

UNITED STATES DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY

**Spectrographic analyses of insoluble-residue samples,  
Joplin 1° x 2° quadrangle, Kansas and Missouri:  
Drill hole nos. 68, 69, and 70**

By

John H. Bullock, Jr.\* and Helen W. Folger\*

Open-File Report 90-20

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, DFC, Box 25046, MS 973, Denver, CO 80225

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

## CONTENTS

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

## FIGURE

Figure 1. Locations of drill hole nos. 68, 69, and 70, Joplin 1° x 2° quadrangle, Missouri and Kansas.....	2
--	---

## TABLES

Table 1. Spectrographic analyses of insoluble-residue samples from drill hole no. 68, Joplin 1° x 2° quadrangle, Missouri and Kansas.....	5
Table 2. Spectrographic analyses of insoluble-residue samples from drill hole no. 69, Joplin 1° x 2° quadrangle, Missouri and Kansas.....	8
Table 3. Spectrographic analyses of insoluble-residue samples from drill hole no. 70, Joplin 1° x 2° quadrangle, Missouri and Kansas.....	10

## INTRODUCTION

Geochemical studies of the Joplin 1° x 2° quadrangle, Missouri and Kansas, 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 Kansas Geological Survey. 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 Kansas Geological Survey (KGS). None of the holes are company confidential and none intersect economically significant mineralized ground.

The analytical results for drill hole no. 68 (#4 Beggs - KGS), drill hole no. 69 (#1 Willis - KGS), and drill hole no. 70 (#1 Franklin - KGS) are given in this report. Drill hole no. 68 is located in sec. 5, T. 26 S., R. 21 E. in Allen County, Kansas; drill hole no. 69 is located in sec. 7, T. 28 S., R. 18 E. in Neosho County, Kansas; drill hole no. 70 is located in sec. 12, T. 28 S., R. 16 E. in Wilson County, Kansas (fig.1). Data for the insoluble-residue samples from drill holes 68, 69, and 70 are listed in tables 1, 2, and 3 respectively. Well name, well number, township, range, and county allow for identification and location of files at the Kansas Geological Survey.

## 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 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 with 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).

