

Quality of Surface Waters of the United States 1949

Parts 1-6

Prepared under the direction of C. G. PAULSEN, Chief Hydraulic Engineer

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1162

*Prepared in cooperation with the States
of Florida, Georgia, Iowa, North Caro-
lina, Ohio, Pennsylvania, South Caro-
lina, and Virginia, and other agencies*



UNITED STATES DEPARTMENT OF THE INTERIOR

Douglas McKay, *Secretary*

GEOLOGICAL SURVEY

W. E. Wrather, *Director*

**For sale by the Superintendent of Documents, U. S. Government Printing Office
Washington 25, D. C. - Price \$2 (paper cover)**

PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Florida, Georgia, Iowa, North Carolina, Ohio, Pennsylvania, South Carolina, and Virginia and other agencies, by personnel of the Water Resources Division under the direction of:

C. G. Paulsen Chief Hydraulic Engineer
S. K. Love Chief, Quality of Water Branch

District Supervisors (Quality of Water)

P. C. Benedict, regional engineer Lincoln, Nebr.
W. L. Lamar, district chemist Columbus, Ohio
F. H. Pauszek, district chemist Raleigh, N. C.
W. F. White, district chemist Washington, D. C.

CONTENTS

	Page
Introduction	1
Collection and examination of samples.....	3
Chemical quality.....	3
Suspended sediment.....	4
Temperature	5
Expression of results.....	5
Composition of surface waters.....	7
Mineral constituents in solution	8
Silica	8
Aluminum	8
Manganese.....	8
Iron.....	9
Calcium.....	9
Magnesium	9
Sodium and potassium	9
Carbonate and bicarbonate.....	10
Sulfate	10
Chloride.....	10
Fluoride.....	10
Nitrate	11
Boron.....	11
Dissolved solids	11
Properties and characteristics of water	11
Oxygen consumed.....	11
Color.....	12
Hydrogen-ion concentration.....	12
Specific conductance	12
Hardness.....	13
Total acidity	13
Corrosiveness	13
Percent sodium	14
Sediment.....	14
Publications.....	15
Cooperation	16
Division of work	16
Stream flow.....	19
Literature cited.....	19
Chemical analyses, water temperatures, and suspended sediment	21
Part 1. North Atlantic Slope basins.....	21
Delaware River basin.....	21
Delaware River at Narrowsburg, N. Y.	21

Chemical analyses, etc.--Continued

North Atlantic Slope basins--Continued

Delaware River basin--Continued

Page

Delaware River at Easton, Pa. 24

Delaware River at Trenton, N. J. 27

Lehigh River at Walnutport, Pa. 30

Lehigh River at Catasauqua, Pa. 33

Schuylkill River at Port Carbon, Pa. 36

Schuylkill River at Landingville, Pa. 39

Schuylkill River at Auburn, Pa. 46

Schuylkill River at Berne, Pa. 52

Schuylkill River at Pottstown, Pa. 59

Schuylkill River at Manayunk, Philadelphia, Pa. 64

Schuylkill River at Belmont Filters, Philadelphia, Pa. 67

Little Schuylkill River at Dreher'sville, Pa. 70

Perkiomen Creek at Graters Ford, Pa. 76

Brandywine Creek at Chadds Ford, Pa. 79

Brandywine Creek at Wilmington, Del. 80

Miscellaneous analyses of streams in Delaware

River basin 83

Miscellaneous analyses of streams in Delaware

River basin in Pennsylvania 84

Susquehanna River basin 97

Susquehanna River at Falls, Pa. 97

Susquehanna River at Danville, Pa. 100

Susquehanna River at Harrisburg, Pa. 106

Lackawanna River at Old Forge, Pa. 109

West Branch Susquehanna River at Lock Haven, Pa. . 112

West Branch Susquehanna River at Lewisburg, Pa. . 115

Frankstown Branch Juniata River at Huntingdon, Pa. 118

Juniata River at Newport, Pa. 121

Raystown Branch Juniata River near Huntingdon, Pa. 124

Codorus Creek near York, Pa. 127

Conestoga Creek at Lancaster, Pa. 130

Miscellaneous analyses of streams in Susquehanna

River basin in Pennsylvania 133

Potomac River basin. 142

South Branch Potomac River near Petersburg, W. Va. 142

Cacapon River at Great Cacapon, W. Va. 143

Conococheague Creek at Fairview, Md. 144

Opequon Creek near Berryville, Va. 146

Abrams Creek at Winchester, Va. 147

Antietam Creek near Waynesboro, Pa. 148

North River near Burketown, Va. 150

South Fork Shenandoah River at Elkton, Va. 151

South Fork Shenandoah River near Luray, Va. 154

South Fork Shenandoah River at Front Royal, Va. ... 157

Middle River near Grottoes, Va. 158

South River at Waynesboro, Va. 159

South River at Harrison, Va. 160

North Fork Shenandoah River at Cootes Store, Va. .. 163

Chemical analyses, etc.--Continued

North Atlantic Slope basins--Continued

Potomac River basin--Continued Page

North Fork Shenandoah River at Mt. Jackson, Va. 164

North Fork Shenandoah River near Strasburg, Va. 165

Monocacy River at Bridgeport, Md. 168

~~Miscellaneous analyses of streams in Potomac~~
~~River basin in Virginia 170~~

Part 2. South Atlantic Slope and Eastern Gulf of Mexico

Basins 171

James River basin 171

James River at Richmond, Va. 171

~~Miscellaneous analyses of streams in James River~~
~~basin in Virginia 174~~

Chowan River basin 175

~~Miscellaneous analyses of streams in Chowan River~~
~~basin in North Carolina 175~~

Roanoke River basin 176

Roanoke River at Roanoke Rapids, N. C. 176

~~Miscellaneous analyses of streams in Roanoke~~
~~River basin in North Carolina 179~~

Pamlico River basin 180

Tar River at Greenville, N. C. 180

Fishing Creek near Enfield, N. C. 181

~~Miscellaneous analyses of streams in Pamlico~~
~~River basin in North Carolina 184~~

Neuse River basin 185

Neuse River near Goldsboro, N. C. 185

~~Miscellaneous analyses of streams in Neuse River~~
~~basin in North Carolina 188~~

Cape Fear River basin 190

Cape Fear River at Fayetteville, N. C. 190

Rockfish Creek near Hope Mills, N. C. 191

~~Miscellaneous analyses of streams in Cape Fear~~
~~River basin in North Carolina 192~~

Waccamaw River basin 193

~~Miscellaneous analyses of streams in Waccamaw~~
~~River basin in North Carolina 193~~

Pee Dee River basin 194

Pee Dee River at Peedee, S. C. 194

~~Miscellaneous analyses of streams in Pee Dee River~~
~~basin in North Carolina 195~~

~~Miscellaneous analyses of streams in Pee Dee River~~
~~basin in South Carolina 196~~

Santee River basin 197

Congaree River at Columbia, S. C. 197

Green River near Mill Spring, N. C. 198

Second Broad River at Cliffside, N. C. 199

First Broad River near Lawndale, N. C. 202

North Tyger River near Moore, S. C. 205

Chemical analyses, etc. --Continued

South Atlantic Slope and Eastern Gulf of Mexico

Basins--Continued

Santee River basin--Continued	Page
—Miscellaneous analyses of streams in Santee River basin in North Carolina	206
—Miscellaneous analyses of streams in Santee River basin in South Carolina	207
Edisto River basin	209
—Miscellaneous analyses of streams in Edisto River basin in South Carolina	209
Combahee-Broad River basins	210
—Miscellaneous analyses of streams in Combahee-Broad River basins in South Carolina.....	210
Savannah River basin.....	211
—Miscellaneous analyses of streams in Savannah River basin.....	211
St. Johns River basin	212
St. Johns River near De Land, Fla.	212
Part 3. Ohio River basin.....	215
Ohio River main stem	215
Allegheny River at Warren, Pa.	215
Allegheny River at Kittanning, Pa.....	218
Allegheny River at Sharpsburg, Pa.....	220
Ohio River at Ambridge, Pa.....	221
Allegheny River tributaries	225
Clarion River near Piney, Pa.	225
Kiskiminetas River at Leechburg, Pa.	228
—Miscellaneous analyses of streams, Allegheny River tributaries in Pennsylvania.....	231
Monongahela River basin.....	233
Tygart River at Elkins, W. Va.	233
Monongahela River at Charleroi, Pa.	234
Shavers Fork at Parsons, W. Va.	237
Youghiogheny River at Sutersville, Pa.....	238
Beaver River basin.....	241
Beaver River at New Brighton, Pa.	241
Muskingum River basin.....	244
Tuscarawas River at Newcomerstown, Ohio.....	244
Little Kanawha River basin.....	245
Little Kanawha River at Glenville, W. Va.....	245
Kanawha River basin	246
New River at Hinton, W. Va.....	246
Greenbrier River at Alderson, W. Va.	247
Knapp Creek at Marlinton, W. Va.....	248
—Miscellaneous analyses of streams in Kanawha River basin in North Carolina	249
Big Sandy River basin	250
Tug Fork at Kermit, W. Va.	250
Scioto River basin.....	251
Olentangy River near Delaware, Ohio	251

Chemical analyses, etc.--Continued	
Ohio River basin--Continued	Page
Tennessee River basin.....	252
North Toe River at Altapass, N. C.	252
—Miscellaneous analyses of streams in Tennessee River basin in North Carolina	255
Part 4. St. Lawrence River basin.....	256
Streams Tributary to Lake Erie	256
Maumee River at Antwerp, Ohio.....	256
Cuyahoga River at Hiram Rapids, Ohio.....	259
Cuyahoga River at Botzum, Ohio.....	262
Cuyahoga River at Independence, Ohio.....	263
Little Cuyahoga River at Massillon Road, Akron, Ohio.....	266
Springfield Lake Outlet at Akron, Ohio	267
Part 5. Hudson Bay and Upper Mississippi River basins	268
Red River of the North basin.....	268
Red River of the North at Fargo, N. Dak.	268
—Miscellaneous analyses of streams in Red River of the North basin	269
Iowa River basin.....	272
Iowa River at Iowa City, Iowa	272
Cedar River at Cedar Rapids, Iowa	281
Part 6. Missouri River basin.....	290
Missouri River main stem	290
Missouri River at Highway Bridge at Toston, Mont.	290
Miscellaneous analyses of streams in Missouri River main stem in Montana.....	293
Marias River basin.....	294
—Miscellaneous analyses of streams in Marias River basin in Montana.....	294
Yellowstone River basin	295
Wind River at Dubois, Wyo.	295
Wind River at Riverton, Wyo.	297
Bighorn River at Thermopolis, Wyo.....	303
Bighorn River near Manderson, Wyo.	309
Bighorn River at Manderson, Wyo.	313
Bighorn River at Kane, Wyo.....	317
Bighorn River at Bighorn, Mont.	322
Popo Agie River near Riverton, Wyo.	327
Fivemile Creek near Pavillion, Wyo.	331
Fivemile Creek near Shoshoni, Wyo.	333
Power Line Wasteway near Pavillion, Wyo.....	338
Pavillion Drain near Pavillion, Wyo.....	339
Ocean Drain at Ocean Lake Outlet near Pavillion, Wyo.	343
Ocean Drain near Pavillion, Wyo.	346
Dudley Wasteway near Pavillion, Wyo.	350
Kellett Drain near Pavillion, Wyo.	351
Dewey Drain near Pavillion, Wyo.	354
Fivemile 76 Drain near Riverton, Wyo.	357
Sand Gulch Drain and Wasteway near Riverton, Wyo.	359

Chemical analyses, etc.--Continued

Missouri River basin--Continued

Yellowstone River basin--Continued

	Page
Lost Wells Butte Drain near Riverton, Wyo.	361
Coleman Drain near Shoshoni, Wyo.	363
Sand Gulch near Shoshoni, Wyo.	366
Eagle Drain near Shoshoni, Wyo.	370
Lateral P-34.9 Wasteway near Shoshoni, Wyo.	374
Lateral P-36.8 Wasteway near Shoshoni, Wyo.	375
Poison Creek near Shoshoni, Wyo.	376
Badwater Creek at Bonneville, Wyo.	378
Muddy Creek near Pavillion, Wyo.	382
Muddy Creek near Shoshoni, Wyo.	385
Dry Cottonwood Creek near Bonneville, Wyo.	388
Shoshone River below Buffalo Bill Reservoir, Wyo.	390
Shoshone River at Byron, Wyo.	392
Tongue River at Miles City, Mont.	394
Powder River at Arvada, Wyo.	398
Middle Fork Powder River above Kaycee, Wyo.	403
—Miscellaneous analyses of streams in Yellowstone River basin.	405
Little Missouri River basin	408
Little Missouri River at Alzada, Mont.	408
Little Missouri River at Medora, N. Dak.	411
—Miscellaneous analyses of streams in Little Missouri River basin in North Dakota	417
Knife River basin	420
—Knife River near Golden Valley, N. Dak.	420
—Miscellaneous analyses of streams in Knife River basin in North Dakota.	424
Heart River basin	425
Heart River near South Heart, N. Dak.	425
Heart River near Richardton, N. Dak.	430
—Miscellaneous analyses of streams in Heart River basin in North Dakota.	434
Cannonball River basin	437
Cannonball River near New Leipzig, N. Dak.	437
Cedar Creek near Pretty Rock, N. Dak.	441
—Miscellaneous analyses of streams in Cannonball River basin in North Dakota.	445
Grand River basin.	446
Grand River at Shadehill, S. Dak.	446
—Miscellaneous analyses of streams in Grand River basin in South Dakota.	452
Moreau River basin	455
Moreau River at Bixby, S. Dak.	455
Moreau River near Faith, S. Dak.	461
—Miscellaneous analyses of streams in Moreau River basin in South Dakota.	468
Cheyenne River basin	469
Cheyenne River near Hot Springs, S. Dak.	469

Chemical analyses, etc.--Continued

Missouri River basin--Continued

Cheyenne River basin--Continued

Page

—Miscellaneous analyses of streams in Cheyenne River basin.....	474
Bad River basin	477
—Miscellaneous analyses of streams in Bad River basin in South Dakota	477
White River basin.....	478
White River near Oglala, S. Dak.....	478
White River near Kadoka, S. Dak.....	483
—Miscellaneous analyses of streams in White River basin in South Dakota.....	488
Ponca Creek basin	489
—Miscellaneous analyses of streams in Ponca Creek basin in Nebraska	489
Niobrara River basin.....	490
Niobrara River near Gordon, Nebr.	490
Niobrara River near Cody, Nebr.....	494
Niobrara River near Sparks, Nebr.....	499
Long Pine Creek near Riverview, Nebr.....	503
—Miscellaneous analyses of streams in Niobrara River basin.....	507
James River basin	512
—Miscellaneous analyses of streams in James River basin	512
Platte River basin.....	513
North Platte River below Casper, Wyo.	513
North Platte River above Bedtick Creek near Douglas, Wyo.....	518
North Platte River near Cassa, Wyo.	523
North Platte River below Guernsey Reservoir, Wyo.....	528
South Platte River at Julesburg, Colo.....	531
Wood River near Riverdale, Nebr.....	535
Middle Loup River at Dunning, Nebr.	539
Middle Loup River at St. Paul, Nebr.	544
South Loup River at St. Michael, Nebr.	550
North Loup River near St. Paul, Nebr.....	555
Beaver Creek at Loretto, Nebr.	561
—Miscellaneous analyses of streams in Platte River basin	566
Kansas River basin	577
Arikaree River at Haigler, Nebr.....	577
Republican River at Trenton, Nebr.....	579
South Fork Republican River near Colo. -Kans. State line	586
Medicine Creek at Cambridge, Nebr.	590
Sappa Creek near Beaver City, Nebr.....	594
Sappa Creek near Stamford, Nebr.....	601
Prairie Dog Creek at Norton, Kans.	606
Smoky Hill River near Ellis, Kans.	614

Chemical analyses, etc.--Continued	
Missouri River basin--Continued	
Kansas River basin--Continued	Page
Rose Creek near Wallace, Kans.	619
Saline River near Russell, Kans.	620
Saline River near Wilson, Kans.	627
Paradise Creek near Paradise, Kans.	631
Wolf Creek near Sylvan Grove, Kans.	637
South Fork Solomon River at Alton, Kans.	642
Solomon River at Beloit, Kans.	647
Miscellaneous analyses of streams in Kansas River basin	653
Index.	657

ILLUSTRATION

- Figure 1. Map of the United States showing basins covered by the two water-supply papers on quality of surface waters in 1949. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by Water-Supply Paper 1163.

QUALITY OF SURFACE WATERS OF THE UNITED STATES, 1949

PARTS 1-6

INTRODUCTION

The quality-of-water investigations of the United States Geological Survey are concerned with chemical and physical characteristics of the surface and ground water supplies of the Nation. Most of the investigations carried on in cooperation with States and other Federal agencies deal with the amounts of matter in solution and in suspension in streams.

The records of chemical analysis, suspended sediment, and temperature for surface waters given in this volume serve as a basis for determining the suitability of the waters examined for industrial, agricultural, and domestic uses insofar as such use is affected by the dissolved or suspended mineral matter in the waters. The discharge of a stream and, to a lesser extent, the chemical quality are related to variations in rainfall and other forms of precipitation. In general, lower concentrations of dissolved solids may be expected during the periods of high flow than during periods of low flow. The concentration in some streams may change materially with relatively small variations in flow, whereas for other streams the quality may remain relatively uniform throughout large ranges in discharge. The quantities of suspended sediment carried by streams are also related to discharge, and during flood periods the sediment concentrations in many streams vary over wide ranges.

The regular yearly publication of records of chemical analyses, suspended sediment, and water temperature was begun by the Geological Survey in 1941. The annual records prior to 1948 were published in a single volume for the entire country. Beginning in 1948, the records were published in two volumes, covering the drainage basins shown in figure 1. The samples for which data are given were collected from October 1, 1948, to September 30, 1949. Descriptive statements are given for each sampling station for which regular series of chemical analyses or sediment determinations have been made. These statements include the location of the stream-sampling station, drainage area, length of time for which records are available, extremes of dissolved solids, total hardness, sediment loads, water temperature, and other pertinent data. Records of water discharge of the streams at, or near, the sampling point for the sampling period are included in most tables of analyses. The records are arranged by drainage basins, according to Geological Survey practice in reporting records of stream flow.

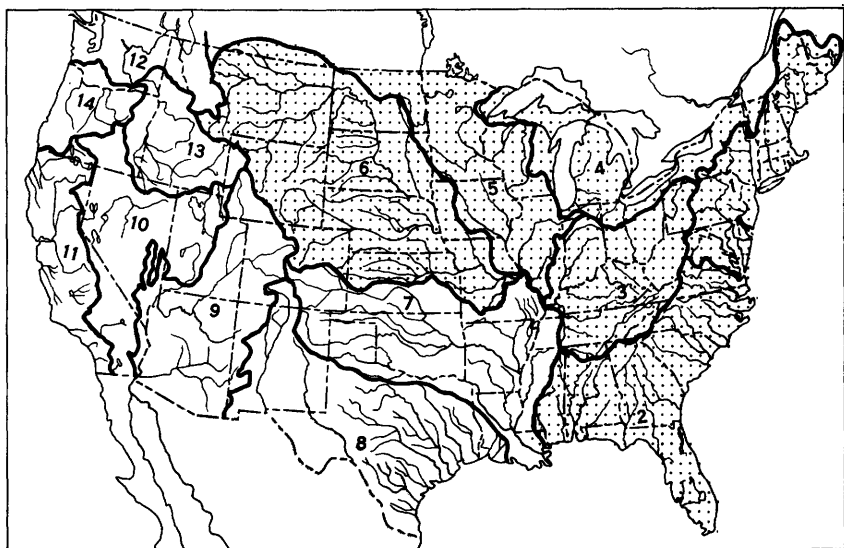


Figure 1. Map of the United States showing basins covered by the two water-supply papers on quality of surface waters in 1949. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by Water-Supply Paper 1163.

During the year ended September 30, 1949, 98 regular sampling stations on 85 streams for the study of the chemical character of surface waters were maintained by the Geological Survey in the area covered by this volume. Samples were collected less frequently during the year at many other points. Water temperatures were measured daily at 109 of the regular sampling stations. Not all analyses of samples of surface water collected during the year have been included. Single analyses of an incomplete nature generally have been omitted. Also, determinations made on the daily samples before compositing have not been reported. Specific conductance was usually determined on each daily sample, and pH, chloride, or other determinations were also made on many of the daily samples. As noted in the table headings these data are available for reference at the district offices listed under Division of Work, on pages 16-19.

Quantities of suspended sediment are reported for 84 stations during the year ended September 30, 1949. The sediment samples were collected from one to five times daily at most stations, depending on the rate of flow and changes in stage of the stream. Sediment samples were collected less frequently during the year at many other points. In connection with measurements of sediment discharge, sizes of sediment particles were determined at 84 of the stations. As noted under "Remarks" in

the table headings, suspended-sediment concentrations also were determined from the samples collected for chemical analyses in some parts of the country. The data do not provide a reliable basis for computing the loads of suspended sediment carried by the stream but may be of value for design and operation of filtration plants utilizing these stream waters. Records of these infrequent determinations are available for reference in the district offices listed.

Material which is transported essentially in continuous contact with the stream bed is termed bed load and is not considered in this report. All other undissolved material in transport is termed suspended sediment and generally constitutes the major part of the total sediment load. At the present time no reliable method has been developed for determining bed load on a routine basis.

COLLECTION AND EXAMINATION OF SAMPLES

CHEMICAL QUALITY

Samples for chemical analysis were usually collected daily at, or near, points on streams where gaging stations are maintained for measurement of water discharge. Most of the analyses were made on 10-day composites of daily samples collected for a period of a year at each sampling point. Three composite samples were usually prepared each month by mixing together equal volumes of daily samples collected from the 1st to the 10th, from the 11th to the 20th, and during the remainder of the month. For some streams that are subject to sudden and large changes in chemical composition or concentration, samples were composited for shorter periods on the basis of the concentration of dissolved solids indicated by measurements of specific conductance of the daily samples.

The samples were analyzed according to methods regularly used by the Geological Survey. These methods are essentially the same as or are modifications of methods described in recognized authoritative publications for the mineral analysis of water samples (Collins, 1928; Am. Public Health Assoc., 1946).

For those waters containing moderately large quantities of soluble salts, the value reported for dissolved solids is the sum of the quantities of the various determined constituents using the carbonate equivalent of the reported bicarbonate. In other analyses the value reported as dissolved solids is the residue on evaporation after drying at 180° C for 1 hour. Specific conductance is given for most analyses and was determined by means of a conductance bridge using a standard potassium chloride solution as reference.

SUSPENDED SEDIMENT

In general, samples were collected daily with the US D-43 depth-integrating sampler (U. S. Inter-agency, 1948, p. 70-76) from a fixed sampling point at one vertical in the cross section. The US DH-48 hand sampler was used at many stations during periods of low flow. Suspended-sediment samples, consisting of depth-integrated samples at three or more verticals in the cross section were made periodically to determine the cross-sectional distribution of the suspended concentration with respect to that at the daily sampling vertical. In streams where comparatively rapid fluctuations in transverse distribution of water discharge or sediment concentration are encountered at the sampling point, samples were taken regularly at two or more verticals to determine the average concentration across the section. During periods of high flow, samples were taken two or more times throughout the day at many sampling stations, and during periods of rapidly changing flow samples were taken hourly at some stations.

Sediment concentrations were determined by filtration or evaporation of the samples as required. At many stations the mean daily concentration for some days was obtained by plotting the instantaneous concentrations on the original or copies of the original gage-height chart. The plotted concentrations adjusted, if necessary, for cross-sectional distribution with respect to that at the daily sampling vertical, were connected or averaged by continuous curves to obtain a concentration graph. This graph represented the estimated concentration at any time and, for most periods, mean daily concentrations were determined from the graph. When the concentration and water discharge were changing rapidly, the day was often subdivided for this computation. For some periods when the day-to-day variation in the concentration was negligible, the data were not plotted, and the average concentration of the samples was used as the mean concentration for the day. For certain stations, when the discharge and sediment concentrations were relatively low and varied only slightly from day to day, the samples for a number of days were composited and the mean daily concentrations and mean daily loads are shown.

For some periods when no samples were collected, daily sediment loads were estimated on the basis of water discharge, sediment concentrations observed immediately preceding and following the periods, and sediment loads for other periods of similar discharge. The estimates were further guided by weather conditions and sediment discharge for other stations.

In many instances where there were no observations for several days, the sediment loads for individual days are not estimated, as numerous factors influencing the quantities of transported sediment made it very difficult to make accurate estimates of sediment loads for individual days. However, estimated sedi-

ment loads for missing days in an otherwise continuous period of sampling have been included in monthly and annual totals for most streams to provide a complete record.

In addition to the records of total quantities of sediment, records of the particle sizes of sediment are included also. The particle sizes of the suspended sediments were determined periodically for many of the stations. As much of the material carried in suspension can pass through the finest sieves, the bottom-withdrawal tube method (U. S. Inter-agency, 1943, p. 82-90) was used in most of the analyses. Generally sieves were used in the determination of particle sizes larger than 0.062 millimeter. Native or distilled water, as noted in the tables of analyses, was used as the settling medium. In some instances, chemical dispersing agents were added to the settling medium. As settling diameters of the clay and colloidal fractions are often affected by the chemical character of the settling medium, analyses made using native water more nearly simulate particle sizes existing in the stream. Results of analyses using distilled water or using a settling medium containing dispersing agents approximate ultimate particle sizes of the finer fractions. The concentration of sediment suspension for analysis was reduced to less than 10,000 parts per million, where necessary, by means of a sample splitter, in order to meet the upper limits recommended for the bottom-withdrawal tube method. The concentration of suspended sediment used in the bottom-withdrawal tube was often different from the concentration in the original suspension. The weight of sediment used is indicated in the tables of analyses.

TEMPERATURE

For most of the stations, daily water temperatures were obtained at the time that the chemical quality or sediment samples were collected. So far as practicable the water temperatures were observed at about the same time each day for an individual river station in order that the data would be relatively unaffected by diurnal variations in temperature. For most large, swiftly flowing streams the diurnal variation in water temperature is probably small, but for sluggish or shallow streams the daily range in temperature may amount to several degrees and may follow closely changes in air temperature. The thermometers used for determination of water temperature were accurate to plus or minus about 0.5° F.

EXPRESSION OF RESULTS

The dissolved mineral constituents are reported in parts per million. A part per million is a unit weight of a constituent in a million unit weights of water. Equivalent parts per million are not given in this report although the expression of analyses in equiv-

alents per million is sometimes preferred. An equivalent per million is a unit chemical combining weight of a constituent in a million unit weights of water and is calculated by dividing the concentration in parts per million by the chemical combining weight of the constituent. For convenience in making this conversion the reciprocals of chemical combining weights of the most commonly reported constituents (ions) are given in the following table:

Constituent	Factor	Constituent	Factor
Iron (Fe ⁺⁺) -----	0.0358	Carbonate (CO ₃ ⁻⁻) ---	0.0333
Iron (Fe ⁺⁺⁺) -----	.0537	Bicarbonate (HCO ₃ ⁻) -	.0164
Calcium (Ca ⁺⁺) -----	.0499	Sulfate (SO ₄ ⁻⁻) -----	.0208
Magnesium (Mg ⁺⁺) ----	.0822	Chloride (Cl ⁻) -----	.0282
Sodium (Na ⁺) -----	.0435	Fluoride (F ⁻) -----	.0526
Potassium (K ⁺) -----	.0256	Nitrate (NO ₃ ⁻) -----	.0161

Results given in parts per million can be converted to grains per United States gallon by dividing by 17.12. A calculated quantity of sodium and potassium is given in some analyses and is the quantity of sodium needed in addition to the calcium and magnesium to balance the acid constituents.

The total hardness, as calcium carbonate (CaCO₃), is calculated from the equivalents of calcium and magnesium except for a few samples for which the reported values also include equivalents of free mineral acid, aluminum, iron, and manganese when present in significant quantities. The hardness caused by calcium and magnesium (and other ions if significant) equivalent to the carbonate and bicarbonate is called carbonate hardness; the hardness in excess of this quantity is called noncarbonate hardness.

In the analyses of most waters used for irrigation, the quantity of dissolved solids is given in tons per acre-foot as well as in parts per million. Percent sodium has been computed for those analyses where sodium and potassium are reported separately by dividing the equivalents per million of sodium by the sum of the equivalents per million of calcium, magnesium, sodium, and potassium and multiplying the quotient by 100. In analyses where sodium and potassium were calculated and reported as a combined value, the value reported for percent sodium will include the equivalent quantity of potassium. In most waters of moderate to high concentration, the proportion of potassium is much smaller than that of sodium.

Specific conductance values are expressed in reciprocal ohms (micromhos at 25°C). The discharge of the streams is reported in second-feet (see Stream Flow, p. 19) and the temperature in degrees Fahrenheit. Color is expressed in units of the platinum-cobalt scale proposed by Hazen (1892, p. 427-428). Hydrogen-ion concentration (pH) is given as the negative logarithm of the

number of moles of ionized hydrogen per liter of water.

An average of analyses (arithmetical or weighted) for the water year is given for most daily sampling stations. An arithmetical average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the river each day for the water year. A weighted average represents approximately the composition of water that would be found in a reservoir containing all of the water passing a given station during the year after thorough mixing in the reservoir. The weighted average of the analyses is computed by multiplying the discharge for the sampling period by the quantities of the individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. Water as represented by the weighted average is less concentrated than that represented by the average of the individual analyses for most streams because at times of high discharge the rivers generally have lower concentrations of dissolved solids.

Mean daily sediment concentrations are expressed in parts per million by weight. Daily sediment loads are expressed in tons per day, and except for subdivided days are usually obtained by multiplying mean daily sediment concentration in parts per million by the mean daily discharge, and the conversion factor 0.0027.

Particle-size analyses are expressed in percentages finer than indicated sizes in millimeters. The size classification used in this report is that recommended by the American Geophysical Union Subcommittee on sediment terminology (Lane, et al; 1947, p. 937). Other data included as pertinent to the size analyses for many streams are the date of collection, the stream discharge and sediment concentration when sample was collected, the concentration of the suspension during analysis, and the method of analysis.

COMPOSITION OF SURFACE WATERS

All natural waters contain dissolved mineral matter. Water in contact with soils or rock, even for only a few hours, will dissolve some rock materials. The quantity of dissolved mineral matter in a natural water depends primarily on the type of rocks or soils through which the water has passed and the length of time it has been in contact with the rocks or soils. Some streams are fed by both surface runoff and underground water from springs or seeps. Such streams reflect the chemical character of their concentrated underground sources during dry periods and are more dilute during periods of heavy rainfall. Underground water is usually more highly concentrated than surface runoff as it remains in contact with the rocks and soils for much longer periods. The concentration of dissolved solids in a river

water is frequently increased by drainage from mines or oil fields, by the addition of industrial or municipal wastes, or--in irrigated regions--by return drain waters.

The mineral constituents and physical properties of natural waters reported in the tables of analyses include those that have a practical bearing on the value of the waters for most purposes. The analyses generally include results for silica, iron, calcium, magnesium, sodium, potassium (or sodium and potassium together as sodium), bicarbonate, sulfate, chloride, fluoride, nitrate, boron, and dissolved solids. Aluminum, manganese, color, pH, acidity, and oxygen consumed are reported for certain streams. The source and significance of the different constituents and properties of natural waters are discussed in the following paragraphs.

MINERAL CONSTITUENTS IN SOLUTION

Silica (SiO_2)

Silica is dissolved from practically all rocks. Some natural surface waters contain less than 5 parts per million of silica and few contain more than 50 parts, but the more common range is from 10 to 30 parts per million. Silica affects the usefulness of a water because it contributes to the formation of boiler scale; it usually is removed from feed water for high-pressure boilers. Silica also forms troublesome deposits on the blades of steam turbines.

Aluminum (Al)

Aluminum is usually present only in negligible quantities in natural waters except in areas where the waters have been in contact with the more soluble rocks of high aluminum content such as bauxite and certain shales. Acid waters often contain large amounts of aluminum. It may be troublesome in feed waters where it tends to be deposited as a scale on boiler tubes.

Manganese (Mn)

Manganese is dissolved in appreciable quantities from rocks in some sections of the country. Waters impounded in large reservoirs may contain manganese that has been dissolved from the mud on the bottom of the reservoir by action of carbon dioxide produced by anaerobic fermentation of organic matter. Manganese is not regularly determined in areas where it is not present in the waters in appreciable amounts. It is especially objectionable in water used in laundry work and in textile processing.

Concentrations as low as 0.2 part per million may cause a dark-brown or black stain on fabrics and porcelain fixtures. Appreciable quantities of manganese are often found in waters containing objectionable quantities of iron.

Iron (Fe)

Iron is dissolved from many rocks and soils. On exposure to the air, normal basic waters that contain more than 1 part per million of iron soon become turbid with the insoluble reddish ferric oxide produced by oxidation. Surface waters, therefore, seldom contain as much as 1 part per million of dissolved iron, although some acid waters carry large quantities of iron in solution. Iron causes reddish-brown stains on white porcelain or enameled ware and fixtures and on fabrics washed in the water.

Calcium (Ca)

Calcium is dissolved from practically all rocks and soils, but the highest concentrations are usually found in waters that have been in contact with limestone, dolomite, and gypsum. Calcium and magnesium make water hard and are largely responsible for the formation of boiler scale. Most waters associated with granite or silicious sands contain less than 10 parts per million of calcium; waters in areas where rocks are composed of dolomite and limestone contain from 30 to 100 parts per million; and waters that have come in contact with deposits of gypsum may contain several hundred parts per million.

Magnesium (Mg)

Magnesium is dissolved from many rocks, particularly from dolomitic rocks. Its effect in water is similar to that of calcium. The magnesium in soft waters may amount to only 1 or 2 parts per million, but water in areas that contain large quantities of dolomite or other magnesium-bearing rocks may contain from 20 to 100 parts per million or more of magnesium.

Sodium and potassium (Na and K)

Sodium and potassium are dissolved from practically all rocks. Sodium is the predominant cation in some of the more highly mineralized waters found in the western United States. Natural waters that contain only 3 or 4 parts per million of the two together are likely to carry almost as much potassium as sodium. As the total quantity of these constituents increases, the proportion of sodium becomes much greater. Moderate quantities of sodium and potassium have little effect on the usefulness of the water for most purposes, but waters that carry more than 50 or 100 parts per million of the two may require careful operation of steam boilers to prevent foaming. More highly mineralized waters that

contain a large proportion of sodium salts may be unsatisfactory for irrigation.

Carbonate and bicarbonate (CO_3) and HCO_3)

Bicarbonate occurs in waters largely through the action of carbon dioxide, which enables the water to dissolve carbonates of calcium and magnesium. Carbonate as such is not usually present in appreciable quantities in natural waters. The bicarbonate in waters that come from relatively insoluble rocks may amount to less than 50 parts per million; many waters from limestone contain from 200 to 400 parts per million. Bicarbonate in moderate concentrations in water has no effect on its value for most uses. Bicarbonate or carbonate is an aid in coagulation for the removal of suspended matter from water.

Sulfate (SO_4)

Sulfate is dissolved from many rocks and soils--in especially large quantities from gypsum and from beds of shale. It is formed also by the oxidation of sulfides of iron and is therefore present in considerable quantities in waters from mines. Sulfate in waters that contain much calcium and magnesium causes the formation of hard scale in steam boilers and may increase the cost of softening the water.

Chloride (Cl)

Chloride is dissolved from rock materials in all parts of the country. Surface waters in the humid regions are usually low in chloride, whereas streams in arid or semiarid regions may contain several hundred parts per million of chloride leached from soils and rocks, especially where the streams receive return drainage from irrigated lands. Large quantities of chloride may affect the industrial use of water by increasing the corrosiveness of waters that contain large quantities of calcium and magnesium.

Fluoride (F)

Fluoride has been reported as being present in some rocks to about the same extent as chloride. However, the quantity of fluoride in natural surface waters is ordinarily very small compared to that of chloride. Fluoride in water in excess of about 1 part per million is associated with the dental defect known as mottled enamel if the water is used for drinking by young children during calcification or formation of the teeth (Dean, 1936, p. 1269-1272). This defect becomes increasingly noticeable as the quantity of fluoride in water increases above 1 part per million. Recent investigations indicate that the incidence of dental caries is less when there are small amounts of fluoride present in the water supply than when there is none.

Nitrate (NO_3)

Nitrate in water is considered a final oxidation product of nitrogenous material and in some instances may indicate previous contamination by sewage or other organic matter. The quantities of nitrate present in surface waters usually amount to less than 5 parts per million (as NO_3) and have no effect on the value of the water for ordinary uses.

It has been reported that as much as 2 parts per million of nitrate in boiler water tends to decrease intercrystalline cracking of boiler steel. Studies made in Illinois indicate that nitrates in excess of 70 parts per million (as NO_3) may contribute to methemoglobinemia ("blue babies") (Faucett and Miller, 1946, p. 593), and more recent investigations conducted in Ohio show that drinking water containing nitrates in the range of 44 to 88 parts per million or more (as NO_3) may be the cause of methemoglobinemia in infants (Waring, 1949). In a report published by the National Research Council, Maxcy (1950, p. 271) concludes that a nitrate content in excess of 44 parts per million (as NO_3) should be regarded as unsafe for infant feeding.

Boron (B)

Boron in small quantities has been found essential for plant growth, but irrigation water containing more than 1 part per million boron is detrimental to citrus and other boron-sensitive crops. Boron is reported in Survey analyses of surface waters in arid and semiarid regions of the Southwest and West where irrigation is practiced or contemplated, but few of the surface waters analyzed have harmful concentrations of boron.

Dissolved solids

The reported quantity of dissolved solids--the residue on evaporation--consists mainly of the dissolved mineral constituents in the water. It may also contain some organic matter and water of crystallization. Waters with less than 500 parts per million of dissolved solids are usually satisfactory for domestic and some industrial uses. Waters containing several thousand parts per million of dissolved solids are sometimes successfully used for irrigation where practices permit the removal of soluble salts through the application of large volumes of water on well-drained lands.

PROPERTIES AND CHARACTERISTICS OF WATER

Oxygen consumed

The value for oxygen consumed furnishes a rough indication

of the oxidizable matter in the unfiltered and filtered samples and gives a partial measure of polluting materials such as sewage and oxidizable industrial wastes. Naturally highly colored waters may have relatively high oxygen consumed, although waters that are not noticeably colored may contain oxidizable material.

Color

In water analysis the term "color" refers to the appearance of water that is free from suspended solids. Many turbid waters that appear yellow, red, or brown when viewed in the stream show very little color after the suspended matter has been removed. The yellow-to-brown color of some waters is usually caused by organic matter extracted from leaves, roots, and other organic substances in the ground. In some areas objectionable color in water results from industrial wastes and sewage. Clear deep water may appear blue as the result of a scattering of sunlight by the water molecules. Water for domestic use and some industrial uses should be free from any perceptible color. A color less than 10 usually passes unnoticed. Some swamp waters have natural color of 200 to 300 or more.

Hydrogen-ion concentration (pH)

The degree of acidity or alkalinity of water, as indicated by the hydrogen-ion concentration, expressed as pH, is related to the corrosive properties of water, and is useful in determining the proper treatment for coagulation that may be necessary at water-treatment plants. A pH value of 7.0 indicates that the water is neither acid nor alkaline. Waters having pH values progressively lower than 7.0 denote increasing acidity, whereas values progressively higher than 7.0 denote increasing alkalinity. (See p. 13). The pH of most natural surface waters ranges between 6 and 8. Some alkaline surface waters have pH values greater than 8.0, and waters containing free mineral acid usually have pH values less than 4.5.

Specific conductance (micromhos at 25 C)

The specific conductance of a water is a measure of its capacity to conduct a current of electricity. The conductance varies with the concentration and degree of ionization of the different minerals in solution and with the temperature of the water. When considered in conjunction with results of determinations for other constituents, specific conductance is a useful determination and plays an important part in indicating changes in concentration of the total quantity of dissolved minerals in surface waters. (See p. 6.)

Hardness

Hardness is the characteristic of water that receives the most attention in industrial and domestic use. It is usually recognized by the increased quantity of soap required to produce lather. The use of hard water is also objectionable because it contributes to the formation of scale in boilers, water heaters, radiators, and pipes, with the resultant decrease in rate of heat transfer, possibility of boiler failure, and loss of flow.

Hardness is caused almost entirely by compounds of calcium and magnesium. Other constituents--such as iron, manganese, aluminum, barium, strontium, and free acid--also cause hardness, although they usually are not present in quantities large enough to have any appreciable effect. Water that has less than 60 parts per million of hardness is usually rated as soft and suitable for many purposes without further softening. Waters with hardness ranging from 61 to 120 parts per million may be considered moderately hard, but this degree of hardness does not seriously interfere with the use of water for many purposes except for use in high-pressure steam boilers and in some industrial processes. Waters with hardness ranging from 121 to 200 parts per million are considered hard, and laundries and industries may profitably soften such supplies. Water with hardness above 200 parts per million usually requires some softening before being used for most purposes.

Total acidity

The total acidity of a natural water represents the content of free carbon dioxide, mineral acids, and salts--especially sulfates of iron and aluminum--that hydrolyze to give hydrogen ions. Acid waters are very corrosive and generally contain excessive amounts of objectionable constituents, such as iron, aluminum, and manganese.

Corrosiveness

The corrosiveness of a water is that property which makes the water aggressive to metal surfaces and frequently results in the appearance of the "red water" caused by solution of iron. The disadvantages of iron in water have been discussed previously. Additionally, corrosion causes the deterioration of water pipes, steam boilers, and water-heating equipment. Many waters that do not appreciably corrode cold-water lines will aggressively attack hot-water lines. Oxygen, carbon dioxide, free acid, and acid-generating salts are the principal constituents in water that cause corrosion. In a general way, very soft waters of low mineral content tend to be more corrosive than hard waters containing appreciable quantities of carbonates and bicarbonates of

calcium and magnesium.

Percent sodium

Percent sodium is reported in most of the analyses of waters collected from streams in the western part of the country where irrigation is practiced extensively. The proportion of sodium to all the basic constituents in the water has a bearing on the suitability of a water for irrigation. (See p. 6 .) Waters in which the percent sodium is more than 60 may be injurious when applied to certain types of soils, particularly when adequate drainage is not provided (Magistad and Christiansen, 1944, p. 8-9; Wilcox, 1948, p. 6).

SEDIMENT

Fluvial sediment is generally regarded as that sediment which is transported by, suspended in, or deposited by water. Suspended sediment is that sediment which remains in suspension in water owing to the upward components of turbulent currents or by colloidal suspension. Most fluvial sediment results from the normal process of erosion, which in turn is part of the geologic cycle of rock transformation. In some instances, this normal process may have been accelerated by agricultural practices. Sediment also results from a number of industrial activities. In certain sections, waste materials from mining, logging, oil-field, and other industrial operations introduce large quantities of suspended as well as dissolved material.

The quantity of sediment, transported or available for transportation, is affected by climatic conditions, form or nature of precipitation, vegetal cover, topography, and land use. An important property of fluvial sediment is the fall velocity of the particles in transport. Particle sizes, as determined by various methods, represent mechanical diameters, which are related to sedimentation diameters indirectly. Sediment particles in the sand-size (0.062 mm) range do not appear to be affected by flocculation or dispersion resulting from the mineral constituents in solution. The sedimentation diameter of clay and silt particles in suspension may vary considerably from point to point in a stream or reservoir, depending on the mineral matter in solution and in suspension and the degree of turbulence present. The size of sediment particles in transport at any point depends on the type of erodible and soluble material in the drainage area, the degree of flocculation present, time in transport, and characteristics of the transporting flow. The flow characteristics include velocity of water, turbulence, and the depth, width, and roughness of the channel. As a result of these variable characteristics, the size of particles transported, as well as the total sediment load,

is in constant adjustment with the characteristics and physical features of the stream and drainage area.

PUBLICATIONS

Reports giving chemical analyses, suspended-sediment loads, and water temperatures of samples of surface water made by the Geological Survey have been published yearly since 1941. Records for the years ended September 30, 1941, 1942, 1943, 1944, 1945, 1946, 1947, and 1948 (two volumes), for many of the stations listed in this report are given in Water-Supply Papers 942, 950, 970, 1022, 1030, 1050, 1102, and 1132 (Parts 1-6).

Geological Survey reports containing analyses of surface-water samples collected prior to 1941 are listed below. Publications dealing largely with the quality of ground-water supplies and only incidentally covering the chemical composition of surface-waters are not included. Publications that are out of print are preceded by an asterisk.

PROFESSIONAL PAPER

- *135. Composition of river and lake waters of the United States, 1924.

BULLETINS

- 479. The geochemical interpretation of water analyses, 1911.
- 770. The data of geochemistry, 1924.

WATER-SUPPLY PAPERS

- *108. Quality of water in the Susquehanna River drainage basin, with an introductory chapter on physiographic features, 1904.
- *161. Quality of water in the upper Ohio River basin and at Erie, Pa., 1906.
- *193. The quality of surface waters in Minnesota, 1907.
- *236. The quality of surface waters in the United States, Part 1, Analyses of waters east of the one hundredth meridian, 1909.
- *237. The quality of the surface waters of California, 1910.
- *239. The quality of the surface waters of Illinois, 1910.
- *273. Quality of the water supplies of Kansas, with a preliminary report on stream pollution by mine waters in southeastern Kansas, 1911.
- *274. Some stream waters of the western United States, with chapters on sediment carried by the Rio Grande and the industrial application of water analyses, 1911.
- *339. Quality of the surface waters of Washington, 1914.

- *363. Quality of the surface waters of Oregon, 1914.
- *418. Mineral springs of Alaska, with a chapter on the chemical character of some surface waters of Alaska, 1917.
- *596-B. Quality of water of Colorado River in 1925-26, 1928.
- *596-D. Quality of water of Pecos River in Texas, 1928.
- *596-E. Quality of the surface waters of New Jersey, 1928.
- *636-A. Quality of water of the Colorado River in 1926-28, 1930.
- *636-B. Suspended matter in the Colorado River in 1925-28, 1930.
- 638-D. Quality of water of the Colorado River in 1928-30, 1932.
- 839. Quality of water of the Rio Grande basin above Fort Quitman, Tex., 1938.
- 889-E. Chemical character of surface waters of Georgia, 1944.
- *998. Suspended sediment in the Colorado River, 1925-41, 1947.
- 1110-C. Quality of water of Conchas Reservoir, New Mexico, 1939-49, 1952.

Many of the reports listed are available for consultation in the larger public and institutional libraries. Copies of Geological Survey publications still in print may be purchased at a nominal cost from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., who will, upon request, furnish lists giving prices.

COOPERATION

The table on p. 17-18 lists State and local agencies that cooperated in quality-of-water investigations in the drainage basins included in this volume. The locations of quality-of-water district offices responsible for the data collected in the drainage basins are given in the table, also.

By reorganization in 1949, the activities of the Ohio Water Resources Board were assumed by the Ohio Department of Natural Resources.

Financial assistance was furnished by the Bureau of Reclamation of the United States Department of the Interior, in the operation of some stations in the Missouri River basin.

In addition to these cooperative programs, many of the stations were operated from funds appropriated directly to the Geological Survey for quality-of-water investigations.

Assistance in collecting records was given by many municipal, State, and Federal agencies.

DIVISION OF WORK

The quality-of-water program was conducted by the water resources division of the Geological Survey, Carl G. Paulsen, chief hydraulic engineer, and S. K. Love, chief of the quality of water branch. The records were collected and prepared for publication under the supervision of district chemists and engineers as follows: In Florida, S. K. Love, in North Carolina and South Car-

State	Cooperating agency	Drainage basin	District or Regional Office
Florida	Florida Geological Survey, Herman Gunter, director. Cities of Miami and Miami Beach, Fla.	South Atlantic slope and Eastern Gulf of Mexico.	P. O. Box 607, Ocala, Fla.
Georgia	Georgia Department of Mines, Mining, and Geology, Garland Peyton, director.	South Atlantic slope and Eastern Gulf of Mexico, Ohio River.	P. O. Box 607, Ocala, Fla.
Iowa	Iowa Geological Survey, H. G. Hershey, director and State geologist.	Upper Mississippi River.	508 Hydraulic Laboratory, Iowa City, Iowa.
North Carolina	North Carolina Department of Conservation and Development, 1/R. Bruce Etheridge, director.	South Atlantic slope and Eastern Gulf of Mexico, Ohio River.	P. O. Box 5668, 103 Oberlin Road, Raleigh, N. C.
Ohio	Ohio Water Resources Board, C. E. MacQuigg, chairman; Ohio Department of Natural Resources, A. W. Marion, director.	Ohio River, St. Lawrence River.	2822 E. Main St. Columbus 9, Ohio.

1/R. Bruce Etheridge, director, resigned June 30, 1949.
George R. Ross, director, July 1 to Sept. 30, 1949.

State	Cooperating agency	Drainage basin	District or Regional Office
Pennsylvania	Pennsylvania Department of Commerce, O. J. Matthews, secretary; Pennsylvania Department of Forests and Waters, M. F. Draemel, secretary.	North Atlantic slope, Ohio River, St. Lawrence River.	1302 Custom House, Philadelphia 6, Pa.
South Carolina	South Carolina Research, Planning, and Development Board, R. M. Cooper, director.	South Atlantic slope and Eastern Gulf of Mexico.	P. O. Box 5668, 103 Oberlin Road, Raleigh, N. C.
Virginia	Virginia Conservation Commission, W. A. Wright, chairman.	North Atlantic slope, South Atlantic slope.	P. O. Box 1488, University Station, Charlottesville, Va.
		Missouri River	510 Rudge-Guenzel Building, Lincoln, Nebr.

olina, F. H. Pauszek; in Virginia, G. W. Whetstone, in Ohio, W. L. Lamar, and in Delaware and Pennsylvania, W. F. White. Any additional analytical data on file can be obtained by writing the responsible Survey district office.

The chemical quality and sediment investigations in the Missouri River basin in Colorado, Iowa, Kansas, Montana, Nebraska, North Dakota, South Dakota, and Wyoming were initiated in 1945. The studies were made as a part of the program of the Interior Department for development of the Missouri River basin through funds provided directly to the Geological Survey for this purpose. The studies were made under the direction of P. C. Benedict, Regional Engineer, Lincoln, Nebr. A few analyses of streams in the Hudson Bay basin in North Dakota were made in connection with this program.

STREAM FLOW

Most of the records of stream discharge, used in conjunction with the chemical analyses and in the computation of sediment loads in this volume, are published in Geological Survey reports on the surface-water supply of the United States. The discharge reported for a composite sample is usually the average of the mean daily discharges for the normal composite period. For analyses in which the composite periods differ from the normal 10- or 11-day period, the discharges reported are the averages of the mean daily discharges for the days indicated. The discharges reported in the tables of single analyses either are daily mean discharges or are discharges for the time at which samples were collected, computed from a stage-discharge relation or from a discharge measurement.

LITERATURE CITED

- American Public Health Association, 1946, Standard methods for the examination of water and sewage, 9th ed, p. 1-112.
- Collins, W. D., 1928, Notes on practical water analysis: U. S. Geol. Survey Water-Supply Paper 596-H.
- Dean, H. T., 1936, Chronic endemic dental fluorosis: Am. Med. Assoc. Jour., v. 107, p. 1269-1272.
- Faucett, R. L., and Miller, H. C., 1946, Methemoglobinemia occurring in infants fed milk diluted with well waters of high nitrate content: Jour. Pediatrics, v. 29, p. 593.
- Hazen, Allen, 1892, A new color standard for natural waters: Am. Chem. Jour., v. 12, p. 427-428.
- Lane, E. W., et al, 1947, Report of the Subcommittee on Terminology: Am. Geophys. Union Trans., v. 28, p. 937.
- Magistad, O. C., and Christiansen, J. E., 1944, Saline soils, their nature and management: U. S. Dept. Agriculture Circ. 707, p. 8-9.

- Maxcy, Kenneth F., 1950, Report on the relation of nitrate concentrations in well waters to the occurrence of methemoglobinemia: Natl. Research Council, Bull., Sanitary Engineer, p. 265, App. D.
- U. S. Inter-agency Report 7, 1943, A study of methods used in measurement and analysis of sediment loads in streams, a study of new methods for size analysis of suspended sediment samples, p. 82-90; U. S. Engineer Office, St. Paul, Minn.
- U. S. Inter-agency Report 8, 1948, A study of methods used in measurement and analysis of sediment loads of streams, measurement of the sediment discharge of streams, p. 70-76; U. S. Engineer Office, St. Paul, Minn.
- Waring, F. Holman, 1949, Significance of nitrates in water supplies: Jour. Am. Water Works Assoc., v. 72, no. 2.
- Wilcox, L. V., 1948, Explanation and interpretation of analyses of irrigation waters: U. S. Dept. Agriculture Circ. 784, p. 6.

CHEMICAL ANALYSES, WATER TEMPERATURES, AND SUSPENDED SEDIMENT

PART 1. NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN

DELAWARE RIVER AT NARROWSBURG, N. Y.

LOCATION --At bridge on U. S. highway 106 at Narrowsburg, Sullivan County, about 9 miles upstream from gaging station above Lackawaxen River near Barryville. DRAINAGE AREA --2,023 square miles above gaging station.

RECORDS AVAILABLE --Chemical analyses: October 1948 to September 1949.

Water temperatures: October 1948 to September 1949.

REMARKS --Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Extremes omitted because of periodic pollution which makes it misleading to report extremes or averages. Records of discharge for water year October 1948 to September 1949 based on records for Delaware River above Lackawaxen River, near Barryville, which are given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1-10, 1948 --	255		5	7.0	81.1	3.5		0.01	0.00	7.0	2.4	4.3	1.6	26	11	3.0	0.0	0.8	43	27	6	
Oct. 11-20 -----	408		5	7.0	77.4	1.7		.01	.00	7.7	2.2	4.1	1.3	24	11	5.8	.0	.7	41	28	9	
Oct. 21-31 -----	447		5	7.2	75.9	1.9		.02	.00	7.7	2.2	3.1	1.2	24	12	4.8	.0	.6	41	28	9	
Nov. 1-10 -----	1,416		5	7.2	73.8	3.2		.01	.00	7.3	2.1	3.4	1.2	20	12	5.0	.0	1.0	41	27	10	
Nov. 11-20 -----	1,426		5	7.0	68.5	3.6		.01	.00	7.0	1.9	3.1	1.0	18	12	4.5	.0	1.8	39	25	10	
Nov. 21-30 -----	3,383		15	6.6	58.0	3.3		.02	--	5.2	1.4	1.7	1.2	11	11	1.8	.1	1.6	36	19	10	
Dec. 1-10 -----	2,344		20	6.6	58.7	3.0		.01	--	5.8	1.5	1.6	1.2	14	11	1.1	.1	1.6	38	21	9	
Dec. 11-18 -----	2,251		10	6.6	56.0	2.0		.02	--	5.8	1.5	1.6	1.6	14	10	1.1	.1	1.8	35	21	9	
Dec. 19-29 -----	1,603		--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 30, 31 -----	39,500		25	6.2	49.4	1.8		.02	--	6.4	2.0	1.3	1.4	8	12	.8	.1	2.0	44	24	18	
Jan. 1-10, 1949 --	17,710		20	6.4	46.4	1.8		.02	--	5.1	1.2	1.0	1.4	11	11	.5	.1	1.7	33	18	11	
Jan. 11-15 -----	6,132		25	6.6	49.8	4.0		.02	--	5.9	1.3	1.4	1.0	12	12	.5	.0	1.8	35	20	10	
Jan. 16-24 -----	3,983		--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 25-31 -----	4,531		15	6.5	44.0	3.0		.01	--	5.6	1.2	1.4	.8	9	11	.8	.1	1.5	31	19	12	
Jan. 28-Feb. 4 --	3,621		--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 5 -----	3,027		10	6.7	59.2	3.4		.03	.00	5.8	1.6	2.5	1.2	11	12	1.8	.0	1.5	36	21	12	
Feb. 6-14 -----	2,131		--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 15 -----	6,085		10	6.5	60.9	2.7		.01	.00	6.0	1.8	2.4	1.3	10	12	2.5	.0	2.2	36	22	14	
Feb. 16-24 -----	10,390		--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 25-27 -----	7,057		10	6.7	49.3	2.6		.01	--	5.8	1.6	--	--	12	10	1.8	--	1.2	30	21	11	
Feb. 28 -----	5,515		5	6.6	161	5.7		--	--	--	--	--	--	42	20	5.0	--	7.6	--	--	--	--
Mar. 1-10 -----	4,939		8	6.9	49.4	2.6		.02	.00	5.5	1.2	2.2	.9	12	10	1.6	.0	.9	30	19	9	
Mar. 11-20 -----	3,354		5	6.9	49.1	1.3		.02	.00	5.4	1.3	2.3	.9	9	12	1.8	.0	.6	30	19	9	
Mar. 21-31 -----	4,333		10	6.6	49.7	3.5		.01	--	5.6	1.3	1.2	1.0	11	10	1.6	.1	1.4	29	19	10	

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT NARROWSBURG, N. Y.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	76	52	42	36	--	35	50	--	64	80	81	73
2	67	52	40	36	--	--	45	--	65	79	80	71
3	65	49	42	36	--	36	45	50	65	80	80	71
4	60	53	42	34	--	38	45	61	68	77	79	75
5	60	55	42	35	--	37	45	58	70	79	80	77
6	58	61	42	38	--	37	40	65	74	78	81	73
7	59	58	40	39	--	39	45	65	72	80	80	65
8	58	53	40	38	--	40	47	62	70	79	82	65
9	56	50	40	39	--	40	45	64	70	76	83	62
10	55	50	40	39	--	39	50	64	70	74	83	62
11	58	50	40	--	--	--	49	62	70	79	83	60
12	58	50	40	39	--	36	50	61	74	77	81	64
13	55	49	41	39	--	36	56	63	80	78	80	63
14	55	45	41	34	--	36	55	59	80	78	82	63
15	60	46	41	34	--	--	58	61	79	--	79	64
16	55	46	40	--	--	--	45	65	78	76	79	65
17	55	45	38	--	--	--	50	65	79	75	80	66
18	50	42	32	--	--	36	50	69	75	76	79	64
19	50	45	--	--	--	--	47	71	79	79	77	62
20	50	46	--	--	--	--	51	63	82	81	76	59
21	49	--	--	--	--	36	53	62	80	80	76	54
22	49	--	--	--	--	45	--	60	78	79	76	55
23	48	--	--	--	--	45	55	61	80	79	72	44
24	48	--	--	--	--	45	49	62	82	80	77	50
25	50	--	--	--	38	40	53	60	79	79	78	48
26	50	--	--	--	38	45	53	60	--	81	79	52
27	50	--	--	--	42	45	54	55	78	81	81	50
28	50	--	--	--	39	45	56	54	80	79	80	58
29	50	--	--	--	--	50	57	58	78	79	71	50
30	50	--	--	--	--	57	55	58	78	79	75	50
31	53	--	35	--	--	--	--	64	--	79	73	--
Average	55	--	--	--	--	--	50	61	75	79	79	61

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT EASTON, PA.

LOCATION.--At raw-water intake, Easton Filter Plant, Easton, Northampton County.

DRAINAGE AREA.--4,535 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 135 micromhos Aug. 21-31, 1949; minimum, 71.4 micromhos Feb. 21-28.

EXTREMES, 1947-49.--Specific conductance: Maximum, 135 micromhos Aug. 21-31, 1949; minimum, 59.2 micromhos Mar. 21-31, 1948.

REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year

October 1948 to September 1949 based on records for Delaware River at Belvidere, N. J., which are given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 1-10, 1948	1,858	3	7.2	113	2.0	0.07	13	3.7	3.9		41	17	2.8	0.1	0.7	89	48	14
Oct. 11-20	1,599	10	7.5	109							41	15			1.0			
Oct. 21-31	1,764	8	7.5	104							40	14			1.6			
Nov. 1-10	2,825	10	7.5	107							40	15			1.0			
Nov. 11-20	3,214	10	7.4	101							32	16			1.9			
Nov. 21-30	6,094	10	7.3	86.7							26	15			2.0			
Dec. 1-10	4,463	8	7.6	86.9							28	15			1.3			
Dec. 11-20	4,353	5	6.9	94.5	4.4						34	14	6.8		1.1			
Dec. 21-31	13,020	5	7.1	108	4.5						24	17	5.2		2.0			
Jan. 1-10, 1949	39,900	11	7.3	66.1	4.6	0.4	6.9	1.9	1.7		11	14	2.5	.0	2.1	45	25	16
Jan. 11-20	12,450	8	6.8	81.8	5.3						25	13	2.5		2.2			
Jan. 21-31	11,280	5	6.8	85.7	4.3						23	17	2.9		2.3			
Feb. 1-10	8,351	5	6.8	94.7	5.0						28	16	2.6		2.1			
Feb. 11-20	14,760	8	6.7	83.0	5.3						26	14	2.2		2.3			
Feb. 21-28	15,250	8	6.9	71.4	4.7						20	13	2.2		1.5			
Mar. 1-10	10,950	5	7.0	76.3	4.2						24	14	2.2		1.3			
Mar. 11-20	8,520	5	6.8	76.7	2.8						23	13	2.4		1.1			
Mar. 21-31	7,922	5	6.9	78.4	2.3						25	13	2.2		1.0			
Apr. 1-10	7,416	8	6.9	80.7	2.1	11	9.2	2.5	2.7		26	13	2.0	.1	1.5	54	33	12
Apr. 11-20	10,050	8	7.4	73.7	3.7						23	12			1.7			
Apr. 21-30	14,760	8	7.3	69.3	3.8						21	12			1.4			
May 1-10	11,870	9	7.0	74.7	4.4						27	13	1.0		1.3			
May 11-20	7,187	9	7.0	84.5	4.4						27	13	2.0		1.3			
May 21-31	12,360	9	7.0	73.9	4.6						22	12	1.9		1.4			

June 1-10	5,268	9	7.1	85.5	3.9	--	--	--	30	13	2.0	--	9	--	--
June 11-20	2,941	6	7.0	102	4.6	--	--	--	37	14	2.5	--	1.1	--	--
June 21-30	2,276	6	7.0	109	4.6	--	--	--	36	15	2.6	--	1.4	--	--
July 1-10	1,694	6	6.8	121	3.0	--	4.0	5.5	44	15	3.6	--	.8	77	49
July 11-20	1,989	6	7.2	124	5.0	.02	13	--	42	17	4.2	--	.7	--	13
July 21-31	1,895	7	7.3	128	6.2	--	--	--	46	17	4.2	--	.6	--	--
Aug. 1-10	1,515	6	7.0	126	3.2	--	--	--	45	16	4.0	--	.8	--	--
Aug. 11-20	1,324	6	6.9	126	3.3	--	--	--	44	15	4.2	--	.8	--	--
Aug. 21-31	1,034	6	6.9	135	2.9	--	--	--	48	17	4.0	--	1.0	--	--
Sept. 1-10	1,559	7	7.2	116	5.4	--	--	--	42	15	3.8	--	.8	--	--
Sept. 11-20	1,109	6	7.2	121	2.9	--	--	--	42	16	3.8	--	.8	--	--
Sept. 21-30	1,397	4	6.6	117	1.8	.02	13	6.6	46	14	6.2	--	.4	74	47
Average	7,052	7	7.1	96.9	4.0	--	--	--	32	15	--	--	1.2	--	--

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT EASTON, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	53	42	34	33	37	52	58	61	76	80	76
2	67	53	42	36	33	36	50	58	63	80	80	72
3	64	51	40	34	33	37	49	60	64	80	72	73
4	62	53	41	34	33	36	49	61	68	80	80	72
5	58	54	40	35	34	38	48	64	69	83	80	73
6	58	58	42	36	34	40	48	66	72	81	82	73
7	59	58	42	36	36	40	48	67	72	80	79	71
8	60	54	41	37	35	40	48	66	71	78	80	70
9	59	55	40	38	36	41	48	65	70	79	82	69
10	59	55	39	40	36	41	48	63	70	77	84	68
11	58	54	38	40	35	41	49	66	72	77	83	67
12	58	52	38	40	34	40	51	66	72	77	81	68
13	57	51	38	39	34	39	57	61	75	77	80	67
14	57	49	38	38	36	39	53	63	76	79	78	70
15	57	48	37	36	40	38	54	62	75	78	78	70
16	56	47	36	36	40	38	54	64	77	78	78	70
17	57	47	36	37	36	39	53	66	76	76	78	71
18	56	47	36	38	36	38	51	68	77	77	76	72
19	54	46	35	40	37	37	49	69	77	79	78	72
20	53	51	33	40	39	36	49	70	78	79	72	68
21	52	45	33	39	40	38	50	64	79	82	71	67
22	51	47	33	37	40	41	51	61	79	81	74	66
23	50	46	34	36	41	44	52	61	78	80	73	66
24	50	46	33	36	40	48	52	62	76	79	75	63
25	51	46	33	38	40	48	53	62	79	79	74	62
26	51	45	33	36	40	49	54	61	78	81	73	63
27	52	46	33	36	39	50	56	60	80	82	77	62
28	52	44	33	36	38	53	57	58	79	83	78	64
29	51	43	33	37	--	54	56	57	71	83	77	63
30	52	42	33	35	--	55	58	57	77	82	77	62
31	51	--	33	35	--	53	--	59	--	83	77	--
Average	56	50	37	37	37	42	52	63	74	80	78	68

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TRENTON, N. J.

LOCATION.--At Trenton Water Works, raw-water intake, Calhoun Street, at Trenton, Mercer County. Sediment samples collected at Calhoun Street Bridge, 20 feet downstream from gaging station which is half a mile upstream from Assunpink Creek.

DRAINAGE AREA.--780 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1949.

Water temperatures: October 1944 to September 1949.

Sediment records: September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 222 micromhos Sept. 11-20; minimum, 83.2 micromhos Jan. 1-10.

TEMPERATURES, 1948-49.--Specific conductance: Maximum, 117 parts per million Sept. 11-20, 1946; minimum, 44 parts per million Mar. 21-31, 1945.

Specific hardness (1944-47).--Maximum, 85 parts per million Sept. 11-20, 1946; minimum, 28 parts per million Mar. 21-31, 1946.

Specific conductance: Maximum, 222 micromhos Sept. 11-20, 1949; minimum, 72.1 micromhos Mar. 21-31, 1945.

Water temperatures: Maximum, 88°F. July 30, 1949; minimum, 33°F. Dec. 20-22, 1944.

REMARKS.--Temperature records furnished by the City of Trenton, N. J. Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 1-10, 1948	3,373	4	7.1	202	3.2	0.03	20	6.9	9.1	--	58	31	10	0.1	3.7	123	78	30
Oct. 11-20	2,896	6	7.6	203	--	--	--	--	--	--	58	30	10	--	3.4	--	--	--
Oct. 21-31	3,056	5	7.6	202	--	--	--	--	--	--	58	30	9.2	--	3.2	--	--	--
Nov. 1-10	4,201	6	7.5	206	--	--	7.5	--	--	--	58	31	10	--	3.7	--	--	--
Nov. 11-20	5,104	5	7.3	150	--	--	--	--	--	--	41	24	7.0	--	3.5	--	--	--
Nov. 21-30	9,300	6	7.4	133	--	--	--	--	--	--	33	24	5.2	--	3.4	--	--	--
Dec. 1-10	7,218	5	7.2	162	--	--	--	--	--	--	32	27	12	--	3.3	--	--	--
Dec. 11-20	7,157	3	6.0	147	4.3	--	--	--	--	--	32	25	--	--	2.6	--	--	--
Dec. 21-31	17,273	3	6.1	150	5.4	--	--	--	--	--	35	27	--	--	3.8	--	--	--
Jan. 1-10, 1949	59,520	10	7.1	83.2	5.5	.01	8.1	2.7	4.4	--	18	19	2.6	.1	3.0	58	31	17
Jan. 11-20	19,110	7	6.9	110	6.1	--	--	--	--	--	27	20	--	--	3.4	--	--	--
Jan. 21-31	19,918	6	6.6	118	6.2	--	--	--	--	--	27	23	4.1	--	4.0	--	--	--
Feb. 1-10	14,630	5	6.6	129	6.1	--	--	--	--	--	32	23	4.8	--	3.8	--	--	--
Feb. 11-16, 20	14,371	5	6.6	144	5.6	--	--	--	--	--	--	--	--	--	3.4	--	--	--
Feb. 17-19	33,600	7	6.6	95.5	5.1	--	--	--	--	--	--	--	2.0	--	3.0	--	--	--
Feb. 21-28	23,290	6	6.6	109	5.1	--	--	--	--	--	24	19	6.5	--	2.9	--	--	--
Mar. 1-10	16,130	5	7.0	121	4.1	--	--	--	--	--	37	19	--	--	2.2	--	--	--
Mar. 11-20	12,710	4	7.1	122	3.6	--	--	--	--	--	32	20	--	--	1.9	--	--	--
Mar. 21-31	12,016	4	7.4	122	4.8	--	--	--	--	--	34	20	--	--	3.0	--	--	--

DELAWARE RIVER BASIN--Continued
DELAWARE RIVER AT TRENTON, N. J.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Apr. 1-10, 1949	11,730	8	6.7	132	3.1	0.16	13	4.2		7.5		22	7.4	0.1	2.5	86	50	19
Apr. 11-20	14,820	5	7.3	111	3.2	--	--	--	--	--	31	18	--	--	2.8	--	--	--
Apr. 21-30	21,590	8	6.6	89.8	4.5	--	--	--	--	--	24	16	--	--	1.3	--	--	--
May 1-10	16,230	10	6.7	99.0	4.4	--	--	--	--	--	26	17	--	--	1.2	--	--	--
May 11-20	11,600	6	7.1	113	4.4	--	--	--	--	--	33	18	3.8	--	2.2	--	--	--
May 21-31	18,060	6	7.0	97.7	4.4	--	--	--	--	--	28	16	3.2	--	2.5	--	--	--
June 1-10	8,338	5	6.9	122	3.9	--	--	--	--	--	34	18	4.2	--	2.1	--	--	--
June 11-20	4,812	4	6.9	154	4.2	--	--	--	--	--	46	23	5.6	--	3.0	--	--	--
June 21-30	3,895	6	6.9	170	5.5	--	--	--	--	--	51	25	6.5	--	3.1	--	--	--
July 1-10	3,123	8	7.1	182	3.3	.02	19	7.0	5.8		62	25	5.9	.1	4.1	112	76	25
July 11-20	4,344	6	7.1	182	3.0	--	--	--	--	--	57	27	6.5	--	4.1	--	--	--
July 21-31	3,697	6	7.9	195	4.6	--	--	--	--	--	67	27	5.4	--	3.0	--	--	--
Aug. 1-10	3,157	5	7.7	187	2.3	--	--	--	--	--	58	27	7.0	--	2.8	--	--	--
Aug. 11-20	2,707	6	7.8	207	3.1	--	--	--	--	--	64	30	7.8	--	3.3	--	--	--
Aug. 21-31	2,280	5	7.8	218	2.9	--	--	--	--	--	60	33	8.2	--	3.6	--	--	--
Sept. 1-10	3,262	5	7.7	183	2.1	--	--	--	--	--	50	30	7.0	--	3.4	--	--	--
Sept. 11-20	2,453	7	7.8	222	2.9	--	--	--	--	--	59	34	8.6	--	3.6	--	--	--
Sept. 21-30	2,441	4	7.2	214	5.8	.04	21	7.3	8.1		68	30	8.2	.1	3.5	129	82	28
Average	10,970	6	--	151	--	--	--	--	--	--	43	24	--	--	3.1	--	--	--

DELAWARE RIVER BASIN--Continued

DELAWARE RIVER AT TRENTON, N. J.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	54	43	35	36	38	54	59	63	79	81	77
2	68	55	43	36	35	38	50	59	64	79	82	75
3	68	54	43	36	34	39	52	63	66	81	81	73
4	64	55	44	36	36	38	53	63	67	82	82	72
5	63	56	45	36	36	39	51	64	70	82	81	73
6	59	59	46	41	36	39	52	67	73	82	81	75
7	59	63	44	40	36	44	50	70	75	82	81	72
8	61	59	45	39	37	41	52	68	72	79	82	70
9	61	57	43	39	38	44	51	66	72	78	82	68
10	60	59	43	41	39	44	52	65	72	77	84	65
11	61	57	40	41	37	43	52	64	70	75	84	73
12	61	54	39	41	37	42	52	62	75	75	82	67
13	59	54	42	41	37	40	54	63	75	76	81	68
14	59	52	46	40	39	41	55	63	76	75	78	69
15	59	50	47	39	41	41	57	65	77	81	77	72
16	58	50	40	39	44	39	57	64	77	81	77	72
17	58	50	39	39	43	41	54	66	78	81	77	70
18	57	50	38	40	37	42	55	68	77	75	73	70
19	55	48	37	42	39	37	52	70	77	81	73	72
20	55	53	34	42	41	38	51	72	79	81	73	72
21	54	54	35	42	42	39	50	64	81	82	72	68
22	54	52	34	41	42	43	52	65	82	82	74	66
23	54	50	36	39	43	48	54	63	81	83	74	68
24	54	49	36	39	42	49	55	63	79	82	75	64
25	54	49	34	41	43	50	54	64	81	82	73	64
26	54	46	34	41	42	51	54	63	82	82	75	63
27	54	48	34	39	42	54	56	61	82	82	79	63
28	54	47	34	39	42	56	59	61	81	84	80	64
29	54	46	34	39	--	55	59	59	76	86	77	66
30	54	44	34	38	--	57	59	59	79	88	77	64
31	54	--	37	37	--	57	--	61	--	86	79	--
Average	58	52	39	39	39	44	54	64	73	81	78	69

Suspended sediment, September 1949

Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----							3,020	20	163
2-----							4,040	28	305
3-----							3,530	11	105
4-----							2,880	8	62
5-----							2,520	4	27
6-----							1/5,310	82	1/1,360
7-----							3,810	58	576
8-----							2,670	11	79
9-----							2,370	4	26
10-----							2,470	4	27
11-----							2,440	4	26
12-----							2,140	7	40
13-----							1,940	6	31
14-----							1,960	6	32
15-----							2,300	4	25
16-----							2,940	13	103
17-----							2,750	9	67
18-----							2,720	5	37
19-----							2,670	6	43
20-----							2,670	3	22
21-----							2,280	4	25
22-----							2,140	9	52
23-----							2,540	12	82
24-----							2,230	4	24
25-----							2,620	5	35
26-----							2,590	2	14
27-----							2,230	2	12
28-----							2,210	2	12
29-----							2,440	3	20
30-----							3,130	7	59
31-----							--	--	--
Total-----							81,560	--	3,490

1/Sediment discharge computed by subdividing day.

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT WALNUTPORT, PA.

LOCATION.--At highway bridge, 0.3 mile downstream from gaging station at Walnutport, Northampton County, and 0.1 mile upstream from Trout Creek.

DRAINAGE AREA.--889 square miles.

RECORDS AVAILABLE.--Sediment records: May 1948 to September 1949.

EXTREMES, 1948-49.--Sediment loads: Maximum, 84,400 tons per day Dec. 30; minimum, 1 ton per day July 2, 3, 8, 10, Aug. 21, 28, Sept. 7, 10, 20.

EXTREMES, 1947-49.--Sediment loads: Maximum, 84,400 tons per day Dec. 30, 1948; minimum, 1 ton per day July 2, 3, 8, 10, Aug. 21, 28, Sept. 7, 10, 20, 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141. Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa.

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	378	5	5	256	7	5	1,220	32	105
2-----	344	5	5	250	9	6	1,180	28	88
3-----	324	7	6	250	6	4	1,100	20	59
4-----	294	6	5	386	10	11	1,090	12	35
5-----	305	6	5	641	16	28	1,060	12	34
6-----	364	15	15	496	5	7	1,130	18	55
7-----	344	6	6	1,880	205	1,040	1,440	51	198
8-----	331	9	8	1,630	178	783	1,300	40	140
9-----	392	8	8	1,020	31	85	1,180	27	86
10-----	422	8	9	886	20	48	1,100	25	74
11-----	357	6	6	800	14	30	1,020	23	63
12-----	364	6	6	696	11	21	1,000	20	54
13-----	357	5	5	652	10	18	1,070	17	49
14-----	338	5	5	590	6	9	1,070	32	92
15-----	324	10	9	540	4	6	1,020	21	58
16-----	318	6	5	504	6	8	1,090	36	106
17-----	318	5	4	504	6	8	1,470	56	222
18-----	439	9	11	513	6	8	1,360	37	136
19-----	522	7	10	541	10	15	1,150	30	93
20-----	430	4	5	2,030	190	1,040	1,100	25	74
21-----	378	6	6	2,480	225	1,510	1,090	27	79
22-----	357	6	6	1,900	51	262	1,070	25	72
23-----	344	8	8	2,100	79	446	1,070	28	81
24-----	331	9	8	1,810	73	356	900	20	49
25-----	318	13	11	1,560	56	236	820	21	46
26-----	305	8	6	1,360	20	73	780	25	53
27-----	288	7	5	1,310	19	67	800	15	32
28-----	272	6	4	1,300	23	81	873	17	40
29-----	272	4	3	1,330	18	65	1,220	150	494
30-----	266	6	4	1,360	35	129	13,300	2,350	84,400
31-----	261	6	4	--	--	--	15,600	940	39,600
Total-	10,657	--	203	31,575	--	6,410	60,653	--	126,800

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT WALNUTPORT, PA.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	January			February			March		
	Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	8,400	500	11,300	2,940	4	32	2,410	10	65
2-----	5,850	190	3,000	2,590	1	7	2,190	10	59
3-----	4,400	90	1,070	2,290	4	25	2,060	11	61
4-----	3,620	39	381	2,310	13	81	1,910	15	77
5-----	4,450	80	961	2,190	15	89	1,890	30	153
6-----	14,600	710	28,000	1,960	11	58	2,170	29	170
7-----	10,400	270	7,580	1,960	13	69	2,390	24	155
8-----	7,180	65	1,650	1,940	16	84	2,060	13	72
9-----	5,400	34	497	1,890	22	112	1,940	21	110
10-----	4,540	20	245	1,910	20	103	1,870	24	121
11-----	3,870	32	335	1,770	28	134	1,890	24	123
12-----	3,380	38	346	1,520	26	107	1,810	24	117
13-----	3,050	33	273	1,570	12	51	1,620	18	79
14-----	2,840	34	261	1,680	7	32	1,520	12	49
15-----	2,490	28	188	2,290	37	229	1,460	12	47
16-----	2,290	15	93	3,380	100	913	1,340	14	51
17-----	2,170	12	70	3,050	25	206	1,330	14	50
18-----	2,080	29	163	2,590	20	140	1,330	13	47
19-----	2,120	46	263	2,430	17	112	1,180	12	38
20-----	2,120	41	235	2,940	32	254	1,150	12	37
21-----	1,890	31	158	3,050	22	181	1,200	15	49
22-----	2,120	22	126	2,840	17	130	1,250	18	61
23-----	2,150	10	58	3,380	28	255	1,590	22	94
24-----	2,290	10	62	3,160	16	137	1,620	22	96
25-----	2,610	43	302	3,160	13	111	1,430	17	66
26-----	2,740	34	252	3,050	17	140	1,330	12	43
27-----	2,740	37	273	2,630	12	85	1,280	11	38
28-----	3,450	40	373	2,570	8	56	1,250	10	34
29-----	4,270	57	656	--	--	--	1,170	8	25
30-----	3,620	10	98	--	--	--	1,090	10	29
31-----	3,160	4	34	--	--	--	1,080	10	29
Total-	126,290	--	59,300	69,040	--	3,930	49,810	--	2,240
Day	April			May			June		
	Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,310	11	39	2,210	20	119	1,760	6	29
2-----	1,460	17	67	2,490	16	107	1,520	12	49
3-----	1,400	15	57	2,840	27	207	1,460	14	55
4-----	1,310	12	42	2,740	24	178	1,330	22	79
5-----	1,250	12	40	2,410	18	117	1,250	22	74
6-----	1,870	33	167	2,430	15	98	1,170	14	44
7-----	2,310	47	294	7,380	305	6,080	1,080	10	29
8-----	2,270	25	153	5,400	55	802	988	16	43
9-----	2,290	17	105	4,000	19	205	930	10	25
10-----	2,060	7	39	3,380	27	247	902	8	19
11-----	1,850	7	35	2,940	12	95	874	6	14
12-----	1,720	6	37	2,590	10	70	860	9	21
13-----	1,640	10	44	2,310	14	87	810	7	15
14-----	2,430	35	230	2,100	10	57	760	8	16
15-----	2,610	22	155	1,960	8	42	713	6	12
16-----	2,190	9	53	1,790	6	29	691	5	9
17-----	1,910	7	36	1,660	8	36	669	6	11
18-----	2,200	12	71	1,590	12	52	748	6	12
19-----	6,420	212	3,670	1,460	10	39	772	6	12
20-----	5,260	45	640	2,780	58	435	680	6	11
21-----	4,000	24	259	4,000	57	616	636	5	9
22-----	3,620	22	215	3,050	13	107	587	3	5
23-----	4,540	52	637	4,000	61	659	549	3	4
24-----	4,270	28	324	3,500	16	151	522	3	4
25-----	3,620	21	205	3,500	29	275	656	24	42
26-----	3,270	20	177	3,050	20	165	1,060	14	40
27-----	3,050	25	206	2,840	16	123	772	2	4
28-----	2,740	22	163	2,490	12	81	680	2	4
29-----	2,430	20	131	2,250	11	67	598	2	3
30-----	2,250	21	127	2,170	10	59	530	2	3
31-----	--	--	--	1,960	8	42	--	--	--
Total-	79,550	--	8,420	89,270	--	11,450	26,553	--	697

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT WALNUTPORT, PA.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	496	2	3	646	10	18	658	2	4
2-----	479	1	1	470	6	8	540	2	3
3-----	454	1	1	445	5	6	470	3	4
4-----	438	2	2	549	8	12	422	2	2
5-----	462	2	2	587	8	13	415	2	2
6-----	462	2	2	513	8	11	587	2	3
7-----	513	2	3	445	6	7	504	1	1
8-----	454	1	1	400	8	9	438	2	2
9-----	415	2	2	370	7	7	445	2	2
10-----	415	1	1	344	9	8	422	1	1
11-----	496	2	3	344	6	6	378	3	3
12-----	462	4	5	378	8	8	357	6	6
13-----	522	4	6	460	8	10	378	7	7
14-----	504	8	11	504	8	11	454	10	12
15-----	511	19	26	438	8	9	549	8	12
16-----	649	25	44	626	26	44	522	7	10
17-----	548	9	13	669	10	18	587	3	5
18-----	950	22	56	888	7	17	607	3	5
19-----	958	18	46	1,090	14	41	702	3	6
20-----	772	6	12	691	5	9	530	1	1
21-----	647	4	7	522	1	1	454	2	2
22-----	549	3	4	445	2	2	438	5	6
23-----	504	4	5	408	4	4	522	4	6
24-----	438	5	6	385	4	4	530	5	7
25-----	415	4	5	357	4	4	470	3	4
26-----	400	3	3	344	2	2	430	5	6
27-----	468	5	6	338	2	2	400	6	6
28-----	479	5	6	331	1	1	462	6	8
29-----	522	8	11	1,080	61	178	679	6	11
30-----	462	6	8	1,310	24	85	1,260	45	153
31-----	1,250	36	122	785	4	8	--	--	--
Total-	17,094	--	423	17,162	--	563	15,610	--	300

Total discharge for year (second-foot days) ----- 593,264
 Total load for year (tons) ----- 220,736

DELAWARE RIVER BASIN--Continued

LEHIGH RIVER AT CATASAUQUA, PA.

LOCATION.--At Race Street bridge at Catasauqua, Northampton County.

DRAINAGE AREA.--1,012 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1949.

Water temperatures: October 1944 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 254 micromhos Oct. 1-10; minimum, 80.2 micromhos May 21-31.

Water temperatures: Maximum, 81°F July 28, 30; minimum, freezing point on many days in December, January, and February.

EXTREMES, 1944-48.--Dissolved solids (1944-47): Maximum, 169 parts per million Oct. 1-10, 1944; minimum, 47 parts per million Mar. 11-20, 1946.

Total hardness (1944-47): Maximum, 106 parts per million Oct. 1-10, 1944; minimum, 26 parts per million Mar. 11-20, 1946.

Specific conductance: Maximum, 254 micromhos Oct. 1-10, 1944; minimum, 75.9 micromhos Mar. 11-20, 1946.

Water temperatures: Maximum, 77°F July 2, 1945; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 based on records for Lehigh River at Bethlehem, which are given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1-10, 1948--	508		4	6.3		6.0		0.05		22	8.3	13		23	84	4.4	0.1	5.2	164	89	70	
Oct. 11-20 ----	519		3	6.9	236			--		--	--	--	--	22	76	--	--	3.4	--	--	--	--
Oct. 21-31 ----	473		2	6.8	229			--		--	--	--	--	28	74	--	--	3.8	--	--	--	--
Nov. 1-10 ----	870		4	7.1	201			--		--	--	--	--	15	65	4.0	--	4.3	--	--	--	--
Nov. 11-20 ----	783		3	6.9	183			--		--	--	--	--	13	59	3.8	--	3.4	--	--	--	--
Nov. 21-30 ----	1,562		4	7.2	130			--		--	--	--	--	12	39	3.6	--	3.3	--	--	--	--
Dec. 1-10 ----	1,252		3	7.1	141			--		--	--	--	--	12	44	3.1	--	3.7	--	--	--	--
Dec. 11-20 ----	1,211		3	7.3	150			--		--	--	--	--	13	42	--	--	2.1	--	--	--	--
Dec. 21-31 ----	7,120		3	6.6	182			--		--	--	--	--	8	31	1.5	--	2.8	69	36	30	--
Jan. 1-10, 1949 -	2,230		6	6.6	186.3			.02		9.2	3.3	3.2		12	35	--	--	1.1	2.8	--	--	--
Jan. 11-20 ----	2,633		5	5.7	115			--		--	--	--	--	12	35	--	--	2.1	--	--	--	--
Jan. 21-31 ----	2,880		4	6.2	110			--		--	--	--	--	15	31	2.4	--	3.2	--	--	--	--
Feb. 1-10 ----	2,297		5	6.5	120			--		--	--	--	--	17	33	2.5	--	4.0	--	--	--	--
Feb. 11-20 ----	2,256		4	6.6	123			--		--	--	--	--	18	33	2.5	--	3.8	--	--	--	--
Feb. 21-28 ----	3,104		4	6.7	98.4			--		--	--	--	--	10	27	2.2	--	4.0	--	--	--	--
Mar. 1-10 ----	2,108		4	6.8	110			--		--	--	--	--	18	32	--	--	3.1	--	--	--	--
Mar. 11-20 ----	1,577		4	6.8	132			--		--	--	--	--	21	36	--	--	3.7	--	--	--	--
Mar. 21-31 ----	1,402		7	7.1	131			--		--	--	--	--	19	34	--	--	3.6	--	--	--	--
Apr. 1-10 ----	1,730		5	6.7	123			--		--	--	--	--	19	33	2.6	.1	3.4	84	46	30	--
Apr. 11-20 ----	2,658		7	6.8	108			.24		12	3.9	4.9		17	27	--	--	2.1	--	--	--	--
Apr. 21-30 ----	3,210		5	6.8	90.5			--		--	--	--	--	11	24	--	--	1.9	--	--	--	--
May 1-10 ----	3,151		7	5.9	88.7			--		--	--	--	--	15	22	--	--	1.7	--	--	--	--
May 11-20 ----	2,068		6	6.4	89.0			--		--	--	--	--	11	25	--	--	1.2	--	--	--	--
May 21-31 ----	2,870		5	6.4	80.2			--		--	--	--	--	11	22	--	--	1.1	--	--	--	--

DELAWARE RIVER BASIN--Continued
LEHIGH RIVER AT CATSAUQUA, PA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
June 1-10, 1949	1,375		4	6.9	104	4.5		--		--	--	--	--	11	29	2.2	--	2.4	--	--	--	--
June 11-20	891		4	6.7	129	5.1		--		--	--	--	--	14	37	2.9	--	3.2	--	--	--	--
June 21-30	771		4	6.8	138	5.2		--		--	--	--	--	16	39	3.9	--	2.7	--	--	--	--
July 1-10	571		4	6.9	162	6.6		0.08		16	5.6	4.1	--	21	45	3.4	0.1	3.4	99	63	46	--
July 11-20	1,055		6	7.2	165	5.4		--		--	--	--	--	26	44	3.2	--	3.9	--	--	--	--
July 21-31	730		4	6.9	177	7.0		--		--	--	--	--	24	49	3.8	--	4.4	--	--	--	--
Aug. 1-10	650		4	6.9	167	7.6		--		--	--	--	--	23	48	3.2	--	3.8	--	--	--	--
Aug. 11-20	745		4	7.0	176	7.7		--		--	--	--	--	22	53	3.1	--	3.9	--	--	--	--
Aug. 21-31	659		4	6.9	172	6.7		--		--	--	--	--	19	53	3.6	--	3.5	--	--	--	--
Sept. 1-10	680		2	7.0	174	2.9		--		--	--	--	--	15	54	3.2	--	3.2	--	--	--	--
Sept. 11-20	626		3	7.1	192	3.0		--		--	--	--	--	17	60	3.5	--	3.8	--	--	--	--
Sept. 21-30	625		5	7.2	170	4.5		.04		15	5.4	7.8	--	21	50	3.2	.1	3.1	108	60	42	--
Average	1,696		4	6.7	145	5.4		--		--	--	--	--	17	43	--	--	3.1	--	--	--	--

DELAWARE RIVER BASIN--Continued
 LEHIGH RIVER AT CATASAUQUA, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	52	40	34	33	36	52	56	58	73	76	70
2	58	53	39	35	32	34	46	58	60	75	75	66
3	59	--	40	35	32	36	46	59	62	76	76	66
4	57	53	40	35	33	35	46	60	64	76	78	68
5	58	55	40	36	35	38	45	62	66	79	78	70
6	55	57	43	38	35	41	48	64	68	80	76	72
7	56	59	--	38	36	39	45	67	69	78	76	68
8	58	54	--	39	35	37	47	60	69	76	78	68
9	55	50	--	40	36	38	46	59	68	75	78	68
10	56	53	--	41	37	42	46	60	66	74	80	62
11	56	51	--	41	35	42	48	58	65	72	79	62
12	56	49	--	39	33	39	49	56	68	74	78	62
13	56	49	--	38	34	36	52	56	71	73	76	64
14	56	46	--	38	38	37	54	56	72	74	74	66
15	58	45	--	36	41	40	55	59	72	76	74	66
16	54	45	37	36	45	36	55	60	71	72	74	68
17	56	47	36	38	40	36	48	62	72	72	74	66
18	54	45	36	40	36	39	49	64	73	71	74	66
19	50	45	35	42	38	38	46	66	72	72	72	68
20	50	48	33	40	42	34	46	69	72	74	66	66
21	41	49	32	38	42	36	49	57	73	76	66	64
22	48	46	32	38	42	40	52	58	75	77	68	64
23	59	45	33	36	40	47	52	58	74	78	70	62
24	50	45	32	37	40	48	50	60	73	76	72	58
25	50	45	32	39	42	49	48	59	76	77	70	54
26	50	43	32	39	41	49	52	58	76	78	70	56
27	51	44	--	38	38	51	57	55	76	79	72	58
28	51	44	32	38	39	55	58	55	75	81	74	58
29	50	43	33	38	--	58	54	54	74	80	76	62
30	50	41	33	36	--	59	54	53	74	81	74	58
31	49	--	34	33	--	55	--	55	--	80	72	--
Average	54	48	--	38	37	42	50	59	70	76	74	64

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT PORT CARBON, PA.

LOCATION.--At Mill Street Bridge at Port Carbon, Schuylkill County, 0.1 mile upstream from Mill Creek.

DRAINAGE AREA.--27.1 square miles.

RECORDS AVAILABLE.--Sediment records: February 1949 to September 1949.

EXTREMES, 1948-49.--Sediment loads: Maximum, 191 tons per day May 22; minimum, 0.1 ton per day on many days.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of water discharge computed from wire-weight gage readings and high-flow, water-stage recorder record. Water discharge records are not published.

Chemical analyses, in parts per million, April 1949 to September 1949

Date of collection	Instantaneous discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
April 6, 1949	83	45	1	4.25	465	9.4	6.0	0.33	2.0	29	16	8.6		0	183	3.0	0.0	2.4	301	178	178	52
April 14	81	54	2	3.70	438	9.0	6.4	1.0	2.0	27	11	9.7		0	173	2.0	0	7	279	162	162	62
June 27	19	70	5	3.40	877	13	5.8	34	4.8	59	38	13	--	0	375	5.0	0	1.2	568	369	369	138
Aug. 9	11	70	3	3.40	969	14	13	38	5.5	71	34	15	--	0	434	9.0	0	6	642	422	422	128
Sept. 21	7.9	62	5	3.20	1,010	17	13	46	3.4	74	40	7.9	--	0	460	6.0	0	6	710	465	465	136

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT PORT CARBON, PA.--Continued

Suspended sediment, February to September 1949

Day	January			February			March		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----				--	--	--	78	260	55
2-----				--	--	--	70	64	12
3-----				--	--	--	66	52	9.3
4-----				--	--	--	58	33	5.2
5-----				--	--	--	61	27	4.5
6-----				--	--	--	67	47	8.5
7-----				--	--	--	55	27	4.0
8-----				--	--	--	46	31	3.9
9-----				--	--	--	52	33	4.6
10-----				--	--	--	50	36	4.9
11-----				--	--	--	58	47	7.4
12-----				--	--	--	46	135	17
13-----				--	--	--	45	34	4.1
14-----				46	36	4.5	42	42	4.8
15-----				68	290	53	37	31	3.1
16-----				62	145	24	34	34	3.1
17-----				45	82	10	38	28	2.7
18-----				56	37	5.6	40	39	4.2
19-----				54	42	6.1	33	30	2.7
20-----				93	177	44	30	25	2.0
21-----				68	47	8.6	32	26	2.2
22-----				78	60	13	34	25	2.3
23-----				108	116	34	42	132	15
24-----				90	70	17	34	40	3.7
25-----				103	96	27	37	35	3.5
26-----				105	60	27	38	35	3.6
27-----				81	35	7.7	37	20	2.0
28-----				88	61	14	33	20	1.8
29-----				--	--	--	31	30	2.5
30-----				--	--	--	32	23	2.0
31-----				--	--	--	32	28	2.4
Total-				1,145	--	295.5	1,386	--	204.0
	April			May			June		
1-----	49	100	13	66	35	6.2	46	18	2.2
2-----	50	42	5.7	58	38	5.9	41	16	1.8
3-----	46	28	3.5	72	78	15	38	20	2.1
4-----	45	38	4.6	56	31	4.7	38	26	2.7
5-----	42	24	2.7	52	25	3.5	37	16	1.6
6-----	83	190	43	50	26	3.5	34	15	1.4
7-----	67	49	8.9	49	22	2.9	32	12	1.0
8-----	67	38	6.9	45	23	2.8	29	16	1.4
9-----	66	29	5.2	41	15	1.7	28	21	1.6
10-----	62	23	3.9	46	30	3.7	27	16	1.2
11-----	61	27	4.5	40	16	1.7	26	12	.8
12-----	56	26	3.9	34	19	1.8	26	16	1.1
13-----	56	45	6.8	36	15	1.5	24	12	.8
14-----	81	196	43	36	24	2.3	23	17	1.1
15-----	68	24	4.4	36	20	1.9	22	18	1.1
16-----	67	19	3.4	32	15	1.3	21	15	.9
17-----	62	23	3.9	32	15	1.3	21	17	1.0
18-----	91	340	84	30	23	1.9	26	47	3.3
19-----	102	218	60	28	14	1.1	24	16	1.0
20-----	91	89	22	72	430	84	21	10	.6
21-----	90	56	14	64	14	2.4	16	15	.6
22-----	102	285	78	61	1,160	191	14	15	.6
23-----	98	185	49	74	250	50	14	16	.6
24-----	114	130	40	72	115	22	14	15	.6
25-----	107	79	23	72	80	16	14	45	1.7
26-----	102	72	20	68	40	7.3	24	30	1.9
27-----	95	56	14	61	41	6.8	19	22	1.1
28-----	83	56	13	64	43	7.4	18	37	1.8
29-----	76	48	9.9	52	28	3.9	13	41	1.4
30-----	67	41	7.4	50	25	3.4	14	20	.8
31-----	--	--	--	48	20	2.6	--	--	--
Total-	2,246	--	601.6	1,597	--	461.5	744	--	39.8

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT PORT CARBON, PA.--Continued

Suspended sediment, February to September 1949--Continued

Day	July			August			September		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	14	20	0.8	9.7	7	0.2	7.6	2	0.1
2-----	12	15	.4	9.7	10	.3	7.6	2	.1
3-----	10	15	.4	12	8	.3	6.8	4	.1
4-----	19	160	8.2	12	10	.3	6.8	5	.1
5-----	14	22	.9	10	8	.2	12	260	8.4
6-----	13	13	.5	10	12	.3	14	75	2.8
7-----	12	11	.4	9.7	10	.3	9.1	14	.4
8-----	11	12	.3	9.7	8	.2	9.1	8	.2
9-----	13	11	.4	11	6	.2	7.9	5	.1
10-----	18	21	1.1	9.1	8	.2	8.8	9	.2
11-----	12	17	.5	9.1	8	.2	7.9	9	.2
12-----	10	17	.5	8.8	6	.1	7.3	5	.1
13-----	21	43	2.6	10	10	.3	9.7	13	.4
14-----	12	17	.5	10	8	.2	9.7	5	.1
15-----	12	12	.4	10	10	.3	8.5	5	.1
16-----	12	12	.4	9.1	9	.2	8.5	8	.2
17-----	12	15	.5	7.9	4	.1	8.5	12	.3
18-----	16	20	.9	19	30	1.5	9.1	75	1.8
19-----	10	13	.4	17	20	.9	12	17	.5
20-----	11	10	.3	9.7	7	.2	9.1	5	.1
21-----	10	11	.3	9.1	6	.1	7.9	6	.1
22-----	20	275	15	8.8	6	.1	10	17	.5
23-----	17	110	5.0	8.8	5	.1	8.2	9	.2
24-----	12	10	.3	8.8	6	.1	8.5	7	.2
25-----	9.7	6	.2	8.8	4	.1	8.5	5	.1
26-----	9.7	7	.2	8.8	4	.1	8.2	5	.1
27-----	17	18	.6	8.8	1	.1	8.8	20	.5
28-----	9.7	7	.2	8.8	3	.1	14	240	9.1
29-----	13	12	.4	37	145	14	17	208	9.6
30-----	13	28	1.0	11	4	.1	18	54	2.6
31-----	14	23	.9	9.1	2	.1	--	--	--
Total-	409.1	--	44.7	341.3	--	21.5	289.1	--	39.3

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT LANDINGVILLE, PA.

LOCATION.--At gaging station at highway bridge at Landingville, Schuylkill County, 0.1 mile upstream from Mahannon Creek, and 5 miles downstream from mouth of West Branch Schuylkill River.

DRAINAGE AREA.--133 square miles.

RECORDS AVAILABLE.--Chemical analyses: December 1947 to September 1949.

Sediment records:--September 1947 to September 1949.

EXTREMES, 1948-49.--Sediment loads: Maximum, 18,740 tons per day Dec. 30, 1948; minimum, 8 tons per day Aug. 17, 1949.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micro-mhos at 25°C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acid-soluble H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 8, 1948	73	52	5	4.35	1,150	14	7.1	0.74	6.6	120	68	12		0	617	10	0.0	2.8	976	633	633	162
Oct. 15	54	55	1	4.7	1,160	8.5	5.6	.34	4.6	111	87	21		5	595	10	0.0	1.0	1,000	593	593	45
Oct. 20	66	54	7	4.20	1,090	14	8.0	1.0	5.1	104	59	21		0	571	7.0	0.0	4.3	867	562	562	72
Oct. 25	54	56	1	4.25	935	12	7.8	.15	6.6	98	58	--		0	513	6.0	0.0	2.5	783	542	542	94
Nov. 4	138	--	5	6.3	713	8.5	8	4.3	3.3	68	37	17		28	330	6.5	0.0	.3	534	344	321	28
Nov. 17	118	52	1	4.7	688	5.0	3.1	2.2	3.9	63	38	9.7		0	345	4.0	0.0	.0	558	344	344	68
Nov. 22	406	46	1	4.35	449	10	2.0	.15	2.5	38	26	6.6		0	220	3.0	0.0	.0	336	219	219	62
Dec. 1	241	42	1	4.30	617	6.5	7.3	.14	3.6	56	37	--		0	317	4.0	0.0	.0	497	341	341	70
Dec. 9	203	44	1	4.30	644	10	9.7	.14	4.0	56	39	4.3		0	352	4.5	0.0	.3	622	364	364	100
Dec. 17	248	40	1	4.40	645	12	8.9	.13	3.5	58	38	--		0	340	4.0	0.0	.1	506	358	358	68
Dec. 22	189	38	1	4.40	694	12	8.9	.13	3.6	62	39	2.2		0	357	4.0	0.0	.0	696	373	373	102
Dec. 30	1,860	--	1	5.0	244	6.5	1.3	.11	1.3	24	14	4.2		2	137	3.5	0.0	.6	196	130	128	22
Jan. 7, 1949	1,330	44	4	4.10	388	7.0	2.5	.47	1.7	30	18	1.7		0	165	2.0	0.0	.5	251	171	171	40
Jan. 11	598	43	2	4.05	576	12	7.9	.18	2.9	44	28	1.2		0	267	2.0	0.0	.8	406	279	279	60
Jan. 19	301	47	2	4.40	674	6.0	9.7	.07	3.4	55	40	--		0	339	7.0	0.0	.0	526	359	359	96
Jan. 28	618	40	3	4.6	417	5.5	3.9	.06	2.0	36	23	3.2		0	199	6.5	0.0	.8	403	210	210	58
Feb. 3	350	31	4	4.10	600	8.0	4.9	.10	3.2	48	30	9.1		0	283	2.0	0.0	1.5	423	279	279	56
Feb. 11	270	33	5	4.20	659	7.6	3.9	.10	3.5	54	33	13		0	307	6.0	0.0	2.0	464	289	289	50
Feb. 15	301	39	5	4.35	594	7.6	4.6	.10	3.2	47	30	13		0	284	4.0	0.0	1.3	426	271	271	46
Feb. 23	485	41	2	4.35	428	7.2	2.9	.07	2.1	30	20	9.6		0	188	3.0	0.0	1.6	274	178	178	44
Mar. 2	309	38	3	4.35	521	6.5	4.1	.15	2.7	44	27	5.2		0	247	2.5	0.0	.8	365	250	250	50
Mar. 10	239	44	4	4.30	601	6.5	5.6	.37	3.3	50	33	4.5		0	295	2.0	0.0	.7	442	301	301	62
Mar. 16	180	39	1	4.35	591	12	6.7	.09	3.7	50	30	4.2		0	286	3.0	0.0	.6	430	293	293	57
Mar. 22	137	--	4	4.30	650	7.0	4.4	.19	3.5	59	34	7.1		0	318	3.0	0.0	.7	477	320	320	52
Mar. 30	135	64	5	4.6	658	12	5.0	.10	3.5	59	33	10		3	319	3.0	0.0	.6	470	317	317	43

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-foot)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																			Total	Non-carbonate	
Apr. 7, 1949	315	50	10	4.10	436	8.0	2.3	0.12	2.6	34	19	4.9	--	0	184	3.0	0.0	2.8	195	185	38
Apr. 14	504	--	3	4.20	345	4.6	2.8	.08	1.8	25	15	3.5	--	0	140	3.0	0.0	4.9	247	146	32
Apr. 20	467	--	1	4.40	428	9.2	4.8	.12	2.2	28	21	7.9	--	0	193	2.5	0.0	1.1	290	188	38
Apr. 26	456	59	3	4.5	424	8.8	4.3	.12	2.1	31	22	2.7	--	0	189	3.0	0.0	.9	288	196	37
May 6	239	71	4	4.40	582	9.6	5.4	.09	2.4	49	28	12	--	0	281	3.5	0.0	1.1	487	273	54
May 11	210	59	2	4.7	682	11	5.5	.15	3.5	61	36	6.9	--	2	330	4.5	0.0	1.3	520	338	48
May 18	144	63	5	4.6	703	9.6	3.4	.35	3.7	62	37	14	--	1	342	5.0	0.1	.9	537	333	41
May 24	280	63	3	4.40	476	9.4	4.7	.08	2.5	38	23	6.0	--	0	218	3.0	0.0	3.8	221	221	45
June 2	173	69	3	4.5	586	9.2	3.9	.08	3.5	51	31	9.5	--	4	285	2.0	0.0	.9	477	283	46
June 7	138	72	3	4.40	711	8.2	3.6	.11	4.2	63	37	10	--	0	338	5.0	0.1	.9	539	338	51
June 16	127	75	1	4.6	768	13	5.4	.22	3.8	70	42	8.0	--	2	378	6.0	0.0	.9	593	385	46
June 23	86	76	2	5.0	851	12	2.4	.18	4.1	77	46	12	--	3	400	7.0	0.0	.8	661	403	32
June 27	86	75	2	4.35	754	11	7.6	.14	4.4	67	35	13	--	0	366	6.0	0.0	1.2	587	363	60
July 8	70	81	2	4.6	891	9.6	1.3	.19	4.9	86	48	10	--	0	423	6.0	0.0	.8	681	429	28
July 14	68	72	5	4.40	949	10	4.4	.19	5.3	86	48	24	--	0	466	7.5	0.0	7.8	734	448	58
July 21	78	82	5	4.40	845	9.5	2.3	.15	3.9	76	41	30	--	0	411	8.0	0.0	9.0	640	380	30
July 27	110	82	7	4.10	726	11	2.5	.14	3.7	68	35	16	--	0	339	5.0	0.0	6.6	548	339	38
Aug. 2	60	70	5	4.5	834	12	2.2	.20	4.7	82	49	23	--	0	451	8.0	0.0	.2	639	427	34
Aug. 10	41	87	6	4.9	966	11	--	--	4.8	92	55	32	--	0	502	10	0.0	.1	764	465	18
Aug. 18	31	88	10	6.1	870	9.0	--	.51	4.6	84	50	21	--	17	421	14	0.0	.4	663	423	41
Aug. 23	42	87	7	5.1	978	9.5	--	.31	5.2	93	55	32	--	0	508	8.0	0.0	.4	764	474	56
Sept. 2	66	86	6	5.10	1,060	12	6.7	.20	5.6	114	61	35	--	0	622	10	0.0	1.2	960	568	66
Sept. 7	71	82	5	3.92	1,380	11	3.8	.23	3.1	168	56	43	--	0	464	10	0.0	.12	760	588	66
Sept. 16	47	89	10	4.05	1,090	11	2.8	.11	3.1	100	50	50	--	0	336	8.0	0.0	1.1	892	488	42
Sept. 21	58	83	5	4.3	1,150	12	6.3	.06	6.5	108	50	50	--	0	803	9.0	0.0	3.4	1,940	554	70
Sept. 27	46	80	5	3.95	1,180	12	6.8	.13	6.8	108	58	38	--	0	806	9.0	0.0	6.0	1,000	564	84

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	61			43	310	36	241	828	359
2-----	56			48	450	58	215	738	428
3-----	57			42	300	34	208	800	449
4-----	41			138	3,860	1,440	205	865	479
5-----	58			91	1,380	339	198	462	247
6-----	88			75	1,195	242	246	685	455
7-----	53			512	5,110	1/8,400	234	595	376
8-----	73			256	1,385	957	217	622	364
9-----	91			220	2,030	1,210	203	405	222
10-----	70			232	1,820	1,140	210	535	303
11-----	52			192	1,310	679	201	590	320
12-----	56			171	1,150	531	203	350	192
13-----	52			169	600	274	195	455	241
14-----	58			155	480	201	173	585	273
15-----	54			120	430	139	187	740	374
16-----	54		2/7, 170	114	590	182	239	505	326
17-----	68			118	1,280	408	248	788	528
18-----	160			103	1,000	278	222	430	258
19-----	86			176	1,940	922	224	500	302
20-----	66			570	3,430	1/5,620	201	560	304
21-----	63			434	1,160	1,360	192	470	244
22-----	60			406	1,280	1,400	189	405	207
23-----	68			430	1,960	2,280	178	472	227
24-----	78			366	2,050	2,030	169	372	170
25-----	54			335	1,300	1,180	164	160	71
26-----	49			301	1,145	930	138	110	41
27-----	57			309	1,510	1,260	132	175	62
28-----	56			276	1,540	1,150	157	160	86
29-----	68			301	1,300	1,060	246	1,090	724
30-----	46			270	1,220	889	1,960	3,680	1/18, 740
31-----	58			--	--	--	1,990	1,120	6,020
Total-	2,011	--	2/7, 170	6,973	--	36,630	9,786	--	33,550
Day	January			February			March		
	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	1,270	620	2,130	448	270	327	341	355	327
2-----	885	720	1,720	392	345	365	309	308	257
3-----	662	465	831	350	295	279	286	130	100
4-----	531	790	1,130	350	328	310	283	204	156
5-----	810	731	1/2, 940	341	300	276	276	180	134
6-----	1,780	2,080	10,000	312	140	118	288	118	92
7-----	1,330	630	2,260	306	328	271	251	76	52
8-----	992	280	750	293	420	332	236	122	78
9-----	796	495	1,060	291	445	350	234	167	106
10-----	670	120	217	288	270	210	239	148	96
11-----	598	460	743	270	246	179	256	194	134
12-----	527	760	1,080	256	230	159	241	176	114
13-----	474	570	750	263	96	68	227	115	70
14-----	420	510	578	270	194	141	208	149	84
15-----	372	505	507	301	275	224	194	90	47
16-----	341	550	507	350	426	403	180	97	47
17-----	309	320	267	332	218	195	185	180	90
18-----	291	400	314	309	182	152	196	254	134
19-----	301	450	366	309	164	137	162	203	89
20-----	273	340	251	412	349	388	160	148	64
21-----	258	300	209	354	221	211	146	99	39
22-----	299	445	359	395	384	410	157	213	90
23-----	270	195	142	485	368	482	203	345	189
24-----	366	550	544	456	205	252	169	176	80
25-----	360	430	418	474	314	402	166	174	78
26-----	420	550	624	430	215	249	166	180	81
27-----	434	440	516	376	273	277	162	80	35
28-----	618	730	1,220	376	270	274	146	107	42
29-----	626	500	845	--	--	--	144	136	53
30-----	550	575	854	--	--	--	135	179	65
31-----	512	390	540	--	--	--	151	177	72
Total-	18,345	--	34,650	9,789	--	7,440	6,497	--	3,100

1/ Sediment discharge computed by subdividing day.

2/ Estimated.

NORTH ATLANTIC SLOPE BASINS

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	198	395	211	326	127	112	187	187	94
2-----	217	171	100	306	112	93	173	113	53
3-----	210	149	85	326	174	153	173	105	49
4-----	196	142	75	283	107	82	176	101	48
5-----	194	195	102	256	83	57	171	57	26
6-----	357	440	424	239	133	86	146	64	25
7-----	315	235	200	244	118	78	138	120	45
8-----	338	284	259	224	50	30	129	111	39
9-----	335	257	232	205	50	28	124	97	32
10-----	304	154	126	212	88	50	118	112	36
11-----	273	128	94	210	96	55	129	99	35
12-----	258	213	148	189	56	29	131	78	28
13-----	278	341	256	173	88	32	116	67	21
14-----	504	974	1,330	176	74	35	120	75	24
15-----	399	265	285	178	41	20	112	75	23
16-----	379	215	220	155	44	18	127	154	53
17-----	338	73	67	144	72	28	116	190	59
18-----	386	222	1/313	144	70	27	120	117	38
19-----	531	643	922	149	136	55	124	64	21
20-----	467	298	376	368	901	1/876	95	51	13
21-----	434	317	372	276	238	177	84	70	16
22-----	493	344	1/595	257	154	1/118	82	92	20
23-----	618	607	1,010	339	380	1/379	86	84	19
24-----	566	369	564	280	195	147	78	72	15
25-----	485	336	440	379	263	234	135	488	1/318
26-----	456	252	310	299	190	153	140	370	140
27-----	434	208	244	280	210	159	86	115	27
28-----	376	183	186	256	218	151	86	210	50
29-----	338	129	118	239	160	103	80	340	73
30-----	312	113	95	222	74	44	82	625	138
31-----	--	--	--	201	47	25	--	--	--
Total-	10,989	--	9,760	7,485	--	3,630	3,666	--	1,580
Day	July			August			September		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	86	290	67	61	213	35	75	285	58
2-----	84	65	15	60	215	35	66	305	54
3-----	75	50	10	58	85	13	68	640	117
4-----	82	175	39	58	123	19	58	110	17
5-----	73	330	65	63	117	20	75	260	53
6-----	58	105	16	56	215	32	142	725	278
7-----	61	120	20	52	68	10	71	130	25
8-----	70	105	20	41	260	29	70	185	35
9-----	64	137	24	44	100	12	60	375	61
10-----	68	126	23	41	124	14	68	355	65
11-----	54	113	16	43	109	13	61	90	15
12-----	51	326	45	64	508	88	46	465	56
13-----	112	422	128	68	390	72	66	165	29
14-----	68	274	50	54	92	13	61	195	32
15-----	60	148	24	45	368	45	54	155	23
16-----	64	383	66	44	107	13	48	170	22
17-----	66	133	24	41	69	8	53	285	41
18-----	97	229	60	84	316	72	61	355	59
19-----	76	210	43	63	160	27	82	310	69
20-----	70	185	35	54	274	40	57	105	16
21-----	78	155	33	53	118	17	56	160	24
22-----	84	222	50	42	182	21	60	270	44
23-----	124	625	209	42	213	24	70	430	81
24-----	82	138	31	41	382	42	57	220	34
25-----	63	56	9	41	270	30	52	125	18
26-----	61	195	32	39	405	43	41	340	38
27-----	110	670	199	45	725	88	46	665	83
28-----	71	178	34	46	120	15	75	600	122
29-----	68	324	59	176	1,160	551	131	700	248
30-----	82	230	51	88	475	113	86	445	103
31-----	105	160	45	66	164	29	--	--	--
Total-	2,367	--	1,540	1,773	--	1,580	2,016	--	1,920

Total discharge for year (second-foot-days) ----- 81,697
 Total load for year (tons) ----- 142,550

1/Sediment discharge computed by subdividing day.

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT LANINGVILLE, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Instantaneous discharge (second-feet)	Suspended sediment										Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.500
Oct. 8, 1948	1:10 p. m.	48	957			6	20	61	75	82	91	98		DS
Oct. 15	12:35 p. m.	45	1,080			6	25	41	88	90	94	99		DS
Oct. 20	2:20 p. m.	56	929			7	25	68	82	89	95	99		DS
Oct. 25	3:30 p. m.	51	557			11	29	52	59	67	81	96		DS
Nov. 4	10:30 a. m.	189	4,580			1	2	3	36	68	93	99		DS
Nov. 7	4:00 p. m.	382	3,650			3	7	15	37	59	89	99		DS
Nov. 7	4:00 p. m.	382	2,800			2	10	20	39	63	95	98		DS
Nov. 12	10:20 a. m.	164	1,120			-	-	-	14	24	36	96		S
Nov. 20	10:55 a. m.	688	3,290			3	14	25	37	57	83	97		BDS
Nov. 22	11:35 a. m.	344	396			12	18	24	33	54	82	96		DS
Dec. 1	4:30 p. m.	234	294			5	19	48	74	86	95	100		DSW
Dec. 9	4:00 p. m.	203	399			4	15	31	41	48	59	87		DSW
Dec. 17	10:40 a. m.	253	421			4	10	21	32	46	59	85		DSW
Dec. 22	3:20 p. m.	166	226			2	10	30	46	53	62	85		DSW
Jan. 7, 1949	2:30 p. m.	1,290	761			3	7	15	21	39	47	77	96	DSW
Jan. 11	11:45 a. m.	582	401			5	11	17	22	28	42	73		DSW
Jan. 19	3:25 p. m.	312	480			3	12	34	55	59	66	85		DSW
Jan. 28	11:30 a. m.	594	697			2	7	21	44	53	64	81		DSW
Feb. 3	1:40 p. m.	326	245			2	10	27	39	44	53	76		DSW
Feb. 11	10:25 a. m.	268	213			7	26	66	88	92	96	--		DSW
Feb. 15	2:05 p. m.	288	146			6	20	53	75	83	87	95		DSW
Feb. 23	2:00 p. m.	474	158			6	20	47	75	86	96	--		DSW
Mar. 10	1:40 p. m.	229	144			13	34	64	79	85	89	94		DSW
Mar. 16	3:15 p. m.	153	161			4	13	31	43	49	62	80		DSW
Mar. 22	2:15 p. m.	151	143			6	28	56	84	90	94	94		DSW
Mar. 30	3:50 p. m.	116	175			6	21	49	92	96	99	--		DSW

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT LANDINGVILLE, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; F, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Instantaneous discharge (second-foot)	Suspended sediment										Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000
Apr. 6, 1949	9:35 a. m.	389	485			3	10	24	78	86	91	96	DSW	DSW
Apr. 6	9:35 a. m.	389	479			4	13	32	79	88	92	96	DSW	DSW
Apr. 7	12:00 m.	309	121			15	40	63	82	89	97	98	DSW	DSW
Apr. 14	9:15 a. m.	542	1,010			5	13	26	78	88	96	99	DSW	DSW
Apr. 14	9:15 a. m.	542	1,060			5	14	35	72	85	94	98	DSW	DSW
Apr. 14	3:20 p. m.	448	514			4	14	32	56	74	80	90	DSW	DSW
Apr. 20	1:10 p. m.	467	239			5	11	19	28	36	52	77	DSW	DSW
Apr. 26	1:45 p. m.	448	269			4	10	15	20	24	33	65	94	DSW
May 6	1:45 p. m.	227	97			4	18	46	72	77	83	92	DSW	DSW
May 11	2:50 p. m.	187	62			8	34	63	82	84	89	98	DSW	DSW
May 18	8:55 a. m.	135	56			26	55	76	95	96	99	100	DSW	DSW
May 18	10:10 a. m.	135	63			56	64	66	71	76	81	92	BS	BS
May 18	11:20 a. m.	142	55			49	59	69	74	79	85	97	BS	BS
May 18	12:10 p. m.	144	74			59	84	90	92	95	99	--	BS	BS
May 18	1:10 p. m.	138	53			38	56	76	85	91	97	--	BS	BS
May 23	4:15 p. m.	301	180			12	32	57	77	83	90	97	DSW	DSW
May 24	12:55 p. m.	266	143			12	32	53	71	78	86	96	DSW	DSW
June 2	2:50 p. m.	157	76			10	34	61	84	87	91	98	DSW	DSW
June 7	2:40 p. m.	135	111			18	53	81	96	99	100	--	DSW	DSW
June 7	1:45 p. m.	129	172			16	46	89	94	96	97	98	DSW	DSW
June 16	1:00 p. m.	112	84			18	39	56	70	75	79	88	95	DSW
June 16	1:05 p. m.	112	76			24	47	69	87	92	94	97	DSW	DSW
June 23	1:45 p. m.	73	73			23	56	75	90	96	98	99	DSW	DSW
June 25	7:30 p. m.	260	2,280			2	6	9	93	98	99	99	100	DSW
June 27	12:45 p. m.	71	77			11	37	62	85	88	92	96	DSW	DSW
July 8	12:50 p. m.	68	87			21	54	79	91	93	96	97	DSW	DSW
July 14	9:20 a. m.	68	320			13	38	81	97	98	99	--	DSW	DSW
July 21	11:50 a. m.	78	140			19	47	75	94	96	98	100	DSW	DSW
July 27	2:15 p. m.	110	272			5	21	59	97	98	99	99	DSW	DSW

Aug. 2	-----	52	138				7	35	71	97	98	99	100	--	DSW
Aug. 10	-----	36	68				13	43	74	90	92	92	98	99	DSW
Aug. 18	-----	93	562				5	18	41	92	96	96	99	100	DSW
Aug. 23	-----	38	138				12	43	77	91	93	95	98	100	DSW
Sept. 2	-----	54	259				15	46	87	97	98	99	100	--	DSW
Sept. 7	-----	63	125				18	49	79	97	98	99	100	--	DSW
Sept. 16	-----	40	204				10	39	78	99	99	100	--	--	DSW
Sept. 21	-----	46	93				17	39	59	86	90	94	98	--	DSW
Sept. 27	-----	38	657				6	16	74	98	99	99	100	--	DSW

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT AUBURN, PA.

LOCATION.--At bridge on State Highway 895, 100 feet downstream from gaging station at Auburn, Schuylkill County, 0.4 mile upstream from Pine Creek, and 3 miles downstream from Plum Creek.

DRAINAGE AREA.--160 square miles.

RECORDS AVAILABLE.--Chemical analyses: December 1947 to September 1949.

Sediment records: October 1947 to September 1949.

EXTREMES, 1948-49.--Sediment loads: Maximum, 29,540 tons per day Dec. 30; minimum, 9 tons per day Aug. 22.

EXTREMES, 1947-49.--Sediment loads: Maximum, 29,540 tons per day Dec. 30, 1948; minimum, 9 tons per day Aug. 22, 1949.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 8, 1948	80		1	4.9	944	13	1.6	1.7	5.7	96	55	24		0	513	6.0	0.0	0.1	785	490	490	30
Oct. 15	52		1	4.6	968	12	5.6	2.8	5.0	104	55	15		0	524	8.0	0.0	2.0	808	527	527	36
Oct. 20	73		1	4.7	894	6.5	1.6	7.2	6.0	82	48	37		4	466	10	0.0	1.0	726	424	420	--
Oct. 27	59		1	4.8	924	11	8.0	9.1	6.4	93	51	23		0	473	10	0.0	1.7	743	461	459	--
Nov. 5	123		1	4.9	761	7.0	2.8	1.5	3.6	71	44	13		3	379	8.0	0.0	2.2	610	381	378	56
Nov. 16	148		1	4.10	742	6.5	9.0	12	4.0	60	41	5.7		0	365	4.0	0.0	1.6	574	374	374	130
Nov. 22	439		1	4.35	419	5.0	3.1	1.0	2.5	34	23			0	190	4.0	0.0	1.8	292	202	202	66
Dec. 1	291		1	4.30	598	7.5	6.2	2.0	3.4	48	34	--		0	280	4.0	0.0	1.6	448	303	303	105
Dec. 8	254		1	4.10	601	12	4.7	0.7	1.6	58	34	9		0	321	2.0	0.0	0.7	513	318	318	54
Dec. 10	223		5	4.40	616	5.0	2.5	1.8	3.7	53	37	2.5		0	294	4.0	0.0	1.0	466	307	307	94
Dec. 14	190		1	4.5	674	7.0	6.3	0.9	2.1	60	39	3.0		0	336	4.0	0.0	0.2	527	349	349	92
Dec. 20	223		2	4.10	536	13	8.4	1.8	2.8	38	27	3.3		0	250	3.5	0.0	5.2	379	262	262	58
Jan. 7, 1949	1,530		1	4.25	310	12	4.8	1.5	1.3	21	14	2.2		0	135	3.5	0.0	0.8	201	141	141	33
Jan. 14	463		1	4.20	610	14	8.3	2.5	3.4	48	32	1.6		0	294	2.5	0.0	1.6	444	307	307	64
Jan. 17	353		2	4.15	670	14	8.9	2.2	3.5	51	35	7.3		0	328	2.0	0.0	2.7	501	331	331	72
Jan. 26	544		3	4.25	504	12	5.4	1.3	2.5	40	26	3.5		0	234	3.5	0.0	3.5	348	244	244	47
Feb. 3	419		4	4.05	569	7.5	5.7	1.7	3.0	44	29	5.8		0	266	3.5	0.0	2.0	402	271	271	61
Feb. 11	338		5	4.25	568	9.0	6.5	1.7	2.9	43	28	9.2		0	269	4.0	0.0	0.9	396	266	266	54
Feb. 15	353		1	4.45	538	7.6	1.8	0.9	2.7	44	26	14		0	248	3.0	0.0	1.9	358	233	233	38
Feb. 21	500		1	4.5	426	6.8	1.2	1.2	2.2	33	21	11		2	189	2.0	0.0	2.1	277	180	178	30
Mar. 2	375		1	4.30	481	11	4.8	0.2	2.5	37	24	3.2		0	217	3.0	0.0	3.4	334	226	226	39
Mar. 10	288		1	4.45	555	8.0	3.3	1.0	3.0	44	28	13		0	260	4.0	0.0	1.1	389	250	250	45
Mar. 16	220		4	4.5	572	7.5	3.6	1.4	3.0	49	31	8.3		3	275	3.0	0.0	0.6	401	276	273	56
Mar. 23	245		4	4.7	543	6.0	3.3	1.7	2.6	50	26	8.0		0	252	4.5	0.0	0.6	385	255	252	29
Mar. 31	190		1	4.5	639	12	3.8	1.0	3.4	55	33	11		0	305	3.5	0.0	1.6	466	301	301	41

443	Apr. 6	5	4.45	356	7.0	2.6	.04	2.0	29	16	6.9		0	150	4.5	.0	3.9	249	157	28
304	Apr. 12	4	4.20	488	5.8	3.3	.10	2.4	34	21	3.7		0	192	2.0	.0	3.2	320	197	36
572	Apr. 20	1	4.40	361	8.2	3.4	.05	1.8	28	16	3.5		0	155	2.5	.0	2.1	248	159	30
463	Apr. 28	1	4.7	453	9.2	4.2	.17	2.1	37	21	3.7		0	200	3.0	.0	2.4	303	206	40
260	May 6	5	4.5	545	9.2	4.0	.07	2.8	46	26	9.9		0	255	3.0	.1	.9	387	249	33
192	May 13	3	4.45	648	9.0	5.3	.17	3.6	56	28	17		0	310	3.5	.0	.9	507	282	44
157	May 18	3	4.6	645	9.0	3.5	.12	3.2	55	32	16		8	302	5.0	.0	.9	485	294	36
383	May 25	2	4.6	425	7.6	2.9	.10	2.2	36	19	8.6		3	190	4.0	.0	1.5	288	186	26
248	May 31	4	4.40	555	8.8	4.4	.10	3.2	45	28	5.2		0	255	3.0	.0	.6	421	259	44
141	June 7	4	4.40	658	11	4.4	.11	3.4	55	33	14		0	314	5.0	.1	.9	492	305	36
119	June 15	2	4.40	771	9.8	5.1	.23	4.5	67	39	15		0	374	6.0	.0	1.2	612	366	44
102	June 20	3	4.25	686	11	1.9	.15	5.1	61	36	17.1		0	319	4.0	.0	.3	550	323	52
92	June 28	4	4.40	808	12	3.8	.23	5.2	72	41	13		0	383	6.0	.0	.7	653	360	50
73	July 11	6	3.65	824	12	3.0	.19	5.0	76	40	20		0	405	9.5	.0	8.2	623	366	54
73	July 20	6	4.30	851	10	3.1	.16	4.3	76	42	26		0	417	7.5	.0	5.9	623	366	54
73	July 26	5	4.00	835	10	3.9	.15	4.5	75	39	20		0	402	8.0	.0	5.2	632	383	58
60	Aug. 3	5	4.5	701	10	2.8	.11	4.5	74	39	20		0	384	7.5	.0	1.3	614	369	40
57	Aug. 9	5	4.6	957	9.5	1.1	.24	4.5	87	49	32		1	484	10.5	.0	1.3	738	434	29
57	Aug. 18	5	4.9	847	9.5	2.8	.10	4.4	80	44	20		3	421	9.5	.0	1.1	684	404	20
45	Aug. 23	5	4.8	927	12	6.9	.31	4.6	85	48	30		2	464	9.0	.0	.1	684	423	26
69	Sept. 2	6	4.45	1,000	14	6.9	.31	5.8	92	52	27		0	533	6.5	.0	.1	822	494	64
62	Sept. 9	7	3.95	967	12	5.5	.10	4.9	90	42	32		0	475	8.0	.0	13	762	442	46
66	Sept. 12	7	3.80	986	14	5.9	.18	5.4	88	42	30		0	476	8.0	.0	10	759	444	66
66	Sept. 20	5	4.05	1,010	12	5.2	.12	5.6	94	53	33		0	520	11	.0	7.4	834	496	52

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT AUBURN, PA.--Continued

Suspended sediment, water year, October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	66	1,890	337	60	280	45	291	805	633
2-----	60	1,420	230	64	375	65	275	1,100	817
3-----	62	1,090	163	49	230	31	257	580	403
4-----	42	350	40	152	2,250	923	245	540	357
5-----	60	970	157	123	1,300	432	228	450	277
6-----	113	2,520	769	100	590	159	282	420	320
7-----	64	1,030	178	645	3,850	1/7,090	278	820	616
8-----	80	1,530	330	345	1,130	1,050	254	625	429
9-----	113	2,610	796	272	1,180	867	234	410	259
10-----	80	1,200	259	291	1,060	833	223	625	376
11-----	57	330	51	239	950	613	220	620	368
12-----	60	630	102	195	800	421	212	270	154
13-----	56	600	91	190	885	454	210	280	159
14-----	62	1,370	229	190	925	475	190	490	251
15-----	52	1,070	150	157	345	146	195	730	384
16-----	52	1,020	143	148	575	230	251	630	427
17-----	67	900	163	159	1,010	434	301	480	390
18-----	173	2,510	1,080	141	725	276	272	305	224
19-----	100	805	217	180	1,010	491	260	215	151
20-----	73	900	177	685	2,580	4,770	223	290	175
21-----	66	1,060	189	544	1,870	2,750	210	285	161
22-----	60	940	152	439	950	1,130	200	325	176
23-----	69	800	149	518	1,360	1,900	195	330	174
24-----	82	925	205	423	975	1,110	178	430	207
25-----	66	420	75	375	1,075	1,090	176	270	128
26-----	56	440	66	318	410	352	148	360	144
27-----	59	775	123	328	560	496	148	250	100
28-----	64	840	145	294	670	532	178	310	149
29-----	75	1,000	202	338	525	479	294	602	478
30-----	57	440	68	331	1,010	903	2,520	4,940	1/29,540
31-----	67	640	116	--	--	--	2,390	2,020	13,000
Total-	2,213	--	7,170	8,293	--	30,550	11,538	--	51,430
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,520	640	2,630	558	178	268	411	248	275
2-----	1,060	220	630	479	162	210	375	160	182
3-----	765	465	961	419	200	226	349	230	217
4-----	605	210	343	415	182	204	338	172	157
5-----	852	320	736	411	176	195	342	300	277
6-----	2,060	1,480	8,230	371	216	216	368	185	184
7-----	1,530	1,140	4,710	383	365	377	321	284	229
8-----	1,170	630	1,990	375	328	332	301	166	135
9-----	948	310	794	371	345	346	291	258	203
10-----	760	220	451	368	414	411	288	210	163
11-----	665	185	332	338	321	293	311	300	252
12-----	580	285	446	298	504	406	301	212	172
13-----	518	390	545	304	345	283	282	135	103
14-----	463	365	456	311	334	281	254	223	153
15-----	415	265	297	353	224	214	239	138	89
16-----	379	195	200	467	402	507	220	129	77
17-----	353	190	181	455	338	415	228	174	107
18-----	318	340	292	407	455	500	237	384	246
19-----	338	390	356	395	415	443	202	270	147
20-----	311	530	445	549	339	502	195	410	216
21-----	272	330	242	500	231	312	185	225	112
22-----	335	455	411	540	273	398	195	333	175
23-----	298	430	346	680	463	850	245	377	249
24-----	419	580	656	640	308	532	212	306	176
25-----	479	310	401	645	265	461	210	312	177
26-----	544	380	558	567	178	272	212	452	259
27-----	600	475	770	483	276	360	208	398	224
28-----	862	460	1,070	479	200	259	190	251	129
29-----	879	285	676	--	--	--	185	216	108
30-----	740	240	480	--	--	--	180	282	137
31-----	655	145	256	--	--	--	190	307	157
Total-	21,693	--	30,890	12,561	--	10,070	8,065	--	5,470

1/Sediment discharge computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT AUBURN, PA.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	Mean discharge (second-foot)	April		Mean discharge (second-foot)	May		Mean discharge (second-foot)	June	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	307	413	342	375	288	280	215	107	62
2-----	311	362	304	360	230	213	202	82	45
3-----	288	299	232	375	272	261	190	119	61
4-----	266	206	148	314	256	204	185	118	59
5-----	239	224	144	282	225	161	178	107	51
6-----	443	451	539	260	275	179	154	127	53
7-----	415	322	361	254	348	217	141	131	50
8-----	419	251	284	239	280	161	132	140	50
9-----	411	336	373	212	267	133	128	101	35
10-----	368	138	137	223	252	129	125	230	78
11-----	321	195	169	220	230	114	130	145	51
12-----	304	218	179	208	325	148	139	122	46
13-----	307	307	254	192	250	101	121	128	42
14-----	660	625	1,110	185	285	106	128	134	46
15-----	522	397	559	190	235	86	119	164	53
16-----	459	409	507	168	210	66	134	107	39
17-----	395	341	364	157	195	55	125	161	54
18-----	443	370	443	157	200	54	125	152	51
19-----	710	768	1,470	157	150	40	134	135	49
20-----	572	363	561	397	925	991	102	130	36
21-----	508	414	568	318	515	420	90	75	18
22-----	549	321	476	263	335	221	90	102	25
23-----	765	637	1,320	403	640	696	88	87	21
24-----	715	445	859	304	330	268	78	106	23
25-----	630	379	645	383	520	522	116	309	1/174
26-----	572	347	536	338	400	350	160	696	1/353
27-----	544	296	435	321	460	375	98	167	44
28-----	463	213	266	294	380	278	92	158	39
29-----	395	343	366	282	320	220	82	225	50
30-----	360	187	182	266	240	151	84	465	106
31-----	--	--	--	248	195	113	--	--	--
Total--	13,661	--	14,130	8,345	--	7,310	3,885	--	2,000
	July			August			September		
1-----	88	425	101	67	150	27	78	361	76
2-----	88	153	36	59	239	38	69	186	35
3-----	78	65	14	60	116	19	71	413	79
4-----	76	102	21	67	102	18	60	240	39
5-----	92	275	68	71	162	31	73	140	28
6-----	73	118	23	69	173	32	202	1,220	1/963
7-----	71	150	29	67	151	27	80	212	46
8-----	75	176	36	52	91	13	73	175	35
9-----	69	158	29	57	222	34	62	190	32
10-----	88	131	31	54	85	12	73	426	84
11-----	75	134	27	54	85	12	76	288	59
12-----	66	87	15	76	410	84	66	121	22
13-----	130	462	162	86	368	85	76	436	89
14-----	88	368	87	64	180	31	82	164	36
15-----	67	425	77	52	80	11	66	105	19
16-----	78	250	53	48	245	32	60	103	17
17-----	75	214	43	45	127	15	67	150	27
18-----	110	276	82	92	350	87	75	212	43
19-----	90	238	58	78	178	37	106	450	129
20-----	73	202	40	60	96	16	66	124	22
21-----	80	245	53	62	328	55	64	124	21
22-----	80	197	43	44	75	9	69	120	22
23-----	152	1,325	544	45	130	16	82	170	38
24-----	92	262	65	48	294	38	69	105	20
25-----	71	98	19	42	535	61	64	220	38
26-----	73	202	40	42	394	45	48	76	10
27-----	125	583	197	46	900	112	54	308	45
28-----	84	202	46	49	428	57	92	385	96
29-----	82	270	60	190	1,160	1/730	152	815	335
30-----	94	332	84	98	374	99	104	310	87
31-----	125	348	117	69	258	48	--	--	--
Total--	2,708	--	2,300	2,013	--	1,930	2,379	--	2,590
Total discharge for year (second-foot-days) ----- 97,354									
Total load for year (tons) ----- 165,840									

1/Sediment discharge computed by subdividing day.

