
P-17	Mudstone, phosphatic	5567-JAP	0.5	18.3	47.3
P-16	Dolomite	N.S.	3.0	--	--
P-15	Phosphate rock, argillaceous	5566-JAP	0.5	18.6	45.5
P-14	Chert	N.S.	7.2	--	--
P-13	Mudstone, calcareous	5540-JAP	5.5	1.1	68.06
P-12	Mudstone	5539-JAP	5.5	2.2	74.3
P-11	Phosphate rock, cherty	5538-JAP	0.6	25.8	30.26
P-10	Mudstone, calcareous	5537-JAP	1.7	1.8	71.06
Note: Below bed P-10 occurs a much-weathered porphyry sill 3.6 feet thick.					
P-9	Mudstone	5536-JAP	0.6	2.2	70.0
P-8	Phosphate rock, argillaceous	5535-JAP	0.7	26.2	29.5
P-7	Chert	N.S.	7.6	--	--
P-6	Phosphate rock	5534-JAP	0.3	30.5	11.9
P-5	Quartzite	N.S.	5.3	--	--
P-4	Chert and quartzite	N.S.	5.7	--	--
P-3	Conglomerate	N.S.	1.0	--	--
P-2	Quartzite, calcareous	N.S.	4.0	--	--
P-1	Conglomerate, calcareous	N.S.	1.0	--	--
Total thickness of Phosphoria formation			81.1		

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
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Quadrant formation--top bed only

Q- 5	Dolomite and calcareous sandstone	N.S.	6.5	--	--
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August 1961. Sample analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mineral Laboratory, Albany, Oregon.

Quadrant formation--top bed only

Quadrant formation--top bed only

Q- 1	Dolomite	N.S.	N.S.	--	--
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Quadrant formation

Q-11	Phosphate rock	5553-270	0.4	23.4	13.4
Q-12	Phosphate rock	5554-270	0.4	23.0	13.3
Q-13	Phosphate rock	5555-270	1.0	23.3	17.3
Q-14	Phosphate rock, calcareous	5556-270	0.6	23.4	14.4
Q-15	Phosphate rock	5557-270	1.0	27.0	22.2
Q-16	Mudstone, calcareous	5558-270	1.2	0.9	15.1
Q-17	Phosphate rock, calcareous, and mudstone	5559-270	2.1	24.0	21.0
Q-18	Phosphate rock and mudstone	5560-270	1.3	23.3	17.3
Q-19	Phosphate rock and mudstone	5561-270	1.0	22.3	14.4
Q-20	Phosphate rock, argillaceous	5562-270	0.7	18.7	27.7
Q-21	Phosphate rock and mudstone	5563-270	4.0	21.7	21.0
Q-22	Mudstone, phosphate	5564-270	2.1	15.4	14.4
Q-23	Mudstone, argillaceous	5565-270	1.1	0.3	21.3
Q-24	Mudstone and phosphate rock	5566-270	1.1	15.3	27.3
Q-25	Mudstone and phosphate rock	5567-270	0.3	16.3	27.3
Q-26	Mudstone and phosphate rock	5568-270	1.0	17.4	20.4

Total thickness of D member

26.3

Lower part of Quadrant formation

Q-27	Limestone; for. col. no. 13694	5569	13.0	--	--
Q-28	Sandstone, calcareous	5570	0.5	--	--
Q-29	Dolomite	5571	4.1	--	--
Q-30	Mudstone, sandy	5572	1.0	--	--
Q-31	Limestone	5573	9.3	--	--
Q-32	Dolomite and mudstone	5574	11.0	--	--
Q-33	Limestone and mudstone	5575	4.2	--	--
Q-34	Limestone	5576	7.0	--	--
Q-35	Limestone, sandy, and chert	5577	14.0	--	--
Q-36	Quartzite, calcareous	5578	3.0	--	--

LA MARCHE GULCH, MONTANA, LOT NUMBER 1366

Phosphoria formation measured and sampled in hand trench and natural exposure near La Marche Gulch on west side of Big Hole River in sec. 32, T. 1 S., R. 9 W., Beaverhead County, Montana. Beds strike N. 40° W. and dip 45° SW. Section measured by R. F. Gosman and sampled by J. A. Peterson in August 1951. Samples analyzed for P_2O_5 and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P_2O_5	ACID INSOLUBLE
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Member E of Phosphoria formation--basal bed only

E- 1	Quartzite	N.S.	N.M.	--	--
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Member D of Phosphoria formation

D-16	Phosphate rock	5585-RFG	0.5	28.4	13.4
D-15	Mudstone	5584-RFG	0.4	3.9	68.3
D-14	Limestone	5583-RFG	1.0	4.3	17.7
D-13	Phosphate rock, calcareous	5582-RFG	0.6	22.4	12.1
D-12	Phosphate rock	5581-RFG	1.5	27.0	22.2
D-11	Mudstone, calcareous	5580-RFG	1.2	0.9	73.1
D-10	Phosphate rock, calcareous, and dolomite	5579-RFG	2.1	24.0	2.9
D- 9	Phosphate rock and mudstone	5578-RFG	1.2	22.8	27.8
D- 8	Phosphate rock and mudstone	5577-RFG	3.0	23.2	29.4
D- 7	Phosphate rock, argillaceous	5576-RFG	2.7	18.7	37.7
D- 6	Phosphate rock and mudstone	5575-RFG	4.0	22.7	31.0
D- 5	Mudstone, phosphatic	5574-RFG	2.1	15.4	44.4
D- 4	Limestone, argillaceous	5573-RFG	1.1	0.8	21.8
D- 3	Mudstone and phosphate rock	5572-RFG	1.1	15.8	44.7
D- 2	Mudstone and phosphate rock	5571-RFG	3.3	16.7	43.8
D- 1	Mudstone and phosphate rock	5570-RFG	1.0	13.4	50.7

Total thickness of D member	26.8
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Lower part of Phosphoria formation

P-19	Limestone; fos. col. no. 12696	N.S.	13.0	--	--
P-18	Sandstone, calcareous	N.S.	0.8	--	--
P-17	Dolomite	N.S.	4.1	--	--
P-16	Mudstone, sandy	N.S.	1.0	--	--
P-15	Limestone	N.S.	9.3	--	--
P-14	Dolomite and mudstone	N.S.	11.0	--	--
P-13	Limestone and mudstone	N.S.	4.2	--	--
P-12	Limestone	N.S.	7.5	--	--
P-11	Limestone, sandy, and chert	N.S.	18.0	--	--
P-10	Quartzite, calcareous	N.S.	3.0	--	--

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P- 9	Chert and sandstone	N.S.	3.2	---	---
P- 8	Limestone, sandy, cherty	N.S.	3.0	---	---
P- 7	Quartzite, calcareous	N.S.	6.5	---	---
P- 6	Dolomite, cherty	N.S.	18.0	---	---
P- 5	Dolomite, cherty	N.S.	14.6	---	---
P- 4	Sandstone, cherty	N.S.	2.0	---	---
P- 3	Dolomite, sandy	N.S.	5.5	---	---
P- 2	Sandstone	N.S.	0.8	---	---
P- 1	Dolomite	N.S.	7.2	---	---

Total thickness of lower part of Phosphoria formation 132.7

Quadrant formation--top bed only

Q- 4	Quartzite, calcareous	N.S.	4.0	--	--
Q- 3	Sandstone	N.S.	0.4	0.7	10.1
Q- 2	Sandstone, calcareous	N.S.	0.7	29.8	4.3
Q- 1	Sandstone, calcareous	N.S.	0.3	3.3	20.3
Q- 5	Phosphate rock, calcareous	N.S.	0.4	27.3	3.2
Q- 6	Sandstone, calcareous	N.S.	0.7	70.4	21.0
Q- 7	Sandstone, calcareous	N.S.	1.3	13.1	27.2
Q- 8	Phosphate rock, calcareous	N.S.	0.6	23.1	2.0
Q- 9	Sandstone, calcareous	N.S.	0.8	4.3	21.7
Q- 10	Sandstone, phosphatic	N.S.	0.8	24.3	21.1
Q- 11	Sandstone, phosphatic, calcareous	N.S.	1.3	42.4	21.4
Q- 12	Sandstone, phosphatic	N.S.	0.7	18.0	22.7

Total thickness of Quadrant formation 17.0

Bed 6 of Phosphoria formation--top and basal beds only

P- 6	Sandstone, calc. chert, and 110%	N.S.	0.3	---	---
P- 7	Dolomite, sandy	N.S.	3.2	---	---

Bed 7 of Phosphoria formation

P- 7	Sandstone	N.S.	2.3	---	---
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Total thickness of Phosphoria formation 132.7

Bed 8 of Phosphoria formation--top bed only

P- 8	Dolomite and chert	N.S.	1.3	---	---
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CANYON CREEK NO. 3, MONTANA, LOT NUMBER 1359

Phosphoria formation measured and sampled in hand trench and natural exposure about 1,500 feet northeast of Canyon Creek road on northeast limb of broad syncline in NW $\frac{1}{4}$ sec. 13, T. 2 S., R. 10 W., Beaverhead County, Montana. Beds strike N. 25° W. and dip 38° SW. Section measured by J. A. Peterson and sampled by R. F. Gosman in July 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
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Member E of Phosphoria formation--basal bed only

E- 1	Chert, sandy	N.S.	2.0	--	--
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Member D of Phosphoria formation

D-13	Phosphate rock	5424-JAP	0.9	31.5	15.8
D-12	Limestone	5423-JAP	0.9	1.2	16.1
D-11	Mudstone	5422-JAP	0.4	0.7	64.9
D-10	Phosphate rock, calcareous	5421-JAP	0.9	29.0	4.9
D- 9	Mudstone, calcareous	5420-JAP	0.3	3.6	59.3
D- 8	Phosphate rock, calcareous	5419-JAP	0.4	27.3	5.3
D- 7	Mudstone, phosphatic	5418-JAP	2.2	20.6	22.9
D- 6	Mudstone, phosphatic	5417-JAP	1.5	13.6	47.2
D- 5	Phosphate rock, argillaceous	5416-JAP	3.0	23.7	24.5
D- 4	Mudstone, calcareous	5415-JAP	3.5	4.5	64.5
D- 3	Mudstone, phosphatic	5414-JAP	2.0	10.5	54.1
D- 2	Mudstone, phosphatic, calcareous	5413-JAP	1.2	13.6	38.3
D- 1	Sandstone, phosphatic	5412-JAP	0.7	15.9	45.3

Total thickness of D member			17.9		
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Member C of Phosphoria formation--top and basal beds only

C- 5	Limestone; fos. col. no. 12694	N.S.	4.5	--	--
C- 1	Dolomite, sandy	N.S.	5.0	--	--

Member B of Phosphoria formation

B- 1	Covered	N.S.	16.5	--	--
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Note: Covered interval forms gentle slope between resistant limestone units.

Member A of Phosphoria formation--top bed only

A-10	Dolomite and chert	N.S.	2.0	--	--
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NORTH BIG HOLE CANYON, MONTANA, LOT NUMBER 1358

Members A, B, D, and E of Phosphoria formation measured and sampled in three hand trenches and natural exposure on north side of Big Hole River in NE $\frac{1}{4}$ sec. 3, T. 5 S., R. 8 W., Madison County, Montana, on northwest limb of asymmetrical anticline. Beds strike N. 70° E. and dip 20° N. Section measured by J. A. Peterson and sampled by Peterson and R. F. Gosman in June and July 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Member E of Phosphoria formation--basal bed only</u>					
E- 1	Quartzite	N.S.	26.5	--	--
<u>Member D of Phosphoria formation</u>					
D-38	Chert	5461--JAP	0.6	4.5	82.4
D-37	Mudstone	5460--JAP	1.0	2.4	71.3
D-36	Mudstone	5459--JAP	1.0	4.5	66.4
D-35	Mudstone, phosphatic	5458--JAP	2.2	13.3	45.4
D-34	Phosphate rock, calcareous	5457--JAP	0.6	15.9	12.4
D-33	Mudstone, calcareous	5456--JAP	0.5	4.8	58.6
D-32	Mudstone	5455--JAP	0.8	4.7	60.7
D-31	Phosphate rock	5454--JAP	0.6	23.9	10.9
D-30	Phosphate rock, argillaceous	5453--JAP	0.7	16.4	31.3
D-29	Mudstone, phosphatic	5452--JAP	0.6	11.7	42.3
D-28	Phosphate rock	5451--JAP	1.3	23.7	9.9
D-27	Mudstone	5450--JAP	0.5	7.7	49.7
D-26	Phosphate rock	5449--JAP	1.8	24.3	10.0
D-25	Limestone, phosphatic	5448--JAP	0.8	12.0	8.0
D-24	Phosphate rock, argillaceous	5447--JAP	0.6	19.4	21.3
D-23	Phosphate rock, argillaceous	5446--JAP	0.8	21.9	20.9
D-22	Phosphate rock, argillaceous	5445--JAP	1.7	26.3	15.0
D-21	Phosphate rock, argillaceous	5444--JAP	1.7	17.0	32.6
D-20	Mudstone	5443--JAP	0.4	6.3	59.5
D-19	Phosphate rock, argillaceous	5442--JAP	1.4	16.3	31.7
D-18	Phosphate rock, argillaceous	5441--JAP	1.4	20.6	22.7
D-17	Mudstone, phosphatic	5440--JAP	2.3	14.0	38.5
D-16	Limestone	5439--JAP	0.4	2.3	5.0
D-15	Limestone	5438--JAP	0.7	2.5	5.8
D-14	Limestone	5437--JAP	0.4	3.4	7.7
D-13	Phosphate rock, argillaceous	5436--JAP	0.5	17.6	28.5
D-12	Limestone	5435--JAP	0.6	5.1	9.9
D-11	Mudstone, phosphatic, calcareous	5434--JAP	1.1	9.8	39.3
D-10	Limestone	5433--JAP	1.1	3.5	6.1
D- 9	Mudstone, phosphatic, calcareous	5432--JAP	0.7	7.9	48.9

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
D- 8	Mudstone, phosphatic, calcareous	5431-JAP	0.4	11.5	38.4
D- 7	Limestone	5430-JAP	0.7	3.3	6.1
D- 6	Phosphate rock, argillaceous, calcareous	5429-JAP	0.5	14.7	27.2
D- 5	Limestone	5428-JAP	1.4	2.2	5.5
D- 4	Phosphate rock, argillaceous	5427-JAP	1.5	19.5	27.5
D- 3	Mudstone, phosphatic, calcareous	5426-JAP	1.5	13.8	38.5
D- 2	Phosphate rock, argillaceous	5425-JAP	0.5	23.2	36.0
D- 1	Mudstone, sandy	N.S.	0.5	--	--
Total thickness of D member			35.8		

Member C of Phosphoria formation--not described

Member B of Phosphoria formation

B- 7	Mudstone	5411-JAP	1.2	0.6	85.3
B- 6	Mudstone	5410-JAP	0.8	0.5	86.3
B- 5	Phosphate rock	5409-JAP	0.6	34.0	10.0
B- 4	Mudstone, sandy, calcareous	5408-JAP	0.9	0.8	68.3
B- 3	Sandstone, calcareous	5407-JAP	2.0	0.3	69.0
B- 2	Limestone, sandy, and sandy mudstone	N.S.	3.3	--	--
B- 1	Limestone, sandy, and sandy mudstone	N.S.	4.2	--	--
Total thickness of B member			13.0		

Member A of Phosphoria formation--top bed only

Note: Approximately 50 feet of upper A member not measured. Complete A member measured at South Big Hole Canyon No. 1.

A- 9	Limestone, argillaceous	5390-JAP	1.5	0.3	27.3
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SOUTH BIG HOLE CANYON NO. 1, MONTANA, LOT NUMBER 1354

Members A, C, and D of Phosphoria formation measured and sampled in natural exposure and hand trench near top of ridge on south side of Big Hole River in SE $\frac{1}{4}$ sec. 3, T. 5 S., R. 8 W., Beaverhead County, Montana, on north-west limb of faulted anticline. Beds strike N. 60° E. and dip 20° NW. Section measured by J. A. Peterson and sampled by R. F. Gosman in June 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Member D of Phosphoria formation--basal beds only</u>					
D-8	Mudstone, phosphatic	5468-JAP	1.0	12.6	49.1
D-7	Phosphate rock, argillaceous	5467-JAP	1.6	25.4	22.4
D-6	Phosphate rock, calcareous, argillaceous	5466-JAP	3.0	20.3	29.5
D-5	Limestone	5465-JAP	1.1	1.1	4.1
D-4	Phosphate rock, argillaceous	5464-JAP	1.3	16.2	39.1
D-3	Limestone, argillaceous	5463-JAP	1.4	1.8	40.2
D-2	Phosphate rock, argillaceous	5462-JAP	1.8	17.3	42.5
D-1	Mudstone	N.S.	4.0	--	--
Total thickness of measured section			15.2		

Member C of Phosphoria formation--top and basal beds only

C-5	Limestone	N.S.	3.3	--	--
C-1	Chert	N.S.	6.6	--	--

Note: Member B apparently lenses out at this locality. Mudstones of member B at North Big Hole Canyon may be represented by upper part of unit A-5 here.

Member A of Phosphoria formation--top bed only

A-5	Chert and limestone	N.S.	19.0	--	--
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SOUTH BIG HOLE CANYON NO. 2, MONTANA, LOT NUMBER 1354

Member B of Phosphoria formation measured and sampled in hand trench along ridge about 1 mile south of Big Hole River in SE $\frac{1}{4}$ sec. 9, T. 5 S., R. 8 W., Beaverhead County, Montana. Section measured by J. A. Peterson and sampled by R. F. Gosman in June 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
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Member C of Phosphoria formation--basal bed only

C-1	Chert	N.S.	6.0	--	--
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Member B of Phosphoria formation

B-8	Mudstone	5399-JAP	2.7	1.7	79.7
B-7	Mudstone	5398-JAP	1.4	6.7	68.0

Note: 5406-JAP is sample of thin bed of phosphate rock contained in bed B-7 near the middle.

