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**GEOHYDROLOGIC DATA IN THE NAVAJO AND HOPI INDIAN
RESERVATIONS, ARIZONA, NEW MEXICO, AND UTAH**

PART II

SELECTED CHEMICAL ANALYSES OF THE GROUND WATER

By L. R. Kister and J. L. Hatchett

United States Department of the Interior, Geological Survey

Prepared in cooperation with the Bureau of Indian Affairs
and the Navajo Tribe

Tucson, Arizona
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CONTENTS

	Page		Page
Introduction	1	Quality of the ground water—Continued	
Purpose, scope, and organization of the report	1	Source and significance of chemical constituents in water—Continued	
Personnel	1	Fluoride (F)	6
Acknowledgments	1	Nitrate (NO ₃)	6
Land-net system and location of wells and springs	1	Boron (B)	6
Quality of the ground water	3	Dissolved solids	7
Expression of results	3	Hardness	7
Source and significance of chemical constituents in water	3	Percent sodium	7
Silica (SiO ₂)	3	Sodium-adsorption ratio (SAR)	7
Iron (Fe)	6	Specific conductance	7
Calcium (Ca) and magnesium (Mg)	6	pH	7
Sodium (Na) and potassium (K)	6	Literature cited	7
Bicarbonate (HCO ₃) and carbonate (CO ₃)	6	Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations,	
Sulfate (SO ₄)	6	Arizona, New Mexico, and Utah	9
Chloride (Cl)	6		

ILLUSTRATIONS

	Page		Page
Figure 1. Map of the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah, showing roads, villages, Bureau of Indian Affairs district boundaries, and 15-minute quadrangles	2	Figure 2. Names of the rocks and sediments of the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah	4



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PART II

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Introduction

The geohydrologic data in this report consist of information about the chemical quality of the ground water in the Navajo and Hopi Indian Reservations in northeastern Arizona, northwestern New Mexico, and southeastern Utah (fig. 1). Chemical analyses were made of water from more than half of the 2,338 drilled wells, dug wells, and springs inventoried in the area before 1957. The data were compiled to provide information about the chemical quality of the ground water from 1,272 selected wells and springs, which will supplement the information contained in the forthcoming comprehensive report on the ground-water resources and geology of the reservations. The comprehensive report is to be published as a U.S. Geological Survey Professional Paper.

Purpose, Scope, and Organization of the Report

In 1946 the U.S. Geological Survey was asked by the Bureau of Indian Affairs to make a series of hydrologic investigations to help alleviate the water shortage at several localities. Later, in 1950, the U.S. Geological Survey in cooperation with the Bureau of Indian Affairs began a comprehensive investigation of the geology and ground-water resources of the Navajo and Hopi Indian Reservations, which occupy parts of northeastern Arizona, northwestern New Mexico, and southeastern Utah (fig. 1). The principal objectives of the investigation were as follows: (1) To determine the feasibility of developing ground-water supplies for stock, domestic, institutional, and industrial use in particular areas and at several-hundred well sites scattered throughout the reservations and in adjoining areas owned by the Navajo Tribe; (2) to compile an inventory of the existing ground-water supplies; (3) to make a comprehensive investigation of the geology and determine the hydrogeologic factors that control the occurrence and movement of ground water; and (4) to appraise the water potential for future development.

The basic geohydrologic data of the Navajo and Hopi Indian Reservations are reproduced separately in sections as Parts I, II, III, and IV of Arizona State Land Department Water Resources Report No. 12. Part I contains a compilation of the records of drilled wells, dug wells, and springs that were inventoried before 1957. Part II (this report) is a compilation of selected chemical analyses from the wells and springs that were sampled. Part III contains selected drillers' logs, lithologic logs, and stratigraphic sections. Part IV consists only of maps of the reservations showing the locations of the wells and springs listed in Parts I, II, and III. Information about other wells that were drilled after the completion of this study is available in the open files of the Geological Survey Ground Water Branch offices in Tucson and Holbrook, Arizona.

Personnel

The collection, compilation, and analysis of the data contained in this report were under the general supervision of A. N. Sayre, former chief, and O. M. Hackett, present chief, of the Ground Water Branch; and S. F. Turner, L. C. Halpenny, and J. W. Harshbarger, former district supervisors, and P. E. Dennis, present district supervisor, of the Ground Water Branch in Arizona. The collection of the data was begun under the direct supervision of Mr. Halpenny and was continued by Mr. Harshbarger.

Substantial contributions, including field inventory of the water developments, collection of water samples for chemical analysis, laboratory analysis of the samples, and geological correlations, were made by other personnel of the Navajo Project and the U.S. Geological Survey Quality of Water Branch, Albuquerque, New Mexico. The chemical analyses were done by A. M. Diaz, J. L. Hatchett, E. F. Williams, I. M. Gutierrez, J. P. Beverage, and H. E. Koester, under the direct supervision of J. D. Hem and J. M. Stow, former and present district chemists respectively of the Albuquerque district of the Quality of Water Branch. The water samples taken for chemical analysis were collected principally by J. P. Akers, J. T. Callahan, G. E. Davis, S. E. Galloway, E. L. Gillespie, H. A. Whitkind, W. F. Hardt, J. H. Irwin, C. A. Repenning, P. R. Stevens, and M. E. Cooley. The geological correlations were made by J. P. Akers and M. E. Cooley. The chemical analyses were typed by Mrs. Ruth Blubaugh and Mrs. Carol Jenkins.

Acknowledgments

The Geological Survey is grateful for the assistance, cooperation, and information given by the late J. J. Schwartz, former head of the Bureau of Indian Affairs water-development program for the Navajo Indians; by M. H. Miller, Bureau of Indian Affairs engineer; by Buster Kingsley, Bureau of Indian Affairs supervisor of the Hopi Indians; and by other personnel of the Bureau of Indian Affairs and the Navajo and Hopi Indian Tribes connected with the well-development program. The hydrologic information given the Geological Survey by the El Paso Natural Gas Co. and various religious missions and trading posts is greatly appreciated. Acknowledgment is due the many water-well drillers who conscientiously collected water samples during the drilling of new wells.

Land-Net System and Location of Wells and Springs

The Navajo and Hopi Indian Reservations are in the south-central section of the Colorado Plateau. The Navajo Indian Reservation occupies parts of Apache, Navajo, and Coconino Counties in

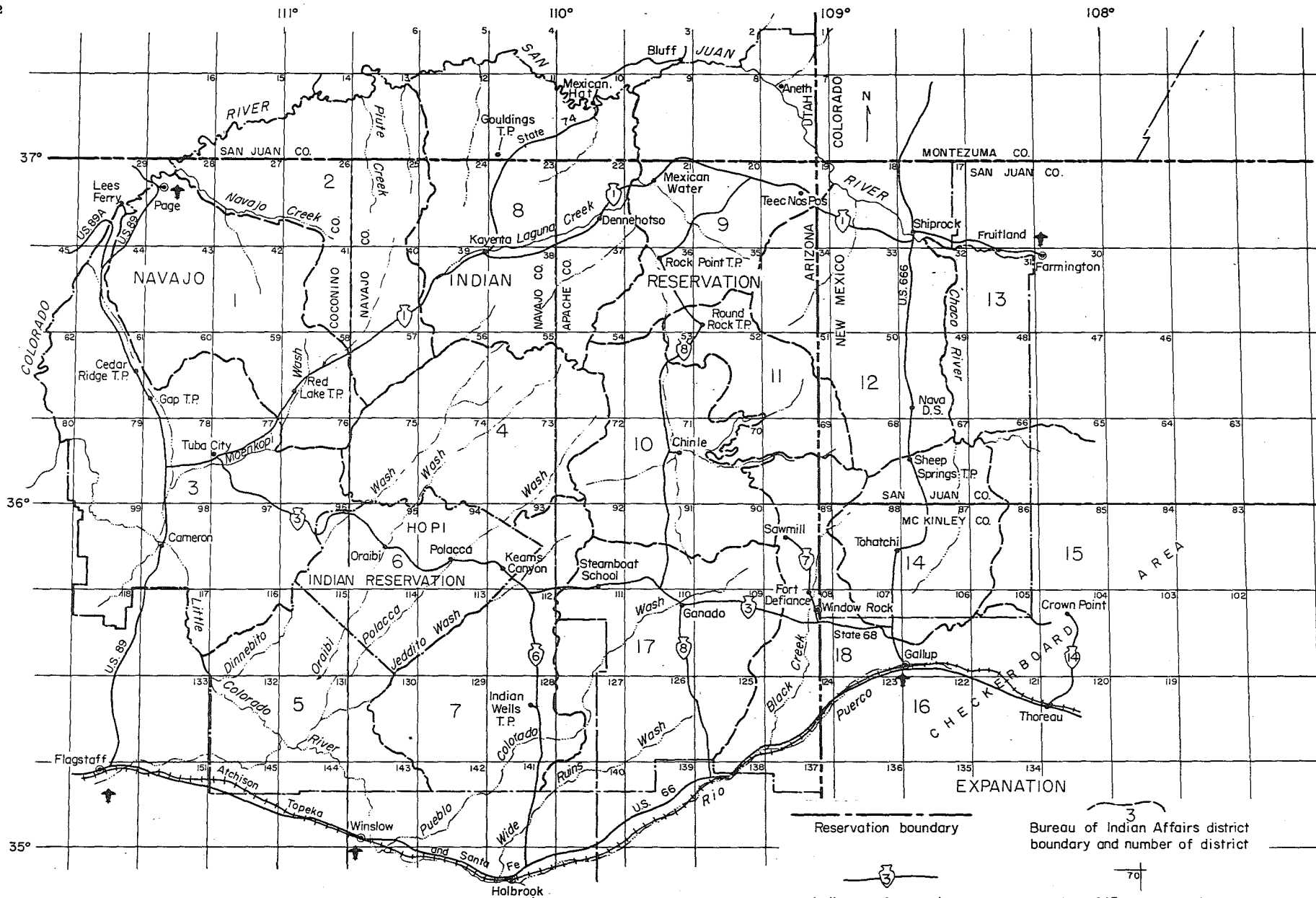


Figure 1.-- Map of the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah, showing roads, villages, Bureau of Indian Affairs district boundaries, and 15 - minute quadrangles.

Reservation boundary

Indian service roads

Air terminal

Bureau of Indian Affairs district boundary and number of district

Number of 15-minute quadrangle

D.S.
Day school

T.P.
Trading Post

10 0 10 20 30 miles

northeastern Arizona, San Juan and McKinley Counties in northwestern New Mexico, and San Juan County in southeastern Utah (fig. 1). The Hopi Indian Reservation is within the central part of the Navajo Indian Reservation in Arizona. The reservations comprise an area of about 25,000 square miles, which is about three times the size of the State of New Jersey.

The Navajo Indian Reservation is divided into 17 administrative districts, numbered 1 to 5 and 7 to 18, and the Hopi Indian Reservation comprises district 6 (fig. 1). District 19 is east of the reservation boundary in New Mexico. The reservations and adjoining area were not mapped in detail at the time of study, but 15-minute planimetric maps of the area had been made from aerial photographs. These maps were used for the geologic and hydrologic base maps and are arbitrarily numbered from 1 to 151, starting in the upper-right corner of the area and numbering consecutively in rows from right to left.

The types of ground-water developments sampled for chemical analysis are principally drilled wells, dug wells, and springs. The type of development and specific location of each are listed only in Part I, "Records of Ground-Water Supplies." The wells and springs are arranged in the numerical order of the 18 administrative districts of the Bureau of Indian Affairs and in accordance with the 15-minute quadrangles within each district. No data are included in this report from district 19, which is outside the reservation boundary in New Mexico.

Quality of the Ground Water

The chemical composition of natural ground water is influenced by its geologic environment, and this relationship between the formation and the chemical composition of its contained water was used by personnel as an aid in identifying strata yielding water to a particular well. The ground water in most of the area is classified as fair to poor and ranges from 500 to 2,000 ppm (parts per million) in dissolved-solids content. Locally, the ground water contains more than 4,000 ppm dissolved solids, but in other areas some water of excellent quality contains less than 250 ppm.

The water-bearing strata are referred to by their standard geologic names and are divided into formations and members. Some aquifers consist of combinations of formations and/or members. Figure 2 lists the stratigraphic names of the rocks that yield water to wells and springs in the Navajo and Hopi Indian Reservations.

There are quality differences from one formation to another and also within the same formation. For example, in some places water from the Coconino Sandstone is too highly mineralized for use. In other places, especially in recharge areas, water of excellent quality is available from the Coconino. In general, the great variation in the quality of the water from the several formations in the Navajo country is caused by the lithologic differences of the rocks, interformational movement between the water-bearing units, and ion exchange along the direction of ground-water movement.

The principal aquifer or aquifers that yield ground water to a development are shown in the "Remarks" column. The depths at which samples of water were taken of stratigraphic units other than the principal aquifer also are shown in this column. Samples obtained during the final bailing or pumping test of the well are indicated by the symbol "D," and those obtained before the well had been drilled to its total depth are indicated by the symbol "ID." Samples collected from a storage tank at

Expression of Results

The chemical analyses list the mineral constituents of the water in parts per million. Parts per million is the measure of the weight of one part of dissolved substance in one million parts of solution; 1 milligram of solute in 1 kilogram of solution. Perhaps some people may be more familiar with data expressed in percentage values, which is the same as parts per hundred. However, the use of percentage values for water analyses involves cumbersome decimals. To convert parts per million to percentage values, multiply parts per million by 10^{-4} or 0.0001. One percent is equivalent to 10,000 ppm. Hardness is often expressed as grains per U.S. gallon. To convert, multiply parts per million hardness by 0.0584.

Some techniques of interpretation require that chemical data be expressed in equivalents per million. Equivalents per million is a unit for expressing the concentration of chemical constituents in terms of the interreacting values of the electrically charged particles, or ions, in solution. One equivalent per million of a positively charged ion will react with one equivalent per million of a negatively charged ion. Parts per million is converted to equivalents per million by multiplying by the reciprocal of the combining weight of the ion as shown below.

<u>Cations</u>	<u>Factor</u>	<u>Anions</u>	<u>Factor</u>
Calcium (Ca ⁺⁺).....	0.04990	Carbonate (CO ₃ ⁻⁻).....	0.03333
Magnesium (Mg ⁺⁺)....	.08226	Bicarbonate (HCO ₃ ⁻)....	.01639
Sodium (Na ⁺).....	.04350	Sulfate (SO ₄ ⁻⁻).....	.02082
Potassium (K ⁺).....	.02557	Chloride (Cl ⁻).....	.02821
		Fluoride (F ⁻).....	.05264
		Nitrate (NO ₃ ⁻).....	.01613

Source and Significance of Chemical Constituents in Water

Pure water probably does not occur naturally and the chemical composition of natural water is variable. Even the purest form—rainwater—contains dissolved gases and small amounts of sodium, chloride, and sulfate ions. The presence of dissolved gases, mainly carbon dioxide, helps the water to extract soluble material from rocks and unconsolidated deposits. The source and significance of the common minerals in ground water in the Navajo and Hopi Indian Reservations are discussed in the following paragraphs.

Silica (SiO₂).--Silicon is found as silica in quartz, chert, and chalcedony or as silicates in feldspar and other minerals. Most of the silica in ordinary water is probably colloidal and does not affect the ionic balance in a water analysis. However, at high pH the silica may be present in the ionized state as calcium silicate. Colloidal silica is a good carrier of other material that may precipitate from solution. Waters high in silica form an exceedingly hard scale on porcelain fixtures, boilers, or other surfaces with which they may come in contact. The ground water of the reservations commonly has more than 15 ppm of silica and the maximum amount analyzed was 63 ppm. High silica content seems to be concentrated in water obtained from the alluvium, Chuska Sandstone, Bidahochi Formation, and volcanic rocks.

SYSTEM	SERIES	<u>ENTIRE AREA</u>		
QUATERNARY		Alluvium Spring deposits Landslide deposits and talus Windblown sands Terrace deposits Volcanic rocks		
TERTIARY	PLIOCENE	Bidahochi Formation Upper member Volcanic member (tuff) Lower member		
	PLIOCENE(?)	Chuska Sandstone		
	PALEOCENE	Nacimiento Formation		
CRETACEOUS	UPPER	<u>BLACK MESA BASIN</u>	<u>SOUTHERN SAN JUAN BASIN</u>	<u>NORTHERN SAN JUAN BASIN</u>
		Yale Point Sandstone Wepo Formation Toreva Formation Upper sandstone member Middle carbonaceous member Lower sandstone member Mancos Shale	Menefee Formation Point Lookout Sandstone Satan Tongue of Mancos Shale Hosta Tongue of Point Lookout Sandstone Cleary Coal Member of Menefee Formation Crevasse Canyon Formation Gibson Coal Member Dalton Sandstone Member Mulatto Tongue of Mancos Shale Bartlett Barren Member Dilco Coal Member Gallup Sandstone Upper part Tongue of Mancos Shale Lower part Mancos Shale	Ojo Alamo Sandstone Kirtland Shale Upper member Farmington Sandstone Member Lower member Fruitland Formation Pictured Cliffs Sandstone Lewis Shale Cliff House Sandstone Menefee Formation Point Lookout Sandstone Mancos Shale (upper part) Gallup Sandstone Mancos Shale (lower part) Dakota Sandstone
	UPPER AND LOWER	Dakota Sandstone Upper member Middle member Lower member	Dakota Sandstone	
	LOWER			Burro Canyon Formation
JURASSIC	UPPER	Cow Springs Sandstone	<u>ENTIRE AREA</u> Morrison Formation Brushy Basin Member Westwater Canyon Member Recapture Shale Member Salt Wash Sandstone Member Summerville Formation Todilto Limestone Entrada Sandstone Upper sandy member Medial silty member Lower sandy member	Bluff Sandstone
	UPPER AND MIDDLE		Carmel Formation	
JURASSIC AND TRIASSIC(?)		Navajo Sandstone		

TRIASSIC(?)	UPPER	Kayenta Formation Moenave Formation Springdale Sandstone Member Dinosaur Canyon Sandstone Member			
TRIASSIC	UPPER	Wingate Sandstone Lukachukai Member Rock Point Member Chinle Formation Church Rock Member Owl Rock Member Petrified Forest Member Upper part Sonsela Sandstone Bed Lower part Monitor Butte Member Lower red member Shinarump Member			
	MIDDLE(?) AND LOWER	<u>SOUTHERN AND SOUTHWESTERN PARTS OF THE RESERVATIONS</u> Moenkopi Formation Holbrook Member Moqui Member Wupatki Member		<u>MONUMENT VALLEY</u> Moenkopi Formation Upper siltstone member Middle sandstone member Lower siltstone member Hoskinnini Member	
TRIASSIC(?)					
PERMIAN		<u>GRAND CANYON</u> Kaibab Limestone Toroweap Formation Coconino Sandstone	<u>DEFIANCE PLATEAU</u> De Chelly Sandstone Upper member Tongue of Supai Formation Lower member	<u>ZUNI MOUNTAINS</u> San Andres Limestone Glorieta Sandstone Yeso Formation Abo Formation	<u>MONUMENT VALLEY</u> Cutler Formation De Chelly Sandstone Member Organ Rock Tongue Cedar Mesa Sandstone Member Halgaito Tongue
CARBONIFEROUS	PERMIAN AND PENNSYLVANIAN	Supai Formation	Supai Formation		Rico Formation
	PENNSYLVANIAN				Hermosa Formation
	MISSISSIPPIAN	Redwall Limestone			Stratigraphic units not listed below the Hermosa Formation
	CAMBRIAN	MIDDLE	Muav Limestone Bright Angel Shale		
MIDDLE AND LOWER		Tapeats Sandstone			
PRECAMBRIAN		Granite	Quartzite and granite	Granite	

Figure 2. --Names of the rocks and sediments of the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah.

Iron (Fe). -- Iron is available from practically all rocks and ground water may contain several parts per million. Upon exposure to air, the iron in water may oxidize and settle out as insoluble ferric hydroxide. Excessive amounts of iron cause an objectionable taste in water and will stain porcelain fixtures and fabrics washed in the water. Iron was recorded in only a few of the chemical analyses and it is listed in the column entitled "Remarks."

Calcium (Ca) and magnesium (Mg). -- Calcium is present in all ground and surface waters of the reservations and is commonly the major cation present. Weathered limestone, dolomite, and rocks cemented by calcium carbonate yield calcium to water. The principal minerals of sedimentary rocks that yield calcium to ground water are gypsum ($\text{CaSO}_4 + 2\text{H}_2\text{O}$), calcite (CaCO_3), and dolomite ($\text{CaMg}(\text{CO}_3)_2$).

Magnesium is abundant in the carbonate rocks (dolomite) and is a typical constituent of some of the silicate minerals, such as olivine, pyroxenes, and micas, which are present as accessory minerals in sedimentary and volcanic rocks of the area. Magnesium usually is present in water in smaller amounts than calcium, but once in solution magnesium does not precipitate as readily as calcium.

The solubility of both calcium and magnesium is increased by the presence of carbon dioxide in the water.

Sodium (Na) and potassium (K). -- All natural waters contain sodium and potassium, which are derived primarily from the weathering of feldspars and evaporites or secondarily from ion-exchange reactions between water and clay materials as ground water moves through sedimentary rocks. If large amounts of both ions are dissolved in the water, sodium will normally be present in much greater quantities than potassium. Sodium and potassium go easily into solution, but potassium is soon adsorbed by clays or used in the formation of mica-like minerals. High percentages of sodium give the water the property of softness, which is desirable for domestic supplies but undesirable for irrigation waters. Generally, in this report sodium and potassium are computed as sodium except for those analyses that indicate a significant amount of potassium.

Bicarbonate (HCO_3) and carbonate (CO_3). -- Bicarbonate is the principal negative ion (anion) present in the ground water of the reservations. Ground waters that are in contact only with granitic rocks usually contain less than 50 ppm of bicarbonate, whereas the waters in contact with carbonate rocks or calcareous material of sedimentary rocks contain as much as 1,900 ppm.

Carbonate is present in relatively few natural waters. Theoretically, carbonate may be present only in water with a pH of more than 8.2. Some ground waters contain carbonate and some waters that have been treated with lime also contain carbonate.

Alkalinity in water is caused primarily by the presence of bicarbonates and carbonates, although other ions may also cause alkalinity. The property of alkalinity in water is its ability to neutralize acid.

Sulfate (SO_4). -- The sulfate ion is produced by oxidation during the weathering of sulfide minerals and it is freed also by the weathering of minerals containing sulfate. Sulfate salts of calcium and magnesium cause the formation of hard scale in boilers. The presence of calcium sulfate (gypsum) in

irrigation water is desirable because of the favorable reactions with the soil. In fact, gypsum is often added to irrigation water or soil to prevent formation of "black alkali" or to reclaim alkali lands. Large concentrations of the sulfate ion can be tolerated by stock, unless it is accompanied by a large chloride-ion content. However, magnesium sulfate (Epsom salts) is objectionable in public supplies because of the laxative effect. The sulfate ion is the principal contaminating agent of water in the area.

Chloride (Cl). -- Chloride is present in all natural water and is the most abundant of the halogen group of elements. Sedimentary rocks, especially those containing evaporite minerals, are an important source of chloride, which also occurs as the predominant ion in sea water. Chloride, therefore, may be found in porous rocks inundated by the sea. Within the Coconino Sandstone and sandstone aquifers of the Mesaverde Group, contamination by chloride occurs from intraformational leakage and by downdip movement of the ground water within an aquifer. Sodium is usually associated with large concentrations of chloride in water. Concentrations of more than 200 to 300 ppm of chloride impart a salty taste to the water.

Fluoride (F). -- Fluoride is second to chloride as the most abundant of all the halogens and is usually present in igneous rocks as fluorite. Fluorite is resistant to weathering, but its solubility increases in the presence of carbon dioxide. Fluoride is present in evaporites, in clay and common soil minerals, and in volcanic rocks. Excessive concentrations of fluoride in drinking water are undesirable. According to the California State Water Pollution Control Board, water containing less than 0.9 to 1.0 ppm of fluoride seldom will cause mottled enamel in children and concentrations of less than 3 or 4 ppm are not likely to cause endemic cumulative fluorosis and skeletal effects in adults. Much of the ground water in the reservations has more than 1.0 ppm of fluoride and the maximum reported was 12 ppm.

Nitrate (NO_3). -- Nitrogen in ground water and surface water comes from weathering of rocks and decay and oxidation of organic material. Nitrate nitrogen is the final oxidation product caused by the reaction of bacteria in the decay of plants and animals. Nitrate in the water from shallow dug wells is mainly of organic origin. The occurrence of nitrate in abundance in evaporites is rare. Large amounts of nitrate in drinking water may cause methemoglobinemia in infants (blue babies). It is recommended that waters containing more than 10 to 20 ppm of nitrate, expressed as nitrogen, should not be used for infant feeding (Comly, 1945). The presence of nitrate also may be an indication of pollution by sewage or other organic decomposition. Ordinarily, ground water from deep aquifers does not contain more than a few parts per million of nitrate.

Boron (B). -- Boron occurs in igneous rocks and in sedimentary rocks as borates in marine evaporites, evaporites in closed basins, and evaporites connected with volcanic activity. Marine evaporites contain chiefly magnesium borates, whereas boron in evaporites in closed basins occurs as calcium borate. Volcanic sublimates contain boron as boric acid and various borates. Boron was determined in only a few of the chemical analyses and it is listed in the column entitled "Remarks."

Dissolved solids.--Dissolved solids is the total quantity of dissolved mineral matter in the water. The terms "dissolved solids (D.S.)" and "residue on evaporation at 180°C" are used synonymously in describing the amount of dissolved material in a unit volume of water. Ground water usually contains more dissolved solids than surface water. Part of the material reported as dissolved solids in colored waters is organic matter, which is not shown in the analyses.

Hardness.--Hardness, sometimes called the soap-consuming property of water, is caused mainly by calcium and magnesium. The hardness caused by the calcium and magnesium equivalent of the bicarbonate in water, is called carbonate or temporary hardness. This may be removed by boiling. Other salts of calcium and magnesium cause noncarbonate or permanent hardness. Hardness is a particularly troublesome property, and large sums of money are spent in softening waters for domestic and industrial use.

Percent sodium.--The term "percent sodium" is the ratio of sodium in the water to the total cations expressed as a percentage, with all the ion concentrations expressed as equivalents per million. Percent sodium is calculated as follows:

$$\text{Percent sodium} = \frac{\text{Na}^+}{\text{Na}^+ + \text{K}^+ + \text{Ca}^{++} + \text{Mg}^{++}} \times 100$$

In soils high concentrations of sodium tend to replace calcium and magnesium from the mineral and organic complexes, with the result that the physical properties of the soil are impaired and the soil becomes relatively impermeable.

Sodium-adsorption ratio (SAR).--SAR is a ratio for soil extracts and irrigation waters, used to express the relative activity of sodium ions in exchange reactions with the soil. It is used as an index of the sodium (alkali) hazard of an irrigation water.

Specific conductance.--The specific conductance of water is a measure of its capacity to conduct an electric current. The conductance varies with the concentration of the ions in solution and is a rough measure of the dissolved-solids content of the water.

pH.--The hydrogen-ion concentration of water is expressed in pH units. The pH denotes whether a water is basic or acidic. The pH of pure water is 7.0 and the pH of most natural waters varies from about 6.0 to slightly more than 8.0. However, except for one analysis which has a pH of 3.3, the ground waters in the reservations have pH values that range from 6.6 to 9.5. Waters with pH values less than 7.0 are acidic and tend to be corrosive, whereas waters with pH values more than 7.0 are basic and may form scales in pipes or boilers.

