

# RECONNAISSANCE OF SELECTED MINOR ELEMENTS IN SURFACE WATERS OF THE UNITED STATES, OCTOBER 1970

As, Cd, Cr, Co, Pb, Hg, Zn



**GEOLOGICAL SURVEY CIRCULAR 643**

*Prepared in cooperation with the U.S. Bureau of Sport Fisheries and Wildlife*



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By W. H. Durum, J. D. Hem, and S. G. Heidel

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**United States Department of the Interior**  
**ROGERS C. B. MORTON, Secretary**



**Geological Survey**  
**William T. Pecora, Director**



## FOREWORD

In recent months many inquiries have been received by the U.S. Geological Survey regarding the occurrence of mercury in water resources. Although public interest has centered on learning more about the widespread natural and manmade sources of mercury, the implication in many inquiries has been: Are there other potentially dangerous chemical elements present in water resources? The nationwide reconnaissance sampling reported here was designed to provide a partial answer to that question.

In view of the growing national concern, there is an acute need to place facts on record as soon as they accumulate. The Survey provides the enclosed data report to assist in establishing a continuing baseline of information about the quality of our water resources.

  
E. L. Hendricks  
Chief Hydrologist



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# Reconnaissance of Selected Minor Elements in Surface Waters of the United States, October 1970

By W. H. Durum, J. D. Hem, and S. G. Heidel

## SUMMARY

A nationwide reconnaissance of selected minor elements in water resources of the 50 States and Puerto Rico was made by the U.S. Geological Survey in cooperation with the U.S. Bureau of Sport Fisheries and Wildlife during autumn, 1970. Initiated in response to the growing need for data on minor elements in water, including toxic metals, the synoptic survey provides an up-to-date baseline of such data largely for dry-weather flows of streams that are sources of municipal and industrial water for the Nation's metropolitan areas.

More than 720 samples obtained during October and November 1970 from rivers and lakes were analyzed for arsenic, cadmium, chromium (hexavalent), cobalt, lead, mercury, and zinc. Sampling sites fall within three categories: (1) surface water sources of public water supplies for cities of more than 100,000 population, or for some States, the largest city in each State, (2) water courses downstream from major municipal and (or) industrial complexes in each State, and (3) U.S. Geological Survey hydrologic bench-mark stations. Hydrologic bench-mark stations were established in the mid-1950's for measuring long-term natural trends in streamflow and water quality. These stations are located in undeveloped drainage basins in the major physiographic regions of the country.

Samples were taken mainly during the period October 1–15, 1970, when rivers were at medium or low-flow stages in many parts of the country. Samples were filtered (0.45-micron openings) to provide information on sediment-free water like that normally supplied to the user. The samples were acidified (1.5 milliliters nitric acid for a 1-liter sample) when collected to prevent separation of minor elements during shipment to a designated laboratory for analysis. For each site, stream discharge in cubic feet per second was measured or estimated at the time of sampling, when it was practicable to do so. More complete chemical analyses for samples collected at many of these sites have been published in the Geological Survey water resources data reports.

The sampling sites used in this survey are shown in figures 1–6 in the back of the report. A brief summary

of the results for each element is given below. The analytical results are given in table 1 in the back of the report.

**Arsenic.**—Seventy-nine percent of the 727 samples examined had arsenic concentration less than 10  $\mu\text{g/l}$  (micrograms per liter) which is the lower limit of detection, 21 percent of the samples had arsenic greater than 10  $\mu\text{g/l}$ , and 2 percent had more than 50  $\mu\text{g/l}$ —the maximum considered safe for drinking water (U.S. Public Health Service, 1962). A sample from Sugar Creek near Fort Mill, S.C., downstream from an industrial complex in North Carolina, had the highest arsenic content, 1,100  $\mu\text{g/l}$ , of any sample obtained in this survey.

Arsenic was identified in as many samples from bench-mark locations as in samples from any other sources.

**Cadmium.**—Cadmium was detected in 42 percent of the samples in concentrations ranging from 1 to 10  $\mu\text{g/l}$ . About 4 percent of the river samples had cadmium in excess of 10  $\mu\text{g/l}$  (the Public Health Service upper limit for drinking water) and these occurred in about one-third of the States. The maximum concentration found was 130  $\mu\text{g/l}$ . Cadmium was detected in samples from bench-mark sites, public water supplies, and metropolitan-industrial complex locations; but 54 percent of the samples did not contain measurable amounts of cadmium. The implication of the data in table 1 is that the higher concentrations of cadmium in water generally occur in areas of high population density.

**Chromium.**—Chromium (hexavalent) rarely was detected at levels much above about 5  $\mu\text{g/l}$ , and occurred in the range 6 to 50  $\mu\text{g/l}$  in only 11 of more than 700 samples. There were no concentrations in excess of 50  $\mu\text{g/l}$ , the upper limit for hexavalent chromium in drinking water.

**Cobalt.**—Cobalt concentrations most commonly were below the detection limit (less than 1  $\mu\text{g/l}$ ), but cobalt was found in 37 percent of the samples, commonly in the range from 1 to 5  $\mu\text{g/l}$ . The higher value is about the upper limit of solubility of cobalt in normal river water.

**Lead.**—Lead was found in about 63 percent of samples in concentrations ranging from 1 to 50  $\mu\text{g/l}$ . In a few waters lead was detected in excess of 50  $\mu\text{g/l}$ , the upper limit for drinking water. Lead occurs widely in the range 6 to 50  $\mu\text{g/l}$ .

Lead was detected less frequently in samples collected at bench-mark sites than in those from public water-supply sources and from streams below metropolitan-industrial areas.

**Mercury.**—Data on mercury are reported in two forms: dissolved and total. The concentration of the dissolved form is an indication of what might occur in a treated or filtered water supply at the same sampling point. Total mercury represents the amount in the water-sediment mixture. The difference between dissolved and total mercury is indicative of the portion that adheres to suspended particles which might be a part of the food chain of the aquatic community.

Dissolved mercury ranged from below the lower limit of detection (0.1  $\mu\text{g/l}$ ) to 4.3  $\mu\text{g/l}$  and was found in only 7 percent of the samples. In none did the concentration exceed the proposed Public Health Service upper limit for dissolved mercury in drinking water, which is 5  $\mu\text{g/l}$ . Total mercury was found in excess of 5  $\mu\text{g/l}$  in a few instances.

**Zinc.**—The concentration of zinc in most samples was in the range of 10 to 50  $\mu\text{g/l}$ , but occasionally exceeded 5,000  $\mu\text{g/l}$ , the recommended (not mandatory) upper limit for drinking water.

The survey shows, as one would expect, that the heavy metals studied are widely distributed in low concentrations in water. There is some evidence that the concentration levels are related to man's activities in certain instances. There appears to be no widespread occurrence of these metals in water in amounts exceeding current drinking water standards. However, the initial assessment of these data does indicate potential problems in a few areas. Although firm conclusions regarding natural patterns and pollution anomalies cannot be drawn from the first results of a survey of this kind, similar data collected in the future will show whether trends exist in the overall distribution of these metals in water and whether the observed anomalies persist and should be studied in greater detail.

## UNITS AND TERMS

Throughout the report, the following units have been used:

**$\mu\text{g/l}$  (microgram per liter).** Equivalent to 1 part per billion (ppb) or 1 pound in a billion pounds of water.

**Cfs (cubic foot per second).** 1 cfs is equivalent to 0.65 mgd (million gallons per day) or 0.0283 cubic meter per second.

**Duration.** Percentage of days (on an annual basis) in which the flow equals or exceeds that given.

## SUMMARY OF ANALYTICAL METHODS

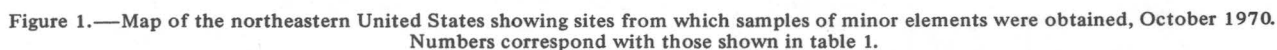
Geological Survey analytical methods (Brown and others, 1970) were used uniformly by all participating laboratories. A provisional Federal Water Quality Administration method (written commun., 1970) for total and dissolved mercury was used.

1. **Arsenic (silver diethyldithiocarbamate method).** Inorganic arsenic compounds are reduced to arsine by zinc in an acid medium. The resulting mixture of gases is passed through a scrubber containing pyrex wool impregnated with lead acetate solution and into an absorbing tube containing silver diethyldithiocarbamate dissolved in pyridine. Arsine reacts with silver diethyldithiocarbamate to form a soluble red substance having maximum absorbance at about 535  $\text{m}\mu$ . The absorbance of the solution is measured spectrophotometrically and arsenic is determined by reference to an analytical curve prepared from standards.
2. **Cadmium (atomic absorption method—chelation-extraction).** Cadmium in the sample is chelated with ammonium pyrrolidine dithiocarbamate (APDC). The chelate is then extracted from the sample with methyl isobutyl ketone (MIBK), which is aspirated into the flame of a spectrophotometer.
3. **Hexavalent chromium (atomic absorption method—chelation-extraction).** Hexavalent chromium in water is chelated with ammonium pyrrolidine dithiocarbamate (APDC) and is extracted from the sample with methyl isobutyl ketone (MIBK) at a pH of 2.4. The MIBK is aspirated into the flame of the spectrophotometer.
4. **Cobalt (atomic absorption method—chelation-extraction).** Cobalt in water is determined by chelation with ammonium pyrrolidine dithiocarbamate (APDC). The chelate is then extracted from the sample with methyl isobutyl ketone (MIBK), which is aspirated into the flame of the spectrophotometer.
5. **Lead (atomic absorption method—chelation-extraction).** Lead in the sample is chelated with ammonium pyrrolidine dithiocarbamate (APDC), which is then extracted into methyl isobutyl ketone (MIBK) and aspirated into the flame of a spectrophotometer.
6. **Zinc (atomic absorption method—direct).** The sample is aspirated directly with no pretreatment other than dilution or filtration as may be required. Zinc concentrations are then determined by standard atomic absorption measurements.
7. **Mercury (flameless atomic absorption procedure).** Persulfate oxidation follows the addition of permanganate to insure that organo-mercury compounds, if present, will be oxidized to the mercuric ion before measurement in the

8. **Mercury (silver wire atomic procedure).** Mercury is collected from an acidified sample of filtered water by amalgamation on a silver wire. The silver wire is electrically heated and the vapor drawn through an absorption cell placed in the light beam of the atomic-absorption spectrophotometer. The procedure was used in the

## REFERENCES

- Brown, Eugene, Skougstad, M. W., and Fishman, M. J., 1970, Methods for collection and analysis of water samples for dissolved minerals and gases: U.S. Geol. Survey Techniques Water Resources Inv., book 5, chap. A1, 160 p.
- U.S. Geological Survey, released annually, Water resources data, Part 2, Water quality records (separate book for each State): U.S. Geol. Survey, Water Resources Div.
- U.S. Public Health Service, 1962, Drinking water standards: U.S. Public Health Service Pub. 956, 61 p.



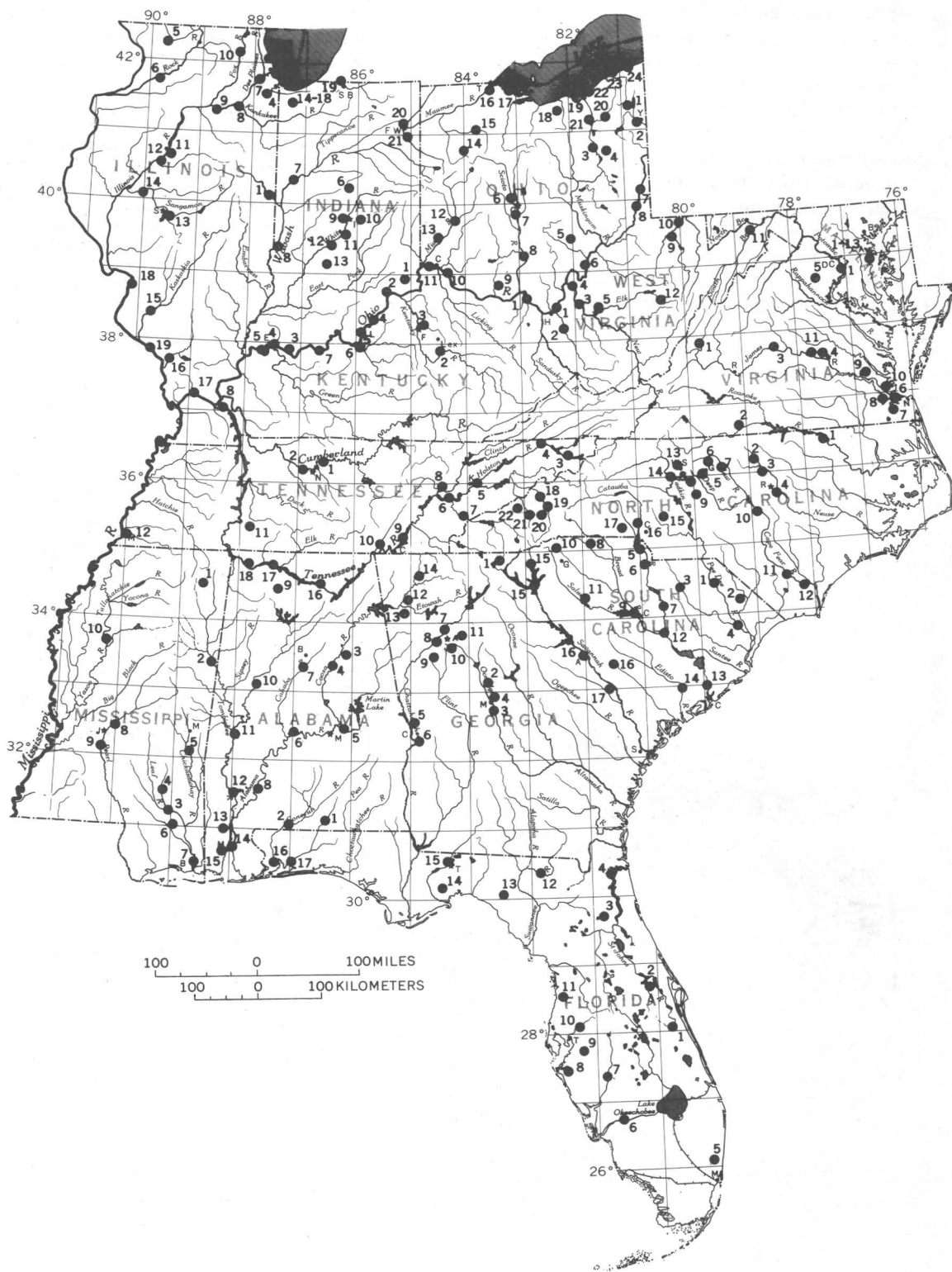


Figure 2.—Map of the southeastern United States showing sites from which samples of minor elements were obtained, October 1970. Numbers correspond with those shown in table 1.



Figure 3.—Map of the central United States showing sites from which samples of minor elements were obtained, October 1970. Numbers correspond with those shown in table 1.

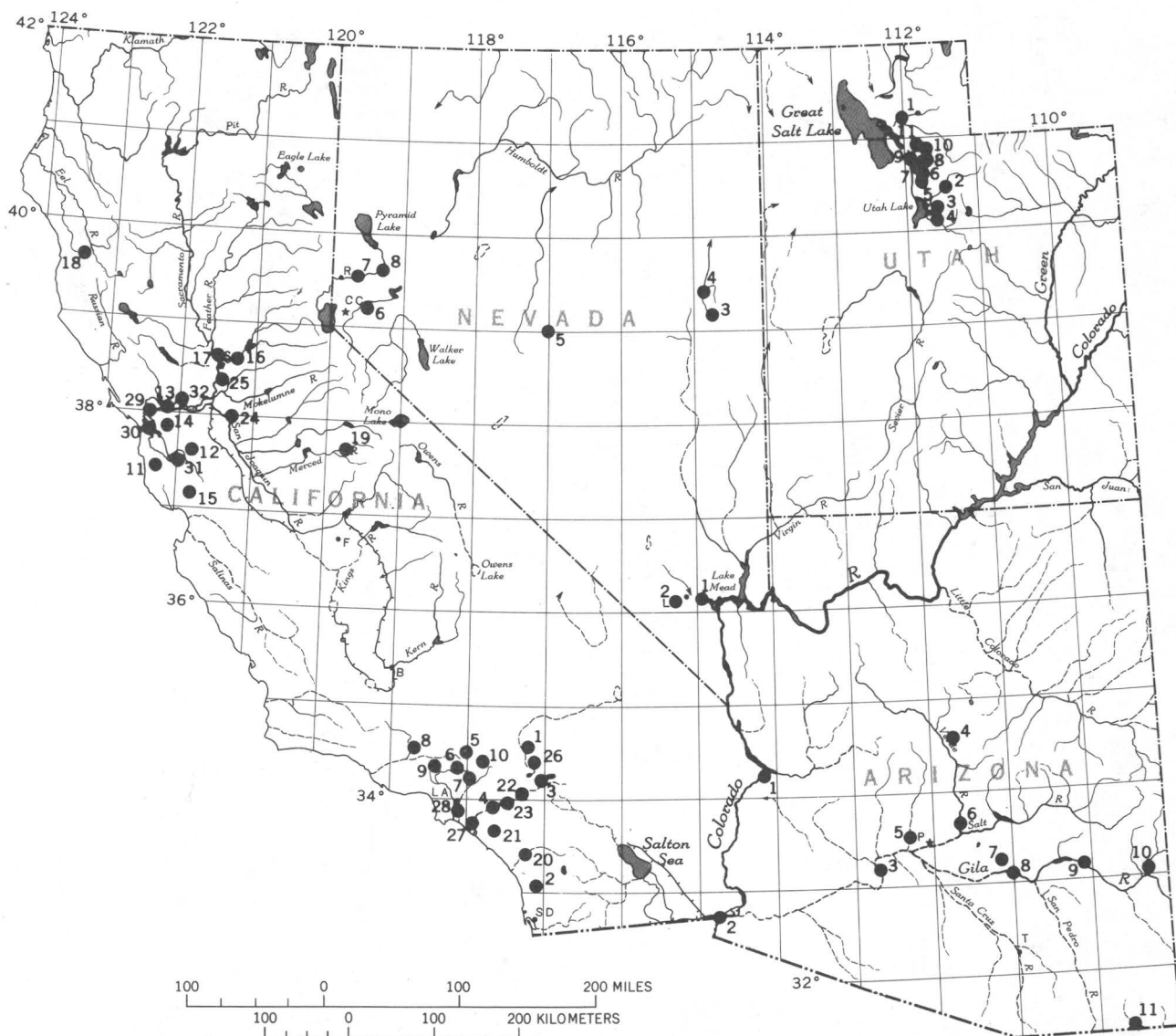


Figure 4.—Map of the southwestern United States showing sites from which samples of minor elements were obtained, October 1970. Numbers correspond with those shown in table 1.

