

CONCENTRATIONS OF DISSOLVED RADON-222 IN WATER FROM SELECTED WELLS AND SPRINGS IN IDAHO, 1989-91

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CONVERSION FACTORS AND ABBREVIATED UNITS

Multiply	By	To Obtain
inch (in.)	2.54	centimeter
foot (ft)	0.3048	meter
mile (mi)	1.609	kilometer
acre	0.4047	hectare
picocurie per liter (pCi/L)	0.037	becquerel per liter

Temperature in °C (degrees Celsius) can be converted to °F (degrees Fahrenheit) as follows:
 $^{\circ}\text{F} = (1.8)(^{\circ}\text{C}) + 32$

Abbreviated units used in report: cm (centimeter); mL (milliliter) .

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Abstract

Concentrations of dissolved radon-222, a naturally occurring radioactive gas, are found in water in Idaho. The U.S. Geological Survey collected water samples for radon-222 analyses from 338 Idaho wells and springs during 1989-91. These water samples were collected as part of ongoing monitoring programs with the Idaho Department of Water Resources and the U.S. Department of Energy. Concentrations of dissolved radon-222 in 372 of the water samples ranged from 58 ± 30 to $5,715 \pm 66$ picocuries per liter; the mean and median concentrations were 446 ± 35 and 242 ± 25 picocuries per liter, respectively.

INTRODUCTION

Radon-222 is a naturally occurring radioactive gas that may be dissolved in water. Radon-222 concentrations in water from Idaho wells and springs are needed by Federal, State, and local agencies to characterize its distribution and to identify the lifetime risks related to exposure. The U.S. Environmental Protection Agency (EPA) estimated that between 2,000 and 40,000 excess lung cancer fatalities in the United States during any 70-year period (an average human life span) result from radon-222 released from public water

supplies (Cothorn, 1987). The average concentration of radon-222 in public water supplies in the United States generates a lifetime risk of death from lung cancer of 1 in 10,000, a risk larger than that generated by any contaminant currently regulated by the Safe Drinking Water Act. The EPA has proposed a maximum contaminant level of 300 pCi/L (picocuries per liter) for radon-222 dissolved in drinking water from public supply systems (EPA, 1991).

Purpose and Scope

The purpose of this report is to present the results of analyses for that fraction of radon-222 dissolved in water collected from 338 wells and springs in Idaho during 1989-91 by the U.S. Geological Survey (USGS). The work was done in cooperation with the Idaho Department of Water Resources and the U.S. Department of Energy as part of ongoing water-quality monitoring programs throughout the State and in the vicinity of the Idaho National Engineering Laboratory.

Radon-222, traditionally called radon, is in the uranium-238 decay series (fig. 1) and has a half-life of 3.82 days; the half-life is the time necessary for one half of the atoms to radioactively decay. Radon isotopes with shorter half-lives include radon-220 (thoron) with a half-life of 55 seconds and radon-219 (actinon) with a half-life of

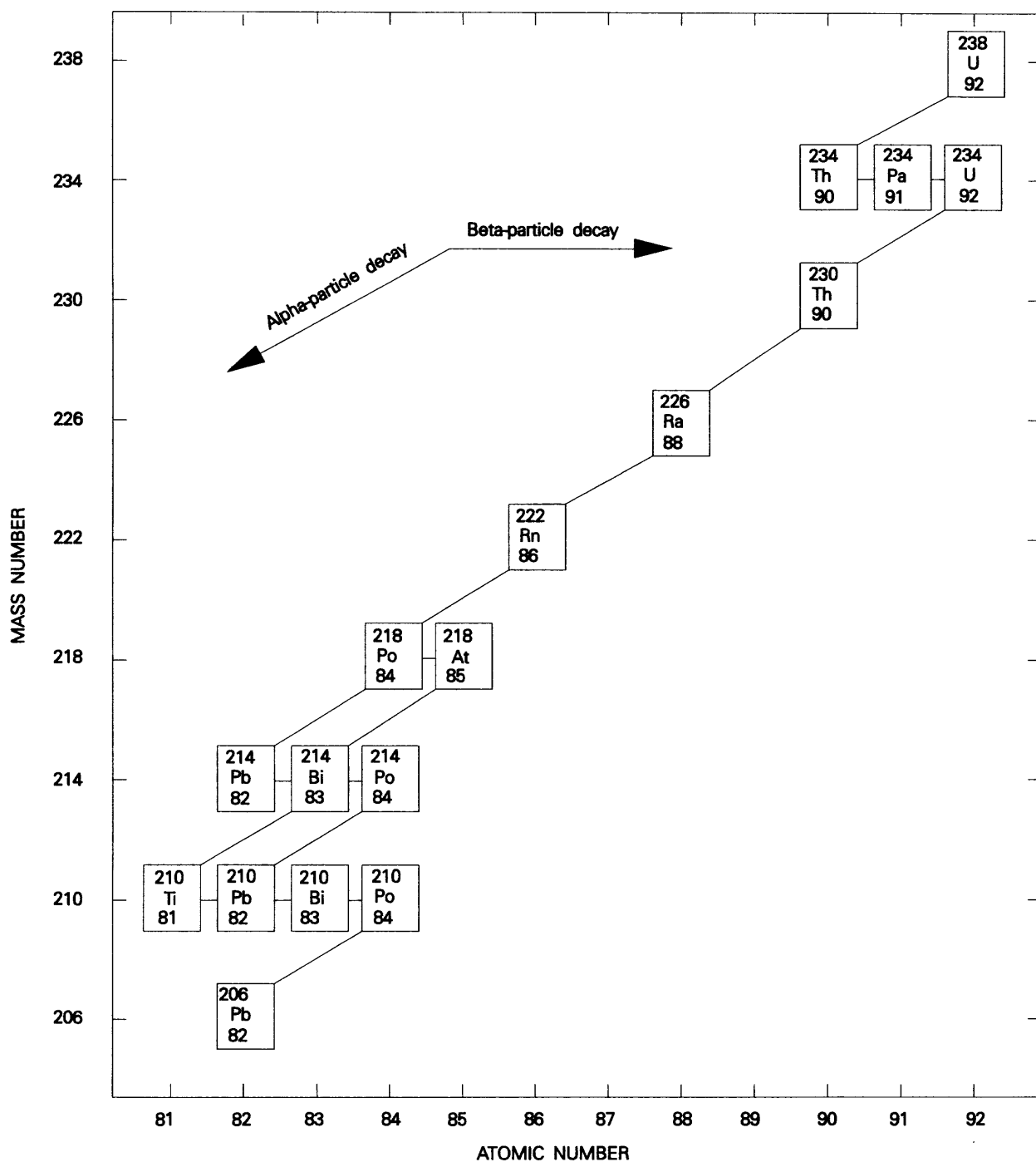


Figure 1.-The uranium-238 decay series.

4 seconds. The concentrations presented in this report are for dissolved radon-222 as this is the only isotope of environmental concern due to its relatively long half-life as compared to radon-220 and radon-219.

Well- And Spring-Numbering System

The well and spring identifier (table 1) used by the USGS in Idaho indicates the location of wells or springs within the official rectangular subdivision of public lands, with reference to the Boise Base Line and Meridian. The first two segments of the number designate the township (T) north or south and range (R) east or west. The third segment gives the section number; four letters, which indicate the 1/4 section (160-acre tract), 1/4–1/4 section (40 acre tract), 1/4–1/4–1/4 section (10 acre tract), 1/4–1/4–1/4–1/4 section (2 1/2-acre tract); and serial number of the well or spring within the tract.

Quarter sections are designated by the letters A, B, C, and D in counterclockwise order from the northeast quarter of each section. Forty-acre, 10-acre, and 2 1/2-acre tracts within each quarter section are lettered in the same manner. Well 5N-2E-29BCC1 (fig. 2) is in the southwest quarter of the southwest quarter of the northwest quarter of Section 29, T. 5 N., R. 2 E.; and was the first well inventoried in that tract. Springs are designated by the letter "S" following the last number.

The USGS identification number used on table 1 consists of 15 digits and is unique to each site. Additionally, several springs listed on table 1 have an 8-digit downstream order number for identification rather than the 15-digit identification number. The 8-digit number is utilized for springs that discharge to rivers or streams and that are routinely sampled by the USGS. The 8-digit numbers for these springs, such as 13117391, include a 2-digit part number "13" plus a 6-digit downstream order number "117391".

Methods And Quality Assurance

The methodology used to collect water samples from wells and springs for radon analyses generally followed guidelines established by the USGS (Wood, 1981; Claassen, 1982; and Cecil and Gesell, 1992). Equipment used to collect water from wells included a short, flexible piece of tubing inserted into a 1,000-mL beaker, a 20-mL glass or polyethylene hypodermic syringe with an 18-gage stainless steel hypodermic needle, and two glass scintillation vials per sampling site with 10 mL of mineral-oil based liquid-scintillation solution in each. The liquid-scintillation solution was obtained from the New England Nuclear Corporation. To collect water samples from domestic wells, the tube was attached to a faucet between the wellhead and the storage tank, if present. To collect samples from wellheads that did not have dedicated pumps, a peristaltic or submersible pump was used to supply an uncontaminated, full-column flow to the beaker. A steady stream was allowed to flow out of the beaker for 2 to 3 minutes to purge the beaker and tube and assure a fresh sample. The flow was adjusted to minimize turbulence and to allow excess water to gently spill over the edge of the beaker (EPA, 1978). Water samples from wells were collected by placing the tip of the hypodermic needle about 1 inch below the surface of the water in the beaker.

Equipment used to collect water samples from springs included a syringe and needle, and two glass scintillation vials per site. Water samples from springs were collected by placing the needle below the water surface of the spring as close as reasonably possible to the spring orifice. For each water sample collected, the syringe and hypodermic needle first were rinsed three times by withdrawing a few milliliters of water into the syringe and ejecting it away from the spring.