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT AUBURN, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment										Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500
			1,000		5	14	35	63	73	92		98	--	DSN	
	Oct. 8, 1948	88												--	DSN
	10:15 a.m.		946		7	14	50	79	85	92		97	--	DSN	
	10:30 a.m.	60												--	DSN
	Oct. 15	96	959		8	20	45	64	72	89		97	--	DSN	
	10:30 a.m.													--	DSN
	Oct. 20	73	854											--	DSN
	10:40 a.m.													--	DSN
	Nov. 5	119	1,650		4	9	26	54	71	90		98	--	DSN	
	1:45 p.m.													--	DSN
	Oct. 10	291	1,140		5	17	32	41	56	82		95	--	DN	
	12:40 p.m.													--	DN
	Nov. 16	380	860		13	34	54	63	75	89		98	--	DN	
	3:40 p.m.													--	DN
	Nov. 22	395	829		2	6	10	16	30	63		93	--	DN	
	3:50 p.m.													--	DN
	Dec. 1	269	567		5	14	32	61	67	79		96	--	DSW	
	3:20 p.m.													--	DSW
	Dec. 10	228	412		7	20	47	64	70	82		96	--	DSW	
	2:55 p.m.													--	DSW
	Dec. 14	190	332		--	--	--	--	--	--		--	--	BN	
	2:15 p.m.													--	BN
	Dec. 20	212	180		15	12	24	36	54	80		98	--	DSW	
	3:05 p.m.													--	DSW
	Oct. 30	2,600	4,580		1	4	8	29	45	64		90	99	DSW	
	Dec. 30	2,950	4,750		2	4	8	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30	2,950	4,400		2	5	9	26	38	57		84	99	DSW	
	Dec. 30														

Apr. 6	10:15 a. m.	491	638			2	8	24	64	72	79	89	97	DSW
Apr. 6	10:20 a. m.	491	613			5	16	35	62	68	74	86	97	DSW
Apr. 6	3:50 p. m.	495	469			5	16	35	75	82	89	95	--	DSW
Apr. 12	3:20 p. m.	288	104			6	26	59	80	86	94	97	--	DSW
Apr. 14	10:00 a. m.	4	814			4	12	26	80	89	94	98	--	DSW
Apr. 14	10:00 a. m.	4	750			4	13	28	74	84	90	100	--	DSW
Apr. 20	11:05 a. m.	580	125			4	15	39	62	78	87	93	--	DSW
Apr. 28	1:05 p. m.	463	149			4	11	22	33	38	50	79	--	DSW
May 6	10:50 a. m.	269	161			8	22	35	44	46	56	70	93	DSW
May 13	2:30 p. m.	192	102			11	30	50	52	63	71	85	93	DSW
May 18	1:25 p. m.	132	189			15	12	49	77	80	86	98	98	DSW
May 23	7:30 p. m.	335	285			11	26	40	51	57	63	81	97	DSW
May 25	9:30 a. m.	407	484			12	27	43	74	77	82	91	97	DSW
May 31	2:50 p. m.	242	131			7	16	24	30	32	36	60	89	DSW
June 7	10:20 a. m.	143	292			14	34	63	81	83	86	92	97	DSW
June 15	12:35 p. m.	108	233			15	34	44	50	52	55	72	99	DSW
June 18	9:30 p. m.	117	79			15	34	52	69	72	79	91	--	DSW
June 20	9:00 a. m.	110	400			11	30	40	90	91	93	97	99	DSW
June 20	1:40 a. m.	100	873			12	32	52	98	98	99	100	--	DSW
June 20	2:05 p. m.	98	382			11	28	61	98	99	100	--	98	DSW
June 28	1:15 p. m.	108	184			14	32	60	86	87	90	95	98	DSW
July 11	1:45 p. m.	62	120			10	29	47	62	64	67	81	--	DSW
July 20	12:35 p. m.	66	232			12	35	59	72	73	75	86	--	DSW
July 26	11:35 a. m.	82	160			13	44	76	92	94	96	99	--	DSW
Aug. 3	11:50 a. m.	67	136			11	40	79	95	97	98	--	--	DSW
Aug. 9	12:35 p. m.	56	177			12	39	70	84	85	86	90	95	DSW
Aug. 18	9:45 a. m.	66	165			10	36	71	91	94	96	98	--	DSW
Aug. 23	9:10 a. m.	54	143			11	37	72	91	93	95	98	--	DSW
Sept. 2	10:25 a. m.	73	182			11	40	72	88	91	94	97	--	DSW
Sept. 9	8:45 a. m.	146	146			17	53	80	97	97	98	98	--	DSW
Sept. 12	3:00 p. m.	54	62			10	28	74	100	--	--	--	--	DSW
Sept. 20	9:55 a. m.	62	141			13	31	55	83	86	89	93	--	DSW

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.

LOCATION --At gaging station at highway bridge at Berne, Berks County, half a mile upstream from Mill Creek, and 6½ miles downstream from Little Schuylkill River.

DRAINAGE AREA --355 square miles.

RECORDS AVAILABLE --Chemical analyses: December 1947 to September 1949.

Water temperatures: February 1948 to September 1949.

Sediment records: October 1947 to September 1949.

EXTREMES, 1948-49 --Sediment loads: Maximum, 85,070 tons per day Dec. 30; minimum, 0.3 ton per day Sept. 2.

EXTREMES, 1947-49 --Sediment loads: Maximum, 90,180 tons per day Nov. 12, 1947; minimum, 0.3 ton per day Sept. 2, 1949.

REMARKS --Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Extremes omitted because of periodic pollution which makes it misleading to report extremes or averages. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1-10, 1948 ---	176		7	4.25	831	12	12	0.12	5.0	85	45	1.3		0	451	6.0	0.0	0.2	721	475	475	112
Oct. 11-20 -----	158		7	4.35	793	13	8.8	.21	4.5	79	44	6.8		0	425	6.0	.0	.6	676	437	437	102
Oct. 21-31 -----	136		1	4.5	844	10	6.0	.16	3.8	86	47	7.5		0	436	7.0	.0	1.2	690	448	448	147
Nov. 1-10 -----	375		3	4.35	672	6.0	2.1	1.4	3.6	62	35	14		0	328	7.0	.0	.1	514	322	322	92
Nov. 11-20 -----	392		1	4.10	610	5.0	8.4	.38	3.6	52	32	7.1		0	315	5.0	.0	.2	577	320	320	94
Nov. 21-Dec. 1 ---	678		1	4.35	434	5.5	7.6	.16	2.6	34	20	2.5		0	208	3.0	.0	.1	384	216	216	72
Dec. 2-11 -----	522		1	4.45	489	7.5	9.9	.13	2.6	43	28	4.3		0	276	4.0	.0	.1	464	284	284	74
Dec. 12-20 -----	528		--	--	--	--	--	--	--	--	--	--		--	--	--	--	--	--	--	--	--
Dec. 21-31 -----	1,620		2	4.10	469	6.5	6.5	.10	2.2	34	20	6.1		0	209	4.0	.0	2.1	301	212	212	--
Jan. 1-10, 1949 ---	2,590		2	4.15	305	6.0	4.1	.11	1.2	22	12	3.1		0	130	2.0	.0	1.5	182	133	133	--
Jan. 11-20 -----	893		2	4.00	486	6.5	7.1	.08	2.0	36	21	6.6		0	222	4.0	.0	2.7	324	225	225	64
Jan. 21-31 -----	1,260		5	4.00	403	7.5	5.2	.13	1.9	32	20	7.5		0	202	3.5	.0	1.1	268	200	200	54
Feb. 1-10 -----	895		2	4.15	402	6.5	3.5	.18	1.9	29	19	4.3		0	174	3.0	.0	1.2	284	177	177	52
Feb. 11-20 -----	850		3	4.25	403	6.4	3.1	.12	1.9	30	18	8.2		0	176	4.0	.0	1.1	268	172	172	42
Feb. 21-28 -----	1,748		4	4.30	301	5.6	2.7	.35	1.3	20	12	7.3		0	125	3.0	.0	1.0	286	119	119	28
Mar. 1-10 -----	748		4	4.30	374	8.0	3.9	.25	1.9	18	12	7.6		0	121	4.0	.0	1.0	272	176	176	49
Mar. 11-20 -----	512		4	4.20	458	8.0	1.9	.27	2.5	36	23	6.3		0	134	4.5	.0	2.0	348	203	203	59
Mar. 21-31 -----	455		4	4.30	462	9.6	8.4	.13	2.6	36	23	6.3		0	237	3.0	.0	1.2	318	238	238	64
Apr. 1-10 -----	871		3	4.45	339	8.4	3.3	.13	1.7	26	16	1.4		0	146	2.5	.0	1.2	223	153	153	42
Apr. 11-20 -----	1,110		2	4.25	286	6.4	2.3	.11	1.4	21	11	5.8		0	118	2.0	.0	2.8	193	115	115	36
Apr. 21-30 -----	1,320		2	4.30	279	6.8	2.3	.08	1.2	20	11	5.4		0	114	3.0	.0	1.5	185	112	112	28
May 1-10 -----	744		2	4.35	392	7.8	4.0	.13	2.0	29	17	6.5		0	171	3.0	.0	1.6	269	170	170	50
May 11-20 -----	501		4	4.6	516	10	7.0	.12	2.6	37	21	13		2	231	3.5	.0	3.8	353	223	223	62
May 21-31 -----	748		2	4.8	380	7.8	4.2	.10	2.0	27	16	8.6		4	184	2.5	.0	1.8	257	160	160	44

June 1-10 -----	355	3	4.7	536	10	7.2	.12	2.7	41	24	9.3	1	290	3.0	.0	1.5	374	246	245	68	
June 11-20 -----	263	1	4.15	649	10	8.4	.19	3.8	51	29	11	0	305	6.0	.0	3.2	475	304	304	76	
June 21-30 -----	208	2	4.05	700	11	8.2	.18	4.0	57	31	11	0	328	5.0	.0	2.2	522	327	327	74	
July 1-10 -----	158	5	3.80	824	12	9.1	.19	4.5	62	38	21	--	0	392	8.0	.0	8.1	596	378	378	93
July 11-20 -----	199	5	3.90	738	10	6.5	.19	4.0	60	34	20	--	0	351	8.0	.0	8.1	528	340	340	72
July 21-31 -----	207	5	3.80	773	12	11	.22	4.0	66	27	22	--	0	366	8.0	.0	8.4	556	353	353	85
Aug. 1-10 -----	139	7	3.80	897	13	12	.19	4.6	77	37	25	--	0	443	10	.0	8.6	678	428	428	97
Aug. 11-20 -----	147	5	3.70	894	12	7.8	.18	4.9	74	41	28	--	0	440	8.0	.0	8.8	666	416	416	100
Aug. 21-31 -----	144	5	3.70	907	12	9.9	.24	4.9	72	43	27	--	0	437	8.0	.0	8.8	670	431	431	118
Sept. 1-10 -----	159	8	3.80	855	14	12	.16	4.8	72	36	18	--	0	422	7.0	.0	7.2	668	412	412	114
Sept. 11-20 -----	166	6	3.80	906	14	14	.13	5.0	79	38	17	--	0	452	7.0	.0	6.8	712	449	449	106
Sept. 21-30 -----	167	8	3.80	876	12	13	.21	4.9	70	36	20	--	0	426	7.0	.0	7.4	693	413	413	104

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	--	40	37	35	34	46	58	57	70	78	71
2	62	--	39	39	35	38	41	60	60	74	74	60
3	60	--	40	37	30	38	47	60	62	75	78	62
4	52	--	42	38	36	37	46	60	63	77	78	65
5	54	--	42	41	39	46	44	64	67	--	78	68
6	50	--	45	44	35	40	46	65	67	78	73	73
7	52	--	41	42	38	40	45	67	68	71	72	65
8	56	--	42	43	36	--	47	60	62	72	74	65
9	54	--	39	45	37	39	45	58	60	72	75	61
10	54	--	37	45	40	46	47	60	62	70	77	57
11	55	46	35	45	37	42	48	56	66	69	77	58
12	56	44	--	42	32	37	48	53	70	74	76	62
13	52	50	--	40	36	36	53	56	73	71	75	63
14	51	43	--	42	43	37	54	57	74	73	73	66
15	49	42	--	--	47	40	58	61	72	77	70	68
16	48	42	--	39	47	33	52	61	73	75	73	60
17	--	46	--	44	39	37	--	63	73	74	73	62
18	--	44	--	44	38	40	42	65	71	71	71	62
19	44	42	--	46	40	32	--	66	71	74	77	70
20	46	53	--	40	47	38	48	68	73	78	64	64
21	44	50	--	37	44	36	50	57	75	80	64	60
22	43	45	--	40	43	46	54	60	77	79	--	60
23	48	46	36	37	42	54	52	58	70	75	69	60
24	50	45	34	--	41	48	50	60	69	72	72	55
25	50	--	46	44	45	50	46	58	76	75	70	53
26	47	41	37	42	41	50	54	57	76	76	67	54
27	49	47	33	40	38	55	57	53	77	78	74	56
28	47	44	33	42	40	57	57	55	74	--	74	60
29	47	--	35	41	--	50	50	57	72	79	74	62
30	47	40	40	36	--	--	53	53	71	79	73	58
31	--	--	40	34	--	53	--	56	--	--	73	--
Average	51	--	--	41	43	43	49	60	69	70	73	62

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	200	660	356	116	145	45	580	530	829
2-----	162	585	256	116	175	55	541	425	621
3-----	162	420	184	112	105	32	508	315	432
4-----	136	310	114	240	942	610	482	255	332
5-----	124	150	50	320	1,550	1,340	463	210	262
6-----	235	1,360	864	190	400	205	541	308	451
7-----	167	651	294	1,110	6,680	1/26,660	664	858	1,540
8-----	144	505	196	636	1,060	1,820	548	380	562
9-----	235	935	594	450	575	699	515	250	348
10-----	190	540	278	463	545	680	489	225	297
11-----	149	310	125	396	400	427	470	270	343
12-----	140	180	68	330	275	245	450	245	297
13-----	132	245	87	330	230	205	476	155	199
14-----	132	275	98	320	260	225	426	190	218
15-----	128	380	131	275	260	193	408	255	281
16-----	120	345	112	270	250	182	502	470	637
17-----	120	375	122	275	225	167	706	798	1,520
18-----	260	1,770	1,240	270	320	233	622	400	672
19-----	235	725	459	265	320	229	587	320	508
20-----	167	305	137	1,190	3,830	1/14,120	580	340	532
21-----	144	290	113	1,080	2,400	7,000	502	220	297
22-----	140	345	130	814	1,230	2,700	470	210	266
23-----	136	275	101	1,070	2,110	6,100	444	215	258
24-----	149	425	171	822	1,240	2,750	414	230	257
25-----	140	350	132	727	1,000	1,960	402	145	157
26-----	136	200	73	601	440	713	374	92	93
27-----	128	170	59	601	425	688	340	80	73
28-----	136	235	86	541	365	532	379	100	102
29-----	136	285	105	622	420	705	685	740	1,370
30-----	132	380	136	678	795	1,460	7,220	4,940	1/85,070
31-----	124	250	84	--	--	--	6,580	2,550	45,300
Total--	4,839	--	6,960	15,230	--	72,980	28,368	--	144,100
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2,780	1,520	11,400	1,280	214	740	1,030	238	662
2-----	1,810	1,150	5,620	1,080	274	799	886	236	564
3-----	1,410	660	2,510	926	195	488	806	251	545
4-----	1,220	630	2,080	894	217	524	734	179	354
5-----	1,750	690	3,260	886	172	411	727	190	373
6-----	6,690	1,570	28,400	790	156	337	769	198	410
7-----	4,120	1,590	17,700	769	164	340	713	100	193
8-----	2,470	1,100	7,340	790	216	461	615	130	216
9-----	2,050	515	2,850	769	289	600	594	143	229
10-----	1,570	450	1,910	762	279	574	608	102	167
11-----	1,360	735	2,700	727	226	444	664	154	275
12-----	1,180	362	1,150	622	168	282	636	167	286
13-----	1,110	310	929	636	146	251	560	130	197
14-----	950	262	672	706	70	133	522	53	75
15-----	838	285	645	790	156	333	496	67	90
16-----	769	283	589	1,080	355	1,040	456	78	96
17-----	741	92	184	1,090	270	795	438	225	266
18-----	678	218	400	950	211	541	470	228	289
19-----	678	230	421	926	168	420	456	128	158
20-----	629	280	475	1,270	326	1,120	420	100	113
21-----	548	250	370	1,190	390	1,250	420	80	91
22-----	678	280	513	1,250	430	1,450	432	92	107
23-----	664	180	324	1,700	602	2,760	534	180	256
24-----	910	220	540	1,510	472	1,920	522	130	183
25-----	1,080	315	918	1,490	483	1,940	450	94	114
26-----	1,180	250	796	1,330	374	1,340	470	112	142
27-----	1,410	490	1,870	1,140	216	665	470	110	140
28-----	2,090	760	4,290	1,110	256	767	463	66	83
29-----	2,130	770	4,430	--	--	--	432	68	79
30-----	1,680	595	2,700	--	--	--	402	68	74
31-----	1,460	315	1,240	--	--	--	408	80	99
Total--	48,633	--	109,200	28,463	--	22,720	17,603	--	6,930

1/Sediment discharge computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BERNE, PA.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	664	202	362	894	2/110	265	456	78	96
2-----	748	205	414	862	108	251	420	86	97
3-----	678	110	201	870	185	435	396	82	88
4-----	671	82	148	727	175	343	379	86	88
5-----	636	72	124	685	108	200	374	70	71
6-----	1,100	282	838	769	192	399	346	68	63
7-----	1,150	220	683	720	108	210	320	57	49
8-----	1,120	176	532	671	72	130	300	62	50
9-----	1,050	216	612	622	57	96	280	54	41
10-----	894	125	302	615	75	124	275	77	57
11-----	790	82	175	574	102	158	275	64	48
12-----	706	98	187	548	75	111	280	67	51
13-----	650	88	154	489	60	79	255	50	35
14-----	1,380	541	1/2,160	444	49	59	250	54	36
15-----	1,130	389	1,190	463	39	49	235	48	31
16-----	1,000	322	869	432	28	33	240	51	33
17-----	886	205	490	408	47	52	260	66	46
18-----	934	290	731	390	65	69	255	57	39
19-----	2,080	1,190	6,680	396	63	67	320	100	86
20-----	1,580	405	1,730	869	412	1/1,120	260	43	30
21-----	1,400	290	1,100	908	481	1/1,310	220	58	35
22-----	1,300	273	958	671	130	235	205	52	29
23-----	1,780	634	3,050	1,080	618	1/1,890	200	39	21
24-----	1,620	355	1,550	783	260	550	185	44	22
25-----	1,470	332	1,320	934	335	845	172	38	18
26-----	1,390	270	1,010	762	188	387	368	276	1/301
27-----	1,280	173	588	762	198	407	225	163	99
28-----	1,110	180	539	650	218	383	180	57	28
29-----	950	178	457	601	131	212	167	62	28
30-----	878	125	296	567	78	119	158	78	33
31-----	--	--	--	515	97	135	--	--	--
Total-	33,025	--	29,460	20,681	--	10,700	8,256	--	1,750
Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	162	116	51	168	94	43	118	7	2.2
2-----	167	83	38	134	51	18	40	3	.3
3-----	162	47	21	137	47	17	118	4	1.3
4-----	144	30	12	164	129	57	116	8	2.5
5-----	205	110	61	154	174	72	110	36	11
6-----	167	38	17	150	90	36	402	201	1/284
7-----	154	21	8.6	137	65	24	199	11	5.9
8-----	144	22	8.6	116	31	9.7	171	10	4.6
9-----	140	25	9.4	113	27	8.2	168	10	4.5
10-----	140	34	13	121	16	5.2	150	8	3.2
11-----	167	49	22	124	14	4.7	147	7	2.8
12-----	136	25	9.2	143	62	24	134	6	2.2
13-----	220	162	96	168	77	35	134	10	3.6
14-----	205	138	76	168	83	38	199	18	9.7
15-----	149	71	29	130	97	34	175	12	5.7
16-----	162	103	45	116	53	17	154	11	4.6
17-----	158	81	35	116	20	6.3	143	10	3.9
18-----	335	225	204	130	35	12	150	22	8.9
19-----	270	104	76	217	84	49	245	38	25
20-----	190	64	33	157	32	14	178	14	6.7
21-----	162	53	23	140	20	7.6	150	14	5.7
22-----	154	50	21	124	17	5.7	147	13	5.2
23-----	245	296	196	110	18	5.3	189	13	6.6
24-----	195	176	93	110	13	3.9	171	7	3.2
25-----	172	67	31	110	7	2.1	154	8	3.3
26-----	158	35	15	107	4	1.2	137	15	5.6
27-----	330	480	428	110	2	.6	130	12	4.2
28-----	225	152	92	107	10	2.9	168	11	5.0
29-----	215	234	136	182	148	73	267	27	19
30-----	190	190	97	272	62	46	326	33	29
31-----	235	350	222	217	20	12	--	--	--
Total-	5,858	--	2,220	4,452	--	684	5,090	--	479

Total discharge for year (second-foot-days) ----- 220,498

Total load for year (tons) ----- 408,183

1/Sediment discharge computed by subdividing day.

2/Estimated.

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT BERNE, PA.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment										Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500
Oct. 1, 1948	11:50 a. m.	172	518			12	33	82	94	96	97		98	DS	
Oct. 5	12:15 a. m.	120	178			38	56	70	78	86	90		95	DS	
Oct. 14	12:20 p. m.	132	263			25	75	99	99	--	--		--	DS	
Oct. 16	2:30 p. m.	120	656			5	11	19	27	45	85		99	DS	
Oct. 18	12:10 p. m.	310	1,720			5	13	37	93	98	99		--	DS	
Oct. 28	12:00 p. m.	144	296			20	66	83	96	97	99		--	DS	
Nov. 5	11:20 a. m.	310	1,370			5	15	33	84	95	98		99	DS	
Nov. 7	2:00 p. m.	1,430	6,320			2	6	9	67	87	98		--	DS	
Nov. 12	4:05 p. m.	315	236			18	47	71	83	94	--		--	DS	
Nov. 20	12:35 p. m.	1,500	4,410			1	3	10	44	63	93		99	DS	
Dec. 1	12:35 p. m.	594	404			8	22	61	83	89	96		--	DSW	
Dec. 6	11:30 a. m.	470	172			5	13	35	67	76	90		--	DSW	
Dec. 13	1:35 p. m.	482	108			5	18	44	80	90	96		--	DSW	
Dec. 21	1:05 p. m.	486	172			5	14	41	64	74	87		--	DSW	
Dec. 28	12:35 p. m.	379	70			2	11	35	65	76	86		--	DSW	
Dec. 30	12:45 p. m.	8,150	1,680			9	20	35	81	96	99		--	DSW	
Dec. 30	9:740	9,740	3,020			6	12	20	37	52	74		89	DSW	
Dec. 30	4:30 p. m.	9,740	3,230			6	11	19	37	52	67		81	DSW	
Dec. 31	1:25 p. m.	6,080	1,750			1	3	8	22	36	59		88	DSW	
Jan. 6, 1949	12:30 p. m.	6,750	1,630			5	8	11	16	23	39		69	DSW	
Jan. 17	10:55 a. m.	734	62			15	40	57	70	82	96		--	DSW	
Jan. 24	4:20 p. m.	1,060	154			11	30	51	71	82	91		--	DSW	
Feb. 2	12:00 m.	1,080	99			24	59	82	94	96	97		--	DSW	
Feb. 10	1:25 p. m.	734	230			14	41	81	96	97	99		--	DSW	
Feb. 14	2:55 p. m.	692	49			19	35	58	69	77	89		--	DSW	
Feb. 21	1:00 p. m.	1,170	90			7	19	38	55	69	81		92	DSW	
Mar. 1	10:00 a. m.	1,030	153			15	46	77	88	93	95		--	DSW	
Mar. 9	11:40 a. m.	587	87			14	38	68	80	85	92		--	DSW	
Mar. 15	11:35 a. m.	496	46			13	34	65	78	82	91		--	DSW	
Mar. 21	11:50 a. m.	63	414			11	37	68	81	90	94		--	DSW	
Mar. 28	12:00 p. m.	470	98			13	38	65	88	93	95		--	DSW	

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT BERNE, PA.--Continued

Particle-size analyses of suspended sediment, water, year October 1948 to September 1949--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; F, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment											Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters												
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000		
Apr. 4, 1949	1:35 p. m.	671	59														DSW
Apr. 6	11:05 a. m.	1,260	405			3	15	33	48	65	83			--	--	98	DSW
Apr. 6	11:05 a. m.	1,260	408			10	20	37	58	69	76			87	85	97	DSW
Apr. 12	12:35 p. m.	692	81			24	55	79	96	98	99			--	--	--	DSW
Apr. 14	10:50 a. m.	1,720	674			10	22	35	60	69	77			91	91	98	DSW
Apr. 14	10:50 a. m.	1,720	599			14	28	47	66	76	84			94	94	--	DSW
Apr. 19	1:50 p. m.	2,000	825			6	14	27	43	51	62			82	82	97	DSW
Apr. 28	11:20 a. m.	1,090	144			13	27	42	56	62	68			86	86	--	DSW
May 3	10:55 a. m.	926	106			14	36	54	70	75	81			89	--	--	DSW
May 10	10:00 a. m.	622	61			17	43	61	77	81	84			--	--	--	DSW
May 19	10:20 a. m.	402	52			18	52	78	97	98	99			--	--	--	DSW
May 23	8:10 p. m.	910	550			13	27	40	52	57	62			75	88	DSW	DSW
May 24	10:15 a. m.	776	229			17	36	56	79	90	96			100	--	--	DSW
June 6	12:50 p. m.	346	48			12	34	58	84	90	94			99	--	--	DSW
June 7	11:05 p. m.	330	52			19	49	74	95	97	99			95	--	--	DSW
June 11	10:25 a. m.	280	54			20	45	66	82	86	88			93	94	--	DSW
June 15	10:35 a. m.	240	36			21	48	71	93	97	99			--	--	--	DSW
June 16	2:15 p. m.	245	38			18	45	73	96	98	99			--	--	--	DSW
June 21	10:15 a. m.	220	52			19	49	81	96	98	99			--	--	--	DSW
June 28	9:55 a. m.	185	55			23	57	80	96	98	100			--	--	--	DSW
July 8	10:35 a. m.	144	34			20	43	63	74	76	78			82	82	--	DSW
July 13	12:45 p. m.	215	87			13	43	71	97	99	99			97	--	--	DSW
July 20	11:30 a. m.	200	50			28	56	82	98	99	--			--	--	--	DSW
July 26	1:15 p. m.	158	30			20	40	67	88	93	98			--	--	--	DSW
Aug. 2	12:50 p. m.	134	23			17	42	75	92	96	--			--	--	--	DSW
Aug. 8	12:45 p. m.	110	36			18	49	74	92	94	96			--	--	--	DSW
Aug. 18	1:50 p. m.	130	79			19	48	75	96	98	--			--	--	--	DSW
Sept. 6	1:00 p. m.	450	58			14	43	68	89	96	99			--	--	--	DSW
Sept. 19	11:00 a. m.	294	36			14	38	60	85	89	92			96	--	--	DSW

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT POTTSTOWN, PA.

LOCATION.--At gaging station at Hanover Street Bridge in Pottstown, Montgomery County, 70 feet from west bank of river, and a third of a mile downstream from Mantawny Creek.

DRAINAGE AREA.--17 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1949.

Water temperatures: March 1948 to September 1949.

EXTREMES 1948-49.--Dissolved solids: Maximum, 339 parts per million Aug. 21-31; minimum, 143 parts per million Jan. 1-10.

Total hardness: Maximum, 220 parts per million Sept. 11-20; minimum, 82 parts per million Jan. 1-10.

Water temperatures: Maximum, 83°F July 6, 30; minimum, freezing point Dec. 28.

Sediment loads: Maximum, 64,100 tons per day Dec. 31; minimum, 5 tons per day July 3.

EXTREMES 1944-49.--Dissolved solids: Maximum, 393 parts per million Oct. 11-20, 1944; minimum, 119 parts per million Mar. 1-10, 1945.

Total hardness: Maximum, 258 parts per million Oct. 11-20, 1944; minimum, 79 parts per million Mar. 1-10, 1945.

Water temperatures: Maximum, 85°F Aug. 29, 1948; minimum, freezing point on many days during winter months.

Sediment loads (1948-49): Maximum, 64,100 tons per day Dec. 31, 1948; minimum 5 tons per day July 3, 1949.

REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 1-10, 1948	641	6	6.6	474	12	0.11	48	19	16		64	149	14	0.1	6.5	322	198	145
Oct. 11-20	608	6	7.2	496	9.2	.04	51	21	14		62	160	13	.2	9.4	331	214	163
Oct. 21-31	542	5	6.7	488	8.4	.06	49	20	15		64	151	13	.2	9.7	320	204	152
Nov. 1-10	1,104	4	7.1	404	6.8	.04	39	16	14		48	128	9.8	.1	8.1	260	163	124
Nov. 11-20	1,013	3	6.3	420	10	.06	42	17	14		46	140	12	.2	6.3	284	175	137
Nov. 21-30	2,148	3	6.7	315	9.2	.04	31	12	13		33	101	12	.1	7.2	212	127	100
Dec. 1-10	1,586	4	6.3	335	10	.04	33	14	9.6		31	110	12	.1	4.6	228	140	115
Dec. 11-20	1,657	5	6.5	321	8.8	.06	32	13	9.2		32	105	8.2	.2	7.2	215	133	107
Dec. 21-31	4,281	5	7.1	287	12	.02	26	11	14		41	88	6.0	.1	8.0	190	110	77
Jan. 1-10, 1949	8,209	3	6.8	214	8.8	.03	20	7.9			26	64	3.5	.1	7.1	143	82	61
Jan. 11-20	2,557	6	7.2	303	9.2	.04	31	13			34	98	5.9	.2	9.2	205	131	103
Jan. 21-31	3,723	8	7.1	259	8.4	.04	26	10	7.4		34	76	5.2	.1	9.3	161	106	78
Feb. 1-10	2,945	5	6.7	259	8.4	.12	26	10	9.2		40		4.8	.1	7.3	172	106	73
Feb. 11-20	2,841	5	6.7	253	8.6	.12	27	10	6.5		42	73	4.5	.1	7.0	170	108	74
Feb. 21-28	3,945	5	6.7	220	11	.04	22	8.8	7.5		39	61	4.2	.2	6.9	147	91	59
Mar. 1-10	2,258	4	7.2	266	8.9	.18	29	11	8.2		44	79	6.2	.1	10	191	118	82
Mar. 11-20	1,567	4	7.2	314	8.6	.17	32	12	9.4		48	89	7.1	.0	8.4	213	129	80
Mar. 21-31	1,444	5	7.1	302	8.5	.22	31	12	7.1		46	84	6.8	.0	9.2	196	127	89

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT POTTSWOWN, PA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949.--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Apr. 1-10, 1949 -----	2,123	4	7.1	269	8.0	0.18	26	10		6.4	40	75	5.4	0.1	7.5	182	111	78
Apr. 11-20 -----	2,971	5	6.7	221	6.8	.08	24	8.9	3.2	3.2	36	61	4.2	.1	5.5	154	96	67
Apr. 21-30 -----	3,430	5	7.5	214	8.7	.10	21	8.1	6.8	6.8	30	63	4.2	.1	5.0	151	86	61
May 1-10 -----	2,083	5	6.8	275	8.7	.09	28	11	9.4	9.4	38	83	6.0	.1	5.4	193	110	79
May 11-20 -----	1,328	7	6.9	327	8.6	.06	32	13	10	10	42	100	8.0	.1	6.2	232	133	99
May 21-31 -----	1,822	7	6.8	294	8.5	.09	29	12	11	11	41	94	6.1	.1	5.5	214	122	88
June 1-10 -----	967	4	6.8	368	7.5	.04	38	15	11	11	44	120	9.8	.1	7.0	260	156	120
June 11-20 -----	750	13	6.8	422	7.6	.04	41	18	15	15	48	144	10	.1	7.5	286	176	137
June 21-30 -----	620	7	6.8	454	8.6	.08	46	19	16	16	50	153	13	.2	9.3	308	193	152
July 1-10 -----	460	8	6.9	458	8.5	.08	46	20	15	15	54	156	10	.2	9.6	310	197	153
July 11-20 -----	1,283	8	7.0	381	11	.10	36	16	14	14	56	118	8.4	.2	6.1	264	156	110
July 21-31 -----	839	8	7.1	360	8.2	.12	36	15	9.0	9.0	62	98	8.8	.1	6.9	246	152	101
Aug. 1-10 -----	512	4	7.2	448	9.3	.08	48	17	14	14	67	136	12	.1	7.6	292	190	135
Aug. 11-20 -----	419	6	7.2	503	11	.06	52	22	11	11	68	156	14	.1	7.3	334	220	164
Aug. 21-31 -----	411	6	7.1	505	14	.04	50	22	18	18	69	164	15	.1	7.4	339	215	159
Sept. 1-10 -----	542	9	7.0	480	7.6	.02	49	20	15	15	54	159	14	.2	8.9	316	204	160
Sept. 11-20 -----	454	9	7.0	485	6.0	.10	52	22	8.2	8.2	60	158	13	.2	6.9	307	220	171
Sept. 21-30 -----	454	9	7.0	508	6.0	.10	52	21	14	14	53	172	13	.1	7.0	325	216	173
Average -----	1,782	6	--	359	8.9	0.08	36	15	10	10	47	112	9.0	0.1	7.5	241	152	113

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT POTTSTOWN, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	56	41	34	33	37	50	58	65	78	77	74
2	68	54	42	38	35	37	49	61	62	78	78	66
3	60	56	42	39	33	39	50	62	67	81	80	68
4	56	55	44	37	35	39	52	63	68	82	80	70
5	54	61	46	39	39	45	49	66	72	82	80	72
6	54	58	47	40	40	44	49	69	75	83	78	74
7	58	57	46	40	38	46	48	65	73	78	79	70
8	60	55	45	43	38	37	48	61	69	77	78	73
9	58	53	42	45	39	39	49	62	68	80	80	66
10	60	54	41	44	40	40	49	66	68	81	81	62
11	61	52	39	43	39	39	48	61	76	80	81	63
12	59	49	40	41	38	37	56	58	79	78	80	66
13	59	50	44	39	39	40	55	62	62	72	82	67
14	58	49	44	40	40	39	49	63	77	75	80	68
15	60	48	40	37	45	42	54	67	76	78	79	71
16	--	47	40	39	43	39	48	67	76	78	75	70
17	57	48	39	44	41	41	50	68	75	77	75	66
18	--	49	38	42	40	40	49	68	76	75	74	70
19	51	47	38	45	39	39	48	71	78	77	75	73
20	52	55	34	42	42	37	46	71	80	78	68	67
21	49	54	33	39	45	43	51	63	82	79	73	68
22	49	47	35	41	43	46	55	65	80	80	74	65
23	51	48	37	38	--	52	55	67	79	79	71	65
24	50	47	34	40	43	47	51	64	81	80	74	64
25	53	50	33	42	44	49	50	64	81	79	73	65
26	51	53	--	41	43	53	53	62	79	80	73	63
27	58	55	--	40	42	51	58	59	80	81	75	60
28	57	53	32	39	41	52	60	64	78	82	77	67
29	58	47	33	39	--	50	56	66	75	82	82	66
30	56	42	35	37	--	52	55	69	77	83	75	64
31	57	--	37	35	--	51	--	68	--	79	76	--
Average	57	52	39	40	40	43	51	64	75	79	77	67

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT POTTSTOWN, PA.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	696	57	107	502	11	15	2,000	172	929
2-----	658	42	75	513	15	21	1,830	138	672
3-----	583	28	44	502	12	18	1,870	116	524
4-----	548	15	22	640	31	53	1,820	85	373
5-----	548	20	30	915	102	252	1,470	62	246
6-----	677	44	80	878	80	190	1,420	45	173
7-----	743	45	90	1,700	505	2,320	1,670	79	356
8-----	628	29	49	2,580	1,240	8,640	1,520	60	246
9-----	839	27	47	1,570	250	1,060	1,380	69	257
10-----	690	28	52	1,240	127	424	1,280	47	183
11-----	639	24	41	1,200	93	302	1,200	44	143
12-----	583	23	36	1,030	77	214	1,150	37	115
13-----	565	20	31	974	60	158	1,240	46	161
14-----	548	22	33	942	60	153	1,200	46	149
15-----	548	24	36	872	41	97	1,210	46	150
16-----	530	22	32	814	36	79	1,940	97	508
17-----	513	23	32	814	44	97	2,350	152	964
18-----	645	37	65	821	43	95	2,230	181	1,090
19-----	848	60	137	842	30	68	2,050	150	832
20-----	658	53	94	1,820	230	1,130	2,000	135	724
21-----	614	27	45	2,740	740	5,480	1,830	102	505
22-----	560	20	30	2,170	272	1,590	1,870	86	389
23-----	542	18	26	2,480	246	1,650	1,570	79	335
24-----	542	18	26	2,410	234	1,520	1,470	61	242
25-----	583	20	32	2,050	212	1,170	1,280	65	225
26-----	565	21	32	1,780	136	653	1,070	41	119
27-----	530	17	24	1,870	119	537	980	41	109
28-----	496	18	24	1,720	136	632	1,110	32	96
29-----	508	21	29	2,110	166	945	1,510	88	359
30-----	513	20	28	2,350	230	1,460	12,200	1,580	52,000
31-----	513	17	24	--	--	--	22,400	1,060	64,100
Total-	18,451	--	1,450	42,649	--	31,020	79,520	--	127,300
Day	January			February			March		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	11,100	721	21,600	3,780	240	2,440	3,000	188	1,520
2-----	6,970	1,390	26,200	3,280	208	1,840	2,740	162	1,200
3-----	5,130	532	7,370	2,800	231	1,750	2,480	166	1,110
4-----	4,050	290	3,170	2,740	267	1,980	2,350	168	1,070
5-----	5,060	455	6,220	2,860	229	1,770	2,230	162	975
6-----	19,000	1,040	53,400	2,670	128	923	2,170	187	1,100
7-----	12,700	560	19,200	2,740	264	1,950	2,170	166	972
8-----	7,790	542	11,400	3,000	336	2,720	1,880	180	913
9-----	5,640	420	6,400	2,800	225	1,700	1,780	99	475
10-----	4,650	234	2,940	2,800	264	2,000	1,780	110	529
11-----	3,900	342	3,600	2,670	189	1,380	2,000	81	437
12-----	3,410	308	2,840	2,410	272	1,770	1,940	85	446
13-----	3,060	273	2,250	2,290	178	1,100	1,670	85	383
14-----	2,740	245	1,810	2,600	151	1,060	1,570	70	297
15-----	2,410	228	1,480	2,670	183	1,320	1,520	85	348
16-----	2,230	231	1,390	3,000	348	2,820	1,420	97	373
17-----	2,110	259	1,470	3,280	287	2,540	1,380	83	310
18-----	2,000	216	1,170	2,930	332	2,630	1,420	76	292
19-----	1,880	176	894	2,800	325	2,460	1,420	68	281
20-----	1,830	164	810	3,760	474	4,810	1,330	47	169
21-----	1,720	116	540	3,900	372	3,920	1,330	70	251
22-----	2,670	768	5,540	3,620	180	1,760	1,380	64	238
23-----	2,350	272	1,730	4,970	564	7,570	1,780	183	880
24-----	2,860	408	3,150	4,500	298	3,620	1,670	97	437
25-----	3,060	350	2,890	4,200	343	3,890	1,470	42	167
26-----	3,470	448	4,200	3,900	396	4,170	1,470	42	167
27-----	4,350	476	5,590	3,340	218	1,970	1,470	46	183
28-----	5,640	388	5,910	3,130	224	1,890	1,420	66	253
29-----	5,820	832	13,100	--	--	--	1,330	38	136
30-----	4,810	550	7,140	--	--	--	1,280	38	131
31-----	4,200	356	4,040	--	--	--	1,280	42	145
Total-	148,610	--	229,400	89,420	--	69,730	54,130	--	16,170

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT POTTSTOWN, PA.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,700	143	656	2,110	94	535	1,200	34	110
2-----	2,170	204	1,200	2,350	169	1,070	1,150	39	121
3-----	1,880	157	796	2,480	154	1,030	1,070	29	84
4-----	1,780	136	653	2,290	185	1,210	1,010	50	136
5-----	1,670	70	316	1,880	176	894	974	22	58
6-----	2,230	162	975	2,050	92	510	966	26	68
7-----	2,740	306	2,260	2,170	122	716	880	26	62
8-----	2,480	236	1,580	1,940	105	551	835	23	52
9-----	2,410	239	1,560	1,780	109	524	807	20	43
10-----	2,170	171	1,000	1,780	58	278	779	18	38
11-----	1,940	140	734	1,670	81	364	779	12	25
12-----	1,830	102	505	1,520	32	131	785	22	45
13-----	1,830	104	513	1,420	49	188	758	12	25
14-----	3,180	348	2,990	1,330	37	133	723	16	31
15-----	3,280	353	3,130	1,280	32	111	695	19	36
16-----	2,740	187	1,380	1,280	40	138	709	15	29
17-----	2,350	204	1,290	1,200	30	97	730	16	32
18-----	2,410	204	1,330	1,110	28	84	744	20	40
19-----	5,340	892	12,900	1,110	28	84	779	17	36
20-----	4,810	459	5,960	1,380	64	235	821	25	55
21-----	4,050	285	3,120	2,110	177	1,010	730	14	28
22-----	3,550	302	2,890	1,670	71	321	642	14	24
23-----	4,810	701	9,100	2,290	180	1,110	617	12	20
24-----	4,350	314	3,690	2,230	161	969	580	13	20
25-----	3,760	272	2,760	2,110	104	591	557	19	29
26-----	3,340	221	1,990	2,000	70	378	636	28	48
27-----	3,060	157	1,300	1,880	68	348	744	22	44
28-----	2,800	144	1,090	1,620	51	223	617	16	27
29-----	2,410	153	996	1,470	40	159	551	15	22
30-----	2,170	110	645	1,380	50	186	528	10	14
31-----	--	--	--	1,280	31	107	--	--	--
Total-	85,240	--	69,310	54,150	--	14,280	23,376	--	1,400
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	511	12	17	662	15	27	517	27	38
2-----	462	13	16	574	13	20	400	18	19
3-----	232	8	5	511	19	26	360	7	7
4-----	434	14	16	551	25	37	350	9	8
5-----	474	34	43	580	21	33	360	15	15
6-----	518	59	83	528	15	21	846	153	348
7-----	562	75	114	474	14	18	1,070	122	354
8-----	490	46	61	443	35	42	598	39	83
9-----	469	43	55	419	8	9	490	28	37
10-----	448	45	55	381	9	9	429	17	20
11-----	469	44	56	324	8	7	381	16	16
12-----	511	42	58	368	9	9	377	17	17
13-----	1,960	555	2,940	400	8	9	424	19	22
14-----	1,140	128	394	419	18	20	506	30	41
15-----	960	79	205	458	21	28	534	28	40
16-----	1,260	64	218	419	10	11	528	21	30
17-----	786	45	96	400	12	13	443	17	20
18-----	1,970	289	1,540	400	11	12	400	14	15
19-----	2,170	270	1,580	469	16	20	361	15	15
20-----	1,600	112	403	534	27	39	568	31	48
21-----	1,150	58	180	419	11	12	448	12	15
22-----	1,060	52	149	381	9	9	400	10	11
23-----	835	36	81	377	7	7	400	14	15
24-----	807	26	57	354	15	14	438	18	21
25-----	695	22	41	359	11	11	409	10	11
26-----	605	20	33	337	16	15	372	9	9
27-----	949	98	251	329	8	7	363	7	7
28-----	1,110	63	189	337	9	8	377	8	8
29-----	800	40	86	448	15	18	469	17	22
30-----	662	13	23	568	28	43	865	57	133
31-----	557	11	17	611	42	69	--	--	--
Total-	26,656	--	9,140	13,834	--	621	14,503	--	1,420

Total discharge for year (second-foot-days) ----- 650,539

Total load for year (tons) ----- 571,241

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT MANAYUNK, PHILADELPHIA, PA.

LOCATION.--At Green Lane Avenue Bridge at Manayunk, Philadelphia County, 5 miles upstream from gaging station at Fairmount Dam.

DRAINAGE AREA.--1,893 square miles above Fairmount Dam.

RECORDS AVAILABLE.--Sediment records: November 1947 to September 1949.

EXTREMES, 1948-49.--Sediment loads: Maximum, 482,100 tons per day Dec. 30; minimum, 12 tons per day Aug. 28.

EXTREMES, 1947-49.--Sediment loads: Maximum, 482,100 tons per day Dec. 30, 1948; minimum, 12 tons per day Aug. 28, 1949.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 based on records for Schuylkill River at Philadelphia (Fairmount Dam), which are given in Water-Supply Paper 1141, and includes water diverted by the City of Philadelphia for municipal water supply.

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,280	27	93	712	25	48	3,180	64	551
2-----	1,110	22	66	696	41	77	2,670	41	294
3-----	959	25	65	691	28	52	2,400	32	207
4-----	820	25	55	855	27	62	2,810	25	190
5-----	829	26	58	870	29	68	2,510	13	88
6-----	871	25	59	1,100	49	146	2,180	18	106
7-----	971	22	58	1,540	37	154	2,060	22	122
8-----	1,030	23	64	2,900	228	1,780	2,300	20	124
9-----	913	26	64	2,440	75	494	2,050	18	100
10-----	884	20	48	1,810	32	156	1,880	15	76
11-----	916	27	67	1,490	20	80	1,760	13	62
12-----	907	28	69	1,400	17	64	1,670	10	45
13-----	817	27	60	1,270	13	45	1,670	13	59
14-----	824	27	60	1,190	12	39	1,690	18	82
15-----	764	24	49	1,120	12	36	1,750	11	52
16-----	757	19	39	1,060	13	37	2,800	23	174
17-----	765	24	50	1,010	13	35	5,040	280	3,810
18-----	803	23	50	1,020	13	36	4,130	91	1,020
19-----	897	25	60	1,040	12	34	3,440	40	373
20-----	1,110	29	87	1,510	16	65	3,120	32	269
21-----	962	17	44	2,870	92	713	2,900	28	219
22-----	849	6	14	2,920	107	842	2,660	23	165
23-----	774	10	21	2,530	68	464	2,490	24	161
24-----	769	17	35	2,930	93	734	2,290	1/19	117
25-----	766	18	37	2,550	91	626	2,040	1/10	55
26-----	787	20	42	2,280	42	260	1,790	1/30	145
27-----	768	17	35	2,260	25	153	1,320	1/13	46
28-----	740	15	30	2,280	21	129	1,210	8	26
29-----	736	18	36	3,370	77	699	1,700	1/100	459
30-----	693	8	15	4,010	140	1,510	29,000	4,910	2/482,100
31-----	722	11	21	--	--	--	35,700	2,300	2/233,900
Total-	26,793	--	1,550	53,734	--	9,640	134,210	--	725,200

1/Estimated.

2/Sediment discharge computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT MANAYUNK, PHILADELPHIA, PA.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	16,600	1,280	57,400	6,150	265	4,400	4,660	48	605
2-----	9,510	1,020	26,200	5,340	100	1,440	4,350	42	494
3-----	7,300	450	8,870	4,540	97	1,190	4,000	57	618
4-----	5,810	300	4,710	4,540	92	1,130	3,850	51	529
5-----	5,830	170	2,680	5,100	108	1,490	3,780	42	427
6-----	32,000	2,416	2/226,200	5,070	80	1,100	3,710	16	160
7-----	18,500	830	41,500	5,380	112	1,630	3,470	35	327
8-----	10,800	700	20,400	6,980	320	6,010	3,220	40	348
9-----	8,250	583	13,000	5,380	125	1,810	2,940	29	230
10-----	6,890	296	5,350	5,080	97	1,310	2,820	25	190
11-----	5,800	137	2,150	4,760	66	848	3,120	23	194
12-----	5,010	125	1,690	4,180	60	678	3,470	30	281
13-----	4,530	115	1,410	3,930	54	572	2,940	13	103
14-----	4,120	87	967	4,660	64	805	2,660	17	122
15-----	3,740	70	707	4,620	60	748	2,530	14	96
16-----	3,280	54	478	4,650	60	753	2,390	16	103
17-----	3,240	50	437	5,900	160	2,550	2,260	19	116
18-----	3,010	45	364	5,000	113	1,530	2,310	18	112
19-----	2,900	42	329	4,370	67	791	2,310	20	125
20-----	2,820	38	289	6,830	296	5,460	2,270	13	80
21-----	2,780	40	300	6,980	349	6,580	2,180	15	88
22-----	7,180	280	5,610	5,740	164	2,540	2,360	20	127
23-----	5,500	135	2,000	9,040	528	12,900	5,150	288	4,000
24-----	5,970	157	2,530	7,240	315	6,160	4,360	174	2,050
25-----	5,750	113	1,760	6,290	105	1,780	3,110	48	402
26-----	5,690	109	1,670	5,960	145	2,330	2,700	20	146
27-----	9,830	492	13,100	5,220	76	1,070	2,620	9	64
28-----	13,000	869	2/32,900	4,810	73	948	2,510	13	88
29-----	10,200	544	15,000	--	--	--	2,310	9	58
30-----	7,980	320	6,900	--	--	--	2,180	10	59
31-----	6,600	260	4,630	--	--	--	2,100	6	34
Total-	240,200	--	501,500	153,700	--	70,550	94,620	--	12,370
Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2,520	13	89	2,900	35	275	1,770	83	397
2-----	3,960	78	834	3,090	25	208	1,650	25	111
3-----	3,400	29	266	3,590	37	359	1,560	12	50
4-----	2,890	31	242	3,460	32	300	1,460	11	43
5-----	2,660	21	151	2,850	28	215	1,360	27	99
6-----	3,460	48	448	2,660	23	165	1,340	12	43
7-----	4,260	77	891	3,070	32	265	1,300	12	42
8-----	3,840	60	621	3,050	22	181	1,180	13	41
9-----	3,590	50	486	2,550	22	151	1,040	15	42
10-----	3,220	31	269	2,560	22	152	965	13	34
11-----	2,920	33	260	2,650	19	136	1,010	10	27
12-----	2,740	24	178	2,390	1/14	90	989	7	19
13-----	2,700	18	131	2,150	10	58	992	9	24
14-----	3,630	64	626	1,920	10	52	964	14	36
15-----	4,520	128	1,580	1,840	5	25	912	15	37
16-----	3,800	97	996	1,780	10	48	885	17	40
17-----	3,330	63	567	1,750	10	47	879	18	43
18-----	3,200	35	302	1,660	8	36	937	16	40
19-----	6,720	278	5,040	1,520	9	37	956	19	49
20-----	7,180	413	8,010	1,570	11	47	1,030	16	45
21-----	5,580	225	3,380	2,120	36	206	1,070	14	40
22-----	4,760	218	2,780	2,740	53	392	988	14	37
23-----	5,840	265	4,180	3,280	81	716	868	15	36
24-----	6,340	133	2,280	3,590	93	902	831	19	43
25-----	5,400	126	1,840	3,230	58	505	810	14	31
26-----	4,600	88	1,090	2,980	37	297	784	10	21
27-----	4,150	62	694	2,880	27	210	863	28	65
28-----	3,840	71	737	2,660	31	223	933	110	278
29-----	3,450	42	392	2,260	18	110	826	25	56
30-----	3,100	30	251	2,050	16	89	767	13	27
31-----	--	--	--	1,880	33	167	--	--	--
Total-	121,600	--	39,590	78,690	--	6,670	31,939	--	1,900

1/Estimated.

2/Sediment discharge computed by subdividing day.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT MANAYUNK, PHILADELPHIA, PA.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	753	17	35	889	24	58	873	19	45
2-----	755	16	33	880	26	62	734	14	28
3-----	703	23	44	858	21	49	618	16	27
4-----	584	22	35	1,030	17	47	526	12	17
5-----	516	24	33	1,150	24	75	491	32	42
6-----	717	27	52	1,000	23	62	1,490	120	483
7-----	948	36	92	840	23	52	1,780	102	491
8-----	913	22	54	791	32	66	1,220	53	175
9-----	731	22	43	705	37	70	743	38	76
10-----	705	8	15	691	24	45	638	30	52
11-----	681	13	24	625	24	40	583	38	60
12-----	788	146	310	567	23	35	540	29	42
13-----	3,480	408	3,830	568	15	23	612	25	41
14-----	3,180	185	1,590	567	13	20	654	23	40
15-----	1,590	48	206	655	21	37	728	21	41
16-----	1,430	41	158	678	20	37	674	22	40
17-----	1,500	32	130	674	17	31	535	26	38
18-----	1,500	34	138	654	18	32	642	14	24
19-----	2,930	79	624	607	22	36	601	27	44
20-----	2,500	48	324	707	18	34	500	41	55
21-----	1,840	38	189	678	24	44	625	28	47
22-----	1,740	32	150	598	24	39	620	35	59
23-----	1,430	27	104	643	16	31	748	46	93
24-----	1,150	25	78	617	11	16	589	30	48
25-----	1,090	18	53	546	16	24	584	16	25
26-----	956	30	77	494	22	29	570	22	34
27-----	1,200	43	139	533	18	26	475	31	40
28-----	2,020	42	229	535	8	12	527	26	37
29-----	1,550	25	105	846	28	64	600	25	40
30-----	1,120	13	39	720	20	39	875	31	56
31-----	873	12	32	1,020	18	50	--	--	--
Total-	41,973	--	8,960	22,364	--	1,290	21,192	--	2,340

Total discharge for year (second-foot-days) ----- 908,294
 Total load for year (tons) ----- 1,408,560

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BELMONT FILTERS, PHILADELPHIA, PA.

LOCATION --At Belmont Filters, Philadelphia, Philadelphia County, 1.6 miles upstream from gaging station at Fairmount Dam in Philadelphia.
DRAINAGE AREA --1,890 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1945 to September 1949.

Water temperatures: October 1945 to September 1949.

EXTREMES 1948-49 --Dissolved solids: Maximum, 316 parts per million Sept. 21-30; minimum, 123 parts per million Jan. 1-10.
Total hardness: Maximum, 205 parts per million Sept. 21-30; minimum, 73 parts per million Jan. 1-10.
Water temperatures: Maximum, 85°F Aug. 1; minimum, 34°F on several days in December and January.

EXTREMES 1944-49 --Dissolved solids: Maximum, 358 parts per million Oct. 11-20, 1947; minimum, 123 parts per million Feb. 21-29, 1948, Jan. 1-10, 1949.
Total hardness: Maximum, 215 parts per million Oct. 11-20, 1947; minimum, 73 parts per million Jan. 1-10, 1949.

Water temperatures: Maximum, 85°F Aug. 1, 1949; minimum, freezing point on many days during winter months.

REMARKS --Samples collected at raw-water intake on west side of river at Belmont Filters by City of Philadelphia. Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 based on records for Schuylkill River at Philadelphia, which are given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 1-10, 1948	552	4	6.8	421	9.6	0.08	40	18	19			88	104	0.2	5.3	282	166	94
Oct. 11-20	538	4	6.8	447	11	.12	43	17	15			91	104	.3	5.5	287	177	103
Oct. 21-31	463	4	6.6	455	9.2	.04	44	18	16			84	115	.2	8.6	285	184	115
Nov. 1-10	1,086	5	6.1	533	7.2	.04	42	17	16			83	108	.2	8.8	273	175	107
Nov. 11-20	568	4	6.6	368	8.2	.04	37	13	12			64	100	.1	6.8	236	154	102
Nov. 21-30	2,508	4	7.1	310	8.8	.12	31	13	7.4			49	85	.1	6.6	202	131	91
Dec. 1-10	2,100	4	6.4	307	9.6	.04	30	13	9.0			51	84	.2	4.9	201	128	87
Dec. 11-20	2,412	5	6.7	313	10	.04	31	13	9.1			49	86	.2	8.1	203	131	91
Dec. 21-31	7,249	3	7.1	289	12	.04	28	12	9.1			50	74	.2	8.1	180	119	78
Jan. 1-10, 1949	11,820	10	7.0	189	8.3	.07	18	6.9	10			39	48	.2	7.0	123	73	41
Jan. 11-20	3,528	6	7.2	277	9.0	.04	28	11	8.2			43	77	.1	9.3	183	115	80
Jan. 21-31	6,994	10	6.9	232	10	.05	23	8.9	7.5			39	60	.1	8.2	153	94	62
Feb. 1-10	5,022	8	6.7	231	10	.24	22	9.3	9.2			46	59	.1	6.7	155	93	55
Feb. 11-20	4,579	5	6.8	244	11	.06	24	9.7	8.5			49	61	.0	6.9	162	100	60
Feb. 21-28	6,112	6	7.4	215	10	.23	21	8.1	7.1	1.7		45	51	.1	7.6	135	86	49
Mar. 1-10	3,372	4	7.2	215	10	.25	26	9.1	3.4			51	52	.1	9.0	145	105	63
Mar. 11-20	2,866	6	7.1	286	11	.24	28	11	10			56	66	.1	10	187	115	69
Mar. 21-31	2,569	6	7.1	276	12	.11	27	10	10			58	61	.2	8.2	180	108	61
Apr. 1-10	3,086	6	7.3	258	11	.12	26	9.9	7.3			52	60	.2	7.5	169	106	63
Apr. 11-20	3,782	6	6.9	235	9.4	.09	23	8.7	7.9			48	55	.1	5.8	169	93	54
Apr. 21-30	4,415	6	6.9	211	9.3	.08	20	7.7	8.6			42	52	.1	4.5	150	82	47
May 1-10	2,687	7	6.9	255	9.8	.08	25	9.7	9.1			48	66	.1	5.3	187	102	63
May 11-20	1,633	3	7.0	296	7.5	.06	30	12	8.9			58	75	.1	6.0	204	124	77
May 21-31	2,403	5	7.0	274	8.1	.08	28	11	7.8			54	68	.1	6.0	190	115	71

DELAWARE RIVER BASIN--Continued
SCHUYLKILL RIVER AT BELMONT FILTERS, PHILADELPHIA, PA.--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued										Hardness as CaCO ₃			
					Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Total	Non-carbonate
June 1-10, 1949	1,058	5	6.9	329	7.8	0.06	32	14	11		60	89	9.6	0.2	7.4	218	137	88
June 11-20	654	7	6.8	395	8.0	.04	38	17	13		72	105	13	.2	6.3	259	165	106
June 21-30	544	8	6.8	410	8.2	.06	39	18	10		76	100	14	.2	8.5	267	171	109
July 1-10	416	7	6.9	429	7.8	.04	41	18	17		80	114	15	.3	8.0	282	176	111
July 11-20	1,654	5	7.1	334	12	.10	32	13	13		64	85	11	.1	7.1	228	133	81
July 21-31	1,043	5	7.1	316	8.6	.10	30	12	13		73	70	11	.1	6.0	210	124	64
Aug. 1-10	555	7	7.3	383	9.2	.06	40	16	8.2		82	87	14	.2	6.7	235	166	98
Aug. 11-20	306	7	7.3	447	8.4	.08	43	18	17		89	110	18	.2	5.6	277	181	108
Aug. 21-31	337	8	6.9	485	8.4	.08	46	20	81		81	132	18	.1	6.1	303	197	131
Sept. 1-10	595	7	7.2	429	8.7	.04	42	17	14		77	109	16	.2	6.4	268	175	112
Sept. 11-20	282	7	7.2	444	9.8	.08	44	19	10		81	111	16	.2	6.5	277	188	122
Sept. 21-30	286	7	7.0	476	4.9	.10	46	22	9.8		80	122	20	.2	6.4	316	205	140
Average	1/2,488	6	--	331	9.3	0.08	32	13	12		63	83	11	0.2	7.0	216	133	82

1/Does not include average daily discharge of 309 second feet diverted by City of Philadelphia for municipal water supply.

DELAWARE RIVER BASIN--Continued

SCHUYLKILL RIVER AT BELMONT FILTERS, PHILADELPHIA, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	53	45	34	38	42	52	59	63	76	85	75
2	65	53	44	34	36	40	53	61	65	76	84	77
3	67	53	44	34	35	39	54	52	66	76	83	74
4	67	53	44	34	35	39	52	62	68	77	83	75
5	66	54	42	34	36	39	52	62	70	78	82	74
6	65	54	43	34	36	39	51	65	73	83	81	75
7	60	54	44	35	36	41	50	68	74	82	80	75
8	59	55	44	35	37	42	50	68	75	82	81	74
9	59	59	42	35	38	43	45	70	74	82	81	74
10	59	58	42	36	38	44	50	69	73	--	81	71
11	59	56	42	37	38	45	50	68	72	--	83	70
12	59	55	42	--	38	45	50	68	72	77	84	69
13	66	54	--	36	38	43	51	64	72	77	82	68
14	--	54	40	36	40	46	52	65	74	77	82	68
15	65	52	41	36	37	40	52	63	73	76	82	68
16	60	50	41	35	38	41	52	63	73	77	--	70
17	59	48	41	35	38	41	52	63	73	78	--	71
18	59	48	--	35	40	47	52	63	73	78	--	74
19	56	48	40	--	44	41	55	64	76	78	77	76
20	57	48	39	36	42	40	54	67	75	81	75	70
21	57	48	--	35	--	40	52	70	77	81	77	63
22	55	48	37	43	--	40	52	69	77	82	75	71
23	57	51	36	37	--	40	52	66	80	76	75	70
24	53	51	36	35	43	41	54	65	80	83	76	69
25	53	51	36	36	43	41	55	65	79	83	75	67
26	52	50	38	36	43	40	55	66	80	82	75	66
27	52	48	35	38	43	44	55	66	80	83	75	65
28	52	--	34	36	--	45	55	63	82	83	76	64
29	52	48	35	35	--	46	55	62	78	83	78	65
30	52	47	34	43	--	50	58	62	78	85	78	65
31	53	--	34	40	--	51	--	61	--	86	78	--
Average	59	52	40	36	--	42	52	64	74	80	79	70

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT DREHERSVILLE, PA.

LOCATION.--At highway bridge at Dreherstown, Schuylkill County, 700 feet downstream from gaging station, 2½ miles downstream from Indian Run, and 5½ miles upstream from mouth.

DRAINAGE AREA.--122 square miles.

RECORDS AVAILABLE.--Chemical analyses: December 1947 to September 1949.

Sediment records: October 1947 to September 1949.

EXTREMES, 1948-49.--Sediment loads: Maximum, 19,390 tons per day Dec. 28; minimum, 1.2 tons per day July 9.

EXTREMES, 1947-49.--Sediment loads: Maximum, 23,130 tons per day Nov. 8, 1947; minimum, 1.2 tons per day July 9, 1949.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 available in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1, 1948	59	68	1	3.70	921	4.5	17	0.39	5.4	88	44	8.0		0	504	6.0	0.0	0.6	748	516	516	223
Oct. 5	50	52	1	3.80	936	7.5	21	2.9	5.7	82	45	7.3		0	516	8.0	0.0	0.4	828	533	533	150
Oct. 14	50	--	1	3.75	1,010	8.0	25	1.1	6.9	93	48	3.1		0	587	4.0	0.0	1.7	864	590	590	225
Oct. 21	52	48	1	3.85	851	7.5	19	2.6	4.8	76	40	11		0	468	9.0	0.0	0.3	724	476	476	170
Oct. 27	52	55	1	3.70	1,040	8.0	19	2.6	6.4	98	51	13		0	578	6.0	0.0	1.2	884	582	582	228
Nov. 4	104	56	1	3.50	914	5.5	17	5.4	5.2	68	38	3.3		0	433	12	0.0	0.3	692	461	461	116
Nov. 9	115	49	1	3.95	606	9	14	2.8	3.3	46	28	--		0	287	5.0	0.0	0.5	470	320	320	128
Nov. 17	86	49	1	3.70	765	5.0	14	1.2	4.0	68	34	3.4		0	388	6.0	0.0	0.2	599	405	405	150
Nov. 23	283	45	1	4.25	285	7.0	3.0	1.2	1.5	23	13	2.0		0	127	3.0	0.0	0.6	203	133	133	48
Nov. 30	198	42	1	3.90	440	5.5	6.2	1.5	1.9	32	18	5.4		0	192	7.0	0.0	0.6	302	198	198	96
Dec. 8	169	42	1	3.90	500	6.5	12	1.1	2.0	33	17	4.7		0	218	6.0	0.0	4.9	302	229	229	94
Dec. 14	150	--	1	3.85	578	6.5	11	1.5	2.8	42	18	15		0	263	5.0	0.0	4.3	374	253	253	106
Dec. 20	162	32	3	3.65	517	5.5	10	1.6	2.3	33	18	3.1		0	215	5.0	0.0	4.5	304	228	228	92
Dec. 26	132	41	1	3.90	563	5.5	15	2.1	3.0	46	26	8.1		0	315	8.0	0.0	0.2	501	317	317	106
Jan. 6, 1949	1,770	41	4	3.80	446	8.5	1.1	6.6	1.6	13	7.4	1.2		0	186	2.0	0.0	0.9	125	80	80	40
Jan. 11	253	42	3	3.70	416	8.5	9.6	2.5	1.9	128	17	2.9		0	196	3.0	0.0	3.0	254	206	206	76
Jan. 18	265	43	3	3.70	577	8.5	10	3.8	2.7	38	24	3.5		0	253	3.5	0.0	3.6	363	266	266	99
Jan. 26	360	43	3	3.80	402	8.8	6.8	1.9	2.0	35	15	2.2		0	194	3.0	0.0	4.9	342	174	174	65
Feb. 2	375	34	2	3.90	371	7.0	7.2	2.3	1.7	24	13	2.7		0	153	4.0	0.0	5.2	321	163	163	67
Feb. 10	279	34	4	3.85	494	9.0	8.0	0.9	2.3	33	20	4.1		0	206	9.0	0.0	3.8	221	221	221	74
Feb. 16	370	42	1	3.95	369	8.8	7.3	1.2	2.3	24	14	1.7		0	156	4.0	0.0	2.8	220	167	167	68
Feb. 22	410	38	3	4.00	328	6.5	5.4	1.4	1.5	22	12	2.3		0	133	4.0	0.0	4.2	200	143	143	58
Mar. 4	271	39	4	4.00	447	9.0	5.9	2.1	2.3	32	18	6.6		0	194	5.0	0.0	2.0	204	196	196	71
Mar. 9	218	44	1	3.95	463	11	6.4	1.6	2.1	33	20	4.7		0	203	5.0	0.0	1.8	295	210	210	82
Mar. 15	191	37	1	3.80	522	10	9.0	1.6	2.9	35	22	2.6		0	235	3.5	0.0	2.2	342	246	246	92
Mar. 22	138	48	1	3.85	517	10	10	1.5	2.5	34	22	2.8		0	233	3.5	0.0	2.0	342	243	243	100
Mar. 28	156	59	3	3.80	566	11	13	1.5	3.0	37	24	--		0	258	5.0	0.0	2.7	375	277	277	96

Apr. 7	326	44	3	4.00	364	6.4	7.1	.10	1.8	24	12	4.0	0	153	3.0	.0	3.2	288	157	157	62
Apr. 11	271	54	4	4.00	351	3.8	6.8	.11	1.7	20	13	3.1	0	145	2.5	.0	2.4	256	150	150	58
Apr. 19	782	48	5	4.15	195	6.4	3.4	.07	1.6	11	5.9	--	0	75	3.5	.0	3.2	123	75	75	36
Apr. 27	452	83	4	3.95	340	7.2	5.2	.14	1.6	21	12	4.4	0	138	2.0	.0	2.7	220	139	139	52
May 3	334	84	2	4.15	359	8.6	5.7	.07	1.7	24	14	3.3	0	152	2.0	.0	2.1	242	156	156	48
May 11	255	53	3	3.80	458	8.8	6.6	.11	2.3	31	17	3.7	0	169	4.0	.0	2.7	326	197	197	78
May 19	162	70	3	3.85	599	10	13	.15	3.0	42	25	2.4	0	280	3.5	.1	1.8	437	293	293	95
May 25	375	63	4	4.05	313	7.6	5.0	.18	1.5	20	11	4.5	0	129	3.0	.0	1.8	198	130	130	50
June 1	201	64	5	3.80	511	8.4	7.9	.51	2.6	35	20	7.3	0	229	2.5	.0	2.2	364	228	228	88
June 8	130	63	4	3.75	661	12	15	.84	3.4	45	26	6.3	0	313	4.0	.0	3.0	486	320	320	112
June 17	99	76	2	4.20	822	12	18	.49	4.1	56	34	13	0	330	6.5	.0	4.5	599	391	391	158
June 23	91	72	2	4.20	877	13	19	.69	4.5	61	36	10	0	413	6.0	.0	3.2	639	419	419	138
June 29	66	75	2	3.55	831	14	20	.34	4.8	54	31	4.6	0	361	5.0	.0	4.5	594	397	397	148
July 7	66	78	3	3.60	913	15	18	.84	5.2	70	35	4.9	0	426	6.0	.0	1.8	696	443	443	150
July 13	88	71	5	3.40	943	14	18	.35	4.9	69	35	12	0	444	7.0	.0	9.6	680	447	447	162
July 19	94	78	5	3.60	735	11	11	.23	4.1	55	28	11	0	337	5.0	.0	5.0	542	334	334	114
July 25	68	79	5	4.05	1,050	16	26	.39	7.0	77	44	17	0	557	6.0	.0	1.8	854	536	536	200
Aug. 3	59	72	7	4.05	1,100	16	19	.58	6.2	84	50	12	0	568	6.0	.0	.2	870	538	538	159
Aug. 10	50	78	5	3.90	1,120	16	25	1.0	6.1	82	49	13	0	574	7.0	.0	.2	859	565	565	218
Aug. 17	59	76	5	4.20	973	16	17	.50	5.7	75	45	14	0	513	8.0	.0	.2	806	582	582	175
Aug. 26	48	64	5	3.90	1,130	16	24	.96	6.3	90	51	12	0	561	5.0	.0	5.4	888	588	588	175
Sept. 1	61	69	6	4.05	1,020	16	23	.85	5.9	84	44	15	0	545	5.0	.0	7.9	822	536	536	184
Sept. 7	68	61	6	3.50	969	15	21	.31	5.3	78	34	13	0	471	7.0	.0	7.9	780	478	478	158
Sept. 14	78	73	5	3.60	857	12	17	.19	--	71	--	--	0	417	--	--	--	--	--	--	190
Sept. 20	59	63	5	3.70	926	16	24	.24	5.8	66	41	14	0	461	7.0	.0	3.4	756	468	468	190
Sept. 27	45	60	10	3.40	1,150	12	23	.48	7.0	81	51	25	0	584	9.0	.0	6.4	514	575	575	222

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT DREHERSVILLE, PA.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	59	910	145	41	60	6.6	172	820	381
2-----	54	850	124	43	52	6.0	162	525	230
3-----	48	420	55	37	55	5.5	156	975	410
4-----	39	210	22	104	2,120	594	150	510	207
5-----	50	640	86	86	960	223	138	360	134
6-----	78	2,100	443	61	400	66	188	892	454
7-----	59	615	98	287	5,220	1/4,960	185	780	389
8-----	61	680	112	138	950	354	169	535	244
9-----	78	950	200	115	600	186	169	645	294
10-----	61	555	92	124	862	289	166	640	286
11-----	43	240	28	102	730	201	153	422	174
12-----	57	325	50	84	300	68	153	345	143
13-----	52	370	52	86	385	89	162	450	197
14-----	50	495	67	81	715	156	150	542	220
15-----	48	375	49	76	1,800	370	147	570	226
16-----	48	560	73	78	635	134	169	725	332
17-----	52	392	55	86	620	144	198	910	486
18-----	94	2,730	694	84	520	118	169	610	278
19-----	74	420	84	96	1,240	321	159	488	210
20-----	59	345	55	410	5,170	5,720	162	455	199
21-----	52	282	40	275	3,060	2,270	147	445	177
22-----	52	278	39	240	1,620	1,050	144	580	225
23-----	52	330	46	283	1,900	1,450	141	525	200
24-----	50	345	46	229	1,375	850	135	572	208
25-----	45	125	15	211	1,130	643	138	340	127
26-----	52	165	23	178	760	364	107	355	103
27-----	52	265	37	188	695	354	110	75	22
28-----	52	318	45	166	565	253	132	255	91
29-----	52	440	62	201	1,120	608	240	1,260	815
30-----	43	370	43	198	850	454	2,470	3,180	1/19,390
31-----	41	110	12	--	--	--	1,880	1,060	5,350
Total--	1,707	--	2,990	4,388	--	22,310	8,921	--	32,200
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,110	1,460	4,380	430	108	125	348	38	36
2-----	738	600	1,200	375	87	88	313	84	71
3-----	546	440	648	344	175	163	296	136	109
4-----	436	190	224	334	54	49	271	83	61
5-----	703	470	1/1,490	321	53	46	271	56	41
6-----	1,770	440	2,100	283	38	29	287	58	45
7-----	1,300	235	826	291	38	30	263	39	28
8-----	872	150	354	283	132	101	225	147	89
9-----	654	120	212	279	170	128	218	83	49
10-----	534	142	205	279	174	131	218	65	38
11-----	464	175	219	263	161	114	229	38	23
12-----	400	180	194	240	59	38	218	34	20
13-----	362	162	158	243	38	25	204	24	13
14-----	339	155	142	271	42	31	194	21	11
15-----	308	160	133	317	100	86	191	27	14
16-----	283	80	61	370	197	197	178	27	13
17-----	267	45	32	366	100	99	172	18	8.4
18-----	255	95	65	344	54	50	169	23	10
19-----	267	160	115	334	51	46	156	30	13
20-----	240	115	75	447	200	241	141	22	8.4
21-----	215	160	93	390	84	89	135	12	4.4
22-----	267	92	66	410	2/150	166	138	17	6.3
23-----	255	42	29	510	2/250	344	175	41	19
24-----	344	68	82	464	2/150	188	159	22	9.4
25-----	357	95	92	474	2/100	128	150	18	7.3
26-----	380	80	82	430	2/75	87	156	23	9.7
27-----	400	90	97	375	2/50	51	153	16	6.6
28-----	626	247	418	366	2/50	49	156	21	8.9
29-----	661	141	252	--	--	--	147	154	61
30-----	540	88	128	--	--	--	144	95	37
31-----	492	25	33	--	--	--	150	114	46
Total--	16,385	--	14,200	9,833	--	2,920	6,225	--	916

1/Sediment discharge computed by subdividing day.

2/Estimated.

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT DREHERSVILLE, PA.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	222	213	128	326	75	66	201	83	45
2-----	211	62	35	321	48	42	188	93	47
3-----	198	29	15	334	271	244	172	83	39
4-----	204	35	19	279	102	77	159	68	29
5-----	201	71	39	290	179	1/167	147	33	13
6-----	344	354	329	334	214	193	141	22	8.4
7-----	326	153	135	330	171	152	135	50	18
8-----	330	113	101	304	58	48	130	56	20
9-----	313	131	111	387	44	34	124	57	19
10-----	283	77	59	283	135	103	121	62	20
11-----	271	56	41	255	97	67	118	64	21
12-----	243	128	84	233	79	50	118	51	16
13-----	233	72	45	211	100	57	110	24	7.0
14-----	385	439	456	204	50	28	107	23	6.8
15-----	291	122	96	191	30	15	96	23	5.9
16-----	283	57	43	188	35	18	99	17	4.6
17-----	263	39	28	175	162	77	99	19	5.1
18-----	385	323	1/718	162	111	49	115	56	17
19-----	782	766	1,620	162	99	43	124	103	35
20-----	579	208	325	375	678	1/788	102	17	4.6
21-----	464	174	218	291	240	188	99	35	9.4
22-----	492	198	263	271	140	102	94	38	9.7
23-----	626	292	494	436	550	647	91	59	15
24-----	579	117	183	352	155	147	86	37	8.6
25-----	522	75	106	375	205	208	104	233	65
26-----	486	87	114	330	145	129	132	820	292
27-----	452	77	94	300	124	100	84	33	7.6
28-----	395	80	85	267	112	81	74	36	7.3
29-----	352	96	91	247	46	31	66	17	3.0
30-----	313	71	60	233	35	22	64	15	2.7
31-----	--	--	--	222	30	18	--	--	--
Total-	11,028	--	6,140	8,568	--	3,990	3,500	--	802
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	66	14	2.5	50	30	4.0	61	125	21
2-----	66	15	2.7	52	78	11	54	166	24
3-----	64	8	1.4	59	575	92	45	101	12
4-----	76	33	6.8	66	890	159	43	48	5.6
5-----	81	30	6.6	59	260	41	68	200	37
6-----	74	13	2.6	54	130	19	110	465	138
7-----	68	15	2.7	45	45	5.5	68	170	31
8-----	59	13	2.1	41	20	2.2	66	125	22
9-----	54	8	1.2	43	25	2.9	61	332	55
10-----	59	12	1.9	50	30	4.0	54	159	23
11-----	57	10	1.5	57	72	11	43	90	10
12-----	64	17	2.9	66	342	61	43	26	3.0
13-----	88	75	18	61	160	26	61	100	16
14-----	71	114	22	78	1,490	314	78	326	69
15-----	64	242	42	48	80	10	68	266	49
16-----	71	160	31	71	350	67	57	148	23
17-----	64	110	19	59	240	38	54	280	41
18-----	104	93	26	76	184	38	54	177	26
19-----	94	104	26	74	283	57	91	468	115
20-----	71	55	11	52	100	14	59	59	9.4
21-----	68	47	8.6	41	88	9.7	50	35	4.7
22-----	66	122	22	39	31	3.3	57	60	9.2
23-----	76	60	12	39	48	5.0	68	138	25
24-----	64	40	6.9	45	59	7.2	57	58	8.9
25-----	68	19	3.5	45	103	13	45	29	3.5
26-----	71	35	6.7	48	125	16	43	20	2.3
27-----	107	175	51	45	168	20	45	38	4.6
28-----	66	78	14	39	115	12	66	70	12
29-----	91	677	166	169	2,600	1,190	121	1,020	333
30-----	71	90	17	96	341	88	113	345	105
31-----	78	108	23	68	109	20	--	--	--
Total-	2,239	--	561	1,835	--	2,360	1,903	--	1,240

Total discharge for year (second-foot-days) ----- 76,532

Total load for year (tons) ----- 90,629

1/Sediment discharge computed by subdividing day.

DELAWARE RIVER BASIN--Continued

LITTLE SCHUYLKILL RIVER AT DREHERSVILLE, PA.--Continued

Particle-size analyses of suspended sediment water year October 1948 to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;

W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (cfs)	Suspended sediment											Methods of analysis																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																								
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																							

DELAWARE RIVER BASIN

Apr. 6	11:50 a.m.	390	452	8	24	49	75	82	86	92	96	DSW
Apr. 6	11:50 a.m.	390	471	8	20	45	75	82	86	92	94	DSW
Apr. 6	9:50 a.m.	326	471	11	26	58	82	88	97	97	---	DSW
Apr. 11	2:40 p.m.	271	271	14	26	58	55	72	84	---	---	DSW
Apr. 14	11:50 a.m.	360	526	14	28	52	81	86	93	97	---	DSW
Apr. 14	11:50 a.m.	380	534	13	28	56	81	88	93	96	97	DSW
Apr. 19	3:10 p.m.	274	274	7	20	36	62	78	94	99	---	DSW
Apr. 27	2:20 p.m.	332	407	7	26	48	65	73	84	98	---	DSW
May 3	1:50 p.m.	325	156	16	40	58	75	80	84	91	96	DSW
May 11	10:00 a.m.	255	103	8	30	58	84	88	91	---	---	DSW
May 19	12:25 p.m.	159	86	13	42	66	91	94	97	---	---	DSW
May 25	1:35 p.m.	366	147	17	39	56	75	83	92	---	---	DSW
June 1	12:50 p.m.	201	85	11	45	70	89	93	96	---	---	DSW
June 7	12:30 p.m.	135	46	16	45	73	90	96	96	---	---	DSW
June 8	11:25 a.m.	130	54	19	49	74	94	97	---	---	---	DSW
June 17	1:45 p.m.	99	22	25	48	69	86	91	---	---	---	DSW
June 23	11:25 a.m.	91	45	34	63	82	95	97	---	---	---	DSW
June 29	11:45 a.m.	66	25	32	63	84	96	99	---	---	---	DSW
July 7	12:50 p.m.	66	15	54	72	89	94	---	---	---	---	DSW
July 13	9:00 a.m.	99	127	17	48	77	91	95	98	---	---	DSW
July 19	3:00 p.m.	84	139	28	59	81	92	95	98	---	---	DSW
July 25	1:50 p.m.	68	31	14	34	44	53	70	86	---	---	DSW
Aug. 3	9:30 a.m.	66	493	9	23	68	99	99	99	100	---	DSW
Aug. 10	10:00 a.m.	50	38	14	44	71	92	94	96	---	---	DSW
Aug. 17	2:05 p.m.	48	94	16	50	82	98	98	99	---	---	DSW
Aug. 26	9:10 a.m.	48	147	13	51	84	96	97	99	99	100	DSW
Sept. 1	12:55 p.m.	61	113	17	57	84	95	97	98	98	100	DSW
Sept. 7	10:20 a.m.	66	148	18	63	84	100	---	---	---	---	DSW
Sept. 14	11:35 a.m.	68	554	9	24	62	100	---	---	---	---	DSW
Sept. 20	12:10 p.m.	59	113	9	19	33	61	77	89	97	99	DSW
Sept. 27	12:05 p.m.	45	57	16	34	53	87	93	96	96	99	DSW

DELAWARE RIVER BASIN--Continued

PERKIOMEN CREEK AT GRATERS FORD, PA.

LOCATION.--At highway bridge at Graters Ford, Montgomery County, 1,650 feet downstream from gaging station at Graters Ford.

DRAINAGE AREA.--279 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

Sediment records: April 1948 to September 1949.

EXTREMES, 1948-49.--Sediment loads: Maximum, 10,600 tons per day Dec. 30, 1948; minimum, 0.2 ton per day Oct. 12, 1948, June 4, July 3, 1949.

EXTREMES, April 1948 to September 1949.--Sediment loads: Maximum, 10,600 tons per day Dec. 30, 1948; minimum, 0.2 ton per day Oct. 12, 1948, June 4, July 3, 1949.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Temperature (°F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																		Total	Non-carbonate
Oct. 4, 1948	54	62	10	8.2	215	8.0	0.17	23	8.8	11	--	94	25	10	0.0	1.3	134	94	16
Oct. 21	48	52	10	8.2	228	8.9	.12	25	7.3	12	--	100	24	8.0	.0	1.7	134	93	11
Nov. 11	396	56	10	7.5	147	4.8	.03	14	6.0	8.9	--	50	23	4.0	.0	2.7	97	60	19
Apr. 21, 1949	186	61	10	7.7	180	5.6	.07	13	7.1	8.6	--	66	32	2.0	.0	3.5	117	74	20
May 12	848	63	30	6.9	146	13	.16	15	6.0	7.9	--	62	22	2.0	.0	3.5	103	63	12
June 9	60	76	10	8.2	190	--	.09	20	8.1	12	--	92	26	4.0	.0	.6	109	83	8
June 22	51	84	10	7.5	203	16	.03	21	8.0	7.9	--	88	24	7.0	.0	2.2	132	85	13
July 15	125	82	5	6.9	179	14	.04	17	6.4	4.4	--	43	29	6.0	.1	5.1	116	69	33
July 28	292	79	60	7.2	432	13	.36	13	6.2	7.8	--	49	27	5.0	.0	5.4	132	58	18
July 29	158	82	5	6.5	176	14	.02	18	6.5	6.3	--	52	31	5.5	.1	3.2	116	72	39
Aug. 11	52	80	15	7.7	202	10	.02	21	8.4	5.1	--	78	29	5.0	.0	1.4	124	87	23
Aug. 16	56	74	20	8.0	228	8.8	.10	25	8.3	8.1	--	94	28	7.0	.0	1.1	140	97	20
Aug. 24	27	82	10	7.6	230	10	.03	25	8.0	12	--	92	32	8.0	.0	2.4	144	95	20
Sept. 8	105	74	20	7.3	174	11	.13	17	7.1	5.7	--	58	27	4.0	.0	4.7	115	72	24
Sept. 20	61	68	25	7.5	214	8.6	.07	21	8.2	8.0	--	80	29	7.0	.0	1.5	130	86	21
Sept. 22	43	69	5	7.5	230	8.7	.04	23	9.0	8.5	--	86	32	6.0	.0	1.4	146	94	24

DELAWARE RIVER BASIN--Continued
 PERKIOMEN CREEK AT GRATERS FORD, PA.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	159	14	6.0	43	7	0.8	272	7	5.1
2-----	98	6	2.1	44	4	.5	209	6	3.4
3-----	67	9	1.6	44	8	.9	183	5	2.5
4-----	54	8	1.2	50	3	.4	225	6	3.6
5-----	46	6	.8	108	2	.6	217	7	4.1
6-----	56	2	.3	76	7	1.4	179	6	2.9
7-----	68	5	.6	299	21	17	172	6	2.8
8-----	60	4	.6	183	15	7.4	152	4	1.6
9-----	54	4	.6	107	5	1.5	133	5	1.8
10-----	52	5	.7	92	2	.5	121	6	2.0
11-----	48	4	.5	96	3	.8	110	7	2.1
12-----	43	2	.2	86	4	.9	107	6	1.7
13-----	45	3	.4	81	7	1.5	118	6	1.9
14-----	42	6	.7	83	5	1.1	124	9	3.0
15-----	40	4	.4	82	4	.9	128	8	2.8
16-----	36	4	.4	76	7	1.4	606	19	31
17-----	36	3	.3	67	8	1.5	1,180	45	143
18-----	40	3	.3	68	7	1.3	647	15	26
19-----	72	6	1.2	76	9	1.8	386	13	14
20-----	58	6	.9	382	24	25	328	14	12
21-----	48	7	.9	231	29	18	285	15	12
22-----	45	6	.7	149	15	6.0	254	15	10
23-----	40	6	.6	219	11	6.5	240	9	5.8
24-----	43	8	.9	172	9	4.2	200	6	3.2
25-----	45	6	.7	136	6	2.2	160	31	13
26-----	38	5	.5	113	3	.9	125	85	29
27-----	35	6	.6	148	5	2.0	115	56	17
28-----	38	6	.6	187	5	2.5	130	1/40	14
29-----	42	4	.5	632	63	107	322	1/43	37
30-----	36	4	.4	474	24	31	11,600	340	10,600
31-----	42	5	.6	--	--	--	3,740	--	707
Total-	1,626	--	27.1	4,604	--	248	22,768	--	11,720
Day	January			February			March		
	Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	1,120	20	60	546	2	2.9	427	10	12
2-----	657	10	18	444	4	4.8	398	10	11
3-----	487	8	11	375	4	4.0	415	10	11
4-----	375	7	7.1	438	4	4.7	415	9	10
5-----	2,470	124	826	734	4	7.9	469	8	10
6-----	7,160	240	4,600	642	6	10	481	8	10
7-----	1,280	23	79	1,520	36	148	375	5	5.1
8-----	710	10	19	1,260	21	72	290	6	4.7
9-----	519	6	8.4	854	6	14	276	7	5.2
10-----	427	5	5.8	759	7	14	267	7	5.0
11-----	365	5	4.9	546	4	5.9	378	8	8.2
12-----	323	4	3.5	415	2	2.2	410	8	8.9
13-----	295	4	3.2	442	2	2.4	276	2	1.5
14-----	272	3	2.2	784	4	8.5	245	9	5.9
15-----	233	2	1.3	600	4	6.5	233	4	2.5
16-----	221	4	2.4	680	7	13	209	1	.6
17-----	225	4	2.4	959	27	70	209	3	1.7
18-----	209	2	1.1	494	9	12	217	5	2.9
19-----	213	3	1.7	427	6	6.9	201	2	1.1
20-----	209	9	5.1	1,980	53	284	194	4	2.1
21-----	212	12	6.9	920	21	52	217	6	3.5
22-----	2,800	56	424	850	11	25	276	10	7.5
23-----	892	31	75	2,430	68	446	1,830	190	940
24-----	1,890	53	270	825	22	49	700	47	89
25-----	942	20	51	657	8	14	403	50	55
26-----	1,630	40	176	552	8	12	375	22	22
27-----	1,920	57	294	421	8	9.1	344	10	9.3
28-----	3,700	125	1,250	427	10	12	299	14	11
29-----	1,270	18	62	--	--	--	250	15	10
30-----	638	5	8.6	--	--	--	229	11	6.8
31-----	494	2	2.7	--	--	--	221	5	3.0
Total-	34,158	--	8,280	21,981	--	1,310	11,529	--	1,280

1/Estimated.

DELAWARE RIVER BASIN--Continued

PERKIOMEN CREEK AT GRATERS FORD, PA.--Continued

Suspended sediment, water year October 1948 to September 1849--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	724	18	35	221	20	12	124	4	1.4
2-----	882	23	55	254	13	8.9	116	2	.6
3-----	440	7	8.3	361	8	7.8	101	1	.3
4-----	344	7	6.5	267	8	5.8	94	1	.2
5-----	285	6	4.6	209	5	2.8	88	2	.5
6-----	873	17	40	233	4	2.5	83	2	.5
7-----	566	9	14	392	16	17	74	2	.4
8-----	409	6	6.6	271	12	8.8	64	2	.4
9-----	349	5	4.7	201	7	3.8	60	6	1.0
10-----	281	7	5.3	232	6	3.8	58	7	1.1
11-----	250	4	2.7	263	7	5.0	58	12	1.9
12-----	250	4	2.7	197	2	1.1	58	10	1.6
13-----	234	5	3.2	169	2	.9	57	10	1.5
14-----	590	16	25	149	2	.8	54	10	1.5
15-----	354	9	8.6	139	2	.8	49	11	1.5
16-----	281	6	4.6	133	4	1.4	47	9	1.1
17-----	237	4	2.6	124	2	.7	47	8	1.0
18-----	292	6	4.7	118	2	.6	54	10	1.5
19-----	1,760	45	214	113	2	.6	82	12	2.6
20-----	574	15	23	194	15	7.9	76	9	1.8
21-----	398	9	9.7	328	22	19	62	5	.8
22-----	350	8	7.6	191	8	4.1	51	5	.7
23-----	1,200	29	94	848	54	124	50	9	1.2
24-----	642	20	35	323	20	17	42	6	.7
25-----	438	15	18	354	12	11	38	4	.4
26-----	354	13	12	269	10	7.3	40	5	.5
27-----	319	12	10	384	15	16	50	3	.4
28-----	272	14	10	241	7	4.6	42	3	.4
29-----	237	12	7.7	187	8	4.0	40	4	.4
30-----	221	13	7.7	197	2	1.1	37	5	.5
31-----	--	--	--	143	11	4.2	--	--	--
Total--	14,406	--	683	7,705	--	305	1,896	--	28.4
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	36	4	0.4	88	6	1.4	54	8	1.2
2-----	33	4	.4	72	14	2.7	47	8	1.0
3-----	32	2	.2	69	14	2.6	37	7	.7
4-----	32	12	1.0	319	58	50	30	9	.7
5-----	27	21	1.5	210	21	12	114	13	4.0
6-----	35	25	2.4	146	24	9.4	1,160	293	918
7-----	82	17	3.8	99	14	3.8	184	55	27
8-----	49	9	1.2	84	17	3.9	105	22	6.2
9-----	38	11	1.1	68	13	2.4	82	27	6.0
10-----	34	20	1.8	59	16	2.5	62	22	3.7
11-----	43	198	23	52	10	1.4	54	15	2.2
12-----	44	274	33	48	8	1.0	49	15	2.0
13-----	1,450	490	1,920	50	8	1.1	49	17	2.3
14-----	250	105	71	63	9	1.5	80	12	2.6
15-----	125	14	4.7	62	24	4.0	98	15	4.0
16-----	368	121	120	56	14	2.1	90	14	3.4
17-----	146	89	35	49	7	.9	92	11	2.7
18-----	394	111	118	52	15	2.1	67	9	1.6
19-----	302	52	42	50	13	1.8	66	10	1.8
20-----	167	16	7.2	52	10	1.4	61	12	2.0
21-----	237	29	19	42	8	.9	38	8	.8
22-----	224	42	25	45	7	.9	43	7	.8
23-----	155	19	7.9	40	9	1.0	47	9	1.1
24-----	110	34	10	27	9	.6	54	7	1.0
25-----	83	13	2.9	35	8	.8	45	7	.9
26-----	75	40	8.1	36	10	1.0	46	8	1.0
27-----	856	71	164	25	9	.6	40	8	.9
28-----	292	38	30	27	10	.7	42	8	.9
29-----	158	14	6.0	80	14	3.0	62	7	1.2
30-----	121	6	2.0	112	14	4.2	72	10	1.9
31-----	104	7	2.0	66	6	1.1	--	--	--
Total--	6,102	--	2,660	2,283	--	123	3,070	--	1,000

Total discharge for year (second-foot-days) ----- 132,128
 Total load for year (tons) ----- 27,664.5

DELAWARE RIVER BASIN--Continued
BRANDYWINE CREEK AT CHADDS FORD, PA.

LOCATION.--At gaging station at Pennsylvania Railroad bridge at Chadds Ford, Delaware County.
DRAINAGE AREA.--287 square miles.
RECORDS AVAILABLE.--Chemical analyses: January 1948 to September 1949.
REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Date of collection	Mean discharge (second-foot)	Temperature (°F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 18, 1948----	250	--	6	6.5	149	13		0.10		13	4.9	8.6		46	19	6.5	0.1	5.6	99	53	--	
Dec. 1-----	415	--	6	8.0	142	13		.06		13	4.8	7.6		41	21	6.0	.1	5.7	98	52	--	
Dec. 27-----	260	--	6	6.7	163	14		.12		16	5.8	3.2		36	19	6.2	.2	14	105	63	--	
Jan. 31, 1949----	925	34	6	7.2	127	12		.04		11	4.5	6.6		32	19	4.5	.2	9.2	88	46	--	
Mar. 3-----	760	46	6	7.7	134	13		.03		12	4.6	7.2		37	18	5.2	.2	9.4	90	49	--	
Apr. 12-----	467	--	5	7.3	133	12		.06		12	4.6	7.0		40	17	4.6	.1	8.5	87	49	--	
Apr. 21-----	495	57	8	7.3	127	10		.02		11	4.4	8.4		42	17	4.4	.1	6.6	86	46	--	
May 19-----	315	--	8	6.6	145	13		.02		13	4.5	8.0		46	16	5.8	.1	6.8	95	51	13	
June 6-----	260	--	10	7.4	175	9.3		.05		14	5.5	10		62	17	5.5	.2	4.2	103	58	7	
July 15-----	281	75	12	6.8	138	9.8		.02		12	4.7	6.8	--	40	22	5.2	.1	6.1	102	49	16	
July 25-----	183	80	10	7.8	166	7.5		--		--	--	--	--	56	19	8.0	.1	5.5	--	--	--	
Sept. 7-----	114	70	10	7.3	173	7.8		.16		16	6.0	10		65	17	8.0	.1	4.9	103	65	--	

DELAWARE RIVER BASIN--Continued

BRANDYWINE CREEK AT WILMINGTON, DEL.

LOCATION.--At Henry Clay Bridge, in Wilmington, New Castle County, 0.2 mile upstream from gaging station at Wilmington, and 4.4 miles upstream from mouth. DRAINAGE AREA.--314 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1949.

Sediment records: December 1946 to September 1949.

EXTREMES, 1948-49.--Sediment loads: Maximum, 6,200 tons per day Dec. 30; minimum, less than 1 ton per day Dec. 26, 27.

EXTREMES, 1946-49.--Sediment loads: Maximum, 13,700 tons per day Sept. 10, 1948; minimum, less than 1 ton per day on many days.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, October 1948 to August 1949

Date of collection	Mean discharge (second-foot)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																		Total	Non-carbonate
Oct. 6, 1948	458	55	5	6.9	153	11	0.17	15	6.0	6.1		52	17	6.3	0.0	7.7	104	62	--
Nov. 1	225	--	6	6.8	165	11	.04	15	5.1	9.3		51	20	7.8	.1	5.8	103	58	--
Dec. 1	502	--	15	6.5	138	12	.07	13	4.6	8.1		42	21	5.6	.1	5.7	94	51	--
Jan. 3, 1949	750	--	11	6.9	134	12	.13	12	4.5	5.9		36	19	5.2	.1	5.5	90	48	--
Feb. 2	926	38	7	7.3	132	13	.02	12	4.6	6.2		34	18	5.0	.2	10	86	49	--
Mar. 2	902	38	6	7.2	128	13	.02	10	4.3	8.0		33	17	4.8	.2	10	87	43	--
Apr. 3	678	50	8	6.9	124	13	.03	11	4.3	7.0		36	17	4.6	.2	7.5	87	45	--
May 2	490	63	7	6.9	135	9.4	.12	12	4.6	7.2		42	16	5.8	.2	5.7	85	49	--
May 31	350	61	7	6.7	141	13	.03	13	4.5	7.2		45	15	6.1	.2	6.2	93	51	14
July 1	195	72	11	7.9	162	9.4	--	--	--	--		54	19	8.5	.1	5.2	--	--	--
July 15	379	76	12	6.7	131	9.3	.03	12	4.4	5.3	--	35	20	4.2	.0	6.0	96	48	19
Aug. 17	153	76	7	7.3	173	6.9	.03	15	5.7	8.1	--	58	19	5.0	.1	4.9	95	61	3

DELAWARE RIVER BASIN--Continued

BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	716	29	56	225	12	7.3	502	12	16
2-----	344	8	7.4	230	13	8.1	428	6	6.9
3-----	295	8	6.4	225	5	3.0	407	11	12
4-----	277	8	6.0	302	4	3.3	662	10	18
5-----	295	6	4.8	337	5	4.5	534	14	20
6-----	458	13	16	271	5	3.7	458	8	9.9
7-----	337	12	11	576	19	30	442	8	9.6
8-----	309	16	13	428	14	16	393	5	5.3
9-----	323	6	5.2	316	8	6.8	365	5	4.9
10-----	295	9	7.2	295	7	5.6	344	4	3.7
11-----	271	5	3.7	289	6	4.7	323	3	2.6
12-----	271	4	2.9	259	6	4.2	330	2	1.8
13-----	259	9	6.3	271	6	4.4	351	2	1.9
14-----	259	9	6.3	277	5	3.7	351	4	3.8
15-----	253	7	4.8	253	5	3.4	421	18	20
16-----	247	8	5.3	247	6	4.0	878	31	73
17-----	241	5	3.2	253	6	4.1	1,070	40	116
18-----	277	7	5.2	259	5	3.5	614	4	6.6
19-----	323	8	7.0	253	12	8.2	518	7	9.8
20-----	271	6	4.4	588	14	22	488	2	2.6
21-----	253	7	4.8	458	13	16	450	3	3.6
22-----	241	6	3.9	344	14	13	458	6	7.4
23-----	247	8	5.3	421	6	6.8	450	4	4.9
24-----	247	9	6.0	351	8	7.6	414	3	3.3
25-----	235	9	5.7	344	7	6.5	379	3	3.1
26-----	230	8	5.0	309	5	4.2	260	1	0.7
27-----	225	8	4.9	450	32	39	320	1	.9
28-----	225	7	4.3	480	41	53	365	1	1.0
29-----	230	9	5.6	1,300	183	642	495	400	535
30-----	230	7	4.3	846	50	114	3,530	650	6,200
31-----	220	9	5.3	--	--	--	2,690	75	545
Total-	8,904	--	237	11,457	--	1,050	19,690	--	7,650
Day	January			February			March		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,110	28	84	1,030	8	22	934	2	5.0
2-----	862	8	19	928	7	17	902	5	12
3-----	750	2	4.0	838	8	18	886	7	17
4-----	670	4	7.2	1,030	14	39	870	3	7.0
5-----	886	12	29	1,150	20	62	878	3	7.1
6-----	3,610	190	1,850	990	11	29	854	3	6.9
7-----	1,250	38	128	1,190	26	83	758	3	6.1
8-----	926	11	28	1,350	49	179	694	2	3.8
9-----	870	1	2.3	1,070	11	32	686	2	3.7
10-----	798	8	17	1,030	7	19	686	2	3.7
11-----	742	5	10	950	12	31	838	3	6.8
12-----	710	3	5.8	862	7	16	806	2	4.3
13-----	686	2	3.7	902	18	44	654	1	1.8
14-----	646	3	5.2	1,110	20	60	622	1	1.7
15-----	606	3	4.9	974	16	42	614	8	13
16-----	598	4	6.5	966	15	39	598	7	11
17-----	590	3	4.8	1,300	41	144	590	4	6.4
18-----	574	2	3.1	918	18	45	630	5	8.5
19-----	590	3	4.8	854	10	23	606	4	6.5
20-----	574	5	7.7	1,350	34	124	590	4	6.4
21-----	574	40	62	1,070	16	46	622	4	6.7
22-----	1,580	115	491	1,030	23	64	686	3	5.6
23-----	934	50	126	1,590	88	378	1,880	272	1,690
24-----	1,190	42	135	1,070	23	66	1,070	50	144
25-----	966	35	91	982	6	16	798	11	24
26-----	1,220	29	116	942	6	15	742	9	18
27-----	1,700	118	619	878	4	9.5	726	8	16
28-----	2,680	220	1,910	934	4	10	686	6	11
29-----	1,470	50	198	--	--	--	630	5	8.5
30-----	1,030	7	19	--	--	--	614	8	13
31-----	1,030	10	28	--	--	--	606	4	6.5
Total-	32,422	--	6,020	29,286	--	1,670	23,756	--	2,080

DELAWARE RIVER BASIN--Continued

BRANDYWINE CREEK AT WILMINGTON, DEL.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	782	6	13	470	3	3.8	340	9	8.3
2-----	918	14	35	490	5	6.6	330	9	8.0
3-----	678	4	7.3	500	36	49	309	10	8.3
4-----	614	3	5.0	490	8	11	302	8	6.5
5-----	566	6	9.2	458	3	3.7	295	9	7.2
6-----	1,100	45	134	450	6	7.3	289	10	7.8
7-----	822	17	38	530	16	23	271	9	6.6
8-----	638	5	8.6	465	8	10	253	10	6.8
9-----	590	2	3.2	421	10	11	247	9	6.0
10-----	542	2	2.9	550	88	131	253	10	6.8
11-----	534	2	2.9	534	10	14	259	11	7.7
12-----	526	2	2.8	458	5	6.2	253	11	7.5
13-----	542	7	10	421	6	6.8	241	10	6.5
14-----	886	23	55	393	5	5.3	241	9	5.9
15-----	638	12	21	450	5	6.1	235	13	8.3
16-----	534	4	5.8	407	4	4.4	241	11	7.2
17-----	510	2	2.8	393	3	3.2	259	12	8.4
18-----	558	12	18	386	4	4.2	277	15	11
19-----	1,150	195	605	372	2	2.0	302	13	11
20-----	740	11	22	365	6	5.9	283	18	14
21-----	560	4	6.0	435	8	9.4	247	16	11
22-----	560	11	17	414	23	26	225	15	9.1
23-----	810	14	31	1,150	88	273	210	13	7.4
24-----	660	6	11	600	26	42	200	13	7.0
25-----	570	6	9.2	900	80	194	200	12	6.5
26-----	510	4	5.5	500	31	42	210	13	7.4
27-----	510	4	5.5	520	20	28	200	13	7.0
28-----	470	3	3.8	450	12	15	185	15	7.9
29-----	450	4	4.9	400	8	8.6	200	17	9.2
30-----	450	4	4.9	370	10	10	200	12	6.5
31-----	--	--	--	350	12	11	--	--	--
Total--	19,418	--	1,100	15,092	--	974	7,567	--	239

Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	195	12	6.3	190	8	4.1	140	7	3.6
2-----	205	11	6.1	171	10	4.6	140	4	1.5
3-----	185	8	4.0	166	7	3.1	136	15	5.5
4-----	176	7	3.3	220	10	5.9	132	8	2.9
5-----	171	8	3.7	277	12	9.0	128	6	2.1
6-----	379	30	31	421	26	29	128	5	1.7
7-----	472	52	66	241	34	22	117	8	2.5
8-----	316	24	20	205	15	8.3	124	10	3.3
9-----	225	16	9.7	190	12	6.2	121	7	2.3
10-----	215	14	8.1	180	6	2.9	114	8	2.5
11-----	259	17	12	166	6	2.7	110	7	2.1
12-----	259	25	17	166	6	2.7	107	5	1.5
13-----	1,510	274	1,120	171	12	5.5	132	7	2.5
14-----	638	66	114	176	15	7.1	200	7	3.8
15-----	379	27	28	171	14	6.5	176	5	2.4
16-----	283	12	9.2	171	13	6.0	157	11	4.7
17-----	316	80	68	153	11	4.5	190	15	7.7
18-----	400	88	95	157	9	3.8	144	10	3.9
19-----	480	92	119	190	7	3.6	144	8	3.1
20-----	337	58	53	171	11	5.1	132	8	2.9
21-----	283	20	15	149	11	4.4	121	9	2.9
22-----	386	25	26	136	10	3.7	121	10	3.3
23-----	265	20	14	132	9	3.2	195	12	6.3
24-----	225	17	10	140	10	3.8	166	10	4.5
25-----	210	19	11	136	10	3.7	136	8	2.9
26-----	205	14	7.7	121	9	2.9	124	7	2.3
27-----	190	8	4.1	128	9	3.1	121	7	2.3
28-----	185	7	3.5	128	6	2.1	157	10	4.2
29-----	166	9	4.0	241	25	16	166	12	5.4
30-----	166	10	4.5	200	8	4.3	180	11	5.3
31-----	205	10	5.5	230	2	1.2	--	--	--
Total--	9,866	--	1,900	5,694	--	191	4,309	--	102

Total discharge for year (second-foot-days) ----- 187,481

Total load for year (tons) ----- 23,213

DELAWARE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Instantaneous discharge (second-feet)	Temperature (° F)	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																			Total	Non-carbonate	
DELAWARE RIVER AT NARROWSBURG, N. Y.																					
July 28, 1949----		80	10 6.9	62.2	1.6		0.06		6.8	2.0	3.3	--	22	9.5	1.5	0.0	0.6	47	25	7	
Aug. 16-----		82	15 7.2	73.6	1.6		.08		7.6	2.1	4.4	--	24	11	3.5	.0	.7	43	28	8	
Sept. 20-----		65	11 6.9	70.6	1.1		.07		7.2	2.0	3.1	--	23	10	3.5	.0	.2	41	26	7	
DELAWARE RIVER AT EASTON, PA.																					
July 28, 1949----	1/2,000	83	25 7.3	138	2.0		0.09		15	4.4	4.9	--	51	19	3.0	0.2	1.3	101	56	14	
Aug. 16-----	1/956	78	30 7.6	149	2.2		.40		16	4.8	4.9	--	44	29	4.0	.0	2.1	119	60	24	
Sept. 20-----	1/821	68	8 7.8	140	1.8		.06		16	5.1	4.5	--	52	21	3.0	.0	1.0	82	61	18	
DELAWARE RIVER AT TRENTON, N. J.																					
July 28, 1949----	1/3,290	83	10 7.7	186	3.0		0.05		19	6.7	6.6	--	63	26	7.5	0.0	2.1	114	75	23	
Aug. 16-----	1/2,440	79	15 7.9	207	3.6		.12		21	6.8	7.2	--	61	32	8.5	.0	3.0	129	80	30	
Sept. 20-----	1/2,670	70	16 7.9	197	1.0		.07		21	7.2	8.4	--	60	33	8.0	.0	1.9	126	82	33	
LACKAWAXEN RIVER AT HAWLEY, PA.																					
July 28, 1949----	1/62	80	15 7.2	89.2	1.6		0.04		11	3.2	2.8	--	32	17	2.5	0.0	0.6	54	41	14	
Aug. 16-----	1/53	71	25 7.5	94.6	1.6		.10		12	1.7	5.2	--	34	12	3.2	.0	.9	58	37	9	
Sept. 20-----	1/58	62	19 7.4	90.9	.7		.08		12	1.6	3.6	--	33	12	4.0	.0	.4	53	37	10	
LACKAWAXEN RIVER AT KIMBLES, PA.																					
Oct. 15, 1948----	43		5 6.6	69.0	1.8		0.01		8.5	1.4	3.7		23	11	2.2	0.2	1.2	44	27	8	
Nov. 17-----	1,430		6 7.1	57.3	1.4		.02		6.8	.9	4.0		17	11	2.1	.1	.9	42	21	7	
Dec. 22-----	1,226		6 6.7	82.1	2.5		.02		9.8	1.2	4.8		21	17	2.9	.1	.8	56	29	12	
Jan. 26, 1949----	2,070		12 6.8	62.7	3.8		.04		7.7	1.3	3.2		13	16	2.0	.0	1.6	45	25	14	
Apr. 5-----	258		7 6.6	71.0	3.0		.02		7.8	1.4	4.3		18	14	2.4	.2	1.6	50	25	10	
May 11-----	1,900		10 6.7	65.7	2.2		.02		7.9	.9	4.2		19	12	2.0	.1	1.8	44	23	8	
June 15-----	1,590		12 6.1	74.4	2.1		.02		8.4	1.4	4.0		19	13	2.5	.1	3.0	46	27	11	

1/ Mean daily discharge.

DELAWARE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Instantaneous discharge (second-feet)	Temperature (° F)	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	Total acidity as H ₂ SO ₄
LACKAWAXEN RIVER AT ROWLAND																				
July 28, 1949----	132	72	10	6.8	51.7	1.2	0.08		6.8	1.3	0.4	--	12	12	1.0	0.1	0.7	36	22	12
Aug. 16-----	129	68	15	7.1	57.1	1.0	.20		6.8	1.4	1.9	--	18	10	1.0	.0	.6	37	23	8
Sept. 20-----	118	61	10	7.0	52.2	1.2	.06		6.0	1.1	1.4	--	14	9.9	1.5	.0	.5	33	19	8
SHOHOLA CREEK AT SHOHOLA																				
July 28, 1949----	14.8	78	25	6.8	40.5	2.8	0.02		3.2	1.4	2.8	--	13	9.1	2.0	0.0	0.9	38	14	3
Aug. 16-----	14.1	68	20	7.0	44.5	2.8	.05		3.4	1.4	4.4	--	15	6.3	1.5	.0	.8	33	14	2
Sept. 20-----	11.9	60	20	6.9	42.5	2.5	.03		3.6	1.4	4.0	--	16	6.8	1.5	.0	.3	29	15	2
RAYMOND KILL AT RAYMOND KILL																				
Nov. 3, 1948----				7.3	48.8	5.2							17	6.9	2.0		0.4		18	4
BUSCKILL CREEK AT SHOEMAKERS																				
July 28, 1949----	1/24	83	25	6.9	37.2	3.6	0.02		4.4	1.0	1.9	--	13	5.7	1.0	0.1	0.7	34	15	4
Aug. 16-----	1/15	74	15	7.1	41.4	2.6	.06		4.4	.9	2.3	--	13	6.5	1.5	.0	.9	30	15	4
Sept. 20-----	1/10	61	10	6.9	39.8	2.3	.02		3.4	1.3	1.7	--	11	6.9	1.5	.0	.4	26	14	5
BRODHEAD CREEK NEAR STROUDSBURG																				
July 28, 1949----	100	82	10	7.0	89.8	4.2	0.11		11	1.8	4.3	--	26	19	2.5	0.0	1.6	63	35	14
Aug. 16-----	77	74	10	7.2	101	4.0	.13		12	1.7	5.1	--	20	23	3.0	.0	1.7	37	37	12
Sept. 20-----	93	67	24	6.5	98.6	4.2	.18		12	1.8	4.1	--	18	25	3.0	.0	1.3	64	37	23
POCONO CREEK AT STROUDSBURG																				
Nov. 3, 1948----				7.4	57.4								17	9.1	1.8		1.1		19	5
MARSHALLS CREEK AT MARSHALLS CREEK																				
Nov. 3, 1948----		50		6.8	68.6	4.8							23	16	4		0.4		22	3

1/ Mean daily discharge.

CHERRY CREEK AT DELAWARE WATER GAP

Nov. 3, 1948 ----			8.0	221	3.6					109	20	1.8		0.9		95	6
-------------------	--	--	-----	-----	-----	--	--	--	--	-----	----	-----	--	-----	--	----	---

BUSHKILL CREEK AT TATAMY

Nov. 19, 1948 ---		52	6	7.1	297		0.05	39	11	1.2	81	65	5		5.1	143	76
-------------------	--	----	---	-----	-----	--	------	----	----	-----	----	----	---	--	-----	-----	----

BUSHKILL CREEK AT EASTON

Nov. 19, 1948 ---		48	4	7.7	536		0.12	51	21	31	166	122	7		11	214	78
-------------------	--	----	---	-----	-----	--	------	----	----	----	-----	-----	---	--	----	-----	----

LEHIGH RIVER AT TANNERY

July 29, 1949 ----	1/166	81	25	6.5	39.2	1.8	0.04		4.2	0.7	1.9	--	10	6.6	2.0	0.0	0.9	38	14	5
Aug. 16 - ----	1/343	73	25	6.8	37.6	2.2	.19		4.6	.7	1.5	--	8.0	10	1.5	.0	1.2	28	14	8
Sept. 20 - ----	1/208	67	30	6.5	31.8	1.2	.03		2.8	.9	2.4	--	7.5	6.0	2.0	.0	.7	25	11	5

LEHIGH RIVER AT GLENDON

Oct. 15, 1948 ---	616	62	12	6.7	346	--	0.26		31	15	--	85	72		--		7.0		139	69
Nov. 3 - ----	537	58	--	7.5	344	7.2	--		--	--	--	93	64	11			11		108	20
Nov. 19 - ----	822	53	5	7.1	283	--	.08		25	13	9.0	36	61	11			17		116	98
Dec. 21 - ----	1,910	39	5	6.5	182	--	.10		17	6.6	8.1	38	42	5			7.5		120	30
Jan. 25, 1949 ---	3,220	42	5	6.6	160	--	.10		16	5.6	5.2	32	35	5			5.7		63	37
Mar. 3 - ----	2,790	39	5	6.6	164	--	.10		16	5.2	6.7	36	34	4			6.6		61	32
Apr. 19 - ----	2,100	55	4	7.1	168	5.7	.01		16	8.4	--	39	30	6.5			7.5		74	42
May 18 - ----	2,140	68	3	7.0	158	6.0	.01		15	8.3	--	38	26	6.0			7.5		72	40
June 24 - ----	824	82	3	7.2	237	6.5	.01		25	11	6.2	65	38	9.5			9.2		100	47
July 29 - ----	885	85	5	6.8	261	3.7	.12		27	11	3.0	63	48	9			6.0		113	51

LEHIGH RIVER AT EASTON

July 28, 1949 ----		88	20	7.5	276	6.4	0.18		27	7.0	12	--	74	47	10	0.0	6.8	178	96	36
Aug. 16 - ----		78	10	7.5	277	4.8	.14		28	10	11	--	80	49	7.0	.0	6.6	195	111	45
Sept. 20 - ----		71	13	7.1	233	5.2	.10		23	9.2	6.5	--	54	52	6.5	.0	4.7	155	95	51

1/ Mean daily discharge.

DELAWARE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Instantaneous discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																			Total	Non-carbonate	
COOKS CREEK NEAR SPRINGTOWN																					
Apr. 5, 1949 ----	25	50	8	7.8	171	11		0.12	19	7.6	2.8			62	21	5.0		6.3		79	28
COOKS CREEK NEAR RIEGELSVILLE																					
Apr. 5, 1949 ----	37	50	5	7.8	208	11		0.08	24	11				90	23	3.0		6.0		105	31
TINICUM CREEK NEAR OTTSVILLE																					
Apr. 5, 1949 ----		50	12	7.2	140	16		0.24	12	8.0	3.7			38	30	5		1.8		63	32
TINICUM CREEK AT TINICUM																					
Apr. 5, 1949 ----	30	49	8	7.4	131	14		0.10	12	7.2	3.2			34	29	5		1.8		60	32
TOHICKON CREEK NEAR QUAKERTOWN																					
Apr. 5, 1949 ----	30	50	22	7.2	251	15		0.15	24	12	4.1			56	44	14		8.3		109	63
TOHICKON CREEK AT TOHICKON																					
Apr. 5, 1949 ----	63	50	20	7.7	141	13		0.10	14	7.0	3.3			38	28	6		2.6		64	33
TOHICKON CREEK NEAR PIPERSVILLE																					
Nov. 3, 1948 ----	1/5.0	48	--	7.5	378	2.1		--	13	--	--			120	68	16	--	0.9	--	110	12
Apr. 5, 1949 ----	1/91	49	16	7.2	142	11		0.17	13	5.8	3.0			35	31	4	0.1	1.2	95	56	28
July 28 ----	1/35	83	60	7.1	123	9.4		.54	14	6.1	5.2		--	34	32	4.0	.0	2.4	100	60	32
Aug. 16 ----	1/8.7	76	25	7.9	277	4.6		.11	24	10	16		--	87	45	12	.0	.7	165	101	30
Sept. 20 ----	1/13	67	27	7.5	223	4.8		.08	22	8.6	11		--	62	45	8.0	.0	2.4	143	90	39
TOHICKON CREEK AT POINT PLEASANT																					
Apr. 5, 1949 ----	90	51	15	7.3	142	9.6		0.14	13	5.9	6.3			34	33	5	0.1	1.2	94	57	29

1/ Mean daily discharge.