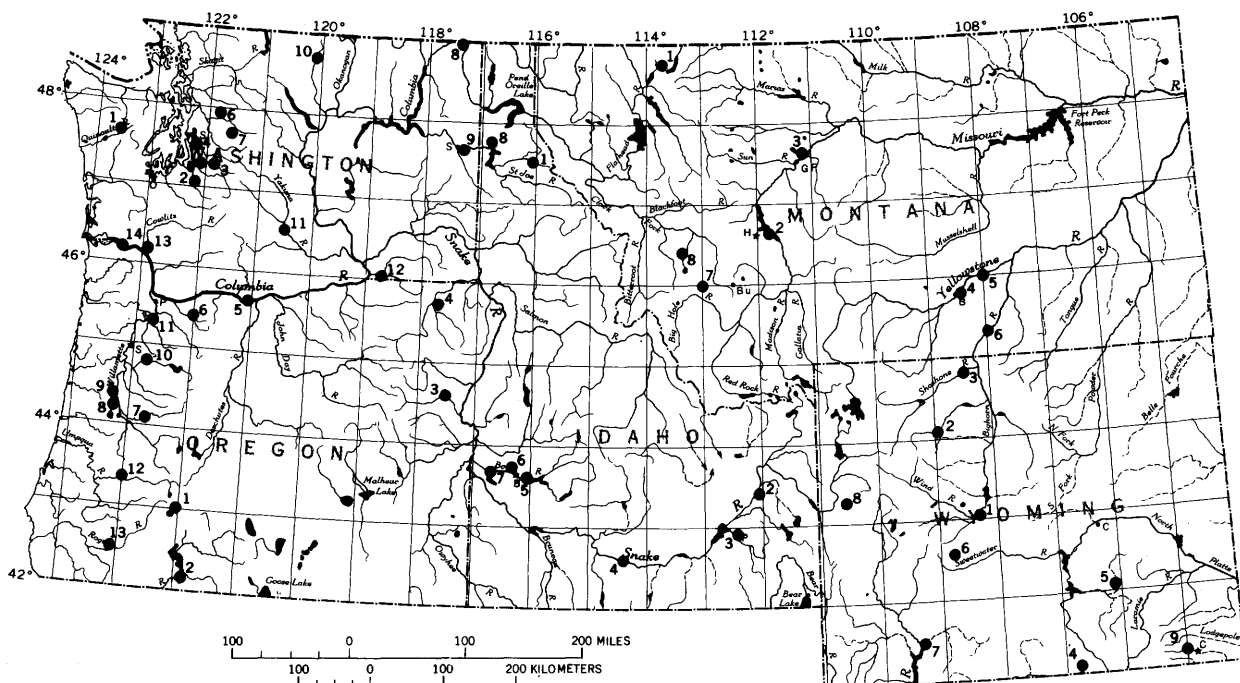


Figure 5.—Map of the northwestern United States showing sites from which samples of minor elements were obtained, October 1970. Numbers correspond with those shown in table 1.

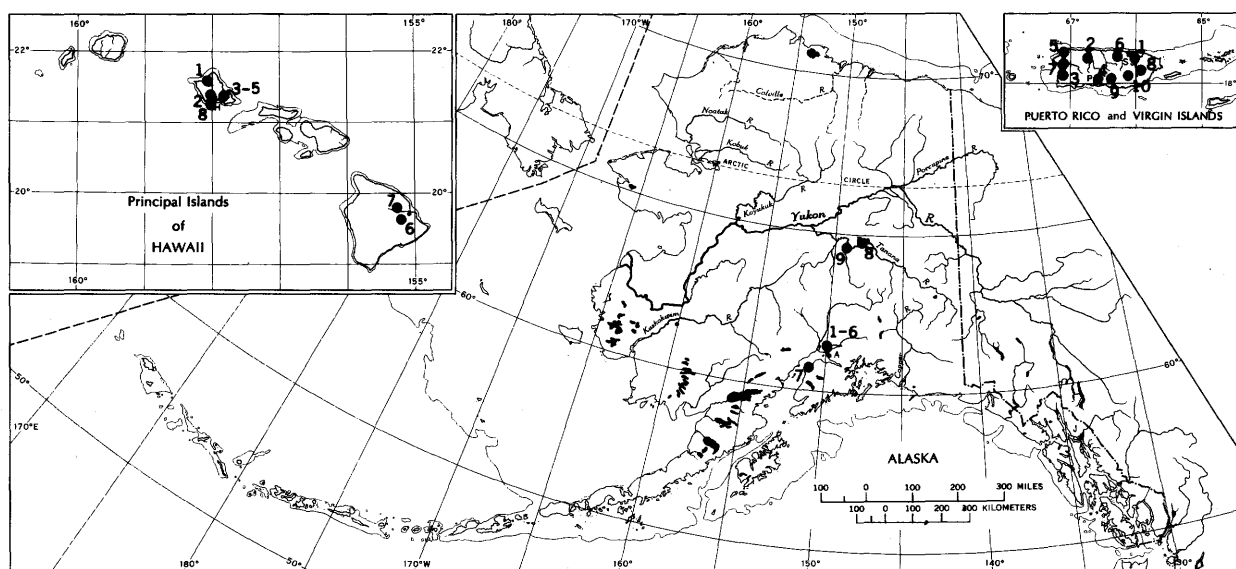


Figure 6.—Map of Alaska, Hawaii, Puerto Rico, and Virgin Islands showing sites from which samples of minor elements were obtained, October 1970. Numbers correspond with those shown in table 1.



Table 1.—*Reconnaissance of selected minor elements in*

[Analysis in micrograms per liter. Source of sample: PWS, public water]

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
<b>ALABAMA</b>				
02369800	1—BM	Blackwater near Bradley.....	Oct. 7	102
02374760	2—MIC	Conecuh River south of Pollard.....	Oct. 7	1,400
02404000	3—MIC	Choccolocco Creek near Jenifer.....	Oct. 15	84
02407000	4—MIC	Coosa River at Childersburg.....	Oct. 14	18,000
02419893	5—PWS	Tallapoosa River at U.S. 231 bridge near Montgomery.....	Oct. 26	9,600
02423000	6—MIC	Alabama River at Selma.....	Oct. 13	11,900
02423390	7—PWS	Cahaba River pump station, Birmingham.....	Oct. 23	71.4 mgd
02429500	8—MIC	Alabama River at Claiborne.....	Oct. 9	3,400
02450250	9—BM	Sipsey Fork near Grayson.....	Oct. 22	17.1
02465280	10—MIC	Black Warrior River at Fosters Bridge near Tuscaloosa.....	Oct. 26	600
02469525	11—MIC	Tombigbee River at Highway 10 near Nanafalia.....	Oct. 8	2,400
02470240	12—MIC	Tombigbee River near Carlton.....	Oct. 9	500
02470649	13—PWS	Cold Creek Reservoir Saraland pump station near Mobile.....	Oct. 7	43 mgd
02471018	14—MIC	Mobile River at Government Street at Mobile.....	Oct. 6	4,000
02480008	15—PWS	Big Creek Reservoir pump station, Mobile.....	Oct. 6	63.7 mgd
03575500	16—PWS	Tennessee River at Whitesburg.....	Oct. 21	38,100
03586000	17—MIC	Tennessee River at Wheeler Dam.....	Oct. 21	24,000
03590680	18—MIC	Tennessee River at Smithsonia.....	Oct. 21	43,200
<b>ALASKA</b>				
15276000	1—PWS	Ship Creek near Anchorage.....	Oct. 16	.....
15276600	2—MIC	Ship Creek, Post Road.....	Oct. 16	.....
15275100	3—MIC	Chester Creek, Arctic Blvd.....	Oct. 16	.....
15275300	4—MIC	Fish Creek, Northernlights Blvd.....	Oct. 16	.....
15274600	5—MIC	Campbell Creek near Spinard.....	Oct. 16	.....
15274700	6—MIC	Hood Creek, Northernlights Blvd.....	Oct. 19	.....
15267160	7—MIC	Swanson River near Kenai.....	Sept. 30	.....
.....	8—MIC	Chena River at Pikes Landing Road Crossing.....	Oct. 16	.....
15158400	9—MIC	Tanana River near Nenana.....	Oct. 15	.....
<b>ARIZONA</b>				
09477520	1—MIC	Colorado River below Parker Dam.....	Oct. 16	.....
09522000	2—MIC	Colorado River at northerly international boundary.....	Oct. 27	730
09518000	3—MIC	Gila River diversion at Gillespie Dam.....	Oct. 19	.....
09508300	4—BM	Wet Bottom Creek near Childs.....	Oct. 15	.....
.....	5—PWS	Phoenix-Squaw Peak treatment plant intake.....	Oct. 12	.....
.....	6—PWS	Phoenix-Verde River treatment plant intake.....	Oct. 12	.....
.....	7—MIC	Mineral Creek near Big Dome, 3 mi. south of Ray.....	Oct. 8	<sup>b</sup> 10
09474000	8—MIC	Gila River at Kelvin.....	Oct. 23	.....
.....	9—MIC	Gila River approximately 1 mile upstream from San Carlos Indian Reservation boundary.....	Oct. 8	120
09444500	10—MIC	San Francisco River at Clifton.....	Oct. 19	.....
.....	11—MIC	Whitewater Draw at International Boundary.....	Oct. 10	<sup>b</sup> 5

<sup>a</sup>Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium<sup>b</sup>Estimated.



surface waters of the United States, October 1970

supply (raw); MIC, municipal and industrial complex; BM, bench mark]

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total
ALABAMA—Continued								
50	(a)	(a)	2	6	9	(a)	(a)	(a)
90	(a)	(a)	(a)	8	3	(a)	0.1	(a)
95	(a)	5	2	(a)	(a)	30	(a)	(a)
20	(a)	2	2	(a)	4	50	(a)	(a)
15	10	2	(a)	45	10	(a)	(a)	(a)
67	(a)	(a)	(a)	(a)	(a)	(a)	.1	(a)
-----	10	12	2	(a)	(a)	20	(a)	(a)
99	(a)	4	(a)	22	9	(a)	(a)	(a)
60	(a)	5	1	(a)	6	(a)	(a)	(a)
85	30	6	(a)	22	6	(a)	(a)	(a)
90	(a)	(a)	3	12	(a)	(a)	(a)	(a)
90	(a)	2	2	(a)	10	(a)	(a)	(a)
-----	(a)	2	(a)	5	2	10	.1	(a)
90	(a)	65	1	12	(a)	30	.1	(a)
-----	(a)	(a)	(a)	17	(a)	20	(a)	(a)
40	(a)	90	(a)	12	(a)	(a)	.1	(a)
75	(a)	5	(a)	(a)	(a)	(a)	.1	(a)
40	(a)	10	(a)	25	(a)	(a)	(a)	(a)

ALASKA—Continued

-----	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
-----	(a)	(a)	(a)	(a)	1	10	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
-----	(a)	(a)	(a)	(a)	2	(a)	-----	(a)
-----	(a)	(a)	(a)	3	3	110	-----	(a)
-----	10	(a)	(a)	(a)	3	(a)	-----	1.1
-----	(a)	(a)	(a)	(a)	5	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	45	-----	(a)

ARIZONA—Continued

-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	30	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	(a)	(a)	1	(a)	20	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	130	(a)	4,500	(a)	42,000	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	2.3
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	1	2	1	(a)	20	-----	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
ARKANSAS				
-----	1—MIC	White River near Goshen, below Fayetteville.....	Oct. 16	-----
-----	2—PWS	Lake Fayetteville on White River.....	Oct. 16	-----
-----	3—BM	North Sylamore Creek near Fifty Six.....	Oct. 30	-----
-----	4—PWS	Lake Fort Smith on Frog Bayou.....	-----	-----
-----	5—MIC	Arkansas River at Lock and Dam 13 below Ft. Smith.....	Oct. 15	-----
-----	6—PWS	Lake Winona on Alum Fork, Saline River.....	Oct. 29	-----
-----	7—MIC	Arkansas River at Lock and Dam 6 below Little Rock.....	-----	-----
07264000	8—MIC	Bayou Meto near Lonoke.....	Oct. 28	-----
-----	9—MIC	Arkansas River near Lock and Dam 3 below Pine Bluff.....	Oct. 28	-----
07340300	10—BM	Cossatot River near Vandervoort.....	Nov. 10	-----
-----	11—PWS	Hot Springs Reservoir on Bull Bayou.....	<sup>c</sup> Oct. 8	-----
-----	12—MIC	Ouachita River near Malvern, below Hot Springs.....	Oct. 9	-----
07363300	13—MIC	Hurricane Creek near Sheridan.....	Oct. 28	-----
CALIFORNIA				
10261500	1—PWS	Mojave River at lower narrows at Victorville.....	Oct. 7	1.5
11041000	2—PWS	San Luis Rey River near Bonsall.....	Oct. 7	.50
11051500	3—PWS	Santa Ana River near Mentone.....	Oct. 8	.40
11074000	4—PWS	Santa Ana River below Prado Dam.....	Oct. 8	27
11098000	5—PWS	Arroyo Seco near Pasadena.....	Oct. 7	1.3
11102300	6—PWS	Rio Hondo above Spreading Grounds below Whittier Narrows Dam.	Oct. 7	136
11087500	7—PWS	San Gabriel River at Pico.....	Oct. 7	-----
-----	8—PWS	Owen's River Aqueduct at Los Angeles.....	Oct. 7	-----
-----	9—PWS	Los Angeles River at Glendale.....	Oct. 7	-----
-----	10—PWS	Colorado River Aqueduct at La Verne.....	Oct. 7	-----
-----	11—PWS	Lower Crystal Spring Reservoir near San Mateo.....	<sup>c</sup> Oct. 14	-----
-----	12—PWS	San Antonio Reservoir near Sunol.....	<sup>c</sup> Oct. 15	-----
-----	13—PWS	San Pablo Reservoir near Orinda.....	Oct. 13	-----
-----	14—PWS	Upper San Leandro Reservoir near San Leandro.....	Oct. 13	-----
-----	15—PWS	South Bay Aqueduct at Los Gatos.....	Oct. 12	-----
-----	16—PWS	American River at Watt Ave. Bridge at Sacramento.....	Oct. 5	<sup>b</sup> 2,500
11447500	17—PWS	Sacramento River below American River at Sacramento.....	Oct. 7	<sup>b</sup> 15,400
11475560	18—BM	Elder Creek near Branscomb.....	Oct. 7	-----
11264500	19—BM	Merced River at Happy Isles Bridge near Yosemite.....	Oct. 20	-----
11046500	20—MIC	San Juan Creek near San Juan Capistrano.....	Oct. 7	1.0
11048500	21—MIC	San Diego Creek near Irvine.....	Oct. 7	.50
11066500	22—MIC	Santa Ana River at Riverside.....	Oct. 8	60
11072200	23—MIC	Temescal Creek at Corona.....	Oct. 8	10
11311150	24—MIC	San Joaquin River near Stockton Ship Channel.....	Oct. 2	-----
11447650	25—MIC	Sacramento River at Freeport.....	Oct. 5	<sup>b</sup> 15,500

<sup>a</sup>Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter, cadmium, chromium<sup>b</sup>Estimated.<sup>c</sup>Sample obtained for mercury Jan. 29, 1971.<sup>e</sup>Sample obtained for mercury Feb. 5, 1971.

surface waters of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

ARKANSAS—Continued

-----	80	(a)	(a)	25	(a)	60	(a)	0.5
-----	20	5	(a)	5	2	65	(a)	(a)
-----	60	10	(a)	5	10	15	(a)	(a)
-----	30	5	1	(a)	14	50	(a)	(a)
-----	140	5	(a)	25	(a)	25	0.2	(a)
-----	(a)	18	2	15	20	30	.1	.5
-----	(a)	12	(a)	8	11	10	(a)	(a)
-----	40	4	(a)	20	(a)	100	.2	(a)
-----	90	9	(a)	6	(a)	(a)	(a)	(a)
-----	(a)	5	(a)	6	14	200	(a)	(a)
-----	(a)	20	(a)	(a)	(a)	15	(a)	(a)
-----	(a)	18	(a)	(a)	4	45	(a)	.9
-----	(a)	15	2	55	10	150	(a)	(a)