Literature Cited

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SELECTED CHEMICAL ANALYSES OF THE GROUND WATER IN THE NAVAJO AND HOPI INDIAN RESERVATIONS,

ARIZONA, NEW MEXICO, AND UTAH

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah

[Analyses in parts per million, except as indicated. Remarks: D, sample obtained from final bailing or pumping test; ID, sample obtained during drilling; T, sample obtained from storage tank at well; Stratigraphic names are water-bearing strata. Dissolved solids: Sum of determined constituents]

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH	
																Parts per million	Tons per acre- foot	Calcium magne- sium	Non- car- bonate					
DISTRICT 1																								
27	1T-229	5/13/55	D; Navajo	68	12	25	14		10		144	0	15	3	0.2	4.8	155	0.21	120	2	15	0.4	255	7.6
	1A-10	7/29/54	Entrada	66	18	42	10		15		193	0	5.8	8	.2	2.4	196	.27	146	0	18	.5	320	---
28	1K-223	3/10/54	D; Navajo	69	15	27	10		11		126	0	16	8	.6	.2	150	.20	108	6	18	.5	230	---
	1A-92A	6/26/52	Carmel	----	45	68	40		31		284	8	81	20	.7	50	484	.66	334	88	17	.7	739	---
	1A-90	7/27/54	do.	73	18	37	13		15		176	0	17	12	.2	.2	199	.27	146	2	18	.5	334	---
	1A-91	1/26/54	Entrada	----	27	61	13		60		277	0	58	14	.6	33	403	.58	206	0	39	-----	616	---
41	1T-218	4/23/53	T; Navajo	57	13	26	6.3		9.0		122	0	3.7	2.0	.3	3.4	124	.17	91	0	18	.4	198	---
	1T-227	5/10/55	D; Navajo	60	9.4	31	8.5		10		138	0	12	6	.2	.0	145	.20	112	0	16	.4	243	7.7
	1A-17	5/21/52	Carmel	----	14	71	28		102		198	0	224	41	1.5	70	650	.88	292	130	43	2.6	985	---
	1A-18	7/29/54	Alluvium	64	9.7	58	10		31		176	0	63	10	.3	35	304	.41	186	42	27	1.0	482	---
	1A-119	7/ 9/54	do.	59	8.6	86	15		62		208	0	209	14	.4	2.9	500	.68	276	106	33	1.6	783	---
	1A-53	7/29/54	Entrada	60	9.1	75	15		70		250	0	170	12	.6	.6	475	.65	248	44	38	1.9	729	---
42	1A-23	3/22/50	Tongue of Navajo in Kayenta	62	13	20	8.0		16		109	0	9.7	8	-----	7.6	136	.18	83	0	29	.7	224	---
	1K-217	2/22/51	ID, 45 feet; Carmel	----	-----	-----	-----	-----	-----	-----	144	0	-----	49	.5	-----	-----	-----	230	112	-----	-----	664	---
		2/22/51	ID, 75 feet; Carmel	----	-----	-----	-----	-----	-----	-----	189	0	-----	153	.3	-----	-----	-----	774	619	-----	-----	1,720	---
		6/ 3/53	Navajo	66	14	20	8.4		3.7		100	0	3.9	1	.3	5.0	105	.14	84	2	9	.2	172	---
	1K-220	7/21/53	D; Navajo	----	9.5	20	8.2		21		125	0	14	8.5	.4	.3	143	.19	84	0	36	1.0	235	---
	1K-221	8/11/53	do.	65	18	30	8.6		23		153	0	17	7	.2	7.3	186	.25	110	0	31	.9	302	---
	1A-19	7/29/54	Alluvium	71	12	67	10		55		250	0	82	11	.7	23	384	.52	208	3	36	1.6	597	---
	1A-33	7/ 8/54	Carmel	64	25	67	15		32		251	0	43	27	1.5	8.0	342	.47	228	23	24	.9	554	---
	1A-1	3/19/50	do.	45	13	70	33		58		184	0	190	52	.3	15	522	.71	310	159	29	1.4	817	---
	1A-2	3/19/50	do.	54	11	88	45		153		192	0	331	124	.8	71	919	1.25	404	247	45	3.3	1,420	---
	1A-4	7/30/54	do.	70	16	62	20		31		306	0	23	17	.7	3.1	323	.44	236	0	22	.9	541	---
	1A-5	7/30/54	do.	78	13	62	38		83		198	0	154	101	1.0	28	577	.78	310	148	37	2.0	948	---
	1A-5A	7/30/54	do.	78	19	48	17		41		210	0	59	18	.7	23	329	.45	190	18	32	1.3	527	---
	1A-35	7/29/54	Entrada	62	9.4	38	11		49		232	0	31	15	.7	.3	268	.36	140	0	43	1.8	447	---
43	1K-215	8/28/51	D; Navajo	----	12	27	13		1.2		108	0	11	8	.2	14	139	.19	121	32	2	.0	244	---
	Copper Mine Mission	8/25/54	T; Navajo	76	-----	-----	-----	-----	-----	-----	81	0	-----	11	-----	-----	-----	-----	-----	-----	-----	-----	203	---
	1A-106	7/15/54	Navajo	55	-----	-----	-----	-----	-----	-----	57	0	-----	5	-----	-----	-----	-----	-----	-----	-----	-----	181	---
	1A-107	7/15/54	do.	78	-----	-----	-----	-----	-----	-----	68	0	-----	8	-----	-----	-----	-----	70	14	-----	-----	173	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH		
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate						
DISTRICT 1—Continued																									
44	1K-231	7/ /56	D; Navajo	65	12	32	16		6.2		130	0	15	16	0.6	17	179	0.24	146	40	8	0.2	316	6.9	
	1A-112	7/26/54	Navajo	63	-----	-----	-----	-----	-----	-----	150	0	-----	6	.4	.9	-----	-----	116	0	-----	-----	255	---	
58	1K-214	5/27/50	D; Navajo	-----	-----	42	9.8		2.5		148	0	9.3	8	.2	10	155	.21	146	24	4	.1	264	---	
	1K-219	1/13/54	T; Navajo	-----	13	32	6.8		7.6		111	9	6.4	4	.2	7.6	141	.19	108	2	13	.3	228	---	
	1K-225	11/18/54	Navajo	-----	17	54	12		7.4		194	0	25	7	.2	5.4	233	.30	184	25	8	.2	379	7.6	
	1K-228	7/ 9/54	ID, 340 feet; Carmel	61	20	40	7.1		58		220	0	34	26	.4	.5	294	.40	129	0	49	2.2	473	---	
		2/10/55	T; Navajo	-----	-----	-----	-----	-----	-----	-----	93	0	-----	2	-----	2.2	-----	-----	31	0	-----	-----	182	---	
	1A-51	7/ 8/54	Carmel	64	17	112	14		44		480	0	24	9	.4	.5	457	.62	337	0	22	1.0	735	---	
	1A-69	6/24/54	Alluvium	58	16	540	183		352		462	0	2,310	46	.1	20	3,690	5.20	2,100	1,720	27	3.3	4,010	---	
	1A-81	6/24/54	Landslide and talus	65	18	210	233		233		166	0	1,720	37	2.1	5.4	2,540	3.45	1,480	1,350	25	2.6	2,920	---	
	1A-87	8/24/51	Alluvium	-----	16	55	33		90		220	0	202	54	.6	.7	559	.76	272	92	42	2.4	889	---	
	1A-48	7/ 8/54	Entrada	60	19	75	14		40		347	0	28	12	.2	.5	360	.49	244	0	40	1.1	584	---	
	1A-62	6/29/54	Landslide and talus	64	23	53	11		68		307	0	34	26	.6	.2	367	.50	177	0	46	2.2	556	---	
	1A-64	6/24/54	Wepo	65	22	64	14		26		209	0	55	29	.4	2.8	316	.43	217	46	21	.8	522	---	
	1A-66	7/ 2/54	Toreva	61	23	197	37		163		335	0	559	81	.3	32	1,260	1.71	644	369	35	2.8	1,750	---	
	1A-71	6/23/54	Navajo	69	-----	-----	-----	-----	-----	-----	82	0	-----	4.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	183	---
	1A-73	6/24/54	do.	80	23	91	18		93		344	0	126	48	1.0	26	595	.81	301	19	40	2.3	930	---	
	1A-59	6/23/54	do.	78	30	52	8.1		40		221	0	27	27	.6	.5	294	.40	163	0	35	1.3	461	---	
59	1A-160	7/ 8/54	T; Navajo	-----	-----	-----	-----	-----	-----	-----	109	0	-----	10	-----	-----	-----	-----	-----	-----	-----	-----	-----	237	---
	1K-204	10/ 7/50	Navajo	-----	15	24	7.9		6.7		101	0	7.4	6	.2	9.6	127	.17	92	10	14	.3	203	---	
	1K-216	4/22/53	T; Navajo	-----	14	-----	-----	-----	22		124	0	16	4	.2	5.3	-----	-----	81	0	37	1.1	251	---	
	1K-222	4/15/54	D; Navajo	-----	16	-----	-----	-----	12		134	0	11	11	.2	9.0	-----	-----	118	8	19	.5	265	---	
	1K-224	9/19/54	do.	60	-----	-----	-----	-----	-----	-----	134	0	-----	9	-----	9.3	-----	-----	109	0	-----	-----	-----	280	---
	1A-43	7/ 7/54	Entrada	65	19	91	34		49		539	0	9.5	13	1.2	.6	482	.66	367	0	22	1.1	831	---	
	1A-84	7/ 7/54	Navajo	66	8.8	29	3.1		11		60	0	11	9	.2	44	146	.20	85	36	22	.5	237	---	
	1A-86	7/ 7/54	do.	71	14	49	3.1		14		149	0	19	11	.2	10	193	.26	135	13	19	.5	316	---	
60	1A-25	3/22/50	Kayenta and Moenave	62	13	2.2	1.0		154		225	64	24	16	.6	5.7	392	.53	10	0	97	22	651	---	
	1A-115	7/14/54	Navajo	60	14	26	8.1		12		114	0	11	10	.4	6.4	144	.20	98	5	21	.5	236	---	
	1K-202	1/14/54	T; Navajo	-----	9.4	16	8.8		6.4		83	0	8.6	6	.1	4.9	101	.14	76	8	16	.3	172	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH
																Parts per million	Tons per acre-foot	Calcium magnesium	Non-carbonate				
DISTRICT 1—Continued																							
60 con.	1K-203	7/15/54	T; Navajo	---	16	24	6.9	9.9		83	0	14	13	0.4	9.7	135	0.18	88	20	20	0.5	214	---
	1A-114	7/15/54	Navajo	62	13	40	7.8	14		72	0	23	10	.2	80	223	.30	132	73	19	.5	333	---
	1A-116	7/15/54	Alluvium	69	8.7	11	1.4	-----	-----		34	0	-----	5	.6	.4	-----	-----	33	5	-----	-----	101
75	1A-80A	6/25/54	do.	62	18	41	7.2	26		165	0	33	8	.6	7.6	222	.30	132	0	30	1.0	349	---
76	1A-70	7/ 2/54	Navajo	66	20	50	13	30		192	0	53	19	1.0	1.8	282	.38	178	21	27	1.0	450	---
	1A-76	6/25/54	Alluvium	65	15	564	77	105		107	0	1,760	14	.4	15	2,600	3.54	1,720	1,640	12	1.1	2,740	---
	1A-74	6/24/54	Navajo	75	15	57	3.1	11		184	0	14	3	.6	10	204	.28	154	4	14	.4	328	---
	1A-75	6/25/54	do.	67	15	135	30	117		199	0	496	22	.9	3.3	917	1.25	460	298	36	2.4	1,240	---
	1A-82	6/25/54	Alluvium	85	17	20	3.1	133		205	0	156	13	.6	1.4	445	.61	62	0	82	7.3	676	---
	1A-83	6/25/54	Navajo	85	10	19	1.6	30		88	0	36	3	1.0	5.1	149	.20	54	0	55	1.8	230	---
DISTRICT 2																							
13	2A-28	7/29/54	Kayenta	63	14	30	9.5	6.4		128	0	11	5.0	0.4	4.2	144	0.20	114	9	11	0.3	240	---
14	2A-96	7/10/48	Alluvium	56	20	66	27	14		335	0	16	10	.0	.1	318	.43	276	1	10	.4	536	---
	2A-104	9/11/53	Navajo	70	29	62	17	6.4		257	0	15	8	.2	.9	264	.36	224	14	6	.2	433	---
	2A-106	9/ 4/53	Landslide and talus	47	18	29	8.2	3.4		122	0	6.0	4	.2	2.0	131	.18	106	6	7	.1	212	---
	2A-106A	9/ 4/53	do.	50	19	68	20	7.8		304	0	7.2	8	.2	.2	279	.28	252	2	6	.2	476	---
	2GS-14-3	9/ 2/53	Wingate (Lukachukai)	60	-----	-----	-----	-----	-----	190	0	-----	10	-----	-----	-----	-----	162	6	-----	-----	341	---
	2GS-14-4	9/ 2/53	do.	55	-----	-----	-----	-----	-----	170	8	-----	10	-----	-----	-----	-----	160	8	-----	-----	320	---
	2A-101	9/10/53	Navajo	65	24	84	22	6.9		366	0	5.4	6	.2	.8	329	.45	300	0	5	.2	329	---
	2A-111	9/11/53	do.	72	17	43	23	13		232	0	22	11	.2	.4	244	.33	202	12	12	.4	418	---
	2A-111A	9/11/53	do.	70	14	42	22	13		234	0	18	9	.2	.8	234	.32	196	4	13	.4	408	---
	2GS-14-1	9/13/53	do.	64	12	25	15	12		158	0	10	6	.2	1.9	160	.22	124	0	18	.5	274	---
2GS-14-2	9/ 2/53	Wingate (Lukachukai)	60	17	47	18	6.9		220	0	12	9	.2	.9	219	.30	192	11	7	.2	373	---	
25	2K-305	9/18/52	Navajo	58	-----	-----	-----	-----	-----	194	0	-----	3	-----	-----	-----	-----	145	-----	-----	-----	311	---
		1/20/54	T; Navajo	32	15	66	8.7	3.2		224	0	13	4	.4	5.2	226	.31	200	17	3	-----	384	---
	2A-32	7/28/54	Navajo, Kayenta	74	15	27	2.6	8.0		95	0	4.1	8	.2	1.4	113	.15	78	0	18	.4	182	---
	2A-35	6/ 4/53	T; Navajo	51	15	23	2.4	2.1		72	0	9.3	1	.4	1.5	90	.12	68	8	6	-----	135	---
	2A-130	7/21/54	Navajo	65	11	29	1.4	12		105	0	4.5	9.5	.2	.6	120	.16	78	0	25	.6	199	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH
																Parts per million	Tons per acre-foot	Calcium-magnesium	Non-carbonate				
DISTRICT 2—Continued																							
26	2A-93	3/24/55	Iron (Fe) total 1.7; Wingate (Lukachukai)	57	12	38	19	12	1.5	165	0	23	18	0.1	18	223	0.30	173	38	13	0.4	391	7.8
	2T-316	8/18/54	Wingate (Lukachukai)	---	11	28	14		37	180	0	17	19	1.2	15	231	.31	128	0	38	1.4	403	---
	2A-107	9/ 3/53	Navajo	60	15	28	11		2.1	127	0	6.8	5	.1	1.0	131	.18	115	11	4	.1	227	---
	2A-108	7/22/54	Wingate (Lukachukai)	62	21	24	6.9		6.2	102	0	8.0	5.5	.4	1.5	124	.17	88	5	13	.3	192	---
40	2K-300	4/23/53	T; Navajo	---	14	39	6.2		3.0	128	0	9.7	5.0	.2	8.4	148	.20	123	18	5	.1	252	---
	2K-301	1/28/54	do.	---	11	32	4.7		6.9	118	0	8.0	2	.2	7.5	130	.18	100	3	13	.3	201	---
	2K-302	10/15/51	D; Navajo, Wingate (Lukachukai)	56	12	48	6.3		.2	152	0	8.6	4	.4	7.8	162	.22	146	22	0	.0	270	---
	2K-318	10/ /54	D; Navajo	---	---	---	---	---	---	161	0	---	8	---	5.4	---	---	128	0	---	---	303	---
	2K-320	3/15/56	Navajo and Wingate (Lukachukai)	56	17	28	5.3		18	126	0	13	10	.2	2.7	157	.21	94	0	29	.8	250	8.2
	2T-304	9/18/51	Navajo	57	14	31	5.4		6.4	113	0	11	4	.2	4.6	133	.18	100	7	12	.3	219	---
	Shonto 1	10/11/49	Alluvium	52	18	44	7.6		9.9	146	0	14	14	.0	11	190	.26	141	22	13	.4	317	---
	2A-40A	8/ 6/54	Navajo	64	15	32	3.7		8.5	119	0	4.7	5.5	.2	3.3	132	.18	95	0	16	.4	209	---
	2A-41	8/ 6/54	do.	71	---	---	---	---	---	253	5	---	12	---	---	---	---	---	---	---	---	471	---
	2C-14	8/ 7/54	do.	70	8.7	26	1.2		4.1	84	0	6.0	2	.2	.5	90	.12	70	1	11	.7	146	---
	Shonto 2	3/20/50	do.	54	27	59	23		17	294	0	17	14	.4	.9	303	.41	242	0	14	.5	501	---
41	2A-13	3/20/50	T; Navajo	---	14	45	8.8		3.2	146	0	11	9	.0	15	178	.24	148	29	5	.1	299	---
	2K-303	8/30/51	D; Navajo	---	15	40	5.9		8.5	150	0	6.0	7	.2	4.4	161	.22	124	2	13	.3	267	---
	2K-319	9/ 3/54	Navajo	---	---	---	---	---	---	150	0	---	8	---	---	---	---	---	---	---	---	261	---
	2T-317	5/23/52	do.	---	13	41	7.0		3.4	127	0	12	8	.1	13	160	.22	132	28	5	.1	267	---
	2A-26	5/18/55	Iron (Fe) total 0.00; Navajo	62	6.7	24	3.2	2.6	4.0	84	0	8.1	2.8	.1	3.8	96	.13	73	4	7	.1	162	8.2
	2A-124	7/27/54	Navajo	75	21	66	14		17	272	0	21	6	1.0	2.9	283	.38	222	0	14	.5	459	---
	2GS-41-1	7/27/54	-----	76	15	68	18		16	307	0	9.3	10	.6	3.3	291	.40	244	0	13	.5	509	---
57	2A-4	4/28/55	Landslide and talus	44	14	48	14		34	228	0	44	12	.5	.2	279	.38	178	0	29	1.1	465	7.5
	2A-10	4/28/55	do.	46	---	---	---	---	---	267	0	---	26	---	2.1	---	---	112	0	---	---	685	7.6
	2A-11	4/28/55	do.	51	14	48	12		65	242	0	72	24	.6	1.1	356	.48	170	0	45	2.2	582	7.4
	2A-56	8/11/54	Toreva	71	17	298	96		149	241	0	1,200	10	.6	.3	1,890	2.57	1,140	940	22	1.9	2,250	---
	2C-2	4/28/55	Landslide and	50	17	81	22		88	234	0	243	23	1.4	2.8	593	.81	292	101	39	2.2	892	7.7

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH
																Parts per million	Tons per acre-foot	Calcium-magnesium	Non-carbonate				
DISTRICT 3																							
29	3A-189A	4/30/52	Chinle (Shinarump)	---	12	21	12	23		135	0	16	15	0.3	4.5	171	0.23	102	0	33	1.0	290	---
	Lees Ferry	1/ / 52	Chinle	---						177	12		56	.2				74	0			725	---
44	3A-187	4/30/52	Alluvium	---	11	360	183	144		165	0	1,670	52	.4	20	2,520	3.43	1,650	1,520	16	1.5	2,860	---
	3A-188	4/30/52	Moenkopi	---	11	536	193	225		261	0	2,240	48	.6	6.8	3,390	4.61	2,130	1,920	19	2.1	3,660	---
59	3K-313	4/20/55	Tongue of Navajo in Kayenta	56						115	0		10	.3	5.9			83	0			242	7.4
	3K-324	3/ 3/55	D; Navajo	60						175	0		9					145	2			329	7.5
60	3K-316	1/10/52	do.	58	12	22	4.3	43		133	0	16	10	.3	33	207	.28	72	0	57	2.2	321	---
	3K-317	1/14/54	T; Navajo	---	17	26	7.9	15		124	0	12	9	.3	3.0	145	.20	98	0	25	.7	250	---
	Gap T. P. 1	2/10/55	D; Chinle (Shinarump)	---	11	40	25	303		648	0	259	38	1.6	4.5	1,000	1.36	203	0	76	9.2	1,530	---
	3A-184 and 184A	9/27/49	Alluvium	64	18	9.2	4.5	231		481	0	89	20	1.4	31	641	.87	42	0	92	16	1,000	---
	3A-194	7/15/54	Navajo	68	18	29	7.4	12		120	0	11	9	.4	8.1	154	.21	103	4	21	.5	251	---
	3A-209	9/27/49	Alluvium	68	20	12	6.2	218		464	0	88	22	1.8	28	625	.85	56	0	90	13	975	---
61	3A-183	9/27/49	do.	69	13	4.8	4.8	347		654	0	180	19	2.7	35	928	1.26	32	0	96	27	1,440	---
76	3K-330	6/22/55	D; Navajo	64	17			232		183	0	337	22	.3	.4			30	0	94	18	1,090	8.0
	3M-156	1/27/55	T; Entrada and Carmel undiff., Navajo	---	13	1.6	.4	221		225	44	119	68	3.0	.1	581	.79	6	0	99	41	965	---
	3M-159	7/ 8/54	Entrada and Carmel undiff.	66	30	93	49	124		172	0	430	72	2.1	16	903	1.23	434	292	39	2.6	1,320	---
77	3K-312	11/ 3/53	T; Navajo	---	11	30	5.0	50		176	0	47	6.0	.6	1.7	238	.32	96	0	53	2.2	387	---
	3K-318-1	5/16/52	Tongue of Navajo in Kayenta	61	14	23	4.9	10		95	0	8.3	6.0	.1	5.8	119	.16	78	0	22	.5	192	7.3
	3K-318-2	4/ 2/53	do.	62	13	22	5.0	12		92	0	10	6	.2	7.0	120	.16	76	0	25	.6	193	---
	3K-323	10/13/54	D; Navajo	---						135	0		8.5		7.6			108	0			252	---
	3K-325	6/ 1/55	do.	57	13	42	9.5	26		139	0	50	17	.8	10	236	.32	143	29	28	.9	391	7.5
	3K-329	7/19/55	do.	62	12	67	24	46		240	0	147	9	.6	2.6	426	.58	266	69	27	1.2	666	7.6
	3T-322-1	2/ 2/54	Tongue of Navajo in Kayenta	60						96	0		6									197	---
	3T-322-2	2/ 2/54	do.	60						96	0		6									199	---
	3GS-77-5	9/15/54	do.	76	13	11	6.0	77		174	0	36	24	.6	4.4	258	.35	52	0	76	4.6	423	---
	Rare Metals Corp. 1	4/11/55	Navajo, tongue of Navajo in Kayenta	61		25	6.4			115	0		6		11			89	0			246	7.8
	Rare Metals Corp. 2	9/20/55	do.	60	13	29	9.0	29		159	0	13	12	.3	12	168	.23	110	0	36	1.2	268	7.3

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH	
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate					
DISTRICT 3—Continued																								
77 con.	3A-5A	2/27/48	Navajo	60	---	---	---	---	---	117	0	---	6.0	---	---	---	---	---	---	---	---	---	227	---
	3A-15	7/ 7/54	do.	67	22	77	16	158	---	204	0	202	136	1.6	36	749	1.02	258	91	57	4.3	1,180	---	
	3A-17	3/ 9/55	Iron (Fe) total 0.00; tongue of Navajo in Kayenta	55	16	31	5.8	111	2.2	220	0	68	3.1	.6	62	436	.59	102	0	70	4.8	678	8.0	
	3A-18	2/26/48	Navajo	61	---	24	5.1	12	---	102	0	10	5.0	.4	6.4	113	.15	81	0	24	.6	196	---	
	3A-89	6/24/54	do.	70	18	48	9.1	39	---	220	0	30	20	.6	.8	274	.37	158	0	35	1.3	445	---	
	3A-144	7/17/54	do.	72	16	26	6.2	79	---	182	0	60	29	.6	9.7	316	.43	90	0	79	3.6	515	---	
	3B-270	2/22/51	Tongue of Navajo in Kayenta	57	15	23	3.9	37	---	139	5	14	10	.2	4.3	180	.24	74	0	53	1.9	277	---	
	3GS-77-1	9/ 6/51	Navajo	---	18	58	10	50	---	200	0	37	64	.4	.2	337	.46	186	22	37	1.6	576	---	
	3GS-77-2	10/ 6/50	do.	---	13	---	---	---	---	99	0	---	8.0	.2	6.5	---	---	88	7	---	---	216	---	
	3GS-77-3	2/26/48	do.	60	---	---	---	---	---	100	0	---	8.0	---	---	---	---	---	---	---	---	210	---	
	3GS-77-6	5/16/52	Tongue of Navajo in Kayenta	---	13	21	6.1	17	---	112	0	10	6	.2	5.2	134	.18	78	0	33	.9	222	---	
	3A-5	2/27/48	Navajo	60	---	26	4.9	12	---	94	0	13	5.0	.2	16	123	.17	85	8	23	.6	199	---	
78	3T-222	5/ 9/55	Iron (Fe) total 0.00; Navajo, tongue of Navajo in Kayenta	61	13	22	4.4	8.9	2.2	90	0	9.1	4.5	.1	6.4	115	.16	73	0	20	.5	188	8.2	
	3A-48	9/27/49	Alluvium	71	25	40	20	199	---	426	0	179	50	1.3	5.7	730	.99	182	0	70	6.4	1,140	---	
	3A-201	9/27/49	do.	70	19	9.8	6.0	311	---	674	0	115	30	1.9	6.5	831	1.13	49	0	93	19	1,300	---	
	3A-43A	4/ 4/52	Tongue of Navajo in Kayenta	---	---	---	---	---	---	117	0	---	60	---	---	---	---	146	0	---	---	489	---	
	3A-44	4/ 4/52	do.	---	14	39	18	73	---	169	0	72	82	.2	.1	381	.52	172	33	48	2.4	679	---	
	3A-44A	4/ 4/52	do.	---	14	42	16	43	---	123	0	52	72	.2	8.4	309	.42	171	70	35	1.4	543	---	
	3A-45	4/ 5/52	do.	---	20	9.5	4.5	253	---	597	0	41	40	1.0	.5	664	.90	46	0	93	17	1,060	---	
	3A-46	2/25/48	do.	60	---	16	7.8	27	---	132	0	9.1	6.0	.6	3.3	135	.18	72	0	45	1.4	228	---	
	3A-202	4/ 4/52	Moenave	---	---	---	---	---	---	222	0	---	51	---	---	---	---	12	0	---	---	602	---	
	3A-203	4/ 4/52	Chinle (Owl Rock)	---	---	---	---	---	---	229	0	---	57	---	---	---	---	8	0	---	---	632	---	
	3A-204	4/ 5/52	Tongue of Navajo in Kayenta	---	14	9.8	4.0	160	---	298	0	50	61	.8	6.4	453	.62	41	0	89	11	749	---	
	3A-206	4/ 4/52	Navajo	---	---	---	---	---	---	237	0	---	61	---	---	---	---	10	0	---	---	658	---	
	3B-267	5/ 1/52	Tongue of Navajo in Kayenta	---	---	---	---	---	---	137	0	---	6	---	---	---	---	---	---	---	---	274	---	
	3GS-78-1	9/ 6/51	Navajo	40	22	34	14	52	---	192	0	41	38	.6	1.0	298	.41	142	0	44	1.9	491	---	
				---	---	---	---	707	---	622	0	165	1,120	.2	1.1	2,560	3.48	725	216	68	11	4,500	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH
																Parts per million	Tons per acre-foot	Calcium-magnesium	Non-carbonate				
DISTRICT 3—Continued																							
96	3A-153	9/28/49	Navajo and tongue of Navajo in Kayenta	61	16	23	7.3	56		152	0	50	22	0.6	0.8	251	0.34	88	0	58	2.6	405	---
	3K-311	7/ 4/51	Entrada and Carmel undiff., Navajo	----	9.7	7.5	2.4	365		220	0	223	284	3.0	1.2	1,000	1.36	28	0	97	30	1,720	---
	3K-320	4/28/55	Navajo	54	14	43	13	49		204	0	77	12	1.0	.8	310	.42	161	0	40	1.7	505	8.0
	3K-332	5/ 3/55	do.	63	-----	-----	-----	-----	-----	327	38	-----	13	.8	-----	-----	-----	58	0	-----	-----	789	9.1
	3M-175	5/16/52	do.	----	12	20	6.3	77		197	0	62	10	.7	.5	286	.39	76	0	69	3.8	461	---
	3M-176	7/ 3/51	do.	----	18	2.5	1.6	167		238	16	119	20	.6	.2	462	.63	12	0	97	21	732	---
	3M-170	7/ 4/51	Toreva	----	-----	-----	-----	-----	-----	290	0	-----	18	-----	-----	-----	-----	-----	-----	-----	-----	699	---
	3M-172	5/16/52	Alluvium	----	10	174	29	38		214	0	416	16	.7	2.3	791	1.08	553	378	13	.7	1,130	---
97	3A-27	5/14/52	Navajo	----	12	58	16	29		146	0	132	10	.6	.8	330	.45	210	91	23	.9	518	---
	3A-28	7/ 3/51	do.	----	12	35	7.4	116		169	0	199	17	.6	.3	470	.64	118	0	68	4.7	732	---
	3A-149	9/28/49	do.	61	12	29	10	72		160	0	121	8	.5	.7	332	.45	114	0	58	2.9	522	---
	3A-151	7/ 3/51	do.	----	13	5.8	2.1	95		153	0	71	20	.4	.3	283	.38	23	0	90	8.6	451	---
	3K-326	5/25/55	D; Navajo	60	15	117	33	161		122	0	623	19	.7	.3	1,030	1.40	428	328	45	3.4	1,410	7.8
	3K-328	5/16/55	do.	62	13	133	41	30		137	0	406	21	.3	.0	711	.97	500	388	11	.6	989	7.6
	3A-26A	7/ 7/54	Navajo	85	18	23	2.9	21		103	0	20	5	.4	2.0	143	.19	70	0	40	1.1	221	---
	3A-30	7/14/54	Chinle (Owl Rock)	65	9.1	40	30	1,310		240	0	835	1,340	2.7	129	3,810	5.18	224	27	93	38	6,190	---
98	3K-331	4/ 5/55	D; Kaibab	62	9.1	95	63	927		265	0	250	1,440	.5	3.8	2,920	3.97	496	279	80	18	5,180	7.3
	Cameron 1	8/19/49	Moenkopi	66	9.0	37	51	98		358	0	151	43	1.7	.2	567	.77	202	8	41	2.5	936	---
	Cameron 2	4/20/51	Kaibab, Toroweap, and Coconino	----	13	118	61	973		300	0	258	1,520	.3	1.9	3,090	4.20	546	300	79	18	5,480	---
	Rare Metals test hole	2/17/55	D; Chinle (Shinarump)	----	16	11	6.2	589		591	0	305	375	-----	4.2	1,600	2.18	53	0	96	35	2,580	---
	3A-61	7/14/54	Alluvium	77	31	133	16	41		108	0	366	6	.5	8.8	655	.89	398	310	18	.9	871	---
	3A-39	7/14/54	Chinle (Owl Rock)	77	25	4.4	2.4	199		326	6	37	95	1.2	2.6	533	.72	21	0	95	19	879	---
	3A-58	8/19/49	Volcanic	64	25	57	30	30		195	0	134	10	.5	20	403	.55	266	106	20	.8	602	---
116	3A-155	7/ 9/54	Chinle (Owl Rock)	72	18	7.1	3.3	303		487	5	132	96	2.4	3.4	809	1.10	31	0	96	24	1,310	---
117	3A-35	7/13/54	Terrace	72	21	18	4.2	276		339	0	255	77	3.6	.3	822	1.12	62	0	91	15	1,290	---
	3GS-117-1	2/ 3/54	do.	44	15	18	4.2	161		275	0	136	26	2.4	2.1	500	.68	62	0	85	8.8	805	---

DISTRICT 4

55	4K-382	6/26/53	D; Toreva	----	22	174	58	54		147	0	605	22	0.3	8.3	1,020	1.39	672	552	15	0.9	1,330	---
	4K-389	7/ /56	D; Wepo	----	13	429	514	1,000		196	0	4,850	106	1.5	.3	7,010	9.53	3,180	3,020	41	7.7	7,270	6.6
		7/17/56	Wepo	----	8.4	79	50	197		408	0	447	18	2.1	.0	1,000	1.36	402	68	52	4.3	1,450	7.4

