MASTER

HARRISBURG 1° × 2° NTMS AREA, PENNSYLVANIA

SUPPLEMENTAL DATA REPORT

NATIONAL URANIUM RESOURCE EVALUATION PROGRAM

HYDROGEOCHEMICAL AND STREAM SEDIMENT RECONNAISSANCE

J. R. COOK AND E. L. DROMGOOLE

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Publication Date: August 1981

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PREPARED FOR THE U. S. DEPARTMENT OF ENERGY UNDER CONTRACT DE-AC09-76SR00001

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ABSTRACT

This data report presents supplemental analytical results for 1011 stream sediment samples that were collected as part of the SRL-NURE reconnaissance in the National Topographic Map Series (NTMS) Harrisburg 1° x 2° quadrangle. Results are reported for 23 elements (extractable U, Ag, As, Ba, Be, Ca, Co, Cr, Cu, K, Li, Mg, Mo, Nb, Ni, P, Pb, Se, Sn, Sr, W, Y, and Zn). Analyses are tabulated and displayed graphically on microfiche. Field data and neutron activation analysis (NAA) were open-filed in DPST-79-146-1 [GJBX-31(79)].

CONTENTS

Introduction	5
Methods of Analysis	7
Description of Data Tables and Plots	7
Data Tables	7
SRL Identification Number	7
DOE Identification Number	13
Supplemental Elemental Analyses	13
Plots	13
References	15

LIST OF FIGURES

1	Location Map for the Harrisburg 1° x 2° NTMS Quadrangle	6
2	Analysis Scheme for Supplemental Elements	8

LIST OF TABLES

1	Results of Certification Test for Supplemental Analyses	11
2	Designators for Counties in the Harrisburg 1° x 2° NTMS Quadrangle	12
3	Sample Type Codes Used in DOE Sample Identification Number	14

MICROFICHE (3 total)

(In Pocket)

HARRISBURG TABLES

Analyses listed alphabetically by SRL sample identification numbers. Analyses include extractable U, Ag, As, Ba, Be, Ca, Co, Cr, Cu, K, Li, Mg, Mo, Nb, Ni, P, Pb, Se, Sn, Sr, W, Y, and Zn.

HARRISBURG SEDIMENT PLOTS

Cumulative frequency diagrams, histograms, and areal distribution plots of extractable U, Ag, As, Ba, Be, Ca, Co, Cr, Cu, K, Li, Mg, Mo, Nb, Ni, P, Pb, Se, Sn, Sr, W, Y, and Zn.

HARRISBURG SURFACE SAMPLE SITE LOCATION MAP

SRL sample identification number marking the site where the sample was taken. This figure is suitable for enlargement to typical map scales.

SUPPLEMENTAL DATA REPORT: HARRISBURG 1° x 2° NTMS QUADRANGLE

INTRODUCTION

The National Uranium Resource Evaluation (NURE) program was established to evaluate domestic uranium resources in the continental United States and to identify areas favorable for uranium exploration. The Grand Junction Office (GJO) of the Department of Energy (DOE) is responsible for administering the program. The Savannah River Laboratory (SRL) is responsible for hydrogeochemical and surface sediment reconnaissance (HSSR) of 3.9 million square kilometers (1.5 million square miles) in 37 eastern and western states.

The data presented here are reconnaissance data intended for use in identifying broad areas for further study. While care has been taken to provide reliable sampling and analyses, verification of individual analyses is beyond the scope of this report. The data should be viewed statistically because "one-point anomalies" may be misleading. Regional trends, however, should be reliable.

This report is one of a series presenting SRL reconnaissance supplemental data. Detailed descriptions of sampling techniques, field data, and neutron activation results (including U, Th, and Hf) were reported in an open-filed basic data report for the Harrisburg quadrangle [DPST-79-146-1; GJBX-31(79)]. Identification numbers (both SRL and DOE) and supplemental analyses are presented in this report in tabular form. Areal distribution plots of all elements in sediments are included on microfiche. All data will be available on magnetic tape from:

GJOIS Project
UCC-ND Computer Applications Department
4500 North Building
Oak Ridge National Laboratory
P.O. Box X
Oak Ridge, TN 37830

A summary of the SRL development program in support of the reconnaissance is available in SRL-NURE progress reports (SRL-138). SRL-HSSR data reports are cited in Reference SRL-146.

The location of the Harrisburg quadrangle is shown in Figure 1.

FIGURE 1. Location Map for the Harrisburg 1° x 2° NTMS Quadrangle

METHODS OF ANALYSIS

Stream sediment samples were analyzed for supplemental elements by a contractor. Methods of sample dissolution and analysis for each supplemental element are shown in Figure 2. A summary of analytical results for 100 test standards (unknown to the vendor) are shown in Table 1. Analytical results (Table 1) are well within specifications. A standard and blank were analyzed with each group of 40 samples.