INGHAM'S SPRING CREEK AT NEW HOPE

Apr. 5, 1949 -----	16	52	8	8.0	247	10	0.30	27	15	122	21	3	7.0	129	29
--------------------	----	----	---	-----	-----	----	------	----	----	-----	----	---	-----	-----	----

PIDCOCK CREEK NEAR NEW HOPE

Apr. 5, 1949 -----	50	8	7.4	163	15	0.12	14	7.6	7.8	48	29	7	4.7	66	27
--------------------	----	---	-----	-----	----	------	----	-----	-----	----	----	---	-----	----	----

MILL CREEK AT BRISTOL (U. S. HIGHWAY 13)

Apr. 5, 1949 -----	24	52	18	7.2	116	8.5	0.24	8.7	4.2	6.3	14	27	6	0.1	5.4	89	39	28
--------------------	----	----	----	-----	-----	-----	------	-----	-----	-----	----	----	---	-----	-----	----	----	----

NESHAMINY CREEK NEAR EDISON

Apr. 5, 1949 -----	51	5	7.5	181	9.0	0.20	18	8.5	2.6	38	34	9	7.7	80	49
--------------------	----	---	-----	-----	-----	------	----	-----	-----	----	----	---	-----	----	----

NESHAMINY CREEK NEAR LANGHORNE

Oct. 15, 1948	28	56	9	7.2	232	--	0.18	18	7.7	--	69	44	--	1.2	--	77	20
Mar. 15, 1949	245	42	4	7.1	177	11	.02	15	9.6	--	34	35	9.0	--	9.1	77	49
Apr. 5	227	--	7	7.3	173	10	.15	14	6.0	9.7	36	35	7	0.0	6.1	111	60
May 26	279	62	16	6.6	169	8.0	--	--	--	--	39	30	6.2	--	5.0	--	--
June 24	42	75	16	7.1	202	15	.01	16	9.6	--	58	28	13	--	6.5	79	32
July 28	100	82	35	7.4	141	2.2	.15	12	5.6	8.0	38	21	9	--	5.8	53	22
Aug. 19	29	77	10	7.3	207	7.0	.07	17	7.0	14	65	30	10	.1	3.2	139	71

NESHAMINY CREEK AT HULMEVILLE

Apr. 5, 1949 -----	240	51	6	7.2	167	11	0.15	14	6.4	9.0	34	33	9	7.4	61	33
--------------------	-----	----	---	-----	-----	----	------	----	-----	-----	----	----	---	-----	----	----

NESHAMINY CREEK AT CROYDON

Apr. 5, 1949 -----	250		8	7.0	169	11	0.09	14	5.9	8.6	34	33	7	0.2	6.6	111	59	31
--------------------	-----	--	---	-----	-----	----	------	----	-----	-----	----	----	---	-----	-----	-----	----	----

LITTLE NESHAMINY CREEK AT HARTSVILLE

Apr. 5, 1949 -----	49	5	7.2	165	11	0.25	16	8.3	2.6	38	31	8	6.3	74	43
--------------------	----	---	-----	-----	----	------	----	-----	-----	----	----	---	-----	----	----

DELAWARE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Instantaneous discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																				Total	Non-carbonate
POQUESSING CREEK AT PHILADELPHIA																					
Apr. 5, 1949-----	31	51	8	7.2	149	13		0.07		9.6	4.9	9.5		20	20	12	0.1	13	102	44	28
PENNYPACK CREEK AT PHILADELPHIA																					
Apr. 5, 1949-----	125	49	10	7.4	196	14		0.21		14	6.0	12		40	33	11	0.0	4.2	127	60	27
FRANKFORD CREEK AT BRIDGE STREET, PHILADELPHIA																					
Apr. 5, 1949-----		57	100	8.2	1,190	40		0.24		26	7.8	210		390	183	28		3.6		97	
LITTLE SCHUYLKILL RIVER AT TAMAQUA																					
Sept. 19, 1949 ---	18.2	69	2	4.10	166	7.0	3.0	0.08	0.25	10	4.8	1.8		0	59	5.0	0.1	1.8	91	66	36
LITTLE SCHUYLKILL RIVER AT PORT CLINTON																					
Sept. 19, 1949 ---	73.1	76	0	3.65	717	12	16	0.12	2.3	52	28	9.6		0	343	8.0	0.1	2.1	498	350	153
WEST BRANCH LITTLE SCHUYLKILL RIVER AT GINTHERS																					
Sept. 19, 1949 ---	6.44	60	0	3.40	438	11	11	0.30	0.84	15	7.1	5.8		0	154	2.0	0.1	1.1	214	152	115
STILL CREEK ONE-THIRD MILE SOUTH OF GINTHERS, RT. 29																					
Sept. 19, 1949----	0.69	62	5	6.4	77.2	4.0		0.25	0.0	9.0	2.1	1.8		18	16	1.8	0.1	1.0	46	31	16
PINE CREEK BETWEEN BARNESVILLE AND HOMETOWN, RT. 45																					
Sept. 19, 1949 ---	3.06	68	1	6.3	73.3	4.6		0.02	0.0	7.0	1.7	3.2		14	14	3.8	0.0	0.1	45	24	13

LOCUST CREEK, 2½ MILES NORTH OF TAMAKUA, RT. 29

Sept. 19, 1949 ---	4.10	65	5	6.5	47.3	2.2	0.02	0.0	5.0	1.6	1.4	16	6.0	2.0	0.0	0.0	31	19	8
--------------------	------	----	---	-----	------	-----	------	-----	-----	-----	-----	----	-----	-----	-----	-----	----	----	---

PANTHER CREEK AT TAMAKUA

Sept. 19, 1949 ---	22.3	68	0	3.15	1,940	25	64	1.6	8.2	167	107	1.2	0	1,190	21	2.0	1.1	1,680	1,270	436
--------------------	------	----	---	------	-------	----	----	-----	-----	-----	-----	-----	---	-------	----	-----	-----	-------	-------	-----

BEAVER CREEK, ONE-FOURTH MILE NORTH OF HECLA

Sept. 19, 1949 ---	4.97	67	5	6.5	67.6	4.0	0.02	0.0	6.8	1.8	3.1	16	10	3.5	0.1	3.0	43	24	11
--------------------	------	----	---	-----	------	-----	------	-----	-----	-----	-----	----	----	-----	-----	-----	----	----	----

INDIAN RUN CREEK AT RAUCH'S DAM, 1½ MILES NORTHEAST OF DREHERSVILLE

Sept. 19, 1949 ---	6.37	69	5	6.5	85	6.2	0.02	0.0	5.4	1.9	1.9	15	8.7	2.0	0.1	1.2	38	21	9
--------------------	------	----	---	-----	----	-----	------	-----	-----	-----	-----	----	-----	-----	-----	-----	----	----	---

MANATAWNY CREEK AT POTTSTOWN

Oct. 15, 1948 ---	---	---	3	7.4	236	---	0.07	26	9.8	6.3	111	16	5.6	---	---	4.2	---	105	14
Nov. 19 ---	---	---	6	7.2	217	12	---	25	8.5	5.6	102	17	---	---	0.2	4.2	131	97	14
Dec. 21 ---	---	---	6	7.3	206	12	---	23	7.5	8.8	80	23	---	---	---	6.0	130	88	23
Jan. 25, 1949 ---	45	38	8	7.7	178	---	---	20	7.0	3.3	62	23	4	---	---	6.8	---	79	28
Mar. 3 ---	38	6	7.9	193	13	---	---	22	7.1	7.6	76	24	4	---	---	8.8	139	84	22
Apr. 13 ---	---	---	4	7.7	192	14	---	21	---	---	84	14	5	---	---	5.8	---	92	23
May 18 ---	72	10	8.0	189	---	---	---	20	8.1	5.1	86	14	4	---	---	4.6	---	83	13
June 24 ---	81	8	---	214	---	---	---	24	9.2	5.4	106	13	4	---	---	4.3	---	98	11
July 29 ---	80	10	7.7	202	---	---	---	22	8.6	4.7	90	17	5	---	---	2.5	---	90	16
Sept. 2 ---	73	8	7.9	237	---	---	---	---	---	---	110	17	5.5	---	---	2.1	---	100	10

PIGEON CREEK AT PARKER FORD

July 14, 1949 ---	14	69	21	6.8	134	9.3	0.07	12	4.0	6.9	---	26	24	4.5	0.1	6.6	96	46	25
-------------------	----	----	----	-----	-----	-----	------	----	-----	-----	-----	----	----	-----	-----	-----	----	----	----

FRENCH CREEK AT KNAURTOWN

July 14, 1949 ---	28	69	21	6.8	77.7	9.7	0.12	7.3	2.6	9.7	---	25	12	2.4	0.1	1.8	61	29	8
-------------------	----	----	----	-----	------	-----	------	-----	-----	-----	-----	----	----	-----	-----	-----	----	----	---

DELAWARE RIVER BASIN--Continued
 MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA--Continued
 Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Instantaneous discharge (second-feet)	Temperature (° F)	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	Total acidity as H ₂ SO ₄
FRENCH CREEK AT PHOENIXVILLE																				
July 14, 1949 ----	94	68	20	6.5	95.1	8.4	0.17	8.8	2.8	11	--	24	15	3.8	0.1	3.9	75	33	14	
SOUTH BRANCH FRENCH CREEK NEAR COVENTRYVILLE																				
July 14, 1949 ----	26	68	26	6.5	105	10	0.27	9.6	3.3	11	--	28	16	3.8	0.1	4.2	82	38	15	
PICKERING CREEK NEAR PERKIOMEN JUNCTION																				
July 15, 1949 ----	16	84	16	7.1	130	5.5	0.13	13	4.0	6.5		49	16	4.1	0.1	1.1	88	49	8	
NORTHWEST BRANCH PERKIOMEN CREEK NEAR GREENLANE																				
Apr. 6, 1949 -----	100	49	16	7.1	127	13	0.15	13	4.4	5.2		38	21	4	0.1	3.8	86	51	19	
Apr. 6, 1949 -----		49	20	7.1	165	11	0.22	16	7.8	3.8		42	33	6		3.7		72	38	
MACOBY CREEK AT GREENLANE																				
Apr. 6, 1949 -----	67	48	30	7.1	133	10	0.08	12	5.6	5.7		32	33	2		2.6		53	27	
UNAMI CREEK NEAR SUNNEYTOWN																				
Apr. 6, 1949 -----	175	49	12	7.4	149	15	0.15	15	6.9	7.4		56	30	2		2.4		66	20	
WEST SWAMP CREEK AT LAYFIELD																				
Apr. 6, 1949 -----	120	51	42	7.0	154	12	0.08	16	5.9	5.4		42	31	3		6.1		64	30	
WEST SWAMP CREEK NEAR DELPHI																				
Apr. 6, 1949 -----	245	48	50	6.7	158	9.6	0.05	15	5.6	6.7		41	31	4	0.1	4.1	109	60	27	
NORTHEAST BRANCH PERKIOMEN CREEK NEAR BERKEY																				
Apr. 6, 1949 -----	274	49	10	7.2	182	7.2	0.07	15	6.9	7.7		33	41	6	0.1	5.0	117	66	39	

NORTHEAST BRANCH PERKIOMEN CREEK NEAR SCHWENKVILLE

Apr. 6, 1949 -----	300	50	10	7.2	189	7.9	0.02	24	7.8		44	43	6	5.5	92	56
--------------------	-----	----	----	-----	-----	-----	------	----	-----	--	----	----	---	-----	----	----

INDIAN CREEK NEAR VERNFIELD

Apr. 6, 1949 -----	15	49	13	7.4	280	9.0	0.05	23	12	13	66	49	15	12	107	53
--------------------	----	----	----	-----	-----	-----	------	----	----	----	----	----	----	----	-----	----

SKIPPAK CREEK AT MAINLAND

Apr. 6, 1949 -----	28	49	33	7.6	250	7.9	0.08	20	9.5	8.7	46	42	18	1.4	89	51
--------------------	----	----	----	-----	-----	-----	------	----	-----	-----	----	----	----	-----	----	----

SKIPPAK CREEK NEAR COLLEGEVILLE

Apr. 6, 1949 -----		50	15	7.0	205	8.5	0.46	18	8.1	8.0	38	41	11	7.6	78	47
--------------------	--	----	----	-----	-----	-----	------	----	-----	-----	----	----	----	-----	----	----

VALLEY CREEK AT VALLEY FORGE

Apr. 7, 1949 -----	51	52	8	7.9	328	8.6	0.08	39	17		154	24	7	8.0	167	41
--------------------	----	----	---	-----	-----	-----	------	----	----	--	-----	----	---	-----	-----	----

TROUT CREEK NEAR PORT KENNEDY

Apr. 7, 1949 -----	12	52	8	7.8	276	11	0.05	34	15		144	16	4	9.7	147	28
--------------------	----	----	---	-----	-----	----	------	----	----	--	-----	----	---	-----	-----	----

ABRAM RUN NEAR BRIDGEPORT

Apr. 7, 1949 -----	4	50	8	6.9	123	11	0.23	12	5.5	4.4	32	22	5	7.5	53	26
--------------------	---	----	---	-----	-----	----	------	----	-----	-----	----	----	---	-----	----	----

STONY CREEK AT NORRISTOWN

Apr. 6, 1949 -----	50	50	20	7.0	215	10	0.05	18	9.2	7.9	42	43	11	6.5	83	48
--------------------	----	----	----	-----	-----	----	------	----	-----	-----	----	----	----	-----	----	----

PLYMOUTH CREEK AT CONSHOHOCKEN

Apr. 6, 1949 -----	16	64	5	7.9	409	11	0.08	33	23	13	166	56	8.0	8.7	185	49
--------------------	----	----	---	-----	-----	----	------	----	----	----	-----	----	-----	-----	-----	----

GULPH CREEK NEAR WEST CONSHOHOCKEN

Apr. 7, 1949 -----	14	50	10	7.0	179	10	0.15	10	7.5	15	50	32	7	6.4	56	14
--------------------	----	----	----	-----	-----	----	------	----	-----	----	----	----	---	-----	----	----

DELAWARE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued																				
Date of collection	Instantaneous discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Hardness as CaCO ₃	
																			Dissolved solids	Non-carbonate
MILL CREEK NEAR GLADWYNE																				
Apr. 7, 1949 -----	18	48	5	7.5	184	14		0.08		16	6.3	12		40	37	9		9.4		66 33
WISSAHICKON CREEK AT WHITEHARSH																				
Apr. 6, 1949 -----	180	48	18	7.2	188	9.5		0.10		17	8.5	7.3		50	37	6		6.7		77 36
WISSAHICKON CREEK NEAR FORT WASHINGTON																				
Apr. 6, 1949 -----	129	49	15	7.0	198	10		0.12		18	9.5	6.3		50	40	7		6.4		84 43
WISSAHICKON CREEK AT PHILADELPHIA																				
Apr. 6, 1949 -----		50	8	7.5	199	10		0.24		25	13	4.0		82	37	9		7.6		116 48
SANDY RUN AT FORT WASHINGTON																				
Apr. 6, 1949 -----	49	48	40	7.1	182	6.9		0.08		16	8.8	7.4		46	30	5		20		76 38
DARBY CREEK NEAR ITHAN (GOSHON ROAD)																				
Apr. 21, 1949 -----	20	61	6	7.2	135	14		0.05		12	4.7	8.3	--	44	19	6.2	0.1	7.0	94	49 13
DARBY CREEK AT DARBY																				
Apr. 21, 1949 -----	47	51	7	6.7	161	15		0.04		14	5.0	10	--	36	24	8.5	0.2	6.0	111	56 26
DARBY CREEK NEAR PROSPECT PARK																				
Apr. 21, 1949 -----		55	16	6.8	188	7.3		0.04		17	5.7	8.2	--	34	39	8.6	0.3	9.4	120	66 38
ITHAN CREEK NEAR ITHAN (OLD DARBY ROAD)																				
Apr. 21, 1949 -----	9	61	5	7.1	174	20		0.03		17	6.1	6.3	--	44	28	7.5	0.1	7.9	117	68 31
COBBS CREEK AT WEST OVERBROOK (TOWNSHIP LINE)																				
Apr. 21, 1949 -----	6	62	5	7.2	207	12		0.04		20	7.6	8.4	--	49	32	10	0.1	12	133	81 41

CORBS CREEK NEAR DARBY (WOODLAND AVENUE)

Apr. 21, 1949 ---	18	54	16	6.5	335	16		0.04	28	8.1	12	--	61	49	27	0.5	22	220	103	53
-------------------	----	----	----	-----	-----	----	--	------	----	-----	----	----	----	----	----	-----	----	-----	-----	----

CRUM CREEK NEAR NEWTON SQUARE

Apr. 21, 1949 ---	14	60	8	6.9	91.6	14		0.03	7.3	4.2	4.2	--	28	11	4	0.1	5.4	68	35	12
-------------------	----	----	---	-----	------	----	--	------	-----	-----	-----	----	----	----	---	-----	-----	----	----	----

CRUM CREEK AT SPRINGTON RESERVOIR NEAR MEDIA

Apr. 21, 1949 ---	32	55	6	7.1	102	13		0.05	8.0	4.3	9.0	--	28	15	4.5	0.1	5.4	70	38	15
-------------------	----	----	---	-----	-----	----	--	------	-----	-----	-----	----	----	----	-----	-----	-----	----	----	----

CRUM CREEK AT EDDYSTONE (U. S. HIGHWAY 13)

Apr. 21, 1949 ---	41	56	6	6.9	117	11		0.05	8.9	4.6	7.2	--	25	21	5.2	0.2	6.0	76	41	21
-------------------	----	----	---	-----	-----	----	--	------	-----	-----	-----	----	----	----	-----	-----	-----	----	----	----

RIDLEY CREEK NEAR WILLISTOWN

July 15, 1949 ---	8, 9	73	17	6.6	113	9, 7		0.14	8.7	5.5	5.6		32	13	5.2	0.1	4.6	78	44	18
-------------------	------	----	----	-----	-----	------	--	------	-----	-----	-----	--	----	----	-----	-----	-----	----	----	----

RIDLEY CREEK NEAR GRADYVILLE

Apr. 21, 1949 ---	31	62	5	7.2	96.7	14		0.05	7.2	4.1	5.7		29	13	3.8	0.1	5.2	71	35	11
-------------------	----	----	---	-----	------	----	--	------	-----	-----	-----	--	----	----	-----	-----	-----	----	----	----

RIDLEY CREEK AT CHESTER (17TH STREET)

Apr. 21, 1949 ---	78	55	7	7.1	121	16		0.05	9.3	4.7	9.1	--	30	18	5.9	0.2	7.5	83	43	18
-------------------	----	----	---	-----	-----	----	--	------	-----	-----	-----	----	----	----	-----	-----	-----	----	----	----

CHESTER CREEK NEAR WESTTOWN

July 15, 1949 ---	15	71	13	6.8	179	7, 8		0.06	14	5.3	13	--	49	19	11	0.1	8.9	117	57	17
-------------------	----	----	----	-----	-----	------	--	------	----	-----	----	----	----	----	----	-----	-----	-----	----	----

CHESTER CREEK NEAR CHEYNEY

Apr. 21, 1949 ---	28	65	8	7.3	147	16		0.02	12	4.8	7.7	--	35	18	7.6	0.1	10	101	50	21
-------------------	----	----	---	-----	-----	----	--	------	----	-----	-----	----	----	----	-----	-----	----	-----	----	----

CHESTER CREEK AT LENNI MILLS

Apr. 21, 1949 ---	52	60	10	7.2	145	15		0.02	12	4.9	7.2		36	19	6.6	0.1	8.6	100	50	21
-------------------	----	----	----	-----	-----	----	--	------	----	-----	-----	--	----	----	-----	-----	-----	-----	----	----

DELAWARE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN DELAWARE RIVER BASIN IN PENNSYLVANIA--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Instantaneous discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																				Total	Non-carbonate
CHESTER CREEK AT CHESTER (KIRLIN STREET)																					
Apr. 21, 1949 ---	108	57	7	7.3	138	15		0.05	11	4.7	8.4	--		33	20	7.1	0.2	8.3	94	47	20
WEST BRANCH CHESTER CREEK NEAR LENNI MILLS																					
Apr. 21, 1949 ---	27	57	8	6.7	117	13		0.03		9.6	4.0	5.9		30	14	5.4	0.1	7.7	79	40	16
MARCUS HOOK CREEK AT TRAINER (RIDGE ROAD)																					
Apr. 21, 1949 ---	3.7		8	6.8	218	16		0.08	15	8.7	15			37	54	10	0.2	5.1	159	73	43
NAAMAN CREEK NEAR MARCUS HOOK (PENNSYLVANIA-DELAWARE STATE LINE)																					
Apr. 21, 1949 ---	20	65	10	6.8	129	15		0.04	10	4.4	7.8			30	20	6.8	0.1	5.8	90	43	18
WEST BRANCH BRANDYWINE CREEK AT CEDAR KNOLL																					
July 14, 1949 ---	45	74	30	6.3	98.7	7.5		0.14		8.5	3.5	3.8	--	20	17	4.0	0.1	6.3	73	36	19
WEST BRANCH BRANDYWINE CREEK AT COATESVILLE																					
Sept. 7, 1949 ----		69	7	6.9	119	14		0.02	11	4.5	3.7	2.3		44	10	7.2	0.1	1.9	79	46	10
WEST BRANCH BRANDYWINE CREEK AT MORTONVILLE																					
July 14, 1949 ----	47	80	10	6.6	173	9.2		0.03	15	5.3	17			41	40	7.2	0.1	8.3	131	59	26
WEST BRANCH BRANDYWINE CREEK NEAR WAWASET																					
July 15, 1949 ----	123	78	10	6.8	146	9.1		0.01	13	4.8	8.1	--		41	20	6.2	0.1	9.1	103	52	19
DOE RUN CREEK NEAR DOE RUN																					
July 14, 1949 ---	26	77	8	6.6	98.7	8.7		0.02		8.8	3.6	3.8	--	34	7.9	4.1	0.1	8.0	78	37	9
BUCK RUN CREEK NEAR DOE RUN																					
July 14, 1949 ----	29	74	15	6.2	117	7.4		0.09	11	3.6	4.5	--		30	14	6.0	0.1	9.4	82	42	18

EAST BRANCH BRANDYWINE CREEK AT LYNDELL

July 14, 1949-----	37	74	28	6.3	100	13	0.05	9.0	2.8	4.0	1.6	25	13	3.2	0.2	4.0	80	34	13
--------------------	----	----	----	-----	-----	----	------	-----	-----	-----	-----	----	----	-----	-----	-----	----	----	----

EAST BRANCH BRANDYWINE CREEK NEAR SUGARS BRIDGE

July 15, 1949-----	80	79	25	6.4	160	10	0.06	13	4.5	11	--	41	31	5.0	0.0	4.1	118	51	17
--------------------	----	----	----	-----	-----	----	------	----	-----	----	----	----	----	-----	-----	-----	-----	----	----

EAST BRANCH BRANDYWINE CREEK NEAR WAWASET

July 15, 1949-----	105		18	6.4	112	9.6	0.02	14	5.0	7.6	--	46	24	4.8	0.1	5.1	112	56	18
--------------------	-----	--	----	-----	-----	-----	------	----	-----	-----	----	----	----	-----	-----	-----	-----	----	----

MARSH CREEK NEAR LYNDELL

July 14, 1949-----	91	70	55	5.6	78.1	9.1	0.06	6.8	2.4	2.4	1.6	14	18	2.1	0.1	2.5	65	27	15
--------------------	----	----	----	-----	------	-----	------	-----	-----	-----	-----	----	----	-----	-----	-----	----	----	----

BEAVER CREEK AT DOWNINGTON

July 14, 1949-----	15	73	12	6.6	206	8.7	0.02	22	7.9	5.7	2.1	76	26	5.5	0.1	6.3	134	87	25
--------------------	----	----	----	-----	-----	-----	------	----	-----	-----	-----	----	----	-----	-----	-----	-----	----	----

VALLEY CREEK NEAR SUGARS BRIDGE

July 15, 1949-----	19	77	5	6.8	193	7.2	0.05	20	8.8	4.6	--	89	12	4.6	0.0	6.3	124	86	13
--------------------	----	----	---	-----	-----	-----	------	----	-----	-----	----	----	----	-----	-----	-----	-----	----	----

WEST BRANCH RED CLAY NEAR KENNETT SQUARE

July 15, 1949-----	17	73	8	6.9	179	14	0.05	16	6.8	5.3	3.4	60	16	6.8	0.1	12	117	68	19
--------------------	----	----	---	-----	-----	----	------	----	-----	-----	-----	----	----	-----	-----	----	-----	----	----

EAST BRANCH RED CLAY NEAR KENNETT SQUARE

July 15, 1949-----	86	75	10	6.9	175	15	0.04	16	6.2	5.8	3.3	58	18	6.5	0.2	9.4	118	65	18
--------------------	----	----	----	-----	-----	----	------	----	-----	-----	-----	----	----	-----	-----	-----	-----	----	----

EAST BRANCH WHITE CLAY CREEK AT LANDENBERG

July 15, 1949-----	24	75	8	7.3	203	13	0.06	21	8.0	8.7	3.3	80	21	6.2	0.1	11	134	85	20
--------------------	----	----	---	-----	-----	----	------	----	-----	-----	-----	----	----	-----	-----	----	-----	----	----

WEST BRANCH WHITE CLAY CREEK NEAR LANDENBERG

July 14, 1949-----	14	74	14	7.0	100	12	0.07	8.4	3.1	3.2	2.8	31	8.8	4.6	0.1	6.7	72	34	8
--------------------	----	----	----	-----	-----	----	------	-----	-----	-----	-----	----	-----	-----	-----	-----	----	----	---

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Instantaneous discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																			Total	Non-carbonate	
BIG ELK CREEK NEAR LEWISVILLE																					
July 14, 1949-----	47	77	16	6.6	85.2	8.2	0.08	6.9	2.4	3.8	2.8	22	10	4.5	0.1	5.3	62	27	9		
LITTLE ELK CREEK NEAR LEWISVILLE																					
July 14, 1949-----	15	74	18	7.0	119	11	0.16	7.4	6.5	4.1	2.8	39	12	5.1	0.2	6.0	83	45	13		

SUSQUEHANNA RIVER BASIN

SUSQUEHANNA RIVER AT FALLS, PA.

LOCATION.--At bridge on State Highway 92, 400 feet upstream from Buttermilk Creek, Wyoming County, and approximately 17 miles upstream from gaging station at Wilkes Barre, Luzerne County.

DRAINAGE AREA.--9 440 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1949.

Water temperatures: October 1944 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 277 micromhos Oct. 1-10; minimum, 88.9 micromhos Jan. 1-10.

Water temperatures: Maximum, 87°F June 26-29; minimum, freezing point on many days in December, January, and February.

EXTREMES, 1944-49.--Dissolved solids (1944-47): Maximum, 143 parts per million Sept. 21-30, 1947; minimum, 58 parts per million May 21-31, 1946.

Total hardness (1944-47): Maximum, 105 parts per million Sept. 11-20, 1946; minimum, 36 parts per million May 21-31, 1946.

Specific conductance: Maximum, 282 micromhos Oct. 21-31, 1947; minimum, 88.9 micromhos Jan. 1-10, 1949.

Water temperatures: Maximum, 83°F Aug. 27, 1948; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 based on records for Susquehanna River at Wilkes-Barre, which are given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C.)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1-10, 1948 -	1,055		3	7.3	277	1.0		0.02		33	6.3	12		108	22	16	0.1	1.4	154	108	20	
Oct. 11-20 -	1,480		2	7.6	263	--		--	--	--	--	--	--	103	24	7.6	--	2.1	--	--	--	
Oct. 21-31 -	1,999		3	7.6	263	--		--	--	--	--	--	--	101	25	--	--	1.3	--	--	--	
Nov. 1-10 -	3,927		6	7.5	224	--		--	--	--	--	--	--	87	22	11	--	2.4	--	--	--	
Nov. 11-20 -	5,223		7	7.4	177	--		--	--	--	--	--	--	64	21	7.1	--	2.7	--	--	--	
Nov. 21-30 -	12,150		8	7.2	140	--		--	--	--	--	--	--	47	19	5.2	--	2.6	--	--	--	
Dec. 1-10 -	8,067		9	7.1	152	4.6		--	--	--	--	--	--	53	20	--	--	2.0	--	--	--	
Dec. 11-20 -	7,746	--	--	--	--	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Dec. 21-31 -	13,320		8	7.2	154	3.3		--	--	--	--	--	--	50	20	--	--	3.0	--	--	--	
Jan. 1-10, 1949 -	47,510		8	6.9	88	4.7		.02	10	2.3	4.4			25	17	2.2	.1	2.9	64	34	14	
Jan. 11-20 -	18,480		10	7.1	128	5.7		--	--	--	--	--	--	42	17	--	--	3.1	--	--	--	
Jan. 21-31 -	18,220		10	7.1	127	5.0		--	--	--	--	--	--	42	17	--	--	3.0	--	--	--	
Feb. 1-10 -	11,570		10	7.3	143	5.1		--	--	--	--	--	--	51	18	--	--	3.0	--	--	--	
Feb. 11-20 -	19,940		10	7.2	132	4.6		--	--	--	--	--	--	36	16	--	--	2.9	--	--	--	
Feb. 21-28 -	22,050		10	7.1	112	4.3		--	--	--	--	--	--	38	16	--	--	2.6	--	--	--	
Mar. 1-10 -	19,980		9	7.2	125	4.7		--	--	--	--	--	--	40	16	--	--	2.4	--	--	--	
Mar. 11-20 -	13,690		11	7.3	139	3.9		--	--	--	--	--	--	47	16	--	--	1.7	--	--	--	
Mar. 21-31 -	12,030		6	7.4	138	2.7		--	--	--	--	--	--	55	15	--	--	2.1	--	--	--	

SUSQUEHANNA RIVER BASIN--Continued
SUSQUEHANNA RIVER AT FALLS, PA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949.--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Apr. 1-10, 1949--	15,540		8	7.2	128	2.4		0.04		17	3.0	4.3		48	17	3.6	0.1	2.1	82	55	15	
Apr. 11-20-----	19,820		6	7.3	111	3.3		--		--	--	--		39	15	--	--	1.9	--	--	--	
Apr. 21-30-----	17,850		8	6.9	118	3.4		--		--	--	--		46	15	--	--	1.1	--	--	--	
May 1-10-----	13,630		8	6.9	128	3.4		--		--	--	--		49	16	5	--	2.3	--	--	--	
May 11-20-----	7,682		6	6.9	148	4.4		--		--	--	--		49	16	3	--	2.3	--	--	--	
May 21-31-----	14,460		4	7.1	129	4.6		--		--	--	--		49	16	3	--	2.3	--	--	--	
June 1-10-----	5,430		7	6.7	156	4.0		--		--	--	--		61	18	5	--	1.2	--	--	--	
June 11-20-----	2,831		7	7.3	190	3.7		--		--	--	--		78	20	7	--	1.5	--	--	--	
June 21-30-----	2,610		6	7.5	222	3.2		--		--	--	--		89	22	9.6	--	1.0	--	--	--	
July 1-10-----	2,014		7	7.3	210	3.2		.02		31	4.9	4.3		92	18	7.6	.1	2.3	124	98	22	
July 11-20-----	1,378		6	7.4	224	5.3		--		--	--	--		93	20	9.0	--	1.0	--	--	--	
July 21-31-----	1,393		6	7.3	233	4.5		--		--	--	--		93	21	12	--	1.0	--	--	--	
Aug. 1-10-----	2,402		6	7.3	231	3.0		--		--	--	--		91	20	11	--	1.2	--	--	--	
Aug. 11-20-----	1,587		6	7.4	214	3.2		--		--	--	--		84	18	9.5	--	1.5	--	--	--	
Aug. 21-31-----	1,505		6	7.3	234	3.2		--		--	--	--		90	21	12	--	1.6	--	--	--	
Sept. 1-10-----	4,082		6	7.2	176	3.4		--		--	--	--		65	19	7.1	--	1.7	--	--	--	
Sept. 11-20-----	1,714		6	7.2	209	2.0		--		--	--	--		78	20	9.0	--	1.1	--	--	--	
Sept. 21-30-----	3,549		4	7.4	208	2.3		.02		26	4.5	8.2		84	19	8.0	.1	1.1	123	83	14	
Average-----	9,841		7	7.2	173	3.6		--		--	--	--		65	19	--	--	1.9	--	--	--	

SUSSUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT FALLS, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	51	42	32	32	36	49	63	74	79	80	74
2	57	51	41	33	32	36	48	62	67	84	81	72
3	57	52	40	32	32	36	49	62	70	79	81	72
4	59	53	40	32	32	37	47	60	74	81	81	72
5	52	56	41	35	32	39	47	68	74	83	82	74
6	53	56	41	35	33	38	49	68	75	82	82	72
7	55	54	41	33	34	36	50	62	74	82	82	68
8	53	56	40	34	34	39	46	60	69	81	82	67
9	53	54	39	36	35	38	46	60	72	79	82	65
10	53	54	39	37	34	39	47	62	72	76	85	63
11	--	53	--	36	34	38	49	62	74	--	85	66
12	52	51	--	37	34	39	49	63	78	79	82	67
13	51	50	--	35	35	39	51	62	79	79	82	68
14	50	48	--	34	36	39	50	62	79	80	82	68
15	49	48	--	36	35	39	51	66	72	79	78	67
16	49	48	--	36	36	39	49	66	79	80	78	68
17	49	48	--	36	33	38	49	67	79	80	76	68
18	40	48	--	37	36	39	49	70	75	82	79	69
19	40	43	--	39	36	39	46	--	79	82	79	69
20	--	45	--	39	39	39	48	66	79	82	72	67
21	--	49	34	36	39	39	51	62	82	80	74	65
22	--	48	35	37	38	39	52	62	82	83	72	64
23	--	45	33	37	40	39	51	63	82	81	74	65
24	--	41	33	37	40	48	49	63	79	81	69	63
25	--	44	32	35	40	49	51	62	79	81	72	63
26	--	44	32	37	40	49	49	54	87	83	72	62
27	--	43	33	36	40	51	52	53	87	84	74	62
28	--	45	35	35	36	52	51	53	87	85	74	62
29	--	44	33	36	--	54	51	51	87	86	74	60
30	--	41	35	35	--	54	54	54	80	83	72	61
31	--	--	33	35	--	47	--	60	--	81	72	--
Average	--	49	--	35	34	41	49	62	78	81	78	67

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.

LOCATION.--At gaging station at highway bridge at Danville, Montour County, three-quarters of a mile upstream from Mahoning Creek.
DRAINAGE AREA.--11,220 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1906 to September 1907, October 1945 to September 1949.

Water temperatures: October 1945 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 542 micromhos Oct. 1-10; minimum, 116 micromhos Jan. 1-10.

Water temperatures: Maximum, 87°F Aug. 9, 10; minimum, 33°F Dec. 26, Jan. 4.

EXTREMES, 1945-49.--Dissolved solids (1945-47): Maximum, 334 parts per million Sept. 11-20, 1946; minimum, 68 parts per million May 21-31, 1946.

TOTAL HARDNESS (1945-47): Maximum, 223 parts per million Sept. 11-20, 1946; minimum, 46 parts per million May 21-31, 1946.

Specific conductance: Maximum, 542 micromhos Oct. 1-10, 1948; minimum, 111 micromhos Mar. 21-31, 1949.

Water temperatures: Maximum, 87°F Aug. 9, 10, 1949; minimum, freezing point on many days during winter months.

REMARKS. Specimens collected daily at midstream 1906-07, and at point 465 feet from north end of bridge 1948-49. Due to cross-sectional differences in concentration of dissolved solids, samples also collected three times a month at points 120, 650, 880, and 1180 feet from north end of bridge.

1945-49. Records of specific conductance of daily samples, October 1945 to September 1949, available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949, given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micromhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 1-10, 1948	1,285	3	6.5	542	3.2	0.06	4.8	23		29	26	215	11	0.2	2.8	372	214	193
Oct. 11-20	1,670	2	7.1	515							31	205	7.1		2.4			
Oct. 21-31	2,201	2	7.3	425							54	135			2.2			
Nov. 1-10	4,686	5	7.0	394							42	132	11		2.0			
Nov. 11-20	6,624	5	6.9	252							48	66	7.8		2.8			
Nov. 21-30	14,320	4	7.2	181							36	43	5.0		3.0			
Dec. 1-10	9,726	4	6.9	206							35	54	5.2		2.6			
Dec. 11-20	9,725	5	6.9	220							33	55	11		2.4			
Dec. 21-31	15,590	5	6.1	221	3.1						28	65			2.0			
Jan. 1-10, 1949	61,720	10	7.4	116	5.1	.07	12	3.3	2.2		14	29	3.0	1.1	2.7	72	44	32
Jan. 11-20	23,420	3	6.1	166	5.2						28	45			2.6			
Jan. 21-31	22,350	3	6.2	169	5.6						32	41			2.7			
Feb. 1-10	14,940	3	6.2	193	4.9						34	51			2.7			
Feb. 11-20	26,075	3	6.2	185	4.0						34	47			2.3			
Feb. 21-28	28,390	7	6.2	146	5.0						35	35	3.4		2.5			
Mar. 1-10	24,540	6	6.6	158	4.2						32	38	4.1		2.4			
Mar. 11-20	17,290	4	7.2	168	3.7						30	41			1.5			
Mar. 21-31	13,590	4	7.1	190	2.8						43	44			2.3			

Apr. 1-10	18,360	5	6.9	172	1.9	.20	20	5.3	4.8	40	40	4.0	.1	2.2	130	72	39
Apr. 11-20	26,240	6	7.1	140	4.1	--	--	--	--	29	32	--	--	2.0	--	--	--
Apr. 21-30	22,850	4	7.1	155	3.5	--	--	--	--	33	37	--	--	1.1	--	--	--
May 1-10	18,010	3	7.0	172	2.9	--	--	--	--	37	42	--	--	1.4	--	--	--
May 11-20	9,927	4	7.0	221	3.7	--	--	--	--	35	64	--	--	1.6	--	--	--
May 21-31	18,220	6	7.0	179	4.9	--	--	--	--	37	44	--	--	1.5	--	--	--
June 1-10	7,039	7	7.0	248	4.2	--	--	--	--	36	78	--	--	1.1	--	--	--
June 11-20	3,506	4	6.9	343	4.6	--	--	--	--	31	127	8	--	1.8	--	--	--
June 21-30	2,961	3	6.9	406	5.0	--	--	--	--	28	157	9	--	1.8	--	--	--
July 1-10	2,535	4	7.0	399	4.6	.06	41	16	11	40	140	9	.1	1.4	259	168	135
July 11-20	1,839	6	6.7	449	6.5	--	--	--	--	22	181	8	--	2.0	--	--	--
July 21-31	1,577	5	6.7	496	5.9	--	--	--	--	15	211	10	--	2.1	--	--	--
Aug. 1-10	2,727	6	7.0	412	6.1	--	--	--	--	35	150	12	--	1.7	--	--	--
Aug. 11-20	2,047	6	7.0	412	5.2	--	--	--	--	30	164	16	--	2.0	--	--	--
Aug. 21-31	1,793	4	7.1	463	2.4	--	--	--	--	17	184	8	--	1.8	--	--	--
Sept. 1-10	4,690	5	6.7	304	4.5	--	--	--	--	37	184	8	--	2.8	--	--	--
Sept. 11-20	2,022	5	6.7	400	4.8	--	--	--	--	14	165	6	--	3.0	--	--	--
Sept. 21-30	3,726	8	7.3	360	2.4	.08	36	13	8.6	44	106	9.5	.1	2.3	236	143	107
Average	12,250	5	6.9	283	4.3	--	--	--	--	32	94	--	--	2.1	--	--	--

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Chemical analyses of cross-section samples, in parts per million, water year October 1948 to September 1949

Date of collection	Discharge (second-feet)	Station	Time	Temperature (°F)	pH	Specific conductance (micromhos at 25°C)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)
Oct. 5, 1948 -----	1,230	1180	5:00 p. m.	--	6.5	424	67	133
		880		--	6.3	498	18	213
		650		--	6.3	517	16	224
		465		--	--	537	--	--
		120		55	6.0	477	38	185
Oct. 14-----	1,440	1180	4:00 p. m.	--	6.2	434	24	144
		880		--	6.1	511	7	217
		650		--	6.2	537	14	223
		465		56	--	550	--	--
		120		57	6.0	496	37	185
Oct. 25-----	2,530	1180	1:00 p. m.	--	6.5	354	27	120
		880		--	6.5	388	36	130
		650		--	6.4	394	46	124
		465		54	--	384	--	--
		120		58	6.1	349	52	99
Nov. 4-----	1,680	1180	5:00 p. m.	56	5.5	369	19	144
		880		56	5.5	418	16	167
		650		56	5.5	433	19	171
		465		56	--	448	--	--
		120		56	6.1	380	48	125
Nov. 14-----	7,020	1180	1:00 p. m.	52	5.4	228	15	80
		880		52	5.5	244	27	78
		650		52	5.9	242	50	67
		465		52	--	237	--	--
		120		52	5.8	187	35	47
Nov. 24-----	16,800	1180	2:00 p. m.	46	5.4	184	16	60
		880		46	5.5	189	29	53
		650		46	5.6	185	33	53
		465		46	--	183	--	--
		120		46	5.6	148	28	41
Dec. 4-----	8,690	1180	1:00 p. m.	48	5.4	206	14	75
		880		48	5.6	211	25	73
		650		48	5.6	207	32	67
		465		48	--	206	--	--
		120		48	5.7	169	34	47
Dec. 14-----	7,770	1180	5:00 p. m.	43	4.9	213	7	81
		880		43	5.3	223	17	77
		650		43	5.2	243	17	68
		465		42	--	218	--	--
		120		43	5.6	221	26	47
Dec. 24-----	8,180	1180	2:00 p. m.	36	5.2	204	11	75
		880		36	5.8	218	22	74
		650		36	5.7	221	27	69
		465		35	--	209	--	--
		120		36	5.6	169	26	47
Jan. 4, 1949-----	37,600	1180	4:00 p. m.	34	5.3	134	9	48
		880		34	5.3	124	12	39
		650		34	5.4	118	16	34
		465		33	--	115	--	--
		120		34	5.3	104	15	30
Jan. 14-----	24,600	1180	1:00 p. m.	36	5.4	165	11	58
		880		35	5.5	160	19	51
		650		36	5.6	155	24	42
		465		36	--	144	--	--
		120		36	5.8	135	24	33
Jan. 24-----	17,200	1180	4:00 p. m.	37	5.6	180	18	57
		880		37	5.6	176	28	51
		650		37	5.7	171	29	45
		465		38	--	168	--	--
		120		37	5.9	152	31	37
Feb. 4-----	15,200	1180	4:00 p. m.	34	6.4	187	10	69
		880	5:00 p. m.	35	6.7	184	28	52
		650		34	6.6	192	21	59
		465		34	--	186	--	--
		120		34	6.8	153	28	37

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.--Continued

Chemical analyses of cross-section samples, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Discharge (second-feet)	Station	Time	Temperature (°F)	pH	Specific conductance (micromhos at 25°C)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)
Feb. 14, 1949-----	9,420	1180	4:00 p. m.	40	6.4	213	16	72
		880		38	6.4	245	33	79
		650		36	6.7	241	34	74
		465		37	--	222	--	--
		120		36	6.8	195	35	52
Feb. 24-----	30,600	1180	4:00 p. m.	40	6.5	143	17	43
		880		42	6.7	146	26	39
		650		41	6.7	157	30	33
		465		41	--	141	--	--
		120		40	6.9	123	27	29
Mar. 4-----	17,300	1180	4:00 p. m.	37	7.2	167	22	53
		880		37	7.1	169	32	50
		650		37	7.0	166	34	43
		465		37	--	171	--	--
		120		37	6.8	149	30	34
Mar. 14-----	18,100	1180	4:00 p. m.	42	6.7	166	22	51
		880		42	6.7	167	29	46
		650		42	6.8	162	33	44
		465		42	--	164	--	--
		120		42	6.7	143	31	35
Mar. 24-----	10,700	1180	4:30 p. m.	46	6.4	211	21	69
		880		46	6.6	215	35	63
		650		46	6.8	211	42	59
		465		46	--	212	--	--
		120		46	6.6	180	36	48
Apr. 4-----	15,800	1180	4:30 p. m.	50	6.0	181	28	53
		880		50	6.3	184	38	48
		650		50	6.3	184	44	46
		465		50	--	181	--	--
		120		50	6.5	158	38	35
Apr. 14-----	26,900	1180	5:00 p. m.	52	5.8	158	15	50
		880		53	6.0	174	28	46
		650		53	5.9	172	32	45
		465		53	--	153	--	--
		120		52	7.0	87.9	14	20
Apr. 24-----	24,500	1180	3:00 p. m.	52	5.8	162	14	53
		880		52	6.1	163	26	49
		650		52	6.2	160	28	41
		465		52	--	153	--	--
		120		52	6.1	118	23	34
May 4-----	16,800	1180	4:30 p. m.	65	6.5	184	27	59
		880		65	6.7	184	31	56
		650		65	6.5	181	35	51
		465		65	--	179	--	--
		120		65	6.4	130	24	34
May 14-----	10,100	1180	1:00 p. m.	65	6.0	209	11	77
		880		65	6.5	211	24	69
		650		65	6.5	205	28	63
		465	4:00 p. m.	65	--	206	--	--
		120	1:00 p. m.	65	7.4	172	27	51
May 24-----	18,400	1180	4:00 p. m.	65	6.4	174	23	53
		880		65	6.6	175	31	49
		650		65	6.7	172	37	44
		465		65	--	175	--	--
		120		65	6.9	155	37	35
June 4-----	7,750	1180	11:00 a. m.	70	6.1	226	8	84
		880		70	6.4	231	23	77
		650		70	6.6	225	28	72
		465		70	--	226	--	--
June 15-----	3,770	1180	7:00 p. m.	78	6.0	325	8	132
		880		78	6.2	342	15	136
		650		78	6.4	345	19	134
		465		--	--	--	--	--
		120		78	6.6	343	27	127

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLF, PA.--Continued

Chemical analyses of cross-section samples, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Discharge (second-feet)	Station	Time	Temperature (°F)	pH	Specific conductance (micromhos at 25°C)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)
June 24, 1949 -----	2,360	1180	3:00 p. m.	86	6.0	396	7	168
		880		83	6.3	420	10	181
		650		83	6.4	428	13	182
		465		83	--	431	--	--
		120		83	6.6	373	28	136
July 4 -----	2,590	1180	9:00 a. m.	83	6.4	368	34	133
		880		83	6.5	380	35	139
		650		83	6.4	387	41	137
		465		83	--	385	--	--
		120		83	6.6	348	55	107
July 14 -----	1,860	1180	5:00 p. m.	82	5.8	390	10	165
		880		82	5.9	407	11	170
		650		82	6.1	418	15	169
		465		82	--	420	--	--
		120		82	6.4	370	35	130
July 24 -----	1,450	1180	6:00 p. m.	80	6.2	459	26	179
		880		80	5.9	488	7	215
		650		80	6.2	501	9	218
		465		--	--	--	--	--
		120		80	6.2	471	42	191
Aug. 4 -----	4,050	1180	6:00 p. m.	84	6.2	434	6	179
		880		88	6.1	441	14	175
		650		83	6.1	438	19	168
		465		83	--	499	--	--
		120		83	6.8	403	40	138
Aug. 14 -----	1,790	1180?	7:00 p. m.	82	5.7	400	6	162
		880		83	5.9	377	10	149
		650?		84	6.2	311	17	111
		465	9:00 a. m.	82	--	353	--	--
		120	7:00 p. m.	83	6.2	394	18	153
Aug. 24 -----	1,380	1180	7:00 p. m.	--	--	--	--	--
		880		83	5.2	469	3	200
		650		83	5.5	482	3	205
		465		83	--	473	--	--
		120		83	6.4	427	24	164
Sept. 4 -----	5,550	1180	5:00 p. m.	75	6.3	289	33	82
		880		75	6.6	279	52	73
		650		75	6.6	279	58	65
		465		75	--	279	--	--
		120		75	6.7	261	61	58
Sept. 17 -----	2,060	1180	2:30 p. m.	75	4.7	454	1	196
		880		75	4.10	469	--	196
		650		75	5.1	441	3	188
		465		75	6.1	427	11	178
		120		75	6.4	353	22	130

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT DANVILLE, PA.

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	58	44	34	34	38	51	60	65	80	83	78
2	67	56	47	34	34	36	50	56	66	82	80	78
3	68	56	44	34	35	36	50	60	66	82	80	80
4	60	56	48	33	34	37	50	65	70	83	83	75
5	--	60	46	34	36	37	50	65	70	84	82	75
6	54	--	48	35	35	--	50	63	70	84	83	75
7	55	60	48	35	35	37	50	--	67	--	85	74
8	56	--	--	36	36	38	50	60	68	83	85	73
9	60	54	42	35	38	38	50	60	68	82	87	73
10	--	60	41	--	38	--	--	60	70	80	87	--
11	56	58	40	35	34	38	--	58	70	--	85	74
12	60	56	44	35	35	37	--	58	71	82	85	73
13	56	52	44	37	36	40	50	64	70	82	80	74
14	56	52	42	36	37	42	53	65	--	82	82	73
15	60	48	40	--	43	44	50	--	78	--	82	73
16	60	48	44	37	38	40	50	68	75	82	84	--
17	65	48	42	36	37	40	52	70	73	80	83	--
18	56	50	42	37	38	44	--	72	75	80	--	74
19	55	48	--	35	37	--	49	74	78	83	80	74
20	52	46	42	--	36	--	52	74	--	85	82	72
21	--	--	41	34	35	44	50	68	78	80	80	74
22	50	46	--	38	36	44	50	--	79	80	80	--
23	51	--	39	--	38	46	50	68	--	--	--	75
24	--	46	35	38	41	46	52	65	83	--	83	73
25	54	46	34	38	40	46	50	66	80	82	83	73
26	--	46	33	--	42	48	42	65	83	--	84	73
27	60	46	35	38	40	50	52	66	80	83	82	74
28	58	44	34	38	36	50	52	--	83	--	83	--
29	55	44	35	--	--	52	52	67	80	83	--	73
30	54	45	--	38	--	52	53	65	80	83	80	75
31	64	--	35	35	--	50	--	66	--	82	80	--
Average	58	51	41	36	37	43	50	65	74	--	83	74

NORTH ATLANTIC SLOPE BASINS

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT HARRISBURG, PA.

LOCATION.--At Walnut Street Bridge, in Harrisburg, Dauphin County.

DRAINAGE AREA.--24,100 square miles.

RECORDS AVAILABLE.--Chemical analyses: Composites of daily samples collected from east channel station 1180, October 1944 to September 1946. Cross-section samples, one to three times monthly, October 1944 to September 1949.

Water temperatures: East channel station 1180, October 1944 to September 1946. Cross-section, October 1944 to September 1949.

EXTREMES, 1944-49.--Dissolved solids, East channel station 1180 (1944-46): Maximum, 241 parts per million Feb. 1-10, 1946; minimum, 54 parts per million Mar. 11-20, 1946. Total hardness, East channel station 1180 (1944-46): Maximum, 156 parts per million Feb. 1-10, 1946; minimum, 35 parts per million Jan. 11-20, Mar. 11-20, 1946.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses of cross-section samples, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Sampling point		Temperature (°F)	Color	pH	Specific conductance (micromhos at 25°C)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Total hardness as CaCO ₃
		Channel	Station									
Oct. 8, 1948 --	4,650	East	120	64	15	4.9	539	6	239	9	2.5	254
			600	64	10	6.5	473	22	181	11	1.5	210
			1,180	64	10	6.8	363	55	113	9	2.0	154
		West	600	64	5	7.0	353	85	84	14	1.2	160
			1,100	64	10	7.1	346	102	64	15	1.0	143
			1,320	64	10	7.2	312	144	26	10	6.5	150
Oct. 20 -----	9,080	East	120	47	10	4.8	469	3	192	18	4.1	222
			600	47	10	6.4	501	17	196	11	2.5	219
			1,180	47	10	6.7	320	44	86	10	2.0	141
		West	600	47	15	7.0	314	80	68	10	2.5	131
			1,100	47	20	7.1	266	106	30	8	6.5	134
			1,320	47	15	7.1	281	128	23	5	7.5	140
Oct. 29 -----	5,320	East	120	49	4	5.9	457	15	181	12	3.0	210
			600	49	3	6.4	398	36	134	8.5	2.5	183
			1,180	50	4	6.5	313	30	101	8.5	2.2	136
		West	600	49	3	6.6	310	54	88	8.0	2.5	138
			1,100	49	4	6.9	313	99	55	9.2	1.7	138
			1,320	50	4	7.1	275	124	21	6.5	6.5	118
Nov. 15 -----	16,200	East	120	45	4	5.9	292	6	112	6.5	4.0	117
			600	45	3	6.7	254	46	69	7.5	3.0	105
			1,180	44	4	6.3	182	23	51	5.2	2.5	74
		West	600	44	4	7.0	178	26	50	4.5	2.5	82
			1,100	45	3	6.7	245	66	50	6.5	4.0	104
			1,320	44	3	7.0	273	122	23	5.0	7.5	129
Nov. 30 -----	28,800	East	120	40	12	5.6	226	4	87	4.5	2.5	--
			600	40	12	6.3	179	30	49	4.5	1.5	69
			1,180	40	13	6.3	124	16	36	3.2	1.7	51
		West	600	40	4	6.5	126	24	30	3.2	2.0	62
			1,100	40	11	6.8	176	52	32	3.5	3.5	78
			1,320	40	20	7.0	236	100	24	4.0	7.0	111
Dec. 14 -----	24,600	East	120	40	12	5.9	266	8	104	3.2	2.0	108
			600	39	9	6.5	201	36	53	5.0	2.2	87
			1,180	39	12	6.4	126	13	34	2.5	1.5	54
		West	600	38	11	7.2	135	26	34	3.2	1.5	78
			1,100	39	12	6.9	177	55	29	5.0	3.5	81
			1,320	40	11	7.1	231	98	21	5.0	5.8	111
Feb. 8, 1949 --	35,400	East	120	34	11	5.4	249	6	99	5.5	1.8	111
			600	33	10	6.6	179	28	49	4.8	3.0	78
			1,180	34	11	6.1	133	10	54	3.5	1.8	63
		West	600	34	9	6.9	140	32	34	3.8	2.5	68
			1,100	35	10	7.0	157	53	26	3.2	3.5	75
			1,320	35	10	7.2	244	111	21	4.5	7.5	120
Mar. 5 -----	39,300	East	120	36	6	6.0	213	4	78	3.2	2.5	93
			600	35	12	6.6	150	28	41	3.5	2.2	70
			1,180	35	9	6.4	112	13	33	2.0	2.2	48
		West	600	35	10	6.3	112	17	31	2.0	1.5	45
			1,100	35	10	6.7	165	52	28	4.0	3.4	75
			1,320	36	15	7.2	253	117	21	3.8	7.8	116
Mar. 15 -----	36,700	East	120	36	11	6.1	220	10	83	3.2	2.2	95
			600	36	11	6.6	164	26	46	4.0	2.2	72
			1,180	36	10	6.5	128	18	36	4.0	1.8	57
		West	600	--	--	--	--	--	--	--	--	--
			1,100	37	11	6.8	176	52	32	5.5	2.5	75
			1,320	37	11	7.7	273	132	21	5.0	6.8	132
Mar. 25 -----	25,100	East	120	49	12	6.0	281	7	110	4.0	1.8	120
			600	48	15	6.4	215	32	60	5.0	2.5	90
			1,180	47	12	6.6	154	19	46	3.5	2.0	68
		West	600	48	12	6.6	145	23	40	3.2	1.8	57
			1,100	49	10	7.0	198	68	30	5.0	2.2	90
			1,320	49	10	7.3	290	142	17	4.8	7.8	--

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT HARRISBURG, PA.--Continued

Chemical analyses of cross-section samples, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-foot)	Sampling point		Temperature (°F)	Color	pH	Specific conductance (micromhos at 25°C)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Total hardness as CaCO ₃
		Channel	Station									
Apr. 5, 1949 ---	43,300	East	120	48	1	6.3	206	20	67	4	2.3	81
			600	48	1	6.6	163	37	49	4	2.5	68
			1,180	48	1	6.0	101	8	32	1	1.5	39
		West	600	47	1	6.2	104	12	32	1	0.9	42
			1,100	50	2	6.7	163	50	29	2	3.1	66
			1,320	50	2	7.0	206	83	24	3	4.5	87
Apr. 14-----	52,500	East	120	55	2	6.0	175	11	61	2	1.9	66
			600	52	2	6.5	146	27	39	2	1.8	60
			1,180	52	2	6.3	98.3	11	30	2	1.4	38
		West	600	53	2	6.6	101	18	25	1	1.3	40
			1,100	54	2	6.7	131	44	20	2	2.5	57
			1,320	55	4	7.0	256	120	19	3	8.7	108
Apr. 26-----	50,500	East	120	53	2	5.9	177	8	67	2	2.0	72
			600	54	2	6.5	146	29	39	2	2.6	58
			1,180	53	2	6.4	109	16	29	2	2.7	42
		West	600	53	2	6.4	99.3	14	28	2	1.8	38
			1,100	55	3	6.4	149	49	24	3	2.8	63
			1,320	55	3	7.1	198	89	26	4	4.8	90
May 10 -----	34,200	East	120	63	2	6.0	205	12	82	2	1.7	82
			600	64	3	6.5	155	28	47	2	2.7	63
			1,180	64	3	6.5	129	23	49	2	2.4	50
		West	600	64	3	6.5	109	18	31	1	1.3	46
			1,100	65	4	7.0	155	50	28	3	2.2	68
			1,320	63	4	7.1	240	107	33	2	5.7	112
May 23 -----	49,000	East	120	63	2	6.1	228	14	84	2	2.0	92
			600	62	2	6.3	175	27	49	5	3.2	69
			1,180	61	2	6.2	112	12	36	2	1.9	42
		West	600	60	2	6.0	106	11	40	2	1.8	40
			1,100	61	2	6.6	140	33	29	2	2.4	56
			1,320	61	3	7.1	236	104	22	4	6.0	108
June 7 -----	14,100	East	120	72	1	5.1	328	3	134	4	1.7	136
			600	73	1	6.8	234	29	82	3	2.0	96
			1,180	71	1	6.7	137	16	40	2	1.2	52
		West	600	72	1	6.6	124	20	38	2	1.4	48
			1,100	72	2	7.1	198	67	31	5	1.2	82
			1,320	72	2	7.3	249	114	17	6	4.6	112
June 20 -----	9,080	East	120	76	1	4.8	443	1	205	5	0.8	190
			600	77	1	6.4	299	12	114	5	1.5	118
			1,180	77	--	7.2	180	30	49	4	1.5	72
		West	600	77	--	7.3	261	74	45	8	1.5	100
			1,100	76	4	7.1	252	108	36	6	2.5	112
			1,320	76	4	7.5	330	175	19	6	6.0	160
July 7 -----	6,150	East	120	78	1	6.3	459	12	204	8	0.5	198
			600	77	1	6.8	339	38	117	8	1.0	138
			1,180	77	4	7.6	223	35	77	5	1.5	90
		West	600	73	4	7.1	242	66	76	6	1.0	96
			1,100	73	4	7.8	257	102	39	7	1.6	120
			1,320	73	4	7.4	223	107	23	5	2.7	102
July 20 -----	17,800	East	120	81	2	5.9	410	6	175	8	1.5	176
			600	76	7	7.6	188	44	40	5	4.0	76
			1,180	75	12	6.8	165	52	24	5	4.2	68
		West	600	76	12	6.9	164	51	27	5	4.0	70
			1,100	78	8	6.7	154	53	20	4	3.8	64
			1,320	78	10	7.1	221	98	21	2	6.9	98
Aug. 1-----	5,560	East	120	76	2	4.7	564	2	263	7	1.3	242
			600	76	2	6.2	460	14	187	10	1.6	192
			1,180	76	2	7.2	264	46	77	6	1.5	114
		West	600	76	3	7.3	213	66	40	4	1.5	86
			1,100	76	4	7.2	211	81	25	6	1.7	88
			1,320	79	2	7.4	198	86	18	10	2.0	84
Aug. 30 -----	5,100	East	120	72	1	5.1	424	3	187	10	2.0	174
			600	72	1	6.2	424	12	180	10	1.8	174
			1,180	72	2	6.9	323	44	102	11	1.3	126
		West	600	74	4	7.2	282	78	66	10	0.6	112
			1,100	75	4	7.2	263	91	43	12	1.3	106
			1,320	75	5	7.1	205	82	27	11	1.5	84

SUSQUEHANNA RIVER BASIN--Continued

SUSQUEHANNA RIVER AT HARRISBURG, PA.--Continued

Chemical analyses of cross-section samples, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	Sampling point		Temperature ("F)	Color	pH	Specific conductance (micromhos at 25°C)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Total hardness as CaCO ₃
		Channel	Station									
Sept. 11, 1949 --	5,100	East	120	65	4	5.2	417	2	198	8	1.5	188
			600	64	3	6.4	320	18	133	8	1.2	140
			1,180	64	6	6.6	261	40	82	10	1.2	104
		West	600	64	4	6.8	267	68	74	9	1.3	110
			1,100	64	3	7.2	284	96	60	9	0.8	116
			1,320	64	4	7.2	256	114	24	11	3.3	114
Sept. 27 -----	7,690	East	120	60	2	4.5	533	1	244	12	2.4	220
			600	62	3	6.2	404	16	158	10	1.9	170
			1,180	62	3	6.8	258	27	81	7	1.9	114
		West	300	62	3	7.1	241	36	71	7	1.4	98
			1,100	62	2	7.4	328	87	78	13	1.5	128
			1,300	61	3	7.4	306	140	28	12	7.2	140

SUSQUEHANNA RIVER BASIN--Continued

LACKAWANNA RIVER AT OLD FORGE, PA.

LOCATION.--At bridge 600 feet upstream from gaging station which is 150 feet upstream from Delaware, Lackawanna & Western Railroad bridge in Old Forge, Lackawanna County, half a mile upstream from Ascension Brook.

DRAINAGE AREA.--332 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

EXTREMES, 1948-49.--Dissolved solids: Maximum, 1,280 parts per million Oct. 21-31; minimum, 123 parts per million Jan. 5-10.

Total hardness: Maximum, 984 parts per million Oct. 21-31; minimum, 109 parts per million Jan. 5-10.

Water temperatures: Maximum, 77°F July 28; minimum, 35°F on several days in December, January, and February.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1143.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1-10, 1948 -	118		9	2.85	1,550	24	23	0.45	3.0	132	73	28		0	858	7	0.4	0.5	1,250	845	845	80
Oct. 11-20 -	128		8	3.40	1,410	15	12	1.3	6.4	124	90	3.9		0	747	9.0	.3	.1	1,100	783	783	160
Oct. 21-31 -	118		12	3.30	1,590	14	15	1.9	6.5	148	94	3.0		0	844	7.5	.3	.16	1,280	884	884	191
Nov. 1-10 -	323		10	3.60	1,030	10	6.4	.61	8.1	86	62	8.4		0	515	8.2	.25	.1	769	530	530	86
Nov. 11-20 -	238		10	3.45	1,130	12	10	.9	8.5	91	67	3.1		0	568	6.5	.2	.1	856	594	594	118
Nov. 21-30 -	326		10	3.60	836	8.0	4.2	.71	6.5	65	48	7.1		0	400	5.5	.1	.1	592	409	409	89
Dec. 1-10 -	321		9	3.70	901	9.0	6.5	.52	6.5	75	53	7.6		0	454	6.0	.1	.1	674	465	465	99
Dec. 11-20 -	367		10	3.60	865	15	5.8	.69	8.7	68	49	4.9		0	416	7.5	.1	.1	613	433	433	90
Dec. 21-31 -	1,226		10	3.60	596	6.5	3.6	.16	2.4	39	28	5.4		0	240	4.8	.1	.3	372	245	245	58
Jan. 1-4, 1949 -	1,432		3	3.80	596	4.2	6.7	.04	4.90	14	8.6			0	73	3.0	.1	.6	123	109	109	16
Jan. 5-10 -	2,328		6	3.60	766	9.0	4.7	.16	2.1	52	39	12		0	338	4.5	.1	.2	530	333	333	89
Jan. 11-20 -	694		5	3.60	766	8.5	4.7	.15	3.3	58	40	5.0		0	347	5.2	.1	.1	512	358	358	86
Jan. 21-31 -	584		5	3.50	789																	
Feb. 1-10 -	459		3	3.50	877	9.5	5.9	.21	3.4	58	44	19		0	398	5.5	.1	.1	602	381	381	96
Feb. 11-14 -	384		3	3.50	1,050	11	6.5	.46	4.1	74	56	11		0	472	5.2	.1	.2	734	476	476	117
Feb. 15-20 -	888		3	3.90	541	6.5	3.1	.08	2.2	38	25	11		0	228	8.2	.1	.2	350	225	225	56
Feb. 21-28 -	769		4	3.80	561	6.0	2.1	.08	1.9	40	28	6.3		0	231	8.2	.1	.1	365	238	238	47
Mar. 1-10 -	674		4	3.70	665	7.5	1.8	.10	2.4	48	34	11		0	287	6.0	.1	.1	435	284	284	56
Mar. 11-20 -	491		3	3.60	768	8.0	2.5	.18	3.3	54	39	15		0	337	6.7	.2	.1	500	328	328	69
Mar. 21-31 -	445		25	3.40	850	11	7.1	.73	4.5	66	35	17		0	391	5.4	.1	1.6	616	380	380	69

SUSQUEHANNA RIVER BASIN--Continued
LACKAWANNA RIVER AT OLD FORGE, PA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	Total acidity as H ₂ SO ₄
Apr. 1-10, 1949--	545		22	3.65	676	9.3	6.3	1.4	6.0	49	31		3.9	0	298	3.2	0.2	0.6	468	307	50
Apr. 11-13, 16-18--	618		4	3.55	656	8.8	2.0	.20	6.0	49	32	5.9		0	287	2.8	.1	.6	455	291	57
Apr. 14, 15, 19, 20	1,210		25	3.80	348	6.6	5.3	.53	2.5	27	16			0	287	1.8	.1	1.5	213	177	25
Apr. 21-30-----	973		7	3.85	500	7.8	6.2	.88	6.0	38	28			0	218	1.9	.2	.4	337	257	36
May 1-10-----	712		10	3.60	600	8.5	7.6	.78	5.0	46	30			0	265	3.0	.1	.5	414	304	43
May 11-19-----	445		6	3.30	865	12	7.3	.82	7.5	71	45			0	408	3.0	.1	.4	648	446	73
May 20-----	1,280		10	5.9	314	6.7	--	--	--	--	--			--	113	6.5	--	1.8	231	--	--
May 21-27-----	938		4	3.65	511	7.8	5.5	.40	4.0	39	23			--	218	1.8	.1	.5	354	242	38
May 28-31-----	566		4	3.50	710	9.7	11	.62	2.0	56	27	2.6		0	321	3.1	.1	.6	518	334	54
June 1-10-----	317		6	3.30	1,140	10	4.7	1.5	3.9	90	63	22		0	565	6.2	.1	.2	844	548	124
June 11-20-----	234		7	3.20	1,330	9.2	7.5	4.1	5.6	106	77	23		0	690	8.0	.1	.8	1,050	680	138
June 21-30-----	215		7	3.30	1,310	7.3	4.7	5.0	6.3	108	78	28		0	689	8.5	.1	.7	1,040	669	132
July 1-10-----	185		5	3.25	1,350	9.0	7.1	3.9	6.0	109	78	31		0	712	7.5	.1	.8	1,070	685	156
July 11-20-----	172		18	3.45	1,310	8.0	6.6	8.0	6.0	112	78	33		0	714	7.5	.1	.6	1,080	682	148
July 21-31-----	245		32	3.40	1,190	9.6	4.9	6.8	5.7	103	71	15		0	621	8.0	.1	.6	961	626	138
Aug. 1-10-----	199		8	3.25	1,210	16	6.7	1.0	4.6	99	71	10		0	806	7.0	.2	.1	986	619	140
Aug. 11-20-----	186		8	3.23	1,240	14	6.9	.74	3.7	101	72	13		0	834	7.0	.2	.1	984	619	108
Aug. 21-31-----	271		6	3.30	1,230	15	8	.94	4.2	104	73	6.5		0	694	7.0	.2	.1	924	631	110
Sept. 1-10-----	157		6	3.15	1,480	13	8	1.2	7.2	112	76	30		0	718	6.9	.2	.1	1,050	691	152
Sept. 11-20-----	147		8	3.30	1,400	16	12	.3	7.2	115	81	9.8		0	748	6.9	.3	.1	1,080	749	154
Sept. 21-29-----	172		8	3.30	1,240	14	9.0	.63	5.7	104	75			0	631	9.2	.3	.1	930	649	104
Sept. 30-----	317		--	4.30	541	--	--	--	--	--	--	--		--	263	--	--	--	--	--	--
Average	465		9	3.40	927	10	6.9	1.2	4.8	76	52	--		--	454	5.9	0.2	0.4	694	475	94

SUSQUEHANNA RIVER BASIN--Continued
LACKAWANNA RIVER AT OLD FORGE, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	89	58	37	--	38	36	41	57	64	68	65	66
2	61	51	43	36	35	39	39	60	60	--	70	59
3	63	56	48	38	37	41	37	60	62	73	69	60
4	55	88	47	42	40	40	50	55	60	75	72	84
5	55	62	45	39	38	38	45	62	70	74	72	69
6	67	68	50	37	40	45	48	62	62	74	69	68
7	61	56	44	38	42	35	50	62	64	70	68	60
8	61	55	45	39	40	39	47	55	57	68	71	62
9	61	69	45	--	42	39	50	61	60	67	70	58
10	69	68	--	42	41	45	49	56	61	65	72	63
11	68	51	--	42	40	43	47	57	64	70	67	62
12	58	52	--	38	42	38	50	57	69	69	71	65
13	56	54	--	41	43	37	49	54	64	70	71	63
14	61	49	--	40	46	39	50	58	70	68	69	68
15	56	49	--	39	50	40	55	56	68	68	88	64
16	63	48	--	42	40	40	47	56	69	69	66	62
17	59	53	--	47	38	45	44	66	68	79	69	60
18	51	50	--	44	38	42	47	60	73	72	70	70
19	57	48	--	50	40	40	48	63	72	72	65	66
20	53	60	--	41	45	41	45	51	69	85	60	61
21	60	50	--	40	40	41	48	53	68	76	59	56
22	50	49	39	39	37	54	53	54	70	74	63	63
23	65	47	40	41	42	52	50	57	66	71	65	57
24	54	46	37	44	42	45	49	58	65	69	68	54
25	53	53	38	42	45	50	49	56	69	71	64	56
26	52	46	36	--	39	51	53	55	72	72	65	56
27	58	46	35	40	47	52	55	57	73	75	60	59
28	53	45	35	42	42	55	54	58	74	77	70	63
29	52	46	37	39	--	54	49	55	68	76	68	60
30	51	45	45	38	--	52	52	58	69	70	64	55
31	54	--	36	35	--	51	--	62	--	76	68	--
Average	58	53	--	41	41	44	48	58	67	72	67	62

SUSQUEHANNA RIVER BASIN--Continued

WEST BRANCH SUSQUEHANNA RIVER AT LOCK HAVEN, PA.

LOCATION --In north channel at bridge on northeast side of Great Island, 2 miles downstream from Lock Haven, Clinton County.
 DRAINAGE AREA--3,357 square miles.
 RECORDS AVAILABLE--Chemical analyses: October 1945 to September 1949.

Water temperatures: October 1945 to September 1949.

EXTREMES 1948-49--Specific conductance: 5 maximum, 628 micromhos July 11-20; minimum, 111 micromhos Apr. 11-20.
 Water temperatures: Maximum, 83° July 4-7; minimum, 33° July 15-17.

EXTREMES 1945-49--Dissolved solids: Maximum, 262 parts per million Sept. 21-30, 1946; minimum, 51 parts per million Mar. 1-10, 1946.
 Total hardness (1945-47): Maximum, 299 parts per million Mar. 1-10, 1948.
 Specific conductance: Maximum, 628 micromhos July 11-20; minimum, 109 micromhos Apr. 21-30, 1948.

Water temperatures: Maximum, 83° July 5, 1949; minimum, freezing during winter months.

REMARKS --Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 based on records for Susquehanna River at Renovo, which are given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1-10, 1948--	359		7	3.90	570	8.4	11	0.16	1.5	46	17		3.8		250	7.5	0.2	1.8	385	272	272	72
Oct. 11-20 -----	819		5	3.50	619	--	--	--	--	--	--	--	--	0	243	8	--	1.0	--	--	--	103
Oct. 21-31 -----	521		5	3.65	462	--	--	.14	--	--	--	--	--	0	172	6	--	1.2	--	--	--	73
Nov. 1-10 -----	1,194		6	3.80	451	--	--	--	--	--	--	--	--	0	171	7	--	--	--	--	--	66
Nov. 11-20 -----	1,648		5	3.90	368	4.4	3.5	.04	.62	23	9.5	--	--	--	--	9	.0	1.4	172	135	135	66
Nov. 21-30 -----	4,413		5	4.45	169	--	--	--	--	--	--	--	--	0	53	6	--	1.0	--	--	--	33
Dec. 1-10 -----	4,597		5	4.5	165	--	--	--	--	--	--	--	--	0	57	3	--	.9	--	--	--	94
Dec. 11-20 -----	16,090		5	4.25	150	--	--	--	--	--	--	--	--	0	41	4	--	1.0	--	--	--	42
Dec. 21-31 -----	17,597		5	4.25	136	--	--	--	--	--	--	--	--	0	48	4	--	1.0	--	--	--	39
Jan. 1-10, 1949--	15,370		5	4.30	136	--	--	--	--	--	--	--	--	0	38	1	--	1.0	--	--	--	39
Jan. 11-20 -----	8,358		10	4.20	186	5.5	2.0	.04	.23	11	3.8	4.8	--	0	82	2.2	.0	1.2	103	58	58	56
Jan. 21-31 -----	17,980		5	4.20	150	--	--	--	--	--	--	--	--	0	48	5	--	.7	--	--	--	32
Feb. 1-10 -----	7,285		10	4.20	176	--	--	--	--	--	--	--	--	0	52	2	.1	1.1	--	--	--	21
Feb. 11-15, 18 --	6,633		20	4.20	213	--	--	.0	--	--	--	--	--	0	63	2	.1	1.4	--	--	--	24
Feb. 16, 17, 19, 20	15,625		10	4.40	118	--	--	.0	--	--	--	--	--	0	40	1	.0	1.0	--	--	--	13
Feb. 21-28 -----	12,140		15	4.30	137	--	--	.0	--	--	--	--	--	0	48	1	.0	1.4	--	--	--	12
Mar. 1-10 -----	7,497		20	4.30	151	--	--	.0	--	--	--	--	--	0	52	1	.0	1.0	--	--	--	18
Mar. 11-20 -----	4,993		5	4.30	162	--	--	.0	--	--	--	--	--	0	56	2	.0	1.0	--	--	--	18
Mar. 21-31 -----	6,245		20	4.00	160	--	--	.02	--	--	--	--	--	0	57	1	.1	1.2	--	--	--	20

Apr. 1-10 -----	11,100	5	4.30	118	5.7	.9	0.01	.05	8.1	3.5	.3	0	39	.8	.1	.7	60	42	42	18
Apr. 11-20 -----	9,375	10	4.40	111	--	--	.02	--	--	--	--	0	34	1	.0	.8	--	--	--	10
Apr. 21-30 -----	8,385	10	4.5	118	--	--	.02	--	--	--	--	0	43	1	.1	.6	--	--	--	8
May 1-10 -----	4,266	10	4.20	155	--	--	.03	--	--	--	--	0	57	2	.0	.6	--	--	--	16
May 11-20 -----	2,437	5	3.90	235	--	--	--	--	--	--	--	0	77	4	--	.1	--	--	--	30
May 21-31 -----	8,170	5	4.25	135	--	--	--	--	--	--	--	0	43	2	--	.1	--	--	--	18
June 1-10 -----	2,355	5	3.9	197	--	--	--	--	--	--	--	0	65	1.5	.1	.1	--	--	--	24
June 11-20 -----	1,165	5	3.6	304	--	--	.15	--	--	--	--	0	96	5	.1	1.0	--	--	--	40
June 21-30 -----	808	10	3.4	415	--	--	.30	--	--	--	--	0	135	6	.1	.9	--	--	--	57
July 1-10 -----	624	5	3.2	540	--	--	.45	--	--	--	--	0	174	9	.2	1.0	--	--	--	70
July 11-20 -----	797	1	3.30	628	--	--	--	--	--	--	--	0	211	4	--	.3	--	--	--	68
July 21-31 -----	650	2	3.40	526	--	--	.28	--	--	--	--	0	188	4	.2	1.1	--	--	--	56
Aug. 1-10 -----	409	2	3.40	581	--	--	.38	--	--	--	--	0	211	6	.1	.8	--	--	--	62
Aug. 11-20 -----	404	5	3.40	579	--	--	.5	--	--	--	--	0	214	7	--	1.4	--	184	184	74
Aug. 21-31 -----	522	5	3.40	523	--	--	.45	--	--	--	--	0	188	6	--	1.0	--	163	163	64
Sept. 1-10 -----	521	5	3.30	571	8.1	2.7	.50	2.0	35	15	11	0	200	5.8	.2	.3	310	193	193	52
Sept. 11-20 -----	422	5	3.35	589	--	--	--	--	--	--	--	0	207	7	--	.0	--	157	157	64
Sept. 21-30 -----	510	5	3.30	553	--	--	--	--	--	--	--	0	196	8	--	.0	--	146	146	60
Average -----	4,822	7	3.93	311	--	--	--	--	--	--	--	0	109	4.1	--	0.9	--	--	--	44

SUSQUEHANNA RIVER BASIN--Continued

WEST BRANCH SUSQUEHANNA RIVER AT LOCK HAVEN, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	47	44	34	33	34	48	55	60	74	75	70
2	64	45	42	34	33	36	46	53	63	78	74	66
3	61	47	40	35	33	37	47	51	66	78	75	67
4	58	50	39	35	33	36	46	60	67	79	75	68
5	55	51	41	36	34	36	45	65	--	83	75	70
6	57	55	42	38	34	38	45	62	68	80	73	71
7	56	52	40	38	33	36	44	64	70	78	72	66
8	55	50	38	39	33	38	44	63	65	76	73	67
9	56	49	37	40	34	36	44	63	65	74	77	62
10	52	51	35	42	34	38	45	63	64	74	75	59
11	54	49	36	38	34	34	45	60	65	72	75	62
12	55	46	35	40	33	36	48	60	72	76	78	64
13	54	45	38	42	33	35	51	58	73	76	77	65
14	52	43	38	37	34	36	52	60	75	75	76	67
15	50	46	40	37	38	36	47	61	75	74	75	65
16	51	45	38	38	36	38	50	60	73	75	76	62
17	53	47	38	37	35	36	48	64	73	77	74	62
18	53	47	38	40	37	35	47	64	73	75	72	64
19	52	46	34	40	36	36	46	68	75	78	70	65
20	50	47	35	40	38	34	45	70	73	76	68	63
21	48	45	34	36	40	36	45	67	75	80	67	60
22	47	43	33	35	38	38	49	64	78	82	68	64
23	45	41	34	34	37	40	50	60	74	78	69	60
24	45	43	33	36	36	44	49	60	75	75	70	55
25	47	42	32	37	36	47	45	58	78	78	67	54
26	46	43	32	39	34	49	49	58	80	80	68	55
27	46	41	33	41	--	50	55	54	78	79	72	58
28	44	42	33	42	36	50	44	53	80	81	75	61
29	45	40	34	38	--	52	56	53	75	80	74	60
30	46	40	33	36	--	54	54	52	78	80	71	59
31	45	--	33	33	--	52	--	56	--	78	72	--
Average	52	46	37	38	35	40	48	60	72	77	73	63

SUSQUEHANNA RIVER BASIN--Continued

WEST BRANCH SUSQUEHANNA RIVER AT LEWISBURG, PA.

LOCATION.--At gaging station at Market Street Bridge at Lewisburg, Union County, 563 feet from east bank of river, 0.2 mile downstream from Buffalo Creek, and 7.4 miles upstream from mouth.

DRAINAGE AREA.--6,847 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1949.

Water temperatures: October 1944 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 331 micromhos Oct. 1-10; minimum, 90.6 micromhos Jan. 1-10.

Water temperatures: Maximum, 90°F July 28, Aug. 10; minimum, freezing point on many days in December and February.

EXTREMES, 1944-49.--Dissolved solids (1944-47): Maximum, 219 parts per million Oct. 1-10, 1944; minimum, 46 parts per million May 1-10, 1945.

Total hardness (1944-47): Maximum, 133 parts per million Oct. 1-10, 1944; minimum, 26 parts per million May 21-31, 1946.

Specific conductance: Maximum, 331 micromhos Oct. 1-10, 1948; minimum, 72.0 micromhos May 21-31, 1946.

Water temperatures: Maximum, 90°F July 28, Aug. 10, 1949; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance and pH of daily samples available in district office in Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Tem-perature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Alum-inum (Al)	Iron (Fe)	Man-gan-ese (Mn)	Cal-cium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Pot-assium (K)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Dis-solved solids	Hardness as CaCO ₃		Total acid-ity as H ₂ SO ₄
																				Total	Non-carbon-ate	
Oct. 1-10, 1948--	982		15	7.1	331	9.2		0.22	0.00	33	10	14		40	100	11	0.1	2.1	211	123	91	
Oct. 11-20--	1,949		10	6.2	319	--		--	--	--	--	--	--	26	101	12	--	--	--	--	--	--
Oct. 21-31--	1,525		10	6.4	295	--		--	--	--	--	--	--	10	105	10	--	--	--	--	--	--
Nov. 1-5--	1,354		10	6.4	251	--		--	--	--	--	--	--	18	82	10	--	--	--	--	--	--
Nov. 6-10--	7,218		20	6.6	169	--		--	--	--	--	--	--	16	47	6	--	--	--	--	--	--
Nov. 11-20--	5,652		10	6.2	173	5.0		.01	.00	17	5.2	7.9		14	59	5	.0	1.4	104	64	32	
Nov. 21-30--	12,260		10	6.3	121	--		--	--	--	--	--	--	12	34	4	--	1.8	--	--	--	--
Dec. 1-10--	8,580		10	6.5	129	--		--	--	--	--	--	--	11	37	5	--	1.5	--	--	--	--
Dec. 11-20--	15,140		5	6.7	114	--		--	--	--	--	--	--	4	35	4	--	2.1	--	--	--	--
Dec. 21-31--	13,940		5	6.6	113	--		--	--	--	--	--	--	6	34	4	--	2.3	--	--	--	--
Jan. 1-10, 1949--	33,640		10	6.3	80.6	5.0		.04	.20	10	3.7	3.9		3	31	2	--	2.4	--	--	--	--
Jan. 11-20--	18,520		10	6.6	108	--		.02	--	--	--	--	--	4	37	3.8	.0	1.8	64	40	37	
Jan. 21-31--	26,240		5	6.0	106	--		--	--	--	--	--	--	4	36	2.4	--	1.8	--	--	--	--
Feb. 1-10--	14,910		5	6.1	120	--		--	--	--	--	--	--	4	43	4	--	1.5	--	--	--	--
Feb. 11-20--	17,940		5	6.2	116	--		--	--	--	--	--	--	4	41	2	--	1.4	--	--	--	--
Feb. 21-28--	21,420		5	6.3	98.1	--		--	--	--	--	--	--	3	41	4	--	1.3	--	--	--	--
Mar. 1-10--	14,360		5	6.3	106	--		--	--	--	--	--	--	5	36	2	--	1.3	--	--	--	--
Mar. 11-20--	9,769		5	6.4	116	--		--	--	--	--	--	--	7	43	2	--	1.3	--	--	--	--
Mar. 21-31--	9,358		5	6.4	133	--		--	--	--	--	--	--	6	44	4	--	1.0	--	--	--	--
Apr. 1-10--	18,250		10	6.6	91.9	5.1		.07	.05	9.1	3.1	2.2		6	30	2.2	.1	.7	56	35	31	
Apr. 11-20--	20,420		10	6.1	87.8	--		--	--	--	--	--	--	7	29	2	--	1.0	--	--	--	--
Apr. 21-30--	15,490		10	6.1	94.1	--		--	--	--	--	--	--	7	32	2	--	.9	--	--	--	--
May 1-10--	10,530		10	6.1	95.9	--		--	--	--	--	--	--	8	34	2	--	1.0	--	--	--	--
May 11-20--	5,479		10	6.3	133	--		--	--	--	--	--	--	12	43	2	--	1.2	--	--	--	--
May 21-31--	17,930		10	6.1	94.0	--		--	--	--	--	--	--	7	31	2	--	.6	--	--	--	--

SUSQUEHANNA RIVER BASIN--Continued
WEST BRANCH SUSQUEHANNA RIVER AT LEWISBURG, PA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
June 1-10, 1949--	5,239		5	8.4		--	--	0.00	--	--	--	--	--	9	38	4	0.1	0.9	--	--	--	--
June 11-20-----	2,672		5	6.5	119	--	--	--	--	--	--	--	--	16	49	5	1	1.3	--	--	--	--
June 21-30-----	2,265		5	6.7	156	--	--	0.00	--	--	--	--	--	13	57	5	2	2.2	--	--	--	--
July 1-10-----	1,435		5	6.8	204	--	--	0.00	--	--	--	--	--	15	67	5	2	1.9	--	--	--	--
July 11-20-----	1,486		2	7.1	258	--	--	.02	--	--	--	--	--	16	89	4	1	1.8	--	--	--	--
July 21-31-----	1,339		2	6.5	310	--	--	.02	--	--	--	--	--	8	118	7	1	1.3	--	--	--	--
Aug. 1-10-----	1,041		5	6.7	284	--	--	--	--	--	--	--	--	12	101	8	--	1.6	--	111	101	--
Aug. 11-20-----	953		5	6.8	299	--	--	--	--	--	--	--	--	23	99	9	--	1.9	--	116	97	--
Aug. 21-31-----	1,551		5	7.1	272	--	--	--	--	--	--	--	--	27	82	9	--	1.9	--	106	84	--
Sept. 1-10-----	1,505		10	6.9	254	4.0	--	.01	.00	26	8.6	8.3	--	23	83	8.0	1	1.9	162	100	81	--
Sept. 11-20-----	1,324		5	6.4	255	--	--	--	--	--	--	--	--	14	88	7	--	1.6	--	102	91	--
Sept. 21-30-----	1,896		5	6.4	209	--	--	--	--	--	--	--	--	18	67	6	--	1.3	--	78	63	--
Average-----	9,436		8	6.5	173	--	--	--	--	--	--	--	--	12	57	5	--	1.5	--	--	--	--

SUSQUEHANNA RIVER BASIN--Continued

WEST BRANCH SUSQUEHANNA RIVER AT LEWISBURG, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	52	40	34	--	36	50	58	50	80	85	70
2	68	52	39	35	--	36	50	62	67	85	80	76
3	64	54	38	35	32	36	47	63	70	85	80	70
4	60	52	40	36	--	41	48	66	71	85	85	72
5	55	55	39	36	38	--	47	70	74	85	85	74
6	60	53	40	37	34	40	45	70	75	80	83	70
7	62	56	40	40	35	38	45	66	75	80	83	65
8	60	53	39	38	36	40	45	67	70	80	85	70
9	60	51	38	39	37	40	47	65	80	80	85	70
10	58	52	37	40	35	40	48	65	70	77	90	70
11	59	50	35	40	35	39	50	63	76	80	85	78
12	57	47	--	38	34	40	52	65	78	80	80	70
13	55	47	32	38	35	39	52	63	80	80	85	70
14	55	42	38	38	37	38	55	64	80	80	83	75
15	57	46	36	37	40	37	54	66	80	83	80	70
16	57	45	36	39	40	37	48	67	80	82	80	70
17	53	47	32	39	39	39	49	69	75	80	80	70
18	56	45	36	38	39	38	46	68	75	80	75	70
19	--	44	35	40	39	39	47	68	75	--	75	70
20	50	--	35	40	41	38	50	65	80	85	75	67
21	50	47	35	38	41	41	50	65	80	85	72	67
22	49	45	34	39	40	44	51	58	80	--	72	60
23	50	45	35	36	41	46	52	60	80	80	75	65
24	53	44	34	36	--	50	50	61	80	81	77	65
25	53	43	--	36	40	47	52	60	80	85	82	65
26	54	42	--	36	41	50	55	60	83	85	80	65
27	53	43	--	40	40	52	58	60	81	85	84	65
28	52	42	32	40	38	52	57	58	80	90	--	65
29	53	41	33	40	--	55	58	55	75	88	82	60
30	52	41	34	38	--	57	60	58	80	--	78	67
31	50	--	33	33	--	52	--	60	--	83	75	--
Average	56	47	36	38	38	43	49	63	76	82	81	69

SUSQUEHANNA RIVER BASIN--Continued
FRANKSTOWN BRANCH JUNIATA RIVER AT HUNTINGDON, PA.

LOCATION --At Fourth Street bridge at Huntingdon, Huntingdon County.

DRAINAGE AREA --816 square miles

RECORDS AVAILABLE --Chemical analyses: October 1947 to September 1949.

Water temperatures: October 1947 to September 1949.

EXTREMES 1948-49 --Specific conductance: Maximum, 412 micromhos Sept. 21-30; minimum, 191 micromhos Jan. 21-31.

Water temperatures: Maximum, 80°F on several days in June, July, and August; minimum, 34°F Feb. 1-3.

EXTREMES 1947-49 --Dissolved solids (1947-48): Maximum, 241 parts per million Oct. 21-31, 1947; minimum, 109 parts per million May 1-10, 1948.

Total hardness (1947-48): Maximum, 175 parts per million Oct. 21-31, 1947; minimum, 79 parts per million Feb. 21-29, 1948.

Water temperatures: Maximum, 80°F on several days in June, July, and August, 1949; minimum, freezing point Jan. 23 to Feb. 2, 1948.

REMARKS --Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature ('F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1-10, 1948 --	316					5.3		0.02	0.00	46	14	15	1.7	155	35	26	0.1	4.6	229	172	45	
Oct. 11-20 -----	304	20	6.8		404	7.3		.02	.00	45	13	13	2.0	139	41	22	.2	5.2	221	166	52	
Oct. 21-31 -----	268	15	6.6		385	5.7		.02	.00	46	14	15	2.2	148	40	26	.1	4.5	230	172	51	
Nov. 1-10 -----	328	9	7.1		363	--		--	--	--	--	--	--	100	59	12	--	2.2	--	--	--	
Nov. 11-20 -----	327	10	7.1		195	7.0		.02	--	23	6.5	--	3.9	89	22	6.2	.1	5.1	121	84	28	
Nov. 21-30 -----	852	12	7.2		278	11		--	--	--	--	--	--	92	33	--	--	3.2	--	--	--	
Dec. 1-10 -----	1,109	9	7.0		262	8.1		--	--	--	--	--	--	84	32	--	--	5.1	--	--	--	
Dec. 11-20 -----	1,828	7	7.1		234	8.2		--	--	--	--	--	--	78	29	--	--	5.2	--	--	--	
Dec. 21-31 -----	1,783	6	7.1		341	9.1		.02	--	39	11	13	--	92	30	--	--	5.3	--	--	--	
Jan. 1-10, 1949 --	2,863	8	7.4		251	8.3		--	--	--	--	--	--	120	42	17	.1	5.5	203	143	44	
Jan. 11-20 -----	1,759	10	7.1		226	8.5		--	--	39	--	--	--	76	29	--	--	5.7	--	--	--	
Jan. 21-31 -----	3,482	8	7.0		191	8.9		--	--	39	--	--	--	60	29	--	--	4.6	--	--	--	
Feb. 1-10 -----	1,621	7	7.3		229	7.9		--	--	--	--	--	--	82	26	--	--	6.2	--	--	--	
Feb. 11-20 -----	1,490	6	7.2		229	6.9		--	--	--	--	--	--	80	28	--	--	5.8	--	--	--	
Feb. 21-28 -----	2,531	8	7.3		196	8.2		--	--	--	--	--	--	70	27	--	--	4.1	--	--	--	
Mar. 1-10 -----	1,479	7	7.3		231	7.4		--	--	--	--	--	--	82	25	--	--	5.3	--	--	--	
Mar. 11-20 -----	1,047	3	7.5		251	5.3		--	--	--	--	--	--	97	29	--	--	4.0	--	--	--	
Mar. 21-31 -----	1,926	4	7.4		253	4.3		--	--	--	--	--	--	94	28	--	--	3.8	--	--	--	
Apr. 1-10 -----	1,602	8	6.9		199	4.2		.08	--	24	6.7	3.6	--	68	26	7.0	.0	3.4	129	87	32	
Apr. 11-20 -----	1,324	4	7.4		212	4.4		--	--	--	--	--	--	78	25	--	--	3.2	--	--	--	
Apr. 21-30 -----	1,049	7	7.1		240	3.0		--	--	--	--	--	--	87	27	10	--	2.1	--	--	--	
May 1-10 -----	780	7	7.3		273	2.9		--	--	--	--	--	--	103	27	13	--	2.2	--	--	--	
May 11-20 -----	551	--	--		305	--		--	--	--	--	--	--	--	--	--	--	--	--	--	--	
May 21-31 -----	739	5	7.3		261	6.1		--	--	--	--	--	--	94	31	14	--	3.5	--	--	--	

June 1-10 -----	440	7	7.6	302	4.0	--	--	--	--	110	28	18	--	2.7	--	--	--
June 11-20 -----	380	8	7.4	344	2.4	--	--	--	--	126	31	22	--	2.1	--	--	--
June 21-30 -----	322	8	7.5	358	4.8	--	--	--	--	136	29	23	--	2.8	--	--	--
July 1-10 -----	369	11	7.3	350	4.9	.15	41	12	10	132	31	21	.2	4.8	196	152	44
July 11-20 -----	1,191	7	7.4	278	7.2	--	--	--	--	91	35	12	--	4.0	--	--	--
July 21-31 -----	584	5	7.4	277	5.8	--	--	--	--	107	33	8.5	--	4.6	--	--	--
Aug. 1-10 -----	421	5	7.4	319	3.6	--	--	--	--	122	32	14	--	4.6	--	--	--
Aug. 11-20 -----	383	7	7.4	365	5.4	--	--	--	--	139	31	23	--	4.9	--	--	--
Aug. 21-31 -----	339	5	7.4	384	5.2	--	--	--	--	146	32	23	--	4.1	--	--	--
Sept. 1-10 -----	279	7	7.3	378	5.2	--	--	--	--	144	32	22	--	3.6	--	--	--
Sept. 11-20 -----	269	8	7.2	400	3.4	--	--	--	--	150	32	26	--	4.3	--	--	--
Sept. 21-30 -----	268	11	7.3	412	2.6	.08	47	14	12	153	31	28	.1	5.1	263	175	49
Average-----	989	8	7.2	294	5.9	--	--	--	--	106	31	--	--	4.2	--	--	--

SUSQUEHANNA RIVER BASIN--Continued

FRANKSTOWN BRANCH JUNIATA RIVER AT HUNTINGDON, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	52	42	--	34	48	54	60	66	76	78	74
2	64	52	44	--	--	38	48	60	68	78	76	70
3	62	52	40	--	34	40	48	64	--	78	78	70
4	62	54	44	50	36	40	45	66	68	80	76	72
5	62	54	44	50	38	42	50	62	68	78	76	72
6	62	--	44	52	42	42	48	62	68	78	76	72
7	62	--	44	50	38	46	50	60	70	76	--	74
8	58	--	42	50	42	44	48	66	70	74	78	72
9	58	--	42	48	46	42	48	64	70	74	78	70
10	58	--	40	50	46	42	50	64	70	76	80	70
11	60	36	40	44	44	44	54	66	70	76	80	64
12	58	38	40	44	40	--	50	64	72	76	78	64
13	56	38	44	42	44	42	50	64	74	72	80	64
14	54	40	46	42	46	40	56	--	78	76	78	64
15	54	42	44	42	48	40	54	64	76	76	78	60
16	56	40	--	42	48	40	52	66	76	74	76	62
17	54	40	44	44	44	40	50	--	78	72	76	62
18	52	40	42	44	44	40	50	69	74	78	74	68
19	52	40	42	44	44	40	50	69	74	74	74	68
20	48	44	42	42	46	42	--	64	76	74	74	66
21	56	48	40	44	46	44	54	--	76	79	74	64
22	50	48	42	42	46	46	54	64	78	74	74	66
23	54	48	40	40	46	48	54	64	78	76	72	64
24	50	48	40	40	46	52	54	64	78	74	74	62
25	52	48	38	42	44	50	52	66	78	78	74	64
26	50	46	36	44	46	52	56	64	78	78	76	62
27	52	46	36	44	46	54	60	64	80	78	78	62
28	58	45	36	44	44	54	58	58	78	78	76	--
29	56	44	36	44	--	54	56	58	76	79	76	--
30	52	44	36	38	--	56	58	58	78	78	76	60
31	52	--	34	35	--	56	--	66	--	--	74	--
Average	56	45	41	44	43	45	52	64	74	76	76	66

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.

LOCATION.--At gaging station at highway bridge at Newport, Perry County, 1,000 feet upstream from Little Buffalo Creek, and 230 feet from west bank of river.
DRAINAGE AREA.--335 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1949.

Water temperatures: October 1944 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 398 micromhos Oct. 1-10; minimum, 119 micromhos Apr. 11-20.

Water temperatures: Maximum, 87°F July 3; freezing point on several days in December and January.

EXTREMES, 1944-49.--Dissolved solids (1944-47): Maximum, 282 parts per million Oct. 1-10, 1944; minimum, 78 parts per million Mar. 1-10, 1945, May 21-31, 1946.

Total hardness (1944-47): Maximum, 167 parts per million Oct. 1-10, 1944; minimum, 50 parts per million May 21-31, 1946.

Specific conductance: Maximum, 444 micromhos Oct. 1-10, 1944; minimum, 119 micromhos Apr. 11-20, 1948.

Water temperatures: Maximum, 87°F Aug. 29, 1948; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C.)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1-10, 1948 -	816		15	7.3	397	1.0		0.04	--	40	13	24	3.5	120	78	16	0.0	1.3	231	153	--	55
Oct. 11-20 -	1,258		11	7.5	341	--		--	--	--	--	--	--	103	66	10	--	3.1	--	--	--	--
Oct. 21-31 -	889		6	7.0	344	--		--	--	--	--	--	--	101	66	12	--	2.0	--	--	--	--
Nov. 1-10 -	2,077		9	7.1	324	--		--	--	--	--	--	--	133	40	19	--	5.3	--	--	--	--
Nov. 11-18 -	1,900		20	7.2	269	5.4		.04	0.00	29	7.6	14	--	80	51	10	.0	2.4	160	104	38	--
Nov. 19, 20 -	4,000		35	6.9	143	4.2		.04	.00	19	4.4	--	--	32	20	5	.0	5.2	84	66	39	--
Nov. 21-30 -	5,449		7	6.8	176	--		--	--	--	--	--	--	49	31	4.4	--	3.8	--	--	--	--
Dec. 1-10 -	5,092		6	6.8	177	--		--	--	--	--	--	--	53	30	4.9	--	5.1	--	--	--	--
Dec. 11-20 -	6,846		8	6.8	179	--		--	--	--	--	--	--	54	26	6.1	--	5.0	--	--	--	--
Dec. 21-31 -	7,127		7	6.8	171	--		--	--	--	--	--	--	52	26	3.8	--	5.8	--	--	--	--
Jan. 1-10, 1949 -	12,500		8	7.0	130	7.6		.06	--	15	3.8	4.1	--	36	23	3	.1	4.9	88	53	24	--
Jan. 11-20 -	5,424		6	6.9	159	--		--	--	--	--	--	--	49	25	3.6	--	4.7	--	--	--	--
Jan. 21-31 -	11,830		6	7.0	144	--		--	--	--	--	--	--	44	24	3.5	--	5.0	--	--	--	--
Feb. 1-10 -	6,830		5	6.8	146	--		--	--	--	--	--	--	45	23	3.2	--	4.4	--	--	--	--
Feb. 11-20 -	6,310		7	7.4	153	6.4		--	--	--	--	--	--	47	25	4.0	--	3.6	--	--	--	--
Feb. 21-28 -	10,280		8	7.4	122	6.4		--	--	--	--	--	--	37	20	2.8	--	3.8	--	--	--	--
Mar. 1-10 -	5,430		3	7.4	152	6.2		--	--	--	--	--	--	52	23	--	--	2.8	--	--	--	--
Mar. 11-20 -	3,753		3	7.4	172	4.5		--	--	--	--	--	--	66	27	--	--	3.2	--	--	--	--
Mar. 21-31 -	2,838		5	7.4	206	2.1		--	--	--	--	--	--	67	34	--	--	2.6	--	--	--	--
Apr. 1-10 -	4,997		5	7.0	160	4.1		.04	--	18	4.9	5.4	--	51	26	3.9	.0	3.0	106	65	23	--
Apr. 11-20 -	7,224		8	7.3	119	5.7		--	--	--	--	--	--	37	18	--	--	3.3	--	--	--	--
Apr. 21-30 -	4,031		3	7.0	157	5.6		--	--	--	--	--	--	54	23	--	--	1.4	--	--	--	--
May 1-10 -	3,186		5	7.1	174	4.3		--	--	--	--	--	--	44	20	--	--	1.8	--	--	--	--
May 11-20 -	2,104		5	7.0	205	3.7		--	--	--	--	--	--	70	28	--	--	1.7	--	--	--	--
May 21-31 -	2,451		5	7.2	205	5.8		--	--	--	--	--	--	79	29	--	--	2.0	--	--	--	--

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃			Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	Total	
June 1-10, 1949 --	1,401		6	7.6	236	2.6		--	--	--	--	--	--	80	35	8.5	0.8	0.8	--	--	--	--	--
June 11-20 -----	1,216		6	7.4	279	2.2		--	--	--	--	--	--	88	45	10	--	1.0	--	--	--	--	--
June 21-30 -----	1,240		7	7.3	273	3.6		--	--	--	--	--	--	89	43	9.4	--	1.0	--	--	--	--	--
July 1-10 -----	1,407		8	7.3	285	4.7		0.04	--	31	9.4	12	--	94	49	9.4	.1	1.9	181	116	39	--	--
July 11, 12, 14-18	4,114		16	7.4	216	4.8		--	--	--	--	--	--	70	34	6.0	--	2.4	--	--	--	--	--
July 13, 15, 20 --	8,973		22	7.4	133	5.4		--	--	--	--	--	--	42	20	3.5	--	2.6	--	--	--	--	--
July 21-31 -----	3,128		7	7.1	183	7.7		--	--	--	--	--	--	60	31	3.9	--	3.3	--	--	--	--	--
Aug. 1-10 -----	1,870		6	7.3	222	5.4		--	--	--	--	--	--	76	37	5.1	--	1.9	--	--	--	--	--
Aug. 11-20 -----	1,183		6	7.4	270	3.8		--	--	--	--	--	--	90	44	9.1	--	1.5	--	--	--	--	--
Aug. 21-31 -----	1,037		5	7.4	309	4.6		--	--	--	--	--	--	96	53	10	--	1.8	--	--	--	--	--
Sept. 1-10 -----	946		6	7.3	325	3.3		--	--	--	--	--	--	106	54	11	--	1.9	--	--	--	--	--
Sept. 11-20 -----	758		5	7.2	367	3.0		--	--	--	--	--	--	108	68	14	--	1.9	--	--	--	--	--
Sept. 21-30 -----	704		10	7.7	380	1.9		.04	--	38	11	19	--	110	66	15	.1	2.3	235	140	50	--	--
Average -----	3,902		8	7.2	221	--		--	--	--	--	--	--	70	36	--	--	2.9	--	--	--	--	--

SUSQUEHANNA RIVER BASIN--Continued

JUNIATA RIVER AT NEWPORT, PA.--Continued¹

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	54	43	32	37	38	52	60	67	76	79	71
2	68	53	39	32	37	38	50	63	65	79	69	72
3	67	52	40	32	34	37	53	66	71	87	79	71
4	60	53	41	33	37	38	55	67	70	82	79	76
5	57	53	43	35	37	42	51	69	78	83	80	77
6	54	61	43	39	37	44	49	69	76	82	79	76
7	53	54	41	42	37	43	50	71	75	78	83	72
8	54	54	41	39	37	41	50	72	71	75	78	71
9	57	52	40	42	37	44	52	69	72	79	80	68
10	58	54	40	40	37	44	54	63	70	78	80	64
11	56	51	38	42	38	44	51	63	74	73	84	68
12	57	50	39	41	37	42	56	64	81	79	82	68
13	55	48	38	41	38	41	54	66	79	70	81	69
14	56	46	38	42	39	41	53	68	79	76	82	68
15	54	46	39	37	43	40	56	70	77	76	78	68
16	53	46	39	40	41	37	54	69	78	77	79	68
17	54	49	39	42	41	38	53	69	79	78	79	68
18	54	44	38	41	42	40	53	71	75	78	75	74
19	51	48	39	43	40	40	50	71	77	74	75	74
20	49	51	38	40	47	42	51	69	77	72	71	69
21	47	48	38	39	42	44	55	68	81	77	74	69
22	47	47	37	38	44	44	55	68	80	77	73	65
23	48	47	35	38	44	52	55	68	78	78	73	68
24	54	46	35	38	44	53	53	69	79	82	77	58
25	55	47	35	39	44	54	54	69	81	80	75	65
26	51	--	33	39	44	52	54	63	84	80	75	61
27	52	45	32	40	44	57	62	62	79	84	78	61
28	50	42	32	40	41	56	61	63	80	83	76	64
29	52	42	34	41	--	58	59	61	78	84	81	60
30	52	43	34	39	--	59	60	65	71	82	77	59
31	51	--	34	37	--	56	--	63	--	84	77	--
Average	55	49	38	39	40	45	54	67	76	79	78	68

SUSQUEHANNA RIVER BASIN--Continued

RAYSTOWN BRANCH JUNIATA RIVER NEAR HUNTINGDON, PA.

LOCATION.--At gaging station at Hawn Bridge, a quarter of a mile below Pennsylvania Electric Co. power dam, 6 miles south of Huntingdon, Huntingdon County, and 9 miles upstream from mouth.

DRAINAGE AREA.--957 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1949.

Water temperatures: October 1946 to September 1949.

EXTREMES, 1946-49.--Specific conductance: Maximum, 299 micromhos Oct. 1-10; minimum, 103 micromhos Feb. 21-28.

Water temperatures: Maximum, 81°F on several days in June, July, and August; minimum, freezing point on several days in February and March.

EXTREMES, 1946-49.--Dissolved solids (1946-47): Maximum, 168 parts per million Aug. 11-20, 1947; minimum, 64 parts per million Apr. 11-20, 1947.

Total hardness (1946-47): Maximum, 125 parts per million Aug. 11-20, 1947; minimum, 41 parts per million Apr. 11-20, 1947.

Specific conductance: Maximum, 299 micromhos Oct. 1-10, 1948; minimum, 81.3 micromhos Apr. 21-30, 1948.

Water temperatures: Maximum, 82°F July 31, 1948; minimum, freezing point on many days during winter months.

REMARKS.--Flow is regulated by dam a quarter of a mile upstream from gaging station. Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micro-mhos at 25°C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acid-soluble as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1-10, 1948	361		15	7.4	299	2.9		0.02	0.00	36	14	1.9		94	63	4.2	0.2	3.0	180	147		70
Oct. 11-20	347		5	7.4	263									88	41	4		3.2				
Oct. 21-31	239		5	7.3	227									75	41	3		3.8				
Nov. 1-10	864		10	7.3	215									65	39			3.6				
Nov. 11-20	634		25	7.3	156	9.4		.15	.00	18	4.9	4.3		45	28	3.6	.1	3.8	99	65	28	
Nov. 21-30	1,466		10	7.4	140									35	28			4.0				
Dec. 1-10	1,499		7	7.4	133									34	26			3.8				
Dec. 11-20	2,374		25	6.6	115	6.6		.12	.00	13	3.9	2.4		28	24	2	.0	3.8	71	48	26	
Dec. 21-31	1,974		5	7.4	115									28	22			4.0				
Jan. 1-10, 1949	3,313		5	7.1	107	13		.09		10	3.3	5.9		26	22	2.5	.1	4.1	79	38	17	
Jan. 11-20	1,451		5	7.4	134	6.2								37	25			3.9				
Jan. 21-31	3,883		6	7.4	110	5.7								29	22	2.1		3.2				
Feb. 1-10	2,138		6	7.8	122	5.3								31	23	2.0		3.9				
Feb. 11-20	1,967		6	7.4	123	6.7								34	23	2.0		3.3				
Feb. 21-28	2,980		7	7.8	103	6.7								25	20	2.4		2.9				
Mar. 1-10	1,555		6	7.4	132	6.7								35	25	2.4		3.1				
Mar. 11-20	1,124		7	7.3	138	6.2								39	27	2.2		3.0				
Mar. 21-31	787		8	7.8	160	4.4								48	31	2.2		3.0				

Apr. 1-10	1,741	8	7.0	125	4.8	23	--	14	4.3	3.2	36	24	2.2	.1	2.3	85	53	23
Apr. 11-20	1,508	7	7.3	115	6.2	--	--	--	--	--	34	22	--	--	2.3	--	--	--
Apr. 21-30	983	7	7.3	158	3.8	--	--	--	--	--	48	27	4.1	--	1.9	--	--	--
May 1-10	725	7	7.3	148	3.2	--	--	--	--	--	43	28	3.1	--	2.5	--	--	--
May 11-20	487	4	7.2	170	3.2	--	--	--	--	--	65	33	2.8	--	1.7	--	--	--
May 21-31	617	3	7.2	191	5.2	--	--	--	--	--	59	36	2.4	--	2.3	--	--	--
June 1-10	304	3	7.1	195	5.3	--	--	--	--	--	62	35	2.5	--	3.0	--	--	--
June 11-20	335	4	7.1	205	4.7	--	--	--	--	--	65	39	2.5	--	2.4	--	--	--
June 21-30	375	4	7.3	227	4.8	--	--	--	--	--	74	45	2.8	--	2.1	--	--	--
July 1-10	497	5	7.0	218	6.5	04	--	27	8.7	1.6	76	36	2.8	.1	3.1	127	103	41
July 11, 12	585	7	7.5	197	--	--	--	--	--	--	66	35	6	--	3.9	--	--	--
July 13-20	3,288	11	7.1	120	8.7	--	--	--	--	--	37	20	2.4	--	3.9	--	--	--
July 21-31	1,243	6	7.0	131	7.2	--	--	--	--	--	41	22	2.4	--	3.4	--	--	--
Aug. 1-10	606	5	7.1	167	5.9	--	--	--	--	--	56	28	2.8	--	2.5	--	--	--
Aug. 11-20	308	6	7.1	186	6.4	--	--	--	--	--	63	29	2.9	--	2.7	--	--	--
Aug. 21-31	278	5	7.2	236	5.6	--	--	--	--	--	84	39	2.6	--	3.1	--	--	--
Sept. 1-10	228	6	7.4	240	5.0	--	--	--	--	--	83	41	2.4	--	3.0	--	--	--
Sept. 11-20	159	6	7.2	249	4.2	--	--	--	--	--	86	44	2.6	--	2.8	--	--	--
Sept. 21-30	158	7	7.4	259	2.8	04	--	30	11	3.1	88	46	2.9	.1	3.0	156	120	48
Average	1,167	77	7.3	171	5.8	--	--	--	--	--	53	31	2.8	--	3.1	--	--	--

SUSQUEHANNA RIVER BASIN--Continued

RAYSTOWN BRANCH JUNIATA RIVER NEAR HUNTINGDON, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	54	42	33	33	38	51	63	63	79	81	74
2	68	52	40	35	32	37	51	65	65	--	79	74
3	64	50	42	35	32	33	51	65	66	80	78	75
4	64	52	--	33	34	32	51	67	68	80	80	76
5	62	54	40	37	34	40	47	68	--	80	78	75
6	62	--	--	37	33	40	48	68	69	78	79	72
7	63	53	41	40	32	38	50	67	67	78	80	72
8	62	54	41	39	33	43	48	68	66	79	79	71
9	60	53	40	40	33	42	50	69	68	80	80	70
10	60	53	38	41	32	41	48	68	71	80	80	71
11	60	52	37	40	33	40	--	68	--	78	81	70
12	58	50	38	--	32	40	55	69	75	76	--	70
13	58	50	38	--	40	--	52	68	75	--	81	70
14	57	49	38	--	39	40	56	68	75	72	80	69
15	58	49	--	40	41	38	57	68	75	74	78	69
16	58	48	39	39	43	38	52	68	75	76	80	68
17	57	49	41	39	34	38	55	68	73	68	78	--
18	55	48	39	39	44	38	54	69	74	71	78	69
19	55	47	37	39	45	38	51	--	75	72	76	71
20	54	47	37	39	44	37	51	67	77	74	78	68
21	53	47	36	38	42	40	54	69	79	75	76	69
22	52	47	36	40	43	42	54	69	--	76	76	67
23	53	47	36	39	44	41	53	68	79	75	76	66
24	51	48	35	39	44	45	54	68	80	78	77	66
25	51	45	35	40	42	48	56	--	81	78	76	66
26	51	45	37	40	43	47	--	65	80	79	77	65
27	51	45	33	42	--	52	58	65	80	80	77	64
28	51	44	35	45	40	51	58	65	79	80	77	65
29	52	42	34	--	--	55	62	65	78	80	76	63
30	54	42	40	38	--	54	62	64	80	81	76	61
31	52	--	35	34	--	52	--	64	--	80	76	--
Average	57	49	38	39	38	42	53	67	74	77	78	69

SUSQUEHANNA RIVER BASIN--Continued
CODORUS CREEK NEAR YORK, PA.

LOCATION --At Richland Ave. Bridge, York County, 0.9 mile downstream from gaging station near York.

DRAINAGE AREA --222 square miles above gaging station.

RECORDS AVAILABLE --Chemical analyses: October 1948 to September 1949.

Water temperatures: October 1948 to September 1949.

EXEMES, 1948-49 --Dissolved solids: Maximum, 346 parts per million Sept. 11-20; minimum, 108 parts per million Apr. 11-20.

Total hardness: Maximum, 129 p.p.m. per million Sept. 11-20; minimum, 59 parts per million May 21-31.

Water temperatures: Maximum, 87° F. per million Sept. 11-20; minimum, 68° F. per million May 1-10.

Water discharges: Maximum, 129 p.p.m. per million Sept. 11-20; minimum, 26 p.p.m. per million May 1-10.

REMARKS --Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Discharge records for gaging station near York for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1-10, 1948 --	97		80	7.1	422	6.0		0.06		28	5.3	60	7.2	162	29	41	0.1	0.1	257	92	0	
Oct. 11-20 --	80		80	7.1	387	6.8		.12		30	5.4	47	5.1	146	26	38	.1	.1	238	97	0	
Oct. 21-31 --	66		60	7.0	440	7.2		.08		26	5.8	58	6.7	147	32	46	.1	.1	266	89	0	
Nov. 1-10 --	113		50	6.9	354	6.0		.10		26	5.6	38	7.4	126	26	32	.1	.1	214	88	0	
Nov. 11-20 --	92		60	7.0	339	4.0		.08		30	5.5	28	3.0	124	19	30	.0	.2	207	97	0	
Nov. 21-30 --	168		40	7.0	263	5.6		.18		25	4.9	14	3.0	90	24	19	.0	2.5	159	83	9	
Dec. 1-10 --	220		30	6.9	212	5.4		.17		21	4.7	15	2.7	68	22	14	.0	5.7	130	72	16	
Dec. 11-20 --	274		25	6.9	202	4.8		.04		20	4.9	16	2.4	64	21	13	.0	9.4	128	70	18	
Dec. 21-31 --	503		30	7.0	204	6.4		.16		21	4.7	6.7	3.1	68	17	10	.0	9.7	128	72	16	
Jan. 1-10, 1949 --	918		12	7.1	179	7.2		.12		19	4.4	5.4	2.8	54	18	7.0	.0	16	109	66	21	
Jan. 11-20 --	359		17	7.1	210	7.4		.06		20	4.8	11	2.4	64	17	12	.1	17	127	70	17	
Jan. 21-31 --	723		12	7.0	189	6.6		.08		19	4.5	7.5	3.4	56	18	9.0	.1	15	114	66	20	
Feb. 1-10 --	550		20	7.0	179	7.0		.05		18	4.4	6.2	2.6	52	17	8.0	.0	14	109	63	20	
Feb. 11-20 --	493		20	7.0	183	6.8		.05		18	4.5	7.9	2.0	54	17	10	.0	14	111	63	19	
Feb. 21-28 --	446		17	7.2	182	8.8		.03		17	4.5	10	1.7	54	16	11	.0	14	112	61	17	
Mar. 1-10 --	323		16	7.0	193	6.5		.05		18	4.5	13	1.7	37	17	12	.0	15	117	63	15	
Mar. 11-20 --	261		18	7.0	202	6.1		.07		19	4.5	13	1.9	62	18	14	.0	13	123	66	15	
Mar. 21-31 --	243		28	7.0	211	6.1		.06		19	4.4	15	1.5	67	16	15	.1	10	138	66	11	
Apr. 1-10 --	286		15	7.1	186	6.7		.05		18	4.2	14	1.8	59	16	12	.0	10	115	62	14	
Apr. 11-20 --	421		13	7.1	170	7.2		.10		19	4.1	10	2.0	59	14	8.5	.2	10	108	64	16	
Apr. 21-30 --	290		20	6.8	182	6.7		.05		19	4.2	8.0	1.4	35	17	12	.1	9.9	114	65	19	
May 1-10 --	268		20	7.0	169	6.5		.04		18	4.1	5.5	1.4	36	13	10	.0	8.7	108	62	16	
May 11-20 --	227		20	7.2	181	6.8		.05		18	4.1	7.5	1.4	52	14	14	.0	16	115	52	18	
May 21-31 --	191		28	7.1	202	6.8		.04		18	3.5	16	3.8	65	16	14	.1	6.3	122	59	6	

SUSQUEHANNA RIVER BASIN--Continued
CODORUS CREEK NEAR YORK, PA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
June 1-10, 1949 --	110		7	6.9	251	4.8		0.05		22	4.0	22	4.8	81	20	23	0.1	3.4	152	71	5	
June 11-20 -----	989		8	6.6	284	5.5		.05		22	3.9	26	4.4	94	20	26	.1	3.0	168	71	0	
June 21-26, 29, 30	80		12	6.4	353	4.1		.08		26	5.1	37	1.9	114	16	34	.4	1.8	203	86	0	
July 1, 2 -----	91		12	6.5	184	3.7		--		--	--	--	--	170	17	13	--	6.6	128	--	--	
July 3-10 -----	102		4	6.7	328	3.5		--		--	--	--	--	109	19	37	--	2.1	187	65	--	
July 11-20 -----	311		6	6.5	278	4.3		.09		20	4.1	12	2.2	76	18	10	.4	5.4	109	69	7	
July 21-29 -----	111		38	6.6	275	3.4		.13		20	4.5	16	2.0	71	18	16	.2	5.4	134	89	10	
July 30, 31 -----	283		4	6.5	191	3.9		.08		24	5.6	26	2.4	98	20	23	.3	3.6	166	83	3	
Aug. 1, 5 -----	161		25	6.8	171	6.1		.08		17	4.5	--	--	55	--	10	--	3.8	115	61	16	
Aug. 2-4, 6-10 ---	91		45	7.3	301	6.6		.08		26	5.4	24	4.0	96	23	26	.1	1.8	180	87	8	
Aug. 11-18, 20 ---	59		22	7.2	399	6.2		.10		31	6.0	41	4.2	136	27	42	.1	3	245	102	0	
Aug. 15 -----	77		22	6.7	206	6.4		.10		--	--	--	--	56	20	20	--	3.8	--	61	15	
Aug. 21-31 -----	57		21	7.1	439	6.0		.12		30	6.0	47	4.6	150	30	45	.1	3	276	100	0	
Sept. 1-10 -----	50		24	7.0	402	6.3		.10		30	5.9	40	5.1	138	26	40	.1	.4	257	99	0	
Sept. 14, 16-20 ---	53		27	7.5	381	3.8		.15		30	6.6	33	4.5	113	23	39	.2	.4	231	102	5	
Sept. 12, 13, 15 ---	40		26	7.2	561	4.2		.15		37	9.0	56	5.6	136	38	71	.2	.3	346	129	18	
Sept. 21-27, 29 ---	56		24	7.2	450	3.2		.06		29	7.2	51	4.6	142	29	42	.2	.4	279	102	0	
Sept. 28, 30 -----	70		24	7.3	265	3.0		.06		24	5.7	17	4.6	87	22	17	--	2.0	163	83	12	
Average -----	245		25	7.0	266	5.7		0.08		23	5.0	23	3.3	88	20	22	0.1	5.9	165	77	--	

SUSQUEHANNA RIVER BASIN--Continued

CODORUS CREEK NEAR YORK, PA.

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	54	43	39	37	38	52	62	68	75	79	70
2	66	55	42	40	37	38	51	61	70	80	80	69
3	64	52	44	38	36	38	53	62	70	80	80	67
4	57	55	47	41	40	42	52	52	71	--	81	--
5	56	60	45	43	42	41	50	68	73	82	78	76
6	56	62	47	44	39	49	49	70	70	87	78	75
7	57	59	45	43	41	44	51	70	72	75	77	68
8	60	53	46	44	41	41	50	67	65	76	81	69
9	58	51	44	45	42	42	50	62	67	76	82	68
10	58	56	41	44	42	47	50	62	68	75	84	69
11	61	53	39	45	39	45	52	60	73	79	82	--
12	60	49	40	45	37	48	51	55	75	75	80	76
13	58	51	44	42	41	40	58	64	71	74	80	70
14	57	50	45	43	46	40	52	65	75	77	77	70
15	55	48	44	40	50	43	60	65	76	--	77	70
16	54	47	42	41	50	38	55	65	76	78	75	69
17	56	50	42	43	45	40	51	67	76	80	75	70
18	56	47	41	39	42	43	51	70	78	--	73	71
19	50	48	39	45	45	38	51	74	77	--	71	70
20	50	47	36	38	48	39	49	70	--	81	71	70
21	49	52	39	40	47	42	51	60	81	81	74	68
22	49	50	40	41	45	48	58	65	80	85	74	65
23	51	49	39	41	46	53	52	67	78	81	72	60
24	52	48	38	42	45	52	51	62	78	81	75	60
25	53	48	34	45	48	53	60	62	81	81	75	60
26	52	45	32	45	44	57	61	60	81	81	77	61
27	51	49	33	43	43	57	65	59	81	83	80	65
28	50	48	34	42	43	59	63	61	76	84	80	60
29	52	44	32	44	--	55	61	61	74	81	77	60
30	50	43	39	39	--	56	58	60	76	80	80	59
31	50	--	39	36	--	59	--	65	--	79	72	--
Average	55	51	40	42	43	46	54	64	74	80	77	67

SUSQUEHANNA RIVER BASIN--Continued

CONESTOGA CREEK AT LANCASTER, PA.

LOCATION --At raw-water intake for Lancaster, Lancaster County, 500 feet upstream from gaging station at Pennsylvania Railroad bridge, and three-quarters of a mile east of Lancaster.

DRAINAGE AREA --322 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1947 to September 1949.

Water temperatures: October 1947 to September 1949.

EXTREMES 1948-49 --Dissolved solids: Maximum, 246 parts per million Sept. 1-10; minimum, 172 parts per million July 11-20.

Total hardness: Maximum, 187 parts per million Sept. 11-20; minimum, 119 parts per million July 11-20.

Water temperatures: Maximum, 78°F July 5, 29, 30; minimum, freezing point on several days in December, January, and February.

EXTREMES 1947-49 --Dissolved solids: Maximum, 276 parts per million July 11-20, 1948; minimum, 156 parts per million Apr. 11-20, 1948.

Total hardness: Maximum, 193 parts per million Sept. 1-10, 21-30, 1948; minimum, 115 parts per million Nov. 1-10, 1947.

Water temperatures: Maximum, 78°F July 5, 29, 30, 1949; minimum, freezing point on many days during winter months.

REMARKS --Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (cfs)	Temperature (°F)	Color	pH	Specific conductance (micro-mhos at 25°C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																				Total	Non-carbonate
Oct. 1-10, 1948	139		4	7.8	371	4.0		0.04		47	14	9.0		178	24	7.2	0.2	16	231	175	29
Oct. 11-20	124		4	7.8	374	5.2		0.04		48	15	7.7		184	22	7.8	2	16	234	181	31
Oct. 21-31	103		5	7.8	369	3.2		0.08		48	14	9.9		186	22	7.4	1	16	228	177	30
Nov. 1-10	196		7	7.3	329	7.6		0.04		40	13	7.0		153	23	6.2	1	14	194	153	28
Nov. 11-20	146		6	7.5	349	9.0		0.04		44	14	2.7		158	23	5.9	1	14	211	167	38
Nov. 21-30	270		7	7.4	294	10		0.04		34	11	7.9		128	24	6.4	1	10	179	130	25
Dec. 1-10	251		6	7.2	316	13		0.02		41	12	4.7		141	26	6.6	1	12	197	152	36
Dec. 11-20	303		3	7.4	332	10		0.04		43	13	4.2		149	25	6.6	1	15	207	161	39
Dec. 21-31	610		8	7.6	329	12		0.04		41	12	5.8		142	27	5.8	1	14	198	152	35
Jan. 1-10, 1949	1,513		11	7.4	286	9.2		0.07		38	10	1.7		120	23	5.2	1	12	184	136	38
Jan. 11-20	704		7	7.4	335	11		0.04		45	12	9.5		172	22	6.1	1	12	212	162	21
Jan. 21-31	1,023		10	7.4	281	9.4		0.06		37	10	3.4		122	22	5.6	1	12	178	133	33
Feb. 1-10	890		8	7.3	292	11		0.06		39	11	2.8		131	23	4.8	0	13	181	143	35
Feb. 11-20	883		8	7.4	292	12		0.06		39	11	2.7		129	24	4.9	1	13	184	143	37
Feb. 21-28	934		8	7.4	279	12		0.06		37	11	2.4		122	23	5.2	1	14	178	138	38
Mar. 1-10	643		10	7.2	309	8.7		0.16		41	12	4.2		139	23	5.2	0	14	186	152	38
Mar. 11-20	472		5	7.8	322	8.4		0.17		43	12	2.2		148	21	5.2	0	19	210	157	35
Mar. 21-31	428		6	7.7	311	7.8		0.17		42	12	2.3		143	19	5.2	1	18	195	154	37

Apr. 1-10 -----	459	5	7.4	283	7.4	.19			36	10	5.7	128	20	4.8	.1	13	184	131	26
Apr. 11-20 -----	528	7	7.3	287	7.9	.08			36	9.5	3.1	116	19	4.8	.1	11	183	124	29
Apr. 21-30 -----	465	5	7.6	282	15	.08			33	8.4	5.2	118	19	4.8	.1	11	187	121	24
May 1-10 -----	288	7	7.7	286	10	.08			36	10	7.0	132	20	5.1	.1	12	202	131	23
May 11-20 -----	283	15	7.7	315	7.9	.04			42	12	3.6	150	19	5.5	.1	14	202	154	31
May 21-31 -----	279	4	7.6	309	10	.02			41	11	4.3	144	20	5.8	.1	12	195	148	30
June 1-10 -----	177	15	7.7	347	7.4	.04			47	13	4.6	170	21	6.2	.1	13	213	171	31
June 11-20 -----	151	8	7.6	361	6.8	.04			50	14	4.0	176	24	7.2	.1	14	220	182	38
June 21-30 -----	121	8	7.4	369	9.1	.06			47	15	6.3	176	25	7.1	.1	15	219	179	35
July 1-10 -----	126	6	7.7	364	10	.04			47	15	8.5	192	23	7.1	.1	7.4	219	179	22
July 11-20 -----	410	8	7.6	258	8.2	.10			32	9.5	8.2	118	21	6.4	.1	11	172	119	22
July 21-31 -----	163	8	7.7	339	9.3	.12			44	13	11	172	23	7.0	.1	14	211	163	22
Aug. 1-10 -----	121	8	7.9	350	7.1	.04			45	13	10	178	21	6.5	.1	13	222	166	20
Aug. 11-20 -----	92	8	7.8	382	7.6	.10			50	15	7.8	192	26	7.1	.1	11	235	186	29
Aug. 21-31 -----	102	8	7.7	371	8.3	.12			49	14	10	192	23	6.9	.1	13	233	180	22
Sept. 1-10 -----	83	6	7.6	396	10	.04			51	13	7.0	192	17	7.0	.2	13	246	181	53
Sept. 11-20 -----	76	6	7.6	392	8.4	.06			52	14	4.9	191	20	7.1	.1	13	234	187	31
Sept. 21-30 -----	69	7	7.7	388	7.7	.04			50	14	7.4	190	21	7.1	.1	13	232	182	27
Average -----	397	7	7.6	328	8.9	0.07			43	12	5.8	155	22	6.1	0.1	13	205	157	30

SUSQUEHANNA RIVER BASIN--Continued

CONESTOGA CREEK AT LANCASTER, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	82	--	38	34	34	38	44	54	59	89	74	88
2	84	50	36	34	34	35	42	56	80	72	74	86
3	82	48	36	34	32	36	44	58	81	73	74	85
4	59	52	38	36	34	37	47	61	82	75	73	85
5	56	54	38	38	37	37	46	63	64	78	73	85
6	54	57	40	38	34	37	44	55	66	76	72	86
7	56	58	40	38	38	40	44	65	67	71	73	85
8	56	53	38	38	36	38	46	62	63	70	73	84
9	56	52	37	38	37	39	47	80	63	72	74	82
10	56	53	36	40	37	41	48	58	63	69	75	61
11	58	50	36	40	36	39	46	54	65	69	76	80
12	58	50	36	39	36	36	48	54	67	69	76	81
13	58	48	36	38	36	34	48	54	70	66	75	61
14	56	48	38	38	38	36	52	56	71	67	72	62
15	56	48	36	34	42	35	52	58	71	69	70	66
16	54	46	36	34	44	35	52	58	71	70	70	64
17	54	46	36	36	40	36	48	57	71	68	69	62
18	55	46	--	38	40	36	46	60	71	69	68	63
19	51	46	31	40	37	34	45	62	--	70	67	64
20	53	48	32	38	42	--	45	61	70	72	66	65
21	50	48	36	36	42	38	50	59	72	72	66	62
22	49	46	34	37	40	44	51	57	73	73	65	61
23	48	45	34	37	42	48	50	58	73	74	65	59
24	49	46	34	36	42	48	50	59	72	74	67	57
25	50	42	--	38	41	48	50	59	73	73	69	56
26	51	44	--	38	40	48	53	57	74	74	67	56
27	51	42	--	37	38	52	56	55	74	75	68	55
28	50	40	32	36	40	53	56	55	73	76	68	56
29	52	44	--	36	--	52	55	54	70	78	70	57
30	48	38	--	33	--	52	53	68	68	78	71	56
31	49	--	32	32	--	49	--	56	--	76	70	--
Average	54	48	36	37	38	41	49	58	68	72	71	62

SUSQUEHANNA RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN SUSQUEHANNA RIVER BASIN IN PENNSYLVANIA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Instantaneous discharge (second-foot)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	Total acidity as H ₂ SO ₄
SUSQUEHANNA RIVER AT SHICKSHINNY																					
Nov. 4, 1948 -----	1,580																				
Left Side -----		56		6.8	462	2.8									54	167	14		2.8	178	134
Center -----		56		6.8	460	3.6									55	165	14		3.0	169	124
Right Center -----		56		6.8	457	3.5									53	163	14		2.7	154	111
Right Side -----		56		6.7	342	3.6									51	163	14		2.6	147	103
															41	115	11		2.7	119	85
LACKAWANNA RIVER AT FORREST CITY																					
Nov. 3, 1948 -----		47		7.0	101										26	17	2.5		3.2	34	13
LACKAWANNA RIVER AT CARBONDALE																					
Nov. 3, 1948 -----		49		3.85	516										222	1.0			0.8	174	174
LACKAWANNA RIVER AT OLD FORGE																					
Nov. 3, 1948 -----	1/102																				
Left Side -----		59		6.6	811	27									129	321	12		0.3	328	222
Center -----		59		6.5	872	20									115	370	14		.3	350	256
Right Side -----		59		6.4	899	18									88	419	12		.2	410	338
TOBY CREEK AT LUZERNE																					
Nov. 4, 1948 -----	25	55		6.9	186										41	34	11		2.1		
HARVEY CREEK AT WEST NANTICOKE																					
Nov. 4, 1948 -----		53		7.1	88.4	2.7									24	15	3		2.1	20	
HUNLOCK CREEK AT HUNLOCK																					
Nov. 4, 1948 -----		54		6.9	70.8										26	8.4	3.5		0.4	20	0

1/ Mean daily discharge.

SUSQUEHANNA RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN SUSQUEHANNA RIVER BASIN IN PENNSYLVANIA--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Instantaneous discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄	
																			Total	Non-carbonate		
Nov. 4, 1948		54		6.9	82.7									16	19	3		1.2	22	9		
SHICKSHINNY CREEK AT SHICKSHINNY																						
WAPWALLOPEN CREEK AT WAPWALLOPEN																						
Feb. 25, 1949	131	41		5 7.4	45.6	5.6		0.12		5.2	1.4	3.3		10	13	3	0.0	0.2	33	19	11	
Mar. 24	43	47		5 6.6	47.0	--		.13		--	--	--		8	19	4	--	1.1	32	27	20	
Apr. 22	109	54		5 6.5	44.3	4.2		.08		4.5	1.7	--		8	17	5	0.0	.8	28	32	25	
May 19	35	60		7 7.0	41.4							--		10	6.5	1	.1	.6	37	16	10	
June 17	16	72		7 7.0	45.0	--		.05		--	--	--		11	9.9	4	0	.7	37	20	11	
July 22	6	78		13 7.5	52.6	--		.13		--	--	--		15	9.7	2	0	2.0	30	21	9	
Aug. 29	48	70		23 6.2	51.4	3.6		.07		5.0	2.3	2.6		11	13	2	.2	2.0	38	22	13	
Sept. 30	16	57		3 6.6	67.6	4.9		.08	0.00	5.3	1.9	2.0		14	10	2.5	0	.0	34	21	10	
NESCOPECK CREEK AT NESCOPECK																						
Nov. 4, 1948		58		3 1.10	1,270	18		--	--	--	--	--		0	590	24	--	0.4	--	--	--	
Feb. 25, 1949	477	43		2 3.55	401	13		0.32	2.2	16	5.7	13		0	148	7	0.0	3.0	213	138	--	
Mar. 24	284	48		3 3.40	589	--		.26	--	--	--	--		0	234	7	0	1.3	347	162	--	
Apr. 22	--	56		5 3.55	436	--		.25	--	--	--	--		0	167	5	--	.9	240	125	--	
May 19	225	73		3 3.50	608	6.0	18	.77	3.2	18	21	4.0		0	245	6	0	.9	382	256	256	
June 17	140	74		3 3.15	973	--		.70	--	--	--	--		0	414	15	0	1.0	678	161	--	
July 22	60	82		5 3.70	1,130	--		1.6	--	--	--	--		0	524	10	.1	1.3	850	371	--	
Aug. 29	293	74		2 3.65	1,040	20	25	2.5	6.0	38	46	26		0	478	6	.2	3.1	698	452	452	
Sept. 30	115	61		1 2.40	1,250	19	45	2.6	4.7	48	11	--		0	641	8	.1	1.9	827	679	--	
CATAWISSA CREEK AT CATAWISSA																						
Feb. 25, 1949	597	43		3 4.40	131	7.8	3.2	0.15	0.24	7.6	3.9	1.8		0	47	5	0.0	3.2	75	55	--	
Mar. 24	204	53		5 4.25	192	--	--	.12	--	--	--	--		0	78	1.0	.1	1.7	111	61	--	
Apr. 22	482	54		4 3.30	146	--	--	.12	--	--	--	--		0	60	2.0	0	1.5	82	44	--	

CATAWISSA CREEK AT CATAWISSA--Continued

May 19, 1948	121	73	3	3.90	266	5.6	7.5	0.31	1.0	11	8.8	--	0	104	4	0.1	1.2	175	116	116
June 17	89	76	2	3.90	250	--	--	--	--	--	--	--	0	144	13	0	1.2	234	92	--
July 22	52	80	5	4.20	286	--	--	--	--	--	--	--	0	155	4	0	1.7	284	64	--
Aug. 29	77	73	5	4.05	576	14	10	--	3.1	24	27	22	0	266	4	0	2.7	396	238	236
Sept. 30	70	56	1	3.10	602	15	29	.90	1.4	26	13	1.5	0	315	2	.1	2.8	--	329	--

MAHONING CREEK AT DANVILLE

Nov. 4, 1948		60		7.5	182	5.1							73	22	4.0		2.6		66	6
--------------	--	----	--	-----	-----	-----	--	--	--	--	--	--	----	----	-----	--	-----	--	----	---

BRIAR CREEK AT BRIAR

Nov. 4, 1948				7.0	119							13	49	14	3.5		3.0		34	0
--------------	--	--	--	-----	-----	--	--	--	--	--	--	----	----	----	-----	--	-----	--	----	---

SHAMOKIN CREEK AT WEIGH SCALE

Feb. 24, 1949	162	48	3	3.00	1,540	4.0	--	1.5	--	95	20	7.7	0	597	15	0.0	0.2	1,020	626	626
Mar. 24	75	61	15	3.75	1,440	--	--	49	--	--	--	--	0	663	82	.1	11	1,140	316	--
Apr. 22	112	58	10	3.00	1,470	--	--	20	--	--	--	--	0	709	13	.1	1.7	1,200	372	--
May 19	99	71	10	3.00	1,850	24	45	11	6.1	85	58	28	0	659	120	.0	3.4	1,200	798	798
June 16	74	75	30	3.20	1,550	--	--	13	--	--	--	--	0	720	65	.1	9.2	1,170	389	--
July 21	41	80	20	4.6	1,550	--	--	12	--	--	--	--	0	753	72	.0	14	1,310	638	--
Aug. 26	36	77	20	3.90	1,620	23	--	7.7	--	119	62	29	0	776	60	.2	8.0	1,230	837	837
Sept. 29	56	70	5	6.1	754	9.4	6.2	18	1.9	58	34	2.4	55	284	24	.1	1.6	510	371	326

PENNS CREEK NEAR SELINGROVE

Nov. 4, 1948		53		7.9	212							14	107	14	2.8		0.5		77	
--------------	--	----	--	-----	-----	--	--	--	--	--	--	----	-----	----	-----	--	-----	--	----	--

MIDDLE CREEK NEAR SELINGROVE

Nov. 4, 1948		53		7.6	215	7.0							83	24	6.0		3.3		76	8
--------------	--	----	--	-----	-----	-----	--	--	--	--	--	--	----	----	-----	--	-----	--	----	---

SUSQUEHANNA RIVER BASIN--Continued
 MISCELLANEOUS ANALYSES OF STREAMS IN SUSQUEHANNA RIVER BASIN IN PENNSYLVANIA--Continued
 Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Instantaneous discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																			Total	Non-carbonate	
MAHANOTY CREEK AT DORNSIFE																					
Feb. 24, 1949	441	44	5	3.50	917	5.8	27	0.23	4.7	61	22	1.8		0	396	7	0.0	0.1	662	418	418
Mar. 24	180	52	3	3.40	1,410	--	--	.45	--	--	--	--	--	0	777	3.0	.1	.6	1,000	474	--
Apr. 22	330	56	3	3.50	1,020	--	--	.44	--	--	--	--	--	0	531	5.0	.1	.2	772	319	--
May 19	181	75	5	3.40	1,500	12	35	.88	8.7	112	78	36		0	847	22	.0	.0	1,280	834	834
June 16	112	81	3	3.35	1,770	--	--	.76	--	--	--	--	--	0	1,020	20	.0	.0	1,680	444	--
July 21	95	85	5	3.70	2,060	--	--	1.2	--	176	117	97		0	1,200	8.0	.1	.9	1,980	768	--
Aug. 26	86	75	5	3.80	2,110	30	45	2.0	12	176	117	97		0	1,350	6.0	.3	1.4	2,020	1,210	1,210
Sept. 29	122	59	1	2.90	1,960	21	31	2.6	7.2	150	78	147		0	1,210	12	.1	2.4	1,760	959	--
WEST MAHANTANGO CREEK NEAR MCKEES HALF FALLS																					
Nov. 4, 1948		55		7.8	185	5.5								77	22	2.8		1.8		70	7
EAST MAHANTANGO CREEK NEAR DALMATIA																					
Feb. 24, 1949		42	5	6.2	95.6	3.2	--	0.05	--	7.3	3.9	4.5		4	27	4	0.0	8.8	54	34	31
Mar. 25		51	3	4.80	125	--	--	.27	--	--	--	--	--	--	48	2.0	.0	3.5	65	40	--
Apr. 25		51	5	5.8	86.0	--	--	.11	--	--	--	--	--	--	43	3.0	.0	3.0	53	38	--
May 20		66	3	4.6	144	2.8	1.5	.13	0.7	9.2	6.2	2.2		4	52	3.0	.0	2.0	87	58	55
June 16		76	2	4.20	212	--	--	.06	--	--	--	--	--	--	75	5.0	.0	1.3	134	45	--
July 21		81	10	6.3	128	--	--	.20	--	--	--	--	--	7	43	3.0	.1	5.4	104	46	40
Aug. 26		78	5	5.7	187	5.4	--	.10	--	14	9.8	5.8		3	73	5.0	.1	3.0	121	76	73
Sept. 29		61	5	4.20	211	6.5	.4	.02	1.0	15	7.2	5.6		0	78	2.2	.0	2.4	128	72	--
WICONISCO CREEK NEAR ELIZABETHVILLE																					
Feb. 24, 1949	305	44	3	7.0	125	3.4		0.07		12	5.2	2.9		8	43	3.5	0.1	1.7	77	52	45
Mar. 25	106	51	5	6.6	235	--	--	.12	--	--	--	--	--	12	101	2.0	.0	2.2	138	107	97
Apr. 25	237	57	5	6.8	125	--	--	.15	--	--	--	--	--	10	49	3.0	.0	2.0	75	58	50
May 20	--	62	10	6.7	241	1.6		.62	23	13	13	2.0		24	88	3.0	.1	1.5	157	112	93
June 16	51	74	3	7.3	331	--	--	.03	--	--	--	--	--	34	123	6.0	.0	2.6	234	121	93
July 21	39	82	10	7.3	326	--	--	.08	--	--	--	--	--	30	110	6.0	.1	4.8	233	129	104
Aug. 26	19	72	7	7.5	501	8.5	--	.19	7.5	50	27	10		40	204	7.0	.1	3.8	344	236	203
Sept. 29	29	60	5	6.5	392	6.8		.04	37	18	18	10		37	144	4	.1	2.4	253	166	136

LITTLE JUNIATA CREEK AT DUNCANNON

Nov. 4, 1948 -----	55	7.6	174	4.6		75	16	4.0	3.0	65	4
--------------------	----	-----	-----	-----	--	----	----	-----	-----	----	---

SHERMANS CREEK AT DUNCANNON

Nov. 4, 1948 -----	53	7.8	185	3.7		92	13	2.5	1.3	71	
--------------------	----	-----	-----	-----	--	----	----	-----	-----	----	--

SWATARA CREEK AT HARPER TAVERN

Feb. 24, 1949 -----	44	5	9.4	87.4	2.0	0.08	9.5	2.8	3.5	2/16	19	5	0.0	3.6	51	35	--
Mar. 25 -----	52	5	8.9	113	--	.05	--	--	--	18	59	3.0	.0	3.0	69	46	31
Apr. 25 -----	50	5	8.8	119.0	--	.15	--	--	--	12	28	3.0	.0	3.4	45	34	24
May 20 -----	67	5	8.8	122	8.6	.09	13	5.2	1.9	22	32	3.0	.2	2.6	89	54	36
June 16 -----																	
July 21 -----	75	1	7.1	180	--	.03	--	--	--	21	61	3.0	.0	1.8	132	70	53
Aug. 26 -----	80	7	7.4	184	--	.11	--	--	--	54	38	4.0	.0	7.8	125	60	22
Sept. 29 -----	68	5	7.2	241	5.2	.19	27	10	5.2	38	75	5.0	.2	3.5	154	109	77
	60	10	6.5	329	7.0	.02	26	11	4.9	20	95	3.0	.0	1.6	171	116	94

SWATARA CREEK NEAR MIDDLETOWN

Nov. 4, 1948 -----	55	7.6	325	7.9						118	48	7.2		9.7	107	16	
--------------------	----	-----	-----	-----	--	--	--	--	--	-----	----	-----	--	-----	-----	----	--

CONEWAGO CREEK NEAR ELIZABETHTOWN (S. W. LEBANON COUNTY)

Nov. 4, 1948 -----	55	7.3	175	18						63	20	5.5		3.5	55	3	
--------------------	----	-----	-----	----	--	--	--	--	--	----	----	-----	--	-----	----	---	--

LITTLE CHICKIES CREEK AT MT. JOY

Nov. 4, 1948 -----	55	7.5	277	7.6						148	16	7.0		11	107		
--------------------	----	-----	-----	-----	--	--	--	--	--	-----	----	-----	--	----	-----	--	--

1/ Mean daily discharge.
2/ Includes equivalent of 6 parts per million of carbonate (CO₃).

