

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

**Spectrographic analyses of insoluble-residue samples,
Harrison 1° x 2° quadrangle, Missouri and Arkansas:
Drill holes nos. 11, 12, and 14**

by

M. S. Erickson and B. Chazin

Open-File Report 87-520

This report is preliminary and has not been reviewed for conformity with U.S. Geological Survey editorial standards and stratigraphic nomenclature. Any use of trade names is for descriptive purposes only and does not imply endorsement by the U.S. Geological Survey.

U.S. Geological Survey, P.O. Box 25046, DFC, MS 973, Denver, Colorado 80225

Prepared in cooperation with the Arkansas Geological Commission and the Missouri Division of Geology and Land Survey.

1987

CONTENTS

	Page
Introduction.....	1
Preparation and analysis of samples.....	1
Description of data tables.....	3
Explanation of data.....	4
RASS.....	4
Acknowledgments.....	4
References.....	4

FIGURE

Figure 1. Locations of drill holes, Harrison 1° x 2° quadrangle, Missouri and Arkansas.....	2
--	---

TABLES

Table 1. Spectrographic analyses of insoluble-residue samples from drill hole no. 11, Harrison 1° x 2° quadrangle, Missouri and Arkansas.....	5
Table 2. Spectrographic analyses of insoluble-residue samples from drill hole no. 12, Harrison 1° x 2° quadrangle, Missouri and Arkansas.....	8
Table 3. Spectrographic analyses of insoluble-residue samples from drill hole no. 14, Harrison 1° x 2° quadrangle, Missouri and Arkansas.....	11

INTRODUCTION

Geochemical studies of the Harrison 1° x 2° quadrangle, Missouri and Arkansas, were begun in 1983 as part of a multidisciplinary study of the quadrangle by the U.S. Geological Survey, the Missouri Division of Geology and Land Survey, and the Arkansas Geological Commission. The purpose of the study was to assess the mineral resource potential of the area by integrated geologic, geochemical, and geophysical studies.

The geochemical work has been directed at the characterization of the sedimentary rocks in the quadrangle through spectrographic analyses of dilute-hydrochloric-acid insoluble-residue samples of whole rock from widely spaced drill holes. Drill holes have been selected for study from the sample libraries of the Missouri Division of Geology and Land Survey and the Arkansas Geological Commission. None of the holes are company confidential and none intersect economically significant mineralized ground.

The analytical results for drill hole no. 11 (Arkansas I.D., Layne Western #3 Eureka Springs, Carroll Co. 1994), drill hole no. 12 (Arkansas I.D., R.W.D. #1 Forum, Ark., Madison Co. 1933), and drill hole no. 14 (Arkansas I.D., Banks #1 Independent, Madison Co. 315) are given in this report. Drill hole no. 11 is located in sec. 14, T. 20 N., R. 26 W. in Carroll County, Arkansas; drill hole no. 12 is located in sec. 35, T. 18 N., R. 26 W. in Madison County, Arkansas; and drill hole no. 14 is located in sec. 6, T. 16 N., R. 27 W. in Madison Co., Arkansas. Data for the insoluble-residue samples in drill holes 11, 12, and 14 are listed in tables 1, 2, and 3, respectively. State I.D., well name and/or well county number, county, and location allow identification and the ability to locate samples in Arkansas at the Arkansas Geologic Commission, Little Rock, Arkansas.