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

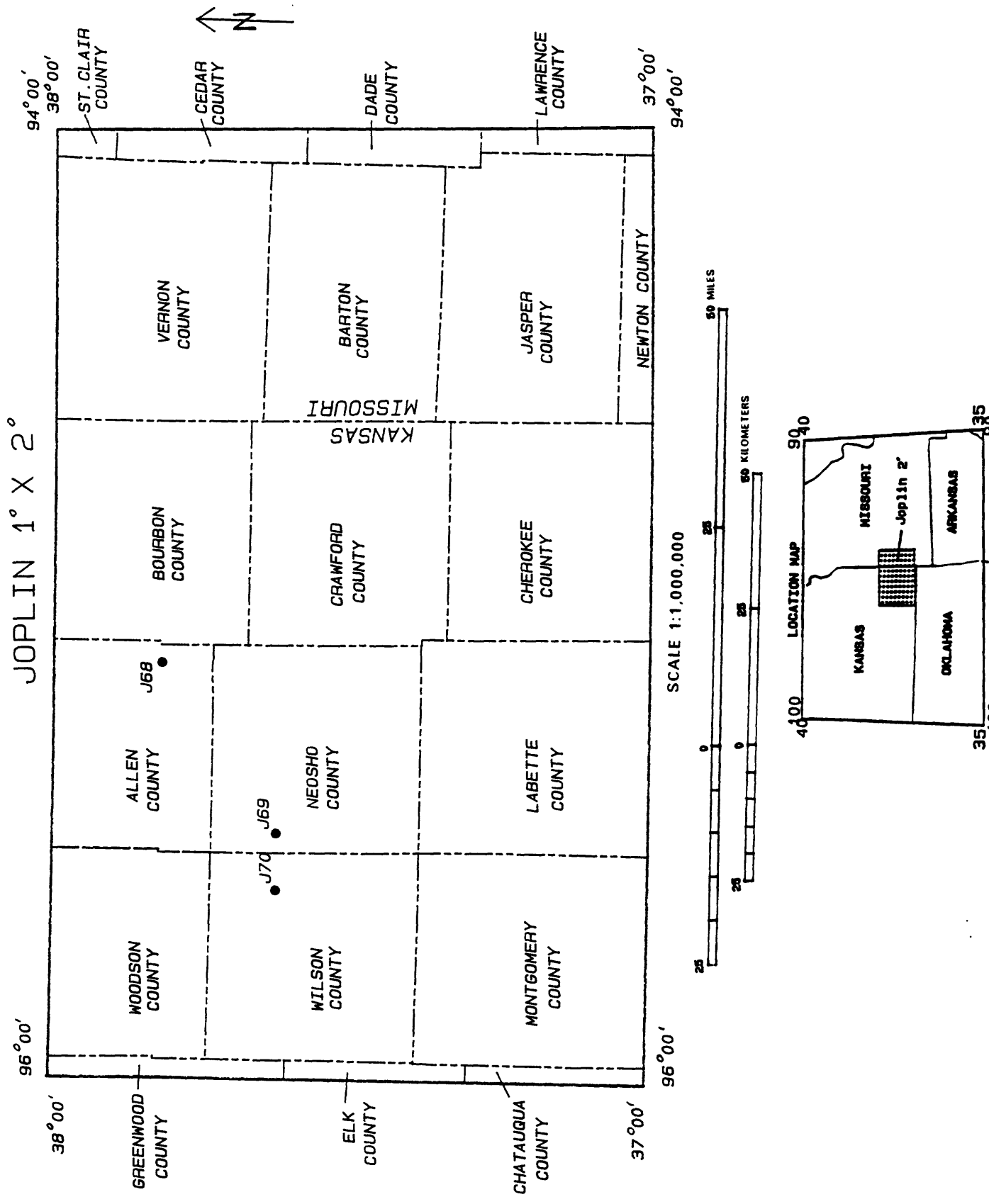


Figure 1. Locations of drill holes 68, 69, and 70, Joplin 1° x 2° quadrangle, Missouri and Kansas.

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 J, signifying Joplin. The next number signifies the USGS drill-hole number. The letter R appears after the drill hole number and signifies insoluble residue. The next four digits identify the depth of the sample from the drill-hole collar. Most samples are composites of approximate 10-foot intervals, dependent upon the original sample intervals 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 of tables 1 through 3. The code and formation names are as follows:

<u>Code</u>	<u>Formation</u>
20	Pennsylvanian Undifferentiated
31	Chattanooga Shale
40	Mississippian Undifferentiated
60	Ordovician Undifferentiated

**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 weight percent (%); all other elements are in parts per million. Other symbols shown on the tables are:

- N = Not detected at the limit of determination;
- < = 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)

may 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 Kansas Geological Survey, Dr. Lee C. Gerhart, State Geologist, and his staff, for making these drill-hole samples available from their sample library.

### **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.
- 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. 68, JOPLIN 1 x 2 QUADRANGLE,  
MISSOURI AND KANSAS.