CONESTOGA CREEK AT HUNSECKER

Oct. 19, 1948	186	51	15	7.6	334	--				188	17	8.0	0.0	11	207
Oct. 26	123	53	10	8.0	344	6.6	0.05	48	18	5.0	186	30	8.0	0.0	12
Nov. 3	104	51	15	7.8	358	5.0				198	22	12	0.0	9.2	219

CONESTOGA CREEK NEAR EDEN

Oct. 19, 1948	188	52	10	7.7	344	--				188	20	8.0	0.0	11	219
Oct. 26	124	51	10	7.9	351	5.2	0.10	50	14	11	190	29	8.0	0.0	11
Nov. 3	105	52	20	7.8	361	4.8				201	21	14	0.0	9.0	232

CONESTOGA CREEK AT LANCASTER (U. S. G. S. GAGING STATION)

Oct. 19, 1948	192	52	10	7.7	365	--				200	19	8.0	0.0	10	270
Oct. 26	127	53	15	7.7	344	5.4	0.09	50	14	11	194	21	10	0.0	13
Nov. 3	107	52	20	7.8	372	5.1				206	21	12	0.0	10	219

CONESTOGA CREEK NEAR LANCASTER (U. S. HIGHWAY 30)

Oct. 19, 1948	202	49	5	7.5	404	--				204	23	12	0.0	14	257
Oct. 26	136	53	15	8.0	358	6.0	0.09	51	15	10	196	26	10	0.0	12
Nov. 3	115	58	10	7.6	401	5.1				206	22	16	0.0	12	378

CONESTOGA CREEK AT LANCASTER (U. S. HIGHWAY 222)

Oct. 19, 1948	202	54	5	7.7	376	--				200	21	10	0.0	14	283
Oct. 26	136	53	10	8.1	391	4.0	0.14	51	16	4.6	182	28	12	0.0	12
Nov. 3	116	52	10	7.6	398	3.6				202	24	15	0.0	11	244

CONESTOGA CREEK NEAR LANCASTER (STATE HIGHWAY 324)

Oct. 20, 1948	233	50	5	7.6	413	--				214	21	12	0.0	14	310
Oct. 26	133	61	15	7.7	418	4.0	0.06	53	16	16	214	25	16	0.0	11
Nov. 3	132	52	10	7.5	448	4.4				230	28	21	0.0	7.5	232

SUSQUEHANNA RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN SUSQUEHANNA RIVER BASIN IN PENNSYLVANIA--Continued
Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Instantaneous discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																				Total	Non-carbonate
CONESTOGA CREEK NEAR NEW DANVILLE																					
Oct. 20, 1948	234	50	10	7.6	411	--				52	17	14		210	22	10	0.0	14		296	
Oct. 26	134	54	15	8.1	395	4.0		0.07						206	31	14	0.0	12	242	200	31
Nov. 3	133	51	20	7.5	425	3.4								220	27	21	0.0	9.2		232	
CONESTOGA CREEK NEAR MILLERSVILLE																					
Oct. 20, 1948	235	50	15	7.7	396	--				52	14	16		198	22	12	0.0	13		257	17
Oct. 26	307	54	12	7.9	382	3.0		0.12						206	24	14	0.0	11	264	188	
Nov. 3	133	52	15	7.5	429	3.2								220	26	22	0.0	9.8		219	
CONESTOGA CREEK NEAR CONESTOGA																					
Oct. 20, 1948	333	50	15	7.6	400	--				51	16	15		202	23	14	0.0	14		283	
Oct. 26	343	54	15	7.9	395	4.2		0.06						202	32	14	0.0	10	243	193	28
Nov. 3	361	52	20	7.5	428	2.8								224	26	22	0.0	10		207	
CONESTOGA CREEK AT SAFE HARBOR																					
Oct. 20, 1948	379	51	10	7.6	395	--				52	15	14		210	22	12	0.0	12		244	
Oct. 26	373	54	25	8.0	405	2.0		0.13						204	25	15	0.0	9.0	262	192	25
Nov. 3	389	51	15	7.6	425	2.2								232	25	18	0.0	10		323	
MUDDY CREEK AT HINKLETON																					
Oct. 19, 1948	21.0	48	27	7.2	176	--				23	5.0	17		66	23	7.0	0.0	3.0		134	
Oct. 26	11.7	49	15	7.3	214	9.8		0.10						82	36	6.0	0.0	2.3	150	78	11
Nov. 3	12.5	50	20	7.8	194	9.2								84	21	9.0	0.0	1.2		134	
CACALICO CREEK NEAR OREGON																					
Oct. 19, 1948	69.0	48	10	7.6	295	--				47	11	10		156	17	9.0	0.0	8.0		257	
Oct. 26	45.8	50	15	7.9	316	5.4		0.07						172	22	8.0	0.0	12	210	163	22
Nov. 3	30.5	50	20	7.8	324	6.1								182	15	12	0.1	8.8		232	

POTOMAC RIVER BASIN

SOUTH BRANCH POTOMAC RIVER NEAR PETERSBURG, W. VA.

LOCATION.--At Potomac Edison Power plant, 1,000 feet upstream from gaging station which is 1.2 miles downstream from North Fork of South Branch Potomac River and 2½ miles west of Petersburg, Grant County.

DRAINAGE AREA.--642 square miles above gaging station.

RECORDS AVAILABLE.--January 1947 to September 1949.

EXTREMES, 1948-49.--Water temperatures: 80°F July 30, Aug. 13; minimum freezing point Dec. 26-28.

EXTREMES, 1947-49: Water temperatures: Maximum, 82°F Aug. 14, 15, 1947; minimum, freezing point on several days during winter months.

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	52	41	34	37	36	55	59	70	71	77	68
2	63	54	41	34	37	35	53	64	69	72	76	69
3	63	54	42	35	36	38	52	66	69	74	75	70
4	60	53	43	38	39	41	53	68	70	76	75	71
5	56	54	45	41	41	45	49	71	71	77	76	72
6	54	60	46	43	40	47	48	73	70	77	77	73
7	53	57	43	43	44	46	48	73	71	75	78	71
8	57	52	43	42	41	45	47	70	72	73	78	69
9	58	48	41	45	44	43	47	68	71	72	78	66
10	59	52	39	46	46	40	48	66	70	71	79	66
11	59	48	36	47	40	40	50	64	72	72	79	65
12	57	49	40	49	39	38	51	65	75	71	79	65
13	55	46	45	46	43	35	53	64	77	71	80	66
14	53	45	48	42	49	40	55	63	76	71	79	67
15	52	46	47	46	51	42	55	65	76	71	78	69
16	54	45	46	47	47	40	50	66	73	71	74	69
17	56	48	45	46	42	41	46	69	73	71	72	70
18	53	46	43	45	40	38	50	71	72	71	70	70
19	50	46	40	47	42	39	48	70	71	71	70	70
20	50	50	40	43	47	41	49	67	70	71	68	69
21	49	49	40	38	46	45	52	67	70	71	68	68
22	48	47	41	40	46	47	50	67	71	72	68	66
23	49	47	40	41	46	48	54	65	72	72	69	66
24	50	46	37	45	45	48	55	64	74	73	70	65
25	49	46	36	50	46	51	55	64	74	74	72	65
26	49	44	32	48	43	52	57	62	74	76	75	64
27	48	46	32	48	41	57	58	59	72	77	77	64
28	48	44	32	50	40	55	60	61	75	78	73	64
29	49	41	35	45	--	55	59	64	73	79	69	64
30	49	41	40	38	--	56	58	62	70	80	68	63
31	48	--	37	35	--	57	--	65	--	78	67	--
Average	54	49	41	43	43	45	52	66	72	74	74	67

POTOMAC RIVER BASIN--Continued

CACAPON RIVER AT GREAT CACAPON, W. VA.

LOCATION.--At the Potomac Edison power plant, 2½ miles upstream from mouth, and 4 miles downstream from gaging station near Great Cacapon.
 DRAINAGE AREA.--681 square miles above power plant (677 square miles above gaging station).
 RECORDS AVAILABLE.--October 1946 to September 1949.
 EXTREMES, 1948-49.--Water temperatures: Maximum, 80°F July 7; minimum, 33°F Feb. 2, 3, 5.
 EXTREMES, 1946-49.--Water temperatures: Maximum, 80°F July 6, 1948, July 7, 1949; minimum, freezing point on many days during winter months.

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	59	48	46	35	34	34	53	56	66	78	75	73
2	58	52	39	34	33	34	50	--	87	76	75	70
3	59	51	39	35	33	34	48	54	69	79	76	70
4	59	51	41	35	34	35	48	56	68	--	77	70
5	58	52	41	35	33	36	47	58	75	78	77	70
6	55	52	43	35	34	37	48	58	74	78	76	74
7	53	52	42	37	35	35	49	60	72	80	75	72
8	52	53	42	41	38	34	47	60	72	78	75	72
9	50	53	42	41	40	36	46	65	71	76	76	70
10	50	52	42	41	36	44	48	67	70	75	77	66
11	50	48	40	42	34	42	49	65	70	75	78	65
12	54	48	40	44	38	44	50	64	70	76	78	68
13	55	47	41	44	38	40	52	63	72	72	78	67
14	54	46	40	43	46	41	55	63	76	69	78	67
15	55	46	40	39	44	41	56	63	77	69	76	66
16	54	44	40	39	44	40	56	64	77	71	74	65
17	54	42	41	40	44	40	55	64	75	72	75	65
18	54	44	42	40	43	40	55	65	70	--	72	65
19	54	46	40	41	43	39	53	67	68	73	70	64
20	56	46	38	40	44	39	50	68	68	74	68	66
21	54	42	37	40	44	39	50	65	68	74	67	65
22	56	40	37	40	44	44	52	63	72	75	67	66
23	54	42	37	39	44	45	52	62	74	76	68	64
24	52	43	36	39	43	45	55	62	76	75	67	65
25	50	44	35	42	44	47	55	60	77	76	66	67
26	49	44	34	41	43	48	55	60	78	75	68	68
27	49	44	35	42	43	49	56	59	78	70	67	68
28	48	45	38	43	43	53	56	58	76	74	78	68
29	48	43	38	40	--	53	55	67	74	72	76	66
30	48	43	36	39	--	53	54	68	77	75	74	64
31	48	--	34	36	--	54	--	66	--	74	74	--
Average	53	47	39	39	40	42	52	62	73	75	73	68

POTOMAC RIVER BASIN--Continued
CONOCOHEAGUE CREEK AT FAIRVIEW, MD.

LOCATION.--At highway bridge 0.7 mile downstream from gaging station at Fairview, Washington County. The water-stage recorder is 2 miles upstream from Rockdale Run and 6½ miles northwest of Hagerstown.
DRAINAGE AREA.--494 square miles.
RECORDS AVAILABLE.--Chemical analyses: April 1948 to September 1949.
REMARKS.--Discharge records for gaging station at Fairview for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Instantaneous discharge (second-feet)	Temperature (°F)	Suspended sediment	Dissolved oxygen	Biochemical oxygen demand (five days at 20°C)	Color	pH	Specific conductance (microhms at 25°C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Total hardness as CaCO ₃
Oct. 6, 1948----	114	54	4	16	5.4	5	8.5	307	--	--	--	--	--	--	1/180	--	--	--	4.3	--	232
Oct. 13 -----	126	55	5	13.6	6.8	7	8.3	297	--	--	--	--	--	--	170	--	--	--	5.4	--	219
Oct. 20 -----	324	49	12	12.2	3.0	15	7.1	251	5.0	0.14	36	6.0	4.0	4.0	90	31	9.0	0.0	6.0	163	115
Oct. 27 -----	110	52	6	15.1	9.1	8	8.4	312	--	--	--	--	--	--	2/178	--	--	--	4.7	--	207
Nov. 3 -----	104	50	3	10.8	1.8	5	7.8	261	--	--	--	--	--	--	196	--	--	--	1.2	--	232
Nov. 10 -----	223	52	6	12	2.4	5	7.8	261	--	--	--	--	--	--	142	--	--	--	1.4	--	719
Nov. 17 -----	138	46	2	14.6	3.6	5	8.3	286	.4	.09	42	10	9.7	9.7	152	20	8.0	.0	2.2	165	446
Nov. 24 -----	700	46	24	9.8	1.9	20	7.8	224	--	--	--	--	--	--	114	--	--	--	3.6	--	183
Dec. 1 -----	884	41	25	10.6	2.6	5	7.4	222	--	--	--	--	--	--	100	--	--	--	7.5	--	104
Dec. 8 -----	665	44	12	10.5	1.7	5	7.5	229	--	--	--	--	--	--	112	--	--	--	5.8	--	110
Dec. 15 -----	1,168	43	10	10.4	3.1	1	7.7	266	6.0	.09	42	9.2	4.6	4.6	150	18	4.0	.0	6.8	167	143
Jan. 5, 1949----	1,066	40	23	10.4	3.0	5	7.3	237	--	--	--	--	--	--	117	--	--	--	7.2	--	119
Jan. 12 -----	1,016	42	23	10.3	1.9	5	7.3	239	--	--	--	--	--	--	184	--	--	--	8.9	--	147
Jan. 19 -----	598	43	24	10.3	2.9	5	7.3	232	--	--	--	--	--	--	168	--	--	--	8.2	--	146
Jan. 26 -----	1,290	43	27	10.2	2.7	10	7.7	219	9.0	.19	32	7.3	4.0	4.0	108	18	4.0	.1	6.8	132	110
Feb. 9 -----	1,290	41	28	11.2	2.0	5	7.8	231	--	--	--	--	--	--	116	--	--	--	7.5	--	125
Feb. 16 -----	876	48	24	10.6	1.4	6	7.9	250	--	--	--	--	--	--	132	--	--	--	6.6	--	140
Feb. 23 -----	1,620	45	79	11.1	2.3	8	7.9	210	2.6	.27	31	5.9	4.8	4.8	102	16	4.0	.0	8.5	125	102
Mar. 9 -----	555	44	8	11.2	2.1	2	7.8	275	--	--	--	--	--	--	144	--	--	--	10	--	131
Mar. 16 -----	425	39	10	12.7	2.9	5	7.8	294	--	--	--	--	--	--	156	--	--	--	9.1	--	152
Mar. 23 -----	394	56	5	10.7	1.5	5	8.2	281	1.2	.10	44	8.5	6.4	6.4	158	15	5.0	.0	8.4	159	145
Mar. 30 -----	308	56	3	12.3	1.7	10	8.1	284	--	--	--	--	--	--	159	--	--	--	7.1	--	159
Apr. 6 -----	810	48	38	11.1	3.5	5	7.6	262	--	--	--	--	--	--	136	--	--	--	7.4	--	138
Apr. 13 -----	428	51	23	10.3	3.2	5	7.7	238	--	--	--	--	--	--	130	--	--	--	6.3	--	129
Apr. 20 -----	596	53	5	12.4	2.2	7	7.8	205	4.6	.17	31	6.0	4.9	4.9	106	15	5.0	.1	4.3	119	102
Apr. 27 -----	436	62	8	10.4	1.8	7	8.0	233	--	--	--	--	--	--	122	--	--	--	5.4	--	103

1/Includes equivalent of 10 parts per million of carbonate (CO₃).
2/Includes equivalent of 6 parts per million of carbonate (CO₃).

May 4	475	68	15	9.7	1.9	5	7.6	212	--	--	--	--	115	--	--	4.7	102
May 11	360	59	8	10.8	1.5	5	7.8	207	--	--	--	--	130	--	--	5.2	117
May 18	251	72	12	10.8	1.8	8	8.6	200	4.4	8.3	8.3	4.4	2/110	12	4.0	5.8	104
May 25	373	63	22	9.5	1.6	8	7.7	225	--	--	--	--	112	--	--	5.4	112
June 1	165	66	8	12.9	1.3	7	8.2	254	--	--	--	--	133	--	--	7.2	117
June 8	145	69	8	14.6	4.0	5	8.4	284	--	--	--	--	3/146	--	--	6.1	137
June 15	134	76	7	12.4	2.5	8	8.2	293	3.8	10	7.7	7.7	166	16	4.0	5.8	154
June 22	278	77	31	7.8	1.2	10	7.8	220	--	--	--	--	112	--	--	6.1	107
June 29	151	72	9	9.1	1.4	5	8.0	258	--	--	--	--	142	--	--	6.0	119
July 6	116	83	12	13	8	8	8.0	274	--	--	--	--	158	--	--	5.0	138
July 13	956	70	136	8.6	2.8	35	7.3	218	--	--	--	--	83	--	--	14	92
July 20	1,900	76	76	6.6	8	30	7.4	200	8.2	5.6	6.0	6.0	100	16	4.0	6.1	96
July 27	448	76	26	8.1	1.1	20	7.8	292	--	--	--	--	160	--	--	8.2	143
Aug. 3	238	79	15	8.7	2	5	7.9	315	--	--	--	--	166	--	--	7.8	155
Aug. 10	184	79	12	11	1.7	10	8.2	324	--	--	--	--	174	--	--	6.3	166
Aug. 17	151	75	8	10.8	1.2	5	8.3	333	3.0	10	4.5	4.5	183	15	4.0	8.2	200
Aug. 24	136	73	2	12.4	1.4	8	8.2	336	--	--	--	--	180	--	--	9.4	168
Aug. 31	206	71	12	8.4	1.5	15	7.9	252	--	--	--	--	129	--	--	6.0	128
Sept. 7	128	64	4	9.0	9	5	7.8	352	--	--	--	--	194	--	--	9.2	174
Sept. 14	120	71	6	11	1.2	5	7.7	364	--	--	--	--	198	--	--	9.6	180
Sept. 21	112	63	88	11.5	1.2	15	8.2	332	1.6	12	0.3	0.3	174	16	5.0	7.2	188
Sept. 28	108	63	66	11.6	1.2	10	7.8	339	--	--	--	--	186	--	--	8.6	170

2/Includes equivalent of 6 parts per million of carbonate (CO₃).3/Includes equivalent of 8 parts per million of carbonate (CO₃).

POTOMAC RIVER BASIN--Continued

OPEQUON CREEK NEAR BERRYVILLE, VA.

LOCATION.--At gaging station 35 feet downstream from bridge on U. S. Highway 340, 2.3 miles downstream from Spring Run, and 5 miles west of Berryville, Clarke County, 58 square miles.

DATE WHEN TAKEN.--October 1948 to September 1949.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949 given in Water-Supply Paper 1141.

REMARKS.--Records of discharge for water year October 1948 to September 1949.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 5, 1948	60	8	7.8	374	4.8	0.01	56	13	2.3		201	21	5.4	0.2	4.2	214	193	28
Nov. 5	25	3	7.8	389	4.9	.04	58	13	3.4		186	42	5.2	.1	2.2	236	198	46
Dec. 16	717	70	7.2	172	3.8	.05	22	4.8	1.1		56	24	3.2	.1	1.7	104	75	29
Jan. 20, 1949	38	8	8.0	380	3.1	.03	60	13	2.1		204	30	3.5	.0	5.3	227	203	36
Mar. 10	27	10	7.8	362	3.4	.04	58	13	2.9		204	26	3.1	.1	4.3	239	196	31
Apr. 7	30	12	7.3	308	5.1	.04	47	11	2.4		154	34	2.8	.0	2.6	195	162	36
May 4	18	18	7.3	251	8.0	.04	36	7.6	4.6		116	20	3.5	.1	1.8	185	131	26
June 1	11	5	7.6	207	8.0	.04	82	16	2.0		240	18	3.0	.2	4.4	244	220	24
July 13	73	30	7.6	345	8.0	.02	33	6.8	4.1		101	27	4.1	.1	2.9	155	110	28
Aug. 26	24	10	7.8	383	1.4	.03	57	15	2.5		215	23	4.2	.2	3.4	222	204	28

POTOMAC RIVER BASIN--Continued

ABRAMS CREEK AT WINCHESTER, VA.

LOCATION.--At gaging station at culvert under railroad siding, 400 feet downstream from Loudoun Street, half a mile south of Winchester, Frederick County, and 6.3 miles upstream from mouth.

DRAINAGE AREA.--5.6 square miles.

RECORDS AVAILABLE.--Chemical analyses: November 1948 to July 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, November 1948 to July 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Nov. 5, 1948	3.2	5	5.8	609	11	1.0	87	18	6.4		359	5.2	3.8	--	0.1	327	291	0
Jan. 20, 1949	8.4	3	7.7	510	6.1	.02	81	20	.9		308	19	3.5	.1	11	301	284	32
Feb. 16	11	--	--	490	--	--	--	--	--	--	288	--	--	--	--	300	--	--
Mar. 10	6.6	8	7.6	496	3.8	.02	77	21	--	--	294	18	3.8	.2	11	285	278	38
Apr. 7	5.1	10	7.8	473	6.6	.03	72	13	4.0		276	16	2.8	.2	7.7	282	258	32
June 9	8.4	4	7.7	471	6.6	.03	66	19	6.6		280	16	2.4	.2	8.7	284	243	13
July 13	5.5	8	7.9	502	7.6	.03	79	18	--	--	300	15	3.0	.2	5.3	303	271	25

POTOMAC RIVER BASIN--Continued

ANTIETAM CREEK NEAR WAYNESBORO, PA.

LOCATION.--At gaging station at county highway bridge at Rock Forge, Md., 0.5 mile downstream from Maryland-Pennsylvania State line.

DRAINAGE AREA.--83.5 square miles.

RECORDS AVAILABLE.--Chemical analyses: April 1948 to September 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Instantaneous discharge (second-feet)	Temperature (°F)	Suspended sediment	Dissolved oxygen	Biochemical oxygen demand (five days at 20°C)	Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Total hardness as CaCO ₃
Oct. 6, 1948--	138	52	44	10.2	3.7	15	7.1	183	--	--	--	--	--	--	88	--	--	--	5.5	--	183
Oct. 13 -----	53	52	8	10.9	3.4	5	7.8	323	--	--	--	--	--	--	190	--	--	--	6.0	--	190
Oct. 20 -----	69	50	7	11.6	2.1	10	7.5	391	3.4	0.09	47	12	8.9	8.9	186	15	8.0	0.0	8.5	207	167
Oct. 27 -----	54	49	6	13.4	10.1	5	8.0	345	--	--	--	--	--	--	206	--	--	--	6.8	--	206
Nov. 3 -----	54	50	3	11.5	2.3	5	7.7	352	--	--	--	--	--	--	208	--	--	--	6.4	--	207
Nov. 10 -----	91	53	14	10.6	1.6	5	7.6	289	--	--	--	--	--	--	166	--	--	--	5.8	--	166
Nov. 17 -----	64	48	5	11.7	2.1	5	7.8	326	3.6	.06	45	15	1.3	1.3	182	17	6.0	.0	3.7	187	174
Nov. 24 -----	90	47	8	10.9	2.6	5	7.9	292	--	--	--	--	--	--	168	--	--	--	3.5	--	244
Dec. 1 -----	118	42	10	11.4	3.0	5	7.5	264	--	--	--	--	--	--	142	--	--	--	8.2	--	110
Dec. 8 -----	123	42	8	11.0	1.9	5	7.5	257	--	--	--	--	--	--	138	--	--	--	7.2	--	116
Dec. 15 -----	132	43	22	10.0	3.2	1	7.4	256	5.5	.05	35	11	3.9	3.9	146	8.4	4.0	.0	8.8	168	133
Jan. 5, 1949--	280	43	100	9.6	2.9	10	7.1	246	--	--	--	--	--	--	128	--	--	--	7.8	--	146
Jan. 12 -----	446	40	22	9.8	1.5	8	7.5	267	--	--	--	--	--	--	140	--	--	--	7.5	--	134
Jan. 19 -----	165	47	29	9.7	2.0	8	7.4	297	--	--	--	--	--	--	162	--	--	--	9.8	--	183
Jan. 26 -----	240	44	120	10.2	4.2	15	7.4	257	7.0	.16	35	11	3.3	3.3	128	19	6.0	.1	7.8	150	133
Feb. 9 -----	214	43	24	11.2	2.0	5	7.7	276	--	--	--	--	--	--	150	--	--	--	8.2	--	152
Feb. 16 -----	229	47	32	10.7	1.8	7	7.9	246	--	--	--	--	--	--	132	--	--	--	7.2	--	143
Feb. 23 -----	254	46	31	11.2	2.3	6	7.8	239	2.0	.03	32	9.7	5.4	5.4	124	15	5.0	.0	9.1	135	120
Mar. 9 -----	151	48	17	12.0	2.0	5	7.9	297	--	--	--	--	--	--	155	--	--	--	12	--	137
Mar. 16 -----	126	48	14	13.3	2.9	2	8.0	267	--	--	--	--	--	--	160	--	--	--	11	--	149
Mar. 23 -----	126	54	10	11.0	2.1	8	8.0	268	3.4	.12	40	12	7.4	7.4	164	14	6.0	.0	10	164	149
Mar. 30 -----	111	52	11	12.0	2.0	8	8.1	307	--	--	--	--	--	--	166	--	--	--	11	--	121
Apr. 6 -----	188	47	22	11.2	3.0	5	7.7	214	--	--	--	--	--	--	110	--	--	--	8.6	--	107
Apr. 13 -----	132	51	12	10.1	2.4	5	7.7	268	--	--	--	--	--	--	146	--	--	--	9.2	--	135
Apr. 20 -----	143	49	12	13.4	2.6	5	7.8	233	4.6	.10	32	9.5	3.9	3.9	124	13	4.0	.0	8.4	133	119
Apr. 27 -----	140	57	21	10.2	2.0	5	7.8	238	--	--	--	--	--	--	130	--	--	--	7.6	--	121
May 4 -----	122	65	20	10.8	3.1	5	7.7	247	--	--	--	--	--	--	134	--	--	--	8.6	--	123
May 11 -----	112	53	14	11.6	1.6	5	7.7	248	--	--	--	--	--	--	132	--	--	--	8.4	--	114
May 18 -----	93	65	12	11.7	1.7	5	8.0	266	3.4	.10	37	12	4.1	4.1	150	14	4.0	.1	9.2	147	142
May 25 -----	97	57	18	10.4	1.6	8	7.7	251	--	--	--	--	--	--	138	--	--	--	7.4	--	131

June 1	75	59	4	11.6	1.2	7	7.7	283	--	--	--	--	--	--	166	--	--	--	11	--	142
June 5	63	60	9	11.3	2.1	5	7.9	316	4.6	16	43	14	--	--	180	12	4.0	--	12	--	164
June 9	71	60	18	8.9	1.8	10	7.6	310	--	--	--	--	--	--	182	--	--	--	8.2	190	165
June 15	71	62	18	8.9	1.6	3	7.7	310	--	--	--	--	--	--	181	--	--	--	8.2	--	165
June 22	67	65	17	8.3	1.7	5	7.5	299	--	--	--	--	--	--	186	--	--	--	8.4	--	142
June 28	67	65	17	8.3	1.7	5	7.5	299	--	--	--	--	--	--	186	--	--	--	8.4	--	142
June 30	52	70	17	10.3	1.9	5	7.5	325	--	--	--	--	--	--	186	--	--	--	8.4	--	159
July 6	378	66	104	6.3	1.9	35	7.0	140	--	--	--	--	--	--	86	--	--	--	4.4	--	51
July 13	378	66	104	6.3	1.4	35	7.0	140	--	--	--	--	--	--	94	15	3.0	--	4.4	--	51
July 20	416	66	56	7.8	1.4	20	7.2	187	6.4	.22	24	7.1	--	--	94	15	3.0	--	5.8	125	90
July 27	172	67	23	9.1	1.0	15	7.7	272	--	--	--	--	--	--	150	--	--	--	7.6	--	133
Aug. 3	130	68	17	9.7	9	10	7.8	302	--	--	--	--	--	--	161	--	--	--	11	--	159
Aug. 10	105	70	13	10.7	1.7	7	8.0	321	--	--	--	--	--	--	175	--	--	--	9.4	--	173
Aug. 17	86	68	12	10.1	2.1	5	8.1	326	5.0	.11	45	14	--	--	180	18	3.0	--	11	195	170
Aug. 24	77	65	16	9.4	1.2	7	7.8	339	--	--	--	--	--	--	182	--	--	--	12	--	176
Aug. 31	81	64	24	9.2	1.4	15	7.9	315	--	--	--	--	--	--	168	--	--	--	11	--	158
Sept. 7	72	59	13	9.3	1.3	7	7.5	339	--	--	--	--	--	--	184	--	--	--	11	--	180
Sept. 14	218	65	118	7.7	2.7	30	7.1	178	--	--	--	--	--	--	83	--	--	--	6.0	--	82
Sept. 21	76	56	16	10.1	1.1	10	7.9	320	1.4	.22	43	14	--	--	170	14	3.0	--	12	183	165
Sept. 28	81	60	7	10.3	1.3	10	7.6	315	--	--	--	--	--	--	168	--	--	--	12	--	158

POTOMAC RIVER BASIN--Continued
NORTH RIVER NEAR BURKETOWN, VA.

LOCATION --At gaging station, three-quarters of a mile downstream from Pleasant Run, 2½ miles northeast of Burkettown, Augusta County, and 8 miles upstream from Middle River.

DRAINAGE AREA --375 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1948 to September 1949.

REMARKS --Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 11, 1948	980	10	7.4	138	4.1	0.01	18	5.7	1.2		71	6.0	2.2	0.2	3.6	78	68	10
Nov. 9	1,130	4	7.9	86.2	3.4	.04	10	3.8	1.3		42	5.0	1.5	.1	1.8	50	41	6
Dec. 16	1,040	22	7.9	137	2.8	.10	19	5.8	.6		72	7.2	2.2	.1	3.5	84	71	12
Jan. 18, 1949	568	8	7.4	184	3.6	.02	25	8.1	.5		103	6.6	1.0	.0	5.2	104	96	11
Feb. 14	559	5	7.8	181	3.8	.02	25	5.6			102	6.3	2.2	.0	5.2	104	85	2
Mar. 7	325	5	7.5	210	3.0	.03	29	10	3.1		121	6.9	2.0	.0	4.6	116	113	14
Apr. 5	317	8	7.5	177	2.8	.03	23	8.3	3.2		101	6.4	1.8	.0	3.1	94	92	9
May 3	656	15	6.8	131	5.4	.05	15	5.9	2.9		71	5.6	2.2	.1	.6	73	62	4
June 6	236	5	8.2	228	2.6	.03	29	11	1.2		132	5.2	3.0	.1	2.6	127	118	9
July 11	246	8	7.4	244	4.9	.04	31	12	.4		139	6.3	2.6	.0	4.4	134	127	13
Aug. 26	468	5	8.1	204	2.3	.03	26	10	.4		116	5.8	1.9	.0	3.1	113	106	11
Sept. 13	293	10	7.3	246	4.1	.02	37	13	.3		160	6.4	2.9	.0	5.5	131	146	13

POTOMAC RIVER BASIN--Continued

SOUTH FORK SHENANDOAH RIVER AT ELKTON, VA.

LOCATION --At bridge on U. S. Highway 33 at Elkton, Rockingham County, and about 10 miles downstream from gaging station near Lynwood.
DRAINAGE AREA --1,200 square miles.

RECORDS AVAILABLE --October 1948 to September 1949.

Water temperatures: October 1948 to September 1949.

EXTREMES, 1948-49 --Disolved solids: Maximum, 164 parts per million Sept. 21-30; minimum, 96 parts per million Apr. 11-20.

Total hardness: Maximum, 132 parts per million Sept. 21-30; minimum, 85 parts per million Dec. 1-10, Apr. 11-20.

Water temperatures: Maximum, 77° F July 27, 29; minimum, freezing point Dec. 28.

REMARKS --Records of specific conductance of daily samples and quantities of suspended matter in the composite samples available in district office at Charlottesville, Va. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Oxygen consumed		pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered															Total	Non-carbonate
Oct. 1-10, 1948		4.4	3.6	10	7.6	199	7.3	0.02	26	7.1	3.1	1.5	105	10	0.0	2.0	117	94	8
Oct. 11-20		1.2	1.0	5	7.2	245	7.8	.01	33	10	2.2		133	11	0.0	3.2	140	123	14
Oct. 21-31		1.9	1.6	3	7.4	285	4.8	.01	38	12	3.1		159	12	0.0	3.0	156	144	14
Nov. 1-10		1.5	1.0	5	7.5	243	5.5	.02	32	11	1.1		132	11	0.0	2.9	134	125	17
Nov. 11-20		1.0	.6	4	7.3	210	6.1	.01	28	9.6	1.8		117	10	0.0	2.4	121	109	14
Nov. 21-30		2.6	1.2	5	7.1	183	6.8	.02	24	6.8	2.4		94	9.9	0.0	2.3	104	88	11
Dec. 1-10		3.8	1.2	8	7.2	175	5.7	.02	24	6.0	2.3		91	8.6	.1	3.2	102	85	10
Dec. 11-20		1.3	.8	5	7.3	227	5.9	.02	31	9.1	1.2		122	10	0.0	3.7	131	115	15
Dec. 21-31		1.3	.8	8	7.4	245	6.1	.04	33	9.2	2.6		132	10	0.0	3.6	135	120	12
Jan. 1-10, 1949		2.6	1.2	8	7.0	197	6.2	.08	25	5.8	3.0		96	8.6	0.0	2.4	104	86	8
Jan. 11-20		1.5	1.3	4	7.2	245	6.0	.02	33	8.0	3.2		127	9.6	0.0	2.8	130	115	11
Jan. 21-31		1.9	1.4	6	7.2	232	6.0	.04	30	7.2	3.4		117	9.5	0.0	2.8	120	104	9
Feb. 1-10		1.2	.8	15	7.8	213	4.8	.04	31	8.0	1.2		114	11	0.0	4.4	118	110	17
Feb. 11-19		1.5	1.1	4	7.7	235	5.0	.02	32	10	3.5	1.7	127	9.5	0.0	3.2	127	121	17
Feb. 20-28		1.4	1.2	3	7.7	233	5.0	.03	32	9.8	3.2	1.5	128	9.1	0.0	2.7	126	120	15
Mar. 1-10		1.3	1.2	3	7.8	257	3.5	.02	35	12	3.2	1.7	142	10	0.0	3.1	139	137	20
Mar. 11-20		1.5	1.1	5	7.3	260	2.6	.03	36	12	3.9	1.5	149	11	0.0	3.0	149	139	17
Mar. 21-31		1.7	1.1	15	7.3	197	4.5	.03	26	7.7	2.0	1.6	107	8.8	0.0	1.4	109	96	14
Apr. 1-10		.6	.6	4	7.4	213	4.3	.04	29	9.3	2.8	1.4	118	8.8	0.0	2.9	120	111	14
Apr. 11-20		3.0	.5	5	7.5	167	5.7	.05	23	6.6	1.8	1.1	92	7.3	0.0	1.8	96	85	9
Apr. 21-30		1.8	.3	8	7.7	231	5.5	.03	30	10	2.6	1.1	126	8.9	0.0	2.6	130	116	13
May 1-10		1.3	.7	8	7.7	191	4.9	.05	25	8.3	2.6	1.3	104	8.1	0.0	2.1	108	97	11
May 11-20		1.5	.4	8	7.5	177	5.0	.04	23	7.2	1.6	1.6	101	7.2	0.0	1.6	117	92	9
May 21-30		.9	.3	8	7.4	175	4.6	.04	23	7.3	1.4	1.4	95	7.1	0.0	1.6	111	87	10

POTOMAC RIVER BASIN--Continued
SOUTH FORK SHENANDOAH RIVER AT ELKTON, VA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered																Total	Non-carbonate
June 1-10, 1949-----		1.7	1.7	18	7.4	282	2.4	0.05	32	12		3.7	145	9.9	4.9	0.0	1.5	149	129	10
June 11-20-----		4.4	1.8	17	7.5	236	3.9	.05	29	11		2.5	125	8.8	4.0	.0	1.7	133	118	15
June 21-30-----		2.9	1.6	21	7.5	198	6.2	.07	25	7.7		2.3	104	7.6	2.8	.0	2.6	119	94	9
July 1-10-----		2.0	1.1	8	7.0	222	6.5	.01	30	8.8		1.2	121	9.3	2.9	.1	1.8	133	111	12
July 11-20-----		3.9		22	7.0	175	6.9	.04	24	6.8		2.2	98	7.1	2.4	.1	1.5	139	108	8
July 21-31-----		3.0	1.2	5	6.9	208	6.4	.04	28	8.6		3.3	119	7.8	3.1	.1	2.6	122	109	8
Aug. 1-10-----		1.6	1.3	6	7.1	267	5.5	.03	35	12		4.8	157	10	4.0	.1	2.7	153	137	8
Aug. 11-20-----		3.4	1.7	15	7.0	197	6.0	.04	26	8.2		2.5	108	8.5	3.1	.1	2.5	117	99	10
Aug. 21-31-----		2.8	1.4	14	7.0	200	6.6	.05	27	8.3		2.4	112	8.3	2.9	.1	2.4	118	102	10
Sept. 1-10-----		5.2	1.5	15	7.0	215	4.9	.03	30	9.7	2.8	1.1	120	8.7	3.2	.0	2.2	130	115	16
Sept. 11-20-----		1.8	1.2	20	7.3	277	4.1	.03	38	13		2.0	158	11	4.6	.0	2.1	161	143	15
Sept. 21-30-----		1.9	1.2	4	7.4	293	4.0	.04	38	14		3.7	170	12	5.0	.0	1.8	164	152	13
Average-----		2.1	1.2	9	--	222	5.4	0.03	30	9.2		2.8	121	9.3	3.2	0.1	2.5	126	113	14

POTOMAC RIVER BASIN--Continued

SOUTH FORK SHENANDOAH RIVER AT ELKTON, VA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	51	43	38	36	40	57	58	64	65	74	64
2	62	55	43	38	38	39	55	58	64	69	72	64
3	63	56	45	38	38	40	54	64	65	70	74	64
4	61	56	47	40	40	40	53	64	66	74	75	67
5	59	54	47	43	41	43	53	65	67	74	74	68
6	51	59	48	45	43	46	51	65	69	76	76	68
7	54	58	47	43	44	45	49	67	70	76	73	68
8	56	53	47	44	46	43	49	65	68	76	72	68
9	56	52	44	44	45	43	49	65	68	73	74	64
10	55	53	44	44	47	46	51	65	68	73	74	62
11	57	50	40	48	43	43	52	57	72	72	74	66
12	58	50	42	44	41	43	53	55	72	73	72	64
13	58	50	44	45	43	43	54	57	72	73	74	65
14	57	48	45	44	43	41	53	58	73	72	74	65
15	55	46	48	43	51	43	53	64	74	72	73	66
16	56	47	48	45	51	40	53	63	74	70	72	67
17	55	49	48	43	48	43	50	66	72	70	64	67
18	53	47	44	45	45	43	49	65	63	69	65	67
19	52	49	44	50	43	41	50	67	65	72	65	68
20	51	52	44	45	48	43	50	68	65	71	62	65
21	50	51	41	42	48	43	52	65	65	70	65	65
22	50	50	43	42	50	48	55	64	69	70	65	65
23	51	48	44	42	48	50	55	63	69	73	65	65
24	52	48	42	44	46	51	57	61	70	74	69	62
25	50	49	42	49	47	53	55	63	72	75	70	60
26	50	46	38	48	47	53	56	63	74	75	70	59
27	52	49	34	50	45	55	57	58	74	77	70	60
28	52	49	32	50	45	57	58	58	75	76	70	60
29	52	45	38	48	--	54	58	60	73	77	68	62
30	51	43	42	43	--	55	58	58	74	76	65	60
31	52	--	42	38	--	57	--	--	--	76	65	--
Average	55	50	43	44	45	46	53	62	70	73	70	64

POTOMAC RIVER BASIN--Continued

SOUTH FORK SHENANDOAH RIVER NEAR LURAY, VA.

LOCATION --At gaging station at highway bridge 2 miles upstream from Mill Creek and 4 miles west of Luray, Page County.

DRAINAGE AREA --1,377 square miles.

RECORDS AVAILABLE --Chemical analyses: April 1929 to March 1930 and October 1948 to September 1949.

Water temperatures: October 1948 to September 1949.

EXTREMES, 1948-49. --Dissolved solids: Maximum, 161 parts per million Sept. 21-30; minimum, 93 parts per million Apr. 11-20.

Total hardness: Maximum, 146 parts per million Sept. 21-30; minimum, 78 parts per million Apr. 11-20.

Water temperatures: Maximum, 82°F Aug. 10; minimum 35°F Dec. 27.

EXTREMES, 1929-30, 1948-49. --Dissolved solids: Maximum, 170 parts per million Sept. 21-30, 1929; minimum, 81 parts per million May 1-10, 1929.

Total hardness: Maximum, 156 parts per million Sept. 21-30, 1929; minimum, 66 parts per million May 1-10, 1929.

REMARKS --Records of specific conductance of daily samples and of quantities of suspended sediment in the composite samples available in district office at Charlottesville, Va. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25°C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered																Total	Non-carbonate
Oct. 1-10, 1948	3,344	6.8	2.6	11	7.7	207	6.0	0.03	27	7.6	3.7	1.4	108	11	3.8	0.0	2.4	121	99	10
Oct. 11-20	1,680	1.4	1.0	5	7.5	231	7.4	.01	31	8.7	2.6		122	11	3.2		3.3	130	113	13
Oct. 21-31	1,988	.8	.8	4	7.8	270	4.0	.01	35	11	2.8		144	13	3.8	.1	2.0	143	133	15
Nov. 1-10	1,644	2.2	.9	5	7.5	246	4.2	.02	31	9.7	4.0		131	11	3.8	.0	2.1	130	117	10
Nov. 11-20	1,371	1.1	.8	4	7.6	201	4.8	.01	26	8.0	2.9		107	10	3.4	.0	1.4	111	88	10
Nov. 21-30	3,479	2.7	1.2	5	7.2	182	6.4	.01	24	6.1	2.1		90	10	2.8	.0	1.9	102	85	11
Dec. 1-10	6,516	4.0	.7	10	7.2	170	7.4	.02	23	5.2	3.2		86	9.0	2.5	.1	2.8	97	79	8
Dec. 11-20	2,542	1.3	.8	7	7.2	229	6.5	.02	32	8.2	2.6		122	10	3.0	.0	3.3	127	114	14
Dec. 21-31	2,533	1.4	1.1	7	7.4	232	5.9	.03	31	8.6	2.5		123	10	3.0	.0	3.1	128	113	12
Jan. 1-10, 1949	4,431	2.3	1.5	10	7.0	180	5.8	.04	34	5.9	2.3		88	9.8	2.2	.0	3.1	100	84	12
Jan. 11-20	2,404	1.2	1.4	3	7.3	215	5.4	.02	32	8.2	4.1		124	11	3.5	.0	3.8	129	114	12
Jan. 21-31	2,984	1.9	1.4	8	7.6	202	6.7	.03	31	7.8	3.9		113	12	3.0	.0	3.2	121	109	17
Feb. 1-10	3,097	1.5	1.0	12	7.6	196	4.4	.04	28	7.4	3.7		108	11	3.0	.0	3.1	117	100	12
Feb. 11-19	2,229	1.4	1.5	4	7.7	229	5.1	.02	32	9.8	3.1	1.6	122	9.9	3.2	.1	3.5	125	120	20
Feb. 20-28	1,736	1.3	1.5	3	7.7	228	4.5	.02	30	9.8	3.6		124	123	3.2	.0	2.9	120	115	14
Mar. 1-10	1,437	2.2	1.3	8	7.4	244	2.4	.03	34	11	3.0	1.2	136	11	3.5	.1	2.3	137	130	19
Mar. 11-20	1,186	.9	.6	12	7.8	256	1.6	.02	34	11	3.0	1.6	142	11	3.6	.1	1.5	140	130	14
Mar. 21-31	2,191	1.6	1.1	14	7.3	197	3.5	.04	26	7.6	2.3	1.6	104	9.5	2.8	.1	1.9	108	96	11
Apr. 1-10	1,729	1.7	.9	10	7.4	211	2.7	.04	28	6.7	2.4	1.6	116	9.4	2.9	.2	1.1	114	106	11
Apr. 11-20	3,488	2.2	.7	5	7.6	159	5.3	.04	21	6.2	2.2	1.1	85	7.7	2.4	.1	2.5	93	78	8
Apr. 21-28	1,446	1.9	--	8	7.2	215	3.8	.02	29	9.0	2.3		118	9.9	3.5	.1	2.8	127	109	13
Apr. 29-May 10	1,951	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 11-20	2,099	--	--	7	7.1	180	--	--	--	--	--	--	101	--	--	--	2.0	--	--	--
May 21-31	1,784	1.9	1.4	8	7.5	185	4.6	.02	23	7.1	2.3		94	7.9	3.0	.1	2.3	110	87	1.0

June 1-10 -----	796	1.9	1.2	13	7.8	250	1.4	.01	32	11	1.4	136	9.6	4.2	.0	.9	144	125	14
June 11-20 -----	6,825	4.8	1.8	20	7.6	227	2.6	.05	29	10	2.6	125	9.0	4.0	.1	1.8	138	113	11
June 21-30 -----	2,833	3.0	--	7	7.3	184	6.2	.02	25	6.7	1.7	96	8.0	3.2	.1	2.4	111	90	11
July 1-10 -----	1,762	2.8	1.8	5	7.4	204	5.7	.02	28	8.3	1.5	113	7.8	3.1	.1	2.5	132	104	11
July 11-20 -----	3,981	3.3	2.2	8	7.4	182	5.1	.02	24	6.9	3.1	99	7.3	3.0	.1	2.2	112	88	7
July 21-31 -----	2,075	2.4	2.0	5	7.6	198	4.9	.01	27	7.9	2.7	111	7.5	3.5	.0	2.5	122	100	9
Aug. 1-10 -----	1,076	1.9	1.0	5	7.3	247	4.7	.04	34	11	4.5	150	9.2	4.0	.1	1.9	147	130	7
Aug. 11-20 -----	3,029	2.7	1.7	15	7.5	220	4.1	.05	29	9.6	3.6	124	9.1	4.9	.0	2.1	134	112	10
Aug. 21-31 -----	2,829	2.3	1.9	15	7.2	185	5.3	.02	26	7.9	2.8	107	8.5	2.1	.0	2.4	123	57	10
Sept. 1-10 -----	1,897	2.0	1.8	5	7.2	208	7.3	.05	27	8.6	3.5	116	8.5	3.0	.1	2.5	120	103	8
Sept. 11-20 -----	1,074	1.2	1.1	6	7.9	259	3.7	.05	35	12	3.3	154	11	4.0	.0	.8	149	137	10
Sept. 21-30 -----	1,780	1.3	1.3	4	8.0	285	2.4	.05	37	13	5.2	169	11	4.9	.0	.4	161	146	7
Average -----	2,404	2.2	1.3	8	--	215	4.8	0.03	29	8.7	3.2	117	9.7	3.3	0.1	2.3	124	108	12

*

POTOMAC RIVER BASIN--Continued¹

SOUTH FORK SHENANDOAH RIVER NEAR LURAY, VA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	56	42	40	39	42	58	--	64	71	80	69
2	68	56	41	39	37	41	57	--	71	73	81	69
3	65	54	45	40	39	41	56	--	71	78	80	68
4	62	55	49	41	42	44	58	--	73	78	80	67
5	58	60	48	43	44	46	55	--	70	80	77	72
6	52	63	50	45	43	48	54	--	76	80	76	71
7	55	60	48	45	45	46	53	--	75	80	75	69
8	59	55	48	46	46	47	52	--	73	75	76	69
9	58	53	42	46	49	47	54	--	76	76	76	70
10	60	55	43	47	47	48	53	--	71	76	82	--
11	60	51	42	48	44	48	52	61	69	79	81	--
12	60	50	41	47	45	46	54	60	72	79	78	68
13	59	53	44	46	47	48	55	62	76	76	78	70
14	58	48	44	46	49	49	56	65	76	77	78	70
15	57	48	46	45	50	45	57	65	77	75	77	71
16	59	50	47	44	--	45	52	67	77	73	71	69
17	60	51	47	48	--	44	50	69	75	72	--	70
18	56	51	46	47	--	43	52	71	67	73	--	71
19	54	50	47	41	--	43	52	72	66	72	71	73
20	53	51	42	48	--	41	56	70	69	76	69	72
21	52	54	42	45	--	48	58	67	72	77	66	70
22	52	51	43	47	--	51	58	65	71	76	69	70
23	52	50	44	47	--	53	59	67	72	78	71	65
24	55	48	42	46	--	57	59	68	75	75	71	82
25	53	48	42	50	49	56	60	66	75	78	72	59
26	51	48	40	49	48	56	62	65	76	77	76	63
27	56	49	35	50	46	59	63	63	79	79	78	64
28	53	45	36	51	45	59	62	71	77	80	75	65
29	57	42	40	48	--	60	--	60	75	80	70	63
30	54	41	41	43	--	61	--	66	72	81	71	59
31	55	--	40	41	--	59	--	63	--	80	68	--
Average	57	52	43	45	--	49	56	--	73	77	75	68

POTOMAC RIVER BASIN--Continued

SOUTH FORK SHENANDOAH RIVER AT FRONT ROYAL, VA.

LOCATION.--At gaging station at highway bridge 1 mile west of Front Royal, Warren County, and 3½ miles upstream from confluence with North Fork. DRAINAGE AREA.--1,638 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 6, 1948	8,030	15	7.7	195	7.4	0.01	25	7.2	2.9		98	11	3.2	0.0	2.6	115	92	12
Nov. 5	1,070	4	8.1	259	1.0	.04	35	11	2.5		145	11	4.9	.1	.8	144	133	14
Dec. 17	4,200	10	7.5	215	3.3	.04	32	9.7	.2		123	11	3.0	.1	4.3	129	120	19
Dec. 29	1,820	8	7.2	236	3.2	.02	34	8.6	2.9		132	11	3.2	.0	3.1	144	120	12
Jan. 19, 1949	2,380	8	7.7	216	2.3	.05	31	8.6	1.2		120	10	2.8	.0	3.2	120	113	14
Mar. 8	1,520	9	7.7	238	1.7	.01	32	9.7	2.8		133	11	3.0	.1	1.0	130	120	11
Apr. 6	1,960	14	7.7	200	1.4	.02	26	8.1	3.2		110	9.7	2.8	.1	.8	106	98	8
May 5	3,520	12	7.7	190	6.3	.04	24	7.5	3.5		102	9.2	2.5	.1	1.7	107	91	7
June 8	888	8	7.8	251	1.0	.02	32	11	2.4		138	10	4.6	.1	.2	136	125	12
July 14	1,960	13	8.0	221	6.5	.02	28	8.6	2.0		116	8.3	3.1	.0	1.8	127	105	10
Aug. 26	1,410	3	8.0	211	4.8	.02	26	8.6	3.2		117	6.8	3.6	.1	2.3	121	105	9
Sept. 26	951	7	7.8	245	2.2	.08	34	12	3.8		152	11	4.1	.1	.5	144	134	10

POTOMAC RIVER BASIN--Continued
MIDDLE RIVER NEAR GROTTOS, VA.

LOCATION.--At gaging station at highway bridge at Mount Meridian, Augusta County, 1½ miles upstream from mouth and 3 miles west of Grottoes, Rockingham County.
DRAINAGE AREA.--360 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.
REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 12, 1948	391	4	8.4	353	6.2	0.01	54	13	2.4	1.7	209	12	3.0	0.1	2.3	200	188	17
Nov. 8	740	12	7.9	191	7.0	.04	27	6.5	.6	.6	98	8.7	2.5	.1	2.8	107	94	14
Dec. 15	720	17	7.9	335	3.1	.04	54	14	1.2	210	210	12	3.0	.1	7.2	200	192	20
Jan. 17, 1949	545	6	7.4	356	5.2	.04	50	11	4.0	197	197	9.8	2.5	.0	4.3	186	170	9
Feb. 14	598	5	7.8	323	3.8	.02	45	13	8.0	194	194	14	3.2	.0	6.5	196	166	7
Mar. 7	363	8	7.5	314	11	.03	43	16	--	187	187	8.9	2.0	.0	4.2	175	173	20
Apr. 4	326	5	7.8	314	1.6	.04	46	14	4.0	196	196	8.6	1.6	.0	3.0	177	172	12
May 2	377	14	7.9	310	3.8	.03	46	15	.7	200	200	8.8	2.5	.0	1.7	188	176	13
June 6	203	6	8.0	318	1.0	.03	40	16	2.6	194	194	5.7	2.9	.1	2.4	178	166	7
July 11	298	10	8.0	368	5.1	.01	51	15	2.3	221	221	6.6	2.5	.0	3.0	212	189	8
Aug. 26	394	8	8.1	321	4.2	.03	46	15	--	200	200	6.3	2.5	.1	2.6	182	176	13
Sept. 12	243	4	7.8	328	5.2	.08	46	16	2.0	212	212	5.7	2.2	.1	2.2	188	181	7

POTOMAC RIVER BASIN--Continued

SOUTH RIVER AT WAYNESBORO, VA.

LOCATION.--At gaging station at highway bridge just upstream from Baker Spring, in Waynesboro, Augusta County, 4 miles downstream from Back Creek. DRAINAGE AREA.--144 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949.

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 12, 1948	183	6	7.5	123	6.8	0.01	15	5.3	2.0		68	4.9	1.2	0.1	1.1	70	59	4
Nov. 8	189	25	7.4	98.3	7.1	.16	13	4.7	.9		56	4.3	1.5	.2	.8	64	52	6
Dec. 15	282	5	6.9	134	6.0	.04	16	4.6	1.8		67	4.8	1.2	.1	1.2	71	59	4
Jan. 17, 1949	230	3	7.4	129	6.1	.05	17	5.4	3.1		72	6.3	2.8	.1	2.0	73	65	6
Feb. 14	250	6	7.5	125	3.6	.04	17	5.4	.3		70	3.8	1.5	.0	2.2	68	65	7
Mar. 7	139	8	7.7	149	5.4	.22	22	7.3	2.8		88	6.3	1.4	.1	2.4	87	85	13
Apr. 4	160	10	7.4	139	5.6	.04	18	6.3	2.5		77	5.0	1.0	.1	.9	83	71	8
May 2	338	7	6.9	104	6.7	.05	13	4.6	.8		57	4.0	1.1	.1	.5	60	51	5
June 6	87	4	7.8	196	5.5	.02	24	8.9	2.0		110	7.2	1.1	.1	1.8	111	96	6
July 11	283	15	7.4	102	6.1	.03	13	4.0	2.2		52	4.4	1.0	.0	.7	57	49	11
Sept. 19	90	5	7.1	167	7.6	.02	22	8.2	.9		95	6.5	2.8	.1	2.2	98	89	11

POTOMAC RIVER BASIN--Continued

SOUTH RIVER AT HARRISTON, VA.

LOCATION.--At gaging station at highway bridge in Harrison, Augusta County, half a mile downstream from Still Run and 7 miles upstream from confluence with North River.

DRAINAGE AREA.--222 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

Water temperatures: October 1948 to September 1949.

EXTREMES, 1948-49.--Dissolved solids: Maximum, 158 parts per million Sept. 21-30; minimum, 66 parts per million Dec. 1-10.

Total hardness: Maximum, 109 parts per million Sept. 21-30; minimum, 47 parts per million Dec. 1-10.

Water temperatures: Maximum, 81°F Aug. 13; minimum, 38°F Dec. 26, Jan. 1.

REMARKS.--Records of specific conductance of daily samples and of quantities of suspended sediment in the composite samples available in district office at Charlottesville, Va. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered																Total	Non-carbonate
Oct. 1-10, 1948 ----	424	2.7	1.8	7	7.2	153	7.5	0.02	18	5.6	4.2		66	15	4.2	0.0	1.6	94	38	14
Oct. 11-20 -----	254	1.1	.8	4	7.8	214	8.6	.01	23	7.3		1.3	87	18	7.2	.1	1.6	120	87	16
Oct. 21-31 -----	177	1.1	.4	5	7.2	233	7.6	.01	27	8.3	7.2		102	21	7.6	.1	.8	131	102	18
Nov. 1-10 -----	223	1.4	.8	7	7.2	217	8.3	.01	24	8.2		7.0	91	21	8.0	.1	1.1	124	94	19
Nov. 11-20 -----	264	.8	.6	9	7.1	189	8.0	.01	21	7.2	5.5		79	18	6.5	.1	1.4	105	82	17
Nov. 21-30 -----	604	1.2	.6	7	6.6	122	7.3	.02	14	4.5	3.1		52	11	3.5	.1	1.1	72	53	11
Dec. 1-10 -----	1,538	1.9	.7	9	7.3	115	6.9	.03	13	3.5		3.3	48	8.4	3.0	.1	1.8	66	47	8
Dec. 11-20 -----	440	1.0	.7	7	6.9	162	7.1	.01	19	5.6	4.4		73	12	3.9	.1	2.2	92	70	11
Dec. 21-31 -----	463	1.5	1.0	5	6.8	179	6.9	.01	20	6.2	5.3		77	14	5.2	.1	2.1	100	75	12
Jan. 10, 1949 -----	745	1.6	1.2	4	7.0	128	6.3	.02	15	4.0	2.3		54	9.1	2.8	.1	1.1	69	54	10
Jan. 11-20 -----	411	1.3	.9	3	6.9	183	6.2	.02	22	5.6	2.7		76	13	4.5	.1	1.7	97	78	10
Jan. 21-31 -----	548	1.9	1.2	5	7.2	141	5.7	.02	17	5.2	4.8		66	12	4.2	.0	2.1	85	64	10
Feb. 1-10 -----	505	2.0	1.0	5	7.4	144	5.1	.08	19	5.9	4.1		74	12	4.2	.1	1.6	85	72	11
Feb. 11-19 -----	396	1.0	.8	10	7.6	179	5.8	.04	19	6.6	6.6		78	13	6.4	.1	2.6	92	75	11
Feb. 20-28 -----	286	1.9	1.3	3	7.4	189	6.6	.02	24	8.2	5.6	2.0	90	17	6.0	.1	1.8	112	94	20
Mar. 1-10 -----	236	1.3	1.5	5	6.9	215	6.0	.05	26	7.9	6.4		96	19	6.6	.0	1.9	123	97	19
Mar. 11-20 -----	218	1.8	1.5	8	7.1	221	5.8	.03	26	8.2	6.3	2.0	95	21	7.5	.1	1.8	128	99	21
Mar. 21-31 -----	459	1.7	.9	11	6.7	149	6.2	.02	17	5.2	4.2	1.3	65	12	4.6	.2	.9	94	64	11
Apr. 1-10 -----	348	1.4	1.0	10	6.7	185	5.8	.03	20	6.6	5.9		70	15	7.1	.4	9.0	110	77	20
Apr. 11-20 -----	474	1.2	.7	8	6.7	137	6.4	.05	16	5.2	3.7	3.0	70	11	4.2	.1	2.0	116	81	14
Apr. 21-30 -----	287	.7	.4	5	7.3	185	6.4	.06	23	7.0	6.2		83	10	7.0	.1	1.8	118	87	19
May 1-10 -----	535	1.9	.8	17	7.3	134	6.0	.02	16	3.1	3.5	1.4	83	19.2	5.8	.2	1.9	128	60	12
May 11-20 -----	451	.5	.3	8	6.8	145	6.3	.06	17	3.1		4.3	87	12	5.8	.3	2.4	96	73	14
May 21-31 -----	218	1.7	1.2	4	6.9	207	6.4	.03	24	8.0	2.7		85	18	5.5	.1	2.8	127	93	23

June 1-10 -----	145	1.7	1.3	5	7.2	245	6.2	.02	27	9.8	5.0	97	24	8.5	.0	2.5	155	108	28
June 11-20 -----	1,113	4.5	2.2	12	7.2	200	6.1	.05	24	7.7	2.5	82	17	7.5	.1	1.6	122	92	24
June 21-30 -----	494	2.9	1.8	10	7.3	145	6.6	.05	16	5.0	4.0	58	12	5.6	.1	1.3	90	60	13
July 1-10 -----	435	--	--	18	7.0	131	5.7	.04	16	4.6	2.2	56	12	2.9	.1	.9	78	59	13
July 11-20 -----	589	2.5	--	15	6.5	124	7.2	.05	15	4.1	2.1	53	9.8	3.2	.0	.9	76	54	11
July 21-31 -----	271	1.8	1.3	8	6.5	190	6.9	.02	21	6.7	5.9	80	16	6.8	.0	1.1	114	80	14
Aug. 1-10 -----	167	1.9	1.1	8	6.7	215	8.0	.03	27	8.4	5.0	92	24	7.9	.0	1.4	143	102	26
Aug. 11-20 -----	180	1.8	1.3	10	7.0	230	7.8	.02	26	8.6	5.0	87	25	8.9	.1	1.2	142	100	29
Aug. 21-31 -----	366	2.2	1.1	10	6.8	199	6.6	.03	21	7.3	6.5	79	22	7.8	.1	1.5	121	82	18
Sept. 1-10 -----	265	--	1.3	5	6.9	173	8.6	.04	20	6.9	7.3	71	21	7.1	.1	4.8	117	78	20
Sept. 11-20 -----	163	--	1.3	6	6.8	231	7.7	.06	27	8.7	7.7	96	27	8.5	.2	.8	139	103	24
Sept. 21-30 -----	130	--	1.0	8	7.0	267	8.4	.08	28	9.5	11	98	33	12	.2	.4	158	109	29
Average -----	410	1.7	1.1	8	--	180	6.8	0.03	21	6.6	5.3	76	16	6.0	0.1	1.9	107	80	17

POTOMAC RIVER BASIN--Continued

SOUTH RIVER AT HARRISTON, VA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	68	59	46	38	40	42	59	63	70	68	75	68
2	68	58	45	39	42	44	57	66	70	71	76	68
3	66	57	47	48	41	45	54	62	71	73	78	68
4	61	59	45	45	45	47	57	64	71	75	77	70
5	59	59	47	46	46	50	54	66	73	76	78	73
6	54	63	50	46	45	53	50	69	74	77	76	74
7	57	60	48	45	46	48	51	69	74	77	78	71
8	60	56	45	44	45	49	52	67	71	72	77	70
9	60	55	43	48	48	49	52	67	71	72	78	69
10	59	60	44	50	46	49	55	62	72	72	79	--
11	60	55	43	50	43	49	54	56	72	72	79	--
12	61	53	45	48	45	47	55	57	75	74	80	--
13	60	59	49	46	48	49	57	60	75	73	81	68
14	60	52	51	45	54	49	55	62	75	73	78	71
15	58	52	50	50	50	47	60	65	76	73	74	71
16	59	52	49	49	54	--	54	65	75	--	71	71
17	61	53	48	50	45	47	50	67	68	72	69	71
18	58	53	47	50	47	46	54	70	65	72	72	73
19	54	53	45	53	50	46	54	70	68	74	73	73
20	54	55	44	48	54	47	55	70	68	75	70	70
21	54	52	48	44	50	50	57	65	71	76	70	69
22	53	53	46	46	50	54	58	67	69	78	68	68
23	55	52	45	45	50	54	59	69	72	77	72	68
24	57	52	45	48	50	53	59	70	75	77	73	65
25	55	51	43	50	51	55	64	68	75	77	72	65
26	57	50	38	51	48	55	64	65	78	77	75	63
27	55	53	39	51	48	60	64	64	76	80	78	63
28	55	48	40	53	47	59	63	65	77	80	75	64
29	56	45	45	48	--	59	63	66	70	80	68	65
30	57	45	46	43	--	59	--	65	68	80	68	62
31	57	--	42	39	--	59	--	68	--	78	--	--
Aver- age	58	54	45	47	47	51	57	65	72	75	75	69

POTOMAC RIVER BASIN--Continued

NORTH FORK SHENANDOAH RIVER AT COOTES STORE, VA.

LOCATION.--At gaging station at Cootes Store, Rockingham County, 300 feet upstream from highway bridge, 1 mile downstream from Brooks Gap, and 3 1/2 miles upstream from Linville Creek.

DRAINAGE AREA.--115 square miles.

RECORDS AVAILABLE.--October 1948 to September 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 8, 1948	1,000	10	6.9	77.6	5.7	0.04	8.4	3.2	1.4		28	8.1	2.5	0.2	1.9	53	34	11
Nov. 10	323	7	7.6	60.4	6.1	.04	6.6	2.1	1.3		19	7.2	2.2	.1	1.8	40	25	10
Dec. 16	916	20	7.5	46.0	3.9	.07	4.9	2.0	1.5		12	7.9	2.0	.1	3.1	39	20	11
Jan. 17, 1949	256	15	7.0	69.5	5.3	.13	7.1	1.7	.5		18	7.4	1.5	.0	1.5	35	25	10
Feb. 15	209	8	6.4	55.1	5.5	.02	7.2	1.8	1.0		20	7.3	2.0	.0	.8	37	25	9
Mar. 7	115	5	6.3	60.3	5.1	.02	7.0	2.0	2.1		23	7.6	2.0	.0	.8	39	26	7
Apr. 5	104	8	6.1	56.9	5.4	.04	7.0	2.3	1.1		24	7.4	1.2	.0	.4	37	27	7
May 3	937	10	6.6	61.0	5.2	.07	7.1	2.1	.9		23	6.5	1.4	.0	.8	46	26	8
June 7	36	4	7.7	86.1	6.0	.02	10	2.8	2.5		36	7.2	2.0	.0	.5	54	36	5
July 12	214	5	6.8	73.9	5.4	.01	8.0	2.5	2.3		30	7.4	1.5	.1	.8	48	30	6
Aug. 26	84	5	6.8	73.7	6.0	.01	8.5	2.4	2.6		31	7.4	1.6	.1	1.5	48	31	6
Sept. 13	51	5	6.9	72.5	6.1	.01	8.0	2.7	1.4		33	6.7	1.5	.0	.7	46	34	6

POTOMAC RIVER BASIN--Continued
NORTH FORK SHENANDOAH RIVER AT MOUNT JACKSON, VA.

LOCATION.--At gaging station at highway bridge in Mount Jackson, Shenandoah County, 750 feet downstream from Mill Creek.
DRAINAGE AREA.--509 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.
REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 7, 1948	1,570	20	7.5	216	7.6	0.04	32	7.0	0.3		108	11	3.1	0.2	5.6	126	106	20
Nov. 10	660	8	7.6	201	3.4	.02	31	7.9	.3		114	8.6	3.2	.1	3.0	122	110	16
Dec. 10	1,500	28	7.4	155	2.9	.04	23	5.5	.6		80	9.5	2.2	.1	3.0	98	80	14
Jan. 18, 1949	605	5	7.3	258	3.4	.06	39	9.8	.4		146	10	2.8	.0	5.5	148	138	18
Feb. 15	550	5	7.2	259	1.1	.02	39	10	--		145	10	2.8	.0	5.5	144	138	20
Mar. 8	345	10	7.6	287	1.5	.02	42	12	--		164	11	2.5	.0	5.3	158	154	20
Apr. 6	605	22	8.8	242	4.3	.06	36	9.5	.9		136	12	2.5	.0	4.1	139	129	17
May 4	900	10	8.9	142	6.7	.03	19	5.5	1.0		75	7.2	1.5	.0	1.4	86	70	9
June 8	181	--	7.8	334	2.1	.02	47	15	.4		199	9.1	2.8	.1	3.9	195	179	16
July 12	345	13	7.1	226	5.3	.02	30	9.0	.8		121	8.4	2.5	.1	2.3	127	112	13
Aug. 26	238	15	8.5	270	3.1	.02	39	11	.2		154	9.1	2.6	.1	4.1	152	143	16
Sept. 19	188	5	7.5	319	5.2	.03	48	15	1.2		201	9.0	3.6	.0	6.1	181	161	17

POTOMAC RIVER BASIN--Continued

NORTH FORK SHENANDOAH RIVER NEAR STRASBURG, VA.

LOCATION. --At gaging station at highway bridge 2 miles east of Strasburg, Shenandoah County, 2 miles upstream from Cedar Creek, and 10 miles upstream from confluence with South Fork.

DRAINAGE AREA. --772 square miles.

RECORDS AVAILABLE. --Chemical analyses: April 1929 to March 1930, October 1948 to September 1949.

Water temperatures. --October 1948 to September 1949.

EXTREMES, 1948-49. --Dissolved solids: Maximum, 191 parts per million Oct. 21-31; minimum, 109 parts per million June 19-30.

Total hardness: Maximum, 173 parts per million Oct. 21-31; minimum, 86 parts per million June 19-30.

Water temperatures: Maximum, 86°F July 27-30; minimum, 34°F Feb. 4-5.

EXTREMES, 1929-30, 1948-49. --Dissolved solids: Maximum, 191 parts per million Oct. 21-31, 1948; minimum 108 parts per million May 21-31, 1929.

Total hardness: Maximum, 174 parts per million Sept. 21-30, 1929; minimum, 86 parts per million June 19-30, 1949.

REMARKS. --Records of specific conductance of daily samples and of quantities of suspended sediment in the composite samples available in district office at Charlottesville, Va. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered								Total	Non-carbonate								
Oct. 1-10, 1948	1,719	5.7	2.8	12	7.6	269	8.0	0.03	40	9.4	0.9		150	12	3.1	0.0	0.8	157	138	10
Oct. 11-20	817	1.9	1.7	8	7.8	321	7.2	.03	47	11	2.6		180	13	3.2	.0	3.1	181	162	15
Oct. 21-31	497	3.6	1.8	5	8.0	331	6.0	.02	48	13	2.4		191	14	3.8	.0	2.4	191	173	17
Nov. 1-3	352			6	7.2	309	--	--	--	--	--		181	9.0	3.0	.0	4.5	--	--	--
Nov. 4-10	729	2.3	2.1	8	7.9	226	6.0	.03	32	8.0	1.9		121	12	2.5	.0	2.1	129	113	14
Nov. 11-20	1,743	2.9	2.1	10	7.8	235	5.8	.03	33	8.0	1.8		121	14	2.8	.0	1.8	135	115	16
Dec. 1-10	2,298	1.4	1.1	6	7.4	240	7.4	.06	36	8.0	1.2		129	12	2.6	.1	4.0	138	123	17
Dec. 11-20	1,375	2.0	1.5	10	7.5	238	6.4	.03	34	7.8	3.0		127	12	2.6	.1	3.6	134	117	13
Dec. 21-31	1,422	1.3	1.1	9	7.5	242	6.6	.02	34	8.2	2.8		127	13	3.0	.0	3.5	136	119	14
Jan. 1-2, 1949	2,280												92	--	--	--	--	114	--	--
Jan. 3-10	1,141	2.1	.8	8	7.4	269	5.8	.01	41	10	1.9		150	13	3.5	.0	6.0	156	143	19
Jan. 11-20	1,350	2.3	1.1	18	7.7	246	7.2	.04	37	8.7	3.9		129	20	3.8	.0	5.8	150	128	22
Feb. 1-10	1,422	1.9	.9	10	7.8	230	5.7	.04	35	8.5	2.1		128	12	3.2	.0	6.1	135	122	17
Feb. 11-19	1,096	2.1	1.8	5	7.6	271	5.7	.06	40	10	3.1	1.8	145	12	3.5	.1	3.3	149	141	22
Feb. 20-28	1,126	1.8	1.7	6	7.7	238	5.6	.03	35	8.6	2.7	1.5	128	12	2.8	.1	3.3	134	123	18
Mar. 1-10	735	1.5	1.2	5	7.9	282	5.0	.02	41	10	3.9	1.7	157	13	3.4	.1	2.8	155	143	15
Mar. 11-20	567	1.6	1.4	5	8.0	312	4.2	.03	47	12	4.2	1.8	177	14	2.9	.1	4.2	172	167	22
Mar. 21-31	704	1.1	.7	10	7.5	260	3.7	.04	37	10	2.1	1.6	144	12	2.6	.1	2.0	143	133	15
Apr. 1-10	670	1.4	1.2	9	7.7	260	3.3	.03	36	11	2.3	1.3	147	12	2.8	.1	1.6	145	135	15
Apr. 11-20	1,495	2.8	1.1	8	7.7	192	7.1	.04	27	6.8	3.1		103	11	2.0	.1	2.6	115	95	11
Apr. 21-30	637	.6	.6	4	8.2	242	2.9	.03	37	11	2.4	1.2	136	11	2.9	.0	2.6	137	138	26
May 1-10	1,178	2.1	1.5	18	7.3	198	5.1	.10	28	7.2	2.1		106	10	2.6	.2	1.2	128	99	11
May 11-20	808	1.8	.9	6	7.6	229	4.0	.03	34	9.3	.6		132	10	3.0	.1	1.8	151	123	15
May 21, 25-31	801	1.3	.5	10	7.3	223	6.7	.02	30	7.7	1.7		116	9.9	2.4	.1	1.4	125	106	11

POTOMAC RIVER BASIN--Continued
NORTH FORK SHENANDOAH RIVER NEAR STRASBURG, VA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-foot)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered																Total	Non-carbonate
June 1-10, 1949	360	0.4	0.5	8	7.7	271	2.8	0.01	34	12		3.0	151	11	3.2	0.1	1.0	148	134	10
June 11-18	480	.9	.9	5	7.8	320	2.8	.01	40	15		1.2	178	12	3.1	.1	1.4	171	162	16
June 19-30	1,801	4.4	1.6	15	7.6	183	7.4	.01	25	5.8		1.4	93	8.5	1.8	.1	1.7	109	86	10
July 1-10	845	1.7	1.2	15	7.7	211	7.0	.04	30	6.9		1.2	112	9.4	2.2	.0	1.5	126	103	11
July 11-20	1,838	4.4	2.4	20	6.7	184	8.2	.05	27	6.0		2.2	100	9.2	2.2	.1	2.2	114	92	10
July 21-31	857	2.7	1.7	12	7.2	249	7.7	.07	37	9.4		1.3	143	10	2.6	.1	2.8	149	131	14
Aug. 1-10	516	2.0	1.4	8	7.4	273	5.5	.06	38	12		2.9	161	11	3.4	.1	2.5	158	144	12
Aug. 11-20	1,170	3.4	2.0	18	7.3	286	7.2	.08	34	9.5		2.7	137	11	2.9	.1	2.2	146	124	12
Aug. 21-31	916	2.4	2.0	10	7.5	231	4.3	.02	34	8.9		.6	130	10	3.0	.0	2.0	142	121	15
Sept. 1-10	620	1.7	1.5	15	7.9	253	5.3	.05	37	10	2.4	1.4	148	9.8	3.0	.0	2.0	157	133	12
Sept. 14-15	349	--	--	10	7.8	261	14	.05	45	9.4		--	148	20	3.0	--	3.0	160	151	30
Sept. 19-30	250	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Average	1,047	2.1	1.4	10	--	248	6.0	0.04	36	9.4		2.5	138	12	2.9	0.1	2.7	144	128	15

POTOMAC RIVER BASIN--Continued

NORTH FORK SHENANDOAH RIVER NEAR STRASBURG, VA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	58	47	40	40	41	58	65	73	71	80	72
2	68	58	47	40	38	41	58	66	73	75	81	70
3	66	50	48	--	38	41	57	63	73	78	81	75
4	68	--	46	--	34	42	57	64	75	82	80	73
5	66	--	45	--	34	46	53	68	75	74	82	74
6	52	--	44	--	--	48	53	71	78	76	79	69
7	54	--	44	--	--	45	54	71	76	80	83	70
8	54	--	44	--	45	46	54	71	74	75	80	68
9	56	--	42	--	46	46	54	71	73	76	82	70
10	52	--	42	--	43	46	56	68	72	74	82	69
11	60	55	40	50	42	44	54	66	76	75	83	68
12	58	58	40	--	42	44	56	64	79	75	78	70
13	54	55	42	46	44	46	56	65	80	76	81	71
14	52	55	45	45	47	47	56	66	77	78	81	68
15	54	57	47	44	49	43	56	67	82	73	75	70
16	54	56	47	45	49	43	52	67	77	74	78	--
17	54	55	44	44	48	43	54	71	75	75	72	--
18	55	55	43	45	48	41	54	71	74	72	75	--
19	54	52	45	48	47	42	51	73	66	75	70	--
20	54	50	40	44	46	44	55	69	68	75	69	--
21	55	51	40	48	49	48	59	64	73	75	70	--
22	58	50	40	49	48	50	58	--	73	78	68	--
23	57	50	41	48	48	54	59	--	76	78	69	--
24	56	51	41	43	48	55	58	--	79	80	73	--
25	--	50	40	47	47	54	61	65	81	83	75	--
26	--	50	40	51	46	56	65	63	82	83	77	--
27	58	48	39	49	46	60	63	63	82	86	78	--
28	58	48	40	--	44	58	64	65	79	86	76	--
29	60	45	40	--	--	60	63	66	79	86	76	--
30	60	45	40	--	--	63	63	69	78	86	73	--
31	57	--	39	--	--	61	--	69	--	82	70	--
Average	58	--	43	--	44	48	57	67	76	78	77	--

POTOMAC RIVER BASIN--Continued
MONOCACY RIVER AT BRIDGEPORT, MD.

LOCATION ---At bridge on State Highway 32 at Bridgeport, Carroll County, 60 feet upstream from gaging station which is 0.9 mile upstream from Cattail Branch, 3.4 miles northwest of Taylorstown, and 4.8 miles downstream from confluence of Rock and Marsh Creeks.

Drainage Area 173 square miles.

RECORDS AVAILABLE ---Chemical analyses: April 1948 to September 1949.

REMARKS ---Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1141.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Instantaneous discharge (second-feet)	Temperature (°F)	Suspended sediment	Biochemical oxygen demand (five days at 20°C)	Color	pH	Specific conductance (micromhos at 25°C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Total hardness as CaCO ₃
Oct. 6, 1948---	16	55	19	9.2	2.3	5	7.5	210	--	--	--	--	--	100	--	--	--	--	0.6	139
Oct. 13 -----	14	--	18	8.0	3.2	15	6.8	214	--	--	--	--	--	82	--	--	--	2.2	--	183
Oct. 20 -----	43	49	18	9.8	2.2	15	7.5	218	4.4	0.08	4.3	15	--	76	24	12	0.0	1.7	125	73
Oct. 27 -----	12	49	10	8.6	4.5	20	6.9	199	--	--	--	--	--	88	--	--	--	4.9	--	163
Nov. 3 -----	12	50	11	7.6	1.8	5	7.0	214	--	--	--	--	--	45	--	--	--	5.8	--	196
Nov. 10 -----	432	50	28	10.4	2.1	13	6.9	289	--	--	--	--	--	45	--	--	--	1.2	--	184
Nov. 17 -----	65	45	6	11.0	1.6	13	7.1	205	8.2	14	7.3	7.8	--	55	38	10	.0	1.2	130	183
Nov. 24 -----	226	--	10	9.8	2.1	25	6.8	172	--	--	--	--	--	50	--	--	--	4.3	--	134
Dec. 1 -----	310	38	10	11.2	0.0	15	7.0	152	--	--	--	--	--	33	--	--	--	3.9	--	85
Dec. 8 -----	210	42	9	10.4	3.0	15	6.9	154	--	--	--	--	--	38	--	--	--	3.2	--	92
Dec. 15 -----	118	41	5	10.6	4.7	1	7.2	162	8.0	.05	6.3	2.0	--	50	29	4.0	.0	4.2	100	76
Jan. 5, 1949---	268	37	12	11.2	4.3	10	6.7	142	--	--	--	--	--	32	--	--	--	4.5	--	58
Jan. 12 -----	192	40	2	10.5	2.2	8	6.9	134	--	--	--	--	--	35	--	--	--	3.8	--	87
Jan. 19 -----	116	40	8	11.0	2.5	10	7.0	148	--	--	--	--	--	46	--	--	--	3.4	--	87
Jan. 26 -----	484	41	21	10.9	3.4	25	7.5	141	11	.28	5.2	5.4	--	38	28	5.0	.1	3.8	99	60
Feb. 9 -----	528	38	22	11.6	2.8	9	7.1	127	--	--	--	--	--	36	--	--	--	4.2	--	55
Feb. 16 -----	542	49	36	10.4	2.4	7	7.1	139	--	--	--	--	--	46	--	--	--	3.0	--	63
Feb. 23 -----	734	42	59	11.2	2.6	8	7.2	137	3.6	.38	4.6	5.6	--	40	25	5.0	.0	4.5	91	57
Mar. 9 -----	92	40	4	11.6	2.4	8	7.2	148	--	--	--	--	--	49	--	--	--	2.7	--	71
Mar. 16 -----	71	36	12	13.0	2.9	7	7.2	154	--	--	--	--	--	50	--	--	--	2.2	--	67
Mar. 23 -----	94	52	9	10.5	1.9	5	7.3	167	4.0	.21	5.5	6.8	--	56	25	6.0	.0	3.0	98	68
Mar. 30 -----	56	55	4	9.0	1.6	8	7.2	171	--	--	--	--	--	64	--	--	--	1.5	--	81
Apr. 6 -----	1,130	42	155	10.4	4.5	25	7.1	148	--	--	--	--	--	51	--	--	--	3.6	--	67
Apr. 13 -----	81	52	1	9.3	1.7	10	7.4	148	--	--	--	--	--	54	--	--	--	1.2	--	67
Apr. 20 -----	204	49	6	11.0	2.4	25	7.3	137	9.8	.43	4.6	4.6	--	46	24	4.0	.1	1.7	92	60
Apr. 27 -----	101	60	6	9.1	1.5	15	7.5	138	--	--	--	--	--	52	--	--	--	1.3	--	62
May 4 -----	172	66	26	7.0	2.4	30	7.0	135	--	--	--	--	--	50	--	--	--	2.1	--	53
May 11 -----	120	53	10	8.2	1.9	10	7.1	153	--	--	--	--	--	60	--	--	--	2.2	--	57
May 18 -----	48	67	18	6.7	1.1	7	7.6	152	4.2	.10	5.6	4.8	--	66	19	4.0	.2	2.2	89	68
May 25 -----	70	63	43	7.3	1.6	15	7.1	165	--	--	--	--	--	66	--	--	--	4.7	--	66

June 1-----	24	64	9	9.0	2.3	8	7.4	187	--	--	--	--	2.1	--	70
June 8-----	15	67	10	6.9	0.5	7	7.5	188	--	--	--	--	.8	--	65
June 15-----	11	76	16	6.1	2.0	15	7.4	195	2.6	20	6.4	6.8	.0	100	76
June 22-----	21	79	12	5.4	1.4	10	7.4	141	--	--	--	--	1.3	--	54
June 29-----	14	74	22	4.6	1.4	15	7.4	172	--	--	--	--	1.8	--	65
July 6-----	81	74	9	6.2	1.2	10	7.2	158	--	--	--	--	.8	--	62
July 13-----	7.6	70	161	7.2	3.4	70	6.6	122	--	--	--	--	11	--	44
July 20-----	1,950.6	77	16	6.8	0.2	35	7.0	138	12	15	4.8	6.3	.2	104	58
July 27-----	68	80	9	6.7	0.9	30	7.2	134	--	--	--	--	1.8	--	50
Aug. 3-----	41	78	35	5.0	0.5	25	7.2	139	--	--	--	--	1.8	--	51
Aug. 10-----	19	80	14	6.0	0.9	15	7.2	149	--	--	--	--	.8	--	57
Aug. 17-----	15	81	23	7.3	2.4	15	7.6	173	2.4	19	5.3	5.5	.1	100	69
Aug. 24-----	11	74	12	8.0	3.0	15	7.5	166	--	--	--	--	.2	--	65
Aug. 31-----	27	75	14	7.0	2.0	25	7.5	144	--	--	--	--	.2	--	59
Sept. 7-----	8.8	68	16	5.8	1.8	20	7.1	163	--	--	--	--	1.6	--	62
Sept. 14-----	8.2	68	7	6.5	2.1	15	7.0	169	--	--	--	--	1.1	--	67
Sept. 21-----	14	63	11	7.2	1.8	10	7.6	194	.8	20	6.9	5.3	.0	111	78
Sept. 28-----	7.6	62	16	8.2	1.6	10	7.1	182	--	--	--	--	1.2	--	70

POTOMAC RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN POTOMAC RIVER BASIN IN VIRGINIA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
NORTH RIVER NEAR STOKESVILLE																		
Nov. 9, 1948	81	3	7.9	15.6	3.7	0.02	1.7	0.6	0.3		4.0	2.8	0.8	0.0	0.1	14	7	3
Jan. 11, 1949	40	3	5.8	---	3.2	.03	1.2	.5	1.5		4.0	3.8	.5	.1	.1	13	5	2
July 15	40	8	7.3	22.5	5.3	.04	2.4	1.0	.8		8.0	3.7	.8	.1	.1	19	10	4
DRY RIVER AT RAWLEY SPRINGS																		
Nov. 10, 1948	262	4	8.2	18.9	3.8	0.03	1.6	0.9	0.4		3.0	4.4	0.9	0.1	0.1	16	8	5
Jan. 11, 1949	157	12	6.8	---	3.0	.01	2.5	.5	1.5		6	4.6	1.2		.1	16	8	3
STONY CREEK AT COLUMBIA FURNACE																		
Nov. 10, 1948	106	10	7.4	87.0	5.0	0.02	12	3.2	0.9		38	9.1	2.0	0.2	1.4	56	43	12
Jan. 19, 1949	80	5	7.4	113	4.7	.03	16	3.6	2.8		58	9.7	1.8	.0	.7	66	55	7
Mar. 9	62	8	7.4	120	5.1	.03	16	4.1	1.9		58	9.8	1.8	.0	.6	68	57	9
Apr. 6	83	2	7.4	115	5.1	.03	16	3.5	1.0		54	9.6	1.2	.1	.3	68	54	10
CEDAR CREEK NEAR WINCHESTER																		
Nov. 5, 1948	40	3	7.6	168	6.5	0.03	26	4.0	1.5		80	15	2.1	0.1	0.2	99	81	16
Jan. 20, 1949	90	12	7.3	109	7.4	.10	17	2.7	2.3		53	12	1.5	.0	.5	72	54	10
Mar. 9	76	23	7.2	123	5.0	.04	18	3.3	1.8		58	12	1.2	.1	.4	73	58	11
Apr. 7	88	20	7.0	109	6.1	.06	16	2.0	2.8		48	12	1.5	.0	.2	68	48	9
PASSAGE CREEK AT BUCKTON																		
Nov. 5, 1948	35	5	7.8	108	6.6	0.05	14	2.9	3.5		50	10	2.0	0.1	0.1	65	47	6
Jan. 20, 1949	78	15	7.5	65.8	4.9	.07	7.8	1.8	2.5		25	8.4	1.8	.1	.2	38	27	6
Mar. 9	64	10	7.3	71.9	6.3	.05	8.4	2.1	1.5		25	8.9	1.9	.0	.5	46	30	9
Apr. 6	144	35	7.3	69	6.6	.25	9.0	1.4	2.7		26	9.9	1.4	.1	.3	49	28	7
June 7	22	9	7.8	101	5.4	.06	14	2.9	.9		48	6.7	1.5	.1	.1	61	47	8
July 14	115	25	7.5	86.4	7.5	.05	10	2.6	2.8		35	9.2	1.9	.1	.6	57	36	7
GOOSE CREEK NEAR LEESBURG																		
Nov. 4, 1948	218	4	7.9	94.9	14	0.05	9.3	3.3	3.4		34	8.2	4.1	0.1	2.2	67	37	9
Jan. 21, 1949	448	5	6.7	96.3	16	.07	8.0	2.2	4.5		26	9.9	3.1	.1	3.3	63	29	8
Mar. 10	350	8	6.9	84.8	---	.07	8.2	2.9	3.5		26	9.1	4.0	.1	4.1	59	32	11
Apr. 7	518	28	6.8	81.8	8.4	.08	8.4	2.1	4.9		28	11	2.9	.1	2.0	62	30	7

JAMES RIVER BASIN

JAMES RIVER AT RICHMOND, VA.

LOCATION.--At filtration plant of Richmond waterworks, half a mile west of city limits of Richmond, Henrico County, and 2½ miles downstream from gaging station near Richmond.

DRAINAGE AREA.--6,757 square miles above gaging station.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1949.

Water temperatures: October 1947 to September 1949.

TOTALS, 1948-49.--Dissolved solids: Maximum, 101 parts per million Nov. 1-10; minimum, 58 parts per million Dec. 1-10.

Water hardness: Maximum, 61 parts per million Nov. 1-10; minimum, 35 parts per million Dec. 1-10.

Water temperatures: Maximum, 82°F July 28-31, Aug. 2, 3; minimum, 40°F Dec. 25-28, 30.

EXTREMES, 1949.--Dissolved solids: Maximum, 123 parts per million Oct. 11-20, 1947; minimum, 58 parts per million Apr. 1-10, Dec. 1-10, 1948.

Water temperatures: Maximum, 89°F Aug. 28, 1948; minimum, 38°F Jan. 8, 1949.

REMARKS.--Records of specific conductance of daily samples available in district office at Charlottesville, Va. Discharge records for gaging station near Richmond for water year October 1948 to September 1949 given in Water-Supply Paper 1412.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Oxygen consumed		pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered															Total	Non-carbonate
Oct. 1-10, 1948	8,496			33	143	8.2	0.12	16	2.6		9.9	52	21	5.2	0.0	0.5	94	51	8
Oct. 11-20	5,119			25	7.4	130	.08	16	3.1	6.3		52	16	4.4	.1	.7	83	53	10
Oct. 21-31	2,702			18	7.2	141	.08	16	3.6	7.7		54	20	4.1	.1	.4	91	55	10
Nov. 1-10	4,703			23	7.3	160	.06	18	4.0	8.0		56	23	5.9	.1	.5	101	61	15
Nov. 11-20	4,653			20	7.0	130	.06	16	3.0	6.4		52	17	3.8	.1	.3	85	52	10
Nov. 21-30	20,730			65	6.7	109	.14	13	2.7		5.8	44	13	4.0	.1	.8	74	44	8
Dec. 1-10	50,290			75	6.8	85.2	.26	11	1.9	4.5		38	8.9	2.2	.1	1.5	58	35	4
Dec. 11-20	16,180			20	7.1	121	.20	15	2.3	3.2		42	11	2.8	.2	.7	70	44	8
Dec. 21-31	34,180			30	7.6	111	.23	15	2.1	3.4		47	13	2.8	.1	.6	71	50	12
Jan. 1-10, 1949	11,030			32	7.4	107	.20	14	2.1	3.4		37	13.1	2.2	.0	.6	59	36	6
Jan. 11-20	11,030			32	7.4	107	.20	14	2.1	3.4		49	11	3.0	.0	.6	70	46	6
Jan. 21-31	18,670			56	7.3	98.1	.23	13	2.5	3.7		42	11	3.0	.1	.6	68	43	8
Feb. 1-10	16,390			40	7.5	93.7	.26	12	2.7	3.5		41	10	2.8	.1	.6	67	41	7
Feb. 11-20	12,910			20	6.3	101	.95	13	2.3	4.0		42	11	2.8	.1	.6	66	42	8
Feb. 20-28	10,640			23	6.8	107	.96	14	2.6	4.9		44	12	3.2	.1	.5	70	43	7
Mar. 1-10	8,168			20	6.8	108	.94	13	2.6	4.7		44	12	3.0	.1	.5	70	43	7
Mar. 11-20	6,735			20	6.9	124	.89	15	2.8	5.8		49	15	3.6	.1	.5	78	49	9
Mar. 21-31	21,080			18	6.3	97.2	.05	11	2.7	3.7		39	10	2.4	.1	.7	63	39	7
Apr. 1-10	9,754			10	6.7	100	.94	12	3.1	3.7		44	9.7	2.8	.1	.5	69	43	7
Apr. 11-20	21,370			20	6.8	106	.90	14	2.9	3.1		49	8.6	2.8	.1	.4	73	47	7
Apr. 21-30	8,835			20	6.8	110	.06	14	3.1	4.1		53	8.1	3.1	.0	.4	74	48	4
May 1-10	12,960			30	6.9	101	.86	14	2.9	2.7		48	8.0	2.9	.2	.4	67	47	8
May 11-20	12,370			30	7.4	110	.92	13	3.1	3.3		49	7.6	2.5	.1	.6	71	45	5
May 21-31	6,862			10	7.4	129	.04	15	3.5	4.1		55	10	3.2	.1	.6	76	52	7

JAMES RIVER BASIN--Continued
JAMES RIVER AT RICHMOND, VA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-foot)	Oxygen consumed		pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered															Total	Non-carbonate
June 1-10, 1949 ----	3,438			7.4	129	5.5	0.04	15	3.3	5.4		56	11	3.5	0.1	0.3	73	51	5
June 11-20 -----	7,708			23	135	7.5	.04	15	2.6	6.6		53	13	3.5	.1	.5	79	48	5
June 21-31 -----	7,415			38	108	9.2	.03	13	3.6	2.0		41	11	4.0	.1	.7	67	47	14
July 1-10 -----	7,270			28	103	10	.06	14	3.0	3.0		47	9.8	3.1	.1	.6	75	47	9
July 11-20 -----	15,590			45	6.3	9.9	.05	13	2.7	3.1		44	9.4	2.6	.1	.7	70	44	7
July 21-31 -----	9,328			25	6.5	9.3	.04	14	3.0	4.8		49	13	2.5	.0	.6	81	47	7
Aug. 1-10 -----	3,663			15	6.6	11	.02	16	3.6	3.0		57	8.9	3.5	.0	.4	72	55	8
Aug. 11-20 -----	10,860			30	6.6	8.6	.18	13	3.1	4.7		44	12	3.8	.2	1.1	73	45	9
Aug. 21-30 -----	6,885			15	6.9	127	.05	15	3.6	5.3		51	15	4.1	.1	.5	84	52	10
Sept. 1-10 -----	7,159			25	6.8	9.9	.12	14	3.1	5.0		50	12	3.2	.1	.5	80	48	7
Sept. 11-20 -----	3,043			15	6.9	9.3	.08	15	3.1	4.4		48	14	3.8	.1	.4	81	50	11
Sept. 21-30 -----	2,392			10	6.9	9.3	.11	15	3.6	7.9		53	19	4.2	.1	.1	86	52	9
Average - ----	11,680			29	--	9.1	0.12	14	2.9	4.8		48	12	3.3	0.1	0.6	75	47	8

JAMES RIVER BASIN--Continued

JAMES RIVER AT RICHMOND, VA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	58	52	41	46	51	63	64	69	73	81	75
2	71	59	48	41	46	48	61	63	--	75	82	72
3	67	59	49	41	44	45	60	64	69	75	82	73
4	66	58	49	43	44	46	60	64	70	78	81	72
5	62	59	52	43	43	46	60	67	72	77	81	73
6	61	64	52	43	43	46	59	67	72	79	81	79
7	58	61	51	41	43	47	59	68	73	81	80	73
8	61	61	51	45	--	44	60	67	72	80	77	72
9	61	59	50	45	47	47	60	67	--	77	79	69
10	62	57	46	43	46	47	59	67	70	77	79	66
11	62	59	45	44	47	47	58	68	72	79	80	66
12	62	57	46	44	47	48	57	68	73	79	79	69
13	61	55	46	44	48	48	57	64	75	79	79	72
14	61	54	46	46	47	48	57	64	75	79	81	73
15	60	54	46	46	50	--	58	66	75	78	80	72
16	62	53	46	46	50	43	58	64	79	75	77	72
17	60	53	46	48	47	45	57	64	75	78	76	72
18	58	53	46	46	51	46	58	66	76	75	74	73
19	58	52	46	47	51	43	58	66	77	77	77	73
20	58	55	45	47	52	45	58	70	77	76	72	72
21	57	54	46	48	52	48	61	68	77	79	74	68
22	57	54	46	47	52	52	59	68	78	78	75	73
23	56	54	46	46	52	53	62	68	77	77	76	68
24	56	52	45	49	51	53	63	68	76	77	73	64
25	56	52	40	49	50	54	62	--	79	79	75	64
26	55	52	40	48	52	55	63	66	79	80	74	64
27	55	52	40	48	52	58	64	64	79	81	75	64
28	55	51	40	50	51	56	63	64	81	82	76	66
29	57	49	42	48	--	60	64	--	77	82	73	65
30	58	50	40	46	--	63	64	66	--	82	75	63
31	58	--	41	46	--	63	--	68	--	82	--	--
Average	60	55	46	45	48	50	60	66	75	78	77	70

JAMES RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN JAMES RIVER BASIN IN VIRGINIA
Chemical analyses, in parts per million, October 1948 to February 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dis-solved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
JAMES RIVER AT BUCHANAN 1/																		
Oct. 1-10, 1948	3,044	13	7.0	259	7.0	0.08	34	6.7	5.4		104	27	7.1	0.1	0.6	146	112	27
Oct. 11-13	2,033	--	--	--	--	--	--	--	--	--	99	--	--	--	--	125	--	--
Nov. 10-19	1,618	28	7.2	197	5.9	.07	26	5.8	5.4		84	20	7.1	.1	.6	118	89	20
Jan. 1-10, 1949	9,060	10	7.0	122	6.0	.06	17	3.7	4.2		59	10	4.5	.1	1.6	73	58	9
Jan. 11-20	3,039	23	7.1	196	5.0	.03	27	6.0	4.1		91	17	5.6	.1	.7	114	92	17
Jan. 21-31	7,460	22	7.6	140	5.6	.03	19	4.0	4.3		68	12	3.2	.0	.5	85	64	8
Feb. 1-10	5,876	10	6.8	147	5.7	.02	20	3.7	4.0		98	12	3.4	.1	.8	86	65	9
Feb. 11-20	4,219	10	6.8	152	5.1	.05	21	3.9	3.4		69	13	3.6	.1	.6	88	68	12

1/Composites of daily samples.

CHOWAN RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN CHOWAN RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate

CHOWAN RIVER AT CHOWAN-BERTIE COUNTY LINE NEAR EDENTON

Feb. 24, 1949	-----		23	6.5	56.7	9.3	0.29	4.2	1.0	5.1	14	5.8	4.8	0.2	1.0	53	15	3
---------------	-------	--	----	-----	------	-----	------	-----	-----	-----	----	-----	-----	-----	-----	----	----	---

POTECASI CREEK AT POTECAZI

Aug. 11, 1949	1/-----		99	6.0	35.5	10	1.5	3.2	1.2	2.2	10	3.3	3.8	0.2	0.1	56	13	5
---------------	---------	--	----	-----	------	----	-----	-----	-----	-----	----	-----	-----	-----	-----	----	----	---

AHOSKIE CREEK AT AHOSKIE

Aug. 11, 1949	2/-----		75	6.7	32.0	8.9	0.22	2.7	0.7	2.2	8	3.1	2.8	0.1	0.6	50	10	3
---------------	---------	--	----	-----	------	-----	------	-----	-----	-----	---	-----	-----	-----	-----	----	----	---

BENNETTS CREEK NEAR GATESVILLE

Aug. 12, 1949	-----		85	5.5	19.6	18	0.04	3.8	1.2	2.5	10	5.8	3.5	0.1	0.6	65	14	6
---------------	-------	--	----	-----	------	----	------	-----	-----	-----	----	-----	-----	-----	-----	----	----	---

1/Large proportion of organic matter present; sum of mineral constituents 30 ppm.

2/Large proportion of organic matter present; sum of mineral constituents 25 ppm.

3/Discharge measurement made when sample collected.

ROANOKE RIVER BASIN

ROANOKE RIVER AT ROANOKE RAPIDS, N. C.

LOCATION.--At bridge on State Highway 47, 1½ miles upstream from gaging station at Roanoke Rapids, Halifax County.
DRAINAGE AREA.--8,410 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

Water temperatures: October 1948 to September 1949.

EXTREMES, 1948-49.--Dissolved solids: Maximum, 74 parts per million Nov. 11-20; minimum 46 parts per million Dec. 1-10, Jan. 1-10.

Total hardness: Maximum, 34 parts per million Oct. 21-31; minimum, 20 parts per million Jan. 1-10.

Water temperatures: Maximum, 90°F July 30; minimum, 37°F Dec. 27.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1142.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Oxygen consumed (Unfiltered)	Color	pH	Specific conductance (micro-mhos at 25°C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																		Total	Non-carbonate
Oct. 1-10, 1948	11,120	8.8	4.0	11	6.8	--	0.07	5.4	2.4	5.4	1.9	31	7.0	3.8	0.0	2.1	57	23	0
Oct. 11-20	4,250	3.3	2.6	7	7.2	96.1	.59	7.0	2.9	8.5		40	7.6	4.6	.1	.4	71	29	0
Oct. 21-31	3,436	2.7	2.4	4	7.3	109	.12	7.8	3.5	9.8		47	8.7	5.1	.1	.1	73	34	0
Nov. 1-10	5,184	4.6	3.4	14	7.2	102	.10	7.2	3.1	9.9		44	7.8	5.0	.1	.2	73	31	0
Nov. 11-20	4,492	3.7	3.6	8	7.4	102	.10	7.7	3.3	7.6		42	7.5	4.9	.0	.2	74	33	0
Nov. 21-30	20,620	8.7	4.2	14	6.4	70.0	.02	4.9	2.1	5.6		26	6.3	3.4	.0	.5	51	21	0
Dec. 1-10	40,250	9.0	3.2	12	6.6	64.6	.02	5.2	2.0	4.0		23	6.6	2.6	.0	.5	46	21	2
Dec. 11-20	11,510	4.1	2.4	12	6.9	97.8	.02	7.0	2.9	5.2		34	6.8	3.4	.1	.7	60	29	2
Dec. 21-31	13,710	5.3	3.9	18	6.9	77.0	.12	6.9	2.5	5.7	1.0	31	6.4	3.2	.1	.4	54	25	0
Jan. 1-10, 1949	23,210	7.1	3.0	18	6.9	60.9	.11	4.9	1.9	3.1		23	6.2	2.8	.1	.8	46	20	1
Jan. 11-20	9,625	2.9	2.1	7	7.3	79.4	.02	7.1	2.6	4.8		33	6.5	3.0	.1	.6	57	28	1
Jan. 21-31	11,020	3.3	2.5	8	7.3	79.4	.02	6.7	2.7	5.2		32	7.0	3.5	.1	.5	56	28	2
Feb. 1-10	14,980	4.2	2.6	4	6.8	71.5	.02	5.6	2.4	5.6		30	6.0	3.2	.0	.8	54	24	0
Feb. 11-20	15,420	4.1	1.7	7	6.9	71.8	.13	5.8	2.3	5.5		30	6.0	3.1	.1	.5	55	24	0
Feb. 20-28	11,230	3.2	2.4	3	7.1	78.4	9.7	6.6	2.6	5.4		34	6.1	3.1	.0	.5	55	27	0
Mar. 1-10	8,665	2.8	2.1	3	7.0	82.5	9.4	6.6	2.7	5.6		35	5.6	3.5	.0	.3	56	28	0
Mar. 11-20	7,625	2.2	1.9	3	7.2	83.7	.15	6.1	2.6	6.6		37	5.9	3.8	.0	.4	59	28	0
Mar. 21-31	17,960	6.2	1.7	3	6.8	70.5	.01	5.9	2.3	5.8		30	5.9	3.6	.1	.7	52	24	0
Apr. 1-10	10,130	3.5	2.7	3	7.0	79.5	.01	6.5	2.6	5.5	.7	34	5.3	3.6	.1	.7	57	27	0
Apr. 11-20	14,370	6.7	2.4	3	6.8	79.1	.14	6.2	2.5	4.3		32	5.5	2.8	.0	1.0	55	27	1
Apr. 21-30	11,110	6.8	3.1	6	6.8	78.1	.04	6.3	2.5	5.1		32	5.8	3.0	.0	.6	55	28	0
May 1-10	15,330	7.2	2.8	4	6.8	71.3	.13	5.9	2.2	3.9		28	5.0	2.5	.0	.6	51	24	1
May 11-20	21,190	--	3.0	5	6.8	71.3	.02	5.2	2.0	4.3		25	5.5	2.5	.0	1.0	48	21	1
May 21-31	7,596	3.7	2.2	4	7.0	85.7	.02	6.8	2.7	5.8		36	5.3	3.4	.1	.6	62	29	0

June 1-10	5,008	2.5	2.0	4	7.1	85.1	14	.02	7.2	2.9	6.2	40	4.5	3.9	.1	59	30	0
June 11-20	6,285	4.2	2.3	4	7.0	84.1	13	.03	6.7	2.8	6.0	36	5.3	4.0	.1	61	28	0
June 21-30	6,325	5.1	2.5	6	6.9	91.0	15	.02	7.0	2.8	6.3	37	5.5	4.0	.1	63	29	0
July 1-10	13,450	7.6	2.7	8	6.9	88.7	13	.03	5.8	2.4	4.4	28	5.8	2.6	.1	53	24	1
July 11-20	23,640	7.2	4.0	6	6.6	80.4	13	.04	5.6	1.9	4.0	25	5.8	2.0	.2	51	22	1
July 21-31	9,359	3.6	2.4	8	6.8	101	16	.01	8.2	3.0	6.9	42	6.9	4.0	.1	67	33	0
Aug. 1-10	5,311	4.4	2.1	6	7.0	92.1	14	.03	7.1	3.3	6.3	40	6.3	3.6	.0	62	31	0
Aug. 11-20	8,405	6.1	2.5	7	6.9	79.2	12	.02	6.0	2.6	5.4	32	5.6	3.4	.1	56	26	0
Aug. 21-31	11,890	4.3	2.6	8	6.7	71.7	13	.04	6.2	3.1	3.3	31	5.2	2.8	.0	57	28	3
Sept. 1-10	13,200	4.2	2.6	4	6.6	72.7	14	.17	5.6	2.2	4.6	28	5.5	2.9	.0	52	23	0
Sept. 11-20	6,213	5.6	1.5	6	6.8	86.5	13	.02	6.8	3.4	5.6	36	6.5	3.4	.0	62	31	0
Sept. 21-30	5,301	3.0	2.0	6	6.5	86.5	16	.04	6.9	2.8	6.0	37	6.4	4.2	.2	64	29	0
Average	11,990	4.9	2.6	6	--	81.0	13	0.06	6.4	2.6	5.7	33	6.2	3.4	0.1	58	27	0

ROANOKE RIVER BASIN--Continued
 ROANOKE RIVER AT ROANOKE RAPIDS, N. C.--Continued

Temperature (° F) of water, water year October 1948 to September 1949

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	72	56	47	42	40	47	60	64	72	81	85	74
2	---	58	48	40	40	46	58	64	72	81	85	73
3	---	58	48	40	40	46	57	63	73	80	85	72
4	66	62	48	40	40	43	57	63	73	80	85	73
5	62	67	50	41	41	47	57	65	74	79	85	73
6	58	68	51	44	42	47	57	69	74	79	85	73
7	---	68	50	44	44	46	58	70	75	79	85	73
8	60	60	49	44	47	47	55	70	75	80	85	73
9	---	60	46	45	47	47	56	75	80	86	86	73
10	60	84	45	45	47	47	56	70	75	80	86	72
11	---	59	45	45	45	47	57	70	77	79	86	73
12	65	57	44	46	45	47	57	68	79	78	86	73
13	---	56	48	47	46	47	59	65	80	77	86	72
14	---	53	48	48	47	47	60	64	79	77	84	74
15	62	52	46	48	51	46	62	65	81	77	82	75
16	---	52	44	47	52	46	62	67	80	77	80	75
17	60	56	43	51	52	47	60	69	79	77	77	76
18	---	56	43	51	53	47	59	70	78	77	78	75
19	58	57	42	50	53	46	58	71	79	77	77	75
20	---	57	42	49	53	47	60	70	81	77	75	75
21	---	56	---	---	55	50	60	70	83	77	73	74
22	55	54	43	46	51	50	61	70	83	79	72	74
23	---	55	44	47	52	48	60	70	84	72	72	72
24	56	56	40	47	52	49	61	70	85	82	75	70
25	---	55	40	47	53	52	61	70	85	82	75	68
26	---	54	38	50	52	55	61	70	87	83	75	66
27	56	53	37	50	49	57	62	70	86	83	75	68
28	---	50	39	50	47	59	63	70	84	87	77	69
29	57	48	42	48	---	60	63	70	82	89	75	68
30	---	58	42	41	---	62	63	70	80	90	74	65
31	57	---	44	40	---	63	---	70	---	86	73	---
Average	60	57	45	46	48	50	59	68	79	80	80	72

ROANOKE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN ROANOKE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
ROANOKE RIVER NEAR SCOTLAND NECK																		
June 8, 1949 -----	5,200	7	6.5	94.4	14	0.06	6.7	3.0	8.4		43	5.6	4.0	0.1	0.3	64	29	0
DAN RIVER AT LEAKSVILLE																		
Jan. 19, 1949 -----	1,180	2	6.9	49.4	15	0.01	4.3	1.9	2.5		22	2.8	2.4	0.0	0.3	44	19	1
June 27 -----	961	7	6.1	40.3	12	.05	3.4	1.2	4.3		19	2.5	1.8	.2	1.9	38	13	0
MAYO RIVER NEAR PRICE																		
Apr. 20, 1949 -----	419	2	6.9	38.3	12	0.02	3.1	0.3	5.2		19	2.5	1.2	0.1	0.2	35	9	0
SMITH RIVER AT SPRAY																		
Jan. 19, 1949 -----	588	12	6.8	60.5	14	0.01	4.1	1.9	4.1		24	3.3	2.4	0.1	0.4	45	18	0
June 28 -----	1,040	7	6.4	49.1	13	.02	4.1	1.6	3.7		23	3.2	1.8	0	.2	42	17	0
ROQUIST CREEK NEAR WINDSOR																		
Apr. 22, 1949 1/----	2/16.2	55	6.0	60.6	5.6	0.66	4.6	1.6	5.8		22	2.6	7.0	0.0	0.1	62	18	0

1/Large proportion of organic matter present; sum of mineral constituents.39 ppm.

2/Discharge measurement made when sample collected.

PAMLICO RIVER BASIN

TAR RIVER AT GREENVILLE, N. C.

LOCATION --At bridge on State Highway 11 at Greenville, Pitt County.

DRAINAGE AREA --2,680 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1948 to September 1949.

REMARKS --Estimated discharge based on measurements made at gaging station at Tarboro, N. C. Discharge records for gaging station at Tarboro, for water year October 1948 to September 1949 given in Water-Supply Paper 1142.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 15, 1948	1,400	32	8.6	--	14	0.21	4.6	1.6	6.1	1.5	15	11	6.1	0.0	0.4	65	18	6
Nov. 15	2,800	65	6.2	96.9	13	.18	4.6	1.8	4.8	17	17	6.5	5.8	.0	.5	80	19	5
Dec. 15	3,600	14	6.0	80.0	13	.12	4.2	1.5	6.5	18	18	7.0	5.8	.0	.6	52	17	2
Jan. 15, 1949	3,600	17	6.4	64.1	12	.04	3.6	1.1	5.4	.7	16	6.0	5.2	.0	.7	46	14	0
Feb. 15	7,500	28	6.2	52.5	9.7	.13	3.6	1.2	4.5	14	14	5.4	4.4	.0	.6	47	14	2
Mar. 19	2,400	18	6.6	62.4	11	.18	4.2	1.4	6.1	20	20	5.1	5.2	.0	.7	50	16	0
Apr. 15	2,400	17	6.7	65.9	12	.07	4.4	1.6	6.0	.8	23	4.0	5.8	.0	.6	52	18	0
May 15	7,000	33	5.8	51.0	8.3	.10	3.6	1.2	3.6	14	14	5.0	3.4	.0	.5	47	14	2
June 15	600	7	6.6	84.8	5.2	.01	5.2	2.1	8.5		30	5.6	5.6	.2	1.1	54	22	0
July 15	1,900	16	6.5	72.4	17	.62	5.8	1.5	6.2	.9	24	6.0	6.0	.1	1.2	69	21	1
Aug. 15	650	13	6.3	73.7	17	.72	7.5	2.3	4.6		28	6.4	5.8	.1	.1	60	28	5
Sept. 15	1,500	20	6.3	63.6	15	.10	4.1	1.5	5.2	1.3	17	5.6	5.2	.1	.6	55	16	2

LOCATION.--At gaging station at bridge on U. S. Highway 301, 2,000 feet downstream from Atlantic Coast Line Railroad bridge, 2 miles southwest of Enfield, Halifax County, and 4½ miles downstream from Rocky Creek.

DRAINAGE AREA.--462 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

Water temperatures: October 1948 to September 1949.

EXTREMES, 1948-49.--Dissolved solids: Maximum, 65 parts per million June 11-20; minimum, 44 parts per million Dec. 1-10.

Total hardness: Maximum, 24 parts per million June 11-20, 21-30; minimum, 13 parts per million Jan. 1-10.

Water temperatures: Maximum, 83°F July 28; minimum, 33°F Dec. 28.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1142.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25°C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered																Total	Non-carbonate
Oct. 1-10, 1948	631	7.7	6.3	27	6.6	14	0.08	3.8	1.7	4.1	1.9	23	4.1	3.2	0.1	52	16	0	16	0
Oct. 11-20	190	4.6	4.4	10	6.8	63.8	0.32	4.2	1.8	7.1	6.6	28	4.0	4.1	1.1	61	18	0	18	0
Oct. 21-31	289	5.3	4.3	10	6.8	70.2	0.02	4.6	2.1	6.0	6.0	29	3.7	4.5	1.1	63	20	0	20	0
Nov. 1-10	1,356	11	7.7	32	6.2	59.5	0.16	4.0	1.7	4.9	4.9	21	4.4	4.1	0.1	52	17	0	17	0
Nov. 11-20	613	7.3	6.1	18	6.5	63.8	0.10	4.0	1.8	6.2	6.2	25	3.6	4.6	0.1	54	17	0	17	0
Nov. 21-30	1,742	11	8.3	28	6.4	35.5	0.15	3.4	1.5	4.3	4.3	18	3.7	3.8	0.1	46	15	0	15	0
Dec. 1-10	2,308	8.8	7.0	27	6.3	43.9	0.04	3.4	1.4	3.0	3.0	15	4.0	3.0	0.1	44	14	2	14	2
Dec. 11-20	914	5.8	4.4	12	6.8	59.7	0.03	4.2	1.8	4.8	4.8	24	3.1	3.9	0.1	53	18	0	18	0
Dec. 21-31	982	7.8	4.0	13	6.8	48.5	0.02	3.2	1.3	3.6	3.6	17	3.5	4.1	0.1	45	13	0	13	0
Jan. 1-10, 1949	1,507	7.6	5.0	18	6.8	58.7	0.04	3.5	1.6	7.2	7.2	26	3.3	4.0	0.1	50	15	0	15	0
Jan. 11-20	593	6.9	4.0	10	6.6	64.0	0.04	3.5	1.6	5.3	5.3	26	3.3	4.2	0.1	52	20	0	20	0
Jan. 21-31	635	5.2	4.8	17	7.0	84.0	0.03	4.9	1.9	5.7	5.7	28	2.2	4.0	0.1	52	19	0	19	0
Feb. 1-10	809	4.9	3.5	9	6.7	81.0	0.09	4.1	1.7	6.3	6.3	27	2.1	4.1	0.1	58	17	0	17	0
Feb. 11-19	1,485	7.2	5.9	21	6.6	50.4	0.09	3.9	1.7	5.3	5.3	23	3.8	3.8	0.1	55	48	16	48	16
Feb. 20-28	631	5.5	4.2	9	6.6	58.5	0.05	4.0	1.7	6.1	6.1	25	3.1	4.0	0.1	55	48	18	48	18
Mar. 1-10	629	5.2	3.8	8	6.8	81.3	0.03	4.2	1.8	6.3	6.3	27	2.7	4.1	0.1	7	49	18	0	0
Mar. 11-20	591	4.2	2.8	7	6.9	82.0	0.01	4.5	2.2	4.8	4.8	27	2.8	3.9	0.1	4	50	20	0	0
Mar. 21-31	633	5.5	3.6	14	6.9	63.6	0.04	4.4	1.9	5.7	5.7	28	2.2	4.0	0.1	52	19	0	19	0
Apr. 1-10	599	5.6	4.4	8	6.8	97.7	0.04	5.2	2.2	5.7	5.7	34	2.3	4.2	0.1	55	56	22	0	0
Apr. 11-20	457	5.2	4.0	6	6.7	88.6	0.08	4.8	2.0	7.1	7.1	33	2.4	3.9	0.1	55	55	20	0	0
Apr. 21-30	484	4.9	3.4	8	6.8	87.7	0.15	3.8	5.0	5.3	5.3	30	2.8	3.4	0.1	57	21	0	21	0
May 1-10	381	4.6	3.5	8	6.8	71.3	0.14	4.3	5.6	2.3	5.0	32	2.6	3.5	0.1	57	23	0	23	0
May 11-20	1,016	7.7	5.6	17	6.9	56.3	0.04	4.5	1.8	3.6	3.6	22	3.2	3.1	0.1	52	19	1	19	1
May 21-31	279	4.5	3.2	6	6.7	70.3	0.02	5.2	2.1	5.8	5.8	32	2.0	3.5	0.1	58	22	0	22	0

PAMLICO RIVER BASIN--Continued
FISHING CREEK NEAR ENFIELD, N. C.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-foot)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered																Total	Non-carbonate
June 1-10, 1949	181	3.8	3.2	6	6.9	71.5	18	0.02	5.2	2.1	7.1		35	2.0	4.0	0.1	0.4	58	22	0
June 11-20	189	4.0	3.2	7	6.8	72.9	14	.02	5.8	2.3	6.6		36	1.9	4.4	.1	.4	65	24	0
June 21-30	190	3.9	2.8	8	6.8	77.0	19	.03	5.6	2.5	6.1		36	1.9	3.8	.0	.8	62	24	0
July 1-10	541	8.8	5.0	17	6.6	57.1	16	.05	4.4	1.9	4.0	1.0	23	3.9	3.5	.1	1.5	54	19	0
July 11-20	432	5.5	4.5	12	6.4	62.4	16	.04	4.5	1.9			26	3.3	3.2	.2	.8	56	19	0
July 21-31	237	6.3	4.2	8	6.6	68.0	18	.03	5.3	2.1	6.0		32	2.7	3.4	.2	.8	59	22	0
Aug. 1-10	512	12	6.3	23	6.6	57.6	15	.06	6.2	1.8	5.3		30	4.1	3.5	.1	.5	58	23	0
Aug. 11-20	432	6.6	4.6	17	6.6	62.0	16	.02	5.2	1.9	5.1		28	3.2	3.5	.1	.4	54	21	0
Aug. 21-31	1,340	7.8	6.9	28	6.3	50.8	12	.02	3.3	1.8	4.2		20	3.4	3.0	.1	.5	48	16	0
Sept. 1-10	1,002	7.2	6.0	19	6.5	55.0	14	.31	4.3	1.9	3.8		20	4.6	3.4	.1	.6	52	19	2
Sept. 11-20	1,116	8.4	6.4	18	6.8	59.3	16	.02	4.6	1.7	5.4		26	3.2	3.6	.1	.4	54	18	0
Sept. 21-30	310	--	3.9	16	6.7	67.8	18	.06	5.2	2.1	4.9	1.2	30	2.9	4.4	.1	.5	57	22	0
Average--	718	6.5	4.8	15	--	61.9	15	0.08	4.5	1.9	5.4		27	3.1	3.8	0.1	0.5	54	19	0

Temperature (° F) of water, water year October 1948 to September 1949

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	67	53	47	44	44	45	62	80	85	74	81	74
2	66	53	44	40	41	43	60	81	85	74	74	72
3	66	53	47	38	39	42	59	75	75	75	75	72
4	66	56	50	40	40	41	57	84	86	76	76	70
5	63	61	49	41	42	44	55	85	88	76	76	70
6	59	62	51	46	45	47	55	66	69	80	76	71
7	57	63	49	49	46	47	55	68	70	79	76	74
8	57	61	51	48	46	47	55	68	71	80	75	71
9	57	59	51	47	46	46	54	67	68	74	77	68
10	56	58	48	46	50	47	56	69	68	74	78	68
11	57	57	44	48	49	47	55	65	70	78	79	65
12	60	54	44	48	45	46	57	60	73	75	80	68
13	59	54	46	46	47	45	59	59	74	76	80	68
14	59	51	47	46	48	44	60	60	72	76	80	69
15	51	51	49	44	51	45	62	62	74	76	80	70
16	51	50	50	44	55	44	62	63	73	76	76	72
17	56	52	50	48	54	45	60	65	74	75	74	72
18	56	53	48	48	51	47	57	65	74	76	74	71
19	54	54	46	51	51	45	57	68	74	76	74	72
20	52	56	44	50	51	46	56	70	76	76	74	70
21	50	53	42	50	54	50	56	70	77	78	74	66
22	49	51	42	47	54	48	59	70	78	78	76	67
23	51	55	43	46	53	52	60	70	79	79	77	68
24	51	53	43	46	51	52	61	70	80	80	72	62
25	52	53	41	49	51	60	58	71	80	80	74	63
26	52	51	38	52	50	61	59	69	80	80	73	62
27	52	52	34	53	49	63	60	66	82	81	74	64
28	53	52	33	51	48	65	62	64	82	83	76	65
29	50	51	36	53	--	61	59	61	81	82	74	65
30	48	41	41	50	51	61	59	63	79	80	74	63
31	51	--	41	47	--	63	--	65	--	80	74	--
Average	56	54	45	47	46	50	58	66	74	78	76	68

PAMLICO RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN PAMLICO RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dis-solved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
TAR RIVER NEAR TAR RIVER																		
Dec. 12, 1948 -----	122	7	6.9	64.4	14	0.01	4.9	2.1	4.4		22	5.0	4.8	0.1	0.4	52	21	3
June 7, 1949 -----	30	3	6.6	74.0	14	.02	5.3	2.5	6.0		34	2.8	3.9	.1	.4	55	24	0
TAR RIVER NEAR NASHVILLE																		
June 7, 1949 -----	246	5	7.0	65.4	17	0.01	4.4	1.9	6.5		30	2.3	3.8	0.1	0.4	58	19	0
PAMLICO RIVER AT WASHINGTON																		
Sept. 9, 1949 -----		55	5.9	62.6	7.2	0.67	4.3	1.4	4.1		12	5.7	6.5	0.0	0.5	56	16	7
SAPONY CREEK NEAR NASHVILLE																		
Aug. 14, 1949 -----	1/2.71	29	6.4	71.5	14	0.09	6.2	2.4	5.2		32	2.7	4.8	0.3	0.2	63	25	0
TRANTERS CREEK AT LATHAM																		
Apr. 21, 1949	2/--	100	6.0	54.5	3.4	0.27	3.6	4.4	1.9		10	8.6	9.6	0.1	0.1	3/71	27	19
TRANTERS CREEK NEAR WASHINGTON																		
Oct. 7, 1948-----		45	6.4		7.8	0.17	21	41	321		23	86	575	0.1	0.3	1,160	221	202
TRANTERS CREEK ABOVE WASHINGTON																		
Oct. 7, 1948 -----		110	5.9		9.2	0.36	5.1	2.1	6.9		14	13	8.0	0.0	0.2	82	21	10

1/Discharge measurement made when sample collected.

2/Discharge: 0. Zero flow caused by rising tide.

3/Large proportion of organic matter present; sum of mineral constituents 37 ppm.

NEUSE RIVER BASIN

NEUSE RIVER NEAR GOLDSBORO, N. C.

LOCATION:--At bridge on U. S. Highway 117, 2½ miles upstream from Stoney Creek, 2 miles upstream from gaging station near Goldsboro, and 3½ miles southwest of Goldsboro, Wayne County, N. C.

DRAINAGE AREA:--2,370 square miles.

RECORDS AVAILABLE:--Chemical analyses: October 1948 to September 1949.

Water temperatures:--October 1948 to September 1949. Maximum, 65 parts per million Sept. 21-30; minimum, 43 parts per million Jan. 1-10.

EXTREMES 1948-49:--Dissolved solids: Maximum, 65 parts per million July 21-31; minimum, 11 parts per million Jan. 1-10.

Total hardness: Maximum, 21 parts per million July 21-31; minimum, 37°P Dec. 28.

Water temperatures: Maximum, 86°P June 29, July 28; minimum, 37°P Dec. 28.