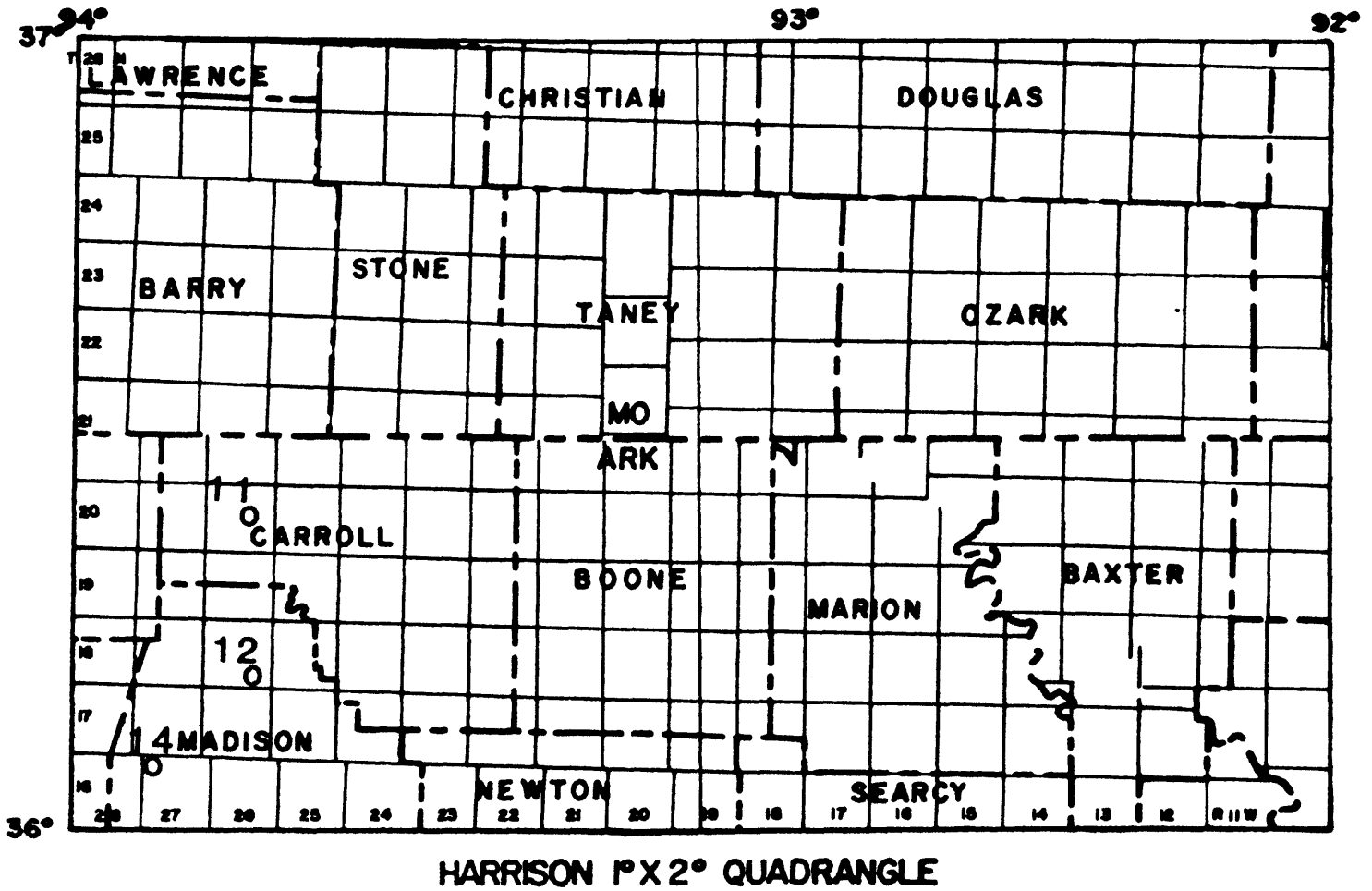
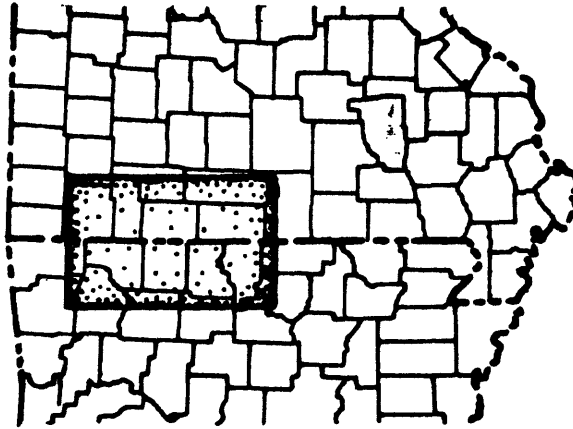
PREPARATION AND ANALYSIS OF SAMPLES

Insoluble residues were prepared by dissolving approximately 80 grams of crushed carbonate rock in repeated applications of 1:5 hydrochloric acid until the carbonate was removed. The samples were then filtered and dried overnight at 50°C.

The samples were then pulverized to minus 140 mesh (0.105 mm) in a vertical grinder equipped with ceramic plates. Some insoluble-residue samples contained only a few milligrams of material, and these were hand ground in an agate mortar and pestle. A hand magnet was passed over the insoluble-residue samples before grinding to remove filings or chips of drill bit that might have been present.

Each sample was analyzed semiquantitatively for 31 elements using a six-step D.C.-arc optical-emission spectrographic method (Grimes and Marranzino, 1968).

The semiquantitative spectrographic values are reported as six steps per order of magnitude (1, 0.7, 0.5, 0.3, 0.2, and 0.15) and are approximate geometric midpoints of the concentration ranges. The precision is shown to be within one adjoining reporting interval on each side of the reported value 83 percent of the time and within two adjoining intervals on each side of the reported value 96 percent of the time (Motooka and Grimes, 1976).