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH
																Parts per million	Tons per acre-foot	Calcium magnesium	Non-carbonate				
DISTRICT 4—Continued																							
56	4K-380	2/28/52	D; Wepo, Toreva	61	6.1	17	4.7	258		457	0	205	22	1.6	0.2	740	1.01	62	0	90	14	1,160	---
	4M-27	10/27/54	Alluvium	----	13	60	17	41		142	17	135	15	.8	.5	369	.50	220	76	29	1.2	562	---
	4M-28	10/27/54	do.	----	14	116	35	97		260	0	382	13	1.1	16	802	1.09	434	220	33	2.0	1,120	---
57	4K-387	1/ 5/55	D; Dakota, Cow Springs	----	6.2	5.2	2.6	389		363	0	226	233	2.4	1.0	1,040	1.41	24	0	97	35	1,720	---
	4K-349	10/28/54	Landslide and talus	56	20	72	24	115		286	0	239	26	2.0	1.6	641	.87	278	44	47	3.0	942	---
	4M-61	10/28/54	Toreva	55	15	150	62	55		268	0	496	7	.5	1.0	918	1.25	630	410	16	.9	1,230	---
	4M-60	10/28/54	do.	----	21	59	15	32		118	6	126	21	.6	11	350	.48	208	102	25	1.0	530	---
72	4K-388	9/29/54	D; Morrison, Cow Springs	56	-----	-----	-----	-----		471	0	-----	9	.4	.1	-----	-----	415	29	-----	-----	1,210	---
	4R-21	5/ 5/50	T; Morrison, Cow Springs	----	8.4	119	51	360		526	0	746	12	.3	80	1,640	2.23	506	76	61	7.0	2,220	---
	4T-386	10/ 6/54	do.	----	15	349	164	166		470	0	1,430	23	.3	.2	2,380	3.24	1,550	1,160	19	1.8	2,710	---
	4M-195	10/ 6/54	Landslide and talus	62	-----	397	202	-----	-----	268	0	-----	22	1.0	3.6	-----	-----	1,820	1,600	-----	-----	3,340	---
	4R-17	10/20/54	do.	51	12	457	559	847		366	0	4,710	50	1.3	3.6	6,820	9.28	3,440	3,140	35	6.3	6,890	---
73	4K-300A	11/20/50	Toreva	56	14	34	19	176		290	0	281	9	.6	2.2	679	.92	163	0	70	6.0	1,020	---
	4K-300B	11/20/50	do.	56	13	36	18	201		298	0	330	8	.6	2.0	756	1.03	164	0	73	6.8	1,120	---
	4K-379	10/ 6/54	T; Morrison, Cow Springs	----	6.7	7.9	1.5	534		272	0	887	27	.8	.1	1,600	2.18	26	0	98	46	2,310	---
	4K-381	6/ /52	ID, 95 feet; alluvium	----	29	226	81	141		604	0	623	14	.7	47	1,460	1.99	897	402	25	2.0	1,940	---
		6/17/52	D; Dakota	----	8.5	22	6.3	703		286	0	1,270	34	1.5	.2	2,190	2.98	81	0	95	34	3,060	---
	4M-4	10/ 5/54	Dakota, Cow Springs	63	9.2	12	3.1	686		300	0	1,170	45	2.2	1.0	2,080	2.83	42	0	97	46	2,930	---
	4M-43	11/ 2/50	Toreva	----	12	222	70	39		442	0	526	12	.2	.4	1,100	1.50	842	480	9	.6	1,490	---
	4M-95	11/ 3/50	do.	----	11	93	38	55		329	0	220	6	.3	.2	586	.80	388	118	24	1.2	892	---
	4M-201	11/ 3/50	do.	----	10	72	37	54		244	0	227	7	.3	1.3	529	.72	332	132	26	1.3	802	---
	4R-26	5/ 5/50	T; Morrison, Cow Springs	----	10	2.5	2.0	494		324	24	718	21	1.5	.7	1,430	1.94	14	0	99	57	2,130	---
	4R-27	5/ 5/50	Dakota	57	8.7	5.5	2.3	525		372	0	777	27	3.9	1.3	1,530	2.08	23	0	98	48	2,260	---
	4T-385	11/ 1/54	D; Dakota	----	9.7	9.5	3.8	424		532	0	422	53	3.5	1.2	1,190	1.62	39	0	96	29	1,800	---
	Pinon 3	7/14/53	Toreva	----	12	110	47	61		327	0	306	10	.1	.8	708	.96	468	200	22	1.2	1,010	---
	Pinon 4	8/16/51	D; Toreva	56	12	94	42	63		285	0	278	13	.8	1.2	644	.88	407	174	25	1.4	958	---
	4M-70	5/ 5/50	Landslide and talus	54	18	58	19	122		241	0	251	18	1.2	.7	607	.83	222	25	54	3.6	912	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
DISTRICT 4—Continued																							
73 con.	4R-12	10/ 6/54	Toreva	58	17	67	17	22		254	0	39	23	0.6	1.6	312	0.42	237	29	17	0.6	519	---
		4GS-73-3	10/ 8/54	Landslide and talus	----	23	95	24	196		308	0	396	64	1.5	3.8	954	1.30	336	83	56	4.7	1,390
74	4M-87	8/ 5/52	Toreva	74	14	47	10	17		180	0	20	6	.4	22	225	.31	158	11	19	.6	375	---
	4M-89	8/ 1/52	Wepo	73	30	141	62	295		500	0	777	18	.4	3.9	1,570	2.14	607	198	51	5.2	2,100	---
	4M-101	11/ 3/50	Toreva	----	15	82	31	150		479	0	241	9	.4	1.3	766	1.04	332	0	50	3.6	1,140	---
	4M-103	8/ 1/52	Wepo	68	18	56	13	34		228	0	38	28	.2	1.3	300	.41	193	6	28	1.1	496	---
	4M-105A	8/ 1/52	do.	69	18	37	19	27		184	0	38	11	.2	1.3	262	.36	170	20	25	.9	418	---
	4M-109	10/27/54	do.	59	15	38	14	52		232	0	37	22	.6	5.8	298	.41	152	0	43	1.8	499	---
	4M-116	10/27/54	do.	47	20	46	18	28		231	0	32	15	.4	5.9	279	.38	189	0	24	.9	468	---
	4M-115	10/26/54	do.	61	23	28	9.5	20		148	0	11	12	.4	.6	178	.24	109	0	28	.8	287	---
	4M-187	10/27/54	do.	56	13	37	7.6	18		154	0	20	10	.4	.6	183	.25	124	0	24	.7	310	---
	75	4K-377	8/ 2/52	do.	79	12	27	9.0	77		238	0	61	8	.2	1.6	313	.43	104	0	62	3.3	502
4K-383		11/20/54	D; Toreva	----	10	13	4.8	116		287	0	50	11	.8	.5	347	.47	52	0	83	7.0	564	---
4K-384		1/19/55	do.	58	9.1	12	3.4	158		395	0	44	12	.4	.3	433	.59	44	0	89	10	704	---
4M-128A		8/ 1/52	T; Toreva	----	20	32	17	164		442	0	126	8	.4	1.0	586	.80	150	0	70	5.8	906	---
4M-128B		10/29/54	Toreva	58	8.3	2.8	1.2	119		253	0	32	6	.6	.2	314	.43	12	0	96	15	514	---
4T-378		10/29/53	T; Toreva	----	18	68	26	138		342	0	264	13	.6	1.1	697	.95	276	0	52	3.6	1,040	---
4M-137		10/28/54	Alluvium	59	14	12	5.3	110		255	0	62	10	.6	1.9	341	.46	52	0	82	6.6	560	---
4M-142		10/29/53	Wepo	----	18	86	12	20		250	12	29	21	.4	26	347	.47	264	40	14	.5	560	---
4M-143		10/28/54	do.	56	19	86	28	14		415	0	6.5	8	.4	.6	367	.50	330	0	8	.3	643	---
4M-128		8/ 1/52	do.	70	17	46	11	51		137	0	91	32	.4	22	337	.46	160	48	41	1.7	541	---
4M-139	10/28/54	Toreva	54	20	42	16	59		241	0	65	15	1.2	12	349	.47	171	0	43	1.9	551	---	
4M-149	10/29/54	do.	59	14	20	5.7	15		85	0	19	7.5	.4	6.1	130	.18	74	4	31	.8	219	---	
93	4M-79	5/ 5/50	Dakota, Cow Springs	59	9.6	3.2	1.6	410		476	24	395	38	3.9	.2	1,120	1.52	14	0	98	47	1,720	---
	4M-77	10/27/54	Landslide and talus	58	21	41	7.9	32		186	0	29	13	.8	.5	236	.32	135	0	34	1.2	381	---

DISTRICT 5

115	5K-307	5/13/54	T; alluvium	----	16	262	146	865		182	0	2,240	210	1.4	439	4,270	5.81	1,250	1,100	60	11	5,150	---
	5M-1	5/13/54	Alluvium	67	14	-----	-----	78		128	0	240	30	.2	12	-----	-----	237	132	42	2.2	762	---
	5M-4	5/13/54	Navajo	68	17	-----	-----	31		154	0	139	10	.4	.2	-----	-----	270	144	31	.8	639	---
	5M-73	5/13/54	Alluvium	68	16	200	27	96		165	0	614	28	.1	5.5	1,070	1.46	610	475	25	1.7	1,390	---
116	5M-68	5/14/54	Chinle (Petrified Forest)	68	36	12	4.2	835		1,150	462	100	26	3.0	1.1	2,050	2.79	48	0	97	53	3,260	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH
																Parts per million	Tons per acre-foot	Calcium-magnesium	Non-carbonate				
DISTRICT 5—Continued																							
116 con.	5M-74	6/ 9/51	Moenkopi	---	15	39	11	158		292	0	189	25	1.6	14	597	0.81	142	0	71	5.8	924	---
	5M-75	5/14/54	Terrace	67	20	20	5.2	115		267	0	74	13	1.8	2.8	383	.52	72	0	78	5.9	603	---
130	5T-308	3/17/52	D; Moenkopi and Kaibab, Coconino	64	13	213	62	4,330		326	8	728	6,500			12,000	16.3	786	506	92	67	19,300	---
	5K-12	9/ 7/50	Alluvium	61	18	10	5.0	105		229	0	44	13	1.2	24	333	.45	46	0	83	6.8	522	---
	5M-31	5/14/54	T; alluvium	---	8.0	8.0	9.2	807		470	67	476	425	11	237	2,280	3.10	58	0	97	46	3,620	---
	5M-54	5/13/54	Alluvium	60	6.1	14	7.2	476		634	11	364	125	2.3	.5	1,320	1.80	64	0	94	26	2,060	---
131	5K-322	9/13/55	do.	64	---	---	---	796		194	0	2,040	355	.8	5.5	---	---	1,060	901	62	11	4,680	7.4
	Leupp	9/ 7/50	do.	60	19	96	35	414		329	0	213	560	.4	2.5	1,500	2.04	384	114	70	9.2	2,600	---
	Sunrise T. P.	9/ 8/50	T; Kaibab	---	11	102	59	192		250	0	262	308	.2	1.3	1,060	1.44	497	292	46	3.7	1,770	---
	5K-302	5/14/54	Alluvium	61	16	29	21	226		216	0	104	218	3.6	58	782	1.06	159	0	76	7.8	1,370	---
	5M-30	9/ 7/50	do.	62	16	54	47	286		226	0	432	152	3.1	115	1,220	1.66	328	143	65	6.8	1,860	---
	5M-40	5/23/52	do.	---	21	22	8.3	459		537	0	78	396	1.2	6.2	1,260	1.71	89	0	92	21	2,140	---
	5M-47	5/13/54	do.	56	15	78	19	799		368	0	214	1,050	.0	4.1	2,360	3.21	272	0	86	21	4,040	---
	Tolani Lake D. S.	6/10/53	do.	57	21	176	94	348		150	8	1,090	135	1.8	143	2,090	2.84	826	690	48	5.3	2,770	---
132	5K-309	11/ 2/53	T; Coconino	---	13	94	44	26		217	0	235	34	.6	1.0	555	.75	416	238	12	.6	846	---
	5K-314	5/11/54	Coconino	66	13	91	48	141		220	0	219	228	.4	.5	849	1.15	424	244	42	3.0	1,430	---
	5K-315A	3/22/55	do.	60	---	90	46	---		221	0	---	37	---	---	---	---	414	232	---	---	921	7.5
	5K-318	4/ 7/55	D; Coconino	---	13	83	62	259		235	0	262	395	.2	2.7	1,190	1.62	462	270	55	5.2	2,020	7.8
	5M-103	11/20/53	Coconino and Supai	59	12	41	20	4.1		211	0	11	4.5	.4	1.8	199	.27	184	12	5	.1	346	---
	5M-104	6/10/51	Coconino	---	12	104	59	365		201	0	275	598	.2	2.0	1,510	2.05	502	338	61	7.1	2,610	---
	5M-108	8/19/51	do.	---	13	102	49	214		209	0	258	340	.2	2.4	1,080	1.47	456	284	51	4.4	1,840	---
	EPNG-L-1	4/14/53	do.	63	12	94	44	63		208	0	230	100	.2	.8	646	.88	416	245	25	1.3	1,030	---
	5M-110	8/19/51	Alluvium	---	21	48	15	211		242	0	114	228	.6	1.5	758	1.03	182	0	72	6.8	1,320	---
143	5M-84	5/12/54	do.	58	---	---	---	2,160		216	0	953	3,290	---	---	---	---	1,120	943	81	28	11,600	---
	5M-85	5/12/54	do.	57	15	84	19	366		395	0	136	436	.4	2.3	1,250	1.70	288	0	73	9.3	2,170	---
	5M-126	5/12/54	do.	57	28	---	---	369		378	0	158	482	.6	3.4	---	---	355	46	69	8.5	2,370	---
144	5K-313	9/23/53	ID, 45 feet; alluvium	---	14	2,870	2,040	12,000		106	0	2,560	27,500	---	39	47,100	64.1	15,500	15,500	63	42	62,800	---
	5K-313	5/11/54	Coconino, Kaibab	62	13	105	51	807		280	0	204	1,260	.3	6.2	2,580	3.51	472	242	79	16	4,550	---
	5M-86	9/ 7/50	Coconino	62	12	98	53	136		235	0	246	218	.2	1.5	881	1.20	462	270	39	2.8	1,470	---
	5M-88	5/11/54	do.	69	14	102	45	85		218	0	255	127	.2	.8	736	1.00	440	261	30	1.8	1,170	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH	
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
DISTRICT 5—Continued																								
144 con.	5M-33	5/12/53	Alluvium	61	15	92	23	3,250		134	0	512	4,790	0.7	----	8,750	11.9	324	214	96	78	14,000	---	
	5M-82	2/ 5/52	do.	51	14	123	40	452		256	0	142	775	.6	2.8	1,680	2.28	472	262	68	9.1	3,050	---	
145	5K-316	4/22/55	D; Coconino	60	11	67	40	100		190	0	312	48	.4	.2	672	.91	334	178	40	2.4	1,020	7.3	
	5K-317	3/15/55	Coconino	----	----	70	41	-----		216	0	-----	23	-----	-----	-----	-----	343	166	----	-----	856	7.4	
	5M-94	9/ 7/50	do.	63	11	90	48	23		202	0	264	22	.2	1.4	560	.76	422	256	11	.5	840	---	
	5M-122	9/ 7/50	do.	60	12	102	53	62		148	0	424	58	.2	2.2	796	1.08	514	392	21	1.1	1,160	---	
DISTRICT 6																								
74	6M-130	4/14/55	Wepo	67	11	18	6.6	19		94	0	17	11	0.6	1.4	131	0.18	72	0	36	1.0	226	7.5	
93	6K-2	1/10/50	Alluvium	51	16	111	30	22		358	0	134	53	.6	1.9	544	.74	400	107	22	1.1	912	---	
	6K-320	8/30/54	D; Dakota, Cow Springs	----	12	-----	-----	-----		374	14	-----	33	1.9	1.1	-----	-----	40	0	----	-----	2,350	---	
	6K-323	6/28/55	D; Toreva	----	23	-----	-----	25		183	0	22	13	.4	12	-----	-----	148	0	27	.9	387	6.9	
	6M-2	5/ 4/50	Alluvium	55	19	66	20	83		268	0	160	11	.8	30	522	.71	246	27	42	2.3	779	---	
	6M-80	5/ 5/50	Dakota	60	10	5.0	1.3	431		464	24	445	44	3.5	.2	1,190	1.62	18	0	98	44	1,810	---	
	6M-4A	4/21/55	Toreva	44	21	118	20	45		259	0	139	.75	1.0	12	558	.76	376	164	21	1.0	914	7.1	
	6A-20	4/21/55	do.	44	19	79	24	24		306	0	75	13	.5	.3	385	.52	296	45	15	.6	641	7.1	
	6A-21	4/21/55	do.	43	-----	-----	-----	-----		310	0	-----	11	-----	.3	-----	-----	-----	-----	-----	-----	-----	576	7.6
	6H-11	4/19/55	Wepo	47	18	36	17	12		178	0	23	9	.5	2.0	206	.28	160	14	14	.4	357	7.1	
	6K-1S	10/30/51	Toreva	54	22	67	10	19		190	0	44	21	.2	22	299	.41	208	52	16	.6	486	---	
	6K-2S	10/30/51	do.	52	-----	-----	-----	-----		185	0	-----	16	-----	-----	-----	-----	-----	-----	-----	-----	-----	443	---
	6K-3S	10/30/51	do.	52	23	56	7.5	20		189	0	26	12	.2	19	257	.35	170	16	21	.7	413	---	
	6K-7S	1/16/50	do.	53	21	175	30	21		337	0	261	26	.3	26	726	.99	560	284	8	.4	1,070	---	
	6K-9S	1/17/50	do.	----	18	85	21	11		291	0	77	11	.2	.3	366	.50	298	60	11	.4	594	---	
	6K-12S	10/30/51	do.	54	25	64	9.0	16		202	0	29	16	.2	16	275	.37	196	31	15	.5	459	---	
	6K-13S	10/30/51	do.	52	-----	-----	-----	-----		199	0	-----	16	-----	-----	-----	-----	-----	-----	-----	-----	-----	449	---
	6K-14S	10/30/51	do.	52	23	59	8.4	20		195	0	28	14	.2	19	268	.36	182	22	19	.6	429	---	
	6K-308S	4/21/55	do.	42	16	18	7.4	114		258	16	59	15	1.0	.3	374	.51	76	0	77	5.7	600	8.7	
	6M-11	4/21/55	do.	58	25	71	14	23		210	0	55	25	.8	22	339	.46	234	62	18	.7	565	7.4	
	6M-82	4/22/55	do.	----	-----	-----	-----	-----		222	0	-----	15	-----	-----	-----	-----	-----	-----	-----	-----	-----	486	7.1
94	6H-14	5/ 4/50	T; alluvium	----	17	480	178	540		324	0	2,600	83	.5	15	4,070	5.54	1,930	1,660	38	5.3	4,560	---	
	6H-15	5/ 4/50	Alluvium	56	17	97	26	56		140	0	221	40	.4	85	611	.83	349	234	26	1.3	921	---	
	6H-16	5/ 4/50	T; alluvium	----	19	97	24	51		216	0	179	21	1.0	69	567	.77	340	164	25	1.2	830	---	
	6K-301	8/19/53	Cow Springs	64	12	7.5	2.2	501		524	0	487	118	5.1	1.5	1,390	1.89	28	0	98	42	2,140	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH	
																Parts per million	Tons per acre-foot	Calcium-magnesium	Non-carbonate					
DISTRICT 6—Continued																								
94 con.	6K-305-94	4/20/55	Cow Springs, Entrada, and Carmel undiff.	62	10	5.6	2.8	603		448	0	294	438	4.0	3.8	1,600	2.18	26	0	98	52	2,660	8.0	
	6K-306	4/27/55	do.	---	12	8.7	1.9	730		398	0	369	635	4.0	2.0	1,960	2.67	30	0	98	58	3,280	8.1	
	6K-308	10/29/53	T; Toreva	---	9.5	19	6.6	85		249	0	44	5	.4	1.0	292	.40	74	0	71	4.3	---	---	
	6K-311	4/19/55	Toreva	57	10	7.9	2.9	197		277	0	179	30	1.2	.6	565	.77	32	0	93	15	898	7.8	
	6M-3	5/ 4/50	Alluvium	54	16	145	42	120		304	0	442	59	.9	.5	975	1.33	534	286	33	2.3	1,390	---	
	6M-7	5/ 4/50	do.	55	16	232	49	96		168	0	616	50	.5	172	1,310	1.78	780	643	21	1.5	1,800	---	
	6M-10	5/ 4/50	do.	57	18	440	203	707		316	0	2,950	82	.5	28	4,580	6.23	1,930	1,670	44	7.0	5,140	---	
	6M-10A	1/25/54	Dakota, Cow Springs	48	42	-----	-----	556		518	28	440	214	6.0	.6	-----	-----	39	0	97	39	2,500	---	
	6M-19	8/ 6/52	Alluvium	71	23	309	87	236		228	0	1,250	72	.3	64	2,150	2.92	1,130	942	31	3.1	2,530	---	
	6M-40	8/ 5/52	Dakota, Cow Springs	66	9.3	14	5.2	840		208	0	522	820	3.2	3.8	2,320	3.16	56	0	97	48	3,810	---	
	6M-43	11/ 3/50	Toreva	---	12	18	4.9	95		241	0	51	13	.4	2.7	316	.43	65	0	76	5.1	511	---	
	6M-66	5/ 5/50	Dakota and Cow Springs	61	11	2.2	1.2	461		436	20	499	63	4.7	.1	1,280	1.74	10	0	99	62	1,940	---	
	Sunlight Baptist Mission	3/18/54	Cow Springs, Entrada, and Carmel undiff.	---	7.9	14	1.7	821		330	14	407	780	3.0	.5	2,210	3.01	42	0	98	55	3,870	---	
	6H-1	4/20/55	Landslide and talus	46	12	129	114	96		223	0	724	31	.9	11	1,230	1.67	790	600	21	1.5	1,710	7.4	
	6M-9	4/13/55	Alluvium	48	12	98	26	104		235	0	297	34	1.0	33	721	.98	352	159	39	2.4	1,070	7.0	
	6B-3	4/21/55	Landslide and talus	50	16	52	16	66		196	0	134	18	.5	14	412	.56	196	35	42	2.0	641	7.3	
	6H-2	8/ 5/52	Alluvium	75	19	96	24	52		204	0	217	28	.2	21	557	.76	338	171	25	1.2	829	---	
	6H-3	4/19/55	Windblown sands	42	20	68	18	70		346	0	87	7	.8	12	453	.62	244	0	38	1.9	715	7.4	
	6H-5	4/19/55	Toreva	52	-----	-----	-----	-----		190	0	-----	11	-----	20	-----	-----	-----	-----	-----	-----	-----	430	7.2
	6H-20	8/ 5/52	Landslide and talus	71	16	99	28	98		228	0	294	33	1.4	39	720	.98	362	175	37	2.2	1,090	---	
	6H-22	7/10/52	Toreva	---	27	118	29	75		168	0	275	100	.4	12	719	.98	414	276	28	1.6	1,100	---	
	6H-22A	7/10/52	do.	67	26	67	19	80		185	11	139	62	.8	19	515	.70	245	76	42	2.2	824	---	
	6K-310S	4/14/55	do.	64	14	17	9.2	17		79	0	33	12	.5	.4	142	.19	80	16	32	.8	242	7.0	
	6M-4	4/21/55	Alluvium	56	15	86	20	92		197	0	257	45	1.0	1.5	614	.84	296	135	40	2.3	938	7.1	
	6M-5	4/20/55	Landslide and talus	60	-----	-----	-----	-----		244	0	-----	31	-----	.4	-----	-----	-----	-----	-----	-----	-----	904	7.7
	6M-21	4/19/55	do.	50	17	117	28	145		153	0	429	52	1.3	90	954	1.30	407	282	44	3.1	1,350	7.6	
	6M-67	4/20/55	do.	55	-----	-----	-----	-----		223	0	-----	20	-----	-----	-----	-----	-----	-----	-----	-----	-----	533	7.1

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
DISTRICT 6—Continued																							
94 con.	6M-68	4/27/55	Landslide and talus	69	8.8	79	25	74		208	0	258	14	1.0	0.4	562	0.76	300	130	35	1.9	850	7.2
95	6H-32	7/ 3/52	T; Entrada and Carmel undiff., Navajo	---	13	10	3.1	750		241	0	408	735	2.8	2.3	2,040	2.77	38	0	98	53	3,510	---
	6K-305-95	4/27/55	Entrada and Carmel undiff.	63	19	4.4	1.9	253		160	71	120	136	1.2	.6	685	.93	19	0	97	25	1,150	9.5
	6K-309A	6/13/53	D; Toreva	61	---	---	---	---		274	0	---	30	.4	23	---	---	283	58	---	---	802	7.5
	6K-309B	6/18/53	do.	61	7.1	75	26	67		269	0	149	30	1.8	21	509	.69	294	74	33	1.7	810	---
	6K-310	6/29/53	D; Navajo	62	9.1	14	5.2	113		198	28	73	12	.0	.5	352	.48	56	0	81	6.5	466	---
	6M-52A	7/ 3/52	Entrada and Carmel undiff.	---	12	12	4.2	369		234	0	174	330	3.6	1.9	1,020	1.39	48	0	94	23	1,800	---
	6M-60	7/ 2/52	Alluvium	66	17	252	107	193		275	0	1,120	30	.5	65	1,920	2.61	1,070	843	28	2.6	2,320	---
	6M-64	6/12/52	Dakota	67	13	6.8	1.2	537		664	0	250	261	6.0	1.0	1,400	1.90	22	0	98	50	2,290	---
	6M-302	7/ 4/52	Dakota, Cow Springs	69	12	3.0	.9	327		396	0	133	175	4.4	1.4	852	1.16	11	0	98	43	1,450	---
	6M-58	4/21/55	Landslide and talus	51	15	141	39	124		217	0	507	40	1.7	20	995	1.35	512	334	35	2.4	1,390	7.1
	6M-70	7/ 3/52	do.	68	11	500	157	594		150	9	2,470	240	2.3	162	4,220	5.74	1,890	1,760	41	5.9	4,800	---
	6M-302B	4/ 8/55	Alluvium	46	13	95	38	122		197	0	328	67	.6	73	834	1.13	393	232	40	2.7	1,240	7.3
	6H-26	7/10/52	Toreva	66	26	50	10	39		118	0	104	28	.5	5.6	321	.44	166	70	34	1.3	503	---
	6H-27	4/20/55	do.	---	21	92	23	72		172	0	205	83	1.0	7.7	590	.80	324	183	32	1.7	926	7.2
	6H-27A	4/27/55	do.	60	18	64	12	48		169	0	104	45	.6	2.7	377	.51	209	70	33	1.4	620	7.3
	6H-31	4/20/55	Landslide and talus	57	21	302	108	605		437	0	1,240	600	.8	20	3,110	4.23	1,200	840	52	7.6	4,370	7.1
	6M-39	4/14/55	Toreva	54	15	38	13	29		126	0	63	28	.5	2.0	250	.34	148	46	30	1.0	422	7.0
	6M-63	7/ 2/52	do.	---	11	30	6.6	14		120	0	12	9	.7	9.0	151	.21	102	4	23	.6	253	---
	6M-72	11/ 6/52	do.	58	19	123	45	95		291	0	300	85	.6	31	842	1.15	492	254	29	1.9	1,280	---
	Hotevilla Spring	11/ 6/52	do.	56	20	116	41	92		264	0	180	92	.6	154	826	1.12	458	242	31	1.9	1,260	---
96	6H-55	7/ 8/54	Entrada and Carmel undiff., Navajo	63	15	2.0	.5	217		176	28	151	90	1.4	.3	591	.80	7	0	99	36	988	---
	6K-300	4/21/53	do.	60	18	6.0	1.7	211		208	47	193	19	1.0	.5	599	.81	22	0	95	20	952	---
	6K-321	6/22/55	D; Cow Springs, Entrada and Carmel undiff.	---	11	---	---	316		307	0	420	15	1.1	.3	---	---	25	0	96	28	1,380	8.0
	6K-322	7/31/55	D; Navajo	---	15	7.9	2.6	148		248	0	123	12	1.2	1.6	433	.59	30	0	91	12	682	---
	6M-174	9/26/50	Cow Springs, Entrada and Carmel undiff.	60	11	20	6.6	591		439	0	860	69	2.6	2.5	1,780	2.42	77	0	94	29	2,590	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
DISTRICT 6—Continued																							
96 con.	6M-44	3/30/55	Landslide and talus	48	16	139	56	231		145	0	734	136	0.9	2.9	1,390	1.89	578	458	47	4.2	1,970	7.1
	6M-45	3/30/55	Alluvium	47	5.7	532	338	308		131	0	3,110	21	1.0	12	4,390	5.97	2,720	2,610	20	2.6	4,490	7.2
	6M-50	3/30/55	do.	47	15	476	119	182		117	0	1,850	23	.8	19	2,740	3.73	1,680	1,580	19	1.9	2,990	7.3
	6M-183	6/13/52	Landslide and talus	----	16	120	26	106		152	0	409	29	2.3	51	834	1.13	406	282	36	2.3	1,160	---
	6M-183A	4/ 6/55	do.	50	15	101	22	94		172	0	340	25	2.5	12	696	.95	342	202	37	2.2	1,020	7.3
113	6H-12	9/13/50	Dakota	62	9.0	9.2	3.4	420		351	18	477	87	4.3	1.7	1,200	1.63	37	0	96	30	1,880	---
	6H-13	9/13/50	Entrada and Carmel undiff.	64	11	3.2	1.5	290		376	21	103	133	2.6	1.0	751	1.02	14	0	98	34	1,260	---
	6M-17	9/13/50	Alluvium	60	16	115	31	89		223	0	278	59	.0	66	764	1.04	414	232	32	1.9	1,130	---
	6M-13	4/13/55	Toreva	52	-----	-----	-----	-----		224	0	-----	4.0	-----	-----	-----	-----	202	18	---	-----	430	7.2
	6M-15	7/11/52	do.	63	23	61	11	15		235	0	30	3	.8	1.4	261	.35	197	4	15	.5	419	---
	6M-16	4/13/55	Landslide and talus	52	16	95	25	74		176	0	292	16	1.8	32	639	.87	340	196	32	1.7	930	7.5
114	6K-304	5/19/55	Iron (Fe) total 0.62; Entrada and Carmel undiff.	62	14	29	4.4	50	3.4	179	0	41	9.8	.5	.0	240	.33	90	0	53	2.3	388	8.2
	6M-25	9/13/50	Alluvium	60	17	410	159	695		239	0	2,430	322	.9	7.7	4,160	5.66	1,680	1,480	47	7.4	5,040	---
	6M-26	9/13/50	do.	61	18	255	64	225		135	0	1,090	57	.2	77	1,850	2.52	899	788	35	3.3	2,320	---
	6M-29	9/13/50	do.	62	16	494	132	348		165	0	1,880	183	.4	287	3,420	4.65	1,830	1,690	29	3.5	4,000	---
	6M-27	9/13/50	do.	66	17	49	11	85		243	0	85	42	.4	6.0	415	.56	168	0	52	2.9	680	---
	6M-24	4/ 7/55	do.	55	10	173	72	369		334	0	1,000	150	1.2	.3	1,940	2.64	728	454	52	5.9	2,660	7.6
	6M-27A	4/ 7/55	do.	54	-----	-----	-----	-----		209	0	-----	23	-----	-----	-----	-----	-----	-----	---	-----	535	7.2
	6M-32	4/ 7/55	Navajo	56	15	38	5.7	76		216	0	66	26	.5	.2	333	.45	118	0	58	3.0	549	7.3
115	6H-79	7/ 5/51	do.	69	13	13	3.2	94		177	0	74	17	1.0	1.1	303	.41	46	0	82	6.0	482	---
	6K-307	4/21/53	Entrada and Carmel undiff., Navajo	62	8.9	62	35	681		342	0	1,330	74	2.6	4.3	2,370	3.22	298	18	83	17	3,260	---
	6K-310(N)	8/26/53	D; tongue of Navajo in Kayenta	61	14	68	13	29		195	0	100	14	.4	1.0	335	.46	223	63	22	-----	537	---
	6M-54	7/ 9/52	Navajo	72	17	105	16	109		166	0	281	.82	.5	24	716	.97	328	192	42	2.6	1,080	---
DISTRICT 7																							
92	7H-2	6/16/54	Toreva	56	21	57	6.6	16		198	0	17	15	0.5	2.1	232	0.32	169	7	17	.5	382	---
	7H-16	6/16/54	do.	57	-----	-----	-----	-----		238	0	-----	17	-----	-----	-----	-----	204	0	---	-----	434	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH	
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
DISTRICT 7—Continued																								
92 con.	7H-28	6/17/54	Toreva	57	12	64	7.6	20		212	0	21	15	1.0	18	263	0.36	190	17	18	0.6	436	---	
	7H-31	6/17/54	do.	57	-----	-----	-----	-----	-----	194	0	-----	25	-----	-----	-----	-----	192	33	-----	-----	424	---	
	7R-36	6/18/54	do.	51	28	67	7.8	28		207	0	51	25	.3	.1	309	.42	199	30	23	.9	486	---	
	7R-37	6/17/54	Landslide and talus	55	22	37	6.5	41		165	0	53	12	.6	.8	254	.35	119	0	43	1.7	397	---	
93	7H-37	4/27/50	Dakota	62	7.9	2.0	1.0	270		263	7	333	14	1.0	.2	765	1.04	9	0	98	39	1,190	---	
	7K-361	6/ /54	ID, 290 feet; Mancos	----	8.4	-----	-----	-----	753		505	0	141	780	3.6	.7	-----	-----	35	0	98	55	3,410	---
		6/15/54	D; Dakota	----	10	10	2.4	419		426	8	454	73	2.9	.4	1,190	1.62	35	0	96	31	1,820	---	
	7K-364	3/10/55	ID, 245 feet; Bidahochi, Toreva	56	-----	-----	-----	-----	-----	-----	228	0	-----	29	.4	9.8	-----	-----	226	39	-----	-----	484	7.4
		7T-353	6/ /51	Alluvium	----	17	375	139	349		453	0	1,800	26	.6	.2	2,920	3.97	1,510	1,150	34	-----	3,400	---
	6/ 5/51		ID, 140 feet; Mancos	----	9.6	18	3.9	519		517	0	44	505	2.4	1.1	1,360	1.85	61	0	95	29	2,390	---	
	Jeddito T. P.	6/18/54	T; Dakota	----	9.8	7.1	.9	455		556	0	291	170	4.0	1.9	1,210	1.65	21	0	98	43	1,930	---	
		6/19/54	T; Toreva	----	18	139	19	97		414	0	228	41	.1	.9	747	1.02	425	86	33	2.0	1,120	---	
	7H-26	6/17/54	Toreva	53	-----	-----	-----	-----	-----	-----	290	0	-----	20	-----	-----	-----	-----	248	10	-----	-----	560	---
	7H-6	6/18/54	do.	51	-----	-----	-----	-----	-----	-----	175	0	-----	19	-----	-----	-----	-----	-----	-----	-----	-----	535	---
	7H-32	4/27/50	do.	50	17	28	5.4	10		114	0	13	2	.8	3.4	136	.18	92	0	20	.5	215	---	
	7H-33	4/27/50	do.	54	16	45	12	5.8		185	0	18	2	.6	.1	190	.26	162	10	7	.2	324	---	
	7H-34	4/27/50	do.	54	16	72	11	24		255	0	28	16	.6	18	312	.42	224	16	19	.7	514	---	
	7H-242	8/13/54	do.	83	21	100	15	43		251	0	132	24	.7	32	491	.67	311	106	23	1.1	747	---	
	7R-34	6/18/54	Landslide and talus	64	21	147	46	248		226	8	787	53	1.0	2.0	1,420	1.93	556	358	49	1.7	1,890	---	
	7R-39	6/18/54	Toreva	56	-----	-----	-----	-----	-----	-----	216	0	-----	18	-----	-----	-----	-----	218	41	-----	-----	483	---
7R-43	6/18/54	do.	64	22	70	14	228		261	0	386	74	.9	5.8	929	1.26	232	18	68	6.5	1,370	---		
111	7K-365	3/ 4/55	D; Dakota	58	10	19	5.0	100		254	0	60	8	.8	.7	328	.45	68	0	76	5.3	526	7.6	
112	7H-15	9/14/50	Dakota	65	9.9	1.5	1.9	228		286	9	217	17	2.6	1.3	629	.86	12	0	98	29	992	---	
	7H-45	7/ 3/51	do.	63	13	2.0	1.4	116		273	0	28	6	.8	.5	302	.41	11	0	96	15	484	---	
	7H-52	9/14/50	Cow Springs, Entrada, and Carmel undiff.	55	10	6.0	2.6	543		374	0	746	82	2.1	1.0	1,580	2.15	26	0	98	47	2,360	---	
	7K-355	8/28/52	D; Entrada and Carmel undiff.	----	10	92	20	382		313	0	779	49	2.1	.3	1,490	2.03	312	55	73	9.4	2,100	---	
		6/17/54	Entrada and Carmel undiff.	71	17	2.8	.7	213		406	10	48	49	2.0	.6	542	.74	10	0	98	29	880	---	
7K-362	2/11/55	ID, 98 feet; Bidahochi	----	11	6.4	4.8	366		292	39	492	6	1.7	2.0	1,070	1.46	36	0	96	27	1,530	---		