REMARKS:--Discharge records for gaging station near Goldsboro for water year October 1948 to September 1949 given in Water-Supply Paper 1142.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered																Total	Non-carbonate
Oct. 1-10, 1948 ----	3,540	11	7.7	33	6.3	--	10	0.11	3.6	1.5	5.0	1.6	15	7.8	5.1	0.1	0.6	54	15	3
Oct. 11-20 -----	1,996	8.3	6.8	32	6.4	66.2	14	.28	3.6	1.4	6.6		15	7.9	5.6	.0	.4	62	15	2
Oct. 21-31 -----	2,814	6.7	5.7	22	6.8	75.3	13	.13	4.2	1.7	7.4		20	6.5	6.8	.1	.8	63	18	1
Nov. 1-10 -----	2,816	11	7.5	36	6.4	66.9	12	.06	4.0	1.6	7.8		22	6.5	5.9	.0	.5	64	17	0
Nov. 11-20 -----	3,432	12	8.4	33	6.2	63.2	11	.21	4.0	1.7	5.3		17	6.0	5.8	.0	.2	56	17	3
Nov. 21-30 -----	6,102	12	8.7	40	6.1	61.9	10	.16	3.5	1.4	6.2		16	6.0	6.0	.0	.1	55	14	1
Dec. 1-10 -----	11,240	12	10	45	6.0	43.9	8.2	.04	3.2	1.3	3.8		12	5.8	3.9	.0	.3	46	13	4
Dec. 11-20 -----	9,252	11	7.8	37	6.6	47.1	10	.07	3.7	1.5	7.4		22	4.8	5.9	.0	.2	49	13	0
Dec. 21-31 -----	6,883	11	6.2	27	6.2	49.8	8	.04	3.6	1.2	5.1		12	5.3	5.2	.0	.4	43	12	3
Jan. 1-10, 1949 ----	7,134	8.5	6.1	29	6.2	46.8	8.5	.04	3.9	1.0	3.6	.8	13	5.3	4.5	.0	.5	43	11	1
Jan. 11-20 -----	4,271	7.0	4.8	23	6.5	54.2	10	.03	3.9	1.1	3.0		13	5.1	5.0	.1	.6	46	16	5
Jan. 21-31 -----	2,741	7.8	7.8	22	6.6	59.6	11	.03	3.9	1.3	5.6		16	5.1	5.8	.1	.6	49	13	2
Feb. 1-10 -----	3,431	7.4	5.8	23	6.8	57.0	11	.03	3.6	1.3	6.0		17	5.2	5.2	.1	.6	48	14	0
Feb. 11-20 -----	4,238	7.4	5.3	22	6.6	55.1	10	.05	3.2	1.2	5.2		17	4.6	4.9	.1	.6	48	13	0
Feb. 21-28 -----	5,616	10	7.4	26	6.1	53.1	7.6	.07	3.3	1.2	5.2		15	5.1	4.6	.0	.5	45	13	1
Mar. 1-10 -----	3,621	9.2	6.2	22	6.2	53.7	7.3	.06	3.2	1.2	5.5		15	4.4	5.4	.0	.5	44	13	1
Mar. 11-20 -----	2,546	6.6	4.1	17	6.4	57.4	11	.04	3.2	1.4	6.8		19	4.2	5.6	.0	.8	47	14	0
Mar. 21-31 -----	2,739	8.6	6.4	17	6.4	60.6	11	.05	3.6	1.4	6.5		19	4.2	5.8	.1	.7	48	15	0
Apr. 1-10 -----	2,655	11	6.4	21	6.5	60.5	11	.07	3.8	1.4	6.2	.8	21	4.0	5.8	.1	.7	51	15	0
Apr. 11-20 -----	2,008	8.6	5.2	17	6.5	64.1	12	.07	4.2	1.6	6.4		22	3.9	5.8	.1	.7	52	17	0
Apr. 21-30 -----	1,830	7.8	5.2	17	6.6	76.7	13	.06	4.6	1.6	5.8		23	3.8	5.4	.0	.5	54	18	0
May 1-10 -----	3,698	11	7.5	32	6.4	57.3	8.4	.05	3.5	1.3	5.0		16	4.2	5.1	.0	.4	50	14	1
May 11-20 -----	7,468	12	9.3	45	6.2	46.2	8.3	.05	2.8	1.1	4.2		13	4.4	3.6	.0	.4	46	12	1
May 21-31 -----	1,611	8.7	5.7	27	6.5	67.6	13	.05	3.7	1.3	5.8		17	3.9	5.8	.0	1.2	54	15	1

NEUSE RIVER BASIN--Continued

NEUSE RIVER NEAR GOLDSBORO, N. C.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered																Total	Non-carbonate
June 1-10, 1949	1,407	8.3	5.9	25	6.5	61.1	12	0.05	3.4	1.2	6.9		19	3.7	5.8	0.0	0.9	53	13	0
June 11-20	1,083	8.5	6.1	25	6.5	77.4	12	.05	3.8	1.7	8.9		25	4.5	6.9	.1	.9	61	16	0
June 21-30	929	6.4	4.5	18	6.6	74.6	13	.04	4.0	1.8	8.2		24	4.2	6.8	.1	1.6	58	17	0
July 1-10	3,560	11	7.6	32	6.3	51.2	9.3	.05	3.4	1.3	3.5	.9	15	4.9	4.4	.0	.8	49	14	2
July 11-20	2,838	11	8.2	17	6.3	59.6	13	.25	4.9	1.4	5.2		18	5.4	5.1	.2	1.4	56	18	3
July 21-31	2,450	12	6.5	26	6.4	64.8	13	.02	4.7	2.2	3.6		19	4.4	5.2	.1	1.1	50	21	5
Aug. 1-10	1,910	10	6.0	23	6.4	65.2	13	.05	4.2	1.4	7.3		21	5.4	6.1	.1	.7	56	16	0
Aug. 11-20	1,339	7.6	4.9	18	6.6	71.9	13	.02	3.4	1.9	7.6		22	4.6	6.2	.1	1.2	38	16	0
Aug. 21-31	4,793	12	8.3	45	6.3	50.2	6	.02	4.2	1.9	2.8		15	4.6	4.5	.1	.5	40	16	6
Sept. 1-10	10,180	13	18.4	47	5.9	41.6	17.5	.02	2.9	1.2	3.3		12	4.1	3.5	.1	.8	53	12	2
Sept. 11-20	3,692	13	8.4	37	6.1	53.2	11	.04	3.3	1.6	5.7		25	4.7	6.1	.1	.8	63	15	0
Sept. 21-30	2,018	9.6	6.6	31	6.7	70.1	20	.06	4.6	1.9	6.0	1.6	25	4.7	6.1	.1	.8	63	15	0
Average	3,874	9.8	6.8	28	--	60.5	11	0.07	3.7	1.5	5.8		18	5.0	5.4	0.1	0.7	52	15	1

NEUSE RIVER BASIN

187

Temperature (° F) of water, water year October 1948 to September 1949

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	69	59	50	44	46	46	65	61	68	70	81	74
2	69	59	49	42	44	45	63	64	70	73	80	73
3	68	59	50	42	43	44	63	64	67	73	80	73
4	66	62	51	43	43	44	57	60	68	73	77	73
5	65	66	55	44	54	50	57	60	69	73	77	73
6	62	69	53	47	44	49	58	68	71	78	78	73
7	60	64	50	46	46	50	58	66	74	79	77	74
8	60	62	54	47	47	49	58	69	74	80	79	74
9	59	62	51	47	51	49	57	69	73	77	80	72
10	59	62	50	47	52	49	56	69	73	78	80	71
11	62	60	48	48	48	49	59	67	74	78	81	68
12	62	54	48	49	44	48	59	64	74	77	--	69
13	61	57	52	48	49	48	61	63	74	79	84	69
14	61	54	53	48	50	47	61	62	75	78	83	70
15	59	54	51	46	52	47	64	63	75	78	83	72
16	59	54	55	47	55	46	64	63	74	78	82	73
17	59	56	54	49	55	47	63	64	74	77	79	74
18	56	54	51	50	53	52	60	65	76	77	78	74
19	56	52	50	54	54	48	61	67	77	78	77	76
20	57	54	46	51	54	49	60	70	78	76	74	74
21	54	56	45	50	55	49	62	71	79	77	74	72
22	54	54	45	49	54	52	64	70	80	77	72	71
23	54	56	45	50	54	54	64	76	81	78	72	70
24	56	54	45	49	53	57	64	72	81	78	72	68
25	56	54	40	50	54	58	63	74	82	81	73	66
26	54	54	39	54	53	63	63	72	81	83	74	66
27	56	55	38	54	51	64	64	68	84	84	75	67
28	54	54	37	55	50	65	66	68	82	80	75	68
29	55	53	40	55	--	63	62	67	86	84	77	68
30	54	52	43	52	--	64	61	68	80	85	75	65
31	56	--	43	47	--	64	--	68	--	83	74	--
Average	59	57	48	49	50	52	61	67	76	79	77	71

NEUSE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN NEUSE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃ Total
ENO RIVER NEAR BRAGTOWN																	
Oct. 20, 1948	-----	12	6.9	169	14	0.03	5.8	2.4	10	30	8.5	9.6	0.0	0.1	0.1	70	24 0
NEUSE RIVER NEAR NORTHSIDE																	
Oct. 20, 1948	-----	151	22	6.2	101	0.11	6.5	2.3	9.7	30	7.4	7.9	0.1	3.8	73	26	1
June 7, 1949	178	7	6.5	90.7	12	.01	6.0	2.4	7.2	30	5.1	6.0	.1	2.2	63	25	0
NEUSE RIVER NEAR CLAYTON																	
Feb. 2, 1949	-----	3,010	8	7.0	73.5	0.01	5.8	2.1	5.2	26	4.8	5.4	0.1	0.4	60	23	2
Aug. 1	939	9	6.6	37.4	15	.23	5.1	1.9	8.4	24	5.2	8.1	.1	2.6	70	20	1
Sept. 28	462	10	6.5	87.8	18	.09	5.4	2.2	8.4	31	4.1	6.5	.1	2.2	66	22	0
NEUSE RIVER NEAR GOLDSBORO																	
Aug. 17, 1949	-----	815	17	6.3	71.1	0.07	5.4	1.7	5.8	22	4.0	6.8	0.2	1.0	58	20	2
NEUSE RIVER AT KINSTON																	
Oct. 21, 1948	-----	1,050	37	6.5	12	0.09	4.2	1.7	4.9	14	7.9	5.8	0.1	0.1	56	18	6
NEUSE RIVER NEAR FORT BARNWELL																	
Oct. 21, 1948	-----	45	6.5	73.3	13	0.51	5.2	1.4	6.1	14	10	6.5	0.1	0.8	61	19	7
FLAT RIVER AT BAHAMA																	
Dec. 29, 1948	-----	131	7	6.8	54.8	0.01	4.2	1.6	4.2	19	4.6	3.8	0.1	0.3	47	17	2
SWIFT CREEK NEAR MCCOLLERS																	
May 21, 1949	-----	1/20.8	12	6.5	62.3	0.04	3.9	1.7	6.3	26	1.9	3.5	0.1	0.3	51	17	0

1/Discharge measurement made when sample collected.

SWIFT CREEK NEAR SMITHFIELD

Oct. 20, 1948 -----		32	6.5	61.6	18	0.38	4.1	1.5	6.1	22	4.6	4.5	0.1	0.3	59	16	0
---------------------	--	----	-----	------	----	------	-----	-----	-----	----	-----	-----	-----	-----	----	----	---

MIDDLE CREEK NEAR SMITHFIELD

Oct. 20, 1948 -----		50	6.6		13	0.58	3.9	1.6	3.7	16	4.8	4.2	0.1	0.3	50	16	3
---------------------	--	----	-----	--	----	------	-----	-----	-----	----	-----	-----	-----	-----	----	----	---

BLACK CREEK NEAR FOUR OAKS

Oct. 20, 1948 -----		65	6.1	43.4	8.6	0.72	2.3	0.9	4.5	6	4.4	6.5	0.0	0.3	47	9	4
---------------------	--	----	-----	------	-----	------	-----	-----	-----	---	-----	-----	-----	-----	----	---	---

LITTLE RIVER NEAR GOLDSBORO

Oct. 21, 1948 -----		65	6.5		13	0.17	2.6	1.1	5.1	11	5.7	4.8	0.1	0.1	56	11	2
---------------------	--	----	-----	--	----	------	-----	-----	-----	----	-----	-----	-----	-----	----	----	---

CONTENTNEA CREEK NEAR WILSON

June 8, 1949 -----	33	17	6.3	49.6	7.9	0.17	2.9	1.3	4.9	17	2.2	4.2	0.1	0.9	44	13	0
--------------------	----	----	-----	------	-----	------	-----	-----	-----	----	-----	-----	-----	-----	----	----	---

CONTENTNEA CREEK AT HOOKERTON

Feb. 15, 1949 -----	1,150	17	5.8	52.3	7.4	0.02	3.0	1.0	6.8	14	5.1	6.4	0.0	0.7	44	12	0
---------------------	-------	----	-----	------	-----	------	-----	-----	-----	----	-----	-----	-----	-----	----	----	---

CONTENTNEA CREEK AT GRIFTON

Oct. 21, 1948 -----		45	6.2		11	0.49	5.5	1.4	5.0	9	12	6.5	0.2	0.9	64	19	12
---------------------	--	----	-----	--	----	------	-----	-----	-----	---	----	-----	-----	-----	----	----	----

SWIFT CREEK NEAR VANCEBORO

June 24, 1949 -----	1/38.0	60	6.4	79.1	9.3	0.24	8.2	3.0	2.4	29	4.7	6.4	0.1	0.2	69	33	9
---------------------	--------	----	-----	------	-----	------	-----	-----	-----	----	-----	-----	-----	-----	----	----	---

TRENT RIVER NEAR TRENTON

June 24, 1949 -----	1/171	80	6.6	91.2	6.2	0.13	13	1.2	2.8	37	5.1	5.0	0.1	0.8	73	37	7
---------------------	-------	----	-----	------	-----	------	----	-----	-----	----	-----	-----	-----	-----	----	----	---

TRENT RIVER NEAR POLLOCKSVILLE

Oct. 22, 1948 -----		60	6.8		7.9	0.05	24	1.3	3.0	60	14	5.5	0.1	0.1	108	65	16
---------------------	--	----	-----	--	-----	------	----	-----	-----	----	----	-----	-----	-----	-----	----	----

1/Discharge measurement made when sample collected.

CAPE FEAR RIVER BASIN
CAPE FEAR RIVER AT FAYETTEVILLE, N. C.

LOCATION.--At bridge on State Highway 24 at Fayetteville, Cumberland County.
DRAINAGE AREA.--4,290 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.
REMARKS.--Estimated discharge based on records at Fayetteville, at gaging station at Lock 3 near Tarheel, and at nearby streams. Discharge records for gaging station near Tarheel, for water year October 1948 to September 1949 given in Water-Supply Paper 1142.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered																Total	Non-carbonate
Oct. 15, 1948-----	1,700			25	6.2	59.8	10	0.40	2.8	1.3	5.4	1.0	11	6.5	5.8	0.0	0.5	52	12	3
Dec. 15-----	4,000			32	6.7	82.6	11	.06	4.0	1.4		5.2	18	5.2	4.8	.0	.3	50	16	1
Jan. 15, 1949-----	4,400			9	6.7	48.8	9.9	.02	3.0	1.0	5.0	.7	15	4.7	4.9	.1	.6	39	12	0
Feb. 15-----	5,000			22	6.4	58.3	9.8	.04	3.4	1.6		5.6	18	5.7	4.1	.2	.4	50	15	0
Mar. 15-----	3,100			10	6.8	65.7	9.9	.02	4.4	2.4	10		21	6.5	13	.2	.4	63	21	4
Apr. 15-----	8,700			15	6.6	62.7	12	.03	4.3	1.6	5.4	.8	23	4.3	4.8	.2	.4	49	18	0
May 15-----	7,700			27	6.0	47.3	7.8	.05	2.6	1.1	4.6		14	4.0	3.5	.1	.4	40	11	0
June 15-----	1,100			16	6.5	80.6	3.5	.01	3.5	1.6	8.3		23	4.3	6.2	.3	.7	48	15	0
July 15-----	2,900			8	6.3	70.9	12	.05	4.0	1.6	5.7	.8	22	5.5		.0	1.3	56	17	6
Aug. 15-----	4,480			12	6.4	66.8	9.4	.40	4.2	1.8		8.0	21	6.0	7.0	.1	1.1	52	17	6
Sept. 29-----	13,000			18	6.3	72.8	13	.25	3.6	1.7	7.5	1.4	23	5.4	6.2	.1	.7	55	16	0

CAPE FEAR RIVER BASIN--Continued

ROCKFISH CREEK NEAR HOPE MILLS, N. C.

LOCATION.--About 1,500 feet upstream from gaging station which is at bridge on U. S. Highway 301, at mouth of Little Rockfish Creek, 1½ miles east of town of Hope Mills, Cumberland County, and 5½ miles upstream from mouth.

DRAINAGE AREA.--191 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

REMARKS.--Estimated discharge based on measurements made at gaging station. Discharge records for gaging station near Hope Mills, for water year October 1948 to September 1949 given in Water Supply Paper 1142.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 15, 1948	220	45	5.1	--	4.7	0.10	1.6	0.7	1.8	0.5	6	2.1	2.6	0.0	0.3	28	7	2
Nov. 15	360	10	5.6	42.9	4.7	.05	1.8	.9	1.2		9	1.8	2.8	.0	.1	1/27	8	3
Dec. 15	380	26	5.2	19.6	4.5	.05	1.2	.5	3.3		7	2.3	2.8	.0	.2	24	5	0
Jan. 15, 1949	220	26	5.5	19.2	3.7	.04	1.4	1.4		.3	6	2.1	2.6	.0	.3	21	6	1
Feb. 15	380	22	5.4	18.4	3.6	.03	2.0	.8	2.0		4	1.9	2.6	.0	.4	20	8	5
Mar. 15	360	23	5.4	17.9	3.5	.03	1.4	.5	2.0		4	2.5	2.6	.0	.4	19	6	2
Apr. 15	360	22	5.6	16.5	4.1	.04	1.6		52.1	.2	6	1.4	2.6	.1	.2	21	6	1
May 15	190	45	5.2	19.8	3.7	.08	1.2	.5	2.7		6	2.3	2.3	.0	.2	1/26	5	0
June 15	200	16	5.4	17.8	3.9	.01	2.0	.8	.4		4	1.9	2.2	.2	.3	23	8	5
July 15	160	17	5.2	18.9	5.3	.01	1.6		52.4	.1	9	2.0	3.0	.1	.3	24	6	0
Aug. 15	220	26	5.1	18.3	4.6	.02	1.5	.6	1.4		4	1.5	2.8	.1	.3	2/26	6	3
Sept. 15	380	45	5.6	18.7	5.2	.21	1.5		72.0	.6	6	1.9	2.8	.2	.2	28	7	2

1/Large proportion of organic matter present; sum of mineral constituents 16 ppm.

2/Large proportion of organic matter present; sum of mineral constituents 15 ppm.

CAPE FEAR RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN CAPE FEAR RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dis-solved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
HAW RIVER NEAR BENAJA																		
Apr. 20, 1949 -----	139	4	6.4	62.1	16	0.20	5.0	1.9	5.7		32	2.3	2.5	0.1	0.4	52	20	0
HAW RIVER AT HAW RIVER																		
Apr. 20, 1949 -----	378	4	6.6	100	17	0.01	5.6	0.3	15		34	7.2	5.8	1.0	2.0	72	16	0
HAW RIVER NEAR PITTSBORO																		
Apr. 20, 1949 -----	928	6	6.8	78.9	14	0.02	5.6	0.4	10		30	6.0	3.9	0.3	0.6	57	16	0
CAPE FEAR RIVER AT LILLINGTON																		
June 9, 1949 -----	897	8	7.1	104	7.1	0.01	5.8	2.3	12		39	6.4	7.0	0.4	0.5	66	24	0
ALAMANCE CREEK NEAR GRAHAM																		
Apr. 20, 1949 -----	--	5	6.8	78.6	15	0.01	5.8	0.3	11		36	4.6	3.9	0.0	0.5	59	16	0
LITTLE COHARIE CREEK AT ROSEBORO																		
June 22, 1949 1/ -----	2/51.3	80	5.1	35.6	6.9	0.18	2.0	0.5	3.6		3	3.3	5.9	0.1	0.6	48	7	5

1/Large proportion of organic matter present; sum of mineral constituents 25 ppm.

2/Discharge measurement made when sample collected.

WACCAMAW RIVER BASIN
MISCELLANEOUS ANALYSES OF STREAMS IN WACCAMAW RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
WACCAMAW RIVER AT FREELAND																		
June 9, 1949-----	199	120	5.3	42.3	5.1	0.29	2.8	0.8	3.1		5	3.4	6.4	0.0	0.3	62	10	6

PEE DEE RIVER BASIN

PEE DEE RIVER AT PEDEE, S. C.

LOCATION --At gaging station at new bridge on U. S. Highway 76, at Peedee, Marion County, 0.2 mile downstream from Atlantic Coast Line Railroad bridge, and 8 1/2 miles downstream from Black Creek.

DRAINAGE AREA --8,870 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1948 to September 1949.

REMARKS --Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1142.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered																Total	Non-carbonate
Oct. 15, 1948 -----	5,820	7.1	5.3	25	6.6	--	9.4	0.05	2.9	1.4	4.8		18	4.2	4.6	0.1	0.4	43	13	0
Nov. 20 -----	9,190	6.2	4.8	11	6.6	57.2	10	.08	3.6	1.5	7.1	0.7	23	4.6	4.5	.0	.6	45	15	0
Dec. 18 -----	11,600	8.0	6.7	20	6.6	52.9	9.9	.09	3.1	1.4	6.0		18	4.9	4.4	.0	.5	45	14	0
Jan. 15, 1949 -----	21,100	5.4	4.2	11	6.6	46.9	9.6	.03	3.1	1.3	5.0	.8	18	4.9	4.6	.0	.5	38	13	0
Feb. 16 -----	15,000	6.4	5.2	16	6.3	49.5	8.7	.04	3.1	1.4	5.7		18	4.4	4.1	.1	.5	40	13	0
Mar. 17 -----	10,100	3.6	3.4	7	6.9	55.3	9.3	.03	4.2	1.7	4.9		22	3.8	3.9	.1	.6	42	18	0
Apr. 17 -----	14,700	4.2	3.5	7	6.8	58.7	11	.02	3.9	1.7	5.2	.6	24	4.0	3.6	.1	.5	45	17	0
May 15 -----	23,400	5.1	3.6	5	6.4	53.5	11	.06	4.0	1.6	4.3		20	4.1	3.2	.1	.8	43	17	0
June 19 -----	7,410	5.7	3.2	7	6.5	51.7	9.6	.06	3.6	1.5	4.3		19	3.5	3.2	.0	.9	39	15	0
July 17 -----	12,100	5.1	1.9	2	6.6	53.1	11	.02	3.8	1.4	4.2	.6	20	3.9	3.5	.0	.4	41	15	0
Aug. 20 -----	13,200	3.4	3.0	6	6.6	54.4	10	.14	3.6	1.5	4.2		21	4.2	3.1	.1	.5	39	15	0
Sept. 18 -----	8,660	5.6	3.6	11	6.4	48.4	11	.13	3.5	1.5	4.2	1.5	20	3.7	4.3	.0	.4	41	15	0

PEE DEE RIVER BASIN--Continued
 MISCELLANEOUS ANALYSES OF STREAMS IN PEE DEE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
YADKIN RIVER AT YADKIN COLLEGE																		
Nov. 30, 1948 -----	15,500	13	6.2	83.4	7.9	0.05	3.2	1.4	1.5		10	5.1	2.2	0.1	0.2	34	14	6
Apr. 28, 1949 -----	3,150	2	6.3	51.0	11	.01	4.1	1.4	3.8		19	4.2	2.5	.1	.7	42	16	0
ELK CREEK AT ELKVILLE																		
Aug. 26, 1949 -----	1/138	7	6.8	28.4	10	0.02	2.6	0.8	2.6		14	1.7	1.2	0.1	0.4	28	10	0
MIDDLE FORK REDDIES RIVER AT WILBAR																		
May 31, 1949 -----	1/32.4	3	6.5	21.6	8.6	0.02	1.7	0.7	2.0		9	2.1	1.0	0.1	0.3	26	7	0
ROCKY RIVER NEAR CONCORD																		
Aug. 12, 1949 -----	1/79.0	65	6.9	157	25	0.07	12	6.6	54		142	11	32	0.2	0.1	220	57	0
LITTLE RIVER NEAR STAR																		
Aug. 11, 1949 -----	1/18.2	7	6.5	56.2	18	0.05	3.9	1.4	6.0		27	2.1	2.8	0.1	0.2	49	16	0
LUMBER RIVER AT BOARDMAN																		
Jan. 5, 1949 -----	3420	75	5.3	33.4	5.8	0.07	1.8	0.6	3.7		5	3.2	5.0	0.1	0.3	32	7	3

1/Discharge measurement made when sample collected.

1/Discharge measurement made when sample collected.

PEE DEE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN PEE DEE RIVER BASIN IN SOUTH CAROLINA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
CEDAR CREEK AT SOCIETY HILL																		
May 31, 1949-----	1/58.6	18	5.6	16.1	3.7	0.03	0.3	0.1	4.6		5	2.6	2.9	0.0	0.3	19	1	0
LITTLE PEE DEE RIVER NEAR DILLON																		
Feb. 24, 1949-----	1,450	100	5.9	36.2	1.7	0.28	1.8	0.9	3.9		7	2.5	5.6	0.1	0.3	2/39	8	2

1/Discharge measurement made when sample collected.

2/Large proportion of organic matter; sum of mineral constituents 20 ppm.

SANTÉE RIVER BASIN

CONGAREE RIVER AT COLUMBIA, S. C.

LOCATION --At Columbia, Richland County, 1,000 feet downstream from Gervais Street bridge, and 1.4 miles downstream from confluence of Broad and Saluda Rivers.
DRAINAGE AREA --7,850 square miles.
RECORDS AVAILABLE --Chemical analyses: October 1948 to September 1949.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge 1/ (second-foot)	Oxygen consumed		pH	Color	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered																Total	Non-carbonate
Oct. 14, 1948	7,710	3.7	3.7	6.6	6	--	10	0.38	3.5	1.6	4.6	0.9	23	3.8	3.5	0.1	0.3	50	15	0
Nov. 15	5,120	3.4	3.4	6.8	8	82.4	10	.04	3.2	1.4	7.9	7.9	26	3.8	3.6	.1	.4	47	14	0
Dec. 16	14,500	4.6	3.3	6.2	8	58.2	8.8	.02	3.1	1.4	7.7	7.7	24	4.3	3.6	.1	.9	43	14	0
Jan. 14, 1949	12,700	4.3	3.2	7.0	8	57.7	8.6	.04	3.4	2.1	5.4	1.0	22	4.2	3.6	.1	.5	45	17	0
Feb. 15	14,100	3.6	2.9	7.0	5	55.1	8.2	.06	3.2	1.4	6.5	6.5	22	4.2	3.2	.2	.5	42	14	0
Mar. 15	12,400	3.8	3.6	7.0	5	55.5	8.0	.06	3.4	1.4	6.0	6.0	22	4.1	3.2	.1	.4	43	14	0
Apr. 20	11,700	3.9	3.0	6.8	6	55.4	9.4	.02	3.2	1.3	5.6	.8	20	4.0	3.5	.1	.7	41	13	0
May 16	10,500	3.8	2.6	6.7	4	56.3	11	.12	3.3	1.6	5.8	5.8	22	3.9	3.2	.1	.6	46	15	0
June 23	5,970	3.1	1.8	6.6	3	50.9	13	.05	3.4	1.4	5.2	5.2	21	3.2	2.8	.1	.9	42	14	0
July 15	11,500	6.0	2.2	6.5	3	49.9	12	.02	3.5	1.3	2.6	1.0	17	4.0	2.9	.0	.7	42	14	0
Aug. 15	5,310	3.1	2.6	7.5	4	57.0	11	.47	3.6	1.5	7.5	7.5	24	4.8	4.5	.1	.4	46	15	0
Sept. 14	12,900	2.8	2.3	6.7	18	59.7	12	.27	3.7	1.7	5.0	1.6	25	5.0	3.9	.0	.3	46	16	0

1/ Provisional discharge records.

SANTÉE RIVER BASIN--Continued
GREEN RIVER NEAR MILL SPRING, N. C.

LOCATION.--At gaging station at abandoned Ford, 1½ miles northeast of Pea Ridge Church, 2 miles downstream from Walnut Creek, and 5½ miles northeast of Mill Spring, Polk County.
DRAINAGE AREA.--174 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge / (second-foot)	Oxygen consumed		pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered															Total	Non-carbonate
Oct. 15, 1948	284			6.8	--	12	0.03	2.0	0.9	2.8	0.8	16	1.6	1.2	0.1	0.2	29	9	0
Nov. 15	410			4.6	56.4	10	.03	2.5	1.1	2.0		13	2.2	1.5	.0	.2	29	11	0
Dec. 15	485			6.6	26.0	11	.02	1.9	.7	4.2		15	2.0	1.5	.0	.3	29	8	0
Jan. 15, 1949	730			6.6	25.8	9.4	.01	1.8	.7	2.5	.4	12	1.8	1.5	.0	.3	24	7	0
Feb. 15	727			6.7	25.9	9.5	.02	1.8	.9	3.5		13	2.1	1.8	.1	.2	26	8	0
Mar. 15	462			6.8	26.3	12	.02	2.2	.7	1.4		10	1.7	1.6	.1	.5	27	10	2
Apr. 15	912			6.4	24.9	10	.01	2.0	.7	2.5	.4	13	1.7	1.4	.1	.3	26	8	0
May 15	227			6.4	28.2	10	.05	1.9	.7	2.9		12	1.6	1.4	.0	.5	26	8	0
June 15	478			6.4	31.2	10	.01	2.0	.9	3.0		12	1.4	2.2	.1	.6	29	9	0
July 15	1,150			6.1	31.7	12	.02	2.4	.8	4.4		15	1.9	2.6	.1	.5	32	9	0
Aug. 15	294			6.5	29.0	12	.01	2.6	1.0	2.5		13	2.3	1.9	.0	.4	29	11	0
Sept. 15	456			6.4	27.0	12	.04	2.2	.9	2.3	.8	14	2.7	1.5	.0	.2	30	9	0

1/Provisional discharge records.

SANTEE RIVER BASIN--Continued

SECOND BROAD RIVER AT CLIFFSIDE, N. C.

LOCATION.--At dam of Cliffside Mills, about a quarter of a mile upstream from gaging station at Cliffside, Rutherford County. DRAINAGE AREA.--211 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

Water temperatures: October 1948 to September 1949.

EXTREMES, 1948-49.--Dissolved solids: Maximum, 55 parts per million Oct. 21-31; minimum, 36 parts per million Nov. 21-30.

Total hardness: Maximum, 18 parts per million July 21-31; minimum, 12 parts per million Nov. 21-30, Jan. 1-10, July 11-20, Aug. 1-10.

Water temperatures: Maximum, 80° F June 26-29, July 28; minimum, 38° F Dec. 27.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1142.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Hardness as CaCO ₃	
		Unfiltered	Filtered															Total	Non-carbonate
Oct. 1-10, 1948-----	150	2.6	1.8	3	6.8	--	14	0.05	3.6	1.6	5.9	1.3	25	3.1	4.6	0.0	0.5	48	0
Oct. 11-20-----	145	2.0	1.8	2	7.0	66.5	16	.04	3.9	1.7	8.1		26	3.4	6.2	.1	.3	54	0
Oct. 21-31-----	129	2.2	1.4	3	7.0	69.8	17	.02	3.4	1.7	8.4		26	3.6	6.2	.1	.2	55	0
Nov. 1-10-----	296	3.6	2.4	4	6.9	57.6	12	.01	3.4	1.7	6.8		24	3.0	4.5	.0	.4	44	0
Nov. 11-20-----	240	2.5	2.1	3	6.8	61.5	13	.01	3.9	1.7	6.6		26	2.8	4.6	.0	.4	46	0
Nov. 21-30-----	1,075	5.9	2.0	5	6.6	46.1	10	.02	2.8	1.3	5.3		19	3.6	2.9	.0	.5	36	0
Dec. 1-10-----	509	2.6	1.7	4	6.7	49.5	11	.02	3.1	1.4	5.3		20	3.4	3.2	.1	.5	39	0
Dec. 11-20-----	249	2.2	1.4	5	6.8	55.4	14	.01	3.4	1.5	5.7		23	2.8	3.5	.0	.4	43	0
Dec. 21-31-----	461	2.8	1.8	6	6.8	50.0	12	.01	3.2	1.3	5.4		21	3.8	2.6	.0	.4	39	0
Jan. 1-10, 1949-----	488	2.8	2.4	4	6.8	47.2	11	.03	3.1	1.1	3.9	.8	18	3.3	3.1	.1	.7	37	0
Jan. 11-20-----	287	1.6	1.4	7	7.0	52.9	13	.02	4.3	1.5	5.2		24	3.4	3.2	.1	.3	44	0
Jan. 21-31-----	247	1.8	1.6	8	7.1	56.2	13	.02	4.4	1.5	5.4		23	3.6	4.0	.1	.4	46	0
Feb. 1-10-----	383	2.0	1.2	3	6.8	48.7	13	.01	3.5	1.8	4.6		22	2.8	3.4	.0	.5	40	0
Feb. 11-19-----	481	2.4	1.5	3	6.8	51.4	13	.01	3.4	1.4	5.2		20	3.3	3.9	.0	.4	42	0
Feb. 20-28-----	550	3.4	1.8	3	6.7	50.7	9.6	.01	3.4	1.3	5.7		21	3.4	3.5	.0	.7	40	0
Mar. 1-10-----	281	2.0	1.9	2	7.0	56.0	12	.02	3.6	1.5	6.5		23	3.1	4.5	.1	.8	44	0
Mar. 11-20-----	252	1.4	1.4	4	6.9	54.1	14	.01	3.6	1.5	5.7		23	2.5	3.8	.1	.5	43	0
Mar. 21-31-----	478	2.8	1.5	3	6.8	46.7	12	.01	3.1	1.3	4.0		18	2.8	2.5	.1	.5	38	0
Apr. 1-10-----	410	3.0	1.8	3	7.0	51.3	13	.03	3.7	1.4	4.9	.6	22	2.8	3.4	.0	.6	40	0
Apr. 11-20-----	512	3.1	1.3	2	6.8	47.3	12	.01	3.4	1.5	4.0		19	3.5	2.6	.0	.6	40	0
Apr. 21-30-----	314	2.4	1.3	3	6.8	60.2	15	.02	3.4	1.5	6.2		23	2.9	4.1	.0	.7	44	0
May 1-10-----	555	4.6	1.6	3	6.7	49.4	14	.03	3.6	1.4	3.8		19	3.1	2.5	.0	.8	39	0
May 11-20-----	317	--	1.6	2	6.6	57.1	14	.02	3.6	1.3	5.7		22	2.8	3.5	.0	.9	44	0
May 21-31-----	236	3.4	1.8	2	6.7	54.7	16	.02	3.4	1.4	6.0		23	2.6	3.4	.1	.8	45	0

SANTÉE RIVER BASIN--Continued
SECOND BROAD RIVER AT CLIFFSIDE, N. C.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-foot)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Undisturbed	Filtrated																Total	Non-carbonate
June 1-10, 1949	196	3.4	1.5	3	6.5	55.9	15	0.02	3.8	1.6	5.6		22	2.8	3.9	0.1	2.0	47	16	0
June 11-20	414	5.2	1.6	3	6.6	51.1	14	.02	3.2	1.4	6.1		21	3.3	4.1	.1	.4	44	14	0
June 21-30	280	11	2.0	4	6.6	55.0	15	.02	3.7	1.6	5.0		24	2.4	2.8	.1	.5	44	16	0
July 1-10	200	3.4	1.7	3	7.0	55.5	15	.02	3.9	1.5	4.7	.5	25	2.5	3.6	.0	1.0	48	16	0
July 11-20	645	12	2.0	2	6.5	42.8	11	.04	3.0	1.1	4.5		17	3.3	2.9	.0	.4	37	12	0
July 21-31	335	2.8	2.3	3	6.7	56.8	16	.02	4.9	1.5	4.7		24	3.2	3.4	.1	.7	47	18	0
Aug. 1-10	238	3.6	3.0	3	6.8	60.9	16	.04	3.0	1.0	9.2		25	3.8	4.6	.0	.7	50	12	0
Aug. 11-20	172	6.8	2.0	3	6.7	60.1	14	.02	3.3	1.4	7.1		24	3.6	4.8	.1	.4	46	15	0
Aug. 21-31	1,221	7.2	6.9	3	6.6	46.4	11	.02	3.3	1.6	3.3		17	3.3	3.3	.1	.5	38	15	1
Sept. 1-10	399	2.6	1.9	2	6.7	54.8	15	.12	3.3	1.6	5.9		22	3.6	3.8	.1	.3	44	15	0
Sept. 11-20	240	2.9	1.4	3	6.8	54.4	15	.07	3.9	1.7	3.0		16	3.9	4.0	.1	.3	44	17	4
Sept. 21-30	218	2.0	1.5	3	6.8	61.2	16	.07	3.7	1.6	6.1	1.4	26	3.2	4.5	.0	.3	50	16	0
Average	378	3.6	1.9	3	--	54.1	14	0.03	3.6	1.5	5.6		22	3.2	3.7	0.0	0.6	44	15	0

Temperature (° F) of water, water year October 1948 to September 1949

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	64	55	48	43	42	49	60	56	67	77	77	71
2	66	57	47	41	40	46	58	61	68	75	77	69
3	66	60	49	41	42	47	55	64	68	75	77	60
4	65	61	50	41	44	47	53	65	67	75	77	71
5	61	61	50	48	48	50	58	66	66	76	76	72
6	61	62	51	50	48	50	58	67	74	79	78	72
7	60	60	50	47	50	54	58	65	75	78	78	73
8	62	57	48	46	48	50	57	70	74	79	76	73
9	63	56	50	48	52	58	58	70	78	78	70	73
10	62	57	48	45	53	52	58	68	72	78	70	72
11	60	53	45	53	51	50	60	64	69	75	78	68
12	61	51	45	55	45	49	59	63	70	75	78	68
13	61	55	47	55	46	50	59	62	73	74	77	66
14	60	51	51	--	48	48	57	63	73	74	77	66
15	60	51	55	47	57	48	58	65	73	75	78	70
16	59	50	58	48	59	49	60	70	72	74	78	70
17	60	51	58	50	54	50	55	70	70	73	74	70
18	59	52	55	52	52	50	55	71	70	73	74	73
19	57	56	50	55	50	49	59	72	73	73	74	73
20	53	55	41	54	51	49	57	72	73	72	75	72
21	53	55	45	48	56	51	59	71	75	76	73	70
22	52	53	45	47	55	52	61	73	75	76	71	66
23	51	54	48	49	54	56	62	73	78	77	65	66
24	53	53	50	53	53	57	64	72	78	77	71	65
25	53	53	48	55	52	58	61	71	79	77	71	62
26	54	53	40	59	52	60	62	70	80	79	71	63
27	52	41	38	60	53	62	63	66	80	79	72	65
28	54	53	39	60	52	64	64	65	80	80	72	62
29	55	49	42	56	--	64	62	65	80	79	71	65
30	55	50	44	48	--	62	57	66	79	72	63	62
31	54	--	45	42	--	62	--	67	--	79	71	--
Average	58	54	48	50	50	53	59	67	73	76	74	69

SANTÉE RIVER BASIN--Continued

FIRST BROAD RIVER NEAR LAWDALE, N. C.

LOCATION.--At bridge on county road about 1,700 feet upstream from gaging station near Lawndale, about 1,200 feet upstream from dam at Double Shoals, and 2½ miles southeast of Lawndale, Cleveland County.

DRAINAGE AREA.--198 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

Water temperatures: October 1948 to September 1949.

EXTREMES, 1948-49.--Dissolved solids: Maximum, 48 parts per million Nov. 1-10; minimum, 29 parts per million Jan. 1-10, Feb. 20-28.

Total hardness: Maximum, 18 parts per million Aug. 1-10; minimum, 9 parts per million Jan. 11-20, July 11-20.

Water temperatures: Maximum, 81°F June 29, July 7, 8, 28, 30, Aug. 14, 16; minimum, 33°F Jan. 2.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply paper 1142.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (cfs--feet)	Oxygen consumed		Color	pH	Specific conduct-- (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered																Total	Non-carbonate
Oct. 1-10, 1948	142	2.6	2.0	3	7.0	--	11	0.13	2.6	1.0	5.5	1.2	22	2.9	2.9	0.0	0.3	40	11	0
Oct. 11-20	131	2.3	1.6	3	7.0	54.6	13	.16	2.7	1.1	8.0	7.8	25	3.1	3.2	.1	.3	44	11	0
Oct. 21-31	127	2.4	1.8	4	7.1	57.1	14	.07	2.5	1.2	7.8	8.0	24	3.3	3.4	.0	.2	45	11	0
Nov. 1-10	283	3.6	2.4	6	6.9	49.4	10	--	2.4	1.1	6.3	6.3	20	3.5	2.8	.0	.3	48	10	0
Nov. 11-20	246	3.0	2.0	3	6.8	54.5	11	.03	2.6	1.2	8.0	8.0	25	3.1	3.5	.0	.3	42	11	0
Nov. 21-30	1,182	6.8	2.1	2	6.5	37.6	8.6	.02	2.5	1.1	4.3	4.3	15	3.7	2.2	.1	.7	33	11	0
Dec. 1-10	592	3.5	2.1	4	6.7	39.1	9.9	.01	2.7	1.2	5.1	5.1	17	3.4	3.4	.0	.7	37	12	0
Dec. 11-20	256	2.8	2.3	4	6.9	46.6	11	.01	2.8	1.1	5.2	5.2	19	3.0	3.1	.0	.3	39	12	0
Dec. 21-31	441	3.1	1.6	3	6.6	40.4	9.6	.02	2.6	1.0	5.2	5.2	18	2.8	2.4	.1	.8	35	11	0
Jan. 1-10, 1949	460	3.0	1.8	2	6.4	34.6	9.1	.01	2.4	.9	2.9	.5	14	2.9	2.0	.0	.4	29	10	0
Jan. 11-20	260	2.6	1.5	12	6.4	51.4	9.1	.01	2.3	.9	6.4	6.4	19	2.9	2.9	.1	.6	36	9	0
Jan. 21-31	242	1.7	1.3	4	7.3	44.1	9.4	.01	2.7	1.0	5.3	5.3	18	3.5	2.5	.1	.2	35	11	0
Feb. 1-10	332	2.0	1.1	2	7.0	36.7	9.7	.01	2.4	1.0	4.4	4.4	17	2.2	2.1	.0	.5	31	10	0
Feb. 11-19	409	2.3	1.8	3	6.6	35.9	7.9	.02	2.4	1.0	3.7	3.7	14	3.1	2.2	.0	.4	30	10	0
Feb. 20-28	550	2.6	1.5	4	6.7	34.1	9.1	.02	2.4	1.0	3.4	3.4	14	2.8	1.9	.0	.6	29	10	0
Mar. 1-10	286	2.1	1.5	2	6.8	43.1	8.6	.01	2.6	1.0	5.6	5.6	19	2.9	2.6	.0	.6	34	11	0
Mar. 11-20	252	1.6	1.2	3	7.0	44.0	12	.01	2.4	1.0	5.0	5.0	17	3.2	2.2	.1	.4	35	10	0
Mar. 21-31	384	2.4	1.4	3	7.0	39.2	10	.01	2.2	1.0	4.8	4.8	17	2.4	2.1	.1	.4	32	10	0
Apr. 1-10	342	3.2	1.7	2	6.8	37.8	10	.02	2.6	1.0	3.9	.6	17	2.4	2.2	.0	.5	32	11	0
Apr. 11-20	425	3.4	1.8	3	6.7	37.2	10	.02	3.0	1.1	3.9	3.9	17	2.9	2.4	.0	.5	32	12	0
Apr. 21-30	262	2.7	1.4	4	6.9	47.3	10	.01	2.7	1.0	5.0	5.0	20	2.9	2.4	.0	.3	34	11	0
May 1-10	471	6.0	1.5	3	6.7	35.6	8.2	.02	2.6	1.0	4.3	4.3	15	3.3	3.0	.1	.9	33	11	0
May 11-20	437	8.3	1.3	3	6.5	41.1	9.6	.02	2.6	1.0	4.2	4.2	13	3.3	2.2	.0	.7	34	10	0
May 21-31	297	2.6	2.3	3	6.5	38.9	12	.03	2.4	1.0	4.8	4.8	17	2.3	2.5	.1	.5	35	10	0

June 1-10 -----	255	3.6	2.0	3	6.8	44.8	12	.03	2.6	1.0	5.5	19	2.4	2.8	.1	.5	39	11	0
June 11-20 -----	330	6.4	1.8	5	6.4	40.6	10	.03	2.4	.9	4.7	16	2.8	2.0	.1	1.0	33	10	0
June 21-30 -----	235	3.2	1.6	4	6.7	46.0	12	.05	2.7	1.2	5.2	19	3.0	2.5	.1	.8	38	12	0
July 1-10 -----	214	3.7	2.1	4	7.1	43.2	13	.02	2.6	1.4	4.9	22	2.8	2.6	.0	.9	40	12	0
July 11-20 -----	894	13	2.0	2	6.3	35.6	9.1	.04	2.2	.9	3.9	13	3.3	2.1	.1	.5	33	9	0
July 21-31 -----	311	2.9	1.8	3	6.6	42.7	12	.03	3.0	1.0	4.4	18	2.6	2.1	.1	.6	36	12	0
Aug. 1-10 -----	279	3.3	3.0	4	6.9	46.6	12	.02	4.9	1.3	3.5	20	3.5	3.1	.1	.6	40	18	1
Aug. 11-20 -----	1,284	3.0	1.6	3	6.8	46.4	11	.02	3.1	1.4	4.9	21	2.8	2.4	.1	.4	37	14	0
Aug. 21-31 -----	1,338	3.8	2.4	4	6.7	37.8	9.4	.03	3.0	1.2	3.3	16	3.0	2.0	.1	.4	31	12	0
Sept. 1-10 -----	1,038	2.2	1.4	1	6.5	39.3	11	.07	2.3	1.0	4.6	16	3.1	2.1	.1	.5	34	10	0
Sept. 11-20 -----	218	2.2	2.3	2	6.8	46.0	13	.10	2.8	1.1	6.0	19	3.7	3.5	.0	.3	38	12	0
Sept. 21-30 -----	194	1.7	1.3	3	7.1	46.8	13	.04	2.4	1.4	7.1	24	3.8	4.1	.0	.3	46	12	0
Average -----	384	3.5	1.8	3	--	42.8	11	0.03	2.6	1.1	5.1	18	3.0	2.6	0.0	0.5	36	11	0

SANTÉE RIVER BASIN--Continued
FIRST BROAD RIVER NEAR LAWDALE, N. C.--Continued
Temperature (° F) of water, water year October 1948 to September 1949

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	66	54	47	35	40	42	61	60	67	75	74	70
2	68	57	47	32	42	43	55	62	69	75	75	69
3	66	60	47	31	42	45	54	62	69	76	75	69
4	66	58	50	40	43	46	52	63	67	76	77	71
5	59	59	50	42	48	47	55	65	68	79	74	72
6	59	55	51	45	46	50	50	66	73	78	78	72
7	60	56	49	45	47	52	54	65	75	81	77	70
8	62	55	49	45	48	49	57	67	75	81	78	71
9	62	55	50	47	52	49	57	66	74	77	78	69
10	59	56	47	49	53	53	56	68	71	77	79	65
11	60	54	43	50	55	49	56	58	72	75	79	65
12	60	49	47	53	49	48	57	60	74	74	80	66
13	60	51	48	49	51	47	58	61	73	74	79	67
14	58	52	46	46	54	45	59	64	74	76	81	68
15	57	48	54	48	55	46	61	65	72	75	79	72
16	56	49	58	49	57	45	58	67	72	74	81	73
17	59	51	58	50	53	46	54	68	74	73	74	74
18	58	53	47	53	50	50	53	67	75	73	74	74
19	55	55	45	55	51	48	55	68	74	71	77	75
20	54	54	45	52	52	49	56	70	73	73	74	71
21	50	52	42	46	54	50	58	70	75	74	67	70
22	51	52	43	45	55	53	62	70	75	76	63	66
23	49	53	46	50	53	55	63	71	76	79	65	66
24	48	53	46	51	53	57	60	71	79	79	70	64
25	50	51	42	55	51	59	58	69	79	80	73	63
26	50	47	38	57	51	62	59	68	79	80	75	61
27	50	50	37	57	50	65	61	66	79	80	70	60
28	53	51	35	59	48	62	63	64	80	81	70	62
29	54	50	39	55	--	56	59	66	81	80	70	65
30	53	49	43	53	--	59	55	67	79	81	71	63
31	52	--	39	40	--	63	--	66	--	77	70	--
Average	57	53	46	48	50	51	57	66	74	77	74	68

SANTÉE RIVER BASIN--Continued

NORTH TYGER RIVER NEAR MOORE, S. C.

LOCATION.--At gaging station at Ott Shoals, 2.0 miles upstream from Wards Creek, 2.6 miles southeast of Moore, Spartanburg County, and 5.3 miles upstream from confluence with South Tyger River.

DRAINAGE AREA.--162 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1142.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Oxygen consumed		Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered																Total	Non-carbonate
Oct. 15, 1948	93.0	7.9	4.3	33	9.8	--	16	0.12	1.3	0.3	86	2.8	1705	17	14	0.1	1.6	248	4	0
Nov. 15	164	6.0	3.3	16	6.8	168	14	.02	5.2	1.9	28		63	11	12	.0	.1	106	20	0
Dec. 15	223	4.4	2.9	16	7.0	151	12	.04	3.1	1.1	30		71	10	7.0	.0	.1	100	12	0
Jan. 15, 1949	248	5.0	3.1	16	7.0	161	16	.01	3.0	.9	27	2.2	61	14	8.8	.0	.1	102	11	0
Feb. 15	304	2.3	1.9	3	6.8	89.3	10	.06	2.2	.9	17		42	5.4	3.4	.1	1.0	62	9	0
Mar. 15	282	2.7	2.4	12	7.3	115	11	.03	1.8	.8	24		53	7.6	4.5	.1	1.2	77	8	0
Apr. 15	527	4.8	3.2	7	6.6	85.1	9.7	.04	2.4	.9	13	1.1	34	8.0	3.2	.1	.7	58	10	0
May 15	332	4.0	2.4	7	7.0	154	13	.06	3.3	1.3	29		66	11	7.6	.1	.0	100	14	0
June 15	210	5.1	3.0	13	7.5	147	14	.04	2.0	.9	30		65	8.8	7.4	.0	.1	96	9	0
July 15	259	9.1	4.0	7	7.0	127	12	.02	2.0	.8	22	2.2	53	10	7.2	.0	.1	88	8	0
Aug. 15	103	2.0	1.4	2	6.8	125	15	.02	6.8	2.3	17		60	5.0	5.9	.1	1.5	83	26	0
Sept. 15	208	4.2	2.4	17	7.1	165	13	.08	3.6	1.3	28	2.6	70	12	10	.0	.1	105	14	0

1/Includes equivalent of 64 parts of carbonate (CO₃).

SANTÉE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN SANTÉE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
CATAWBA RIVER NEAR MARION																		
May 7, 1949 -----	475	4	6.9	34.1	11	0.02	2.4	0.8	3.6		14	2.3	2.2	0.0	0.2	30	9	0
June 6 -----	291	3	6.8	28.0	11	.01	2.2	.8	2.9		13	2.6	1.0	.1	.1	28	9	0
CURTIS CREEK NEAR OLD FORT																		
Aug. 3, 1949 -----	1/68.2	7	7.1	18.5	7.9	0.02	1.5	0.5	2.7		8	2.9	1.0	0.2	0.2	20	6	0
NORTH FORK CATAWBA RIVER AT PITTS																		
June 6, 1949 -----	1/21.5	4	7.1	53.8	6.5	0.02	4.8	2.5	2.8		28	3.3	1.0	0.1	0.4	38	22	0
CROWDERS CREEK NEAR GASTONIA																		
Aug. 10, 1949 -----	1/47.8	6	6.5	76.5	20	0.19	6.1	2.0	6.7		33	4.1	4.2	0.2	0.4	63	23	0

1/Discharge measurement made when sample collected.

1/Discharge measurement made when sample collected.

SANTEE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN Santee River Basin in South Carolina

Chemical analyses, in parts per million, water year October 1948 to September 1949

Chemical analyses, in parts per million, water, year October 1930 to September 1950																		
Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag-nesium (Mg)	Sodium (Na)	Potas-sium (K)	Bicar-bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dis-solved solids	Hardness as CaCO ₃	
																	Total	Non-carbon-ate
BROAD RIVER NEAR GAFFNEY																		
Feb. 15, 1949 -----	2,910	7	6.6	35.3	11	0.01	2.4	1.2	3.3		16	2.0	1.9	0.0	0.2	32	11	0
BUFFALO CREEK NEAR BLACKSBURG																		
Feb. 15, 1949 -----	1/190	4	6.4	46.6	13	0.02	3.0	1.4	4.9		20	2.7	3.0	0.1	0.3	40	13	0
KINGS CREEK AT KINGS CREEK																		
May 16, 1949 -----	1/59.4	6	7.4	97.2	14	0.07	11	3.0	4.6		51	3.9	2.6	0.1	0.2	64	40	0
BULLOCK CREEK NEAR SHARON																		
Feb. 15, 1949 -----	1/75.5	6	6.8	76.8	19	0.03	5.9	2.3	6.3		34	4.9	3.2	0.1	0.2	62	24	0
NORTH PACOLET RIVER AT FINGERSVILLE																		
May 18, 1949 -----	198	7	6.9	51.5	14	0.03	2.3	0.9	7.5		23	3.8	1.6	0.1	0.6	42	9	0
PACOLET RIVER NEAR CLIFTON																		
Feb. 15, 1949 -----	627	4	6.8	36.8	11	0.02	2.4	1.1	3.6		16	1.8	2.0	0.1	0.3	33	10	0
SOUTH TYGER RIVER NEAR REIDVILLE																		
May 17, 1949 -----	234	4	6.8	33.4	11	0.05	2.5	0.8	4.0		15	1.9	2.2	0.0	0.9	33	10	0
SOUTH TYGER RIVER NEAR WOODRUFF																		
May 17, 1949 -----	257	3	6.8	40.4	12	0.05	2.8	1.0	4.9		17	2.9	2.4	0.1	1.3	37	11	0
SALUDA RIVER NEAR GREENVILLE																		
June 14, 1949 -----	755	4	6.3	27.7	14	0.02	2.0	0.8	3.6		15	1.4	1.4	0.0	0.5	30	8	0

1/Discharge measurement made when sample collected.

SANTÉE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN SANTÉE RIVER BASIN IN SOUTH CAROLINA--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-foot)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
SALUDA RIVER NEAR WARE SHOALS																		
Feb. 14, 1949 -----	1,640	7	6.8	57.3	12	0.04	2.8	0.9	8.1		26	3.7	1.8	0.1	0.4	44	11	0
REEDY RIVER NEAR WARE SHOALS																		
Feb. 14, 1949 -----	517	12	6.6	90.7	9.3	0.06	2.8	1.1	14		31	6.7	5.2	0.3	2.4	64	12	0
CONGAREE CREEK NEAR CAYCE																		
Mar. 30, 1949 -----	1/252	23	5.6	13.1	2.5	0.04	1.6	0.5	2.1		7	1.9	2.0	0.0	0.2	17	6	0
LAKE MARION-MOULTRIE DIVERSION CANAL NEAR PINEVILLE																		
Feb. 15, 1949 -----	29,500	7	6.8	52.5	9.6	0.10	3.6	1.5	5.0		21	3.5	3.0	0.2	0.4	42	15	0

1/Discharge measurement made when sample collected.

EDISTO RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN EDISTO RIVER BASIN IN SOUTH CAROLINA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
SOUTH FORK EDISTO RIVER NEAR MONTMORENCI																		
May 23, 1949-----	186	17	5.8	20.0	5.0	0.04	1.0	0.4	4.1		6	3.4	3.1	0.0	0.3	23	4	0
SOUTH FORK EDISTO RIVER NEAR DENMARK																		
Mar. 16, 1949-----	1,090	27	6.8	22.9	2.6	0.04	2.0	0.7	2.2		8	1.6	3.1	0.0	0.2	21	8	1
EDISTO RIVER NEAR GIVHANS																		
Feb. 16, 1949-----	7,690	70	6.1	37.7	4.0	0.12	3.7	1.2	2.3		14	1.7	4.1	0.0	0.2	1/42	14	3

1/Large proportion of organic matter; sum of mineral constituents 24 ppm.

1/Large proportion of organic matter; sum of mineral constituents 24 ppm.

COMBAHEE-BROAD RIVER BASINS
MISCELLANEOUS ANALYSES OF STREAMS IN COMBAHEE-BROAD RIVER BASINS IN SOUTH CAROLINA
Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
SALKEHATCHIE RIVER NEAR BARNWELL																		
Mar. 16, 1949 -----	1/227	31	6.7	41.4	5.3	0.04	4.5	0.6	2.6		16	1.6	3.0	-0.0	0.3	31	14	1
COOSAWEATCHIE RIVER NEAR HAMPTON																		
Mar. 16, 1949 -----	1/350	55	6.6	51.3	5.6	0.09	5.6	1.2	3.0		20	1.7	5.1	0.0	0.2	45	19	2

1/Discharge measurement made when sample collected.

SAVANNAH RIVER BASIN
MISCELLANEOUS ANALYSES OF STREAMS IN SAVANNAH RIVER BASIN

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
SAVANNAH RIVER NEAR CALHOUN FALLS, S.C.																		
Mar. 4, 1949	6,650	7	6.8	38.1	12	0.04	2.7	1.2	3.8	16	2.7	2.4	0.1	0.6	0.1	35	12	0
SAVANNAH RIVER NEAR AUGUSTA, GA.																		
Mar. 2, 1949	16,700	7	6.7	45.5	13	0.02	3.7	1.3	3.8	20	2.4	2.4	0.1	0.5	0.1	39	15	0
SAVANNAH RIVER AT BURTONS FERRY BRIDGE NEAR MILLHAVEN, GA.																		
May 25, 1949	10,000	6	6.7	48.7	12	0.03	3.6	1.2	4.6	19	3.0	3.0	0.1	0.9	0.1	41	14	0
KEOWEE RIVER NEAR NEWRY, S.C.																		
June 15, 1949	1,840	7	6.0	19.4	8.6	0.03	1.5	0.6	3.3	11	2.2	1.0	0.1	0.6	0.1	22	6	0
TWELVE MILE CREEK NEAR PICKENS, S.C.																		
June 15, 1949	1,156	2	6.2	32.8	12	0.06	2.5	1.0	3.7	16	1.6	2.0	0.0	0.9	0.0	33	10	0
SENECA RIVER NEAR ANDERSON, S.C.																		
June 16, 1949	3,470	7	6.2	30.5	11	0.05	2.4	0.6	3.4	13	2.0	1.9	0.0	0.5	0.0	29	8	0
LITTLE RIVER NEAR MOUNT CARMEL, S.C.																		
Mar. 24, 1949	194	3	7.2	64.2	16	0.02	4.4	2.1	5.7	29	3.4	3.0	0.1	0.4	0.1	49	20	0
STEVENS CREEK NEAR WOODC, S.C.																		
May 23, 1949	90.0	12	7.3	111	17	0.25	8.4	3.7	9.5	52	4.4	6.4	0.1	0.3	0.1	77	36	0

1/Discharge measurement made when sample collected.

ST. JOHNS RIVER BASIN

ST. JOHNS RIVER NEAR DE LAND, FLA.

LOCATION.--At Crows Bluff Bridge on State Highway 44, 1,000 feet upstream from gaging station which is 5 miles west of De Land, Volusia County.
DRAINAGE AREA.--About 3,000 square miles.

RECORDS AVAILABLE.--Chemical analyses: January 1948 to December 1949.

Water temperatures: January 1948 to December 1949.

EXPERIES, 1949.--Dissolved solids: Maximum, 1,090 parts per million July 11-20; minimum, 272 parts per million Oct. 21-31.

Total hardness: Maximum, 313 parts per million July 11-20; minimum, 82 parts per million Nov. 1-10.

Water temperatures: Maximum, 86°F July 30-31, Aug. 10; minimum, 51°F Nov. 27.

EXPERIES, January 1948 to December 1949.--Dissolved solids: Maximum, 1,090 parts per million July 11-20, 1949; minimum, 272 parts per million Oct. 21-31, 1949.

Total hardness: Maximum, 313 parts per million July 11-20, 1949; minimum, 82 parts per million Nov. 1-10, 1949.

Water temperatures: Maximum, 89°F June 25, 1948; minimum, 51°F Nov. 27, 1949.

REMARKS.--Records of specific conductance of daily samples available in the quality of water branch office at Ocala, Fla. Quality-of-water sampling dis-

continued December 31, 1949. Therefore data for period October 1948 to September 1949 are included in the record for the 1949 water year. Discharge records

for gaging station near De Land for water year October 1948 to September 1949 and for period October 1949 to December 1949 given in Water-Supply Paper

1142 and 1172.

Chemical analyses, in parts per million, calendar year January 1948 to December 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Jan. 1, 12-20, 1949	--	80	7.1	769	8.2	0.04	29	14	112		54	44	200	0.4	1.1	439	130	86
Jan. 21-24, 26-31	2,534	90	7.1	861	7.7	.08	32	13	118		64	52	200	.0	1.0	524	133	81
Feb. 1-10	2,234	65	7.1	946	6.5	.06	37	17	126		70	60	223	.0	1.0	563	162	105
Feb. 11-20	2,098	80	7.3	977	6.8	.08	38	17	131		66	63	233	.1	.9	574	165	111
Feb. 21-28	1,634	80	7.2	1,080	6.5	.20	43	20	138		69	60	262	.1	1.0	666	180	133
Mar. 1-10	1,813	60	7.4	1,190	8.2	.04	46	22	129		84	93	226	.0	1.1	695	205	136
Mar. 11-20	1,747	50	7.4	1,260	7.7	.10	50	22	162		78	71	304	.1	.6	763	215	151
Mar. 21-31	2,058	70	7.3	1,200	6.0	.12	45	20	136		88	86	232	.1	.8	715	195	122
Apr. 1-10	1,696	60	7.4	1,390	7.4	.20	52	26	183		86	81	340	.0	.6	843	237	166
Apr. 11-20	1,779	50	7.4	1,310	8.2	.06	53	20	186		99	98	245	.0	.6	778	214	133
Apr. 21-24, 26-30	1,634	50	7.5	1,370	8.2	.04	56	26	175		86	86	330	.0	.8	814	247	176
May 1-10	1,634	35	7.5	1,480	5.9	.01	52	26	205		98	83	365	.1	.7	876	237	156
May 11-20	1,405	35	7.6	1,420	6.5	.01	54	28	185		96	82	345	.1	.6	847	250	171
May 21-31	1,731	30	7.1	1,560	7.8	.03	56	26	205	6.5	103	85	380	--	.8	855	247	161
June 1-10	1,683	30	7.2	1,610	5.9	.06	56	30	211	6.5	94	86	402	--	1.0	897	263	186
June 11-20	2,221	35	7.3	1,510	7.6	.03	56	34	196	2.2	103	85	358	--	.7	836	238	154
June 21-30	2,437	35	7.3	1,510	5.1	.03	55	23	203	9.3	81	91	365	--	1.0	840	232	165
July 1-10	2,372	35	6.6	1,760	4.3	.04	57	32	242		78	109	440	.1	1.4	1,000	274	210
July 11-20	2,872	80	6.8	1,890	5.1	.08	58	36	276		56	133	503	.1	.6	1,040	274	238
July 21-31	3,021	80	6.8	1,890	4.6	.03	58	34	241		48	108	408	.1	.8	1,067	274	238
Aug. 1-10	2,097	120	6.9	1,524	6.9	.02	56	26	235		54	143	403	.1	.7	869	249	210
Aug. 11-20	2,618	140	6.8	1,440	7.5	.02	56	26	235		54	143	345	.1	.7	869	244	200
Aug. 21-31	2,855	100	6.9	1,300	6.8	.02	46	26	198		56	127	335	.1	1.2	751	222	176

Sept. 1-10 -----	5,631	90	7.0	1,020	5.9	.02	37	20	142		42	92	250	.1	.3	602	175	140
Sept. 11-20 -----	6,010	120	6.7	794	5.4	.05	30	15	107		36	62	195	.1	.6	466	137	107
Sept. 21-30 -----	6,391	80	6.9	674	7.8	.01	26	13	93		42	51	165	.1	.5	406	118	84
Oct. 1-10 -----	8,779	150	7.1	558	5.9	.01	23	11	73		40	42	130	.1	.6	348	103	70
Oct. 11-20 -----	9,367	160	6.7	461	5.1	.00	20	11	66		36	38	120	.1	.6	293	95	66
Oct. 21-31 -----	8,404	160	6.6	475	7.7	.30	19	8.6	60		34	30	108	.1	1.2	272	83	55
Nov. 1-10 -----	7,471	150	6.8	492	7.7	.20	19	8.3	66		37	28	118	.0	.9	281	82	51
Nov. 11-20 -----	6,355	120	6.7	497	7.7	.20	20	8.6	64		38	27	114	.0	.8	282	85	54
Nov. 21-30 -----	5,783	120	6.9	536	7.2	.20	22	10	68		40	32	123	.0	.8	300	96	63
Dec. 1-10 -----	4,464	130	7.0	588	7.2	.20	24	11	75		42	40	136	.1	.7	329	105	71
Dec. 11-20 -----	3,461	100	7.0	650	7.7	.20	27	12	84		48	39	153	.0	.6	366	117	77
Dec. 21-31 -----	3,827	240	7.0	697	7.7	.10	28	12	87		50	45	163	.0	.4	387	119	78
Average -----	--	90	7.1	1,100	6.7	0.09	41	20	149		64	76	264	0.1	0.8	639	184	132

ST. JOHNS RIVER BASIN--Continued

ST. JOHNS RIVER NEAR DE LAND, FLA.--Continued

Temperature (°F) of water, calendar year January 1949 to December 1949

Day	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.
1	--	70	68	80	76	79	84	85	81	79	76	59
2	--	69	68	73	77	81	84	84	82	78	73	59
3	--	69	68	76	73	77	84	83	83	78	70	60
4	--	70	69	76	78	77	85	83	84	79	62	53
5	--	71	68	74	76	80	85	83	83	78	60	60
6	--	70	68	74	77	80	84	84	82	79	61	60
7	--	71	69	76	76	80	84	85	84	80	60	59
8	--	71	68	73	76	81	85	85	84	80	61	61
9	--	72	68	73	80	81	85	84	85	80	62	62
10	--	73	69	73	79	80	84	86	83	79	69	62
11	--	72	68	72	80	79	84	84	81	78	62	65
12	65	70	68	73	80	76	85	83	80	79	70	60
13	66	70	69	72	73	80	85	80	80	78	70	60
14	66	70	69	71	78	81	85	81	81	79	69	62
15	66	70	69	72	72	81	84	82	80	77	70	63
16	67	71	69	73	77	82	83	83	81	76	68	65
17	68	71	69	70	79	84	84	84	82	78	62	60
18	68	71	69	72	78	84	83	85	83	78	62	65
19	69	71	70	73	73	82	83	85	82	78	61	66
20	69	73	70	74	78	84	83	85	84	76	60	60
21	70	73	70	75	78	82	84	84	83	76	62	62
22	71	72	74	74	78	85	83	82	82	76	59	62
23	71	74	70	75	80	83	82	81	82	75	60	62
24	71	73	70	76	81	82	82	82	81	71	60	64
25	--	74	71	--	82	82	83	83	82	76	61	65
26	72	73	70	74	80	81	84	83	80	77	59	65
27	72	74	75	75	80	82	84	80	80	76	51	66
28	72	72	79	76	80	83	85	79	80	77	52	67
29	72	--	78	75	78	82	85	78	79	77	53	65
30	71	--	78	76	81	83	86	81	79	78	61	68
31	70	--	79	--	80	--	86	80	--	79	--	67
Average	--	71	70	74	78	80	84	83	82	78	63	62

OHIO RIVER MAIN STEM

ALLEGHENY RIVER AT WARREN, PA.

LOCATION.--At bridge on U. S. Highway 6, Warren County, approximately 9 1/2 miles downstream from gaging station near Kinzua.
DRAINAGE AREA.--2,233 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

Water temperatures: October 1948 to September 1949.

EXTREMES, 1948-49.--Dissolved solids: Maximum, 573 parts per million Sept. 11-20; minimum, 100 parts per million July 11-20.

Total hardness: Maximum, 180 parts per million Oct. 1-10; minimum, 41 parts per million Jan. 21-31, Apr. 1-30.

Specific conductance: Maximum, 896 micromhos Oct. 1-10; minimum, 132 micromhos Apr. 21-30.

Water temperatures: Maximum, 84° F July 13-14; minimum, freezing point on several days in January, February, and March.

REMARKS.--Records of specific conductance, pH, and chloride of daily samples available in District office at Philadelphia, Pa. Discharge records for gaging station near Kinzua for water year October 1948 to September 1949 given in Water-Supply Paper 1143.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Oct. 1-10, 1948	307	4	7.1	896	1.6	0.06	56	9.9	102	5.8	80	27	220	0.1	0.8	532	180	115
Oct. 11-20	930	5	7.0	813	1.6	.10	50	8.7	96	5.9	69	26	195	.2	1.2	476	160	104
Oct. 21-31	713	5	7.0	559	2.0	.08	45	6.6	58	8.2	62	24	120	.4	1.0	323	139	89
Nov. 1-10	621	15	7.1	716	1.2	.04	45	8.7	74	1.4	76	25	160	.1	.8	421	148	86
Nov. 11-20	1,691	15	7.0	492	2.0	.08	29	6.4	51	1.4	47	21	110	.0	1.3	293	99	60
Nov. 21-30	3,043	15	6.9	296	4.4	.08	21	4.7	27	2.0	30	21	55	.0	1.6	179	72	47
Dec. 1-10	1,693	15	7.0	376	2.4	.08	24	6.4	37	1.4	40	21	80	.0	1.4	225	86	53
Dec. 11-20	2,978	15	6.9	308	3.2	.10	19	4.4	30	1.6	29	19	60	.0	1.5	186	66	42
Dec. 21-31	3,342	8	6.9	318	4.2	.08	21	4.2	29	1.7	32	18	50	.1	1.5	179	70	43
Jan. 1-10, 1949	7,706	3	6.7	178	5.4	.14	12	3.0	15	1.9	18	15	31	.0	1.7	103	42	28
Jan. 11-20	5,176	8	7.0	207	5.2	.08	14	3.1	16	1.5	22	15	38	.1	1.6	120	48	30
Jan. 21-31	7,257	10	6.8	183	5.4	.07	12	2.8	15	1.7	20	15	31	.1	1.7	105	41	25
Feb. 1-10	3,786	10	7.0	228	5.6	.08	16	3.5	18	2.6	26	15	42	.1	2.1	132	54	33
Feb. 11-20	6,038	5	6.8	219	4.7	.04	16	3.3	18	1.0	24	15	40	.0	1.5	131	53	34
Feb. 21-28	4,475	7	7.1	210	5.1	.06	14	3.3	16	1.0	24	13	35	.1	1.5	123	46	29
Mar. 1-10	4,440	5	6.9	215	4.1	.07	15	3.3	19	1.0	26	13	36	.1	1.3	127	51	30
Mar. 11-20	3,041	7	7.0	260	3.4	.11	18	3.6	22	1.0	26	16	46	.0	1.9	150	60	36
Mar. 21-31	6,045	14	7.0	192	3.6	.11	13	3.0	18	1.1	21	14	35	.0	1.3	111	45	28

OHIO RIVER MAIN STEM--Continued
ALLEGHENY RIVER AT WARREN, PA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949.--Continued

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
Apr. 1-10, 1949	7,734	10	6.4	156	4.7	0.06	12	2.7	15	1.0	19	14	27	0.1	1.6	101	41	26
Apr. 11-20	7,289	5	6.5	155	4.5	.09	12	2.8	12	.8	20	15	26	.1	1.7	100	41	25
Apr. 21-30	7,403	7	6.3	152	4.6	.11	12	2.6	11	1.0	20	14	26	.1	1.5	101	41	24
May 1-10	3,226	10	7.2	238	2.8	.05	18	3.6	22	1.0	32	14	44	.0	1.0	143	60	34
May 11-20	1,500	7	6.6	368	2.0	.11	27	5.0	31	1.0	46	17	75	.1	2.0	221	88	50
May 21-31	5,917	9	6.8	205	4.8	.08	14	2.8	21	3.1	29	14	42	.0	1.4	132	46	23
June 1-10	1,404	6	7.2	340	2.2	.10	24	4.0	31	5.3	49	15	72	.0	.7	204	76	36
June 11-20	683	7	7.2	503	4.0	.10	34	5.7	50	6.2	67	18	108	.1	.8	304	108	49
June 21-30	633	8	7.3	561	4.4	.06	36	6.2	60	6.1	68	20	125	.1	.6	345	115	60
July 1-10	498	6	6.5	562	2.0	.10	36	9.6	62	6.4	66	21	127	.1	.5	299	129	75
July 11-20	355	6	6.5	685	1.6	.10	41	10	79	5.2	68	21	160	.1	.9	439	143	88
July 21-31	638	7	6.6	616	2.2	.20	36	9.4	73	4.0	58	24	146	.1	1.0	393	128	81
Aug. 1-10	358	12	7.2	590	5.0	.05	37	9.2	61	2.9	70	20	125	.1	.7	365	130	73
Aug. 11-20	329	10	7.2	747	2.9	.05	46	9.0	83	3.0	70	21	172	.1	.3	481	152	94
Aug. 21-31	422	10	7.3	824	3.8	.05	46	10	92	3.8	68	24	195	.1	.2	541	156	100
Sept. 1-10	413	8	7.3	756	3.6	.05	44	8.5	82	3.5	68	25	175	.1	.1	489	145	89
Sept. 11-20	363	6	7.6	867	3.2	.05	52	10	97	3.7	72	27	210	.1	.1	573	171	112
Sept. 21-30	522	11	7.4	752	2.3	.10	48	12	83	1.8	70	33	170	.1	.9	421	169	112
Average	2,864	9	7.0	437	3.5	0.08	28	5.9	45	2.8	45	19	95	0.1	1.1	266	94	57

OHIO RIVER MAIN STEM--Continued
 ALLEGHENY RIVER AT WARREN, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	52	41	32	32	32	45	53	67	77	78	67
2	66	54	37	32	32	32	42	61	68	81	80	66
3	63	55	37	34	32	36	42	63	71	80	74	64
4	57	54	37	35	32	35	47	58	70	79	74	67
5	56	55	37	34	33	36	44	69	70	79	72	73
6	54	50	37	34	34	40	42	71	70	80	74	71
7	55	50	37	34	34	38	42	65	70	77	74	65
8	54	46	36	36	33	38	42	67	68	76	74	66
9	54	49	35	38	36	37	44	61	63	78	76	65
10	53	50	35	38	34	37	47	56	66	74	76	65
11	52	44	35	38	34	36	--	56	69	82	76	62
12	50	47	35	37	33	34	--	59	74	83	79	69
13	52	43	37	35	36	36	--	64	74	84	78	64
14	51	44	39	34	39	35	--	61	76	84	75	69
15	52	43	39	37	42	34	--	60	74	82	74	63
16	55	41	37	38	41	36	--	63	79	68	73	65
17	54	43	36	39	37	34	--	67	76	76	75	67
18	49	43	33	39	39	34	--	67	74	74	70	67
19	47	45	32	40	40	33	--	66	74	76	70	67
20	46	44	33	36	41	37	--	64	77	79	67	62
21	47	43	33	34	40	42	51	63	76	79	73	61
22	46	44	--	34	40	42	49	61	80	78	67	61
23	48	43	33	32	40	41	47	62	83	78	67	58
24	50	43	33	35	41	45	45	61	81	78	69	57
25	49	42	33	38	39	44	50	61	81	79	69	59
26	49	43	33	39	37	47	52	58	80	74	74	54
27	51	43	31	37	34	51	55	56	79	78	77	63
28	49	--	33	38	41	52	56	54	77	78	76	62
29	50	41	33	36	--	52	56	53	77	77	74	58
30	51	42	34	35	--	50	54	53	77	78	73	59
31	52	--	33	33	--	47	--	63	--	74	71	--
Average	52	46	35	36	37	39	--	61	72	78	74	64

OHIO RIVER MAIN STEM--Continued

ALLEGHENY RIVER AT KITTANNING, PA.

LOCATION.--At city raw-water intake, about 1,000 feet upstream from bridge on U. S. Highway 422, at Kittanning, Armstrong County, and about 1,500 feet downstream from gaging station.

DRAINAGE AREA.--8 973 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1906 to September 1907, October 1944 to September 1949. (unpublished).

Water temperatures: October 1944 to September 1949 (unpublished).

EXTREMES, 1948-49.--Specific conductance: Maximum, 488 micromhos Oct. 11-20; minimum, 141 micromhos May 24-31.

EXTREMES, 1906-07, 1944-49.--Dissolved solids (1906-07, 1944-47): Maximum, 304 parts per million Oct. 11-20, 1946; minimum, 54 parts per million Jan. 7-15, 1907.

Total hardness (1906-07, 1944-47): Maximum, 135 parts per million Oct. 1-20, 1946; minimum, 29 parts per million Jan. 7-15, 1907.

Specific conductance (1944-49): Maximum, 521 micromhos Oct. 11-20, 1946; minimum, 101 micromhos Mar. 21-31, 1945.

REMARKS.--Records of specific conductance and temperature of daily samples available in district office at Philadelphia, Pa. Temperature records not published because temperature at water plant may be influenced by travel distance in pipe line to plant. Discharge records for gaging station at Kittanning for water year October 1948 to September 1949 given in Water-Supply Paper 1143.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micromhos at 25° C.)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1-10, 1948-	1,181	15	7.4	15	467	2.1		0.03	0.0	37	8.5	41		62	75	62	0.2	0.6	266	127	76	
Oct. 11-20 -	3,907	10	7.2	13	488	--	--	--	--	--	--	--	--	64	75	69	--	.3	--	--	--	--
Oct. 21-31 -	4,528	13	7.0	13	306	--	--	--	--	--	--	--	--	50	43	38	--	1.0	306	--	--	--
Nov. 1-10 -	3,059	25	7.0	25	346	--	--	--	--	--	--	--	--	50	54	38	--	.4	--	--	--	--
Nov. 11-20 -	5,532	20	7.0	20	365	2.4	--	.04	.0	32	6.8	30	--	58	53	50	.1	.6	207	108	60	
Nov. 21-30 -	13,162	25	7.1	25	282	--	--	--	--	--	--	--	--	38	42	34	--	.8	--	--	--	--
Dec. 1-10 -	9,361	20	7.0	20	229	--	--	--	--	--	--	--	--	28	40	24	--	1.2	--	--	--	--
Dec. 11-20 -	20,184	20	7.0	20	217	--	--	--	--	--	--	--	--	25	42	23	--	1.5	--	--	--	--
Dec. 21-31 -	12,932	15	7.0	15	189	--	--	--	--	--	--	--	--	22	39	20	--	1.4	--	--	--	--
Jan. 1-10, 1949	35,830	15	7.0	15	154	--	--	--	--	--	--	--	--	16	30	13	--	1.4	--	--	--	--
Jan. 11-20 -	20,860	15	7.2	15	163	5.2	--	.08	.0	14	3.9	7.8	--	18	31	14	.1	1.2	86	51	36	
Jan. 21-31 -	38,045	15	7.0	15	142	--	--	--	--	--	--	--	--	14	30	12	--	1.4	--	--	--	--
Feb. 1-10 -	19,270	5	7.0	5	150	--	--	.00	--	--	--	--	--	14	39	12	.2	1.7	--	--	--	--
Feb. 11-20 -	25,840	10	7.0	10	169	--	--	.02	--	--	--	--	--	19	38	7	.1	1.5	--	--	--	--
Feb. 21-28 -	24,538	5	6.8	5	145	--	--	.00	--	--	--	--	--	15	38	11	.1	2.9	--	--	--	--
Mar. 1-10 -	18,030	5	6.9	5	166	--	--	.02	--	--	--	--	--	20	37	14	.2	1.4	--	--	--	--
Mar. 11-20 -	14,530	5	7.1	5	171	--	--	.04	--	--	--	--	--	20	36	16	.1	1.0	--	--	--	--
Mar. 21-31 -	26,632	10	6.6	10	154	--	--	.04	--	--	--	--	--	22	33	12	.0	.8	--	--	--	--

Apr. 1-10 -----	28,540	144	5.4	.00	.0	13	3.4	7.8	20	29	11	.2	1.0	83	46	30
Apr. 11-20 -----	20,330	154	--	.04	--	--	--	--	20	33	18	.1	1.0	--	--	--
Apr. 21-30 -----	26,020	146	--	.03	--	--	--	--	19	35	11	.0	1.0	--	--	--
May 1-10 -----	12,767	158	--	--	--	--	--	--	24	30	15	--	.5	--	--	--
May 11-20 -----	5,575	227	--	--	--	--	--	--	34	39	23	--	.4	--	--	--
May 21-23 -----	27,960	215	--	--	--	--	--	--	32	38	24	--	.6	--	--	--
May 24-31 -----	25,550	141	--	--	--	--	--	--	20	27	15	--	--	--	--	--
June 1-10 -----	5,904	183	--	--	--	--	--	--	27	34	18	.1	.4	--	--	--
June 11-20 -----	3,604	232	--	.00	--	--	--	--	38	44	28	.1	.4	--	--	--
June 21-30 -----	3,078	306	--	.00	--	--	--	--	47	49	37	.1	.5	--	--	--
July 1-10 -----	2,447	327	--	.00	--	--	--	--	51	46	41	.2	.6	--	--	--
July 11-20 -----	2,902	322	--	.00	--	--	--	--	40	59	39	.2	.6	--	--	--
July 21-24, 26-31	4,827	306	--	.02	--	--	--	--	43	53	32	.1	.8	--	--	--
July 25 -----	5,570	346	--	--	--	--	--	--	29	66	35	--	--	--	--	--
Aug. 1-10 -----	2,828	302	--	--	--	--	--	--	46	54	36	--	.7	--	--	--
Aug. 11-20 -----	2,781	336	--	--	--	--	--	--	50	50	28	--	.6	--	--	--
Aug. 21-31 -----	2,673	241	--	--	--	--	--	--	48	35	24	--	.9	--	--	--
Sept. 1-10 -----	3,341	319	4.6	.03	.0	26	7.1	25	53	48	40	.1	.8	191	94	51
Sept. 11-20 -----	1,898	378	--	--	--	--	--	--	55	52	53	--	.6	--	--	--
Sept. 21-30 -----	2,779	388	--	--	--	--	--	--	64	58	48	--	.8	--	--	--
Average -----	12,860	250	--	--	--	--	--	--	35	44	28	--	0.9	--	--	--

OHIO RIVER MAIN STEM--Continued

ALLEGHENY RIVER AT SHARPSBURG, PA.

LOCATION.--At Sharpsburg bridge, Allegheny County, 18.8 miles below gaging station at Natrona.

RECORDS AVAILABLE.--Chemical analyses: Monthly cross-section samples October 1947 to September 1949.

REMARKS.--Station 100 is approximately 100 feet from north (right) bank and station 800 is approximately 90 feet from south (left) bank. Records of discharge for water year October 1948 to September 1949 based on records for Allegheny River at Natrona, which are given in Water-Supply Paper 1143.

Chemical analyses of cross-section samples, in parts per million, water year October 1948 to September 1949

Date of collection	Discharge (second-feet)	Station	Time	Temperature (°F)	Color	pH	Specific conductance (microhmhos at 25°C)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Total hardness as CaCO ₃
Oct. 18, 1948	4,590	800	8:55 a.m.	56	1	4.00	718	0	281	40	1.0	218
		600	9:00 a.m.	56	1	4.00	712	0	274	42	.9	225
		410	9:00 a.m.	56	3	4.00	713	0	276	38	.9	232
		250	9:05 a.m.	57	2	4.20	701	0	277	39	.8	240
		100	9:10 a.m.	56	2	4.20	697	0	273	40	1.2	225
Nov. 15-----	7,250	800	3:35 p.m.	49	2	6.3	414	24	120	35	4.0	117
		600	3:40 p.m.	49	3	6.3	415	21	119	34	2.1	111
		410	3:45 p.m.	48	4	6.4	411	21	119	33	2.0	120
		250	3:50 p.m.	49	4	6.1	407	20	120	32	2.0	120
		100	3:55 p.m.	49	4	6.2	407	21	118	34	2.1	126
Dec. 22-----	20,200	800	4:15 p.m.	36	6	3.90	260	0	69	12	1.5	93
		600	4:10 p.m.	36	6	5.9	204	10	57	12	2.5	76
		410	4:05 p.m.	36	12	5.6	196	8	54	12	2.0	90
		250	4:00 p.m.	37	12	6.1	185	10	56	13	2.2	76
		100	3:55 p.m.	38	15	6.2	203	11	54	12	2.0	75
Jan. 18, 1949	21,800	800	10:15 a.m.	36	4	5.3	221	4	66	14	2.5	63
		600	10:20 a.m.	38	4	5.3	221	4	63	14	2.4	64
		410	10:25 a.m.	38	4	5.5	218	5	66	14	2.5	62
		250	10:30 a.m.	40	5	5.6	215	6	63	14	2.2	66
		100	10:35 a.m.	40	5	5.9	219	8	67	14	2.5	62
Feb. 11-----	18,700	800	8:55 a.m.	35	5	4.40	270	--	91	12	2.2	84
		600	9:00 a.m.	34	5	4.5	264	--	90	12	2.5	81
		410	9:05 a.m.	35	4	4.7	254	4	85	12	2.5	81
		250	9:10 a.m.	35	4	4.8	248	2	80	12	2.5	81
		100	9:15 a.m.	35	4	5.3	252	4	83	14	3.0	96
Mar. 22 -----	14,400	800	--	--	--	--	--	--	--	--	--	--
		600	4:20 p.m.	44	9	5.6	253	6	81	15	.8	81
		410	4:15 p.m.	44	11	5.6	251	6	80	17	.8	78
		250	4:10 p.m.	44	10	5.1	255	4	81	16	1.8	84
		100	4:05 p.m.	44	10	5.6	251	6	77	16	1.8	81
Apr. 18-----	25,600	800	9:25 a.m.	50	11	6.0	202	14	60	13	1.0	57
		600	9:20 a.m.	50	9	6.2	198	12	59	13	.7	64
		410	9:15 a.m.	41	10	6.4	191	14	54	13	.6	54
		250	9:10 a.m.	50	22	6.3	189	17	49	13	.8	52
		100	9:05 a.m.	50	20	6.4	189	18	49	13	.6	51
May 13 -----	7,250	800	9:00 a.m.	67	4	6.0	282	12	86	17	1.5	84
		600	9:04 a.m.	67	4	5.9	272	7	84	17	1.2	81
		410	9:06 a.m.	67	5	5.8	272	8	84	17	1.2	81
		250	9:10 a.m.	67	5	5.8	272	8	86	17	1.2	81
		100	9:15 a.m.	67	4	5.7	274	10	89	17	1.4	76
June 14 -----	4,190	800	7:45 a.m.	76	2	5.2	317	4	120	18	3.2	102
		600	7:55 a.m.	75	3	5.4	311	4	113	18	2.4	96
		410	8:00 a.m.	75	2	5.5	316	3	108	18	2.2	98
		250	8:05 a.m.	75	3	5.1	316	4	106	18	2.2	94
		100	8:10 a.m.	75	3	5.3	316	4	126	18	1.9	100
July 15 -----	5,180	800	9:45 a.m.	80	2	6.0	420	14	122	34	1.9	117
		600	9:50 a.m.	80	2	6.0	423	15	--	34	2.0	132
		410	9:55 a.m.	80	5	6.0	420	14	--	34	1.7	117
		250	10:00 a.m.	80	2	6.1	420	14	120	34	1.7	135
		100	10:00 a.m.	81	2	5.9	420	14	124	34	1.9	141
Aug. 17-----	2,550	800	11:47 a.m.	81	1	4.6	453	1	158	28	1.9	142
		600	11:44 a.m.	81	1	4.8	452	4	159	28	2.0	144
		410	11:44 a.m.	82	2	4.7	451	3	158	28	2.0	144
		250	11:38 a.m.	82	1	4.7	455	5	158	28	2.2	144
		100	11:35 a.m.	82	1	4.5	456	1	158	28	2.0	144
Sept. 14 -----	2,500	800	4:05 p.m.	73	2	6.1	464	16	148	36	3.4	144
		600	4:03 p.m.	72	2	5.9	480	14	156	37	3.3	148
		410	4:00 p.m.	72	2	5.8	483	12	154	36	3.1	148
		250	3:56 p.m.	72	2	5.8	478	11	150	38	3.4	148
		100	3:54 p.m.	73	2	6.1	476	18	148	37	3.3	144

OHIO RIVER MAIN STEM--Continued

OHIO RIVER AT AMBRIDGE, PA.

LOCATION.--At bridge on State Highway 930, at Ambridge, Beaver County, 1.2 miles downstream from Sewickley Creek, and approximately 5 miles below gaging station on Sewickley Creek, Allegheny County.

DRAINAGE AREA 19,560 square miles.

RECORDS AVAILABLE: Chemical analyses: October 1945 to September 1949.

Water temperatures: October 1945 to September 1949.

EXTREMES 1948-49.--Specific conductance: Maximum 679 micromhos Oct. 1-10; minimum 184 micromhos Jan. 1-10.

Water temperatures: Maximum 85° F on several days in July and August; minimum freezing point Jan. 2, 3.

EXTREMES 1945-49.--Dissolved solids (1945-47): Maximum 600 parts per million Oct. 1-10, 1946; minimum 79 parts per million Apr. 1-10, 1947.

Total hardness (1945-47): Maximum 302 parts per million Oct. 1-10, 1946; minimum 43 parts per million Apr. 1-10, 1947.

Specific conductance: Maximum 921 micromhos Oct. 1-10, 1946; minimum 128 micromhos Apr. 1-10, 1947.

Water temperatures: Maximum 86° F Aug. 20, 21, 1947; minimum freezing point on many days during winter months.

REMARKS.--Samples collected daily from highway bridge at point 400 feet from east bank of river. Due to cross-sectional differences in concentration of dissolved solids water samples also collected once a month at points 340, 625, 870, 1090, and 1380 feet from east bank of river. Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 based on records for Ohio River at Sewickley, which are given in Water-Supply Paper 1143.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F)	pH	Specific conductance (micromhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																			Total	Non-carbonate	
Oct. 1-10, 1948--	6,406		5 3.65	679	7.8	3.2	0.14	1.5	51	14	36		0	246	23	0.3	7.4	408	217	217	40
Oct. 11-20-----	9,861		5 3.80	646									0	249	24						48
Oct. 21-31-----	10,350		10 5.4	501									12	149	44						
Nov. 1-10-----	10,260		5 4.45	481									0	162	29						26
Nov. 11-20-----	14,450		5 4.15	495	4.0	2.1	02	1.3	42	12	22		0	174	24	0	3.8	306	171	171	44
Nov. 21-30-----	30,640		5 6.2	372									15	108	21		2.4				
Dec. 1-10-----	37,720		5 6.1	267									9	75	17		2.2				
Dec. 11-20-----	42,370		5 6.1	232									8	73	14		2.6				
Dec. 21-31-----	42,810		5 3.4	238									8	74	13		3.0				
Jan. 1-10, 1949--	74,170		15 5.0	184									5	52	12	0	3.8	119	63	59	
Jan. 11-20-----	42,300		5 5.6	183	5.5		05	35	17	4.9	6.5		8	53	11	1	1.8				
Jan. 21-31-----	104,700		5 6.1	188									8	53	11						
Feb. 1-10-----	59,530		5 5.0	205									2	80	10		2.0				
Feb. 11-20-----	60,520		5 5.5	225									4	87	14		1.4				
Feb. 21-28-----	68,320		5 6.0	188									6	65	9		2.5				
Mar. 1-10-----	44,740		5 6.0	223									5	87	11		1.8				
Mar. 11-20-----	41,130		5 6.2	239									7	87	14		1.6				
Mar. 21-31-----	49,450		20 5.9	220									9	69	14		2				

OHIO RIVER MAIN STEM--Continued
OHIO RIVER AT AMBRIDGE, PA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Apr. 1-10, 1948-----	54,500		10	6.5	196	5.7	--	0.04	0.05	18	4.9	12		9	64	11	0.2	1.4	125	65	58	--
Apr. 11-20-----	42,260		10	6.0	204	--	--	--	--	--	--	--	--	9	93	12	--	1.8	--	--	--	--
Apr. 21-30-----	42,240		10	6.0	216	--	--	--	--	--	--	--	--	10	98	14	--	1.8	--	--	--	--
May 1-10-----	21,570		10	5.9	257	--	--	--	--	--	--	--	--	6	144	11	--	1.3	--	--	--	--
May 11-20-----	10,550		10	5.7	375	--	--	--	--	--	--	--	--	8	93	15	--	1.1	--	--	--	--
May 21-31-----	40,630		10	5.9	276	--	--	--	--	--	--	--	--	8	93	15	--	1.8	--	--	--	--
June 1-10-----	10,960		4	6.1	312	--	--	--	--	--	--	--	--	5	111	14	2	1.0	--	--	--	--
June 11-20-----	7,958		5	4.1	544	--	--	--	--	--	--	--	--	1	134	16	3	2.6	--	--	--	--
June 21-30-----	8,265		5	5.6	385	--	--	--	--	--	--	--	--	3	182	23	4	2.2	--	--	--	--
July 1-10-----	8,275		5	4.0	485	--	--	--	--	--	--	--	--	2	179	20	3	2.6	--	--	--	--
July 11-20-----	15,250		5	4.8	489	--	--	--	--	--	--	--	--	2	147	17	2	1.8	--	--	--	--
July 21-31-----	15,530		1	5.1	390	--	--	--	--	--	--	--	--	2	147	17	2	1.8	--	--	--	--
Aug. 1-10-----	9,298		2	5.6	393	--	--	--	--	--	--	--	--	6	138	22	--	4.0	--	--	--	--
Aug. 11-20-----	11,540		1	5.0	429	--	--	--	--	--	--	--	--	4	155	20	--	4.0	--	--	--	--
Aug. 21-31-----	9,335		2	4.05	453	--	--	--	--	--	--	--	--	0	184	20	--	3.8	--	--	--	16
Sept. 1-10-----	8,709		5	5.9	450	7.0	--	.04	1.5	39	11	27	--	8	152	22	2	3.4	286	143	136	--
Sept. 11-20-----	5,086		3	5.5	420	--	--	--	--	--	--	--	--	4	150	22	--	5.1	--	--	--	--
Sept. 21-30-----	6,273		1	5.0	509	--	--	--	--	--	--	--	--	3	152	30	--	5.4	--	--	--	--
Average -----	30,620		6	5.4	348	--	--	--	--	--	--	--	--	5	121	18	--	2.7	--	--	--	--

OHIO RIVER MAIN STEM--Continued

OHIO RIVER AT AMBRIDGE, PA.--Continued

Chemical analyses of cross-section samples, in parts per million, water year October 1948 to September 1949

Date of collection	Discharge (second-feet)	Station	Time	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25°C)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Nitrate (NO ₃)	Total hardness as CaCO ₃
Oct. 18, 1948 -	11,100	1380	4:35 p. m.	60	2	4.30	633	0	252	27	2.6	218
		1090	4:39 p. m.	60	4	3.80	687	0	280	29	5.5	218
		870	4:43 p. m.	60	3	4.05	653	0	259	27	4.0	202
		625	4:49 p. m.	60	4	3.90	655	0	254	28	4.2	202
		340	4:52 p. m.	60	2	4.10	643	0	252	28	3.0	210
Nov. 15-----	13,200	1380	11:35 a. m.	52	2	4.7	478	1	184	21	1.2	132
		1090	11:25 a. m.	52	1	4.7	479	2	183	20	1.0	150
		870	11:15 a. m.	52	1	4.7	499	1	192	22	1.0	156
		625	11:10 a. m.	52	1	4.8	514	2	205	21	1.0	144
		340	11:05 a. m.	53	1	4.8	515	2	207	25	1.0	150
Dec. 22-----	58,500	1380	2:15 p. m.	44	10	4.30	241	0	87	6	1.5	90
		1090	2:20 p. m.	43	11	4.30	234	0	70	5	1.5	90
		870	2:25 p. m.	43	11	4.40	223	0	72	6	1.5	--
		625	2:30 p. m.	41	6	4.9	208	4	73	8	2.2	81
		340	2:35 p. m.	39	11	5.6	209	7	63	11	2.5	84
Jan. 18, 1949 -	39,600	1380	12:50 p. m.	48	4	4.10	303	0	110	8	2.2	96
		1090	12:45 p. m.	46	4	4.30	289	0	102	8	2.4	90
		870	12:40 p. m.	44	5	4.30	266	0	91	10	3.2	72
		625	12:35 p. m.	41	4	4.9	232	2	77	12	2.8	66
		340	12:30 p. m.	40	5	5.6	219	8	68	12	2.7	69
Feb. 11-----	37,800	1380	11:30 a. m.	39	4	4.30	308	0	115	9	3.0	87
		1090	11:30 a. m.	39	5	4.30	297	0	107	9	3.2	78
		870	11:35 a. m.	38	5	4.40	287	0	102	9	2.8	78
		625	11:40 a. m.	37	4	4.6	264	2	91	12	5.2	78
		340	11:40 a. m.	36	4	4.7	258	2	88	12	5.2	75
Mar. 22 -----	33,300	1380	1:35 p. m.	42	10	4.00	358	0	128	12	2.8	111
		1090	1:30 p. m.	42	10	4.10	348	0	121	14	1.5	108
		870	1:25 p. m.	42	12	4.20	316	0	108	13	2.5	96
		625	1:20 p. m.	42	9	4.40	289	0	94	14	2.2	90
		340	1:15 p. m.	42	10	4.8	286	0	88	18	2.0	87
Apr. 18-----	35,100	1380	5:30 p. m.	52	10	6.3	263	5	95	10	.8	84
		1090	5:25 p. m.	52	10	6.3	217	11	67	12	1.2	64
		870	5:35 p. m.	51	11	5.9	237	6	78	11	2.0	66
		625	5:20 p. m.	51	10	5.3	255	4	86	10	2.0	81
		340	5:15 p. m.	51	9	6.2	211	12	60	12	1.5	60
May 13 -----	11,000	1380	11:00 a. m.	68	5	5.4	364	4	127	16	3.0	112
		1090	10:55 a. m.	68	4	4.8	374	2	132	16	3.2	112
		870	10:50 a. m.	68	5	5.3	368	4	130	16	2.5	116
		625	10:45 a. m.	68	6	5.1	384	4	135	17	3.4	120
		340	10:40 a. m.	68	5	6.1	368	9	126	16	3.0	116
June 14 -----	6,540	1380	10:00 a. m.	78	2	5.3	396	4	141	16	4.5	122
		1090	10:05 a. m.	77	2	5.4	384	5	139	17	5.1	116
		870	10:15 a. m.	78	2	5.0	392	4	141	16	4.7	114
		625	10:20 a. m.	78	2	5.7	386	7	142	16	5.5	134
		340	10:25 a. m.	78	2	5.0	382	3	144	18	4.7	126
July 15 -----	16,100	1380	12:00 m.	80	2	5.3	475	3	171	24	1.2	--
		1090	11:55 a. m.	80	2	5.6	475	7	166	24	1.1	--
		870	11:50 a. m.	79	2	5.5	475	4	172	24	1.2	150
		625	11:50 a. m.	80	2	5.5	476	4	167	24	1.4	153
		340	11:45 a. m.	81	1	5.5	475	5	166	24	1.3	150
Aug. 17-----	9,520	1380	12:55 p. m.	83	1	5.3	423	8	152	20	5.1	128
		1090	1:00 p. m.	82	1	5.4	421	7	150	20	4.9	128
		870	1:05 p. m.	82	1	5.4	420	6	156	22	4.7	128
		625	1:08 p. m.	83	1	5.7	422	10	154	20	4.3	130
		340	1:08 p. m.	83	1	5.4	419	6	144	21	4.4	128
Sept. 14 -----	5,640	1380	6:35 p. m.	73	1	5.3	401	4	151	18	4.9	126
		1090	6:31 p. m.	73	1	5.4	400	4	145	18	4.3	122
		870	6:29 p. m.	73	1	5.2	401	4	149	18	4.3	122
		625	6:22 p. m.	73	1	5.3	406	6	150	19	4.6	122
		340	6:15 p. m.	73	1	5.4	404	5	145	18	4.7	124

OHIO RIVER MAIN STEM--Continued
OHIO RIVER AT AMBRIDGE, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	70	56	43	--	35	35	50	57	64	83	82	79
2	71	67	43	32	--	37	50	59	64	84	82	77
3	69	57	45	31	35	37	48	61	66	82	83	77
4	69	59	43	34	35	39	47	63	69	83	84	76
5	76	59	43	36	35	39	47	65	70	85	84	76
6	66	59	44	35	36	39	46	66	71	84	82	76
7	67	58	44	34	35	39	46	65	70	84	82	77
8	66	58	44	35	36	39	45	65	70	84	83	74
9	65	58	42	36	38	39	45	66	71	84	84	74
10	65	57	41	37	38	39	45	66	72	83	85	73
11	65	56	41	37	36	37	45	67	74	83	85	74
12	64	55	41	37	38	37	46	67	74	83	84	74
13	63	54	42	37	38	36	38	68	77	83	84	74
14	62	53	43	37	40	36	50	68	77	83	84	74
15	62	53	42	38	41	36	50	69	78	83	85	73
16	64	52	42	38	40	36	50	69	78	82	85	74
17	62	52	42	38	41	36	49	70	78	80	83	74
18	61	53	41	39	43	35	49	72	79	80	83	74
19	59	52	40	39	41	36	49	72	80	81	82	74
20	59	52	39	39	41	37	49	73	81	81	77	73
21	58	52	39	39	40	39	50	72	81	82	76	73
22	57	51	39	39	41	40	51	70	80	83	77	72
23	56	49	39	39	42	40	51	69	80	82	78	71
24	58	48	38	39	42	41	51	65	81	81	78	70
25	56	48	39	39	43	43	51	64	82	83	80	70
26	56	48	39	39	41	43	51	63	82	83	80	70
27	55	48	35	41	40	45	51	62	83	84	82	70
28	56	48	36	40	39	47	51	61	83	85	80	69
29	57	46	37	39	--	50	56	59	83	85	80	69
30	56	45	37	35	--	50	55	59	83	84	80	68
31	56	--	33	37	--	52	--	62	--	85	80	--
Average	62	53	41	37	39	40	49	66	76	83	82	83

ALLEGHENY RIVER TRIBUTARIES

CLARION RIVER NEAR PINEY, PA.

LOCATION --At hydroelectric plant of Pennsylvania Electric Co., 2½ miles from Piney, Clarion County, and a quarter of a mile upstream from gaging station. DRAINAGE AREA --951 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1946 to September 1949.

EXTREMES, 1946-49 --Specific conductance: Maximum, 575 micromhos Nov. 1-10; minimum, 113 micromhos June 1-10.

EXTREMES, 1946-49 --Dissolved solids (1946-47): Maximum, 317 parts per million Sept. 11-20, 1947; minimum, 59 parts per million Apr. 1-10, 1947.

EXTREMES, 1946-49 --Total hardness (1946-47): Maximum, 142 parts per million Sept. 11-20, 1947; minimum, 28 parts per million Apr. 1-10, 1947.

EXTREMES, 1946-49 --Total hardness (1948-49): Maximum, 100 micromhos Nov. 1-10, 1948; minimum, 100 micromhos Mar. 21-31, Apr. 11-20, 1948.

REMARKS --Samples collected by Pennsylvania Electric Co. Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Discharge records for gaging station near Piney for water year October 1946 to September 1949 given in Water-Supply Paper 1143.

Chemical analyses, in parts per million, water year October 1946 to September 1949

Date of collection	Mean discharge (second-foot)	Temperature (°F)	Color pH	Specific conductance (micro-mhos at 25° C)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																		Total	Non-carbonate	
Oct. 1-10, 1948 -	146		90	6.8	4.4	1.6	0.50	40	7.3	35		39	77	65	0.4	1.2	286	130	98	
Oct. 11-20 -	274		120	6.8	504							54	76	73		1.6				
Oct. 21, 23-31 -	169		120	6.9	549							50	85	81		1.6				
Oct. 22 -	106		100	6.2	283							30	49	31		1.8				
Nov. 1-10 -	331		90	6.9	575							50	91	88		1.0				
Nov. 11-20 -	460		90	6.8	572	.10	.00	51	8.0	48		53	91	88	.0	1.4	366	160	117	
Nov. 21-30 -	1,181		85	6.9	500							43	77	73		.9				
Dec. 1-10 -	1,007		40	6.8								23	47	37		.2				
Dec. 11-20 -	2,483		30	6.9	205	.12	.00	18	4.2	11		13	41	24	.0	.6	126	62	52	
Dec. 21-31 -	1,732		30	6.7	145							6	35	12		.6				
Jan. 1-10, 1949 -	3,716		25	6.4	147							12	34	17		.5				
Jan. 11-20 -	1,690		20	6.8	135	.22	.10	12	3.5	5.4		6	32	12	.1	1.8	77	44	39	
Jan. 21-31 -	4,223		5	6.2	142	.15						6	36	12	.1	.8				
Feb. 1-10 -			5	6.1	115							2	36	10		.3				
Feb. 11-20 -	2,980		10	6.2	169							6	43	18		.4				
Feb. 21-28 -	2,983		8	6.2	121							3	38	8		.3				
Mar. 1-10 -	1,999		15	6.4	133							7	47	10		.2				
Mar. 11-20 -	1,420		20	6.5	146							8	48	14		.4				
Mar. 21-31 -	2,132		25	6.1	159							10	37	17		.4				

ALLEGHENY RIVER TRIBUTARIES--Continued

CLARION RIVER NEAR PINEY, PA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-foot)	Temperature (° F.)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Hardness as CaCO ₃	
																			Total	Non-carbonate
Apr. 1-10, 1949--	2,617		25	6.5	135	5.7		0.34	0.05	12	3.3	8.2		8	34	13	0.2	0.6	89	44
Apr. 11-20-----	2,236		25	6.3	133	--		--	--	--	--	--	--	8	33	11	--	.2	--	--
Apr. 21-30-----	3,165		25	6.5	129	--		--	--	--	--	--	--	12	34	11	--	.4	--	--
May 1-10-----	1,358		25	6.5	118	--		--	--	--	--	--	--	9	30	11	--	.3	--	--
May 11-20-----	860		40	6.6	154	--		--	--	--	--	--	--	8	37	12	--	.4	--	--
May 21-31-----	4,495		40	6.8	124	--		--	--	--	--	--	--	12	30	10	--	.3	--	--
June 1-10-----	777		12	6.4	113	--		--	--	--	--	--	--	10	27	8.8	.1	.2	--	--
June 11-20-----	351		30	6.4	131	--		.04	--	--	--	--	--	8	34	12	.1	.4	--	--
June 21-30-----	273		30	6.5	168	--		.02	--	--	--	--	--	10	40	15	.2	.4	--	--
July 1-10-----	281		25	6.7	204	5.1		.13	.00	21	4.2	11	1.9	15	49	24	.0	.9	125	70
July 11-20-----	349		30	6.7	255	4.3		.18	.00	20	4.7	17	2.3	21	56	26	.0	1.1	149	69
July 21-31-----	430		10	6.4	292	3.8		.07	.25	22	4.8	19	3.9	12	65	28	--	1.4	174	75
Aug. 1-10-----	408		60	6.5	395	3.6		.90	1.1	34	6.7	27	2.4	25	81	50	--	1.1	289	112
Aug. 11-20-----	193		70	6.6	419	3.6		.18	.75	39	6.7	32	2.5	33	88	53	--	1.8	288	125
Aug. 21-31-----	145		50	6.7	513	4.1		.74	.00	49	11	34	14	56	100	88	.0	2.0	330	165
Sept. 1-10-----	141		50	7.0	533	4.6		.46	.00	51	10	31	16	38	96	69	.0	2.0	346	168
Sept. 11-20-----	108		120	6.7	532	--		--	--	--	--	--	--	58	105	72	--	1.6	--	--
Sept. 21-30-----	139		110	6.8	543	--		--	--	--	--	--	--	58	105	74	--	1.4	--	--
Average-----	1,391		46	6.6	277	--		--	--	--	--	--	--	22	56	34	--	0.9	--	--

ALLEGHENY RIVER TRIBUTARIES--Continued

KISKIMINETAS RIVER AT LEECHBURG, PA.

LOCATION --At raw-water intake of West Leechburg plant of Allegheny-Ludlum Steel Corp., 0.2 mile below Brandy Run, Armstrong County.

DRAINAGE AREA --1,860 square miles; October 1946 to September 1949.

RECORDS AVAILABLE --Chemical analyses: October 1946 to September 1949.

Water temperatures: October 1946 to September 1949.

EXTREMES, 1948-49 --Specific conductance: Maximum, 2,200 micromhos Oct. 1-10; minimum, 384 micromhos Feb. 21-28.

Water temperatures: Maximum, 88°F July 6, 30; minimum, freezing point Dec. 26.

EXTREMES, 1946-49 --Dissolved solids (1946-47): Maximum, 786 parts per million Oct. 1-10, 1946; minimum, 183 parts per million Jan. 1-10, 1947.

Total hardness (1946-47): Maximum, 514 parts per million Oct. 1-10, 1946; minimum, 119 parts per million Jan. 1-10, 1947.

Specific conductance: Maximum, 2,200 micromhos Oct. 1-10, 1948; minimum, 269 micromhos June 20, 1948.

Water temperatures: Maximum, 88°F July 6, 30, 1949; minimum, freezing point on many days during winter months.

REMARKS --Chemical quality fluctuates rapidly due to presence of industrial wastes. Samples collected by Allegheny-Ludlum Steel Corp. Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 based on records for Kiskiminetas River at Vandergrift, which are given in Water-Supply Paper 1143.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (°F)	Color	pH	Specific conductance (micromhos at 25° C)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																			Total	Non-carbonate	
Oct. 1-10, 1948 -	581		15	2.60	2,200	21	--	2.0	123	43	48	--	0	821	19	15	26	1,170	838	838	821
Oct. 11-20 -	949		10	2.65	1,810	--	32	--	--	--	--	--	0	613	11	--	38	--	--	--	474
Oct. 21-31 -	632		7	2.70	1,740	--	19	--	--	--	--	--	0	585	12	--	26	--	--	--	445
Nov. 1-10 -	1,265		4	2.80	1,630	--	84	--	--	--	--	--	--	523	8	--	--	--	--	--	478
Nov. 11-20 -	2,214		10	2.75	1,600	11	30	3.6	56	20	4.6	--	0	438	12	0	13	663	480	480	331
Nov. 21-30 -	2,552		5	2.90	1,080	--	16	--	--	--	--	--	--	286	8.2	6.5	23	--	--	--	235
Dec. 1-10 -	3,013		5	3.30	658	--	60	--	--	--	--	--	0	186	6.8	1.2	12	--	--	--	96
Dec. 11-20 -	6,137		5	3.40	513	--	32	--	--	--	--	--	0	135	8	.8	3.4	--	--	--	157
Dec. 21-31 -	7,386		5	3.10	815	--	8.4	--	--	--	--	--	0	237	10	12	3.6	--	--	--	225
Jan. 1-10, 1949 -	7,250		--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 11-20 -	3,536		5	3.55	434	--	24	--	--	--	--	--	--	124	12	--	2.7	--	--	--	84
Jan. 21-30 -	3,536		10	3.30	723	8.0	54	2.0	34	13	5.7	--	0	268	6	2.0	2.5	306	215	215	388
Jan. 31-20 -	2,406		14	3.60	1,010	9.2	8.3	3.0	44	18	15	--	0	268	8	20	16	435	321	321	547
Jan. 21-31 -	10,980		5	3.60	415	--	2.1	--	--	--	--	--	--	128	6	.8	2.6	--	--	--	111
Feb. 1-10 -	5,096		10	3.40	630	--	35	--	--	--	--	--	0	201	3	1.4	7.1	--	--	--	105
Feb. 11-20 -	5,330		5	3.40	545	--	25	--	--	--	--	--	0	196	4	1.2	7.0	--	--	--	72
Feb. 21-28 -	7,510		5	3.70	384	--	10	--	--	--	--	--	0	141	4	1.2	4.7	--	--	--	48
Mar. 1-10 -	5,068		--	--	588	--	35	--	--	--	--	--	0	186	4	1.5	6.5	--	--	--	72
Mar. 11-20 -	3,900		10	3.30	690	--	70	--	--	--	--	--	0	238	5	2.0	9.0	--	--	--	92
Mar. 21-31 -	3,601		5	3.30	735	--	85	--	--	--	--	--	0	236	6	4.0	9.5	--	--	--	98

5,666	5	3.60	437	9.4	4.0	.11	1.4	26	8.9	7.5	0	143	1.2	.9	2.6	215	139	139	56
Apr. 1-10-----																			
Apr. 11-20-----	3,285	10	3.25	656	--	--	.25	--	--	--	0	216	4	4.0	5.4	--	--	--	91
Apr. 21-30-----	3,526	10	3.40	601	--	--	.22	--	--	--	0	200	2	3.2	5.4	--	--	--	79
May 1-10-----	1,798	10	3.15	860	--	--	4.2	--	--	--	0	292	8	9.0	7.4	--	--	--	154
May 11-20-----	1,048	10	3.10	1,180	--	--	4.1	--	--	--	0	415	2	8.0	6.8	--	--	--	178
May 21, 22-----	1,800	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 23-31-----	2,153	10	3.15	849	--	--	4.1	--	--	--	0	303	1	6.0	6.9	--	--	--	122
June 1-10-----	923	5	3.05	1,090	14	9.1	1.4	2.3	58	23	26	12	0	359	11	2.5	524	348	161
June 11-20-----	790	5	3.00	1,280	14	11	2.8	3.0	80	30	32	13	0	472	13	2.5	688	453	176
June 21-30-----	705	5	2.90	1,300	14	12	2.0	2.7	75	26	34	7.8	0	469	13	2.5	655	442	183
July 1-2, 4-6, 8-10	689	5	3.10	1,120	16	11	.76	2.8	76	23	35	14	0	437	13	2.5	653	397	143
July 3, 7-----	721	5	3.00	1,300	9.2	--	.36	--	27	5.5	207	39	1/65	484	13	5.2	841	90	36
July 11-20-----	2,768	3	3.10	837	11	1.3	2.8	3.6	52	15	16	14	0	272	5	4.8	419	262	133
July 21-31-----	1,714	5	2.90	947	11	1.0	4.0	2.6	41	20	17	7.4	0	271	8.5	7.5	404	280	161
Aug. 1-10-----	1,370	5	2.90	1,040	16	.8	4.2	1.0	48	27	22	5.0	0	313	8.5	8	461	320	166
Aug. 11-20-----	1,039	4	2.85	1,260	26	1.1	4.1	5.2	66	28	39	1.3	0	409	9.2	7.2	615	382	186
Aug. 21-30-----	1,310	5	3.00	1,420	35	--	28.15	5.2	90	2.6	232	16	120	443	10	11	812	18	--
Aug. 22-31-----	1,439	5	2.75	1,420	32	18	28	8.6	69	33	36	12	0	443	14	34	720	505	329
Sept. 1-10-----	783	0	2.90	1,290	18	18	8.2	8.0	72	30	10	10	0	436	12	10	661	484	209
Sept. 11-20-----	483	0	2.95	1,570	21	18	8.2	6.4	88	35	27	27	0	533	16	12	841	560	235
Sept. 21-30-----	508	0	2.95	1,660	21	21	3.4	8.0	102	40	23	23	0	598	18	7.0	900	623	208
Average-----	2,836	6	3.35	1,031	--	--	8.1	--	--	--	--	--	--	339	8.6	5.8	--	--	212

1/Includes equivalent of 14 parts per million carbonate (CO₃).

ALLEGHENY RIVER TRIBUTARIES--Continued
KISKIMINETAS RIVER AT LEECHBURG, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	55	48	--	50	43	53	--	72	85	82	75
2	57	57	44	--	43	40	48	68	74	85	79	75
3	--	59	49	38	42	43	50	68	75	87	78	72
4	63	65	54	43	40	45	47	69	75	85	80	--
5	60	77	60	46	41	53	50	73	75	87	82	75
6	59	63	48	46	41	55	48	75	77	88	70	73
7	63	65	50	45	44	45	50	73	--	87	75	71
8	62	59	52	48	44	45	49	70	72	--	83	70
9	63	58	46	--	45	47	48	69	74	77	82	65
10	60	56	43	47	46	50	50	--	75	85	82	68
11	60	56	50	48	46	45	50	68	75	85	85	65
12	60	56	--	47	45	46	57	69	--	76	85	65
13	58	56	45	48	--	42	62	65	80	75	83	70
14	57	57	46	45	48	43	59	65	80	79	83	70
15	57	53	52	45	50	43	60	66	80	79	80	70
16	55	51	51	--	50	43	50	67	82	76	80	70
17	--	53	49	51	48	45	--	68	80	75	79	65
18	54	50	56	52	45	45	50	69	78	74	80	75
19	53	55	48	53	49	45	39	70	80	--	80	73
20	57	55	45	48	50	50	50	65	82	76	--	76
21	56	57	46	49	47	52	--	--	83	79	72	70
22	58	55	46	--	48	55	56	--	70	80	73	70
23	57	53	44	65	48	52	60	62	70	--	75	--
24	59	52	40	52	46	52	56	70	70	--	79	63
25	58	50	42	49	47	58	51	70	68	84	78	--
26	57	52	31	50	46	65	54	65	70	84	79	62
27	55	57	38	50	--	--	64	63	85	85	80	63
28	56	57	39	47	46	56	64	58	85	85	75	65
29	59	47	44	46	--	58	60	60	85	87	74	63
30	65	50	44	45	--	56	60	61	85	88	74	60
31	57	--	41	42	--	56	--	68	--	--	75	--
Average	59	56	46	48	46	49	53	67	77	82	79	69

ALLEGHENY RIVER TRIBUTARIES--Continued
 MISCELLANEOUS ANALYSES OF STREAMS, ALLEGHENY RIVER TRIBUTARIES IN PENNSYLVANIA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Instantaneous discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																				Total	Non-carbonate
FRENCH CREEK AT CARTERS CORNERS																					
Aug. 5, 1949 ----	1/96	69	25	7.2	182	4.0		0.04	0.00	27	5.3	2.7	1.8	84	16	2.6	0.1	1.4	108	89	28
FRENCH CREEK AT MEADVILLE																					
Aug. 5, 1949 ----	395	76	30	7.2	211	3.6		0.17	0.00	27	4.7	8.0	3.3	84	19	8.2	0.1	2.6	124	87	39
FRENCH CREEK NEAR FRANKLIN (1½ miles above mouth)																					
Aug. 5, 1949 ----	660	77	20	7.4	189	4.9		0.04	0.00	25	4.5	6.2	1.9	77	19	4.8	0.0	0.8	114	81*	29
FRENCH CREEK AT FRANKLIN																					
Aug. 5, 1949 ----	660	77	20	7.4	190	4.9		0.06	0.00	25	4.7	4.8	2.4	77	20	4.9	0.0	0.8	115	82	32
SOUTH BRANCH FRENCH CREEK NEAR UNION CITY																					
Aug. 5, 1949 ----	27	67	15	7.2	222	3.8		0.13	0.00	33	6.1	3.6	2.2	103	22	3.8	0.3	2.2	130	107	34
LE BOEUF CREEK NEAR WATERFORD																					
Aug. 5, 1949 ----	35	71	30	6.8	172	6.8		0.04	0.00	26	5.1	1.7	1.5	78	18	2.0	0.1	1.5	112	86	28
MUDDY CREEK NEAR CAMBRIDGE SPRINGS																					
Aug. 5, 1949 ----	36	68	10	6.9	180	5.9		0.19	0.00	26	4.6	3.2	1.5	85	15	2.5	0.1	1.1	101	84	23
CONNEAUTE CREEK AT DRAKES MILL, NEAR CAMBRIDGE SPRINGS																					
Aug. 4, 1949 ----	27	76	10	6.9	194	4.3		0.02	0.00	28	5.4	3.3	1.4	90	18	2.8	0.1	3.8	120	92	27
LITTLE CONNEAUTE CREEK NEAR CAMBRIDGE SPRINGS																					
Aug. 4, 1949 ----	26	70	20	7.2	149	4.7		0.09	0.00	20	4.0	1.9	2.1	64	17	1.9	0.1	1.8	91	66	21

1/ Mean daily discharge.

1/Mean daily discharge.

ALLEGHENY RIVER TRIBUTARIES--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN ALLEGHENY RIVER TRIBUTARIES IN PENNSYLVANIA--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Instantaneous discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
WOODCOCK CREEK NEAR SAEGERTOWN																						
Aug. 5, 1949 ----	18	73	10	7.4	175	4.0		0.05	0.00	24	4.9	3.4	1.8	80	16	2.6	0.1	0.8	101	80	34	
CUSSEWAGO CREEK AT MEADVILLE																						
Aug. 5, 1949 ----	84	73	50	6.9	124	7.0		0.47	0.00	17	3.3	3.1	2.6	53	14	2.5	0.1	1.1	90	56	23	
CONNEAUT LAKE OUTLET NEAR CUSTARD																						
Aug. 3, 1949 ----	39	72	25	6.8	195	8.0		0.04	0.00	28	4.9	4.4	2.6	90	17	2.6	0.2	0.4	122	90	29	
LITTLE SUGAR CREEK AT COCHRANTON																						
Aug. 3, 1949 ----	10	80	15	8.6	189	5.3		0.06	0.00	27	5.3	3.5	2.3	2/94	15	2.6	0.1	0.2	111	89	22	
SUGAR CREEK AT SUGARCREEK																						
Aug. 3, 1949 ----	58	72	10	8.5	160	6.5		0.08	0.00	22	4.4	3.8	1.7	2/77	12	3.6	0.1	0.5	93	73	20	
MIDDLE FORK SUGAR CREEK NEAR BRADLEYTOWN																						
Aug. 3, 1949 ----	11	65	20	7.2	131	7.3		0.12	0.00	17	3.5	3.7	1.9	57	13	1.9	0.1	0.9	80	57	21	

2/Includes some carbonate (CO₃) as equivalent bicarbonate (HCO₃).

2/Includes some carbonate (CO₃) as equivalent bicarbonate (HCO₃).

MONONGAHELA RIVER BASIN

TYGART RIVER AT ELKINS, W. VA.

LOCATION.--At city water plant at Elkins, Randolph County, 2½ miles upstream from gaging station near Elkins.

DRAINAGE AREA.--268 square miles above water plant (272 square miles above gaging station) RECORDS AVAILABLE.--Water temperatures: January 1947 to September 1949.

EXTREMES, 1948-49.--Water temperatures: Maximum, 90°F July 6; minimum, freezing point Dec. 26, 27, 31, Jan. 1.

EXTREMES, 1947-49.--Water temperatures: Maximum, 90°F July 6, 1949; minimum, freezing point on many days during winter months.

REMARKS.--Discharge records for gaging station near Elkins for water year October 1948 to September 1949 given in Water-Supply Paper 1143. No appreciable inflow between water plant and gaging station except during periods of heavy local rains. During flood periods part of the flow is diverted around the water plant in a flood by-pass channel.

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	49	45	32	37	34	44	65	71	79	81	67
2	63	51	44	33	37	35	48	67	73	78	80	70
3	58	51	42	34	35	38	47	69	74	81	79	71
4	54	54	47	35	38	42	53	69	74	86	81	73
5	51	54	46	41	--	45	48	74	74	88	80	75
6	55	51	45	40	40	42	45	76	76	90	78	70
7	56	47	45	38	42	44	47	74	75	86	76	71
8	56	52	47	41	42	42	46	75	72	80	78	69
9	57	54	39	44	42	42	49	73	76	79	81	66
10	58	48	37	44	38	45	51	66	77	76	83	66
11	57	48	33	40	39	38	49	66	77	78	84	65
12	56	46	34	40	39	40	51	67	75	76	83	67
13	54	45	41	43	43	42	53	67	76	76	82	69
14	54	45	46	38	46	42	56	66	76	76	82	70
15	54	46	47	40	47	40	53	67	78	77	72	70
16	54	47	50	43	48	39	38	68	78	76	73	65
17	52	45	40	40	43	40	44	71	77	74	71	71
18	51	47	45	46	43	38	45	74	76	75	72	70
19	48	47	34	44	43	38	45	74	77	76	68	68
20	46	48	38	44	45	42	49	67	82	78	68	64
21	47	46	40	41	48	46	54	73	83	76	72	65
22	47	47	42	40	48	46	54	62	83	79	71	62
23	47	45	39	40	45	47	57	68	85	78	76	62
24	48	45	37	49	45	51	46	64	86	79	76	61
25	48	46	34	48	43	53	56	57	85	80	78	59
26	50	50	32	46	41	54	62	57	80	81	79	63
27	49	44	32	49	41	55	62	59	82	83	80	64
28	49	43	33	51	35	48	61	60	82	84	69	63
29	55	42	40	38	--	56	62	63	83	85	74	59
30	55	44	34	34	--	57	62	68	75	85	73	56
31	49	--	32	36	--	58	--	--	--	78	69	--
Average	53	48	40	41	42	44	51	67	78	80	76	66

MONONGAHELA RIVER BASIN--Continued
MONONGAHELA RIVER AT CHARLEROI, PA.

LOCATION.--At Mercantile Bridge Co. toll bridge, approximately 1½ miles downstream from gaging station at Charleroi, Washington County, and 1 mile downstream from lock 4.

DRAINAGE AREA.--5,213 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1944 to September 1949.

Water temperatures: October 1944 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 59 micromhos Nov. 1-10; minimum, 178 micromhos Dec. 1-10.

Water temperatures: Maximum, 89°F on several days in July and August; minimum, 36°F on several days in January and March.

EXTREMES, 1944-49.--Dissolved solids (1944-47): Maximum, 749 parts per million Sept. 11-20, 1946; minimum, 99 parts per million Feb. 11-20, 1946.

Total hardness (1944-47): Maximum, 399 parts per million Sept. 11-20, 1946; minimum, 52 parts per million Apr. 1-10, 1947.

Specific conductance: Maximum, 1,210 micromhos Sept. 11-20, 1946; minimum, 163 micromhos Nov. 21-30, 1945.

Water temperatures: Maximum, 86°F Sept. 1, 1948; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Discharge records for gaging station at Charleroi for water year October 1948 to September 1949 given in Water-Supply Paper 1143. No appreciable inflow between gaging station and sampling point except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1-10, 1948 --	2,546		12	3.75	417	5.6	2.2	0.09	0.62	25	8.5	19		0	145	5.0	0.1	3.8	226	120	120	28
Oct. 11-20 -----	2,846		1	3.80	386	--	--	--	--	--	--	--	--	0	139	6	--	1.6	--	--	--	46
Oct. 21-31 -----	2,721		1	3.85	455	--	--	--	--	--	--	--	--	0	173	9	--	2.0	--	--	--	54
Nov. 1-10 -----	3,493		6	3.55	591	--	--	--	--	--	--	--	--	0	213	6	--	--	--	--	--	94
Nov. 11-20 -----	4,886		5	3.75	442	5.4	1.4	0.04	.73	31	12	13		0	154	7	0	3.2	249	145	145	49
Nov. 21-30 -----	10,250		5	4.20	294	--	--	--	--	--	--	--	--	0	96	5.0	0	3.0	--	--	--	25
Dec. 1-10 -----	18,020		5	4.6	178	--	--	--	--	--	--	--	--	2	66	4	1	2.6	--	--	--	--
Dec. 11, 13-20 --	37,040		5	4.5	192	--	--	--	--	--	--	--	--	0	63	2.8	0	3.5	--	--	--	19
Dec. 12 -----	6,900		5	6.5	282	--	--	--	--	--	--	--	--	6	77	3	0	4	--	--	--	--
Dec. 21-31 -----	16,300		5	4.00	260	--	--	--	--	--	--	--	--	0	94	4.0	0	3.6	--	--	--	35
Jan. 1-4, 6-10, 1949	18,100		5	4.10	256	--	--	--	--	--	--	--	--	0	94	4.0	1	2.8	--	--	--	33
Jan. 5 -----	11,900		10	3.60	510	--	--	--	--	--	--	--	--	0	195	6	--	3.0	--	--	--	127
Jan. 11-20 -----	11,150		12	4.15	264	5.8	1.2	0.06	.35	20	6.9	6.6		0	91	4	2	2.6	153	89	50	35
Jan. 21-24 -----	17,640		10	4.10	285	--	--	--	--	--	--	--	--	0	107	4	1	3.0	--	--	--	30
Jan. 25-31 -----	48,200		10	4.40	199	--	--	--	--	--	--	--	--	0	76	6	0	3.8	--	--	--	10
Feb. 1-10 -----	20,950		10	4.10	242	--	--	--	--	--	--	--	--	0	90	4	0	2.2	--	--	--	22
Feb. 11-16, 20 --	16,350		5	3.90	307	--	--	--	--	--	--	--	--	0	113	3	0	2.5	--	--	--	29
Feb. 17, 18 -----	29,700		10	4.6	184	--	--	--	--	--	--	--	--	1	64	2	1	2.3	--	--	--	--
Feb. 19 -----	22,800		--	3.90	520	--	--	--	--	--	--	--	--	0	114	98	1	2.3	--	--	--	44
Feb. 21-28 -----	21,050		10	4.30	198	--	--	--	--	--	--	--	--	0	80	3	0	2.2	--	--	--	11
Mar. 1-10 -----	12,180		5	4.10	292	--	--	--	--	--	--	--	--	0	113	3	0	1.9	--	--	--	24
Mar. 11-20 -----	14,030		15	4.30	264	--	--	--	--	--	--	--	--	0	109	1	0	2.0	--	--	--	20
Mar. 21-31 -----	12,160		15	3.90	274	--	--	--	--	--	--	--	--	0	109	4	2	2.2	--	--	--	24

Apr. 1-10	11,530	5	4.30	289	6.2	1.0	.02	.58	23	8.0	9.9	0	111	2.3	.2	1.4	173	96	99	21
Apr. 11-20	12,070	20	4.40	263	--	--	.02	--	--	--	--	0	106	6	.0	1.8	--	--	--	16
Apr. 21-30	6,686	10	4.20	335	--	--	.02	--	--	--	--	0	138	4	.1	1.4	--	--	--	25
May 1-10	2,654	10	4.15	421	--	--	.02	--	--	--	--	0	176	8	.1	1.3	--	--	--	33
May 11-20	2,120	20	3.90	524	--	--	.04	--	--	--	--	0	204	2	.2	1.1	--	--	--	40
May 21-31	8,221	10	4.00	456	--	--	.15	--	--	--	--	0	191	6	.2	1.0	--	--	--	34
June 1-10	1,974	3	4.5	394	--	--	--	--	--	--	--	0	161	5.8	.2	.8	--	--	--	16
June 11-20	2,580	10	3.90	513	--	--	.08	--	--	--	--	0	203	8	--	1.4	--	--	--	31
June 21-30	2,456	3	3.70	409	--	--	.10	--	--	--	--	0	152	7	--	.4	--	--	--	32
July 1-10	1,857	1	3.90	574	--	--	.22	--	--	--	--	0	197	7	--	.7	--	--	--	41
July 11-15, 19	6,857	1	3.75	577	--	--	.11	--	--	--	--	0	215	8	--	.3	--	--	--	50
July 16-18, 20	6,830	1	3.70	312	--	--	.10	--	--	--	--	0	117	5	--	.5	--	--	--	22
July 19-23, 31	5,836	1	4.00	349	--	--	.03	--	--	--	--	0	146	8	.2	.9	--	--	--	24
July 26-29	3,942	2	4.30	230	--	--	.02	--	--	--	--	0	63	2	.1	.9	--	--	--	11
Aug. 1-10	1,695	5	3.80	427	--	--	.05	--	--	--	--	0	163	10	.1	3.0	--	118	118	53
Aug. 11-20	4,649	5	3.65	460	--	--	.10	--	--	--	--	0	163	8	.1	3.4	--	136	128	39
Aug. 21-31	3,134	5	3.95	327	--	--	.05	--	--	--	--	0	156	4	.1	2.8	--	167	97	17
Sept. 1-10	1,805	2	4.15	369	6.8	1.4	.07	.70	27	8.9	20	0	144	6.2	.1	1.0	226	116	116	19
Sept. 11-20	1,992	1	3.95	526	--	--	--	--	--	--	--	0	214	10	--	1.3	--	--	--	30
Sept. 21-30	1,213	1	3.85	462	--	--	--	--	--	--	--	0	179	10	--	2.6	--	--	--	24
Average	9,390	7	4.1	359	--	--	0.05	--	--	--	--	--	134	7.5	--	2.0	--	--	--	34

MONONGAHELA RIVER BASIN--Continued
MONONGAHELA RIVER AT CHARLEROI, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	51	46	37	42	41	52	57	65	79	79	75
2	66	--	45	37	43	42	52	58	67	80	79	75
3	65	53	45	36	42	41	53	61	68	81	79	73
4	65	54	46	37	42	42	52	62	69	82	79	75
5	64	55	--	38	42	45	52	62	70	82	79	75
6	63	--	45	--	42	44	50	--	61	82	79	74
7	63	54	45	36	41	42	50	64	70	82	79	74
8	62	54	43	37	42	41	50	65	69	81	80	73
9	63	54	43	40	41	42	51	65	70	81	81	72
10	60	53	42	39	40	41	51	65	69	80	80	72
11	60	52	42	39	39	40	51	65	72	82	81	70
12	60	52	43	39	40	39	52	65	72	81	81	69
13	60	52	44	--	40	40	52	--	72	81	81	68
14	59	51	42	39	40	40	55	65	74	79	82	68
15	59	50	43	41	42	39	53	65	75	79	80	67
16	59	51	43	41	42	39	51	66	75	78	80	67
17	58	51	47	42	45	39	53	67	74	78	79	66
18	57	50	46	42	46	36	51	--	76	77	78	66
19	57	50	46	40	46	36	51	69	77	78	76	64
20	56	51	47	41	46	36	52	68	77	78	76	65
21	54	50	46	42	46	39	54	68	77	78	77	72
22	55	50	45	42	46	39	54	67	77	79	76	71
23	54	50	--	41	46	39	54	68	77	79	76	71
24	54	49	43	43	45	45	53	67	77	80	75	72
25	--	50	--	42	45	41	54	68	77	81	75	70
26	52	48	40	44	45	40	55	68	77	80	76	70
27	52	48	--	46	46	50	56	68	77	79	76	70
28	52	48	--	47	43	50	57	63	78	81	78	71
29	52	48	39	46	--	50	57	63	77	81	76	70
30	52	47	39	44	--	52	57	64	79	81	76	70
31	51	--	37	43	--	54	--	64	--	80	75	--
Average	58	51	44	41	43	42	53	65	73	80	78	70

MONONGAHELA RIVER BASIN--Continued

YOUGHIOGHENY RIVER AT SUTERSVILLE, PA.

LOCATION.--At highway bridge, approximately 2 miles downstream from Sewickley Creek, Westmoreland County, and 500 feet downstream from gaging station at Sutersville.

DRAINAGE AREA.--1,715 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 296 microhos Mar. 11-20; minimum, 121 microhos Jan. 21-31.

Water temperatures: Maximum, 79°F July 6; minimum, 33°F Dec. 25-27.

EXTREMES, 1947-48.--Dissolved solids (1947-48): Maximum, 563 parts per million Oct. 11-20, 1947; minimum, 68 parts per million May 4-10, 1948.

Total hardness (1947-48): Maximum, 302 parts per million Oct. 1-10, 1947; minimum, 38 parts per million May 4-10, 1948.

Specific conductance: Maximum, 1,060 microhos Oct. 11-20, 1947; minimum, 108 microhos May 4-10, 1948.

Water temperatures: Maximum, 84°F July 16, 1948; minimum, freezing point on several days during winter months.