Locations of drill holes discussed in this report

The visual lower limits of determination for the 31 elements that were determined spectrographically for this report are as follows:

For those given in percent:

Calcium	0.05
Iron	0.05
Magnesium	0.02
Titanium	0.002

For those given in ppm:

Antimony	100	Molybdenum	5
Arsenic	200	Nickel	5
Barium	20	Niobium	20
Beryllium	1	Scandium	5
Bismuth	10	Silver	0.5
Boron	10	Strontium	100
Cadmium	20	Thorium	100
Chromium	10	Tin	10
Cobalt	5	Tungsten	50
Copper	5	Vanadium	10
Gold	10	Yttrium	10
Lanthanum	20	Zinc	200
Lead	10	Zirconium	10
Manganese	10		

DESCRIPTION OF DATA TABLES

Each sample is identified by an eight-character code beginning with the letter H, signifying Harrison. The letter R either follows this number or appears at the end of the character code, and signifies insoluble residue. The next two numbers signify the USGS drill-hole number. The last four digits identify the depth of the sample from the drill-hole collar. Samples are composites of from 50-150' intervals, dependent upon the original sample interval and upon the amount of sample material available for analysis.

The stratigraphic unit of the sample is identified by a coded number in the last column (tables 1 through 3) following the thorium column. The code and formation names are as follows:

<u>Code</u>	<u>Formation</u>
11	Precambrian Rocks
15	Potosi Formation
16	Eminence Dolomite
17	Gunter Sandstone member of the Gasconade Formation
30	Chattanooga Shale
31	Undifferentiated Mississippian units
40	Undifferentiated Ordovician units
41	Undifferentiated Cambrian units

EXPLANATION OF DATA

The columns in tables 1 through 3 have headings of sample, elements, and formation. The letter S over the columns signifies emission-spectrographic data.

Iron, magnesium, calcium, and titanium are reported in percent (%); all other elements are in parts per million. Other symbols shown on the tables are:

- N = Not detected at the limit of determination shown;
- < = Detected, but below the limit of determination shown; and
- > = Greater than the limit of determination shown.

Because of the formatting used in the computer program that produced tables 1-3, some of the elements listed in these tables (Fe, Mg, Ca, Ti, Ag, and Be) carry one or more nonsignificant zeros to the right of the significant digits. The analyst did not determine these elements to the accuracy suggested by the extra zeros.

RASS

Upon completion of all analytical work, the information from the samples is entered into a computer-based file called RASS (Rock Analysis Storage System). This RASS file contains both descriptive geological information and analytical data. Any or all of this information may be retrieved and placed in a standard form (STATPAC) for computerized statistical manipulation or publication (VanTrump and Miesch, 1977).

ACKNOWLEDGMENTS

The authors wish to thank the Missouri Division of Geology and Land Survey--Dr. Wallace B. Howe, former Director, and Dr. J. Hadley Williams, Director--and the Arkansas Geological Commission, Dr. Norman F. Williams, State Geologist, for making these drill-hole samples available from their sample libraries.

REFERENCES

- Grimes, D. J., and Marranzino, A. P., 1968, Direct-current arc and alternating-current spark emission spectrographic field methods for the semiquantitative analysis of geologic materials: U.S. Geological Survey Circular 591, 6 p.
- Missouri Geological Survey, 1979, Geologic Map of Missouri: Rolla, Missouri, scale 1:500,000.
- Motooka, J. M., and Grimes, D. J., 1976, Analytical precision of one-sixth order semiquantitative spectrographic analyses: U.S. Geological Survey Circular 738, 25 p.
- VanTrump, George, Jr., and Miesch, A. T., 1977, The U.S. Geological Survey RASS-STATPAC system for management and statistical reduction of geochemical data: Computers and Geosciences, v. 3, p. 475-488.

TABLE 1.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H11, HARRISON 1 X 2
QUADRANGLE, MISSOURI AND ARKANSAS.