	Phosphate rock	5406-JAP	(0.2)	30.1	18.3
B-6	Phosphate rock	5397-JAP	0.3	33.0	10.7
B-5	Phosphate rock	5396-JAP	0.5	34.4	7.3
B-4	Phosphate rock	5395-JAP	1.0	37.6	2.8
B-3	Phosphate rock, sandy	5394-JAP	0.5	20.5	39.2
B-2	Mudstone, calcareous, sandy	5393-JAP	1.2	0.4	69.9
B-1	Mudstone, sandy, calcareous	5392-JAP	5.2	0.2	69.9

Total thickness of B member	12.8
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Member A of Phosphoria formation--top bed only

A-1	Limestone and chert	N.S.	17.3	--	--
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INDIAN CREEK, MONTANA, LOT NUMBER 1362

Phosphoria formation measured and sampled at natural exposure on north side of Indian Creek in sec. 20, T. 8 S., R. 2 E., Madison County, Montana. Section measured by R. F. Gosman and sampled by J. A. Peterson in August 1951. Samples analyzed for P_2O_5 and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P_2O_5	ACID INSOLUBLE
<u>Dinwoody formation---basal bed only</u>					
TrD-1	Sandstone, calcareous	N.S.	0.5	--	--
<u>Phosphoria formation</u>					
P- 16	Quartzite	N.S.	78.0	--	--
P- 15	Chert	N.S.	39.0	--	--
P- 14	Phosphate rock and mudstone	5497-RFG	0.3	23.9	32.3
P- 13	Limestone	5496-RFG	0.4	1.7	10.3
P- 12	Phosphate rock, calcareous, and phosphatic mudstone	5495-RFG	2.0	23.9	16.3
P- 11	Phosphate rock	5494-RFG	1.1	31.9	3.9
P- 10	Mudstone, calcareous	5493-RFG	1.0	3.8	63.3
P- 9	Dolomite	5492-RFG	0.4	1.6	8.1
P- 8	Mudstone and phosphate rock	5491-RFG	0.7	19.5	26.5
P- 7	Mudstone, phosphatic	5490-RFG	0.6	15.0	47.5
P- 6	Quartzite, calcareous	N.S.	5.7	--	--
P- 5	Mudstone, calcareous, and quartzite	N.S.	4.5	--	--
P- 4	Quartzite	N.S.	6.5	--	--
P- 3	Mudstone, sandy	N.S.	3.4	--	--
P- 2	Sandstone, dolomitic, and sandy dolomite	N.S.	8.7	--	--
P- 1	Sandstone, calcareous	N.S.	0.3	--	--
Total thickness of Phosphoria formation			152.6		
<u>Quadrant formation---top bed only</u>					
Q- 2	Sandstone, dolomitic	N.S.	17.0	--	--

CINNABAR MOUNTAIN, MONTANA, LOT NUMBER 1363

Phosphoria formation measured and sampled in natural exposure on east side of Cinnabar Mountain, sec. 31, T. 8 S., R. 8 E., Park County, Montana. Beds strike N. 50° W. and dip 75° SW. Section measured by J. A. Peterson and sampled by R. F. Gosman in August 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Dinwoody formation---basal bed only</u>					
TrD-1	Limestone; fos. col. no. 12695	N.S.	4.8	---	---
<u>Phosphoria formation</u>					
P- 17	Quartzite, calcareous	N.S.	6.5	---	---
P- 16	Chert and dolomite	N.S.	11.8	---	---
P- 15	Quartzite	N.S.	7.2	---	---
P- 14	Dolomite	N.S.	2.5	---	---
P- 13	Quartzite, cherty, calcareous	N.S.	8.0	---	---
P- 12	Quartzite, cherty	N.S.	7.0	---	---
P- 11	Chert and calcareous mudstone	5530-JAP	1.3	2.1	72.7
P- 10	Chert, argillaceous	5529-JAP	2.0	3.4	71.9
P- 9	Mudstone, calcareous; contains gypsum	5528-JAP	0.8	4.9	64.5
P- 8	Phosphate rock, argillaceous	5527-JAP	2.3	19.9	35.8
P- 7	Limestone	5526-JAP	1.0	8.3	9.3
P- 6	Phosphate rock, argillaceous, calcareous	5519-JAP	2.2	21.6	23.03
P- 5	Phosphate rock, argillaceous, calcareous	5518-JAP	1.7	21.3	23.7
P- 4	Phosphate rock, calcareous	5517-JAP	1.5	23.4	17.5
P- 3	Mudstone, calcareous, phosphatic	5516-JAP	1.4	12.6	32.5
P- 2	Phosphate rock, argillaceous, calcareous	5499-JAP	0.7	16.8	36.3
P- 1	Conglomerate, phosphatic	5498-JAP	1.0	12.4	49.6
Total thickness of Phosphoria formation			58.9		

Quadrant formation---top bed only

Q- 2	Sandstone, calcareous, argillaceous	N.S.	3.0	---	---
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LONDON RIDGE, MONTANA, LOT NUMBER 1361

Part of member B of Phosphoria formation measured and sampled in bulldozer trench in SW $\frac{1}{4}$ sec. 27, T. 12 S., R. 2 W., Beaverhead County, Montana. Beds strike E-W and dip 25° W. Section measured by J. A. Peterson and sampled by Peterson and R. F. Gosman in August 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Member C of Phosphoria formation---basal bed only</u>					
C-1	Quartzite, phosphatic	N.S.	3.0	--	--
<u>Member B of Phosphoria formation</u>					
B-6	Phosphate rock, sandy	5489-JAP	0.2	19.3	41.5
B-5	Phosphate rock, cherty	5488-JAP	0.4	18.7	46.4
B-4	Phosphate rock	5487-JAP	1.1	28.8	18.0
B-3	Phosphate rock, sandy	5486-JAP	1.4	27.6	20.5
B-2	Phosphate rock, argillaceous, calcareous	5485-JAP	1.1	28.7	18.3
B-1	Phosphate rock, cherty	5484-JAP	1.2	26.3	20.6
Total thickness of B member			5.4		
<u>Member A of Phosphoria formation---top bed only</u>					
A-1	Chert, calcareous	N.S.	0.6	--	--

BEAR CREEK, IDAHO, LOT NUMBER 1353

Phosphatic shale and upper shale member of the Phosphoria formation sampled near Bear Creek, NE $\frac{1}{4}$ sec. 31, T. 1 S., R. 45 E., Bonneville County, Idaho, on the west limb of an anticline trending N. 35° W. and plunging southeast. Beds strike N. 70° W. and dip from 45° to 75° S. Section measured by R. P. Sheldon, T. M. Cheney, R. G. Waring, and M. A. Warner in August 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Dinwoody formation--lower bed only</u>					
Din-1	Siltstone	N.S.	1.2	---	---
<u>Upper shale member of Phosphoria formation</u>					
U- 3	Mudstone	N.S.	0.9	---	---
U- 2	Mudstone	N.S.	1.2	---	---
U- 1	Phosphate rock, argillaceous	6571-MAW	0.9	23.8	28.5
<u>Rex chert member of Phosphoria formation</u>					
R- 4	Chert; fos. col. no. 12536	N.S.	24.0	---	---
R- 3	Covered; rocks probably faulted	N.S.	?	---	---
R- 2	Mudstone, cherty	N.S.	2.3	---	---
R- 1	Mudstone, cherty	N.S.	1.4	---	---
<u>Phosphatic shale member of Phosphoria formation</u>					
P- 61	Phosphate rock	6567-MAW	0.6	31.8	15.0
P- 60	Phosphate rock	6566-MAW	2.3	29.5	13.1
P- 59	Phosphate rock	6565-MAW	1.0	35.9	6.8
P- 58	Phosphate rock	6564-MAW	1.9	36.5	5.2
P- 57	Phosphate rock; fos. col. no. 12534	6563-MAW	1.1	34.8	3.3
P- 56	Phosphate rock; fos. col. no. 12534	6562-MAW	1.6	36.2	2.0
P- 55	Phosphate rock; fos. col. no. 12534	6561-MAW	1.3	35.6	2.2
P- 54	Phosphate rock and mudstone; fos. col. no. 12534	6560-MAW	1.2	24.0	29.1
P- 53	Phosphate rock; fos. col. no. 12534	6559-MAW	1.4	35.2	3.8
P- 52	Phosphate rock	6558-MAW	0.3	32.3	10.9
P- 51	Mudstone and phosphate rock	6557-MAW	0.6	12.1	57.2
P- 50	Mudstone	6556-MAW	1.3	3.66	78.0
P- 49	Phosphate rock and mudstone	6555-MAW	0.5	24.9	21.9
P- 48	Mudstone	6554-MAW	0.5	4.08	75.0
P- 47	Phosphate rock, argillaceous	6553-MAW	0.7	21.2	26.0

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P- 46	Mudstone, calcareous, phosphatic	6552-MAW	1.0	10.0	48.7
P- 45	Mudstone	6551-MAW	2.0	0.3	76.6
P- 44	Mudstone	6550-MAW	2.6	5.8	68.0
P- 43	Siltstone	6549-RGW	0.9	1.0	82.9
P- 42	Siltstone	6548-RGW	0.5	4.5	75.0
P- 41	Siltstone	6547-RGW	1.5	0.4	84.9
P- 40	Mudstone, calcareous	6546-TMC	1.3	7.7	55.3
P- 39	Mudstone, calcareous	6545-TMC	1.6	5.1	54.3
P- 38	Mudstone	6544-TMC	0.6	6.6	64.2
P- 37	Mudstone	6543-TMC	1.2	3.0	78.9
P- 36	Mudstone, phosphatic	6542-TMC	1.3	14.1	44.5
P- 35	Mudstone	6541-TMC	0.5	5.9	71.1
P- 34	Mudstone, phosphatic, calcareous	6540-TMC	0.7	13.7	43.5
P- 33	Mudstone, phosphatic	6539-TMC	0.4	9.4	61.1
P- 32	Phosphate rock, argillaceous, and mudstone	6538-TMC	0.7	17.5	35.4
P- 31	Mudstone, calcareous, phosphatic	6537-TMC	0.7	8.4	47.3
P- 30	Mudstone and calcareous, argillaceous phosphate rock	6536-TMC	1.3	14.6	35.7
P- 29	Phosphate rock, calcareous	6535-TMC	0.9	28.4	9.7
P- 28	Phosphate rock and calcareous mudstone	6534-TMC	1.2	26.8	12.5
P- 27	Mudstone	6533-TMC	1.0	3.4	77.3
P- 26	Mudstone	6532-TMC	0.7	2.9	78.7
P- 25	Mudstone, calcareous	6531-TMC	0.5	7.5	56.1
P- 24	Mudstone	6530-TMC	0.8	5.0	69.0
P- 23	Mudstone and phosphatic, calcareous mudstone	6529-TMC	0.7	10.0	46.5
P- 22	Mudstone and calcareous, phosphatic mudstone	6528-TMC	0.7	13.0	40.5
P- 21	Mudstone, calcareous	6527-TMC	0.4	4.9	57.3
P- 20	Phosphate rock, argillaceous, calcareous	6526-TMC	0.7	19.2	27.5
P- 19	Phosphate rock, argillaceous, calcareous	6525-TMC	0.4	19.3	28.3
P- 18	Mudstone, phosphatic, and calcareous mudstone	6524-RPS	0.5	12.2	40.9
P- 17	Phosphate rock, calcareous	6523-RPS	1.0	24.8	17.4
P- 16	Phosphate rock, argillaceous	6522-RPS	0.9	22.8	22.9
P- 15	Phosphate rock, argillaceous, calcareous	6521-RPS	0.6	20.4	27.0
P- 14	Phosphate rock, argillaceous	6520-RPS	0.9	18.4	30.5
P- 13	Phosphate rock	6519-RPS	1.3	27.1	11.7
P- 12	Phosphate rock, calcareous, argillaceous	6518-RPS	1.0	22.6	21.9

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P- 11	Phosphate rock	6517--RPS	1.0	25.2	19.0
P- 10	Mudstone, calcareous	6516--RPS	0.8	7.0	64.5
P- 9	Phosphate rock, calcareous	6515--RPS	1.4	27.2	6.2
P- 8	Phosphate rock	6514--RPS	1.0	32.8	4.6
P- 7	Phosphate rock, calcareous	6513--RPS	0.3	26.5	15.0
P- 6	Phosphate rock	6512--RPS	1.8	31.5	9.1
P- 5	Siltstone	6511--RPS	1.6	0.9	83.1
P- 4	Phosphate rock	6510--RPS	1.0	31.2	6.5
P- 3	Mudstone	6509--RPS	1.3	5.0	69.1
P- 2	Phosphate rock	6508--RPS	0.4	31.7	6.6
P- 1	Limestone, argillaceous, and mudstone	6570--RPS	2.0	1.7	36.3
Total thickness of phosphatic shale member			61.9		

Wells formation--top bed only

W- 24 Dolomite, sandy; fos. col. no.
12531

N.S. 2.7 -- --

FORT HALL INDIAN RESERVATION, IDAHO, LOT NUMBER 1349

Upper portion of phosphatic shale member of Phosphoria formation sampled in trench of Westvaco Company about 1 mile east of J. R. Simplot Company mine and Fort Hall Indian Reservation, sec. 23 (?), T. 4 S., R. 37 E., Bingham County, Idaho. Beds strike N. 50° W. and dip 25° S. Section measured and sampled by M. A. Warner and R. A. Smart in July 1951. Samples analyzed for P_2O_5 and acid insoluble by Trace Elements Section Laboratory, Denver, Colorado.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P_2O_5	ACID INSOLUBLE
<u>Rex member of Phosphoria formation--lower bed only</u>					
R- 1	Mudstone, cherty	N.S.	2.5	---	---
<u>Phosphatic shale member of Phosphoria formation</u>					
P-67	Mudstone	N.S.	0.6	---	---
P-66	Mudstone and mantle	N.S.	11.5	---	---
P-65	Phosphate rock, argillaceous	6337-RAS	1.8	18.9	42.1
P-64	Mudstone	6336-RAS	2.6	5.25	73.0
Note: Beds P-64 to P-67 badly weathered and slumped.					
P-63	Mudstone	6335-RAS	1.6	1.40	84.7
P-62	Phosphate rock	6334-RAS	1.5	28.0	16.3
P-61	Mudstone	6333-RAS	3.5	6.80	72.3
P-60	Mudstone	6332-RAS	2.5	7.65	70.6
P-59	Phosphate rock, argillaceous, calcareous	6331-MAW	2.3	20.0	37.4
Note: Beds P-59 to P-61 badly weathered.					
P-58	Phosphate rock	6330-MAW	0.6	29.5	16.8
P-57	Mudstone, phosphatic	6329-MAW	2.8	8.15	66.5
P-56	Phosphate rock, argillaceous	6328-MAW	0.6	26.8	23.7
P-55	Phosphate rock, argillaceous	6327-MAW	2.1	18.0	42.0
P-54	Mudstone, phosphatic	6326-MAW	1.5	10.8	58.7
P-53	Mudstone, phosphatic	5325-MAW	2.6	15.4	44.2
P-52	Mudstone, phosphatic	6324-MAW	3.0	17.0	44.4
P-51	Phosphate rock	6323-MAW	1.1	32.8	9.14
P-50	Mudstone	6322-MAW	0.6	6.85	72.0
P-49	Phosphate rock	6321-MAW	1.5	33.0	11.8
Note: 6321-MAW correlates with 2720-WOM of lot no. 1269.					
Total thickness of measured section			44.3		

SNOWDRIFT MOUNTAIN, IDAHO, LOT NUMBER 1372

Phosphatic shale member of the Phosphoria formation measured and sampled on Snowdrift Mountain, NW $\frac{1}{4}$ NW $\frac{1}{4}$, sec. 8, T. 10 S., R. 45 E., Caribou County, Idaho, on the east limb of the Georgetown syncline. Beds strike N. 20° E. and dip 65° W. Section measured and sampled by T. M. Cheney, J. A. Peterson, R. G. Waring, R. A. Smart, and E. R. Cressman in September 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
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Rex member of Phosphoria formation--basal bed only

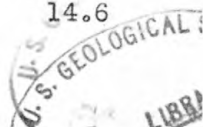
R- 1	Chert and mudstone	6775-JAP	2.6	2.3	75.3
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Phosphatic shale member of Phosphoria formation

P-156	Phosphate rock, argillaceous	6774-JAP	0.5	29.5	21.3
P-155	Mudstone	6773-JAP	0.8	2.4	75.5
P-154	Mudstone	6772-JAP	1.0	7.3	60.8
P-153	Mudstone; fos. col. no. 12595	6771-JAP	1.9	1.2	81.4
P-152	Mudstone; fos. col. no. 12595	6770-JAP	6.0	1.6	78.5
P-151	Mudstone	6769-JAP	6.2	3.6	73.0
P-150	Mudstone, calcareous	6768-JAP	1.2	6.5	53.4

Note: Bed P-150 is highly weathered.