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

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s
J68R0510	37 48 52	95 7 38	2	.7	.07	.3	100	2	N	N
J68R0530	37 48 52	95 7 38	3	.5	.05	.5	150	N	N	N
J68R0550	37 48 52	95 7 38	5	1	<.05	.7	200	N	N	N
J68R0570	37 48 52	95 7 38	5	1	<.05	.7	200	N	N	N
J68R0590	37 48 52	95 7 38	5	1	<.05	.5	200	N	N	N
J68R0610	37 48 52	95 7 38	5	1	<.05	.5	200	N	N	N
J68R0630	37 48 52	95 7 38	5	1	.05	.5	200	.7	N	N
J68R0650	37 48 52	95 7 38	5	1	<.05	.7	200	N	N	N
J68R0670	37 48 52	95 7 38	2	.5	<.05	.3	70	N	N	N
J68R0690	37 48 52	95 7 38	3	.7	<.05	.5	100	N	N	N
J68R0710	37 48 52	95 7 38	2	.7	<.05	.5	100	N	N	N
J68R0730	37 48 52	95 7 38	2	.5	<.05	.5	100	N	N	N
J68R0750	37 48 52	95 7 38	3	.7	<.05	.7	100	N	N	N
J68R0770	37 48 52	95 7 38	2	.7	<.05	.7	150	N	N	N
J68R0790	37 48 52	95 7 38	2	1	<.05	.5	150	N	N	N
J68R0810	37 48 52	95 7 38	2	1	<.05	.7	150	N	N	N
J68R0830	37 48 52	95 7 38	3	.7	<.05	.7	100	N	N	N
J68R0850	37 48 52	95 7 38	3	.7	<.05	.7	150	N	N	N
J68R0870	37 48 52	95 7 38	3	.7	<.05	.7	100	N	N	N
J68R0890	37 48 52	95 7 38	2	.2	<.05	.3	50	N	N	N
J68R0915	37 48 52	95 7 38	3	.2	.07	.3	50	N	N	N
J68R0930	37 48 52	95 7 38	3	.15	.1	.2	70	N	N	N
J68R0950	37 48 52	95 7 38	1.5	.2	.1	.2	70	N	N	N
J68R0970	37 48 52	95 7 38	2	.3	.15	.3	70	N	N	N
J68R0990	37 48 52	95 7 38	.7	.15	.1	.2	70	N	N	N
J68R1010	37 48 52	95 7 38	.5	.07	.05	.1	20	N	N	N
J68R1030	37 48 52	95 7 38	.5	.05	.05	.1	30	N	N	N
J68R1050	37 48 52	95 7 38	1.5	.07	.05	.15	50	N	N	N
J68R1070	37 48 52	95 7 38	.7	.1	.07	.2	50	N	N	N
J68R1090	37 48 52	95 7 38	1	.15	.07	.2	70	N	N	N
J68R1110	37 48 52	95 7 38	.7	.1	.1	.15	50	N	N	N
J68R1130	37 48 52	95 7 38	2	.5	.1	.5	200	N	N	N
J68R1150	37 48 52	95 7 38	3	1	.1	1	100	N	N	N
J68R1170	37 48 52	95 7 38	3	1	.05	.7	150	N	N	N
J68R1190	37 48 52	95 7 38	5	1	.07	.7	150	N	N	N
J68R1210	37 48 52	95 7 38	3	1	.1	.7	100	N	N	N
J68R1230	37 48 52	95 7 38	5	1	.05	.5	150	N	N	N
J68R1250	37 48 52	95 7 38	5	.15	.07	.15	50	N	N	N
J68R1275	37 48 52	95 7 38	2	.2	.1	.2	100	N	N	N

TABLE 1--SPECTROGRAPHIC ANALYSES OF INSOLUBLE-RESIDUE SAMPLES FROM DRILL HOLE NO. 68, JOPLIN 1 x 2 QUADRANGLE,  
MISSOURI AND KANSAS.--Continued