Twelve to 15 mL of water then were withdrawn slowly from the beaker or spring to avoid developing a vacuum in the syringe. Rapid withdrawal of the water sample could have reduced

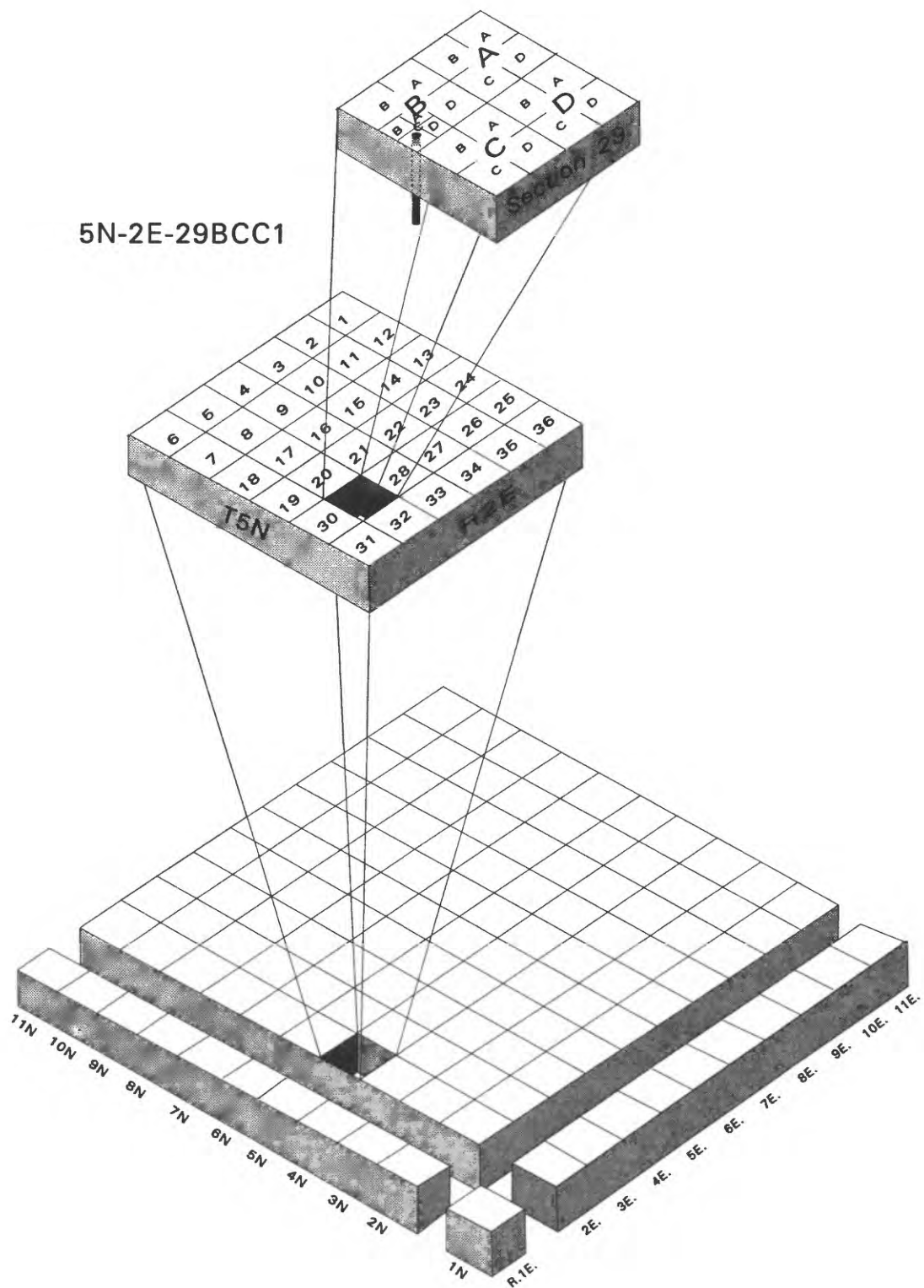


Figure 2.-Well- and spring-numbering system.

the air pressure, and drawn radon and other dissolved gasses out of solution. The syringe then was pointed upward and any air bubbles and excess water were ejected slowly until 10 mL of water remained in the syringe. The sample then was ready for transfer to the glass scintillation vial.

The tip of the needle was placed carefully at the bottom of the liquid-scintillation solution in the vial. The water was ejected slowly from the syringe into the vial without causing any turbulence or air bubbles that may have resulted in the loss of radon. The needle was removed from the vial and the cap was tightened securely to prevent leakage. The vial then was shaken vigorously to promote the movement of the radon gas from the water into the liquid-scintillation solution. A small piece of tape was placed on the cap of the vial and the site identification number, sample number, and collection time (date, hour, and minute) were written on the tape. Tape was not placed on the wall of the collection vial and the walls were not marked in any way because this would have interfered with the laboratory analysis.

This procedure was repeated to obtain two separate samples from each well or spring for quality assurance. Collection of sequential samples provided a means of checking analytical reproducibility and monitoring possible radon leakage from a vial. The two vials were placed in a small, foam-packed cardboard box and sent by overnight delivery to the USGS National Water Quality Laboratory in Arvada, Colorado. The concentration reported for dissolved radon for a given sampling site is an average of the concentration in the two vials except in those instances where a vial leaked or broke during shipment.

Water-sample analysis was by direct liquid-scintillation counting (Pritchard and Gesell, 1977). Each vial, with a 10-mL water sample and 10 mL of the liquid-scintillation solution, was shaken in the laboratory to mix the fluids. After a 3-hour waiting period, the radioactivity was measured using a commercial liquid-scintillation counter. The measurement of radioactivity for each sample

was then converted to a radon-222 concentration and decay corrected to the time of sample collection. The analytical method detection limit is about 80 pCi/L for a 10-mL water sample.

Acknowledgments

The authors gratefully acknowledge the many landowners and water users who allowed access to their property for collection of water samples.

CONCENTRATIONS OF DISSOLVED RADON-222

Water samples were collected from 338 Idaho wells and springs during 1989-91 for radon-222 analyses. Concentrations of dissolved radon-222 are presented in table 1 (at back of report). Locations of wells and springs sampled for radon are shown on figures 3-9 (at back of report). Concentrations are presented as an analytical result with an analytical uncertainty as two sample standard deviations (2s), for example, 132 ± 33 pCi/L. The last two columns in table 1 present an average concentration and calculated experimental standard error for each pair of water samples. Only paired observations were used for the descriptive statistics. If more than one pair of samples were taken on a given day for a site, only the first sample pair taken that day was used for the statistics. Negative radon-222 concentrations occurred if the radioactivity (due to radon-222) in a water sample was less than the background radioactivity or the radioactivity of the prepared blank sample in the laboratory. The associated uncertainty presented with the overall mean concentration of the 372 pairs of water samples used for statistics was a calculated experimental standard error and was an estimate of the uncertainty of the mean concentration (Iman and Conover, 1983, p. 158). The average concentrations of dissolved radon-222 in the 372 pairs of water samples ranged from -58 ± 30 to $5,715 \pm 66$ pCi/L; the mean and median concentrations were 446 ± 35 and 242 ± 25 pCi/L, respectively.

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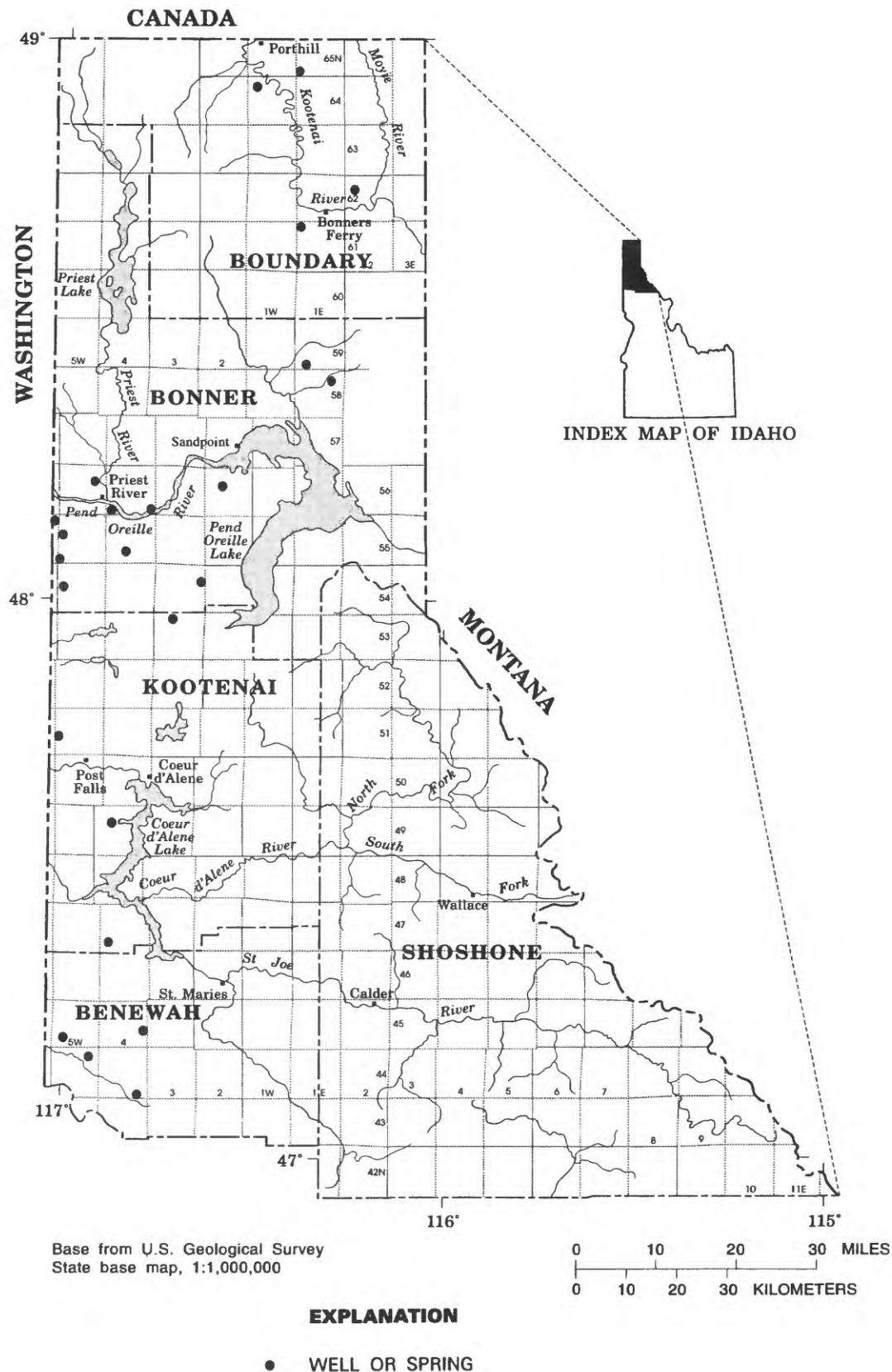


Figure 3.—Location of wells and springs sampled for radon in north Idaho.