CALIFORNIA—Continued

-----	(a)	2	(a)	(a)	10	(a)	-----	(a)
-----	(a)	(a)	3	(a)	4	(a)	-----	0.7
-----	(a)	4	3	(a)	24	(a)	-----	.5
-----	(a)	6	(a)	1	34	30	-----	1.2
-----	5	3	(a)	(a)	13	10	-----	(a)
-----	(a)	(a)	(a)	(a)	9	(a)	-----	.8
-----	(a)	(a)	(a)	(a)	(a)	20	-----	.6
-----	(a)	1	(a)	(a)	14	(a)	-----	(a)
-----	(a)	1	2	(a)	13	(a)	-----	1.7
-----	(a)	4	(a)	(a)	20	(a)	-----	.7
-----	(a)	(a)	(a)	(a)	(a)	50	-----	.5
-----	(a)	(a)	(a)	(a)	(a)	35	-----	.3
-----	(a)	(a)	(a)	(a)	(a)	10	-----	2.6
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	1.1
-----	(a)	(a)	(a)	(a)	(a)	20	-----	1.4
-----	(a)	2	(a)	(a)	1	(a)	-----	(a)
-----	(a)	1	(a)	(a)	1	(a)	-----	.7
-----	(a)	(a)	(a)	(a)	2	10	-----	1.1
-----	(a)	(a)	(a)	(a)	2	120	-----	6.0
-----	(a)	6	(a)	(a)	30	(a)	-----	(a)
-----	(a)	(a)	4	(a)	(a)	10	-----	.8
-----	(a)	5	(a)	1	16	60	-----	.9
-----	5	5	(a)	2.0	34	50	-----	1.3
-----	(a)	(a)	(a)	(a)	1	(a)	-----	2.9
-----	(a)	2	(a)	(a)	1	(a)	-----	(a)

(hexavalent), cobalt, and lead; less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
CALIFORNIA—Continued				
-----	26—MIC	Mojave River below Victorville.....	Oct. 7	20
-----	27—MIC	San Gabriel River near Los Angeles.....	Oct. 7	5.0
-----	28—MIC	Los Angeles River near Los Angeles.....	Oct. 7	4.0
-----	29—MIC	Castro Creek at Richmond.....	Oct. 8	-----
-----	30—MIC	Islais Creek Canal near San Francisco.....	Oct. 8	-----
-----	31—MIC	Coyote Creek near Alviso.....	Oct. 9	-----
-----	32—MIC	Bulls Head Creek near Martinez.....	Oct. 9	b.25
COLORADO				
06707000	1—PWS	North Fork South Platte River at South Platte.....	Oct. 6	-----
06707455	2—PWS	South Platte River above South Platte.....	Oct. 6	1.35
06720500	3—MIC	South Platte River at Henderson.....	Oct. 7	538
06728855	4—MIC	Boulder Creek below Boulder.....	Oct. 13	31
06752500	5—MIC	Cache la Poudre River near Greeley.....	Oct. 13	-----
07083000	6—BM	Halfmoon Creek near Malta.....	Oct. 9	-----
07099500	7—PWS	Arkansas River above Water Works near Pueblo.....	Oct. 7	472
07103355	8—PWS	Blue River Supply at Manitou Springs.....	Oct. 13	13.2
07105555	9—MIC	Fountain Creek below Sewer Plant at Colorado Springs.....	Oct. 13	30
07109155	10—MIC	Arkansas River at Highway 233 crossing near Vineland.....	Oct. 7	810
09022500	11—PWS	East Portal of Moffat Tunnel near Tolland.....	Oct. 13	45.4
09049155	12—MIC	Tenmile Creek above Highway Bridge at Frisco.....	Oct. 26	23.4
09153000	13—MIC	Colorado River near Fruita.....	Oct. 15	6,480
09177100	14—MIC	San Miguel River below Uravan.....	Oct. 15	205
09352900	15—BM	Vallecito Creek near Bayfield.....	Oct. 12	79
09346000	16—PWS	Navajo River near Edith.....	Oct. 12	-----
09346400	17—PWS	San Juan River near Carracas.....	Oct. 12	-----
09349800	18—PWS	Piedra River near Arboles.....	Oct. 12	-----
09354500	19—PWS	Los Pinos River at La Boca.....	Oct. 12	-----
CONNECTICUT				
01122500	2—MIC	Shetucket River near Willimantic.....	Oct. 1	107
01125500	3—MIC	Quinebaug River at Putnam.....	Oct. 1	75
01184000	4—BM	Connecticut River at Thompsonville.....	Oct. 9	9,930
01186240	5—MIC	Still River near Winsted.....	Oct. 1	47
01187500	6—PWS	Barkhamsted Reservoir near Barkhamsted.....	Oct. 8	-----
01187870	7—PWS	Nepaug Reservoir at Collinsville.....	Oct. 8	-----
01189000	8—MIC	Pequabuck River at Forestville.....	Oct. 1	17
01192700	9—MIC	Mattabeset River at East Berlin.....	Oct. 1	19
01193050	10—MIC	Connecticut River near Middle Haddam.....	Oct. 1	-----
01195320	11—PWS	Lake Gaillard at North Branford.....	Oct. 14	-----
01195420	12—PWS	Lake Saltonstall at East Haven.....	Oct. 14	-----

<sup>a</sup>Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium<sup>b</sup>Estimated.

surface waters of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

CALIFORNIA—Continued

-----	(a)	2	(a)	(a)	12	(a)	-----	0.8
-----	10	2	(a)	1	13	(a)	-----	1.5
-----	10	(a)	(a)	(a)	5	10	-----	1.0
-----	(a)	(a)	(a)	(a)	(a)	15	-----	1.4
-----	(a)	(a)	(a)	(a)	(a)	15	-----	4.7
-----	(a)	(a)	(a)	(a)	(a)	30	-----	2.4
-----	10	1	(a)	(a)	1.5	60	-----	1.1

COLORADO—Continued

-----	(a)	(a)	(a)	(a)	(a)	30	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	1	(a)	(a)	14	40	-----	0.5
-----	(a)	(a)	(a)	(a)	(a)	30	-----	.6
-----	(a)	(a)	(a)	(a)	(a)	5	-----	(a)
-----	(a)	2	(a)	(a)	(a)	25	-----	(a)
-----	(a)	(a)	(a)	(a)	2	30	-----	(a)
-----	(a)	1	(a)	(a)	4	90	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	140	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	60	-----	(a)
-----	(a)	1	(a)	(a)	(a)	20	-----	(a)
-----	(a)	1	(a)	(a)	(a)	195	-----	(a)
-----	5	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	1	(a)	(a)	(a)	30	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	40	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	1	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)

CONNECTICUT—Continued

88	(a)	(a)	(a)	(a)	3	(a)	(a)	(a)
94	(a)	1	(a)	2	3	(a)	(a)	(a)
-----	10	1	1	1	10	10	(a)	(a)
-----	10	(a)	6	(a)	6	(a)	(a)	(a)
-----	(a)	(a)	3	(a)	7	10	(a)	(a)
-----	(a)	(a)	3	1	2	(a)	(a)	(a)
93	10	6	(a)	(a)	8	390	(a)	(a)
99	(a)	3	2	1	2	30	(a)	(a)
-----	(a)	9	(a)	(a)	4	(a)	(a)	(a)
-----	(a)	1	(a)	1	(a)	(a)	(a)	(a)
-----	(a)	1	(a)	2	(a)	(a)	(a)	0.7

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
CONNECTICUT—Continued				
01196500	13—MIC	Quinnipiac River at Wallingford.....	Oct. 1	65
01196625	14—PWS	Whitney Lake at New Haven.....	Oct. 14	.....
01196633	15—PWS	Lake Watrous near Bethany.....	Oct. 14	.....
01196636	16—PWS	Glen Dam Reservoir near Woodbridge.....	Oct. 14	.....
01196650	17—PWS	Lake Wintergreen at Woodbridge.....	Oct. 14	.....
01201485	18—MIC	Still River at Brookfield Junction.....	Oct. 1	24.3
01202000	19—PWS	Shepaug Reservoir at Woodville.....	Oct. 8	.....
01207500	20—PWS	Morris Reservoir near Thomaston.....	Oct. 8	.....
01208000	21—PWS	Wigwam Reservoir near Thomaston.....	Oct. 8	.....
01208500	22—MIC	Naugatuck River at Beacon Falls.....	Oct. 1	97
01208810	23—PWS	Trap Falls Reservoir near Huntington.....	Oct. 8	.....
01208830	24—PWS	Milford (Beaver Brook) Reservoir at Devon.....	Oct. 14	.....
01208909	25—PWS	Easton Reservoir near Easton.....	Oct. 8	.....
01208919	26—PWS	Hemlock Reservoir near Plattsville.....	Oct. 8	.....
DELAWARE				
01482100	1—MIC	Delaware River at Delaware Memorial Bridge.....	Oct. 8	Tidal
01482800	2—MIC	Delaware River at Reedy Island Jetty.....	Oct. 6	Tidal
.....	3—MIC	Red Clay Creek at Marshallton.....	Oct. 23	57
.....	4—PWS	Brandywine Creek above intake at Wilmington.....	Oct. 23	830
DISTRICT OF COLUMBIA				
.....	1—MIC	Potomac River at Woodrow Wilson Bridge near Wash., D.C.	Oct. 7	Tidal
FLORIDA				
02232000	1—PWS	St. Johns River near Melbourne.....	Oct. 14	155
02233500	2—MIC	Econlockhatchee River near Chuluota.....	Sept. 22	.....
02245200	3—MIC	Rice Creek near Palatka.....	Sept. 28	-654
02246500	4—MIC	St. Johns River at Jacksonville.....	Oct. 2	.....
02283200	5—MIC	Plantation Road Canal at S-33 near Ft. Lauderdale.....	Oct. 29	.....
02292900	6—PWS	Caloosahatchee River near Olga at S-79.....	Oct. 29	.....
02296750	7—MIC	Peace River at Arcadia.....	Nov. 6	.....
02299800	8—MIC	Phillippi Creek at Sarasota.....	Oct. 6	.....
02301500	9—MIC	Alafia River at Lithia.....	Oct. 7	335
02303000	10—PWS	Hillsborough River near Zephyrhills.....	Sept. 23	102
02310500	11—PWS	Weekiwachee Springs near Brooksville.....	Oct. 1	235
02315520	12—MIC	Swift Creek at Facil.....	Oct. 6	24.6
02324500	13—MIC	Fenholloway River at Foley.....	Nov. 10	67.5
02327100	14—BM	Sopchoppy River near Sopchoppy.....	Nov. 12	119
02329000	15—MIC	Ochlockonee River near Havana.....	Nov. 12	126

<sup>a</sup> Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium

surface waters of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

CONNECTICUT—Continued

85	(a)	2	2	(a)	2	20	(a)	(a)
-----	(a)	1	(a)	1	(a)	10	(a)	(a)
-----	(a)	1	1	2	2	(a)	(a)	(a)
-----	(a)	1	(a)	3	3	(a)	(a)	(a)
-----	10	(a)	(a)	1	1	(a)	(a)	(a)
-----	10	1	3	1	2	(a)	(a)	(a)
-----	(a)	1	2	(a)	4	(a)	(a)	(a)
-----	(a)	(a)	1	(a)	(a)	10	(a)	(a)
-----	(a)	1	3	3	2	(a)	(a)	(a)
90	40	22	3	2	4	1,600	(a)	(a)
-----	(a)	1	3	(a)	3	(a)	-----	(a)
-----	20	(a)	(a)	1	1	10	(a)	(a)
-----	(a)	(a)	2	(a)	8	(a)	(a)	(a)
-----	(a)	(a)	3	(a)	2	(a)	(a)	(a)

DELAWARE—Continued

-----	(a)	(a)	(a)	(a)	23	40	-----	(a)
-----	(a)	(a)	(a)	2	14	30	-----	(a)
45	(a)	(a)	(a)	1	12	400	-----	(a)
10	(a)	(a)	(a)	(a)	2	10	-----	(a)

DISTRICT OF COLUMBIA—Continued

-----	(a)	(a)	(a)	(a)	(a)	110	-----	(a)
-------	-----	-----	-----	-----	-----	-----	-------	-----

FLORIDA—Continued

-----	(a)	(a)	(a)	1	1	50	-----	(a)
-----	(a)	(a)	2	(a)	3	60	-----	(a)
-----	10	1	(a)	1	3	200	-----	0.9
-----	(a)	(a)	(a)	(a)	2	60	-----	.9
-----	(a)	(a)	1	(a)	4	50	-----	(a)
-----	(a)	(a)	1	1	1	40	-----	2.2
-----	(a)	(a)	(a)	1	3	50	-----	1.1
-----	(a)	(a)	1	(a)	1	80	-----	.6
-----	(a)	(a)	2	(a)	1	70	-----	1
-----	(a)	(a)	(a)	(a)	1	90	-----	1.1
-----	(a)	(a)	1	(a)	(a)	40	-----	.9
-----	(a)	(a)	1	(a)	1	50	-----	(a)
-----	30	(a)	1	(a)	(a)	65	-----	(a)
-----	10	1	(a)	(a)	1	70	-----	(a)
-----	(a)	1	1	1	4	30	-----	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
FLORIDA—Continued				
02376108	16—MIC	Eleven Mile Creek near Ensley.....	Sept. 23	65.1
.....	17—MIC	Escambia Bay at Pensacola.....	Nov. 12	.....
GEORGIA				
02178400	1—BM	Tallulah River near Clayton.....	Oct. 14	.....
02212600	2—BM	Falling Creek near Juliette.....	Oct. 15	.....
.....	3—MIC	Ocmulgee River near Warner Robins.....	Oct. 15	.....
.....	4—PWS	Ocmulgee River at Macon Intakes.....	Oct. 15	.....
.....	5—PWS	Chattahoochee River above Columbus.....	Oct. 15	.....
.....	6—MIC	Chattahoochee River below Columbus.....	Oct. 15	.....
.....	7—PWS	Chattahoochee River at Atlanta.....	Oct. 13	.....
02337000	8—PWS	Sweetwater Creek near Austell.....	Oct. 13	.....
02337170	9—MIC	Chattahoochee River near Fairborn.....	Oct. 13	.....
.....	10—MIC	Flint River below Atlanta at Highway 138.....	Oct. 16	.....
.....	11—MIC	South River below Atlanta at Highway 155.....	Oct. 16	.....
.....	12—PWS	Oostanaula River near Rome.....	Oct. 14	.....
02397000	13—MIC	Coosa River near Rome.....	Oct. 14	.....
02387000	14—PWS	Conasauga River at Tilton.....	Oct. 14	.....
.....	15—PWS	Hartwell Reservoir at Spillway.....	Oct. 9	.....
.....	16—PWS	Savannah River above Augusta.....	Oct. 12	.....
02197500	17—MIC	Savannah River at Burtons Ferry Bridge near Millhaven.....	Oct. 12	11,000
HAWAII				
16210500	1—MIC	Kaukonahua Stream at Waialua.....	Oct. 7	b <sub>1</sub>
16213000	2—MIC	Waikele Stream at Waipahu.....	Oct. 7	.....
16232000	3—PWS	Nuuanu Stream near Honolulu.....	Oct. 7	2.4
16247100	4—MIC	Manoa—Palolo Drainage Canal at Mailiila.....	Oct. 7	12.9
16264800	5—MIC	Kawainui Drainage Canal at Kailua.....	Oct. 7	.....
16704000	6—PWS	Wailuku River at Piihonua.....	Oct. 13	36.4
16717000	7—BM	Honolii Stream near Papaikou.....	Oct. 13	19.0
.....	8—MIC	Kalihi Stream at mouth on Nimitz Highway Bridge.....	Oct. 7	.....
IDAHO				
12413300	1—MIC	South Fork Coeur d'Alene River at Smelterville.....	Oct. 8	106
13060000	2—MIC	Snake River near Shelley.....	Oct. 6	.....
13075910	3—MIC	Portneuf River near Tyhee.....	Oct. 6	.....
13093100	4—MIC	Rock Creek at mouth near Twin Falls.....	Oct. 19	.....
13204300	5—PWS	Boise River above pump station near Boise.....	Oct. 8	702
13206000	6—MIC	Boise River at Strawberry Glen Bridge near Boise.....	Oct. 9	.....
13211440	7—MIC	Indian Creek at Caldwell.....	Oct. 23	.....
12416000	8—BM	Hayden Creek below North Fork near Hayden Lake.....	Oct. 21	5.6

<sup>a</sup>Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium<sup>b</sup>Estimated.



surface waters of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

FLORIDA—Continued

-----	10	(a)	2	2	1	110	-----	(a)
-----	(a)	(a)	2	1	1	55	-----	(a)

GEORGIA—Continued

-----	45	1	(a)	(a)	18	10	-----	(a)
-----	(a)	(a)	(a)	(a)	13	30	-----	(a)
-----	20	(a)	(a)	(a)	14	20	-----	(a)
-----	20	1	1	(a)	15	310	-----	(a)
-----	(a)	1	(a)	(a)	29	60	-----	(a)
-----	25	(a)	1	(a)	6	20	-----	(a)
-----	(a)	1	1	(a)	23	20	-----	(a)
-----	30	5	(a)	2	22	150	-----	(a)
-----	(a)	1	2	(a)	44	50	-----	(a)
-----	20	1	3	1	12	30	-----	(a)
-----	10	(a)	5	2	9	80	-----	(a)
-----	20	1	(a)	(a)	32	130	-----	(a)
-----	20	(a)	1	(a)	20	60	-----	(a)
-----	20	2	(a)	1	14	120	-----	(a)
-----	(a)	(a)	1	(a)	(a)	20	-----	(a)
-----	(a)	(a)	1	1	(a)	10	-----	(a)
-----	(a)	(a)	(a)	1	(a)	30	-----	(a)