Sample	B-ppm s	Ba-ppm s	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
J68R0510	200	200	3	N	N	15	500	200	20	70	N	500
J68R0530	100	1,000	1.5	N	N	10	70	20	20	N	N	20
J68R0550	150	500	3	N	N	20	100	20	50	N	N	30
J68R0570	150	300	3	N	N	20	100	20	30	N	N	50
J68R0590	150	500	3	N	N	20	100	70	20	5	N	70
J68R0610	150	300	2	N	N	15	100	30	30	N	N	30
J68R0630	200	700	3	N	N	15	200	100	20	10	N	100
J68R0650	200	500	3	N	N	15	150	50	50	<5	N	50
J68R0670	150	300	2	N	N	7	100	20	N	N	N	30
J68R0690	150	500	2	N	N	20	100	50	20	N	N	50
J68R0710	100	300	2	N	N	15	100	50	30	N	N	20
J68R0730	150	200	2	N	N	15	100	50	30	N	N	50
J68R0750	150	300	3	N	N	20	100	20	50	N	N	70
J68R0770	150	300	3	N	N	15	100	20	30	N	N	50
J68R0790	150	300	2	N	N	20	100	20	50	N	N	70
J68R0810	150	300	3	N	N	20	100	50	50	N	N	50
J68R0830	150	200	3	N	N	20	150	200	50	N	N	70
J68R0850	150	200	3	N	N	15	100	70	50	N	N	50
J68R0870	150	200	3	N	N	15	100	20	50	N	N	50
J68R0890	150	150	1.5	N	N	10	70	30	20	N	N	50
J68R0915	150	150	2	N	N	20	70	15	50	N	N	70
J68R0930	150	100	1	N	N	10	50	20	20	N	N	50
J68R0950	150	100	1	N	N	10	50	15	20	N	N	20
J68R0970	150	100	1	N	N	7	50	200	20	N	N	50
J68R0990	100	70	N	N	N	N	20	10	N	N	N	15
J68R1010	100	70	N	N	N	N	10	<5	N	N	N	<5
J68R1030	100	50	N	N	N	N	N	10	N	N	N	10
J68R1050	100	70	N	N	N	5	10	15	N	<5	N	20
J68R1070	100	100	N	N	N	N	N	7	N	N	N	10
J68R1090	70	100	N	N	N	5	15	7	N	N	N	15
J68R1110	70	70	N	N	N	5	10	7	N	N	N	10
J68R1130	100	200	2	N	N	10	50	100	20	N	N	50
J68R1150	150	300	3	N	N	7	100	20	30	N	N	50
J68R1170	100	200	2	N	N	10	100	100	30	N	N	50
J68R1190	100	200	3	N	N	10	100	100	50	N	N	50
J68R1210	100	200	2	N	N	15	100	50	20	<5	N	50
J68R1230	100	300	5	N	N	20	70	50	20	10	N	70
J68R1250	100	500	N	N	N	7	N	30	N	<5	N	50
J68R1275	100	100	1	N	N	5	20	20	20	N	N	30



TABLE 1--SPECTROGRAPHIC ANALYSES OF INSOLUBLE-RESIDUE SAMPLES FROM DRILL HOLE NO. 68, JOPLIN 1 x 2 QUADRANGLE,  
MISSOURI AND KANSAS.--Continued