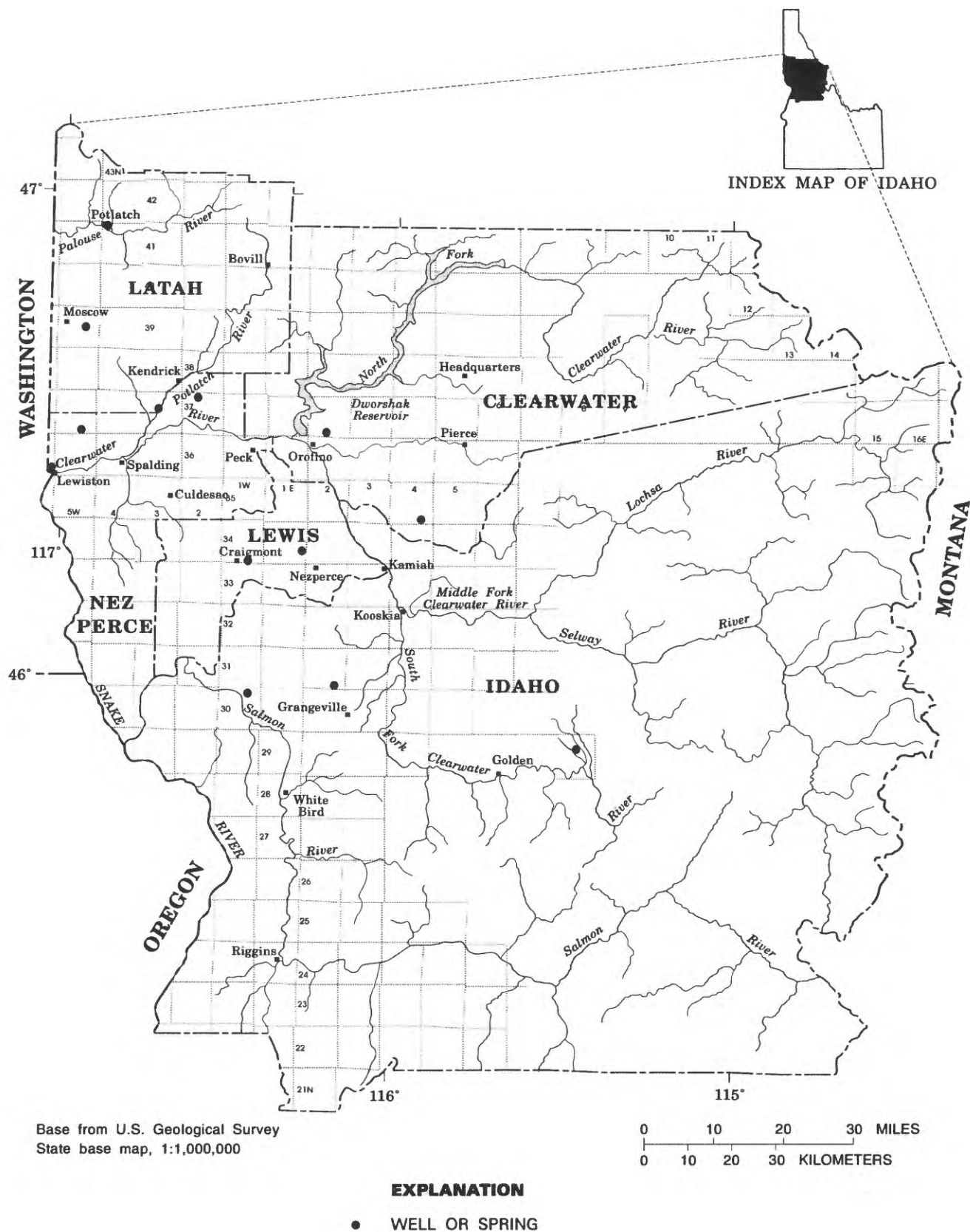


Figure 4.—Location of wells and springs sampled for radon in north-central Idaho.

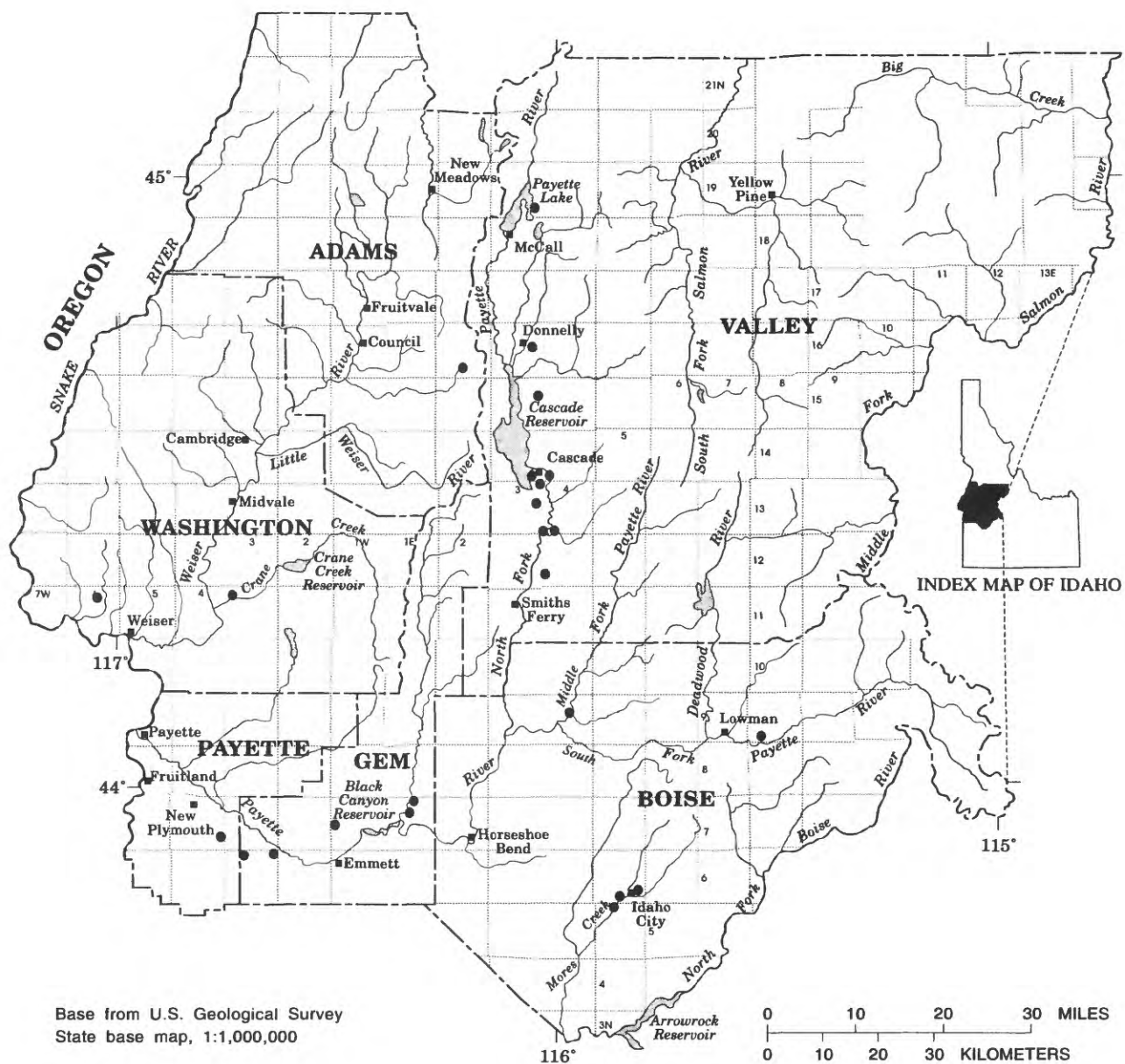


Figure 5.—Location of wells and springs sampled for radon in west-central Idaho.

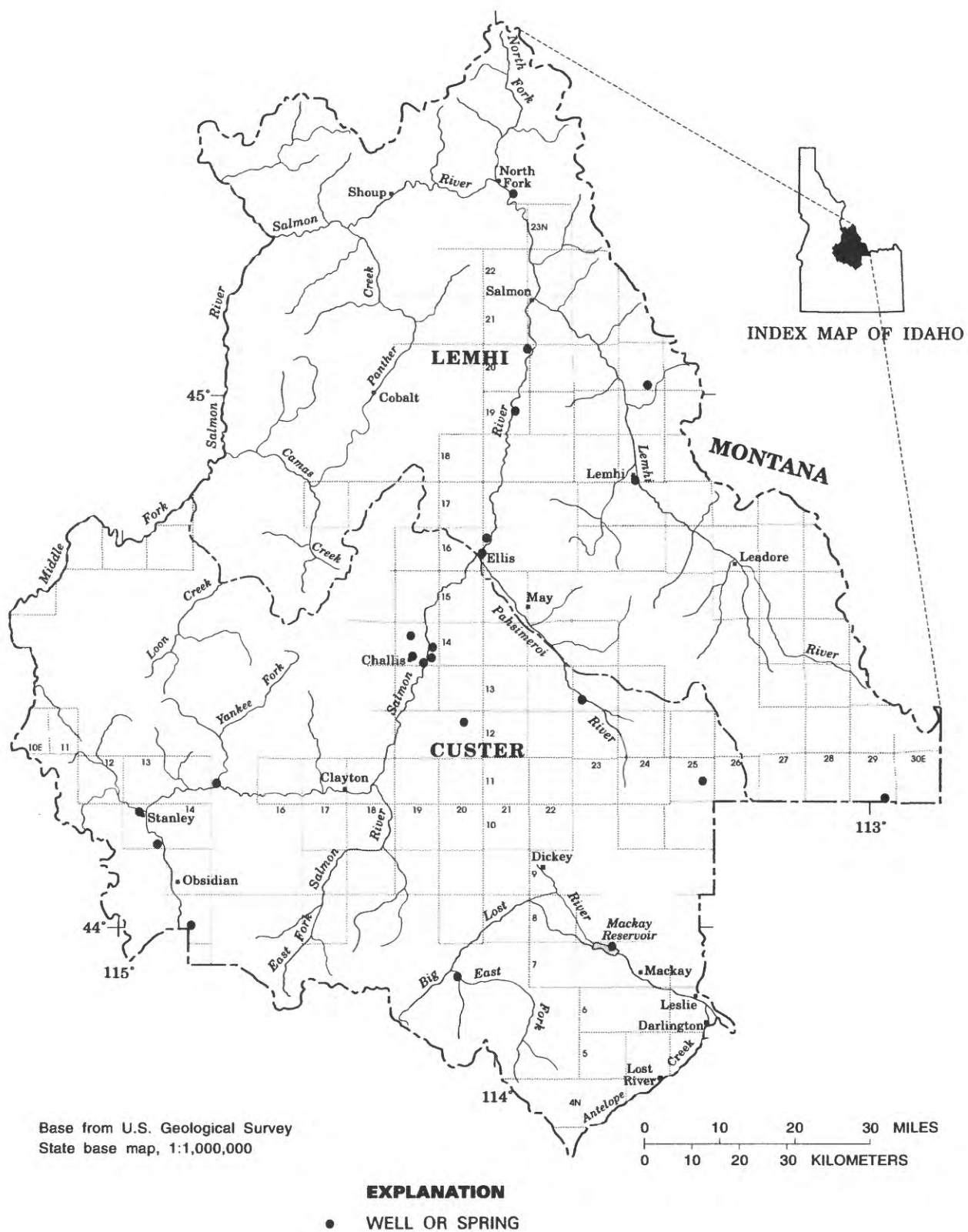


Figure 6.-Location of wells and springs sampled for radon in east-central Idaho.