HAWAII—Continued

-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	0.7
-----	(a)	(a)	(a)	(a)	(a)	10	-----	.6
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	1.2
-----	(a)	(a)	(a)	(a)	(a)	20	-----	1.0

IDAHO—Continued

-----	30	21	(a)	14	5	19,000	-----	6.8
-----	(a)	(a)	(a)	(a)	3	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	1.1
-----	10	(a)	(a)	(a)	2	(a)	-----	.5
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	3	60	-----	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
ILLINOIS				
03339000	1—MIC	Vermilion River near Danville.....	Oct. 8	560
04087415	2—PWS	Lake Michigan at Evanston Water Works.....	Oct. 7	-----
04087430	3—PWS	Lake Michigan at Chicago Water Works.....	Oct. 7	-----
04091000	4—MIC	Little Calumet River at South Holland.....	Oct. 7	60
05435500	5—MIC	Pecatonica River at Freeport.....	Oct. 6	550
05443500	6—MIC	Rock River near Como.....	Oct. 6	5,350
05532500	7—MIC	Des Plaines River at Riverside.....	Oct. 7	580
05540500	8—MIC	Du Page River at Shorewood.....	Oct. 8	170
05543500	9—MIC	Illinois River at Marseilles.....	Oct. 8	6,650
05550000	10—MIC	Fox River at Algonquin.....	Oct. 7	740
05559900	11—PWS	Illinois River at Peoria Water Co., Peoria.....	Oct. 6	-----
05568500	12—MIC	Illinois River at Kingston Mines.....	Oct. 6	22,100
05576200	13—MIC	Lake Springfield at Springfield Water Works.....	Oct. 5	-----
05583000	14—MIC	Sangamon River near Oakford.....	Oct. 6	2,050
05595000	15—MIC	Kaskaskia River at New Athens.....	Oct. 5	490
05599500	16—MIC	Big Muddy River at Murphysboro.....	Oct. 5	650
-----	17—MIC	Ohio River at Lock and Dam 53 near Grand Chain.....	Oct. 7	-----
07001000	18—PWS	Mississippi River at East St. Louis.....	Oct. 13	298,000
07020500	19—MIC	Mississippi River at Chester.....	Oct. 14	312,000
INDIANA				
03276700	1—BM	South Hogan Creek near Dillsboro.....	Oct. 13	16
03292000	2—MIC	Ohio River near Madison.....	Oct. 8	-----
03322000	3—PWS	Ohio River at Evansville, waterplant.....	Oct. 13	4,800
03322150	4—MIC	Ohio River at navigation light on old Henderson Road.....	Oct. 13	48,000
03322200	5—MIC	Ohio River at Dam 48.....	Oct. 13	48,000
03333700	6—MIC	Wildcat Creek at Kokomo.....	Oct. 12	175
03335680	7—MIC	Wabash River at bridge near Westpoint.....	Oct. 14	3,900
03341560	8—MIC	Wabash River at Dresser powerplant near Terre Haute.....	Oct. 13	6,400
03351050	9—PWS	White River Canal at College Ave. in Indianapolis.....	Oct. 12	<sup>b</sup> 60
03352700	10—PWS	Fall Creek at Keystone Ave. bridge in Indianapolis.....	Oct. 12	70
03353625	11—MIC	White River below mouth of Eagle Creek at I-465 bridge.....	Oct. 12	<sup>b</sup> 600
03353660	12—MIC	White River at Waverly.....	Oct. 12	<sup>b</sup> 750
03372650	13—MIC	Clear Creek below treatment plant near Bloomington.....	Oct. 12	<sup>b</sup> 4
04087600	14—MIC	Little Calumet River at Munster.....	Oct. 13	26
04092390	15—MIC	Grand Calumet River at Hohman Street bridge at Hammond... .....	Oct. 13	<sup>b</sup> 40
04092600	16—PWS	Lake Michigan at filtration plant at Whiting.....	Oct. 13	-----
04092700	17—MIC	Industrial Canal at 151 Street bridge at E. Chicago.....	Oct. 13	<sup>b</sup> 800
04092800	18—PWS	Lake Michigan at filtration plant at Gary.....	Oct. 13	-----
04101400	19—MIC	St. Joseph River at Bertrand, Mich.....	Oct. 13	-----
04180600	20—PWS	St. Joseph River at filtration plant at Ft. Wayne.....	Oct. 12	-----
04183000	21—MIC	Maumee River at New Haven.....	Oct. 12	175

<sup>a</sup> Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium<sup>b</sup> Estimated.

surface waters of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

ILLINOIS—Continued

37	(a)	3	(a)	(a)	16	30	-----	(a)
-----	(a)	(a)	1	1	3	130	-----	(a)
-----	(a)	(a)	1	1	5	40	-----	1.4
53	10	1	1	1	5	50	-----	(a)
55	(a)	(a)	1	2	11	80	-----	(a)
30	10	1	1	1	10	60	-----	(a)
18	(a)	(a)	1	(a)	5	40	-----	(a)
34	(a)	1	1	1	11	30	-----	(a)
57	(a)	1	1	1	11	50	-----	(a)
33	(a)	(a)	1	1	10	50	-----	.8
-----	(a)	(a)	(a)	1	4	50	-----	(a)
18	10	1	1	1	10	30	-----	.9
-----	(a)	(a)	1	(a)	10	100	-----	(a)
39	(a)	(a)	1	1	10	170	-----	(a)
71	(a)	(a)	1	1	12	20	-----	(a)
38	(a)	(a)	(a)	1	3	10	-----	(a)
-----	(a)	15	(a)	(a)	3	(a)	(a)	-----
1-2 yr. high	10	16	(a)	4	7	(a)	(a)	-----
1-2 yr. high	20	12	(a)	8	25	(a)	(a)	-----

INDIANA—Continued

-----	(a)	(a)	1	(a)	5	60	(a)	(a)
-----	(a)	(a)	(a)	12	6	10	(a)	0.5
-----	10	(a)	1	(a)	1	(a)	-----	(a)
-----	(a)	(a)	1	(a)	5	20	0.5	(a)
-----	(a)	(a)	1	(a)	10	20	-----	(a)
-----	(a)	3	1	4	9	220	(a)	(a)
-----	(a)	(a)	1	1	5	190	.5	(a)
-----	(a)	1	(a)	(a)	1	10	(a)	(a)
-----	(a)	(a)	1	(a)	9	50	(a)	(a)
-----	(a)	(a)	(a)	(a)	5	100	(a)	(a)
-----	(a)	(a)	1	(a)	4	110	(a)	(a)
-----	10	1	(a)	(a)	1	(a)	(a)	(a)
-----	(a)	(a)	(a)	(a)	9	100	(a)	(a)
-----	10	(a)	1	(a)	(a)	60	-----	(a)
-----	10	1	1	1	15	60	(a)	(a)
-----	(a)	(a)	(a)	(a)	1	60	(a)	(a)
-----	(a)	(a)	(a)	(a)	10	130	.6	(a)
-----	(a)	(a)	1	(a)	1	(a)	(a)	.8
-----	(a)	(a)	1	(a)	1	100	(a)	(a)
-----	(a)	(a)	(a)	(a)	3	90	(a)	(a)
-----	(a)	4	(a)	(a)	3	50	(a)	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
IOWA				
05414700	1—MIC	Mississippi River below Dubuque.....	Oct. 9	23,000
05422620	2—PWS	Mississippi River at Davenport.....	Oct. 7	19,000
05448090	3—MIC	Mississippi River below Davenport.....	Oct. 7	24,000
05451820	4—MIC	Iowa River near Tama, below Marshalltown.....	Oct. 6	200
05464020	5—MIC	Cedar River at Gilbertville bridge, below Waterloo.....	Oct. 8	930
05464670	6—MIC	Cedar River below Cedar Rapids.....	Oct. 6	1,300
05480600	7—MIC	Des Moines River below Ft. Dodge.....	Oct. 8	210
05485520	8—MIC	Des Moines River below Des Moines.....	Oct. 6	350
05489620	9—MIC	Des Moines River at Cliffland bridge, below Ottumwa.....	Oct. 1	3,100
06600530	10—MIC	Missouri River below Sioux City.....	Oct. 9	41,000
06897950	11—BM	Elk Creek near Decatur City.....	Oct. 1	5.2
KANSAS				
06891000	1—MIC	Kansas River at Lecompton.....	Oct. 12	3,950
06892500	2—MIC	Kansas River at Bonner Springs.....	Oct. 14	5,050
07143330	3—MIC	Arkansas River near Hutchinson.....	Oct. 6	285
07144200	4—MIC	Little Arkansas River at Valley Center.....	Oct. 6	930
07144550	5—MIC	Arkansas River at Derby.....	Oct. 7	390
07187600	6—MIC	Spring River near Baxter Springs.....	Oct. 12	650
07147500	7—MIC	Walnut River near Douglass.....	Oct. 14	250
06898990	8—PWS	Kansas River at Topeka Water Plant.....	Oct. 12	.....
07144790	9—PWS	Cheney Reservoir near Cheney.....	Oct. 7	.....
.....	10—PWS	City of Wichita well field.....	Oct. 7	.....
06821265	11—PWS	Missouri River at intake to Kansas City powerplant.....	Oct. 14	.....
06821265	12—MIC	Missouri River below Kansas City powerplant.....	Oct. 14	.....
KENTUCKY				
03216600	1—MIC	Ohio River Greenup Dam.....	Oct. 8	.....
.....	2—PWS	Kentucky River at Lexington.....	Oct. 22	.....
.....	3—MIC	Elkhorn Creek near Frankfort.....	Oct. 5	.....
.....	4—PWS	Ohio River at Louisville.....	Oct. 5	.....
03294500	5—MIC	Ohio River at Louisville.....	Oct. 23	50,000
.....	6—MIC	Salt River at mouth near Louisville.....	Oct. 5	.....
.....	7—MIC	Ohio River at Owensboro.....	Oct. 9	.....
.....	8—MIC	Tennessee River near Paducah.....	Oct. 6	.....
LOUISIANA				
02490193	1—MIC	Pearl River at Pools Bluff Sill near Bogalusa.....	Oct. 29	1,600
07344480	2—PWS	Cross Lake at Shreveport.....	Oct. 20	.....

<sup>a</sup>Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium<sup>b</sup>Estimated.

surface waters of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

IOWA—Continued

-----	(a)	(a)	(a)	(a)	(a)	40	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	40	-----	1.4
-----	(a)	(a)	(a)	(a)	(a)	50	-----	(a)
63	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
64	(a)	(a)	(a)	(a)	(a)	40	-----	1.8
63	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
66	(a)	(a)	(a)	(a)	(a)	30	-----	(a)
85	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
40	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	30	-----	.8
b60	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)

KANSAS—Continued

-----	(a)	(a)	(a)	(a)	3	30	-----	1.8
-----	(a)	1	(a)	(a)	2	10	-----	.6
-----	(a)	(a)	(a)	(a)	5	200	-----	2.1
-----	(a)	(a)	(a)	(a)	6	60	-----	3.7
-----	(a)	(a)	(a)	(a)	(a)	65	-----	4.3
-----	(a)	4	(a)	(a)	(a)	610	-----	1
-----	(a)	(a)	(a)	(a)	(a)	20	-----	1.1
-----	(a)	1	(a)	(a)	(a)	40	-----	.5
-----	(a)	(a)	(a)	(a)	(a)	50	-----	1.4
-----	(a)	(a)	(a)	(a)	(a)	70	-----	2.6
-----	(a)	1	(a)	(a)	6	40	-----	.5
-----	(a)	2	(a)	(a)	5	40	-----	.6

KENTUCKY—Continued

-----	(a)	(a)	(a)	(a)	20	10	-----	0.4
-----	(a)	5	(a)	8	5	55	(a)	(a)
-----	(a)	(a)	(a)	6	(a)	65	0.1	1.1
-----	(a)	3	2	10	10	140	(a)	.3
-----	70	20	(a)	(a)	2	190	.1	-----
-----	(a)	(a)	(a)	20	5	120	(a)	(a)
-----	(a)	10	(a)	16	10	5	.6	.8
-----	10	(a)	(a)	2	4	(a)	(a)	(a)

LOUISIANA—Continued

-----	10	7	(a)	10	5	(a)	(a)	(a)
-----	10	16	(a)	4	2	(a)	(a)	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
LOUISIANA—Continued				
07348500	3—MIC	Red River at Shreveport.....	Oct. 19	35,400
07349500	4—MIC	Bodcau Bayou near Sarepta.....	Oct. 20	409
07355600	5—MIC	Red River at Moncla.....	Oct. 19	28,400
07366500	6—PWS	Bayou Desiard at Monroe.....	Oct. 21	-0
07371600	7—MIC	Dugdemona River near Dodson.....	Oct. 20	38
07367000	8—MIC	Ouachita River at Monroe.....	Oct. 21	3,400
07373000	9—BM	Big Creek at Pollock.....	Oct. 22	16
07374500	10—MIC	Mississippi River near New Orleans.....	Oct. 20	328,000
.....	11—MIC	Mississippi River at Belle Chasse.....	Oct. 20	328,000
.....	12—PWS	Atchafalaya River at Morgan City.....	Oct. 27	183,000
08017090	13—MIC	Calcasieu River near Sulphur.....	Oct. 20	1,800
MAINE				
.....	1—MIC	Aroostook River near Ft. Fairfield.....	Oct. 12	3,000
01021000	2—MIC	St. Croix River at Baring.....	Oct. 20	1,070
.....	3—MIC	Penobscot River at Orono.....	Oct. 14	6,100
01048500	4—MIC	Kennebec River at Waterville.....	Oct. 14	4,000
01054200	5—BM	Wild River at Gilead.....	Oct. 12	28
01059000	6—MIC	Androscoggin River near Auburn.....	Oct. 15	3,240
.....	7—PWS	Sebago Lake near North Windham.....	Oct. 12	.....
MARYLAND				
.....	1—PWS	Susquehanna River at Conowingo Reservoir.....	Oct. 22	.....
.....	2—PWS	Gunpowder Falls at Loch Raven Reservoir at Parkville.....	Oct. 12	.....
.....	3—MIC	Back River at Essex near Porter Bar.....	Oct. 12	Tidal
.....	4—MIC	Middle Branch Patapsco River at Route 2 at Baltimore.....	Oct. 9	.....
.....	5—PWS	North Branch Patapsco River at Liberty Reservoir near Marriotsville.	Oct. 12	.....
.....	6—PWS	Patuxent River at T. Howard Duckett Reservoir near Laurel.....	Oct. 16	.....
.....	7—MIC	North Branch Potomac River at Westernport.....	Oct. 5	126
.....	8—MIC	North Branch Potomac River at Cumberland Fairgrounds.....	Oct. 8	110
.....	9—PWS	Evitts Creek at Cumberland municipal supply intake at Lake Gordon.	Oct. 5	.....
.....	10—PWS	Potomac River above Conococheague Creek near Williamsport..	Oct. 19	730
.....	11—MIC	Antietam Creek at Alternate Rte. 40 at Funkstown.....	Oct. 5	91
.....	12—MIC	Monocacy River above Linganore Creek near Frederick.....	Oct. 19	123
.....	13—PWS	Potomac River at Great Falls.....	Oct. 16	2,600
MASSACHUSETTS				
01095450	1—PWS	Wachusett Reservoir near Clinton.....	Oct. 8	.....
01096550	2—PWS	Merrimack River above Lowell.....	Oct. 14	.....

<sup>a</sup>Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium

surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

LOUISIANA—Continued

-----	10	8	(a)	(a)	4	25	(a)	(a)
-----	20	10	(a)	10	(a)	200	(a)	(a)
-----	(a)	14	(a)	5	(a)	(a)	(a)	(a)
-----	10	8	(a)	(a)	4	(a)	(a)	(a)
-----	10	10	(a)	5	2	40	(a)	(a)
-----	(a)	8	2	(a)	7	(a)	(a)	(a)
-----	10	10	(a)	(a)	(a)	55	(a)	(a)
-----	(a)	6	(a)	(a)	(a)	(a)	(a)	0.7
-----	10	6	(a)	(a)	(a)	(a)	(a)	(a)
-----	20	8	2	22	5	5	(a)	(a)
-----	(a)	30	3	(a)	(a)	10	0.8	1.0

MAINE—Continued

30	(a)	2	(a)	1	5	20	(a)	(a)
85	20	22	(a)	4	890	230	(a)	(a)
80	(a)	1	(a)	2	5	(a)	(a)	(a)
50	(a)	1	(a)	1	11	80	(a)	(a)
75	(a)	2	(a)	1	25	10	(a)	0.6
75	10	5	1	2	8	(a)	(a)	(a)
-----	(a)	3	(a)	2	5	(a)	(a)	(a)

MARYLAND—Continued

-----	10	(a)	(a)	(a)	(a)	10	-----	(a)
-----	10	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	5	-----	(a)
-----	30	(a)	(a)	(a)	(a)	40	-----	(a)
-----	10	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
80	10	(a)	(a)	4	(a)	130	-----	(a)
90	(a)	(a)	10	23	(a)	170	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	60	-----	(a)
70	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
70	(a)	(a)	(a)	(a)	6	10	-----	(a)
85	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
75	(a)	(a)	(a)	(a)	(a)	10	-----	(a)

MASSACHUSETTS—Continued

-----	(a)	(a)	(a)	(a)	4	10	(a)	0.5
-----	(a)	(a)	(a)	3	9	20	(a)	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
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## MASSACHUSETTS—Continued

01097490	3—PWS	Sudbury Reservoir near Framingham.....	Oct. 8	.....
01100000	4—MIC	Merrimack River below Concord River at Lowell .....	Oct. 16	.....
01100750	5—MIC	Merrimack River at West Newbury.....	Oct. 14	.....
01102200	6—PWS	Breeds Pond Reservoir at Lynn.....	Oct. 9	.....
01103020	7—PWS	Fresh Pond Reservoir at Cambridge.....	Oct. 7	.....
01107240	8—PWS	Little Quittacas Pond near Rochester.....	Oct. 12	.....
01109110	9—PWS	North Watuppa Pond near Fall River .....	Oct. 12	.....
01109550	10—PWS	Holden Reservoir near Holden.....	Oct. 9	.....
01110500	11—MIC	Blackstone River at Northbridge .....	Oct. 9	392
01175000	12—PWS	Quabbin Reservoir near West Ware.....	Oct. 8	.....
01182500	13—PWS	Cobble Mountain Reservoir near Westfield.....	Oct. 9	.....
01197500	14—MIC	Housatonic River at Great Barrington .....	Oct. 9	.....