Sample	Pb-ppm s	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#
J68R0510	30	N	7	N	100	500	N	10	1,000	100	N	20
J68R0530	<10	N	7	N	200	100	N	15	200	300	N	20
J68R0550	<10	N	20	N	100	200	N	20	N	200	N	20
J68R0570	10	N	20	N	100	300	N	20	N	150	N	20
J68R0590	10	N	20	N	100	300	N	15	N	150	N	20
J68R0610	<10	N	15	N	100	200	N	15	N	150	N	20
J68R0630	30	N	15	N	150	300	N	15	500	150	N	20
J68R0650	30	N	20	N	200	200	N	30	300	200	N	20
J68R0670	10	N	5	N	N	70	N	10	200	70	N	20
J68R0690	10	N	15	N	N	150	N	15	N	150	N	20
J68R0710	<10	N	15	N	150	150	N	20	N	200	N	20
J68R0730	10	N	15	N	150	100	N	20	N	200	N	20
J68R0750	10	N	15	N	100	200	N	50	<200	300	N	20
J68R0770	10	N	15	N	100	150	N	20	N	200	N	20
J68R0790	20	N	15	N	100	200	N	20	N	150	N	20
J68R0810	15	N	15	N	100	150	N	50	N	200	N	20
J68R0830	30	N	20	N	100	150	N	30	N	150	N	20
J68R0850	20	N	20	N	100	200	N	30	N	200	N	20
J68R0870	20	N	20	N	100	200	N	30	N	200	N	20
J68R0890	<10	N	5	N	100	70	N	20	300	100	N	40
J68R0915	<10	N	5	N	100	70	N	30	300	70	N	40
J68R0930	N	N	<5	N	100	50	N	15	300	70	N	40
J68R0950	<10	N	<5	N	N	50	N	10	N	100	N	40
J68R0970	N	N	5	N	100	70	N	10	<200	100	N	40
J68R0990	N	N	N	N	100	50	N	N	N	70	N	40
J68R1010	N	N	N	N	100	10	N	N	200	30	N	40
J68R1030	N	N	N	N	100	10	N	N	<200	20	N	40
J68R1050	N	N	N	N	100	20	N	N	200	50	N	40
J68R1070	N	N	N	N	100	30	N	N	<200	70	N	40
J68R1090	N	N	N	N	100	30	N	N	<200	50	N	40
J68R1110	N	N	N	N	100	20	N	N	N	50	N	40
J68R1130	10	N	7	N	100	150	N	15	N	150	N	40
J68R1150	20	N	7	N	100	200	N	20	N	500	N	40
J68R1170	<10	N	10	N	100	200	N	20	N	300	N	40
J68R1190	10	N	15	N	100	200	N	30	N	200	N	40
J68R1210	20	N	10	N	100	200	N	20	N	150	N	40
J68R1230	10	N	10	N	100	300	N	15	200	150	N	31
J68R1250	N	N	N	N	100	30	N	N	N	70	N	60
J68R1275	<10	N	<5	N	100	50	N	10	N	100	N	60

TABLE 2--SPECTROGRAPHIC ANALYSES OF INSOLUBLE-RESIDUE SAMPLES FROM DRILL HOLE NO. 69, JOPLIN 1 x 2 QUADRANGLE, MISSOURI AND KANSAS.

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

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s
J69R0763	37 37 18	95 28 53	3	.7	<.05	.7	100	N	N	N
J69R0843	37 37 18	95 28 53	2	.7	<.05	.7	100	N	N	N
J69R0923	37 37 18	95 28 53	2	.7	<.05	.7	150	N	N	N
J69R1003	37 37 18	95 28 53	1.5	.2	<.05	.5	70	N	N	N
J69R1038	37 37 18	95 28 53	3	.7	<.05	.7	100	N	N	N
J69R1065	37 37 18	95 28 53	3	.3	.05	.7	50	N	N	N
J69R1110	37 37 18	95 28 53	.5	.1	<.05	.07	30	N	N	N
J69R1150	37 37 18	95 28 53	.2	.05	<.05	.03	10	N	N	N
J69R1195	37 37 18	95 28 53	.2	.05	.05	.03	10	N	N	N
J69R1240	37 37 18	95 28 53	1	.1	.07	.1	30	N	N	N
J69R1280	37 37 18	95 28 53	5	.7	.15	.5	200	N	N	N
J69R1310	37 37 18	95 28 53	3	1	.07	.7	150	N	N	N
J69R1330	37 37 18	95 28 53	3	1	.05	.7	150	N	N	N
J69R1360	37 37 18	95 28 53	3	1	.07	.7	150	N	N	N
J69R1384	37 37 18	95 28 53	2	.5	.05	.5	100	N	N	N