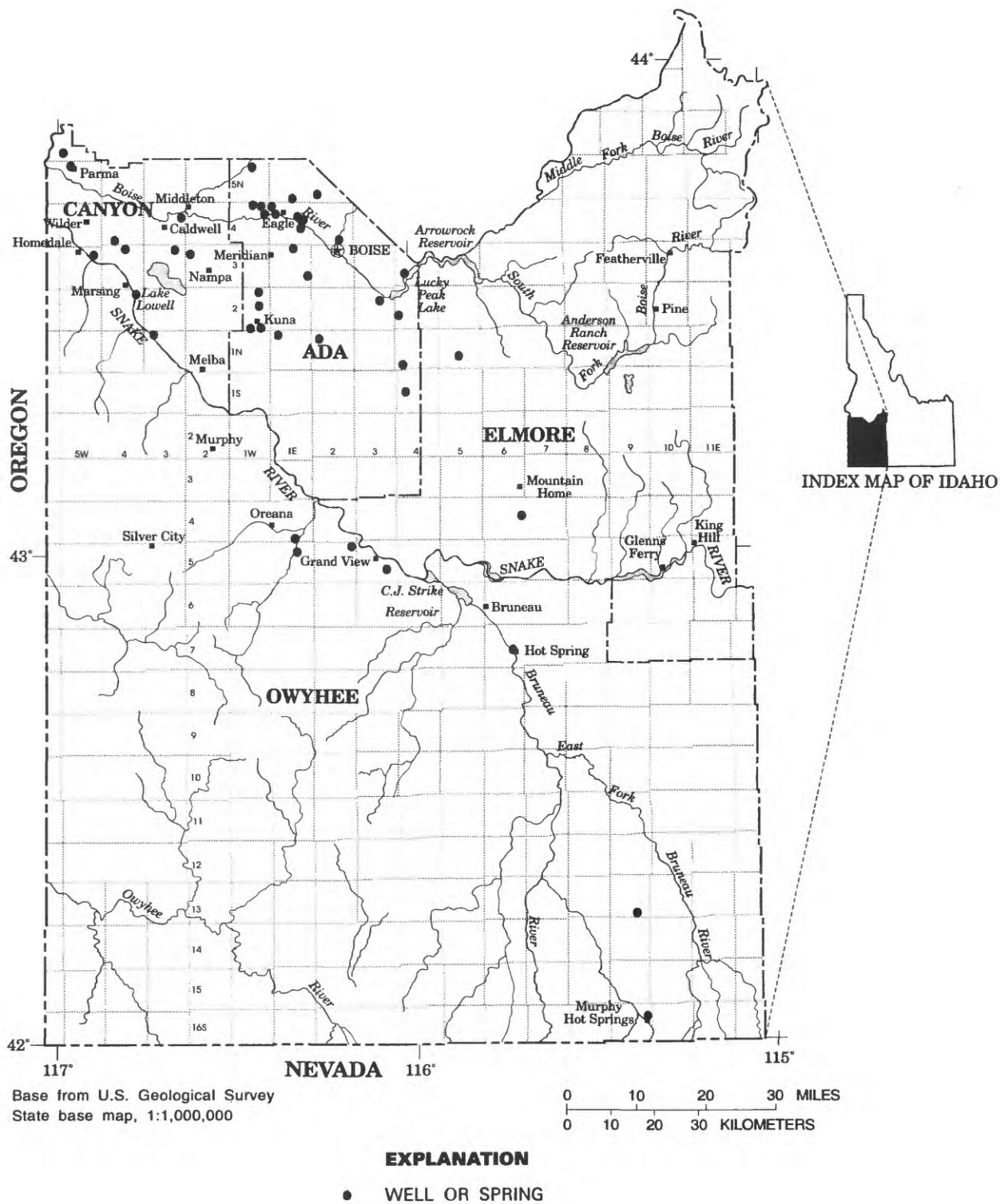


Figure 7.—Location of wells and springs sampled for radon in southwest Idaho.

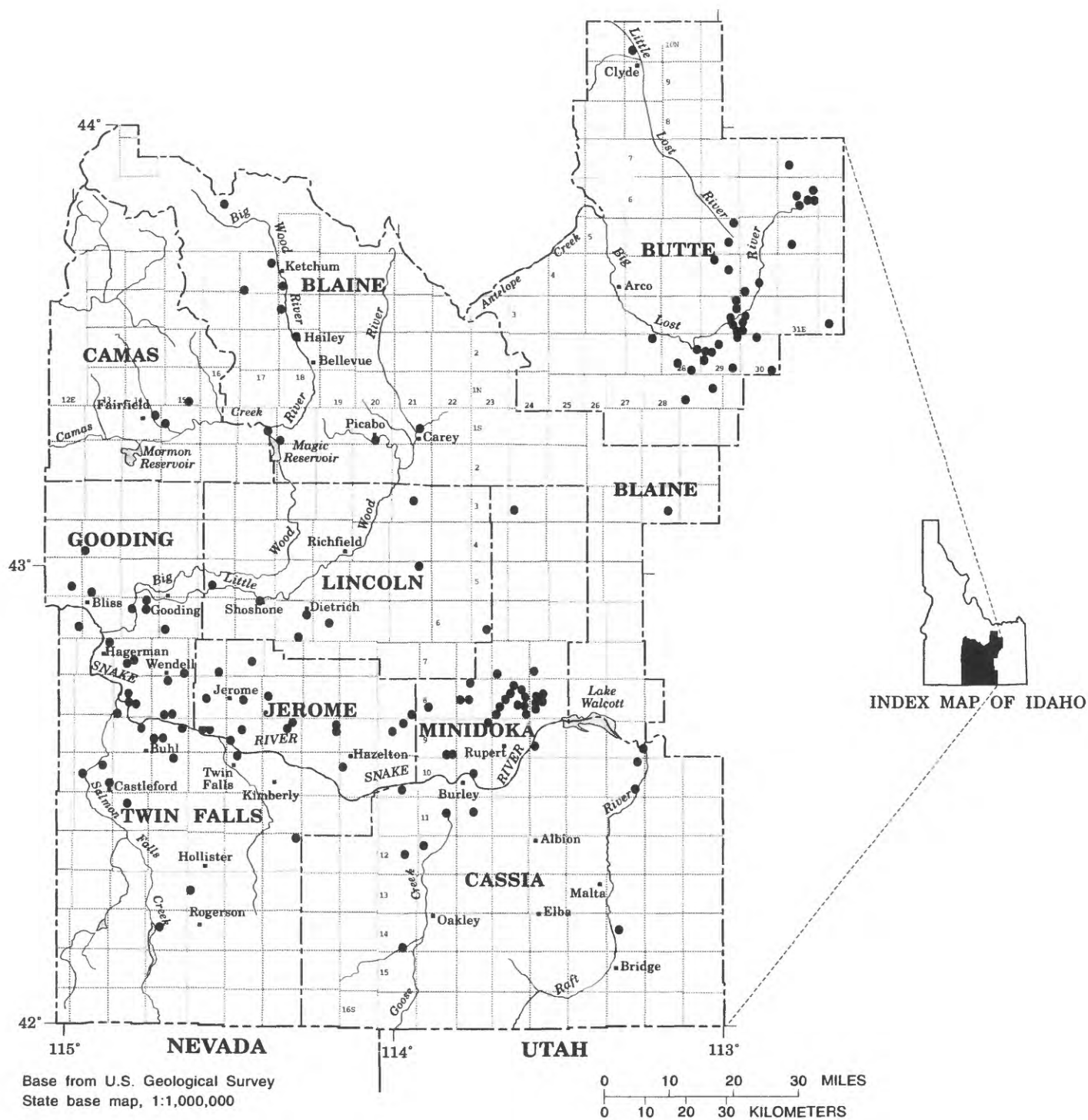


Figure 8.—Location of wells and springs sampled for radon in south-central Idaho.

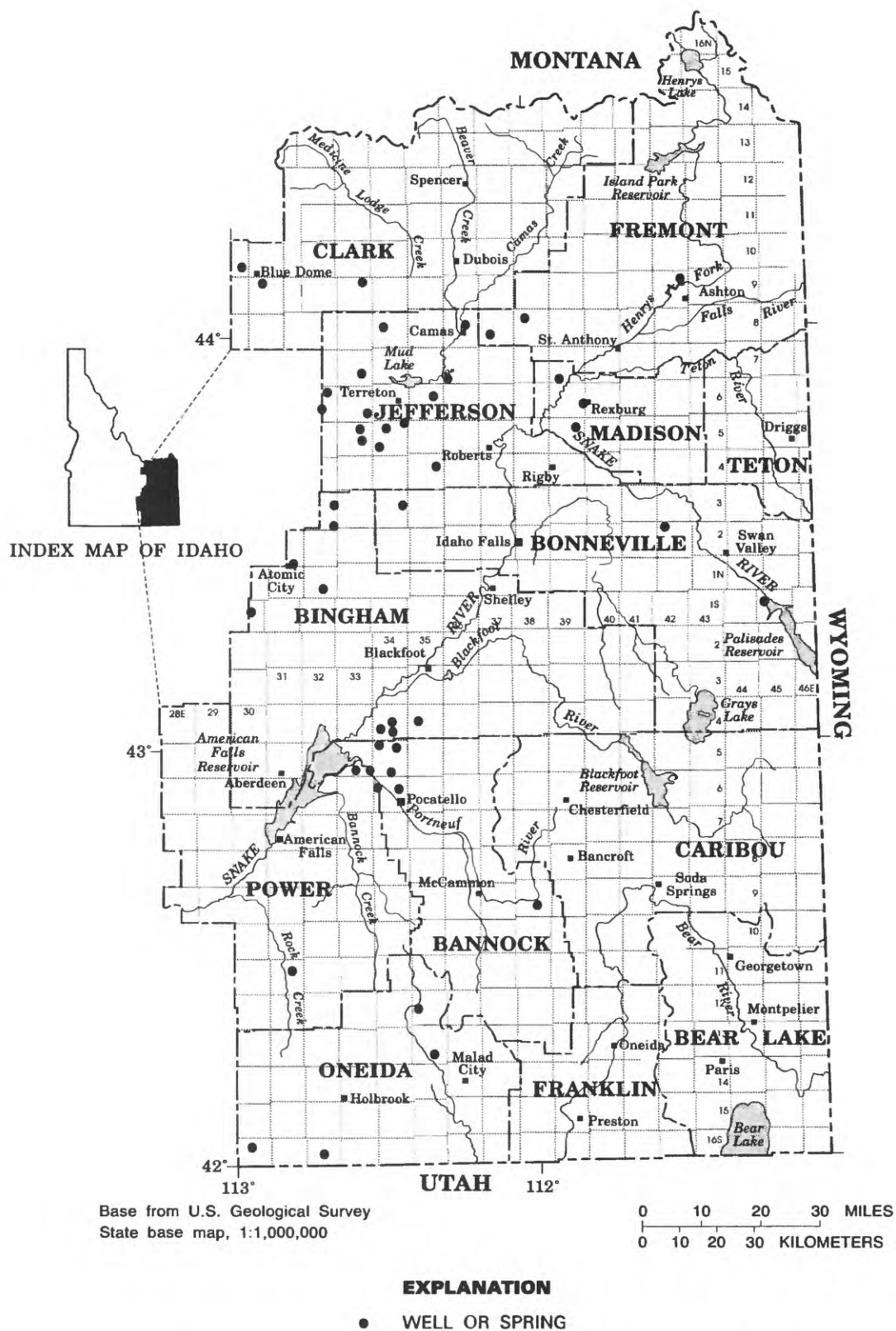


Figure 9.—Location of wells and springs sampled for radon in southeast Idaho.