DESCRIPTION OF DATA TABLES AND PLOTS

Data Tables

The supplemental data are presented in tabular form on the microfiche. Below is a brief description of the columnar entries.

SRL Identification Number

Each SRL site code contains 4 letters and a three-digit number. The first two letters identify the state that contains the sampling site. PA is the two-letter designator for Pennsylvania. The third and fourth letters indicate which county contains the sampling site (Table 2).

Sites are numbered sequentially within each county. Numbers from 001 to 499 designate surface sites. Numbers from 501 to 999 designate ground water sites. This report includes supplemental analyses of sediment samples only.

Columns 8 and 9 represent the sample analyzed. In most reports, the S1 fraction [finer than 149 micrometers (U.S. Std. 100 mesh)] was analyzed. S0 means that the coarse fraction from 420 μ m to 1000 μ m (U.S. Std. 18 to 40 mesh) was analyzed. Other specific fractions will be identified in individual reports as necessary.

FIGURE 2. Analysis Scheme for Supplemental Elements

PHASE II:

FIGURE 2. Continued

PHASE III:

FIGURE 2. Continued

TABLE 1

Results of Certification Test for Supplemental Analyses*

Element**	Concentration, ppm		Diff.	Accuracy, [†] %	Relative Precision (3σ), %
	Accepted	Measured			
Ag	29.4	33.6	4.2	12	5
Ba	498	508	10	2	6
Be	13.6	15.1	1.5	1	15
Co	49.6	46.4	-3.2	-7	10
Cr	149	152	3	2	22
Cu	50.1	51.1	1.0	2	24
K	5020	5170	155	3	5
Li	150	147	-3	-2	6
Mg	5000	5150	154	3	3
Mo	25	25	0	0	12
Nb	49.9	47.5	-2.4	-5	27
Ni	149	139	-10	-7	6
P	802	794	-8	-1	17
Pb	308	335	27	12	5
Sn	125	121	-4	-3	14
Sr	970	1170	199	17	10
W	150	148	-1.5	-1	16
Y	490	434	-56	-13	12
Zn	120	112	-8	-7	4

* Standards included the geochemical soil standards and rock standards currently available from U.S. Geological Survey, SRL stream sediment standards doped with varying levels of the elements, and synthetic standards.

** No statistical data have been collected for As, Se, Ca, Th, and extractable U.

† "Accuracy" is a measure of deviation from the accepted value.

TABLE 2**Designators for Counties in the Harrisburg 1° x 2° NTMS Quadrangle**

<u>Site Code</u>	<u>County</u>	<u>Site Code</u>	<u>County</u>
PAAD	Adams	PALE	Lebanon
PABR	Berks	PALN	Lancaster
PACE	Centre	PALU	Luzerne
PACI	Clinton	PAMI	Mifflin
PACO	Columbia	PAMT	Montour
PACU	Cumberland	PANR	Northumberland
PADA	Dauphin	PAPE	Perry
PAFR	Franklin	PASC	Schuylkill
PAFU	Fulton	PASN	Snyder
PAHU	Huntingdon	PAUN	Union
PAJU	Juniata	PAYO	York

DOE Identification Number

Each sample is assigned a DOE ID number. The number consists of 28 characters as follows:

1-2	State (see Table 2)
4-10	Latitude of site
12-19	Longitude of site
21	Laboratory code (4 = SRL)
23-24	Sample type (see Table 3)
26-28	Replication code. Generally only original samples (-000) are reported in the Data Reports.

Supplemental Elemental Analyses

The elements are listed alphabetically. Concentrations of each element are reported in parts per million (ppm) by weight. Note that the elemental (not oxide) concentration is quoted in this table. Values below detection limits are indicated by a minus (-). For example, -3 means that the sample contains less than 3 ppm of that element. If background limit is not available, a period (.) is used to indicate not only that the element was not detected, but that the detection limit is not estimated for that element. Missing data are indicated by "M." Missing data are indicative of insufficient sample for analysis.

Plots

Cumulative frequency and histograms of analyses for each element are presented on microfiche. Areal distribution plots are included. Each type of plot is self-explanatory.