REMARKS.--Samples collected from point about 75 feet from west left bank. Some differences in quality across river occur owing to influence of Sewickley Creek. Records of specific conductance and pH of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1143.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F)	pH	Specific conductance (microhos at 25° C)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																			Total	Non-carbonate	
Oct. 1-10, 1948 --	1,327		10	4.20	4.3	0.5	0.02	1.1	20	4.7	13	1.4	0	92	3.8	0.1	1.3	149	77	77	41
Oct. 11-20 -----	1,579		--	4.5	4.0	.6	.02	.65	17	5.2	10	1.0	--	79	1.8	.1	2.2	129	66	--	--
Oct. 21-31 -----	1,207		5	4.6	270	--	--	--	--	--	--	--	2	100	2	--	.4	--	--	--	--
Nov. 1-10 -----	1,651		5	4.7	213	--	.03	--	--	--	--	--	2	76	6	--	.9	--	--	--	--
Nov. 11-20 -----	2,059		5	4.8	200	--	.04	--	--	--	--	--	2	72	6	--	1.3	--	--	--	--
Nov. 21-30 -----	2,921		5	5.3	160	--	.06	--	--	--	--	--	4	54	4	--	2.1	--	--	--	--
Dec. 1-10 -----	3,022		5	5.4	149	--	.01	--	--	--	--	--	3	54	6	--	3.4	--	--	--	--
Dec. 11-20 -----	8,314		5	5.5	125	--	.01	--	--	--	--	--	2	43	4	--	2.5	--	--	--	--
Dec. 21-31 -----	4,989		5	4.9	151	--	.02	--	--	--	--	--	1	53	3	--	2.8	--	--	--	--
Jan. 1-10, 1949 --	5,689		5	5.3	137	--	.03	--	--	--	--	--	2	42	7	--	3.5	--	--	--	--
Jan. 11-14, 19 20	3,762		5	4.6	142	5.3	.02	25	12	3.7	--	2.6	1	46	2	.1	3.5	81	49	48	26
Jan. 15-18 -----	2,440		7	4.40	204	5.8	.04	35	17	5.2	--	5.1	0	74	2	.1	3.2	120	72	72	53
Jan. 21-31 -----	11,360		5	5.7	121	--	.02	--	--	--	--	--	4	38	2.5	.0	1.8	--	--	--	--
Feb. 1-10 -----	6,385		10	4.7	130	--	.00	--	--	--	--	--	1	49	2	.1	3.2	--	--	--	--
Feb. 11-20 -----	4,982		5	4.7	130	--	.00	--	--	--	--	--	0	51	2	.1	3.2	--	--	--	--
Feb. 21-28 -----	6,560		5	5.6	24	--	.00	--	--	--	--	--	4	46	2	.1	2.8	--	--	--	--
Mar. 1-10 -----	5,176		10	5.0	132	--	.00	--	--	--	--	--	5	56	1	--	2.7	--	--	--	--
Mar. 11-20 -----	3,685		10	5.0	187	--	.00	--	--	--	--	--	3	85	3	.1	2.7	--	--	--	--
Mar. 21-31 -----	3,202		10	4.5	180	--	.02	--	--	--	--	--	0	68	4	.1	2.5	--	--	--	--

Apr. 1-10-----	4,246	5 5.2	154	6.0	--	--	00	.20	13	4.3	6.6	2	56	2.4	.1	1.2	94	50	48	--
Apr. 11-20-----	2,494	5 4.9	188				--	--	--	--	--	1	69	4	--	1.2	--	--	--	--
Apr. 21-30-----	2,524	10 5.4	184				00	--	--	--	--	3	68	2	--	1.7	--	--	--	--
May 1-10-----	1,526	5 4.20	246				--	--	--	--	--	0	96	2	--	1.4	--	--	--	14
May 11-20-----	1,288	3 3.90	296				--	--	--	--	--	0	110	2.6	.1	.6	--	--	--	18
May 21-31-----	2,212	3 4.30	218				--	--	--	--	--	0	83	2.2	.1	1.4	--	--	--	12
June 1-10-----	1,127	3 4.00	274				--	--	--	--	--	0	105	2.9	.1	.8	--	--	--	16
June 11, 13-20	1,241	1 3.95	285				.04	--	--	--	--	0	101	2	--	.7	--	--	--	16
June 21-----	1,120	1 4.6	149				--	--	--	--	--	0	51	1	--	2.2	--	--	--	4
June 21-30-----	1,339	5 4.20	253				.03	--	--	--	--	0	91	2	--	1.5	--	--	--	10
July 1-10-----	1,034	1 4.05	280				--	--	--	--	--	0	102	2	--	1.1	--	--	--	13
July 11-20-----	1,469	4 4.15	252				.04	--	--	--	--	0	91	3	--	1.4	--	--	--	11
July 21-31-----	1,624	2 4.30	231				.02	--	--	--	--	0	84	2	.1	2.0	--	--	--	10
Aug. 1-10-----	1,597	4 4.35	217				--	--	--	--	--	0	87	4	--	1.6	--	--	--	10
Aug. 11-20-----	2,734	2 4.8	205				--	--	--	--	--	2	78	2	--	1.8	--	--	--	--
Aug. 21-31-----	1,786	1 4.40	218				--	--	--	--	--	0	85	2	--	1.6	--	--	--	10
Sept. 1-10-----	1,589	4 4.5	213	5.7	.3	.10	--	.40	17	5.5	9.5	0	80	2.5	.1	1.4	127	68	68	9
Sept. 11-20-----	1,219	5 4.10	227				--	--	--	--	--	0	83	2	--	1.0	--	--	--	8
Sept. 21-30-----	1,291	3 4.00	238				--	--	--	--	--	0	84	2	--	.8	--	63	63	9
Average-----	3,037	5 4.6	199				--	--	--	--	--	--	73	2.9	--	1.9	--	--	--	--

MONONGAHELA RIVER BASIN--Continued
 YOUGHIOGHENY RIVER AT SUTERSVILLE, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949												
Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	52	43	34	36	38	53	61	60	72	68	67
2	64	51	40	35	36	35	46	60	63	72	70	63
3	60	54	42	34	36	38	45	62	65	74	72	65
4	61	54	40	37	40	39	48	64	65	75	71	69
5	62	58	41	41	38	40	48	70	66	77	72	--
6	56	56	44	40	38	39	45	65	66	79	72	68
7	59	54	43	40	40	39	45	68	68	78	72	66
8	60	52	42	39	40	39	46	66	62	75	72	65
9	57	52	38	42	41	40	44	64	62	73	73	62
10	56	50	38	42	40	41	46	62	65	72	74	66
11	58	48	38	41	38	39	49	55	67	72	75	62
12	57	42	41	35	35	35	52	57	68	74	74	63
13	57	46	44	38	44	38	56	57	70	70	73	65
14	55	46	45	38	44	38	59	60	72	68	73	65
15	55	43	44	38	49	39	55	62	71	71	70	65
16	52	46	45	44	46	37	49	63	72	68	74	64
17	52	50	43	42	43	36	48	61	70	72	71	65
18	52	48	40	43	47	38	49	64	70	72	68	67
19	50	50	37	44	41	34	46	72	70	72	66	69
20	50	50	38	39	42	34	48	62	71	74	59	65
21	50	47	39	37	44	42	51	59	71	75	59	60
22	50	46	39	38	44	45	52	61	71	75	60	64
23	50	46	37	43	44	45	51	62	71	74	66	61
24	50	45	36	--	43	47	50	60	72	75	67	60
25	51	44	33	40	43	49	51	57	72	76	68	59
26	50	44	33	45	41	50	55	58	78	77	75	59
27	50	45	33	--	41	50	60	54	78	78	72	59
28	51	46	39	46	40	55	59	53	74	77	72	62
29	50	42	43	44	--	56	59	54	72	76	76	60
30	49	44	39	35	--	55	50	54	69	77	67	56
31	50	--	36	37	--	56	--	57	--	70	68	--
Average	55	48	40	40	41	42	51	61	69	74	70	63

BEAVER RIVER BASIN

BEAVER RIVER AT NEW BRIGHTON, PA.

LOCATION.--At head of intake canal of Beaver Falls Municipal Authority, 3 miles upstream from mouth, and 2.5 miles downstream from gaging station at Beaver Falls, Beaver County.

DRAINAGE AREA.--3,112 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1949.

Water temperatures: October 1945 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 517 micromhos Oct. 1-10; minimum, 277 micromhos Apr. 1-10.

Water temperatures: Maximum, 88°F July 6; minimum, freezing point Dec. 27.

EXTREMES, 1945-49.--Dissolved solids (1945-47): Maximum, 362 parts per million Nov. 21-30, 1946; minimum, 136 parts per million Apr. 1-10, 1947.

Total hardness (1945-47): Maximum, 199 parts per million Nov. 11-30, 1946; minimum, 85 parts per million Mar. 1-10, 1946.

Specific conductance: Maximum, 665 micromhos Feb. 1-10, 1948; minimum, 210 micromhos June 1-10, 1947, Feb. 15-20, 1948.

Water temperatures: Maximum, 88°F July 6, 1949; minimum, freezing point Feb. 7, 11, 1947, Dec. 27, 1948.

REMARKS.--Intake canal located on east bank of river. Samples collected by Beaver Falls Municipal Authority. Records of specific conductance of daily samples available in district office at Philadelphia, Pa. Records of discharge for water year October 1948 to September 1949 based on records for Beaver River at Beaver Falls which are given in Water-Supply Paper 1143.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Oct. 1-10, 1948--	936		15	6.8	517	4.0		0.05	0.25	58	11	25		36	156	28	0.7	13	338	190		160
Oct. 11-20-----	1,526		7	6.7	503	--	--	--	--	--	--	--	--	41	143	30	--	12	--	--	--	--
Oct. 21-31-----	1,038		12	6.7	452	--	--	--	--	--	--	--	--	36	129	24	--	12	--	--	--	--
Nov. 1-10-----	1,215		15	6.5	506	--	--	--	--	--	--	--	--	44	147	--	--	--	--	--	--	--
Nov. 11-20-----	1,282		15	6.6	484	6.0		02	0	52	11	25		50	136	31	.0	3.8	306	175		134
Nov. 21-30-----	3,195		15	6.5	404	--	--	--	--	--	--	--	--	41	102	23	--	7.4	--	--	--	--
Dec. 1-10-----	2,311		15	6.7	378	--	--	--	--	--	--	--	--	32	99	24	--	6.8	--	--	--	--
Dec. 11-20-----	7,678		50	6.3	333	--	--	--	--	--	--	--	--	33	94	20	--	3.1	--	--	--	--
Dec. 21-31-----	3,123		15	6.6	339	--	--	--	--	--	--	--	--	28	91	18	--	8.1	--	--	--	--
Jan. 1-10, 1949--	6,921		10	6.7	280	--	--	--	--	--	--	--	--	28	73	12	--	7.4	--	--	--	--
Jan. 11-20-----	3,144		10	6.8	339	7.5		.06	0	38	8.5	13		28	99	18	.1	8.2	215	129		107
Jan. 21-31-----	12,080		15	6.9	280	--	--	--	--	--	--	--	--	29	73	12	--	6.8	--	--	--	--
Feb. 1-10-----	5,103		15	6.8	321	--	--	--	--	--	--	--	--	35	96	14	--	1.6	--	--	--	--
Feb. 11-20-----	6,540		30	7.0	281	--	--	--	--	--	--	--	--	33	82	12	--	4.0	--	--	--	--
Feb. 21-28-----	8,289		15	7.1	259	--	--	--	--	--	--	--	--	31	90	12	--	3.5	--	--	--	--
Mar. 1-10-----	4,632		15	7.0	300	--	--	--	--	--	--	--	--	33	88	14	--	4.0	--	--	--	--
Mar. 11-20-----	3,880		15	7.0	310	--	--	--	--	--	--	--	--	30	96	15	--	3.0	--	--	--	--
Mar. 21-31-----	5,214		15	6.4	293	--	--	--	--	--	--	--	--	30	89	14	--	4.0	--	--	--	--

BEAVER RIVER BASIN--Continued
BEAVER RIVER AT NEW BRIGHTON, PA.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-foot)	Temperature (° F.)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Aluminum (Al)	Iron (Fe)	Manganese (Mn)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃		Total acidity as H ₂ SO ₄
																				Total	Non-carbonate	
Apr. 1-10, 1949	5,896		15	7.1	277	6.8		0.08	0.0	31	7.6		9.0	33	77	14	0.3	3.1	175	106	82	
Apr. 11-20	2,928		15	6.6	338									42	105	16	--	3.8	--	--	--	
Apr. 21-30	4,278		15	6.7	321									43	100	16	--	3.4	--	--	--	
May 1-10	1,883		15	6.7	359									42	105	19	--	3.6	--	--	--	
May 11-20	1,164		15	6.8	494									47	150	26	--	4.2	--	--	--	
May 21-31	--		10	6.9	315									43	80	12	--	3.8	--	--	--	
June 1-10	1,104		7	6.8	442									40	137	22	.6	8.0	--	--	--	
June 11-20	1,064		20	6.8	488			.0						39	150	25	.8	5.4	--	--	--	
June 21-30	1,211		25	7.0	436			.0						43	130	22	.6	5.6	--	--	--	
July 1-10	1,200		15	7.1	436			.0						49	122	23	.7	6.3	--	--	--	
July 11-20	1,295		5	7.2	413									48	117	20	.6	5.2	--	--	--	
July 21-31	1,703		7	6.9	416			.04						46	123	19	.4	8.2	--	--	--	
Aug. 1-10	1,299		10	6.9	405									45	115	21	.4	4.7	--	--	156	119
Aug. 11-20	967		10	6.9	452									42	135	22	.8	4.6	--	--	169	135
Aug. 21-31	887		5	6.6	470									32	156	23	.8	3.9	--	--	--	
Sept. 1-10	999		30	6.8	453	5.4		.14	.0	51	11	11		44	131	24	.0	4.2	289	172	136	
Sept. 11-20	778		5	6.8	499									50	153	22	.6	4.4	--	--	--	
Sept. 21-30	780		10	6.6	515									40	170	24	.7	5.6	--	--	--	
Average	3,080		15	6.8	392	--		--	--	--	--	--	--	38	115	20	--	5.6	--	--	--	

BEAVER RIVER BASIN--Continued

BEAVER RIVER AT NEW BRIGHTON, PA.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	72	58	46	40	37	40	56	83	66	84	78	78
2	70	59	46	38	37	39	48	66	70	84	78	73
3	70	58	46	38	37	40	45	65	72	84	80	72
4	68	60	45	38	38	41	49	--	--	85	80	77
5	67	60	46	42	40	42	50	70	76	84	80	74
6	66	60	46	42	39	46	50	72	76	88	80	78
7	66	61	47	40	41	--	49	72	78	80	81	78
8	64	60	46	39	40	43	49	72	74	83	82	77
9	63	58	45	42	42	45	49	71	67	84	82	71
10	64	57	44	45	41	45	50	69	74	83	84	71
11	64	55	43	45	40	44	--	66	75	80	84	76
12	62	55	44	45	40	41	54	67	71	82	84	70
13	60	53	43	44	40	41	57	66	80	82	79	70
14	60	51	44	43	40	41	61	67	80	82	84	70
15	61	52	47	43	43	40	63	65	--	83	84	71
16	60	51	45	45	43	40	59	70	80	83	84	71
17	63	52	46	47	41	40	52	72	80	84	82	71
18	61	50	--	48	40	41	--	73	82	82	80	72
19	53	53	41	48	41	41	52	75	81	81	80	72
20	54	52	41	47	40	42	--	76	82	82	79	72
21	54	55	41	45	43	40	52	--	81	82	79	70
22	55	52	42	44	42	44	56	68	84	82	78	70
23	53	51	43	43	42	49	58	67	--	82	79	64
24	55	51	42	44	43	49	56	65	82	82	78	64
25	56	50	41	45	43	50	55	68	85	82	78	63
26	76	48	40	45	43	53	--	66	85	83	79	61
27	56	48	32	44	44	56	60	64	84	84	79	65
28	57	50	39	43	42	--	62	67	84	85	81	66
29	57	48	39	43	--	56	63	60	82	85	81	62
30	56	48	42	37	--	58	61	60	84	86	80	64
31	57	--	40	38	--	57	--	62	--	83	79	--
Average	61	54	43	43	41	45	54	68	78	83	81	70

MUSKINGUM RIVER BASIN

TUSCARAWAS RIVER AT NEWCOMERSTOWN, OHIO

LOCATION.--At gaging station at highway bridge, three-quarters of a mile south of Newcomerstown, Tuscarawas County, 2 miles upstream from Buckhorn Creek, and 4 miles downstream from Dunlap Creek.

DRAINAGE AREA.--2,436 square miles.

RECORDS AVAILABLE.--Chemical analyses: July 1946 to September 1948.

Water temperatures: July 1946 to May 1949.

EXTREMES.--1946-49.--Dissolved solids (1946-47) : Maximum, 3,490 parts per million.

Sept. 21-30, 1946; minimum, 307 parts per million July 14, 1946.

Total hardness (1946-47) : Maximum, 1,540 parts per million Sept. 21-30, 1946; minimum, 191 parts per million June 1-10, 1947.

Water temperatures: Maximum, 82°F Aug. 29, 1948; minimum, freezing point on many days during winter months.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1143. Records of specific conductance and chloride of daily samples available in district office at Columbus, Ohio.

Temperature (°F) of water, October 1948 to May 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	54	42	33	32	41	49	72				
2	63	54	42	34	32	42	49	71				
3	62	54	41	34	35	41	48	72				
4	70	54	41	34	36	41	48	70				
5	58	54	41	--	37	43	48	68				
6	56	54	41	--	37	43	49	65				
7	56	54	41	--	38	42	49	65				
8	56	54	41	--	38	42	48	--				
9	56	53	37	--	40	43	47	--				
10	56	50	37	--	39	42	50	--				
11	56	49	37	--	39	40	51	--				
12	55	49	37	--	39	41	55	--				
13	55	--	37	--	40	41	55	--				
14	55	--	41	--	40	39	55	--				
15	53	--	41	--	41	37	54	--				
16	56	46	41	--	41	37	54	--				
17	54	45	41	--	41	37	50	--				
18	53	45	38	--	42	37	47	--				
19	51	46	38	--	41	39	46	--				
20	50	47	38	--	42	40	45	--				
21	49	46	38	41	41	45	52	--				
22	49	47	36	41	41	45	53	--				
23	49	45	38	42	40	47	54	--				
24	49	45	36	42	40	48	54	--				
25	49	43	--	42	39	49	55	--				
26	49	45	34	41	40	50	55	--				
27	50	45	34	41	39	53	57	--				
28	50	43	33	40	40	53	59	--				
29	48	43	34	40	--	54	60	--				
30	48	43	35	35	--	55	60	--				
31	50	--	34	32	--	55	--	--				
Average	54	48	38	--	39	44	52	--				

LITTLE KANAWHA RIVER BASIN

LITTLE KANAWHA RIVER AT GLENVILLE, W. VA.

LOCATION.--At water plant at Glenville, Gilmer County, half a mile upstream from gaging station at Glenville.

DRAINAGE AREA.--386 square miles above gaging station.

RECORDS AVAILABLE.--October 1946 to September 1949.

EXTREMES, 1948-49.--Water temperatures: Maximum, 78°F June 27-30; minimum, 32°F Dec. 31, Feb. 27, 28.

EXTREMES, 1946-49: Water temperatures: Maximum, 86°F Aug. 22, 1947; minimum, 32°F on many days during winter months.

REMARKS.--Record of water temperatures furnished by West Virginia Water Service Co.

Discharge records for gaging station at Glenville for water year October 1948 to September 1949 given in Water-Supply Paper 1143.

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	56	46	35	36	38	47	62	63	68	74	66
2	62	56	46	34	36	38	48	62	64	68	74	64
3	64	55	44	35	36	36	48	64	65	70	74	62
4	62	54	46	35	38	34	50	64	65	77	72	60
5	60	54	47	36	38	34	48	65	65	74	72	60
6	58	52	47	36	40	36	46	65	66	73	74	58
7	56	54	47	40	40	37	44	65	66	74	72	56
8	54	50	46	42	40	38	44	65	66	73	71	56
9	54	48	46	45	40	37	45	64	67	73	72	57
10	54	46	46	44	38	36	46	60	67	72	74	57
11	54	44	45	44	38	35	47	60	68	74	74	58
12	54	42	45	42	36	34	47	60	68	74	75	58
13	52	44	45	42	36	34	47	60	69	76	75	59
14	50	44	45	44	36	35	46	60	70	76	75	59
15	48	44	45	45	36	35	46	60	70	76	72	60
16	48	40	45	46	36	36	46	60	70	76	68	62
17	46	38	44	47	37	37	46	62	70	74	66	62
18	46	38	44	48	37	36	47	62	72	74	64	60
19	47	38	43	48	37	34	48	64	72	72	67	59
20	47	40	42	48	36	34	50	64	74	70	60	58
21	46	40	40	46	36	36	50	65	74	70	60	56
22	46	42	40	44	36	38	50	65	76	68	60	56
23	46	44	38	46	37	40	52	64	74	68	60	54
24	47	44	38	48	38	42	50	62	74	68	59	53
25	47	44	36	49	37	44	52	60	76	70	60	52
26	47	44	35	49	34	46	52	57	76	70	62	52
27	47	44	34	49	32	50	56	55	78	72	64	52
28	48	44	35	49	32	50	56	55	78	72	66	51
29	48	45	36	46	--	50	56	56	78	72	64	50
30	48	45	34	44	--	50	58	57	78	72	64	52
31	48	--	32	44	--	50	--	58	--	72	64	--
Average	51	46	42	44	37	39	49	61	71	72	68	57

KANAWHA RIVER BASIN--Continued

NEW RIVER AT HINTON, W. VA.

LOCATION.--At water plant at Hinton, Summers County, 500 feet upstream from gaging station at Hinton.

DRAINAGE AREA.--6,257 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1949.

EXTREMES, 1948-49.--Water temperatures: Maximum, 82°F July 26-30; minimum, 34°F Dec. 28. August 1948; minimum, freezing point on many days during winter months.

REMARKS.--Record of water temperatures furnished by West Virginia Water Service Co. Discharge records for gaging station at Hinton for water year October 1948 to September 1949 given in Water-Supply Paper 1143.

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	53	45	37	39	40	55	58		76	78	71
2	67	53	45	36	38	38	54	59		74	78	70
3	67	54	45	36	37	38	53	60		74	79	70
4	64	54	45	36	37	39	52	60		75	78	70
5	63	55	47	37	38	40	52	62		77	78	71
6	61	57	47	39	40	43	51	63		80	78	73
7	60	58	46	42	41	41	49	67		81	77	73
8	60	56	46	42	41	42	48	66		80	76	73
9	59	54	44	42	42	42	47	66		79	78	71
10	59	53	43	42	43	43	49	66		77	78	70
11	59	51	41	44	41	42	49	64		76	79	69
12	59	49	40	44	40	41	50	61		76	80	68
13	59	49	40	44	41	40	51	60		75	80	67
14	58	48	41	44	42	40	52	61		75	78	67
15	57	48	43	43	42	40	53	62		74	79	67
16	57	46	46	43	45	39	52	64		71	78	69
17	57	47	48	43	44	40	50	65		72	76	69
18	57	47	48	45	44	41	49	67		72	74	71
19	54	48	46	44	43	41	48	68		72	74	71
20	53	48	44	44	44	41	48	68		72	74	71
21	52	49	43	43	44	42	50	69		72	72	69
22	51	49	43	42	47	44	52	68		74	71	69
23	51	49	42	43	46	46	53	67		76	70	68
24	52	49	41	44	46	48	54	67		77	71	65
25	53	48	40	45	45	50	54	65		78	72	63
26	52	47	37	46	45	51	54	63		79	74	62
27	52	47	36	47	44	53	56	61		81	76	63
28	52	47	34	48	43	53	57	61		82	76	63
29	52	46	35	48	--	52	59	60		82	74	63
30	52	45	35	45	--	53	58	61		82	72	60
31	51	--	37	41	--	54	--	63		81	71	--
Average	57	50	42	43	42	44	52	64	--	77	76	68

KANAWHA RIVER BASIN--Continued

GREENBRIER RIVER AT ALDERSON, W. VA.

LOCATION.--At city water plant at Alderson, Monroe County, 900 feet upstream from highway bridge, and 500 feet upstream from gaging station at Alderson.

DRAINAGE AREA.--1,357 square miles.

RECORDS AVAILABLE.--October 1946 to March 1949.

REMARKS.--Discharge records for gaging station at Alderson for water year October 1948 to September 1949 given in Water-Supply Paper 1143.

Temperature (°F) of water, October 1948 to March 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	50	44	35	38	40						
2	64	54	44	--	37	38						
3	--	54	44	36	36	38						
4	64	54	44	36	38	39						
5	60	56	--	38	40	--						
6	58	--	46	40	--	--						
7	56	--	45	42	42	42						
8	58	54	44	42	43	41						
9	58	53	42	--	43	42						
10	--	50	40	44	44	43						
11	58	50	38	44	41	42						
12	58	48	--	45	39	39						
13	56	46	40	44	--	--						
14	56	--	41	43	45	40						
15	56	--	--	43	45	40						
16	56	--	46	--	45	38						
17	--	--	48	44	46	40						
18	54	44	47	44	44	41						
19	52	48	--	45	--	--						
20	50	49	48	45	--	--						
21	48	--	48	42	44	42						
22	46	47	48	42	45	42						
23	47	47	49	--	47	45						
24	--	47	49	45	47	45						
25	50	47	40	45	45	50						
26	50	44	36	48	44	51						
27	50	44	34	48	--	--						
28	50	--	34	50	42	53						
29	50	44	35	--	--	53						
30	--	42	36	--	--	54						
31	--	--	36	45	--	56						
Average	55	-- ^a	44	43	43	44						

KANAWHA RIVER BASIN--Continued

KNAPP CREEK AT MARLINTON, W. VA.

LOCATION.--At city water plant at Marlinton, Pocahontas County, 1 mile upstream from mouth, and 2 miles downstream from gaging station at Marlinton.

DRAINAGE AREA.--108 square miles above gaging station.

RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1949.

EXTREMES, 1948-49.--Water temperatures: Maximum, 76°F July 29-31; minimum, freezing point on many days during winter months.

EXTREMES, 1946-49.--Water temperatures: Maximum, 78°F June 21, 22, 1948; minimum, freezing point on many days during winter months.

REMARKS.--Discharge records for gaging station at Marlinton for water year October 1948 to September 1949 given in Water-Supply Paper 1143.

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	60	48	40	31	32	31	50	51	60	63	67	60
2	59	48	38	31	31	31	47	52	60	66	67	61
3	58	49	42	32	31	35	44	54	63	69	69	61
4	57	50	44	34	35	33	45	54	63	73	71	62
5	51	50	43	35	36	34	44	55	63	73	73	65
6	50	49	45	38	36	39	45	54	64	74	71	68
7	53	48	40	36	34	35	45	58	63	75	72	67
8	55	46	40	36	36	34	45	60	62	73	69	68
9	52	44	40	38	38	38	45	58	62	72	70	53
10	53	47	36	40	40	40	41	58	60	65	69	51
11	54	41	32	43	32	36	44	55	62	66	69	57
12	54	44	34	42	32	34	46	52	63	69	72	58
13	53	43	38	37	37	33	48	53	66	68	73	59
14	52	40	42	38	41	34	47	54	69	65	73	62
15	50	39	44	37	43	36	48	58	68	62	72	63
16	48	39	46	35	43	31	44	60	65	65	69	65
17	52	39	44	35	38	36	43	59	70	68	65	64
18	49	39	38	40	36	38	44	59	70	65	64	65
19	40	43	32	40	39	34	41	61	71	63	66	64
20	42	46	32	37	42	37	41	62	69	67	65	59
21	40	48	33	34	43	43	45	60	66	68	68	51
22	44	48	33	36	45	40	46	56	68	67	65	53
23	41	47	32	40	42	41	46	56	67	70	63	54
24	41	44	34	43	39	43	45	56	72	73	63	54
25	42	42	32	44	40	45	46	55	73	74	64	51
26	41	40	32	44	37	46	48	53	73	73	69	53
27	42	42	31	45	37	49	54	49	72	74	70	53
28	42	40	31	45	36	47	51	51	71	75	67	55
29	42	42	31	41	--	43	51	52	69	76	64	56
30	43	41	35	34	--	46	51	54	64	76	60	50
31	43	--	34	31	--	51	--	60	--	76	62	--
Average	48	44	37	38	38	38	46	56	66	70	68	59

MISCELLANEOUS ANALYSES OF STREAMS IN KANAWHA RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
SOUTH FORK NEW RIVER NEAR JEFFERSON																		
Dec. 30, 1948 -----	1,420	6	8.4	29.8	7.8	0.00	3.4	1.2	0.0	0.0	10	2.2	1.1	0.0	1.8	29	13	5
Apr. 12, 1949 -----	615	2	8.6	28.0	7.2	.01	2.7	1.0	1.0	1.0	11	1.6	1.0	.1	.8	25	11	2
NORTH FORK NEW RIVER AT CRESTON																		
Aug. 10, 1949 -----	88.8	8	8.5	17.1	11	0.05	4.6	1.6	2.0	2.0	23	1.4	1.0	0.1	0.7	40	18	0

BIG SANDY RIVER BASIN

TUG FORK AT KERMIT, W. VA.

LOCATION.--At city water plant at Kermit, Mingo County, three-quarters of a mile downstream from Wolf Creek, and 3 miles downstream from gaging station near Kermit.
DRAINAGE AREA.--1,274 square miles above water plant (1,185 square miles above gaging station).

RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1949.

EXTREMES, 1948-49.--Water temperatures: Maximum, 90°F July 29; minimum, 35°F Dec. 26, 28

EXTREMES, 1946-49.--Water temperatures: Maximum, 90°F July 29, 1949; minimum, freezing point Feb. 5, 1947.

REMARKS.--Discharge records for gaging station near Kermit for water year October 1948 to September 1949 given in Water-Supply Paper 1143.

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	67	49	49	40	42	40	55	60	72	81	79	73
2	66	48	49	36	42	42	53	61	72	80	78	70
3	65	50	48	37	38	44	52	62	72	84	78	71
4	63	51	54	40	46	43	50	63	73	85	80	75
5	60	52	52	45	45	45	51	66	73	83	79	76
6	61	51	50	37	43	47	50	66	73	86	80	76
7	59	57	42	45	45	45	51	68	73	83	81	74
8	59	54	45	46	45	39	53	68	70	88	82	73
9	59	53	48	47	44	50	51	69	71	86	86	66
10	60	55	42	47	45	48	52	67	72	78	84	64
11	61	50	38	49	42	45	53	66	72	76	81	66
12	57	48	44	48	43	47	54	67	76	74	81	67
13	54	50	43	47	43	44	56	68	75	74	83	70
14	55	49	46	46	50	45	59	66	78	75	83	74
15	54	48	50	48	52	42	60	68	79	76	82	68
16	56	48	55	49	51	39	55	69	80	80	80	69
17	66	49	53	52	48	42	51	70	81	78	78	67
18	50	49	52	48	44	43	49	72	82	78	76	72
19	46	50	48	52	46	--	52	72	83	74	80	74
20	47	51	45	46	48	42	53	71	81	80	76	69
21	46	46	46	46	48	42	55	72	81	81	74	69
22	50	49	45	47	54	43	54	72	80	82	74	68
23	46	49	42	47	50	50	54	72	78	84	75	66
24	45	49	40	48	50	53	55	72	78	87	74	62
25	45	49	44	55	47	55	56	68	82	84	75	65
26	46	49	35	53	48	57	58	68	82	83	76	62
27	46	49	36	53	48	56	58	66	83	82	78	63
28	50	49	35	56	47	55	59	64	79	84	74	64
29	48	49	38	52	--	53	60	66	81	90	74	63
30	49	49	40	40	--	55	59	65	82	85	73	57
31	50	--	38	46	--	56	--	68	--	81	73	--
Average	54	50	45	47	46	47	54	67	77	81	78	68

SCIOTO RIVER BASIN

OLENTANGY RIVER NEAR DELAWARE, OHIO

LOCATION.--At Stone Mill Bridge $1\frac{1}{2}$ miles north of Delaware, Delaware County, and 4 miles downstream from gaging station near Delaware.

DRAINAGE AREA.--387 square miles above gaging station.

RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1949.

EXTREMES, 1948-49.--Water temperatures: Maximum, 88°F July 5-6, 8; minimum, freezing point on days during winter months.

EXTREMES, 1946-49.--Water temperatures: Maximum, 88°F Aug. 27, 1948, July 5-6, 8, 1949; minimum, freezing point on many days during winter months.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1143.

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	65	52	39	31	32	36	50	67	75	86	76	66
2	64	52	39	32	32	35	45	67	75	86	78	70
3	60	54	38	33	32	40	53	72	80	86	76	65
4	58	54	38	35	32	44	55	74	74	87	76	74
5	56	56	40	37	32	45	47	78	76	88	82	75
6	56	54	41	35	32	41	48	77	76	88	82	71
7	56	52	41	35	32	37	49	70	76	87	80	75
8	54	50	37	35	34	47	47	69	75	88	86	68
9	53	49	35	39	36	42	49	64	76	87	86	68
10	52	47	33	38	35	36	53	63	76	86	87	68
11	52	45	33	36	34	37	57	63	73	84	86	70
12	52	44	33	36	35	36	61	60	73	85	80	70
13	53	44	38	36	36	34	58	67	78	83	77	70
14	55	43	42	36	40	39	63	60	78	83	81	68
15	56	43	42	34	44	37	47	67	78	82	81	66
16	51	44	41	43	42	35	45	75	75	78	78	64
17	50	44	40	40	38	39	40	75	75	76	76	59
18	48	45	38	39	39	39	41	75	75	77	79	69
19	48	47	37	37	38	37	45	75	75	85	74	68
20	47	47	36	36	42	47	49	60	85	80	74	64
21	47	47	37	35	40	52	59	69	82	80	77	66
22	48	45	37	34	39	56	58	66	82	81	77	67
23	49	45	36	36	39	46	56	69	82	80	77	62
24	50	44	34	40	39	55	50	67	83	85	81	60
25	50	43	32	40	38	61	54	64	78	86	83	63
26	51	42	32	39	36	50	58	60	84	86	81	66
27	51	40	32	38	38	60	61	60	84	86	77	65
28	51	40	34	38	37	60	62	55	83	86	77	63
29	50	40	32	37	--	54	67	62	85	86	78	61
30	47	39	31	32	--	58	58	64	84	84	74	60
31	50	--	32	32	--	60	--	74	--	76	73	--
Average	53	46	36	36	37	45	53	67	78	84	79	67

TENNESSEE RIVER BASIN

NORTH TOE RIVER AT ALTOPASS, N. C.

LOCATION ---At suspension bridge about 400 feet downstream from gaging station at Altopass, and 1 mile northwest of Altopass, Mitchell County.
DRAINAGE AREA ---104 square miles.

RECORDS AVAILABLE ---Chemical analyses; October 1948 to September 1949.

Water temperatures: October 1948 to September 1949.

EXTREMES 1948-49 ---Dissolved solids: Maximum, 35 parts per million Nov. 1-10; minimum, 25 parts per million Jan. 1-10.

Total hardness: Maximum, 14 parts per million Nov. 1-10; minimum, 9 parts per million Dec. 21-31, Jan. 1-10.

Water temperatures: Maximum, 74°F June 26; minimum, freezing point Dec. 26, Mar. 1.

REMARKS ---Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1143.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Oxygen consumed		pH	Specific conductance (micro-mhos at 25°C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
		Unfiltered	Filtered															Total	Non-carbonate
Oct. 1-10, 1948-----	89.3	2.4	2.0	4	6.9	11	0.07	3.0	1.2	2.3	0.7	18	2.6	1.6	0.0	6.3	32	12	0
Oct. 11-20-----	80.6	2.7	1.7	4	6.9	40.6	11	3.0	1.3	4.5		21	2.7	1.8	0	2	34	13	0
Oct. 21-31-----	73.6	2.2	1.6	4	6.9	39.2	11	3.0	1.2	3.8		18	3.0	1.9	0	2	34	12	0
Nov. 1-10-----	214	5.0	2.6	12	6.5	64.0	9.0	3.6	1.3	1.8		14	3.5	2.0	0	4	35	14	3
Nov. 11-20-----	171	3.5	1.9	3	6.6	34.7	8.7	2.6	1.1	2.8		14	2.3	1.9	0	7	29	11	0
Nov. 21-30-----	459	6.4	2.4	3	6.4	33.5	8.3	2.5	1.0	3.4		14	2.3	1.8	1.1	1.4	28	10	0
Dec. 1-10-----	347	3.8	1.9	5	6.6	28.8	8.5	2.6	1.0	1.3		10	2.4	1.2	0	1.2	26	11	2
Dec. 11-20-----	206	2.3	2.2	4	6.7	29.7	8.6	2.2	1.2	2.9		14	2.3	1.5	1.1	1.7	27	10	0
Dec. 21-31-----	286	4.1	2.0	7	6.7	29.6	7.9	2.2	1.2	3.5		14	2.2	1.4	1.1	1.1	27	9	0
Jan. 1-10, 1949-----	334	3.2	1.8	3	6.4	28.6	8.7	2.4	1.0	1.6	.6	11	2.3	1.4	0	1.0	25	9	0
Jan. 11-20-----	215	2.6	1.8	6	6.4	36.6	10	2.4	1.0	3.3		14	2.9	1.2	0	1.8	28	10	0
Jan. 21-31-----	206	2.1	2.1	7	7.0	31.2	8.2	3.0	1.0	2.6		14	2.9	1.2	1.1	1.0	28	12	0
Feb. 1-10-----	243	2.8	1.9	4	6.5	31.1	8.7	2.6	1.0	2.7		14	2.0	1.4	0	1.2	27	11	0
Feb. 11-19-----	267	3.6	1.5	3	6.6	28.3	8.5	2.5	1.0	2.5		13	2.1	1.2	0	1.2	27	10	0
Feb. 20-28-----	215	3.8	2.1	4	6.6	30.1	6.1	2.6	1.0	2.3		12	2.8	1.4	0	1.2	26	11	1
Mar. 1-10-----	284	3.6	2.1	3	6.8	28.9	7.8	2.4	1.0	3.1		13	2.5	1.6	1.1	1.3	26	10	0
Mar. 11-20-----	286	3.2	1.6	5	6.6	28.4	9.2	2.6	1.0	2.6		14	2.0	1.2	0	1.3	27	11	0
Mar. 21-31-----	361	4.0	1.8	5	6.6	30.5	8.5	2.4	1.0	2.8		13	2.1	1.2	0	1.4	26	10	0
Apr. 1-10-----	272	3.6	2.4	3	6.4	29.8	8.9	3.7	1.0	2.3	.4	15	2.5	1.8	0	1.2	29	13	1
Apr. 11-20-----	440	6.4	2.0	3	6.4	28.6	8.4	2.4	1.1	2.8		13	2.0	1.3	0	1.6	26	10	0
Apr. 21-30-----	294	3.6	1.9	3	6.7	30.7	8.5	2.5	1.1	1.6		11	2.2	1.3	0	1.0	28	11	2
May 1-10-----	354	3.8	1.8	6	6.7	30.5	8.0	2.2	1.0	2.6		12	2.4	1.3	0	1.0	27	10	0
May 11-20-----	310	4.8	2.0	4	6.7	30.4	8.3	2.4	1.2	1.7		12	2.4	1.1	0	1.0	27	11	1
May 21-31-----	181	2.8	1.9	2	6.5	31.9	9.6	2.4	1.0	3.1		15	1.7	1.4	0	1.5	29	10	0

June 1-10 -----	128	2.4	2.2	3	6.7	32.6	9.3	.01	2.8	1.0	2.9	16	1.6	1.6	.0	.4	29	11	0
June 11-20 -----	400	6.1	2.4	6	6.3	32.9	8.2	.05	2.9	1.3	2.5	15	2.3	1.6	.1	.6	30	13	0
June 21-30 -----	188	3.3	2.4	6	6.7	32.6	9.2	.07	2.8	1.3	2.5	15	2.0	1.5	.1	.5	29	12	0
July 1-10 -----	151	3.3	2.0	7	6.9	34.2	13.2	.02	3.0	1.2	2.1	2	1.8	1.5	.0	.9	33	12	0
July 11-20 -----	568	11	2.4	6	6.4	32.3	9.1	.01	2.6	1.1	2.7	14	2.3	1.8	.1	.4	30	11	0
July 21-31 -----	314	4.6	2.1	4	6.4	32.6	10	.03	3.5	1.0	2.0	15	2.3	1.2	.0	.9	31	13	1
Aug. 1-10 -----	254	5.6	2.2	7	6.7	33.6	10	.04	3.0	1.1	3.5	17	2.3	1.8	.1	.5	30	12	0
Aug. 11-20 -----	240	5.6	2.3	6	6.6	37.2	9.7	.04	3.0	1.0	3.7	17	2.6	1.6	.0	.8	30	12	0
Aug. 21-31 -----	657	7.2	2.5	6	6.6	32.6	9.2	.02	3.0	1.0	3.1	15	2.8	1.6	.0	1.2	29	12	0
Sept. 1-10 -----	296	2.7	2.5	2	6.8	31.6	9.7	.14	2.6	1.1	3.0	16	2.0	1.5	.0	.4	28	11	0
Sept. 11-20 -----	191	1.2	1.2	2	6.7	33.6	9.8	.04	3.1	1.1	3.0	16	2.4	1.9	.0	.7	30	12	0
Sept. 21-30 -----	168	4.1	.8	4	7.0	34.6	9.8	.14	2.8	1.2	2.2	17	2.3	1.6	.0	.4	32	12	0
Average-----	271	4.0	2.0	5	--	33.2	9.1	0.04	2.7	1.1	2.7	15	2.4	1.5	0.0	0.8	29	11	0

TENNESSEE RIVER BASIN--Continued
 NORTH FOR RIVER AT ALBANY, N. C.--Continued
 Temperature (° F.) of water, water year October 1948 to September 1949

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	62	49	41	33	34	32	33	33	63		64	63
2	60	51	40	33	34	34	45	37	61	60	60	60
3	59	53	45	37	34	35	47	56	60	70	64	61
4	56	52	47	41	30	39	48	53	62	71	67	62
5	54	56	45	43	42	39	49	60	62	70	67	65
6		59	46	44	43	45	44	60	64	70	67	64
7	55	53	42	38	45	41	47	60	64	70	72	63
8	56	46	44	41	41	40	50	69	65	71	66	65
9	54	49	43	43	45	44	47	62	65	69	66	62
10	52	53	40	45	47	46	46	61	60	72	67	58
11	55	46	34	46	37	38	49	57	65	69	66	61
12	53	43	36	50	37	39	51	54	67	64	64	56
13	54	46	41	43	46	39	52	55	65	66	64	56
14	51	41	51	41	46	39	54	57	65	67	70	60
15	46	41	52	42	50	46	47	53	64	67	71	64
16	54	47	53	47	43	39	41	59	60	67	67	64
17	49	47	43	51	41	44	46	52	65	65	67	70
18	49	49	42	45	45	38	47	60	65	63	67	65
19	44	50	39	45	47	39	47	62	65	63	67	61
20		50	36	45	47							
21	42	46	35	42	47	41	50	62	67	65	62	57
22	45	40	40	43	49	45	54	60	66	65	60	58
23	47	40	41	40	45	47	54	62	66	67	61	60
24	46	45	42	40	46	49	55	63	68	67	63	54
25	44	44	37	51	45	54	48	62	71	68	66	57
26												
27	41	41	32	52	45	56	50	58	74	63	66	53
28	43	45	33	53	43	56	36	55	71	60	67	54
29	42	42	33	54	40	55	36	55	72	60	64	55
30	45	46	37	46	47	47	54	56	71	71	62	56
31	47	42	42	30	31	31	31	30	71	71	60	52
				33	--	56	--	61	--	71	62	--
Average	50	46	41	44	43	43	50	50	65	68	66	60

MISCELLANEOUS ANALYSES OF STREAMS IN TENNESSEE RIVER BASIN IN NORTH CAROLINA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																	Total	Non-carbonate
FRENCH BROAD RIVER AT MARSHALL																		
Apr. 21, 1949 -----	2,820	3	6.5	52.4	9.6	0.02	3.1	0.2	7.5		14	9.8	1.8	0.1	0.5	42	9	0
IVY RIVER NEAR MARSHALL																		
Apr. 21, 1949 -----	145	2	6.8	44.9	12	0.01	4.0	0.3	4.7		19	3.6	1.0	0.1	0.7	38	11	0
PIGEON RIVER AT CANTON																		
Apr. 21, 1949 -----	344	2	6.5	17.7	7.8	0.01	2.0	0.3	1.1		7	1.9	0.5	0.0	0.3	20	6	0
PIGEON RIVER NEAR HEPCO																		
Apr. 21, 1949 -----	698	27	6.3	161	8.1	0.09	15	1.1	16		41	12	21	0.0	0.0	99	42	8
JONATHAN CREEK AT COVE CREEK																		
Apr. 21, 1949 -----	144	4	6.9	21.2	8.4	0.01	1.6	0.3	2.2		8	2.2	0.5	0.0	0.7	22	5	0
TUCKASEGEE RIVER AT DILLSBORO																		
Apr. 21, 1949 -----	1,080	4	6.9	19.3	6.7	0.01	1.4	0.7	1.7		8	1.9	0.8	0.1	0.3	20	6	0
SCOTTS CREEK AT DILLSBORO																		
Apr. 21, 1949 -----	135	100	6.3	58.1	10	0.01	2.0	0.5	12		28	10	0.2	0.1	0.1	61	7	0

PART 4. ST. LAWRENCE RIVER BASIN
STREAMS TRIBUTARY TO LAKE ERIE
MAUMEE RIVER AT ANTWERP, OHIO

LOCATION.---At bridge on State Highway 49, just upstream from gaging station, 1 mile north of Antwerp, Paulding County, 7 miles downstream from Indiana State line, and 10 miles upstream from Marie Delorme Lake.
DRAINAGE AREA.--2,049 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

EXTREMES, 1948-49.--Dissolved solids: Maximum, 496 parts per million Oct. 1-10; minimum, 214 parts per million Jan. 21-31.

Total hardness: Maximum, 343 parts per million Oct. 1-10; minimum, 158 parts per million Jan. 21-31.

Water temperatures: Maximum, 83° F July 5-6; minimum, freezing point Feb. 1-2, 5, 7.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1144. Records of specific conductance of daily samples in district office at Columbus, Ohio.

Chemical analyses in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																		Total	Non-carbonate
Oct. 1-10, 1948	138		10	7.7	766	6.8	0.02	78	36	38		282	140	32	0.5	2.4	496	343	112
Oct. 11-20	150		10	7.6	764	7.6	.02	74	33	43		280	128	31	.6	3.6	480	320	91
Oct. 21-31	139		10	7.6	775	7.2	.02	77	34	39		277	134	31	.6	6.2	482	332	103
Nov. 1-10	443		22	7.8	705	6.3	.02	72	29	32		250	127	25	.3	3.0	476	296	182
Nov. 11-20	459		22	7.8	597	6.3	.02	72	23	17		216	89	16	.4	8.0	371	271	97
Nov. 21-30	1,158		25	7.5	499	8.4	.14	66	18	6.5		172	83	10	.3	13	323	239	98
Dec. 1-10	642		20	7.6	580	8.4	.08	74	21	14		196	107	13	.3	14	376	271	110
Dec. 11-20	1,955		18	7.8	577	8.0	.06	75	22	11		200	105	13	.2	12	372	278	114
Dec. 21-31	2,683		25	7.6	465	7.2	.05	64	16	6.4		157	64	8.2	.1	13	300	226	97
Jan. 1-10, 1949	5,470		30	7.7	347	5.3	.05	50	11	1.7		116	59	5.1	.1	12	232	170	75
Jan. 11-20	7,709		25	7.8	403	6.4	.05	58	13	1.8		134	70	5.6	.1	14	257	198	88
Jan. 21-31	8,581		27	7.3	330	6.5	.19	47	10	3.6		110	54	4.9	.3	15	214	158	68
Feb. 1-10	2,789		27	7.5	475	6.4	.12	66	16	8.8		172	83	7.8	.3	13	308	230	90
Feb. 11-20	7,925		30	7.4	386	5.8	.20	54	12	4.8		141	60	5.4	.3	10	250	184	69
Feb. 21-28	5,989		27	7.4	370	6.0	.14	53	12	3.7		134	59	5.0	.3	13	240	182	72
Mar. 1-10	2,151		25	7.6	506	4.4	.09	72	17	7.9		192	88	5.2	.3	12	329	250	92
Mar. 11-20	1,183		23	7.6	586	5.6	.06	82	21	9.7		217	107	9.9	.3	10	382	291	113
Mar. 21-31	2,187		23	7.6	520	6.0	.08	71	18	9.6		193	88	8.4	.3	12	326	251	93
Apr. 1-10	2,250		27	7.5	499	5.6	.09	71	17	7.7		184	89	7.0	.3	12	318	247	96
Apr. 11-20	1,015		20	7.8	624	4.4	.06	86	23	11		240	111	10	.3	7.6	399	309	111
Apr. 21-30	1,384		25	7.6	558	2.4	.08	76	19	12		205	99	9.5	.3	10	363	268	100
May 1-10	1,060		20	8.0	552	3.6	.06	74	20	12		216	92	10	.5	4.9	354	267	90
May 11-20	550		20	8.2	645	4.4	.06	84	26	14		258	111	11	.5	4.9	400	316	105
May 21-31	4,805		35	8.0	441	5.6	.04	62	14	6.6		170	64	7.1	.4	12	304	212	73

June 1-10-----	497	33	8.1	540	7.6	.04	87	25	12	253	115	10	.4	5.2	424	320	113
June 11-20-----	1,783	27	8.1	591	6.0	.06	75	23	11	223	93	10	.5	14	363	262	83
June 21-30-----	1,464	30	8.1	539	11	.06	74	19	7.3	196	41	10	.4	21	319	262	100
July 1-10-----	1,150	31	8.1	478	8.0	.06	64	16	13	216	70	18.4	.4	10	313	226	66
July 11-20-----	517	26	8.2	542	13	.04	70	20	12	216	79	11	.5	6.4	351	257	78
July 21-31-----	402	26	8.1	627	6.8	.06	78	23	16	237	100	14	.5	5.5	404	289	95
Aug. 1-10-----	431	23	8.1	534	7.6	.05	64	21	12	201	83	12	.5	4.7	338	246	81
Aug. 11-20-----	325	20	7.8	595	4.4	.04	86	25	23	221	98	22	.6	2.8	379	267	86
Aug. 21-31-----	473	26	7.9	595	8.0	.09	64	21	21	212	98	16	.5	4.8	338	246	72
Sept. 1-10-----	262	26	8.0	503	6.4	.11	61	20	14	175	90	15	.6	6.0	324	234	90
Sept. 11-20-----	262	20	7.9	586	3.2	.12	65	24	23	224	94	16	.6	5.6	371	261	77
Sept. 21-30-----	250	17	7.8	606	5.6	.06	70	25	23	230	104	17	.5	7.0	368	277	89
Average-----	1,692	23	--	549	6.6	0.07	69	21	14	203	93	13	0.4	9.2	352	258	92

STREAMS TRIBUTARY TO LAKE ERIE--Continued
MAUMEE RIVER AT ANTWERP, OHIO--Continued

Temperature (° F) of water, year October 1948 to September 1949

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	64	56	41	35	32	37	52	61	67	77	76	67
2	65	54	40	35	32	36	49	61	70	79	72	67
3	60	55	40	35	33	36	48	62	72	80	75	68
4	57	--	42	34	37	37	48	65	74	82	75	70
5	57	58	45	35	32	39	49	67	74	83	74	72
6	54	56	43	35	34	40	48	70	73	83	75	71
7	56	53	40	36	32	40	50	71	72	82	75	75
8	55	52	37	37	33	42	50	65	67	80	73	68
9	55	52	37	38	35	44	49	69	68	82	76	66
10	53	51	36	37	35	41	51	63	69	76	80	65
11	58	49	37	37	33	41	53	60	73	78	82	65
12	52	49	39	38	33	36	53	62	75	72	81	67
13	53	48	42	38	33	38	56	65	74	78	79	65
14	52	43	42	38	33	39	58	68	75	78	78	--
15	50	46	43	36	40	36	53	69	75	76	78	63
16	55	45	44	40	37	36	51	70	70	76	77	62
17	52	48	42	41	37	38	52	69	68	75	73	63
18	50	47	41	40	35	38	50	72	70	77	78	65
19	48	49	40	38	37	37	51	73	70	79	78	64
20	47	47	38	36	38	38	47	68	73	80	74	64
21	47	48	37	35	38	41	49	64	75	80	72	62
22	50	48	38	35	38	46	55	61	75	79	71	60
23	50	46	37	35	39	46	56	60	76	76	72	59
24	50	45	36	35	39	45	55	63	76	78	73	59
25	50	44	36	38	38	53	55	61	79	80	75	58
26	49	45	34	38	38	51	57	60	79	82	78	59
27	50	45	34	38	38	52	57	69	77	--	73	62
28	51	44	34	37	37	52	58	63	78	82	76	63
29	50	42	35	36	--	53	58	59	78	82	73	59
30	51	41	36	34	--	54	61	61	75	82	72	57
31	51	--	35	35	--	51	--	61	--	75	71	--
Average	53	49	39	36	36	42	53	65	73	79	75	64

CUYAHOGA RIVER AT HIRAM RAPIDS, OHIO

LOCATION --At gaging station at upstream bridge in Hiram Rapids, Portage County, and 0.6 mile downstream from Black Brook.
DRAINAGE AREA --147 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

Water temperatures: October 1948 to September 1949.
EXTREMES, 1948-49.--Dissolved solids: Maximum, 215 parts per million June 11-20; minimum, 109 parts per million Mar. 21-31.

Total hardness: Maximum, 162 parts per million June 11-20; minimum, 80 parts per million Mar. 21-31.

Water temperatures: Maximum, 78°F, July 3-4, 6-7, 28-30; minimum, freezing point Mar. 17.
REMARKS--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1144. Records of specific conductance of daily samples available in district office at Columbus, Ohio.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																		Total	Non-carbonate
Oct. 1-10, 1948-----	31.4																		
Oct. 11-20-----	55.5																		
Oct. 21-31-----	48.1																		
Nov. 1-10-----	54.8																		
Nov. 11-20-----	71.2																		
Nov. 21-30-----	142																		
Dec. 1-10-----	132																		
Dec. 11-20-----	241																		
Dec. 21-31-----	162																		
Jan. 1-10, 1949-----	306																		
Jan. 11-20-----	191																		
Jan. 21-31-----	477																		
Feb. 1-10-----	243																		
Feb. 11-20-----	435																		
Feb. 21-28-----	298																		
Mar. 1-10-----	242																		
Mar. 11-20-----	212																		
Mar. 21-31-----	449																		
Apr. 1-10-----	269																		
Apr. 11-20-----	144																		
Apr. 21-30-----	236																		
May 1-10-----	117																		
May 11-20-----	44.0																		
May 21-31-----	325																		

STREAMS TRIBUTARY TO LAKE ERIE--Continued
CUYAHOGA RIVER AT HIRAW RAPIDS, OHIO--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-foot)	Temperature (° F.)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																		Total	Non-carbonate
June 1-10, 1948	59.9		18	7.9	272	5.2	0.04	40	8.3	2.8		112	40	3.5	0.1	1.7	189	134	42
June 11-20	31.6		14	8.0	325	6.8	.07	47	11	3.8		140	47	4.0	.1	1.6	215	162	48
June 21-30	53.1		13	8.1	299	4.1	.04	43	9.3	8.8		138	41	4.8	.1	2.4	209	146	32
July 1-10	38.9		15	6.9	310	7.6	.02	45	10	4.2		136	42	3.8	.2	1.8	183	133	32
July 11-20	56.1		15	6.8	261	6.2	.02	37	8.6	3.1		114	33	3.5	.2	1.5	164	128	34
July 21-31	82.4		25	6.8	246	6.2	.03	34	8.3	4.3		108	31	4.0	.3	1.5	159	119	30
Aug. 1-10	54.0		30	6.8	255	9.4	.05	35	8.0	4.1		103	35	4.5	.3	1.5	187	120	36
Aug. 11-20	22.0		15	7.2	324	6.4	.02	46	11	4.9		146	42	4.2	.3	.9	201	150	40
Aug. 21-31	34.2		10	7.8	314	7.2	.05	45	10	4.4		142	38	4.2	.2	.8	193	153	37
Sept. 1-10	90.3		24	7.9	232	5.6	.07	30	6.9	4.8		90	32	4.0	.2	.4	149	103	29
Sept. 11-20	60.0		20	7.8	244	5.2	.14	27	7.9	12		112	27	4.4	.2	.4	152	100	8
Sept. 21-30	43.4		19	7.6	270	4.6	.06	37	8.6	4.5		122	30	3.8	.2	.4	184	128	28
Average	155		16	--	250	5.9	0.04	34	8.0	3.9		93	40	4.2	0.1	1.3	158	118	42

Temperature (° F.) of water, water year October 1948 to September 1949

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	60	--	--	33	--	--	50	61	62	75	68	64
2	--	--	--	--	33	--	43	64	65	75	68	58
3	58	48	--	34	--	36	44	64	68	78	70	60
4	--	--	--	35	--	--	44	65	68	78	70	65
5	55	56	--	37	--	36	46	66	69	76	69	67
6	--	--	--	--	--	--	--	70	62	78	69	67
7	54	55	--	38	--	36	45	69	68	78	70	65
8	52	51	--	35	35	36	48	65	64	75	73	64
9	51	48	--	--	35	38	44	64	63	76	74	60
10	51	48	--	--	--	36	44	58	65	75	73	59
11	51	46	--	37	--	34	48	55	68	72	75	60
12	51	45	--	--	--	34	47	57	68	72	73	60
13	51	44	--	35	--	34	52	58	71	72	73	63
14	50	46	--	--	--	38	53	60	71	74	72	63
15	54	46	36	39	--	38	56	60	73	72	74	61
16	51	44	42	--	--	36	48	60	74	72	72	58
17	51	44	37	40	--	32	47	59	74	73	73	57
18	54	44	34	39	--	35	45	67	73	73	72	61
19	45	44	34	--	--	34	45	68	74	74	70	62
20	45	43	--	36	--	38	45	56	75	75	68	61
21	44	43	36	--	--	38	49	62	71	74	73	58
22	45	43	35	36	--	42	50	62	74	73	66	59
23	45	43	37	39	--	44	49	60	73	71	62	58
24	48	43	33	40	--	48	51	64	74	73	65	56
25	48	44	--	39	--	45	46	50	76	73	62	55
26	--	--	33	39	--	48	51	60	76	74	68	54
27	--	--	33	38	--	53	56	59	74	77	69	56
28	--	--	--	--	--	51	56	56	76	78	72	59
29	--	--	--	--	--	52	55	55	70	78	70	56
30	--	--	34	35	--	53	52	57	75	78	68	53
31	48	--	--	--	--	50	--	61	--	72	68	--
Average	51	--	--	--	--	40	49	61	70	75	70	60

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT BOTZUM, OHIO

LOCATION.--At narrow gage track on bridge at Akron Sewage Treatment Plant at Botzum, Summit County, 2 miles downstream from gaging station at Old Portage, 3½ miles downstream from Little Cuyahoga River, and 6 miles north of Akron.

DRAINAGE AREA.--405 square miles above gaging station.

RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1948.

Specific conductance and chloride: October 1948 to September 1949.

Water temperatures: October 1946 to September 1949.

EXTREMES, 1948-49.--Water temperatures: Maximum, 88°F July 21, 27-28, Aug. 10; minimum, 34°F Dec. 26.

EXTREMES, 1946-48.--Dissolved solids: Maximum, 501 parts per million Oct. 1-10, 1946; minimum, 139 parts per million Apr. 1-10, 1947.

Total hardness: Maximum, 293 parts per million Oct. 1-10, 1946; minimum, 87 parts per million Apr. 1-10, 1947.

Water temperatures: Maximum, 93°F Aug. 19, 21, 1947; minimum, 33°F Jan. 21, 1947, Feb. 15, 1948.

REMARKS.--Records of specific conductance and chlorides of daily samples available in district office at Columbus, Ohio. Discharge records for gaging station near Old Portage for water year October 1948 to September 1949 given in Water-Supply Paper 1144. No appreciable inflow between gaging station and sampling point except during periods of heavy local rains.

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	73	64	50	37	39	43	56	65	75	87	84	74
2	72	66	49	--	39	43	56	70	76	87	86	75
3	67	66	51	39	40	44	51	70	77	85	83	74
4	62	67	49	43	41	46	57	76	80	83	86	77
5	67	69	50	42	42	49	56	78	79	83	84	75
6	68	68	48	47	40	45	56	80	77	86	79	73
7	68	66	50	42	42	46	56	72	77	84	77	76
8	66	63	50	41	45	48	55	68	76	86	84	75
9	77	65	50	42	45	47	55	70	78	82	87	77
10	60	62	47	43	42	44	54	71	79	76	88	70
11	62	62	48	43	45	44	60	72	76	82	85	75
12	67	63	48	43	46	43	64	74	82	84	83	75
13	65	62	51	40	45	43	62	75	82	85	79	77
14	67	59	51	45	48	42	67	76	80	84	75	73
15	66	59	53	46	47	45	59	76	80	80	82	71
16	67	60	49	49	45	46	56	75	82	77	85	77
17	60	61	45	44	43	48	56	79	78	76	77	67
18	58	62	48	45	44	46	53	80	81	82	82	77
19	67	64	40	47	43	44	56	81	83	85	78	73
20	63	59	40	47	42	42	62	76	79	85	72	69
21	62	58	42	44	46	49	64	--	85	88	70	70
22	62	57	43	43	45	48	64	72	85	83	74	72
23	59	58	42	41	46	47	62	76	85	84	77	69
24	60	57	42	44	47	50	56	71	81	85	77	67
25	60	55	38	47	45	52	61	69	--	83	80	70
26	63	51	34	45	42	49	62	70	83	86	79	70
27	65	52	37	44	41	52	65	66	85	88	78	70
28	66	49	43	42	42	55	65	63	86	88	79	70
29	67	50	47	38	--	58	66	66	86	83	81	--
30	67	51	42	35	--	59	66	63	84	79	79	65
31	64	--	40	38	--	59	--	71	--	79	80	--
Average	65	60	46	43	43	48	59	72	81	83	80	73

STREAMS TRIBUTARY TO LAKE ERIE--Continued

CUYAHOGA RIVER AT INDEPENDENCE, OHIO

LOCATION --At gaging station at bridge on Rockside Road in Valley View, and 1 mile northeast of Independence, Cuyahoga County.

RAINAGE AREA --109 square miles.

RECORDS AVAILABLE --Channel analyses: October 1948 to September 1949.

Water temperatures --October 1948 to September 1949.

EXTREMES 1948-49 --Channel analyses: Maximum 727 parts per million July 11-20; minimum, 254 parts per million Jan. 21-31.

Total hardness --Maximum 297 parts per million Oct. 1-10; minimum, 155 parts per million Jan. 21-31.

Water temperatures --Maximum 88° F. Aug. 18; minimum 34° F. Dec. 27.

REMARKS --Daily sampling in some instances is considered questionable as evidenced by consecutive and distributed identical daily specific conductance results which may be due to collecting samples for different days at one time. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1144. Records of specific conductance of daily samples available in district office at Columbus, Ohio.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	Temperature (° F.)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																		Total	Non-carbonate
Oct. 1-10, 1948	133		25	7.3	1,110	7.5	0.09	86	20	116		197	165	148	0.4	7.7	676	297	135
Oct. 11-20	311		23	7.4	1,130	8.0	.02	77	18	127		174	148	170	.5	5.0	672	266	134
Oct. 21-31	221		30	7.3	1,130	8.5	.18	77	18	124		181	138	170	.4	3.3	664	266	118
Nov. 1-10	230		20	7.4	1,170	10	.02	82	19	125		176	143	180	.4	7.9	688	283	138
Nov. 11-20	317		15	6.8	1,110	10	.10	82	19	113		174	146	162	.4	5.2	669	283	140
Nov. 21-30	547		27	7.6	559	8.8	.32	62	15	45		136	106	64	.2	2.8	401	216	105
Dec. 1-10	387		18	7.5	781	8.0	.07	65	15	71		143	115	97	.2	3.7	472	224	107
Dec. 11-20	1,227		17	7.1	585	7.0	.08	54	13	41		108	96	60	.3	4.5	358	188	100
Dec. 21-31	811		17	6.9	586	7.0	.07	56	14	36		110	101	57	.2	6.6	368	202	112
Jan. 1-10, 1949	1,595		17	7.3	496	8.4	.08	50	11	29		94	83	39	.2	2.6	302	170	83
Jan. 11-20	857		10	7.9	603	6.4	.06	55	14	38		106	85	59	.2	4.0	366	195	113
Jan. 21-31	2,195		13	6.8	412	6.6	.06	42	11	18		76	76	28	.1	3.4	254	155	86
Feb. 1-10	910		10	6.9	531	6.8	.08	48	11	37		94	90	50	.2	3.4	321	165	88
Feb. 11-20	1,641		11	6.8	493	6.8	.11	47	11	28		84	85	44	.2	3.8	296	162	94
Feb. 21-28	1,424		10	7.2	417	5.6	.06	45	11	18		82	80	30	.1	4.7	264	158	90
Mar. 1-10	925		10	6.9	511	5.2	.09	50	12	31		98	92	42	.2	5.7	313	174	94
Mar. 11-20	884		9	6.8	794	6.0	.08	59	14	74		106	105	117	.3	4.8	473	205	118
Mar. 21-31	1,713		10	7.1	575	12	.09	49	12	42		100	84	64	.2	2.4	356	172	80
Apr. 1-10	1,234		10	6.9	533	5.2	.08	47	12	37		102	83	52	.1	3.4	330	167	83
Apr. 11-20	804		20	7.1	717	14	.10	58	14	62		130	105	84	.2	2.6	438	202	86
Apr. 21-30	1,265		11	7.2	499	4.0	.06	54	12	27		105	89	42	.3	5.6	307	184	98
May 1-10	458		11	7.3	774	5.2	.07	74	17	58		159	116	88	.3	5.8	471	255	124
May 11-20	255		11	7.5	1,060	5.0	.07	85	19	105		176	142	156	.4	7.8	639	290	146
May 21-31	957		18	7.5	529	4.0	.10	54	12	27		126	76	40	.4	2.9	316	184	81

STREAMS TRIBUTARY TO LAKE ERIE--Continued
CUYAHOGA RIVER AT INDEPENDENCE, OHIO--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																		Total	Non-carbonate
June 1-10, 1949	214		18	7.3	948	4.0	0.06	76	16	93		176	115	134	0.5	5.2	562	255	111
June 11-20	160		19	7.7	1,220	6.0	.08	88	17	144		201	139	204	.4	4.2	724	289	125
June 21-30	197		13	7.6	1,090	7.5	.06	84	18	109		167	134	168	.5	7.8	650	284	147
July 1-10	222		16	7.6	1,210	7.0	.08	84	18	144		196	141	201	.5	6.3	706	284	123
July 11-20	183		15	7.6	1,240	6.0	.07	85	18	144		187	130	216	.5	6.9	727	286	133
July 21-31	395		18	7.6	774	9.6	.06	68	15	66		156	100	97	.4	5.8	471	231	104
Aug. 1-10	250		15	7.6	771	11	.05	69	15	68		168	109	87	.4	9.2	476	234	96
Aug. 11-20	182		14	7.6	1,010	10	.05	80	18	99		177	128	142	.5	11	619	274	129
Aug. 21-31	144		20	7.7	1,080	6.5	.06	81	18	109		172	135	156	.5	12	651	276	135
Sept. 1-10	162		16	7.8	917	3.0	.06	72	18	91		178	112	127	.6	9.0	585	254	108
Sept. 11-20	138		13	7.5	989	6.0	.04	76	18	103		186	124	138	.5	12	600	264	111
Sept. 21-30	147		20	7.5	1,110	7.0	.08	78	18	125		175	132	176	.5	13	666	269	125
Average	646		16	--	821	7.2	0.08	67	15	76		144	113	108	0.3	5.9	496	229	111

Temperature (° F.) of water, water year October 1948 to September 1949

Day	October	November	December	January	February	March	April	May	June	July	August	September
1	64	55	45	36	35	38	48	75	68	82	78	68
2	63	54	45	35	38	--	50	78	72	82	87	69
3	62	55	45	35	36	--	50	76	72	82	78	70
4	61	56	46	36	38	--	52	60	76	84	79	72
5	59	59	47	38	38	--	52	58	75	86	80	74
6	58	58	44	35	38	38	52	58	75	86	80	74
7	57	60	44	43	35	36	54	65	78	84	78	74
8	58	59	43	42	40	36	54	70	74	82	80	68
9	58	56	44	40	38	38	54	70	72	84	82	68
10	57	59	45	42	38	38	55	67	74	84	82	65
11	58	55	42	--	36	40	55	65	75	78	84	65
12	56	50	41	39	44	36	50	64	75	78	83	68
13	55	51	45	41	45	38	48	65	78	78	79	68
14	55	50	44	44	44	38	48	70	78	82	80	70
15	54	49	44	42	42	38	50	68	81	82	79	70
16	56	50	43	42	40	40	48	70	80	80	80	64
17	55	49	45	42	42	38	50	72	78	82	79	69
18	56	48	41	40	40	36	52	74	78	80	80	67
19	55	49	44	42	44	38	52	77	80	78	88	68
20	57	50	40	40	44	40	52	68	81	81	76	68
21	50	50	38	39	40	38	55	68	84	78	75	65
22	54	59	42	39	42	45	55	69	82	80	74	64
23	54	58	45	40	--	42	54	66	80	80	74	65
24	55	59	40	40	--	40	56	65	82	80	74	62
25	54	58	41	46	38	42	54	65	82	82	75	60
26	56	56	42	44	--	40	55	62	82	82	76	66
27	54	48	42	40	--	46	55	65	81	85	76	62
28	54	47	34	38	38	44	54	62	80	85	74	65
29	54	43	37	38	--	46	56	64	84	80	76	62
30	54	44	36	38	--	44	55	62	84	86	74	61
31	54	45	39	38	--	44	56	68	84	80	72	60
31	54	--	37	35	--	46	--	68	--	78	74	--
Average	56	53	42	40	40	40	53	68	78	82	78	67

STREAMS TRIBUTARY TO LAKE ERIE--Continued
 SPRINGFIELD LAKE OUTLET AT AKRON, OHIO

LOCATION --At gaging station in Akron, Summit County, 0.3 mile upstream from mouth, and 3 miles downstream from Springfield Lake.
 DRAINAGE AREA --8.40 square miles.

RECORDS AVAILABLE --Chemical analyses: At approximately one-month intervals October 1948 to September 1949.

REMARKS --Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1144. Records of specific conductance of daily samples available in district office at Columbus, Ohio.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	Temperature (° F)	Color	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids	Hardness as CaCO ₃	
																		Total	Non-carbonate
Oct. 6, 1948	0.6		6	7.7	432	5.6	0.07	55	13	15		137	72	24	0.1	2.0	265	191	78
Dec. 21	5.0		10	7.3	442	3.6	.04	55	11	18		120	80	27	.1	3.0	270	182	84
Jan. 4, 1949	4.6		10	7.4	436	3.6	.04	56	12	9.7		118	74	24	.1	2.8	267	189	92
Feb. 14	11		15	7.4	390	3.4	.05	51	10	9.4		98	74	20	.1	3.6	241	168	88
Mar. 28	9.9		11	7.8	407	3.6	.04	52	11	17		117	78	22	.2	3.6	252	175	79
Apr. 26	8.7		13	8.1	409	3.2	.04	55	10	17		129	73	22	.3	2.4	253	178	73
May 18	3.0		8	7.9	429	3.6	.11	52	12	19		134	69	26	.2	2.0	260	179	69
June 23	1.0		12	7.9	424	4.8	.06	50	13	20		132	72	26	.2	2.4	262	178	70
July 21	2.4		17	7.3	--	5.6	.07	51	11	12		124	65	20	.2	.1	277	172	71
Aug. 17	0.8		7	7.9	--	5.2	.08	52	13	16		137	67	25	.2	.9	288	183	71
Sept. 13	0.7		9	7.7	429	2.6	.07	47	12	20		136	61	24	.2	2.2	261	167	55

RED RIVER OF THE NORTH BASIN

RED RIVER OF THE NORTH AT FARGO, N. DAK.

LOCATION.--At city water plant, half a mile upstream from gaging station, which is just upstream from Island Park Dam in Fargo, Cass County, and 10 miles upstream from Sheyenne River.

DRAINAGE AREA.--5,800 square miles.

RECORDS AVAILABLE.--Water temperatures: October 1946 to September 1949, January 1932 to October 1946 (unpublished) in files of City of Fargo Water Works Department.

EXTREMES, 1948-49.--Water temperatures: Maximum, 82°F Aug. 13; minimum, freezing point Dec. 1-Apr. 7.

EXTREMES, 1946-49.--Water temperatures: Maximum, 82°F July 7-12, 1948, Aug. 13, 1949; minimum, freezing point many days each year.

REMARKS.--Record of water temperatures furnished by City of Fargo Water Works Department. Discharge records for gaging station at Fargo for water year October 1948 to September 1949 given in Water-Supply Paper 1145.

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	61	48	33	33	33	33	33	--	68	79	75	70
2	59	50	33	--	33	33	33	59	70	79	75	68
3	--	50	33	33	33	33	--	61	70	--	75	68
4	59	50	33	33	33	33	33	63	70	81	75	--
5	59	50	--	33	33	33	33	63	--	79	75	68
6	57	48	33	33	--	--	33	61	70	81	77	66
7	57	--	33	33	33	33	33	61	70	79	--	66
8	57	46	33	33	33	33	36	--	68	79	79	64
9	55	45	33	--	33	33	39	63	68	79	79	64
10	--	43	33	33	33	33	--	61	70	--	79	66
11	54	43	33	33	33	33	41	63	72	77	81	--
12	52	41	--	33	33	33	46	64	--	75	81	64
13	52	39	33	33	--	--	50	64	73	75	82	63
14	52	--	33	33	33	33	50	64	72	75	--	61
15	52	39	33	33	33	33	50	--	72	75	81	61
16	50	39	33	--	33	33	48	68	72	75	81	61
17	--	39	33	33	33	33	--	68	72	--	79	61
18	48	39	33	33	33	33	48	70	70	75	81	--
19	46	37	--	33	33	33	48	64	--	75	79	59
20	48	36	33	33	--	--	50	63	70	73	79	59
21	46	--	33	33	33	33	54	63	70	75	--	57
22	48	36	33	33	33	33	54	--	70	73	77	57
23	48	36	33	--	33	33	52	63	72	73	77	57
24	--	36	33	33	33	33	--	61	73	--	77	59
25	46	36	33	33	33	33	54	61	73	79	77	--
26	48	36	--	33	33	33	54	63	--	79	77	61
27	48	36	33	33	--	--	55	63	75	79	77	59
28	48	--	33	33	33	33	57	63	75	79	--	59
29	48	36	33	33	--	33	59	--	75	77	75	57
30	48	36	33	--	--	33	59	68	77	77	73	59
31	--	--	33	33	--	33	--	68	--	--	70	--
Average	52	41	33	33	33	33	46	64	71	77	78	62

RED RIVER OF THE NORTH BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER OF THE NORTH BASIN

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bon- ate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium
																	Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
RED RIVER OF THE NORTH AT FARGO, N. DAK.																						
May 16, 1949	264	7.4	645	9.0	0.08	58	38	22	0	274	107	8.0	0.1	1.2	0.18	499	0.68			301	76	14
June 21	249	7.6	497	9.6	0.10	49	34	2.5	0	252	52	4.4	0.1	1.2	0.14	291	0.40			263	56	2
July 16	1,300	7.7	334	24	0.02	40	12	15	0	152	46	5.0	0.1	1.8	--	218	0.30			150	25	18
RED RIVER OF THE NORTH AT GRAND FORKS, N. DAK.																						
May 28, 1949	1,780	7.8	602	13	0.10	66	31	17	0	260	101	7.0	0.1	1.5	0.11	405	0.55			292	79	11
June 22	2,420	8.3	612	16	0.02	52	26	18	1.6	10	166	108	7.0	0.1	0.7	0.63	372	0.51		237	84	14
July 18	4,830	7.9	447	27	0.04	51	19	20	0	208	66	5.0	0.2	2.9	--	302	0.41			206	35	17
SHEYENNE RIVER NEAR HARVEY, N. DAK.																						
June 13, 1949		8.6	1,230	5.4	0.05	43	38	202	37	455	222	26	0.4	0.7	1.0	878	1.19			264	0	62
SHEYENNE RIVER AT SHEYENNE, N. DAK.																						
Mar. 30, 1949	5.0	7.6	2,170	30	0.06	103	96	304	0	1,120	316	45	0.2	1.1	0.72	1,460	1.99			652	0	50
Apr. 7	1,340	6.9	169	10	0.04	14	5.5	11	0	62	25	2.0	0.9	2.5	0.00	111	1.15			58	7	30
May 2	63	7.4	647	21	0.02	36	21	78	0	276	102	9.0	0.2	1.6	0.32	444	0.60			177	0	49
June 13	25	8.6	980	13	0.02	25	40	138	33	356	146	19	0.2	1.3	0.40	878	0.92			227	0	59
July 30	.1	8.4	1,200	11	0.06	28	35	217	16	500	202	25	0.3	3.8	--	802	1.09			214	0	69
SHEYENNE RIVER AT VALLEY CITY, N. DAK.																						
May 12, 1949	198	7.4	760	22	0.02	67	30	59	0	303	140	16	0.2	2.2	0.23	520	0.71			291	43	31
June 21	64	7.7	813	18	0.02	67	34	66	0	310	166	16	0.2	1.3	0.24	567	0.77			307	53	32
SHEYENNE RIVER AT WEST FARGO, N. DAK.																						
May 16, 1949	368	7.3	695	22	0.02	68	25	48	0	271	122	19	0.2	1.4	0.23	467	0.64			273	51	25
June 21	178	7.4	901	19	0.02	78	35	72	0	356	146	35	0.2	1.6	0.29	806	0.82			339	48	32
July 16	205	7.8	885	28	0.02	72	27	91	0	282	190	38	0.1	5.4	--	806	0.82			291	60	40
MAPLE RIVER AT MAPLETON, N. DAK.																						
May 16, 1949	13	7.5	1,290	14	0.12	105	47	109	0	342	298	71	0.2	1.0	0.33	886	1.20			456	176	34
June 21	10	7.6	1,310	10	0.10	64	51	143	0	256	325	92	0.2	1.2	0.42	879	1.20			369	159	46

RED RIVER OF THE NORTH BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN RED RIVER OF THE NORTH BASIN--Continued
Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Chemical analyses, in parts per million, water year October 1949 to September, 1950--Continued

Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent non- car- bon- ate	
																	Parts per mil- lion	Tons per acre- foot	Tons per day	Total		
BUFFALO RIVER NEAR DILWORTH, MINN.																						
May 18, 1949-----	100	7.7	836	27	0.02	100	50	15	0	333	204	0.5	0.1	2.0	0.1	0.20	615	0.84	455	182	7	
June 21-----	32	7.5	864	12	.02	70	51	4.1	0	334	106	5.2	.2	1.2	0.20	455	.62		384	110	2	
WILD RICE RIVER AT HENDRUM, MINN.																						
May 18, 1949-----	36	7.9	541	19	0.02	62	29	16	0	294	60	1.7	0.1	2.9	0.1	0.19	340	0.46	274	33	11	
June 21-----	113	7.4	564	18	.02	67	40	8.3	0	316	82	2.4	.2	1.4	0.19	393	.53		332	73	5	
July 17-----	495	7.4	469	24	.06	58	24	16	0	270	46	3.4	.3	2.5		330	.45		243	22	12	
GOOSE RIVER NEAR PORTLAND, N. DAK.																						
May 19, 1949-----	6.3	7.5	1,170	18	0.10	139	52	58	0	362	348	18	0.2	1.1	0.25	867	1.18		561	264	18	
June 21-----	3.7	7.6	1,030	22	.10	139	51	12	0	310	292	16	.1	1.6	.23	748	1.02		597	303	4	
GOOSE RIVER AT HILLSBORO, N. DAK.																						
May 19, 1949-----	34	7.5	1,380	19	0.02	158	58	97	0	360	456	50	0.8	1.6	0.42	1,020	1.39		633	338	25	
June 21-----	32	7.5	1,190	24	.10	122	52	64	0	294	340	43	.1	1.5	.35	876	1.19		519	278	21	
MARSH RIVER NEAR SHELLY, MINN.																						
June 21, 1949-----	215	7.4	567	16	0.05	67	36	3.0	0	280	86	0.5	0.2	1.8	0.14	400	0.54		316	86	11	
MARSH RIVER AT SHELLY, MINN.																						
May 18, 1949-----	188	8.6	477	21	0.06	55	26	18	8	262	48	2.8	0.3	2.3		326	0.44		245	17	14	
RED LAKE RIVER AT CROOKSTON, MINN.																						
May 18, 1949-----	1,010	7.5	502	11	0.10	63	26	2.3	0	222	82	0.2	0.1	1.2	0.02	323	0.44		264	82	2	
June 21-----	1,650	8.3	575	21	.02	67	25	21	0.8	16	180	139	.2	.1	.9	.48	379	.52		270	96	14
SOURIS RIVER NEAR VERENDRYE, N. DAK.																						
-Mar. 8, 1949-----	240	8.0	815	21	0.02	64	26	87	0	342	131	23	0.2	8.8	0.15	555	0.75		266	0	42	
Apr. 10-----	3,430	7.1	203	6.8	.15	19	4.4	16	0	79	30	.7	.1	4.6	.05	143	.19		66	1	35	
May 11-----	562	8.4	609	13	.01	52	22	61	10	242	112	12	.1	3.3	--	404	.55		218	3	38	
July 26-----	44	8.4	1,100	18	.02	66	31	152	13	431	180	39	.2	5.2	--	732	1.00		292	0	53	

DES LACS RIVER AT FOXHOLM, N. DAK.

Mar. 7, 1949-----	0.1	8.0	1,000	26.4	0.02	75	37	.44	0	532	169	24	0.4	6.9	0.17	754	1.03	329	0	46
Apr. 5-----	1,500	7.2	1,057	26.4	.15	17	3.0	.12	0	57	17	.8	.1	3.9	.01	115	.16	30	0	35
May 12-----	51	7.4	96	17	.15	4	23	152	0	336	176	20	.2	.3	---	636	.81	221	0	39
Aug. 16-----	2.1	8.4	1,240	24	.03	58	41	173	16	456	240	22	.3	9.3	---	842	1.15	313	0	35

IOWA RIVER BASIN
IOWA RIVER AT IOWA CITY, IOWA

LOCATION --At Benton Street bridge at Iowa City, Johnson County, half a mile downstream from gaging station.
DRAINAGE AREA --3 230 square miles.

RECORDS AVAILABLE --Chemical analyses: September 1906 to September 1949.
Water temperatures: January 1944 to September 1949.

Sediment records: October 1943 to September 1949.

EXTREMES 1946-47 --Sediment concentrations: Maximum daily, 3,810 ppm Apr. 5; minimum daily, 4 ppm Feb. 5.
Sediment loads: Maximum daily, 152,000 tons June 16; minimum daily, 6 tons Feb. 5.

EXTREMES 1947-48 --Sediment concentrations: Maximum daily, 3,110 ppm Feb. 28; minimum daily, 17 ppm Nov. 12.

Sediment loads: Maximum daily, 80,520 tons Mar. 19; minimum daily, 7 tons Feb. 15.

EXTREMES 1948-49 --Specific conductance: Maximum, 562 microhos Dec. 14; minimum, 133 microhos Feb. 27.

Water temperatures: Maximum, 89°F July 4; minimum, freezing point on many days during December to March.

Sediment concentrations: Maximum daily, 3,330 ppm Mar. 24; minimum daily, 10 ppm Feb. 6.

Sediment loads: Maximum daily, 43,480 tons Mar. 8; minimum daily, 8 tons Feb. 17.

EXTREMES 1943-49 --Dissolved solids (1944-47): Maximum, 402 ppm Jan. 11-20, 1944; minimum, 96 ppm Jan. 5-10, 1946.

Total hardness (1944-47): Maximum, 345 ppm Dec. 21-31, 1944; minimum, 54 ppm Jan. 5-10, 1946.

Specific conductance (July 1947 to September 1949): Maximum, 739 microhos Feb. 3, 1948; minimum, 133 microhos Feb. 27, 1949.

Water temperatures (1944-49): Maximum, 89°F July 4, 1949; minimum, freezing point on many days during winter months.

Sediment concentrations (1944-49): Maximum, 5,200 ppm June 20, 1946; minimum daily, 4 ppm Feb. 10-12, 1945, Feb. 5, 1947.

Sediment loads: Maximum daily, 177,000 tons May 23, 1944; minimum daily, 3 tons Jan. 24, 1945.

REMARKS --Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water years October 1947 to September 1949 given in Water-Supply Papers 1085, 1115, 1145.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean dis-charge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Po-tas-sium (K)	Car-bonate (CO ₃)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Bo-ron (B)	Dissolved solids			Hardness as CaCO ₃		
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	Per-cent so-dium
Oct. 1-31, 1948-----	179	7.7	423	11	0.03	55	20	10	5.2	0	208	54	10	0.2	2.8	0.12	254	0.35	123	220	49	9
Nov. 1-30-----	256	7.5	438	9.0	.02	55	21	11	5.6	0	221	54	10	.2	3.1	.09	260	.35	180	224	43	9
Dec. 1-31-----	255	8.0	511	15	.02	60	20	14	3.2	0	228	49	11	.2	7.8	.03	270	.37	186	232	45	11
Jan. 1-31, 1949-----	1,435	7.5	256	11	.05	28	9.3	6.7	4.0	0	101	28	4.5	.1	9.6	.02	160	.22	622	108	25	11
Feb. 1-23-----	486	8.5	438	16	.04	59	17	1.6	.8	0	189	40	7.0	.2	8.8	.11	276	.38	362	217	49	2
Feb. 24-Mar. 12-----	7,080	7.9	157	10	.30	20	5.3	2.2	.8	0	64	18	1.5	.2	5.0	.26	100	.14	1,910	72	20	6
Mar. 13-31-----	4,350	8.0	294	15	.04	39	11	3.3	.8	0	129	35	2.5	.1	11	.13	194	.26	2,280	143	37	5
Apr. 1-30-----	2,249	8.5	418	18	.04	57	16	4.0	1.6	8	177	48	4.0	.2	11	.10	264	.36	1,600	208	50	4
May 1-31-----	718	8.5	434	13	.02	56	22	8.5	5.6	14	196	52	6.0	.4	3.0	.29	276	.38	535	230	46	7
June 1-23-----	646	7.0	388	12	.02	47	17	5.4	1.2	0	182	44	6.5	.2	3.5	.20	242	.33	422	188	39	6
June 4, Sta. 255 1/2-----	1,210	---	390	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
June 4, Sta. 320 1/2-----	1,210	---	394	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
June 4, Sta. 365 1/2-----	1,210	---	402	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
June 4, Sta. 375 1/2-----	1,210	---	395	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
June 4, Sta. 440 1/2-----	1,210	---	404	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

1/Not included in weighted average.

June 24-30 -----	1,840	7.0	243	11	.14	32	9.8	5.2	4.0	0	112	34	6.2	4	3.2	10	23	845	121	29	8
July 1-13 -----	875	8.2	396	20	.02	52	15	5.8	1.9	7	173	37	5.6	2	16	.06	.35	597	191	38	6
July 14-31 -----	479	7.9	414	15	.03	52	18	12	1.8	0	201	42	8.2	3	4.8	.10	.36	339	204	39	11
Aug. 1-31 -----	210	8.1	453	9.4	.03	55	21	11	2.0	0	219	47	11	2	2.8	.10	.39	181	224	44	10
Sept. 1-11 -----	164	7.3	451	7.4	.04	56	22	14	3.2	0	232	48	12	2	2.8	.10	.41	151	230	40	12
Sept. 12-18 -----	588	7.3	335	9.6	.04	38	15	9.3	5.6	0	157	36	8.8	2	3.4	.05	.33	391	157	28	11
Sept. 19-30 -----	143	7.3	360	7.8	.04	43	16	10	3.6	0	177	36	9.2	2	3.7	.05	.30	84	174	29	11
Weighted average ---	1,182	--	301	13	0.11	39	12	4.7	1.9	--	2/136	34	4.0	0.2	7.7	0.15	191	609	147	35	6

2/Includes carbonate as bicarbonate.

IOWA RIVER BASIN--Continued

IOWA RIVER AT IOWA CITY, IOWA--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 7 a. m. and 4 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	64	54	34	32	32	32	43	64	67	84	79	70
2	63	54	34	32	32	32	42	64	74	84	75	70
3	64	55	34	33	32	33	46	64	72	87	76	71
4	59	55	34	33	32	33	46	68	74	89	81	73
5	59	56	34	32	32	34	47	72	76	88	76	72
6	60	53	34	32	32	34	47	73	75	86	76	70
7	58	54	34	32	32	35	48	71	73	85	78	68
8	54	51	34	32	32	33	50	68	71	82	81	65
9	53	49	34	32	32	33	50	67	69	82	83	66
10	54	46	32	32	32	33	54	63	70	82	83	65
11	54	45	32	32	33	33	51	62	73	79	83	67
12	53	44	36	32	33	33	54	64	76	79	82	65
13	52	43	35	32	32	33	55	67	76	79	79	65
14	52	43	34	32	32	33	56	69	68	79	82	62
15	53	41	34	33	33	33	50	71	74	79	82	63
16	54	43	33	32	33	33	45	70	73	80	81	62
17	53	41	32	32	33	33	47	69	76	81	81	64
18	50	44	32	32	33	33	45	69	78	79	79	66
19	50	45	33	32	34	33	45	70	82	81	79	64
20	48	45	33	32	33	34	47	67	81	81	79	68
21	49	44	33	32	33	35	50	64	82	82	78	67
22	50	42	32	32	33	46	50	63	81	78	78	65
23	49	39	32	33	33	38	53	62	81	80	80	66
24	52	38	32	32	33	42	55	63	77	82	79	62
25	49	37	32	32	33	42	55	67	78	81	79	63
26	50	35	32	32	33	42	63	63	77	83	80	62
27	50	36	32	32	33	42	61	65	78	84	79	63
28	51	38	33	32	32	43	61	65	78	80	79	60
29	51	35	33	--	--	46	61	70	78	81	80	56
30	53	35	32	--	--	47	63	71	81	78	81	56
31	55	--	32	32	--	45	--	72	--	81	77	--
Average	54	45	33	32	33	36	51	67	76	82	80	65

IOWA RIVER BASIN--Continued

IOWA RIVER AT IOWA CITY, IOWA--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,320	215	766	2,040	190	1,050	1,270	62	213
2-----	1,200	115	373	2,210	224	1,340	1,200	59	191
3-----	1,120	94	284	3,280	742	1/6,710	1,140	51	157
4-----	1,040	83	233	3,140	804	6,820	1,080	58	169
5-----	967	80	209	2,660	445	3,200	1,120	49	148
6-----	903	74	180	2,370	283	1,810	1,080	49	143
7-----	861	73	170	2,230	195	1,170	1,140	54	166
8-----	825	78	174	2,130	160	920	1,190	38	122
9-----	795	75	161	2,040	140	771	1,190	62	199
10-----	778	71	149	2,100	152	862	1,170	68	215
11-----	801	72	156	2,130	138	794	1,130	53	162
12-----	807	45	98	2,140	182	1,050	1,160	49	153
13-----	825	38	85	2,000	170	918	993	58	156
14-----	915	38	94	1,940	142	744	1,010	43	117
15-----	922	35	87	1,880	122	619	960	34	88
16-----	960	38	98	1,880	142	721	948	44	113
17-----	986	42	112	1,920	154	798	520	33	46
18-----	2,350	502	1/3,890	1,950	147	774	320	28	24
19-----	2,270	522	3,200	1,840	128	636	380	31	32
20-----	2,050	267	1,480	1,780	104	500	460	23	29
21-----	1,600	234	1,010	1,720	104	483	718	22	43
22-----	1,410	146	556	1,650	95	423	807	28	61
23-----	1,310	85	301	1,580	79	337	954	28	72
24-----	1,460	85	335	1,540	79	328	825	33	74
25-----	2,840	619	1/5,080	1,480	67	268	773	30	63
26-----	3,800	1,840	18,900	1,490	64	257	790	41	87
27-----	3,090	850	7,090	1,410	66	251	795	42	90
28-----	2,710	540	3,950	1,370	64	237	915	30	74
29-----	2,440	415	2,730	1,320	58	207	762	23	47
30-----	2,210	280	1,730	1,310	59	209	506	27	37
31-----	2,100	230	1,300	--	--	--	340	18	17
Total-	47,665	--	54,981	58,530	--	35,207	27,646	--	3,308
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	340	26	24	535	14	20	1,130	25	76
2-----	400	28	30	482	8	10	1,050	23	65
3-----	460	19	24	482	9	12	1,000	15	40
4-----	480	21	27	527	5	7	1,010	17	46
5-----	480	29	38	539	4	6	870	21	49
6-----	490	30	40	580	5	8	891	17	41
7-----	500	37	50	600	7	11	954	19	49
8-----	510	34	47	600	6	10	1,140	34	105
9-----	530	36	52	570	7	11	1,360	46	169
10-----	530	28	40	600	13	21	1,620	93	407
11-----	530	30	43	530	13	19	1,760	127	604
12-----	530	32	46	550	10	15	1,850	136	679
13-----	580	26	41	592	12	19	2,210	230	1,370
14-----	1,310	76	269	980	24	64	2,970	578	4,630
15-----	1,350	116	423	1,680	95	431	3,180	522	4,460
16-----	1,220	73	240	2,700	272	1/2,040	3,300	459	4,090
17-----	1,030	94	261	2,940	344	2,730	3,250	498	4,370
18-----	960	71	184	2,900	347	2,720	3,240	540	4,720
19-----	897	49	119	3,120	294	2,480	3,500	564	5,330
20-----	873	26	61	2,900	230	1,800	3,430	635	5,880
21-----	784	18	38	2,520	157	1,070	3,480	1,140	10,700
22-----	750	16	32	2,220	98	587	3,630	1,360	13,300
23-----	760	16	33	2,160	65	379	3,020	930	7,580
24-----	760	12	25	2,210	41	245	3,630	1,330	13,000
25-----	762	12	25	1,780	38	183	4,050	1,810	19,800
26-----	795	19	41	1,460	32	126	3,900	2,720	28,600
27-----	873	17	40	1,300	30	105	3,550	1,760	16,900
28-----	915	14	35	1,210	30	98	3,180	1,370	11,700
29-----	922	15	37	--	--	--	2,860	705	5,440
30-----	680	15	28	--	--	--	2,650	505	3,610
31-----	587	13	21	--	--	--	2,520	410	2,790
Total-	22,588	--	2,414	39,267	--	15,227	76,165	--	170,620

1/Sediment discharge computed by subdividing day.

IOWA RIVER BASIN--Continued

IOWA RIVER AT IOWA CITY, NEBR.--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2,460	340	2,260	4,270	698	8,050	5,480	975	1/14,600
2-----	2,370	295	1,890	4,100	625	6,920	6,610	951	17,000
3-----	2,200	220	1,310	3,870	726	7,590	7,070	680	13,000
4-----	2,670	460	1/3,590	3,490	565	5,330	12,900	1,660	1/60,300
5-----	6,000	3,810	1/65,000	3,140	358	3,040	17,700	1,190	56,900
6-----	7,580	2,450	1/50,500	2,850	269	2,070	17,000	803	36,900
7-----	6,420	1,440	25,000	2,700	210	1,530	24,200	1,410	1/93,300
8-----	6,010	850	13,800	2,520	189	1,290	27,400	1,270	94,000
9-----	5,860	750	11,900	2,370	171	1,090	23,000	905	56,200
10-----	5,750	1,090	16,900	2,270	156	956	17,700	690	33,000
11-----	6,220	1,850	31,100	2,140	135	780	13,200	331	11,800
12-----	5,960	1,140	18,300	2,020	118	644	10,800	238	6,940
13-----	6,340	829	14,200	1,940	130	681	11,100	760	22,800
14-----	7,170	843	16,300	1,910	119	614	10,900	746	22,000
15-----	7,580	699	14,300	1,900	122	626	15,700	1,390	1/64,900
16-----	7,430	462	9,270	1,900	110	564	29,500	1,880	1/152,000
17-----	7,360	416	8,270	1,960	119	630	32,600	1,650	1/146,000
18-----	7,220	361	7,040	2,170	130	762	27,900	1,070	80,600
19-----	7,250	344	6,730	2,400	189	1,220	20,700	716	40,000
20-----	9,330	754	19,000	2,360	221	1,410	15,400	478	19,900
21-----	8,720	500	11,800	2,340	198	1,250	13,800	428	15,900
22-----	7,710	369	7,680	2,260	208	1,270	14,200	458	17,600
23-----	7,780	346	7,250	2,190	178	1,050	16,300	555	24,400
24-----	7,250	287	5,620	2,090	157	886	17,200	558	25,900
25-----	6,350	273	4,680	2,080	151	848	15,800	497	21,200
26-----	5,180	350	4,900	2,040	137	755	16,500	493	22,000
27-----	4,450	516	6,200	1,930	129	672	15,900	528	22,700
28-----	4,060	673	7,380	2,200	161	956	13,600	408	15,000
29-----	3,810	464	4,770	4,740	1,680	1/21,700	12,100	369	12,100
30-----	4,890	2,260	1/30,300	4,710	1,610	20,500	12,700	1,030	1/37,400
31-----	--	--	--	4,870	1,240	16,300	--	--	--
Total-	179,360	--	427,240	83,730	--	111,984	494,960	--	1,256,340
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	13,600	742	27,200	1,240	128	429	404	--	2/51
2-----	15,200	828	34,000	1,200	110	356	421	--	2/61
3-----	12,700	539	18,500	1,150	115	357	424	--	2/55
4-----	10,500	376	10,700	1,090	111	327	398	--	2/57
5-----	9,850	391	10,400	1,060	117	335	387	--	2/46
6-----	12,000	1,220	1/39,400	1,000	131	354	404	--	2/40
7-----	10,200	584	16,100	946	148	378	376	--	2/42
8-----	8,650	370	8,640	898	115	279	342	--	2/44
9-----	7,880	330	7,020	830	116	260	340	--	2/46
10-----	7,250	321	6,280	781	111	234	331	--	2/46
11-----	6,600	320	5,700	742	117	234	354	--	2/71
12-----	6,680	714	1/14,200	694	126	236	359	--	2/62
13-----	7,630	1,540	31,700	673	106	193	340	--	2/43
14-----	6,580	724	12,900	657	109	193	323	--	2/45
15-----	5,370	432	6,260	594	108	173	334	--	2/47
16-----	4,910	451	5,980	559	119	180	300	--	2/45
17-----	4,330	499	5,830	555	114	171	248	--	2/35
18-----	3,640	419	4,120	527	110	157	309	--	2/44
19-----	3,170	385	3,800	486	76	100	289	--	2/36
20-----	3,010	369	3,000	483	74	97	282	--	2/39
21-----	2,700	337	2,460	480	85	110	309	--	2/47
22-----	2,340	319	2,020	465	99	124	255	--	2/35
23-----	2,160	262	1,530	459	115	143	247	--	2/29
24-----	2,050	200	1,110	453	--	2/81	254	--	2/27
25-----	1,930	183	954	444	--	2/72	276	--	2/32
26-----	1,810	165	806	410	--	2/73	245	--	2/30
27-----	1,730	151	705	401	--	2/66	250	--	2/30
28-----	1,620	120	525	421	--	2/59	298	--	2/36
29-----	1,540	105	437	441	--	2/57	218	--	2/27
30-----	1,410	104	396	407	--	2/46	221	--	2/30
31-----	1,340	119	431	401	--	2/47	--	--	--
Total-	180,380	--	282,604	20,947	--	5,921	9,538	--	1,278
Total discharge for year (second-foot-days) -----									1,240,776
Total load for year (tons) -----									2,367,124

1/Sediment discharge computed by subdividing day.

2/Estimated.

IOWA RIVER BASIN--Continued

IOWA RIVER AT IOWA CITY, IOWA--Continued

Suspended sediment, water year October 1947 to September 1948

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	231	84	52	522	--	1/97	250	58	39
2-----	211	82	47	568	66	101	390	54	57
3-----	225	113	69	652	67	118	531	50	72
4-----	250	86	58	674	70	127	670	--	1/85
5-----	227	74	45	697	69	130	860	55	128
6-----	357	68	66	652	68	120	775	113	236
7-----	277	--	1/48	594	62	99	890	115	276
8-----	290	66	52	577	46	72	948	102	261
9-----	280	69	52	505	--	1/46	461	86	107
10-----	256	63	44	543	27	40	465	78	98
11-----	236	85	54	526	--	1/30	469	64	81
12-----	241	--	1/60	514	17	24	518	--	1/57
13-----	241	86	56	489	18	24	539	19	28
14-----	222	77	46	481	40	52	670	38	69
15-----	216	74	43	457	35	43	805	44	96
16-----	233	66	42	465	27	34	630	32	54
17-----	241	56	36	477	24	31	539	40	58
18-----	211	83	47	489	--	1/29	625	43	73
19-----	203	95	52	489	20	26	599	39	63
20-----	206	91	51	505	18	25	599	40	65
21-----	256	--	1/61	522	--	1/27	573	36	56
22-----	209	86	49	505	23	31	568	33	51
23-----	201	84	46	501	29	39	564	--	1/47
24-----	196	--	1/44	518	36	50	518	30	42
25-----	176	85	40	518	58	81	510	--	1/55
26-----	191	80	41	485	--	1/80	510	54	74
27-----	211	90	51	539	60	87	505	56	76
28-----	253	87	59	409	58	64	497	50	67
29-----	329	83	74	330	60	53	465	41	51
30-----	372	78	78	280	62	47	481	41	53
31-----	522	73	103	--	--	--	461	41	51
Total-	7, 770	--	1, 666	15, 483	--	1, 827	17, 885	--	2, 626
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	380	38	39	171	54	25	6, 400	2, 450	43, 340
2-----	260	35	25	169	44	20	8, 600	1, 510	35, 060
3-----	250	34	23	167	50	23	7, 500	760	15, 390
4-----	320	--	1/30	167	34	15	7, 400	621	12, 410
5-----	350	37	35	165	33	15	8, 500	611	14, 020
6-----	370	--	1/45	154	34	14	7, 500	386	7, 820
7-----	394	--	1/57	160	43	19	4, 040	243	2, 650
8-----	433	55	64	151	41	17	3, 130	199	1, 680
9-----	437	41	48	150	33	13	2, 500	182	1, 230
10-----	417	32	36	155	27	11	2, 100	152	862
11-----	402	49	53	149	26	10	1, 700	97	445
12-----	417	50	56	151	25	10	1, 350	79	288
13-----	394	40	43	155	20	8	1, 150	70	217
14-----	340	36	33	145	24	9	1, 300	95	333
15-----	325	39	34	150	18	7	2, 850	361	2, 900
16-----	310	29	24	150	--	1/9	6, 260	785	2/13, 940
17-----	220	34	20	670	38	69	8, 730	1, 050	24, 750
18-----	225	27	16	1, 990	193	1, 040	10, 600	1, 330	2/38, 480
19-----	230	37	23	2, 190	276	1, 630	15, 200	1, 950	2/80, 520
20-----	256	28	19	1, 020	214	589	14, 600	1, 400	2/56, 310
21-----	256	--	1/17	600	224	363	14, 800	1, 650	65, 930
22-----	253	24	16	420	160	181	16, 500	1, 580	70, 390
23-----	236	26	17	440	130	154	13, 300	1, 260	45, 250
24-----	203	28	15	610	160	264	12, 500	1, 130	38, 150
25-----	200	--	1/17	810	268	586	10, 200	710	19, 550
26-----	190	35	18	620	151	253	8, 280	460	10, 280
27-----	180	35	17	2, 070	976	5, 450	6, 990	386	7, 280
28-----	180	42	20	6, 640	3, 110	55, 760	5, 520	1, 160	17, 290
29-----	183	54	27	3, 980	2, 260	24, 290	4, 570	1, 860	22, 950
30-----	179	35	17	--	--	--	4, 230	1, 970	22, 500
31-----	171	--	1/21	--	--	--	4, 440	1, 990	23, 860
Total-	8, 961	--	925	24, 569	--	90, 854	222, 740	--	696, 085

1/Estimated.

2/Sediment discharge computed by subdividing day.

IOWA RIVER BASIN--Continued

IOWA RIVER AT IOWA CITY, IOWA--Continued

Suspended sediment, water year October 1947 to September 1948--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	4,750	1,010	12,950	1,470	114	452	684	67	124
2-----	5,070	647	8,810	1,690	131	598	746	64	129
3-----	3,960	480	5,130	2,020	238	1,300	648	72	126
4-----	2,800	446	3,370	2,520	405	2,760	670	76	137
5-----	2,400	348	2,260	2,320	500	3,130	688	78	145
6-----	2,180	303	1,780	2,320	338	2,120	738	82	163
7-----	2,020	266	1,450	3,120	672	5,660	850	102	234
8-----	1,900	252	1,290	3,490	1,720	16,210	738	120	239
9-----	1,800	218	1,060	3,280	1,150	10,180	682	116	217
10-----	1,770	227	1,080	3,070	715	5,930	674	100	182
11-----	1,850	238	1,190	2,760	505	3,760	634	94	161
12-----	1,700	389	1,790	2,540	362	2,480	661	116	207
13-----	1,550	990	4,140	2,340	300	1,900	666	82	147
14-----	1,470	399	1,580	2,170	234	1,370	666	79	142
15-----	1,570	294	1,250	2,120	193	1,100	670	78	141
16-----	1,460	268	1,060	2,010	168	912	670	74	134
17-----	1,210	278	908	1,870	141	712	668	73	131
18-----	1,140	213	656	1,720	104	483	670	71	128
19-----	1,180	172	548	1,580	101	431	674	78	142
20-----	1,070	167	482	1,470	82	325	688	85	158
21-----	998	119	321	1,410	85	324	692	85	159
22-----	965	106	276	1,390	80	300	674	86	157
23-----	998	65	175	1,290	72	251	625	71	120
24-----	1,030	66	184	1,180	77	245	510	69	95
25-----	1,060	71	203	1,080	73	213	473	72	92
26-----	1,680	94	426	1,010	60	164	489	77	102
27-----	1,810	199	973	954	53	137	733	563	1,110
28-----	1,700	323	1,480	900	46	112	1,240	1,160	3,880
29-----	1,570	176	746	870	47	110	885	798	1,910
30-----	1,490	126	507	840	41	93	742	315	631
31-----	--	--	--	810	57	125	--	--	--
Total-	56,151	--	58,075	57,614	--	63,887	20,856	--	11,443
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	938	251	585	670	215	389	201	99	54
2-----	1,080	160	467	547	155	229	326	104	92
3-----	875	--	1,676	469	144	182	312	118	99
4-----	692	377	704	421	118	134	183	85	42
5-----	815	304	669	398	111	119	160	61	26
6-----	652	178	313	375	102	103	183	62	31
7-----	652	134	236	357	108	104	227	72	44
8-----	621	145	243	329	111	99	214	80	46
9-----	543	108	158	316	91	78	206	78	43
10-----	518	105	147	329	96	85	196	71	38
11-----	461	126	157	309	100	83	188	68	35
12-----	461	143	178	283	89	68	179	71	34
13-----	581	153	240	283	80	61	167	82	37
14-----	830	249	558	274	87	64	162	65	28
15-----	607	281	461	265	71	51	158	67	29
16-----	473	201	257	247	67	45	145	77	30
17-----	453	158	193	225	66	40	143	70	27
18-----	738	126	251	241	66	43	141	67	26
19-----	855	114	263	233	67	42	137	52	19
20-----	679	570	1,040	219	70	41	165	58	26
21-----	2,580	1,900	13,240	211	70	40	256	92	64
22-----	2,170	820	4,800	211	69	39	236	150	96
23-----	1,450	1,420	5,560	209	64	36	216	121	71
24-----	976	695	1,830	188	60	30	209	107	60
25-----	1,090	589	2,140	183	58	29	196	102	54
26-----	1,610	1,270	5,520	181	57	28	188	84	43
27-----	1,180	486	1,550	165	59	26	171	88	41
28-----	905	375	916	156	58	24	160	88	38
29-----	746	395	796	143	54	21	151	84	34
30-----	1,450	400	2,170	165	55	25	139	78	29
31-----	821	490	1,220	201	79	43	--	--	--
Total-	28,602	--	47,008	8,803	--	2,401	5,715	--	1,336

Total discharge for year (second-foot-days) ----- 475,149

Total load for year (tons) ----- 978,113

1/Estimated.

2/Sediment discharge computed by subdividing day.

IOWA RIVER BASIN--Continued

IOWA RIVER AT IOWA CITY, IOWA--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	123	158	52	133	51	18	225	46	28
2-----	118	90	29	184	58	29	198	33	18
3-----	119	100	32	188	69	35	186	21	11
4-----	123	81	27	158	70	30	216	23	13
5-----	119	72	23	156	71	30	233	39	25
6-----	127	82	28	162	75	33	259	56	39
7-----	479	172	1/243	171	70	32	244	74	49
8-----	552	402	599	176	64	30	203	136	75
9-----	275	267	198	181	64	31	158	60	1/30
10-----	203	215	118	170	61	28	131	45	16
11-----	234	156	99	147	69	27	116	33	10
12-----	199	90	48	142	104	40	154	60	25
13-----	184	68	34	131	41	14	186	30	15
14-----	193	54	28	167	47	21	219	32	19
15-----	188	40	20	171	47	22	423	72	1/103
16-----	179	75	36	253	42	29	648	272	1/508
17-----	171	144	66	296	56	45	421	163	185
18-----	209	60	34	322	92	80	176	229	109
19-----	201	56	30	287	132	102	216	261	1/162
20-----	106	67	19	518	138	193	268	99	72
21-----	135	59	22	514	179	248	456	168	207
22-----	137	52	19	522	164	231	390	57	60
23-----	123	51	17	368	175	174	127	34	12
24-----	123	52	17	375	118	119	112	32	10
25-----	123	47	15	343	122	113	290	51	40
26-----	123	55	18	375	64	65	271	17	12
27-----	135	54	20	268	58	43	129	26	9
28-----	149	50	20	290	40	31	116	50	16
29-----	141	52	20	265	47	34	474	49	63
30-----	133	63	23	253	66	45	522	38	54
31-----	129	53	18	--	--	--	143	45	17
Total-	5,553	--	1,972	7,686	--	1,972	7,912	--	2,012
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	256	63	44	550	--	2/18	3,800	311	3,190
2-----	413	22	25	540	20	29	3,900	312	3,290
3-----	417	28	32	520	28	39	4,300	400	4,640
4-----	1,110	128	1/621	540	23	34	5,400	650	9,480
5-----	2,370	361	2,310	520	15	21	6,200	848	14,200
6-----	2,100	271	1,540	520	10	14	5,800	819	12,830
7-----	1,810	320	1,560	510	12	17	7,000	1,010	19,090
8-----	2,150	250	1,450	510	18	25	12,200	1,320	43,480
9-----	2,150	221	1,280	500	50	68	13,200	1,020	36,350
10-----	2,070	190	1,060	250	78	53	13,700	772	28,560
11-----	1,590	107	459	518	32	45	13,300	512	18,390
12-----	1,210	64	209	526	54	77	11,400	345	10,820
13-----	1,020	44	121	497	47	1/65	9,630	275	7,150
14-----	965	58	151	489	384	507	7,960	250	5,370
15-----	1,440	174	1/915	233	152	96	5,940	310	4,970
16-----	2,500	577	3,890	413	13	14	3,980	368	3,950
17-----	2,070	329	1,840	277	11	8	3,100	295	2,470
18-----	2,150	260	1,510	340	11	10	2,560	218	1,510
19-----	3,380	245	2,240	343	14	13	2,230	210	1,260
20-----	2,800	200	1,510	560	18	27	1,990	168	903
21-----	2,400	134	868	648	24	42	1,910	130	670
22-----	1,600	112	484	625	32	54	2,390	300	1/2,000
23-----	1,000	86	232	740	150	1/427	3,680	1,600	1/17,070
24-----	900	76	185	4,000	968	1/15,210	4,680	3,330	1/41,410
25-----	800	48	104	4,800	502	1/9,740	4,780	2,150	27,750
26-----	750	41	83	4,000	495	5,340	4,180	1,400	15,800
27-----	700	28	53	3,600	400	3,890	4,480	1,100	13,310
28-----	650	22	38	3,700	342	3,420	4,580	1,220	15,090
29-----	610	16	26	--	--	--	4,580	1,340	16,570
30-----	560	--	2/18	--	--	--	4,580	1,170	14,470
31-----	540	--	2/17	--	--	--	5,390	2,420	35,220
Total-	44,481	--	24,875	31,269	--	39,303	182,820	--	431,063

1/Sediment discharge computed by subdividing day.

2/Estimated.

IOWA RIVER BASIN--Continued

IOWA RIVER AT IOWA CITY, IOWA--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	5,500	1,520	22,570	1,050	56	159	715	56	108
2-----	5,390	950	13,630		72	193	738	99	197
3-----	4,980	730	9,820		90	234	992	265	710
4-----	4,380	538	6,340		910	209	1,210	353	1/1,180
5-----	3,580	438	4,230		85	197	1,020	728	2,000
6-----	3,100	348	2,910		98	214	910	736	1,810
7-----	2,740	290	2,150		785	90	191	738	434
8-----	2,470	237	1,580		760	77	158	648	335
9-----	2,230	200	1,200		760	78	160	603	278
10-----	1,990	155	833		738	79	157	560	209
11-----	1,830	116	573		715	67	129	531	165
12-----	1,710	97	448		692	53	99	518	143
13-----	1,590	83	356		670	50	90	344	146
14-----	1,430	77	297		670	61	110	692	178
15-----	1,550	88	368		625	100	169	539	299
16-----	1,550	80	335		625	77	130	603	156
17-----	1,670	88	397		625	75	127	539	160
18-----	1,750	109	515		603	75	122	603	247
19-----	1,750	119	562		648	72	126	481	188
20-----	1,750	118	558		648	77	135	514	155
21-----	1,710	110	508		648	78	136	489	145
22-----	1,750	100	472		760	67	137	477	140
23-----	1,710	92	425		760	85	174	389	200
24-----	1,630	83	365		715	75	145	1,720	1,990
25-----	1,510	75	306		670	75	136	2,650	2,740
26-----	1,430	63	243		648	70	122	1,790	2,600
27-----	1,320	58	207		625	67	113	2,150	2,550
28-----	1,210	55	180		603	77	125	1,870	2,080
29-----	1,140	54	166		581	86	135	1,470	980
30-----	1,110	55	165		560	72	109	1,240	750
31-----	--	--	--		526	63	89	--	--
Total-	67,460	--	72,909	22,247	--	4,530	27,743	--	84,405
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,080	281	819	318	146	125	141	75	29
2-----	992	230	616	296	159	127	101	72	20
3-----	938	196	496	262	150	106	137	80	30
4-----	1,140	189	582	247	120	80	230	68	42
5-----	965	234	610	219	85	50	193	74	39
6-----	910	343	843	201	68	37	174	55	26
7-----	910	319	784	219	59	35	253	55	38
8-----	885	204	487	203	52	29	198	66	35
9-----	860	184	427	186	52	26	206	77	43
10-----	760	210	431	219	56	33	174	56	26
11-----	670	207	374	368	68	68	216	74	43
12-----	560	172	260	409	90	99	1,040	228	640
13-----	469	158	200	259	94	66	882	526	1,250
14-----	514	135	187	183	56	28	581	374	587
15-----	473	100	128	203	57	31	557	194	292
16-----	433	106	124	186	63	32	506	143	195
17-----	409	105	116	191	52	27	261	166	117
18-----	409	94	104	188	61	31	287	258	200
19-----	406	89	98	198	62	33	278	198	149
20-----	469	95	120	193	64	33	82	211	47
21-----	535	95	137	186	62	31	181	150	73
22-----	473	95	121	178	64	31	165	100	45
23-----	409	87	96	147	59	23	152	88	36
24-----	462	135	176	175	72	34	139	73	27
25-----	433	244	285	170	47	22	131	55	19
26-----	421	150	171	169	45	21	134	70	25
27-----	810	146	319	141	40	15	126	65	22
28-----	596	260	418	141	69	26	122	70	23
29-----	603	150	244	147	70	28	105	80	23
30-----	429	126	146	160	58	25	105	50	14
31-----	326	133	117	149	78	31	--	--	--
Total-	19,769	--	10,036	6,509	--	1,383	7,857	--	4,155

Total discharge for year (second-foot-days) ----- 431,306

Total load for year (tons) ----- 678,615

1/Sediment discharge computed by subdividing day.

IOWA RIVER BASIN--Continued
CEDAR RIVER AT CEDAR RAPIDS, IOWA

LOCATION --At Eighth Avenue bridge at Cedar Rapids, Linn County, 500 feet downstream from gaging station, 2.6 miles upstream from Prairie Creek. DRAINAGE AREA, --5,640 square miles.

RECORDS AVAILABLE --Chemical analyses: September 1906 to September 1907, January 1914 to September 1949.

Water temperatures: January 1944 to September 1949.

Sediment records: October 1943 to September 1949.

EXTREMES, 1948-49 --Sediment concentrations: Maximum daily, 1,700 ppm June 15, minimum daily, 1 ppm Feb. 11.

EXTREMES, 1947-48 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1946-47 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1945-46 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1944-45 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1943-44 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1942-43 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1941-42 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1940-41 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1939-40 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1938-39 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1937-38 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1936-37 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1935-36 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1934-35 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1933-34 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1932-33 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1931-32 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1930-31 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1929-30 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1928-29 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1927-28 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1926-27 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1925-26 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1924-25 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1923-24 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1922-23 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1921-22 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1920-21 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1919-20 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1918-19 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1917-18 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1916-17 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1915-16 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1914-15 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1913-14 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1912-13 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1911-12 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1910-11 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1909-10 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1908-09 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1907-08 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1906-07 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1905-06 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1904-05 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1903-04 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1902-03 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1901-02 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1900-01 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1899-00 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1898-99 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1897-98 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

EXTREMES, 1896-97 --Sediment daily, 445,000 tons June 15; minimum daily, 8 tons Feb. 11.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Per cent non-carbonate
																Parts per million	Tons per acre-foot	Tons per day	Total		
Oct. 1-31, 1948 ----	753	7.9	411	8.2	0.03	43	20	16		0.4	188	30	0.3	1.2	--	270	0.37	549	190	36	15
Nov. 1-30 -----	849	8.0	439	7.8	.03	48	20	17	2.0	209	32	26	.1	2.0	--	290	.39	665	202	31	15
Dec. 1-31 -----	731	7.8	548	14	.05	68	22	20	1.2	234	42	29	.4	.14	0.02	334	.45	659	260	52	14
Dec. 16, Sta. 120 1/2	810	--	509	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 16, Sta. 230 1/2	810	--	513	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 16, Sta. 300 1/2	810	--	505	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 16, Sta. 325 1/2	810	--	533	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 16, Sta. 420 1/2	810	--	504	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 16, Sta. 500 1/2	810	--	507	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

1/Not included in weighted average.

REMARKS --Daily samples for chemical analyses composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water years October 1947 to September 1949 given in Water-Supply Papers 1055, 1115, and 1145.

IOWA RIVER BASIN--Continued
CEDAR RIVER AT CEDAR RAPIDS, IOWA--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-foot)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Jan. 1-31, 1949 ---	1,575	7.4	355	13	0.07	45	13	11	1.6	154	34	16	0.4	7.9	0.03	244	0.33	1,040	166	40	12
Feb. 1-Mar. 4 ---	1,560	7.6	391	13	.01	45	17	8.1	2.8	175	35	16	.2	6.3	.06	254	.35	1,070	183	39	9
Mar. 5-13 ---	18,900	7.5	202	11	.19	27	14	6.6	4.1	99	14	3.5	.2	4.3	.00	130	.18	6,630	95	14	9
Mar. 14-31 ---	7,430	7.7	313	14	.05	35	14	5.7	4.0	139	34	8.0	.2	9.7	.00	226	.31	4,530	145	31	8
Apr. 1-6 ---	12,600	7.3	323	16	.04	43	11	1.0	.8	116	36	4.5	.1	13	.15	198	.27	6,840	153	58	1
Apr. 7-30 ---	4,420	8.5	418	15	.04	57	15	9.3	.8	2/188	44	8.5	.2	9.2	.13	252	.34	3,010	204	50	9
May 1-31 ---	1,684	8.0	377	8.8	.02	42	17	16	4.0	173	41	14	.3	2.9	.17	222	.30	1,010	175	33	16
June 1-27 ---	1,820	7.3	362	9.2	.04	43	15	13	5.6	178	32	15	.2	4.0	.20	230	.31	1,130	169	23	14
June 6, Sta. 120 1/-	2,110	---	398	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
June 6, Sta. 230 1/-	2,110	---	402	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
June 6, Sta. 300 1/-	2,110	---	404	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
June 6, Sta. 325 1/-	2,110	---	413	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
June 6, Sta. 420 1/-	2,110	---	407	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
June 6, Sta. 500 1/-	2,110	---	408	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
June 28-30 ---	4,540	8.2	321	14	.06	43	10	9.3	5.6	146	30	10	.2	8.6	.30	204	.28	2,500	149	29	11
July 1-9 ---	2,650	7.8	357	16	.02	48	11	8.5	2.4	165	27	12	.3	7.4	.06	228	.31	1,630	165	30	10
July 10-Aug. 5 ---	1,250	8.0	376	8.6	.02	40	16	15	1.6	153	35	19	.2	4.5	.10	228	.31	1,770	166	41	16
Aug. 6-31 ---	687	7.7	405	7.7	.03	33	20	21	2.0	181	31	28	.3	4.3	.05	232	.32	418	165	33	21
Sept. 1-30 ---	806	7.2	391	6.6	.04	31	19	19	5.2	172	27	28	.2	4.8	.05	220	.30	360	156	15	20
Weighted average -	2,368	---	338	12	0.07	41	13	8.8	2.4	151	31	12	0.2	6.9	0.07	216	0.29	1,360	156	32	11

1/Not included in weighted average.

2/Includes equivalent of 10 parts per million of carbonate (CO₃).

IOWA RIVER BASIN--Continued

CEDAR RIVER AT CEDAR RAPIDS, IOWA--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 [Once-daily temperature measurement between 7 a. m. and 8 p. m.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	56	37	36	35	37	44	64	78	86	80	71
2	66	56	39	37	35	37	45	64	73	86	78	70
3	62	56	38	37	35	37	48	67	75	86	70	70
4	61	56	40	36	35	37	46	73	75	89	79	71
5	60	55	42	35	35	37	48	76	77	88	80	71
6	60	52	41	35	35	37	50	77	79	88	80	69
7	58	49	38	36	36	36	53	71	76	83	84	67
8	56	50	38	37	34	36	50	68	71	82	86	68
9	56	46	35	36	35	36	55	68	70	80	88	68
10	54	46	35	37	35	35	53	65	73	82	85	68
11	52	46	36	37	36	36	55	66	76	81	82	67
12	55	45	37	36	36	36	57	68	80	81	81	68
13	55	45	37	35	35	36	61	72	80	82	81	68
14	58	45	37	36	35	39	57	70	78	81	82	65
15	59	46	35	36	35	38	48	70	77	80	84	64
16	58	45	35	35	36	36	48	69	78	80	84	66
17	54	46	36	35	36	38	48	70	80	83	84	65
18	50	46	36	34	36	38	48	70	81	83	83	68
19	50	46	36	35	36	37	48	69	83	84	80	68
20	51	46	36	35	37	40	52	65	84	82	76	64
21	52	45	37	35	35	44	55	61	83	81	78	66
22	52	43	35	35	36	42	56	61	81	81	79	65
23	52	39	35	35	37	42	56	66	81	81	78	64
24	49	37	35	35	36	42	58	65	79	83	80	65
25	52	39	35	35	37	45	61	66	79	85	81	65
26	53	42	35	35	35	47	65	67	80	84	80	65
27	50	41	37	35	35	45	65	69	80	83	81	65
28	55	40	35	34	35	42	65	70	81	83	79	63
29	55	39	37	34	--	46	65	70	80	83	78	62
30	55	38	36	35	--	47	66	71	83	81	77	60
31	55	--	36	35	--	46	--	75	--	81	74	--
Average	56	46	37	35	36	40	54	68	78	83	81	67

IOWA RIVER BASIN--Continued

CEDAR RIVER AT CEDAR RAPIDS, IOWA--Continued

Suspended sediment, water year October 1946 to September 1947

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2,420	33	216	3,860	84	875	2,370	17	109
2-----	2,330	25	157	4,770	155	2,000	2,090	18	102
3-----	2,220	29	174	5,110	146	2,010	1,940	16	84
4-----	2,110	33	188	4,670	130	1,640	1,920	18	93
5-----	2,020	38	207	4,050	72	787	2,110	18	103
6-----	1,900	38	195	3,770	51	519	2,110	16	91
7-----	1,820	39	192	3,650	50	493	2,220	22	132
8-----	1,740	39	183	3,590	53	514	2,260	40	244
9-----	1,680	40	181	3,500	42	397	2,150	31	180
10-----	1,700	42	193	3,440	41	381	2,150	28	163
11-----	1,780	36	173	3,470	42	393	2,040	18	99
12-----	1,860	22	110	3,470	40	375	2,040	20	110
13-----	1,880	21	107	3,440	39	362	2,020	15	82
14-----	2,240	17	103	3,710	39	391	1,880	16	81
15-----	2,560	29	200	3,830	42	434	1,820	18	88
16-----	2,840	36	276	4,050	53	580	1,450	16	63
17-----	2,860	38	293	4,050	39	426	1,280	17	59
18-----	3,160	40	341	3,830	39	403	900	15	36
19-----	3,190	43	370	3,590	39	378	670	28	47
20-----	3,000	36	292	3,500	35	331	987	33	88
21-----	2,860	33	255	3,380	29	265	1,330	28	101
22-----	2,660	40	287	3,190	35	301	1,570	19	81
23-----	2,370	77	493	3,100	28	234	1,760	16	76
24-----	3,600	359	1/4,090	2,940	17	135	1,840	18	89
25-----	6,400	492	1/8,710	2,780	17	128	1,720	22	102
26-----	4,410	162	1,930	2,760	17	127	1,520	18	74
27-----	3,800	90	923	2,610	19	134	1,560	11	46
28-----	4,240	116	1,330	2,490	22	148	1,740	19	89
29-----	4,410	106	1,260	2,470	24	160	1,650	8	36
30-----	4,310	95	1,110	2,490	22	148	1,350	8	29
31-----	4,020	80	868	--	--	--	950	13	33
Total--	88,390	--	25,407	105,560	--	15,469	53,347	--	2,810
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	950	8	21	850	10	23	1,730	4	19
2-----	1,020	9	25	870	9	21	1,660	6	27
3-----	1,080	14	41	960	10	26	1,580	5	21
4-----	1,100	23	68	1,080	8	23	1,550	2	8
5-----	1,120	14	42	1,180	6	19	1,520	7	29
6-----	1,140	12	37	1,280	7	24	1,570	8	34
7-----	1,150	--	2/37	1,330	6	22	1,780	24	115
8-----	1,160	13	41	1,350	4	15	2,020	22	120
9-----	1,160	13	41	1,340	5	18	2,300	25	155
10-----	1,170	36	114	1,310	4	14	2,680	29	210
11-----	1,180	22	70	1,270	1	3	3,020	33	269
12-----	1,230	7	23	1,280	2	7	3,350	44	398
13-----	1,300	11	39	1,310	3	11	3,770	64	651
14-----	1,360	28	103	1,480	3	12	4,810	129	1,680
15-----	1,440	26	101	2,640	45	321	5,660	118	1,800
16-----	1,520	15	62	3,410	68	626	5,420	93	1,360
17-----	1,600	9	39	3,470	47	440	5,910	92	1,470
18-----	1,700	17	78	3,470	33	309	6,400	109	1,880
19-----	1,860	11	55	3,650	38	374	6,920	109	2,040
20-----	1,940	11	58	3,650	38	374	6,400	114	1,970
21-----	2,070	14	78	3,560	40	384	5,840	173	2,730
22-----	1,800	15	73	3,420	35	323	5,150	152	2,110
23-----	1,280	13	45	2,980	16	129	4,340	74	867
24-----	1,430	7	27	2,500	9	61	4,540	85	1,040
25-----	1,650	7	31	2,030	9	49	5,010	112	1,520
26-----	1,800	8	39	1,950	15	80	5,600	126	1,910
27-----	1,940	11	58	1,890	12	61	6,440	138	2,400
28-----	1,980	12	64	1,820	7	34	7,310	246	1/4,930
29-----	1,880	13	66	--	--	--	7,730	280	5,840
30-----	1,420	15	58	--	--	--	6,720	221	4,010
31-----	1,060	9	26	--	--	--	6,050	166	2,710
Total--	44,490	--	1,660	57,330	--	3,803	134,780	--	44,323

1/Sediment discharge computed by subdividing day.

2/Estimated.

IOWA RIVER BASIN--Continued

CEDAR RIVER AT CEDAR RAPIDS, IOWA--Continued

Suspended sediment, water year October 1946 to September 1947--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	5,520	140	2,090	6,050	138	2,250	10,900	1,040	1/36,100
2-----	5,080	115	1,580	5,840	135	2,130	26,100	1,340	1/93,100
3-----	4,770	96	1,240	5,490	100	1,480	35,400	1,150	1/111,000
4-----	5,150	124	1,720	5,080	99	1,360	32,900	914	1/81,700
5-----	7,760	670	1/15,200	4,600	70	869	32,500	885	1/79,300
6-----	8,600	533	12,400	4,540	65	797	35,400	1,080	1/104,000
7-----	7,340	248	4,910	4,500	62	753	25,500	646	44,500
8-----	7,660	228	4,720	4,340	59	691	19,700	469	24,900
9-----	8,920	252	6,070	4,020	57	619	13,300	419	15,000
10-----	12,800	951	1/35,300	3,770	60	611	10,600	374	10,700
11-----	16,200	781	34,200	3,590	55	533	9,520	290	7,450
12-----	14,500	362	14,200	3,470	41	384	8,960	228	5,520
13-----	12,500	340	11,500	3,350	48	434	17,800	956	1/53,700
14-----	13,600	341	12,500	3,350	44	398	43,800	1,610	1/192,000
15-----	16,300	322	14,200	3,350	49	443	53,300	1,700	245,000
16-----	17,800	242	11,600	3,410	45	414	51,800	1,060	148,000
17-----	15,300	167	6,900	3,900	57	600	38,700	468	1/49,400
18-----	11,700	124	3,920	4,370	63	743	30,100	408	33,200
19-----	10,400	120	3,370	4,410	67	798	24,100	382	24,900
20-----	10,600	137	3,920	4,340	75	879	20,700	336	18,800
21-----	9,160	125	3,090	4,280	76	878	21,900	265	15,700
22-----	8,500	102	2,340	4,120	60	667	22,100	252	15,000
23-----	7,730	112	2,340	3,830	64	662	19,200	236	12,400
24-----	7,400	104	2,080	3,800	59	605	16,600	245	11,000
25-----	7,060	102	1,940	3,740	50	505	15,700	263	11,100
26-----	7,310	141	2,780	3,770	47	478	15,500	235	9,830
27-----	7,380	184	3,670	3,620	45	440	14,300	191	7,370
28-----	7,140	168	3,240	3,650	77	759	12,700	180	6,170
29-----	6,780	125	2,290	8,360	531	1/12,300	11,900	272	8,740
30-----	6,400	119	2,060	8,180	320	7,070	11,500	291	9,040
31-----	--	--	--	6,920	190	3,550	--	--	--
Total--	287,360	--	227,370	140,040	--	45,100	702,480	--	1,484,620
Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	11,400	466	14,300	2,640	75	535	1,700	47	216
2-----	13,000	467	16,400	2,640	63	449	1,820	49	241
3-----	15,400	420	17,500	2,560	68	470	1,940	51	267
4-----	17,300	270	12,600	2,470	65	433	1,880	52	264
5-----	18,800	273	13,900	2,390	67	432	1,740	48	226
6-----	17,800	443	21,300	2,300	65	404	1,610	54	235
7-----	15,600	390	16,400	2,240	72	435	1,540	49	204
8-----	12,800	323	11,200	2,130	77	443	1,480	42	168
9-----	12,000	274	8,680	2,020	63	344	1,400	66	249
10-----	12,300	233	7,740	1,880	70	355	1,330	63	226
11-----	11,600	207	6,480	1,920	76	394	1,330	49	176
12-----	9,900	213	5,690	1,840	63	313	1,380	46	171
13-----	8,360	166	3,750	1,840	63	313	1,540	47	195
14-----	7,000	125	2,360	1,780	57	274	1,500	50	202
15-----	6,540	134	2,370	1,720	54	251	1,430	57	220
16-----	6,360	129	2,220	1,700	66	303	1,330	53	190
17-----	6,640	146	2,620	1,680	70	318	1,430	47	181
18-----	6,960	172	3,230	1,630	65	286	1,470	44	175
19-----	7,480	241	4,870	1,610	51	222	1,420	44	169
20-----	6,440	180	3,130	1,430	42	162	1,470	45	179
21-----	5,770	151	2,350	1,450	36	141	1,400	47	178
22-----	5,210	156	2,190	1,480	50	200	1,220	37	122
23-----	4,740	104	1,330	1,450	46	180	1,350	32	117
24-----	4,410	101	1,200	1,420	60	230	1,200	37	120
25-----	4,150	95	1,060	1,380	86	320	1,180	39	124
26-----	3,900	101	1,060	1,380	55	205	1,230	33	110
27-----	3,530	93	886	1,400	52	197	1,080	44	126
28-----	3,380	80	730	1,350	38	139	1,140	36	111
29-----	3,240	82	717	1,360	41	151	1,040	47	132
30-----	3,020	92	750	1,520	40	164	1,100	34	101
31-----	2,890	81	632	1,610	48	209	--	--	--
Total--	267,920	--	189,845	56,220	--	9,272	42,660	--	5,395

Total discharge for year (second-foot-days) -----

1,980,577

Total load for year (tons) -----

2,055,074

1/Seciment discharge computed by subdividing day.