P-149	Mudstone; fos. col. no. 12594	6767-JAP	1.4	6.4	68.9
P-148	Mudstone	6766-JAP	2.1	1.8	80.7
P-147	Mudstone, calcareous, phosphatic	6765-JAP	0.6	9.3	51.0
P-146	Phosphate rock	6764-JAP	0.5	30.9	12.6
P-145	Mudstone; fos. col. no. 12593	6763-JAP	2.0	1.5	80.4
P-144	Mudstone	6762-JAP	0.7	2.7	73.4
P-143	Phosphate rock	6761-JAP	1.0	36.2	2.5
P-142	Phosphate rock	6760-JAP	0.5	35.7	2.8
P-141	Phosphate rock	6759-JAP	0.9	34.7	5.2
P-140	Mudstone	6758-JAP	1.6	4.4	71.1
P-139	Phosphate rock and mudstone	6757-ERC	1.1	23.4	28.2
P-138	Phosphate rock, argillaceous	6756-ERC	1.9	27.4	20.6
P-137	Phosphate rock	6755-ERC	0.8	32.0	10.03
P-136	Phosphate rock	6754-ERC	1.7	33.6	6.63
P-135	Phosphate rock	6753-ERC	0.9	30.3	13.3
P-134	Phosphate rock, argillaceous	6752-RGW	0.6	17.7	40.6
P-133	Phosphate rock, argillaceous, and phosphatic mudstone	6751-RGW	0.8	23.4	26.5
P-132	Phosphate rock	6750-RGW	0.6	34.6	6.3
P-131	Phosphate rock	6749-RGW	0.8	29.9	14.6



BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P-130	Phosphate rock	6748-RGW	0.8	36.7	1.2
P-129	Phosphate rock	6747-RGW	0.8	36.6	2.3
P-128	Phosphate rock	6746-RGW	0.7	34.5	7.7
P-127	Phosphate rock	6745-RGW	1.1	26.9	16.6
P-126	Phosphate rock	6744-RGW	1.4	31.6	8.2
P-125	Phosphate rock	6743-RGW	1.4	28.5	12.9
P-124	Phosphate rock	6742-RGW	1.2	26.5	15.4
P-123	Phosphate rock	6741-RGW	1.5	25.8	16.8
P-122	Phosphate rock	6740-RGW	0.8	23.6	19.2
P-121	Phosphate rock, argillaceous	6739-RGW	1.3	18.6	30.2
P-120	Mudstone, phosphatic	6738-RGW	0.7	11.7	50.3
P-119	Mudstone	6737-RGW	1.7	5.3	68.7
P-118	Mudstone, phosphatic	6736-RGW	1.0	12.4	47.9
P-117	Phosphate rock, argillaceous, calcareous	6735-RGW	0.8	14.9	34.7
P-116	Phosphate rock, argillaceous	6734-RGW	1.6	19.6	34.3
P-115	Mudstone, phosphatic	6733-RGW	0.7	11.4	54.1
P-114	Phosphate rock, argillaceous	6732-RGW	1.5	18.6	38.9
P-113	Mudstone, phosphatic	6731-RGW	0.6	15.7	43.2
P-112	Phosphate rock	6730-RGW	1.3	26.9	19.2
P-111	Mudstone	6729-RGW	0.6	3.2	80.2
P-110	Mudstone, phosphatic	6728-RGW	1.3	7.8	69.4
P-109	Phosphate rock, argillaceous	6727-RGW	0.7	23.6	25.2
P-108	Mudstone, phosphatic; fos. col. no. 12592	6726-RGW	1.4	12.7	55.3
P-107	Mudstone, phosphatic	6725-RGW	1.8	8.7	64.9
P-106	Mudstone	6724-RGW	1.4	5.6	69.0
P-105	Phosphate rock, argillaceous, and mudstone	6723-RGW	1.0	13.5	48.7
P-104	Phosphate rock, argillaceous	6722-RGW	0.6	22.8	30.8
P-103	Mudstone, phosphatic, and mudstone	6721-RGW	1.9	8.1	59.9
P-102	Mudstone	6720-RGW	2.5	3.8	76.06
P-101	Mudstone	6719-RAS	1.3	7.4	58.5
P-100	Mudstone	6718-RAS	1.7	5.5	67.0
P- 99	Mudstone	6717-RAS	0.9	2.2	78.3
P- 98	Mudstone	6716-RAS	3.3	3.3	72.0
P- 97	Phosphate rock, argillaceous, calcareous	6715-RAS	0.7	15.7	35.0
P- 96	Mudstone, phosphatic; fos. col. no. 12591	6714-RAS	1.3	8.4	64.0
P- 95	Mudstone, phosphatic, calcareous	6713-RAS	0.5	10.3	47.7
P- 94	Phosphate rock, argillaceous	6712-RAS	0.6	18.3	32.9
P- 93	Phosphate rock	6711-RAS	0.5	31.5	8.4

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P- 92	Phosphate rock, argillaceous, and phosphate rock	6710-RAS	0.5	19.9	26.9
P- 91	Mudstone, phosphatic	6709-RAS	0.4	14.1	47.2
P- 90	Mudstone, phosphatic	6708-RAS	0.4	11.3	54.4
P- 89	Phosphate rock, argillaceous	6707-RAS	0.7	21.9	32.7
P- 88	Mudstone	6706-RAS	1.8	4.2	79.4
P- 87	Limestone	6705-RAS	3.5	1.3	18.7
P- 86	Mudstone, cherty, phosphatic	6704-RAS	0.5	9.6	64.6
P- 85	Mudstone	6703-RAS	0.9	2.7	82.6
P- 84	Phosphate rock, argillaceous, cherty; fos. col. no. 12590	6702-RAS	0.8	22.7	32.5
P- 83	Mudstone, phosphatic	6701-RAS	0.9	9.5	64.0
P- 82	Phosphate rock, argillaceous	6700-RAS	0.4	19.3	33.6
P- 81	Mudstone	6699-RAS	2.2	--	--
P- 80	Mudstone and phosphatic mudstone	6698-TMC	0.7	12.9	38.4
P- 79	Phosphate rock, argillaceous, calcareous	6697-TMC	1.0	15.4	28.9
P- 78	Mudstone and argillaceous, calcareous phosphate rock	6696-TMC	0.5	18.6	26.8
P- 77	Mudstone	6695-TMC	1.0	6.3	64.2
P- 76	Phosphate rock	6694-TMC	0.7	22.3	18.5
P- 75	Mudstone, phosphatic, calcareous	6693-TMC	0.7	11.3	45.6
P- 74	Phosphate rock, argillaceous	6692-TMC	0.5	15.9	38.2
P- 73	Mudstone, phosphatic	6691-TMC	0.6	9.4	52.5
P- 72	Phosphate rock, argillaceous; phosphatic mudstone, and mudstone	6690-TMC	1.1	12.9	38.4
P- 71	Phosphate rock, argillaceous, and mudstone	6689-TMC	0.7	16.3	33.2
P- 70	Mudstone, calcareous, phosphatic	6688-TMC	0.8	9.5	42.1
P- 69	Mudstone, phosphatic; mudstone, and argillaceous phosphate rock	6687-TMC	0.5	16.8	55.9
P- 68	Mudstone, phosphatic	6686-TMC	0.8	14.7	39.1
P- 67	Mudstone, phosphatic	6685-TMC	2.2	11.6	45.7
P- 66	Mudstone	6684-TMC	2.0	2.6	71.7
P- 65	Mudstone	6683-TMC	3.1	0.5	92.5
P- 64	Mudstone, cherty	6682-TMC	1.2	0.3	88.5
P- 63	Mudstone	6681-TMC	1.6	2.4	74.6
P- 62	Mudstone	6680-TMC	2.2	3.9	69.3
P- 61	Mudstone	6679-TMC	4.5	4.4	70.9
P- 60	Mudstone	6678-TMC	2.0	2.2	71.8
P- 59	Mudstone, phosphatic	6677-TMC	1.9	12.4	48.9
P- 58	Phosphate rock, argillaceous	6676-TMC	0.7	18.7	35.6
P- 57	Mudstone, phosphatic	6675-TMC	1.7	9.4	59.1

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P- 56	Phosphate rock, argillaceous	6674-TMC	0.8	20.2	30.1
P- 55	Phosphate rock, argillaceous	6673-TMC	1.0	20.8	27.7
P- 54	Phosphate rock, argillaceous, calcareous	6672-TMC	0.5	17.7	29.3
P- 53	Phosphate rock, argillaceous, and calcareous mudstone	6671-TMC	0.5	17.1	33.4
P- 52	Phosphate rock, argillaceous, and phosphatic mudstone	6670-TMC	1.1	17.5	37.1
P- 51	Mudstone	6669-TMC	0.7	7.6	65.8
P- 50	Mudstone, phosphatic	6668-TMC	0.9	13.6	45.9
P- 49	Mudstone, phosphatic	6667-TMC	1.2	14.4	42.5
P- 48	Mudstone, phosphatic, and mudstone	6666-TMC	0.9	19.2	30.5
P- 47	Phosphate rock, argillaceous	6665-TMC	0.5	19.1	29.7
P- 46	Phosphate rock, argillaceous	6664-TMC	1.0	16.7	34.5
P- 45	Mudstone, phosphatic	6663-TMC	2.6	12.4	46.6
P- 44	Mudstone, phosphatic	6662-TMC	0.9	13.1	47.3
P- 43	Phosphate rock, argillaceous	6661-TMC	0.7	21.9	25.4
P- 42	Phosphate rock, argillaceous	6660-TMC	1.1	19.1	32.2
P- 41	Phosphate rock, calcareous	6659-TMC	0.6	23.4	18.7
P- 40	Phosphate rock	6658-TMC	0.5	25.2	14.1
P- 39	Phosphate rock	6657-TMC	1.3	25.0	16.7
P- 38	Phosphate rock, argillaceous	6656-TMC	0.8	24.6	21.1
P- 37	Phosphate rock	6655-TMC	1.1	31.2	6.9
P- 36	Phosphate rock	6654-TMC	0.7	25.5	18.9
P- 35	Mudstone, calcareous	6653-TMC	0.4	3.5	47.1
P- 34	Phosphate rock	6652-TMC	0.7	23.7	18.1
P- 33	Phosphate rock	6651-TMC	0.6	26.4	11.4
P- 32	Phosphate rock, argillaceous, and mudstone	6650-TMC	0.6	21.8	25.3
P- 31	Phosphate rock	6649-TMC	0.6	24.8	20.1
P- 30	Mudstone, phosphatic	6648-JAP	2.0	12.7	52.9
P- 29	Mudstone, phosphatic	6647-JAP	3.0	11.2	53.5
P- 28	Mudstone	6646-JAP	2.5	7.6	64.8
P- 27	Phosphate rock, argillaceous	6645-JAP	1.2	21.5	29.5
P- 26	Phosphate rock	6644-JAP	1.0	29.6	15.2
P- 25	Phosphate rock	6643-JAP	2.9	27.1	18.1
P- 24	Phosphate rock, argillaceous	6642-JAP	1.8	23.2	28.4
P- 23	Mudstone, phosphatic	6641-JAP	1.9	12.6	52.9
P- 22	Phosphate rock; fos. col. no. 12558	6640-JAP	3.5	27.3	19.3
P- 21	Phosphate rock	6639-JAP	0.6	28.8	15.9
P- 20	Phosphate rock	6638-JAP	0.8	29.5	14.2
P- 19	Phosphate rock	6637-JAP	2.2	28.1	17.1

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P- 18	Phosphate rock, argillaceous	6636-JAP	2.1	21.7	30.1
P- 17	Phosphate rock	6635-JAP	0.6	30.6	15.7
P- 16	Mudstone, phosphatic	6634-JAP	0.7	11.5	50.3
P- 15	Phosphate rock, argillaceous; fos. col. no. 12587	6633-JAP	2.7	23.3	27.9
P- 14	Phosphate rock, argillaceous, and phosphatic mudstone	6632-JAP	1.4	17.7	39.4
P- 13	Phosphate rock	6631-JAP	0.9	32.6	6.7
P- 12	Phosphate rock	6630-JAP	0.9	33.7	3.3
P- 11	Phosphate rock	6629-JAP	1.5	33.4	3.5
P- 10	Phosphate rock	6628-JAP	1.5	34.9	2.3
P- 9	Phosphate rock	6627-JAP	2.2	32.3	6.0
P- 8	Limestone, argillaceous	6626-JAP	2.6	1.0	38.0
P- 7	Limestone, argillaceous	6625-JAP	2.0	0.4	34.1
P- 6	Limestone, argillaceous	6624-JAP	2.0	0.9	45.7
P- 5	Phosphate rock	6623-JAP	0.5	33.8	6.5
P- 4	Limestone	6622-JAP	0.9	1.2	2.8
P- 3	Phosphate rock, calcareous; fos. col. no. 12585	6621-JAP	0.7	29.4	4.1
P- 2	Dolomite, argillaceous; fos. col. no. 12584	6620-JAP	1.2	0.7	27.8
P- 1	Phosphate rock; fos. col. no. 12583	6619-JAP	0.7	32.3	6.2
Total thickness of phosphatic shale member			199.5		

Wells formation--top bed only

W- 1	Dolomite, siliceous	N.S.	N.M.		
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MUD SPRING, IDAHO, LOT NUMBER 1351

Phosphatic shale member of the Phosphoria formation measured and sampled near Mud Spring, sec. 7, T. 12 S., R. 29 E., Cassia County, Idaho. Beds strike N. 75° W. and dip 30° S. Section measured and sampled by T. M. Cheney, R. A. Smart, R. G. Waring, and M. A. Warner in July 1951. Samples analyzed for P_2O_5 and acid insoluble by Trace Elements Section Laboratory, Denver, Colorado.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P_2O_5	ACID INSOLUBLE
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Rex member of Phosphoria formation--basal bed only

R- 1	Mudstone	N.S.	3.8	--	--
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Phosphatic shale member of Phosphoria formation

P-47	Siltstone, phosphatic, calcareous	6454-RGW	1.4	10.2	52.6
P-46	Mudstone, calcareous	6453-RGW	0.9	6.95	62.8
P-45	Siltstone	6452-RGW	2.0	3.10	75.1
P-44	Mudstone	6451-RGW	2.0	2.65	79.1
P-43	Mudstone	6450-RGW	2.0	4.50	73.2

P-42	Siltstone and argillaceous phosphate rock	6449-RGW	1.0	10.8	59.2
P-41	Mudstone, phosphatic	6448-RGW	1.0	11.6	57.4

Note: Beds P-41 to P-46 are highly crumpled, slumped, and weathered. Thicknesses are only approximate.

P-40	Siltstone	6447-RGW	5.2	4.85	71.8
P-39	Siltstone, phosphatic	6446-RGW	2.3	9.50	58.7
P-38	Mudstone and phosphatic siltstone	6445-RGW	2.4	10.4	57.2
P-37	Siltstone, phosphatic; fos. col. no. 12641	6444-RGW	1.4	9.65	58.7
P-36	Mudstone, cherty, phosphatic, and siltstone	6443-RGW	1.9	9.05	62.1
P-35	Mudstone	6442-TMC	2.2	7.50	69.0
P-34	Mudstone and chert; fos. col. no. 12639	6441-TMC	0.6	7.20	66.1
P-33	Mudstone	6440-TMC	2.0	5.70	70.0
P-32	Phosphate rock, argillaceous; fos. col. no. 12640	6439-TMC	0.9	21.8	33.0
P-31	Phosphate rock	6438-TMC	2.0	28.4	17.6
P-30	Phosphate rock, argillaceous	6437-TMC	1.4	23.3	32.5
P-29	Mudstone, phosphatic, and argillaceous phosphate rock	6436-TMC	1.0	19.2	42.2
P-28	Mudstone, phosphatic	6435-TMC	2.2	10.4	64.4
P-27	Phosphate rock, argillaceous	6434-RAS	2.0	19.5	40.4
P-26	Mudstone, phosphatic	6433-RAS	0.7	16.4	46.2

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P-25	Mudstone, phosphatic	6432--RAS	1.0	9.35	66.8
P-24	Mudstone, phosphatic	6431--RAS	1.1	10.0	64.1
P-23	Mudstone	6430--RAS	0.8	7.75	71.6
P-22	Mudstone	6429--RAS	3.2	2.20	86.7
P-21	Mudstone	6428--RAS	2.5	4.90	78.1
P-20	Mudstone	6427--RAS	1.4	2.20	86.1
P-19	Mudstone	6426--RAS	1.0	6.50	71.1
P-18	Mudstone	6425--MAW	2.2	0.75	84.8
Note: Beds P-18 and P-19 are highly weathered.					
P-17	Mudstone, phosphatic	6424--MAW	3.5	9.15	61.9
P-16	Mudstone	6423--MAW	4.0	6.75	70.5
P-15	Mudstone	6422--MAW	4.0	1.80	88.7
P-14	Mudstone	6421--MAW	3.9	0.95	92.0
P-13	Phosphate rock	6420--MAW	1.0	32.3	15.9
P-12	Phosphate rock, argillaceous	6419--MAW	1.5	26.0	26.6
P-11	Mudstone, phosphatic	6418--RAS	5.2	9.40	63.9
P-10	Phosphate rock, argillaceous	6417--RAS	1.1	19.9	38.3
P- 9	Phosphate rock	6416--RAS	0.9	30.1	15.7
P- 8	Phosphate rock, argillaceous, calcareous	6415--RAS	0.6	21.5	33.8
P- 7	Phosphate rock	6414--RAS	0.9	28.2	18.9
P- 6	Phosphate rock	6413--RAS	0.6	27.1	23.4
P- 5	Mudstone, phosphatic	6412--RAS	0.8	11.9	57.0
P- 4	Siltstone; fos. col. no. 12638	6411--RAS	1.0	0.90	93.6
P- 3	Phosphate rock, argillaceous; fos. col. no. 12638	6410--RAS	0.7	19.7	42.8
P- 2	Mudstone, phosphatic	6409--RAS	1.3	12.8	55.6
P- 1	Mudstone and phosphate rock; fos. col. no. 12637	6408--RAS	0.9	28.0	24.9

Total thickness of phosphatic shale member 83.6

Wells formation--not measured

RED CREEK, WYOMING, LOT NUMBER 1368

Phosphoria formation measured and sampled at natural exposure by Red Creek about 1/2 mile from its juncture with the Snake River and about 6 miles east of the Snake River Ranger Station, Yellowstone National Park. The area is unsurveyed. Formation outcrops on the north flank of a small anticline. Beds strike N-S and dip 20° E. Section measured and sampled by R. P. Sheldon, R. G. Waring, T. M. Cheney, and R. A. Smart in August 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
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Phosphoria formation

Note: A few feet of cover separate the Phosphoria formation from the Chugwater formation.

P-33	Sandstone, fos. col. no. 12553	N.S.	8.2		
P-32	Chert, sandy	N.S.	3.6		
P-31	Chert	N.S.	7.1		
P-30	Chert	N.S.	8.5		
P-29	Chert	N.S.	3.4		
P-28	Chert	N.S.	2.7		
P-27	Chert	N.S.	4.8		
P-26	Chert	N.S.	2.2		
P-25	Chert	N.S.	2.5		
P-24	Chert	N.S.	6.5		
P-23	Chert	N.S.	4.3		
P-22	Phosphate rock, argillaceous; fos. col. no. 12552	6581-RPS	0.6	20.4	39.6
P-21	Sandstone	N.S.	4.5		
P-20	Chert, sandy, and phosphatic sandstone	N.S.	6.7		
P-19	Sandstone, phosphatic, and cherty sandstone	N.S.	2.2		
P-18	Sandstone, cherty	N.S.	5.7		
P-17	Sandstone, cherty	N.S.	1.5		

Note: The rest of the section below was measured on the opposite (east) side of Red Creek. The correlation between segments is reliable.