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Fe-pct. S	Mq-pct. S	Ce-pct. S	Ti-pct. S	Mn-pptm S	Ag-pptm S	As-pptm S	Au-pptm S	B-pptm S	Ba-pptm S
H11R0010	3.00	1.00	<.05	.50	100	N	N	N	150	500
H11P0050	2.00	1.00	.05	.30	20	N	N	N	150	200
H11R0100	1.00	.50	.10	.15	10	N	N	N	100	150
H11R0150	.70	.50	.10	.20	10	N	N	N	100	200
H11R0200	.70	.20	.10	.20	10	N	N	N	70	200
H11R0250	5.00	.70	.07	.50	20	N	N	N	100	200
H11R0300	7.00	1.00	.10	.50	30	N	N	N	150	500
H11R0350	5.00	1.00	.10	.70	30	N	N	N	200	500
H11R0400	1.50	1.00	.15	.50	20	N	N	N	150	300
H11R0450	2.00	1.00	.10	.50	20	N	N	N	150	500
H11R0500	3.00	1.00	.05	.50	30	N	N	N	150	300
H11R0550	5.00	1.00	.05	.50	30	N	N	N	150	500
H11R0600	5.00	1.00	.05	.70	50	.7	N	N	100	200
H11R0650	.50	.10	.07	.10	10	N	N	N	70	50
H11R0700	1.50	.20	.10	.20	10	N	N	N	100	150
H11P0750	1.00	.20	<.05	.15	10	N	N	N	50	100
H11R0800	1.00	.20	.10	.15	2,000	N	N	N	70	100
H11R0850	.50	.10	<.05	.07	10	N	N	N	50	70
H11R0900	.70	.20	<.05	.10	<10	N	N	N	70	100
H11R0950	.30	.07	<.05	.05	10	N	N	N	20	30
H11R1000	.20	.07	<.05	.07	<10	N	N	N	20	50
H11R1100	.50	.10	.07	.05	<10	N	N	N	30	100
H11R1200	.10	.03	.05	.01	<10	N	N	N	50	50
H11R1300	.50	.10	<.05	.15	<10	N	N	N	100	100
H11R1370	.70	.10	<.05	.15	<10	N	N	N	50	70
H11P1420	<.05	<.02	<.05	.01	<10	N	N	N	10	<20
H11P1500	.30	.15	<.05	.10	<10	N	N	N	50	50
H11R1600	5.00	1.00	<.05	.50	20	.7	N	N	150	150
H11R1710	15.00	3.00	<.05	1.00	100	2.0	200	N	1,500	200

TABLE 1.--- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H11, HARRISON 1 X 2
QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s
H11R0010	1.5	N	N	500	200	70	30	50	N	50	<10
H11R0050	1.5	N	N	30	70	50	N	10	N	30	<10
H11R0100	<1.0	N	N	15	30	20	N	<5	N	10	<10
H11R0150	1.0	N	N	7	30	20	N	<5	N	10	<10
H11R0200	<1.0	N	N	<5	20	20	N	<5	N	10	<10
H11R0250	1.0	N	N	5	50	50	N	5	N	15	<10
H11R0300	1.0	N	N	7	100	70	N	5	N	20	50
H11P0350	1.0	N	N	7	150	50	N	7	N	20	30
H11R0400	1.0	N	N	5	100	20	N	<5	N	15	<10
H11R0450	<1.0	N	N	7	150	30	N	5	N	20	20
H11R0500	1.0	N	N	10	100	500	N	10	N	20	50
H11R0550	<1.0	N	N	10	100	100	N	30	N	30	30
H11R0600	<1.0	N	N	10	100	150	N	50	N	20	50
H11R0650	11	N	N	<5	15	10	N	7	N	7	<10
H11R0700	11	N	N	<5	20	15	N	10	N	10	<10
H11R0750	11	N	N	<5	20	15	N	7	N	15	<10
H11R0800	<1.0	N	N	<5	20	15	N	5	N	20	<10
H11R0850	<1.0	N	N	<5	15	10	N	5	N	15	<10
H11R0900	<1.0	N	N	<5	15	5	N	5	N	7	<10
H11P0950	<1.0	N	N	<5	10	<5	N	5	N	5	<10
H11R1000	<1.0	N	N	<5	20	<5	N	<5	N	7	<10
H11R1100	<1.0	N	N	<5	20	<5	N	<5	N	7	<10
H11R1200	<1.0	N	N	<5	20	<5	N	<5	N	7	<10
H11R1300	<1.0	N	N	<5	20	7	N	<5	N	7	<10
H11R1370	<1.0	N	N	<5	20	10	N	10	N	10	<10
H11R1420	<1.0	N	N	<5	15	<5	N	<5	N	7	<10
H11R1500	<1.0	N	N	<5	50	5	N	5	N	7	<10
H11R1600	2.0	N	N	7	100	50	N	20	N	50	50
H11R1710	10.0	N	N	20	200	200	N	30	N	100	100