TABLE 3

Sample Type Codes Used in DOE Sample Identification Number*

<u>Digit</u>	<u>Sample Type</u>
50	Stream sediment from flowing stream, sieved <149 μm and dried <110°C
51	Stream water, filtered through <0.8 μm filter at the site
52	Well water, filtered through <0.8 μm filter at the site
53	Spring water, filtered through <0.8 μm filter at the site
54	Lake water, filtered through <0.8 μm filter at the site
55	Lake sediment
56	Glacial till
57	Peat
58	Soil, sieved >149 μm and <1000 μm
59	Soil, sieved <149 μm
60	Stream sediment from dry stream, sieved >149 μm and <1000 μm , and dried <110°C
61	Stream sediment from dry stream, sieved <149 μm and dried <110°C
62	Talus
63	Volcanic neck
64	Playa sediment
65	Hot springs, sinter
66-69	Spare numbers**

* The 28-character DOE-GJO identification number for NURE samples contains two digits to denote sample type. The digits 50 through 69 have been set aside for SRL use.

** To be noted in individual reports as needed.

REFERENCES

SRL-138, Savannah River Laboratory Quarterly and Semiannual Reports, Hydrogeochemical and Stream Sediment Reconnaissance, National Uranium Resource Evaluation Program: E. I. du Pont de Nemours & Co., Savannah River Laboratory, Aiken, SC.

<u>Period</u>	<u>SRL Doc. No.</u>	<u>DOE-GJO Doc. No.*</u>
January-March 1975	DPST-75-138-1	GJBX-5(76)
April-June 1975	DPST-75-138-2	GJBX-6(76)
July-September 1975	DPST-75-138-3	GJBX-7(76)
October-December 1975	DPST-75-138-4	GJBX-8(76)
January-March 1976	DPST-76-138-1	GJBX-17(76)
April-June 1976	DPST-76-138-2	GJBX-27(76)
July-September 1976	DPST-76-138-3	GJBX-63(76)
October-December 1976	DPST-76-138-4	GJBX-6(77)
January-March 1977	DPST-77-138-1	GJBX-35(77)
April-June 1977	DPST-77-138-2	GJBX-55(77)
July-September 1977	DPST-77-138-3	GJBX-90(77)
October-December 1977	DPST-77-138-4	GJBX-37(78)
January-March 1978	DPST-78-138-1	GJBX-66(78)
April-September 1978	DPST-78-138-2	GJBX-13(79)
October 1978-March 1979	DPST-79-138-1	GJBX-86(79)
April-September 1979	DPST-79-138-2	GJBX-160(79)
October 1979-March 1980	DPST-80-138-1	GJBX-146(80)

SRL-146, SRL-NURE Data Reports, E. I. du Pont de Nemours & Co., Savannah River Laboratory, Aiken, SC

<u>NTMS 1° x 2° Quadrangle</u>	<u>SRL Doc. No.</u>	<u>DOE-GJO Doc. No.*</u>
Winston-Salem†	DPST-77-146-1	GJBX-6(77)
Spartanburg	DPST-77-146-2	GJBX-09(78)
Charlotte	DPST-78-146-1	GJBX-40(78)
Greenville	DPST-78-146-2	GJBX-47(78)
Winston-Salem††	DPST-78-146-3	GJBX-58(78)
Greensboro	DPST-78-146-4	GJBX-74(78)
Knoxville	DPST-78-146-5	GJBX-75(79)
Scranton	DPST-78-146-6	GJBX-02(79)
Scranton	DPST-78-146-6S	GJBX-24(81)
Athens	DPST-78-146-7	GJBX-20(79)
Harrisburg	DPST-79-146-1	GJBX-31(79)
Harrisburg	DPST-79-146-1S	(this report)
Portland	DPST-79-146-2	GJBX-28(79)
Portland	DPST-79-146-2S	GJBX-106(81)