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91
[See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
-- indicates no data available, * indicates liquid scintillation vial leaked or was broken during shipment]

Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
ADA COUNTY								
5N 01W 09CCD1	434650116280801	375	8-08-91	0830	23.0	132±33	88±34	110±24
5N 01E 34DCD1	434321116190801	54	7-16-91	1530	14.0	246±35	237±35	242±25
5N 02E 29BCC1	434433116150401	68	7-17-91	1142	15.0	388±39	300±38	344±27
4N 01W 01CAA1	434244116241101	260	8-08-91	1100	13.0	387±34	416±35	402±24
4N 01W 02AAB1	434315116250201	68	7-15-91	1125	14.0	447±36	477±37	462±26
4N 01W 12DDB1	434139116235001	81	7-15-91	1545	13.0	288±35	285±35	287±25
4N 01E 06BBB1	434315116233201	67	7-15-91	1355	15.0	1,317±43	1,324±44	1,321±31
4N 01E 08CAD1	434145116215301	462	7-16-91	1013	14.5	598±38	641±38	620±27
4N 01E 11BBB1	434223116183901	203	8-08-91	1300	16.0	1,017±39	1,051±40	1,034±28
4N 01E 13BBA1	434128116170201	150	7-18-91	1054	17.0	327±45	248±45	288±32
4N 01E 23DAC1	433957116173601	403	10-17-91	1040	17.0	80±64	60±65	70±46
4N 02E 34CCCD1	433802116123901	29	10-24-91	1310	15.0	991±39	1,035±40	1,013±28
3N 01E 03BBA1	433802116194801	117	7-16-91	1321	13.5	728±37	731±37	730±26
3N 01E 25BCB1	433417116172701	117	7-17-91	1525	13.0	495±37	500±37	498±26
3N 04E 21CAC1	433443115591601	199	10-17-91	1130	16.0	773±62	876±64	825±45

Table 1.—Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
[See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
-- indicates no data available, * indicates liquid scintillation vial leaked or was broken during shipment]

Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
ADA COUNTY—continued								
2N 03E 10BCB1	433134116053301	471	8-06-91	0830	19.5	1,725±45	1,746±46	1,736±32
2N 04E 19CDC1	432918116013801	995	8-06-91	1130	20.0	380±35	399±36	390±25
2N 01W 02BBA1	433246116255401	104	7-18-91	1350	15.0	478±46	515±47	497±33
2N 01W 11ADA1	433143116245101	190	7-18-91	1520	12.5	511±48	550±49	531±34
2N 01W 34DAD1	432750116260001	353	8-07-91	0915	18.0	335±37	332±37	334±26
2N 01W 35BDC2	432759116253701	227	7-22-91	1100	14.5	1,377±47	1,366±48	1,372±34
1N 01E 05CCD1	432641116221201	440	8-06-91	1400	25.0	370±33	383±34	377±24
1N 02E 08ADA2	432620116140102	400	8-07-91	1345	24.5	1,283±40	1,258±40	1,271±28
1N 04E 32AAB1	432306115595201	711	7-22-91	1545	24.0	447±38	445±39	446±27
1S 04E 17CCC2	431946116004502	900	7-23-91	1445	20.0	383±37	427±38	405±27
ADAMS COUNTY								
16N 02E 33BCC1S	444054116134101	NA	7-18-91	1425	70.5	524±65	501±66	513±46
BANNOCK COUNTY								
5S 33E 36ADA1	425644112320701	130	7-29-91	1305	12.5	292±34	272±34	282±24
5S 34E 05DADD1	430043112294501	63	7-25-91	1145	12.0	567±38	590±38	579±27
5S 34E 11CCC1	430102112271901	85	7-25-91	1050	13.0	356±34	426±35	391±24

Table 1.—Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
[See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
-- indicates no data available, * indicates liquid scintillation vial leaked or was broken during shipment]

Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
BANNOCK COUNTY—continued								
5S 34E 34BAA1	425657112275901	185	7-25-91	1333	14.5	351±35	342±35	347±25
6S 34E 07ADA2	425456112305502	151	7-29-91	1130	13.5	489±35	479±35	484±25
6S 34E 10CCD1	425422112282001	120	7-25-91	1445	13.0	603±35	605±36	604±25
9S 38E 22CCB1S	423711112001901	NA	6-30-90	1131	41.0	4,906±71	4,975±73	4,941±51
		NA	5-30-91	1107	43.0	4,865±61	4,667±61	4,766±43
		NA	5-30-91	1127	43.0	4,693±62	4,680±63	4,687±44
		NA	5-30-91	1142	43.0	4,909±61	4,804±61	4,857±43
		NA	5-30-91	1209	43.0	5,078±63	4,977±63	5,028±45
BENEWAH COUNTY								
45N 05W 29BBB1	471316117000101	227	9-03-91	1015	12.0	113±37	92±37	103±26
45N 04W 24CAC1	471415116460001	76	9-03-91	1359	9.5	376±37	404±38	390±27
44N 05W 11CCC1	470949116560901	190	8-13-91	0920	14.5	416±36	423±36	420±25
44N 04W 35DCC1	470554116462601	100	8-13-91	1200	9.0	799±37	924±37	862±26
BINGHAM COUNTY								
3N 32E 13DCA1	433509112384801	790	2-15-89	1115	13.5	75±37	105±38	90±27
3N 32E 36ADD1	433255112381801	865	5-15-91	1320	14.0	71±38	83±39	77±27

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
 [See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable, -- indicates no data available, * indicates liquid scintillation vial leaked or was broken during shipment]

Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
BINGHAM COUNTY—continued								
2N 31E 35DCC1	432700112470801	636	5-30-91	1047	14.5	81±32	67±32	74±23
1N 32E 27ABD1	432335112404801	--	8-27-91	1150	15.0	69±33	86±34	78±24
1S 30E 15BCA1	432019112563201	751	9-14-89	1330	15.5	4±34	6±34	5±24
		751	7-17-90	1408	15.5	8±38	20±40	14±28
4S 34E 15CDC1	430400112280801	94	8-01-91	1305	12.0	287±34	402±35	345±24
4S 34E 21CBB2	430332112293502	255	8-01-91	1146	12.0	195±35	196±35	196±25
4S 34E 26DAD1	430228112261201	80	8-01-91	1015	13.0	536±36	558±36	547±25
4S 35E 17CCA1	430409112233301	87	7-29-91	1445	14.0	186±33	167±34	177±24
BLAINE COUNTY								
6N 16E 33CCA1S	434819114350601	NA	5-20-91	1538	--	692±128	836±131	764±92
4N 17E 12DDD1	434117114215701	68	9-19-91	1145	13.0	1,137±63	1,120±63	1,129±45
4N 17E 31BBC1S	433828114291001	NA	5-20-91	1810	--	1,776±131	1,615±131	1,696±93
4N 18E 30ADB3	433914114205401	37	9-19-91	1545	11.0	845±83	862±84	854±59
3N 18E 18AAA1	433558114204701	--	10-09-91	1540	10.5	849±46	834±46	842±33
2N 18E 10DCB1	433055114174201	93	5-23-91	1115	--	760±84	715±85	738±60
1S 17E 23AAB1S	431943114235301	NA	6-28-90	1225	61.0	643±38	684±39	664±27

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
[See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
-- indicates no data available, * indicates liquid scintillation vial leaked or was broken during shipment]

Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
BLAINE COUNTY—continued								
1S 18E 31DBC1	431728114215101	100	9-17-91	1130	15.0	717±36	756±36	737±25
1S 20E 34CCB1	431723114042901	490	10-09-91	1115	21.0	2,593±48	2,628±49	2,611±34
1S 21E 14CDB1	432002113554501	128	10-09-91	1329	11.0	1,149±44	1,154±44	1,152±31
1S 21E 14DDD1S	431958113545801	NA	6-28-90	1423	48.0	218±34	239±35	229±24
3S 28E 27ACB1	430805113102401	1,091	9-27-89	1520	16.5	77±32	81±33	79±23
			8-24-90	1305	16.6	78±47	76±48	77±34
BOISE COUNTY								
9N 04E 15CCA1	440637115582501	68	10-18-91	1330	14.0	563±52	466±52	515±37
9N 08E 32CBA1S	440420115324001	NA	9-10-91	1130	52.5	1,878±69	1,994±71	1,936±50
5N 05E 04ABB1	434824115515601	125	10-17-91	1420	9.0	156±61	201±62	179±43
6N 05E 26CBB1	434943115505601	128	10-17-91	1500	10.5	644±46	613±46	629±33
6N 05E 34ABA1	434903115511901	65	10-17-91	1440	9.5	1,484±64	1,459±65	1,472±46
BONNER COUNTY								
59N 01E 32CAC1	482515116215901	85	10-01-91	1330	8.5	3,877±63	3,982±64	3,930±45
58N 01E 11BCC1	482350116175301	125	10-01-91	1515	8.0	1,242±47	1,236±47	1,239±33

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
 [See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
BONNER COUNTY—continued								
56N 05W 14ADA1	481218116550001	205	9-25-91	1300	9.0	616±37	652±38	634±27
		205	9-25-91	1305	9.0	605±38	598±38	602±27
56N 04W 30BAD1	481045116525901	317	9-25-91	1100	11.5	145±36	157±37	151±26
56N 04W 36DDC1	480906116460301	651	9-25-91	1900	9.0	422±44	457±45	440±31
56N 02W 16DCA1	481148116342201	84	10-01-91	1800	9.0	833±43	817±43	825±30
55N 06W 01DDD1	480821117012301	210	9-25-91	1515	8.0	426±44	375±44	401±31
55N 05W 18DBD1	480645117002601	49	9-25-91	1715	7.5	390±45	456±47	423±33
55N 05W 31BBC1	480436117011301	302	9-26-91	1345	9.5	864±40	872±41	868±29
55N 04W 28DBB1	480510116501101	99	9-26-91	1000	8.0	441±37	400±38	421±27
54N 05W 18AAA1	480207117001401	146	9-26-91	1200	8.5	919±42	906±42	913±30
54N 03W 13DBB1	480138116383601	40	9-29-91	1700	8.5	581±43	533±44	557±31
BONNEVILLE COUNTY								
3N 34E 13BDD1	433526112244201	720	9-12-91	1125	12.0	105±53	191±54	148±38
2N 42E 05AAD2	433210111314701	615	7-30-91	1445	14.5	602±37	595±38	599±27
1S 45E 17CAA1	431945111123101	125	7-30-91	1140	9.0	176±34	76±34	126±24

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
[See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
-- indicates no data available, * indicates liquid scintillation vial leaked or was broken during shipment]

Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
BOUNDARY COUNTY								
65N 01E 31BBB1	485655116233801	47	9-30-91	1400	9.5	803±45	853±45	828±32
64N 01W 08AAB1	485509116291401	52	9-30-91	1630	6.5	1,818±49	1,775±49	1,797±35
62N 02E 17BCC1	484415116143001	270	10-01-91	1000	10.0	418±37	481±38	450±27
61N 01E 06AAB1	484025116224401	75	9-30-91	1050	10.5	505±37	*	*
BUTTE COUNTY								
10N 27E 19CAA1	441052113171001	127	9-17-91	1145	7.5	471±53	572±54	522±38
7N 31E 28DAB1	435419112453101	386	5-22-91	1432	10.5	209±40	181±40	195±28
6N 31E 12ACD1	435153112420501	324	3-01-89	1215	14.0	208±32	214±32	211±22
6N 31E 13CAB1	435053112423201	310	3-07-89	1310	15.0	228±37	271±38	250±27
6N 31E 13CAB2	435054112423201	252	3-06-89	1315	12.7	287±45	284±46	285±32
6N 31E 13DBB1	435053112420801	326	2-28-89	1430	11.0	261±39	293±40	277±28
6N 31E 13DBC1	435042112420901	315	3-02-89	1320	11.1	33±40	30±41	32±29
6N 31E 14AAB1	435116112430301	300	12-13-89	1305	9.5	141±68	153±69	147±49
6N 31E 16DCA1	435038112453401	550	5-22-91	1218	11.5	217±39	184±40	201±28
6N 31E 27BDD1	434915112443901	1,200	5-20-91	1228	20.0	141±54	70±54	106±38
5N 29E 01BBB1	434751112571801	148	5-10-91	1121	10.0	248±49	242±49	245±35