TABLE 1.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H11, HARRISON 1 X 2
QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	St-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Form
H11R0010	N	15	N	100	200	<50	15	N	100	N	31
H11R0050	N	7	N	N	100	<50	N	N	100	N	31
H11R0100	N	<5	N	100	30	<50	N	N	50	N	40
H11R0150	N	<5	N	<100	50	<50	N	N	100	N	40
H11R0200	N	N	N	<100	50	<50	N	N	100	N	40
H11R0250	N	7	N	<100	100	<50	N	N	150	N	40
H11R0300	N	10	N	<100	100	<50	N	N	150	N	40
H11R0350	N	10	N	500	100	<50	N	N	150	N	40
H11R0400	N	5	N	150	100	<50	N	N	150	N	40
H11R0450	N	10	N	150	150	<50	N	N	200	N	40
H11R0500	N	7	N	<100	150	<50	N	N	150	N	40
H11R0550	N	7	N	<100	100	<50	N	N	200	N	40
H11R0600	N	5	N	<100	100	<50	N	N	100	N	40
H11R0650	N	N	N	<100	20	<50	N	N	10	N	40
H11R0700	N	<5	N	100	50	<50	N	N	70	N	40
H11R0750	N	<5	N	<100	30	<50	N	N	50	N	40
H11R0800	N	N	N	<100	50	<50	N	N	50	N	40
H11R0850	N	N	N	<100	20	<50	N	N	50	N	40
H11R0900	N	N	N	<100	50	<50	N	N	50	N	40
H11R0950	N	N	N	<100	15	<50	N	N	50	N	40
H11R1000	N	N	N	<100	30	<50	N	N	30	N	40
H11R1100	N	N	N	<100	20	<50	N	N	50	N	40
H11R1200	N	N	N	<100	20	<50	N	N	N	N	40
H11R1300	N	N	N	<100	70	<50	N	N	10	N	40
H11R1370	N	N	N	<100	70	<50	N	N	50	N	40
H11R1420	N	N	N	<100	10	<50	N	N	30	N	17
H11R1500	N	N	N	<100	20	<50	N	N	20	N	16
H11R1600	N	7	N	<100	200	<50	N	N	100	N	16
H11R1710	N	15	N	<100	1,000	<50	10	N	150	N	16

TABLE 2.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H12, HARRISON 1 X 2 QUADRANGLE, MISSOURI AND ARKANSAS.

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-pptm s	Ag-pptm s	As-pptm s	Au-pptm s	B-pptm s	Ba-pptm s
H120100R	.15	.02	<.05	.020	10	N	N	N	100	100
H120150R	<.05	<.02	.07	.003	<10	N	N	N	100	20
H120200R	.05	.02	.07	.015	<10	N	N	N	100	70
H120270R	.15	.15	.50	.030	15	N	N	N	100	100
H120330R	.20	.15	.30	.050	20	N	N	N	100	100
H120350R	1.00	1.00	<.05	.500	50	N	N	N	200	300
H120400R	2.00	.30	.05	.200	30	N	N	N	100	200
H120440R	.10	.03	<.05	.020	<10	N	N	N	20	50
H120510R	.10	.10	<.05	.050	<10	N	N	N	30	200
H120600R	3.00	1.00	<.05	.500	15	N	N	N	200	300
H120680R	1.00	.50	.05	.150	10	N	N	N	100	150
H120800R	1.00	.30	.07	.200	50	N	N	N	100	300
H120900R	1.50	.50	.07	.200	10	N	N	N	100	300
H121000R	.70	.20	<.05	.100	<10	N	N	N	100	150
H121100R	2.00	.30	<.05	.200	15	N	N	N	100	200
H121200R	1.00	.20	<.05	.100	10	N	N	N	100	150
H121300R	.70	.20	<.05	.100	10	N	N	N	50	150
H121400R	1.00	.50	<.05	.150	15	N	N	N	100	200
H121500R	1.00	.10	<.05	.070	20	N	N	N	100	150
H121600R	.30	.07	.05	.050	<10	N	N	N	50	100
H121700R	.15	.07	.05	.030	<10	N	N	N	50	150
H121800R	.15	.05	<.05	.010	<10	N	N	N	50	50
H121900R	.15	.02	<.05	.010	<10	N	N	N	50	70
H121970R	.70	.20	.05	.070	10	N	N	N	50	100

TABLE 2.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H12, HARRISON 1 X 2
QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Re-pbm s	Bi-pbm s	Cd-pbm s	Co-pbm s	Cr-pbm s	Cu-pbm s	La-pbm s	Mo-pbm s	Nb-pbm s	Ni-pbm s	Pb-pbm s
H120100R	N	N	N	N	<10	7	N	N	N	5	N
H120150R	N	N	N	N	<10	<5	N	<5	N	<5	N
H120200R	N	N	N	N	<10	<5	N	<5	N	5	N
H120270R	N	N	N	10	10	<5	N	<5	N	30	N
H120330R	N	N	N	<5	<10	<5	N	N	N	15	N
H120350R	2.0	N	N	10	100	50	<20	5	<20	30	10
H120400R	1.5	N	N	7	50	20	<20	5	N	50	N
H120440R	N	N	N	N	<10	<5	N	N	N	7	N
H120510R	N	N	N	N	<10	5	N	N	N	10	N
H120600R	1.5	N	N	10	100	100	50	5	N	50	15
H120680R	2.0	N	N	N	30	15	N	5	N	15	N
H120800R	1.0	N	N	5	20	15	N	5	<20	15	10
H120900R	1.0	N	N	<5	50	50	N	5	N	30	50
H121000R	1.0	N	N	<5	10	15	N	5	N	10	N
H121100R	1.0	N	N	<5	50	50	N	7	N	20	20
H121200R	1.0	N	N	<5	20	20	N	10	N	15	15
H121300R	1.0	N	N	N	20	15	N	10	N	15	<10
H121400R	N	N	N	5	50	30	N	10	N	15	10
H121500R	N	N	N	<5	20	10	N	7	N	10	<10
H121600R	N	N	N	<5	10	15	N	5	N	10	<10
H121700R	N	N	N	10	10	150	N	<5	N	10	N
H121800R	N	N	N	N	<10	<5	N	<5	N	5	N
H121900R	N	N	N	<5	10	50	N	<5	N	7	N
H121970R	1.0	N	<20	N	15	20	N	7	N	10	<10