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH	
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate					
DISTRICT 7—Continued																								
112 con.	7K-362	2/16/55	D; Cow Springs, Entrada, and Carmel undiff.	56	12	10	2.4	1,090		186	0	318	1,360	1.7	2.8	2,890	3.93	35	0	99	80	4,990	---	
		4/26/55	Cow Springs, Entrada and Carmel undiff.	55	12	1.6	.4	263		266	48	146	80	5.2	.4	688	.94	6	0	99	49	1,150	9.3	
	7K-363	4/12/55	D; Cow Springs, Entrada, and Carmel undiff.	60	9.4	3.2	1.9	344		410	8	290	74	2.4	.9	935	1.27	16	0	98	37	1,440	8.4	
	White Cone T. P.	4/26/55	Cow Springs, Entrada and Carmel undiff.	54	12	6.0	1.4	306		253	6	233	154	3.6	.6	847	1.15	21	0	97	29	1,390	8.4	
	7H-51	9/14/50	Alluvium	56	37	30	44	93		448	0	92	22	1.2	106	696	.95	380	14	35	2.1	1,060	---	
	7H-49	6/18/54	Spring deposits	61	30	36	32	63		363	0	33	13	.5	7.0	394	.54	222	0	38	1.8	632	---	
	7H-63	7/ 3/51	do.	70	19	9.0	5.0	71		162	0	21	16	.4	25	246	.33	43	0	78	4.7	390	---	
	7H-155	9/14/50	do.	65	36	42	25	34		264	0	28	21	.2	7.9	324	.44	208	0	26	1	528	---	
113	7K-369	5/ /56	D; Entrada and Carmel undiff.	65	16	1.6	1.0	180		312	35	59	16	.4	.3	463	.63	8	0	98	28	736	8.9	
	7H-81	9/ 1/53	Alluvium	61	29	25	11	128		302	0	64	46	.6	5.6	458	.62	108	0	72	5.4	726	---	
	7H-81A	7/11/52	do.	62	38	29	17	144		332	0	68	59	.5	35	554	.75	142	0	69	5.2	878	---	
	7H-180	7/ 4/51	do.	-----	-----	-----	-----	-----	-----	262	0	-----	42	-----	-----	-----	-----	-----	-----	-----	-----	-----	666	---
	7K-302	7/11/52	do.	60	24	20	7.3	150		290	0	94	37	1.0	19	495	.67	80	0	80	7.3	783	---	
	7K-315	7/11/52	Terrace	60	21	15	5.0	277		433	0	136	100	2.8	18	788	1.07	58	0	91	16	1,320	---	
	7H-76	6/16/54	Spring deposits	64	-----	-----	-----	-----	-----	459	0	-----	8	-----	-----	-----	-----	318	0	-----	-----	-----	752	---
	7H-79	6/16/54	Terrace	-----	25	49	18	191		301	0	179	105	.5	36	752	1.02	196	0	68	5.9	1,180	---	
	7H-179	6/16/54	Spring deposits	64	27	39	24	55		265	0	70	16	.3	1.2	362	.49	196	0	38	1.7	575	---	
	114	7H-218	6/15/54	Alluvium	63	29	57	47	258		322	0	359	165	.8	31	1,100	1.50	336	72	63	6.1	1,680	---
127	7H-121	9/ 9/50	do.	67	20	295	195	2,130		425	0	1,070	3,330	.3	-----	7,250	9.86	1,540	1,190	75	24	11,600	---	
	7H-119	5/26/54	Terrace	65	21	31	13	86		190	0	45	38	.2	75	402	.55	131	0	59	3.3	656	---	
	7H-125	5/26/54	Chinle (Owl Rock)	60	14	3.6	.7	399		777	11	91	82	2.6	8.1	994	1.35	12	0	99	50	1,630	---	
	7H-129	5/26/54	do.	67	19	5.2	2.9	172		334	0	51	48	.6	4.0	467	.64	25	0	94	15	772	---	
128	7K-367	7/ 6/55	ID, 325 feet; Bidahochi (volcanic)	60	-----	-----	-----	247		308	0	449	49	2.0	.1	-----	-----	256	4	68	6.7	1,470	7.4	
		7/12/55	D, 522 feet; Bidahochi (volcanic)	64	-----	-----	-----	423		662	8	296	58	2.8	.2	-----	-----	33	0	97	32	1,790	8.4	
	7H-117	5/28/54	Alluvium	59	27	-----	-----	126		294	0	93	34	1.0	12	-----	-----	124	0	69	4.9	746	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH		
																Parts per million	Tons per acre- foot	Calcium magne- sium	Non- car- bonate						
DISTRICT 7—Continued																									
128 con.	7H-123	9/ 9/50	Terrace	61	21	14	7.6		146		314	0	63	24	3.2	21	455	0.62	66	0	33	7.3	707	---	
	7H-154	5/26/54	Wingate (Rock Point)	65	26	89	37		336		402	0	582	117	.9	1.0	1,390	1.89	374	44	66	7.5	2,020	---	
	7H-165	5/26/54	Alluvium	60	25	67	24		160		269	0	329	19	1.2	24	781	1.06	266	45	57	4.3	1,160	---	
	7H-244	5/26/54	Spring deposits	55	-----	-----	-----	-----	-----	-----	309	0	-----	14	-----	-----	-----	-----	-----	-----	-----	-----	-----	571	---
	7H-47	5/27/54	do.	58	27	20	19		67		285	0	16	7	.4	15	311	.42	128	0	53	2.6	482	---	
	7H-113	9/ 9/50	Bidahochi	-----	25	54	21		226		306	0	123	234	.5	2.0	836	1.14	221	0	69	6.6	1,430	---	
	7H-115	5/27/54	Wingate (Rock Point)	-----	20	-----	-----	-----	179		366	0	100	53	.8	2.3	-----	-----	94	0	81	8.0	911	---	
	7H-147	6/17/53	Chinle (Owl Rock)	73	7.4	21	7.6		137		371	0	48	12	2.2	4.9	422	.57	84	0	78	6.5	684	---	
	7H-149	5/26/54	Spring deposits	67	20	18	14		108		284	0	55	33	.4	.8	389	.53	102	0	70	4.7	629	---	
	7H-151	5/26/54	Wingate (Rock Point)	68	-----	-----	-----	-----	-----	-----	398	0	-----	85	-----	-----	-----	-----	-----	-----	-----	-----	-----	1,120	---
	7H-153	5/26/54	do.	61	27	44	23		236		228	0	337	116	.9	18	914	1.24	204	18	72	7.2	1,420	---	
	7H-158A	5/27/54	Spring deposits	-----	31	41	39		41		395	0	11	5	.1	11	373	.51	263	0	25	1.1	619	---	
	7H-159	5/27/54	do.	54	15	6.4	3.8		86		223	0	14	14	.6	.3	250	.34	32	0	86	6.6	401	---	
	7H-161	5/27/54	do.	58	25	40	19		37		260	0	20	16	.2	.8	286	.39	178	0	31	1.2	477	---	
	7H-162	5/26/54	do.	60	23	17	14		105		311	0	39	20	.6	2.8	374	.51	100	0	69	4.6	590	---	
	7H-164	5/26/54	do.	64	34	-----	-----	-----	64		248	0	19	12	-----	5.9	-----	-----	106	0	57	2.7	453	---	
	7H-186	6/18/54	do.	70	26	10	7.4		86		224	0	27	15	.6	10	292	.40	56	0	77	5.0	474	---	
	7H-187	5/26/54	Wingate (Rock Point)	74	21	2.4	2.4		191		404	18	41	17	1.0	.5	492	.67	16	0	96	21	770	---	
	7H-238A	9/ 9/50	Spring deposits	62	27	38	14		18		179	0	22	10	.2	10	227	.31	152	6	21	.6	365	---	
	7H-239	5/27/54	do.	63	-----	-----	-----	-----	-----	-----	317	0	-----	24	-----	-----	-----	-----	-----	-----	-----	-----	-----	620	---
7K-303	5/26/54	do.	60	17	4.0	1.4		250		465	0	118	37	.8	.6	658	.89	16	0	97	27	1,050	---		
7K-313	5/28/54	do.	68	23	-----	-----	-----	77		244	0	41	20	.8	13	-----	-----	115	0	59	3.1	496	---		
129	7K-356A	6/16/53	ID, 1,690 feet; Coconino	-----	-----	924	166	5,960	-----	-----	-----	1,350	10,100	-----	-----	-----	-----	2,990	-----	81	47	28,300	---		
	7H-92	6/ 3/54	Alluvium	60	32	67	30		358		322	0	307	339	1.2	5.2	1,300	1.77	290	26	73	9.1	2,100	---	
	7H-94	9/ 6/50	do.	58	26	40	13		99		232	0	69	58	.6	28	448	.61	154	0	58	3.5	719	---	
	7H-198A	6/30/55	D; alluvium	-----	13	-----	-----	-----	81		186	0	27	14	.8	4.4	-----	-----	30	0	85	6.4	373	7.9	
	7K-319	9/ 6/50	Alluvium	-----	36	42	17		271		279	0	166	244	1.3	20	934	1.27	175	0	77	8.9	1,560	---	
	7H-43	5/27/54	Landslide and talus	61	30	22	16		68		268	0	19	17	.8	4.2	309	.42	121	0	55	2.7	493	---	
	7H-87	5/27/54	do.	59	29	30	14		94		364	0	24	8	.4	.3	379	.52	132	0	61	3.5	596	---	
	7H-103	7/29/52	Wingate (Rock Point)	80	29	29	11		147		292	0	94	116	.4	4.1	532	.72	118	0	73	5.0	307	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH	
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate					
DISTRICT 7—Continued																								
129 con.	7H-104	7/29/52	Wingate (Rock Point)	69	-----	-----	-----	-----	-----	210	0	-----	114	-----	-----	-----	-----	-----	-----	-----	-----	-----	877	---
	7H-105	7/29/52	do.	64	25	35	15	155	-----	196	0	119	138	0.4	7.1	592	0.81	149	0	69	5.5	983	---	
	7H-182	5/27/54	Spring deposits	59	-----	-----	-----	-----	-----	224	0	-----	7	.2	-----	-----	-----	59	0	-----	-----	393	---	
	7H-183	5/27/54	do.	56	33	45	16	63	-----	317	0	24	19	.4	4.1	360	.49	178	0	44	2.1	569	---	
	7H-184	5/27/54	do.	60	-----	-----	-----	-----	-----	236	0	-----	18	.2	-----	-----	-----	106	0	-----	-----	470	---	
	7H-211	5/27/54	do.	59	-----	-----	-----	-----	-----	565	0	-----	8	.2	-----	-----	-----	256	0	-----	-----	880	---	
	7H-217	7/29/52	Wingate (Rock Point)	67	27	45	21	154	-----	190	0	107	184	.4	6.6	639	.87	199	44	63	4.7	1,090	---	
130	7K-320	5/16/52	Alluvium and Chinle (Owl Rock)	---	20	21	14	539	-----	523	0	138	492	2.4	11	1,500	2.04	110	0	91	22	2,550	---	
	7H-212	6/ 4/54	Wingate (Lukachukai)	70	16	12	2.8	308	-----	430	0	201	100	.2	8.7	860	1.17	42	0	94	21	1,410	---	
	7H-214	9/ 7/50	Alluvium	63	16	11	7.1	489	-----	440	10	163	400	1.2	6.0	1,320	1.80	56	0	95	28	2,240	---	
141	7K-374	10/ 3/55	ID, 46 feet; alluvium	72	-----	-----	-----	821	-----	398	0	611	715	1.1	1.3	-----	-----	190	0	90	26	3,870	7.7	
		10/ 3/55	D; alluvium	63	-----	-----	-----	2,020	-----	322	0	1,090	2,860	.6	5.1	-----	-----	1,050	786	81	27	10,200	7.2	
	7H-134	9/12/50	Alluvium	72	12	4.0	3.1	370	-----	368	0	397	73	1.7	5.6	1,050	1.43	22	0	97	34	1,610	---	
	7H-136	4/10/51	do.	47	12	13	3.9	450	-----	722	20	267	85	1.4	1.4	1,210	1.65	48	0	95	28	1,890	---	
142	7H-203	6/ 1/54	Chinle (Owl Rock)	59	19	19	9.0	444	-----	570	0	258	220	1.4	.6	1,250	1.70	84	0	92	21	2,030	---	
	7H-207	6/11/54	Alluvium	60	-----	-----	-----	-----	-----	318	0	-----	2,350	-----	-----	-----	-----	195	0	-----	-----	8,000	---	
DISTRICT 8																								
10	8A-260	9/ 9/54	Cutler (De Chelly)	72	14	33	13	166	-----	327	0	181	26	0.6	2.8	597	0.81	136	0	73	6.2	941	---	
11	8K-422	9/ /53	ID, 154 feet; Cutler (Cedar Mesa)	---	21	76	28	33	-----	248	0	134	22	.4	2.1	438	.60	304	102	19	.8	771	---	
		10/11/53	D; Cutler (Cedar Mesa)	58	20	289	113	133	-----	201	21	1,190	24	.6	.4	1,890	2.57	1,190	986	20	1.7	2,320	---	
	8A-230	8/11/49	Alluvium	68	20	10	12	277	-----	592	0	123	39	1.9	5.7	780	1.06	74	0	89	14	1,220	---	
	8A-280	9/17/54	do.	---	18	540	159	126	-----	97	0	2,050	42	.8	2.1	2,990	4.07	2,000	1,920	12	1.2	3,140	---	
	8A-191	9/17/54	Cutler (Cedar Mesa)	68	-----	-----	-----	-----	-----	165	0	-----	9.0	-----	3.5	-----	-----	156	21	-----	-----	342	---	
	8A-193	9/17/54	do.	66	23	69	16	23	-----	252	0	47	19	.4	6.2	328	.45	238	32	18	.7	538	---	
	8A-229	9/ 9/54	Cutler (Organ Rock Tongue)	70	17	20	14	313	-----	466	0	230	110	1.2	10	944	1.28	108	0	86	13	1,470	---	
	8A-281	9/17/54	Cutler (Halgaito Tongue)	74	19	421	147	119	-----	174	0	1,670	20	.7	2.5	2,490	3.39	1,660	1,510	13	1.3	2,760	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate				
DISTRICT 8—Continued																							
11 con.	8A-294	9/18/54	Cutler (Cedar Mesa)	67	15	64	9.0	26		182	0	75	15	0.4	4.2	298	0.41	196	48	22	0.8	450	---
12	8A-216	10/ 1/48	D; alluvium	---	---	46	82	124		480	0	226	61	1.9	.9	778	1.06	452	58	37	2.5	1,230	---
	8A-216A	9/30/54	Alluvium	59	18	28	57	116		358	0	180	50	1.0	2.9	629	.86	304	11	45	2.9	989	---
	8A-216B	9/30/54	do.	68	---	31	58	---	---	374	0	---	46	1.0	---	---	---	316	10	---	---	986	---
	8K-432	5/ 6/55	ID, 290 feet; Cutler (Cedar Mesa, Organ Rock)	---	---	---	---	---	---	800	26	---	122	2.4	2.4	---	---	40	0	---	---	2,170	8.5
		5/21/55	D; Cutler (Cedar Mesa)	64	11	44	27	151		306	0	228	37	1.0	7.4	656	.89	221	0	60	4.4	1,030	7.6
	8A-213	9/30/54	Cutler (De Chelly)	65	11	16	13	---	---	124	0	---	6	---	3.2	---	---	94	0	---	---	213	---
	8A-217	6/ 8/48	Alluvium	---	16	50	79	56		280	0	299	20	.7	.3	659	.90	450	220	21	1.1	997	---
	8K-550	9/30/54	Cutler (De Chelly)	64	11	16	14	---	---	182	0	---	10	---	3.4	---	---	98	0	---	---	315	---
21	8A-224	10/ 6/54	Navajo	60	24	---	---	63		266	0	65	34	1.0	2.0	---	---	200	0	41	1.9	617	---
22	8A-101	8/ 2/49	do.	62	---	---	---	---	---	176	0	---	5	---	---	---	---	---	---	---	---	303	---
	8K-403	8/17/49	Navajo, Kayenta, Wingate	---	11	2.2	1.3	103		207	10	21	12	.6	9.1	272	.37	11	0	95	13	431	---
	8K-434	6/17/55	D; Navajo	58	19	54	8.3	16		150	0	36	25	---	10	242	.33	168	46	17	.5	410	7.3
	8A-243	9/15/54	Alluvium	70	15	189	30	132		136	0	472	164	.3	59	1,130	1.54	595	484	33	2.4	1,670	---
	8A-245	8/12/49	do.	62	16	74	8.0	68		128	0	174	48	.3	14	465	.63	218	112	41	2.0	725	---
	8A-246A	9/15/54	do.	70	15	40	3.3	26		137	0	28	17	.2	6.0	202	.27	114	1	34	1.1	327	---
	8A-258	8/17/49	do.	60	26	41	8.6	14		114	0	47	12	.6	9.1	214	.29	138	44	18	.5	321	---
	8A-236	10/ 6/50	Cutler (Cedar Mesa)	---	15	93	69	207		192	0	584	132	.2	18	1,210	1.65	516	358	47	4.0	1,650	---
	VCA-3	9/16/54	Alluvium	65	15	22	18	103		333	0	51	16	.6	2.9	392	.53	129	0	63	3.9	647	---
23	8K-402	8/11/49	Alluvium, Cutler (De Chelly)	60	16	59	37	88		212	0	229	42	.3	22	598	.81	299	126	39	2.2	913	---
	8K-417	11/10/48	do.	---	---	23	27	23		216	6	19	6	.4	2.2	213	.29	168	0	23	.8	392	---
	8A-227	9/30/54	Alluvium	68	18	25	13	234		416	0	162	69	2.0	14	742	1.01	116	0	81	9.4	1,140	---
	8A-225	10/ 1/54	Chinle (Shinarump)	68	12	---	---	---	---	170	0	---	5	.6	1.9	---	---	141	2	---	---	297	---
	8A-238	9/ 8/54	Cutler (Cedar Mesa)	78	23	50	27	118		354	0	116	54	1.0	2.8	566	.77	236	0	52	3.3	907	---
24	8K-433	4/20/55	Chinle (Shinarump)	---	10	35	23	45		317	0	42	11	.8	.4	333	.45	223	0	31	1.3	580	7.8
	8A-296	9/29/54	Alluvium	64	20	5.6	1.4	449		828	28	139	85	2.0	1.1	1,140	1.55	20	0	98	44	1,780	---
	8A-200	9/29/54	Chinle (Shinarump)	66	16	33	23	89		344	0	63	15	.4	1.3	410	.56	177	0	52	2.9	664	---
	8A-201	9/30/54	do.	56	16	108	18	29		260	0	172	10	.4	.4	482	.66	344	130	16	.7	689	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH	
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
DISTRICT 8—Continued																								
24 con.	8A-220	9/29/54	Chinle (Shinarump)	66	28	59	13	22		200	0	50	22	0.4	0.4	293	0.40	200	36	19	0.7	447	---	
	8A-297	9/29/54	Chinle (Owl Rock)	---	---	---	---	---	---	608	75	---	167	---	---	---	---	36	0	---	---	1,990	---	
	8K-404A	10/14/54	Navajo	62	12	58	8.0	4.1		202	0	10	6	.2	1.9	199	.27	178	12	5	.1	345	---	
37	8A-179	4/22/53	T; Navajo	---	16	34	22		142	151	0	264	54	1.0	10	617	.84	176	52	64	4.7	951	---	
	8A-180	8/ 4/49	Navajo	66	15	21	11		67	196	0	55	14	.6	6.0	286	.39	98	0	60	3.0	464	---	
	8A-273	8/18/49	Entrada	60	11	262	64		543		83	0	1,930	8	.7	9.3	2,870	3.90	916	848	56	7.8	3,640	---
	8A-273A	6/23/55	D; Navajo	60	13	24	7.4		233		237	0	307	86	.4	.2	788	1.07	90	0	86	11	1,310	7.8
	8A-277	8/18/49	Morrison (Salt Wash)	62	11	176	62		92		93	0	705	58	.8	.6	1,150	1.56	694	618	22	15	1,380	---
	8K-1	8/19/49	Navajo	60	15	1.8	1.9		98		211	18	10	6	.2	5.0	260	.35	12	0	94	12	410	---
	8K-421	5/ 6/52	D; Navajo	61	15	42	13		295		288	0	460	59	.9	.1	1,030	1.40	158	0	80	10	1,540	---
		5/11/55	Navajo	62	15	1.6	.4		104		168	32	20	11	.8	3.5	271	.37	6	0	98	19	445	9.4
	8K-430	2/12/55	ID, 390 feet; Morrison (Salt Wash)	57	16	28	8.8		80		167	0	105	22	1.2	.2	343	.47	106	0	62	3.4	553	---
		3/ 1/55	ID, 630 feet; Carmel(?)	---	3.9	66	22		290		96	0	708	47	1.3	.0	1,190	1.62	255	176	71	7.9	1,690	---
		3/ 4/55	D; Navajo	60	16	3.2	1.0		107		198	33	13	8	---	4.1	283	.38	12	0	95	13	456	9.1
	8K-431	4/ 5/55	do.	---	12	---	---		46		327	0	45	10	.8	.7	---	---	232	0	30	1.3	600	7.2
8A-135A	8/21/52	Terrace	68	14	20	3.8		241		235	0	252	78	.6	27	752	1.02	66	0	89	13	1,180	---	
8A-177	10/12/54	Alluvium	62	14	592	76		59		147	0	1,710	8	.7	4.4	2,540	3.45	1,790	1,670	7	.6	2,660	---	
8A-178	7/17/52	Morrison (Recapture)	63	14	80	14		26		135	0	174	9	.9	7.6	392	.53	257	46	18	.7	579	---	
8A-135	8/21/52	Terrace	70	11	24	8.5		352		212	0	521	84	.8	30	1,140	1.55	95	0	89	16	1,720	---	
38	8A-106	8/11/49	T; Entrada	---	17	2.5	1.2		96	198	16	21	5	.4	.8	257	.35	11	0	95	13	408	---	
	8A-121	7/15/52	Navajo	63	16	4.0	1.2		144	209	5	33	77	.4	5.6	389	.53	15	0	95	16	665	---	
	8A-136	4/22/53	do.	58	10	---	---		258	176	0	179	171	2.4	1.0	---	---	18	0	97	26	1,220	---	
	8A-138	8/12/49	T; Navajo	---	---	---	---		---	203	0	---	11	---	---	---	---	---	---	---	---	---	550	---
	8K-416	7/ 1/54	Navajo, Kayenta	---	18	18	9.9		34		152	0	24	6.0	.2	2.6	188	.26	86	0	47	1.6	297	---
	8K-420	5/11/55	Navajo	---	16	1.6	.9		76		126	30	6.6	6	.2	3.9	202	.27	8	0	96	12	322	9.4
	8K-426	6/18/54	D; Morrison	64	---	---	---		---	---	235	0	---	19	.6	---	---	---	250	58	---	---	1,120	---
		6/24/54	do.	---	9.2	115	70		199		285	0	718	17	.2	.0	1,270	1.73	575	340	43	3.6	1,730	---
	8T-419	4/ 8/52	D; Navajo	---	7.5	14	4.2		214		235	6	195	74	1.0	6.7	638	.87	52	0	90	13	1,040	---
		10/ 7/52	Navajo	50	16	4.5	1.1		74		154	21	7.0	3	.6	3.7	206	.28	16	0	91	8.2	325	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH	
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
DISTRICT 8—Continued																								
38 con.	8A-114	7/15/52	Alluvium	61	13	190	68	308		192	0	1,170	32	0.6	2.5	1,880	2.56	754	596	47	4.9	2,400	---	
	8A-127	10/13/54	Morrison (Recapture)	62	15	38	25	63		192	0	112	14	1.4	48	410	.56	198	40	41	2.0	627	---	
	8A-128	10/13/54	Alluvium	64	9.9	19	12	247		298	0	295	53	2.4	3.8	789	1.07	97	0	85	11	1,220	---	
	8A-100	8/12/49	Terrace	66	16	4.2	1.6	57		139	0	16	3	.6	5.0	172	.23	17	0	88	6.0	259	---	
	8A-111	10/13/54	Dakota	57	13	66	18	9.9		152	0	96	24	.2	1.5	304	.41	238	114	8	.3	494	---	
	8A-122	6/12/54	Morrison (Recapture)	---	---	286	188	146		218	0	1,520	30	---	---	2,280	3.10	1,490	1,310	18	1.6	2,750	---	
	8A-122A	10/12/54	do.	56	14	189	109	115		294	0	858	23	.4	1.4	1,450	1.97	920	678	21	1.6	1,850	---	
	8A-124	7/15/52	Morrison (Westwater Canyon)	65	10	54	13	12		110	0	99	13	.3	3.1	258	.35	188	98	13	.4	416	---	
	8A-125	10/13/54	Alluvium, Dakota, Morrison	58	11	536	128	526		150	0	2,730	26	.9	3.3	4,040	5.49	1,860	1,740	38	5.3	4,310	---	
39	8A-295	2/12/48	Navajo, Kayenta	48	---	22	9.1	41		180	0	24	5.0	.4	1.5	192	.26	92	0	49	1.9	329	---	
	8K-401	7/16/52	Navajo	69	14	28	6.9	4.6		113	0	6.2	3	.3	5.4	124	.17	98	6	9	.2	207	---	
	8A-119	10/14/54	Toreva	54	7.4	29	7.6	---	---	122	0	---	3.0	---	---	---	---	104	4	---	---	197	---	
	8A-139	10/15/54	Wepo	38	---	---	---	---	---	366	0	---	65	---	1.6	---	---	3,380	3,080	---	---	4,860	---	
	8A-143	10/15/54	do.	48	19	254	150	79		280	0	1,110	18	.8	11	1,780	2.42	1,250	1,020	12	1.0	2,140	---	
	8A-295B	2/12/48	Carmel	41	---	---	---	---	---	250	0	---	8.5	---	---	---	---	---	---	---	---	---	487	---
54	8K-435	5/25/55	ID, 247 feet; Entrada	---	---	---	---	---	---	37	0	---	2,230	---	---	---	---	---	---	---	---	---	8,010	7.4
		6/ 7/55	D; Navajo	---	18	3.2	1.7	119		252	9	9.1	26	1.0	4.0	315	.43	15	0	95	13	520	8.7	
	8A-175	10/12/54	Morrison (Westwater Canyon)	59	15	373	188	268		222	0	1,980	28	.8	2.7	2,960	4.03	1,700	1,520	25	2.8	3,280	---	
	8A-176	10/11/54	do.	64	10	66	27	20		146	0	160	18	1.2	5.7	380	.52	276	156	14	.5	586	---	
56	8A-147	10/15/54	Wepo	63	13	488	219	140		272	0	2,070	30	.6	1.0	3,100	4.22	2,120	1,900	13	1.3	3,320	---	
DISTRICT 9																								
7	9K-3	10/20/54	Alluvium	70	19	17	3.8	136		244	0	129	11	1.6	0.8	438	0.60	58	0	84	7.8	671	---	
8	9K-219	1/20/54	D; Navajo	62	29	5.5	2.2	178		366	22	51	10	1.6	1.1	480	.65	22	0	94	16	698	---	
		3/11/55	Navajo	59	19	8.7	7.2	43		151	0	12	5	.6	1.4	171	.23	51	0	65	2.6	274	7.5	
	9T-214	12/ 3/53	do.	61	14	2.0	.5	129	1.9	177	29	50	28	.8	.4	341	.46	7	0	97	21	565	---	
	9Y-32	8/30/49	Wingate (Lukachukai)	66	17	2.0	1.3	161		242	83	9.5	5	1.0	4.9	404	.55	10	0	97	22	662	---	
	Shell Oil Co. water well	3/11/55	Iron (Fe) total 0.11; Navajo	62	14	1.3	.7	195	.8	341	45	52	21	.8	.5	500	.68	6	0	97	35	846	9.0	
	9Y-41A	10/21/54	Alluvium	60	15	7.9	2.2	373		452	0	412	20	2.7	6.0	1,060	1.44	28	0	97	30	1,610	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate				
DISTRICT 9—Continued																							
8 con.	9Y-40	10/21/54	Morrison (Recapture)	62	15	34	7.6	113		261	0	86	33	1.2	11	429	0.58	116	0	68	4.6	679	---
	9Y-41	10/21/54	do.	63	15	70	22	134		199	0	361	11	.5	.6	712	.97	265	102	52	3.6	1,030	---
	9Y-42	10/21/54	do.	63	14	9.5	10	58		195	0	16	6	.4	6.5	216	.29	64	0	66	3.1	354	---
	9Y-43A	10/21/54	do.	58	16	43	9.7	24		149	0	54	13	.8	2.4	236	.32	148	26	26	.9	384	---
	9Y-57	10/20/54	Wingate (Lukachukai)	68	---	---	---	---		130	0	---	5.5	---	3.0	---	---	105	6	---	---	228	---
	9Y-61	10/27/54	Morrison (Recapture)	66	17	46	17	37		249	0	21	12	.5	25	298	.41	185	0	30	1.2	506	---
	9Y-62	10/27/54	do.	58	18	36	8.3	27		127	0	43	10	.7	21	226	.31	124	20	32	1.0	359	---
9	9K-209	10/27/54	Bluff, Navajo	64	11	7.1	3.3	67		148	0	38	9	.5	1.6	210	.29	31	0	82	5.2	329	---
	9K-221	11/ 3/54	Navajo	58	19	18	7.6	30		119	0	30	8	.6	.3	172	.23	76	0	46	1.5	273	---
	9T-220	1/ 6/54	D; Navajo	62	17	17	4.6	64		194	0	31	6	.2	.1	235	.32	62	0	69	3.5	364	---
	9Y-30	10/29/54	Navajo	42	15	37	9.5	84		205	0	84	41	.2	.5	372	.51	132	0	58	3.2	606	---
	9Y-66	10/29/54	Alluvium	60	---	---	---	---		220	0	---	16	---	---	---	---	130	0	---	---	441	---
	9Y-21	11/ 4/54	Navajo	61	17	24	4.3	19		107	0	12	10	.6	3.5	143	.19	78	0	35	.9	220	---
	9Y-24	11/ 3/54	Bluff	62	---	---	---	---		218	0	---	4	---	---	---	---	---	---	---	---	354	---
	9Y-25	11/ 3/54	do.	62	16	29	3.3	58		221	0	17	7	.8	.8	241	.33	86	0	59	2.7	388	---
	9Y-27	11/ 3/54	Entrada	64	18	40	11	44		172	0	65	19	.7	4.3	287	.39	145	4	40	1.6	467	---
	9Y-29	10/27/54	Navajo	58	15	33	13	28		136	0	48	13	.5	18	236	.32	136	24	31	1.0	384	---
	9Y-31	10/27/54	do.	54	---	---	---	---		244	6	---	51	---	---	---	---	15	0	---	---	678	---
	9Y-65	10/29/54	Wingate (Lukachukai)	56	14	21	9.7	12		121	0	9	5.0	.2	1.7	133	.18	92	0	21	.5	206	---
19	9Y-100	5/29/52	Navajo	64	12	4.0	.9	148		295	0	74	11	.4	.6	396	.54	14	0	96	18	620	---
	Teec Nos Pos 1	12/ 8/53	Morrison (Recapture, Salt Wash) and Bluff	60	---	79	20	34	1.2	328	0	---	8	---	---	---	---	279	10	21	.9	612	---
	Teec Nos Pos 4	3/11/55	D; Morrison (Salt Wash) and Entrada	60	17	59	19	44		302	0	59	7	.4	.1	354	.48	225	0	30	1.3	389	7.3
	9B-26	10/14/54	Morrison (Salt Wash)	64	28	195	54	695		312	0	1,500	275	1.3	13	2,910	3.96	708	453	68	11	3,880	---
	Teec Nos Pos 2	8/31/49	T; Morrison (Recapture)	---	19	66	13	71		244	0	130	17	.1	14	450	.61	218	18	41	2.1	681	---
	Teec Nos Pos 3	2/25/54	Morrison (Recapture)	---	---	---	---	33		277	0	60	10	---	2.6	---	---	233	6	24	.9	354	---
	9Y-5	10/13/54	do.	58	27	65	21	70		343	0	75	21	1.0	12	461	.63	248	0	38	1.9	723	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH	
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
DISTRICT 9—Continued																								
20 con.	9K-212	8/30/49	Navajo and Wingate (Lukachukai)	71	12	20	8.8	7.8		101	0	7.2	4	0.2	8.0	118	0.16	86	3	17	0.4	192	---	
	9K-213	11/19/54	Morrison (Salt Wash)	52	15	33	12	155		317	0	157	31	.4	.4	560	.76	132	0	72	5.9	879	---	
	9K-216	12/ 8/53	Morrison (Salt Wash), Bluff and Navajo	59	16	25	19	49		252	6	23	4	.4	.7	267	.36	140	0	43	1.8	441	---	
	9K-217	10/15/54	Alluvium	58	20	44	34	70		316	0	89	35	.4	1.2	449	.61	250	0	38	1.9	726	---	
	9Y-10	12/ 8/53	T; Navajo	---	15	5.0	.4	157	1.5	285	13	65	24	.4	.2	422	.57	14	0	96	18	679	---	
	9B-5	11/18/54	Navajo	52	27	58	20	49		233	0	81	39	.4	3.3	393	.53	226	36	32	1.4	630	---	
	9B-6	11/19/54	do.	50	11	28	6.6	82		192	0	93	13	.4	1.7	330	.45	97	0	65	3.6	524	---	
	9B-9	10/14/54	Morrison (Salt Wash)	60	26	37	29	111		340	0	150	11	.6	2.5	534	.73	212	0	53	3.3	817	---	
	9B-12	11/17/54	do.	54	---	---	---	---	---	283	0	---	69	---	---	---	---	340	108	---	---	1,690	---	
	9B-21	10/13/54	Bluff	64	17	16	4.8	167		313	0	104	33	1.0	11	508	.69	60	0	86	9.4	809	---	
	9R-3	10/15/54	Morrison (Salt Wash)	56	17	37	13	99		292	0	96	15	.4	.8	422	.57	146	0	60	3.6	655	---	
	9R-4	11/18/54	do.	60	14	64	20	213		294	0	386	40	.7	2.7	885	1.20	242	0	66	6.0	1,330	---	
	9R-6	11/18/54	do.	46	---	---	---	---	---	81	0	---	5	---	5.9	---	---	70	4	---	---	187	---	
21	9K-210	8/31/49	T; Navajo	---	---	---	---	---	---	104	0	---	5	---	---	---	---	---	---	---	---	218	---	
	9K-210A	8/21/52	do.	---	12	21	2.9	20		105	0	8.6	5	.6	4.3	126	.17	64	0	40	1.1	209	---	
	9K-218	12/ 3/53	Navajo, Wingate (Lukachukai)	58	17	23	6.4	12		92	0	18	10	.2	2.8	134	.18	84	8	24	.6	219	---	
	9Y-12	3/11/55	Iron (Fe) total 0.50; Navajo	58	11	.8	.9	144	.8	217	33	64	16	.3	.5	380	.52	6	0	96	27	630	9.2	
	9Y-81	8/ 3/49	Navajo, Wingate (Lukachukai)	62	---	32	3.5	2.1		103	0	8.4	2	.0	4.0	103	.14	94	10	5	.1	193	---	
	9B-4	11/10/54	Navajo	46	---	---	---	---	---	131	0	---	12	1.0	3.8	---	---	68	0	---	---	306	---	
	9Y-73	11/10/54	Wingate (Lukachukai)	54	17	25	3.4	11		99	0	8.0	5	.2	3.8	122	.17	76	0	24	.5	200	---	
	9Y-75	11/10/54	Navajo	50	24	44	10	23		175	0	30	9	.6	17	244	.33	151	8	25	.8	387	---	
35	9T-222	6/18/54	D; Wingate (Lukachukai)	---	9.3	19	5.2	50		193	0	12	5	.3	.1	196	.27	69	0	61	2.6	327	---	
36	9K-215	9/19/52	Wingate (Lukachukai)	---	12	13	4.4	132		245	0	81	29	.8	11	403	.55	50	0	85	8.1	648	---	
	9Y-97	8/ 3/49	Alluvium	62	29	15	9.8	221		505	0	109	16	.9	6.9	656	.89	78	0	86	11	1,010	---	
	9Y-98	8/ 3/49	do.	---	---	17	7.5	203		336	0	198	21	.9	2.0	615	.84	74	0	86	10	976	---	
	9Y-98A	8/ 3/49	do.	62	---	17	7.2	208		329	0	212	22	.9	.6	630	.86	72	0	86	11	1,010	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH		
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate						
DISTRICT 9—Continued																									
36 con.	9Y-96	12/ 2/54	Kayenta	42	13	21	8.6	115		247	0	56	41	0.8	20	396	0.54	88	0	74	5.3	676	---		
	9A-25	12/ 1/54	Navajo	46	15	52	16	39		177	0	82	34	.8	.8	327	.44	196	50	30	1.2	534	---		
	9R-7	11/ 9/54	Wingate (Lukachukai)	46	16	52	7.6	9.9		206	0	7.6	3	.3	.3	198	.27	160	0	12	.3	337	---		
37	9Y-92	11/13/53	T; Navajo	---	15	134	64	76	4.8	104	0	625	12	1.1	15	998	1.36	598	512	21	1.3	1,310	---		
	9Y-95	8/ 3/49	Navajo	62	---	13	4.9	61		118	0	44	22	.2	14	217	.30	52	0	72	3.7	369	---		
DISTRICT 10																									
53	10K-7	7/20/49	Chinle (Shinarump), De Chelly	---	---	---	---	---	---	278	0	---	13	---	---	---	---	---	---	---	---	652	---		
	10K-213	7/28/49	De Chelly	---	---	101	38	15	---	362	0	126	8	0.9	0.1	467	0.64	408	112	8	0.3	747	---		
	10K-216	8/ 1/49	Alluvium	60	---	12	5.7	---	372	---	488	33	349	28	1.0	1.2	1,040	1.41	54	0	94	22	1,610	---	
	10K-217	7/20/49	Chinle (Shinarump) and De Chelly	---	---	54	19	---	66	---	266	0	114	12	.7	.2	397	.54	212	0	40	2.0	648	---	
	10K-235	5/10/55	Navajo, Kayenta, and Wingate (Lukachukai)	57	17	24	7.2	36	---	116	0	44	13	.8	8.7	208	.28	90	0	47	1.7	339	7.2		
	10R-98	7/18/49	Alluvium	---	---	---	---	---	---	---	270	0	---	17	---	---	---	---	---	---	---	---	---	1,300	---
	10R-166	7/18/49	do.	---	---	10	3.7	---	307	---	484	0	262	24	1.7	.7	848	1.15	40	0	94	21	1,330	---	
	10R-174	7/25/49	Wingate (Lukachukai)	---	---	41	10	---	66	---	123	0	112	41	.5	12	343	.47	144	42	50	2.4	564	---	
	10T-238	5/ /54	ID, 40 feet; alluvium	---	---	---	---	---	618	---	508	0	1,260	35	---	---	---	---	435	18	76	13	3,080	---	
		4/27/54	D; alluvium	59	18	44	17	---	450	---	548	0	632	33	1.3	2.3	1,470	2.00	180	0	84	15	2,110	---	
	10T-241	5/ 6/54	do.	---	---	---	---	---	---	---	540	0	---	18	---	---	---	---	96	0	---	---	---	1,730	---
	10R-94	8/ 8/54	Alluvium	71	13	79	20	---	33	---	292	0	80	12	1.0	10	392	.53	279	40	20	.9	626	---	
	10R-97	7/21/49	do.	---	---	22	9.2	---	339	---	436	0	424	20	1.2	.5	1,030	1.40	93	0	89	15	1,540	---	
	10R-162	7/21/49	do.	---	---	96	33	---	321	---	590	0	494	51	.7	.8	1,290	1.75	375	0	65	7.2	1,850	---	
	10R-93	7/28/54	Chinle (Petrified Forest, lower)	65	15	12	6.7	---	146	---	328	0	87	8	1.4	.6	438	.60	58	0	85	8.4	682	---	
	10R-108	7/30/54	Wingate (Lukachukai)	65	20	46	8.5	---	197	---	196	0	226	121	1.2	12	728	.99	150	0	74	7.0	1,040	---	
	10R-109	2/27/50	Kayenta	---	13	119	21	---	109	---	127	0	431	19	1.3	48	824	1.12	384	280	38	2.4	1,190	---	
10R-114	8/27/52	Wingate (Lukachukai)	72	22	36	4.7	---	59	---	186	0	50	20	.6	5.0	289	.39	110	0	54	2.5	461	---		
10R-115	3/ 3/50	Kayenta	45	17	60	10	---	16	---	134	0	81	15	1.2	8.9	275	.37	190	80	16	.5	432	---		
10R-120	7/29/54	Wingate (Lukachukai)	65	27	67	21	---	213	---	356	0	250	114	1.0	1.4	869	1.18	254	0	65	5.8	1,340	---		
10R-125	8/27/52	Chinle (lower red)	68	11	85	36	---	21	---	248	0	183	8	.6	.3	467	.64	360	157	11	.5	736	---		