IOWA RIVER BASIN--Continued

CEDAR RIVER AT CEDAR RAPIDS, IOWA--Continued

Suspended sediment, water year October 1947 to September 1948

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,110	22	66	1,820	29	143	640	23	40
2-----	1,080	56	163	1,760	34	162	935	19	48
3-----	1,110	40	120	1,740	37	174	1,430	15	58
4-----	1,220	42	138	1,780	40	192	1,700	45	207
5-----	1,230	42	145	1,780	43	207	2,040	36	198
6-----	1,250	48	162	1,630	25	110	2,190	61	361
7-----	1,180	--	1/182	1,590	26	112	2,300	51	317
8-----	1,280	69	238	1,560	22	93	1,900	39	200
9-----	1,100	83	247	1,500	27	109	1,300	24	64
10-----	1,140	49	151	1,470	24	95	900	16	39
11-----	1,120	64	194	1,360	15	55	880	20	48
12-----	1,100	64	190	1,420	20	77	1,100	17	50
13-----	1,010	41	112	1,310	22	78	1,400	17	64
14-----	1,030	64	178	1,310	13	46	1,450	15	59
15-----	1,080	40	117	1,330	16	57	1,500	13	53
16-----	987	48	128	1,420	18	69	1,350	13	47
17-----	987	40	107	1,360	10	37	800	14	30
18-----	1,010	36	98	1,430	14	54	680	24	44
19-----	987	41	109	1,470	36	143	920	26	65
20-----	1,000	48	130	1,420	18	69	1,150	22	68
21-----	1,000	69	186	1,420	26	100	1,300	34	119
22-----	987	41	109	1,430	29	112	1,350	22	80
23-----	974	38	100	1,430	36	139	1,300	16	56
24-----	961	47	122	1,470	35	139	1,150	17	53
25-----	1,030	36	100	1,520	34	140	1,100	17	50
26-----	1,220	48	158	1,450	25	98	1,150	17	53
27-----	1,140	39	120	1,380	17	63	1,100	15	45
28-----	1,500	38	154	1,170	22	69	1,100	12	36
29-----	1,650	36	160	990	20	53	1,150	10	31
30-----	1,780	--	1/187	750	13	26	1,100	15	45
31-----	1,860	39	196	--	--	--	1,150	32	99
Total-	36,163	--	4,567	43,470	--	3,021	39,515	--	2,747
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,050	19	54	590	23	37	17,800	862	41,430
2-----	850	17	39	600	26	42	25,100	760	51,510
3-----	780	33	69	600	19	31	31,800	474	40,700
4-----	860	30	70	590	20	32	29,400	295	23,420
5-----	970	46	120	580	19	30	18,500	190	2/9,760
6-----	1,080	52	152	580	18	28	9,830	120	3,180
7-----	1,140	32	98	580	17	27	5,980	100	1,610
8-----	1,060	31	89	570	20	31	5,210	95	1,340
9-----	1,060	47	135	570	16	25	4,640	79	990
10-----	1,080	33	96	580	21	33	4,180	45	508
11-----	1,060	23	66	590	24	38	4,050	--	1/634
12-----	1,050	28	79	590	19	30	3,560	75	721
13-----	1,010	17	46	580	23	36	3,130	--	1/524
14-----	880	27	64	590	18	29	3,410	47	433
15-----	670	30	54	600	14	23	4,280	59	682
16-----	720	29	56	650	10	18	8,320	306	6,870
17-----	740	22	44	700	12	23	13,300	618	22,190
18-----	740	20	40	800	90	194	18,300	690	34,090
19-----	730	15	30	1,100	80	238	22,600	1,230	2/80,570
20-----	720	30	58	1,400	46	174	32,500	1,030	89,550
21-----	700	33	62	1,700	21	96	32,500	620	54,410
22-----	700	28	53	2,000	11	59	30,200	596	48,600
23-----	710	33	63	2,400	22	143	21,600	368	21,460
24-----	710	23	44	2,300	26	161	14,600	230	9,070
25-----	700	20	38	2,200	26	154	9,970	170	4,580
26-----	680	17	31	2,100	39	221	7,800	864	18,200
27-----	660	18	32	2,000	98	2/540	8,680	1,190	27,890
28-----	660	27	48	6,400	1,210	20,910	7,980	532	11,460
29-----	640	31	54	10,600	858	24,560	8,010	595	12,870
30-----	620	54	80	--	--	--	7,840	538	11,390
31-----	600	36	58	--	--	--	7,060	346	6,600
Total-	25,630	--	2,032	45,140	--	47,963	422,130	--	637,242

1/Estimated.

2/Sediment discharge computed by subdividing day.

IOWA RIVER BASIN--Continued

CEDAR RIVER AT CEDAR RAPIDS, IOWA--Continued

Suspended sediment, water year October 1947 to September 1948--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	6,260	190	3,210	3,500	108	1,020	1,700	77	353
2-----	5,420	139	2,030	3,800	267	2,740	1,470	72	286
3-----	4,770	124	1,600	4,700	220	2,790	1,650	56	249
4-----	4,370	111	1,310	4,120	116	1,290	1,570	56	237
5-----	4,020	100	1,090	3,710	94	942	1,590	258	1,110
6-----	3,800	--	1/975	4,470	284	3,430	3,330	267	2,400
7-----	3,620	--	1/899	4,640	234	2,930	4,210	193	2,190
8-----	3,380	90	821	4,810	157	2,040	3,270	138	1,220
9-----	3,380	147	1,340	4,700	140	1,780	2,420	110	719
10-----	3,560	254	2,440	4,470	147	1,770	2,190	141	834
11-----	3,620	219	2,140	4,640	154	1,930	1,940	112	587
12-----	3,500	131	1,240	5,150	144	2,000	1,920	116	601
13-----	3,500	165	1,560	5,110	160	2,210	1,860	126	633
14-----	3,470	128	1,200	5,250	197	2,790	1,780	106	509
15-----	3,270	166	1,470	5,150	132	1,840	1,720	101	469
16-----	3,050	143	1,180	5,110	112	1,550	1,700	91	418
17-----	2,890	80	624	5,520	141	2,100	1,560	104	438
18-----	2,710	64	468	4,940	260	3,470	1,590	113	485
19-----	2,610	51	359	4,310	215	2,500	1,560	92	388
20-----	2,470	172	1,150	3,800	149	1,530	1,420	99	380
21-----	2,370	68	435	3,500	112	1,060	1,480	90	360
22-----	2,300	79	491	3,160	102	870	1,420	78	299
23-----	2,420	84	549	2,840	88	675	1,560	82	345
24-----	3,130	156	1,320	2,560	88	608	1,470	73	290
25-----	3,470	176	1,650	2,420	79	516	1,350	70	255
26-----	3,470	120	1,120	2,240	70	423	1,400	58	219
27-----	3,680	110	1,090	2,110	58	330	1,360	--	1/330
28-----	3,930	123	1,270	2,020	61	333	1,430	139	537
29-----	3,740	125	1,260	1,880	--	1/416	1,860	103	517
30-----	3,500	139	1,310	1,840	103	512	2,190	99	585
31-----	--	--	--	1,780	79	380	--	--	--
Total--	105,680	--	37,601	118,250	--	48,775	55,970	--	18,243
	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2,780	122	916	834	49	110	967	71	185
2-----	2,970	204	1,640	834	53	119	795	50	107
3-----	2,740	140	1,040	834	52	117	860	40	93
4-----	2,370	110	704	834	50	113	860	43	100
5-----	2,110	97	553	834	36	81	821	40	89
6-----	1,880	89	452	821	38	84	747	52	105
7-----	1,670	91	410	808	48	105	699	58	109
8-----	1,420	84	322	808	40	87	711	58	111
9-----	1,350	73	266	771	32	67	711	79	152
10-----	1,350	58	211	834	34	77	711	45	86
11-----	1,250	40	135	783	28	59	653	35	62
12-----	1,050	33	94	759	18	37	565	42	64
13-----	1,170	37	117	783	24	51	664	31	56
14-----	1,420	106	406	795	29	62	631	38	65
15-----	1,250	99	334	771	28	58	631	41	70
16-----	1,430	78	301	723	29	57	631	42	72
17-----	1,500	78	316	711	42	81	620	42	70
18-----	1,420	99	390	808	34	74	620	36	60
19-----	1,060	86	246	783	33	70	587	47	74
20-----	1,300	60	211	808	46	100	620	39	65
21-----	1,250	52	176	795	32	69	711	35	67
22-----	1,310	62	219	699	31	59	687	44	82
23-----	1,250	64	216	687	38	70	631	48	82
24-----	1,140	52	160	699	34	64	699	43	81
25-----	886	55	132	687	38	70	700	42	79
26-----	1,300	57	200	687	41	76	720	44	86
27-----	1,130	57	182	642	--	1/66	740	47	94
28-----	1,080	46	134	631	34	58	631	47	80
29-----	967	--	1/120	631	48	82	740	36	72
30-----	1,080	58	169	899	42	102	631	32	55
31-----	899	49	119	1,170	73	231	--	--	--
Total--	45,832	--	10,881	24,163	--	2,556	20,994	--	2,573

Total discharge for year (second-foot-days) ----- 982,937
 Total load for year (tons) ----- 818,201

1/Estimated.

IOWA RIVER BASIN--Continued

CEDAR RIVER AT CEDAR RAPIDS, IOWA--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	687	37	69	565	31	47	847	13	30
2-----	664	29	52	642	33	57	808	13	28
3-----	609	38	62	642	36	62	821	15	33
4-----	555	30	45	631	37	63	1,000	11	30
5-----	609	38	62	653	37	65	1,200	14	45
6-----	642	34	59	664	30	54	1,100	18	53
7-----	1,060	36	103	759	21	43	1,020	13	36
8-----	1,100	68	202	771	30	62	783	11	23
9-----	981	41	109	873	26	61	648	25	44
10-----	771	28	58	886	25	60	429	16	19
11-----	939	25	63	860	21	49	485	21	27
12-----	834	30	68	711	24	46	465	16	20
13-----	886	29	69	834	25	56	582	17	27
14-----	771	25	52	808	24	52	953	24	62
15-----	772	37	77	698	31	58	950	43	110
16-----	664	56	100	899	28	68	810	39	85
17-----	687	26	48	808	23	50	730	26	51
18-----	747	29	58	747	21	42	700	12	23
19-----	664	17	30	912	33	81	670	12	22
20-----	735	19	38	1,180	57	182	642	14	24
21-----	687	26	48	1,100	40	119	711	11	21
22-----	747	23	46	873	17	40	860	8	19
23-----	834	24	54	1,020	15	41	653	9	16
24-----	834	22	50	1,100	15	45	631	10	17
25-----	808	27	59	1,080	15	44	680	10	18
26-----	759	28	57	899	18	44	720	8	16
27-----	642	29	50	1,040	26	73	550	9	13
28-----	664	28	50	1,010	23	63	490	6	8
29-----	665	32	57	900	18	44	600	9	15
30-----	664	32	57	912	15	37	580	7	11
31-----	653	28	49	--	--	--	550	10	15
Total--	23,334	--	2,001	25,477	--	1,808	22,668	--	961
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	600	8	13	1,020	8	22	3,400	44	404
2-----	580	16	25	970	15	39	3,350	45	407
3-----	560	37	56	840	9	20	4,000	88	950
4-----	1,200	100	324	860	7	16	5,000	262	3,540
5-----	2,400	109	706	920	5	12	8,000	439	9,480
6-----	2,200	64	380	960	5	13	11,000	491	14,580
7-----	2,000	43	232	920	4	10	23,700	700	1/48,400
8-----	1,800	29	141	850	5	11	28,500	408	1/31,550
9-----	1,950	24	126	800	8	17	26,300	217	15,410
10-----	1,800	16	78	840	9	20	24,100	170	11,060
11-----	1,600	13	56	830	7	16	21,600	107	6,240
12-----	1,430	12	46	810	6	13	15,800	80	3,410
13-----	1,450	12	47	790	5	11	11,000	89	2,640
14-----	1,550	9	38	790	6	13	7,800	83	1,750
15-----	1,700	16	73	810	6	13	6,580	69	1,230
16-----	2,400	161	1,040	750	9	18	5,350	48	693
17-----	2,800	128	968	730	11	22	4,670	29	366
18-----	2,700	82	598	750	7	14	4,340	27	316
19-----	2,200	68	404	840	6	14	3,900	25	283
20-----	1,850	54	270	820	6	13	3,560	30	288
21-----	1,650	56	249	770	8	17	3,440	35	325
22-----	1,500	38	154	740	7	14	4,340	217	1/2,570
23-----	1,400	31	117	1,000	9	24	5,010	212	2,870
24-----	1,500	26	105	1,500	49	198	5,700	337	5,180
25-----	1,300	22	77	3,600	73	710	6,750	208	3,790
26-----	1,200	20	65	3,300	45	401	8,320	258	5,800
27-----	1,100	15	45	3,100	40	335	9,550	559	14,410
28-----	1,140	12	37	3,400	45	413	11,000	594	17,640
29-----	1,180	14	45	--	--	--	12,400	502	16,810
30-----	1,020	9	25	--	--	--	14,100	422	16,070
31-----	1,070	6	17	--	--	--	16,900	400	18,250
Total--	48,830	--	6,557	34,310	--	2,439	319,460	--	254,702

1/Sediment discharge computed by subdividing day.

IOWA RIVER BASIN--Continued
CEDAR RIVER AT CEDAR RAPIDS, IOWA--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	16,900	237	10,810	2,470	41	273	2,640	662	1/4,520
2-----	14,100	159	6,050	2,390	40	258	1,740	472	1/2,290
3-----	11,000	145	4,310	2,240	39	236	1,980	225	1,200
4-----	11,300	143	4,360	2,130	32	184	1,830	210	1,070
5-----	12,400	149	4,990	2,020	32	174	1,960	145	767
6-----	11,000	123	3,650	1,980	34	182	2,110	127	724
7-----	8,500	117	2,690	1,940	38	199	2,040	106	584
8-----	7,100	107	2,050	1,880	42	213	1,940	110	576
9-----	6,400	92	1,590	1,840	39	194	1,570	93	394
10-----	5,700	67	1,030	1,780	35	168	1,420	73	280
11-----	5,180	70	979	1,650	33	147	1,380	67	250
12-----	4,670	69	870	1,570	32	136	1,310	63	223
13-----	4,340	57	668	1,500	42	170	1,050	45	128
14-----	4,020	56	608	1,520	42	172	1,230	42	139
15-----	4,020	41	445	1,570	47	199	1,310	46	163
16-----	3,900	37	390	1,570	59	250	1,310	40	141
17-----	4,180	44	497	1,560	47	198	1,420	46	176
18-----	4,340	51	598	1,560	36	152	1,160	44	138
19-----	4,020	55	597	1,480	40	160	1,050	43	122
20-----	4,180	52	587	1,420	37	142	1,050	45	128
21-----	4,340	52	609	1,450	34	133	1,310	60	212
22-----	4,340	55	644	1,610	35	152	1,310	109	386
23-----	4,340	54	633	1,610	31	135	1,180	109	347
24-----	4,020	57	619	1,420	32	123	2,640	433	1/3,380
25-----	3,710	53	531	1,670	34	153	3,990	1,000	10,780
26-----	3,380	47	429	1,380	44	164	3,410	616	1/5,730
27-----	3,190	49	422	1,560	36	152	3,680	295	2,930
28-----	2,970	49	393	1,310	30	106	5,010	323	4,440
29-----	2,740	50	370	1,330	28	101	4,840	280	3,660
30-----	2,540	44	302	1,280	29	100	3,770	180	1,530
31-----	--	--	--	1,430	28	108	--	--	--
Total-	182,820	--	52,721	52,120	--	5,234	62,690	--	47,708
	July			August			September		
1-----	3,080	160	1,330	1,040	50	140	465	61	77
2-----	2,860	110	849	1,100	58	172	475	48	62
3-----	2,710	110	805	1,140	51	157	505	38	52
4-----	2,860	128	988	1,050	47	133	620	30	50
5-----	2,860	200	1,540	1,010	37	101	735	40	79
6-----	2,190	182	1,080	939	36	91	545	35	52
7-----	2,370	240	1,540	795	36	77	587	34	54
8-----	1,940	174	911	834	35	79	576	41	64
9-----	2,970	460	1/3,780	711	30	58	576	46	72
10-----	1,900	213	1,090	711	36	69	565	44	67
11-----	1,610	130	565	779	49	103	620	40	67
12-----	1,330	110	395	923	40	100	847	41	94
13-----	1,330	91	327	847	37	85	912	44	108
14-----	1,250	101	341	735	39	77	834	42	95
15-----	1,170	87	275	711	39	75	675	47	86
16-----	1,110	75	225	687	47	87	735	42	83
17-----	1,040	67	188	699	39	74	699	35	66
18-----	1,040	63	177	653	32	56	687	29	54
19-----	1,020	62	171	687	47	87	862	38	68
20-----	1,050	72	204	620	58	97	555	38	57
21-----	1,360	83	305	609	38	62	565	32	49
22-----	1,920	82	425	565	35	53	565	28	43
23-----	1,800	78	379	555	33	49	505	23	31
24-----	1,590	91	391	576	25	39	515	36	50
25-----	1,310	78	276	565	20	31	505	37	50
26-----	1,250	65	219	495	19	25	475	32	41
27-----	1,170	60	190	642	30	52	505	26	35
28-----	1,100	53	157	565	35	53	495	28	37
29-----	1,020	40	110	475	31	40	495	32	43
30-----	995	37	99	456	26	32	465	31	39
31-----	912	47	116	505	49	67	--	--	--
Total-	52,117	--	19,448	22,679	--	2,421	18,165	--	1,845

Total discharge for year (second-foot-days) ----- 864,670

Total load for year (tons) ----- 397,485

1/Sediment discharge computed by subdividing day.

PART 6. MISSOURI RIVER BASIN

MISSOURI RIVER MAIN STEM

MISSOURI RIVER AT HIGHWAY BRIDGE AT TOSTON, MONT.

LOCATION.--At bridge on U. S. Highway 10N at Toston, Broadwater County 2 miles upstream from Crow Creek, 2½ miles downstream from gaging station at Toston, and 9½ miles downstream from Sixteensmile Creek.

DRAINAGE AREA.--Approximately 14,000 square miles.

RECORDS AVAILABLE.--Water temperatures: May to September 1949.

Sediment records: March to September 1949.

EXTREMES, March to September 1949.--Sediment concentrations: Maximum daily, 278 ppm Apr. 20; minimum daily, 8 ppm June 30.

Sediment loads: Maximum daily, 7,950 tons Apr. 20; minimum daily, 64 tons Aug. 12.

REMARKS.--Discharge records for gaging station at Toston for water year 1948 to September 1949 given in Water-Supply Paper 1146. No appreciable inflow between gaging station and sampling point except during periods of heavy local rains.

Chemical analyses, in parts per million, May to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent non- car- bon- ate
																Parts per mil- lion	Tons per acre- foot	Total	Non- carbon- ate	
May 5, 1949 -----	8,010	7.5	281	23	0.02	30	8.0	15	120	30	6.0	0.8	0.8	1.0	0.10	191	0.26	108	10	24
July 7 -----	3,780	8.1	329	22	.01	36	10	25	170	31	8.0	.8	.8	.19	.29	216	.29	131	0	30
Sept. 12 -----	3,520	8.1	421	27	.02	41	8.3	42	187	50	14	1.1	1.1	.8	.30	273	.37	137	0	40

MISSOURI RIVER MAIN STEM--Continued

MISSOURI RIVER AT HIGHWAY BRIDGE AT TOSTON, MONT.--Continued

Temperature (°F) of water May to September 1949
 [Once-daily temperature measurement between 11 a.m. and 4 p.m.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								--	--	64	74	66
2								--	53	--	75	66
3								51	60	65	75	62
4								--	64	65	75	60
5								50	60	64	71	58
6								53	60	64	75	65
7								56	66	65	70	58
8								58	68	68	--	64
9								60	--	70	--	64
10								61	--	70	--	64
11								62	--	71	74	53
12								62	63	70	75	53
13								61	66	70	65	54
14								59	66	74	71	56
15								60	65	74	70	55
16								59	63	74	72	56
17								52	58	70	74	53
18								49	58	69	72	55
19								49	64	70	66	55
20								--	--	66	66	58
21								--	--	68	74	58
22								--	--	66	72	55
23								--	--	68	70	60
24								--	64	68	68	58
25								--	--	78	68	58
26								--	64	68	68	58
27								--	60	63	65	57
28								--	64	65	70	56
29								--	64	68	65	--
30								--	64	71	66	56
31								--	--	72	66	--
Average								--	--	69	70	58

Suspended sediment, March to September 1949

Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----							--	--	--
2-----							--	--	--
3-----							--	--	--
4-----							--	--	--
5-----							--	--	--
6-----							--	--	--
7-----							--	--	--
8-----							--	--	--
9-----							--	--	--
10-----							--	--	--
11-----							--	--	--
12-----							--	--	--
13-----							--	--	--
14-----							--	--	--
15-----							--	--	--
16-----							--	--	--
17-----							3,640	28	275
18-----							3,730	42	423
19-----							4,230	97	1,110
20-----							4,810	127	1,650
21-----							5,440	183	2,690
22-----							5,730	189	2,920
23-----							5,330	172	2,480
24-----							5,290	117	1,670
25-----							5,180	69	965
26-----							5,030	47	638
27-----							4,910	64	849
28-----							4,790	48	620
29-----							4,710	41	521
30-----							4,670	38	479
31-----							4,710	36	458
Total-							72,200	--	17,750

MISSOURI RIVER MAIN STEM--Continued

MISSOURI RIVER AT HIGHWAY BRIDGE AT TOSTON, MONT.--Continued

Suspended sediment, March to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	4,750	36	462	10,400	116	3,260	12,300	88	2,920
2-----	5,180	61	854	9,750	89	2,340	13,000	79	2,770
3-----	5,620	63	956	9,030	76	1,850	13,700	88	3,260
4-----	5,830	54	850	8,550	74	1,710	13,900	70	2,630
5-----	5,970	57	919	8,010	57	1,230	13,400	62	2,240
6-----	6,240	68	1,140	7,540	54	1,100	11,800	51	1,620
7-----	6,580	84	1,490	7,120	52	1,000	11,200	51	1,540
8-----	6,870	108	2,000	6,950	49	920	11,100	55	1,650
9-----	7,170	91	1,760	6,920	53	990	11,000	--	1/1,500
10-----	7,200	88	1,710	7,280	54	1,060	10,800	--	1/1,300
11-----	7,170	92	1,780	7,700	59	1,230	10,500	--	1/1,200
12-----	7,590	127	2,600	8,370	68	1,540	10,200	46	1,270
13-----	8,250	195	4,340	9,030	79	1,920	9,850	53	1,410
14-----	8,400	137	3,110	9,780	90	2,380	9,060	38	929
15-----	8,310	112	2,520	10,500	110	3,120	8,130	--	1/700
16-----	8,280	108	2,410	11,400	152	4,680	7,230	28	546
17-----	8,430	171	3,890	12,600	178	6,050	6,820	25	460
18-----	8,640	123	2,870	14,500	182	7,130	6,430	18	312
19-----	9,340	174	4,390	14,200	133	5,100	6,740	26	473
20-----	10,600	278	7,950	13,200	96	3,420	7,820	17	359
21-----	11,200	208	6,290	12,300	82	2,720	7,790	--	1/300
22-----	10,500	161	4,560	12,700	74	2,540	6,890	--	1/280
23-----	9,880	111	2,960	12,400	71	2,380	6,500	22	366
24-----	9,530	122	3,140	12,000	67	2,170	6,070	17	279
25-----	9,780	117	3,090	11,000	62	1,840	5,640	--	1/180
26-----	10,100	115	3,140	10,200	53	1,460	5,310	10	143
27-----	10,100	110	3,000	9,460	47	1,200	5,330	13	187
28-----	9,780	94	2,480	9,340	53	1,340	5,120	12	166
29-----	9,590	107	2,770	10,100	67	1,830	4,770	10	129
30-----	10,000	120	3,240	11,400	78	2,400	4,420	8	95
31-----	--	--	--	11,800	68	2,170	--	--	--
Total-	246,880	--	82,670	315,530	--	74,080	262,620	--	31,230
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	4,250	9	103	2,020	15	82	2,380	11	71
2-----	4,070	--	140	1,970	16	85	2,360	13	83
3-----	3,780	14	142	1,960	14	74	2,440	13	86
4-----	3,620	13	127	1,970	13	69	2,510	12	81
5-----	3,730	22	221	2,000	16	86	2,670	11	79
6-----	3,820	18	186	2,020	16	87	2,860	11	85
7-----	3,800	10	103	2,030	14	77	3,020	11	90
8-----	3,670	9	89	1,970	--	1/70	3,200	12	104
9-----	3,540	10	96	1,970	--	1/75	3,250	13	114
10-----	3,470	10	94	1,980	15	80	3,200	13	112
11-----	3,440	11	102	1,980	14	75	3,320	10	90
12-----	3,210	14	121	1,980	12	64	3,500	10	94
13-----	3,050	13	107	1,970	13	69	3,660	15	148
14-----	3,020	16	130	2,020	12	65	3,670	14	139
15-----	2,970	16	128	2,030	12	66	3,670	14	139
16-----	2,860	18	139	2,080	12	67	3,690	16	159
17-----	2,680	15	108	2,120	12	69	3,620	16	156
18-----	2,570	14	97	2,170	12	70	3,740	14	141
19-----	2,520	13	88	2,190	11	65	3,920	16	169
20-----	2,440	16	105	2,190	11	65	3,910	16	190
21-----	2,430	14	92	2,190	11	65	3,740	14	141
22-----	2,430	11	72	2,190	11	65	3,690	18	179
23-----	2,430	11	72	2,200	14	83	3,540	22	210
24-----	2,380	16	103	2,270	14	86	3,470	22	206
25-----	2,270	12	74	2,300	11	68	3,490	20	188
26-----	2,250	11	67	2,320	12	75	3,470	20	187
27-----	2,240	16	97	2,330	12	76	3,380	19	173
28-----	2,250	15	91	2,360	12	76	3,450	19	177
29-----	2,240	14	85	2,330	12	76	3,450	--	1/200
30-----	2,160	13	76	2,330	13	82	3,520	22	209
31-----	2,060	14	78	2,330	12	76	--	--	--
Total-	91,630	--	3,330	65,770	--	2,290	99,790	--	4,200
Total discharge for period Mar. 17 to Sept. 30 (second-foot-days) -----									
Total load for period Mar. 17 to Sept. 30 (tons) -----									
									1,154,620
									215,600

1/Estimated.

MISCELLANEOUS ANALYSES OF STREAMS IN MISSOURI RIVER MAIN STEM IN MONTANA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- lids
																	Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	

FORT PECK RESERVOIR

May 31, 1948-----	8.0	666	13	0.01	56	21	72	0	176	192	10	0.8	0.5	0.15	458	0.62	226	82	37				
Aug. 7 -----	8.0	552	10	.02	51	19	42	0	166	140	9.0	.6	.4	--	392	.53	205	69	31				
Aug. 19, 8 a. m. -----	8.2	520	12	.03	52	18	34	6	156	126	6.0	.4	.4	--	372	.51	204	66	27				
Aug. 19, 10 a. m. -----	8.1	660	11	.03	64	21	53	0	184	190	8.0	.5	.0	--	486	.66	246	95	32				
Nov. 12 -----	8.2	700	25	.05	64	24	65	6.4	5	189	220	10	.8	.4	.11	516	.70	258	93	35			
Aug. 5, 1949 -----	8.0	628	9.4	.02	60	21	41	0	181	158	7.5	.7	.7	--	419	.57	236	88	28				
Aug. 28 -----	8.0	607	11	.05	57	20	47	0	183	157	7.5	.7	.9	--	405	.55	225	75	31				

MISSOURI RIVER NEAR WOLF POINT

Mar. 12, 1949 -----	7.6	751	13	0.05	56	19	85	0	204	208	11	0.7	1.7	0.13	503	0.68	218	51	46				
Apr. 9 -----	7.5	658	12	.01	49	19	64	0	172	178	7.3	.6	1.7	.32	457	.62	201	60	41				
May 5 -----	7.7	662	11	.01	55	20	59	0	178	180	8.0	.6	1.4	.24	448	.61	220	74	37				
June 9 -----	7.7	678	11	.01	56	21	59	0	189	178	8.0	.8	1.4	.22	456	.62	225	71	36				
July 8 -----	7.8	651	12	.01	55	20	55	0	183	169	8.0	.8	1.5	.13	475	.65	220	70	33				
Aug. 12 -----	7.7	642	16	.05	55	20	60	0	187	176	8.0	.7	2.0	--	433	.89	220	67	37				
Sept. 9 -----	7.8	628	12	.08	56	22	35	0	186	174	9.8	.6	1.7	--	428	.56	230	67	37				

1/ Mean daily discharge.

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)

BEAVERHEAD RIVER AT BARRATTS

May 19, 1949 -----	1,070	209	604
June 9 -----	750	112	227
July 27 -----	284	37	28
Aug. 29 -----	322	24	21
Aug. 30 -----	333	22	20

MARIAS RIVER BASIN

MISCELLANEOUS ANALYSES OF STREAMS IN MARIAS RIVER BASIN IN MONTANA

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949

Periodic determinations of suspended sediment discharge, water year October 1948 to September 1949			
Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)
MARIAS RIVER NEAR SHELBY			
Oct. 29, 1948 -----	327	36	32
Dec. 1 -----	263	258	183
Feb. 9, 1949 -----	1/160	38	16
Mar. 4 -----	1/440	104	124
Mar. 30 -----	1/740	274	548
May 2 -----	1,700	144	661
May 24 -----	3,080	281	340
June 11 -----	2,100	135	765
July 13 -----	744	448	898
Aug. 6 -----	219	46	27
Sept. 6 -----	225	12	7

1/Mean daily discharge.

YELLOWSTONE RIVER BASIN

WIND RIVER AT DUBOIS, WYO.

LOCATION.--At county bridge at Dubois. Fremont County, half a mile downstream from Horse Creek, and 7 miles downstream from gaging station near Dubois. RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

Water temperatures: October 1948 to September 1949.

EXTREMES, 1948-49.--Dissolved solids: Maximum, 296 ppm Jan. 1-31; minimum, 88 ppm May 2-31.

Total hardness: Maximum, 216 ppm Jan. 1-31; minimum, 88 ppm May 2-31.

Specific conductance: Maximum, 527 micromhos June 2; minimum, 189 micromhos May 17.

Water temperatures: Maximum, 70°F Aug. 1; minimum, freezing point on many days in December, January, and February.

REMARKS.--Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Daily samples for chemical analysis composed either by discharge or by equal volume. Chemical analyses and water temperatures for Wind River near Dubois, April 1947 to September 1948 given in Water-Supply Papers 1102 and 1132. Discharge records for gaging station near Dubois, for water year October 1948 to September 1949 given in Water-Supply Paper 1146. No appreciable inflow between gaging station and sampling point except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-foot)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids			Hardness as CaCO ₃		Percent non-carbonate
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Oct. 1-31, 1948	83	8.2	380	24	0.02	49	13	21	3.2	6	196	42	5.0	0.4	0.1	0.08	258	0.35	58	176	5	20
Nov. 1-30	72	8.0	419	25	.02	58	14	20	8.6	0	231	48	6.0	.4	.2	.02	278	.38	54	202	13	17
Dec. 1-31	67	8.1	397	27	.05	60	14	11	3.2	0	225	47	7.5	.3	.2	.04	280	.38	51	207	23	10
Jan. 1-31, 1949	58	8.1	460	27	.05	62	15	12	2.4	0	228	47	8.0	.4	.2	.04	296	.40	46	216	21	11
Feb. 1-28	52	8.4	446	24	.02	52	17	14	3.2	11	200	46	7.0	.4	.6	.20	280	.38	39	200	18	13
Mar. 1-21	53	8.2	396	28	.02	41	15	17	1.6	8	172	44	6.0	.4	.2	.50	248	.34	35	164	10	18
Mar. 22-26	48	8.0	412	26	.04	42	17	13	1.6	0	182	46	7.0	.4	1.0	.20	250	.34	32	175	26	14
Mar. 27-31	46	7.9	410	24	.01	59	13	14	6.4	0	223	43	6.0	.4	1.2	--	280	.38	35	201	18	13
Apr. 1-28	109	7.8	359	24	.01	45	13	14	.4	0	180	32	8.0	.3	.8	--	233	.32	69	166	18	15
Apr. 29-May 1	207	7.8	281	24	.04	39	7.2	9.6	2.4	0	146	24	3.6	.4	.5	--	178	.24	99	127	7	14
May 2-31	437	7.5	194	19	.02	28	4.3	7.5	2.0	0	98	18	2.4	.4	.5	11	131	.18	155	88	8	15
June 1-30	534	8.2	384	25	.02	38	12	25	2.4	5	154	63	4.0	.1	.8	.20	264	.36	381	145	11	27
July 1-31	239	7.7	345	26	.02	38	14	9.0	6.0	0	168	32	4.0	.4	.6	.10	226	.31	146	153	15	11
Aug. 1-31	118	8.0	397	26	.02	49	12	12	4.4	0	203	30	5.0	.4	.8	.20	248	.34	79	172	6	13
Sept. 1-17	98	8.0	389	31	.02	48	12	11	4.4	0	199	30	5.0	.2	.8	.10	246	.33	65	170	7	12
Weighted average 1/-	2/163	--	340	24	0.02	40	11	15	3.2	--	3/165	40	4.4	0.3	0.6	0.14	227	0.31	100	146	11	18

1/Weighted average for period sampled only.

2/Mean discharge Wind River near Dubois for water year was 160 second-foot.

3/Includes carbonate as bicarbonate.

YELLOWSTONE RIVER BASIN--Continued

WIND RIVER AT DUBOIS, WYO.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 3 p. m. and 8 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	49	34	33	--	38	61	57	49	63	70	57
2	57	49	34	32	32	38	59	57	--	59	67	55
3	59	48	36	33	33	40	52	56	54	59	69	57
4	57	46	35	33	31	42	49	57	52	58	64	55
5	54	49	34	34	31	39	52	55	49	60	68	54
6	54	46	34	35	31	38	48	52	56	59	69	56
7	57	41	34	32	31	39	52	53	55	61	67	56
8	62	44	34	31	32	36	55	53	47	62	68	53
9	59	44	36	34	36	37	58	53	51	63	67	54
10	61	44	36	33	34	37	60	50	51	61	65	57
11	63	46	37	33	33	39	62	49	49	64	66	51
12	61	44	--	33	34	37	62	51	49	61	67	49
13	59	41	33	33	31	40	61	52	46	63	66	47
14	58	38	34	31	31	34	59	53	51	64	64	45
15	60	40	34	31	33	35	57	49	54	65	65	49
16	59	38	34	34	31	36	48	49	53	64	65	46
17	61	34	33	--	33	39	52	50	49	62	66	44
18	56	36	32	31	35	38	54	49	58	61	67	--
19	58	33	33	32	34	38	57	50	--	67	69	--
20	58	38	32	31	33	41	57	50	53	65	65	--
21	57	36	34	31	36	36	60	49	49	67	68	--
22	59	36	32	--	34	--	--	49	--	61	65	--
23	57	38	33	--	33	--	63	50	49	69	66	--
24	58	34	33	32	35	--	61	51	51	67	64	--
25	56	35	32	31	34	--	63	52	59	68	66	--
26	52	34	34	33	37	--	54	51	57	68	69	--
27	52	35	33	33	36	--	55	51	61	67	63	--
28	51	34	33	31	36	--	52	50	58	66	67	--
29	51	34	32	33	--	--	57	49	61	65	67	--
30	51	34	34	34	--	--	56	49	58	67	68	--
31	51	--	35	31	--	--	--	49	--	69	65	--
Average	57	40	34	32	33	--	56	51	53	64	67	--

YELLOWSTONE RIVER BASIN--Continued
WIND RIVER AT RIVERTON, WYO.

LOCATION --At gaging station at bridge on State Highway 320, three-quarters of a mile southeast of Riverton, Fremont County.

DRAINAGE AREA --2,320 square miles.

RECORDS AVAILABLE --Chemical analyses: March 1947 to September 1949.

Water temperatures: April 1947 to September 1949.

Sediment records: October 1948 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 557 micromhos Mar. 26; minimum, 175 micromhos June 21.

Water temperatures: Minimum, freezing point on many days in November, December, February, and March.

Sediment concentrations: Maximum daily, 2,730 ppm May 18; minimum daily, not determined.

Sediment loads: Maximum daily, 25,500 tons June 13; minimum daily, 12 tons Aug. 18.

EXTREMES, 1947-49.--Dissolved solids (1947): Maximum, 358 ppm Apr. 22-29, 1947; minimum, 1.06 ppm July 1-31, 1947.

Total hardness (1947): Maximum, 216 ppm Mar. 31-Apr. 10, 1947; minimum, 72 ppm Aug. 1-9, 1947.

Water temperatures: Maximum (1947-48), 73°F Aug. 31, 1948; minimum, freezing point on many days during winter months.

Specific conductance: Maximum, 822 micromhos May 13, 1948; minimum, 152 micromhos July 1, 1947.

REMARKS.--Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Daily samples for chemical analysis composited by discharge. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids			Hardness as CaCO ₃	
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate
Oct. 1-31, 1948 ---	566	8.1	475	17	0.02	42	12	37	0.4	166	86	8.0	0.3	0.9	0.07	262	0.36	400	154	18
Nov. 1-30 ---	427	8.2	502	18	.03	57	15	37	4.0	1/196	102	8.0	.2	.4	.17	346	.47	399	204	44
Dec. 1-23 ---	465	7.9	472	19	.02	51	15	28	1.2	179	92	8.0	.3	2.1	.06	309	.42	388	189	42
Feb. 24-Mar. 2, 1949 ---	418	8.2	460	16	.02	49	14	37	1.6	2/161	102	9.0	.3	2.2	--	298	.41	336	180	49
Mar. 3-25 ---	550	8.0	461	18	.02	50	14	33	3.2	159	106	7.5	.2	2.1	.04	306	.42	454	183	53
Mar. 26-Apr. 30 ---	619	8.2	424	19	.02	46	13	27	1.2	155	83	7.0	.2	1.3	.03	276	.38	461	169	42
May 1-10 ---	614	7.5	362	19	.03	40	8.0	25	2.4	132	68	5.8	.3	.7	.19	229	.31	380	133	25
May 11-17 ---	1,600	7.3	257	19	.03	34	4.4	11	2.4	108	36	2.4	.2	1.1	.22	164	.22	708	103	14
May 18 ---	2,830	7.6	287	20	.02	47	4.3	26		176	39	3.6	--	2.5	--	224	.30	1,710	135	0
May 19-27 ---	1,620	7.6	259	21	.03	33	5.0	12	2.8	107	40	2.4	.2	.5	.16	172	.23	752	103	15
May 28-31 ---	2,600	7.2	209	20	.03	27	3.3	10	1.2	84	27	3.4	.3	.7	--	143	.19	1,000	81	12
June 1-7 ---	1,320	8.3	246	22	.10	26	6.4	13	4.0	1/97	38	1.0	.1	.6	.08	180	.24	642	92	12
June 8-11 ---	2,560	7.4	211	22	.06	25	5.3	8.1	2.4	91	28	1.0	.1	.6	--	160	.22	1,110	85	10
June 12-14 ---	3,940	8.1	220	21	.10	29	4.7	4.9	1.8	102	18	1.0	.1	1.2	--	154	.21	1,640	92	8
June 15-27 ---	2,410	8.2	196	20	.10	24	5.2	7.3		2/85	23	1.0	.1	.4	.11	144	.20	937	82	12
June 28-29 ---	1,570	7.9	220	19	.02	24	5.4	13	2.0	92	31	3.0	.2	.6	.15	162	.22	687	82	7
June 30-July 19 ---	1,590	7.3	207	17	.04	24	5.3	9.0	3.2	83	33	3.0	.2	.6	.30	136	.18	584	82	14

1/Includes equivalent of 4 parts per million of carbonate (CO₃).

2/Includes equivalent of 7 parts per million of carbonate (CO₃).

3/Includes equivalent of 3 parts per million of carbonate (CO₃).

YELLOWSTONE RIVER BASIN--Continued
WIND RIVER AT RIVERTON, WYO.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃	
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate
July 20-31, 1949 --	477	8.0	275	14	0.04	29	5.9	20	0.8	101	53	4.0	0.2	1.1	0.30	180	0.24	232	97	14
Aug. 1 -----	208	7.2	375	13	.06	38	8.9	26	1.2	120	79	5.0	.2	1.5	--	242	.33	136	132	34
Aug. 2-20 -----	290	7.3	370	15	.05	35	9.6	28	1.2	118	79	6.0	.2	1.1	.20	240	.33	188	127	30
Aug. 21-26 -----	346	8.0	385	18	.02	35	8.7	32	2.0	116	88	9.5	.1	.7	.60	260	.35	243	124	29
Aug. 27-Sept. 30 --	705	7.6	352	13	.02	37	9.2	24	.8	120	72	7.0	.1	.9	.17	226	.31	430	131	33
Weighted average 4/	5/858	--	315	18	0.04	35	8.2	19	1.9	120	56	4.5	0.2	0.8	0.15	208	0.28	482	121	23
																				25

4/Weighted average for period sampled only.

5/ Mean discharge for water year was 775 second-feet.

YELLOWSTONE RIVER BASIN--Continued

WIND RIVER AT RIVERTON, WYO.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 8 a. m. and 6 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	58	40	31		--	32	41	57	55	68	78	72
2	52	43	34		--	32	41	--	52	--	--	--
3	40	41	34		--	--	41	--	54	--	--	57
4	56	39	34		--	33	49	55	--	--	--	59
5	50	40	34		--	--	40	44	54	70	71	--
6	44	37	32		--	--	49	--	63	70	77	65
7	40	36	32		--	--	50	53	64	72	78	--
8	52	34	32		--	33	49	--	59	--	68	67
9	52	36	32		--	33	51	64	--	--	68	--
10	46	35	32		--	32	49	--	--	--	74	63
11	46	34	33		--	33	54	--	63	--	72	--
12	44	36	34		--	--	--	63	57	--	71	56
13	50	39	33		--	--	48	--	58	71	71	--
14	36	34	33		--	33	46	--	--	--	--	61
15	51	38	35		--	33	54	57	--	72	74	--
16	42	35	32		--	--	53	54	63	71	73	--
17	36	34	33		--	32	47	54	64	69	73	--
18	42	34	32		--	33	59	60	56	67	75	58
19	42	32	32		--	33	58	55	62	--	73	60
20	42	33	32		--	32	50	60	--	70	--	60
21	50	35	31		--	33	55	60	62	69	72	61
22	52	32	31		32	33	59	56	--	71	72	62
23	50	35	31		32	38	57	--	61	79	73	--
24	44	34	--		32	38	--	61	--	73	72	52
25	44	34	--		32	--	56	63	--	73	72	57
26	33	31	--		--	37	56	64	64	74	70	62
27	41	31	--		32	38	58	63	65	--	--	60
28	42	32	--		--	--	61	64	62	71	--	60
29	41	32	--		--	33	55	--	65	--	--	59
30	40	33	--		--	34	52	57	--	74	--	57
31	41	--	--		--	40	--	56	--	--	71	--
Average	45	36	--		--	--	51	--	--	--	--	--

YELLOWSTONE RIVER BASIN--Continued

WIND RIVER AT RIVERTON, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	500			437			423		
2-----	508			458			458		
3-----	532			465			508		
4-----	620			472			532		
5-----	620	38	60	423			472	23	28
6-----	644			381	29	32	409		
7-----	636			416			402		
8-----	612			423			388		
9-----	628			348			388		
10-----	676			336			437		
11-----	708	25	42	381			516	41	56
12-----	572			381			588		
13-----	572			660	190	339	612		
14-----	580			776	374	784	516		
15-----	604			465	119	149	472		
16-----	866	78	155	409	39	43	437		
17-----	692	--	1/80	402			395		
18-----	604	--	1/60	354			409		
19-----	612	--	1/65	324			430	23	28
20-----	564	--	1/60	348			465		
21-----	500			423			486		
22-----	465			437			486		
23-----	479			451	39	42	472		
24-----	479	27	35	479			440		
25-----	486			423			400		
26-----	493			402			335		
27-----	458			367			355	--	1/26
28-----	451			360			400		
29-----	465	14	17	381			450		
30-----	458			423			470		
31-----	451			--	--	--	470		
Total-	17,535	--	1,600	12,805	--	2,290	14,021	--	1,020
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	470			385			460	40	50
2-----	345			365			480	196	254
3-----	280			360			500	--	1/260
4-----	310			355			520	112	157
5-----	390			355			550	--	1/150
6-----	430			350			570	--	1/190
7-----	435			350			630	253	430
8-----	410			345			610	131	216
9-----	425			345			600	107	173
10-----	410			340			600	205	332
11-----	428	--	1/22	340	--	1/22	590	168	288
12-----	420			340			555	191	286
13-----	420			335			530	182	260
14-----	425			335			510	72	99
15-----	470			335			490	118	156
16-----	490			330			505	191	260
17-----	490			330			520	175	246
18-----	440			330			530	181	259
19-----	385			335			580	198	310
20-----	350			340			610	280	461
21-----	320			345			600	422	684
22-----	310			350			530	515	737
23-----	275			355			490	--	1/800
24-----	290			360			500	715	965
25-----	300			380	52	54	530	785	1,140
26-----	320	--	1/13	395			451	332	404
27-----	330			410			423	130	148
28-----	350			440			423	75	86
29-----	360			--	--	--	409	50	55
30-----	365			--	--	--	381	39	40
31-----	380			--	--	--	374	40	40
Total-	11,815	--	580	9,935	--	840	16,051	--	9,920

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

WIND RIVER AT RIVERTON, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			April			May		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	388	49	51	732	200	395	2,090	543	3,060
2-----	381	35	36	588	143	227	1,580	371	1,580
3-----	375	34	36	479	120	155	1,200	260	842
4-----	1	32	36	604	144	235	970	180	472
5-----	444	42	50	749	175	354	848	160	366
6-----	508	80	110	692	108	202	1,110	214	642
7-----	540	85	124	572	60	93	1,410	420	1,600
8-----	564	110	168	479	48	62	1,950	698	3,670
9-----	644	162	282	548	64	95	2,530	944	6,450
10-----	612	138	228	692	80	149	2,680	1,110	8,030
11-----	604	65	106	950	265	680	3,080	1,200	9,980
12-----	676	80	146	1,070	423	1,220	3,640	2,780	2/18,500
13-----	803	262	568	1,520	885	3,630	4,160	2,190	2/25,500
14-----	758	222	454	1,680	816	3,700	4,030	1,910	20,800
15-----	612	--	1/190	1,660	672	3,010	2,990	979	7,900
16-----	516	50	70	2,010	1,290	7,000	2,640	739	5,260
17-----	524	--	1/55	2,340	1,230	7,770	2,470	675	4,500
18-----	532	35	50	2,830	2,780	2/22,100	2,280	466	2,870
19-----	676	50	91	2,440	1,950	12,800	2,420	659	4,300
20-----	716	130	251	1,870	734	3,700	3,440	1,220	11,300
21-----	500	70	94	1,670	457	2,060	2,990	704	5,680
22-----	416	58	65	1,500	398	1,610	2,500	578	3,900
23-----	612	100	165	1,350	362	1,320	2,200	430	2,550
24-----	716	140	271	1,300	412	1,440	1,910	339	1,750
25-----	960	378	980	1,200	208	674	1,660	369	1,650
26-----	1,000	438	1,180	1,400	291	1,100	1,750	410	1,940
27-----	960	292	757	1,880	643	3,260	2,130	394	2,260
28-----	1,160	1,210	2/4,080	2,300	817	5,080	1,680	218	989
29-----	1,300	925	3,250	2,710	1,040	7,600	1,450	258	1,010
30-----	884	628	1,500	2,780	896	6,730	1,330	280	1,010
31-----	--	--	--	2,620	702	4,970	--	--	--
Total-	19,817	--	15,440	45,215	--	103,400	67,118	--	160,400
Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,080	189	552	208	35	20	486	40	52
2-----	1,100	158	469	381	--	1/55	447	58	70
3-----	1,350	188	685	375	69	70	400	57	62
4-----	1,560	190	800	373	63	63	716	270	522
5-----	1,540	190	790	401	55	60	803	312	676
6-----	1,670	240	1,080	367	35	35	848	300	686
7-----	1,830	220	1,090	342	41	38	873	--	1/550
8-----	1,850	155	774	312	35	29	927	165	413
9-----	1,880	145	736	348	33	31	952	--	1/300
10-----	1,900	120	616	342	35	32	893	108	260
11-----	1,780	120	577	354	33	32	911	--	1/220
12-----	1,740	125	587	300	35	28	990	66	176
13-----	1,720	160	743	269	44	32	1,000	--	1/110
14-----	1,610	175	761	239	55	35	930	32	80
15-----	1,680	235	1,070	203	62	34	875	29	68
16-----	1,540	190	789	209	65	37	830	29	65
17-----	1,580	155	661	148	42	17	803	29	63
18-----	1,570	160	678	135	32	12	803	29	63
19-----	1,450	160	626	181	68	33	785	25	53
20-----	1,150	120	373	234	--	1/40	758	19	39
21-----	988	92	245	324	43	38	724	15	29
22-----	762	112	230	306	28	23	716	15	29
23-----	612	80	132	290	23	18	708	--	1/26
24-----	430	30	35	312	30	25	692	13	24
25-----	348	23	22	374	29	29	684	15	28
26-----	330	25	22	472	39	50	692	17	32
27-----	286	40	31	458	--	1/60	612	16	26
28-----	196	70	37	437	--	1/50	580	19	30
29-----	147	68	27	430	--	1/42	493	15	20
30-----	240	72	47	465	31	39	508	15	21
31-----	230	40	25	458	31	38	--	--	--
Total-	36,149	--	15,510	10,047	--	1,140	22,439	--	4,790

Total discharge for year (second-foot-days) ----- 282,947

Total load for year (tons) ----- 316,700

1/Estimated.

2/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued
WIND RIVER AT RIVERTON, WYO.--Continued

Particle-size analyses of suspended sediment, May to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment										Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									1.000
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		
May 14, 1949	7:10 p. m.	1,780	681	1,710			24	33	46	54	68	90	99	BW
May 21	2:55 p. m.	1,640	427	614			--	--	--	46	57	91	100	BW
June 1	4:35 p. m.	1,970	567	538			--	17	22	33	45	96	100	BW
Sept. 4	5:55 p. m.	749	346	273		58	69	77	82	89	91	98	100	BW

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT THERMOPOLIS, WYO.

LOCATION(revised).--At Broadway Street bridge, upstream from principal hot springs inflow, 1 mile upstream from water-stage recorder at Thermopolis, Nat. Springs Comm'n., and 3½ miles downstream from Buffalo Creek. Water discharge measurements made at this site.

DRAINAGE AREA, 1,080 square miles.

RECORDS AVAILABLE--Chemical analyses: April 1947 to September 1949.

Water temperatures: April 1947 to September 1949.

Sediment records: March 1946 to September 1949.

EXTREMES 1948-49.--Specific conductance: Maximum, 1,150 micromhos Apr. 1; minimum, 280 micromhos June 1.

Water temperatures: Maximum, 69°F Aug. 8; minimum, freezing point on several days in January.

Sediment concentrations: Maximum daily, 11,000 ppm July 14; minimum daily, 62 ppm Dec. 29.

EXTREMES 1946-49.--Dissolved solids (1947): Maximum, 126 ppm Apr. 1-10, 1947; minimum, 91 tons Dec. 29.

Total hardness (1947): Maximum, 346 ppm Apr. 1-20, 1947; minimum, 107 ppm July 7-15, 1947.

Specific conductance (1947-49): Maximum, 1,270 micromhos Apr. 26, 1947; minimum, 245 micromhos June 10, 1948.

Water temperatures (1947-49): Maximum, 72°F July 10, 11, 24, 1948; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 30,800 ppm Sept. 20, 1948; minimum daily, 34 ppm Jan. 2, 1947.

Sediment loads: Maximum daily, 250,000 tons June 23, 1948; minimum daily, 33 tons Jan. 2, 1947.

REMARKS.--Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Daily samples for chemical analysis composited by discharge. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micromhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbo-nate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Per-cent so-dium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Oct. 1-31, 1948-----	866	8.3	828	18	0.04	63	25	101	6.0	8	184	287	17	0.4	1.5	0.00	640	0.87	1,500	280	96	45
Nov. 1-30-----	734	8.4	858	19	.03	77	30	92	14	12	201	296	17	.4	1.9	.00	870	.91	1,330	315	131	38
Dec. 1-31-----	649	8.0	877	18	.01	81	24	77	3.6	0	220	251	16	.4	2.2	.15	616	.84	1,080	300	120	35
Jan. 1-31, 1949-----	595	8.4	819	17	.01	78	22	71	2.0	8	190	250	16	.4	2.7	.18	572	.78	919	285	116	35
Feb. 1-9-----	644	8.0	764	23	.04	48	24	67	9.6	4	141	234	13	.4	2.9	.20	510	.69	887	219	97	39
Feb. 10-28-----	744	8.4	820	17	.02	68	24	70	5.6	12	168	248	14	.4	3.1	.20	550	.75	1,100	268	111	36
Mar. 1-22-----	1,010	8.1	960	18	.06	71	27	89	5.6	0	188	312	16	.4	3.8	.25	666	.91	1,820	288	134	40
Mar. 23-30-----	1,090	8.2	943	21	.02	71	26	87	94.8	12	164	304	16	.4	3.4	.25	656	.89	1,930	284	130	39
Mar. 31-Apr. 27-----	1,080	8.3	912	21	.02	73	28	76	4.0	16	168	282	14	.4	3.0	.20	628	.85	1,830	297	133	25
Apr. 28-----	1,980	7.4	586	23	.04	55	16	39	1.6	0	182	130	7.4	.2	2.9	--	392	.53	2,100	203	54	29
Apr. 29-30-----	2,430	8.3	511	21	.04	48	15	39	2.4	8	144	119	7.0	.4	1.5	.15	334	.45	2,190	182	51	32
May 1-31-----	3,385	8.2	453	20	.02	43	11	39	6.0	4	130	114	8.0	.3	2.2	.20	312	.42	2,810	153	40	35
June 1-11-----	4,010	7.9	407	15	.04	39	9	29	4.8	0	113	104	4.8	.3	2.0	.10	272	.37	2,940	137	44	31
June 12-20-----	6,630	7.6	322	17	.04	32	7	22	2.4	0	100	72	3.2	.2	1.7	.10	216	.29	3,870	110	28	30
June 21-----	8,130	7.4	326	18	.06	46	9.5	29	21	0	138	76	3.6	.2	2.0	--	252	.34	5,530	154	41	23
June 22-30-----	4,650	7.3	348	16	.06	32	6.5	29	1.6	0	96	88	4.4	.2	1.6	.10	242	.33	3,040	107	28	37

YELLOWSTONE RIVER BASIN--Continued
 BIGHORN RIVER AT THERMOPOLIS, WYO.--Continued

Chemical analyses, in parts per million, water year October 1946 to September 1949--Continued

Date of collection	Mean discharge (second-foot)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
July 1-31, 1949 -----	2,339	7.2	585	17	0.03	50	13	50	4.0	0	137	182	10	0.2	2.0	0.10	392	0.53	2,480	179	67	37
Aug. 1-31 -----	839	7.9	1,000	16	.02	78	22	107	5.2	0	177	338	18	.5	3.2	.10	694	.94	4,570	285	140	44
Sept. 1-30 -----	1,169	7.9	807	11	.04	64	19	77	1.2	0	166	245	14	.2	2.3	.13	516	.70	1,660	236	100	41
Weighted average ---	1,552	--	616	17	0.03	53	16	55	4.5	--	1/152	179	10	0.3	2.2	0.13	426	0.58	1,780	199	74	37

1/Includes carbonate as bicarbonate.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT THERMOPOLIS, WYO.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement at approximately 12 m.7

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	44	33	33	33	34	37	53	58	62	65	63
2	55	47	33	33	33	34	40	53	55	63	67	63
3	55	45	34	32	33	35	43	57	54	64	66	62
4	57	43	34	33	33	34	40	58	55	64	68	54
5	56	37	33	33	33	34	42	52	55	64	68	57
6	49	37	33	33	33	34	46	48	58	63	68	59
7	41	37	33	33	33	35	48	47	60	64	68	60
8	47	38	33	33	34	35	51	51	63	64	69	61
9	48	36	33	32	34	34	49	55	63	64	67	62
10	49	36	33	32	36	33	45	59	63	64	65	63
11	48	36	33	33	35	35	47	61	64	64	65	61
12	48	38	34	33	32	34	52	61	64	63	66	52
13	49	39	34	34	--	35	50	63	61	63	65	53
14	50	38	33	34	32	33	51	62	60	63	65	53
15	51	39	33	33	33	33	46	62	61	63	65	53
16	42	36	33	33	33	34	49	61	61	65	65	68
17	44	38	33	33	35	34	51	57	60	64	65	55
18	44	34	33	33	36	34	53	53	60	65	66	54
19	45	33	33	32	33	34	55	51	59	65	65	54
20	45	33	33	32	33	35	57	52	60	64	65	57
21	46	34	33	32	34	34	53	55	61	63	65	54
22	46	33	33	32	34	34	53	54	62	64	64	56
23	--	34	33	32	35	35	54	55	62	64	66	56
24	52	33	33	32	34	34	57	57	62	65	66	57
25	47	33	33	32	34	34	60	59	62	65	64	57
26	45	33	33	33	34	34	56	61	64	65	64	57
27	45	33	34	34	34	34	57	63	61	65	63	57
28	45	33	33	33	34	34	58	62	62	64	64	45
29	45	34	33	32	--	34	60	61	62	65	64	57
30	44	33	33	33	--	34	56	--	62	65	62	54
31	43	--	33	34	--	36	--	59	--	65	63	--
Average	48	37	33	33	34	34	51	57	60	64	65	57

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT THERMOPOLIS, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	959	1,210	3,140	745	408	821	715	302	583
2-----	898	1,190	2,880	735	419	832	705	347	661
3-----	904	1,190	2,910	735	466	925	730	515	1,020
4-----	904	1,240	3,020	760	475	975	775	531	1,110
5-----	959	1,500	3,880	755	447	911	760	248	509
6-----	932	1,300	3,270	725	373	731	785	890	1,890
7-----	942	1,240	3,150	685	360	666	660	218	388
8-----	932	1,180	2,970	705	455	865	548	182	240
9-----	904	1,160	2,840	710	371	711	574	151	234
10-----	915	1,210	2,990	680	334	613	584	538	849
11-----	948	1,210	3,100	700	485	917	628	471	800
12-----	959	1,120	2,900	745	545	1,100	710	555	1,060
13-----	835	749	1,690	735	535	1,060	820	660	1,460
14-----	780	664	1,400	926	1,430	3,580	845	235	536
15-----	840	1,890	4,290	1,040	1,960	5,500	750	152	308
16-----	910	5,760	14,200	815	840	1,850	656	120	212
17-----	1,100	2,260	6,710	750	504	1,020	556	74	111
18-----	964	1,600	4,160	700	370	700	500	78	105
19-----	876	1,260	2,980	660	298	531	588	112	178
20-----	882	855	2,040	620	246	412	690	269	501
21-----	855	658	1,520	690	238	444	695	179	336
22-----	800	550	1,190	745	370	744	685	106	196
23-----	765	544	1,120	695	297	557	646	72	126
24-----	770	545	1,130	735	300	595	656	123	218
25-----	770	508	1,060	800	402	869	610	134	220
26-----	775	498	1,040	735	246	488	516	112	156
27-----	780	530	1,120	725	302	591	450	115	140
28-----	750	440	891	685	190	352	500	73	98
29-----	745	413	831	628	213	362	543	62	91
30-----	750	419	849	651	224	394	606	77	126
31-----	750	410	830	--	--	--	620	84	141
Total-	26,853	--	86,100	22,015	--	30,120	20,106	--	14,600
Day	January			February			March		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	628	82	139	870	1,190	2,150	882	409	973
2-----	633	165	282	656	889	1,580	882	446	1,060
3-----	496	69	93	651	776	1,360	904	441	1,080
4-----	420	90	102	624	630	1,060	959	480	1,240
5-----	548	150	222	628	1,130	1,920	1,010	626	1,710
6-----	638	188	324	633	1,200	2,050	1,040	800	2,240
7-----	651	146	257	646	1,500	2,820	1,120	890	2,690
8-----	665	180	324	651	1,700	2,990	1,160	1,180	3,700
9-----	597	128	206	638	1,120	1,930	1,090	760	2,240
10-----	615	106	176	656	1,680	2,980	986	360	958
11-----	592	105	168	656	1,010	1,790	986	470	1,250
12-----	606	115	188	690	750	1,400	970	520	1,360
13-----	610	145	238	710	550	1,050	981	620	1,640
14-----	608	190	311	680	300	550	904	520	1,270
15-----	670	172	311	680	254	468	882	440	1,050
16-----	700	220	416	695	265	497	871	425	1,000
17-----	720	280	544	705	409	779	920	590	1,470
18-----	730	375	740	735	337	670	932	830	2,080
19-----	685	280	518	715	224	432	1,010	1,060	2,890
20-----	638	275	474	720	185	360	1,100	1,480	4,390
21-----	543	233	342	740	248	498	1,270	2,100	7,200
22-----	500	385	520	775	346	724	1,310	2,130	7,530
23-----	460	412	512	800	406	877	1,320	2,080	7,410
24-----	430	608	706	800	321	694	1,150	1,480	4,600
25-----	450	532	646	820	298	637	1,110	1,600	4,790
26-----	500	319	431	835	--	699	1,130	1,940	5,920
27-----	570	240	370	850	272	624	1,100	1,850	5,490
28-----	615	215	357	871	427	1,000	1,040	1,890	5,300
29-----	620	300	503	--	--	--	981	1,590	4,210
30-----	642	475	824	--	--	--	928	1,460	3,640
31-----	665	980	1,760	--	--	--	860	1,550	3,600
Total-	18,445	--	13,000	19,930	--	34,380	31,786	--	95,980

307

BIGHORN RIVER AT THERMOPOLIS, WYO.--Continued

Suspended sediment, water									Year October 1976 to September 1977—Continued		
Day	Mean discharge (second-foot)	April		Mean discharge (second-foot)	May		Mean discharge (second-foot)	June			
		Suspended sediment			Suspended sediment			Suspended sediment			
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		
1-----	835	1,520	3,430	2,060	2,910	16,200	4,570	2,620	32,400		
2-----	840	1,430	3,240	1,890	2,020	10,300	4,280	3,220	37,200		
3-----	835	1,380	3,110	1,610	1,480	6,430	3,430	4,990	46,200		
4-----	845	1,460	3,330	1,500	1,360	5,510	2,990	2,180	17,600		
5-----	866	1,500	3,510	1,970	2,800	14,900	2,700	1,410	10,300		
6-----	882	1,540	3,660	2,260	3,280	20,000	3,010	1,440	11,700		
7-----	942	1,800	4,570	2,170	2,910	17,000	3,550	5,070	48,600		
8-----	964	1,870	4,870	1,950	2,520	13,300	3,720	4,960	49,900		
9-----	970	1,850	4,840	1,810	2,700	13,200	4,790	4,290	55,500		
10-----	1,050	1,980	5,610	1,870	2,660	13,400	5,360	4,700	68,000		
11-----	1,060	2,030	5,810	2,120	2,340	13,400	5,760	3,400	52,900		
12-----	976	1,620	4,270	2,430	2,420	15,900	6,670	4,940	88,900		
13-----	1,040	1,860	5,220	2,800	3,650	27,600	7,470	5,290	107,000		
14-----	1,300	2,940	10,300	3,440	4,840	45,000	8,350	5,040	113,000		
15-----	1,250	2,520	8,500	3,640	3,900	38,300	6,980	4,310	81,300		
16-----	1,120	1,770	5,350	3,950	3,670	39,200	6,170	2,760	46,000		
17-----	998	1,460	3,940	4,810	4,920	63,900	5,780	2,140	33,400		
18-----	970	1,390	3,640	5,290	5,310	76,000	5,520	2,060	30,700		
19-----	992	1,380	3,700	5,700	6,350	97,800	5,470	2,150	31,800		
20-----	1,030	1,890	5,260	4,980	5,170	69,500	7,220	3,040	59,200		
21-----	1,230	2,290	7,600	4,340	4,000	46,900	8,130	2,580	56,600		
22-----	1,050	1,570	4,450	4,130	3,480	38,800	7,000	2,250	42,500		
23-----	976	1,400	3,690	3,780	2,940	30,000	6,060	1,850	30,200		
24-----	1,140	1,790	5,510	3,480	2,580	24,200	5,260	1,900	27,000		
25-----	1,350	2,400	8,740	3,290	2,320	20,600	4,330	1,590	18,600		
26-----	1,770	4,700	22,400	3,240	2,050	17,900	3,860	1,400	14,600		
27-----	1,970	3,800	20,200	3,700	2,450	24,500	4,090	1,520	16,800		
28-----	1,980	3,200	17,100	4,410	4,040	48,100	4,440	1,560	18,700		
29-----	2,310	3,840	24,000	4,760	4,250	54,600	3,620	1,430	14,000		
30-----	2,540	4,120	28,200	5,040	4,170	56,800	3,220	1,480	12,900		
31-----	--	--	--	4,970	3,340	44,800	--	--	--		
Total--	36,081	--	238,000	103,390	--	1,024,000	153,800	--	1,273,000		
July				August			September				
1-----	2,880	1,370	10,600	792	1,660	3,550	930	1,560	3,920		
2-----	2,450	1,200	7,940	780	1,580	3,330	940	1,590	4,040		
3-----	2,490	1,290	8,680	854	2,560	5,900	958	1,710	4,420		
4-----	2,700	1,080	7,880	904	2,320	5,680	971	1,790	4,690		
5-----	3,350	1,400	12,700</								

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT THERMOPOLIS, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	
Oct. 14, 1948	10:50 a. m.	810	697	1,150	--	20	40	54	70	88	97	97		98	BN
Oct. 14	10:50 a. m.	810	697	1,140	--	32	42	53	68	85	92	98		100	BN
Feb. 11, 1949	3:30 p. m.	665	848	676	--	3	6	12	25	56	82	91		92	BN
Feb. 11	3:30 p. m.	665	848	620	--	3	4	10	22	56	84	94		96	BN
Apr. 1	8:50	1,560	1,300	1,300	--	22	37	64	80	89	94	97		100	BN
June 6	3:37 p. m.	4,050	4,440	1,250	15	23	30	38	48	61	77	90		97	BN
June 13	--	7,750	4,720	2,000	--	18	33	44	56	73	86	95		99	BN
July 13	10:21 a. m.	2,950	3,430	1,230	17	28	37	50	67	78	89	96		99	BN
July 15	7:15 a. m.	3,000	12,300	4,420	26	43	59	74	89	93	95	97		98	BN
Aug. 2	11:06 a. m.	780	1,620	1,490	36	66	82	94	98	99	100	--		100	BN
Aug. 15	10:57 a. m.	800	1,860	5,100	33	56	79	90	98	98	99	99		100	BN
Aug. 22	3:05 p. m.	804	1,800	1,360	34	51	67	85	97	99	100	100		--	BN
Aug. 31	10:00 a. m.	948	1,710	2,770	32	44	60	74	88	95	97	99		100	BN
Sept. 1	7:15 a. m.	935	1,580	1,190	27	47	61	77	86	94	96	98		99	BN
Sept. 7	3:11 p. m.	1,350	2,320	1,730	24	32	44	58	70	84	92	97		100	BN
Sept. 10	7:15 a. m.	1,380	2,010	1,410	14	22	31	43	60	83	92	98		100	BN
Sept. 15	2:55 p. m.	1,360	1,470	844	1	10	28	38	53	77	88	94		98	BN
Sept. 15	2:55 p. m.	1,360	1,470	894	15	22	31	42	55	78	87	94		98	BN
Sept. 20	7:15 a. m.	1,200	1,080	860	21	29	40	50	59	80	81	89		91	BN
Sept. 22	10:04 a. m.	1,120	918	1,350	20	29	40	50	63	78	92	98		99	BN
Sept. 30	5:15 p. m.	957	700	497	30	39	55	66	76	86	95	98		99	BN

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER NEAR MANDERSON, WYO.

LOCATION --At gaging station at bridge, a quarter of a mile west of Rairden and 6 miles southeast of Manderson, Big Horn County, Wyo.

RECORDS AVAILABLE --Water temperatures: August and September 1949.

Sediment Records: April to September 1949.

EXTREMES 1948-49 --Sediment concentrations: Maximum daily, 22,000 ppm Sept. 4; minimum daily, 270 ppm Aug. 25.

Sediment loads: Maximum daily, 175,000 tons June 13; minimum daily, 163 tons Aug. 25.

REMARKS --Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, June to July 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids			Hardness as CaCO ₃		Per- cent non- car- bon- ate	
															Bo- ron (B)	Parts per mil- lion	Tons per acre- foot	Tons per day	Total		Non- carbon- ate
June 14, 1949	7,300	7.7	383	17	0.02	40	7.0	31	123	84	4.5	0.2	1.8	0.32	257	0.35		129	28	35	
July 1	2,510	7.7	501	14	.02	45	10	46	119	133	10	.3	1.7	.20	333	.45		154	56	35	

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER NEAR MANDERSON, WYO.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 [Once-daily temperature measurement in August generally at 9 a.m.; all others generally at 5 p.m.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							41	--	--	--	80	71
2							41	62	--	--	70	70
3							--	--	--	--	68	62
4							--	--	--	--	77	64
5							--	--	--	--	70	60
6							--	--	65	--	69	67
7							--	--	--	--	72	69
8							--	--	--	--	73	67
9							--	--	--	--	72	74
10							--	--	--	--	80	68
11							--	--	--	--	80	59
12							--	--	--	--	74	61
13							--	70	66	--	65	63
14							--	--	--	74	66	63
15							--	--	--	--	69	66
16							--	--	--	--	69	64
17							--	--	--	--	67	61
18							--	--	--	--	66	65
19							--	--	--	--	69	66
20							--	--	66	--	68	59
21							--	--	--	--	70	64
22							--	--	--	--	68	65
23							--	--	--	--	70	65
24							--	--	--	--	68	66
25							--	--	--	--	65	65
26							--	--	--	--	65	65
27							--	--	--	75	66	63
28							--	--	67	74	63	65
29							--	--	--	78	67	61
30							--	--	68	80	64	62
31							--	--	--	78	66	--
Average							--	--	--	--	70	65

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER NEAR MANDERSON, WYO.--Continued

Suspended sediment, April to September 1949

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	--	--	--	1,840	--	1/25,000	4,840	3,670	48,000
2-----	--	--	--	1,260	2,850	9,700	4,900	9,200	122,000
3-----	--	--	--	1,020	--	1/7,900	4,250	8,800	101,000
4-----	--	--	--	987	--	1/7,600	2,960	6,150	49,200
5-----	--	--	--	987	2,600	6,930	2,240	5,350	32,400
6-----	--	--	--	1,300	3,400	11,900	2,120	4,160	23,800
7-----	--	--	--	1,640	4,250	18,800	2,440	4,320	28,500
8-----	--	--	--	1,560	3,200	13,500	4,330	8,250	96,400
9-----	--	--	--	1,290	2,650	9,230	3,780	10,400	106,000
10-----	--	--	--	1,170	--	1/8,500	4,760	6,950	89,300
11-----	--	--	--	1,280	2,950	10,200	5,210	4,140	58,200
12-----	--	--	--	1,530	3,600	14,900	6,090	7,960	131,000
13-----	--	--	--	1,670	3,240	14,600	6,970	9,300	175,000
14-----	--	--	--	2,200	6,600	39,200	7,510	5,640	114,000
15-----	--	--	--	2,680	7,150	51,700	7,890	5,970	127,000
16-----	--	--	--	2,880	5,900	45,900	6,680	4,360	78,600
17-----	--	--	--	3,450	7,550	70,300	5,330	3,380	48,600
18-----	--	--	--	4,270	7,580	87,400	4,650	2,820	35,400
19-----	--	--	--	4,840	6,700	87,500	4,750	2,620	33,600
20-----	--	--	--	4,610	7,010	87,200	5,250	3,690	52,300
21-----	--	--	--	4,290	9,200	107,000	7,340	4,400	87,100
22-----	--	--	--	3,760	6,900	70,000	6,990	3,920	74,000
23-----	--	--	--	3,280	--	1/51,000	5,450	2,520	37,100
24-----	--	--	--	2,770	5,000	37,400	4,750	2,220	28,500
25-----	960	2,010	5,210	2,440	--	1/30,000	4,100	2,960	32,800
26-----	1,120	2,300	6,950	2,190	4,000	23,600	3,320	2,300	20,600
27-----	1,370	3,670	13,600	2,350	3,750	23,900	3,210	2,340	20,300
28-----	1,460	4,060	16,100	3,300	5,670	50,500	3,760	2,280	23,100
29-----	1,480	3,450	13,800	3,950	4,300	45,900	3,530	2,180	20,800
30-----	1,670	5,500	24,800	4,420	4,450	53,100	2,850	1,830	14,100
31-----	--	--	--	5,150	7,700	107,000	--	--	--
Total-	8,060	--	80,460	80,344	--	1,228,000	142,250	--	1,909,000
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2,580	1,850	12,900	216	394	230	400	980	1,060
2-----	2,220	--	1/13,000	218	454	266	408	1,180	1,300
3-----	1,830	2,320	11,500	212	460	263	1,000	15,800	2/82,500
4-----	2,120	1,650	9,440	220	404	240	1,060	22,000	2/76,700
5-----	2,620	2,820	19,900	298	1,040	836	708	4,720	9,020
6-----	2,980	4,600	36,800	312	915	770	1,050	4,280	12,100
7-----	2,850	1,870	14,400	333	918	825	1,240	3,550	11,900
8-----	2,880	2,080	16,200	315	870	740	1,150	3,110	9,650
9-----	2,750	2,490	18,500	306	918	758	1,180	3,140	10,000
10-----	2,680	1,990	14,400	290	812	635	1,290	3,000	10,400
11-----	2,750	2,820	20,900	282	690	526	1,380	3,450	12,900
12-----	2,690	2,110	15,300	306	770	636	1,160	2,800	8,760
13-----	2,750	10,100	75,000	295	762	607	1,140	2,070	6,370
14-----	3,550	17,400	167,000	244	682	449	1,210	2,250	7,350
15-----	3,040	12,700	104,000	244	630	415	1,330	1,820	6,540
16-----	2,310	6,400	40,000	236	532	339	1,300	1,680	5,890
17-----	2,100	3,980	22,600	228	465	286	1,170	1,500	4,740
18-----	1,880	2,840	14,400	220	428	254	1,110	2,270	6,800
19-----	1,730	2,760	12,900	214	380	220	1,110	1,970	5,900
20-----	1,550	1,740	7,280	206	341	190	1,030	1,320	3,670
21-----	1,270	1,920	6,590	214	--	1/300	1,060	1,620	4,640
22-----	1,090	1,900	5,590	194	390	204	1,060	1,550	4,440
23-----	996	1,860	5,000	214	375	217	996	1,340	3,600
24-----	824	1,770	3,940	246	377	250	1,010	1,580	4,300
25-----	720	1,440	2,800	224	270	163	1,000	1,300	3,510
26-----	530	1,030	1,470	210	300	170	978	1,650	4,360
27-----	420	890	1,010	216	358	209	936	1,660	4,200
28-----	339	927	849	292	599	472	936	1,100	2,780
29-----	292	709	559	336	752	682	904	1,100	2,680
30-----	282	606	461	354	913	872	987	1,700	4,530
31-----	236	467	298	388	952	998	--	--	--
Total-	56,839	--	675,000	8,083	--	14,120	31,313	--	332,600
Total discharge for period Apr. 25 to Sept. 30 (second-foot-days) -----									
Total load for period Apr. 25 to Sept. 30 (tons) -----									326,889
									4,239,000

1/Estimated.

2/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER NEAR MANDERSON, WYO.--Continued

Particle-size analyses of suspended sediment, April to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Apr. 1, 1949	12:37 p. m.	960	1,700	1,400	--	27	37	47	51	77	87	91		100	BW
June 13	4:32 p. m.	7,220	9,310	1,050	--	31	41	49	58	67	75	--		--	BW
July 14	4:00 p. m.	2,710	11,600	4,870	27	38	54	66	80	89	93	96		97	BW
July 16	5:05 p. m.	2,290	5,580	2,080	23	38	53	75	80	87	95	98		99	BW
July 27	11:10 a. m.	432	881	1,600	50	63	85	87	92	94	95	98		99	BW
Aug. 4	3:23 p. m.	230	392	582	52	60	80	91	97	99	100	--		--	BW
Aug. 4	3:23 p. m.	230	392	580	13	25	--	--	94	97	98	99		100	BN
Aug. 12	3:28 p. m.	308	773	1,150	51	56	69	74	77	83	89	95		98	BW
Aug. 24	11:32 a. m.	248	317	1,040	37	65	82	94	95	98	98	99		100	BW
Sept. 1	9:24 a. m.	408	910	1,520	39	58	75	84	89	93	95	98		99	BW
Sept. 8	12:01 p. m.	1,130	2,960	1,480	2	8	33	--	65	76	88	95		99	BN
Sept. 8	12:01 p. m.	1,130	2,960	1,600	21	31	42	55	66	75	84	91		94	BW
Sept. 16	1:52 p. m.	1,330	1,600	1,210	14	19	29	39	47	58	70	84		98	BW
Sept. 20	12:26 p. m.	1,120	1,180	1,640	16	25	34	42	50	59	69	96		99	BW
Sept. 24	5:45 p. m.	1,050	1,470	1,060	14	20	26	30	37	44	56	90		98	BW
Sept. 29	11:32 a. m.	920	1,783	722	20	30	43	51	60	67	73	93		99	BW

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT MANDERSON, WYO.

LOCATION.--At gaging station at bridge on U. S. Highway 20, three-eighths of a mile west of Manderson, Big Horn County, and 2½ miles upstream from Nowood Creek.

DRAINAGE AREA.--11,900 square miles.

RECORDS AVAILABLE.--Sediment records: March 1946 to September 1949 (discontinued).

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 28,000 ppm Sept. 4; minimum daily, not determined.

Sediment loads: Maximum daily, 207,000 tons June 13; minimum daily, not determined.

EXTREMES, 1946-49.--Sediment concentrations: Maximum daily, 34,000 ppm Sept. 20, 1948; minimum daily, not determined.

Sediment loads: Maximum daily, 622,000 tons June 23, 1948; minimum daily, not determined.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, October to December 1948

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Pot- as- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium		
																Bor- on (B)	Parts per mil- lion	Tons per acre- foot	Tons per day		Total	Non- carbon- ate
Oct. 6, 1948 -----	883	8.3	1,090	13	0.01	86	28	135	14	3	209	388	34	0.8	2.2	0.08	794	1.07		330	154	46
Dec. 3 -----	850	7.6	1,310	18	.06	110	39		124	0	270	422	29	.3	2.7	.17	916	1.25		435	214	38

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT MANDERSON, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	862	5,700	13,300	883	1,250	2,980	792	--	1/2,000
2-----	841	--	1/7,400	876	1,300	3,070	841	--	1/1,600
3-----	771	--	1/6,500	869	1,700	3,990	850	1,500	3,440
4-----	813	--	1/6,900	906	1,750	4,280	880	2,800	6,180
5-----	834	3,900	8,780	938	1,980	5,020	920	2,500	6,210
6-----	883	3,400	8,110	930	2,200	5,520	900	2,090	5,080
7-----	855	1,870	4,320	898	2,100	5,090	950	1,400	3,590
8-----	869	--	1/4,100	841	1,650	3,750	740	1,800	3,600
9-----	883	--	1/5,000	827	1,600	3,570	660	1,500	2,670
10-----	869	--	1/6,000	906	1,300	3,180	680	1,580	2,900
11-----	890	2,570	6,180	841	--	1/2,800	700	1,710	3,230
12-----	954	2,210	5,690	862	1,500	3,490	740	2,000	4,000
13-----	954	--	1/4,400	930	1,800	4,520	850	1,980	4,550
14-----	855	1,420	3,280	930	2,050	5,150	960	--	1/3,600
15-----	876	2,200	5,210	1,170	3,460	10,900	1,000	700	1,890
16-----	994	8,700	23,400	1,330	4,640	16,700	900	130	3,160
17-----	914	4,400	10,900	1,070	2,880	8,320	750	150	3,040
18-----	1,220	8,000	26,400	930	2,000	5,020	650	100	1,760
19-----	1,170	5,100	16,100	876	1,540	3,640	800	550	891
20-----	1,100	--	1/10,000	771	1,420	2,960	700	880	1,660
21-----	1,080	--	1/6,600	750	1,850	3,740	850	1,000	2,290
22-----	1,030	1,800	5,010	799	1,270	2,740	840	1,320	3,000
23-----	954	1,600	4,120	834	1,580	3,560	820	820	1,820
24-----	906	--	1/2,900	827	1,360	3,040	780	550	1,160
25-----	890	1,250	3,000	841	910	2,070	780	470	990
26-----	890	--	1/4,100	922	860	2,140	700	--	1/900
27-----	906	1,800	4,400	848	1,050	2,400	620	450	753
28-----	946	--	1/3,800	869	1,500	3,520	550	260	386
29-----	898	--	1/3,000	806	1,780	3,880	600	190	308
30-----	898	--	1/4,800	708	1,600	3,060	660	--	1/1,000
31-----	876	--	1/3,800	--	--	--	740	870	1,740
Total-	28,681	--	227,500	26,788	--	134,100	24,003	--	79,400
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	750	--	1/1,800	800	--	--	1,050	--	--
2-----	750	670	1,360	820	--	--	1,100	--	--
3-----	760	190	390	800	--	--	1,100	--	--
4-----	500	245	331	800	--	--	1,100	1,450	--
5-----	300	365	295	760	--	--	1,150	--	--
6-----	300	110	--	740	--	--	1,200	--	--
7-----	750	--	1/950	720	272	--	1,250	3,070	--
8-----	800	670	1,450	340	388	--	1,300	--	--
9-----	800	350	757	740	--	--	1,400	--	--
10-----	750	--	1/1,100	750	--	--	1,300	--	--
11-----	750	--	1/2,100	750	313	--	1,200	--	--
12-----	720	1,210	2,350	780	--	--	1,200	--	--
13-----	740	1,170	2,340	820	--	--	1,200	--	--
14-----	760	--	--	860	--	--	1,200	--	--
15-----	740	--	--	840	--	--	1,100	--	--
16-----	800	--	--	840	--	--	1,100	--	--
17-----	850	--	--	850	--	--	1,050	--	--
18-----	880	--	--	860	--	--	1,100	1,260	--
19-----	900	--	--	900	--	--	1,200	--	--
20-----	850	--	--	900	--	--	1,300	--	--
21-----	800	--	--	900	--	--	1,500	--	--
22-----	700	--	1/900	920	--	--	1,700	--	--
23-----	600	--	--	940	--	1/2,600	1,800	4,020	19,600
24-----	560	--	--	980	--	--	1,700	--	1/20,000
25-----	540	--	--	980	--	--	1,590	4,800	20,600
26-----	600	--	--	1,000	--	--	1,400	3,790	14,300
27-----	650	--	--	1,050	--	--	1,390	3,520	13,200
28-----	700	--	--	1,050	--	--	1,400	3,120	11,800
29-----	750	--	--	--	--	--	1,280	2,880	9,950
30-----	750	--	--	--	--	--	1,210	2,570	8,400
31-----	800	--	--	--	--	--	1,150	2,560	7,950
Total-	21,900	--	31,500	23,890	--	40,800	39,720	--	266,600

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT MANDERSON, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Suspended sediment, water year October 1948 to September 1949--Continued									
Day	April			May			June		
	Mean dis- charge (second- feet)	Suspended sediment		Mean dis- charge (second- feet)	Suspended sediment		Mean dis- charge (second- feet)	Suspended sediment	
		Mean con- centration (ppm)	Tons per day		Mean con- centration (ppm)	Tons per day		Mean con- centration (ppm)	Tons per day
1-----	1,080	2,460	7,170	2,000	6,690	36,100	4,880	5,800	76,400
2-----	1,080	2,610	7,610	1,430	3,960	15,300	4,930	8,300	110,000
3-----	1,110	2,540	7,610	1,190	2,820	9,060	4,500	11,400	139,000
4-----	1,100	2,540	7,550	1,080	1,960	5,710	3,140	6,650	56,400
5-----	1,160	2,720	8,520	1,030	1,830	5,090	2,570	4,300	29,800
6-----	1,170	3,080	9,720	1,500	4,230	17,100	2,340	3,350	21,200
7-----	1,170	3,130	9,880	1,700	4,640	21,300	2,500	6,090	41,100
8-----	1,200	3,420	11,100	1,560	3,490	14,700	4,400	12,500	149,000
9-----	1,200	3,240	10,500	1,370	3,490	12,900	3,850	9,150	95,000
10-----	1,160	3,220	10,100	1,250	3,220	10,900	4,800	8,000	104,000
11-----	1,200	3,340	10,800	1,280	3,460	12,000	5,270	7,130	101,000
12-----	1,100	2,610	7,750	1,540	3,940	16,400	6,150	8,480	140,000
13-----	1,080	2,530	7,380	1,740	4,050	19,000	7,020	10,900	207,000
14-----	1,220	2,400	7,900	2,250	6,710	40,800	7,560	6,720	137,000
15-----	1,410	2,700	10,300	2,720	8,280	60,800	7,950	6,320	136,000
16-----	1,310	2,870	10,200	2,860	7,350	56,700	6,730	4,700	85,400
17-----	1,170	2,390	7,550	3,300	7,250	64,600	5,370	3,650	52,900
18-----	1,030	1,880	5,230	4,200	9,350	106,000	4,700	3,960	50,300
19-----	1,080	1,880	5,480	4,830	9,850	128,000	4,790	3,990	51,600
20-----	1,030	1,860	5,170	4,610	8,500	106,000	5,290	4,330	61,900
21-----	1,130	2,200	6,710	4,320	9,330	109,000	7,380	4,530	90,200
22-----	1,170	2,250	7,110	3,790	7,650	78,300	7,330	4,080	80,400
23-----	978	1,890	4,990	3,340	5,250	47,400	5,470	3,620	53,500
24-----	906	1,590	3,890	3,000	4,620	37,400	4,860	4,320	56,700
25-----	1,000	1,710	4,620	2,760	4,840	36,000	4,320	4,160	48,500
26-----	1,190	2,410	7,740	2,560	4,100	28,400	3,660	4,140	40,900
27-----	1,470	4,200	16,700	2,630	3,800	27,000	3,420	4,200	38,800
28-----	1,630	4,400	19,400	3,640	7,380	72,500	3,770	4,370	44,400
29-----	1,590	3,280	14,100	4,200	7,700	87,400	3,720	4,040	40,600
30-----	1,820	4,400	21,600	4,520	6,500	79,300	3,100	2,590	21,700
31-----	--	--	--	5,170	8,500	119,000	--	--	--
Total--	35,944	--	274,400	83,370	--	1,480,000	145,770	--	2,361,000
July									
1-----	2,820	2,860	21,800	266	414	297	505	1,710	2,330
2-----	2,530	2,200	15,000	251	475	322	540	2,050	2,990
3-----	2,010	1,650	8,960	254	411	282	883	7,550	2/32,200
4-----	2,170	1,910	11,200	251	384	260	1,120	28,000	2/100,400
5-----	2,660	2,470	17,700	364	811	797	813	6,800	14,900
6-----	3,000	5,980	48,500	352	791	752	1,040	4,880	13,700
7-----	3,300	4,660	41,500	392	862	913	1,260	3,940	13,400
8-----	3,090	4,610	38,500	408	879	969	1,320	3,880	13,800
9-----	2,960	3,380	27,000	372	805	809	1,300	3,380	11,800
10-----	2,790	3,000	22,600	340	835	767	1,340	2,900	10,500
11-----	2,850	2,960	22,800	328	676	599	1,540	5,210	21,600
12-----	2,880	3,370	26,200	368	760	755	1,320	3,570	12,700
13-----	2,800	9,480	71,700	352	769	731	1,270	2,120	7,270
14-----	3,300	22,200	198,000	340	720	661	1,410	2,080	7,920
15-----	3,040	17,700	145,000	308	619	515	1,470	1,820	7,220
16-----	2,600	9,800	68,800	275	478	355	1,400	1,870	7,080
17-----	2,510	5,310	33,100	260	418	294	1,270	--	1/7,200
18-----	2,010	3,390	18,400	260	382	268	1,140	2,000	6,160
19-----	1,870	2,910	14,700	254	325	223	1,130	2,060	6,290
20-----	1,680	2,630	11,900	248	281	188	1,080	1,540	4,490
21-----	1,390	2,140	8,040	278	468	351	1,100	1,470	4,370
22-----	1,190	1,840	5,920	248	427	286	1,070	1,350	3,900
23-----	1,090	1,760	5,180	299	483	390	1,040	1,440	4,050
24-----	890	1,560	3,750	305	587	483	1,030	1,450	4,030
25-----	720	1,280	2,490	290	411	322	1,030	2,620	7,280
26-----	570	1,020	1,570	281	476	362	1,030	1,250	3,480
27-----	530	961	1,380	281	639	485	1,000	1,220	3,300
28-----	472	848	1,080	356	985	946	1,030	1,150	3,200
29-----	412	716	797	420	1,580	1,790	1,010	1,050	2,860
30-----	360	593	576	452	2,360	2,880	1,050	1,140	3,230
31-----	305	488	402	480	1,560	2,020	--	--	--
Total--	60,599	--	894,500	9,933	--	21,070	33,541	--	343,600
Total discharge for year (second-foot-days)-----									
								534,139	
Total load for year (tons)-----									
								6,154,000	

1/Estimated.

2/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT MANDERSON, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250			0.350	0.500
Oct. 7, 1948	3:40 p. m.	834	1,740	2,980	--	7	30	44	47	56	78	95		99		BN
Oct. 7	3:40 p. m.	834	1,740	3,150	--	--	34	40	46	56	66	85		97		BN
Oct. 25	9:30 a. m.	883	1,270	1,500	--	--	18	26	32	44	60	92		99		BN
Oct. 25	9:30 a. m.	883	1,270	1,800	--	13	19	24	31	44	62	90		100		BN
Mar. 31, 1949	4:00 p. m.	1,130	2,520	1,860	--	20	29	37	41	49	61	74		93		BN
Apr. 1	10:45 a. m.	1,100	2,430	1,010	--	24	34	41	48	58	78	93		95		BN
Apr. 2	9:55 a. m.	1,050	2,700	1,740	--	22	26	41	47	58	79	98		99		BN
May 2	2:03 p. m.	1,520	3,870	2,060	--	16	21	28	38	56	72	86		100		BN
May 13	2:23 p. m.	1,890	4,160	1,830	--	11	16	21	28	42	63	85		95		BN
June 13	3:18 p. m.	6,950	10,800	1,080	--	37	47	55	62	69	78	88		96		BN
July 15	9:54 a. m.	3,610	17,400	1,890	28	43	56	70	82	89	92	95		97		BN
July 27	3:20 p. m.	520	914	2,480	40	58	70	77	79	82	86	91		94		BN
Aug. 12	1:04 p. m.	368	783	1,100	39	60	74	81	86	89	90	95		98		BN
Aug. 12	1:04 p. m.	368	783	1,100	1	11	56	--	--	89	93	95		96		BN
Aug. 24	1:14 p. m.	299	492	721	28	47	73	77	82	89	91	94		96		BN
Sept. 4	12:00 m.	1,010	26,500	2,540	30	41	51	59	62	63	71	80		88		BN
Sept. 12	5:43 p. m.	1,280	2,630	1,110	--	--	8	59	75	85	88	94		97		BN
Sept. 12	5:43 p. m.	1,280	2,630	1,230	35	50	65	74	85	92	96	98		99		BN

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT KANE, WYO.

LOCATION.--At gaging station at bridge on State Highway 14, half a mile east of Kane, Big Horn County.

DRAINAGE AREA.--15,900 square miles.

RECORDS AVAILABLE.--Water temperatures: July to September 1949.

Sediment records: March 1946 to September 1949.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 18,300 ppm Sept. 5; minimum daily, not determined.

Sediment loads: Maximum daily, 295,000 tons June 8; minimum daily, not determined.

EXTREMES, 1946-49.--Sediment concentrations: Maximum daily, 33,000 ppm Apr. 20, 1948, Sept. 21, 1948; minimum daily, not determined.

Sediment loads: Maximum daily, 972,000 tons June 25, 1946; minimum daily, not determined.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to July 1949

Date of collection	Discharge (second- feet)	pH	Specific conductance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent non- carbon- ate
																Parts per million	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
Oct. 6, 1948 -----	1,440	7.8	1,110	24	0.03	94	35	125	228	410	24	0.5	0.12	2.3	0.12	868	1.18		378	191	42
Mar. 4, 1949 -----	2,770	7.3	933	14	.02	76	38	66	166	316	14	.3	.3	3.3	.00	645	.88		346	210	29
May 6 -----	2,650	7.6	652	19	.02	63	18	49	166	178	10	.3	.3	1.0	--	454	.62		231	95	32
June 14 -----	12,100	7.8	453	15	.02	46	9.5	35	128	110	5.4	.3	.3	1.4	--	308	.42		154	49	33
July 1 -----	3,710	7.5	522	15	.02	49	12	41	130	136	8.0	.3	.3	1.4	--	352	.48		172	65	34

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT KANE, WYO.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 6 a.m. and 10 a.m. /

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--						45	--	--	68	69	65
2	--							--	--	--	75	64
3	--		32					--	--	--	72	60
4	--							--	--	--	71	58
5	--							--	--	--	69	58
6	50							53	67	--	69	58
7	--			32	32			--	--	--	72	62
8	--							--	--	--	70	61
9	--							--	--	--	68	62
10	--							--	--	--	77	63
11	--							--	--	--	79	50
12	--							--	--	--	--	50
13	--							64	--	--	--	54
14	--							--	--	--	77	55
15	--							--	65	73	75	59
16	--							--	--	--	67	62
17	--							--	--	--	--	60
18	--							--	--	--	73	54
19	--							--	--	--	--	55
20	--							--	--	--	--	56
21	--							--	--	--	72	55
22	46							--	--	--	--	53
23	--						34	--	67	--	--	58
24	--							--	--	--	--	60
25	--							--	--	--	75	60
26	--							--	--	--	71	55
27	--							--	--	70	--	55
28	--							--	--	71	--	61
29	--							--	--	75	62	56
30	--							--	66	76	64	53
31	--							--	--	71	63	--
Average	--							--	--	--	--	58

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT KANE, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,590	--	1/4,700	1,380	700	2,610	950	--	1/2,300
2-----	1,510	929	3,780	1,380	850	3,170	1,160	--	1/3,600
3-----	1,550	--	1/6,200	1,370	880	3,260	1,370	1,240	4,590
4-----	1,480	--	1/7,500	1,360	1,060	3,890	1,440	--	1/5,200
5-----	1,500	1,440	5,840	1,430	--	1/8,800	1,410	2,250	8,560
6-----	1,450	1,470	5,750	1,390	1,950	7,320	1,390	1,880	7,060
7-----	1,470	872	3,460	1,380	--	1/3,100	1,310	2,460	8,700
8-----	1,420	1,260	4,830	1,350	450	1,640	1,270	3,080	10,600
9-----	1,480	--	1/4,500	1,340	790	2,860	1,130	1,110	3,390
10-----	1,470	801	3,180	1,380	710	2,640	1,000	1,000	2,700
11-----	1,410	970	3,690	1,440	600	2,330	900	--	1/4,680
12-----	1,440	1,200	4,660	1,400	1,210	4,570	1,000	--	1/2,200
13-----	1,460	1,280	4,960	1,420	--	1/4,400	1,100	410	1,220
14-----	1,480	1,510	6,040	1,480	--	1/3,900	1,200	--	1/360
15-----	1,430	1,420	5,480	1,470	840	3,330	1,300	60	211
16-----	1,590	2,400	10,300	1,710	1,600	7,390	1,300	580	2,040
17-----	1,630	3,350	14,700	1,750	1,670	7,890	1,100	--	--
18-----	1,610	3,470	15,100	1,490	1,500	6,030	950	--	--
19-----	1,740	3,050	14,300	1,390	1,110	4,170	800	--	--
20-----	1,600	1,350	5,830	1,270	--	1/3,000	700	--	--
21-----	1,510	1,440	5,870	1,310	--	1/4,000	800	--	--
22-----	1,520	1,400	5,750	1,330	--	1/7,200	850	--	--
23-----	1,470	1,400	5,560	1,370	3,420	12,600	900	--	--
24-----	1,440	1,640	6,380	1,430	--	1/13,000	900	--	1/1,100
25-----	1,390	1,280	4,730	1,380	--	1/4,200	860	--	--
26-----	1,400	1,170	4,420	1,350	480	1,750	860	--	--
27-----	1,420	1,110	4,260	1,250	--	1/4,700	820	--	--
28-----	1,410	1,030	3,920	1,100	1,250	3,710	750	--	--
29-----	1,410	1,140	4,340	1,050	1,930	5,470	700	--	--
30-----	1,400	800	3,020	1,000	930	2,510	740	--	--
31-----	1,380	410	1,530	--	--	--	800	--	--
Total-	46,060	--	184,600	41,150	--	145,400	31,760	--	83,800
Day	January			February			March		
	Mean discharge (second-feet)	Mean concentration (ppm)	Tons per day	Mean discharge (second-feet)	Mean concentration (ppm)	Tons per day	Mean discharge (second-feet)	Mean concentration (ppm)	Tons per day
1-----	900	--	--	1,050	--	--	1,500	--	--
2-----	900	--	--	1,100	--	--	1,700	--	--
3-----	900	--	--	1,150	--	--	2,000	--	--
4-----	880	--	--	1,150	--	--	2,500	2,820	--
5-----	750	--	--	1,150	--	--	3,000	--	--
6-----	550	--	--	1,100	--	--	2,700	--	--
7-----	600	55	1/220	1,050	--	--	2,400	--	--
8-----	950	--	--	1,050	168	--	2,200	--	--
9-----	950	--	--	1,050	--	--	2,100	--	--
10-----	940	--	--	1,050	--	1/500	1,900	--	15,000
11-----	900	--	--	1,050	--	--	1,800	--	--
12-----	880	--	--	1,050	--	--	1,750	--	--
13-----	870	--	--	1,100	--	--	1,700	--	--
14-----	870	--	--	1,100	--	--	1,650	--	--
15-----	870	--	--	1,200	--	--	1,600	--	--
16-----	900	--	--	1,150	--	--	1,550	--	--
17-----	950	--	--	1,100	--	--	1,500	--	--
18-----	1,000	--	--	1,100	--	--	1,500	1,600	6,480
19-----	1,100	--	--	1,150	--	--	1,700	1,500	6,880
20-----	1,100	--	--	1,200	--	--	2,000	3,790	20,500
21-----	1,050	--	--	1,200	--	--	2,500	7,500	50,600
22-----	900	--	--	1,200	--	1/4,600	3,160	6,550	55,900
23-----	820	--	1/380	1,200	--	--	3,290	6,650	59,100
24-----	760	--	--	1,250	--	--	2,980	5,300	42,600
25-----	720	--	--	1,300	--	--	2,750	4,760	35,400
26-----	700	--	--	1,300	--	--	2,430	4,250	27,900
27-----	730	--	--	1,350	--	--	2,420	4,600	30,100
28-----	780	--	--	1,400	--	--	2,460	4,200	27,900
29-----	850	--	--	--	--	--	2,130	3,850	22,200
30-----	900	--	--	--	--	--	1,860	2,880	14,500
31-----	1,000	--	--	--	--	--	1,840	2,660	13,200
Total-	26,970	--	9,200	32,300	--	63,200	66,570	--	668,000

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT KANE, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,830	2,700	13,300	2,930	5,800	45,900	7,330	4,400	87,000
2-----	1,780	2,550	12,300	2,670	5,000	36,000	7,070	3,960	75,600
3-----	1,780	1,480	7,110	2,350	3,250	20,600	7,730	5,600	117,000
4-----	1,790	2,650	12,800	2,320	--	1/19,000	6,550	8,800	156,000
5-----	1,780	1,720	8,270	2,430	--	1/20,000	5,460	5,860	86,400
6-----	1,820	2,600	12,800	2,600	2,790	19,600	5,610	8,550	130,000
7-----	1,880	2,620	13,300	2,810	2,820	21,400	7,360	12,300	244,000
8-----	1,890	2,700	13,800	2,700	3,380	24,600	8,180	13,400	295,000
9-----	1,910	1,500	7,740	2,620	3,100	21,900	7,650	9,750	201,000
10-----	1,850	--	1/9,200	2,470	3,200	21,400	8,320	8,200	184,000
11-----	1,740	1,650	7,750	2,670	3,430	24,700	9,920	6,850	183,000
12-----	1,700	1,310	6,010	3,030	3,820	31,200	10,500	7,200	204,000
13-----	1,720	1,510	7,010	3,530	5,080	48,400	12,200	8,800	290,000
14-----	1,820	2,050	10,100	3,960	6,140	65,700	12,300	6,410	213,000
15-----	1,860	--	1/12,000	4,740	7,700	98,500	12,000	5,040	183,000
16-----	2,060	3,080	17,100	5,150	8,000	111,000	10,800	5,670	165,000
17-----	2,010	2,720	14,800	6,010	6,580	107,000	9,190	4,670	116,000
18-----	1,840	2,500	12,400	6,530	6,680	118,000	8,480	3,850	88,200
19-----	1,730	1,890	8,830	6,940	7,400	139,000	7,970	4,200	90,400
20-----	1,840	2,050	10,200	6,940	6,380	120,000	8,350	3,680	83,000
21-----	1,780	--	1/10,000	6,680	6,550	118,000	9,530	4,110	108,000
22-----	1,950	--	1/14,000	6,550	7,920	140,000	10,300	4,050	113,000
23-----	1,860	2,190	11,000	5,740	8,500	132,000	8,560	3,710	85,800
24-----	1,700	920	4,220	5,080	4,720	64,800	6,970	3,830	72,000
25-----	1,650	920	4,100	4,580	4,200	52,000	6,190	3,140	52,500
26-----	1,880	1,820	9,240	4,360	2,360	27,800	5,370	3,290	47,700
27-----	2,100	2,680	15,200	4,360	3,190	37,600	5,030	3,000	40,700
28-----	2,500	3,980	26,800	4,990	4,250	57,300	4,990	2,460	33,100
29-----	2,500	4,300	29,000	6,110	5,490	90,600	4,920	2,620	34,800
30-----	2,670	4,700	33,900	7,390	5,180	103,000	4,330	2,110	24,600
31-----	--	--	--	7,730	6,180	129,000	--	--	--
Total--	57,220	--	374,300	138,970	--	2,068,000	239,140	--	3,782,000
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	3,920	1,890	20,000	582	583	885	708	470	698
2-----	3,470	1,970	18,500	542	321	469	694	435	815
3-----	3,020	1,940	15,800	538	260	378	758	652	1,340
4-----	2,830	2,040	15,600	518	390	545	1,510	8,190	2/45,800
5-----	3,140	2,280	19,300	518	423	592	1,330	18,300	65,700
6-----	3,750	2,850	28,800	600	460	745	1,200	8,750	28,400
7-----	3,920	3,730	39,500	638	492	848	1,600	3,940	17,000
8-----	3,790	2,310	23,600	638	482	831	1,630	3,230	14,200
9-----	3,630	2,160	21,200	638	558	962	1,700	2,870	13,200
10-----	3,430	1,490	13,800	632	566	966	1,700	2,850	13,100
11-----	3,260	1,450	12,800	610	389	641	1,780	2,820	13,500
12-----	3,690	9,750	97,200	570	--	1/550	1,850	3,800	19,000
13-----	3,430	4,840	43,000	568	--	1/550	1,850	3,810	19,000
14-----	3,920	7,740	2/89,600	568	387	591	1,880	1,610	8,170
15-----	3,530	13,200	126,000	570	430	662	1,970	2,480	13,200
16-----	3,510	11,900	113,000	546	326	480	1,800	2,090	10,200
17-----	3,000	7,450	60,300	502	--	1/360	1,730	2,300	10,700
18-----	2,810	3,500	26,800	490	261	345	1,580	1,720	7,340
19-----	2,430	2,670	17,500	474	--	1/360	1,560	870	3,660
20-----	2,230	2,210	13,300	458	--	1/420	1,560	1,450	6,190
21-----	2,120	2,030	11,600	458	348	431	1,540	1,530	6,360
22-----	1,890	1,780	9,080	466	--	1/380	1,590	1,450	6,220
23-----	1,760	1,720	8,170	474	--	1/300	1,570	698	2,960
24-----	1,540	1,730	7,190	458	152	188	1,510	1,430	5,830
25-----	1,370	1,690	6,250	518	237	332	1,520	1,420	5,830
26-----	1,240	1,520	5,090	510	126	173	1,460	1,270	5,000
27-----	974	1,150	3,020	494	--	1/140	1,470	1,150	4,560
28-----	782	1,000	2,110	498	--	1/180	1,390	968	3,630
29-----	694	965	1,810	550	287	426	1,370	734	2,710
30-----	638	779	1,340	620	451	755	1,310	970	3,430
31-----	610	732	1,210	668	452	815	--	--	--
Total--	80,328	--	872,300	16,890	--	16,280	45,140	--	357,900

Total discharge for year (second-foot-days) ----- 822,498
 Total load for year (tons) ----- 8,623,000

1/Estimated.

2/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued
BIGHORN RIVER AT KANE, WYO.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949
(Methods of analysis: B, bottom without sand; sub., D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500		1.000
Oct. 6, 1948	12:10 p. m.	1,440	1,480	2,190	--	10	31	46	55	62	72	94	98		BN
Oct. 6	12:10 p. m.	1,450	1,480	2,270	--	20	38	44	53	62	73	100	--		BN
Oct. 22	11:56 a. m.	1,550	1,400	2,340	--	7	23	50	54	62	78	98	100		BN
Oct. 22	11:56 a. m.	1,550	1,400	2,270	--	33	42	42	51	60	72	93	99		BN
Dec. 3	1:45 p. m.	1,380	1,240	1,330	--	7	13	23	34	44	63	93	99		BN
Dec. 3	1:45 p. m.	1,380	1,240	1,100	--	1	6	12	20	32	45	64	80		BW
Mar. 18, 1949	12:01 p. m.	1,500	1,450	1,260	--	16	21	28	33	50	78	98	99		BW
Mar. 23	12:07 p. m.	3,090	5,980	580	--	28	42	56	64	72	81	100	--		BN
Mar. 23	12:07 p. m.	3,090	5,980	540	15	25	40	51	58	68	80	95	100		BW
May 6	1:00 p. m.	2,620	2,810	1,020	--	16	23	30	44	62	79	92	100		BW
May 13	11:07 a. m.	3,670	5,380	1,190	--	24	26	37	56	75	91	97	100		BW
June 6	12:25 p. m.	5,490	9,150	750	26	40	51	62	71	81	91	99	100		BW
June 13	11:58 a. m.	12,000	8,520	1,580	27	37	46	56	68	81	96	100	--		BW
July 1	11:35 a. m.	3,710	1,860	2,300	28	39	54	69	80	86	91	96	98		BW
July 10	7:23 a. m.	3,510	1,550	610	27	35	42	45	51	62	78	93	96		BW
July 15	1:35 p. m.	3,220	14,500	3,110	29	51	68	83	90	92	95	98	100		BW
July 27	11:42 a. m.	956	1,030	26	39	56	59	62	71	78	90	98	99		BW
Aug. 4	11:32 a. m.	316	386	1,080	22	40	53	57	62	67	83	97	99		BW
Aug. 18	11:30 a. m.	490	381	381	29	41	55	58	65	72	81	94	97		BW
Aug. 18	11:30 a. m.	490	245	426	21	33	55	65	69	73	76	88	95		BN
Aug. 24	4:27 p. m.	444	158	414	20	30	37	42	47	57	68	90	99		BW
Sept. 1	12:49 p. m.	694	472	757	15	18	42	48	55	66	76	94	98		BN
Sept. 1	12:49 p. m.	694	472	808	14	22	33	36	42	51	62	85	97		BW
Sept. 7	10:49 a. m.	1,640	3,900	1,400	44	52	68	70	76	82	88	97	100		BW
Sept. 13	6:25 p. m.	1,850	3,600	1,400	24	31	43	50	54	61	74	94	100		BW
Sept. 16	11:05 a. m.	1,780	1,760	1,410	14	25	35	43	53	61	76	96	100		BW
Sept. 22	8:59	1,859	1,120	859	2	12	28	34	38	46	64	85	100		BN
Sept. 22	12:21 p. m.	1,650	1,220	808	13	20	28	36	42	50	65	97	100		BN
Sept. 28	10:51 a. m.	1,380	1,893	594	--	16	28	35	40	48	56	81	96		BN
Sept. 28	10:51 a. m.	1,380	893	687	--	27	36	41	47	52	64	95	100		BW

1/ Mean daily discharge.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT BIGHORN, MONT.

LOCATION --At bridge on U. S. Highways 10 and 12, three-quarters of a mile upstream from mouth, 1 mile southwest of Bighorn, Treasure County, and 3 1/2 miles downstream from gaging station near Custer.

RECORDS AVAILABLE --Water temperatures: April to September 1949.

Sediment records: July 1947 to September 1949.

EXTREMES 1948-49 --Water temperatures (April to September 1949): Maximum, 77°F Aug. 21.

Sediment concentrations: Maximum daily, 9,750 ppm June 10; minimum daily, 127 ppm Aug. 24.

Sediment loads: Maximum daily, 353,000 tons June 14; minimum daily, 357 tons Aug. 24.

EXTREMES 1947-49 --Sediment concentrations: Maximum daily, 20,000 ppm Sept. 23, 1948; minimum daily, 69 ppm Mar. 11, 1948.

Sediment loads: Maximum daily, 539,000 tons June 4, 1948; minimum daily, 323 tons Sept. 4, 1948.

REMARKS --Chemical analyses and sediment records previously published under Bighorn River near Custer, Mont. Discharge records for gaging station near Custer for water year October 1948 to September 1949 given in Water-Supply Paper 1146. No appreciable inflow between gaging station and sampling point except small amounts of irrigation waste water.

Chemical analyses, in parts per million, March to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- di- um
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
Mar. 1, 1949 -----	3,200	7.6	985	16	0.02	81	29	86	206	306	13	0.4	0.4	2.7	0.24	674	0.92		321	152	37
May 3 -----	3,450	7.6	807	19	.05	67	24	69	188	232	11	.4	.4	3.3		571	.78		266	112	36
June 21 -----	12,000	7.6	476	15	.02	44	10	44	131	124	5.5	2	2	2.6		317	.43		151	44	39
July 6 -----	6,020	7.9	668	16	.02	59	16	59	142	202	8.3	4	4	2.1		465	.63		213	97	38
Sept. 14 -----	2,760	8.2	1,160	17	.02	95	26	140	217	424	17		.5	4.5		872	1.19		344	166	47

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT BIGHORN, MONT.--Continued

Temperature (°F) of water, April to September 1949
 /Once-daily temperature measurement between 6 a. m. and 9 a. m. 7

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							--	54	64	65	70	65
2							--	56	62	70	71	65
3							--	59	60	69	71	64
4							--	56	59	70	73	61
5							--	54	61	69	73	61
6							--	52	64	70	75	59
7							54	55	65	71	76	59
8							54	56	69	70	73	60
9							50	57	69	70	70	61
10							48	62	70	71	73	63
11							50	64	71	72	73	59
12							54	65	69	71	73	52
13							50	66	68	--	71	53
14							47	64	65	--	69	55
15							49	66	65	70	71	55
16							50	65	65	73	70	59
17							55	64	63	69	70	53
18							53	57	60	67	69	54
19							55	54	60	69	69	56
20							57	58	64	67	70	--
21							53	60	64	67	77	--
22							52	60	67	67	71	55
23							54	53	67	69	72	57
24							60	53	67	72	69	57
25							54	59	67	71	70	60
26							54	61	68	70	67	60
27							58	65	63	71	66	56
28							60	66	64	66	67	55
29							61	69	65	67	68	55
30							58	68	65	71	65	60
31							--	68	--	71	65	--
Average							54	60	65	69	71	58

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT BIGHORN, MONT.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2,700	992	7,240	2,480	384	2,570	2,480	572	3,830
2-----	2,560	828	5,720	2,480	404	2,700	2,560	408	2,820
3-----	2,480	763	5,110	2,480	386	2,580	2,610	593	4,180
4-----	2,410	705	4,590	2,510	405	2,740	2,580		
5-----	2,390	656	4,240	2,490	322	2,160	2,510		
6-----	2,370	611	3,910	2,510	415	2,810	2,200		
7-----	2,390	582	3,760	2,560	--	1/2,400	2,000		
8-----	2,410	639	4,150	2,510	299	2,020	1,800		
9-----	2,390	632	4,080	2,560	607	4,200	1,650		
10-----	2,370	626	4,010	2,560	517	3,580	1,650		
11-----	2,390	569	3,670	2,530	377	2,580	1,650	291	
12-----	2,440	629	4,140	2,630	390	2,770	1,650	--	
13-----	2,420	612	4,000	2,610	308	2,170	1,700	--	
14-----	2,420	546	3,560	2,580	373	2,600	1,700	--	
15-----	2,390	542	3,500	2,580	352	2,450	1,700	--	
16-----	2,330	540	3,400	2,600	292	2,050	1,700	--	
17-----	2,310	496	3,090	2,690	353	2,560	1,750	--	
18-----	2,560	634	4,380	2,780	385	2,890	1,800	--	
19-----	2,560	756	5,230	2,600	468	3,280	1,900	--	
20-----	2,670	1,390	10,000	2,460	526	3,500	1,950	--	
21-----	2,630	1,440	10,200	2,390	508	3,270	2,000	--	
22-----	2,540	1,290	8,850	2,410	492	3,200	1,900	--	
23-----	2,780	1,100	8,260	2,460	420	2,790	1,850	--	
24-----	2,690	907	6,590	2,420	370	2,420	1,850	--	
25-----	2,610	689	4,850	2,530	368	2,510	1,850	--	
26-----	2,600	590	4,140	2,530	386	2,640	1,800	--	
27-----	2,560	500	3,460	2,390	492	3,180	1,800	--	
28-----	2,580	473	3,290	2,390	416	2,680	1,800	--	
29-----	2,560	494	3,420	2,280	368	2,270	1,800	--	
30-----	2,560	514	3,560	2,460	--	1/3,600	1,800	--	
31-----	2,480	408	2,730	--	--	--	1,800	--	
Total-	77,550	--	151,200	75,460	--	83,170	59,790	--	55,000
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,800	--		1,800			3,200	1,160	10,000
2-----	1,800	--		1,800			3,400	1,320	12,100
3-----	1,800	--		1,850			3,600	--	1/16,000
4-----	1,800	--		1,850			4,500	--	1/11,000
5-----	1,800	--		1,900	--	1/4,000	5,500	720	10,700
6-----	1,700	--		1,900			7,000	--	1/62,000
7-----	1,700	--		1,900			8,000	3,350	72,400
8-----	1,700	--		1,900			8,500	1,420	32,600
9-----	1,700	--		1,900	770	3,950	8,000	1,280	27,600
10-----	1,700	--		1,900	850	4,360	7,000	1,050	19,800
11-----	1,700	--		1,900	1,900	9,750	6,000	730	11,800
12-----	1,700	--		1,900	560	2,870	5,000	680	9,190
13-----	1,700	--		1,900	630	3,230	4,500	620	7,540
14-----	1,700	--		1,900	420	2,180	4,000	445	4,810
15-----	1,700	--		1,950	700	3,690	3,500	285	2,690
16-----	1,600	--		2,000	380	2,050	3,300	330	2,940
17-----	1,800	--		2,000	500	2,700	3,200	251	2,170
18-----	1,800	250		2,000	514	2,780	3,400	320	2,940
19-----	1,800	--		2,000	516	2,780	4,000	420	4,540
20-----	1,800	--		2,000	507	2,740	4,500	580	7,050
21-----	1,700	--		2,100	1,370	7,760	5,000	780	10,500
22-----	1,700	--		2,200	2,040	12,100	5,500	1,630	24,200
23-----	1,700	--		2,300	540	3,360	6,000	2,820	45,700
24-----	1,700	--		2,400	800	5,190	6,100	3,040	50,100
25-----	1,700	--		2,500	755	5,100	6,150	3,740	62,100
26-----	1,750			2,650	555	3,970	6,200	3,320	55,600
27-----	1,750			2,800	503	3,800	6,100	4,280	70,400
28-----	1,750			3,000	625	5,060	6,000	4,370	70,900
29-----	1,750	--	1/2,500	--	--	--	5,500	3,380	50,200
30-----	1,750			--	--	--	5,000	3,040	41,000
31-----	1,750			--	--	--	4,600	4,800	59,800
Total-	53,000	--	50,000	58,200	--	121,000	162,250	--	872,200

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT BIGHORN, MONT.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	4,200	4,300	48,800	2,840	1,770	13,600	8,880	3,990	95,500
2-----	3,360	2,080	18,900	3,010	2,200	17,900	9,240	3,790	94,500
3-----	3,240	1,730	15,100	3,360	2,450	22,200	8,710	3,480	81,800
4-----	3,260	1,440	12,700	3,410	2,160	19,900	9,510	5,330	137,000
5-----	3,320	1,310	11,700	3,270	1,920	17,000	8,860	8,230	197,000
6-----	3,220	1,330	11,600	3,360	1,690	15,300	8,880	7,280	135,000
7-----	3,260	1,390	12,200	3,500	1,670	15,800	6,740	4,680	85,000
8-----	3,440	1,330	12,400	3,680	1,720	17,000	9,240	9,630	240,000
9-----	3,380	1,350	12,300	3,660	1,740	17,200	10,200	8,380	230,000
10-----	3,340	1,250	11,300	3,520	1,820	17,300	9,860	9,750	260,000
11-----	3,300	1,180	10,500	3,320	1,720	15,400	9,700	7,780	204,000
12-----	3,160	1,200	10,200	3,250	1,620	14,200	11,200	6,840	207,000
13-----	3,160	1,110	9,460	3,590	1,980	19,200	12,300	6,900	229,000
14-----	3,360	1,260	11,400	3,880	2,600	27,200	13,900	9,400	353,000
15-----	3,450	1,660	15,500	4,130	3,270	36,400	14,400	8,210	319,000
16-----	3,570	1,500	14,500	5,470	4,450	65,800	15,400	7,120	296,000
17-----	3,640	1,490	14,600	6,660	6,030	108,000	14,300	5,940	229,000
18-----	3,540	1,420	13,600	7,560	6,650	136,000	12,500	4,900	165,000
19-----	3,320	1,410	12,600	7,740	6,030	126,000	11,700	3,940	125,000
20-----	3,140	1,230	10,400	8,080	5,420	118,000	11,500	3,260	101,000
21-----	2,970	1,200	9,820	8,120	4,620	101,000	12,000	3,260	106,000
22-----	2,930	1,210	9,560	7,890	4,110	87,500	13,100	4,210	149,000
23-----	2,870	1,090	8,550	7,490	4,670	94,500	13,900	4,270	160,000
24-----	2,870	939	7,280	7,240	5,540	108,000	12,300	3,460	115,000
25-----	2,800	1,000	7,560	6,290	6,400	109,000	11,100	2,890	88,600
26-----	2,630	1,120	7,950	5,440	4,440	65,100	9,670	2,610	68,100
27-----	2,580	1,140	7,940	5,010	2,970	40,200	8,630	2,170	50,500
28-----	2,600	1,030	7,230	4,860	2,460	32,300	8,370	1,940	43,900
29-----	2,760	1,480	11,000	5,660	2,700	41,300	8,230	1,710	38,000
30-----	2,820	1,480	11,300	6,880	3,380	62,800	7,930	1,550	33,200
31-----	--	--	--	8,260	4,130	92,100	--	--	--
Total-	95,490	--	377,600	160,410	--	1,673,000	320,230	--	4,634,000
	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	7,240	1,510	29,500	1,950	423	2,220	1,200	178	576
2-----	6,490	1,440	25,200	1,860	374	1,880	1,180	173	551
3-----	5,530	1,500	22,400	1,740	320	1,500	1,280	175	605
4-----	4,670	1,520	19,200	1,550	328	1,370	1,500	397	1,610
5-----	4,750	1,360	17,400	1,400	280	1,060	1,650	574	2,860
6-----	6,050	2,870	43,600	1,370	269	995	2,650	1,380	9,870
7-----	6,350	3,840	65,800	1,340	322	1,170	2,550	1,670	11,500
8-----	6,420	2,740	47,500	1,340	310	1,120	2,650	5,900	42,200
9-----	5,890	2,490	39,600	1,330	266	955	2,800	3,730	28,200
10-----	5,660	1,490	22,800	1,320	243	866	2,600	1,850	13,000
11-----	5,380	1,490	21,600	1,330	345	1,240	2,360	1,640	10,500
12-----	5,220	1,320	18,600	1,330	292	1,050	2,630	1,550	11,000
13-----	5,310	1,390	19,900	1,310	220	778	2,780	1,670	12,500
14-----	4,670	2,410	30,400	1,270	210	720	2,800	1,460	11,000
15-----	5,280	3,750	53,400	1,230	201	668	2,840	1,590	12,200
16-----	5,190	3,810	53,400	1,200	188	610	2,990	1,650	13,300
17-----	4,950	5,860	78,500	1,210	380	1,240	3,060	1,370	11,300
18-----	4,370	5,850	69,000	1,100	618	1,830	2,930	1,240	9,800
19-----	4,260	4,890	56,200	1,120	230	695	2,850	975	7,500
20-----	3,780	2,730	27,900	1,080	198	578	2,720	823	6,040
21-----	3,340	1,700	15,300	1,060	167	478	2,690	785	5,700
22-----	3,040	1,450	11,900	1,060	165	472	2,610	834	5,880
23-----	2,800	1,160	8,760	1,010	133	362	2,560	781	5,400
24-----	2,560	1,120	7,740	1,040	127	357	2,540	818	5,600
25-----	2,580	1,200	8,360	1,060	138	395	2,490	727	4,890
26-----	2,480	929	6,210	1,060	138	395	2,480	678	4,500
27-----	2,440	966	6,500	1,110	171	513	2,480	753	5,000
28-----	2,390	827	5,340	1,130	179	546	2,440	729	4,800
29-----	2,330	761	4,790	1,140	172	529	2,420	680	4,440
30-----	2,070	583	3,310	1,150	146	460	2,420	745	4,860
31-----	2,010	487	2,640	1,200	215	696	--	--	--
Total-	135,500	--	842,800	39,400	--	27,750	73,310	--	267,200

Total discharge for year (second-foot-days)-----1,310,590

Total load for year (tons)-----9,155,000

YELLOWSTONE RIVER BASIN--Continued

BIGHORN RIVER AT BIGHORN, MONT.--Continued

Particle-size analyses suspended sediment, November 1948 to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Nov. 16, 1948	1:19 p. m.	2,560	245	1,010	--	11	17	30	34	37	46	78		94	BN
May 3, 1949	1:10 p. m.	3,210	2,400	515	--	36	45	58	67	78	86	94		97	BW
May 19	3:24 p. m.	7,780	6,000	1,210	--	31	42	52	66	78	86	94		98	BW
June 22	9:54 a. m.	13,000	4,340	1,140	--	16	20	27	45	70	88	96		99	BW
July 7	8:00 a. m.	6,400	6,380	2,610	38	51	65	76	82	86	88	93		96	BW
July 15	7:30 a. m.	4,640	4,360	1,830	34	48	66	70	75	78	82	92		99	BW
July 20	11:27 a. m.	3,900	2,620	1,960	34	50	63	71	73	77	82	90		96	BW
Aug. 3	1:48 p. m.	1,770	283	973	28	38	50	59	67	76	81	82		84	BW
Sept. 1	2:28 p. m.	1,150	141	340	--	35	54	60	60	77	84	95		100	BW
Sept. 7	6:30 p. m.	2,200	1,940	1,400	30	47	62	68	72	76	82	94		97	BW
Sept. 14	6:02 p. m.	2,760	1,330	1,628	0	12	42	--	68	72	76	94		98	BN
Sept. 14	6:02 p. m.	2,760	1,330	900	--	38	52	61	66	74	80	98		100	BW
Sept. 24	9:00 a. m.	2,540	906	616	--	20	24	32	33	36	42	74		96	BW
														99	

YELLOWSTONE RIVER BASIN--Continued

POPO AGIE RIVER NEAR RIVERTON, WYO.

LOCATION.--At downstream side of bridge on Sand Draw Road, a quarter of a mile upstream from gaging station, which is 1½ miles upstream from mouth and 2 miles southeast of Riverton, Fremont County.

DRAINAGE AREA.--2,010 square miles.

RECORDS AVAILABLE.--Water temperatures: March to September 1949.

Sediment records: March to September 1949.

EXTREMES, March to September 1949.--Sediment concentrations: Maximum daily, 2,000 ppm May 8; minimum daily, not determined.

Sediment loads: Maximum daily, 17,000 tons June 14; minimum daily, 1 ton Sept. 25-30.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, March to September 1949

[Once-daily temperature measurement between 3 p. m. and 6 p. m.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						--	45	56	54	86	78	74
2						--	46	50	53	83	--	--
3						--	45	53	54	86	--	58
4						--	51	55	54	--	71	60
5						--	53	45	53	87	--	--
6						--	53	44	56	87	80	67
7						--	56	49	59	88	82	--
8						32	--	--	58	63	72	73
9						--	58	60	59	--	72	--
10						32	51	60	62	--	--	67
11						32	58	56	61	70	75	--
12						32	52	62	56	--	72	63
13						33	50	60	54	69	73	--
14						--	48	55	58	66	--	63
15						--	58	57	--	72	75	--
16						32	56	53	59	74	--	--
17						--	48	51	58	89	75	--
18						33	59	49	55	88	77	--
19						32	65	53	58	64	73	--
20						32	55	57	58	87	--	63
21						32	56	51	59	71	74	--
22						--	--	55	59	61	73	64
23						40	--	43	59	75	75	--
24						39	64	59	64	76	72	--
25						42	60	64	63	74	72	--
26						42	58	63	60	75	73	64
27						41	59	63	54	84	--	62
28						41	--	59	58	71	--	61
29						39	58	56	62	--	--	60
30						43	55	58	57	75	--	--
31						--	--	55	--	--	69	--
Average						--	54	55	58	69	--	--

YELLOWSTONE RIVER BASIN--Continued

POPO AGIE RIVER NEAR RIVERTON, WYO.--Continued

Suspended sediment, March to September 1949

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----							--	--	--
2-----							--	--	--
3-----							--	--	--
4-----							--	--	--
5-----							--	--	--
6-----							--	--	--
7-----							--	--	--
8-----							--	--	--
9-----							--	--	--
10-----							285	143	110
11-----							280	139	105
12-----							275	140	104
13-----							270	205	149
14-----							270	--	1/120
15-----							265	--	1/120
16-----							270	191	139
17-----							280	--	1/170
18-----							289	321	250
19-----							300	480	389
20-----							322	641	557
21-----							338	713	651
22-----							314	--	1/550
23-----							300	432	350
24-----							314	145	123
25-----							289	180	140
26-----							300	269	218
27-----							268	310	224
28-----							272	240	176
29-----							265	140	100
30-----							261	135	95
31-----							261	248	175
Total-							6,288	--	5,020
Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	268	208	151	860	1,030	2,390	2,070	574	3,210
2-----	272	235	173	760	890	1,830	1,740	382	1,790
3-----	278	246	185	752	970	1,970	1,500	290	1,170
4-----	303	245	200	878	940	2,220	1,340	239	865
5-----	300	323	262	1,020	1,130	3,110	1,500	316	1,280
6-----	292	345	272	1,090	1,270	3,740	1,610	729	3,170
7-----	289	352	275	950	1,520	4,920	1,660	1,310	5,870
8-----	289	384	300	880	2,000	4,750	1,950	958	5,040
9-----	318	440	378	920	1,220	3,030	2,650	958	6,850
10-----	342	395	365	1,020	882	2,430	2,780	844	6,340
11-----	292	442	348	1,150	868	2,700	2,970	656	5,260
12-----	289	475	371	1,200	950	3,080	3,410	770	7,090
13-----	306	473	391	1,280	1,190	4,110	3,800	932	9,560
14-----	334	630	568	1,350	1,370	4,990	4,110	1,530	17,000
15-----	350	680	643	1,600	1,630	7,040	3,410	706	6,500
16-----	322	582	506	1,790	1,670	8,070	2,970	526	4,220
17-----	303	470	385	2,190	1,880	11,000	2,710	435	3,180
18-----	318	441	379	2,260	1,680	10,100	2,590	429	3,000
19-----	342	535	494	2,160	1,910	11,100	3,490	595	5,610
20-----	359	610	591	1,840	1,230	6,110	5,080	557	7,640
21-----	372	740	743	1,730	1,020	4,760	4,050	363	3,970
22-----	386	663	699	1,620	632	3,640	3,000	359	2,910
23-----	422	974	1,110	1,470	698	2,530	2,590	330	2,310
24-----	474	970	1,240	1,410	571	2,170	2,280	263	1,740
25-----	610	1,200	1,980	1,440	560	2,180	1,930	221	1,150
26-----	705	1,310	2,490	1,580	810	2,600	1,810	198	968
27-----	736	1,330	2,640	1,860	809	4,060	2,050	206	1,140
28-----	752	1,290	2,620	2,100	782	4,430	1,960	177	937
29-----	800	1,350	2,920	2,220	719	4,310	1,660	134	601
30-----	930	1,400	3,520	2,420	766	5,010	1,500	128	518
31-----	--	--	--	2,420	708	4,630	--	--	--
Total-	12,353	--	27,400	46,218	--	139,000	76,170	--	120,900

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

POPO AGIE RIVER NEAR RIVERTON, WYO.--Continued

Suspended sediment, March to September 1949--Continued

Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,270	96	329	183	12	6	160	11	5
2-----	1,130	90	275	177	12	6	160	10	4
3-----	1,130	87	265	177	17	8	163	10	4
4-----	1,350	115	419	180	13	6	204	15	8
5-----	1,810	395	1,930	189	12	6	231	14	9
6-----	1,640	132	584	186	15	8	234	16	10
7-----	1,420	95	364	183	15	7	225	--	1/9
8-----	1,220	118	389	172	12	6	210	10	6
9-----	1,130	274	836	163	20	9	192	--	1/3
10-----	1,000	85	230	192	26	13	183	5	2
11-----	939	100	254	189	23	12	180	--	1/2
12-----	912	61	150	169	16	7	195	6	3
13-----	968	50	117	158	21	9	195	--	1/3
14-----	842	115	261	158	23	10	201	6	3
15-----	776	135	283	172	24	11	198	5	3
16-----	698	37	70	172	26	12	180	--	1/2
17-----	624	38	64	158	20	9	160	6	3
18-----	582	27	42	150	20	8	150	--	1/2
19-----	486	24	31	142	16	6	144	--	1/2
20-----	422	22	25	120	--	1/3	132	6	2
21-----	382	20	21	103	8	2	120	7	2
22-----	354	17	16	97	8	2	116	10	3
23-----	322	15	13	93	8	2	116	--	1/3
24-----	272	15	11	87	29	7	114	5	2
25-----	247	13	9	93	28	7	114	--	1/1
26-----	222	7	4	93	23	6	116	3	1
27-----	198	8	4	114	--	1/6	116	3	1
28-----	183	12	6	134	--	1/5	123	3	1
29-----	186	15	8	147	--	1/5	125	3	1
30-----	201	13	7	155	12	5	130	--	1/1
31-----	192	14	7	160	12	5	--	--	--
Total-	23,008	--	7,020	4,666	--	214	4,887	--	101
Total discharge for period Mar. 10 to Sept. 30 (second-foot-days)----- 173,590									
Total load for period Mar. 10 to Sept. 30 (tons)----- 299,700									

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

POPO AGIE RIVER NEAR RIVERTON, WYO.--Continued

Particle-size analyses of suspended sediment, April to June 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	
Apr. 6, 1949	3:15 p. m.	292	338	332	--	52	80	96	--	100	--	--	--	--	BW
May 7	4:45 p. m.	857	1,880	629	32	47	62	75	86	91	95	97	98	98	BW
June 1	12:05 p. m.	2,060	559	721	12	18	24	32	40	50	60	78	96	96	BW

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK NEAR PAVILLION, WYO.