TABLE 2.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H12, HARRISON 1 X 2
QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Sb-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Form
H120100R	N	N	N	N	15	<50	N	N	20	N	31
H120150R	N	N	N	N	15	<50	N	N	N	N	31
H120200R	N	N	N	N	15	<50	N	N	N	N	31
H120270R	N	N	N	N	30	<50	N	N	10	N	31
H120330R	N	N	N	N	20	<50	N	N	20	N	31
H120350R	N	10	N	N	200	<50	15	N	100	N	30
H120400R	N	5	N	N	150	<50	10	N	150	N	40
H120440R	N	N	N	N	10	<50	N	N	30	N	40
H120510R	N	N	N	N	15	<50	N	N	50	N	40
H120600R	N	7	N	<100	150	<50	N	N	70	N	40
H120680R	N	5	N	N	30	<50	N	N	100	N	40
H120800R	N	5	N	<100	20	50	N	N	70	N	40
H120900R	N	5	N	200	50	<50	N	N	100	N	40
H121000R	N	<5	N	N	20	<50	N	N	50	N	40
H121100R	N	5	N	N	50	<50	N	N	100	N	40
H121200R	N	<5	N	N	30	<50	N	N	100	N	40
H121300R	N	<5	N	N	50	<50	N	N	50	N	40
H121400R	N	5	N	N	50	<50	N	N	50	N	40
H121500R	N	<5	N	N	30	<50	N	N	50	N	40
H121600R	N	<5	N	N	20	<50	N	N	30	N	40
H121700R	N	N	N	N	15	200	N	N	30	N	40
H121800R	N	N	N	N	20	<50	N	N	N	N	40
H121900R	N	N	N	N	20	<50	N	N	N	N	40
H121970R	N	<5	N	<100	50	<50	N	N	20	N	40

TABLE 3.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H14, HARRISON 1 X 2
QUADRANGLE, MISSOURI AND ARKANSAS.

[N, not detected; <, detected but below the limit of determination shown; >, determined to be greater than the value shown.]

Sample	Fe-pct. S	Mg-pct. S	Ca-pct. S	Ti-pct. S	Mn-ppm S	Ag-ppm S	As-ppm S	Au-ppm S	B-ppm S	Ba-ppm S
H140050R	.50	.07	<.05	.020	10	N	N	N	70	50
H140107R	.05	<.02	.07	.003	<10	N	N	N	100	70
H140140R	.15	<.02	.05	.003	<10	N	N	N	100	50
H140200R	.05	.02	.15	.002	<10	N	N	N	100	70
H140215R	3.00	1.00	.07	.500	100	N	N	N	200	200
H140300R	2.00	.10	.20	.070	15	N	N	N	70	50
H140315R	10.00	1.00	<.05	.500	100	N	N	N	200	200
H140345R	3.00	1.50	<.05	.700	150	N	N	N	200	300
H140375R	.20	.02	<.05	.010	<10	N	N	N	50	N
H140400R	<.05	<.02	<.05	.010	<10	N	N	N	10	N
H140438R	.15	<.02	<.05	.007	10	N	N	N	<10	<20
H140455R	.10	.02	<.05	.010	<10	N	N	N	<10	20
H140500R	.50	.20	<.05	.100	10	N	N	N	100	200
H140550R	.07	<.02	<.05	.010	<10	N	N	N	30	N
H140600R	.10	.02	<.05	.003	<10	N	N	N	70	<20
H140610R	.05	.02	<.05	.005	<10	N	N	N	20	50
H140700R	10.00	1.00	<.05	.300	15	N	N	N	200	300
H140750R	10.00	1.00	<.05	.300	15	N	N	N	150	300
H140800R	2.00	.15	.05	.050	10	N	N	N	100	150
H140850R	1.50	.20	.05	.050	<10	N	N	N	100	100
H140870R	.20	.10	.05	.030	<10	N	N	N	100	100
H140895R	1.00	.20	.07	.070	10	N	N	N	100	100
H140920R	1.00	.15	<.05	.050	10	N	N	N	100	100
H140948R	.30	.15	.07	.030	<10	N	N	N	100	50
H141000R	1.00	.20	.07	.100	10	N	N	N	100	150
H141018R	1.00	.15	.07	.070	10	N	N	N	70	150
H141050R	1.00	.30	.07	.100	20	N	N	N	100	150
H141100R	1.00	.15	<.05	.050	15	N	N	N	100	100
H141200R	1.50	.20	.05	.100	10	N	N	N	70	150
H141255R	2.00	.50	<.05	.150	10	N	N	N	70	150
H141400R	1.50	.30	.05	.150	10	N	N	N	70	150
H141485R	.10	.05	<.05	.020	<10	N	N	N	70	30
H141552R	.05	.03	<.05	.010	<10	N	N	N	50	70
H141602R	.15	.05	<.05	.015	50	N	N	N	50	30
H141700R	.20	.05	.05	.020	<10	N	N	N	30	50
H141800R	.10	.02	<.05	.002	<10	N	N	N	20	N
H141900R	.20	.05	.05	.007	<10	N	N	N	50	50
H142000R	1.00	.05	.05	.010	<10	N	N	N	20	20
H142053R	.10	.03	<.05	.002	<10	N	N	N	10	N
H142068R	.15	<.02	<.05	.003	<10	N	N	N	<10	N
H142098R	.20	.10	.05	.010	<10	N	N	N	<10	N
H142200R	.50	.05	.05	.003	<10	N	N	N	15	N
H142300R	.50	.20	.20	.015	<10	N	N	N	15	20
H142400R	5.00	.50	.30	.070	<10	N	N	N	20	300
H142441R	3.00	.10	.05	.100	<10	N	N	N	30	500