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate				
DISTRICT 10—Continued																							
53 con.	10R-161	7/29/54	Wingate (Lukachukai)	70	29	36	1.4	101		244	0	82	11	1.0	16	397	0.54	96	0	70	4.5	388	---
54	10K-221	7/28/49	Navajo	----	-----	4.0	.8	165		312	0	43	46	1.4	3.2	417	.57	14	0	96	19	692	---
	10R-111	8/ 4/49	Entrada and Navajo	62	12	65	15	1,140		79	0	2,380	108	.6	3.3	3,760	5.11	224	159	92	33	5,030	---
	10R-119	12/ 2/53	Navajo	56	13	29	11	68	4.6	170	0	90	13	2.2	17	332	.45	118	0	55	2.7	526	---
	10GS-54-1	8/ 4/54	T; Dakota, Morrison	----	11	474	127	103		144	0	1,710	17	.9	5.6	2,520	3.43	1,700	1,590	12	1.1	2,870	---
	10A-132	8/23/52	Alluvium	68	17	508	375	319		259	0	3,050	81	1.0	.8	4,480	6.09	2,810	2,600	20	2.6	4,580	---
	10R-113	8/22/52	do.	71	19	545	171	188		159	0	2,200	32	1.2	2.9	3,240	4.41	2,060	1,930	17	1.8	3,360	---
	10R-158	7/28/49	Dakota	57	-----	40	8.8	9.4		138	0	28	7	.6	3.5	165	.22	136	23	13	.4	294	---
	10R-158A	7/28/49	do.	62	-----	49	13	5.8		130	0	39	27	.2	4.0	202	.27	176	70	7	.2	362	---
70	10K-236	4/12/54	D; De Chelly	----	10	52	26	17		266	0	42	7	.8	.1	286	.39	236	18	14	.5	472	---
	10T-233	4/ 9/54	T; De Chelly	----	8.9	72	22	33		349	0	39	9	.6	1.2	358	.49	270	0	21	.9	599	---
	10T-243	6/ 2/54	D; De Chelly	----	-----	-----	-----	-----	-----	214	0	-----	8	-----	-----	-----	-----	186	10	-----	-----	423	---
	10R-73	6/ 2/54	Chinle (lower red)	60	15	79	20	31		300	0	39	34	.6	12	379	.52	279	33	19	.8	633	---
	10R-78	6/ 3/54	De Chelly	72	17	62	12	58		300	0	54	17	.6	2.0	371	.50	204	0	38	1.7	594	---
	10R-81	6/ 3/54	Chinle (Shinarump)	52	-----	-----	-----	-----	-----	205	0	-----	17	-----	-----	-----	-----	-----	-----	-----	-----	387	---
71	10K-200	7/19/49	Highly colored sample; Chinle (lower red)	----	-----	5.5	1.0	275		470	0	175	22	5.9	2.8	719	.98	18	0	97	29	1,150	---
	10K-232	4/23/48	Alluvium, De Chelly	----	-----	66	18	17		284	0	24	11	.4	.5	277	.38	238	6	13	.5	492	---
	10K-234	1/25/54	D; Chinle (Shinarump)	----	4.9	11	2.9	154		265	0	79	50	1.4	.5	434	.59	40	0	89	11	725	---
	10R-2	7/14/49	Alluvium	60	-----	-----	-----	-----	-----	666	18	-----	17	-----	-----	-----	-----	-----	-----	-----	-----	1,330	---
	10R-3	7/15/49	do.	57	-----	52	17	59		320	0	47	8	.6	3.6	345	.47	200	0	39	1.8	597	---
	10R-54	7/19/49	do.	----	-----	5.5	1.1	202		466	0	52	14	.6	1.1	506	.69	18	0	96	21	829	---
	10R-58	7/27/49	do.	----	-----	30	24	1,150		180	0	891	1,120	1.6	20	3,330	4.53	174	26	94	38	5,480	---
	10R-155	8/28/52	do.	69	15	47	17	72		332	0	34	24	.5	.5	374	.51	188	0	45	2.3	628	---
	10R-156	1/30/48	Boron (B) < 0.1; alluvium	57	19	71	18	21		312	0	26	10	.4	.3	319	.43	251	0	16	.6	510	7.8
	10R-156A	7/18/49	Alluvium	----	-----	71	22	34		278	0	79	20	.4	3.1	366	.50	268	40	22	.9	629	---
	10R-157	7/18/49	Alluvium, Chinle (Shinarump)	----	-----	92	24	18		294	0	100	15	.2	.4	394	.54	328	87	11	.4	660	---
	10R-170	7/18/49	Alluvium	----	-----	58	21	166		440	0	147	55	.3	.5	664	.90	231	0	61	4.8	1,080	---
	10T-242	5/10/54	ID, 85 feet; alluvium	----	12	409	384	> 3,540		982	0	8,890	160	.6	3.3	13,900	18.9	2,600	1,800	75	30	14,300	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH	
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate					
DISTRICT 10—Continued																								
71 con.	10T-242	5/17/54	D; alluvium	---	11	---	---	227	---	538	0	65	18	1.8	6.5	---	---	50	0	91	14	939	---	
	10R-1	2/ 2/48	Boron (B) 0.8; alluvium	---	10	23	4.8	131	---	253	0	117	14	.7	14	439	0.60	77	0	79	6.5	669	7.7	
	10R-15	8/28/52	Wingate (Lukachukai)	66	15	8.5	2.2	188	---	470	10	20	10	.6	1.9	487	.66	30	0	93	15	808	---	
	10R-100	8/12/54	Alluvium	70	---	---	---	---	---	508	0	---	31	---	---	---	---	21	0	---	---	---	1,020	---
	10R-131	8/11/54	do.	71	16	42	14	96	---	196	0	98	76	.6	.0	439	.60	162	2	56	3.3	759	---	
	10R-154	7/28/54	do.	69	---	---	---	---	---	332	0	---	29	---	---	---	---	126	0	---	---	---	766	---
	10R-101	11/30/50	Wingate (Lukachukai)	---	14	28	5.2	---	6.9	98	0	16	4	.2	4.6	127	.17	92	11	14	.3	206	---	
72	10K-237	9/10/54	ID, 250 feet; Cow Springs	---	12	171	69	949	---	322	0	2,380	20	1.3	1.3	3,760	5.11	710	446	74	15	4,720	---	
		9/17/54	D; Cow Springs and Entrada	---	11	135	48	1,350	---	304	0	3,030	52	1.0	.1	4,780	6.50	534	286	85	25	6,000	---	
	10R-49	7/26/49	Alluvium, Cow Springs	---	---	---	---	---	---	322	0	---	17	---	---	---	---	---	---	---	---	---	1,390	---
	10R-51	5/ 5/50	do.	52	9.0	42	12	439	---	491	0	647	16	1.5	7.0	1,420	1.93	154	0	86	15	2,050	---	
	10R-51A	11/ 1/50	Alluvium	---	---	---	---	---	---	458	8	---	17	---	---	---	---	---	---	---	---	---	2,040	---
	Amerada 1	7/29/53	Wingate (Lukachukai)	60	---	---	---	---	---	214	247	---	38	.6	---	---	---	12	0	---	---	---	1,940	---
	Salina T.P. 1	7/31/52	Morrison (Westwater Canyon)	63	13	29	12	22	---	158	0	26	6	.6	4.0	191	.26	122	0	28	.9	316	---	
	10R-50	7/31/52	Morrison (Recapture)	63	15	92	23	224	---	260	13	313	116	4.0	96	1,020	1.39	324	90	60	5.4	1,510	---	
	10R-52	7/31/52	do.	65	11	34	9.8	88	---	187	0	93	19	1.4	45	393	.53	126	0	60	3.4	609	---	
	10R-53	8/18/54	do.	68	---	---	---	---	---	281	0	---	63	3.2	200	---	---	414	184	---	---	---	1,080	---
	10R-62	8/18/54	Alluvium	69	23	429	378	1,380	---	286	0	5,140	30	1.0	.4	7,520	10.2	2,620	2,390	53	12	7,870	---	
	10B-180	7/26/49	Morrison (Recapture)	---	---	86	22	---	116	---	270	0	198	83	1.7	10	650	.88	305	84	45	2.9	1,050	---
	10B-183	8/18/54	Cow Springs	67	9.6	25	5.7	---	124	---	300	0	63	30	.6	.2	406	.55	86	0	76	5.8	680	---
10R-153	8/ 5/54	do.	69	10	25	7.1	---	146	---	208	10	184	19	1.0	.1	504	.69	92	0	78	6.6	781	---	
10R-169	7/26/49	Morrison (Westwater Canyon)	---	---	---	---	---	---	173	0	---	3	---	---	---	---	---	---	---	---	---	---	379	---
10R-169A	7/26/49	do.	---	---	47	18	---	20	---	186	0	60	11	.6	3.5	252	.34	192	39	19	.6	434	---	
90	10K-8	7/27/49	T; Chinle (Shinarump) and De Chelly	---	---	---	---	---	---	279	0	---	30	---	---	---	---	---	---	---	---	---	646	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent sod- ium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate				
DISTRICT 10—Continued																							
90 con.	10R-185	5/ 4/53	Chinle (Shinarump) and De Chelly	56	11	79	22	54		322	0	97	26	0.6	1.0	449	0.61	288	24	29	1.4	752	---
	Nazlini 2	10/19/54	D; De Chelly	---	12	92	39	96		338	0	270	27	.6	.8	703	.96	390	113	35	2.1	1,070	7.2
	10R-26	8/ 8/54	De Chelly	75	---	---	---	---	---	220	0	---	27	---	---	---	---	158	0	---	---	512	---
	10R-28	8/19/54	Chinle (Sonsela)	62	24	98	34	76		256	0	243	61	.2	1.3	664	.90	384	174	30	1.7	996	---
	10R-41	8/13/54	Chinle (Petrified Forest, lower)	70	24	81	13	75		322	27	68	26	.2	.7	473	.64	256	0	39	2.0	731	---
	10R-126	8/19/54	De Chelly	70	19	43	11	46		214	0	37	27	.2	.2	288	.39	152	0	40	1.6	468	---
91	10R-21	7/26/49	T; alluvium	---	---	268	122	578		297	0	2,020	54	.7	1.9	3,190	4.34	1,170	926	52	7.3	3,920	---
	10R-61	7/19/49	Alluvium	---	---	23	14	506		338	0	312	355	1.2	137	1,510	2.05	115	0	91	21	2,460	---
	10T-239	6/11/54	De Chelly	63	7.6	33	8.6	---	---	310	0	---	11	.7	---	---	---	118	0	---	---	593	---
	10K-2	7/14/49	Alluvium	60	---	19	3.9	297		552	8	189	31	.9	.9	822	1.12	64	0	91	16	1,310	---
	10K-219	7/14/49	do.	59	---	---	---	---	---	596	18	---	17	---	---	---	---	---	---	---	---	1,220	---
	10K-220	7/14/49	do.	58	---	---	---	---	---	626	0	---	19	---	---	---	---	---	---	---	---	1,160	---
92	10R-16	5/21/50	T; Cow Springs and Entrada	---	14	260	87	420		565	0	1,350	28	.3	13	2,450	3.33	1,010	543	48	5.8	3,100	---
	10R-139	8/11/54	Dakota	68	18	167	40	38		291	0	355	32	1.3	10	804	1.09	581	342	13	.7	1,130	---