P-16	Chert, sandy, and cherty sandstone	N.S.	12.5		
P-15	Sandstone, dolomitic	N.S.	0.6		
P-14	Sandstone, cherty; fos. col. no. 12551	N.S.	6.6		
P-13	Chert, sandy	N.S.	2.5		
P-12	Mudstone, phosphatic, and mudstone	6582-TMC	0.5	12.3	54.9

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P-11	Sandstone, calcareous; phosphatic chert, and chert	6583-TMC	1.5	9.5	49.1
P-10	Sandstone	N.S.	2.9	---	---
P- 9	Dolomite, sandy; fos. col. no. 12550	N.S.	0.9	---	---
P- 8	Sandstone, dolomitic	N.S.	3.0	---	---
P- 7	Sandstone; fos. col. no. 12549	N.S.	15.0	---	---
P- 6	Chert and dolomite	N.S.	2.4	---	---
P- 5	Sandstone, dolomitic; fos. col. no. 12548	N.S.	2.6	---	---
P- 4	Dolomite, sandy; fos. col. no. 12548	N.S.	11.2	---	---
P- 3	Limestone, dolomitic	N.S.	2.9	---	---
P- 2	Sandstone, dolomitic	N.S.	3.2	---	---
P- 1	Sandstone, conglomeratic; fos. col. no. 12547	N.S.	5.0	---	---
Total thickness of Phosphoria formation			148.3		

Tensleep formation - top bed only

T- 4	Dolomite, chert, and sandstone; fos. col. no. 12546	N.S.	1.9	---	---
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FORELLEN PEAK, WYOMING, LOT NUMBER 1369

Phosphoria formation measured and sampled at a natural exposure on the south slope of Forellen Peak in the northern portion of Grand Teton National Park, unsurveyed land. Section crops out on the east flank of an anticline. Beds strike N-S and dip gently east. Section measured and sampled by R. P. Sheldon, R. G. Waring, and R. A. Smart in August 1951. Samples analyzed for P_2O_5 and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P_2O_5	ACID INSOLUBLE
<u>Phosphoria formation</u>					
Note: A 3- to 5-foot covered interval separates the Phosphoria formation from the Dinwoody formation.					
P-30	Sandstone, cherty; fos. col. no. 12560	N.S.	2.5	---	---
P-29	Covered	N.S.	5.0	---	---
P-28	Sandstone	N.S.	7.5	---	---
P-27	Sandstone	N.S.	7.4	---	---
P-26	Sandstone, cherty	N.S.	3.3	---	---
P-25	Covered	N.S.	5.0	---	---
P-24	Sandstone, dolomitic; fos. col. no. 12559	N.S.	4.9	---	---
P-23	Covered	N.S.	10.0	---	---
P-22	Chert, sandy; fos. col. no. 12558	N.S.	3.4	---	---
P-21	Covered (probably chert); fos. col. no. 12558	N.S.	3.3	---	---
P-20	Chert, argillaceous; fos. col. no. 12558	N.S.	6.0	---	---
P-19	Covered	N.S.	2.0	---	---
P-18	Chert, argillaceous	N.S.	2.4	---	---
P-17	Chert	N.S.	5.2	---	---
P-16	Covered	N.S.	7.0	---	---
P-15	Chert, sandy	N.S.	12.5	---	---
P-14	Chert, sandy	N.S.	6.2	---	---
P-13	Chert	N.S.	18.3	---	---
P-12	Phosphate rock, argillaceous; fos. col. no. 12557	6584-RGW	0.6	23.9	31.9
P-11	Sandstone; fos. col. no. 12557	N.S.	1.0	---	---
P-10	Sandstone, calcareous; fos. col. no. 12557	N.S.	4.5	---	---
P- 9	Sandstone, cherty, and calcareous sandstone	N.S.	1.8	---	---
P- 8	Sandstone, calcareous, fos. col. no. 12556	N.S.	2.5	---	---

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P- 7	Sandstone; fos. col. no. 12556	N.S.	6.4	---	---
P- 6	Sandstone	N.S.	17.0	---	---
P- 5	Sandstone; fos. col. no. 12555	N.S.	6.0	---	---
P- 4	Covered	N.S.	6.0	---	---
P- 3	Chert, argillaceous	N.S.	6.2	---	---
P- 2	Covered	N.S.	20.0	---	---
P- 1	Sandstone, phosphatic; fos. col. no. 12554	N.S.	N.M.	---	---
Total thickness of Phosphoria formation			183.9†		

Note: Total thickness accurate to within about 10 feet.

HUNGRY CREEK, WYOMING, LOT NUMBER 1375

Upper shale and Rex members of Phosphoria formation measured and sampled in a bulldozer trench and at a natural exposure on Hungry Creek, T. 41 N., R. 118 W., about 9 miles southeast of Victor, Idaho, on the Teton Pass highway, Teton County, Wyoming, on the southwest limb of an anticline. Beds strike N. 20° W. and dip 40° SW. Section measured and sampled by R. P. Sheldon, T. M. Cheney, and J. A. Peterson in October 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
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Upper shale member of Phosphoria formation--covered above

U-18	Sandstone; fos. col. no. 12667	6794-TMC	5.4	6.3	76.8
U-17	Covered	N.S.	14.0 ?	--	--
U-16	Mudstone and mantle	N.S.	4.0 ?	--	--

Note: Bed U-16 badly slumped and mixed with mantle.

U-15	Mudstone, calcareous	6793-RPS	3.0	4.2	47.7
U-14	Limestone, argillaceous, and calcareous mudstone	6792-RPS	1.0	1.7	41.3
U-13	Mudstone, calcareous	6791-RPS	1.3	3.3	48.6
U-12	Mudstone, calcareous, and mantle	6790-RPS	1.2	3.0	60.3
U-11	Mudstone and mantle	N.S.	3.5	--	--

Note: Beds U-11 and U-12 badly slumped and mixed with mantle.

U-10	Mudstone, calcareous	6789-TMC	5.5	2.2	55.03
U- 9	Mudstone, calcareous	6788-TMC	5.7	2.3	63.2
U- 8	Mudstone, calcareous	6787-JAP	4.5	1.9	72.06
U- 7	Phosphate rock, argillaceous, calcareous	6786-JAP	0.2	17.3	30.06
U- 6	Mudstone, calcareous	6785-JAP	0.9	3.3	58.8
U- 5	Phosphate rock	6784-JAP	0.4	--	--
U- 4	Phosphate rock	6783-JAP	0.6	24.6	19.6
U- 3	Mudstone, calcareous	6782-JAP	2.5	3.6	57.8
U- 2	Mudstone, calcareous	6781-JAP	2.2	5.4	57.6
U- 1	Phosphate rock, argillaceous; fos. col. no. 12666	6780-JAP	0.7	28.6	20.5

Total thickness of measured section 56.6

Rex member of Phosphoria formation--top and basal beds only

R-24	Sandstone; fos. col. no. 12665	N.S.	4.3	--	--
R- 1	Dolomite	N.S.	0.4	--	--

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	ACID P ₂ O ₅ INSOLUBLE
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Phosphatic shale member of Phosphoria formation

Note: The phosphatic shale member is badly crumpled and thinned at this locality. However, about 1/2 mile to the southeast, L. S. Gardner has described and sampled the phosphatic shale member. This data is published in U.S.G.S. Bulletin 944-A.

Wells formation--top bed only

W- 1	Chert	N.S.	11.0	--	--
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TETON PASS, WYOMING, LOT NUMBER 1370

Phosphoria formation sampled in road cut on highway 22, 1/2 mile west of Teton Pass summit, T. 41 N., R. 117 W., Teton County, Wyoming. Beds strike N. 65° W. and dip 60° N. Section measured and sampled by R. G. Waring, and R. A. Smart in August 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Upper shale member of Phosphoria formation--basal beds only</u>					
U- 5	Mudstone	N.S.	0.9	--	--
U- 4	Phosphate rock; fos. col. no. 12581	6590-RAS	0.2	25.3	18.8
U- 3	Mudstone	N.S.	1.1	--	--
U- 2	Mudstone	N.S.	2.2	--	--
U- 1	Mudstone, phosphatic	6589-RAS	1.9	14.3	46.0
<u>Rex member of Phosphoria formation--top and basal beds only</u>					
R-25	Limestone	N.S.	2.5	--	--
R- 1	Sandstone, dolomitic	N.S.	1.0	--	--
<u>Phosphatic shale member of Phosphoria formation</u>					
P-21	Mudstone, cherty; mudstone and phosphate rock	N.S.	2.9	--	--
P-20	Mudstone, cherty, and cherty limestone	N.S.	2.1	--	--
P-19	Phosphate rock; contains siltstone concretion	6588-RGW	0.9	28.8	13.4
P-18	Sandstone and phosphate rock	N.S.	0.9	--	--
P-17	Dolomite	N.S.	0.9	--	--
P-16	Mudstone; fos. col. no. 12576	N.S.	0.9	--	--
P-15	Phosphate rock and chert	N.S.	0.7	--	--
Note: A sandstone and chert lens occurs at top of unit P-15.					
P-14	Chert, sandy, and phosphate rock	N.S.	1.3	--	--
P-13	Siltstone	N.S.	1.9	--	--
Note: A sandstone lens occurs at top of unit P-13.					
P-12	Chert	N.S.	1.2	--	--
P-11	Mudstone, cherty	N.S.	0.5	--	--
P-10	Chert, argillaceous	N.S.	0.8	--	--
P- 9	Mudstone	N.S.	3.2	--	--
P- 8	Mudstone	N.S.	2.8	--	--
P- 7	Mudstone, phosphatic	6587-RAS	0.6	16.2	41.1

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P- 6	Mudstone; fos. col. no. 12575	N.S.	1.3		
P- 5	Mudstone and cherty mudstone	N.S.	0.5		
P- 4	Phosphate rock, argillaceous	6586-RAS	0.4	22.4	22.2
P- 3	Mudstone	N.S.	0.5		
P- 2	Phosphate rock, calcareous	6585-RAS	1.5	21.7	12.6
P- 1	Mudstone	N.S.	1.1		
Total thickness of measured section			26.9		

Note: Unit P-1 is not necessarily the lowest bed of the phosphatic shale member since it is separated from the Wells formation by a fault.

Wells formation--present but not described

P- 15	Mudstone, argillaceous; fos. col.		0.3	10.2	11.2
P- 14	Mudstone, argillaceous	6584-RAS	1.1	11.2	11.2
P- 13	Mudstone, argillaceous	6583-RAS	1.1	11.2	11.2
P- 12	Mudstone, argillaceous	6582-RAS	1.1	11.2	11.2
P- 11	Mudstone, argillaceous	6581-RAS	1.1	11.2	11.2
P- 10	Mudstone, argillaceous	6580-RAS	1.1	11.2	11.2
P- 9	Mudstone, argillaceous	6579-RAS	1.1	11.2	11.2
P- 8	Mudstone, argillaceous	6578-RAS	1.1	11.2	11.2
P- 7	Mudstone, argillaceous	6577-RAS	1.1	11.2	11.2
P- 6	Mudstone, argillaceous	6576-RAS	1.1	11.2	11.2
P- 5	Mudstone, argillaceous	6575-RAS	1.1	11.2	11.2
P- 4	Mudstone, argillaceous	6574-RAS	1.1	11.2	11.2
P- 3	Mudstone, argillaceous	6573-RAS	1.1	11.2	11.2
P- 2	Mudstone, argillaceous	6572-RAS	1.1	11.2	11.2
P- 1	Mudstone, argillaceous	6571-RAS	1.1	11.2	11.2
Total thickness of upper shale member			11.2		

Lower member of Phosphatic Formation--top and basal beds only

P- 15	Mudstone, argillaceous		0.3	10.2	11.2
P- 14	Mudstone, argillaceous; fos. col.		0.3	10.2	11.2
P- 13	Mudstone, argillaceous	6583-RAS	1.1	11.2	11.2
P- 12	Mudstone, argillaceous	6582-RAS	1.1	11.2	11.2
P- 11	Mudstone, argillaceous	6581-RAS	1.1	11.2	11.2
P- 10	Mudstone, argillaceous	6580-RAS	1.1	11.2	11.2
P- 9	Mudstone, argillaceous	6579-RAS	1.1	11.2	11.2
P- 8	Mudstone, argillaceous	6578-RAS	1.1	11.2	11.2
P- 7	Mudstone, argillaceous	6577-RAS	1.1	11.2	11.2
P- 6	Mudstone, argillaceous	6576-RAS	1.1	11.2	11.2
P- 5	Mudstone, argillaceous	6575-RAS	1.1	11.2	11.2
P- 4	Mudstone, argillaceous	6574-RAS	1.1	11.2	11.2
P- 3	Mudstone, argillaceous	6573-RAS	1.1	11.2	11.2
P- 2	Mudstone, argillaceous	6572-RAS	1.1	11.2	11.2
P- 1	Mudstone, argillaceous	6571-RAS	1.1	11.2	11.2

STEER CREEK, WYOMING, LOT NUMBER 1352

Phosphoria formation measured and sampled in a bulldozer trench and at a natural exposure on the north fork of Steer Creek, T. 36 N., R. 116 W., Lincoln County, Wyoming, on the west limb of an anticline. Beds strike N. 35° E. and dip 50° SW. Section measured and sampled by T. M. Cheney, R. G. Waring, R. A. Smart, and M. A. Warner in July 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
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Dinwoody formation--basal bed only

Trd-1	Sandstone, calcareous; fos. col. nos. 12647 and 12649	N.S.	4.3	--	--
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Upper shale member of Phosphoria formation

U- 14	Mudstone, phosphatic; fos. col. no. 12646	6507-TMC	0.9	10.8	59.3
U- 13	Mudstone, calcareous	6506-TMC	2.1	3.6	57.9
U- 12	Mudstone, calcareous	6505-TMC	1.9	3.7	71.7
U- 11	Mudstone, calcareous	6504-TMC	1.4	3.7	70.8
U- 10	Mudstone, calcareous	6503-TMC	4.8	4.1	66.0
U- 9	Mudstone, calcareous	6502-TMC	3.3	6.2	54.9
U- 8	Mudstone, phosphatic	6501-TMC	5.0	8.0	58.8
U- 7	Mudstone, calcareous	6500-RAS	1.0	4.6	53.5
U- 6	Phosphate rock, calcareous	6499-RAS	1.9	24.7	21.2
U- 5	Mudstone, calcareous	6498-RAS	0.6	5.5	61.6
U- 4	Mudstone	6497-RAS	1.9	4.6	68.1
U- 3	Mudstone, calcareous	6496-RAS	0.8	6.8	57.1
U- 2	Mudstone, phosphatic, calcareous	6495-RAS	1.0	11.1	45.1
U- 1	Phosphate rock	6494-RAS	1.1	29.2	18.1

Total thickness of upper shale member	27.7
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Rex member of Phosphoria formation--top and basal beds only

R- 13	Limestone, phosphatic	N.S.	2.0	--	--
R- 12	Sandstone, phosphatic; fos. col. no. 12645	6493-RAS	1.0	9.3	60.1
R- 11	Limestone, argillaceous	N.S.	1.6	--	--
R- 10	Limestone	N.S.	2.2	--	--
R- 9	Phosphate rock, calcareous	6492-RAS	0.7	22.5	9.4
R- 8	Limestone	N.S.	3.1	--	--
R- 1	Chert	N.S.	2.3	--	--

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Phosphatic shale member of Phosphoria formation</u>					
P- 37	Phosphate rock and mudstone	6491-MAW	0.8	24.6	29.0
P- 36	Mudstone, calcareous	6490-MAW	1.6	5.6	64.1
P- 35	Mudstone	6489-MAW	1.8	0.5	77.9
P- 34	Mudstone, calcareous	6488-MAW	4.4	0.3	66.0
P- 33	Mudstone, calcareous	6487-MAW	2.0	0.9	70.0
P- 32	Mudstone, calcareous	6486-MAW	0.6	3.6	58.1
P- 31	Mudstone	6485-MAW	2.4	1.1	83.7
P- 30	Mudstone, phosphatic, calcareous	6484-MAW	0.5	14.4	41.3
P- 29	Mudstone	6483-MAW	4.2	0.6	76.7
P- 28	Mudstone	6482-MAW	1.8	1.5	83.7
P- 27	Phosphate rock and phosphatic, calcareous mudstone	6481-MAW	0.5	18.7	29.4
P- 26	Mudstone, phosphatic, calcareous	6480-MAW	1.4	13.3	34.7
P- 25	Limestone	6479-MAW	2.7	0.5	18.0
P- 24	Mudstone	6478-MAW	0.6	6.9	63.3
P- 23	Mudstone	6477-MAW	1.0	1.7	78.8
P- 22	Mudstone, phosphatic	6476-MAW	1.3	14.2	42.1
P- 21	Limestone, argillaceous	6475-RGW	1.9	1.3	23.8
P- 20	Mudstone and argillaceous phosphate rock	6474-RGW	0.9	10.1	56.2
P- 19	Mudstone, phosphatic, and calcareous mudstone	6473-RGW	1.3	13.3	35.9
P- 18	Phosphate rock, calcareous, argillaceous	6472-RGW	0.5	18.4	24.8
P- 17	Limestone, argillaceous	6471-RGW	2.8	0.9	23.8
P- 16	Siltstone, calcareous	6470-RGW	0.9	1.4	48.6
P- 15	Mudstone, calcareous	6469-RGW	1.3	4.3	48.7
P- 14	Mudstone, calcareous	6468-RGW	1.6	4.5	45.6
P- 13	Mudstone, phosphatic, and calcareous mudstone	6467-RGW	1.0	11.8	39.8
P- 12	Limestone	6466-RGW	0.5	1.2	11.9
Note: Bed P-12 appears lenslike due to squeezing.					
P- 11	Limestone	6465-TMC	1.4	2.3	6.5
P- 10	Mudstone, phosphatic, calcareous, and argillaceous, calcareous phosphate rock	6464-TMC	0.8	18.3	27.2
P- 9	Limestone, argillaceous, phosphatic	6463-TMC	0.6	10.8	33.3
P- 8	Limestone, argillaceous, phosphatic	6462-TMC	0.6	11.4	33.1

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P- 7	Phosphate rock, calcareous	6461-TMC	1.6	25.0	13.3
P- 6	Limestone	6460-TMC	1.6	6.8	2.7
P- 5	Limestone	6459-TMC	1.9	3.6	2.3
P- 4	Phosphate rock	6458-TMC	1.1	29.5	11.7
P- 3	Mudstone, calcareous	6457-TMC	0.9	5.7	62.9
P- 2	Phosphate rock	6456-TMC	1.3	32.7	10.3
P- 1	Mudstone, phosphatic; fos. col. no. 12643	6455-RAS	1.4	8.4	67.9
Total thickness of phosphatic shale member			53.5		