## MICHIGAN

04001000	1—BM	Washington Creek at Windigo.....	Oct. 15	5.68
04045580	2—PWS	St. Marys River at Sault Ste. Marie.....	Oct. 21	.....
04045590	3—MIC	St. Marys River near Sault Ste. Marie.....	Oct. 21	.....
04062360	4—MIC	Michigamme River near Witbeck.....	Oct. 20	b <sub>1</sub> 70
04106600	5—MIC	Kalamazoo River at Parchment .....	Oct. 22	.....
04108890	6—PWS	Lake Michigan near Agnew .....	Oct. 22	.....
04112560	7—MIC	Red Cedar River at Lansing.....	Oct. 23	115
04119200	8—MIC	Grand River at Grandville.....	Oct. 22	.....
04148495	9—MIC	Flint River at Third Ave. bridge at Flint.....	Oct. 15	.....
04156200	10—MIC	Tittabawassee River at Mapleton .....	Oct. 23	690
04157050	11—MIC	Saginaw River at mouth near Alpin Beach .....	Oct. 15	.....
04159130	12—PWS	St. Clair River at Port Huron.....	Oct. 19	.....
04165700	13—PWS	Detroit River at Detroit .....	Oct. 16	.....
04168555	14—MIC	River Rouge cutoff canal at Zug Island.....	Oct. 14	.....
04168649	15—MIC	Detroit River, Trenton Channel at Swan Island .....	Oct. 14	.....
04168670	16—MIC	Detroit River Livingstone Channel below Amherstburg, Ontario.	Oct. 14	.....
04174890	17—MIC	Ford Lake, Huron River, at Ypsilanti .....	Oct. 14	420
04175515	18—PWS	Lake Erie near Pointe Aux Peaux .....	Oct. 14	.....
04176550	19—MIC	River Raisin at mouth near Monroe.....	Oct. 14	.....

## MINNESOTA

04015380	1—PWS	Lake Superior at Duluth.....	Oct. 20	.....
04024000	2—MIC	St. Louis River at Scanlon .....	Oct. 19	1,220
04024040	3—MIC	St. Louis River below Morgan Park at Duluth .....	Oct. 19	1,220
05124480	4—BM	Kawishiwi River near Ely .....	Oct. 21	124
05129400	5—MIC	Rainy Lake at International Falls .....	Oct. 6	.....

<sup>a</sup> Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium

<sup>b</sup> Estimated.



surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

MASSACHUSETTS—Continued

-----	(a)	1	(a)	1	4	20	(a)	0.6
-----	(a)	6	(a)	4	12	40	-----	(a)
-----	(a)	1	(a)	4	5	70	(a)	(a)
-----	(a)	(a)	1	(a)	3	20	(a)	(a)
-----	(a)	(a)	1	1	4	20	(a)	.6
-----	(a)	3	(a)	2	6	(a)	(a)	(a)
-----	(a)	2	(a)	2	7	(a)	(a)	(a)
-----	(a)	1	(a)	(a)	9	20	(a)	.5
-----	10	1	1	17	17	220	(a)	(a)
-----	(a)	1	(a)	1	2	(a)	(a)	.6
-----	(a)	1	(a)	1	7	(a)	(a)	.6
-----	(a)	(a)	(a)	1	4	30	(a)	(a)

MICHIGAN—Continued

Base	10	1	(a)	(a)	2	120	(a)	(a)
Average	20	(a)	(a)	(a)	6	100	(a)	(a)
Average	10	1	(a)	1	5	110	(a)	(a)
High base	10	(a)	(a)	(a)	5	120	(a)	(a)
Above average	20	1	(a)	(a)	5	200	0.1	(a)
-----	10	(a)	(a)	(a)	7	70	.2	0.7
High base	10	1	(a)	(a)	4	130	.1	(a)
Low base	(a)	(a)	(a)	(a)	2	100	.1	.7
Low base	10	1	(a)	(a)	3	60	.4	(a)
Low base	10	(a)	(a)	(a)	2	70	.1	.8
Average	(a)	(a)	(a)	(a)	2	110	.2	(a)
-----	(a)	(a)	(a)	(a)	5	160	(a)	(a)
-----	(a)	(a)	(a)	(a)	4	10	(a)	(a)
Above average	(a)	(a)	(a)	(a)	4	90	(a)	(a)
-----	10	(a)	(a)	(a)	4	30	.2	.6
-----	10	1	(a)	(a)	2	120	.2	(a)
-----	(a)	(a)	(a)	(a)	3	100	.1	(a)
-----	(a)	1	(a)	(a)	3	110	.1	(a)
Average	30	1	(a)	(a)	4	160	(a)	(a)

MINNESOTA—Continued

-----	(a)	1	(a)	(a)	(a)	80	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	20	-----	0.6
-----	(a)	(a)	(a)	(a)	17	40	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	310	-----	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
MINNESOTA—Continued				
05129500	6—MIC	Rainy River at International Falls.....	Oct. 6	8,200
05270600	7—MIC	Mississippi River at Sauk Rapids.....	Oct. 13	2,200
05270700	8—MIC	Mississippi River at St. Cloud .....	Oct. 13	2,200
05288500	9—PWS	Mississippi River near Anoka .....	Oct. 13	3,460
05330910	10—MIC	Minnesota River at Bloomington .....	Oct. 28	2,520
05331580	11—MIC	Mississippi River below Lock and Dam 2 at Hastings.....	Oct. 6	3,100
05373000	12—MIC	S.F. Zumbro River near Rochester .....	Oct. 15	188
05376000	13—BM	N.F. Whitewater River near Elba .....	Oct. 15	30.2
MISSISSIPPI				
02435500	1—MIC	Oldtown Creek at Verona .....	Oct. 7	.....
02441500	2—MIC	Tombigbee River below Columbus .....	Oct. 7	.....
02473360	3—MIC	Leaf River at Mahned .....	Oct. 6	.....
02474500	4—MIC	Tallahala Creek at Ellisville.....	Oct. 6	.....
02476600	5—MIC	Okatibbee Creek at Arundel.....	Oct. 6	.....
02479155	6—BM	Cypress Creek near Janice .....	Oct. 7	.....
02480207	7—MIC	Escatawpa River at Moss Point.....	Oct. 7	.....
02485740	8—PWS	Pearl River at Jackson, Highway 25.....	Oct. 7	.....
02486500	9—MIC	Pearl River at Byram.....	Oct. 7	.....
07287010	10—MIC	Yazoo River at Ft. Loring.....	Oct. 6	.....
MISSOURI				
05495150	1—MIC	Mississippi River at Canton.....	Oct. 12	77,700
06818000	2—PWS	Missouri River at St. Joseph.....	Oct. 14	53,500
.....	3—MIC	Missouri River at Winthrop.....	Oct. 14	54,000
.....	4—PWS	Missouri River at Kansas City.....	Oct.	54,000
.....	5—MIC	Missouri River at Lexington.....	Oct. 5	60,000
.....	6—PWS	Mississippi River at St. Louis at Chain of Rocks plant intake.....	Oct. 13	298,000
06935840	7—PWS	Missouri River near St. Louis at Howard Bend plant intake .....	Oct. 13	155,000
07019045	8—PWS	Meramec River at Paulina Hills.....	Oct. 14	43,000
07020850	9—PWS	Mississippi River at Cape Girardeau.....	Oct. 15	319,000
.....	10—MIC	Mississippi River at Cottonwood Point.....	Oct. 14	.....
.....	11—PWS	McDaniel Lake at Springfield .....	<sup>c</sup> Oct. 19	.....
07052250	12—MIC	James River near Boaz .....	Oct. 19	540
07186600	13—MIC	Turkey Creek near Joplin .....	Oct. 14	38
MONTANA				
05014500	1—BM	Swiftcurrent Creek at Many Glacier.....	Oct. 2	60
06062010	2—MIC	Prickly Pear Creek below East Helena.....	Oct. 9	.....
06090130	3—MIC	Missouri River below Rainbow Dam near Great Falls .....	Oct. 13	6,000
06214501	4—PWS	Yellowstone River at Billings.....	Oct. 8	5,100
06217500	5—MIC	Yellowstone River at Huntley.....	Oct. 8	5,100

<sup>a</sup>Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium<sup>c</sup>Sample obtained for mercury Jan. 29, 1971.

surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

MINNESOTA—Continued

70	10	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	1	(a)	(a)	(a)	20	-----	(a)
-----	(a)	1	(a)	(a)	(a)	20	-----	(a)
-----	(a)	2	(a)	(a)	2	20	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	1	(a)	(a)	(a)	20	-----	(a)
-----	(a)	1	(a)	(a)	5	20	-----	(a)

MISSISSIPPI—Continued

-----	10	10	2	8	(a)	10	(a)	(a)
-----	40	6	1	4	10	(a)	(a)	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
-----	10	(a)	4	40	1	(a)	0.4	(a)
-----	10	10	2	12	(a)	10	(a)	(a)
-----	10	2	4	(a)	10	12	.1	(a)
-----	(a)	55	3	8	8	40	(a)	2.1
-----	(a)	(a)	(a)	4	(a)	(a)	(a)	(a)
-----	20	5	(a)	40	2	(a)	(a)	3.8
-----	(a)	5	(a)	(a)	3	(a)	(a)	(a)

MISSOURI—Continued

1.2-yr. high	10	(a)	(a)	1	(a)	(a)	(a)	(a)
1.01-yr. high	20	14	(a)	18	5	(a)	(a)	(a)
1.01-yr. high	30	8	(a)	8	(a)	5	2.7	3.0
1.01-yr. high	10	5	(a)	(a)	(a)	(a)	(a)	1.8
1.02-yr. high	20	25	(a)	(a)	(a)	40	1.2	1.0
1.2-yr. high	30	(a)	(a)	24	19	(a)	(a)	(a)
1.2-yr. high	10	8	(a)	15	25	(a)	(a)	(a)
25	30	6	(a)	20	12	(a)	(a)	(a)
1.2-yr. high	(a)	20	5	8	(a)	30	(a)	(a)
1.2-yr. high	40	15	(a)	(a)	(a)	20	(a)	(a)
-----	(a)	(a)	(a)	14	15	(a)	(a)	(a)
1.0-yr. high	(a)	10	(a)	14	20	20	4.3	4.8
Mean flow	20	6	(a)	30	30	1,200	(a)	(a)

MONTANA—Continued

-----	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
-----	5	2	(a)	(a)	23	130	-----	(a)
-----	10	(a)	(a)	(a)	(a)	20	-----	(a)
-----	10	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	10	(a)	(a)	(a)	(a)	30	-----	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
MONTANA—Continued				
06288200	6—BM	Beauvais Creek near St. Xavier .....	Oct. 7	7.89
12323750	7—MIC	Silver Bow Creek below Warm Springs Creek, Warm Springs ...	Oct. 7	150
12330100	8—MIC	Flint Creek below Boulder Creek near Maxville .....	Oct. 7	150
NEBRASKA				
06610000	1—PWS	Missouri River at Omaha .....	Oct. 9	47,400
06610670	2—MIC	Missouri River at Bellevue .....	Oct. 9	47,400
06682000	3—MIC	North Platte River near Minatare .....	Oct. 15	1,330
0676570I	4—MIC	Supply Canal near Maxwell .....	Oct. 1	1,850
06772500	5—MIC	Wood River near Chapman .....	Oct. 5	13
06775900	6—BM	Dismal River near Thedford .....	Oct. 1	190
06785000	7—MIC	Middle Loup River at St. Paul .....	Oct. 5	886
06799300	8—MIC	Elkhorn River at Stanton .....	Nov. 5	351
06803500	9—MIC	Salt Creek at Lincoln .....	Oct. 12	203
06882000	10—MIC	Big Blue River at Barneston .....	Nov. 5	58
NEVADA				
09419800	1—MIC	Las Vegas Wash near Boulder City .....	Nov. 19	51
.....	2—MIC	Las Vegas Wash below confluence of Sewage plant .....	Nov. 19	<sup>b</sup> 35
10244950	3—BM	Steptoe Creek near Ely, White Pine County .....	Oct. 23	4.04
.....	4—MIC	Waste discharge at culvert, U.S. Highway 93 White Pine .....	Oct. 23	<sup>b</sup> 25
10249300	5—BM	South Twin River near Round Mtn., Nye County .....	Oct. 29	1.69
.....	6—MIC	Carson River near New Empire, below sewage treatment plant..	Nov. 5	.....
.....	7—PWS	Truckee River at Reno .....	Nov. 4	.....
10350000	8—MIC	Truckee River at Vista .....	Nov. 4	580
NEW HAMPSHIRE				
01092000	1—MIC	Merrimack River near Goffs Falls .....	Oct. 13	.....
01093500	2—PWS	Massabesic Lake near Manchester .....	Oct. 13	.....
01131500	3—MIC	Connecticut River near Dalton .....	Oct. 12	1,580
01154500	4—MIC	Connecticut River at North Walpole .....	Oct. 13	.....
NEW JERSEY				
01378570	1—PWS	Hackensack River at Hackensack .....	Oct. 27	.....
01381200	2—MIC	Rockaway River at Pine Brook .....	Oct. 15	.....
01381800	3—MIC	Whippany River at Pine Brook .....	Oct. 15	.....
01389500	4—PWS	Passaic River at Little Falls .....	Oct. 19	.....
01392600	5—MIC	Passaic River at Harrison .....	Oct. 27	.....
01400480	6—MIC	Raritan River at Technicon Site 1 at Manville .....	Oct. 12	.....
01400510	7—MIC	Raritan River at Manville .....	Oct. 12	.....

<sup>a</sup>Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium<sup>b</sup>Estimated.

surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

MONTANA—Continued

-----	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	2	(a)	(a)	(a)	440	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	20	-----	(a)

NEBRASKA—Continued

-----	(a)	2	(a)	(a)	(a)	20	(a)	(a)
-----	(a)	4	(a)	(a)	(a)	20	(a)	(a)
21	(a)	1	(a)	(a)	(a)	40	-----	0.8
-----	(a)	2	(a)	(a)	(a)	10	(a)	.6
-----	(a)	(a)	(a)	(a)	(a)	10	(a)	(a)
50	(a)	(a)	(a)	(a)	(a)	(a)	(a)	(a)
54	(a)	1	(a)	(a)	(a)	10	-----	(a)
58	(a)	(a)	(a)	(a)	(a)	50	(a)	(a)
12	10	(a)	(a)	(a)	(a)	10	-----	(a)
96	(a)	40	(a)	(a)	(a)	80	(a)	1.0

NEVADA—Continued

-----	(a)	(a)	6	(a)	2	10	-----	(a)
-----	10	2	(a)	(a)	5	180	-----	0.5
-----	(a)	(a)	(a)	(a)	(a)	15	-----	.9
-----	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	10	-----	.8
-----	10	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	.8
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	1.3

NEW HAMPSHIRE—Continued

-----	(a)	1	(a)	3	7	30	(a)	(a)
-----	(a)	2	(a)	2	7	60	(a)	(a)
-----	(a)	(a)	(a)	(a)	4	50	(a)	(a)
-----	10	2	(a)	5	4	30	(a)	0.7

NEW JERSEY—Continued

-----	(a)	(a)	(a)	(a)	7	40	-----	(a)
-----	(a)	1	(a)	(a)	7	20	-----	(a)
-----	10	(a)	(a)	(a)	1	30	-----	(a)
-----	(a)	(a)	(a)	(a)	4	20	-----	(a)
-----	(a)	(a)	(a)	(a)	4	30	-----	(a)
-----	(a)	(a)	(a)	(a)	2	10	-----	(a)
-----	(a)	(a)	(a)	(a)	3	5	-----	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
NEW JERSEY—Continued				
01402900	8—PWS	Millstone River at Manville .....	Oct. 12	.....
01402920	9—MIC	Raritan River at Technicon, Site 2 at South Bound Brook .....	Oct. 12	.....
01403065	10—MIC	Raritan River at Calco Dam at South Bound Brook, Technicon Site 3.	Oct. 12	.....
01404100	11—MIC	Raritan River at South Bound Brook .....	Oct. 12	.....
01408000	12—MIC	Manasquan River at Squankum .....	Oct. 13	.....
01411900	13—MIC	Maurice River Rte. 49, Millville .....	Oct. 12	.....
01456000	14—PWS	Musconetcong River at Hacketstown .....	Oct. 15	.....
01463500	15—PWS	Delaware River at Trenton .....	Oct. 13	3,670
01464000	16—MIC	Assunpink Creek at Trenton .....	Oct. 29	.....
01466500	17—BM	McDonalds Branch in Lebanon State Forest .....	Oct. 12	.....
01467190	18—MIC	Cooper River, Rte. 130, Camden .....	Oct. 12	.....
NEW MEXICO				
07221740	1—MIC	Canadian River at N. Mex.—Tex. Stateline .....	Oct. 7	19.7
08266800	2—MIC	Red River at Fish Hatchery near Questa .....	Oct. 8	50.5
08315000	3—PWS	Santa Fe River above McClure River near Santa Fe .....	Oct. 14	1.84
08317400	4—MIC	Rio Grande below Cochiti Dam .....	Oct. 13	810
08330800	5—MIC	Rio Grande below Rio Bravo Bridge at Albuquerque .....	Oct. 6	.....
08358300	6—MIC	Rio Grande conveyance channel at San Marcial .....	Oct. 12	2.89
08377900	7—BM	Rio Mora near Terrero .....	Oct. 5	.....
08396500	8—MIC	Pecos River near Artesia .....	Oct. 5	.....
08405200	9—MIC	Pecos River below sewage effluent at Carlsbad .....	Oct. 5	.....
09364000	10—PWS	Animas River at Aztec .....	Oct. 13	.....
09365000	11—MIC	San Juan River at Farmington, 60 ft. from bank .....	Oct. 13	.....
09365000	12—MIC	San Juan River at Farmington, 20 ft. from bank .....	Oct. 13	.....
09368000	13—MIC	San Juan River at Shiprock .....	Oct. 14	.....
09430600	14—BM	Mogollon Creek near Cliff .....	Oct. 14	1.89
09431500	15—MIC	Gila River at Redrock .....	Oct. 12	40.3
NEW YORK				
01327750	1—MIC	Hudson River at Fort Edward .....	Oct. 22	.....
01335200	2—PWS	Tomhannock Reservoir near Troy .....	Oct. 23	.....
01335770	3—MIC	Hudson River at Waterford .....	Oct. 30	.....
01343900	4—PWS	Hinckley Reservoir near Utica .....	Oct. 14	.....
01347000	5—MIC	Mohawk River near Little Falls .....	Oct. 15	1,700
01350000	6—PWS	Schoharie Creek at Prattsville .....	Oct. 23	4,770
01354160	7—MIC	Mohawk River at Lock 10, Crainsville .....	Oct. 15	.....
01356400	8—PWS	Mohawk River near Latham .....	Oct. 23	.....
01357000	9—MIC	Mohawk River at Crescent Dam .....	Oct. 24	.....
01359560	10—MIC	Hudson River at Glenmont .....	Oct. 9	.....
01359920	11—PWS	Alcove Reservoir near Albany .....	Oct. 9	.....