Sample	B-ppm s	Ba-ppm s	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
J69R0763	150	300	3	N	N	15	100	50	50	N	<20	50
J69R0843	100	300	3	N	N	15	70	20	50	N	<20	50
J69R0923	100	200	2	N	N	15	70	20	50	N	<20	30
J69R1003	70	150	1	N	N	10	20	10	20	N	<20	20
J69R1038	100	200	3	N	N	20	100	15	50	N	<20	70
J69R1065	150	100	2	N	N	20	150	15	50	N	<20	50
J69R1110	70	70	N	N	N	N	N	<5	N	N	N	7
J69R1150	70	30	N	N	N	N	N	<5	N	N	N	5
J69R1195	70	50	N	N	N	N	N	<5	N	N	N	5
J69R1240	70	50	N	N	N	N	10	<5	N	N	N	10
J69R1280	100	150	2	N	N	20	50	30	20	N	N	50
J69R1310	150	150	3	N	N	15	100	20	20	N	<20	50
J69R1330	150	200	3	N	N	20	100	20	20	N	<20	50
J69R1360	100	150	3	N	N	20	100	150	20	15	<20	50
J69R1384	100	100	2	N	N	20	70	20	N	10	N	50

TABLE 2--SPECTROGRAPHIC ANALYSES OF INSOLUBLE-RESIDUE SAMPLES FROM DRILL HOLE NO. 69, JOPLIN 1 x 2 QUADRANGLE,  
MISSOURI AND KANSAS.--Continued

Sample	Pb-ppm s	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#
J69R0763	10	N	15	N	200	200	N	30	N	200	N	20
J69R0843	N	N	10	N	100	200	N	20	N	300	N	20
J69R0923	N	N	10	N	100	200	N	20	N	300	N	20
J69R1003	15	N	5	N	100	100	N	10	N	300	N	20
J69R1038	15	N	15	N	100	200	N	30	N	200	N	20
J69R1065	<10	N	15	N	150	200	N	20	N	300	N	20
J69R1110	N	N	N	N	N	15	N	N	N	15	N	40
J69R1150	N	N	N	N	N	10	N	N	N	10	N	40
J69R1195	N	N	N	N	N	10	N	N	N	15	N	40
J69R1240	N	N	N	N	N	30	N	N	N	30	N	40
J69R1280	10	N	10	N	N	100	N	15	N	100	N	40
J69R1310	<10	N	15	N	N	200	N	20	N	200	N	40
J69R1330	<10	N	15	N	N	200	N	20	N	200	N	40
J69R1360	10	N	10	N	N	200	N	20	N	150	N	40
J69R1384	20	N	7	N	N	150	N	15	N	100	N	31

TABLE 3--SPECTROGRAPHIC ANALYSES OF INSOLUBLE-RESIDUE SAMPLES FROM DRILL HOLE NO. 70, JOPLIN 1 x 2 QUADRANGLE, MISSOURI AND KANSAS.

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

Sample	Latitude	Longitude	Fe-pct. s	Mg-pct. s	Ca-pct. s	Ti-pct. s	Mn-ppm s	Ag-ppm s	As-ppm s	Au-ppm s
J70R0140	37 37 6	95 36 28	10	.7	.15	.5	150	N	N	N
J70R0220	37 37 6	95 36 28	2	1	.05	1	150	N	N	N
J70R0280	37 37 6	95 36 28	2	.7	.05	1	150	N	N	N
J70R0340	37 37 6	95 36 28	1	.15	.05	.7	50	N	N	N
J70R0390	37 37 6	95 36 28	2	.5	.05	.7	100	N	N	N
J70R0420	37 37 6	95 36 28	1.5	.3	.1	.5	150	N	N	N
J70R0480	37 37 6	95 36 28	3	.5	.07	.7	200	<.5	N	N
J70R0540	37 37 6	95 36 28	3	1	.15	.5	200	2	N	N
J70R0610	37 37 6	95 36 28	5	1	.05	.7	300	N	N	N
J70R0660	37 37 6	95 36 28	5	1	.05	.7	200	N	N	N
J70R0700	37 37 6	95 36 28	3	1	.05	1	200	N	N	N
J70R0760	37 37 6	95 36 28	3	1	<.05	.7	200	N	N	N
J70R0810	37 37 6	95 36 28	5	1	.15	.7	200	N	N	N
J70R0910	37 37 6	95 36 28	3	1	.05	.7	200	N	N	N
J70R0950	37 37 6	95 36 28	3	1	<.05	.7	200	N	N	N
J70R1030	37 37 6	95 36 28	5	.7	<.05	.7	200	N	N	N
J70R1070	37 37 6	95 36 28	5	.7	<.05	1	200	N	N	N
J70R1210	37 37 6	95 36 28	2	.7	<.05	.7	150	N	N	N
J70R1270	37 37 6	95 36 28	2	.5	<.05	.5	100	N	N	N
J70R1320	37 37 6	95 36 28	2	.2	.07	.3	50	N	N	N