Wells formation---top bed only

W- 14	Mudstone	N.S.	0.8	--	--
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CUMBERLAND TRENCH, WYOMING, LOT NUMBER 1346

Phosphatic shale member of the Phosphoria formation measured and sampled near the ghost town of Cumberland, Wyoming, SW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 19, T. 19 N., R. 117 W., Lincoln County, Wyoming, on the west limb of an anticline. Beds strike N. 15° E. and dip 30° W. Section measured and sampled by M. A. Warner, T. M. Cheney, R. A. Smart, and R. G. Waring in June 1951. Samples analyzed for P₂O₅ and acid insoluble by Trace Elements Section Laboratory, Denver, Colorado.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Rex member of Phosphoria formation--basal bed only</u>					
R- 1	Mudstone, cherty	N.S.	1.9	--	--
<u>Phosphatic shale member of Phosphoria formation</u>					
P-80	Mudstone	N.S.	0.9	--	--
P-79	Mudstone, cherty	N.S.	1.2	--	--
P-78	Mudstone	N.S.	0.6	--	--
P-77	Mudstone, cherty	N.S.	0.9	--	--
P-76	Mudstone	N.S.	0.5	--	--
P-75	Mudstone, phosphatic	6253-MAW	0.7	14.0	57.9
P-74	Mudstone	6252-MAW	3.1	2.65	84.8
P-73	Mudstone, phosphatic	6251-MAW	0.4	13.2	59.0
P-72	Mudstone	6250-MAW	1.0	2.20	88.2
P-71	Limestone, phosphatic	6249-MAW	1.0	13.5	18.7
P-70	Mudstone and phosphate rock	6248-MAW	0.5	14.7	49.6
P-69	Mudstone	6247-MAW	0.7	3.55	78.0
P-68	Mudstone, phosphatic	6246-MAW	1.0	16.7	47.4
P-67	Limestone, argillaceous	6245-MAW	0.8	0.60	28.5
P-66	Mudstone	6244-MAW	1.2	3.70	72.7
P-65	Mudstone, calcareous	6243-MAW	3.5	1.35	61.4
P-64	Phosphate rock, argillaceous	6242-MAW	0.4	23.5	21.7
P-63	Mudstone	6241-MAW	3.0	0.80	81.4
P-62	Mudstone	6240-MAW	1.2	4.20	73.3
P-61	Limestone, phosphatic	6239-MAW	1.6	12.7	17.3
P-60	Limestone, argillaceous	6238-MAW	0.8	0.73	40.9
P-59	Phosphate rock, argillaceous	6237-MAW	0.7	19.9	33.8
P-58	Mudstone, calcareous	6236-MAW	1.8	1.63	67.2
P-57	Phosphate rock, calcareous	6235-MAW	0.7	25.6	14.7
P-56	Limestone, argillaceous	6234-MAW	0.9	6.58	22.6
P-55	Mudstone, calcareous, phosphatic	6233-MAW	1.2	9.55	48.9
P-54	Limestone	6232-MAW	1.8	1.73	18.1
P-53	Mudstone	6231-MAW	0.6	1.00	87.8
P-52	Mudstone; fos. col. no. 12573	6230-MAW	1.4	0.73	78.7
P-51	Mudstone, calcareous	6229-MAW	1.6	2.00	65.3

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P-50	Mudstone, calcareous	6228-MAW	1.9	3.73	64.2
P-49	Mudstone	6227-MAW	1.5	3.55	79.0
P-48	Mudstone, calcareous, phosphatic	6226-MAW	1.1	7.88	41.9
P-47	Mudstone	6225-MAW	3.2	1.25	79.3
P-46	Mudstone	6224-MAW	2.4	0.73	87.4
P-45	Mudstone, calcareous	6223-TMC	2.1	5.13	42.6
P-44	Mudstone, calcareous	6222-TMC	1.6	6.50	45.5
P-43	Mudstone, calcareous; fos. col. no. 12572	6221-TMC	2.1	5.00	58.1
P-42	Mudstone, calcareous	6220-TMC	2.0	3.30	66.6
P-41	Limestone, argillaceous, phosphatic	6219-TMC	1.0	8.23	33.5
P-40	Limestone, argillaceous	6218-TMC	2.0	7.65	31.4
P-39	Limestone, argillaceous, phosphatic	6217-TMC	1.1	9.55	29.1
P-38	Phosphate rock, calcareous	6216-TMC	1.9	19.2	18.7
	Siltstone, calcareous, lens	N.S.	(1.2)	--	--
P-37	Limestone, silty	6215-TMC	1.5	1.10	30.0
P-36	Limestone, silty	6214-TMC	1.7	1.65	30.2
P-35	Mudstone, calcareous, phosphatic	6213-TMC	1.0	9.15	39.6
P-34	Limestone, phosphatic	6212-TMC	0.8	13.2	19.6
P-33	Limestone	6211-TMC	0.6	4.85	16.2
P-32	Limestone, argillaceous	6210-TMC	1.1	7.35	36.4
P-31	Mudstone, calcareous, and phosphatic mudstone	6209-TMC	2.1	10.9	46.6
P-30	Limestone, phosphatic, argillaceous	6208-TMC	1.4	12.6	25.1
P-29	Mudstone, calcareous, and phosphatic mudstone	6207-TMC	0.8	17.8	33.3
P-28	Limestone, argillaceous; fos. col. no. 12570	6206-TMC	1.2	3.80	30.9
P-27	Mudstone, phosphatic	6205-TMC	0.4	9.75	67.2
P-26	Phosphate rock, silty, and siltstone	6204-RGW	0.8	18.6	43.2
P-25	Limestone, phosphatic; fos. col. no. 12569	6203-RGW	0.5	10.7	2.5
P-24	Limestone, argillaceous	6202-RGW	0.8	2.35	26.2
P-23	Siltstone, phosphatic	6201-RGW	0.6	8.70	67.6
P-22	Limestone, argillaceous	6200-RGW	3.9	2.15	39.7
P-21	Limestone, argillaceous	6199-RGW	1.9	3.40	30.2
P-20	Sandstone and phosphate rock	6198-RGW	1.1	15.0	45.4
P-19	Siltstone	6197-RGW	0.8	3.10	82.2
P-18	Phosphate rock, argillaceous, calcareous, and phosphate rock; fos. col. no. 12568	6196-RGW	1.0	18.7	38.6

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P-17	Limestone	6195-RGW	2.2	4.75	11.5
P-16	Mudstone and phosphatic mudstone; contains calcite geodes; fos. col. no. 12567	6194-RGW	0.7	15.0	41.8
P-15	Siltstone; fos. col. no. 12566	N.S.	4.0		
P-14	Siltstone	N.S.	4.5		
P-13	Limestone, silty; fos. col. no. 12565	6193-RGW	0.9	4.70	24.8
P-12	Siltstone	N.S.	1.0		
P-11	Siltstone and chert	N.S.	0.6		
P-10	Siltstone	N.S.	1.7		
P-9	Siltstone and chert	N.S.	4.6		
P-8	Mudstone	N.S.	3.5		
P-7	Mudstone	N.S.	1.3		
P-6	Siltstone, cherty	N.S.	0.6		
P-5	Mudstone, calcareous; fos. col. no. 12564	N.S.	2.4		
P-4	Siltstone, phosphatic	6192-RAS	0.7	9.45	64.0
P-3	Mudstone	N.S.	1.7		
P-2	Mudstone	6191-RAS	0.8	7.75	66.9
P-1	Mudstone, phosphatic; fos. col. no. 12563	6190-RAS	0.7	17.6	45.4
Total thickness of phosphatic shale member			115.5		

Wells formation--top bed only

W-15	Mudstone	N.S.	2.9		
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DEVILS SLIDE, UTAH, LOT NUMBER 1345

Park City formation measured and phosphatic beds sampled 4 miles east of Morgan, in Weber Canyon, sec. 26 (?), T. 4 N., R. 3 E., Morgan County, Utah. The section is on the east limb of an anticline dipping 20° E. and striking N. 40° E. Section measured by M. A. Warner, T. M. Cheney, R. G. Waring, and R. A. Smart and sampled by T. K. Rigby, R. A. Smart, and M. A. Warner in June 1951. Samples analyzed for P₂O₅ and acid insoluble by Trace Elements Section Laboratory, Denver, Colorado.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Upper member of Park City formation--basal bed only</u>					
U- 1	Limestone, siliceous	N.S.	1.2	--	--
<u>Phosphatic shale member of Park City formation</u>					
P-139	Siltstone, calcareous	N.S.	7.2	--	--
P-138	Siltstone, phosphatic	6182-RGW	3.2	10.8	53.8
P-137	Siltstone, calcareous	6181-RGW	1.3	2.75	47.6
P-136	Siltstone	6180-RGW	1.4	3.65	73.6
P-135	Siltstone, calcareous	6179-RGW	0.9	3.70	66.0
P-134	Siltstone, calcareous, phosphatic	6178-RGW	1.8	13.9	38.0
P-133	Siltstone, phosphatic, calcareous	6177-RGW	2.2	10.8	46.5
P-132	Siltstone, phosphatic	6176-RGW	1.2	13.8	44.6
P-131	Limestone, silty	6175-RGW	1.9	4.05	40.5
P-130	Siltstone	6174-RGW	1.7	4.15	79.0
P-129	Mudstone	6173-RGW	1.7	4.10	78.3
P-128	Siltstone	6172-RGW	1.4	7.00	60.6
P-127	Siltstone, calcareous	6171-RAS	2.4	3.95	65.8
P-126	Siltstone, calcareous	6170-RAS	4.3	2.65	71.6
P-125	Mudstone, phosphatic	6169-RAS	1.9	13.5	49.8
P-124	Mudstone	6168-RAS	2.5	2.45	79.5
P-123	Phosphate rock, argillaceous	6167-RAS	1.5	19.9	41.3
P-122	Limestone, argillaceous	6166-RAS	1.1	1.10	29.6
P-121	Mudstone	6165-RAS	3.1	6.05	73.1
P-120	Limestone, argillaceous	6164-RAS	0.7	1.10	45.7
P-119	Mudstone and argillaceous phosphate rock	6163-RAS	1.3	10.6	61.6
P-118	Mudstone and calcareous mudstone	6162-RAS	2.2	1.90	55.3
P-117	Mudstone and phosphate rock	6161-RAS	1.1	10.1	59.8
P-116	Limestone	6160-RAS	1.0	1.30	15.2
P-115	Mudstone and phosphate rock	6159-RAS	2.4	10.2	63.0
P-114	Limestone, silty	6158-TMC	1.5	1.25	32.4
P-113	Mudstone and phosphate rock	6157-TMC	1.8	11.4	56.8
P-112	Siltstone, calcareous	6156-TMC	0.7	4.90	53.6
P-111	Limestone	6155-TMC	0.8	1.55	18.5
P-110	Siltstone	6154-TMC	1.2	4.97	68.7

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P-109	Phosphate rock, silty; phosphatic calcareous siltstone and calcareous phosphate rock	6153-TMC	0.9	19.4	29.5
P-108	Siltstone, calcareous	6152-TMC	1.4	7.20	51.5
P-107	Limestone, silty	6151-TMC	3.4	2.45	43.7
P-106	Siltstone, calcareous	6150-TMC	?	6.05	64.4
P-105	Phosphate rock and phosphatic mudstone	6149-TMC	1.8	23.5	28.2
P-104	Limestone, silty	6148-TMC	2.1	0.50	25.0
P-103	Phosphate rock and phosphatic mudstone	6147-TMC	0.8	17.4	32.4
P-102	Limestone, argillaceous	6146-TMC	1.7	3.30	40.2
P-101	Phosphate rock, silty, calcareous	6145-TMC	0.5	18.8	25.3
P-100	Mudstone, calcareous	6144-TMC	1.0	4.80	56.2
P- 99	Limestone, phosphatic, silty	6143-TMC	0.9	15.0	23.2
P- 98	Phosphate rock, silty; calcareous mudstone and phosphatic, calcareous mudstone	6142-TMC	0.9	23.4	21.5
P- 97	Limestone	6141-TMC	2.0	2.70	17.4
P- 96	Phosphate rock, silty	6140-TMC	1.0	22.4	28.2
P- 95	Mudstone, phosphatic; phosphate rock and mudstone	6139-TMC	0.4	15.0	45.0
P- 94	Phosphate rock, silty	6138-TMC	1.0	22.1	31.3
P- 93	Limestone, silty	6137-TMC	2.6	0.45	33.7
P- 92	Limestone, argillaceous	6136-TMC	0.5	2.15	35.5
P- 91	Phosphate rock, argillaceous	6135-TMC	0.9	25.8	27.2
P- 90	Siltstone	6134-TMC	2.3	0.75	86.8
P- 89	Siltstone	6133-TMC	0.4	1.05	85.8
P- 88	Siltstone	6130-TMC	0.6	0.75	81.8
P- 87	Siltstone	6129-TMC	1.8	1.15	83.7
P- 86	Mudstone and phosphate rock	6128-TMC	0.6	13.4	52.4
P- 85	Phosphate rock and mudstone	6127-TMC	0.4	20.8	35.6
P- 84	Phosphate rock, argillaceous	6126-TMC	0.6	22.8	26.4
P- 83	Mudstone, phosphatic	6125-TMC	0.9	17.5	46.0
P- 82	Siltstone	6124-TMC	0.7	6.20	75.2
P- 81	Brecciated zone	N.S.	4.2	---	---
P- 80	Siltstone, calcareous	N.S.	1.9	---	---
P- 79	Limestone, fos. col. no. 12485	N.S.	3.0	---	---
P- 78	Sandstone, calcareous	N.S.	22.8	---	---
P- 77	Breccia	N.S.	28.2	---	---
P- 76	Sandstone, calcareous	N.S.	3.7	---	---
P- 75	Mudstone	N.S.	1.0	---	---
P- 74	Mudstone, phosphatic	6132-MAW	0.7	10.0	53.1
P- 73	Limestone, argillaceous	6131-MAW	2.9	4.65	40.1
P- 72	Mudstone	N.S.	2.3	---	---
P- 71	Mudstone	N.S.	4.1	---	---

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P-109	Phosphate rock, silty; phosphatic calcareous siltstone and calcareous phosphate rock	6153-TMC	0.9	19.4	29.5
P-108	Siltstone, calcareous	6152-TMC	1.4	7.20	51.5
P-107	Limestone, silty	6151-TMC	3.4	2.45	43.7
P-106	Siltstone, calcareous	6150-TMC	?	6.05	64.4
P-105	Phosphate rock and phosphatic mudstone	6149-TMC	1.8	23.5	28.2
P-104	Limestone, silty	6148-TMC	2.1	0.50	25.0
P-103	Phosphate rock and phosphatic mudstone	6147-TMC	0.8	17.4	32.4
P-102	Limestone, argillaceous	6146-TMC	1.7	3.30	40.2
P-101	Phosphate rock, silty, calcareous	6145-TMC	0.5	18.8	25.3
P-100	Mudstone, calcareous	6144-TMC	1.0	4.80	56.2
P- 99	Limestone, phosphatic, silty	6143-TMC	0.9	15.0	23.2
P- 98	Phosphate rock, silty; calcareous mudstone and phosphatic, calcareous mudstone	6142-TMC	0.9	23.4	21.5
P- 97	Limestone	6141-TMC	2.0	2.70	17.4
P- 96	Phosphate rock, silty	6140-TMC	1.0	22.4	28.2
P- 95	Mudstone, phosphatic; phosphate rock and mudstone	6139-TMC	0.4	15.0	45.0
P- 94	Phosphate rock, silty	6138-TMC	1.0	22.1	31.3
P- 93	Limestone, silty	6137-TMC	2.6	0.45	33.7
P- 92	Limestone, argillaceous	6136-TMC	0.5	2.15	35.5
P- 91	Phosphate rock, argillaceous	6135-TMC	0.9	25.8	27.2
P- 90	Siltstone	6134-TMC	2.3	0.75	86.8
P- 89	Siltstone	6133-TMC	0.4	1.05	85.8
P- 88	Siltstone	6130-TMC	0.6	0.75	81.8
P- 87	Siltstone	6129-TMC	1.8	1.15	83.7
P- 86	Mudstone and phosphate rock	6128-TMC	0.6	13.4	52.4
P- 85	Phosphate rock and mudstone	6127-TMC	0.4	20.8	35.6
P- 84	Phosphate rock, argillaceous	6126-TMC	0.6	22.8	26.4
P- 83	Mudstone, phosphatic	6125-TMC	0.9	17.5	46.0
P- 82	Siltstone	6124-TMC	0.7	6.20	75.2
P- 81	Brecciated zone	N.S.	4.2	---	---
P- 80	Siltstone, calcareous	N.S.	1.9	---	---
P- 79	Limestone, fos. col. no. 12485	N.S.	3.0	---	---
P- 78	Sandstone, calcareous	N.S.	22.8	---	---
P- 77	Breccia	N.S.	28.2	---	---
P- 76	Sandstone, calcareous	N.S.	3.7	---	---
P- 75	Mudstone	N.S.	1.0	---	---
P- 74	Mudstone, phosphatic	6132-MAW	0.7	10.0	53.1
P- 73	Limestone, argillaceous	6131-MAW	2.9	4.65	40.1
P- 72	Mudstone	N.S.	2.3	---	---
P- 71	Mudstone	N.S.	4.1	---	---