<sup>a</sup> Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium

surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

NEW JERSEY—Continued

-----	(a)	(a)	(a)	1	5	20	-----	(a)
-----	(a)	(a)	(a)	(a)	4	10	-----	(a)
-----	(a)	(a)	(a)	2	5	30	-----	(a)
-----	(a)	(a)	(a)	2	4	20	-----	(a)
-----	10	1	(a)	1	4	10	-----	(a)
-----	30	1	(a)	1	3	30	-----	(a)
-----	(a)	(a)	(a)	(a)	4	10	-----	(a)
-----	(a)	(a)	(a)	1	5	20	-----	(a)
-----	(a)	(a)	(a)	(a)	9	50	-----	(a)
-----	(a)	1	(a)	1	8	10	-----	(a)
-----	10	1	(a)	1	4	15	-----	(a)

NEW MEXICO—Continued

-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	1	(a)	(a)	(a)	10	-----	(a)
-----	(a)	1	(a)	1	(a)	(a)	-----	(a)
-----	(a)	2	(a)	1	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	1	(a)	30	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	1	(a)	(a)	(a)	20	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	1	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	1	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	1	(a)	(a)	-----	(a)

NEW YORK—Continued

-----	(a)	1	2	1	5	40	(a)	(a)
-----	(a)	1	1	1	5	(a)	(a)	(a)
-----	(a)	(a)	(a)	(a)	(a)	50	(a)	(a)
-----	(a)	1	2	1	7	20	(a)	(a)
54	(a)	1	1	3	2	10	(a)	(a)
.6	(a)	(a)	1	(a)	4	10	(a)	0.6
-----	10	1	2	2	1	(a)	(a)	(a)
-----	10	1	(a)	1	2	30	(a)	.5
-----	(a)	(a)	(a)	1	4	40	(a)	(a)
-----	(a)	(a)	6	(a)	5	20	(a)	(a)
-----	(a)	(a)	5	(a)	(a)	40	(a)	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
NEW YORK—Continued				
01362198	12—BM	Esopus Creek at Shandaken .....	Oct. 14	24
01362500	13—PWS	Esopus Creek at Coldbrook .....	Oct. 14	20
01372058	14—MIC	Hudson River below Poughkeepsie .....	Oct. 14	97.5
01375000	15—PWS	Croton River at New Croton Dam near Croton-on-Hudson .....	Oct. 6	.6
01413500	16—PWS	East Branch Delaware River at Margaretville .....	Oct. 28	400
01425000	17—PWS	West Branch Delaware River at Stilesville .....	Oct. 28	41
01435000	18—PWS	Neversink River near Claryville .....	Oct. 21	65
01503495	19—PWS	Susquehanna River at Tompkins St., Binghamton .....	Oct. 22	<sup>b</sup> 885
01513500	20—MIC	Susquehanna River at Vestal .....	Oct. 22	2,420
04214245	21—PWS	Lake Erie at Woodlawn .....	Oct. 15	.....
04215800	22—MIC	Buffalo River at Michigan Ave., Buffalo .....	Oct. 14	.....
04216050	23—PWS	Lake Erie at Buffalo .....	Oct. 15	.....
04219350	24—PWS	Niagara River at Niagara Falls .....	Oct. 13	.....
04219640	25—MIC	Niagara River at Youngstown .....	Oct. 13	.....
04220284	26—PWS	Lake Ontario at Rochester .....	Oct. 16	.....
04232006	27—MIC	Genesee River at Charlotte Docks, Rochester .....	Oct. 16	<sup>b</sup> 3,070
04236000	28—PWS	Skaneateles Lake at Skaneateles .....	Oct. 13	.....
04240010	29—MIC	Onondaga Creek at Spencer St., Syracuse .....	Oct. 13	209
04240170	30—PWS	Otisco Lake at Marietta .....	Oct. 13	.....
04242500	31—PWS	East Branch Fish Creek at Taberg .....	Oct. 12	408
04249000	32—MIC	Oswego River at Lock 7, Oswego .....	Oct. 12	4,660
04260500	33—MIC	Black River at Watertown .....	Oct. 8	4,650
04265452	34—MIC	Grass River below Massena Center .....	Oct. 14	.....
NORTH CAROLINA				
.....	1—MIC	Roanoke River at Weldon .....	Oct. 21	1,910
.....	2—PWS	Lake Michie on Flat River near Durham .....	Oct. 29	.....
.....	3—PWS	Lake Benson on Swift Creek near Raleigh .....	Oct. 29	.....
.....	4—MIC	Neuse River below Walnut Creek, Wake County .....	Oct. 29	.....
.....	5—PWS	Lake Brandt on Reedy Fork near Greensboro .....	Oct. 28	.....
.....	6—MIC	Buffalo Creek near McLeansville .....	.....	54.6
02096500	7—MIC	Haw River at Haw River .....	Oct. 29	93
.....	8—PWS	High Point Reservoir near High Point .....	Oct. 28	.....
.....	9—MIC	Deep River near High Point .....	Oct. 28	17.5
.....	10—PWS	Little Cross Creek near Fayetteville .....	Oct. 30	.....
.....	11—PWS	Cape Fear River at Lock 1 near Kelly .....	Oct. 20	.....
.....	12—MIC	Cape Fear River near Wilmington .....	Oct. 20	.....
.....	13—PWS	Salem Lake on Salem Creek near Winston Salem .....	Oct. 28	.....
02115860	14—MIC	Muddy Creek near Muddy Creek .....	Oct. 28	102
03144368	15—MIC	Irish Buffalo Creek near Concord .....	Oct. 8	32.6
.....	16—PWS	Catawba River near Charlotte .....	Oct. 8	.....
.....	17—PWS	Long Creek at Gastonia .....	Oct. 8	.....

<sup>a</sup>Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium<sup>b</sup>Estimated.



surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

NEW YORK—Continued

66	(a)	6	(a)	4	5	(a)	(a)	(a)
99.7	(a)	5	(a)	3	3	20	(a)	(a)
-----	(a)	1	(a)	5	4	(a)	(a)	-----
-----	(a)	3	(a)	4	1	20	(a)	(a)
21	(a)	(a)	3	(a)	1	10	(a)	(a)
87	(a)	(a)	2	(a)	(a)	20	(a)	(a)
68	(a)	1	1	(a)	2	(a)	(a)	(a)
74	(a)	1	(a)	(a)	4	(a)	(a)	(a)
60	(a)	1	1	1	5	20	(a)	(a)
-----	(a)	3	(a)	4	1	20	(a)	0.5
-----	20	3	(a)	2	4	40	(a)	.7
-----	20	3	(a)	2	3	30	(a)	.5
-----	(a)	2	(a)	6	1	10	(a)	(a)
-----	(a)	2	(a)	5	3	20	(a)	.6
-----	(a)	1	(a)	6	1	(a)	(a)	(a)
b25	(a)	3	(a)	6	1	20	(a)	(a)
-----	(a)	1	1	1	(a)	30	(a)	(a)
-----	(a)	1	1	2	1	10	(a)	(a)
-----	20	1	1	1	(a)	10	(a)	(a)
37	10	1	(a)	1	(a)	(a)	(a)	(a)
50	10	1	1	1	(a)	(a)	(a)	(a)
25	(a)	(a)	4	(a)	(a)	(a)	(a)	(a)
-----	(a)	2	1	1	2	(a)	(a)	(a)

NORTH CAROLINA—Continued

-----	15	2	2	(a)	(a)	50	-----	(a)
-----	(a)	1	1	(a)	6	30	-----	(a)
-----	(a)	1	2	(a)	5	90	-----	-----
-----	(a)	1	(a)	(a)	6	80	-----	(a)
-----	(a)	1	(a)	(a)	4	230	-----	(a)
-----	(a)	1	1	1	8	180	-----	(a)
-----	(a)	1	1	(a)	5	140	-----	(a)
-----	(a)	1	1	(a)	3	50	-----	(a)
-----	(a)	1	1	(a)	(a)	210	-----	(a)
-----	(a)	1	1	(a)	2	30	-----	(a)
-----	60	1	(a)	(a)	17	300	-----	(a)
-----	(a)	2	1	(a)	4	140	-----	(a)
-----	(a)	3	1	(a)	(a)	380	-----	(a)
-----	(a)	1	(a)	(a)	14	110	-----	(a)
-----	30	(a)	19	1	32	230	-----	(a)
-----	60	(a)	(a)	(a)	3	10	-----	(a)
-----	20	(a)	(a)	(a)	13	70	-----	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
NORTH CAROLINA—Continued				
03451926	18—MIC	French Broad River at Alexander.....	Oct. 15	1,730
03448959	19—PWS	Burnett Lake on North Fork Swannanoa River near Asheville...	Oct. 9	.....
03448616	20—MIC	Hominy Creek near Enka.....	Oct. 14	75.2
03457124	21—MIC	Pigeon River at Clyde.....	Oct. 14	268
03460000	22—BM	Cataloochee Creek near Cataloochee.....	Oct. 13	23.3
NORTH DAKOTA				
05054000	1—MIC	Red River of the North at Fargo.....	Oct. 3	37
05054020	2—MIC	Red River of the North below Fargo.....	Oct. 3	37
05082500	3—MIC	Red River of the North at Grand Forks.....	Oct. 3	1,100
05092003	4—MIC	Red River of the North below Drayton.....	Oct. 5	1,100
05118015	5—MIC	Souris River below Minot.....	Oct. 7	14
06332515	6—BM	Bear Den Creek near Mandaree .....	Oct. 19	.25
06349010	7—MIC	Missouri River below Bismark.....	Oct. 9	28,000
OHIO				
03097200	1—PWS	Meander Creek Reservoir at Youngstown raw water intake near Youngstown.	Oct. 8	.....
03099510	2—MIC	Mahoning River at State line below Lowellville.....	Oct. 8	370
03117100	3—MIC	Tuscarawas River at Navarre .....	Oct. 6	195
03118500	4—PWS	Nimishillen Creek at North Industry.....	Oct. 6	105
03159510	5—MIC	Hocking River below Athens.....	Oct. 3	430
03222010	6—PWS	Scioto River at raw water intake at Columbus .....	Oct. 14	240
03229600	7—MIC	Scioto River below Shadeville.....	Oct. 15	220
03234500	8—MIC	Scioto River at Higby.....	Oct. 3	966
03237280	9—BM	Upper Twin Creek at McGaw.....	Oct. 22	1.9
03238800	10—PWS	Ohio River at raw water intake at Cincinnati.....	Oct. 2	.....
03260200	11—MIC	Ohio River below Cincinnati at Fernbank.....	Oct. 30	.....
03271350	12—MIC	Great Miami River at West Carrollton.....	Oct. 1	360
03272400	13—MIC	Great Miami River near Middletown.....	Oct. 1	400
04187500	14—MIC	Ottawa River at Allentown.....	Oct. 5	20
04189000	15—MIC	Blanchard River near Findlay.....	Oct. 6	20
04194023	16—MIC	Maumee River near mouth at Toledo.....	Oct. 6	317
04194100	17—PWS	Lake Erie at Toledo raw water intake near Toledo.....	Oct. 6	.....
04200550	18—MIC	Black River below Elyria.....	Oct. 14	758
04201600	19—PWS	Lake Erie at raw water intake at Cleveland.....	Oct. 15	.....
04202402	20—PWS	Cuyahoga River at Akron raw water intake near Kent .....	Oct. 7	250
04206300	21—MIC	Cuyahoga River below Akron.....	Oct. 15	530
04208506	22—MIC	Cuyahoga River at 3d Street bridge at Cleveland .....	Oct. 14	1,930
04212200	23—MIC	Grand River at Painesville.....	Oct. 7	740
04212700	24—MIC	Ashtabula River at Ashtabula .....	Oct. 7	360

<sup>a</sup>Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium.

surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

NORTH CAROLINA—Continued

-----	(a)	3	(a)	2	25	110	-----	(a)
-----	(a)	1	(a)	2	25	10	-----	(a)
-----	15	2	(a)	(a)	21	3,400	-----	(a)
-----	20	2	(a)	1	(a)	90	-----	(a)
-----	15	2	(a)	(a)	20	10	-----	(a)

NORTH DAKOTA—Continued

-----	(a)	1	(a)	(a)	(a)	20	-----	0.8
-----	10	26	(a)	(a)	(a)	190	-----	2.2
-----	(a)	1	(a)	(a)	(a)	25	(a)	(a)
-----	(a)	(a)	(a)	(a)	(a)	150	-----	(a)
-----	10	(a)	(a)	(a)	(a)	25	-----	(a)
-----	(a)	1	(a)	(a)	(a)	30	-----	(a)
-----	(a)	1	(a)	(a)	(a)	20	-----	(a)

OHIO—Continued

-----	10	1	2	(a)	1	10	1.0	1.5
68	(a)	2	4	1	1	120	1.0	1.2
32	(a)	8	6	(a)	1	100	.6	1.7
45	10	(a)	3	(a)	(a)	180	1.4	1.5
46	(a)	1	8	(a)	(a)	170	(a)	(a)
-----	(a)	(a)	7	(a)	(a)	140	(a)	.9
80	10	(a)	5	2	1	20	.6	.6
57	10	(a)	10	(a)	(a)	100	(a)	(a)
45	(a)	1	4	(a)	(a)	220	(a)	(a)
-----	(a)	2	6	(a)	(a)	10	(a)	1.3
-----	(a)	1	4	(a)	1	260	(a)	(a)
91	10	2	1	1	(a)	20	(a)	.5
92	(a)	2	5	(a)	1	20	(a)	.8
71	(a)	(a)	1	4	1	220	(a)	.7
68	(a)	(a)	1	(a)	1	40	(a)	.7
84	(a)	1	1	(a)	1	20	.5	.8
-----	(a)	(a)	2	(a)	(a)	10	(a)	(a)
10	10	2	3	(a)	(a)	110	1.7	1.7
-----	(a)	(a)	2	1	(a)	130	(a)	(a)
-----	(a)	1	2	(a)	1	(a)	(a)	(a)
25	(a)	(a)	3	(a)	(a)	(a)	(a)	(a)
10	10	(a)	2	(a)	1	(a)	(a)	(a)
24	(a)	(a)	3	(a)	1	20	.9	1.7
10	(a)	(a)	2	(a)	(a)	120	-----	.6

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
OKLAHOMA				
.....	1—PWS	Lake Hefner at Oklahoma City .....	Oct. 6	.....
.....	2—PWS	Stanley Draper Lake at Oklahoma City .....	Oct. 6	.....
.....	3—PWS	Spavinaw Lake Aqueduct at Tulsa .....	Oct. 14	.....
07174700	4—MIC	Caney River near Ochelata .....	Oct. 20	33
.....	5—MIC	Arkansas River near Coweta .....	Oct. 14	Average
.....	6—MIC	Bird Creek near Catoosa .....	Oct. 20	<sup>b</sup> 40
.....	7—MIC	Pryor Creek near Pryor .....	Oct. 13	<sup>b</sup> 2
07241550	8—MIC	North Canadian River near Harrah .....	Oct. 15	135
.....	9—MIC	Deep Fork River near Arcadia .....	Oct. 15	32
.....	10—MIC	East Cache Creek near Walters .....	Oct. 12	14
07328100	11—MIC	Washita River at Alex .....	Oct. 12	64
07335700	12—BM	Kiamichi River near Big Cedar .....	Oct. 6	22
OREGON				
11492200	1—BM	Crater Lake near Crater Lake .....	Oct. 1	.....
11509500	2—MIC	Klamath River at Keno .....	Oct. 23	.....
.....	3—MIC	Powder River near Baker .....	Oct. 11	.....
13331500	4—BM	Minam River near Minam .....	Oct. 1	90
.....	5—MIC	Columbia River below The Dalles .....	Oct. 27	.....
14139000	6—PWS	Bull Run Reservoir No. 1 near Bull Run .....	Oct. 8	.....
.....	7—PWS	McKenzie River near Leaburg .....	Oct. 20	.....
14165500	8—MIC	McKenzie River near Coburg .....	Oct. 20	2,480
14166000	9—MIC	Willamette River at Harrisburg .....	Oct. 20	.....
14183000	10—PWS	North Santiam River at Mehama .....	Oct. 21	2,150
.....	11—MIC	Willamette River near Oregon City .....	Oct. 21	.....
14312260	12—MIC	South Umpqua River near Roseburg .....	Oct. 20	.....
14361500	13—MIC	Rogue River below Grants Pass .....	Oct. 23	.....
PENNSYLVANIA				
01449700	1—PWS	Wild Creek Reservoir near Hatchery .....	Oct. 13	.....
.....	2—PWS	Little Lehigh River at Allentown Filter Plant .....	Oct. 13	48
01454720	3—MIC	Lehigh River at Easton .....	Oct. 14	.....
01464600	4—MIC	Delaware River at Bristol .....	Oct. 8	Tidal
01467030	5—PWS	Delaware River at Torresdale Filter Plant intake .....	Oct. 8	Tidal
01467200	6—MIC	Delaware River at Ben Franklin Bridge, Philadelphia .....	Oct. 8	Tidal
01470960	7—MIC	Tulpehocken Creek at Blue Marsh damsite near Reading .....	Oct. 13	76
.....	8—PWS	Wolf Creek Reservoir near Pottsville .....	Oct. 14	3.3
.....	9—PWS	Maiden Creek below Lake Ontelaunee, Reading .....	Oct. 13	19.3
.....	10—MIC	Schuylkill River below Reading .....	Oct. 13	443
01474500	11—PWS	Schuylkill River at Philadelphia, Belmont Filter Plant .....	Oct. 8	260
.....	12—PWS	Lake Scranton at dam at Scranton .....	Oct. 12	.....
.....	13—PWS	Spring Brook Reservoir near Wilkes-Barre .....	Oct. 12	.....