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
 [See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temper- ature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experi- mental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
BUTTE COUNTY—continued								
5N 29E 23CDD1	434426112575701	399	5-21-91	1055	17.5	294±44	335±44	314±31
5N 31E 28CCC1	434334112463101	716	6-13-91	1447	17.0	242±35	250±35	246±25
4N 29E 09DCD1	434055112595901	463	5-21-91	1346	16.0	153±43	113±43	133±30
4N 29E 14CAA1	434027112575701	600	6-18-91	1505	13.0	180±40	162±41	171±29
4N 30E 22BDD1	433937112515401	498	6-06-91	1337	14.0	284±53	272±54	278±38
4N 30E 30ADA1	433854112545401	528	5-23-89	1010	12.5	120±33	86±34	103±24
3N 29E 01DBB1	433657112563601	505	11-29-89	1231	12.0	193±34	181±34	187±24
3N 29E 12DDB1	433548112562301	516	6-19-91	1341	12.0	124±49	109±43	117±30
3N 29E 14BCB1	433522112582101	865	5-09-91	1418	15.0	178±58	170±59	174±41
3N 29E 23ABB1	433447112574501	472	5-16-91	1108	14.0	183±34	208±35	196±24
3N 29E 25ABD1	433344112562601	732	5-13-91	1410	14.5	122±33	99±33	111±23
3N 29E 25DCA1	433314112563001	563	5-13-91	1015	14.0	204±34	167±34	186±24
3N 29E 36BCB1	433246112571201	637	6-04-91	1428	13.0	73±45	107±46	90±32
3N 30E 16DDD1	433449112523101	600	6-20-91	1127	14.5	170±35	154±35	162±25
3N 30E 19BCB1	433433112560201	586	6-06-91	0934	12.5	134±55	90±56	112±39
3N 30E 31AAD1	433253112545901	676	5-30-91	1319	13.0	437±36	393±36	415±25

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
[See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
BUTTE COUNTY—continued								
3N 32E 29DDC1	433320112432301	704	5-28-91	1245	14.0	102±35	115±35	109±25
2N 27E 02DDC1	433121113115801	812	5-31-91	1432	12.0	151±77	134±78	143±55
2N 28E 13ADD1	433005113032801	646	4-04-89	1400	14.0	67±34	100±34	84±24
2N 28E 21BBB1	432935113080001	691	5-31-91	1219	11.0	178±81	115±82	147±58
2N 28E 35AAC1	432740113044501	632	5-31-91	1006	11.5	118±58	168±59	143±41
2N 29E 01AAC1	433204112562001	639	6-19-91	0951	12.0	533±46	553±47	543±33
2N 29E 09CAA1	433051113002601	1,075	6-19-91	1135	19.5	165±45	168±45	167±32
2N 29E 17CBC1	432954113020501	626	4-05-89	1125	13.5	134±33	149±34	141±24
2N 29E 18ADD1	433002113021701	685	2-16-89	0940	13.5	140±38	144±39	142±27
		685	3-23-89	1340	13.0	150±33	139±33	145±24
2N 29E 18BDA1	433013113024201	640	4-05-89	1300	14.0	104±33	97±33	100±24
2N 29E 18BDC1	433000113025301	214	4-03-89	1045	13.5	-37±34	-25±34	-31±24
2N 29E 18CBD1	432955113025901	655	4-03-89	1416	14.0	329±35	294±35	312±25
2N 29E 18CCD1	432940113030201	635	4-04-89	1250	14.0	230±34	188±34	209±24
2N 29E 18DCB1	432945113023401	705	4-03-89	1406	15.0	159±35	170±36	165±25
2N 29E 19BCB1	432919113031501	705	4-04-89	1100	11.5	95±36	81±36	88±25

Table 1.—Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
 [See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
BUTTE COUNTY—continued								
2N 29E 35CCC1	432659112582601	760	9-05-89	1230	13.5	41±46	30±47	35±33
2N 30E 04DCC1	433123112530101	1,057	6-25-91	1448	14.5	107±39	135±40	121±28
2N 30E 35DAD1	432717112501501	780	5-08-91	1447	14.5	48±41	47±41	48±29
1N 29E 14DBC1S	432454113012901	NA	9-05-89	1445	8.0	345±50	344±35	344±35
1N 29E 30BBD1	432336113064201	704	9-13-89	1400	12.5	0±39	14±39	7±27
		704	8-21-91	1644	13.0	104±86	172±8	138±61
CAMAS COUNTY								
1N 15E 35BDD1	432236114381801	202	10-09-91	1300	12.5	1,975±47	1,951±47	1,963±33
1S 14E 11CCC1	432033114461401	76	10-09-91	1200	10.5	1,349±47	1,361±48	1,355±34
1S 15E 19BCB2	431926114423202	282	10-09-91	1220	16.0	575±36	611±37	593±26
CANYON COUNTY								
6N 05W 30BAB1	435007116591501	169	10-09-91	1400	19.5	431±36	438±36	435±25
5N 05W 04DCD1	434733116561501	505	9-19-91	1050	25.0	378±34	434±35	406±24
4N 04W 33CDC3	433759116493201	270	9-18-91	1040	19.0	436±35	474±36	455±25
4N 03W 13BAA1	434128116383601	185	9-18-91	1410	15.5	322±33	324±33	323±23
3N 05W 11DAD1	433627116532701	86	8-28-91	0950	16.0	787±40	813±40	800±28

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
[See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
CANYON COUNTY—continued								
3N 04W 03AAD1	433746116473101	78	8-28-91	1215	15.5	3,542±54	3,701±55	3,622±39
3N 03W 03BBC1	433748116412201	110	8-28-91	1410	13.0	483±35	452±35	468±25
3N 03W 11DAC1	433630116392401	90	8-27-91	1420	14.0	734±39	716±39	725±28
3N 02W 07CBC1	433633116375101	196	8-27-91	1230	18.5	215±35	248±35	232±25
2N 04W 02BCA1	433230116471801	121	8-27-91	0945	16.0	315±35	314±35	315±25
CASSIA COUNTY								
9S 25E 19ADA1	423748113341301	95	9-25-91	1230	15.0	158±38	169±38	164±27
9S 27E 25DDB1	423626113141301	190	9-26-91	1300	14.0	551±43	544±43	548±30
10S 21E 34DDD1	423017113581301	505	9-26-91	1500	17.0	111±37	120±37	116±26
10S 27E 02ABB2	423516113154501	500	9-26-91	0945	20.0	871±45	862±45	867±32
10S 27E 26DAC1	423114113152601	--	9-26-91	1130	13.0	472±36	481±37	477±26
11S 22E 14BAB1	422831113504701	206	9-04-91	1345	14.0	222±39	293±40	258±28
11S 23E 16CCB1	422746113464901	195	9-05-91	1130	14.0	255±41	230±41	243±29
12S 21E 14CCB1	422236113581101	2,052	6-14-90	1030	--	2,452±86	*	*
		2,052	7-23-91	1130	49.5	3,788±57	3,971±58	3,880±41
12S 22E 07ADD2	422343113544601	800	9-25-91	1015	13.0	771±42	778±42	775±30

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
[See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable, -- indicates no data available, * indicates liquid scintillation vial leaked or was broken during shipment]

Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
CASSIA COUNTY—continued								
14S 21E 34BDC1	420954113590101	852	6-14-90	1135	--	798±72	*	*
14S 27E 17CAA1	421216113192401	200	11-05-90	1545	45.0	761±50	763±50	762±35
			9-25-91	1600	14.0	326±49	354±50	340±35
CLARK COUNTY								
10N 29E 24AAD1	441113112560601	43	6-13-91	1125	8.0	677±39	710±40	694±28
9N 30E 04CBC1	440813112532201	295	10-10-91	1200	10.5	712±73	764±74	738±52
9N 33E 02BBC1S	440832112331001	NA	6-29-90	1100	54.0	965±57	931±57	948±40
		NA	11-05-90	1255	46.0	479±38	460±38	470±27
CLEARWATER COUNTY								
37N 02E 33CAD1	463016116123901	--	8-15-91	1220	12.0	893±42	898±42	896±30
35N 04E 35BBB1	462020115562601	150	8-15-91	0835	10.5	347±40	328±40	338±28
CUSTER COUNTY								
14N 19E 09ADA1	443335114125301	140	9-17-91	1915	15.5	715±53	796±54	756±38
14N 19E 23DDD1S	443123114102501	NA	6-25-91	1620	--	1,170±55	1,214±55	1,192±39
14N 19E 26BCA1	443105114111501	46	9-11-91	1630	13.0	1,383±95	1,358±96	1,371±68
14N 19E 28CAD1	443040114132701	206	6-26-91	1030	13.5	1,335±48	1,283±48	1,309±34

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
 [See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
CUSTER COUNTY—continued								
14N 19E 34DAA1	442958114113901	206	9-11-91	1815	13.5	1,186±85	1,224±86	1,205±60
13N 23E 29ACC1	442546113453201	3,400	6-26-91	1745	41.0	886±68	873±69	880±48
12N 20E 10CBD1S	442254114051401	57	9-17-91	1445	8.0	840±52	847±53	844±37
11N 25E 23CAB1S	441608113265801	NA	6-24-91	1845	--	437±56	429±57	433±40
11N 15E 19C 1S	441604114445201	NA	6-25-91	1115	--	178±48	143±49	161±34
10N 13E 09AAC1	441257114562001	110	6-24-91	1630	73.0	1,265±65	1,303±66	1,284±46
10N 13E 35CBC1	440856114545301	60	9-10-91	1845	7.5	5,680±93	5,749±94	5,715±66
		60	9-11-91	1245	5.5	1,740±90	1,721±91	1,731±64
		60	9-11-91	1250	5.5	1,597±98	*	*
8N 14E 22CDC1	440007114482801	--	9-10-91	1600	8.0	1,181±69	1,222±70	1,202±49
7N 20E 33CDD1	435311114060101	264	9-12-91	1215	8.0	120±69	140±70	130±49
7N 23E 02DDA1	435739113405701	80	9-12-91	1510	9.0	621±73	562±74	592±52
ELMORE COUNTY								
1N 05E 28ADC1	432339115512701	300	7-23-91	1140	16.0	946±43	984±43	965±30
4S 06E 13AAA1	430458115403701	79	10-07-91	1225	13.5	974±40	931±41	953±29