DISTRICT 11

35	11K-236	6/ 9/52	D; Chinle (Shinarump), De Chelly	65	---	---	---	---	---	---	---	---	23	---	---	---	---	16	---	---	---	944	---
		8/ 5/54	T; Chinle (Shinarump), De Chelly	---	13	12	4.5	66		203	0	16	5	0.2	1.8	218	0.30	48	0	75	4.1	358	---
	11K-238	7/28/54	D; Chinle (Shinarump), De Chelly	---	---	---	---	---	---	238	49	---	33	---	---	---	---	70	0	---	---	728	8.5
		7/29/54	do.	76	---	---	---	---	---	209	0	---	10	---	---	---	---	36	0	---	---	389	8.0
	11Y-54	7/22/49	Chinle (Shinarump) and De Chelly	---	---	11	4.0	78		213	0	29	6	.6	.2	234	.32	44	0	79	5.1	398	---
	11Y-54A	7/22/49	T; Chinle (Sonsela)	---	---	8.8	4.4	294		402	0	274	45	.4	1.3	826	1.12	40	0	94	20	1,310	---
	11Y-46	8/ 6/54	Alluvium	66	24	34	18	221		352	0	173	121	.2	1.5	766	1.04	159	0	75	7.6	1,220	---
	11K-200	8/ 5/54	Chinle (Sonsela)	80	29	5.6	1.8	621		420	33	864	50	.6	.3	1,810	2.46	22	0	98	58	2,610	---
	11Y-2	8/ 5/54	Chinle (Owl Rock)	78	16	5.0	2.6	308		633	0	88	50	.4	18	800	1.09	26	0	96	27	1,280	---
	11Y-45	8/ 8/54	Alluvium	68	30	71	34	126		590	0	37	46	.4	3.1	638	.87	317	0	46	3.1	1,080	---
	11Y-52	8/ 6/54	Wingate (Rock Point)	74	12	26	12	119		360	0	38	25	.4	3.2	413	.56	114	0	69	4.8	685	---
	11Y-60	8/ 6/54	Chinle (Owl Rock)	82	20	11	6.9	589		348	0	835	241	.1	61	1,740	2.37	58	0	77	---	---	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH	
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate					
DISTRICT 11—Continued																								
36	11Y-75	7/18/50	Chinle (Shinarump)	64	13	0.8	3.1	80		196	0	18	6	0.2	0.4	218	0.30	14	0	92	9.1	352	---	
	11Y-47	8/ 4/54	Alluvium	68	25	29	7.6	133		306	0	108	18	.6	4.6	476	.65	104	0	74	5.7	745	---	
	11Y-80	8/ 4/54	do.	62	16	60	18	157		319	0	262	20	.6	.9	622	.94	224	0	60	4.5	1,040	---	
51	11Y-234	9/ 1/51	ID, 445 feet; Chinle (lower red)	----	15	40	12	84		317	0	54	11	.4	.6	373	.51	150	0	55	3.0	610	---	
		9/24/51	D; Chinle (Shinarump), De Chelly	----	10	10	7.5	140		343	0	59	11	.6	1.0	408	.55	56	0	84	8.1	669	---	
	Lukachukai T. P.	1/25/55	T; Chinle (Shinarump)	----	22	62	29	126		462	0	144	12	.6	.2	623	.85	274	0	50	3.3	975	---	
	Catholic Mission	7/29/49	Alluvium	55	-----	-----	-----	-----		500	0	-----	54	-----	-----	-----	-----	-----	-----	-----	-----	-----	991	---
	11Y-3	8/27/54	Chuska	47	61	41	4.8		7.8	157	0	3.5	4.5	.2	.3	200	.27	122	0	12	.3	257	---	
	11Y-35	8/ 2/49	Chinle (lower red)	60	-----	34	34	136		468	0	98	24	.4	.6	558	.76	225	0	57	3.9	919	---	
	11Y-37	8/27/54	Chuska	-----	-----	-----	-----	-----		140	0	-----	5.0	-----	-----	-----	-----	-----	-----	-----	-----	-----	236	---
	11Y-39	8/12/54	Alluvium	62	41	65	24	123		469	0	87	30	.4	12	613	.83	260	0	51	3.3	937	---	
	11Y-107	8/19/54	Chinle (Sonseia)	58	45	83	23	31		364	0	23	30	.2	3.0	417	.57	302	3	18	.8	675	---	
52	11K-237	6/ 8/53	D; De Chelly	----	10	126	46	17		381	0	204	7	2.0	.0	599	.81	504	192	7	.3	916	---	
	11K-239	9/10/54	do.	----	13	107	50	32		532	0	90	7	.6	.1	562	.76	472	36	13	.6	921	---	
	11K-249	8/23/56	De Chelly	64	-----	-----	-----	-----		341	0	-----	7.0	-----	-----	-----	-----	558	278	-----	-----	-----	982	7.0
	11T-235	9/ 4/51	D; De Chelly	62	14	126	48	17		438	0	174	5	1.0	.2	601	.83	512	153	7	.3	956	---	
	11Y-58	8/25/54	Chinle (Shinarump)	61	15	131	38	35		382	0	220	11	.8	.2	639	.87	483	170	14	.7	945	---	
	11Y-69	8/ 2/49	De Chelly	----	15	40	50	38		332	0	97	9	.7	.1	413	.56	306	34	21	.9	681	---	
	11Y-78	7/29/49	T; Chinle (Shinarump), De Chelly	----	-----	-----	-----	-----		338	0	-----	12	-----	-----	-----	-----	-----	-----	-----	-----	-----	838	---
	11Y-109	8/ 2/49	De Chelly	----	-----	121	39	28		346	0	216	8	.7	.6	584	.79	462	179	11	.6	894	---	
	11Y-56	8/25/54	Alluvium	64	-----	-----	-----	-----		342	0	-----	310	-----	-----	-----	-----	735	455	-----	-----	-----	1,880	---
	11Y-41	8/26/54	do.	65	63	18	12	540		1,000	49	278	52	1.2	.4	1,510	2.05	94	0	93	24	2,210	---	
	11Y-55	10/ 7/50	Chinle (Shinarump)	56	16	304	587	871		434	0	4,110	304	.8	1.7	6,410	8.72	3,170	2,820	37	6.7	6,950	---	
	11Y-72	8/25/54	De Chelly	52	-----	139	42	-----		348	0	10	-----	-----	-----	-----	-----	520	234	-----	-----	-----	1,010	---
	11Y-85	8/26/54	Chinle (Sonseia)	62	19	9.9	3.6	342		740	0	127	31	.4	.5	897	1.22	40	0	95	24	1,390	---	
53	11Y-74	8/ 5/54	Chinle (Petrified Forest, upper)	68	15	6.4	1.7	310		512	0	127	100	1.0	3.7	817	1.11	23	0	97	28	1,320	---	
69	11Y-29A	8/18/54	Chuska	57	44	44	5.5	14		186	0	3.5	3.5	.2	.4	206	.28	132	0	18	.5	292	---	
		8/18/54	Chinle (Shinarump)	53	12	104	38	35		392	0	151	9	.4	.2	543	.74	416	94	15	.7	839	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH	
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
DISTRICT 12																								
1	12K-316	12/ 9/53	T; Morrison (Salt Wash)	----	10	5.2	1.7	567	6.6	962	63	296	35	1.8	0.2	1,460	1.99	20	0	98	55	2,230	---	
	12T-312	8/ 7/52	D; Navajo and others	71	16	54	20	1,350		2,300	0	286	685	.4	4.1	3,550	4.83	216	0	93	40	5,390	---	
		12/ 9/53	T; Navajo and others	----	10	134	77	3,400	56	1,140	166	2,720	2,960	.4	-----	10,100	13.7	651	0	91	58	14,300	---	
		3/10/55	Iron (Fe) total 3.8; Entrada(?)	61	11	328	133	5,660	65	435	0	5,820	5,480	.9	10	17,800	24.2	1,370	1,010	88	67	23,400	7.7	
	12T-326	5/10/56	Morrison, Bluff	----	13	30	20		80	334	0	48	4	1.2	.3	362	.49	157	0	53	2.8	616	7.5	
	12T-327	3/ 2/56	do.	63	13	33	18	115		426	0	41	8.5	.8	.2	438	.60	156	0	61	4.0	728	7.6	
	12R-163	9/ 8/54	Dakota	73	15	25	41	556		822	0	673	44	1.1	1.1	1,750	2.39	231	0	84	16	2,500	---	
	12R-173	9/ 8/54	Burro Canyon	68	13	27	12		927	380	0	1,670	54	1.7	1.5	2,890	3.93	117	0	95	37	3,930	---	
	12R-211	9/ 9/54	Morrison (Westwater Canyon)	65	-----	-----	-----	-----	-----	1,200	73	-----	34	-----	-----	-----	-----	100	0	-----	-----	-----	4,720	---
2	12M-52	9/ 8/54	Alluvium	61	10	23	14	129		392	0	55	9	.8	2.2	436	.59	115	0	71	5.2	710	---	
	12R-171	9/ 8/54	Morrison (Recapture)	60	11	24	11	174		486	0	59	14	1.0	1.2	534	.73	105	0	78	7.4	867	---	
7	12K-308	3/10/55	Iron (Fe) total 0.13; Entrada, Navajo, and Wingate (Lukachukai)	65	10	105	74	2,940	28	680	0	1,640	3,490	.1	2.5	8,640	11.8	566	10	90	54	12,000	7.9	
	12K-308A	8/25/49	Morrison, Bluff, and Entrada	----	11	8.5	3.8		786	914	0	841	78	3.9	1.2	2,180	2.96	36	0	98	37	3,180	---	
	12R-189	9/10/54	Alluvium	66	17	23	4.8	239		405	0	189	32	1.8	23	729	.99	77	0	87	12	1,170	---	
	12R-184A	9/ 9/54	Morrison (Westwater Canyon)	67	17	64	13	77		190	0	186	19	.6	3.1	473	.64	213	58	44	2.3	721	---	
17	12K-300	7/19/52	Dakota, Morrison	76	7.0	2.0	.4	978		210	218	1,120	296	5.0	1.5	2,730	3.71	6	0	100	167	4,150	---	
	12K-300A	10/ 9/52	do.	90	17	138	25	848		80	0	2,040	70	1.8	.3	3,180	4.32	448	382	80	17	4,110	---	
	12R-204	8/10/49	-----	83	17	146	28	1,530		254	0	3,210	170	2.1	.6	5,230	7.11	480	272	87	30	6,640	---	
	12T-322	8/31/54	D; alluvium	----	26	437	250		351	150	0	2,510	53	.7	86	3,790	5.15	2,120	2,000	26	3.3	4,070	---	
	12K-300C	8/29/49	Alluvium	72	-----	-----	-----	-----	-----	258	0	-----	47	-----	-----	-----	-----	-----	-----	-----	-----	-----	1,980	---
	12K-300D	9/ 1/49	do.	62	24	146	33	61		380	0	244	18	.9	48	762	1.04	500	188	21	1.2	1,100	---	
	12K-300E	9/ 2/54	do.	65	14	81	13	65		192	0	211	14	.4	.2	493	.67	256	98	36	1.8	723	---	
	12R-137	9/29/54	do.	63	21	189	137	365		290	0	1,400	90	1.3	3.9	2,350	3.20	1,040	798	43	4.9	2,920	---	
18	12K-317	8/ 3/53	ID, 850 feet; Dakota	----	-----	-----	-----	-----	-----	1,460	28	-----	500	-----	-----	-----	-----	-----	-----	-----	-----	-----	3,680	---
		8/ 6/53	D; Dakota	----	16	5.2	3.2	660		1,550	39	7.8	65	10	.2	1,570	2.14	26	0	98	56	2,470	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH	
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate					
DISTRICT 12—Continued																								
18 con.	12K-318	4/ 6/53	D; alluvium	---	7.3	111	28	142		180	0	496	25	0.7	0.1	896	1.22	392	244	44	3.1	1,350	---	
	12K-319	9/21/54	T; alluvium	---	22	183	36	104		346	0	497	20	.7	.9	1,030	1.40	604	321	27	1.3	1,400	---	
	12R-50A	6/27/52	T; Dakota and Morrison	---	13	19	3.1	692		167	6	978	280	1.3	1.0	2,080	2.83	60	0	96	39	3,150	---	
	12R-148	6/27/52	Gallup	69	11	5.5	2.0	617		763	17	17	482	4.8	.6	1,530	2.08	22	0	98	58	2,670	---	
	12R-48	8/24/49	Alluvium	66	---	---	---	---		214	0	---	52	---	---	---	---	---	---	---	---	---	3,600	---
	12R-3	9/18/54	Mancos	63	24	97	28	56		254	0	224	25	1.0	.9	581	.79	357	149	26	1.4	848	---	
	12R-6	9/18/54	Iron (Fe) total 2.2; acidity as H ₂ SO ₄ , 122; Dakota	68	42	330	63	---		---	---	1,460	31	---	---	---	---	1,080	1,210	---	---	---	2,580	3.3
	12GS-18-1	6/30/55	Wingate (Lukachukai)	66	15	3.2	3.6	145		280	22	47	15	1.0	.9	390	.53	23	0	93	13	638	9.0	
19	Bitlabito oil-test water well	6/30/55	-----	66	12	5.6	3.1	472		524	20	142	308	2.0	2.2	1,220	1.66	26	0	97	40	2,040	8.6	
	12R-7A	8/31/49	Morrison (Salt Wash)	58	21	68	18	9.2		227	0	52	15	.6	1.2	297	.40	244	58	8	.3	490	---	
	12GS-19-2	9/22/54	Alluvium	49	21	106	28	17		372	0	92	10	.8	.0	458	.62	380	74	9	.4	731	---	
	Bitlabito 1	6/30/55	Wingate	---	15	4.8	4.5	744		794	52	138	540	1.8	2.2	1,890	2.57	20	0	98	59	3,120	8.8	
32	12K-309	8/10/49	Dakota	61	14	6.0	1.7	548		271	11	831	74	1.0	.2	1,620	2.20	22	0	98	51	2,440	---	
	12K-320	3/ 2/54	ID, 520 feet; Gallup	---	---	---	---	908		276	7	1,800	163	---	---	---	---	368	130	84	21	4,470	---	
		4/11/54	ID, 1,400 feet; Dakota	---	6.5	---	---	187		296	10	142	15	1.0	.8	---	---	25	0	94	16	814	8.5	
		12/ 7/54	Dakota, Morrison (Westwater Canyon)	60	18	---	---	---		146	47	---	5	.6	.0	---	---	2	0	---	---	---	389	9.2
	12R-75	8/10/49	Gallup(?)	76	16	11	3.2	1,010		186	0	1,810	130	2.7	1.0	3,080	4.19	40	0	98	69	4,280	---	
	12R-91	6/26/52	Cliff House	66	19	276	19	452		276	0	1,430	19	2.9	.1	2,350	3.20	766	540	56	7.1	2,940	---	
	12R-132	3/27/52	Gallup(?)	---	11	42	11	1,190		300	15	2,100	190	2.6	.2	3,710	5.05	150	0	95	42	5,100	8.3	
	12R-132A	8/10/49	do.	62	13	96	19	1,390		374	0	2,620	202	3.5	.8	4,530	6.16	318	11	90	34	5,990	---	
	12GS-32-1	1/ 7/54	Gallup	60	25	19	11	398		312	20	541	71	2.1	.2	1,240	1.69	92	0	90	18	1,870	---	
	12R-80	8/12/49	Volcanic intrusive	64	15	6.5	1.1	313		325	0	332	120	.8	.4	900	1.22	20	0	97	30	1,450	---	
	12R-85	9/ 9/54	Gallup	71	27	44	23	449		332	0	700	124	1.7	1.1	1,530	2.08	204	0	83	14	2,240	---	
	12R-101	9/ 8/54	Mancos	63	16	5.2	1.9	418		309	0	558	64	1.7	.2	1,220	1.66	21	0	98	40	1,820	---	
	McMillen oil test	12/28/53	-----	---	15	64	29	707		206	12	1,370	142	.3	.1	2,440	3.32	278	90	85	---	3,480	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH	
																Parts per million	Tons per acre-foot	Calcium-magnesium	Non-carbonate					
DISTRICT 12—Continued																								
33	12K-310	8/ 9/49	T; Dakota	73	-----	-----	-----	-----	-----	371	10	-----	114	-----	-----	-----	-----	-----	-----	-----	-----	-----	2,160	---
	12R-50	8/24/49	Gallup	80	-----	-----	-----	-----	-----	172	0	-----	278	-----	-----	-----	-----	-----	-----	-----	-----	-----	3,160	---
	12R-84	8/12/49	Dakota and Morrison	76	19	3.5	1.1	98	-----	184	26	22	4	0.6	0.4	265	0.36	13	0	94	12	422	---	
	12R-98	12/15/48	Gallup	50	-----	19	14	299	-----	342	0	440	11	.6	1.4	954	.98	105	0	86	13	1,400	---	
	12R-100	8/ 9/49	do.	60	22	34	24	268	-----	286	0	481	21	.5	.3	992	1.35	184	0	76	8.6	1,450	---	
	12T-324	12/ 4/55	Dakota	----	6.6	9.9	1.0	369	-----	347	0	499	17	.7	.2	1,070	1.46	28	0	97	20	1,600	8.2	
	12R-17	8/12/49	Gallup	64	29	66	15	18	-----	184	0	94	11	.3	.9	325	.44	226	75	15	.5	497	---	
	12R-55A	9/23/54	do.	64	30	125	50	78	-----	230	0	450	21	.3	.6	868	1.18	518	329	25	1.5	1,190	---	
	12R-95	8/ 9/49	do.	68	11	7.8	2.2	564	-----	448	0	746	73	2.2	1.5	1,630	2.22	28	0	98	46	2,440	---	
	12R-150	9/23/54	Alluvium	66	18	214	40	206	-----	188	0	937	9	.6	3.4	1,520	2.07	698	544	39	3.4	1,990	---	
	12R-59	9/16/54	Gallup	68	26	71	26	26	-----	164	0	185	9	.4	.6	425	.58	284	150	17	.7	640	---	
	12R-61	9/16/54	Dakota	69	14	-----	-----	133	-----	255	0	75	7	.4	.8	-----	-----	10	0	97	18	569	---	
34	12T-323	9/12/55	Morrison (Salt Wash), Bluff	----	13	11	3.1	-----	-----	217	0	-----	33	1.0	.5	-----	-----	40	0	-----	-----	630	8.0	
	12R-33	11/17/48	Alluvium	50	-----	51	18	104	-----	340	0	83	38	1.2	6.8	470	.64	201	0	53	3.2	793	---	
	12R-39	8/26/49	do.	66	-----	-----	-----	-----	-----	340	0	-----	40	-----	-----	-----	-----	-----	-----	-----	-----	-----	802	---
	Red Rock T. P.	11/17/48	do.	----	-----	54	19	96	-----	332	0	86	40	.8	.9	460	.63	212	0	49	2.9	773	---	
	Red Rock D. S.	11/17/48	do.	56	-----	12	16	189	-----	451	0	74	40	.8	1.4	555	.75	96	0	81	8.4	916	---	
	Cove D. S.	8/26/49	do.	58	-----	-----	-----	-----	-----	445	0	-----	31	-----	-----	-----	-----	-----	-----	-----	-----	-----	817	---
	12R-12	9/22/54	Morrison (Salt Wash)	57	23	62	15	18	-----	257	0	29	8	.4	2.1	284	.39	216	6	15	.5	461	---	
	12R-25	10/ 1/54	Wingate (Rock Point)	60	43	44	20	88	-----	410	0	22	16	.4	1.3	437	.59	192	0	50	2.8	687	---	
	12R-34	9/23/54	Entrada	65	23	49	19	34	-----	245	0	34	22	.4	8.1	310	.42	200	0	27	1.1	495	---	
	12R-36	9/23/54	Wingate (Lukachukai)	60	22	33	11	128	-----	334	0	69	38	.6	5.8	471	.64	128	0	69	4.9	752	---	
	12GS-34-2	8/18/54	Wingate (Rock Point)	65	12	42	23	45	-----	293	0	32	14	.4	2.9	315	.43	200	0	33	1.4	541	---	
	12GS-34-4	9/30/54	Wingate (Lukachukai)	62	-----	-----	-----	-----	-----	267	0	-----	5	-----	-----	-----	-----	234	15	-----	-----	460	---	
49	12K-312	9/22/54	T; Menefee	----	-----	-----	-----	-----	-----	355	18	-----	9	2.8	-----	-----	-----	7	0	-----	-----	707	---	
	12M-49	6/25/52	Cliff House	64	10	5.8	1.7	658	-----	1,140	14	363	66	8.0	2.1	1,690	2.30	22	0	99	62	2,550	---	
	12R-242	9/22/54	do.	62	19	33	16	993	-----	426	0	1,760	88	.6	1.8	3,120	4.24	148	0	94	35	4,200	---	
	12K-3	9/21/54	Alluvium	64	17	43	4.8	211	-----	312	21	261	15	1.0	.6	727	.99	127	0	78	8.1	1,070	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH	
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate					
DISTRICT 12—Continued																								
49 con.	12K-13	9/22/54	Alluvium	69	14	532	104	1,050		290	0	3,440	155	1.0	5.7	5,440	7.40	1,760	1,520	57	11	6,150	---	
	12K-312B	11/ 9/48	do.			225	53	285		329	0	1,050	24	.5	.5	1,800	2.45	780	510	44	4.4	2,330	---	
	12R-93	8/11/49	do.	66						268	0		46										1,300	---
	12R-81	9/ 9/54	Gallup	75	26	100	39	122		145	6	489	25	.7	.2	879	1.20	410	282	39	2.6	1,220	---	
	12R-94	9/ 7/54	do.	64	19	17	4.0	710		430	0	900	215	2.8	3.6	2,080	2.83	59	0	96	40	3,030	---	
	12R-103	9/ 7/54	Volcanic intrusive	63	24	5.6	2.3	311		314	0	351	51	1.5	.9	901	1.23	24	0	97	28	1,350	---	
	12R-104	11/ 9/48	Menefee	60		4.5	3.3	243		296	0	254	30	.9	.7	682	.93	24	0	96	21	1,080	---	
	12R-105	11/10/48	do.	61		6.5	3.7	326		326	0	372	58	1.2	.6	929	1.26	31	0	96	25	1,450	---	
	12R-106	8/15/49	Alluvium	64	16	48	15	327		407	0	502	21	2.5	.7	1,130	1.54	182	0	80	11	1,670	---	
50	12K-311	6/ 6/51	ID, 520 feet; Dakota, Morrison (Westwater Canyon)		9.8	20	2.0	223		325	0	253	15	.8	.2	689	.94	58	0	90	13	1,060	---	
		6/28/51	ID, 1,240 feet; Morrison (Recapture and Salt Wash), Summerville	70	14	7.0	2.4	137		260	15	67	11	.4	.8	383	.52	28	0	92	11	632	---	
		9/16/54	Morrison	69	22	7.1	1.7	64		172	0	15	4	.8	.6	200	.27	24	0	85	5.7	300	---	
	12M-25	11/10/48	T; Morrison	68		7.4	2.4	59		168	0	11	4	.8	.5	168	.23	28	0	82	4.8	286	---	
	12R-83	9/ 4/49	Morrison(?)	77	22	2.2	1.7	92		174	30	11	5	.6	.3	250	.34	12	0	94	11	390	---	
	12M-16	9/ 4/54	Chuska	57	44	23	5.0	7.4		102	0	5.8	3	.2	.1	138	.19	78	0	17	.4	171	---	
	12M-39	12/ 7/54	Gallup		12	218	43	16		205	0	540	10	.3	13	953	1.30	721	553	5	.3	1,270	---	
	12R-71	11/10/48	do.			1.0	1.2	111		208	9	45	10	.4	.6	280	.38	8	0	97	18	471	---	
	12R-71B	9/15/54	do.	72	19	2.4	.5	109		227	0	41	11	.6	.8	296	.40	8	0	97	17	456	---	
	12R-72	9/15/54	Windblown sands and alluvium(?)	68	26	4.8	.2	175		254	0	121	40	1.0	1.4	494	.67	13	0	97	21	754	---	
	12R-115	9/ 7/54	Alluvium	63						108	0		52					408	320				1,320	---
	12R-117	9/17/52	do.	60	28	138	35	32		310	0	270	15	.6	1.1	672	.91	488	234	13	.6	940	---	
	12R-119	9/ 7/54	Gallup	65	38	75	17	20		85	0	204	12	.4	1.8	410	.56	257	188	15	.6	570	---	
	12R-122	9/16/49	Alluvium	62	40	239	130	216		246	0	1,260	61	.4	.2	2,070	2.82	1,130	930	29	2.8	2,510	---	
	12R-154	9/ 6/54	Point Lookout	70	15	15	18	535		572	0	710	42	2.1	3.0	1,620	2.20	112	0	91	22	2,320	---	
	12GS-50-1	9/16/49	Alluvium	62	42	96	26	28		302	0	91	41	.1	8.1	481	.65	346	99	15	.7	731	---	
	12GS-50-3	9/11/52	Volcanic extrusive	58	37	38	6.8	2.1		141	0	4.7	2	.2	4.1	164	.22	123	8	4	.1	246	---	
	12GS-50-4	8/26/49	Alluvium		28	190	45	69		288	0	537	10	.3	.2	1,020	1.39	659	423	19	1.2	1,370	---	
	12GS-50-5	8/26/49	do.		14	7.5	3.1	240		272	34	239	15	.9	.2	688	.94	31	0	94	19	1,100	---	
	12GS-50-6	8/26/49	do.							236	0		16										1,920	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH
																Parts per million	Tons per acre- foot	Calcium magne- sium	Non- car- bonate				
DISTRICT 12—Continued																							
51	12Y-4	9/ 3/54	Chuska	50	30	-----	-----	-----	-----	110	0	-----	4.0	0.4	0.5	-----	-----	85	0	-----	-----	188	---
67	12K-314	6/26/52	Menefee	62	10	13	6.3	1,420	-----	1,480	0	1,610	184	2.3	.4	3,980	5.41	58	0	98	81	5,370	---
	12K-328	7/14/55	do.	---	15	-----	-----	291	-----	615	0	123	9	3.6	2.0	-----	-----	23	0	96	26	1,190	8.0
	12M-27	12/10/48	do.	---	-----	19	5.9	1,150	-----	448	26	2,040	17	3.8	.6	3,480	4.73	72	0	97	59	4,730	---
	12R-125	12/10/48	do.	---	-----	2.5	.7	457	-----	952	24	142	6	8.9	2.0	1,110	1.51	9	0	99	66	1,700	---
	12T-325	3/ 8/56	do.	60	14	4.8	1.9	276	-----	604	9	84	6	5.6	.5	700	.95	20	0	97	27	1,060	8.4
	12K-9	9/21/54	Alluvium	68	18	37	6.2	250	-----	436	0	268	14	1.6	1.2	810	1.10	118	0	82	10	1,200	---
	12R-126	11/ 9/48	do.	52	-----	48	4.8	517	-----	498	0	744	47	3.2	7.9	1,620	2.20	140	0	89	19	2,340	---
	12R-126A	11/ 9/48	do.	57	-----	46	7.0	490	-----	474	0	713	41	3.6	13	1,550	2.11	144	0	88	18	2,270	---
	12R-126B	9/ 6/54	do.	63	52	-----	-----	-----	-----	471	0	-----	48	4.4	15	-----	-----	-----	-----	-----	-----	2,430	---
68	12R-109	11/18/48	do.	---	-----	153	43	176	-----	255	0	662	28	.6	2.8	1,190	1.62	558	350	41	3.2	1,640	---
	12M-4	9/ 5/54	Chuska	55	31	-----	-----	-----	-----	48	0	-----	3.5	.3	4.6	-----	-----	43	4	---	-----	102	---
	12M-20	9/ 5/54	Landslide and talus	60	39	91	11	106	-----	531	0	21	32	.6	.2	562	.76	272	0	46	2.8	885	---
	12R-156	10/16/50	Point Lookout	59	24	278	83	57	-----	388	0	784	16	.7	.4	1,430	1.94	1,040	717	11	.8	1,780	---
	12R-156A	10/16/50	do.	58	3.9	684	267	495	-----	210	0	3,410	113	.2	.2	5,080	6.91	2,800	2,630	28	4.1	5,310	---
	12R-156B	10/16/50	do.	60	33	156	66	76	-----	512	0	363	19	.7	.3	966	1.31	660	241	20	1.3	1,376	---
	12R-161	9/ 4/52	Chuska	48	41	52	11	3.4	-----	201	5	2.7	4	.2	.3	219	.30	174	2	4	.1	328	---
	12GS-68-4	8/24/48	De Chelly	56	-----	27	9.5	14	-----	150	0	10	3	.2	.2	138	.19	106	0	23	.6	251	---
	12GS-68-6	8/25/48	do.	---	-----	-----	-----	-----	-----	255	0	-----	3	-----	-----	-----	-----	-----	-----	-----	-----	403	---
	12GS-68-7	8/24/48	Landslide and talus	48	-----	90	7.6	9.4	-----	319	0	7.4	5	.0	.1	277	.38	256	0	7	.3	491	7.9
	12GS-68-8	8/25/48	do.	---	-----	68	13	23	-----	270	16	9.3	11	.6	.2	274	.37	223	0	19	.7	481	---
DISTRICT 13																							
31	13K-209	8/ 4/53	ID, 1,040 feet; Pictured Cliffs	---	5.6	198	69	6,890	-----	271	0	25	11,000	-----	5.6	18,300	24.9	778	556	95	107	28,900	---
		5/ 5/54	Cliff House	70	-----	-----	-----	6,140	-----	552	0	8,230	4,210	-----	-----	-----	-----	1,600	1,150	67	89	28,600	---
	13K-210A	3/ 1/54	ID, 370 feet; Ojo Alamo	---	9.3	31	1.2	484	-----	262	0	820	35	6.8	.2	1,520	2.07	82	0	93	23	2,200	---
	13R-109	8/23/49	T; Kirtland (Farmington)	---	12	44	4.2	1,280	-----	188	0	7.0	1,930	7.1	1.0	3,380	4.60	128	0	96	49	6,230	---
	13T-205	5/30/51	D; Fruitland and Pictured Cliffs	---	-----	-----	-----	-----	-----	769	0	-----	9,160	-----	-----	-----	-----	-----	-----	-----	-----	25,600	---
		6/28/51	Pictured Cliffs	---	-----	-----	-----	-----	-----	159	0	-----	1,160	-----	-----	-----	-----	-----	-----	-----	-----	3,950	---
	13T-211	5/11/55	Alluvium	58	19	69	17	364	-----	598	0	456	46	1.3	1.5	1,270	1.73	242	0	77	10	1,870	7.9
	13R-96	9/30/54	do.	65	19	234	105	521	-----	342	0	1,570	162	.9	2.9	2,780	3.78	1,020	736	53	7.1	3,500	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH	
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate					
DISTRICT 13—Continued																								
31 con.	13R-115	10/ 1/54	Alluvium	69	12	107	28	189		285	0	486	32	0.9	7.4	1,000	1.36	382	148	52	4.2	1,390	---	
	13R-103	5/10/55	Kirtland (Farmington)	54	12	18	5.7	320		404	6	206	139	4.8	.0	910	1.24	68	0	91	17	1,460	8.3	
	13T-213	5/11/55	Terrace	55	27	110	35	74		322	0	266	19	.6	13	703	.96	418	154	28	1.6	1,020	7.4	
	13GS-31-1	8/26/53	Pictured Cliffs	62	28	100	28	77		392	0	180	14	.7	3.1	624	.85	364	44	32	1.8	937	---	
32	13T-212	5/11/55	Alluvium	60	18	476	378	530		418	0	3,060	202	.6	99	4,970	6.76	2,740	2,400	30	4.4	5,460	7.4	
	13R-28	5/10/55	do.	54	12	167	27	494		268	0	1,280	32	1.1	2.2	2,150	2.92	528	308	67	9.3	2,790	7.0	
	13R-28A	5/10/55	do.	54	---	---	---	---	---	411	0	---	55	---	---	---	---	382	45	---	---	3,420	7.5	
	13R-31	5/10/55	do.	60	14	151	37	827		478	0	1,790	45	1.0	7.0	3,110	4.23	528	137	77	16	4,000	7.4	
48	13K-207	9/18/52	Pictured Cliffs	---	---	---	---	---	---	---	73	---	88	---	---	---	---	---	---	---	---	---	4,530	---
	13K-208	8/25/53	ID, 270 feet; Fruitland	---	---	---	---	---	---	315	27	---	4,670	---	---	---	---	387	83	---	---	---	13,500	---
		9/ 4/53	D; Cliff House	---	11	22	5.7	937		562	0	1,480	77	1.5	2.5	2,810	3.82	78	0	96	46	3,970	---	
	13R-38	9/21/49	Alluvium	63	16	145	15	689		284	0	1,580	24	2.4	3.9	2,620	3.56	424	191	78	15	3,410	---	
	13R-39	9/21/49	do.	62	---	---	---	---	---	280	0	---	21	---	---	---	---	---	---	---	---	---	3,830	---
	13R-48	9/21/49	do.	62	14	62	8.5	624		465	0	1,070	30	1.7	4.6	2,040	2.77	190	0	88	20	2,780	---	
	13R-71	9/20/49	do.	63	26	64	15	777		692	0	1,260	20	1.0	.7	2,500	3.40	221	0	88	23	3,370	---	
	13R-75	9/20/49	do.	62	22	112	15	470		640	28	733	16	.6	5.0	1,720	2.34	341	0	75	11	2,350	---	
	13R-78	9/21/49	do.	---	17	34	13	659		320	0	1,320	30	6.3	1.2	2,290	3.11	263	1	84	18	3,060	---	
	13R-132	5/ 5/55	Ojo Alamo	53	37	86	15	48		148	0	202	25	.8	13	500	.68	276	154	27	1.3	715	7.0	
	13R-134	9/22/49	Alluvium	62	24	70	10	867		634	0	1,430	56	5.2	.4	2,770	3.77	216	0	90	26	3,720	---	
	13R-134A	9/22/49	do.	64	20	196	28	912		531	0	2,010	39	1.7	.1	3,470	4.72	604	169	77	16	4,340	---	
	13R-137	9/20/49	do.	64	19	81	7.9	420		522	0	661	16	1.0	7.4	1,470	2.00	234	0	80	12	2,060	---	
	13R-150	12/ 8/54	do.	50	23	54	8.3	507		575	0	739	18	1.1	2.7	1,640	2.23	168	0	87	17	2,320	---	
	13R-152	9/20/49	do.	---	---	---	---	---	---	684	0	---	18	---	---	---	---	---	---	---	---	---	2,530	---
	13R-43	5/ 5/55	Kirtland (Farmington)	53	11	476	86	402		149	0	2,140	45	.8	.2	3,230	4.39	1,540	1,420	36	4.5	3,670	7.1	
	13R-84	5/ 5/55	Alluvium	58	20	464	62	167		228	0	1,480	32	.7	.1	2,340	3.18	1,410	1,230	20	1.9	2,650	7.5	
	13R-148	5/ 5/55	Ojo Alamo	53	22	35	6.2	44		134	0	76	12	.6	.9	263	.36	113	3	46	1.8	393	7.3	
	13R-153	5/ 4/55	do.	---	23	238	38	201		340	0	724	10	.5	.2	1,400	1.90	610	331	42	3.5	1,720	7.0	
49	13R-136	9/22/49	Alluvium	59	13	277	42	1,230		358	0	3,000	82	.8	.8	4,820	6.56	864	570	76	18	5,860	---	
	13R-149	9/21/49	do.	62	---	---	---	---	---	260	0	---	23	---	---	---	---	---	---	---	---	---	3,030	---
	13R-155	9/22/49	do.	62	20	60	7.2	325		297	0	584	16	1.9	7.3	1,170	1.59	179	0	80	11	1,670	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate				
DISTRICT 13—Continued																							
66 con.	13R-55	5/ 4/55	Alluvium	48	13	26	5.9	317		355	0	442	12	1.7	7.0	1,000	1.36	90	0	88	15	1,480	7.9
	13R-55A	5/ 4/55	do.	54	-----	-----	-----	-----	-----	344	0	-----	12	-----	13	-----	-----	128	0	-----	-----	1,320	7.5
	13R-144	5/ 4/55	do.	50	18	131	52	961		403	21	1,930	131	1.6	214	3,560	4.84	541	176	79	18	4,620	8.5
67	13R-11	5/ 3/55	do.	52	16	91	18	492		577	0	794	40	1.2	13	1,750	2.38	301	0	78	12	2,460	7.6
DISTRICT 14																							
66	14N-79	9/15/49	Menefee	62	10	3.5	1.2	534		522	23	632	30	2.5	1.5	1,490	2.03	14	0	99	63	2,220	---
67	14A-33	7/15/49	do.	62	18	1.8	.7	299		603	66	33	8	2.8	1.5	728	.99	8	0	99	48	1,170	---
	14A-46A	7/12/49	T; alluvium, Menefee	----	15	3.0	.5	134		276	22	31	2	.6	1.1	345	.47	10	0	97	19	544	---
	14K-308	3/31/53	Menefee	----	14	2.0	.9	165		369	10	38	3	1.6	1.6	417	.57	8	0	98	25	664	---
	14K-310	7/11/52	ID, 190 feet; Menefee	----	7.8	14	5.4	1,060		740	0	1,660	14	4.1	7.0	3,140	4.27	57	0	98	61	4,270	8.0
		7/28/52	ID, 535 feet; Menefee	----	16	8.0	5.7	393		910	0	110	9	9.0	1.4	1,000	1.36	44	0	95	26	1,510	---
		7/31/52	D; Menefee	----	20	4.0	2.6	336		805	0	65	7	5.0	1.8	838	1.14	20	0	97	32	1,250	---
	14N-85	7/14/49	Menefee, Point Lookout	66	-----	-----	-----	-----	-----	373	32	-----	4	-----	-----	-----	-----	-----	-----	-----	-----	707	---
	14T-307	3/31/53	Menefee	----	17	2.8	.8	207		345	94	14	4	1.0	.2	511	.69	10	0	98	28	858	---
	14A-26	12/10/48	do.	43	-----	3.5	1.0	345		588	43	155	24	1.9	11	874	1.19	12	0	98	42	1,330	---
	14A-28	10/13/54	do.	63	-----	-----	-----	-----	-----	418	0	-----	7	1.4	1.3	-----	-----	32	0	-----	-----	864	---
	14A-46	11/ 8/48	Alluvium	58	-----	50	4.8	261		434	0	248	58	2.1	13	851	1.16	144	0	80	9.4	1,340	---
	14A-51	1/13/50	do.	----	40	46	5.0	231		346	0	269	45	1.1	8.6	816	1.11	136	0	79	8.6	1,180	---
68	14N-1	9/15/52	Chuska	55	-----	-----	-----	-----	-----	154	0	-----	4	-----	-----	-----	-----	-----	-----	-----	-----	250	---
86	14A-4	8/ 6/49	Point Lookout	58	12	63	44	669		486	0	1,200	102	.6	.2	2,330	3.17	338	0	81	16	3,260	---
	14A-10	8/ 5/49	Menefee	66	-----	-----	-----	-----	-----	1,480	34	-----	180	-----	-----	-----	-----	-----	-----	-----	-----	2,810	---
	14A-81	5/18/55	Point Lookout	60	14	127	96	39		356	0	475	6	.7	.5	933	1.27	712	420	11	.6	1,310	7.7
87	14K-302	12/ 8/48	do.	----	-----	1.2	.5	215		445	47	19	4	1.0	.5	508	.69	5	0	99	42	828	---
	14K-305	5/23/50	Menefee	----	14	4.0	6.1	459		487	26	544	16	.7	.1	1,310	1.78	35	0	97	34	1,930	---
	14K-311	5/26/55	Point Lookout	63	10	38	19	28		224	0	32	11	.4	.2	249	.34	173	0	26	.9	437	8.0
	14K-312	5/26/55	do.	63	13	9.9	4.8	157		402	0	40	7	1.4	.1	431	.59	44	0	89	10	694	8.2
	14K-317	9/29/53	Menefee	----	16	2.8	1.4	280		436	0	217	18	1.0	12	762	1.04	13	0	98	34	1,170	7.8
	14M-1	10/ 1/48	Gallup	----	15	1.0	.5	144		266	28	32	14	.4	.2	366	.50	4	0	99	30	582	---
	14M-4	10/27/48	Point Lookout	53	-----	4.0	.9	238		470	39	72	4	-----	.6	590	.80	14	0	97	28	845	---
	14M-4A	1/ 8/52	D; Point Lookout	----	13	7.0	3.7	216		522	29	14	5	1.4	1.0	547	.74	32	0	94	16	850	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent- sodium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH		
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate						
DISTRICT 14—Continued																									
87 con.	14M-16	11/ 8/48	Menefee	62	-----	6	3.1	226		482	47	29	6	2.4	0.4	558	0.76	28	0	95	19	935	---		
	14M-16A	11/16/53	D; Menefee	62	14	4.2	2.7	272		470	98	49	5	2.0	.9	679	.92	22	0	96	25	1,060	---		
	14M-25	4/ 9/53	Point Lookout	57	12	2.2	1.0	149		323	19	29	3	.8	.5	376	.51	10	0	97	21	610	---		
	14M-25A	11/23/53	do.	-----	-----	-----	-----	-----	-----	340	12	-----	3	-----	-----	-----	-----	-----	-----	-----	-----	-----	619	---	
	14M-26	6/16/49	Menefee	-----	20	1.0	.9	159		362	22	6.2	6	1.4	.9	395	.54	6	0	98	28	621	---		
	14N-45	11/ 8/48	T; Menefee	-----	-----	9	3.5	270		480	0	203	11	.9	2.3	736	1.00	37	0	94	19	1,160	---		
	14N-95	11/ 8/48	do.	-----	-----	8	5.2	394		874	37	82	11	6.9	2.1	977	1.33	42	0	95	27	1,550	---		
	14N-102	6/15/49	Gallup	-----	-----	32	11	341		458	0	259	153	1.5	1.1	1,020	1.39	125	0	86	13	1,670	---		
	EPNG-G1	7/23/53	-----	-----	61	18	7.5	3.3	178		299	48	78	7.3	.8	.8	488	.66	32	0	92	14	800	---	
	14M-17	5/27/55	Alluvium	57	-----	-----	-----	-----	-----	-----	394	0	-----	43	-----	2.1	-----	-----	144	0	-----	-----	-----	1,630	8.0
	14A-73A	5/18/55	Point Lookout	58	8.4	-----	-----	-----	-----	-----	167	0	-----	9	.3	8.6	-----	-----	172	35	-----	-----	-----	328	7.0
	14M-5	5/19/55	Alluvium	67	5.2	46	21	-----	39	-----	280	0	44	6	1.0	.0	300	.41	202	0	30	1.2	532	7.3	
	14M-24	5/19/55	Menefee	65	-----	-----	-----	-----	-----	-----	316	0	-----	25	.8	11	-----	-----	530	271	-----	-----	-----	2,040	8.1
	14N-8A	5/19/55	Landslide and talus	65	-----	-----	-----	-----	-----	-----	369	0	-----	75	1.0	.5	-----	-----	1,260	958	-----	-----	-----	4,420	7.3
Tohatchi Pure Oil	4/28/54	D; Morrison(?) and others	100	-----	-----	-----	-----	155	-----	200	31	130	2	3.2	.8	-----	-----	26	0	93	13	703	8.9		
88	14K-301	10/12/50	Point Lookout and Crevasse Canyon	74	17	44	21	100	-----	236	0	89	90	.4	.3	478	.65	196	3	53	3.1	809	---		
	14K-301A	9/11/50	Alluvium	-----	22	65	10	33	-----	224	0	55	23	-----	.6	319	.43	203	20	26	1.0	517	---		
	14K-303	10/ 6/48	D; Boron (B) < 0.1; Menefee	-----	-----	114	20	55	-----	200	0	294	10	.6	.4	592	.81	366	202	25	1.3	860	---		
	14K-315	11/ 3/53	D; Menefee	-----	-----	-----	-----	-----	-----	229	0	-----	10	-----	-----	-----	-----	13	0	-----	-----	-----	1,110	8.3	
	14N-39	10/ 5/48	Menefee	-----	-----	16	6.1	412	-----	353	24	582	16	.5	2.4	1,230	1.67	65	0	93	22	1,830	---		
	14N-71	5/26/55	do.	57	13	168	28	220	-----	225	0	779	11	.7	.3	1,330	1.81	534	350	47	4.1	1,760	8.1		
	Mexican Springs D. S.	2/19/56	do.	56	-----	-----	-----	-----	-----	-----	223	0	-----	14	.6	-----	-----	414	232	-----	-----	-----	1,080	7.3	
	14A-75	5/25/55	Alluvium	54	11	155	48	262	-----	263	0	874	13	1.0	7.2	1,500	2.04	584	368	49	4.7	1,990	---		
	14N-32	11/ 5/54	do.	51	18	122	20	28	-----	372	0	117	14	.6	.2	503	.68	386	82	14	.6	779	---		
	14N-83	5/25/55	do.	56	16	123	24	98	-----	219	0	408	9	.7	.1	787	1.07	406	226	34	2.1	1,110	7.6		
14N-106	5/25/55	do.	65	14	181	52	56	-----	175	0	593	10	.7	12	1,000	1.36	666	522	15	.9	1,320	7.7			
14A-78	5/25/55	do.	66	-----	-----	-----	-----	-----	-----	224	0	-----	26	-----	.2	-----	-----	1,130	946	-----	-----	-----	2,350	7.9	
14N-6	11/ 4/54	Landslide and talus	49	33	68	9.5	-----	27	-----	279	0	25	9	.4	.3	309	.42	208	0	22	.8	493	---		
14N-16	3/25/53	Chuska	35	35	-----	-----	-----	15	-----	131	0	6.6	7.0	.2	11	-----	-----	101	0	25	.7	223	---		