<sup>a</sup> Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium<sup>b</sup> Estimated.

surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

OKLAHOMA—Continued

-----	(a)	(a)	(a)	(a)	(a)	20	-----	0.8
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	1.7
-----	(a)	1	(a)	(a)	(a)	30	-----	(a)
65	(a)	12	(a)	(a)	(a)	140	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
b45	(a)	4	(a)	(a)	(a)	30	-----	(a)
b60	(a)	(a)	(a)	1	(a)	(a)	-----	(a)
b50	(a)	1	2	1	(a)	20	-----	(a)
b50	10	1	(a)	1	(a)	20	-----	.5
90	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
82	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
40	(a)	8	(a)	(a)	84	790	-----	(a)

OREGON—Continued

-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	1	(a)	(a)	(a)	(a)	-----	(a)
-----	10	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	40	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)

PENNSYLVANIA—Continued

-----	(a)	3	(a)	(a)	3	70	-----	(a)
90	(a)	(a)	(a)	(a)	8	(a)	-----	(a)
80	(a)	(a)	(a)	(a)	3	170	-----	(a)
-----	10	5	(a)	2	39	250	-----	(a)
-----	(a)	2	(a)	2	20	60	-----	(a)
-----	(a)	1	(a)	1	13	220	-----	0.8
90	60	2	(a)	(a)	3	5	-----	(a)
-----	10	11	(a)	2	17	20	-----	(a)
-----	(a)	4	(a)	(a)	3	5	-----	(a)
-----	(a)	3	17	3	5	25	-----	(a)
95	(a)	1	2	2	17	170	-----	(a)
-----	(a)	7	(a)	(a)	8	5	-----	(a)
-----	(a)	27	(a)	(a)	3	10	-----	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
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## PENNSYLVANIA—Continued

01536000	14—MIC	Lackawanna River at Old Forge .....	Oct. 12	-----
01537700	15—MIC	Susquehanna River near Hunlock Creek.....	Oct. 12	2,810
01545500	16—MIC	West Branch Susquehanna River at Renovo.....	Oct. 8	2,440
01545600	17—BM	Young Womans Creek near Renovo.....	Oct. 15	85
.....	18—PWS	Hagerman Run Reservoir at dam near Williamsport .....	Oct. 14	-----
01553500	19—PWS	West Branch Susquehanna River at Lewisburg .....	Oct. 14	11,450
.....	20—MIC	Bald Eagle Creek at Tyrone .....	Oct. 7	114
.....	21—MIC	Juniata River at Lewistown (Rt. 103 bridge).....	Oct. 9	286
01568500	22—PWS	Clark Creek near Carsonville.....	Oct. 7	6.9
01570000	23—PWS	Conodoguinet Creek near Hogestown.....	Oct. 7	119
01570500	24—MIC	Susquehanna River at Harrisburg (sta. 600) .....	Oct. 7	6,900
01570500	25—MIC	Susquehanna River at Harrisburg (sta. 2900).....	Oct. 7	6,900
01571500	26—PWS	Yellow Breeches Creek near Camp Hill .....	Oct. 7	130
01575000	27—PWS	South Branch Codorus Creek near York.....	Oct. 16	40
.....	28—PWS	Lebanon Reservoir at High Bridge.....	Oct. 14	-----
01576500	29—PWS	Conestoga Creek at Lancaster.....	Oct. 12	95
.....	30—PWS	Octoraro Creek near Oxford.....	Oct. 12	27.9
01614090	31—PWS	Conococheague Creek near Fayetteville.....	Oct. 16	1.8
.....	32—PWS	Lake Altoona near Altoona .....	Oct. 7	-----
.....	33—PWS	North Fork Bens Creek at Johnstown.....	Oct. 7	-----
.....	34—PWS	Filter Plant on Lake Erie at Erie.....	Oct. 13	-----
03048500	35—MIC	Kiskiminetas River at Leechburg.....	Oct. 8	505
03049655	36—MIC	Allegheny River at Oakmont.....	Oct. 12	23,500
03082500	37—MIC	Youghiogheny River at Connellsville.....	Oct. 9	1,000
.....	38—MIC	Youghiogheny River at McKeesport .....	Oct. 12	1,200
03085000	39—MIC	Monongahela River at Braddock.....	Oct. 8	2,340
03085250	40—MIC	Chartiers Creek at Canonsburg.....	Oct. 9	30
.....	41—PWS	Lake Oneida near Butler.....	Oct. 8	-----
.....	42—PWS	Beaver River near West Pittsburgh.....	Oct. 8	1,030
.....	43—MIC	Ohio River at Monaca.....	Oct. 9	17,900

## RHODE ISLAND

01109400	1—PWS	Tenmile River near East Providence.....	Oct. 13	-----
01114000	2—MIC	Moshassuck River at Providence.....	Oct. 13	-----
01115450	3—PWS	Scituate Reservoir near Hope.....	Oct. 13	-----
01116610	4—MIC	Pawtuxet River near Warwick.....	Oct. 13	-----

## SOUTH CAROLINA

02131000	1—MIC	Pee Dee River at Pee Dee.....	Oct. 13	-----
02135000	2—MIC	Little Pee Dee River at Galivants Ferry, U.S. 501.....	Oct. 13	875
02135300	3—BM	Scape Ore Swamp near North Bishopville, U.S. 15.....	.....	-----

<sup>a</sup>Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium

surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

PENNSYLVANIA—Continued

-----	(a)	32	3	67	3	50	-----	(a)
80	(a)	2	2	9	7	10	-----	(a)
50	(a)	6	(a)	63	55	80	-----	(a)
-----	(a)	(a)	(a)	1	6	10	-----	(a)
-----	(a)	(a)	(a)	1	7	10	-----	(a)
30	(a)	5	(a)	11	4	20	-----	(a)
20	10	1	(a)	(a)	11	(a)	-----	(a)
98	10	2	(a)	(a)	15	(a)	-----	(a)
-----	(a)	1	(a)	(a)	5	10	-----	(a)
90	(a)	2	(a)	1	5	10	-----	(a)
85	(a)	6	(a)	(a)	5	10	-----	(a)
85	(a)	5	(a)	1	3	10	-----	(a)
90	(a)	2	(a)	1	5	5	-----	(a)
70	(a)	(a)	(a)	(a)	2	5	-----	(a)
-----	(a)	(a)	(a)	2	9	50	-----	(a)
85	(a)	2	(a)	(a)	4	10	-----	(a)
-----	(a)	1	(a)	(a)	2	(a)	-----	(a)
-----	(a)	(a)	(a)	1	4	(a)	-----	(a)
-----	10	(a)	(a)	37	7	210	-----	(a)
-----	(a)	1	(a)	5	2	30	-----	(a)
-----	(a)	(a)	(a)	1	7	10	-----	(a)
85	(a)	3	3	110	29	1,400	-----	(a)
-----	(a)	1	(a)	7	11	60	-----	(a)
65	(a)	(a)	(a)	1	11	10	-----	(a)
-----	10	(a)	(a)	3	10	20	-----	(a)
85	(a)	(a)	(a)	9	3	20	-----	(a)
90	10	(a)	(a)	1	3	10	-----	(a)
-----	(a)	(a)	1	(a)	6	(a)	-----	(a)
55	(a)	(a)	(a)	1	7	60	-----	(a)
55	(a)	(a)	(a)	4	20	20	-----	(a)

RHODE ISLAND—Continued

-----	(a)	1	(a)	3	8	40	(a)	(a)
-----	(a)	3	(a)	4	8	40	(a)	(a)
-----	(a)	2	1	4	5	10	(a)	(a)
-----	20	3	1	3	6	100	(a)	(a)

SOUTH CAROLINA—Continued

-----	(a)	(a)	(a)	(a)	8	50	-----	(a)
-----	10	(a)	1	(a)	1	40	-----	(a)
-----	(a)	(a)	1	(a)	2	10	-----	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
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## SOUTH CAROLINA—Continued

-----	4—MIC	Black River at U.S. 701 Bridge.....	-----	-----
02146820	5—MIC	Sugar Creek near Ft. Mill.....	Oct. 9	60
02147200	6—MIC	Catawba River near Ft. Lawn, Highway 9.....	Oct. 13	10,000
02148310	7—MIC	Wateree River at U.S. 76 Bridge.....	Oct. 14	7,500
-----	8—PWS	South Pamelot River (Rainbow Lake).....	-----	-----
02162105	9—PWS	Broad River Diversion Canal at Columbia.....	Oct. 12	-----
-----	10—PWS	North Saluda Reservoir at Greenville.....	-----	-----
-----	11—MIC	Saluda River near Greenwood.....	Oct. 9	-----
02169750	12—MIC	Congaree River near Ft. Motte.....	Oct. 14	6,000
-----	13—PWS	Goose Creek Reservoir near Charleston.....	Oct. 14	-----
-----	14—MIC	Edisto River near Collegeville.....	Oct. 14	500
-----	15—MIC	Lake Keowee near Salem.....	Oct. 9	-----
02197300	16—BM	Upper Three Runs near New Ellenton.....	Oct. 12	96

## SOUTH DAKOTA

06409000	1—BM	Castle Creek above Deerfield Reservoir.....	Oct. 12	11
06419000	2—MIC	Rapid Creek below Rapid City Sewage Plant.....	Oct. 9	-----
06476050	3—MIC	James River below Huron.....	Oct. 13	2.0
06477950	4—PWS	Mitchell Lake at Mitchell.....	Oct. 12	-----
06478000	5—MIC	James River near Mitchell.....	Oct. 12	-----
06479510	6—MIC	Big Sioux River below Watertown.....	Oct. 14	-----
06482100	7—MIC	Big Sioux River near Brandon.....	Oct. 12	74

## TENNESSEE

3431090	1—PWS	Cumberland River below Mill Creek at Nashville.....	Oct. 9	6,500
3431740	2—MIC	Cumberland River below Richland Creek near Nashville.....	Oct. 9	6,500
3486650	3—MIC	Watauga River near Johnson City.....	Oct. 13	-----
3487650	4—MIC	South Fork Holston River near Kingsport.....	Oct. 13	-----
3495870	5—PWS	Tennessee River above First Creek at Knoxville.....	Oct. 8	-----
3497115	6—MIC	Tennessee River above Little River near Knoxville.....	Oct. 8	-----
3497300	7—BM	Little River above Townsend.....	Oct. 8	32
3538290	8—MIC	Clinch River near Lawnville.....	Oct. 14	-----
3567950	9—PWS	Tennessee River below Citico Creek at Chattanooga.....	Oct. 12	34,600
3569250	10—MIC	Tennessee River near Signal Mountain.....	Oct. 12	40,700
3604000	11—BM	Buffalo River near Flat Woods.....	Oct. 12	329
7032280	12—MIC	Mississippi River near Memphis.....	Oct. 14	288,000

## TEXAS

07227500	1—MIC	Canadian River near Amarillo.....	Oct. 14	4
07227900	2—PWS	Lake Meredith near Sanford.....	Oct. 12	-----
07312700	3—MIC	Wichita River near Charlie.....	Oct. 9	170

<sup>a</sup> Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium



surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

SOUTH CAROLINA—Continued

-----	(a)	(a)	(a)	(a)	2	30	-----	(a)
-----	1,100	(a)	(a)	2	11	120	-----	(a)
-----	10	(a)	(a)	1	2	30	-----	(a)
-----	(a)	(a)	2	1	3	20	-----	(a)
-----	(a)	(a)	1	(a)	(a)	50	-----	(a)
-----	10	(a)	2	2	2	10	-----	(a)
-----	(a)	(a)	(a)	(a)	1	40	-----	(a)
-----	10	(a)	(a)	(a)	3	(a)	-----	(a)
-----	(a)	(a)	1	(a)	1	20	-----	(a)
-----	(a)	(a)	1	(a)	3	20	-----	(a)
-----	(a)	(a)	(a)	(a)	2	10	-----	(a)
-----	(a)	(a)	(a)	2	5	20	-----	(a)
-----	10	(a)	1	(a)	3	10	-----	(a)

SOUTH DAKOTA—Continued

-----	(a)	(a)	(a)	(a)	(a)	15	(a)	-----
-----	(a)	(a)	(a)	(a)	(a)	20	-----	0.7
-----	10	14	(a)	(a)	7	30	-----	(a)
-----	(a)	3	(a)	(a)	2	10	-----	(a)
-----	(a)	12	(a)	(a)	(a)	30	-----	(a)
-----	(a)	3	(a)	(a)	(a)	30	-----	(a)
-----	(a)	4	(a)	(a)	1	30	-----	(a)

TENNESSEE—Continued

-----	(a)	(a)	(a)	6	6	(a)	0.4	0.5
-----	(a)	(a)	(a)	8	8	(a)	(a)	(a)
-----	60	5	(a)	5	12	4,500	(a)	(a)
-----	(a)	9	1	(a)	(a)	25	(a)	(a)
-----	(a)	6	(a)	(a)	5	10	(a)	.3
-----	(a)	10	(a)	(a)	(a)	(a)	(a)	(a)
95	10	6	(a)	35	(a)	5	-----	(a)
-----	30	5	(a)	20	16	15	(a)	(a)
-----	10	4	(a)	34	(a)	10	(a)	(a)
-----	20	8	(a)	(a)	15	(a)	(a)	(a)
50	(a)	5	(a)	16	3	(a)	(a)	(a)
-----	10	8	4	25	12	130	(a)	(a)

TEXAS—Continued

90	(a)	(a)	(a)	1	3	40	-----	(a)
-----	(a)	(a)	(a)	(a)	3	(a)	-----	(a)
-----	(a)	(a)	(a)	2	3	(a)	-----	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
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## TEXAS—Continued

07314000	4—PWS	Lake Kickapoo near Archer City.....	Oct. 17	.....
07314800	5—PWS	Lake Arrowhead near Henrietta .....	Oct. 9	.....
08017400	6—PWS	Lake Tawakoni near Wells Point, Dallas .....	Oct. 6	.....
.....	7—PWS	Neches River at treatment plant at Beaumont .....	Oct. 7	850
.....	8—MIC	Neches River near Bridge City .....	Oct. 7	.....
.....	9—PWS	Lake Worth near Fort Worth.....	Oct. 7	.....
.....	10—PWS	Benbrook Reservoir near Benbrook.....	Oct. 7	.....
.....	11—MIC	West Fork Trinity River at Loop 12 below Grand Prairie .....	Oct. 7	.....
08055500	12—PWS	Elm Fork Trinity River near Carrollton .....	Oct. 6	740
08057410	13—MIC	Trinity River below Dallas .....	Oct. 6	1,520
08060500	14—PWS	Lavon Reservoir near Lavon (Dallas) .....	Oct. 7	.....
08072000	15—PWS	Lake Houston near Sheldon.....	Oct. 8	.....
.....	16—PWS	Houston Ship Channel at San Jacinto Battle Ground, Houston..	Oct. 8	.....
.....	17—MIC	North Fork Double Mt. Fork Brazos River at Lubbock .....	Oct. 12	.....
.....	18—PWS	Lake Abilene near Buffalo Gap.....	Oct. 7	.....
.....	19—PWS	Lake Kirby near Abilene .....	Oct. 7	.....
08083500	20—PWS	Fort Phantom Hill Reservoir near Nugent.....	Oct. 7	.....
08084100	21—MIC	Deadman Creek near Nugent.....	Oct. 15	10
.....	22—PWS	Waco Reservoir near Waco .....	Oct. 13	.....
08098290	23—MIC	Brazos River near Highbank.....	Oct. 19	230
08158000	24—PWS	Colorado River (Town Lake) at Austin.....	Oct. 20	46
.....	25—MIC	Colorado River near Bastrop.....	Oct. 9	.....
08181800	26—MIC	San Antonio River near Elmendorf .....	Oct. 8	154
.....	27—PWS	Nueces River at Calallen.....	Oct. 5	.....
.....	28—MIC	Corpus Christi Ship Channel at outlet to bay .....	Oct. 5	.....
.....	29—PWS	Rio Grande (Franklin Canal) at El Paso.....	Oct. 14	.....
.....	30—MIC	Rio Grande at Riverside Diversion .....	Oct. 14	.....