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
 [See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
FREMONT COUNTY								
9N 42E 11DCD1	440655111273601	--	9-23-91	1230	11.5	2462±47	2,445±47	2,454±33
8N 38E 08BCC1	440212112005201	555	8-05-91	1420	19.5	77±32	83±33	80±23
8N 37E 29CAC1	435923112075401	200	8-05-91	1305	15.0	62±31	39±31	51±22
GEM COUNTY								
7N 01W 19DBA1	435543116295501	91	9-04-91	1400	18.0	163±34	137±35	150±24
7N 01E 03CAA1	435821116192501	120	9-04-91	1140	14.5	671±39	604±39	638±28
7N 01E 15DBD1	435630116190901	128	9-04-91	0910	16.0	827±42	755±42	791±30
6N 03W 01BCC1	435316116390401	45	9-05-91	0905	15.0	183±51	177±51	180±36
6N 03W 04DAD1	435304116413001	60	9-05-91	1055	18.5	729±52	713±52	721±37
GOODING COUNTY								
4S 13E 30ADB1S	430255114570501	NA	6-14-90	1545	--	396±70	415±71	406±50
5S 12E 22BBB1	415851115013301	174	8-29-91	0930	15.5	386±41	371±42	379±29
5S 13E 32CCC1	425620114523001	450	8-29-91	1200	18.0	484±40	506±41	495±29
6S 14E 02BAA1	425619114454101	320	8-21-89	1500	15.0	58±56	59±57	58±40
6S 14E 02BAA2	425618114454001	--	8-13-91	1105	14.5	23±36	29±37	26±26

Table 1.—Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
GOODING COUNTY—continued								
6S 14E 17CCB1	425352114494601	177	8-18-89	1430	15.0	76±65	68±66	72±46
		177	8-15-90	1400	15.0	8±47	50±46	29±33
6S 15E 30ABB1	425243114431701	--	8-18-89	1200	15.0	106±68	65±69	86±48
7S 13E 01DCC1	425030114524101	175	8-22-89	1400	16.5	195±48	198±48	196±34
		175	8-13-91	1324	16.0	126±37	121±37	124±26
7S 14E 15DCD1	424843114474901	--	8-22-89	1745	16.0	45±47	20±47	32±33
7S 14E 20CBC1	424807114505701	180	8-19-89	1110	16.0	2±63	27±64	15±45
		180	8-15-90	1625	16.0	-38±44	-34±46	-36±32
7S 15E 36CCC1	424608114391301	200	8-19-89	0800	14.5	7±67	-3±68	2±48
8S 14E 17DDC1S	13132600	NA	8-18-89	1055	14.5	1±59	-1±60	0±42
		NA	8-13-91	1640	15.0	112±48	99±48	106±34
8S 14E 21ABA2	424320114485701	65	8-28-91	1145	14.5	50±37	59±37	55±26
8S 14E 27CDD1	424147114481501	--	8-22-89	1405	17.0	-17±48	20±49	1±34
		--	8-16-91	1019	15.0	58±52	4±47	31±35
8S 14E 27DCC1	424147114480101	--	8-22-89	1230	15.5	-12±50	-19±50	-15±35

Table 1.—Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
 [See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
GOODING COUNTY—continued								
8S 15E 05BDA1	424550114432701	120	8-21-89	1715	16.0	134±54	115±55	124±38
		120	8-13-91	1933	16.5	139±48	164±49	152±34
8S 15E 32CBB1	424118114435501	--	8-17-89	1600	15.0	31±53	34±53	32±38
		--	8-16-90	1745	14.5	-20±63	*	*
8S 15E 33ABB1	424138114420801	126	8-27-91	0941	14.0	90±44	100±45	95±31
9S 14E 03CBB1S	13095175	NA	8-15-91	1533	15.0	88±58	1±41	45±36
9S 15E 12ACC1S	13093396	NA	8-18-89	1445	14.5	76±56	25±56	51±40
		NA	8-16-90	1920	14.5	-30±61	-47±62	-39±43
IDAHO COUNTY								
31N 02E 35ADB1	455950116093401	192	9-05-91	0944	12.5	758±52	689±51	724±36
30N 01W 02AAA1	455828116243901	163	9-05-91	1150	12.0	572±48	518±48	545±34
29N 08E 15AAA1	455127115263401	146	8-07-91	1110	9.5	953±40	*	*
JEFFERSON COUNTY								
8N 34E 17CCC7	440058112293605	47	6-11-91	1209	12.5	512±38	481±38	497±27
8N 36E 15ACA1	440127112120601	108	8-05-91	1050	11.0	208±34	*	*
7N 33E 27DDD1	435402112332101	207	6-12-91	0935	12.5	195±34	151±34	173±24

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
 [See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
JEFFERSON COUNTY—continued								
7N 36E 31BAB1	435358112161101	100	8-06-91	1035	11.5	224±33	228±34	226±24
6N 32E 11ABA1	435212112394001	266	5-23-91	1022	15.5	242±81	221±80	232±57
6N 32E 22CAC1	434952112411301	309	12-13-89	1135	10.0	263±72	257±73	260±51
6N 33E 26DDB1	434851112321801	312	5-23-91	1255	16.0	374±79	354±77	364±55
6N 35E 14CCC1	435031112182101	250	8-06-91	1247	11.5	141±34	122±34	132±24
5N 33E 10CDC1	434625112342101	428	6-12-91	1254	16.0	262±44	278±45	270±31
5N 33E 23DDA1	434444112322101	392	6-12-91	1818	15.0	153±43	149±43	151±30
5N 34E 01ADBB1	434752112241701	314	8-06-91	1355	13.5	51±32	74±32	63±23
5N 34E 09BDA1	434657112282201	553	6-04-91	1102	12.0	112±47	86±48	99±34
5N 34E 29DAA1	434407112285101	425	6-12-91	1531	13.0	69±44	72±45	71±31
4N 35E 14DBC1	434025112183501	505	9-26-91	1500	12.5	88±34	93±34	91±24
JEROME COUNTY								
7S 16E 34AAA1	424655114333401	320	9-07-89	0830	14.5	55±37	42±38	49±27
		320	8-17-90	1155	15.5	8±60	-10±55	-1±41
7S 17E 22ADA1	424824114263801	--	8-16-89	0910	14.0	46±40	45±40	45±28
		--	8-14-91	1813	14.5	103±58	111±59	107±41

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
[See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
JEROME COUNTY--continued								
8S 16E 20CBA1	424301114364001	--	8-16-89	1450	16.0	29±37	15±37	22±26
8S 17E 27ADA1	424219114263801	--	8-15-89	1645	15.0	17±50	7±51	12±36
8S 18E 18BBC1	424359114240901	--	8-15-89	1345	14.5	4±36	-2±37	1±26
		--	8-16-91	1251	14.0	19±47	11±50	15±34
8S 21E 36ADA1	424125113555501	350	8-21-89	1230	17.0	24±54	53±55	38±38
9S 16E 09AAA1	423958114343801	422	8-22-89	0935	15.5	58±35	101±56	80±39
		422	8-15-90	1820	15.5	14±41	24±41	19±29
9S 16E 10BBB1	423958114343401	155	8-16-89	1912	16.0	157±66	142±67	149±47
		155	8-15-91	1751	15.5	26±54	4±62	15±41
9S 17E 10ADD1	423935114263701	200	8-16-89	1145	15.0	41±36	56±36	49±26
		200	8-17-90	1530	15.5	69±58	73±59	71±41
9S 17E 29ACC1	423651114291801	730	5-09-90	1515	--	599±36	609±37	604±26
9S 18E 02BBC1	424035114192801	369	8-14-89	2020	15.0	168±48	157±49	163±34
9S 18E 11CBC1	424643114192801	220	8-15-89	1030	14.5	84±37	75±37	80±26
		220	8-14-90	1520	15.0	87±34	91±35	89±24

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
 [See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
JEROME COUNTY--continued								
9S 19E 01DCD1	423951114104501	238	8-17-89	1010	14.5	76±67	71±68	74±48
		238	8-14-91	1614	15.0	58±66	25±66	42±47
9S 19E 12BAA1	423945114110301	246	8-22-89	0820	14.5	8±53	-21±53	-6±37
		246	8-16-90	1200	14.0	-3±32	*	*
9S 21E 03CBA1	424021113590001	341	8-16-89	1635	14.5	36±89	23±90	29±63
		341	8-14-90	1200	14.0	44±37	54±37	49±26
9S 21E 17ABA1	423856114005601	380	8-21-89	1420	15.0	8±50	2±51	5±36
		380	8-14-91	1318	15.0	35±43	51±44	43±31
10S 20E 07AAA1	423434114085301	390	8-22-89	0950	16.0	40±54	24±54	32±38
		390	8-14-91	1053	16.5	60±41	72±41	66±29
10S 20E 07AAA2	423431114085501	--	8-17-89	1150	15.5	80±59	127±60	103±42
KOOTENAI COUNTY								
53N 03W 03BAB1	475838116412101	369	9-29-91	1530	9.5	550±43	523±43	537±30
51N 05W 19DBC3	474458117004002	212	7-31-91	1200	11.0	746±38	770±39	758±27
49N 04W 09CCC1	472559116520201	102	8-05-91	1240	9.5	345±34	367±35	356±24
47N 04W 29AAA1	472340116511801	315	8-05-91	0955	14.0	215±35	218±35	217±25

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
[See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
LATAH COUNTY								
41N 04W 06BAC1	465543116531501	513	8-06-91	1055	17.5	169±36	204±37	187±26
39N 05W 14DCA1	464309116552101	140	8-06-91	1330	14.5	996±42	963±42	980±30
LEMHI COUNTY								
24N 21E 22CDD1S	452323114575301	NA	9-18-91	1445	7.5	109±66	180±68	145±47
20N 21E 01AAA1	430551113544601	65	9-18-91	1300	9.0	839±46	837±45	838±32
20N 24E 34CCC1S	450047113362001	NA	7-02-90	0931	62.5	247±35	231±35	239±25
19N 21E 14DBD1	445822113562401	51	9-18-91	1100	10.5	868±47	915±48	892±34
18N 24E 33DBA1	445043113362601	132	9-18-91	1700	11.0	387±69	376±70	382±49
16N 20E 25BDD1	444123114023401	115	9-17-91	1730	12.0	753±50	790±51	772±36
16N 21E 18ADC1S	444310114005701	NA	6-25-91	2000	--	437±77	435±78	436±55
11N 29E 35CCC1	441406112582601	80	10-10-91	0950	10.5	538±71	554±72	546±51
LEWIS COUNTY								
34N 01W 34DAD1	461436116255201	122	8-14-91	0840	9.5	323±39	297±39	310±28
34N 01E 25DDD1	461512116154601	320	8-14-91	1140	12.0	661±37	655±37	658±26