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH	
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
DISTRICT 14—Continued																								
88 con.	14N-25	3/25/53	Chuska	47	44	-----	-----	10	-----	150	0	8.6	11	0.2	1.9	-----	-----	127	4	15	0.4	279	---	
	14N-27	7/15/49	Alluvium	---	-----	50	5.5	7.8	-----	163	0	21	6	.0	.5	171	0.23	148	14	10	.3	302	---	
	14N-24	3/25/53	Chuska	38	38	-----	-----	-----	13	-----	122	0	24	8.0	.1	.5	-----	-----	109	9	21	.5	224	---
	14K-304	8/ 3/48	-----	---	-----	-----	-----	-----	-----	-----	285	0	1,160	88	---	---	---	---	57	0	---	---	3,080	---
	14N-35	10/ 2/48	Boron (B) < 0.1; alluvium	---	-----	182	29	78	-----	291	0	461	15	.3	1.0	910	1.24	573	334	23	1.4	1,230	---	
106	14A-79	6/17/49	Crevasse Canyon (Dalton)	---	-----	3.0	.9	105	-----	237	0	38	4	.2	.5	268	.36	11	0	95	14	455	---	
	14K-313	5/12/55	Gallup	53	17	218	99	72	-----	271	0	335	11	.8	.0	1,390	1.89	951	729	14	1.0	1,780	7.2	
	14K-318	8/18/54	ID, 365 feet; Menefee	61	13	-----	-----	449	-----	752	83	188	14	5.2	.9	-----	-----	8	0	99	69	1,650	---	
		9/ 2/54	ID, 605 feet; Menefee	59	10	40	5.7	2,620	-----	442	0	3,930	956	3.3	1.3	7,780	10.6	124	0	98	102	10,100	---	
		12/21/54	T; Menefee	48	9.4	4.4	3.1	651	-----	736	41	680	30	5.9	.5	1,790	2.43	24	0	98	58	2,650	---	
	14T-306	6/18/51	D; Menefee	---	-----	-----	-----	-----	-----	416	85	-----	22	---	---	---	---	---	21	0	---	---	2,520	---
	14A-12	5/17/55	Alluvium	56	-----	-----	-----	-----	-----	408	79	-----	11	1.4	.1	-----	-----	16	0	---	---	1,170	9.4	
	14A-14	5/13/55	do.	58	-----	-----	-----	-----	-----	409	0	-----	32	1.2	.3	-----	-----	530	195	---	---	3,370	7.4	
	14A-56	5/17/55	Menefee	48	-----	-----	-----	-----	-----	222	0	-----	31	.8	.0	-----	-----	62	0	---	---	921	7.3	
	14A-60	2/17/55	do.	59	-----	-----	-----	-----	-----	459	8	-----	27	.6	.0	-----	-----	17	0	---	---	1,060	8.4	
	14A-61	5/17/55	do.	58	-----	-----	-----	-----	-----	474	0	-----	21	1.0	1.6	-----	-----	340	0	---	---	2,070	7.4	
	14N-70	5/12/55	Crevasse Canyon (Dalton)	52	18	57	20	.9	-----	130	0	102	9	.4	.0	271	.37	224	118	1	.0	436	7.0	
	107	14K-300	12/ 9/48	ID, 1,497 feet; Menefee, Crevasse Canyon, Gallup(?)	---	-----	16	2.6	997	-----	752	57	263	860	6.8	2.1	2,580	3.51	50	0	98	61	4,390	---
		9/18/51	ID, 1,535 feet; Menefee, Crevasse Canyon, Gallup	61	-----	-----	-----	-----	-----	752	63	-----	1,480	5.6	---	---	---	54	0	---	---	6,340	---	
		3/31/53	Gallup	---	15	2.5	.8	174	-----	296	15	102	9	.6	.0	464	.63	10	0	98	25	738	---	
14K-300A		12/ 9/48	Menefee	---	-----	98	34	962	-----	568	49	1,820	14	.0	19	3,280	4.46	384	0	84	21	4,420	---	
14K-314		10/28/53	D; Menefee	---	12	10	2.0	227	-----	326	0	237	9	.6	.3	658	.89	33	0	94	17	989	---	
14Y-9		7/ 9/49	T; Menefee	---	15	1.5	1.0	335	-----	553	70	136	11	2.7	2.1	847	1.15	8	0	99	53	1,340	---	
14Y-9A		12/21/54	do.	---	-----	-----	-----	-----	-----	518	102	-----	14	2.8	.4	-----	-----	5	0	---	---	1,380	---	
14Y-14	12/22/54	Alluvium	46	16	114	24	109	-----	224	0	408	7	.7	.2	789	1.07	383	200	38	2.4	1,110	---		

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH	
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
DISTRICT 15																								
65	15B-24	9/20/49	Cliff House	62	12	120	91	141		376	0	636	7	0.0	0.8	1,190	1.62	674	366	31	2.4	1,610	---	
	15B-25	9/15/49	T; Menefee	---	---	---	---	---	---	600	61	---	51	---	---	---	---	---	---	---	---	2,010	---	
	15K-302	9/12/49	Menefee	66	18	2.5	1.7	536		1,040	106	27	63	12	1.0	1,280	1.74	13	0	99	65	2,000	---	
	15K-337	4/ 8/53	D; Menefee	---	8.4	5.5	3.5	676		990	0	531	80	7.9	.4	1,800	2.45	28	0	98	56	2,640	---	
66	15A-18	9/15/49	Menefee	66	---	---	---	---	---	1,150	59	---	116	---	---	---	---	---	---	---	---	---	2,380	---
	15B-23	9/12/49	Menefee and Point Lookout, Morrison(?)	96	20	4.5	2.1	545		476	18	477	199	2.6	.8	1,500	2.04	20	0	98	54	2,320	---	
	15T-339	8/31/55	D; Menefee	68	11	4.8	2.8	674		1,360	33	137	125	---	1.0	1,660	2.76	24	0	98	60	2,620	8.5	
	15A-21	2/16/55	Alluvium	40	---	---	---	---	---	534	0	---	23	1.4	6.5	---	---	206	0	---	---	---	1,490	---
	15A-22	2/16/55	do.	40	---	---	---	---	---	344	0	---	15	1.0	17	---	---	150	0	---	---	---	1,040	---
	15R-17	9/14/49	do.	62	20	15	3.1	256		466	0	197	10	1.5	1.6	734	1.00	50	0	92	---	---	1,110	---
	15R-19	9/14/49	do.	62	20	39	7.1	276		428	0	336	14	1.4	2.5	907	1.23	126	0	83	---	---	1,350	---
85	15K-309	8/ 4/49	Menefee	66	---	6.2	1.3	696		592	0	853	109	3.1	6.2	1,960	2.67	21	0	99	66	2,870	---	
	15K-336	1/ 4/52	Menefee, Point Lookout	63	11	21	7.9	781		456	0	1,280	50	1.8	2.7	2,380	3.24	85	0	95	37	3,370	---	
	15Q-25	8/ 3/49	do.	70	---	6.5	1.7	756		605	0	698	305	4.5	2.8	2,070	2.82	23	0	99	69	3,130	---	
	15GS-85-1	1/ 5/50	Iron (Fe) total 0.24; Menefee	---	9.3	2.8	2.0	638		1,120	59	85	201	5.2	1.2	1,560	2.12	15	0	99	72	2,480	---	
	Earl Becenti well	2/21/51	ID, 152 feet; Point Lookout	---	6.8	50	19	833		276	6	1,630	53	2.9	.1	2,740	3.73	203	0	90	25	3,650	---	
		3/20/51	ID, 612 feet; Crevasse Canyon (Dalton)	---	---	---	---	454		346	0	575	94	1.1	---	---	---	30	0	97	36	1,930	---	
	Pitt Ranch	4/ 6/53	Point Lookout	---	10	12	3.8	745		236	8	1,350	35	.7	.2	2,280	3.10	46	0	97	---	---	3,190	---
	15A-12	9/13/49	Menefee	65	14	4.0	1.4	450		618	0	362	70	4.2	1.3	1,210	1.65	16	0	98	49	1,850	---	
86	15A-27	12/ 8/48	Point Lookout	---	---	2.5	.7	457		522	45	415	42	3.4	.7	1,220	1.66	9	0	99	66	1,870	---	
	15B-1	7/ 7/49	Menefee	64	---	8.8	2.7	881		825	0	772	317	8.6	.2	2,400	3.26	33	0	98	67	3,640	---	
	15B-7	3/26/53	Menefee, Point Lookout	68	10	7.0	3.2	878		800	16	761	315	7.9	.3	2,390	3.25	30	0	98	69	3,650	---	
	15B-9	3/26/53	Menefee and Point Lookout	64	10	3.5	1.9	628		884	18	474	82	7.0	.3	1,660	2.26	16	0	99	67	2,550	---	
	15B-10	8/ 3/49	Point Lookout, Crevasse Canyon	73	---	---	---	---	---	158	0	---	24	---	---	---	---	---	---	---	---	---	1,460	---
	15B-26	2/10/55	Menefee	---	12	2.4	1.0	750		1,580	34	6.2	182	10	.2	1,770	2.41	10	0	99	103	2,780	---	
	15A-5A	2/10/55	do.	44	10	6.7	2.2	585		508	0	677	120	2.1	1.4	1,650	2.24	26	0	98	50	2,460	---	
	15A-9	2/10/55	do.	---	21	6.0	1.4	37		98	0	8.0	7.0	.6	.2	129	.18	21	0	79	3.5	179	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate				
DISTRICT 15—Continued																							
104 con.	15B-6A	2/23/51	Crevasse Canyon, Gallup	---	23	110	42	128		389	0	383	4	0.3	1.4	884	1.20	447	128	38	2.6	1,230	---
	15B-19	8/ 2/49	Crevasse Canyon and Gallup	---	---	---	---	---	---	282	0	---	8	---	---	---	---	---	---	---	---	1,240	---
	15B-33	8/ 3/49	Crevasse Canyon (Dalton)	65	---	13	2.6	661		254	0	1,130	66	.0	1.8	2,000	2.72	43	0	97	44	2,860	---
	15B-34	8/ 2/49	do.	62	---	---	---	---	---	314	0	---	31	---	---	---	---	---	---	---	---	2,560	---
	15B-35	8/ 2/49	Crevasse Canyon and Gallup	64	---	---	---	---	---	259	0	---	10	---	---	---	---	---	---	---	---	1,300	---
	15K-300	1/12/49	do.	52	---	151	65	160		498	0	555	4	.0	.0	1,180	1.60	644	236	35	2.7	1,650	---
	15K-303	12/12/48	Dakota, Morrison	---	---	13	5.9	119		264	0	90	3	.2	.5	362	.49	57	0	82	6.8	580	---
	15K-335	8/ 2/51	Gallup	65	14	24	11	196		236	0	310	9	.8	.2	681	.93	105	0	80	8.3	1,040	---
	15B-21	5/19/55	Crevasse Canyon (Dalton)	54	---	---	---	63		122	0	2,980	23	1.1	.2	---	---	3,100	3,000	4	.5	4,050	7.6
105	15B-2	7/31/49	Gallup	70	---	14	5.6	---	---	---	---	119	4	---	1.0	---	---	58	---	---	---	565	---
	15T-303	6/ 9/55	do.	59	15	157	89	504		297	0	1,520	16	2.1	.6	2,450	3.33	758	514	59	8.0	3,120	8.1
DISTRICT 16																							
104	16K-325	5/ /52	ID, 85 feet; Mancos	---	---	---	---	1,850		228	0	3,840	134	1.8	---	---	---	345	158	92	43	7,620	---
		5/ /52	ID, 272 feet; Mancos	---	---	---	---	875		492	8	4,920	46	.0	---	---	---	3,700	3,280	34	6.3	7,360	---
		5/ /52	ID, 615 feet; Mancos	---	---	---	---	494		326	0	779	29	.8	---	---	---	48	0	96	31	2,160	---
		4/ 8/53	T, Dakota	---	20	177	70	43		341	0	509	9	.1	0.2	996	0.14	730	450	11	.7	1,330	---
	16K-332	3/18/54	ID, 440 feet; Crevasse Canyon	---	17	552	231	91		638	0	1,890	23	.4	.2	3,120	4.24	2,330	1,800	8	.8	3,400	---
	Smith Lake Mission	5/21/56	Dakota	---	---	---	---	44		331	0	520	8.0	---	.4	---	---	730	458	12	.7	1,330	7.6
	Smith Lake T. P.	9/ 2/49	Dakota and Morrison	---	15	29	9.0	66		237	0	44	7	.6	2.3	290	.39	110	0	57	2.8	468	---
105	16K-318	11/19/48	Dakota, Morrison	---	---	89	29	16		254	0	151	7	.5	.3	419	.57	341	133	9	.4	688	---
	16K-319	6/ 9/55	Dakota	57	14	1.6	1.9	262		518	39	74	8	1.4	1.5	658	.89	12	0	98	33	1,060	8.9
	16T-323	10/18/51	ID, 820 feet; Mancos and Dakota	56	---	---	---	---	---	356	20	---	26	2.2	---	---	---	114	0	---	---	3,050	---
		11/ 2/51	ID, 910 feet; Morrison (Brushy Basin)	---	7.4	---	---	72		138	0	68	14	.8	.6	---	---	50	0	76	4.4	388	---
		4/29/53	Dakota and Morrison (Westwater Canyon)	---	12	4.0	4.4	331		314	30	404	12	1.1	.0	954	1.30	28	0	96	27	1,450	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH	
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate					
DISTRICT 16—Continued																								
105 con.	Iyanbito D. S. 1	3/31/51	ID, 935 feet; Chinle (Petrified Forest)	---	---	---	---	---	---	438	30	---	443	2.2	---	---	---	49	0	---	---	3,780	---	
		2/27/52	D; Glorieta	---	---	---	---	---	---	219	0	---	6	.4	---	---	---	540	360	---	---	1,170	---	
		Iyanbito D. S. 2	6/22/55	T; Moenkopi and Glorieta	60	13	183	55	14	---	241	0	486	6	.2	0.0	876	1.19	682	485	4	.2	1,190	7.3
		Mariana D. S.	2/22/52	ID, 815 feet; Morrison (Westwater Canyon)	---	10	26	4.6	63	---	226	0	24	6	.4	.5	246	.33	84	0	62	3.0	403	---
			5/14/53	Morrison	59	11	18	4.4	214	---	234	0	261	42	2.2	.1	668	.91	63	0	88	12	1,040	---
		16GS-105-1	9/ 1/49	Dakota	---	19	110	43	24	---	260	0	256	11	.6	10	602	.82	452	238	11	.5	873	---
		16GS-105-3	8/30/49	Alluvium	---	12	72	14	13	---	258	0	43	4	.6	2.2	288	.39	237	26	11	.4	480	---
		16GS-105-4	5/11/50	do.	52	15	42	13	8.0	---	160	0	40	2	.2	.1	199	.27	158	28	10	.3	331	---
		16GS-105-11	4/ 7/53	do.	55	15	32	9.0	83	---	272	0	23	23	.6	20	340	.46	117	0	61	3.3	567	---
		Pinedale T. P.	8/31/49	Mancos	---	12	170	55	161	---	359	0	590	50	.4	24	1,240	1.69	650	356	35	2.7	1,710	---
	106	16B-12	5/ 3/50	Glorieta	67	11	169	87	24	---	247	0	596	5	.2	.3	1,010	1.37	779	576	6	.4	1,350	---
16B-40		5/ 9/50	do.	85	13	116	61	112	---	218	0	571	7	.1	.1	987	1.34	540	362	31	2.1	1,340	---	
16K-336		9/24/53	D; alluvium	---	5.8	80	19	227	---	776	0	91	26	1.4	.3	832	1.13	278	0	64	5.9	1,330	---	
16K-340		6/22/54	do.	---	12	139	44	264	---	890	0	314	24	.6	13	1,250	1.70	528	0	52	5.0	1,810	---	
16T-335		12/16/53	D; Menefee and Crevasse Canyon	60	---	---	---	---	---	458	52	---	10	---	---	---	---	---	---	---	---	---	1,080	8.6
EPNG-W1		8/ 6/53	Moenkopi and Glorieta	79	13	100	41	156	---	238	0	506	24	.3	.2	958	1.30	418	223	45	3.3	1,350	---	
EPNG-W2		8/ 6/53	do.	---	7.0	83	35	160	---	168	10	489	25	.3	.1	891	1.21	351	197	50	3.7	1,310	---	
EPNG-W3		8/ 6/53	do.	---	15	12	2.2	301	---	260	0	399	44	.5	.4	902	1.23	39	0	94	21	1,380	---	
Perea T. P.		4/ 3/53	Chinle (Petrified Forest, upper)	---	8.8	8.5	1.7	643	---	359	0	575	376	.7	.5	1,790	2.43	28	0	98	53	2,890	---	
Rehoboth Mission		6/12/52	Moenkopi	81	13	29	12	306	---	284	0	463	50	.6	.2	1,010	1.37	122	0	84	12	1,510	---	
Shamrock Oil Co. 1		12/10/53	Gallup	---	38	456	268	413	---	142	0	2,850	31	.9	11	4,140	5.63	2,240	2,120	29	3.8	4,350	---	
Kit Carson Spring	8/30/49	Morrison (Westwater Canyon)	---	---	---	---	---	---	---	153	0	---	8	---	---	---	---	---	---	---	---	268	---	
107	16A-260	6/22/55	T; Gallup	62	17	1.2	1.0	201	---	282	0	171	23	1.0	.0	554	.75	7	0	98	33	868	---	
	16K-328	8/20/53	D; Menefee	---	5.1	20	11	262	---	498	11	210	12	.0	1.9	778	1.06	95	0	86	12	1,280	---	
	16T-333	12/11/53	ID, 620 feet; Menefee and	60	---	---	---	---	---	548	55	---	9	---	---	---	---	50	0	---	---	1,260	8.4	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH
																Parts per million	Tons per acre- foot	Calcium magne- sium	Non- car- bonate				
DISTRICT 16—Continued																							
107 con.	16T-334	11/30/53	D; Menefee	---	---	---	---	---	---	310	67	---	8	---	---	---	---	14	0	---	---	842	8.8
	16T-339	8/ 7/54	D; Gallup	59	14	48	13	157	---	364	0	188	13	0.5	0.2	613	0.83	174	0	66	5.2	937	---
	16GS-107-4	5/29/53	Menefee	---	7.8	8.2	1.7	807	---	1,020	98	98	470	6.0	.6	2,000	2.72	28	0	98	67	3,350	---
	Allison N. M.	6/22/55	Gallup	58	18	23	22	213	---	303	0	216	96	.5	.6	738	1.00	148	0	76	7.6	1,190	7.6
	Gallup Airport	6/10/55	Crevasse Canyon	60	12	23	5.9	409	---	1,030	0	85	25	1.0	.6	1,070	1.46	82	0	92	20	1,660	7.6
	16A-226	6/ 2/55	Menefee	58	---	---	---	---	---	93	0	---	5	.4	.2	---	---	28	0	---	---	192	7.4
	16GS-107-2	9/14/51	Crevasse Canyon	57	19	64	18	52	---	322	0	36	25	.5	9.2	383	.52	234	0	33	1.5	634	---
108	16A-80	3/10/50	Alluvium	---	4.1	27	18	714	---	996	37	757	17	1.3	.2	2,070	2.82	142	0	92	26	2,950	---
	16A-81	7/ 9/49	do.	---	15	96	21	64	---	354	0	144	6	.0	20	540	.73	326	36	30	1.5	830	---
	16A-81A	10/26/48	do.	---	14	97	21	55	---	293	0	137	11	.1	60	539	.73	328	88	27	1.3	807	---
	16K-323	3/10/50	Morrison and Cow Springs	---	9.2	130	43	149	---	677	0	240	12	.2	2.9	919	1.25	502	0	39	2.9	1,360	---
	16GS-108-1	3/10/50	Landslide and talus	---	---	---	---	---	---	590	0	2,430	---	---	---	---	---	---	---	---	---	4,320	---
120	16B-39	12/ 3/48	Chinle (Sonsela)	62	---	1.2	.5	141	---	244	16	54	19	.4	.9	353	.48	5	0	98	27	576	---
	16K-302	8/19/48	Chinle (Petrified Forest)	---	---	18	3.8	867	---	246	7	534	705	1.0	2.4	2,260	3.07	60	0	97	48	3,630	---
	16K-302A	6/30/52	Iron (Fe) total 3.4; Glorieta	---	11	136	29	9.9	---	265	0	245	5	.4	.0	568	.77	458	242	4	.2	836	---
	16K-303	5/11/50	Chinle (Petrified Forest, upper)	54	5.6	12	13	897	---	408	45	509	770	2.3	1.1	2,460	3.35	84	0	96	43	4,130	---
	16K-326	1/13/51	ID, 180 feet; allu- vium and Chinle	---	---	---	---	---	---	200	32	---	96	2.7	---	---	---	26	0	---	---	1,910	---
		1/27/51	D; Chinle (Sonsela)	56	8.7	13	2.8	207	---	394	6	127	19	.4	.7	579	.79	44	0	91	14	935	---
	16GS-120-1	12/ 6/48	Chinle (Petrified Forest, upper)	---	---	52	11	85	---	261	14	64	34	.2	9.3	398	.54	174	0	52	2.8	679	---
	16GS-120-2	12/ 6/48	do.	---	---	26	7.0	217	---	334	13	184	50	.5	10	672	.91	94	0	83	9.7	1,090	---
	San Antone Mission	3/ 9/53	D; Chinle (Petrified Forest, upper)	---	---	---	---	---	---	114	0	---	4,650	---	---	---	---	373	280	---	---	13,400	---
	16K-303A	11/15/48	Wingate (Rock Point)	45	---	2.0	3.3	219	---	436	0	77	33	1.2	3.6	559	.76	18	0	96	22	881	---
122	16K-341	7/29/54	D; Crevasse Canyon	59	14	22	18	135	---	260	0	178	16	.3	.1	511	.69	129	0	69	5.2	805	---
	Fort Wingate School	12/10/53	Glorieta	55	13	160	45	9.2	---	260	0	365	7	.2	.4	728	.99	584	371	3	.2	1,010	---
	16A-299	6/ 2/55	Alluvium	53	10	101	45	414	---	411	0	930	20	1.2	1.0	1,720	2.34	437	100	67	3.6	2,330	7.3

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH	
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
DISTRICT 16—Continued																								
122 con.	16GS-122-1	8/ 9/50	Chinle (lower red)	55	12	110	34		4.6	314	0	150	7	0.2	0.9	474	0.64	414	157	2	0.1	734	---	
	16GS-122-2	8/ 7/50	do.	---	12	118	37		1.4	335	0	156	8	.2	.5	498	.68	446	172	1	.0	774	---	
	Fort Wingate Spring	8/ 9/50	do.	54	13	141	40		7.6	276	0	283	8	.2	.9	630	.86	516	290	3	.1	913	---	
	Santa Fe Spring	8/ 4/50	do.	55	---	---	---		---	325	0	---	7	---	---	---	---	---	---	---	---	---	730	---
	Sheep Lab Spring	8/ 9/50	do.	56	8.9	103	33		5.8	328	0	118	8	.1	1.2	440	.60	392	124	3	.1	703	---	
123	16A-240	7/13/50	Crevasse Canyon	---	7.5	47	24		471	705	0	602	21	1.9	2.3	1,520	2.07	216	0	83	14	2,140	7.8	
	16K-321	5/ 4/51	ID, 440 feet; Crevasse Canyon	---	7.7	34	12		450	641	9	519	20	1.5	.8	1,370	1.86	134	0	88	17	2,040	---	
		5/10/51	D; Gallup	---	10	58	21		287	587	0	314	30	1.6	.8	1,010	1.37	231	0	73	8.2	1,560	---	
	16K-338	2/26/54	do.	---	13	50	16		137	410	0	124	14	.8	3.2	560	.76	191	0	61	4.3	877	---	
	Dean Kirk T. P.	6/10/55	Dakota	55	15	2.4	3.3		264	273	14	250	59	.9	.3	743	1.01	20	0	97	26	1,170	8.7	
	Mutual Mine	6/10/55	Gallup	61	11	1.2	.7		174	284	17	92	18	1.0	.1	454	.62	6	0	98	31	724	8.8	
124	16K-337	2/10/54	ID, 150 feet; Dakota	---	8.7	224	103		1,430	419	0	3,540	46	.8	.5	5,560	7.56	982	639	76	20	6,720	---	
		2/ /54	ID, 176 feet; Dakota	---	7.7	37	15		559	380	0	980	26	.8	.3	1,810	2.46	154	0	89	20	2,600	---	
		2/15/54	ID, 275 feet; Morrison (Westwater Canyon)	58	24	101	31		136	342	0	369	7	.5	.2	837	1.14	380	100	44	3.0	1,210	---	
	16A-306	5/13/55	Cow Springs	51	13	63	8.8		24	251	0	17	14	.6	.5	264	.36	193	0	21	.7	452	7.5	
136	Cheechilgeetho D. S.	6/ 4/52	Glorieta	---	8.2	264	15		1,330	184	0	637	1,980	.8	1.7	4,330	5.89	720	569	80	---	7,230	---	