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P- 70	Mudstone	N.S.	3.4	---	---
P- 69	Mudstone	N.S.	3.4	---	---
P- 68	Mudstone and chert	N.S.	2.9	---	---
P- 67	Mudstone	N.S.	3.4	---	---
P- 66	Mudstone	N.S.	3.2	---	---
P- 65	Mudstone, calcareous	6123-MAW	3.2	2.25	58.1
P- 64	Mudstone, calcareous	6122-MAW	2.7	2.00	52.2
P- 63	Mudstone, calcareous, phosphatic, and phosphate rock	6121-MAW	0.5	8.85	46.9
P- 62	Mudstone, calcareous	6120-MAW	1.5	3.45	52.1
P- 61	Mudstone, calcareous	6119-MAW	2.3	5.70	50.8
P- 60	Limestone, argillaceous	6118-MAW	2.5	4.70	38.2
P- 59	Limestone, argillaceous	6117-MAW	1.5	3.50	42.2
P- 58	Limestone, argillaceous	6116-MAW	1.5	1.75	40.2
P- 57	Mudstone, calcareous	6115-MAW	1.4	4.00	45.7
P- 56	Phosphate rock, calcareous, argillaceous	6114-MAW	0.35	17.2	22.6
P- 55	Mudstone	N.S.	2.7	---	---
P- 54	Mudstone	N.S.	3.0	---	---
P- 53	Mudstone	N.S.	3.6	---	---
P- 52	Mudstone, cherty, and mudstone	N.S.	1.3	---	---
P- 51	Mudstone, cherty	N.S.	1.4	---	---
P- 50	Mudstone, cherty	N.S.	2.8	---	---
P- 49	Mudstone	N.S.	1.9	---	---
P- 48	Mudstone, cherty	N.S.	0.9	---	---
P- 47	Mudstone	N.S.	2.3	---	---
P- 46	Mudstone	N.S.	0.9	---	---
P- 45	Mudstone, calcareous	6113-MAW	0.8	1.30	54.8
P- 44	Mudstone, calcareous	6112-MAW	3.0	0.04	47.4
P- 43	Mudstone	6111-MAW	0.9	1.35	83.7
P- 42	Mudstone	6110-MAW	1.8	3.15	78.5
P- 41	Mudstone	6109-MAW	1.3	4.90	73.2
P- 40	Mudstone, calcareous	6108-MAW	2.2	1.15	55.0
P- 39	Mudstone, calcareous	6107-MAW	5.5	0.40	59.3
P- 38	Mudstone, calcareous	6106-MAW	3.7	0.50	63.6
P- 37	Limestone	6105-MAW	1.1	0.55	7.3
P- 36	Mudstone, calcareous	6104-MAW	1.6	1.25	72.5
P- 35	Mudstone	6103-MAW	1.5	6.60	66.5
P- 34	Mudstone	6102-MAW	2.6	0.70	81.6
P- 33	Mudstone	6101-MAW	2.9	1.20	82.8
P- 32	Mudstone	6100-MAW	3.1	6.60	67.2
P- 31	Mudstone, calcareous	6099-MAW	3.2	4.85	55.4
P- 30	Mudstone, calcareous	6098-MAW	1.1	2.25	65.2
P- 29	Mudstone	6097-MAW	1.2	3.30	74.7

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
P- 28	Limestone; fos. col. no. 12484	6096-MAW	4.1	0.70	16.5
P- 27	Limestone, argillaceous; fos. col. no. 12484	6095-MAW	1.9	0.80	27.3
P- 26	Mudstone, calcareous	6094-MAW	2.0	5.45	54.3
P- 25	Mudstone, calcareous	6093-MAW	1.4	5.35	46.9
P- 24	Limestone and phosphate rock	6092-MAW	1.0	8.00	12.8
P- 23	Mudstone and phosphatic mudstone	6091-MAW	0.7	11.2	43.1
P- 22	Limestone, phosphatic	6090-MAW	0.9	14.2	10.6
P- 21	Phosphate rock, argillaceous, calcareous	6089-MAW	1.0	16.3	32.9
P- 20	Mudstone, calcareous	6088-MAW	1.8	4.70	52.1
P- 19	Mudstone, phosphatic, calcareous	6087-MAW	2.3	14.7	37.4
P- 18	Limestone, phosphatic, argillaceous	6086-MAW	0.9	9.25	23.4
P- 17	Mudstone, calcareous, phosphatic	6085-MAW	1.9	8.10	40.8
P- 16	Mudstone, phosphatic	6084-MAW	2.1	13.5	47.2
P- 15	Limestone, phosphatic, argillaceous	6083-MAW	0.8	14.6	24.7
P- 14	Limestone	6082-MAW	1.0	2.60	7.7
P- 13	Phosphate rock, calcareous, argillaceous	6081-MAW	1.2	18.1	22.6
P- 12	Limestone, phosphatic, argillaceous	6080-MAW	0.9	10.4	23.5
P- 11	Limestone; chert and calcareous mudstone	N.S.	2.2	--	--
P- 10	Limestone, argillaceous; fos. col. no. 12483	6079-MAW	2.0	1.35	33.3
P- 9	Mudstone, calcareous	6078-MAW	1.4	2.15	58.9
P- 8	Mudstone, phosphatic	6077-MAW	1.0	10.5	57.9
P- 7	Limestone, argillaceous	6076-MAW	1.2	3.95	26.7
P- 6	Limestone; fos. col. no. 12482	6075-MAW	0.7	4.75	14.5
P- 5	Limestone; fos. col. no. 12482	6074-MAW	1.2	7.50	12.5
P- 4	Mudstone	N.S.	1.4	--	--
P- 3	Mudstone, calcareous	N.S.	2.3	--	--
P- 2	Limestone, argillaceous	N.S.	3.9	--	--
P- 1	Mudstone, phosphatic, calcareous, and argillaceous phosphate rock	6185-RAS	1.7	11.6	45.9
Total thickness of phosphatic shale member			301.3	+	
<u>Lower member of Park City formation (?)--top bed only</u>					
L- 41	Mudstone, calcareous	N.S.	3.3	--	--

SOLS CANYON, UTAH, LOT NUMBER 1348

Park City formation measured and phosphatic portions sampled from natural exposures and hand trenches on east side of Sols Canyon, 10 miles southwest of Manila in NW $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 2, T. 2 N., R. 111 W., Daggett County, Utah. Beds strike N. 80° E. and dip 38° N. Section measured and sampled by R. A. Smart, T. M. Cheney, and M. A. Warner in June 1951. Samples analyzed for P₂O₅ and acid insoluble by Trace Elements Section Laboratory, Denver, Colorado.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Upper member of Park City formation--basal bed only</u>					
U- 1	Covered	N.S.	3.0	--	--
<u>Middle member of Park City formation</u>					
M-47	Siltstone, calcareous	N.S.	4.0	--	--
M-46	Mudstone and chert	N.S.	0.5	--	--
M-45	Mudstone, calcareous	N.S.	2.5	--	--
M-44	Mudstone, calcareous	N.S.	2.5	--	--
M-43	Dolomite, argillaceous	6285-MAW	1.7	3.60	39.8
M-42	Mudstone	6284-MAW	0.6	--	--
M-41	Mudstone, dolomitic	6283-MAW	1.7	2.10	58.7
M-40	Mudstone, dolomitic	6282-MAW	1.2	7.25	44.5
M-39	Mudstone, dolomitic	6281-MAW	3.4	2.75	60.3
M-38	Weathered zone	N.S.	1.1	--	--
M-37	Dolomite, argillaceous, phosphatic	6280-MAW	1.6	11.7	35.6
M-36	Limestone, phosphatic	6279-MAW	0.8	14.2	12.7
M-35	Dolomite, calcareous	6278-MAW	1.0	7.45	10.3
M-34	Mudstone, calcareous, and phosphatic, calcareous mudstone	6277-MAW	1.0	10.7	27.9
M-33	Limestone, argillaceous, phosphatic	6276-MAW	0.6	9.00	27.4
M-32	Phosphate rock and phosphatic, calcareous mudstone	6275-MAW	0.5	15.8	32.5
M-31	Mudstone, dolomitic	6274-MAW	0.5	7.25	43.5
M-30	Mudstone, calcareous, and calcareous phosphate rock	6273-MAW	0.7	13.8	32.6
M-29	Mudstone, calcareous	6272-MAW	1.2	6.80	51.0
M-28	Mudstone, silty (?)	N.S.	1.4	--	--
M-27	Dolomite	N.S.	1.1	--	--
M-26	Mudstone, calcareous	6271-RAS	1.2	5.45	57.0
M-25	Mudstone, calcareous	N.S.	2.0	--	--
M-24	Mudstone, calcareous	6270-RAS	1.4	4.60	59.6
M-23	Mudstone, calcareous	6269-RAS	1.7	4.85	58.0

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
M-22	Brecciated zone	N.S.	1.3	---	---
M-21	Mudstone, calcareous, phosphatic	6268-RAS	0.4	7.80	62.8
M-20	Mudstone	6267-RAS	0.8	6.80	72.4
M-19	Limestone, phosphatic, argillaceous	6266-RAS	0.7	10.9	25.6
M-18	Mudstone, calcareous	N.S.	1.3	---	---
M-17	Mudstone, calcareous	6265-RAS	2.2	5.05	43.7
M-16	Mudstone	N.S.	0.7	---	---
M-15	Mudstone, calcareous	N.S.	2.4	---	---
M-14	Mudstone, calcareous	6264-RAS	1.2	7.25	46.1
M-13	Limestone	N.S.	1.8	---	---
M-12	Limestone, argillaceous	6263-RAS	1.9	7.60	35.4
M-11	Limestone, phosphatic, argillaceous	6262-RAS	0.8	11.9	24.3
M-10	Limestone	N.S.	2.1	---	---
M- 9	Limestone, phosphatic	6261-RAS	0.4	13.3	12.2
M- 8	Mudstone, calcareous	6260-RAS	0.8	7.50	46.8
M- 7	Limestone, argillaceous	6259-RAS	0.6	8.62	24.4
M- 6	Mudstone and soil	N.S.	1.3	---	---
M- 5	Limestone, phosphatic, argillaceous	6258-RAS	1.1	10.4	24.1
M- 4	Limestone, phosphatic, argillaceous	6257-RAS	1.2	11.3	22.0
M- 3	Limestone, phosphatic	6256-RAS	1.7	16.4	4.2
M- 2	Mudstone, phosphatic, calcareous	6255-RAS	1.3	13.7	36.2

Note: Units M-2 through M-7 are of questionable thickness and continuity, due to nearness to surface of ground; hence, highly weathered.

M- 1	Limestone, phosphatic	6254-TMC	1.3	16.8	8.2
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Total thickness of middle member 63.2

Lower member of Park City formation--top bed only

L-17	Sandstone, calcareous	N.S.	17.6	---	---
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FORT DOUGLAS, UTAH, LOT NUMBER 1350

Park City formation measured and sampled near Fort Douglas, E₂¹ NE₄¹ sec. 17, T. 1 N., R. 2 E., Salt Lake County, Utah. Section measured from natural exposures and bulldozer trenches. Beds strike N. 73° E. and dip 68° S. Section measured and sampled by M. A. Warner, R. A. Smart, and T. M. Cheney. Samples analyzed for P₂O₅ and acid insoluble by Trace Elements Section Laboratory, Denver, Colorado.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Middle member of Park City formation</u>					
M-242	Siltstone	N.S.	4.6	--	--
M-241	Siltstone	N.S.	4.3	--	--
M-240	Mudstone	N.S.	7.5	--	--
M-239	Mudstone	N.S.	7.2	--	--
M-238	Chert	N.S.	2.8	--	--
M-237	Mudstone, cherty	N.S.	1.8	--	--
M-236	Mudstone, cherty	N.S.	1.5	--	--
M-235	Chert, argillaceous	N.S.	1.5	--	--
M-234	Siltstone	N.S.	2.7	--	--
M-233	Chert, argillaceous	N.S.	1.5	--	--
M-232	Chert, argillaceous	N.S.	13.1	--	--
M-231	Shear zone; brecciated siltstone	N.S.	4.5	--	--
M-230	Siltstone	N.S.	4.1	--	--
M-229	Mudstone	6406-MAW	4.1	6.50	64.2
M-228	Limestone	6405-MAW	1.0	1.70	6.90
M-227	Phosphate rock, argillaceous	6404-MAW	0.6	20.9	30.0
M-226	Siltstone, calcareous	N.S.	0.9	--	--
M-225	Mudstone, cherty	N.S.	8.3	--	--
M-224	Mudstone	N.S.	3.4	--	--
M-223	Siltstone	N.S.	1.9	--	--
M-222	Siltstone	N.S.	2.6	--	--
M-221	Mudstone	N.S.	2.0	--	--
M-220	Siltstone	N.S.	2.5	--	--
M-219	Chert	N.S.	2.5	--	--
M-218	Mudstone	N.S.	4.9	--	--
M-217	Mudstone, cherty	N.S.	1.6	--	--
M-216	Mudstone	N.S.	2.4	--	--
M-215	Mudstone	N.S.	1.4	--	--
M-214	Mudstone	N.S.	1.0	--	--
M-213	Mudstone, phosphatic	6403-MAW	0.5	17.3	44.9
M-212	Mudstone	6402-MAW	1.3	1.20	86.9
M-211	Mudstone and phosphate rock	6401-MAW	1.0	15.5	51.7
M-210	Limestone, silty	6400-MAW	1.1	0.95	35.3

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
M-209	Mudstone, calcareous	6399-MAW	1.0	2.15	68.5
M-208	Mudstone, calcareous	6398-MAW	0.8	1.95	73.9
M-207	Mudstone, phosphatic	6397-MAW	0.5	9.35	63.9
M-206	Mudstone	N.S.	3.8	--	--
M-205	Phosphate rock, argillaceous	6396-MAW	14.0	17.4	38.8
M-204	Mudstone, phosphatic	N.S.	0.9	--	--
M-203	Siltstone, calcareous	N.S.	0.8	--	--
M-202	Mudstone, siliceous	N.S.	0.6	--	--
M-201	Mudstone	N.S.	0.9	--	--
M-200	Mudstone, phosphatic	6407-MAW	0.3	9.50	64.6
M-199	Siltstone, calcareous	N.S.	2.4	--	--
M-198	Limestone, argillaceous; fos. col. no. 12528	N.S.	7.9	--	--
M-197	Limestone, argillaceous	N.S.	18.7	--	--
M-196	Limestone and calcareous sandstone	N.S.	9.2	--	--
M-195	Limestone and calcareous sandstone	N.S.	9.5	--	--
M-194	Limestone	N.S.	4.7	--	--
M-193	Not described	N.S.	26.0	--	--
M-192	Mudstone, calcareous	N.S.	0.6	--	--
M-191	Chert, mudstone, and limestone	N.S.	8.2	--	--
M-190	Mudstone	N.S.	2.3	--	--
M-189	Mudstone	N.S.	1.1	--	--
M-188	Mudstone	N.S.	0.9	--	--
M-187	Mudstone	N.S.	3.1	--	--
M-186	Mudstone, calcareous; fos. col. no. 12527	N.S.	1.8	--	--
M-185	Mudstone, calcareous	N.S.	3.6	--	--
M-184	Limestone, argillaceous	N.S.	1.0	--	--
M-183	Mudstone; fos. col. no. 12526	N.S.	1.5	--	--
M-182	Mudstone	N.S.	2.9	--	--
M-181	Mudstone	N.S.	1.9	--	--
M-180	Mudstone	N.S.	2.6	--	--
M-179	Chert and mudstone; fos. col. no. 12525	N.S.	3.2	--	--
M-178	Chert	N.S.	1.8	--	--
M-177	Mudstone, calcareous, and phosphatic mudstone	N.S.	1.1	--	--
M-176	Mudstone	N.S.	2.5	--	--
M-175	Mudstone	N.S.	2.0	--	--
M-174	Mudstone	N.S.	1.6	--	--
M-173	Mudstone	N.S.	4.2	--	--
M-172	Mudstone	6395-TMC	1.9	1.35	82.7
M-171	Mudstone, phosphatic	6394-TMC	1.9	9.90	55.8
M-170	Mudstone, calcareous	6393-TMC	0.8	1.85	66.3

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
M-169	Mudstone, calcareous, and cherty mudstone	6392-TMC	0.8	5.85	58.0
M-168	Mudstone, calcareous, and calcareous chert; fos. col. no. 12524	6391-TMC	2.6	1.90	63.6
M-167	Mudstone, calcareous	6390-TMC	2.9	1.70	54.1
M-166	Mudstone, calcareous	6389-TMC	1.5	1.70	52.1
M-165	Mudstone, calcareous	6388-TMC	2.9	2.25	52.7
M-164	Mudstone, calcareous	6387-TMC	1.6	2.50	61.0
M-163	Mudstone, calcareous	6386-TMC	1.1	2.75	55.5
M-162	Mudstone, calcareous	6385-TMC	1.9	2.75	48.2
M-161	Mudstone, phosphatic, calcareous; fos. col. no. 12523	6384-TMC	0.6	13.3	46.6
M-160	Siltstone	N.S.	5.2	---	---
M-159	Siltstone	N.S.	7.3	---	---
M-158	Mudstone; fos. col. no. 12522	N.S.	3.8	---	---
M-157	Mudstone	N.S.	4.5	---	---
M-156	Mudstone, calcareous	6383-MAW	0.4	4.65	52.0
M-155	Mudstone, calcareous	6382-MAW	1.4	2.50	47.5
M-154	Mudstone, phosphatic	6381-MAW	0.3	15.5	47.9
M-153	Siltstone	N.S.	10.0	---	---
M-152	Siltstone	N.S.	3.3	---	---
M-151	Siltstone	N.S.	5.8	---	---
M-150	Siltstone	N.S.	8.0	---	---
M-149	Siltstone	N.S.	2.0	---	---
M-148	Siltstone, cherty	N.S.	5.8	---	---
M-147	Siltstone	N.S.	2.2	---	---
M-146	Siltstone	N.S.	3.2	---	---
M-145	Siltstone; fos. col. no. 12521	N.S.	7.3	---	---
M-144	Siltstone	N.S.	1.8	---	---
M-143	Siltstone	N.S.	1.5	---	---
M-142	Mudstone, cherty	N.S.	0.5	---	---
M-141	Siltstone, calcareous	N.S.	1.0	---	---
M-140	Siltstone	N.S.	0.7	---	---
M-139	Mudstone; fos. col. no. 12520	6380-MAW	0.8	4.70	79.5
M-138	Siltstone	6379-MAW	3.4	2.35	78.0
M-137	Limestone, argillaceous	6378-MAW	5.2	1.00	45.7
M-136	Siltstone, calcareous	6377-MAW	1.2	0.85	64.7
M-135	Mudstone, calcareous	6376-MAW	1.4	2.80	65.8
M-134	Mudstone	6375-MAW	1.0	2.00	73.5
M-133	Mudstone	6374-MAW	1.4	4.35	70.3
M-132	Limestone, argillaceous, phosphatic	6373-MAW	0.7	9.95	31.7
M-131	Limestone, argillaceous	6372-MAW	1.1	6.65	44.3