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
 [See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
LINCOLN COUNTY								
3S 21E 15DCB1	430931113563401	652	9-21-89	1425	11.0	60±39	42±39	51±28
		652	8-21-91	1140	11.5	114±87	50±87	82±62
5S 16E 29DBD1	425726114344901	200	8-18-89	0910	16.5	70±83	-12±83	29±59
		200	8-17-90	0945	15.0	32±58	43±59	38±41
5S 21E 03DAC1	430050113561001	454	9-26-89	1400	12.0	4±37	-22±37	-9±26
6S 17E 02ABC1	425610114241501	355	8-17-89	1530	--	29±59	99±61	64±42
6S 18E 12CAA1	425455114160101	360	8-17-89	1000	15.5	36±66	50±67	43±47
		360	8-15-90	1025	15.5	-4±36	25±38	11±26
6S 18E 34DCD1	425104114180001	--	8-18-89	1725	15.0	12±72	72±73	42±51
		--	8-15-91	1126	14.5	23±59	89±59	56±42
6S 19E 21CAB1	425307114122301	252	8-17-89	1330	15.5	47±68	2±68	24±48
6S 23E 29ADD1	425218113435901	401	8-16-89	1100	13.5	26±43	-5±43	11±30
MADISON COUNTY								
7N 39E 32CCA1	435312111533201	55	7-23-91	1335	13.5	638±36	550±36	594±25
6N 39E 24ACC1	435000111482201	97	7-23-91	1542	11.0	698±37	631±37	665±26
5N 39E 11AAC1	434700111493501	72	7-23-91	1104	12.0	476±35	484±35	480±25

Table 1.—Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
[See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
MINIDOKA COUNTY								
3S 24E 20ABA1	430918113371401	655	9-26-89	1110	13.0	-29±389	-8±39	-19±27
		655	10-10-91	1030	12.5	54±35	72±36	63±25
7S 24E 30CAD1	424658113414601	394	8-15-89	1205	12.0	55±44	22±44	38±31
		394	8-13-90	1425	12.0	25±35	*	*
7S 25E 30DAB1	424709113342801	296	8-15-89	1015	13.5	41±42	-5±42	18±30
8S 22E 30CBC1	424151113554601	516	8-16-89	1515	14.5	60±65	51±66	55±46
		516	8-12-91	1756	14.0	87±44	53±45	70±31
8S 23E 05ADA1	424537113470101	388	8-15-89	1500	12.5	-4±41	4±42	0±29
8S 23E 19CCC1	424224113484301	230	8-21-89	1040	15.5	31±53	24±54	27±38
		230	8-12-91	1533	15.0	54±44	31±44	43±31
8S 23E 19DBC1	424237113483801	282	8-16-89	1310	14.0	66±36	61±37	64±26
		282	8-14-90	1005	13.5	42±39	-4±36	46±27
8S 24E 10BCC1	424435113384501	240	5-03-89	0935	14.0	-10±41	-6±42	-8±29
8S 24E 11BAC2	424451113371501	200	5-02-89	1912	13.0	-18±43	-16±44	-17±31
8S 24E 13ABB1	424407113354501	250	5-03-89	1115	13.0	0±42	8±43	4±30
8S 24E 14CDC1	424322113371501	235	5-02-89	1322	14.0	38±36	45±36	42±25

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
[See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
MINIDOKA COUNTY—continued								
8S 24E 21ABA1	424313113391201	347	5-02-89	1145	14.5	26±35	-4±35	11±25
8S 24E 22BDA1	424259113381701	--	5-01-89	1655	18.0	-54±42	-62±42	-58±30
8S 24E 23DCC1	424228113365601	250	5-01-89	1840	15.0	56±42	36±43	46±30
8S 24E 25ABA1	424223113354101	--	5-01-89	1340	13.0	-19±31	3±32	-8±22
8S 24E 25BBB1	424220113362701	150	5-03-89	1505	15.5	22±36	19±36	20±25
8S 24E 28CBA1	424157113394901	165	5-02-89	1015	14.0	129±35	98±35	114±25
8S 24E 31CDC1	424043113420001	212	8-15-89	1710	15.0	39±46	32±46	36±32
8S 25E 08ABA1	424448113332501	235	5-03-89	1317	13.0	7±39	-34±39	-13±28
8S 25E 17AAB1	424337113331401	211	5-02-89	1735	13.0	8±43	-11±43	-2±30
8S 25E 18DCD1	424322113342901	150	5-03-89	1801	15.0	-39±28	-40±28	-40±20
		150	8-14-89	1810	14.0	4±45	-1±46	2±32
		150	8-12-91	1143	14.5	62±64	96±65	79±46
8S 25E 19ABB1	424313113343501	217	5-02-89	1431	14.0	24±37	38±38	31±26
		217	8-14-89	1600	13.5	25±52	-2±53	12±37
		217	8-13-90	1035	14.0	78±35	61±36	70±25
8S 25E 29BAB1	424223113334901	--	5-01-89	1040	14.0	37±32	22±32	30±23

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
 [See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
MINIDOKA COUNTY—continued								
9S 22E 35CCC1	423524113510001	100	9-03-91	1145	12.5	194±41	178±41	186±29
9S 22E 36CDCC1	423528113493701	298	9-03-91	1328	15.5	479±41	535±42	507±29
9S 23E 01ABA1	424037113423201	--	8-21-89	0900	15.0	16±50	30±50	23±35
		--	8-13-90	1805	15.5	36±41	55±41	46±29
10S 23E 15CDC1	423254113452601	80	9-04-91	1140	13.0	714±45	741±46	728±32
NEZ PERCE COUNTY								
37N 05W 35AAD1	463018116550301	325	8-08-91	0830	12.5	167±36	165±36	166±25
37N 03W 16CDC1	463119116440801	70	8-08-91	1208	14.5	272±37	241±37	257±26
37N 02W 04CDB1	463425116354101	253	8-08-91	1325	14.5	143±33	165±34	154±24
36N 06W 36ACB1	462525117015101	630	8-07-91	1544	18.0	311±34	294±34	303±24
ONEIDA COUNTY								
12S 35E 19AAD1	422210112242901	80	9-24-91	0900	10.5	326±41	329±41	328±29
13S 35E 27CCC1	421528112214601	155	9-24-91	1130	12.0	588±44	540±44	564±31
16S 30E 09ABB2	420323112571202	485	9-24-91	1700	13.0	618±42	601±42	610±30
16S 32E 15BBC1	420226112424801	130	9-24-91	1500	12.5	476±43	497±44	487±31

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
 [See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
OWYHEE COUNTY								
1N 03W 06DDC1	432640116440701	560	6-15-90	1200	40.0	271±49	316±50	294±35
4S 01E 34BAD1	430215116192601	2,980	7-18-91	1330	75.0	744±76	639±76	692±54
5S 01E 10BDD1	430017116193101	2,960	7-18-91	1445	59.0	860±74	840±75	850±53
5S 02E 01BBC1	430122116102901	1,800	7-18-91	1530	44.5	328±57	309±58	319±41
5S 03E 26BCB1	425750116043201	2,970	7-18-91	1120	84.0	422±76	376±77	399±54
7S 06E 22DADB1S	424754115431201	NA	6-12-90	1130	--	1,230±61	1,136±61	1,183±43
13S 09E 35CDC1	421445115223401	953	6-12-90	1600	25.5	265±51	236±52	251±36
16S 09E 24BBC1S	420142115214301	NA	6-13-90	1000	--	1,874±55	*	*
		NA	11-06-90	0930	--	1,698±51	1,807±52	1,753±36
PAYETTE COUNTY								
7N 04W 25CBC1	435448116461401	99	9-05-91	1255	15.5	351±50	368±51	360±36
POWER COUNTY								
5S 33E 34CBC1	425620112353801	123	9-26-91	1230	11.0	495±36	487±37	491±26
11S 31E 11CBA1	422846112482401	180	10-02-91	1205	--	267±36	270±37	269±26
TWIN FALLS COUNTY								
6S 12E 25DAA1	425221114580701	620	7-30-91	1418	25.5	161±36	158±36	160±25

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
 [See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
 -- indicates no data available, * indicates liquid scintillation vial leaked or was broken during shipment]

Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
TWIN FALLS COUNTY—continued								
8S 14E 31ABD1	424134114511801	--	7-30-91	1057	16.0	620±39	705±40	663±28
9S 15E 12CCA1	423918114385901	1,423	7-24-91	1000	48.5	1,362±41	1,265±41	1,314±29
9S 15E 28AAB1	423720114414801	120	9-16-91	1322	14.0	176±34	161±34	169±24
9S 15E 30CAD1	423649114443701	130	7-31-91	1314	14.0	181±32	148±33	165±23
9S 17E 33BBC1	423620114283501	750	5-09-90	1245	39.0	893±41	975±42	934±29
10S 13E 11ABC1	423435114534801	220	7-30-91	0909	15.5	223±39	218±40	221±28
10S 13E 20ADA1	423240114565201	1,280	5-10-90	1130	--	108±37	108±38	108±27
10S 13E 25DDC1	423117114521701	280	7-25-91	1115	13.0	312±37	336±38	324±27
10S 15E 03ADD1	423510114402201	100	7-31-91	1454	13.5	130±31	108±31	119±22
10S 17E 04CDA1	423452114281101	2,220	5-09-90	1350	--	1,328±42	1,380±43	1,354±30
11S 14E 09ABA1	422927114485401	230	7-25-91	1344	13.0	293±37	268±38	281±27
12S 18E 01BBA1	422458114175801	--	6-14-90	0945	--	4,431±93	*	*
13S 16E 18DAA1	421742114364801	1,565	7-24-91	0845	30.5	1,253±42	1,221±42	1,237±30
14S 15E 16DDC1	421206114414901	1,890	5-10-90	0940	--	1,832±51	1,858±52	1,845±36

Table 1. —Concentrations of dissolved radon-222 in water from selected wells and springs in Idaho, 1989-91—continued
[See figures 3-9 for location of wells and springs. Springs are designated by "S" at end of spring identifier. NA indicates not applicable,
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Well or spring identifier	U.S. Geological Survey identification number	Well depth, in feet	Date sampled	Time sampled	Water temperature in degrees Celsius	Concentration and analytical uncertainty in picocuries per liter		Average concentration and calculated experimental standard error for samples A and B, in picocuries per liter
						Sample A	Sample B	
VALLEY COUNTY								
19N 03E 26DDC1	445658116025401	87	7-16-91	1430	8.0	266±48	331±61	299±39
16N 03E 14AAB1	444351116030001	110	7-17-91	1215	9.0	201±82	285±84	243±59
15N 03E 13BBC1S	443826116024101	NA	7-18-91	1215	33.5	582±64	542±64	562±45
14N 03E 36AAC1	443037116015601	130	7-16-91	1615	37.0	324±46	353±47	339±33
14N 03E 36ADA1	443039116015001	226	7-17-91	1645	19.5	336±47	294±48	315±34
14N 04E 32CCC1	443006116002701	72	10-08-91	1315	10.5	173±43	185±44	179±31
13N 03E 13ADA1S	442752116321401	NA	7-18-91	1700	45.5	511±63	581±64	546±45
13N 04E 31CAB1S	442500116015501	NA	7-18-91	1730	63.0	241±57	272±58	257±41
13N 04E 32ACC1	442506116003001	10	10-08-91	1530	11.5	345±48	383±49	364±34
13N 04E 32DBB1	425005116002901	75	10-08-91	1700	8.5	484±46	460±47	472±33
12N 04E 30DCA1	442025116012701	87	7-17-91	1305	9.0	400±63	432±64	416±45
WASHINGTON COUNTY								
11N 06W 10CCA1	441755117025801	400	8-20-91	0900	73.0	365±35	468±36	417±25
11N 03W 07BDB1S	441823116444101	NA	8-19-91	1100	85.0	211±33	192±33	202±23