TABLE 3.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H14, HARRISON 1 X 2
QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s
H140050R	N	N	N	5	15	<5	N	N	N	15	N
H140107R	N	N	N	N	10	<5	N	N	N	<5	30
H140140R	N	N	N	N	10	<5	N	<5	N	7	N
H140200R	N	N	N	N	10	<5	N	N	N	5	N
H140215R	1.0	<10	N	20	50	100	N	70	<20	100	20
H140300R	<1.0	N	N	15	20	15	N	7	N	70	500
H140315R	1.0	N	N	20	70	30	N	5	<20	100	30
H140345R	1.5	<10	N	20	100	70	N	50	<20	70	30
H140375R	N	N	N	N	10	<5	N	5	N	5	N
H140400R	N	N	N	N	10	<5	N	<5	N	7	N
H140438R	N	N	N	N	15	<5	N	N	N	10	N
H140455R	N	N	N	N	15	<5	N	<5	N	7	N
H140500R	N	N	N	N	20	10	N	5	N	10	N
H140550R	N	N	N	N	<10	<5	N	<5	N	5	N
H140600R	N	N	N	N	<10	<5	N	<5	N	10	N
H140610R	N	N	N	N	<10	<5	N	<5	N	7	N
H140700R	1.0	<10	N	15	50	100	N	20	<20	70	50
H140750R	1.0	<10	N	15	50	50	N	50	N	50	50
H140800R	N	N	N	<5	15	20	N	7	N	20	20
H140850R	N	N	N	<5	15	15	N	5	N	20	15
H140870R	N	N	N	N	15	5	N	<5	N	10	N
H140895R	<1.0	N	N	5	20	15	N	5	N	20	10
H140920R	N	N	N	N	20	7	N	<5	N	10	20
H140948R	N	N	N	N	15	5	N	<5	N	10	<10
H141000R	<1.0	N	N	N	15	50	N	5	N	15	15
H141018R	N	N	N	N	15	15	N	<5	N	10	10
H141050R	<1.0	N	N	N	20	50	N	<5	N	15	15
H141100R	N	N	N	N	10	50	N	5	N	10	10
H141200R	N	N	N	N	20	50	N	15	N	15	20
H141255R	<1.0	N	N	N	30	30	N	15	N	15	150
H141400R	N	N	N	N	20	50	N	10	N	15	10
H141485R	N	N	N	N	15	5	N	<5	N	7	N
H141552R	N	N	N	N	N	<5	N	<5	N	5	N
H141602R	N	N	N	N	N	7	N	N	N	7	N
H141700R	N	N	N	N	N	5	N	N	N	10	10
H141800R	N	N	N	N	N	5	N	<5	N	10	N
H141900R	N	N	N	N	N	5	N	N	N	7	<10
H142000R	N	N	N	N	N	7	N	5	N	7	<10
H142053R	N	N	N	N	N	<5	N	N	N	7	N
H142068R	N	N	N	N	N	<5	N	N	N	5	<10
H142098R	N	N	N	N	N	<5	N	<5	N	5	<10
H142200R	N	N	N	N	N	<5	N	N	N	7	<10
H142300R	N	N	N	N	N	10	N	N	N	10	<10
H142400R	N	N	N	N	N	150	N	20	N	15	70
H142441R	N	N	N	N	N	30	N	10	N	10	20