Sample	B-ppm s	Ba-ppm s	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
J70R0140	150	2,000	2	N	N	15	70	20	N	N	N	30
J70R0220	150	1,000	2	N	N	10	70	30	30	N	N	20
J70R0280	150	300	2	N	N	10	50	15	30	N	N	20
J70R0340	70	100	1	N	N	<5	15	5	20	N	N	7
J70R0390	100	200	1.5	N	N	10	20	30	20	N	N	15
J70R0420	100	150	1	N	<20	10	30	20	20	<5	N	20
J70R0480	100	200	1.5	N	N	10	100	30	30	10	N	50
J70R0540	150	200	2	N	20	15	300	70	20	50	N	150
J70R0610	200	300	3	N	<20	20	150	70	20	5	N	150
J70R0660	200	1,000	3	N	<20	30	100	50	20	<5	N	100
J70R0700	100	500	1.5	N	N	20	70	20	20	N	N	30
J70R0760	100	200	2	N	N	20	70	20	30	N	N	30
J70R0810	150	1,000	2	N	N	20	150	50	20	10	N	70
J70R0910	100	300	2	N	N	30	70	30	20	N	N	50
J70R0950	100	300	2	N	N	20	100	20	20	N	N	30
J70R1030	150	300	3	N	N	20	100	500	30	N	N	50
J70R1070	150	200	3	N	N	20	100	20	50	5	N	50
J70R1210	100	300	1.5	N	N	20	100	20	50	N	N	30
J70R1270	100	200	2	N	N	20	100	15	50	N	N	50
J70R1320	100	100	1.5	N	N	10	70	20	30	<5	N	50

TABLE 3--SPECTROGRAPHIC ANALYSES OF INSOLUBLE-RESIDUE SAMPLES FROM DRILL HOLE NO. 70, JOPLIN 1 x 2 QUADRANGLE,  
MISSOURI AND KANSAS.--Continued

Sample	Pb-ppm s	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#
J70R0140	15	N	5	N	100	100	N	<10	200	100	N	20
J70R0220	N	N	15	N	100	150	N	20	N	200	N	20
J70R0280	N	N	10	N	100	70	N	20	<200	300	N	20
J70R0340	N	N	N	N	100	30	N	20	N	500	N	20
J70R0390	N	N	<5	N	100	50	N	15	N	300	N	20
J70R0420	<10	N	N	N	100	50	N	N	700	200	N	20
J70R0480	<10	N	7	N	100	150	N	20	N	300	N	20
J70R0540	15	N	10	N	100	500	N	20	500	200	N	20
J70R0610	20	N	15	N	100	200	N	15	700	200	N	20
J70R0660	<10	N	15	N	100	150	N	15	700	200	N	20
J70R0700	N	N	15	N	100	100	N	20	N	300	N	20
J70R0760	N	N	10	N	150	70	N	20	N	200	N	20
J70R0810	70	N	10	N	200	100	N	20	N	200	N	20
J70R0910	10	N	15	N	100	100	N	20	N	200	N	20
J70R0950	N	N	15	N	100	100	N	30	N	200	N	20
J70R1030	N	N	10	N	100	150	N	20	<200	200	N	20
J70R1070	15	N	20	N	200	200	N	30	N	300	N	20
J70R1210	N	N	10	N	100	100	N	20	N	200	N	20
J70R1270	20	N	10	N	100	150	N	20	N	100	N	20
J70R1320	N	N	5	N	100	70	N	10	N	70	N	40