NTMS 1° x 2° Quadrangle	SRL Doc. No.	DOE-GJO Doc. No.*
Glens Falls	DPST-79-146-3	GJBX-44(79)
Glens Falls	DPST-79-146-3S	GJBX-70(81)
Augusta	DPST-79-146-4	GJBX-45(79)
Dyersburg	DPST-79-146-5	GJBX-58(79)
Poplar Bluff	DPST-79-146-6	GJBX-63(79)
Hartford	DPST-79-146-7	GJBX-94(79)
Williamsport	DPST-79-146-8	GJBX-152(79)
Williamsport	DPST-79-146-8S	(in process)
Newark	DPST-79-146-9	GJBX-128(80)
Newark	DPST-79-146-9S	GJBX-71(81)
Albany	DPST-79-146-10	GJBX-140(79)
Albany	DPST-79-146-10S	GJBX-107(81)
Atlanta	DPST-79-146-11	GJBX-129(79)
Delta, Richfield††††	DPST-79-146-12	GJBX-161(79)
Walker Lake	DPST-79-146-13	GJBX-107(80)
McDermitt, Wells†††	DPST-79-146-14	GJBX-117(80)
Reno	DPST-79-146-15	GJBX-108(80)
Reno	DPST-79-146-15S	(in process)
Death Valley	DPST-79-146-16	GJBX-135(80)
Flagstaff	DPST-79-146-17	GJBX-137(81)
Marble Canyon	DPST-79-146-18	GJBX-138(81)
Grand Canyon	DPST-79-146-19	GJBX-142(80)
Pocatello	DPST-79-146-20	GJBX-161(80)
Mesa	DPST-80-146-1	GJBX-216(80)
Mesa	DPST-80-146-1S	GJBX-81(80)
Salton Sea	DPST-80-146-2	GJBX-217(80)
Salton Sea	DPST-80-146-2S	GJBX-113(80)
Ritzville	DPST-80-146-3	GJBX-162(80)
Elko	DPST-80-146-4	GJBX-163(80)
Challis	DPST-80-146-5	GJBX-91(80)
Klamath Falls††††	DPST-80-146-6	GJBX-171(80)
Salina††††	DPST-80-146-7	GJBX-218(80)
Escalante††††	DPST-80-146-8	GJBX-209(80)
Price††††	DPST-80-146-9	GJBX-172(80)
McDermitt††††	DPST-80-146-10	GJBX-173(80)
Wells††††	DPST-80-146-11	GJBX-174(80)
Delta††††	DPST-80-146-12	GJBX-198(80)
Okanogan††††	DPST-80-146-13	GJBX-210(80)
Johnson City††††	DPST-80-146-14	GJBX-26(81)
Spokane††††	DPST-80-146-15	GJBX-211(80)
Spokane	DPST-80-146-15S	GJBX-195(80)
Richfield††††	DPST-80-146-16	GJBX-242(80)
Trona††††	DPST-80-146-17	GJBX-243(80)
Lewiston††††	DPST-80-146-18	GJBX-14(81)
Boston††††	DPST-80-146-19	GJBX-255(80)
Boston	DPST-80-146-19S	GJBX-72(81)

NTMS 1° x 2° Quadrangle	SRL Doc. No.	DOE-GJO Doc. No.*
Providence††††	DPST-80-146-20	GJBX-15(81)
Rocky Mount-Manteo††††	DPST-80-146-21	GJBX-16(81)
Beaufort††††	DPST-80-146-22	GJBX-17(81)
Macon††††	DPST-80-146-23	GJBX-40(81)
Richmond and Eastville††††	DPST-80-146-24	GJBX-18(81)
Rome††††	DPST-80-146-25	GJBX-25(81)
Dothan, Waycross, and Brunswick††††	DPST-80-146-26	GJBX-27(81)
Roanoke††††	DPST-80-146-27	GJBX-73(81)
Gadsden and Tupelo††††	DPST-81-146-1	GJBX-213(81)
Lake Champlain††††	DPST-81-146-2	GJBX-108(81)
Lake Champlain	DPST-81-146-2S	(in process)
Montgomery and parts of Meridian, Hattiesburg, and Andalusia††††	DPST-81-146-3	GJBX-190(81)
Birmingham and West Point††††	DPST-81-146-4	GJBX-191(81)
Charlottesville††††	DPST-81-146-5	GJBX-175(81)
Baker††††	DPST-81-146-6	(in process)
Needles††††	DPST-81-146-7	(in process)
Binghamton††††	DPST-81-146-8	GJBX-192(81)
Raleigh††††	DPST-81-146-9	(in process)
Norfolk and Southern Eastville††††	DPST-81-146-10	(in process)
Bluefield††††	DPST-81-146-11	(in process)
Washington††††	DPST-81-146-12	(in process)
Vya††††	DPST-81-146-13	(in process)
Baltimore††††	DPST-81-146-14	(in process)
Cumberland and Pittsburgh††††	DPST-81-146-15	(in process)
Santa Cruz††††	DPST-81-146-16	(in process)
Little Rock, El Dorado, and Adjacent Areas††††	DPST-81-146-17	(in process)

<u>NTMS 1° x 2° Quadrangle</u>	<u>SRL Doc. No.</u>	<u>DOE-GJO Doc. No.*</u>
Phoenix††††	DPST-81-146-18	(in process)
Phenix City††††	DPST-81-146-19	(in process)
San Bernardino††††	DPST-81-146-20	(in process)

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- † Sediment only.
 - †† Ground water only.
 - ††† SRL analyses of samples collected by Lawrence Livermore National Laboratory
 - †††† Abbreviated report; geology, hydrology, and data discussion sections are omitted.
 - S Supplemental Data Reports.

* DOE-GJO reports are available on microfiche from the Grand Junction Office, DOE, for \$6.00. Prepaid orders should be sent to: Bendix Field Engineering Corporation, Technical Library, P.O. Box 1569, Grand Junction, CO 81501. Checks or money orders should be made out to Bendix Field Engineering Corporation, the operations contractor for DOE's Grand Junction Office.