TABLE 3.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H14, HARRISON 1 X 2
QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Sub-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	W-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Form
H140050R	N	N	N	N	30	<50	N	N	N	N	31
H140107R	N	N	N	N	15	<50	N	N	N	N	31
H140140R	N	N	N	N	20	<50	N	N	N	N	31
H140200R	N	N	N	N	<10	<50	N	<200	N	N	31
H140215R	N	20	N	N	200	<50	15	N	100	N	30
H140300R	N	5	N	N	30	<50	N	200	20	N	40
H140315R	N	20	N	N	150	<50	15	N	200	N	40
H140345R	N	20	N	<100	200	<50	20	<200	150	N	40
H140375R	N	14	N	N	10	<50	N	N	30	N	40
H140400R	N	N	N	N	10	<50	N	N	20	N	40
H140438R	N	N	N	N	10	<50	N	N	20	N	40
H140455R	N	N	N	N	10	<50	N	N	15	N	40
H140500R	N	5	N	N	30	<50	N	N	100	N	40
H140550R	N	N	N	N	10	<50	N	N	20	N	40
H140600R	N	N	N	N	10	<50	N	N	15	N	40
H140610R	N	N	N	N	15	<50	N	N	15	N	40
H140700R	N	7	N	N	100	<50	10	N	150	N	40
H140750R	N	7	N	N	100	<50	N	N	100	N	40
H140800R	N	5	N	N	20	<50	N	N	30	N	40
H140850R	N	N	N	N	20	<50	N	N	10	N	40
H140870R	N	N	N	N	15	<50	N	<200	<10	N	40
H140895R	N	N	N	N	15	50	N	N	15	N	40
H140920R	N	N	N	N	15	<50	N	N	20	N	40
H140948R	N	N	N	N	15	<50	N	N	10	N	40
H141000R	N	N	N	100	30	<50	N	N	30	N	40
H141018R	N	N	N	<100	20	<50	N	N	30	N	40
H141050R	N	N	N	<100	50	<50	N	N	20	N	40
H141100R	N	N	N	<100	20	<50	N	N	20	N	40
H141200R	N	N	N	<100	20	<50	N	N	30	N	40
H141255R	N	N	N	N	50	<50	N	N	50	N	40
H141400R	N	N	N	<100	20	<50	N	N	30	N	40
H141485R	N	N	N	N	50	<50	N	N	50	N	40
H141552R	N	N	N	N	15	<50	N	N	20	N	40
H141602R	N	N	N	N	20	<50	N	N	N	N	40
H141700R	N	N	N	N	20	<50	N	N	20	N	40
H141800R	N	N	N	N	15	<50	N	N	N	N	40
H141900R	N	N	N	N	20	<50	N	N	N	N	40
H142000R	N	N	N	N	30	<50	N	N	N	N	40
H142053R	N	N	N	N	15	<50	N	N	N	N	17
H142068R	N	N	N	N	15	<50	N	N	10	N	17
H142098R	N	N	N	N	15	<50	N	N	10	N	41
H142200R	N	N	N	N	15	<50	N	N	N	N	41
H142300R	N	N	N	N	20	<50	N	N	N	N	41
H142400R	N	N	N	N	20	<50	10	N	300	N	41
H142441R	N	N	N	N	20	<50	20	N	200	N	41

TABLE 3.--- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H14, HARRISON 1 X 2
QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s	B-ppm s	Ba-ppm s
H142450R	3.00	.70	.05	.300	100	N	N	N	20	1,000
H142504R	3.00	.50	<.05	.300	100	N	N	N	20	1,500

TABLE 3.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H14, HARRISON 1 X 2
QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Be-ppm s	Bi-ppm s	Cd-ppm s	Co-ppm s	Cr-ppm s	Cu-ppm s	La-ppm s	Mo-ppm s	Nb-ppm s	Ni-ppm s	Pb-ppm s
H142450R	<1.0	N	N	10	N	10	<20	5	N	15	15
H142504R	<1.0	N	N	10	N	15	50	5	N	15	30

TABLE 3.-- SPECTROGRAPHIC ANALYSES OF INSOLUBLE - RESIDUE SAMPLES FROM DRILL HOLE NO. H14, HARRISON 1 X 2
QUADRANGLE, MISSOURI AND ARKANSAS.--Continued

Sample	Sh-ppm s	Sc-ppm s	Sn-ppm s	Sr-ppm s	V-ppm s	K-ppm s	Y-ppm s	Zn-ppm s	Zr-ppm s	Th-ppm s	Form
H142450R	N	10	N	N	50	<50	50	N	200	N	11
H142504R	W	10	N	N	30	<50	50	N	300	N	11