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
M-130	Mudstone and phosphate rock	6371-MAW	0.8	18.5	35.4
M-129	Mudstone, calcareous	6370-MAW	1.2	1.65	43.0
M-128	Mudstone	6369-MAW	1.2	6.50	70.3
M-127	Mudstone, phosphatic	6368-MAW	1.3	13.9	48.1
M-126	Mudstone, phosphatic	6367-MAW	3.3	11.5	61.4
M-125	Mudstone, calcareous	6366-MAW	2.3	7.55	54.3
M-124	Mudstone, phosphatic	6365-MAW	1.2	12.0	52.6
M-123	Mudstone, phosphatic; fos. col. no. 12519	6364-MAW	1.5	13.2	53.0
M-122	Limestone; fos. col. no. 12518	6363-MAW	1.0	4.85	15.9
M-121	Phosphate rock, argillaceous, calcareous	6362-MAW	2.8	18.4	33.1
M-120	Limestone	6361-MAW	1.2	3.65	12.6
M-119	Phosphate rock, argillaceous	6360-MAW	2.6	21.9	25.0
M-118	Phosphate rock, argillaceous	6359-MAW	2.1	21.9	24.2
M-117	Mudstone	N.S.	3.0	--	--
M-116	Chert and calcite	N.S.	1.2	--	--
M-115	Limestone	6358-MAW	0.7	0.80	18.0
M-114	Limestone, argillaceous	6357-MAW	0.6	4.55	27.6
M-113	Phosphate rock	6356-MAW	2.4	26.9	18.4
M-112	Phosphate rock; fos. col. no. 12514	6355-MAW	0.6	29.7	15.9
M-111	Mudstone	N.S.	5.0	--	--
M-110	Mudstone	N.S.	2.4	--	--
M-109	Mudstone, phosphatic	6354-MAW	1.3	9.85	58.1
M-108	Siltstone	N.S.	6.0	--	--
M-107	Mudstone	N.S.	0.9	--	--
M-106	Mudstone	N.S.	1.6	--	--
M-105	Mudstone	N.S.	2.9	--	--
M-104	Mudstone	N.S.	2.7	--	--
M-103	Mudstone	N.S.	4.6	--	--
M-102	Mudstone	N.S.	2.0	--	--
M-101	Mudstone	N.S.	2.1	--	--
M-100	Mudstone	N.S.	2.3	--	--
M- 99	Mudstone	N.S.	3.5	--	--
M- 98	Mudstone	N.S.	6.6	--	--
M- 97	Mudstone, cherty	N.S.	0.6	--	--
M- 96	Mudstone	N.S.	2.1	--	--
M- 95	Mudstone	N.S.	2.9	--	--
M- 94	Siltstone	N.S.	2.3	--	--
M- 93	Mudstone	N.S.	1.4	--	--
M- 92	Siltstone	N.S.	0.7	--	--
M- 91	Mudstone, phosphatic	6353-MAW	0.4	14.3	53.1
M- 90	Siltstone; fos. col. no. 12513	N.S.	3.5	--	--

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
M- 89	Chert	N.S.	2.2	--	--
M- 88	Mudstone	6352-RAS	0.5	4.05	78.6
M- 87	Limestone	N.S.	0.7	--	--
M- 86	Limestone	N.S.	1.7	--	--
M- 85	Chert	N.S.	0.4	--	--
M- 84	Mudstone	6351-RAS	1.1	3.3	78.9
M- 83	Limestone	N.S.	3.6	--	--
M- 82	Mudstone, calcareous	6350-RAS	0.8	1.75	52.6
M- 81	Chert	N.S.	4.8	--	--
M- 80	Mudstone	N.S.	1.2	--	--
M- 79	Chert, argillaceous	N.S.	1.7	--	--
M- 78	Mudstone, calcareous	N.S.	3.2	--	--
M- 77	Chert, argillaceous	N.S.	6.1	--	--
M- 76	Mudstone, calcareous, and chert; fos. col. no. 12512	N.S.	1.6	--	--
M- 75	Mudstone, calcareous	6349-RAS	1.1	4.10	63.3
M- 74	Mudstone, calcareous, and chert	N.S.	1.6	--	--
M- 73	Chert, argillaceous	N.S.	1.3	--	--
M- 72	Limestone, argillaceous; fos. col. no. 12511	6348-RAS	0.8	5.35	35.3
M- 71	Chert	6347-RAS	0.8	3.95	70.8
M- 70	Mudstone, calcareous	N.S.	2.3	--	--
M- 69	Mudstone, calcareous	N.S.	1.1	--	--
M- 68	Mudstone, calcareous, and chert	N.S.	4.3	--	--
M- 67	Mudstone, cherty, calcareous	N.S.	1.1	--	--
M- 66	Limestone	N.S.	2.4	--	--
M- 65	Mudstone, calcareous	6346-RAS	0.9	4.65	65.6
M- 64	Mudstone, calcareous, and chert	N.S.	1.8	--	--
M- 63	Mudstone	N.S.	1.3	--	--
M- 62	Mudstone, calcareous	N.S.	1.8	--	--
M- 61	Mudstone, calcareous, phosphatic	6345-RAS	0.4	8.85	44.8
M- 60	Mudstone, calcareous, and chert	N.S.	1.3	--	--
M- 59	Mudstone, calcareous	N.S.	1.4	--	--
M- 58	Limestone; fos. col. no. 12510	N.S.	1.8	--	--
M- 57	Mudstone, calcareous	6344-RAS	0.5	7.25	40.9
M- 56	Mudstone, calcareous	N.S.	1.3	--	--
M- 55	Mudstone	N.S.	3.3	--	--
M- 54	Mudstone	N.S.	4.2	--	--
M- 53	Mudstone, calcareous; fos. col. no. 12509	N.S.	4.1	--	--
M- 52	Mudstone	N.S.	3.5	--	--
M- 51	Mudstone	N.S.	4.7	--	--
M- 50	Mudstone	N.S.	1.2	--	--

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
M- 49	Mudstone, dolomitic	N.S.	3.6	--	--
M- 48	Limestone; fos. col. no. 12508	N.S.	1.5	--	--
M- 47	Mudstone, calcareous; fos. col. no. 12507	N.S.	2.9	--	--
M- 46	Covered	N.S.	11.8	--	--
M- 45	Limestone	N.S.	1.9	--	--
M- 44	Mudstone, calcareous; fos. col. no. 12506	N.S.	4.6	--	--
M- 43	Limestone	N.S.	1.8	--	--
M- 42	Limestone, argillaceous; fos. col. no. 12505	N.S.	3.6	--	--
M- 41	Mudstone, cherty; fos. col. no. 12505	N.S.	4.5	--	--
M- 40	Mudstone, cherty; fos. col. no. 12504	N.S.	5.5	--	--
M- 39	Mudstone, calcareous	N.S.	5.3	--	--
M- 38	Mudstone, calcareous	N.S.	2.9	--	--
M- 37	Mudstone, calcareous	N.S.	1.2	--	--
M- 36	Mudstone, calcareous; fos. col. no. 12503	N.S.	2.9	--	--
M- 35	Mudstone, calcareous; fos. col. no. 12502	N.S.	5.9	--	--
M- 34	Mudstone	N.S.	2.3	--	--
M- 33	Limestone, argillaceous	N.S.	2.6	--	--
M- 32	Limestone, cherty	N.S.	2.4	--	--
M- 31	Limestone, argillaceous	N.S.	4.1	--	--
M- 30	Mudstone	N.S.	3.7	--	--
M- 29	Mudstone	N.S.	11.0	--	--
M- 28	Mudstone	N.S.	1.6	--	--
M- 27	Mudstone	N.S.	2.0	--	--
M- 26	Mudstone, calcareous	N.S.	2.9	--	--
M- 25	Mudstone, calcareous	N.S.	3.8	--	--
M- 24	Mudstone, calcareous	N.S.	5.2	--	--
M- 23	Mudstone, calcareous	N.S.	4.8	--	--
M- 22	Mudstone, calcareous	N.S.	0.9	--	--
M- 21	Mudstone, calcareous	N.S.	5.1	--	--
M- 20	Mudstone, calcareous	N.S.	2.3	--	--
M- 19	Limestone, argillaceous	6343-TMC	1.4	6.25	23.1
M- 18	Limestone, argillaceous	6342-TMC	1.1	7.75	24.1
M- 17	Phosphate rock, calcareous	6341-TMC	1.5	21.1	16.1
M- 16	Limestone, argillaceous	6340-TMC	2.7	7.60	31.2
M- 15	Mudstone, calcareous	N.S.	2.6	--	--
M- 14	Mudstone, calcareous	N.S.	5.3	--	--
M- 13	Mudstone, calcareous	N.S.	1.3	--	--

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
M- 12	Mudstone, calcareous; fos. col. no. 12517	N.S.	1.1	--	--
M- 11	Mudstone, calcareous	N.S.	4.6	--	--
M- 10	Mudstone, calcareous	N.S.	2.2	--	--
M- 9	Limestone, phosphatic, argillaceous	6339-TMC	0.4	10.1	23.7
M- 8	Mudstone, calcareous	N.S.	2.6	--	--
M- 7	Mudstone, calcareous	N.S.	2.1	--	--
M- 6	Mudstone	N.S.	0.9	--	--
M- 5	Mudstone, calcareous	N.S.	3.2	--	--
M- 4	Mudstone	N.S.	1.3	--	--
M- 3	Mudstone, calcareous	N.S.	0.7	--	--
M- 2	Covered	N.S.	0.6	--	--
M- 1	Phosphate rock, calcareous	6338-TMC	1.2	11.4	8.7

Total thickness of middle member 684.8

Lower member of Park City formation--top bed only

L- 19	Limestone	N.S.	60.0	--	--
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PINON CANYON, UTAH, LOT NUMBER 1347

Section of Park City formation measured and phosphatic beds sampled in hand trenches and natural exposures on north flank of the Uinta Mountains axis, sec. 14, T. 1 S., R. 6 E., Summit County, Utah, 3 miles east of Oakley, Utah. Beds strike N. 80° E. and dip 30° N. Lower contact is not well defined and is questionable; upper contact is not exposed. Section measured and sampled by T. M. Cheney, R. A. Smart, M. A. Warner, and R. G. Waring in June 1951. Samples analyzed for P₂O₅ and acid insoluble by Trace Elements Section Laboratory, Denver, Colorado.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Park City formation</u>					
PC-120	Limestone, dolomitic; fos. col. no. 12500	N.S.	2.8	--	--
PC-119	Dolomite, argillaceous; fos. col. no. 12500	N.S.	3.2	--	--
PC-118	Dolomite; fos. col. no. 12500	N.S.	3.1	--	--
PC-117	Limestone, dolomitic; fos. col. no. 12500	N.S.	3.2	--	--
PC-116	Dolomite, argillaceous; fos. col. no. 12500	N.S.	2.7	--	--
PC-115	Limestone, dolomitic; fos. col. no. 12500	N.S.	1.9	--	--
PC-114	Siltstone, calcareous; fos. col. no. 12500	N.S.	2.5	--	--
PC-113	Siltstone, calcareous; fos. col. no. 12500	N.S.	1.7	--	--
PC-112	Siltstone, calcareous	N.S.	1.2	--	--
PC-111	Siltstone, calcareous	N.S.	2.9	--	--
PC-110	Siltstone, calcareous	N.S.	1.9	--	--
PC-109	Siltstone, calcareous; fos. col. no. 12499	N.S.	2.1	--	--
PC-108	Limestone	N.S.	2.0	--	--
PC-107	Limestone, silty	6320-RAS	0.4	6.90	31.3
PC-106	Sandstone (?), calcareous	N.S.	4.7	--	--
PC-105	Limestone, lithographic	N.S.	2.8	--	--
PC-104	Limestone, lithographic	N.S.	4.4	--	--
PC-103	Mudstone, calcareous, laminated	N.S.	1.3	--	--
PC-102	Mudstone, calcareous	N.S.	1.8	--	--
PC-101	Mudstone, calcareous	N.S.	1.2	--	--
PC-100	Dolomite, argillaceous	N.S.	3.1	--	--
PC- 99	Siltstone	N.S.	7.2	--	--
PC- 98	Siltstone, dolomitic	N.S.	12.4	--	--
PC- 97	Dolomite, argillaceous	N.S.	1.2	--	--
PC- 96	Mudstone, calcareous	N.S.	0.7	--	--
PC- 95	Limestone, argillaceous	N.S.	8.1	--	--

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
PC- 94	Siltstone	N.S.	3.9	---	---
PC- 93	Sandstone, calcareous	N.S.	2.2	---	---
PC- 92	Sandstone	N.S.	8.7	---	---
PC- 91	Sandstone, calcareous	N.S.	12.9	---	---
PC- 90	Siltstone, dolomitic	N.S.	5.3	---	---
PC- 89	Mudstone, dolomitic	6319-MAW	2.2	0.60	64.7
PC- 88	Dolomite, argillaceous	6318-MAW	1.5	6.00	30.9
PC- 87	Dolomite, sandy, and argillaceous limestone	N.S.	3.4	---	---
PC- 86	Limestone, argillaceous	N.S.	5.6	---	---
PC- 85	Limestone; fos. col. no. 12498	N.S.	3.0	---	---
PC- 84	Sandstone; fos. col. no. 12498	N.S.	2.3	---	---
PC- 83	Sandstone, calcareous; fos. col. no. 12498	N.S.	2.0	---	---
PC- 82	Chert and calcareous sandstone; fos. col. no. 12498	N.S.	1.9	---	---
PC- 81	Chert	N.S.	1.9	---	---
PC- 80	Siltstone	N.S.	1.7	---	---
PC- 79	Siltstone, cherty	N.S.	1.9	---	---
PC- 78	Siltstone, dolomitic	N.S.	1.5	---	---
PC- 77	Siltstone; fos. col. no. 12497	N.S.	3.9	---	---
PC- 76	Siltstone, dolomitic	N.S.	1.5	---	---
PC- 75	Dolomite, argillaceous; fos. col. no. 12496	N.S.	1.9	---	---
PC- 74	Sandstone, calcareous	N.S.	1.0	---	---
PC- 73	Dolomite	N.S.	0.5	---	---
PC- 72	Chert and cherty dolomite	N.S.	1.0	---	---
PC- 71	Chert	N.S.	1.0	---	---
PC- 70	Sandstone, calcareous	N.S.	1.8	---	---
PC- 69	Chert	N.S.	1.8	---	---
PC- 68	Chert	N.S.	2.3	---	---
PC- 67	Limestone, sandy	N.S.	4.0	---	---
PC- 66	Limestone	N.S.	3.6	---	---
PC- 65	Chert	N.S.	3.7	---	---
PC- 64	Chert and dolomite	N.S.	3.8	---	---
PC- 63	Limestone, cherty	N.S.	5.4	---	---
PC- 62	Chert	N.S.	1.2	---	---
PC- 61	Limestone, sandy	N.S.	5.2	---	---
PC- 60	Siltstone, calcareous; fos. col. no. 12495	N.S.	5.3	---	---
PC- 59	Siltstone, calcareous; fos. col. no. 12495	N.S.	4.3	---	---
PC- 58	Siltstone, calcareous, fos. col. no. 12495	N.S.	4.7	---	---

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
PC- 57	Siltstone, calcareous; fos. col. no. 12494	N.S.	1.4	---	---
PC- 56	Siltstone, calcareous; fos. col. no. 12494	N.S.	1.1	---	---
PC- 55	Siltstone; fos. col. no. 12494	N.S.	1.1	---	---
PC- 54	Covered; fos. col. no. 12494	N.S.	7.6	---	---
PC- 53	Limestone; fos. col. no. 12494	N.S.	2.5	---	---
PC- 52	Limestone, argillaceous; fos. col. no. 12493	N.S.	12.9	---	---
PC- 51	Limestone, argillaceous	N.S.	1.7	---	---
PC- 50	Siltstone, calcareous	N.S.	2.3	---	---
PC- 49	Mudstone, calcareous; fos. col. no. 12492	N.S.	0.5	---	---
PC- 48	Dolomite, cherty	N.S.	1.1	---	---
PC- 47	Limestone, phosphatic; fos. col. no. 12492	6317-RAS	1.0	7.85	8.7
PC- 46	Limestone, argillaceous	6316-RAS	1.1	2.80	39.3
PC- 45	Limestone; fos. col. no. 12491	5315-RAS	0.3	7.20	12.1
PC- 44	Siltstone (?), cherty, calcareous	6314-RAS	2.6	2.15	47.8
PC- 43	Mudstone, calcareous	6313-RAS	0.4	4.30	45.9
PC- 42	Siltstone, cherty, calcareous	N.S.	1.3	---	---
PC- 41	Limestone	N.S.	1.5	---	---
PC- 40	Limestone, cherty	N.S.	5.4	---	---
PC- 39	Mudstone, phosphatic, calcareous	6312-RAS	1.1	12.6	39.2
PC- 38	Dolomite, argillaceous	6311-RAS	1.5	2.95	33.6
PC- 37	Mudstone, dolomitic, phosphatic	6310-RAS	0.8	9.80	47.5
PC- 36	Mudstone, dolomitic	6309-RAS	1.0	2.65	68.8
PC- 35	Dolomite	N.S.	3.4	---	---
PC- 34	Dolomite	N.S.	2.9	---	---
PC- 33	Dolomite	N.S.	2.3	---	---
PC- 32	Limestone, dolomitic	N.S.	1.1	---	---
PC- 31	Limestone,	N.S.	1.7	---	---
PC- 30	Mudstone, cherty	N.S.	1.8	---	---
PC- 29	Limestone	N.S.	1.3	---	---
PC- 28	Siltstone	N.S.	1.7	---	---
PC- 27	Siltstone, calcareous, and chert	N.S.	4.2	---	---
PC- 26	Siltstone, calcareous, and chert	N.S.	1.8	---	---
PC- 25	Chert	N.S.	1.8	---	---
PC- 24	Siltstone and chert	N.S.	8.4	---	---
PC- 23	Mudstone	6308-TMC	0.4	2.55	78.0
PC- 22	Limestone, argillaceous	6307-TMC	1.0	0.95	26.1
PC- 21	Limestone, argillaceous	6306-TMC	1.9	3.25	38.7
PC- 20	Limestone, argillaceous	6305-TMC	0.8	1.40	26.7
PC- 19	Mudstone, calcareous	6304-TMC	4.9	2.75	45.8