## UTAH

10140973	1—MIC	Weber River below Ogden Sewage plant near Plain City .....	Oct. 8	640
10159500	2—PWS	Provo River below Deer Creek Dam.....	Oct. 9	165
10162962	3—MIC	Provo Sewage Drain, Provo.....	Oct. 9	21.0
10162963	4—MIC	Mill Race Stream below Provo Sewage Drain .....	Oct. 9	35.0
10167500	5—PWS	Little Cottonwood Creek near Salt Lake City.....	Oct. 8	10.0
10168500	6—PWS	Big Cottonwood Creek near Salt Lake City .....	Oct. 8	41.0
10171000	7—MIC	Jordan River at Salt Lake City.....	Oct. 8	130
10172210	8—BM	Red Butte Creek at Ft. Douglas near Salt Lake City .....	Oct. 20	2.5
10172550	9—MIC	Jordan River at 4th North at Salt Lake City.....	Oct. 8	130
10172622	10—MIC	Sewage drain below Salt Lake City Sewage Plant.....	Oct. 8	45.0
10172623	11—MIC	Sewage drain at Redwood Road at Salt Lake City.....	Oct. 8	46.0

<sup>a</sup>Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium

surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

TEXAS—Continued

-----	(a)	(a)	(a)	1	2	(a)	-----	(a)
-----	(a)	(a)	(a)	2	2	(a)	-----	(a)
-----	(a)	1	(a)	1	2	(a)	-----	(a)
-----	(a)	(a)	(a)	2	2	10	-----	(a)
-----	(a)	(a)	(a)	2	4	(a)	-----	(a)
-----	(a)	(a)	(a)	2	3	(a)	-----	(a)
-----	(a)	(a)	(a)	2	2	(a)	-----	(a)
-----	(a)	1	(a)	2	3	30	-----	1.0
16	(a)	(a)	(a)	1	2	(a)	-----	1.0
20	(a)	1	(a)	2	1	60	-----	1.0
-----	(a)	1	(a)	1	2	(a)	-----	(a)
-----	(a)	1	(a)	2	2	(a)	-----	(a)
-----	(a)	(a)	(a)	2	2	(a)	-----	(a)
-----	10	(a)	(a)	2	2	(a)	-----	(a)
-----	(a)	1	(a)	2	2	20	-----	(a)
-----	(a)	(a)	(a)	2	2	(a)	-----	(a)
-----	(a)	(a)	(a)	2	1	(a)	-----	(a)
-----	(a)	(a)	(a)	1	2	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	2	(a)	-----	(a)
89	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
99	(a)	(a)	(a)	(a)	2	(a)	-----	(a)
-----	(a)	1	(a)	2	4	(a)	-----	(a)
67	(a)	(a)	(a)	1	2	(a)	-----	(a)
-----	(a)	(a)	(a)	2	1	(a)	-----	(a)
-----	(a)	(a)	(a)	2	3	80	-----	(a)
-----	(a)	(a)	(a)	2	2	60	-----	(a)
-----	(a)	(a)	(a)	(a)	1	(a)	-----	(a)

UTAH—Continued

-----	(a)	(a)	(a)	(a)	(a)	30	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	60	-----	0.50
-----	(a)	(a)	(a)	(a)	(a)	40	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	70	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	90	-----	(a)
-----	10	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	1	(a)	(a)	(a)	(a)	-----	(a)
-----	10	(a)	(a)	(a)	(a)	15	-----	(a)
-----	5	2	(a)	(a)	(a)	140	-----	1.0
-----	10	1	(a)	(a)	(a)	120	-----	.7

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
VERMONT				
04282000	1—MIC	Otter Creek at Center Rutland .....	Oct. 13	283
04286000	2—MIC	Winooski River at Montpelier .....	Oct. 13	103
04294500	3—PWS	Lake Champlain at Burlington .....	Oct. 15	.....
VIRGINIA				
.....	1—PWS	Pedlar River above Lynchburg Reservoir near Pedlar Mills.....	Oct. 8	.....
2075000	2—MIC	Dan River at Rte. 29 bridge, Danville.....	Oct. 7	.....
.....	3—MIC	James River at Lynchburg (Rte. 29 bridge).....	Oct. 8	.....
.....	4—MIC	James River at Mayos Bridge at Richmond.....	Oct. 9	.....
.....	5—PWS	Occoquan Creek at Rte. 123 Bridge near Alexandria.....	Oct. 9	.....
.....	6—MIC	South Branch Elizabeth River at Rte. 337, South Norfolk.....	Oct. 16	.....
.....	7—MIC	South Branch Elizabeth River at Rtes. 13 and 460, South Norfolk.	Oct. 16	.....
.....	8—MIC	West Branch Elizabeth River at West Norfolk Bridge, West Norfolk.	Oct. 16	.....
2042500	9—PWS	Chickahominy River at Rte. 155 bridge near Providence Forge..	Oct. 15	.....
.....	10—MIC	James River, Rtes. 17 and 258 Bridge at Newport News <sup>d</sup> .....	Oct. 15	.....
2037000	11—PWS	James River and Kanawha Canal near Richmond .....	Oct. 17	.....
WASHINGTON				
12039300	1—BM	North Fork Quinault River near Amanda Park.....	Oct. 15	133
12101500	2—MIC	Puyallup River at Puyallup.....	Oct. 8	1,150
12106700	3—PWS	Green River at Purification plant near Palmer.....	Oct. 8	181
12113430	4—MIC	Duwamish River at East Marginal Way near Seattle.....	Oct. 13	835
12117500	5—PWS	Cedar River near Landsburg .....	Oct. 8	331
12137500	6—PWS	Sultan River near Startup.....	Oct. 7	389
12147600	7—PWS	South Fork Tolt River near Index.....	Oct. 8	23
12398600	8—MIC	Pend Oreille River at international boundary.....	Oct. 7	29,300
12422500	9—MIC	Spokane River at Spokane.....	Oct. 8	2,260
12447390	10—BM	Andrews Creek near Mazama.....	Oct. 20	3.92
12500450	11—MIC	Yakima River above Ahtanum Creek at Union Gap.....	Oct. 14	1,810
14018500	12—MIC	Walla Walla River near Touchet .....	Oct. 13	107
14244200	13—MIC	Cowlitz River at Kelso .....	Oct. 6	5,600
14247300	14—MIC	Columbia River, Cathlamet Channel at Cathlamet.....	Oct. 6	110,000
WEST VIRGINIA				
.....	1—MIC	Ohio River at Huntington, Guyandotte station.....	Oct. 8	.....
03204000	2—MIC	Guyandotte River at Branchland upstream center of bridge.....	Oct. 8	.....
.....	3—PWS	Kanawha River at Nitro, city water intakes .....	Oct. 9	.....

<sup>a</sup>Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium<sup>b</sup>Estimated.<sup>d</sup>Only unfiltered sample available.

surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

VERMONT—Continued

-----	(a)	3	1	4	50	70	(a)	(a)
-----	(a)	10	(a)	3	17	30	(a)	(a)
-----	(a)	5	(a)	3	13	30	-----	(a)

VIRGINIA—Continued

-----	(a)	(a)	(a)	(a)	3	50	-----	(a)
-----	(a)	(a)	(a)	(a)	42	50	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	30	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	45	-----	(a)
-----	(a)	(a)	(a)	(a)	4	20	-----	(a)
-----	(a)	2	1	(a)	4	210	-----	(a)
-----	(a)	3	(a)	(a)	4	80	-----	(a)
-----	(a)	1	(a)	(a)	4	(a)	-----	(a)
-----	(a)	8	(a)	1	5	80	-----	(a)
-----	(a)	(a)	(a)	(a)	6	20	-----	(a)
-----	(a)	2	(a)	1	(a)	(a)	-----	(a)

WASHINGTON—Continued

-----	(a)	(a)	(a)	(a)	2	10	-----	(a)
-----	(a)	(a)	(a)	(a)	3	10	-----	(a)
-----	10	(a)	(a)	(a)	4	(a)	-----	(a)
-----	(a)	1	(a)	(a)	4	10	-----	(a)
-----	(a)	(a)	(a)	(a)	3	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	7	50	-----	(a)
-----	(a)	(a)	(a)	(a)	2	(a)	-----	(a)
-----	(a)	(a)	(a)	(a)	2	50	-----	(a)
-----	(a)	2	(a)	(a)	3	340	-----	(a)
-----	(a)	1	(a)	(a)	(a)	150	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	190	-----	1
-----	(a)	1	(a)	(a)	5	150	-----	(a)
-----	(a)	(a)	(a)	(a)	5	(a)	-----	(a)
-----	(a)	2	(a)	(a)	4	10	-----	(a)

WEST VIRGINIA—Continued

-----	(a)	3	(a)	(a)	1	15	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
-----	10	1	(a)	(a)	4	10	-----	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
WEST VIRGINIA—Continued				
.....	4—MIC	Kanawha River at Winfield, off center of toll bridge .....	Oct. 9	.....
.....	5—PWS	Elk River at Charleston, city water intakes .....	Oct. 9	.....
.....	6—MIC	Ohio River at Belleville Lock and Dam (side of lock well) .....	Oct. 12	.....
.....	7—PWS	Ohio River at Warwood (Wheeling city intake) .....	Oct. 12	.....
.....	8—MIC	Ohio River at Lock and Dam No. 13 at McMechen .....	Oct. 12	.....
.....	9—PWS	Tygart Valley River at Fairmont (city pump station) .....	Oct. 12	.....
.....	10—MIC	Monongahela River at Opekiska Lock and Dam 14 (downstream end wingwall left).	Oct. 13	.....
01608500	11—MIC	South Branch Potomac River near Springfield, (center of bridge at gage).	Oct. 13	.....
03186500	12—MIC	Williams River at Dyer, center of bridge above gage .....	Oct. 14	.....
WISCONSIN				
04026370	1—PWS	Lake Superior at Ashland .....	Oct. 15	.....
04063700	2—BM	Popple River near Fence .....	Oct. 9	50
04067650	3—MIC	Menominee River at Marinette .....	Oct. 9	1,650
04084410	4—PWS	Lake Winnebago at Neenah .....	Oct. 8	.....
04085085	5—MIC	Fox River at Green Bay .....	Oct. 8	1,850
04086004	6—MIC	Sheboygan River at Sheboygan .....	Oct. 8	46
04086040	7—MIC	Lake Michigan at Milwaukee .....	Oct. 7	.....
04087170	8—PWS	Milwaukee River at Milwaukee .....	Oct. 7	165
05360490	9—MIC	Flambeau River near Ladysmith .....	Oct. 14	840
05367050	10—MIC	Chippewa River near Eau Claire .....	Oct. 14	3,300
05380973	11—PWS	Black River at Neillsville .....	Oct. 14	140
05391000	12—MIC	Wisconsin River near Lake Tomahawk .....	Oct. 15	421
05400970	13—MIC	Wisconsin River at Nekoosa .....	Oct. 13	1,960
05405980	14—MIC	Unnamed Tributary to Wisconsin River near Baraboo .....	Oct. 9	.....
05415000	15—MIC	Galena River at Buncombe .....	Oct. 10	56
05430500	16—MIC	Rock River at Afton .....	Oct. 7	896
WYOMING				
06228000	1—PWS	Wind River at Riverton .....	Oct. 16	550
06274800	2—MIC	Wood River near Kerwin .....	Oct. 22	1.5
06285100	3—MIC	Shoshone River near Lovell .....	Oct. 3	1,220
06623800	4—PWS	Encampment River above Hog Park Creek near Encampment .....	Oct. 6	.....
06634100	5—MIC	Little Medicine Bow River below Shirley .....	Oct. 21	13
06637910	6—MIC	Rock Creek at Atlantic City .....	Oct. 16	10
09217000	7—MIC	Green River near Green River .....	Oct. 11	1,460
13018300	8—BM	Cache Creek near Jackson .....	Oct. 11	7.6
.....	9—PWS	Middle North Crow Creek at Cheyenne .....	Oct. 16	.....

<sup>a</sup> Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium

surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

WEST VIRGINIA—Continued

-----	(a)	(a)	(a)	1	(a)	75	-----	(a)
-----	(a)	4	(a)	2	9	10	-----	(a)
-----	10	2	(a)	1	1	20	-----	(a)
-----	(a)	(a)	(a)	1	1	10	-----	(a)
-----	10	(a)	(a)	1	4	30	-----	(a)
-----	10	(a)	(a)	4	4	30	-----	(a)
-----	(a)	(a)	(a)	7	10	60	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	5	-----	(a)
-----	(a)	(a)	(a)	1	4	5	-----	(a)

WISCONSIN—Continued

-----	(a)	(a)	1	(a)	14	90	(a)	(a)
-----	10	(a)	1	(a)	5	(a)	(a)	(a)
-----	10	(a)	1	(a)	4	(a)	(a)	(a)
-----	10	(a)	1	(a)	10	20	(a)	(a)
-----	10	(a)	(a)	(a)	3	10	(a)	(a)
-----	(a)	(a)	1	(a)	3	30	1.0	1.1
-----	10	(a)	1	(a)	4	20	(a)	(a)
-----	(a)	(a)	1	(a)	2	30	(a)	(a)
-----	(a)	1	1	(a)	5	60	(a)	(a)
-----	(a)	(a)	1	(a)	5	90	(a)	(a)
-----	10	(a)	1	(a)	9	90	(a)	(a)
-----	10	(a)	1	(a)	6	110	(a)	(a)
-----	(a)	1	1	(a)	6	(a)	(a)	(a)
-----	(a)	(a)	(a)	(a)	3	50	(a)	(a)
-----	(a)	(a)	1	(a)	3	120	(a)	(a)
-----	(a)	(a)	1	(a)	2	30	(a)	(a)

WYOMING—Continued

40	(a)	(a)	(a)	(a)	(a)	25	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	70	-----	(a)
16	(a)	(a)	(a)	(a)	(a)	10	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	5	-----	(a)
-----	(a)	(a)	(a)	(a)	3	10	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	20	-----	(a)
-----	(a)	1	(a)	(a)	(a)	20	-----	(a)
-----	(a)	1	(a)	(a)	(a)	10	-----	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

Table 1.—*Reconnaissance of selected minor elements in*

USGS station No.	No. on map and source	Location	Date of collection (1970)	Discharge (cfs)
PUERTO RICO				
-----	1—PWS	Río Piedras at Río Piedras filtration plant.....	Oct. 27	-----
-----	2—PWS	Río Tanama at Arecibo filtration plant.....	Oct. 29	-----
-----	3—PWS	Río Añasco and Río Cañas at Mayaguez filtration plant.....	Oct. 29	-----
-----	4—PWS	Río Portugués and Lago Garzas at Ponce Plant Vieja.....	Oct. 29	-----
-----	5—PWS	Lago Guajataca, canal at Ramey Air Force Base .....	Oct. 29	-----
-----	6—MIC	Río Bayamón near Bayamón, 1.5 miles below Highway 167.....	Oct. 30	<sup>b</sup> 150
-----	7—MIC	Río Culebrinas at Highway 2 near Aguadilla.....	Oct. 29	<sup>b</sup> 200
-----	8—MIC	Río Gurabo at Highway 185 northeast of Juncos.....	Oct. 28	<sup>b</sup> 30
-----	9—MIC	Río Portugués at Highway 1 at Ponce.....	Oct. 28	<sup>b</sup> 30
50055000	10—PWS	Río Grande de Loíza at Highway 30 near Caguas.....	Oct. 28	<sup>b</sup> 120

<sup>a</sup> Less than lower limit of detection as follows: Arsenic and zinc, less than 10 micrograms per liter; cadmium, chromium

<sup>b</sup> Estimated.



surface water of the United States, October 1970—Continued

Duration (percent)	Arsenic (As)	Cadmium (Cd)	Chromium, hexavalent (Cr)	Cobalt (Co)	Lead (Pb)	Zinc (Zn)	Mercury (Hg)	
							Dissolved	Total

PUERTO RICO—Continued

-----	(a)	1	(a)	(a)	4	110	-----	(a)
-----	(a)	1	(a)	(a)	(a)	60	-----	(a)
-----	(a)	1	(a)	(a)	(a)	110	-----	(a)
-----	(a)	1	(a)	(a)	17	60	-----	(a)
-----	(a)	(a)	(a)	(a)	(a)	40	-----	(a)
20	(a)	1	5	(a)	2	90	-----	(a)
40	(a)	1	1	(a)	(a)	40	-----	(a)
55	(a)	(a)	1	(a)	4	150	-----	(a)
3	(a)	(a)	(a)	(a)	1	50	-----	(a)
60	(a)	(a)	1	1	1	60	-----	(a)

(hexavalent), cobalt, and lead, less than 1 microgram per liter; mercury, less than 0.5 microgram per liter.