DISTRICT 17

89	17GS-89-2	11/13/54	De Chelly	52	13	28	7.4		5.5	117	0	10	3.5	0.4	0.2	126	0.17	100	4	11	0.2	209	---	
90	17K-344	6/23/49	Chinle (Shinarump) and De Chelly	---	---	56	12		42	246	0	64	7	.2	1.2	304	.41	189	0	32	1.3	521	---	
	17M-45	6/30/49	Alluvium	---	---	64	15		239	470	0	196	91	.3	27	864	1.18	221	0	70	7.0	1,410	---	
	17M-49A	11/12/54	do.	47	12	60	18		135	393	0	105	59	.6	.8	583	.79	224	0	57	3.9	952	---	
	17M-41A	11/13/54	do.	47	18	28	11		6.0	142	0	6.0	3.0	.3	.8	143	.19	115	0	10	.2	241	---	
91	17M-66	7/11/49	do.	62	19	32	26		906	650	0	917	394	1.8	135	2,750	3.74	187	0	91	29	4,060	---	
	17M-64	8/30/52	Chinle (Owl Rock)	57	15	12	6.3		481	660	0	454	54	1.3	10	1,360	1.85	56	0	95	28	2,020	---	
92	17K-345	7/11/49	Tongue of Cow	---	---	---	---		---	476	0	---	11	---	---	---	---	---	---	---	---	---	1,450	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
DISTRICT 17—Continued																							
92 con.	17M-78	12/ 4/50	Cow Springs	---	12	165	94	371		276	0	1,280	32	0.2	0.8	2,090	2.34	798	572	50	5.7	2,670	---
	17M-239	7/10/49	do.	---	---	---	---	---	---	520	0	---	20	---	---	---	---	---	---	---	---	3,630	---
	17T-363	1/13/54	D; Cow Springs	---	---	---	---	---	---	360	18	---	12	.8	---	---	---	20	0	---	---	682	---
	Steamboat D.S. well	7/28/53	Cow Springs	58	7.4	10	4.4	379		553	0	376	16	.2	.1	1,070	1.46	43	0	95	25	1,670	---
	17M-79	7/10/49	Morrison (Westwater Canyon)	60	---	---	---	---	---	467	0	---	21	---	---	---	---	---	---	---	---	835	---
	17M-261	7/10/49	Dakota	64	18	34	6.7	1.8		120	0	11	3	.4	1.7	136	.18	112	14	3	.1	222	---
109	17K-362	11/11/54	T; De Chelly	---	---	69	14	---	---	271	0	---	15	---	---	---	---	230	8	---	---	473	---
	17M-34	6/23/49	do.	---	---	64	8.4	6.2		227	0	7.0	9	.0	2.1	208	.28	194	8	7	.2	385	---
	17M-11	11/12/54	Chinle (Shinarump)	55	15	68	8.5	14		198	0	22	23	.4	21	269	.37	204	42	13	.4	454	---
	17M-29	11/11/54	De Chelly	51	25	58	11	12		203	0	23	11	.4	9.6	250	.34	190	23	12	.4	402	---
	17M-162	11/18/54	do.	52	---	75	13	---	---	266	0	---	7	---	---	---	---	240	22	---	---	497	---
	Kin Li Chee D.S.	6/23/49	Alluvium	---	---	89	12	16		320	0	7.4	22	.0	6.0	310	.42	272	10	11	.4	554	---
	17M-18	11/11/54	Bidahochi	---	12	59	10	32		150	0	99	20	.4	4.0	310	.42	188	65	27	1.0	509	---
110	17K-2	6/23/49	Chinle (lower red)	---	---	64	8.4	9.0		215	0	9.3	17	.0	5.1	219	.30	194	18	9	.3	409	---
	17K-348	6/23/49	De Chelly	---	---	72	8.5	25		236	0	19	36	.0	4.7	282	.38	214	21	20	.7	516	---
	17K-349	8/ 9/50	Iron (Fe) total 0.01; alluvium	---	23	86	9.8	25		218	0	33	30	.2	66	380	.52	255	76	17	.7	589	---
	17K-355	5/ 1/53	ID, 380 feet; Chinle (Sonsela)	---	24	48	9.0	24		175	0	21	11	.4	35	258	.35	157	14	25	.8	405	---
		7/13/53	D; De Chelly, Supai	68	13	60	26	98		220	0	63	146	.2	21	535	.73	256	76	45	2.7	960	---
	17K-367	2/ 3/55	T; alluvium	---	24	79	32	281		670	0	7.8	268	1.2	2.0	1,020	1.39	328	0	65	6.7	1,760	---
	17K-373	6/25/56	Cow Springs	---	9.5	14	3.6	151		282	0	89	33	1.4	4.7	445	.61	50	0	87	9.3	723	8.1
	17M-44A	6/23/49	De Chelly	---	---	76	9.1	69		291	0	24	79	.0	1.0	401	.55	227	0	40	2.0	740	---
	17M-44P	8/30/52	T; De Chelly	---	17	70	9.6	14		236	0	16	21	.4	3.8	268	.36	214	20	12	.4	466	---
	17M-91	6/30/49	Alluvium	---	---	53	19	146		538	0	11	52	.3	.9	547	.74	210	0	60	4.4	944	---
	17M-99	6/30/49	do.	---	---	46	28	896		243	0	1,230	438	1.2	97	2,860	3.89	230	31	89	26	4,270	---
	17T-358	12/ 3/54	T; De Chelly	---	13	69	13	54		230	0	20	93	.2	1.1	376	.51	226	37	34	1.6	678	---
	17T-360	1/ /54	ID, 90 feet; alluvium	---	12	35	18	209		452	0	109	71	1.4	35	712	.97	162	0	74	7.1	1,150	---
		5/11/55	T; De Chelly	---	14	82	16	35		267	0	17	77	.4	.3	373	.51	270	52	22	.9	681	7.7
	EPNG-N1	3/27/51	D; De Chelly	---	12	77	19	242		269	0	125	316	.2	.8	925	1.26	270	50	66	6.4	1,650	---
	EPNG-N2	7/ 2/53	De Chelly	68	13	80	19	97		214	0	53	182	.2	.9	550	.75	278	102	43	2.5	1,020	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent sod- ium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate				
DISTRICT 17—Continued																							
110 con.	Consolidated Ganado School	4/14/33	De Chelly	62	14	63	8.5	14		218	0	12	20	0.6	2.1	241	0.33	192	14	14	0.4	414	---
	GPM 2	2/ 3/55	do.	52		69	11	-----	-----	227	0	-----	69	-----	-----	-----	-----	217	31	---	-----	608	7.5
	17K-342	2/ 4/55	Alluvium	56	37	79	19		43	313	0	32	49	.6	9.3	423	.58	275	18	25	1.1	702	7.2
	17M-22	7/ 8/49	do.	62	-----	49	4.9		6.0	137	0	9.3	5	-----	33	175	.24	142	30	8	.2	314	---
	17M-98	8/30/52	do.	69	21	130	61		80	607	0	55	136	.6	.8	782	1.06	576	78	23	1.4	1,370	---
	17M-102	6/30/51	do.	60	23	140	28		40	319	0	32	178	.4	7.1	606	.82	464	203	16	.8	1,110	---
	17M-258	8/30/52	do.	68	11	90	27		155	610	0	40	91	.6	.3	715	.97	336	0	50	3.7	1,230	---
	Cornfields D. S.	6/30/49	do.	---	---	46	16		107	431	0	13	32	.6	.3	427	.58	181	0	56	3.4	742	---
	Sunrise T. P.	8/ 9/49	Bidahochi	---	---	---	---	---	---	188	0	---	9	---	---	---	---	---	---	---	---	375	---
111	17K-338	8/ 9/49	Alluvium	57	---	---	---	---	---	294	0	---	34	---	---	---	---	---	---	---	---	579	---
	17M-203	7/15/55	do.	68	26	119	69		1,120	399	0	1,640	690	1.3	2.0	3,860	5.25	580	254	81	20	5,440	7.6
	17M-207	6/19/53	Cow Springs	63	18	221	106		483	898	0	1,170	48	.8	18	2,510	3.41	988	252	52	6.7	3,190	---
	17M-240	7/10/49	Morrison and Cow Springs	---	---	145	69		290	646	0	655	37	.4	14	1,530	2.08	646	116	49	5.0	2,150	---
	17M-246	8/23/49	Bidahochi	---	24	10	6.2		56	141	0	27	13	1.2	8.0	215	.29	50	0	71	3.4	333	---
	17M-166A	8/22/49	Alluvium	57	28	29	28		179	451	0	21	127	1.6	3.0	639	.87	188	0	68	5.7	1,090	---
	17M-167	6/30/51	do.	59	23	22	17		166	411	0	24	83	2.2	.8	540	.73	125	0	74	6.4	884	---
	17M-168	6/30/51	do.	61	32	91	24		317	406	0	305	249	1.0	13	1,230	1.67	326	0	68	7.6	1,950	---
	17M-189	12/ 2/54	do.	50	24	21	27		206	462	0	21	146	1.8	.7	674	.92	164	0	73	7.0	1,160	---
	17M-190	6/30/51	do.	59	28	48	15		182	380	0	62	138	2.4	.4	663	.90	182	0	69	5.9	1,100	---
	17M-192	2/ 3/55	do.	41	---	---	---	---	---	302	0	---	57	1.0	2.6	---	---	280	32	---	---	676	---
	17M-194	6/30/51	do.	61	44	54	20		33	238	0	27	39	1.0	8.4	343	.47	216	22	25	1.0	544	---
	17M-196	3/29/51	do.	48	29	104	14		13	290	0	22	11	.4	84	420	.57	317	80	8	.3	640	---
	17M-197	7/ 6/51	do.	57	24	64	7.2		30	128	16	24	47	.2	37	312	.42	189	58	25	.9	521	---
	17K-319	12/ 3/54	Bidahochi	50	25	40	8.1		23	184	0	11	11	.4	5.7	214	.29	134	0	27	.9	340	---
	17M-170	6/30/51	Terrace	65	33	36	7.2		46	154	0	32	11	1.2	52	294	.40	120	0	46	1.8	448	---
125	17K-356	2/20/53	Bidahochi	---	23	46	6.0		8.7	136	0	14	17	.4	9.6	192	.26	140	28	12	.3	314	---
	17M-133	6/11/53	D; Supai	62	13	584	128		86	147	0	1,890	56	.9	.8	2,830	3.85	1,980	1,860	9	.8	2,980	---
	17M-145	11/ 3/50	De Chelly	56	20	88	13		18	299	0	21	26	.1	9.2	342	.47	273	28	12	.5	588	---
	17M-145A	7/26/51	ID, 690 feet; Supai	---	---	---	---	---	---	278	0	---	32	.4	---	---	---	252	24	---	---	538	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH	
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate					
DISTRICT 17—Continued																								
125 con.	17M-145C	10/ 1/54	D; De Chelly	56	10	100	18		34	332	0	38	57	1.4	3.8	425	0.58	324	52	19	0.8	739	---	
	17M-148	6/24/52	De Chelly and Supai	58	26	40	13		8.7	177	0	7.6	10	.3	5.3	198	.27	154	8	11	.3	328	---	
	17T-361	12/23/53	D; De Chelly, Supai	54	17	74	14		13	255	0	20	25	.2	6.4	295	.40	242	33	11	.4	503	---	
	17M-251	11/24/54	Alluvium	48	28	74	9.5		10	243	0	13	22	.6	1.0	277	.38	224	24	9	.3	454	---	
	17M-154	11/22/54	Bidahochi	49	24	62	5.3		18	194	0	22	21	1.0	1.8	250	.34	176	18	18	.6	405	---	
	17M-241A	11/19/54	Chinle (Shinarump)	57	25	80	17		20	252	0	31	49	.8	3.6	350	.48	270	63	14	.5	593	---	
	17M-243	5/ 1/53	Bidahochi	---	27	80	8.4		21	221	0	21	47	.6	12	326	.44	234	53	17	.6	542	---	
126	17K-347	8/26/49	Chinle (lower red)	---	21	80	12		1.2	225	0	17	16	.2	33	291	.40	249	64	1	.0	482	---	
	17M-111	7/ 8/49	Bidahochi	---	---	27	7.9		12	127	0	6.4	5	.0	11	132	.18	100	0	21	.5	264	---	
	17M-117	8/24/49	do.	62	---	---	---	---	---	177	0	---	5	---	---	---	---	---	---	---	---	---	328	---
	17M-118	11/17/54	do.	53	26	23	4.3		50	192	0	9.1	6	.2	9.8	222	.30	75	0	59	2.5	339	---	
	17M-124	11/17/54	Alluvium	55	26	56	16		33	282	0	4.9	28	.4	.2	304	.41	206	0	33	1.0	504	---	
	17M-125	11/17/54	T; alluvium	---	23	27	8.1		65	264	0	3.7	14	1.0	.5	272	.37	101	0	58	2.8	444	---	
	17M-187	1/21/53	Bidahochi	60	28	4.5	1.9		106	214	7	29	18	2.8	.1	302	.41	19	0	92	11	471	---	
	17M-262	8/24/49	Alluvium	60	26	80	16		14	334	0	4.5	10	.6	1.6	317	.43	266	0	10	.4	533	---	
	17M-126	8/25/49	Bidahochi	58	24	19	7.3		123	232	0	81	47	1.4	.2	417	.57	78	0	78	6.1	672	---	
	17M-126B	5/ /48	do.	---	---	26	16		195	219	0	147	157	---	.2	649	.88	131	0	76	7.4	1,140	---	
127	17H-146	9/ 9/50	Alluvium	56	---	---	---	---	---	324	0	---	3,000	---	---	---	---	---	---	---	---	---	10,800	---
	17K-306	6/26/51	do.	61	25	87	69		1,060	504	26	565	1,240	1.6	2.0	3,320	4.52	500	45	82	21	5,500	---	
	17K-340	8/22/49	do.	61	48	87	82		274	410	0	121	470	1.4	27	1,310	1.78	554	218	52	5.1	2,290	---	
	17K-350	8/26/49	do.	64	14	22	6.6		841	665	0	233	782	6.9	1.8	2,230	3.03	82	0	96	40	3,780	---	
	17K-372	8/18/55	D; alluvium	64	43	---	---		362	474	0	27	380	1.8	1.0	---	---	170	0	82	12	1,960	7.8	
	Mennonite Mission 1	3/22/54	Alluvium	60	21	140	21		146	212	0	98	300	.6	65	896	1.22	436	262	42	3.0	1,610	---	
	Mennonite Mission 2	3/22/54	do.	60	41	68	35		313	454	0	51	400	1.4	2.6	1,140	1.55	314	0	68	7.7	2,020	---	
	Mennonite Mission 3	6/ 9/54	do.	57	---	---	---	---	---	346	0	---	805	---	5.4	---	---	640	356	---	---	---	3,130	---
	17K-341	12/ 2/54	do.	53	32	29	15		50	192	0	27	13	1.0	46	307	.42	134	0	45	1.9	479	---	
	17M-175	6/28/51	Wingate (Rock Point)	61	13	25	15		318	254	0	172	291	1.6	18	979	1.33	124	0	85	12	1,700	---	
	17M-177	6/28/51	Chinle (Owl Rock)	61	17	32	18		397	310	56	603	22	2.3	5.1	1,310	1.78	154	0	85	14	1,900	---	
	17M-172	7/ 6/51	Terrace	---	17	73	12		132	227	0	281	16	1.8	17	645	.88	232	46	55	3.8	982	---	
	17GS-127-1	4/ 2/51	Windblown sands	51	15	42	17		158	158	0	121	191	1.0	146	679	.92	175	46	66	3.2	1,040	---	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH	
																Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
DISTRICT 17—Continued																								
140	17K-352	4/ 1/51	Alluvium	----	22	31	9.2		396		459	0	165	297	3.4	1.4	1,150	1.56	116	0	88	16	1,930	---
		17GS-140-1	11/23/54	do.	55	18	13	4.3		190		322	0	82	70	1.8	2.9	545	.74	50	0	89	12	878
DISTRICT 18																								
68	18A-24	11/10/54	Chuska	32	20	71	11		23		278	0	24	12	0.3	0.3	299	0.41	222	0	18	0.7	501	---
		18A-1	7/ 3/52	do.	----	39	44	6.9		6.9		172	0	5.4	4	.3	.9	192	.26	138	0	10	.3	287
69	18K-330	5/25/53	D; Chinle (Shinarump), De Chelly	53	11	59	13		20		211	0	33	23	.2	3.6	267	.36	200	28	18	.6	458	---
		18A-19	11/16/54	Wingate (Rock Point)	41	11	33	38		147		486	0	74	56	1.2	1.0	600	.82	238	0	57	4.1	1,010
89	18A-22	11/16/54	Chinle (Sonsela)	47	15	25	18		174		472	0	62	43	.8	.5	570	.78	136	0	73	6.5	934	---
		18K-327	2/14/51	Alluvium	----	13	69	30		71		282	0	57	110	.4	2.9	492	.67	296	64	34	1.8	867
	18T-337	9/26/55	Chinle (Petrified Forest, upper, Sonsela)	56	11	15	2.1		411		382	0	356	175	2.7	1.6	1,160	1.58	46	0	95	26	1,840	7.7
	18T-343	7/ /55	D; alluvium, Supai	58	14	-----	-----		21		293	0	59	18	.2	4.4	-----	-----	286	46	14	.5	612	7.5
	18T-344	7/28/55	do.	----	15	64	24		23		292	0	36	19	.2	4.7	330	.45	258	18	16	.6	566	7.3
	18A-39	11/17/54	Alluvium	42	25	79	8.6		39		338	0	14	16	.4	2.4	350	.48	232	0	27	1.1	576	---
	18A-53	11/18/54	Supai	51	15	66	30		32		291	0	51	34	.4	21	392	.53	288	50	19	.8	665	---
	18A-66	10/25/48	Alluvium	----	15	67	22		23		306	0	24	21	.4	.7	324	.44	258	7	16	.6	552	---
	Sawmill D.S.	2/23/51	do.	----	19	89	15		23		231	0	25	25	.2	.5	360	.49	284	12	15	.6	602	---
	Fort Defiance caisson 2	2/29/48	do.	51	-----	56	23		18		273	0	23	14	.6	7.1	276	.38	234	0	15	.5	471	---
	Fort Defiance caisson 5	3/27/53	do.	51	13	-----	-----		20		261	0	28	32	.2	.0	-----	-----	244	30	15	.6	541	---
	18A-31	9/29/48	Volcanic	59	35	24	49		53		286	23	79	13	.2	3.7	420	.57	262	0	31	1.4	644	8.3
	18A-35	11/ 9/54	Summerville	40	16	45	2.3		13		170	0	5.6	3	.4	.3	170	.23	122	0	19	.5	274	---
	18A-48A	10/25/48	De Chelly	----	-----	106	17		41		430	0	29	29	-----	.4	434	.59	334	0	21	1.0	733	---
	18A-50	9/29/48	Volcanic	54	31	20	42		19		279	0	22	7	.2	2.5	281	.38	222	0	16	.6	458	8.2
	18A-51	9/ 1/50	do.	----	30	30	37		12		248	10	21	8	.2	.4	271	.37	227	8	11	.4	443	---
	18A-55	6/25/51	Iron (Fe) total 0.01; Supai	54	14	63	21		12		286	0	19	8.0	.2	2.9	281	.38	244	9	9	.3	495	7.3
	18GS-89-2	4/16/49	Supai	45	-----	64	24		10		298	0	22	9	.2	.1	276	.38	258	14	8	.3	491	---
	Bonita Spring	2/29/48	do.	51	-----	56	25		56		280	0	46	58	.6	2.8	382	.52	242	13	33	1.6	658	---
	Supai Spring	8/24/48	do.	64	-----	51	17		8.3		230	0	16	6	.2	1.5	213	.29	197	8	8	.3	384	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH
																Parts per million	Tons per acre- foot	Calcium, magne- sium	Non- car- bonate				
DISTRICT 18—Continued																							
89 con.	18GS-89-1	4/16/49	Supai, De Chelly	----	-----	46	7.3	12		154	7	18	10	0.2	0.2	176	0.24	145	8	15	0.4	309	---
107	18K-308	1/25/55	T; Gallup	----	35	101	25	35		258	0	203	5	.2	.2	531	.72	355	144	18	.8	777	---
	18K-329	6/24/52	D; Gallup	65	10	42	10	101		294	0	104	9	1.0	1.5	424	.58	146	0	60	3.6	886	7.7
108	18A-134	6/14/49	Chinle (Shinarump)	----	-----	74	19	9.9		236	0	62	13	-----	9.2	303	.41	262	69	8	.3	516	---
	18A-152	11/23/54	T; Chinle (Shinarump), De Chelly	58	10	44	33	19		299	0	29	7	.4	.9	290	.39	246	0	14	.5	516	---
	18A-174	3/10/50	Chinle (lower red) and De Chelly	----	10	7.0	5.1	147		243	12	69	46	.6	1.0	418	.57	38	0	89	10	685	---
	18K-301	3/ 9/50	De Chelly	----	9.7	18	11	99		231	6	54	35	.2	.2	347	.47	90	0	71	4.5	579	---
	18K-357	8/ 3/56	Alluvium	55	-----	-----	-----	-----		283	0	-----	61	-----	-----	-----	-----	140	0	---	-----	869	8.2
	18T-328	11/ 7/52	T; Morrison (Westwater Canyon)	----	11	8.0	2.8	429		388	9	93	374	1.8	2.6	1,120	1.52	32	0	97	33	1,970	---
	18T-342	6/21/55	ID, 175 feet; Chinle (Petrified Forest)	----	-----	-----	-----	1,420		323	0	1,570	965	1.3	1.3	-----	-----	180	0	94	46	6,210	7.2
	Black T. P.	11/18/54	Chinle (Shinarump) and De Chelly	52	10	60	20	51		252	0	75	40	.3	1.1	381	.52	232	25	33	1.3	644	---
	Fort Defiance Consoli- dated School	1/20/53	ID, 84 feet; alluvium	----	17	93	51	165		657	0	2.5	182	.6	1.6	836	1.14	442	0	45	3.4	1,480	---
		4/ 9/53	ID, 725 feet; Chinle (Shinarump)	----	3.9	52	24	1,010		400	0	230	1,320	.8	.6	2,840	3.86	228	0	91	29	4,970	---
		12/18/53	De Chelly	----	11	60	25	19		275	0	29	25	.4	3.1	308	.42	252	27	14	.5	545	---
	St. Michaels Mission	6/14/49	Chinle (Shinarump)	----	-----	80	14	8.1		236	0	59	11	.2	4.1	293	.40	257	64	6	.2	513	---
	St. Michaels School	1/30/50	Chinle (Shinarump), De Chelly	----	11	48	25	22		247	0	41	16	.3	3.0	288	.39	223	20	18	.6	487	---
	Window Rock old well 6	7/ /54	ID, 20 feet; alluvium	----	8.1	87	243	1,600		472	0	2,010	1,570	2.5	2.9	5,760	7.83	1,220	829	74	20	8,210	---
		7/29/54	ID, 52 feet; alluvium	65	13	81	26	503		708	0	260	385	3.2	1.2	1,620	2.20	309	0	78	12	2,640	---
		8/ 6/54	ID, 230 feet; Chinle (lower red)	63	-----	-----	-----	-----		426	0	-----	41	1.4	-----	-----	-----	76	0	---	-----	1,070	---
		9/ 3/54	D; Chinle (Shinarump), De Chelly	63	10	6.7	2.9	138		294	0	44	29	.6	.2	376	.51	28	0	91	11	586	---
	18A-138	6/14/49	Alluvium	----	-----	120	113	79		482	0	332	122	.8	28	1,030	1.40	764	369	18	1.2	1,600	---
	18A-144	6/21/49	De Chelly	----	-----	73	13	23		272	0	32	12	.4	13	300	.41	236	12	17	.6	521	---
	18A-136	6/14/49	Alluvium	----	-----	82	16	10		242	0	69	15	.4	.7	312	.42	270	72	8	.3	534	---

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad- rangle	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Tem- pera- ture (°F)	Silica (SiO ₂)	Calcium (Ca)	Magne- sium (Mg)	Sodium (Na)	Potassium (K)	Bicar- bonate (HCO ₃)	Car- bonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	Sodium- adsorp- tion ratio (SAR)	Specific conduct- ance (micro- mhos at 25°C)	pH	
																Parts per million	Tons per acre- foot	Calcium magne- sium	Non- car- bonate					
DISTRICT 18—Continued																								
108 con.	18A-137	6/14/49	Chinle (lower red)	----	-----	70	9.2		6.2	207	0	41	8	0.4	1.7	238	0.32	212	43	6	0.2	413	---	
	18A-140	11/19/54	Chinle (Petrified Forest, upper)	48	13	14	10		310	412	0	139	150	2.0	64	905	1.23	76	0	90	15	1,450	---	
	18A-142	4/30/48	Alluvium	55	-----	130	46		265	287	0	785	25	1.2	.3	1,390	1.89	514	278	53	5.1	1,910	---	
	18A-153	6/17/49	Chinle (Shinarump)	----	-----	91	33		118	296	0	116	179	.3	2.3	685	.93	352	120	41	2.7	1,210	---	
	Hunters Point T. P.	6/14/49	do.	----	-----	74	33		6.2	311	0	52	16	-----	2.6	337	.46	320	65	4	.2	594	---	
	18A-135B	6/14/49	Chinle (lower red), De Chelly	----	-----	74	12		6.9	196	0	68	12	.2	.5	270	.37	234	74	6	.2	463	---	
109	18K-332	9/14/53	D; De Chelly	57	16	64	15		10	258	0	12	10	.2	4.1	258	.35	221	10	9	.3	446	---	
	18K-333	1/17/54	LD, 540 feet; De Chelly	----	19	74	11		17	265	0	20	19	.4	1.3	292	.40	230	12	14	.5	484	---	
	18A-161	11/24/54	De Chelly	46	13	54	9.5		9.4	191	0	22	6	.4	5.9	214	.29	174	17	11	.3	362	---	
124	18A-111	11/ 3/54	Alluvium	54	17	40	7.8		150	310	0	56	77	1.2	41	542	.74	132	0	71	5.7	891	---	
	18K-305	6/22/49	De Chelly	----	-----	86	20		190	494	0	127	122	.0	.3	789	1.07	296	0	58	4.8	1,320	---	
	18K-324	12/ 2/54	T; Chinle (Shinarump)	67	23	91	26		33	272	0	127	30	.2	9.2	473	.64	334	111	18	.8	739	---	
	18T-334	10/13/54	D; alluvium	----	13	99	20		63	266	0	172	48	.6	1.3	548	.75	329	111	30	1.5	871	---	
	18T-336	10/22/54	Alluvium	54	13	106	24		55	292	0	182	43	.4	.3	563	.77	363	132	25	1.2	954	---	
	ATSF Lupton	11/ 4/54	do.	56	14	52	21		92	360	0	83	23	.8	.6	463	.63	216	0	48	2.7	741	---	
	Box Canyon T. P. 1	9/15/55	do.	75	13	61	18		135	366	0	142	46	1.0	6.5	602	.82	228	0	57	3.9	941	7.2	
	Box Canyon T. P. 2	9/15/55	do.	70	-----	-----	-----	-----	-----	-----	542	0	-----	172	-----	-----	-----	-----	-----	-----	-----	-----	3,100	7.3
	Cliff Dwell- ing T. P.	9/14/55	do.	73	9.5	69	18		190	445	0	232	30	1.0	11	780	1.06	246	0	63	5.3	1,170	7.4	
	D. C. Truck Station	9/14/55	-----	76	15	48	19		262	444	0	255	92	1.8	3.9	915	1.24	198	0	74	8.1	1,430	7.3	
	Indian Trails T. P.	9/15/55	Alluvium	69	17	70	19		66	327	0	75	34	.6	1.3	444	.60	252	0	36	1.8	692	7.1	
	Lupton T. P. 1, 2, and 3	9/15/55	do.	72	16	81	15		31	270	0	23	58	.6	4.0	362	.49	264	42	21	.8	630	7.1	
Mike Kirk's T. P.	9/15/55	do.	74	-----	-----	-----	-----	-----	-----	686	0	-----	870	-----	-----	-----	-----	-----	-----	-----	-----	6,040	7.8	
Three Hogans T. P. 1	9/14/55	Chinle (lower red)	72	-----	-----	-----	-----	-----	-----	362	0	-----	36	-----	-----	-----	-----	-----	-----	-----	-----	2,060	7.9	
Three Hogans T. P. 2	9/14/55	do.	72	-----	-----	-----	-----	-----	-----	370	0	-----	110	-----	-----	-----	-----	-----	-----	-----	-----	3,000	7.1	

Selected chemical analyses of the ground water in the Navajo and Hopi Indian Reservations, Arizona, New Mexico, and Utah—Continued

Quad-range	Bureau of Indian Affairs field number or name	Date of collection	Remarks	Temperature (°F)	Silica (SiO ₂)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium	Sodium-adsorption ratio (SAR)	Specific conductance (micro-mhos at 25°C)	pH	
																Parts per million	Tons per acre-foot	Calcium magnesium	Non-carbonate					
DISTRICT 18—Continued																								
124 con.	Tomahawk T. P.	9/15/55	Alluvium	73	---	---	---	---	---	614	0	---	165	---	---	---	---	---	322	0	---	---	1,970	7.3
	White Mtn. T. P.	9/15/55	Chinle (Shinarump)	73	17	85	22	58	---	252	0	151	41	1.0	5.6	505	0.69	302	96	29	1.5	---	6.9	
	Whiting Bros. Station	9/15/55	Alluvium	70	---	---	---	---	---	550	0	---	140	---	---	---	---	226	0	---	---	2,160	7.2	
	18A-185A	3/27/53	Chinle (lower red)	42	10	37	29	73	---	363	0	44	13	1.0	6.0	392	.53	212	0	43	2.2	667	---	
	18A-214	12/ 2/54	Alluvium	53	12	63	11	8.5	---	198	0	42	7	.2	5.7	246	.33	202	40	8	.3	409	---	
	18A-115	6/22/49	Landslide and talus	---	---	50	5.0	26	---	170	0	19	19	.0	18	221	.30	146	6	28	.9	387	---	
	18A-169	6/21/49	De Chelly	---	---	69	9.7	13	---	227	0	26	18	.0	2.4	250	.34	212	26	12	.4	471	---	
	18A-171	6/17/49	do.	---	---	68	18	5.8	---	257	0	24	12	.4	2.9	258	.35	244	33	5	.2	473	---	
	18A-220A	4/15/53	do.	40	15	76	15	8.5	---	289	0	9.5	13	.2	4.2	283	.38	251	14	7	.2	496	---	
	18A-308	5/13/55	Chinle (Petrified Forest, upper)	52	---	---	---	---	---	289	0	---	17	---	---	---	---	---	---	---	---	---	452	7.5
125	18A-208	6/21/49	T; Bidahochi	---	---	78	12	23	---	261	0	28	27	.0	15	312	.42	244	30	17	.6	569	---	
	18K-335	5/11/55	T; De Chelly	---	15	457	147	6.7	---	132	0	1,560	18	.5	.2	2,270	3.09	1,740	1,640	1	.1	2,470	7.4	
	Big Arrow T. P.	9/15/55	De Chelly	72	20	91	20	133	---	384	0	158	74	.6	17	703	.96	309	0	48	3.3	1,090	7.3	
	Cedar Point T. P.	9/15/55	Chinle (Shinarump)	72	11	71	20	23	---	258	0	44	28	1.4	9.8	335	.46	259	48	16	.6	576	7.1	
	Log Cabin T. P.	9/15/55	do.	74	14	108	29	55	---	362	0	141	44	.6	.4	570	.78	388	92	23	1.2	903	7.0	
	18A-208A	6/21/49	Alluvium	---	---	126	12	5.5	---	253	0	25	23	.2	136	452	.61	364	156	3	.1	719	---	
137	18A-112	6/27/49	Bidahochi	---	---	2.0	.9	85	---	162	0	12	29	.0	10	219	.30	8	0	96	13	384	---	
	18A-113	11/ 4/54	T; Bidahochi	---	3.2	17	5.0	45	---	146	0	8.8	21	.8	.4	173	.24	63	0	61	2.5	310	---	
	18K-331	9/ 5/53	D; Bidahochi	---	26	42	5.2	30	---	172	0	21	14	.2	9.7	233	.32	126	0	34	1.1	368	---	
138	Ranchers Supply	9/15/55	Chinle (Shinarump)	71	13	137	68	94	---	356	0	462	36	.7	.6	986	1.34	662	330	25	1.6	1,360	7.0	