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
PC- 18	Siltstone, calcareous	6303-TMC	2.0	1.70	51.3
PC- 17	Siltstone, calcareous	6302-RGW	2.2	2.05	60.7
PC- 16	Siltstone, calcareous	6301-RGW	1.5	5.30	42.2
PC- 15	Limestone	6300-RGW	1.9	0.90	17.9
PC- 14	Siltstone, calcareous	6299-RGW	4.3	3.65	66.8
PC- 13	Siltstone	6298-RGW	1.5	4.25	70.9
PC- 12	Sandstone, calcareous	6297-RGW	1.5	0.40	46.4
PC- 11	Siltstone, calcareous	6296-RGW	3.8	5.75	56.1
PC- 10	Siltstone, calcareous	6295-RGW	2.2	6.90	50.9
PC- 9	Siltstone, calcareous, phosphatic	6294-RGW	1.7	10.1	45.7
PC- 8	Siltstone, calcareous, phosphatic	6293-RGW	1.9	8.45	41.8
PC- 7	Limestone, argillaceous, phosphatic	6292-RGW	2.7	9.75	30.0
PC- 6	Phosphate rock, argillaceous, calcareous	6291-RGW	1.8	17.0	31.4
PC- 5	Limestone	6290-RGW	1.8	2.65	10.6
PC- 4	Limestone, argillaceous, phosphatic	6289-RGW	1.6	9.15	36.5
PC- 3	Siltstone, calcareous, and argillaceous phosphate rock	6288-RGW	1.2	16.2	18.9
PC- 2	Phosphate rock, calcareous	6287-RGW	0.6	24.5	18.3
PC- 1	Phosphate rock; fos. col. no. 12490	6286-RGW	0.5	29.5	16.6
Total thickness of measured section			326.6		

Weber formation--top bed only

W- 5	Sandstone, calcareous; fos. col. no. 12490	N.S.	11.9	--	--
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STRAWBERRY VALLEY, UTAH, LOT NUMBER 1371

Park City formation measured and sampled partially from bulldozer trenches and partially in natural exposures in Willow Creek Canyon 2 miles north of highway 40, NW $\frac{1}{4}$ sec. 14, T. 2 S., R. 12 W., Wasatch County, Utah. Beds strike N. 30° W. and dip 50° W. The section is overturned 35° to near vertical. Section measured and sampled by R. A. Smart, T. M. Cheney, and R. G. Waring in September 1951. Samples analyzed for P₂O₅ and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
<u>Woodside formation--not measured</u>					
<u>Park City formation</u>					
PC-175	Dolomite	N.S.	75.0		
PC-174	Chert breccia	N.S.	1.0		
PC-173	Dolomite	N.S.	7.0		
PC-172	Covered	N.S.	48.0		
PC-171	Sandstone, calcareous	N.S.	12.0		
PC-170	Clastic limestone	N.S.	19.0		
PC-169	Limestone and chert	N.S.	10.0		
PC-168	Covered	N.S.	90.0		
PC-167	Sandstone, calcareous	N.S.	142.0		
PC-166	Chert and dolomite	N.S.	44.0		
PC-165	Limestone, dolomitic	N.S.	41.0		
PC-164	Sandstone and sandy limestone	N.S.	39.7		
PC-163	Sandstone, dolomitic	N.S.	6.3		
PC-162	Chert, sandstone, and phosphatic sandstone; fos. col. no. 12625	N.S.	7.5		
PC-161	Sandstone	N.S.	0.9		
PC-160	Sandstone	N.S.	0.8		
PC-159	Sandstone and chert	N.S.	2.4		
PC-158	Siltstone	N.S.	4.5		
PC-157	Siltstone	N.S.	6.3		
PC-156	Siltstone	N.S.	2.1		
PC-155	Siltstone	N.S.	5.5		
PC-154	Siltstone	N.S.	14.5		
PC-153	Siltstone, calcareous	6618-RGW	1.2	3.3	67.5
PC-152	Phosphate rock, calcareous, and mudstone	6617-RGW	1.1	16.1	34.4
PC-151	Siltstone, calcareous	6616-RGW	2.5	2.8	66.0
PC-150	Mudstone, phosphatic, calcareous, and mudstone	6615-RGW	1.0	4.4	62.5
PC-149	Siltstone and phosphate rock	6614-RGW	1.0	12.6	42.5
PC-148	Siltstone, dolomitic	N.S.	1.2		
PC-147	Mudstone	N.S.	1.1		

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
PC-146	Chert and mudstone	N.S.	0.9	---	---
PC-145	Mudstone	N.S.	2.2	---	---
PC-144	Mudstone	N.S.	5.3	---	---
PC-143	Mudstone	N.S.	0.5	---	---
PC-142	Mudstone, phosphatic, and phosphate rock	6613-TMC	0.5	14.4	46.2
PC-141	Mudstone, calcareous	N.S.	4.9	---	---
PC-140	Mudstone, calcareous	N.S.	3.4	---	---
PC-139	Siltstone	N.S.	9.1	---	---
PC-138	Siltstone, calcareous	N.S.	3.0	---	---
PC-137	Siltstone, calcareous	6612-RGW	1.2	7.2	45.7
PC-136	Phosphate rock, argillaceous	6611-RGW	0.4	22.5	23.9
PC-135	Limestone, silty, and calcareous mudstone	6610-RGW	1.7	6.2	39.1
PC-134	Mudstone, phosphatic, calcareous	6609-RGW	0.6	12.7	38.5
PC-133	Phosphate rock	6608-RGW	0.5	25.6	12.9
PC-132	Siltstone, calcareous	N.S.	1.9	---	---
PC-131	Limestone, silty	6607-RGW	1.7	4.5	31.0
PC-130	Dolomite	N.S.	0.8	---	---
PC-129	Siltstone, calcareous; siltstone, and chert	N.S.	3.5	---	---
PC-128	Mudstone, phosphatic, calcareous	6606-RGW	1.1	12.3	35.8
PC-127	Phosphate rock and calcareous mudstone	6605-RGW	1.5	16.5	30.0
PC-126	Phosphate rock	6604-RGW	0.5	26.1	12.5
PC-125	Dolomite	N.S.	1.5	---	---
PC-124	Mudstone	N.S.	0.5	---	---
PC-123	Dolomite	N.S.	1.5	---	---
PC-122	Siltstone	N.S.	0.7	---	---
PC-121	Siltstone, cherty	N.S.	2.7	---	---
PC-120	Siltstone, cherty	N.S.	1.8	---	---
PC-119	Mudstone and chert breccia	N.S.	1.8	---	---
PC-118	Siltstone, calcareous, and calcareous chert breccia	N.S.	1.3	---	---
PC-117	Chert and phosphatic mudstone	N.S.	0.9	---	---
PC-116	Siltstone	N.S.	0.9	---	---
PC-115	Siltstone, chert, and mudstone	N.S.	1.8	---	---
PC-114	Chert	N.S.	1.9	---	---
PC-113	Siltstone, dolomitic	N.S.	1.7	---	---
PC-112	Chert	N.S.	1.0	---	---
PC-111	Siltstone, cherty	N.S.	2.5	---	---
PC-110	Chert and siltstone	N.S.	1.6	---	---
PC-109	Phosphate rock, calcareous, and siltstone	6603-RGW	0.4	17.9	32.1

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
PC-108	Siltstone	N.S.	2.5		
PC-107	Siltstone and argillaceous, calcareous phosphate rock	N.S.	1.0		
PC-106	Siltstone and calcareous phosphate rock	N.S.	0.6		
PC-105	Mudstone	N.S.	3.9		
PC-104	Mudstone	N.S.	1.1		
PC-103	Mudstone	N.S.	1.1		
PC-102	Mudstone	N.S.	1.0		
PC-101	Mudstone and phosphatic mudstone	N.S.	1.1		
PC-100	Phosphate rock, calcareous	6602-RAS	0.6	18.5	14.6
PC-99	Mudstone, calcareous, and phosphatic mudstone	6601-RAS	1.7	8.7	36.0
PC-98	Mudstone	N.S.	1.8		
PC-97	Mudstone, dolomitic	N.S.	1.5		
PC-96	Phosphate rock, calcareous	6600-RAS	0.5	23.9	17.3
PC-95	Limestone, argillaceous	6599-RAS	1.6	2.4	31.0
PC-94	Phosphate rock, argillaceous	6598-RAS	1.1	20.7	24.9
PC-93	Mudstone, phosphatic	6597-RAS	0.9	12.7	40.5
PC-92	Limestone, argillaceous	6596-RAS	1.1	4.3	36.5
PC-91	Mudstone	N.S.	1.5		
PC-90	Mudstone	N.S.	2.1		
PC-89	Mudstone	N.S.	1.5		
PC-88	Mudstone	N.S.	2.5		
PC-87	Mudstone, calcareous	N.S.	0.6		
PC-86	Mudstone	N.S.	1.1		
PC-85	Mudstone	N.S.	4.5		
PC-84	Mudstone, calcareous, phosphatic	6595-RAS	0.9	8.3	53.0
PC-83	Mudstone, phosphatic	6594-RAS	0.5	15.7	42.4
PC-82	Mudstone, calcareous	6593-RAS	0.8	2.8	63.3
PC-81	Phosphate rock, argillaceous, and phosphate rock	6592-RAS	0.5	8.3	58.5
PC-80	Siltstone	N.S.	1.2		
PC-79	Siltstone, dolomitic	N.S.	1.0		
PC-78	Dolomite; fos. col. no. 12626	N.S.	2.9		
PC-77	Siltstone	N.S.	3.0		
PC-76	Siltstone	N.S.	2.3		
PC-75	Siltstone	N.S.	0.7		
PC-74	Siltstone	N.S.	0.9		
PC-73	Siltstone	N.S.	1.5		
PC-72	Siltstone	N.S.	2.7		
PC-71	Siltstone	N.S.	0.8		
PC-70	Chert, argillaceous	N.S.	3.5		
PC-69	Mudstone, cherty	N.S.	3.4		

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
PC- 68	Mudstone	N.S.	1.7	---	---
PC- 67	Chert, argillaceous	N.S.	2.9	---	---
PC- 66	Mudstone	N.S.	1.5	---	---
PC- 65	Mudstone	6591-RAS	0.7	7.3	68.1
PC- 64	Siltstone	N.S.	1.4	---	---
PC- 63	Siltstone	N.S.	3.3	---	---
PC- 62	Covered	N.S.	1.8	---	---
PC- 61	Sandstone	N.S.	1.1	---	---
PC- 60	Sandstone	N.S.	5.7	---	---
PC- 59	Sandstone	N.S.	5.1	---	---
PC- 58	Sandstone	N.S.	8.0	---	---
PC- 57	Covered	N.S.	22.0	---	---
PC- 56	Sandstone, calcareous	N.S.	40.0	---	---
PC- 55	Covered	N.S.	13.0	---	---
PC- 54	Sandstone, calcareous	N.S.	8.0	---	---
PC- 53	Sandstone, calcareous	N.S.	19.5	---	---
PC- 52	Covered	N.S.	11.0	---	---
PC- 51	Covered	N.S.	50.0	---	---
PC- 50	Dolomite, siliceous	N.S.	13.0	---	---
PC- 49	Covered	N.S.	15.0	---	---
PC- 48	Limestone	N.S.	3.8	---	---
PC- 47	Siltstone	N.S.	1.1	---	---
PC- 46	Dolomite, siliceous	N.S.	3.0	---	---
PC- 45	Covered	N.S.	10.0	---	---
PC- 44	Covered	N.S.	10.0	---	---
PC- 43	Covered	N.S.	9.0	---	---
PC- 42	Limestone, dolomitic	N.S.	15.0	---	---
PC- 41	Sandstone, calcareous	N.S.	16.0	---	---
PC- 40	Covered	N.S.	3.0	---	---
PC- 39	Limestone, cherty	N.S.	1.3	---	---
PC- 38	Limestone	N.S.	5.4	---	---
PC- 37	Siltstone, dolomitic	N.S.	4.0	---	---
PC- 36	Chert and calcareous siltstone	N.S.	2.4	---	---
PC- 35	Covered	N.S.	12.0	---	---
PC- 34	Siltstone, calcareous	N.S.	1.5	---	---
PC- 33	Limestone, arenaceous	N.S.	1.7	---	---
PC- 32	Siltstone	N.S.	3.4	---	---
PC- 31	Mudstone, calcareous	N.S.	1.7	---	---
PC- 30	Siltstone	N.S.	2.2	---	---
PC- 29	Siltstone	N.S.	1.9	---	---
PC- 28	Siltstone	N.S.	1.3	---	---
PC- 27	Covered	N.S.	7.0	---	---
PC- 26	Siltstone	N.S.	0.9	---	---

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P ₂ O ₅	ACID INSOLUBLE
PC ^{cor} 25	Siltstone	N.S.	1.7	----	----
PC ^{cor} 24	Siltstone	N.S.	1.2	----	----
PC ^{cor} 23	Siltstone	N.S.	4.2	----	----
PC ^{cor} 22	Mudstone	N.S.	1.8	----	----
PC ^{cor} 21	Siltstone	N.S.	0.9	----	----
PC ^{cor} 20	Limestone, arenaceous	N.S.	2.2	----	----
PC ^{cor} 19	Limestone, arenaceous	N.S.	4.7	----	----
PC ^{cor} 18	Siltstone, calcareous	N.S.	0.8	----	----
PC ^{cor} 17	Sandstone, calcareous	N.S.	1.7	----	----
PC ^{cor} 16	Siltstone, calcareous	N.S.	2.9	----	----
PC ^{cor} 15	Limestone, arenaceous	N.S.	1.1	----	----
PC ^{cor} 14	Limestone, arenaceous	N.S.	3.3	----	----
PC ^{cor} 13	Limestone, dolomitic	N.S.	18.0	----	----
PC ^{cor} 12	Limestone, arenaceous	N.S.	13.0	----	----
PC ^{cor} 11	Sandstone	N.S.	6.0	----	----
PC ^{cor} 10	Limestone	N.S.	20.0	----	----
PC ^{cor} 9	Covered	N.S.	70.0	----	----
PC ^{cor} 8	Limestone	N.S.	29.0	----	----
PC ^{cor} 7	Limestone	N.S.	50.0	----	----
PC ^{cor} 6	Covered	N.S.	12.0	----	----
PC ^{cor} 5	Limestone, sandy	N.S.	16.0	----	----
PC ^{cor} 4	Limestone	N.S.	22.0	----	----
PC ^{cor} 3	Covered	N.S.	18.0	----	----
PC ^{cor} 2	Limestone	N.S.	32.0	----	----
PC ^{cor} 1	Limestone	N.S.	20.0	----	----

Total thickness of Park City formation 1,416.6

Oquirrh formation (?)

O ^{cor}	1	Sandstone, calcareous	N.S.	N.M.	----	----
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LITTLE DIAMOND CREEK, UTAH, LOT NUMBER 1376

Part of middle member of Park City formation measured and sampled in old open pit mine under lease to American Smelting and Refining Co. near head of Little Diamond Creek, $S\frac{1}{2}SE\frac{1}{4}$ sec. 22, T. 8 S., R. 4 E., Utah County, Utah. Beds strike N. 20° W. and dip 30° NE. Section measured by T. M. Cheney and sampled by R. G. Waring in October 1951. Samples analyzed for P_2O_5 and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P_2O_5	ACID INSOLUBLE
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Middle member of Park City formation

	Covered	N.S.	N.M.	--	--
PC-5	Phosphate rock	6798-TMC	1.7	30.1	5.4
PC-4	Phosphate rock	6797-TMC	1.4	30.1	6.6
PC-3	Phosphate rock	6796-TMC	1.5	27.8	7.9
PC-2	Phosphate rock	6795-TMC	1.2	26.7	10.8

Note: PC-2 and PC-1 measured about 60 feet apart along strike; no definite correlation between these units, but no more than 1.5 feet of section missing and probably no less than 0.5 feet of section missing. This thickness would be similar to PC-2.

PC-1	Dolomite	N.S.	0.6 †	--	--
	Covered	N.S.	N.M.	--	--

Total thickness of measured section			<u>6.4</u> †		
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PROVIDENCE CANYON, UTAH, LOT NUMBER 1374

Phosphatic shale member of Brazer formation measured in Providence Canyon, T. 11 N., R. 2 E., Cache County, Utah. Beds dip gently east. Section measured and sampled by R. W. Swanson and R. G. Waring in September 1951. Samples analyzed for P_2O_5 and acid insoluble by U. S. Bureau of Mines Laboratory, Albany, Oregon.

BED NO.	ROCK DESCRIPTION	SAMPLE NO.	THICKNESS (FEET)	P_2O_5	ACID INSOLUBLE
<u>Phosphatic shale member of Brazer formation</u>					
B-10	Mudstone	6776-RWS	2.2	5.3	63.5
B- 9	Mudstone, phosphatic	6777-RWS	1.6	10.7	54.2
B- 8	Limestone	N.S.	2.0	--	--
B- 7	Mudstone, phosphatic	6778-RWS	2.1	11.4	55.8
B- 6	Limestone	N.S.	2.7	--	--
B- 5	Mudstone, phosphatic, calcareous	6779-RWS	1.8	13.9	40.03
B- 4	Mudstone, calcareous; contains limestone concretion	N.S.	1.7	--	--
B- 3	Limestone	N.S.	0.6	--	--
B- 2	Mudstone	N.S.	0.4	--	--
B- 1	Chert	N.S.	0.2	--	--

Note: Beds below are covered.

Total thickness of measured section	<u>15.3</u>
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10	Bedstone	6775-KMS	2.2	2.2	61
9	Bedstone, phosphatic	6775-KMS	1.6	1.6	61
8	Bedstone	N.S.	2.0	2.0	61
7	Bedstone, phosphatic	6775-KMS	2.1	2.1	61
6	Bedstone	N.S.	2.7	2.7	61
5	Bedstone, phosphatic, calcareous	6775-KMS	1.8	1.8	61
4	Bedstone, calcareous, contains	N.S.	1.7	1.7	61
3	Bedstone	N.S.	0.8	0.8	61
2	Bedstone	N.S.	0.4	0.4	61
1	Chert	N.S.	0.8	0.8	61

61: Beds below are covered.

61: Thickness of measured section 12.3



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