LOCATION.--At gaging station one hundred feet downstream from Wyoming Canal siphon and 4 miles north of Pavillion, Fremont County.

RECORDS AVAILABLE.--Sediment records: October 1948 to September 1949.

EXTREMES, 1948-49.--Sediment loads: Maximum daily, 64,000 tons June 11; minimum daily, 0 tons on many days.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146. Includes waste flows from Wyoming Canal. No flow October to January.

Suspended sediment, water year October 1948 to September 1949

Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----				0	--	0	10	12,000	324
2-----				0	--	0	14	11,400	431
3-----				0	--	0	10	12,200	329
4-----				0	--	0	9.0	14,000	340
5-----				0	--	0	8.0	--	1/320
6-----				0	--	0	7.0	17,300	327
7-----				0	--	0	3.0	9,820	80
8-----				0	--	0	5.0	10,800	146
9-----				0	--	0	4.0	10,500	113
10-----				0	--	0	3.0	14,700	119
11-----				0	--	0	3.8	9,580	2/101
12-----				0	--	0	3.5	9,160	2/109
13-----				0	--	0	3.2	--	1/95
14-----				0	--	0	.5	3,680	5
15-----				0	--	0	3.2	5,850	2/93
16-----				0	--	0	8.0	9,410	203
17-----				0	--	0	5.6	9,820	2/159
18-----				0	--	0	3.8	10,400	2/134
19-----				0	--	0	8.0	10,900	2/252
20-----				0	--	0	6.2	11,700	196
21-----				1.0	2,200	6	4.5	13,000	2/153
22-----				5.0	8,600	116	2.1	7,490	2/69
23-----				8.0	11,400	246	3.5	10,600	2/111
24-----				5.0	8,700	117	5.0	11,400	2/180
25-----				5.0	--	1/120	3.5	7,670	2/78
26-----				8.0	--	1/180	1.3	6,450	2/28
27-----				8.0	--	1/220	1.3	7,520	2/32
28-----				10	13,200	356	.9	7,850	2/22
29-----				--	--	--	.3	6,120	2/10
30-----				--	--	--	.7	7,850	15
31-----				--	--	--	1.5	4,250	17
Total-	0	--	0	50.0	--	1,400	143.4	--	4,590

1/Estimated.

2/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK NEAR PAVILLION, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1.1	5,500	16	0.4	10,600	11	0.4	5,300	8
2-----	1.1	6,280	19	.3	6,750	5	3.2	17,900	155
3-----	1.5	2,020	8	.4	8,500	9	2.8	13,200	2/125
4-----	1.3	4,290	15	2.8	13,700	104	3.2	3,100	27
5-----	.5	6,160	8	1.7	9,450	43	3.2	950	8
6-----	.4	7,400	8	1.7	7,950	36	8.5	--	1/260
7-----	1.3	8,100	28	1.9	8,650	44	2.3	3,450	21
8-----	1.7	9,680	44	1.3	3,800	13	4.2	--	1/140
9-----	1.9	9,380	48	.7	3,350	6	3.2	8,000	69
10-----	.7	--	17	.5	2,750	4	1.5	1,750	7
11-----	.9	7,900	19	.4	3,200	3	100	--	1/64,000
12-----	1.3	7,200	25	12	1,630	53	28	--	1/5,100
13-----	1.7	8,630	40	11	410	12	3.2	4,490	39
14-----	2.8	12,900	98	.4	2,680	3	3.2	4,500	39
15-----	1.3	10,900	38	.2	4,620	2	1.3	6,440	23
16-----	.7	6,510	12	3.8	10,000	103	.4	1,320	1
17-----	.5	7,530	10	5.9	12,400	198	.4	450	(s)
18-----	.7	8,650	16	7.1	11,100	213	3.0	3,210	2/43
19-----	.7	9,960	19	7.4	17,100	2/263	4.0	7,030	2/84
20-----	1.1	8,790	26	5.9	12,200	194	.7	2,320	4
21-----	.5	8,120	11	6.2	13,100	2/229	.2	480	(s)
22-----	.5	4,810	6	3.5	3,600	34	0	--	0
23-----	.5	5,890	8	.7	650	1	0	--	0
24-----	.5	5,910	8	.1	1,710	(s)	0	--	0
25-----	.4	4,490	5	.4	192	(s)	0	--	0
26-----	.3	4,120	3	0	--	0	0	--	0
27-----	.3	3,960	3	.2	35	(s)	0	--	0
28-----	.2	4,630	3	.3	2,120	2	.1	--	(s)
29-----	.3	7,490	6	.2	1,200	(s)	.1	135	(s)
30-----	.7	9,160	17	0	--	0	.2	105	(s)
31-----	--	--	--	0	--	0	--	--	--
Total--	27.4	--	584	77.4	--	1,680	177.3	--	70,150
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.3	--	(s)	18	1,230	2/97	0	--	0
2-----	.1	36	(s)	19	1,300	2/71	.1	--	(s)
3-----	.1	60	(s)	2.5	439	2/14	1.9	6,600	34
4-----	5.6	11,600	2/241	0	--	0	2.5	8,560	58
5-----	.4	800	(s)	15	531	2/30	1.5	3,110	13
6-----	.1	100	(s)	11	170	5	.7	2,910	6
7-----	0	--	0	.7	30	(s)	.5	1,860	3
8-----	0	--	0	0	--	0	.4	790	(s)
9-----	2.5	14,600	2/217	0	--	0	.2	100	(s)
10-----	.5	195	(s)	0	--	0	.2	36	(s)
11-----	.5	--	(s)	0	--	0	.1	--	--
12-----	63	43,000	2/30,000	0	--	0	.2	16	--
13-----	26	44,900	2/4,550	0	--	0	.4	20	--
14-----	22	4,620	275	0	--	0	.4	--	--
15-----	15	11,600	2/524	0	--	0	.4	--	--
16-----	6.2	2,750	46	0	--	0	.4	--	--
17-----	2.8	360	3	0	--	0	.2	--	--
18-----	1.5	135	(s)	0	--	0	.1	--	--
19-----	4.5	12,200	2/164	0	--	0	.2	--	--
20-----	3.2	838	7	0	--	0	.1	36	--
21-----	4.2	240	3	0	--	0	.1	--	--
22-----	5.0	210	3	0	--	0	.1	--	--
23-----	6.8	--	5	0	--	0	.1	13	--
24-----	10	332	9	0	--	0	.1	39	--
25-----	6.8	--	3	0	--	0	.2	--	--
26-----	7.4	152	3	0	--	0	.2	--	--
27-----	0	--	0	0	--	0	.2	--	--
28-----	0	--	0	0	--	0	.1	--	--
29-----	0	--	0	0	--	0	0	--	0
30-----	.1	25	(s)	0	--	0	0	--	0
31-----	.1	18	(s)	0	--	0	--	--	--
Total--	194.7	--	36,060	73.2	--	217	11.6	--	115

Total discharge for year (second-foot-days) ----- 755.0
 Total load for year (tons) ----- 114,800

1/Estimated.

2/Sediment discharge computed by subdividing day.

(s)Sediment discharge less than 1 ton.

YELLOWSTONE RIVER BASIN--Continued
FIVEMILE CREEK NEAR SHOSHONI, WYO.

LOCATION.--At gaging station 2½ miles upstream from mouth and 5 miles west of Shoshoni, Fremont County.
RECORDS AVAILABLE.--Water temperatures: December 1948 to September 1949.

EXTREMES, 1948-49.--Water temperatures: Maximum, 84°F June 10; minimum, freezing point on many days.
Sediment concentrations: Maximum daily, 136,000 ppm June 12; minimum daily, 140 ppm Dec. 27.

Sediment loads: Maximum daily, 150,000 tons June 12; minimum daily, 8 tons Dec. 27.
EXTREMES, August 1948 to September 1949.--Sediment concentrations: Maximum daily, 136,000 ppm June 12, 1949; minimum, 140 ppm Dec. 27, 1949.

Sediment loads: Maximum daily, 350,000 tons (estimated) Sept. 19, 1948; minimum daily, not determined.
REMARKS.--Records of discharge for water year August 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Oct. 19, 1948-----	45	7.7	3,450	10	0.01	222	53	592	7.2	0	237	1,640	78	0.7	13	0.28	2,730	3.71		772	578	62
Sept. 1, 1949-----	1/195	7.4	1,950	10	.04	131	53	256	4.4	0	168	885	39	.5	2	.30	1,450	1.97		545	407	51
Sept. 13-30-----	146	7.8	2,270	21	.04	136	35	315		0	186	950	44	.8	9.3		1,610	2.19		484	331	58

1/Discharge at time of sampling.

YELLOWSTONE RIVER BASIN--Continued
 FIVEMILE CREEK NEAR SHOSHONI, WYO.--Continued
 Temperature (°F) of water, December 1948 to September 1949
 Once-daily temperature measurement between 10 a. m. and 3 p. m. ⁷

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			--	--	32	38	36	62	60	77	76	66
2			--	--	32	40	38	68	50	68	68	59
3			--	32	--	33	55	58	63	--	70	58
4			--	32	--	40	54	55	61	78	74	66
5			--	--	--	36	44	41	62	82	--	72
6			--	32	--	33	38	44	68	77	67	66
7			--	--	32	40	44	59	69	83	64	63
8			--	--	33	32	52	72	73	83	70	61
9			--	--	34	33	43	70	76	--	71	66
10			--	--	34	32	52	75	84	78	79	71
11			--	32	32	36	60	60	75	70	78	60
12			--	32	32	38	51	67	67	58	72	66
13			--	32	--	34	47	65	61	87	62	58
14			--	32	32	32	50	70	--	74	65	68
15			32	--	32	32	60	69	65	69	73	65
16			32	--	--	33	67	63	65	77	73	67
17			32	--	35	35	71	68	68	68	67	49
18			--	32	33	33	69	49	80	61	76	63
19			--	32	36	37	76	76	71	61	--	53
20			32	32	--	34	60	71	71	70	62	66
21			32	--	36	34	49	52	78	73	--	69
22			32	--	34	38	49	65	72	71	62	63
23			32	--	32	34	69	--	65	61	64	76
24			32	--	36	37	68	72	70	70	63	--
25			--	32	32	37	63	77	63	77	75	50
26			--	--	36	46	70	76	63	78	65	62
27			32	--	33	43	73	79	60	68	65	60
28			32	32	--	37	64	63	--	76	73	63
29			32	--	--	36	64	--	68	81	71	63
30			32	--	--	39	64	73	76	71	62	63
31			32	32	--	44	--	66	--	66	60	--
Average			--	--	--	36	57	65	67	72	69	63

Suspended sediment, August to September 1948

Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----				--	--	--	212	12,500	7,160
2-----				--	--	--	188	--	1/5,900
3-----				--	--	--	185	--	1/5,100
4-----				--	--	--	178	--	1/4,300
5-----				--	--	--	185	--	1/4,000
6-----				--	--	--	188	7,700	3,910
7-----				--	--	--	220	12,600	7,480
8-----				--	--	--	195	--	1/5,800
9-----				--	--	--	195	10,600	5,580
10-----				--	--	--	192	9,400	4,870
11-----				--	--	--	199	--	1/4,800
12-----				--	--	--	206	--	1/5,500
13-----				--	--	--	213	--	1/7,000
14-----				--	--	--	220	12,200	7,250
15-----				--	--	--	222	--	1/6,400
16-----				--	--	--	224	--	1/5,600
17-----				--	--	--	226	--	4,800
18-----				--	--	--	289	7,150	5,580
19-----				--	--	--	915	--	1/350,000
20-----				--	--	--	960	75,000	2/140,000
21-----				--	--	--	165	--	1/13,000
22-----				--	--	--	155	--	1/5,700
23-----				--	--	--	146	--	1/5,200
24-----				--	--	--	140	--	1/4,900
25-----				--	--	--	130	--	1/4,400
26-----				--	--	--	120	--	1/4,000
27-----				--	--	--	115	--	1/3,900
28-----				258	15,100	10,500	105	12,900	3,660
29-----				253	--	1/9,300	105	18,000	5,100
30-----				234	12,900	8,150	108	--	1/4,500
31-----				216	--	1/7,300	--	--	--
Total--				961	--	35,200	6,501	--	645,000

Total discharge for period Aug. 28 to Sept. 30 (second-foot-days) ----- 7,462

Total load for period Aug. 28 to Sept. 30 (tons) ----- 680,000

1/Estimated.

2/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK NEAR SHOSHONI, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	102	--	1/3,900	37	--	1/950	45	--	1/500
2-----	122	14,700	4,840	38	--	1/950	57	4,080	628
3-----	125			38			60		
4-----	139			38			46		
5-----	146			35			34		
6-----	150	--	1/4,100	38	10,100	2/986	38	--	1/220
7-----	150			39			37		
8-----	146			33			40		
9-----	132			47			38		
10-----	125	9,760	1,840	40	12,000	1,080	37	--	1/220
11-----	102			38			34		
12-----	70			40			43		
13-----	57			39			33		
14-----	55	--	1/1,200	39	9,730	1,020	28	910	59
15-----	70			39			24		
16-----	49			41			20		
17-----	45			45	7,080	860	21	620	35
18-----	44	8,150	946	34			26		
19-----	45			33			27		
20-----	43			47			30		
21-----	41	--	1/900	47	--	1/600	30	600	49
22-----	39			40			23		
23-----	39			39			24		
24-----	38			48			25	460	31
25-----	37	10,200	991	43			28		
26-----	38			40			24		
27-----	36			36			21	140	8
28-----	38			33	8,600	882	28		
29-----	38	--	1/950	38			29		
30-----	37			36			28	780	59
31-----	37			--			29		
Total--	2,335	--	66,800	1,178	--	25,900	1,005	--	4,400
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	31	--	1/44	30	1,150	93	43	6,020	747
2-----	30	--	1/42	31	1,290	108	51	6,150	847
3-----	28	550	42	31	--	1/110	61	5,850	963
4-----	28	540	41	31	--	1/100	77	5,340	1,110
5-----	30	--	1/55	30	--	1/95	74	--	1/1,200
6-----	31	810	68	30	--	1/95	72	8,520	2/1,830
7-----	30	--	1/75	28	1,300	98	66	14,300	2/2,820
8-----	31	--	1/75	28	1,130	85	52	15,000	2,110
9-----	27	--	1/60	28	1,240	94	53	15,400	2,200
10-----	27	--	1/60	28	1,400	106	42	12,700	2/1,550
11-----	30	780	62	29	1,720	135	45	13,200	2/1,700
12-----	31	670	56	28	1,580	119	46	17,200	2/2,320
13-----	31	680	57	25	--	1/100	50	18,100	2/2,560
14-----	34	830	76	26	1,980	139	32	8,100	700
15-----	34	--	1/85	28	2,150	163	42	15,700	1,780
16-----	31	--	1/80	28	--	1/140	40	15,500	1,670
17-----	30	--	1/75	29	2,650	207	53	21,200	3,030
18-----	31	980	82	30	2,540	206	65	25,600	4,490
19-----	30	930	75	31	3,620	303	63	24,000	4,080
20-----	27	1,470	107	31	--	1/340	84	23,600	5,350
21-----	26	--	1/70	30	3,680	298	65	25,600	4,490
22-----	27	--	1/60	31	3,200	268	59	24,200	3,860
23-----	28	--	1/65	50	4,720	2/713	51	23,300	3,210
24-----	28	--	1/65	50	4,220	570	52	25,500	3,580
25-----	29	850	67	42	3,770	428	52	22,600	3,170
26-----	30	--	1/70	40	4,680	2/531	52	22,800	3,200
27-----	30	--	1/70	40	5,120	2/584	42	26,200	2,970
28-----	30	1,000	81	39	4,490	2/488	41	17,800	1,970
29-----	30	--	1/75	--	--	--	45	17,200	2,080
30-----	30	--	1/75	--	--	--	54	17,600	2,570
31-----	30	900	73	--	--	--	52	17,500	2,460
Total--	920	--	2,100	902	--	6,720	1,678	--	76,630

1/Estimated.

2/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK NEAR SHOSHONI, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Suspended sediment, water, year October 1946 to September, 1947—Continued									
Day	Mean discharge (second-foot)	April		Mean discharge (second-foot)	May		Mean discharge (second-foot)	June	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	43	13,600	1,580	18	6,200	301	70	11,600	2,190
2-----	40	15,600	1,680	16	5,740	248	118	13,000	4,140
3-----	40	16,000	1,730	17	4,280	196	128	13,300	4,600
4-----	41	16,000	1,770	54	12,800	2/2,020	40	12,300	1,330
5-----	41	18,000	1,770	60	14,200	2,300	73	16,500	3,250
6-----	40	16,000	1,730	63	13,500	2,300	68	17,200	3,160
7-----	40	14,200	1,530	59	10,400	1,660	57	18,000	2,770
8-----	40	12,000	1,300	73	11,000	2,170	73	15,800	3,110
9-----	38	12,600	1,290	60	8,620	1,400	102	18,600	5,120
10-----	36	13,400	1,300	54	7,450	1,090	87	15,100	3,550
11-----	36	12,400	1,210	67	9,750	1,760	104	41,000	2/24,500
12-----	33	13,700	1,220	68	12,000	2,200	265	136,000	2/150,000
13-----	36	13,800	1,340	122	18,500	6,090	112	29,100	8,800
14-----	33	12,400	1,100	99	17,400	4,650	125	23,200	7,830
15-----	31	14,900	1,250	89	12,700	3,050	178	22,100	10,600
16-----	30	11,500	932	108	13,600	3,970	184	21,400	10,600
17-----	30	10,200	826	139	15,600	5,850	198	16,800	8,980
18-----	28	9,300	703	125	20,900	7,050	237	20,000	12,800
19-----	28	8,820	667	105	20,000	5,670	265	21,100	15,100
20-----	26	8,930	627	125	20,800	7,020	254	19,300	13,200
21-----	25	8,600	580	170	20,800	9,550	254	16,400	11,200
22-----	22	8,050	478	136	17,600	6,460	234	16,900	10,700
23-----	19	8,120	417	125	15,300	5,160	223	16,100	9,690
24-----	20	6,900	373	125	12,300	4,150	230	17,600	10,900
25-----	21	8,350	473	95	10,200	2,620	230	22,400	13,900
26-----	21	7,780	441	108	11,600	3,380	226	21,700	13,200
27-----	22	7,250	431	108	10,300	3,000	223	20,300	12,200
28-----	24	6,480	420	87	8,380	1,970	212	17,800	10,200
29-----	26	6,320	444	89	9,050	2,170	226	20,600	12,600
30-----	29	9,150	716	92	9,500	2,360	226	21,900	13,400
31-----	--	--	--	65	11,800	2,070	--	--	--
Total--	939	--	30,330	2,721	--	103,900	5,022	--	413,600
Day	Mean discharge (second-foot)	July		Mean discharge (second-foot)	August		Mean discharge (second-foot)	September	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	216	18,600	10,800	216	17,700	10,300	206	15,100	8,400
2-----	188	17,900	9,090	230	27,800	17,300	195	13,800	7,270
3-----	118	15,300	4,870	209	22,500	12,700	198	18,600	8,870
4-----	95	12,500	3,210	206	20,000	11,100	195	16,400	8,630
5-----	99	13,600	3,640	226	18,400	11,200	192	16,700	8,660
6-----	112	13,600	4,110	237	19,800	12,700	206	16,100	8,950
7-----	178	19,500	9,370	216	20,000	11,700	198	17,700	9,460
8-----	150	16,000	6,480	202	20,300	11,100	198	15,600	8,340
9-----	146	13,300	5,240	206	19,300	10,700	188	14,800	7,510
10-----	164	10,900	4,830	212	16,600	9,500	164	12,200	5,400
11-----	174	14,900	7,000	223	17,000	10,200	156	16,500	6,950
12-----	198	19,100	10,200	234	21,900	13,800	174	18,700	8,790
13-----	328	65,300	2/101,000	234	20,800	13,100	160	16,900	7,300
14-----	195	35,600	19,400	231	18,000	11,200	146	16,500	6,500
15-----	206	38,000	21,900	227	18,400	11,300	150	15,400	6,240
16-----	212	31,800	18,200	223	19,200	11,600	156	15,500	6,530
17-----	188	31,100	15,800	216	18,200	10,600	184	14,600	6,460
18-----	206	27,500	15,300	198	16,600	8,870	180	12,600	5,440
19-----	230	28,200	17,500	198	15,900	8,500	150	14,100	5,710
20-----	209	26,800	15,100	216	16,600	9,680	132	10,800	3,850
21-----	202	23,700	12,900	212	14,800	8,470	89	10,800	2,600
22-----	195	23,200	12,200	181	14,500	7,090	115	10,600	3,280
23-----	198	20,500	11,000	209	15,000	8,460	128	10,200	3,530
24-----	182	23,100	12,000	223	16,200	9,750	146	--	1/3,800
25-----	206	23,800	13,200	209	17,200	9,710	139	12,200	4,580
26-----	192	21,400	11,100	202	14,200	7,740	125	11,400	3,850
27-----	192	19,900	10,300	206	13,500	7,510	139	9,300	3,490
28-----	195	18,200	9,580	202	16,000	8,730	164	10,000	4,430
29-----	220	17,200	10,200	206	17,700	9,840	178	10,200	4,900
30-----	244	17,600	11,600	216	18,000	10,500	195	10,600	5,580
31-----	220	18,500	11,000	212	17,800	10,200	--	--	--
Total--	5,868	--	428,100	6,638	--	325,200	4,906	--	185,300

Total discharge for year (second-foot-days) ----- 34,110

Total load for year (tons) ----- 1,669,000

1/Estimated.

2/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE CREEK NEAR SHOSHONI, WYO. --Continued

Particle-size analyses of suspended sediment, November 1948 to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500		1.000
Nov. 17, 1948	12:32 p. m.	45.0	10,400	--	9	12	18	23	30	44	64	88	96		BW
Jan. 6, 1949	2:40 p. m.	31.4	889	307	8	17	30	30	30	31	34	40	75	100	BN
Feb. 1	2:45 p. m.	30.8	1,270	432	--	24	40	60	68	76	82	95	100		BN
Feb. 1	2:45 p. m.	30.8	1,270	365	16	28	41	55	66	72	76	84	100		BW
Feb. 10	2:02 p. m.	29.0	1,800	2,080	--	8	28	44	50	60	67	90	98		BN
Feb. 10	2:02 p. m.	29.0	1,800	1,740	10	21	30	42	50	58	72	88	98		BN
Feb. 17	3:45 p. m.	29.0	3,320	1,690	.2	5	12	19	26	34	44	74	100		BW
Apr. 21	9:52 a. m.	25.0	10,700	1,510	15	22	29	36	44	56	78	92	98		BW
May 2	11:45 a. m.	16.7	6,940	1,750	--	18	26	38	48	68	86	89	100		BW
May 9	11:10 a. m.	78.5	8,030	2,410	--	12	16	22	30	45	74	91	100		BW
May 12	10:22 a. m.	81.2	13,600	2,040	--	34	44	54	62	72	88	98	100		BW
May 19	10:45 a. m.	122	20,100	1,520	16	25	34	44	58	67	82	95	100		BW
Sept. 2	4:30 p. m.	188	12,400	1,140	--	28	37	45	54	66	82	100	--		BW
Sept. 27	11:26 a. m.	132	9,660	1,890	--	16	24	29	37	52	71	90	99		BW

YELLOWSTONE RIVER BASIN--Continued
POWER LINE WASTEWAY NEAR PAVILLION, WYO.

LOCATION.--At gaging station 300 feet upstream from mouth and 4 miles northeast of Pavillion, Fremont County.

RECORDS AVAILABLE.--Sediment records: May to September 1949.

EXTREMES, May to September 1949.--Sediment concentrations: Maximum daily, 250 ppm May 19; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 2.0 tons May 11; minimum daily, 0 tons on many days.

REMARKS.--Records of discharge for period May to September 1949 given in Water-Supply Paper 1146.

Table 14.0.

Suspended sediment, May to September 1949

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----				0	--	0	1.8	85	0.4
2-----				0	--	0	1.7	69	.3
3-----				0	--	0	1.3	47	.2
4-----				0	--	0	1.0	45	.1
5-----				0	--	0	1.0	43	.1
6-----				0	--	0	1.2	82	.3
7-----				0	--	0	1.1	125	.4
8-----				0	--	0	.8	73	.2
9-----				0	--	0	.5	111	.1
10-----				4.6	86	1.1	.2		
11-----				8.8	84	2.0	.2		
12-----				4.9	54	.7	.1	148	(1)
13-----				2.1	88	.5	.1		
14-----				1.4	107	.4	.1		
15-----				.5	75	.1	.2		
16-----				.8	52	.1	.5	108	.1
17-----				1.2	117	.4	.8	103	.2
18-----				2.1	232	1.3	1.2	85	.3
19-----				2.4	250	1.6	1.0	66	.2
20-----				1.4	172	.6	1.8	100	.5
21-----				.6	93	.2	2.7	88	.6
22-----				.7	68	.1	2.5	55	.4
23-----				.7	55	.1	3.9	52	.5
24-----				.7			4.5	58	.7
25-----				.6			4.6	38	.5
26-----				.5			5.9	42	.7
27-----				.9	30	(1)	5.4	71	1.0
28-----				.8			2.4	53	.3
29-----				.6			2.3	34	.2
30-----				.4			.7	39	
31-----				.9			--	--	--
Total--				37.6	--	9.7	51.5	--	8.9
Suspended sediment, May to September 1949									
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.2			2.6	38	0.3	2.5	9	(1)
2-----	.2			4.9	43	.6	1.2	12	(1)
3-----	.4			4.1	37	.4	1.6	--	(1)
4-----	.4			4.5	33	.4	2.6	7	(1)
5-----	.4			4.4	29	.3	2.6	28	0.2
6-----	.5			6.5	38	.7	2.8	33	.2
7-----	.5			8.5	33	.8	2.7	23	.2
8-----	.2			9.0	30	.7	2.6	16	.1
9-----	.2			8.6	27	.6	2.4	12	(1)
10-----	.2	42	(1)	11	30	.9	2.3	7	(1)
11-----	.4			10	22	.6	2.2	--	(1)
12-----	.4			4.1	35	.4	4.6	52	.6
13-----	.3			2.4	18	.1	8.6	65	1.5
14-----	.1			2.4			5.0	20	.3
15-----	.7			1.3			3.9	8	(1)
16-----	.5			.4			4.5	15	.2
17-----	.2			.1			5.5	28	.4
18-----	.1			.1	8	(1)	5.5	--	2/.3
19-----	.5			.2			5.4	14	.2
20-----	2.4	45	0.3	.7			5.2	14	.2
21-----	2.3	30	.2	1.2			5.1	16	.2
22-----	1.8	26	.1	1.5	28	.1	4.5	--	2/.2
23-----	2.7	38	.3	3.2	24	.2	3.2	10	(1)
24-----	3.1	33	.3	6.2	19	.3	2.9	13	.1
25-----	1.7	26	.1	6.7	11	.2	2.7	--	2/.1
26-----	.2			4.7	--	2/.1	2.4		
27-----	.1			5.2	12	.2	1.2		
28-----	.3			6.4	16	.3	1.0	18	(1)
29-----	.7	30	(1)	5.5	23	.3	1.4		
30-----	.9			4.5	19	.2	.6		
31-----	.9			3.7	14	.1	--	--	--
Total--	23.5	--	2.0	134.6	--	9.0	98.7	--	5.7

Total discharge for period May 1 to Sept. 30 (second-foot-days) ----- 345.9

Total load for period May 1 to Sept. 30 (tons) ----- 35.3

(1) Sediment discharge less than 0.1 ton.

2/Estimated.

YELLOWSTONE RIVER BASIN--Continued

PAVILLION DRAIN NEAR PAVILLION, WYO.

LOCATION.--At gaging station half a mile upstream from mouth and 8 miles east of Pavillion, Fremont County.

RECORDS AVAILABLE.--Water temperatures: February to June 1949.

Sediment records: September 1948 to September 1949.

EXTREMES, 1948-49.--Water temperatures (February to June 1949): Minimum, freezing point on several days in February, March, and April.

Sediment concentrations: Maximum daily, 21,300 ppm May 21; minimum daily, not determined.

Sediment loads: Maximum daily, 1,360 tons July 14; minimum daily, less than 1 ton on many days.

REMARKS.--Records of discharge for September 1948 to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, water year October 1948 to September 1949
/Once-daily temperature measurement between 10 a. m. and 2 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						--	33	62	52			
2						36	32	67	53			
3						33	--	65	56			
4						33	37	59	50			
5						32	32	45	70			
6						33	33	51	60			
7						33	33	--	68			
8						33	33	--	66			
9						33	34	60	71			
10						33	41	79	72			
11						34	37	67	69			
12						34	42	70	70		63	
13						33	36	--	60			
14			32			32	39	71	74			
15						33	33	64	63			
16						33	44	62	65			
17						34	48	55	63			
18					32	33	44	45	53			
19					--	33	58	50	73			
20					--	32	57	65	64			
21					32	35	42	55	76			
22					35	33	--	67	66			
23					32	33	63	59	67			
24					36	33	64	58	72			
25					32	34	59	62	77			
26					--	34	57	--	62			
27					33	32	--	73	--			
28					34	32	64	68	--			
29					--	32	57	75	--			
30					--	32	61	62	--			
31					--	34	--	56	--			
Average					--	33	45	62	65			

YELLOWSTONE RIVER BASIN--Continued

PAVILLION DRAIN NEAR PAVILLION, Wyo.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	10	--	--	0.6	--	--	0.6	--	--
2-----	11	--	--	.6	--	--	.5	--	--
3-----	10	--	--	.6	--	--	.5	--	--
4-----	12	--	--	.6	--	--	.5	--	--
5-----	15	--	--	.6	--	--	.5	--	--
6-----	15	--	--	.6	455	1	.5	--	--
7-----	15	--	--	.6	(1)	--	.5	--	--
8-----	13	--	--	.5	215	(1)	.5	--	--
9-----	11	--	--	.5	160	(1)	.5	--	--
10-----	11	--	--	.5	215	(1)	.5	--	--
11-----	8.0	--	--	.5	258	(1)	.5	--	--
12-----	1.4	180	(1)	.5	305	(1)	.4	--	--
13-----	1.2	--	--	.9	--	(1)	.4	--	--
14-----	1.5	--	--	1.0	--	2/1	.4	84	(1)
15-----	1.8	--	--	1.5	380	2	.4	--	--
16-----	1.4	--	--	1.4	340	1	.4	--	--
17-----	1.1	--	--	1.7	--	--	.4	--	--
18-----	1.0	--	--	1.5	--	--	.4	--	--
19-----	.9	--	--	1.0	--	--	.4	--	--
20-----	.8	134	(1)	.9	--	--	.4	--	--
21-----	.8	--	--	.8	--	--	.4	--	--
22-----	.8	--	--	.7	--	--	.4	--	--
23-----	.7	--	--	.6	--	--	.4	--	--
24-----	.7	--	--	.5	--	--	.4	--	--
25-----	.7	--	--	.5	--	--	.4	--	--
26-----	.7	--	--	2.3	--	--	.4	--	--
27-----	.6	--	--	1.5	--	--	.4	--	--
28-----	.6	181	(1)	1.2	--	--	.3	--	--
29-----	.6	220	(1)	.9	--	--	.3	--	--
30-----	.6	--	--	.7	--	--	.3	--	--
31-----	.6	--	--	--	--	--	.3	--	--
Total--	149.5	--	3/500	26.3	--	3/50	13.2	--	2/7
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0 0.3	--	--	0.2	--	--	1.0	--	2/1
2-----	.3	--	--	.2	--	--	1.1	690	2
3-----	.3	--	--	.2	--	--	1.3	1,120	4
4-----	.3	--	--	.2	--	--	1.5	1,050	4
5-----	.3	--	--	.2	--	--	1.7	1,310	6
6-----	.3	--	--	.2	--	--	2.0	1,400	8
7-----	.3	--	--	.2	--	--	1.7	910	4
8-----	.3	--	--	.2	--	--	1.3	1,190	4
9-----	.3	--	--	.2	--	--	.9	1,930	5
10-----	.3	--	--	.2	--	--	.7	910	2
11-----	.3	--	--	.2	--	--	1.0	1,040	3
12-----	.3	--	--	.2	--	--	2.0	910	5
13-----	.3	--	--	.2	--	--	1.5	1,700	7
14-----	.3	--	--	.2	--	--	1.2	760	2
15-----	.3	--	--	.2	--	--	1.0	700	2
16-----	.3	--	--	.3	--	--	.9	1,280	3
17-----	.3	--	--	.4	--	--	.8	2,610	6
18-----	.3	--	--	.5	280	(1)	.7	2,980	6
19-----	.3	--	--	.4	--	(1)	.6	2,350	4
20-----	.3	--	--	.3	--	(1)	.6	2,690	4
21-----	.3	--	--	.3	255	(1)	.5	2,490	3
22-----	.3	--	--	.3	380	(1)	.5	1,980	3
23-----	.3	--	--	.4	430	(1)	.6	1,330	2
24-----	.3	--	--	.5	305	(1)	.8	2,290	5
25-----	.3	--	--	.6	200	(1)	1.5	2,510	10
26-----	.3	--	--	.7	--	(1)	1.2	3,180	10
27-----	.3	--	--	.8	523	1	1.0	2,570	7
28-----	.3	--	--	.9	398	1	.9	1,090	3
29-----	.2	--	--	--	--	--	.9	1,220	3
30-----	.2	--	--	--	--	--	.8	2,250	5
31-----	.2	--	--	--	--	--	.8	1,860	4
Total--	9.0	--	2/1	9.4	--	3/6	33.0	--	137

(1) Sediment discharge less than 1 ton.

2/Estimated.

3/Includes estimated load for missing days.

YELLOWSTONE RIVER BASIN--Continued

PAVILLION DRAIN NEAR PAVILLION, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.8	2,200	5	0.4	1,540	2	9.6	10,700	277
2-----	.8	1,150	2	.4	1,200	1	14	11,400	431
3-----	.8	--	2/2	.4	1,090	1	13	10,200	358
4-----	.9	690	2	.4	1,090	1	13	9,590	337
5-----	.9	2,090	5	.4	730	(i)	14	7,750	293
6-----	.9	1,980	5	.5	780	1	13	9,250	325
7-----	.9	1,260	3	.5	--	2/2	13	7,600	267
8-----	.9	710	2	.5	1,170	2	12	7,660	248
9-----	1.6	680	3	.4	770	(i)	12	8,410	272
10-----	1.8	1,620	8	3.5	4,100	39	11	8,430	250
11-----	1.0	950	3	7.6	6,100	125	12	9,600	311
12-----	.9	1,120	3	1.8	8,500	41	14	11,100	420
13-----	.8	1,050	2	3.1	14,000	117	15	10,600	429
14-----	.8	950	2	8.4	11,000	249	16	12,200	527
15-----	.8	1,410	3	7.5	10,700	217	17	15,400	708
16-----	.8	1,240	3	10	13,300	359	19	11,900	610
17-----	.6	1,830	3	14	18,400	696	17	9,800	449
18-----	.7	1,510	3	16	16,500	713	22	9,900	588
19-----	.8	1,800	4	13	13,900	488	25	9,100	613
20-----	.7	1,590	3	10	10,400	281	23	7,020	436
21-----	.6	1,280	2	17	21,300	978	24	5,600	363
22-----	.6	--	2/3	16	17,400	752	19	5,500	282
23-----	.6	1,800	3	14	14,700	556	15	3,970	161
24-----	.6	1,810	3	14	7,750	293	15	6,300	255
25-----	.6	1,570	3	13	6,400	225	12	4,300	140
26-----	.5	--	2/2	12	7,700	249	14	4,480	169
27-----	.5	1,570	2	12	9,070	294	12	5,400	175
28-----	.5	1,280	2	14	9,000	340	15	5,360	218
29-----	.5	1,250	2	15	9,950	403	17	6,650	305
30-----	.6	1,420	2	11	9,020	268	16	7,800	336
31-----	--	--	--	10	9,500	256	--	--	--
Total--	23.8	--	90	246.8	--	7,950	463.6	--	10,550
July									
1-----	16	8,500	367	20	9,020	487	13	1,510	53
2-----	15	9,900	401	24	8,450	548	11	1,400	42
3-----	13	8,300	291	21	6,630	376	12	2,070	67
4-----	16	8,100	350	21	5,720	324	12	1,930	63
5-----	17	9,500	436	18	6,400	311	11	2,480	74
6-----	17	8,700	399	18	5,610	273	11	2,290	68
7-----	16	8,000	346	20	4,200	227	8.4	2,020	46
8-----	16	8,700	376	21	3,610	205	8.4	1,450	33
9-----	19	10,800	554	21	5,380	305	9.6	1,700	44
10-----	17	7,900	363	20	6,080	328	13	1,870	66
11-----	20	10,900	589	15	6,510	264	15	1,410	57
12-----	26	9,900	695	14	5,410	204	15	1,200	49
13-----	29	12,100	947	15	5,220	211	11	875	26
14-----	31	16,200	1,360	14	4,800	181	11	825	25
15-----	24	11,900	771	14	5,400	204	10	790	21
16-----	19	10,000	513	12	4,750	154	9.5	743	19
17-----	20	14,100	761	11	6,100	181	7.2	772	15
18-----	21	21,000	1,190	10	6,580	178	7.5	603	12
19-----	24	19,200	1,240	8.7	6,100	143	8.0	430	9
20-----	26	16,800	1,180	12	5,230	169	8.2	378	8
21-----	33	12,300	1,100	14	5,150	195	7.5	365	7
22-----	27	11,400	831	16	3,550	153	8.0	418	9
23-----	20	10,300	556	18	3,610	175	6.8	408	7
24-----	17	9,200	422	17	4,550	209	5.0	443	6
25-----	15	8,900	360	15	3,410	138	4.4	302	4
26-----	13	8,900	312	11	--	2/65	6.7	425	8
27-----	12	8,600	279	12	--	2/60	6.0	465	8
28-----	17	10,400	477	13	1,800	63	8.5	700	16
29-----	21	12,200	692	12	1,700	55	6.8	605	11
30-----	21	10,300	584	12	1,370	44	8.9	700	17
31-----	18	9,300	452	14	2,010	76	--	--	--
Total--	616	--	19,190	483.7	--	6,510	280.4	--	890

Total discharge for year (second-foot-days) ----- 2,354.7
 Total load for year (tons) ----- 3/45,880

(i) Sediment discharge less than 1 ton.

2/ Estimated.

3/ Includes estimated load for missing days.

YELLOWSTONE RIVER BASIN--Continued

PAVILLION DRAIN NEAR PAVILLION, WYO.--Continued

Periodic determinations of suspended-sediment discharge, September 1948

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)
Sept. 1, 1948-----	16	4,640	200
Sept. 6-----	12	3,380	110
Sept. 9-----	16	2,660	115
Sept. 14-----	12	2,190	71
Sept. 15-----	8.4	1,760	40
Sept. 18-----	11	3,880	115
Sept. 21-----	16	7,100	307
Sept. 23-----	9.8	2,900	77
Sept. 25-----	11	2,790	83
Sept. 29-----	6.2	2,290	38

YELLOWSTONE RIVER BASIN--Continued

OCEAN DRAIN AT OCEAN LAKE OUTLET NEAR PAVILLION, WYO.

LOCATION --At gaging station, 150 feet downstream from lake outlet and 6½ miles southeast of Pavillion, Fremont County.

RECORDS AVAILABLE --Sediment records: October 1948 to September 1949.

EXTREMES 1948-49 --Sediment concentrations: Maximum daily, 165 ppm July 20; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 14 tons July 20, Sept. 17; minimum daily, 0 tons May 13-June 11.

REMARKS --Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, September 1947 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Sept. 23, 1947	--	8.2	3,080	0.0	--	140	48	521	0	148	1,360	100	0.7	0.3	--	--	2,240	3.05		547	426	67
Sept. 3, 1948	27	8.5	2,920	7.2	0.02	102	46	507	4	60	1,300	96	.7	.0	0.10	0.10	2,090	2.84		444	388	71
Oct. 14	22	7.4	2,910	11	.08	101	45	519	3.2	0	67	1,310	93	.7	1.2	.15	2,120	2.88		437	382	72
Sept. 16, 1949	33	7.1	2,910	4.2	.01	109	41	518	4.8	0	88	1,350	83	.7	1.6	.23	2,160	2.94		441	369	72

YELLOWSTONE RIVER BASIN--Continued

OCEAN DRAIN AT OCEAN LAKE OUTLET NEAR PAVILLION, WYO.

Suspended sediment, water year October 1948 to September 1949									
Day	Mean discharge (second-foot)	October		Mean discharge (second-foot)	November		Mean discharge (second-foot)	December	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	25	--		20	--	1/0.2	18	--	1/0.2
2-----	25	--		20			18	--	
3-----	26	--		20			19	--	
4-----	26	--		19			19	--	
5-----	26	--		19			19	--	
6-----	24	--		18	6	.3	19	--	
7-----	23	--		19	--	1/.2	20	--	
8-----	23	--		19	4	.2	20	--	
9-----	23	--		19	16	.8	20	--	
10-----	23	--		18	10	.5	20	--	
11-----	22	--	1/0.1	18	8	.4	20	--	
12-----	22	--		18	7	.3	21	--	
13-----	22	--		18	--	1/.3	21	--	
14-----	22	--		17	--	1/.3	21	4	
15-----	22	--		17	15	.7	21	--	
16-----	22	--		17	4	.2	21	7	
17-----	22	--		17	--	--	21	6	
18-----	22	--		17	--	--	21	--	
19-----	22	2		17	--	--	22	--	
20-----	22	--		17	--	--	22	5	
21-----	22	--		18	--	22	4		
22-----	22	--		18	--	21	3		
23-----	22	--		18	--	21	4		
24-----	21	--		18	--	22	5		
25-----	21	--		18	--	22	--		
26-----	21	1		18	--	21	--		
27-----	20	--		18	--	21	7		
28-----	20	--		19	--	21	6		
29-----	20	--		18	--	20	5		
30-----	20	--		20	--	20	5		
31-----	20	--	--	--	20	4			
Total-	619	--	3	547	--	8	634	--	8
January				February			March		
1-----	20	--	1/0.2	19	--	1/0.2	16	6	1/0.3
2-----	20	--		19			16	--	
3-----	21	4		19			17	--	
4-----	20	4		19			17	9	
5-----	20	--		19			17	--	
6-----	20	4		19	--	17	--		
7-----	20	--		19	--	17	--		
8-----	20	--		19	8	17	6		
9-----	21	--		19	--	17	--		
10-----	21	--		18	--	17	--		
11-----	21	5	1/.2	18	--	17	4	1/.4	
12-----	21	6		18	--	17	5		
13-----	21	6		17	--	17	--		
14-----	21	5		17	21	17	--		
15-----	20	4		17	--	17	16		
16-----	20	--		17	--	17	--		
17-----	20	--		17	--	17	--		
18-----	20	4		16	--	17	16		
19-----	20	4		16	--	17	--		
20-----	20	10		16	--	17	--		
21-----	20	--	1/.2	16	8	.4	18	--	
22-----	20	--		16	--	1/.4	18	7	
23-----	20	--		15	11	.4	19	--	
24-----	19	--		16	10	.4	19	--	
25-----	19	--		16	6	.3	19	4	
26-----	19	4		16	--	1/.3	20	--	
27-----	19	4		15	6	.2	19	3	
28-----	19	--		16	6	.3	19	3	
29-----	19	--		--	--	--	19	--	
30-----	19	--		--	--	--	20	--	
31-----	19	--	--	--	--	20	--		
Total-	619	--	7	484	--	12	548	--	11

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

OCEAN DRAIN AT OCEAN LAKE OUTLET NEAR PAVILLION, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	20	3		4.5	105	1.3	0	--	0
2-----	20	--		4.5	110	1.3	0	--	0
3-----	20	--		2.0	22	.1	0	--	0
4-----	20	--		.4	9		0	--	0
5-----	19	2		.4	--		0	--	0
6-----	19	--		.2	--		0	--	0
7-----	19	--		.1	--		0	--	0
8-----	19	11	1/0.3	.1	--	(s)	0	--	0
9-----	18	--		.1	--		0	--	0
10-----	18	--		.1	--		0	--	0
11-----	18	4		.1	--		0	--	0
12-----	17	--		.1	--		.1	--	(s)
13-----	16	--		0	--	0	.1	--	(s)
14-----	17	--		0	--	0	11	--	1/4.0
15-----	17	2		0	--	0	32	--	1/4.3
16-----	16	--	(s)	0	--	0	33	--	1/6.5
17-----	15	--	(s)	0	--	0	31	--	1/1.3
18-----	15	--	(s)	0	--	0	32	--	1/1.9
19-----	14	16	.6	0	--	0	35	--	1/4.7
20-----	12	--	1/1.9	0	--	0	34	--	1/1.5
21-----	11	--	1/6	0	--	0	35	25	2.4
22-----	8.8	19	.4	0	--	0	35	50	4.7
23-----	7.9	90	1.9	0	--	0	33	25	2.2
24-----	7.4	80	1.6	0	--	0	33	20	1.8
25-----	7.4	10	.2	0	--	0	34	20	1.8
26-----	7.7	5	.1	0	--	0	35	--	1/5.2
27-----	7.4	--	(s)	0	--	0	34	15	1.4
28-----	7.0	--	(s)	0	--	0	34	--	1/1.8
29-----	7.2	80	1.6	0	--	0	34	18	1.6
30-----	6.3	--	1/1.7	0	--	0	33	--	1/1.0
31-----	--	--	--	0	--	0	--	--	--
Total--	427.1	--	15	12.6	--	3.0	548.2	--	47
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	33	8	0.7	32	1	(s)	31	3	
2-----	34	40	3.7	32	--	1/0.2	31	--	
3-----	33	--	1/1.8	32	4	.4	32	--	
4-----	32	7	.6	33	--	1/2	32	--	
5-----	32	35	3.0	32	--	1/1	33	4	1/0.4
6-----	31	--	1/1.3	33	3	.3	33	--	
7-----	30	--	1/1.2	33	1	(s)	34	2	
8-----	29	8	.6	33	--	1/2	34	--	
9-----	31	--	1/6	32	1	(s)	34	4	
10-----	31	--	1/5	32	2	.2	34	--	
11-----	32	--	1/8	32	3	.3	34	4	.4
12-----	33	6	.5	33	10	.9	33	3	.3
13-----	34	7	.6	33	6	.5	33	--	1/2
14-----	35	6	.6	33	8	.7	33	2	.2
15-----	35	7	.7	33	--	1/1.0	33	--	1/2
16-----	36	45	4.4	33	14	1.2	33	30	2.7
17-----	34	35	3.2	34	8	.7	32	160	14
18-----	32	--	1/4	33	--	1/5	31	--	1/4.2
19-----	32	20	1.7	34	6	.6	30	14	1.1
20-----	32	165	14	34	--	1/5	30	--	.6
21-----	31	15	1.3	33	6	.5	30	3	
22-----	31	--	1/1.3	34	7	.6	30	--	
23-----	30	21	1.7	34	--	1/9	29	--	
24-----	29	--	1/1.6	33	12	1.1	29	2	
25-----	30	20	1.6	32	12	1.0	29	--	
26-----	30	8	.6	31	--	1/8	29	2	1/2
27-----	32	80	6.9	32	7	.6	28	--	
28-----	31	10	.8	32	7	.6	28	1	
29-----	32	1	(s)	31	6	.5	28	--	
30-----	32	1	(s)	31	6	.5	28	1	
31-----	32	1	(s)	31	3	.2	--	--	
Total--	991	--	57.0	1,010	--	16.1	938	--	28.9

Total discharge for year (second-foot-days) ----- 7,451.9

Total load for year (tons) ----- 217

1/Estimated.

(s)Sediment discharge less than 0.1 ton.

YELLOWSTONE RIVER BASIN--Continued

OCEAN DRAIN NEAR PAVILLION, WYO.

LOCATION.--At gaging station, a quarter of a mile upstream from mouth and 11½ miles east of Pavillion, Fremont County.

RECORDS AVAILABLE.--Water temperatures: December 1948 to September 1949.

Sediment records: August 1948 to September 1949.

EXTREMES, 1948-49.--Water temperatures (December 1948 to September 1949): Minimum, freezing point on many days during December to March.

Sediment concentrations: Maximum daily, 7,330 ppm May 21; minimum daily, not determined.

Sediment loads: Maximum daily, 950 tons June 28; minimum daily, 1 ton May 4, 7.

REMARKS.--Records of discharge from August 1948 to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, water year December 1948 to September 1949

/Once-daily temperature measurement between 10 a.m. and 1 p.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			--	--	32	32	42	61	52	69	--	--
2			--	--	32	--	38	65	53	66	70	--
3			--	32	--	--	53	65	56	--	75	59
4			--	32	--	33	40	60	53	--	--	--
5			--	--	--	36	43	45	70	72	68	66
6			--	32	--	40	54	52	68	78	--	63
7			--	--	32	33	49	64	66	66	--	--
8			--	--	33	33	45	72	61	70	--	65
9			--	--	32	33	45	62	73	--	--	71
10			--	--	33	33	60	72	68	--	--	65
11			--	32	34	34	47	68	71	73	--	--
12			--	32	32	33	57	68	71	68	--	--
13			--	32	--	48	46	71	63	79	--	--
14			--	32	32	32	47	73	76	79	--	--
15			32	--	33	33	44	62	64	80	--	--
16			32	--	--	44	52	56	73	70	--	--
17			32	--	36	34	54	61	66	--	--	--
18			--	32	32	34	33	--	56	--	--	--
19			--	32	34	33	60	--	73	--	76	--
20			32	32	--	44	59	--	--	--	65	--
21			32	--	32	34	47	--	76	69	58	--
22			32	--	34	38	61	64	69	--	--	55
23			32	--	32	39	66	60	69	--	66	64
24			32	--	35	42	--	62	71	--	63	--
25			--	32	32	48	59	62	64	--	--	--
26			--	--	33	41	57	70	65	--	--	--
27			32	--	32	48	73	70	--	--	--	--
28			32	32	32	39	61	73	64	--	--	--
29			32	--	--	38	57	--	68	--	--	--
30			32	--	--	48	58	67	64	--	--	--
31			32	32	--	47	--	60	--	--	--	--
Average			--	1/32	--	38	52	64	66	--	--	--

1/Includes estimated temperature 32°F on missing days.

YELLOWSTONE RIVER BASIN--Continued

OCEAN DRAIN NEAR PAVILLION, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	34			23			19	--	1/6
2-----	35			22	--	1/18	19	120	6
3-----	36			22			20		
4-----	38			21			20		
5-----	37			21	430	24	20		
6-----	34	--	1/55	20	380	20	18		
7-----	37			20	--	1/15	20		
8-----	34			21	570	32	20		
9-----	34			19	550	28	20	--	1/12
10-----	30			19	395	20	20		
11-----	23			19	450	23	20		
12-----	21	434		19	440	23	21		
13-----	20			20	--	1/24	21		
14-----	22	--		18	--	1/22	21		
15-----	22	--		19	485	25	21	535	30
16-----	22	--		19	585	31	21	248	14
17-----	21	--		18			19	300	15
18-----	21	--		19			18	--	1/9
19-----	21	--	1/26	21			21	--	1/11
20-----	22	431		20			21	225	13
21-----	22	--		20			21	232	13
22-----	22	--		18			21	170	10
23-----	22	--		21	--	1/15	21	190	11
24-----	23	--		21			20	245	13
25-----	23	--		21			20	--	1/14
26-----	23	--		20			20	--	1/22
27-----	23	347	22	20			20	600	32
28-----	24	--	1/19	18			20	640	35
29-----	23	252	16	20			20	700	38
30-----	23	--	1/16	22			20	510	28
31-----	23	--	1/16	--	--	--	20	440	24
Total-	815	--	1,100	601	--	570	624	--	490
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	20	--	1/24	20	425	23	19	865	44
2-----	20	--	1/24	18	405	20	20	750	40
3-----	21	490	28	13	--	1/14	20	--	1/42
4-----	20	560	30	13	--	1/15	20	960	52
5-----	20	--	1/30	14	--	1/16	20	1,010	54
6-----	20	570	31	15	--	1/18	20	1,100	59
7-----	20	--	1/32	17	480	22	19	944	48
8-----	20	--	1/32	18	506	25	18	905	44
9-----	20	--	1/32	20	487	26	18	935	45
10-----	18	--	1/30	20	462	25	18	1,030	50
11-----	20	680	37	19	445	23	18	1,120	54
12-----	20	780	42	18	--	1/20	18	1,330	65
13-----	20	650	35	15	--	1/18	18	1,470	71
14-----	20	580	31	19	440	23	18	1,620	79
15-----	20	--	1/30	19	--	1/22	15	1,650	87
16-----	20	--	1/28	26	350	25	16	1,500	65
17-----	20	--	1/30	24	350	23	18	1,430	70
18-----	20	490	26	20	380	20	18	1,400	68
19-----	20	405	22	20	420	23	22	1,500	89
20-----	13	990	35	20	--	1/22	19	1,620	83
21-----	20	--	1/48	20	460	25	15	1,560	63
22-----	20	--	1/42	20	700	38	16	1,530	66
23-----	20	--	1/32	20	755	41	18	1,560	76
24-----	15	--	1/12	19	852	44	20	1,600	86
25-----	5, 1	280	4	19	832	43	21	1,810	103
26-----	10	--	1/8	18	855	42	21	1,960	111
27-----	18	--	1/19	19	930	48	22	2,000	119
28-----	19	425	22	19	855	44	20	1,920	104
29-----	19	--	1/22	--	--	--	21	1,870	106
30-----	19	--	1/24	--	--	--	22	1,960	116
31-----	19	485	25	--	--	--	22	1,850	110
Total-	576, 1	--	870	522	--	748	590	--	2,250

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

OCEAN DRAIN NEAR PAVILLION, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Suspended sediment, water, year October 1946 to September 1948--Continued									
Day	Mean dis-charge (second-foot)	April		Mean dis-charge (second-foot)	May		Mean dis-charge (second-foot)	June	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	22	2,060	122	5.7	640	10	19	2,370	122
2-----	22	2,000	119	4.6	295	4	19	2,320	119
3-----	23	2,040	127	2.7	210	2	14	2,220	84
4-----	23	1,870	116	1.6	159	1	14	--	1/85
5-----	25	1,910	129	2.1	310	2	26	3,880	272
6-----	24	2,020	131	2.2	295	2	22	2,340	139
7-----	23	1,940	121	1.4	310	1	23	2,680	167
8-----	22	1,930	115	2.4	400	3	28	3,390	256
9-----	20	1,660	90	2.3	330	2	27	3,450	252
10-----	18	1,820	88	4.8	1,110	2/19	20	2,320	125
11-----	18	1,690	82	9.9	2,420	2/90	14	1,680	64
12-----	19	1,810	93	11	3,080	92	10	1,320	36
13-----	19	1,480	76	11	3,090	92	9.6	1,340	35
14-----	19	1,430	73	6.6	2,060	37	21	2,640	2/225
15-----	19	1,380	71	7.3	2,850	56	42	5,300	601
16-----	18	1,280	62	22	4,140	246	44	5,100	605
17-----	16	1,300	56	28	4,280	324	49	5,180	685
18-----	16	1,200	52	31	3,750	314	63	5,450	926
19-----	15	1,400	57	35	4,260	403	66	5,260	938
20-----	14	1,460	55	40	4,530	489	65	--	1/900
21-----	12	1,200	39	34	7,330	2/718	64	5,380	930
22-----	10	1,040	28	26	4,820	338	58	5,290	828
23-----	10	1,090	29	24	4,030	261	61	4,570	754
24-----	8.7	--	1/22	27	3,280	239	66	4,630	824
25-----	8.1	691	15	24	2,880	187	68	4,900	899
26-----	7.8	700	15	19	2,430	125	70	4,800	869
27-----	7.8	735	16	14	2,040	77	73	4,490	885
28-----	7.8	650	14	14	2,210	84	77	4,570	950
29-----	7.8	728	15	14	2,000	76	76	4,300	882
30-----	7.6	661	14	14	1,800	68	72	3,690	717
31-----	--	--	--	11	1,880	56	--	--	--
Total-	482.6	--	2,040	452.6	--	4,420	1,280.6	--	15,170
Day	Mean dis-charge (second-foot)	July		Mean dis-charge (second-foot)	August		Mean dis-charge (second-foot)	September	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	67	4,270	773	60	1,980	321	62	2,740	458
2-----	64	4,820	833	63	2,330	396	63	2,980	507
3-----	59	4,880	778	63	2,350	400	70	3,100	586
4-----	59	4,760	759	65	1,930	338	73	3,080	606
5-----	60	4,840	784	63	1,750	281	79	3,150	671
6-----	58	4,790	750	62	1,820	305	79	2,800	598
7-----	59	4,380	699	60	1,650	268	73	2,310	455
8-----	54	4,000	582	59	1,440	230	70	2,320	438
9-----	58	5,980	936	62	1,630	273	59	2,530	403
10-----	63	3,890	661	65	2,170	381	55	2,140	318
11-----	69	3,510	654	71	2,060	395	58	2,310	362
12-----	70	3,580	677	71	2,240	430	59	1,920	306
13-----	68	3,970	729	67	2,870	520	60	1,750	284
14-----	62	3,230	541	69	2,870	535	61	1,480	244
15-----	63	3,400	578	72	2,720	529	63	1,660	282
16-----	70	3,200	605	73	2,930	578	63	1,730	294
17-----	71	3,480	667	75	2,690	545	62	1,720	288
18-----	73	2,980	588	74	2,980	595	59	1,480	236
19-----	73	3,750	739	67	3,140	568	57	1,520	234
20-----	74	3,600	719	61	2,740	452	54	1,200	175
21-----	63	3,060	521	60	2,610	423	49	1,150	152
22-----	57	2,440	376	61	2,510	414	46	1,250	155
23-----	54	2,350	342	64	2,750	475	45	1,080	131
24-----	52	2,450	344	65	2,700	474	50	1,300	176
25-----	51	2,300	317	62	2,180	365	51	970	134
26-----	51	2,220	306	62	--	1/340	51	930	128
27-----	55	2,120	315	58	2,420	379	46	850	106
28-----	56	1,930	292	63	3,030	515	41	850	94
29-----	54	1,980	288	64	3,450	596	42	920	104
30-----	54	1,900	277	64	3,180	550	46	1,000	124
31-----	53	1,730	248	62	3,130	524	--	--	--
Total-	1,894	--	17,680	2,007	--	13,400	1,746	--	9,050

Total discharge for year (second-foot-days) ----- 11,590.9

Total load for year (tons) ----- 67,790

1/Estimated.

2/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

OCEAN DRAIN NEAR PAVILLION, WYO.--Continued

Periodic determinations of suspended-sediment discharge. August to September 1948

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)
Aug. 31, 1948-----	58	2,080	326
Sept. 6-----	40	1,980	150
Sept. 9-----	48	2,680	347
Sept. 14-----	38	2,200	226
Sept. 16-----	41	1,420	157
Sept. 18-----	34	1,630	150
Sept. 21-----	44	1,880	223
Sept. 27-----	29	1,140	89
Sept. 28-----	36	1,634	62
Sept. 29-----	35	946	89

Particle-size analyses of suspended sediment, March to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment													Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Mar. 25, 1949	1:30 p. m.	21	2,440	1,280	12	20	28	38	55	61	77	90		99	BW	
Sept. 1	4:00 p. m.	62	2,870	1,850		16	22	30	38	52	73	92		100	BW	
Sept. 19	2:25 p. m.	55	1,510	597		--	22	24	28	34	48	78		93	BW	
Sept. 23	2:40 p. m.	46	1,070	754		15	21	24	28	34	45	77		90	BW	
Sept. 30	9:25 a. m.	45	878	719		22	26	30	36	44	55	84		94	BW	

MISSOURI RIVER BASIN
YELLOWSTONE RIVER BASIN--Continued
DUDLEY WASTEWAY NEAR PAVILLION, WYO.

LOCATION.--One hundred feet upstream from mouth, and 12 miles east of Pavillion, Fremont County.

RECORDS AVAILABLE.--Sediment records: May to September 1949.

EXTREMES, May to September, 1949.--Sediment Concentrations: Maximum daily, 1,400 ppm May 21; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 15 tons June 15; minimum daily, 0 tons on many days.

REMARKS.--Records of discharge for period May to September 1949 given in Water-Supply Paper 1146.

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----				0	--	0	2.0	76	0.4
2-----				0	--	0	3.8	100	1.0
3-----				0	--	0	1.6	103	.4
4-----				0	--	0	0	--	0
5-----				0	--	0	0	--	0
6-----				0	--	0	.8	72	.2
7-----				0	--	0	1.8	138	.7
8-----				0	--	0	5.5	242	3.6
9-----				.7	--	1/2.0	4.9	200	2.6
10-----				4.0	975	11	1.5	83	.3
11-----				3.0	500	4.0	.6	110	.2
12-----				3.5	375	3.5	1.3	176	.6
13-----				3.0	645	5.2	2.6	171	1.2
14-----				1.9	340	1.7	5.5	241	3.6
15-----				2.6	205	1.4	12	466	15
16-----				1.0	145	.4	4.0	--	1/3.6
17-----				.6	244	.4	1.3	150	.5
18-----				1.1	212	.6	2.5	247	1.7
19-----				1.7	190	.9	2.7	276	2.0
20-----				3.0	246	2.0	2.8	255	1.9
21-----				3.1	1,400	12	3.9	280	2.9
22-----				3.3	160	1.4	5.8	260	4.1
23-----				5.0	338	4.6	6.1	252	4.2
24-----				5.0	300	4.0	8.0	260	5.6
25-----				4.0	148	1.6	7.6	179	3.7
26-----				3.2	134	1.2	7.5	214	4.3
27-----				.2	18	(a)	6.3	147	2.5
28-----				.3	61	(a)	2.9	293	2.3
29-----				5.7	208	3.2	1.7	300	1.4
30-----				5.7	166	2.6	5.6	312	4.7
31-----				5.5	116	1.7	--	--	--
Total--				67.1	--	65.4	112.6	--	75.2
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	5.4	358	5.2	0.1	20	(a)	1.7	39	0.2
2-----	1.7	132	.6	.2	27	(a)	1.8	36	.2
3-----	0	--	0	1.5	98	0.4	1.5	15	(a)
4-----	0	--	0	5.6	266	4.0	1.1	19	(a)
5-----	0	--	0	6.1	--	1/3.8	1.6	22	(a)
6-----	0	--	0	6.5	245	4.3	2.0	40	.2
7-----	5.1	350	4.8	7.2	242	4.7	3.6	72	.7
8-----	.5	90	.1	7.2	238	4.6	3.3	52	.5
9-----	0	--	0	6.9	230	4.3	2.7	40	.3
10-----	.3	--	(a)	4.3	139	1.6	2.8	33	.2
11-----	.4	34	(a)	3.0	122	1.0	2.0	--	1/2
12-----	5.2	200	2.8	.5	75	.1	5.1	160	2.2
13-----	4.8	215	2.8	1.4	82	.3	4.2	125	1.4
14-----	5.4	200	2.9	2.7	112	.8	2.3	38	.2
15-----	5.0	172	2.3	3.2	70	.6	1.5	23	(a)
16-----	2.5	100	.7	4.0	87	.9	2.5	56	.4
17-----	.7	45	(a)	5.2	135	1.9	5.1	130	1.8
18-----	.4	120	.1	6.6	220	3.9	5.5	--	1/2.1
19-----	.3	151	.1	8.3	280	6.3	5.2	118	1.7
20-----	.3	62	(a)	8.2	167	3.7	3.0	46	.4
21-----	.5	64	(a)	6.8	232	4.3	.4	26	(a)
22-----	2.7	115	.8	4.3	137	1.6	.8	33	(a)
23-----	3.7	90	.9	.2	30	(a)	3.8	78	.8
24-----	3.1	83	.7	.7	33	(a)	6.1	101	1.7
25-----	2.9	72	.6	2.0	65	.4	6.0	--	1/1.2
26-----	3.6	125	1.2	2.9	--	1/7	5.7	71	1.1
27-----	3.9	150	1.6	3.1	98	.8	5.1	75	1.0
28-----	5.8	155	2.4	4.3	138	1.6	5.4	77	1.1
29-----	3.4	140	1.3	5.8	160	2.5	3.8	52	.5
30-----	1.2	50	.2	2.3	53	.3	3.5	48	.5
31-----	.1	20	(a)	.6	32	.5	--	--	--
Total--	68.9	--	32.4	121.7	--	60.0	99.1	--	21.0

Total for period May 1 to Sept. 30 (second-foot-days) ----- 469.4

Total load for period May 1 to Sept. 30 (tons) ----- 254

1/Estimated.

(a) Sediment discharge less than 0.1 ton.

YELLOWSTONE RIVER BASIN--Continued

KELLETT DRAIN NEAR PAVILLION, WYO.

LOCATION.--At gaging station 0.1 mile upstream from mouth, 12½ miles north of Riverton, and 13½ miles southeast of Pavillion, Fremont County.

RECORDS AVAILABLE.--Water temperatures: December 1948 to June 1949.

Sediment records: December 1948 to September 1949.

EXTREMES, December 1948 to September 1949.--Water temperatures (December 1948 to June 1949): Minimum, freezing point on many days in December, January, and February.

Sediment concentrations: Maximum daily, 6,420 ppm June 19; minimum daily, not determined.

Sediment loads: Maximum daily, 51 tons Aug. 2; minimum daily, less than 0.1 ton Sept. 26, 28-30.

REMARKS.--Records of discharge for period December 1948 to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, December 1948 to June 1949

/Once-daily temperature measurement between 10 a. m. and 1 p. m. /

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			--	--	--	33	47	61	52			
2			--	--	32	45	42	66	55			
3			--	32	--	38	60	68	58			
4			--	32	--	43	44	--	53			
5			--	--	--	--	47	44	70			
6			--	32	--	42	61	52	77			
7			--	--	--	36	58	--	81			
8			--	--	32	36	51	75	73			
9			--	--	33	36	48	68	81			
10			--	--	34	34	65	78	73			
11			--	32	34	36	51	76	78			
12			--	32	32	36	58	78	76			
13			--	32	--	52	44	72	68			
14			--	32	32	33	55	65	81			
15			32	--	32	42	47	59	77			
16			32	--	--	48	61	60	71			
17			32	--	35	36	65	66	74			
18			--	32	35	36	55	51	54			
19			--	32	34	42	67	69	70			
20			32	32	--	39	64	73	75			
21			32	--	35	38	48	50	76			
22			32	--	33	45	57	69	74			
23			32	--	35	34	71	59	78			
24			32	--	35	43	70	69	66			
25			--	32	36	55	63	72	66			
26			--	--	36	48	63	78	66			
27			32	--	43	45	77	73	66			
28			32	--	36	41	66	80	--			
29			32	--	--	--	59	73	--			
30			32	--	--	49	61	74	--			
31			32	32	--	44	--	63	--			
Average			--	--	--	41	58	67	70			

YELLOWSTONE RIVER BASIN--Continued

KELLETT DRAIN NEAR PAVILLION, WYO.--Continued

Suspended sediment, December 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----							1.2	--	
2-----							1.2	1,010	
3-----							1.2	--	
4-----							1.2	--	
5-----							1.2	--	
6-----							1.1	--	
7-----							1.1	--	
8-----							1.1	--	
9-----							1.1	--	1/2.0
10-----							1.1	--	
11-----							1.1	--	
12-----							1.2	--	
13-----							1.2	--	
14-----							1.2	--	
15-----							1.1	422	
16-----							1.1	446	1.3
17-----							1.1	556	1.7
18-----							1.1	--	1/1.7
19-----							1.1	--	1/1.8
20-----							1.1	855	2.5
21-----							1.1	518	1.5
22-----							1.0	445	1.2
23-----							1.0	495	1.3
24-----							1.0	744	2.0
25-----							1.0	--	1/2.4
26-----							1.0	--	1/2.4
27-----							.9	680	1.7
28-----							.9	676	1.6
29-----							.9	670	1.6
30-----							.9	600	1.5
31-----							.9	431	1.0
Total-							33.4	--	57
Day	January			February			March		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.9	--		0.7	--		0.5	3,000	4.1
2-----	.9	--		.7	423		.4	3,440	3.7
3-----	.9	800		.7	--		.5	4,490	6.1
4-----	.9	514		.7	--		.5	3,100	4.2
5-----	.8	--		.7	--		.6	--	1/6
6-----	.8	1,100	1/1.9	.7	--		.7	3,670	6.9
7-----	.8	--		.7	--		.5	3,200	4.3
8-----	.8	--		.7	900	1.7	.6	2,850	4.6
9-----	.8	--		.7	1,200	2.3	.5	2,900	3.9
10-----	.7	--		.7	1,250	2.4	.5	2,510	3.4
11-----	.7	1,330	2.5	.8	1,320	2.9	.5	2,780	3.8
12-----	.7	2,600	4.9	.8	980	2.1	.4	3,060	3.3
13-----	.7	1,160	2.2	.8	--	1/1.4	.7	3,270	6.2
14-----	.7	1,100	2.1	.8	244	.5	.6	2,970	4.8
15-----	.7	--	1/2.0	.8	375	.8	.5	3,350	4.5
16-----	.7	--	1/2.0	.8	--	1/9	.5	3,450	4.7
17-----	.7	--	1/1.9	1.0	750	2.0	.6	3,470	5.6
18-----	.7	976	1.8	1.0	2,090	5.6	.6	3,090	5.0
19-----	.7	668	1.3	.7	1,900	3.6	.5	2,770	3.7
20-----	.7	520	1.0	.8	--	1/4.0	.6	2,790	4.5
21-----	.7	--		1.1	2,040	6.1	.6	3,720	6.0
22-----	.7	--		.7	2,360	4.5	.6	4,290	6.9
23-----	.7	--		1.0	3,360	9.1	.5	3,260	4.4
24-----	.7	--		.7	3,000	5.7	.7	4,130	7.8
25-----	.6	183	1/.5	.6	3,020	4.9	.7	4,770	9.0
26-----	.6	--		.5	3,100	4.2	.5	4,660	6.3
27-----	.6	--		.8	3,570	7.7	.7	3,710	7.0
28-----	.6	--		.5	3,600	4.9	1.0	3,040	8.2
29-----	.7	--		--	--	--	1.0	2,550	6.9
30-----	.7	--		--	--	--	.8	2,960	6.4
31-----	.7	427	.8	--	--	--	.5	2,550	3.4
Total-	22.6	--	46	21.2	--	84	18.4	--	166

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

KELLETT DRAIN NEAR PAVILLION, WYO.--Continued

Suspended sediment, December 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.5	3,200	4.3	0.5	1,600	2.2	1.4	3,020	11
2-----	.7	3,270	6.2	.5	1,570	2.1	1.4	3,370	13
3-----	.6	3,370	5.5	.5	1,220	1.6	1.0	1,830	4.9
4-----	.7	3,270	6.2	.4	885	1.0	.7	1,550	2.9
5-----	.6	3,840	6.2	.4	838	.9	.7	1,650	3.1
6-----	.8	3,350	7.2	.4	670	.7	.8	1,680	3.6
7-----	.7	3,470	6.6	.4	--	1/.8	.8	1,280	2.8
8-----	.7	3,040	5.7	.4	880	1.0	1.1	1,500	4.5
9-----	.7	2,250	4.3	.5	773	1.0	1.5	2,460	10
10-----	.5	2,470	3.3	.5	716	1.0	1.4	2,100	7.9
11-----	.6	2,960	4.8	.5	715	1.0	1.5	1,930	7.8
12-----	.5	2,740	3.7	.7	1,200	2.3	1.5	4,820	20
13-----	.5	2,590	3.5	.7	1,460	2.8	1.5	2,750	11
14-----	.5	3,000	4.0	.7	1,990	3.8	1.8	2,290	11
15-----	.6	2,690	4.4	.7	1,820	3.4	1.8	2,420	12
16-----	.6	3,000	4.9	.8	1,750	3.8	1.8	2,370	12
17-----	.6	3,020	4.9	1.2	2,160	7.0	1.6	2,420	10
18-----	.6	3,140	5.1	1.2	2,610	3.5	2.1	4,860	28
19-----	.6	3,590	5.8	1.4	3,280	12	1.7	6,420	29
20-----	.5	3,400	4.6	1.2	2,420	7.8	1.4	5,340	20
21-----	.6	3,020	4.9	1.3	4,100	14	1.1	3,280	9.7
22-----	.6	2,630	4.3	1.0	3,290	8.9	1.2	5,350	17
23-----	.4	2,670	2.9	1.0	2,380	6.4	1.0	2,550	6.9
24-----	.6	2,910	4.7	.8	1,810	3.9	1.0	3,060	8.3
25-----	.5	2,600	3.5	.8	2,170	4.7	1.1	3,420	10
26-----	.5	3,000	4.0	.8	2,560	5.5	1.5	4,530	18
27-----	.5	3,250	4.4	.7	1,920	3.6	1.6	3,470	15
28-----	.6	2,690	4.4	.8	1,460	3.2	2.0	3,340	18
29-----	.7	2,540	4.8	.8	1,720	3.7	1.9	3,040	16
30-----	.5	2,310	3.1	1.0	2,150	5.8	2.1	3,700	21
31-----	--	--	--	1.2	2,110	6.8	--	--	--
Total-	17.6	--	142	23.8	--	131	42.0	--	364
Day	July			August			September		
	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	2.5	4,570	31	3.8	4,000	41	1.9	760	3.9
2-----	2.6	3,690	26	4.0	4,730	51	1.7	720	3.3
3-----	1.2	2,280	7.4	3.9	3,550	37	1.8	1,040	5.1
4-----	.8	1,500	3.2	3.6	2,570	25	1.4	485	1.8
5-----	.7	1,500	2.8	2.8	2,530	19	1.3	330	1.2
6-----	.7	1,430	2.7	3.0	2,740	22	1.2	287	.9
7-----	1.8	2,460	12	3.2	2,420	21	1.2	205	.7
8-----	2.4	4,890	32	3.4	2,140	20	1.1	152	.5
9-----	1.8	3,640	18	3.4	1,670	15	1.2	125	.4
10-----	1.7	2,800	13	3.6	2,310	22	1.2	99	.3
11-----	1.6	4,180	18	2.8	1,850	14	1.2	--	1/.2
12-----	2.2	3,640	22	2.8	1,500	11	1.1	52	.2
13-----	3.0	3,450	28	3.8	1,810	19	1.0	68	.2
14-----	2.6	3,280	23	4.1	2,140	24	1.1	57	.2
15-----	2.3	2,510	16	3.9	2,000	21	1.2	68	.2
16-----	2.6	2,920	20	3.4	1,640	15	1.2	98	.3
17-----	3.0	2,460	20	3.8	2,170	22	1.2	128	.4
18-----	2.8	2,480	19	3.2	1,510	13	1.2	--	1/.4
19-----	2.8	2,620	20	2.8	1,490	11	1.3	88	.3
20-----	3.2	3,800	33	2.6	1,300	9.1	1.2	59	.2
21-----	3.0	3,390	27	2.5	1,140	7.7	.8	95	.2
22-----	2.8	3,440	26	2.4	1,440	9.3	1.0	83	.2
23-----	2.5	4,840	33	2.6	1,360	9.5	1.0	52	.1
24-----	2.8	3,440	26	2.5	1,360	9.2	1.0	76	.2
25-----	3.0	3,420	28	2.5	1,820	12	.8	--	1/.1
26-----	3.0	3,910	32	2.5	1,870	13	.8	46	(a)
27-----	2.2	3,990	24	2.0	1,580	8.5	.8	50	.1
28-----	2.8	4,320	33	2.0	1,340	7.2	.8	46	(a)
29-----	3.2	3,820	33	1.9	1,180	6.1	.8	34	(a)
30-----	3.6	4,530	44	2.1	1,290	7.3	.8	--	(a)
31-----	3.4	4,470	41	2.2	1,070	6.4	--	--	--
Total-	74.6	--	714	93.1	--	528	34.3	--	21.9

Total discharge for period Dec. 1 to Sept. 30 (second-foot-days)----- 381.0

Total load for period Dec. 1 to Sept. 30 (tons)----- 2,250

1/Estimated.

(a)Sediment discharge less than 0.1 ton.

YELLOWSTONE RIVER BASIN--Continued

DEWEY DRAIN NEAR PAVILLION, WYO.

LOCATION.--At gaging station 0.1 mile upstream from mouth, 12½ miles north of Riverton, and 13½ miles southeast of Pavillion, Fremont County.

RECORDS AVAILABLE.--Water temperatures: December 1948 to June 1949.

Sediment records: December 1948 to September 1949.

EXTREMES, December 1948 to September 1949.--Water temperatures (December 1949 to June 1949):

Minimum, freezing point on many days during December to March.

Sediment concentrations: Maximum daily, 4,320 ppm June 2; minimum daily, not determined.

Sediment loads: Maximum daily, 10 tons June 23; minimum daily, less than 0.01 ton on many days.

REMARKS.--Records of discharge for period December 1948 to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, December 1948 to June 1949

/Once-daily temperature measurement between 10 a. m. and 2 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			--	--	--	34	42	60	53			
2			--	--	--	45	38	65	54			
3				32	--	41	58	63	58			
4				32	--	36	43	55	55			
5			--	--	--	--	47	43	69			
6			--	32	--	44	55	50	75			
7			--	--	--	47	50	61	77			
8			--	--	32	32	49	67	75			
9			--	--	33	48	46	63	--			
10			--	--	34	38	63	73	67			
11			--	32	34	47	48	77	--			
12			--	32	--	45	56	74	71			
13			--	32	--	52	42	73	67			
14			--	32	32	32	51	62	77			
15			32	--	32	32	44	58	77			
16			32	--	--	47	51	60	76			
17			34	--	36	39	60	64	73			
18			--	32	36	38	52	50	55			
19			--	32	36	36	65	68	67			
20			34	32	--	--	58	72	76			
21			32	--	35	46	46	48	77			
22			32	--	33	54	53	70	75			
23			32	--	34	33	64	64	78			
24			32	--	35	43	64	66	68			
25			--	32	37	52	59	65	68			
26			--	--	36	44	57	--	65			
27			32	--	43	--	72	74	71			
28			32	--	36	39	60	72	--			
29			32	--	--	38	57	67	--			
30			32	--	--	41	55	73	--			
31			32	32	--	44	--	--	--			
Average			--	--	--	42	54	64	69			

YELLOWSTONE RIVER BASIN--Continued

DEWEY DRAIN NEAR PAVILLION, WYO.--Continued

Suspended sediment, December 1948 to September 1949

Suspended sediment, December 1896 to September 1897										
Day	Mean dis- charge (second- feet)	October		Mean dis- charge (second- feet)	November		Mean dis- charge (second- feet)	December		
		Suspended sediment			Suspended sediment			Suspended sediment		
		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day	
1-----							0.2	--	} 1/0.03	
2-----							.2	48		
3-----							.2	--		
4-----							.2	--		
5-----							.2	--		
6-----							.2	--		
7-----							.2	--		
8-----							.2	--		
9-----							.2	--		
10-----							.2	--		
11-----							.3	--		
12-----							.3	--		
13-----							.3	--		
14-----							.3	--		
15-----							.3	76		
16-----							.3	88		
17-----							.2	65		
18-----							.2	--		
19-----							.2	--		
20-----							.3	103		
21-----							.3	132		
22-----							.3	67		
23-----							.3	25		
24-----							.2	28		
25-----							.2	--		
26-----							.2	--		
27-----							.2	42		
28-----							.2	31		
29-----							.2	22		
30-----							.2	20		
31-----							.2	84		
Total-							7.2	--	1.1	
January February March										
1-----	0.2	--	} 1/0.02	0.2	40	0.02	0.1	36	(*)	
2-----	.2	--		.2	53	.03	.2	38	0.02	
3-----	.2	64		.2	--	1/.03	.2	52	.03	
4-----	.2	37		.2	--	1/.02	.2	38	.02	
5-----	.2	--		.2	--	.02	.2	--	1/.02	
6-----	.2	20		.2	--	1/.02	.1	58	.02	
7-----	.2	--		.2	32	.02	.2	51	.03	
8-----	.2	--		.2	41	.02	.1	49	.01	
9-----	.2	--		.2	30	.02	.2	56	.03	
10-----	.2	--		.2	28	.02	.2	15	(*)	
11-----	.3	92		.07	.2	27	.01	.2	30	.02
12-----	.2	68		.04	.2	--	1/.01	.2	51	.03
13-----	.2	46		.02	.2	--	1/.01	.2	36	.02
14-----	.3	41		.03	.2	47	.03	.2	19	.01
15-----	.3	--		1/.04	.2	22	.01	.2	19	.01
16-----	.3	--	1/.05	.2	20	.01	.1	29	(*)	
17-----	.2	--	1/.04	.2	63	.03	.1	29	(*)	
18-----	.3	82	.07	.3	64	.05	.1	18	(*)	
19-----	.2	61	.03	.2	52	.05	.1	16	(*)	
20-----	.2	73	.04	.2	--	1/.02	.2	25	.01	
21-----	.2	--	} 1/.04	.2	33	.02	.2	27	.01	
22-----	.2	--		.2	36	.02	.2	32	.02	
23-----	.2	--		.2	26	.01	.2	37	.02	
24-----	.1	--		.2	24	.01	.2	40	.02	
25-----	.2	75		.1	19	(*)	.2	38	.02	
26-----	.2	--		.2	21	.01	.2	43	.02	
27-----	.2	--		.2	38	.02	.2	--	1/.02	
28-----	.2	--		.2	31	.02	.2	23	.01	
29-----	.2	--		--	--	--	.1	33	(*)	
30-----	.2	--		--	--	--	.1	25	(*)	
31-----	.2	46		--	--	--	.1	24	(*)	
Total-	6.6	--		1.1	5.6	--	0.54	5.2	--	0.48

1/Estimated.

(*)Sediment discharge less than 0.01 ton.

YELLOWSTONE RIVER BASIN--Continued

DEWEY DRAIN NEAR PAVILLION, WYO.--Continued

Suspended sediment, December 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.2			0.1			0.6	500	0.81
2-----	.2			.1			.8	4,320	9.3
3-----	.2			.1			.7	1,180	2.2
4-----	.2			.1			.7	720	1.4
5-----	.1			.1			.5	370	.50
6-----	.2			.1			.7	620	1.2
7-----	.2			.1			.7	700	1.3
8-----	.2			.1			.7	550	1.0
9-----	.1			.1			.8	1,050	2.3
10-----	.1			.1			.5	780	1.0
11-----	.1			.1			.5	590	.80
12-----	.2			.1			.4	660	.71
13-----	.1			.1	18	(*)	.7	830	1.6
14-----	.2			.1			.8	740	1.6
15-----	.2			.2			.8	510	1.1
16-----	.2	13	(*)	.2			1.1	980	2.9
17-----	.2			.2			.8	550	1.2
18-----	.2			.1			.5	450	.61
19-----	.2			.1			.4	340	.37
20-----	.1			.1			.3	220	.18
21-----	.1			.3			.4	250	.27
22-----	.1			.1			.4	112	.12
23-----	.1			.1			1.2	3,140	10
24-----	.1			.2			1.0	465	1.3
25-----	.1			.2	19	0.01	.9	330	.80
26-----	.1			.2	--	1/.04	1.0	290	.78
27-----	.1			.2	80	.04	1.3	346	1.2
28-----	.1			.2	83	.04	1.4	192	.73
29-----	.1			.2	208	.11	1.5	250	1.0
30-----	.1			.8	582	1.3	1.3	150	.53
31-----	--	--	--	.5	450	.61	--	--	--
Total--	4.4	--	0.12	5.3	--	2.29	23.4	--	49.0
Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1.5	120	0.49	1.2	105	0.34	2.2	264	1.6
2-----	1.4	102	.39	1.2	219	.71	1.2	133	.43
3-----	.8	67	.14	.9	149	.36	.9	74	.18
4-----	.7	53	.10	1.0	200	.54	.9	53	.13
5-----	.6	60	.10	1.1	182	.54	1.1	41	.12
6-----	.6	50	.08	1.8	838	4.1	.9	30	.07
7-----	.8	62	.13	1.6	450	1.9	.7	26	.05
8-----	1.0	105	.28	1.6	485	2.1	.7	32	.08
9-----	1.1	243	.72	1.4	352	1.3	.7	52	.10
10-----	1.0	151	.41	2.0	450	2.4	.7	45	.09
11-----	1.1	370	1.1	2.0	341	1.8	.7	--	1/.04
12-----	1.2	570	1.8	1.8	270	1.3	.7	8	.02
13-----	1.2	820	2.7	1.5	172	.70	.7	47	.09
14-----	1.3	1,200	4.2	1.3	114	.40	.7	--	1/.08
15-----	1.3	810	2.8	1.4	71	.27	.7	33	.06
16-----	1.1	650	1.9	1.3	71	.25	.7	--	
17-----	1.5	1,890	7.6	1.6	--	1/.35	.7	--	
18-----	1.2	1,040	3.4	2.2	300	1.8	.7	--	
19-----	.7	320	.60	1.2	116	.38	.7	--	
20-----	.9	259	.63	1.1	72	.21	.6	44	
21-----	1.1	322	.96	1.1	52	.15	.6	--	
22-----	1.1	307	.91	1.1	88	.26	.6	43	
23-----	1.2	252	.82	1.4	181	.68	.7	--	1/.07
24-----	1.5	678	2.8	1.3	314	1.1	.6	--	
25-----	1.6	469	2.1	1.2	131	.42	.6	--	
26-----	1.6	639	2.8	1.0	168	.45	.6	--	
27-----	1.3	322	1.1	1.0	132	.36	.6	44	
28-----	1.0	332	.90	1.6	250	1.1	.6	--	
29-----	.7	135	.26	2.6	500	3.5	.6	46	
30-----	1.0	100	.27	2.3	331	2.1	.6	--	
31-----	1.1	130	.39	2.2	243	1.4	--	--	--
Total--	34.2	--	42.9	46.0	--	33.4	23.0	--	4.2

Total discharge for period Dec. 1 to Sept. 30 (second-foot-days) ----- 160.9

Total load for period Dec. 1 to Sept. 30 (tons) ----- 135

1/Estimated.

(*)Sediment discharge less than 0.01 ton.

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE 76 DRAIN NEAR RIVERTON, WYO.

LOCATION.--At gaging station 200 feet upstream from mouth and 12½ miles north of Riverton, Fremont County.

RECORDS AVAILABLE.--Water temperatures: March to June 1949.

Sediment records: March to September 1949.

EXTREMES, March to September 1949.--Sediment concentrations: Maximum daily, 4,100 ppm June 21; minimum daily, not determined.

Sediment loads: Maximum daily, 8.86 tons June 21; minimum daily, less than 0.01 ton on many days.

REMARKS.--Records of discharge for period March to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, March to June 1949

[Once-daily temperature measurement between 10 a. m. and 1 p. m.]

Day	Mar.	Apr.	May	June
1	--	45	57	53
2	--	37	70	53
3	--	60	67	55
4	--	47	55	51
5	--	48	43	69
6	--	57	51	69
7	--	52	61	76
8	--	48	71	73
9	--	48	69	78
10	--	63	75	62
11	--	49	76	75
12	--	56	77	71
13	--	42	75	70
14	--	53	64	76
15	--	49	50	76
16	47	60	--	73
17	34	65	64	72
18	36	56	53	55
19	36	63	71	66
20	48	58	74	76
21	44	49	50	78
22	43	57	63	74
23	32	69	64	78
24	43	67	69	69
25	55	64	70	70
26	46	63	76	64
27	--	74	74	72
28	40	65	73	--
29	37	62	68	--
30	39	56	70	--
31	47	--	63	--
Average	--	56	65	69

Suspended sediment, March to September 1949

Day	March		
	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	--	--	--
2-----	--	--	--
3-----	--	--	--
4-----	--	--	--
5-----	--	--	--
6-----	--	--	--
7-----	--	--	--
8-----	--	--	--
9-----	--	--	--
10-----	--	--	--
11-----	--	--	--
12-----	--	--	--
13-----	--	--	--
14-----	--	--	--
15-----	--	--	--
16-----	0.2	50	0.03
17-----	.2	225	.12
18-----	.2	455	.25
19-----	.2	210	.11
20-----	.2	200	.11
21-----	.2	120	.06
22-----	.2	135	.07
23-----	.2	100	.05
24-----	.3	80	.06
25-----	.2	166	.09
26-----	.2	180	.10
27-----	.2	--	1/.06
28-----	.2	73	.04
29-----	.2	100	.05
30-----	.2	85	.05
31-----	.2	70	.04
Total-	3.3	--	1.29

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

FIVEMILE 76 DRAIN NEAR RIVERTON, WYO.--Continued

Suspended sediment, March to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.2	62	0.03	0.1	60	0.02	0.4	48	0.05
2-----	.2	50	.03	.1			.4	105	.11
3-----	.3	62	.05	.1			.4	98	.11
4-----	.3	78	.06	.1			.3	58	.05
5-----	.2	70	.04	.1			.3	34	.03
6-----	.2	70	.04	.1	15	(s)	.3	19	.02
7-----	.2	60	.03	.1			.3	10	(s)
8-----	.2	42	.02	.1			.3	20	.02
9-----	.2	38	.02	.1			.3	18	.01
10-----	.2	41	.02	.1			.3	25	.02
11-----	.2	50	.03	.1			.3	25	.02
12-----	.2	95	.05	.1	184	.05	.4	17	.02
13-----	.2	50	.03	.4	930	1.00	.4	23	.02
14-----	.2	58	.03	1.2	800	2.59	.4	25	.03
15-----	.2	21	.01	.8	745	1.61	.4	40	.04
16-----	.2	20	.01	.6	450	.73	.4	25	.03
17-----	.2	52	.03	.5	410	.55	.4	90	.10
18-----	.2	78	.04	.4	240	.26	.5	600	1.30
19-----	.2	48	.03	.4	100	.11	.5	240	.32
20-----	.2	33	.02	.4	110	.12	.4	280	.30
21-----	.2	40	.02	.7	340	.64	.8	4,100	8.86
22-----	.1	135	.04	.4	186	.20	1.0	820	2.21
23-----	.2	118	.06	.4	100	.11	1.4	1,910	7.22
24-----	.2	128	.07	.3	82	.07	1.4	1,700	6.43
25-----	.2	80	.04	.4	65	.07	1.0	510	1.38
26-----	.1	35	(s)	.4	35	.04	1.1	260	.77
27-----	.1	40	.01	.3	42	.03	1.3	420	1.47
28-----	.1	35	(s)	.3	68	.06	1.0	179	.48
29-----	.1	25	(s)	.3	48	.04	.8	165	.36
30-----	.1	48	.01	.3	40	.03	.8	148	.32
31-----	--	--	--	.3	20	.02	--	--	--
Total--	5.6	--	0.90	10.0	--	8.39	18.3	--	32.1
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1.0	125	0.34	0.4	54	0.06	1.0	200	0.54
2-----	1.0	140	.38	1.0	102	.28	.8	130	.28
3-----	.4	97	.10	1.4	118	.45	1.7	380	1.74
4-----	.4	50	.05	1.4	97	.37	1.1	245	.73
5-----	.4	35	.04	.6	165	.27	.8	340	.73
6-----	.4	32	.03	.6	90	.15	1.0	390	1.05
7-----	.4	39	.04	.8	130	.28	1.0	200	.54
8-----	.4	--	1/.04	.8	115	.25	1.0	148	.40
9-----	.4	68	.07	.6	115	.19	1.0	175	.47
10-----	.4	54	.06	.4	80	.09	.9	220	.53
11-----	.4	50	.05	.3	105	.09	.4	--	1/.18
12-----	.4	51	.06	.4	60	.06	.4	95	.10
13-----	.5	43	.06	.5	135	.18	.4	129	.14
14-----	.8	55	.12	.6	545	.88	.4	--	1/.12
15-----	1.0	107	.29	.9	750	1.82	.4	96	.10
16-----	.6	117	.19	.8	125	.27	.4	--	--
17-----	.5	67	.09	.9	--	1/.32	.4	--	--
18-----	.5	85	.11	1.0	75	.20	.4	--	--
19-----	.4	92	.10	1.0	160	.43	.4	--	--
20-----	.6	160	.26	.6	75	.12	.4	108	--
21-----	.4	85	.09	.5	38	.05	.4	--	--
22-----	.4	58	.06	.5	30	.04	.4	148	--
23-----	.4	57	.06	.5	75	.10	.4	--	1/.14
24-----	.4	33	.04	.6	100	.16	.4	--	--
25-----	.4	40	.04	.9	780	1.90	.4	--	--
26-----	.4	57	.06	.6	165	.27	.4	--	--
27-----	.6	53	.09	1.3	195	.68	.4	160	--
28-----	.6	52	.08	1.0	380	1.03	.4	--	--
29-----	.6	54	.09	1.0	140	.38	.4	137	--
30-----	.4	92	.10	1.0	250	.68	.4	--	--
31-----	.4	47	.05	1.0	170	.46	--	--	--
Total--	15.9	--	3.24	23.9	--	12.5	18.3	--	9.75

Total discharge for period Mar. 16 to Sept. 30 (second-foot-days) ----- 95.3

Total load for period Mar. 16 to Sept. 30 (tons) ----- 68.2

1/Estimated.

(s)Sediment discharge less than 0.01 ton.

YELLOWSTONE RIVER BASIN--Continued

SAND GULCH DRAIN AND WASTEWAY NEAR RIVERTON, WYO.

LOCATION.--At gaging station a quarter of a mile upstream from mouth and 12½ miles north of Riverton, Fremont County.

RECORDS AVAILABLE.--Water temperatures: March to June 1949.

Sediment records: March to September 1949.

EXTREMES, March to September 1949.--Sediment concentrations: Maximum daily, 8,000 ppm Aug. 10; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 97 tons Aug. 10; minimum daily, 0 tons on many days.

REMARKS.--Records of discharge for period March to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, March to June 1949

/Once-daily temperature measurement between 10 a. m. and 2 p. m./

Day	Mar.	Apr.	May	June
1	--	--	50	58
2	--	--	33	52
3	--	52	--	63
4	--	44	58	54
5	--	49	42	76
6	--	54	49	--
7	--	49	62	78
8	--	52	65	75
9	--	49	69	83
10	--	58	67	69
11	--	32	--	75
12	--	54	76	--
13	--	41	67	74
14	32	47	87	72
15	32	50	61	72
16	32	59	60	73
17	36	64	64	65
18	36	--	49	58
19	32	--	71	72
20	40	--	69	75
21	--	--	48	82
22	47	--	69	76
23	33	--	65	73
24	32	--	67	71
25	37	--	68	68
26	36	--	77	65
27	--	--	72	72
28	32	66	73	--
29	32	60	63	--
30	40	52	79	--
31	39	--	64	--
Average	--	--	64	70

Suspended sediment, March to September 1949

Day	March		
	Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day
1-----	--	--	--
2-----	--	--	--
3-----	--	--	--
4-----	--	--	--
5-----	--	--	--
6-----	--	--	--
7-----	--	--	--
8-----	--	--	--
9-----	--	--	--
10-----	--	--	--
11-----	--	--	--
12-----	--	--	--
13-----	--	--	--
14-----	0.1	580	0.2
15-----	.1	260	(1)
16-----	.2	1,150	.6
17-----	.2	2,850	1.5
18-----	.2	2,870	1.5
19-----	.2	1,120	.6
20-----	.2	1,280	.7
21-----	.2	500	.3
22-----	.2	181	(1)
23-----	.2		
24-----	.2		
25-----	.2		
26-----	.2		
27-----	.2		
28-----	.2		
29-----	.2		
30-----	.1		
31-----	.1		
Total-	3.2	--	6.5

(1) Sediment discharge less than 0.1 ton.

YELLOWSTONE RIVER BASIN--Continued

SAND GULCH DRAIN AND WASTEWAY NEAR RIVERTON, WYO.--Continued

Suspended sediment, March to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.1			0.1	510	0.1	4.6	46	0.6
2-----	.1			.1	320	(1)	3.3	47	.4
3-----	.1			.1	316	(1)	2.6	88	.6
4-----	.1			.1	268	(1)	0	--	0
5-----	.1			.1	294	(1)	.8	62	.1
6-----	.1	132	(1)	1.3	330	1.2	1.9	33	.2
7-----	.1			.3	268	.2	1.4	30	.1
8-----	.1			0	--	0	2.5	5,150	35
9-----	.1			0	--	0	2.6	5,800	41
10-----	.1			2.2	286	1.7	1.3	50	.2
11-----	.1			3.7	143	1.4	1.2	39	.1
12-----	0	--	0	2.7	81	.6	1.2	44	.1
13-----	0	--	0	3.3	78	.7	1.3	62	.2
14-----	0	--	0	.5	50	(1)	1.3	62	.2
15-----	0	--	0	.1	48	(1)	1.4	130	.5
16-----	0	--	0	.9	36	(1)	1.3	170	.6
17-----	0	--	0	1.3	58	.2	1.2	380	1.2
18-----	0	--	0	.1	46	(1)	1.3	270	.9
19-----	0	--	0	.8	54	.1	1.3	240	.8
20-----	0	--	0	2.3	50	.3	1.3	280	1.0
21-----	0	--	0	2.6	198	1.4	1.2	149	.5
22-----	0	--	0	2.5	50	.3	3.0	280	2.3
23-----	0	--	0	2.8	92	.7	5.5	276	4.1
24-----	0	--	0	2.6	53	.4	6.3	159	2.7
25-----	0	--	0	2.2	39	.2	5.6	432	6.5
26-----	0	--	0	1.7	44	.2	6.0	311	5.0
27-----	0	--	0	.1	102	(1)	5.9	170	2.7
28-----	.1	278	(1)	.3	106	(1)	5.2	340	4.8
29-----	.1	360	(1)	2.2	38	.2	5.2	922	13
30-----	.1	656	.2	2.0	46	.2	3.7	1,310	13
31-----	--	--	--	2.7	37	.3	--	--	--
Total--	1.4	--	0.8	41.7	--	11.0	81.4	--	138
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	3.1	1,060	8.9	4.9	2,400	32	1.4	1,680	6.4
2-----	2.5	781	5.3	5.1	3,610	50	2.4	1,790	12
3-----	1.4	481	1.8	3.9	2,450	26	3.6	910	8.8
4-----	.2	228	.1	4.9	2,500	33	2.7	770	5.6
5-----	.1	200	(1)	3.6	1,580	15	3.2	2,060	18
6-----	.7	700	1.3	4.0	930	10	.9	620	1.5
7-----	4.6	3,700	46	3.4	900	8.3	2.8	239	1.8
8-----	3.3	580	5.2	5.0	1,210	16	5.7	209	3.2
9-----	2.6	460	3.2	9.6	3,180	82	5.5	130	1.9
10-----	2.5	550	3.7	4.5	8,000	97	4.5	105	1.3
11-----	2.7	--	2/4.0	4.5	5,430	66	4.0	85	.9
12-----	3.0	580	4.7	4.5	2,000	24	2.3	92	.6
13-----	3.2	520	4.5	4.5	1,380	17	4.5	830	10
14-----	3.0	760	6.2	4.5	1,000	12	4.2	1,480	17
15-----	3.0	1,300	11	4.9	1,200	16	3.4	1,430	13
16-----	2.8	1,080	8.2	5.1	2,400	33	3.8	1,370	14
17-----	2.8	1,420	11	5.1	1,990	27	3.3	575	5.1
18-----	2.8	3,620	27	5.1	890	12	3.3	--	2/2.4
19-----	2.5	4,350	29	5.1	950	13	3.4	275	2.5
20-----	2.0	5,030	27	5.3	1,430	20	2.5	300	2.0
21-----	1.8	4,440	22	2.1	4,350	25	1.3	448	1.6
22-----	2.0	2,180	12	.2	1,300	.7	.6	388	.6
23-----	2.1	1,860	11	1.9	880	4.5	.6	340	.6
24-----	2.3	2,160	13	3.7	400	4.0	3.2	168	1.5
25-----	2.9	2,450	19	4.5	770	9.3	3.6	--	2/8
26-----	2.9	1,140	8.9	5.8	1,620	29	4.1	74	.8
27-----	3.4	1,430	13	5.0	1,270	17	3.2	81	.7
28-----	2.8	1,470	11	5.4	1,360	20	2.2	66	.4
29-----	3.9	1,770	19	5.6	1,820	28	.1	56	(1)
30-----	7.5	1,420	29	3.7	2,660	27	2.2	58	.3
31-----	6.0	3,340	54	2.6	980	6.9	--	--	--
Total--	86.4	--	420	138.0	--	781	88.5	--	135

Total discharge for period Mar. 14 to Sept. 30 (second-foot-days)----- 440.6

Total load for period Mar. 14 to Sept. 30 (tons)----- 1,490

(1)Sediment discharge less than 0.1 ton.

2/Estimated.

YELLOWSTONE RIVER BASIN--Continued

LOST WELLS BUTTE DRAIN NEAR RIVERTON, WYO.

LOCATION.--At gaging station 0.1 mile upstream from mouth and 11½ miles north of Riverton, Fremont County.

RECORDS AVAILABLE.--Sediment records: March to September 1949.

EXTREMES, March to September 1949.--Sediment concentrations: Maximum daily, 6,400 ppm

June 3; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 328 tons June 3; minimum daily, 0 tons on several days.

REMARKS.--Records of discharge for period March to September 1949 given in Water-Supply Paper 1146.

Suspended sediment, March to September 1949

Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----							--	--	--
2-----							--	--	--
3-----							--	--	--
4-----							--	--	--
5-----							--	--	--
6-----							--	--	--
7-----							--	--	--
8-----							--	--	--
9-----							--	--	--
10-----							--	--	--
11-----							--	--	--
12-----							--	--	--
13-----							--	--	--
14-----							0.2	110	
15-----							.2	--	
16-----							.2	168	
17-----							.3	--	(1)
18-----							.3	--	
19-----							.2	58	
20-----							.3	--	
21-----							.4	2,400	2.6
22-----							.5	1,000	1.4
23-----							.2	313	.2
24-----							.2	413	.2
25-----							.3	388	.3
26-----							.4	--	2/.3
27-----							.4	--	2/.3
28-----							.5	166	.2
29-----							.2	151	(1)
30-----							.2	172	(1)
31-----							.1	123	(1)
Total-							5.1	--	6.3

(1) Sediment discharge less than 0.1 ton.

2/Estimated.

YELLOWSTONE RIVER BASIN--Continued

LOST WELLS BUTTE DRAIN NEAR RIVERTON, WYO.--Continued

Suspended sediment, March to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.3	360	0.3	0	--	0	3.2	585	5.1
2-----	.7	228	.4	0	--	0	8.8	1,500	36
3-----	.3	289	.2	2.0	--	2/.3	19	6,400	328
4-----	.2			9.0	--	2/10	3.5	2,120	20
5-----	.2			4.1	4,830	53	15	4,890	198
6-----	.2			2.2	--	2/6.0	8.4	3,800	86
7-----	.1			.2	230	.1	5.4	1,820	27
8-----	.2			.2	100	(1)	9.2	1,810	45
9-----	.1			5.9	4,400	70	19	3,210	165
10-----	.2			3.3	3,350	30	21	3,190	181
11-----	.1	122	(1)	3.9	3,170	33	21	3,220	183
12-----	.2			5.2	1,580	22	16	2,200	95
13-----	.1			2.7	2,090	15	19	2,620	134
14-----	.2			5.4	1,980	29	7.4	1,630	33
15-----	.1			4.8	1,860	24	4.0	1,520	16
16-----	.1			7.2	2,370	46	8.1	1,910	42
17-----	.1			14	3,140	119	9.0	2,340	57
18-----	.1			7.0	1,620	31	11	1,010	30
19-----	0	--	0	3.7	910	9.1	13	1,250	44
20-----	0	--	0	5.5	1,140	17	9.0	1,360	33
21-----	0	--	0	13	2,350	82	4.8	725	9.4
22-----	0	--	0	13	2,380	84	5.0	730	9.9
23-----	0	--	0	13	2,690	94	4.6	854	11
24-----	0	--	0	14	1,970	74	5.6	653	9.9
25-----	0	--	0	14	1,640	62	6.0	1,150	19
26-----	0	--	0	11	--	2/36	8.6	1,170	27
27-----	0	--	0	6.2	850	14	10	600	16
28-----	0	--	0	4.3	420	4.9	8.6	533	12
29-----	0	--	0	3.3	310	2.8	8.8	630	15
30-----	0	--	0	1.1	120	.4	6.3	458	7.8
31-----	--	--	--	1.2	150	.5	--	--	--
Total--	3.5	--	1.4	180.4	--	969	298.3	--	1,900
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	5.9	702	11	8.8	1,430	34	5.4	578	8.4
2-----	3.4	579	5.3	7.0	1,040	20	5.6	720	11
3-----	.5	128	.2	7.4	853	17	10	578	16
4-----	.2	52	(1)	8.8	1,120	27	9.5	323	8.3
5-----	.1	41	(1)	11	1,230	37	10	233	6.3
6-----	1.6	210	.9	15	1,180	48	15	710	29
7-----	8.8	655	16	14	1,180	45	12	988	32
8-----	1.9	820	4.2	12	1,320	43	10	767	21
9-----	1.8	1,490	7.2	7.9	1,240	26	9.9	900	24
10-----	2.7	1,140	8.3	5.6	1,010	15	12	928	30
11-----	2.8	--	2/6.0	6.7	542	9.8	14	337	13
12-----	7.2	835	16	8.1	539	12	11	420	12
13-----	7.0	1,120	21	11	717	21	8.3	259	5.8
14-----	2.6	800	5.6	14	820	31	7.0	495	9.4
15-----	2.7	979	7.1	12	819	27	7.0	575	11
16-----	2.1	427	2.4	8.3	630	14	6.0	540	8.8
17-----	2.2	433	2.6	6.9	514	9.6	7.4	494	9.9
18-----	2.2	415	2.5	3.4	1,110	10	8.6	--	2/11
19-----	1.1	262	.8	8.3	1,310	29	8.6	417	9.7
20-----	1.2	454	1.5	9.3	1,210	30	7.6	214	4.4
21-----	4.0	590	6.4	11	975	29	7.7	208	4.3
22-----	3.7	1,780	18	9.5	1,090	28	9.2	194	4.8
23-----	4.3	1,060	12	8.8	703	17	8.4	183	4.2
24-----	4.4	700	8.3	9.0	835	20	10	164	4.4
25-----	5.0	690	9.3	8.4	762	17	10	--	2/5.0
26-----	5.0	555	7.5	4.3	693	8.0	9.5	252	6.5
27-----	8.6	1,160	27	4.0	597	6.5	7.2	202	3.9
28-----	12	1,470	48	4.6	619	7.7	7.0	143	2.7
29-----	13	1,380	48	6.4	788	14	6.9	163	3.0
30-----	13	1,970	69	4.7	999	13	6.7	132	2.4
31-----	9.0	1,820	44	5.8	740	12	--	--	--
Total--	140.0	--	416	262.0	--	678	267.5	--	322

Total discharge for period Mar. 14 to Sept. 30 (second-foot-days) ----- 1,156.8

Total load for period Mar. 14 to Sept. 30 (tons) ----- 4,290

(1) Sediment discharge less than 0.1 ton.

2/ Estimated.

YELLOWSTONE RIVER BASIN--Continued

COLEMAN DRAIN NEAR SHOSHONI, WYO.

LOCATION.--At gaging station 0.1 mile upstream from mouth and 11½ miles southwest of Shoshoni, Fremont County.

RECORDS AVAILABLE.--Water temperatures: December 1948 to June 1949.

Sediment records: December 1948 to September 1949.

EXTREMES, December 1948 to September 1949.--Water temperatures (December 1948 to June 1949):

Minimum, freezing point on many days in December, January, and February.

Sediment concentrations: Maximum daily, 3,520 ppm Sept. 13; minimum daily, 26 ppm Feb. 26.

Sediment loads: Maximum daily, 105 tons July 29; minimum daily, 0.1 ton on several days.

REMARKS.--Records of discharge for period December 1948 to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, December 1948 to June 1949
/Once-daily temperature measurement between 10 a. m. and 2 p. m. 7

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			--	--	32	37	40	59	56			
2			--	--	32	38	--	68	53			
3			--	32	--	40	61	71	55			
4			--	32	--	37	53	63	54			
5			--	--	--	--	56	44	81			
6			--	32	--	47	--	47	65			
7			--	--	33	38	46	58	72			
8			--	--	33	40	56	69	72			
9			--	--	33	38	52	69	76			
10			--	--	34	36	63	61	--			
11			--	32	34	37	55	61	66			
12			--	32	32	46	58	75	70			
13			--	32	--	54	49	65	67			
14			--	32	32	34	50	62	66			
15			33	--	34	34	54	--	68			
16			32	--	39	39	58	--	69			
17			35	--	34	44	65	--	62			
18			--	32	--	41	60	--	56			
19			--	32	34	--	50	68	73			
20			37	32	--	54	49	59	73			
21			32	--	36	49	53	--	72			
22			32	--	35	47	58	--	72			
23			32	--	35	34	56	66	64			
24			32	--	34	36	66	76	72			
25			--	32	44	39	59	76	63			
26			--	--	36	37	62	--	63			
27			32	--	48	--	65	60	74			
28			32	--	37	38	68	64	--			
29			32	--	--	--	64	61	--			
30			32	--	--	37	58	69	--			
31			32	32	--	36	--	65	--			
Average			--	--	--	40	57	--	67			

YELLOWSTONE RIVER BASIN--Continued

COLEMAN DRAIN NEAR SHOSHONI, WYO.--Continued

Suspended sediment, December 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----							--	--	--
2-----							--	--	--
3-----							--	--	--
4-----							--	--	--
5-----							--	--	--
6-----							--	--	--
7-----							--	--	--
8-----							--	--	--
9-----							--	--	--
10-----							--	--	--
11-----							--	--	--
12-----							--	--	--
13-----							--	--	--
14-----							--	--	--
15-----							2.4	105	0.7
16-----							2.4	150	1.0
17-----							2.3	200	1.2
18-----							2.3	--	1/1.1
19-----							2.3	--	1/1.1
20-----							2.4	165	1.1
21-----							2.3	130	.8
22-----							2.4	245	1.6
23-----							2.5	190	1.3
24-----							2.1	125	.7
25-----							2.1	--	1/.6
26-----							2.1	--	1/.5
27-----							2.2	108	.6
28-----							2.3	110	.7
29-----							2.2	75	.4
30-----							2.1	69	.4
31-----							2.3	80	.5
Total-----							38.7	--	14.3
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2.2	--		2.4	86	0.6	1.6	81	0.3
2-----	2.1	--		2.4	73	.5	2.1	75	.4
3-----	2.1	86		2.3	--	1/.4	2.1	74	.4
4-----	2.1	74		2.3	--	1/.4	1.8	64	.3
5-----	2.0	--		2.3	--	1/.4	1.8	--	1/.3
6-----	2.0	43	1/0.4	2.4	--	1/.5	1.8	94	.5
7-----	2.0	--		2.4	71	.5	1.7	85	.4
8-----	2.1	--		2.4	70	.5	1.7	60	.3
9-----	2.1	--		2.3	100	.6	1.5	64	.3
10-----	2.1	--		2.3	105	.7	1.5	70	.3
11-----	2.3	91	.6	2.3	80	.5	1.2	75	.2
12-----	2.4	100	.6	2.4	92	.6	1.3	66	.2
13-----	2.3	78	.5	2.4	--	1/.5	1.3	60	.2
14-----	2.4	78	.5	2.4	61	.4	1.5	74	.3
15-----	2.4	--	1/.5	2.4	53	.3	1.5	59	.2
16-----	2.4	--	1/.4	2.3	43	.3	1.5	63	.3
17-----	2.4	--	1/.4	2.3	82	.5	1.6	70	.3
18-----	2.3	52	.3	2.3	--	1/.4	1.6	51	.2
19-----	2.3	70	.4	2.4	67	.4	1.6	--	1/.2
20-----	2.3	96	.6	2.3	--	1/.4	1.7	78	.4
21-----	2.3	--		2.3	60	.4	1.5	51	.2
22-----	2.3	--		2.0	45	.2	1.5	76	.3
23-----	2.3	--		2.3	35	.2	1.7	72	.3
24-----	2.3	--		2.0	42	.2	1.7	72	.3
25-----	2.3	53		2.3	41	.3	1.7	95	.4
26-----	2.2	--	1/.4	2.0	26	.1	1.7	92	.4
27-----	2.2	--		2.4	43	.3	1.6	--	1/.4
28-----	2.2	--		2.1	65	.4	1.6	90	.4
29-----	2.2	--		--	--	--	1.5	74	.3
30-----	2.3	--		--	--	--	1.8	67	.3
31-----	2.4	64		--	--	--	1.7	58	.3
Total-----	69.3	--	13.2	64.4	--	11.5	50.4	--	9.6

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

COLEMAN DRAIN NEAR SHOSHONI, WYO.--Continued

Suspended sediment, December 1948 to September 1949--Continued

Day	April			May			June		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1.7	56	0.3	1.6	74	0.3	4.5	65	0.8
2-----	1.7	49	.2	1.6	65	.3	6.3	308	5.2
3-----	1.7	52	.2	1.6	58	.3	3.9	150	1.6
4-----	1.6	62	.3	1.6	70	.3	2.7	65	.5
5-----	1.6	69	.3	1.7	54	.2	2.5	53	.4
6-----	1.6	56	.2	1.7	32	.1	3.0	47	.4
7-----	1.6	40	.2	1.7	30	.1	3.0	57	.5
8-----	1.6	43	.2	1.6	44	.2	2.7	53	.4
9-----	1.6	35	.2	1.6	51	.2	2.5	47	.3
10-----	1.7	50	.2	1.7	100	.5	2.1	32	.2
11-----	2.0	53	.3	1.7	128	.6	2.0	38	.2
12-----	1.8	54	.3	2.3	128	.8	2.0	34	.2
13-----	1.7	55	.3	2.8	185	1.4	2.1	34	.2
14-----	2.0	51	.3	7.0	540	10	3.0	43	.3
15-----	2.0	42	.2	7.0	460	8.7	4.5	82	1.0
16-----	2.0	37	.2	8.1	528	12	8.9	225	5.4
17-----	1.6	43	.2	6.6	354	6.3	11	385	11
18-----	1.7	46	.2	5.1	180	2.5	16	570	25
19-----	1.7	33	.2	4.5	182	2.2	18	980	48
20-----	1.6	33	.1	3.0	195	1.6	17	858	39
21-----	1.7	66	.3	3.0	200	1.6	16	950	41
22-----	1.7	55	.3	2.4	105	.7	14	930	35
23-----	1.5	74	.3	3.0	105	.9	12	905	29
24-----	1.5	60	.2	6.6	220	3.9	12	1,030	33
25-----	1.5	55	.2	7.4	242	4.8	14	1,240	47
26-----	1.5	49	.2	7.0	--	1/3.2	16	1,270	55
27-----	1.5	62	.3	4.3	110	1.3	15	1,220	49
28-----	1.6	71	.3	3.4	90	.8	14	1,270	48
29-----	1.5	94	.4	4.5	100	1.2	14	1,170	44
30-----	1.5	64	.3	3.7	68	.7	15	1,060	43
31-----	--	--	--	3.0	76	.6	--	--	--
Total-	50.2	--	7.4	112.8	--	68.3	259.7	--	565
Day	July			August			September		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	16	1,120	48	18	1,650	80	14	605	23
2-----	19	1,400	72	17	1,340	62	14	760	29
3-----	12	1,000	32	17	1,520	70	16	903	39
4-----	8.1	625	14	18	1,860	90	14	702	27
5-----	6.6	605	11	18	1,660	81	15	585	24
6-----	4.2	535	6.1	17	1,630	75	14	480	18
7-----	13	1,330	47	17	1,530	70	12	405	13
8-----	15	1,500	61	17	1,790	82	11	385	11
9-----	11	1,180	35	18	1,750	85	11	340	10
10-----	12	1,020	33	18	1,710	83	11	310	9.2
11-----	13	--	1/36	19	1,610	83	10	295	8.0
12-----	12	925	30	18	1,420	69	10	245	6.6
13-----	10	980	26	18	1,580	77	10	3,520	95
14-----	10	1,070	29	20	1,440	78	11	1,170	35
15-----	12	1,100	36	19	1,510	77	11	1,220	36
16-----	14	1,180	45	20	1,620	87	10	1,260	34
17-----	14	950	36	20	1,380	75	8.9	1,030	25
18-----	14	930	35	19	1,310	67	9.2	--	1/20
19-----	14	900	34	19	1,150	59	8.1	675	15
20-----	15	1,000	40	18	1,040	51	8.9	645	16
21-----	16	1,000	43	19	1,050	54	8.5	475	11
22-----	16	1,020	44	18	1,110	54	8.5	448	10
23-----	17	1,150	53	17	1,010	46	7.8	360	7.6
24-----	17	1,570	72	16	870	38	8.1	--	1/7.5
25-----	18	1,630	79	17	805	37	7.4	--	1/6.5
26-----	17	1,850	85	15	682	28	7.0	278	5.3
27-----	20	1,680	91	17	772	35	6.6	205	3.7
28-----	18	1,740	85	16	750	32	8.1	270	5.9
29-----	22	1,770	105	16	708	31	8.1	240	5.2
30-----	22	1,640	97	16	720	31	8.5	275	6.3
31-----	19	1,600	82	14	635	24	--	--	--
Total-	446.9	--	1,540	546	--	1,910	307.7	--	563
Total discharge for period Dec. 15 to Sept. 30 (second-foot-days) -----									
									1,946.1
Total load for period Dec. 15 to Sept. 30 (tons) -----									
									4,700

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

SAND GULCH NEAR SHOSHONI, WYO.

LOCATION.--At gaging station half a mile upstream from mouth and 10½ miles southwest of Shoshoni, Fremont County.

RECORDS AVAILABLE.--Water temperatures: December 1948 to September 1949.

Sediment records: September 1948 to September 1949.

EXTREMES, 1948-49.--Water temperatures (December 1948 to July 1949): Minimum, freezing point on many days in December, January, and February.

Sediment concentrations: Maximum daily, 5,880 ppm Aug. 10; minimum daily, not determined.

Sediment loads: Maximum daily, 797 tons May 4; minimum daily, 1 ton on many days.

REMARKS.--Records of discharge for period September 1948 to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, December 1948 to September 1949
/Once-daily temperature measurement between 9 a. m. and 3 p. m. 7

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			--	--	--	40	35	61	57	66	--	--
2			--	--	--	--	34	70	53	--	--	--
3			--	32	--	38	59	73	56	--	--	--
4			--	32	--	41	50	59	54	--	--	--
5			--	--	--	--	57	--	77	72	--	--
6			--	32	--	47	49	45	66	68	--	--
7			--	--	--	43	44	55	76	70	--	--
8			--	--	--	39	57	64	75	80	--	--
9			--	--	--	47	51	68	76	65	--	--
10			--	--	--	37	64	63	72	65	--	--
11			--	32	--	45	54	70	66	--	72	--
12			--	32	--	40	59	76	89	--	71	52
13			--	32	--	50	--	77	68	--	--	--
14			--	32	--	34	48	61	59	76	--	--
15			32	--	--	36	42	58	68	--	--	--
16			32	--	--	36	59	60	68	76	--	--
17			32	--	--	38	66	61	85	--	--	--
18			--	32	--	41	60	49	57	--	--	--
19			--	32	--	35	52	71	73	--	--	--
20			32	32	--	52	47	64	73	--	--	--
21			32	--	33	47	50	53	72	--	--	--
22			32	--	32	38	56	--	72	--	--	--
23			32	--	33	33	68	68	65	--	--	--
24			32	--	34	36	68	69	72	--	--	--
25			--	--	34	--	62	73	65	--	--	--
26		--	--	--	34	34	63	--	66	--	--	62
27		32	--	--	35	52	63	63	72	59	--	--
28		32	--	--	37	34	71	64	--	68	--	--
29		32	--	--	--	--	68	62	69	66	62	--
30		32	--	--	--	39	60	72	71	--	70	--
31		32	--	--	--	--	--	67	--	--	60	--
Average			--	--	--	40	56	64	67	--	--	--

YELLOWSTONE RIVER BASIN--Continued

SAND GULCH NEAR SHOSHONI, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	32	--	1/18	8.2	--	1/1	7.0	--	1/1
2-----	37			8.2			7.0	56	1
3-----	39			8.2			7.0		
4-----	45	--	1/36	8.5	58	1	7.0		
5-----	47			7.9			7.0		
6-----	47			7.9	57	1	6.0		
7-----	46	--	1/20	8.5	123	3	6.0	--	1/1
8-----	36			8.2			6.0		
9-----	26			8.0	86	2	6.0		
10-----	23	320	22	7.6	58	1	6.0		
11-----	26			7.6	50	1	6.0		
12-----	21	124	7	7.6	37	1	6.0		
13-----	14	--	1/2	7.6	--	1/1	6.0		
14-----	12			7.6	--	1/1	6.0		
15-----	12			7.6	--	1/1	6.0	107	2
16-----	10	9.8	1/1	7.3	51	1	6.0	112	2
17-----	9.8			7.6	57	1	6.0	99	2
18-----	9.2			7.6			6.0	--	1/2
19-----	8.8	21	1	7.6			6.0	--	1/2
20-----	8.5			7.9			6.0	87	1
21-----	8.5			7.3			6.0	74	1
22-----	8.5	--	1/1	7.3	--	1/1	6.0	54	1
23-----	8.5			7.3			6.0	39	1
24-----	8.2			7.3			6.0	68	1
25-----	8.2	40	1	7.3			6.0	--	1/1
26-----	8.2			7.3			6.0	--	1/1
27-----	8.2			7.3			6.0	67	1
28-----	8.2	--	1/1	7.3			5.0	98	1
29-----	7.9	58	1	7.0			5.0	74	1
30-----	7.9	--	1/1	7.0			5.0	69	1
31-----	7.9	--	1/1	--	--	--	5.0	73	1
Total-	599.5	--	310	229.6	--	33	187.0	--	36
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	5.0	--	1/1	5.0	--	1/2	5.0	229	3
2-----	5.0	--	1/1	5.0			6.8	228	4
3-----	5.0	66	1	5.0			4.0	203	2
4-----	5.0	68	1	5.0	58	2	5.3	254	4
5-----	5.0	--	1/1	5.0			5.6	--	1/4
6-----	5.0	78	1	5.0			5.3	236	3
7-----	5.0	--	1/1	5.0	143	2	5.3	246	4
8-----	5.0	--	1/1	5.0			5.0	205	3
9-----	5.0	--	1/1	5.0			5.0	203	3
10-----	5.0	--	1/1	5.0	212	3	4.8	201	3
11-----	5.0	122	2	5.0			4.8	195	3
12-----	5.0	124	2	5.0			4.8	228	3
13-----	5.0	121	2	5.0	238	3	4.8	237	3
14-----	5.0	122	2	4.5			4.8	268	4
15-----	5.0	--	1/1	4.5			6.0	600	10
16-----	5.0	--	1/1	4.5	185	2	4.4	273	3
17-----	5.0	--	1/1	5.0			4.2	242	3
18-----	5.0	72	1	5.0			4.6	233	3
19-----	5.0	81	1	5.0	175	2	4.6	198	3
20-----	5.0	108	1	5.0			5.0	288	4
21-----	5.0	--	1/1	5.0			5.3	257	4
22-----	5.0			5.0	182	3	5.8	305	5
23-----	5.0			5.0	238	3	5.3	188	3
24-----	5.0	--	1/2	5.0	212	3	6.0	300	5
25-----	5.0			4.6	185	2	5.8	310	5
26-----	5.0			5.0	175	2	5.3	280	4
27-----	5.0	--	1/2	6.8	308	6	5.6	--	1/5
28-----	5.0			3.8	236	2	5.0	250	3
29-----	5.0			--	--	--	4.6	177	2
30-----	5.0	--	1/1	--	--	--	4.6	200	3
31-----	5.0			--	--	--	4.2	178	2
Total-	155.0	--	41	138.7	--	63	157.6	--	113

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

SAND GULCH NEAR SHOSHONI, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	4.2	166	2	6.3	116	2	20	610	33
2-----	4.4	170	2	6.8	87	2	31	1,050	88
3-----	4.6	192	2	7.0	90	2	49	2,080	2/358
4-----	4.8	208	3	50	5,450	2/797	9.7	140	4
5-----	4.8	175	2	46	--	1/400	8.8	72	2
6-----	4.8	191	3	54	3,650	532	9.5	83	2
7-----	4.8	164	2	41	2,830	313	10	88	2
8-----	4.8	150	2	52	2,060	289	14	344	13
9-----	4.8	146	2	40	1,170	126	17	379	17
10-----	4.6	136	2	16	420	18	16	225	10
11-----	4.6	106	1	16	580	25	40	894	2/288
12-----	4.6	135	2	23	850	53	63	2,220	2/430
13-----	4.6	133	2	45	1,140	139	39	1,540	162
14-----	5.0	128	2	43	1,150	134	27	1,460	106
15-----	4.8	132	2	43	1,070	124	45	2,690	327
16-----	4.8	98	1	41	1,180	131	48	2,100	272
17-----	4.6	76	1	37	865	86	38	1,450	149
18-----	4.6	101	1	26	584	41	47	1,900	241
19-----	4.8	94	1	21	245	14	57	2,180	336
20-----	4.8	70	1	24	340	22	57	1,930	297
21-----	4.8	88	1	38	748	77	56	1,420	215
22-----	4.0	84	1	37	562	56	53	1,380	197
23-----	4.2	64	1	37	910	91	41	1,070	118
24-----	4.4	66	1	49	728	96	40	840	91
25-----	4.6	60	1	39	450	47	43	760	88
26-----	4.8	52	1	43	--	1/55	45	812	99
27-----	4.8	45	1	53	395	57	41	570	63
28-----	5.0	45	1	33	253	23	37	707	71
29-----	5.3	43	1	27	242	16	42	790	90
30-----	6.6	150	3	32	280	24	43	807	94
31-----	--	--	--	23	338	21	--	--	--
Total-	142.3	--	48	1,049.1	--	3,820	1,087.0	--	4,260
Day	July			August			September		
	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	46	1,340	166	34	1,120	103	39	395	42
2-----	40	1,200	130	32	1,460	126	30	250	20
3-----	13	298	10	31	1,560	131	37	400	40
4-----	8.8	114	3	35	1,330	126	39	310	33
5-----	7.9	80	2	39	1,360	143	41	335	37
6-----	8.8	260	6	43	1,320	153	48	575	75
7-----	41	2,280	252	47	1,660	211	56	910	138
8-----	28	708	54	43	2,750	319	57	1,530	235
9-----	18	300	15	47	4,140	525	53	860	123
10-----	27	740	54	48	5,880	762	47	331	42
11-----	28	--	1/100	47	3,470	440	36	178	17
12-----	42	2,020	229	52	1,930	271	32	170	15
13-----	47	1,720	218	45	1,470	179	22	111	7
14-----	43	1,620	188	43	1,450	168	22	100	6
15-----	43	1,650	192	40	1,140	123	22	122	7
16-----	41	1,170	130	35	770	73	23	113	7
17-----	37	920	92	38	808	83	23	99	6
18-----	36	1,000	97	42	1,080	122	24	--	1/7
19-----	35	885	84	46	882	110	28	112	8
20-----	33	1,010	90	63	1,670	284	29	108	8
21-----	35	--	1/140	70	1,760	333	27	79	6
22-----	34	1,000	92	69	1,730	322	24	78	5
23-----	33	1,020	91	65	1,460	256	24	71	5
24-----	34	978	90	48	855	111	22	--	1/4
25-----	36	1,040	101	45	708	86	20	77	4
26-----	37	915	91	42	650	74	19	60	3
27-----	35	890	84	42	628	71	30	290	23
28-----	34	1,100	101	46	622	77	46	361	45
29-----	38	1,080	111	45	545	66	46	247	31
30-----	35	1,110	105	43	525	61	58	385	60
31-----	34	1,040	93	43	558	65	--	--	--
Total-	1,008.5	--	3,210	1,408	--	5,970	1,024	--	1,060

Total discharge for year (second-foot-days) ----- 7,186.3
 Total load for year (tons) ----- 18,960

1/Estimated.

2/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

SAND GULCH NEAR SHOSHONI, WYO.--Continued

Periodic determinations of suspended-sediment discharge, September 1948

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)
Sept. 1, 1948 -----	54	684	100
Sept. 6 -----	48	552	72
Sept. 9 -----	37	380	38
Sept. 14 -----	42	376	43
Sept. 18 -----	37	264	26
Sept. 25 -----	42	218	25
Sept. 28 -----	28	84	6
Sept. 29 -----	31	106	9

YELLOWSTONE RIVER BASIN--Continued

EAGLE DRAIN NEAR SHOSHONI, WYO.

LOCATION.--At gaging station 0.1 mile upstream from mouth and 7 miles west of Shoshoni, Fremont County.

RECORDS AVAILABLE.--Water temperatures: December 1948 to June 1949.

Sediment records: December 1948 to September 1949.

EXTREMES, December 1948 to September 1949.--Water temperatures (December 1948 to June 1949):

Minimum, freezing point on many days in December, January, and February.

Sediment concentrations: Maximum daily, 2,800 ppm Aug. 9; minimum daily, 20 ppm Feb. 10.

Sediment loads: Maximum daily, 219 tons Aug. 9; minimum daily, 0.1 ton Feb. 9, 10, 15,

June 11.

REMARKS.--Records of discharge for period December 1948 to September 1949 given in

Water-Supply Paper 1146.

Temperature (°F) of water, water year October 1948 to September 1949

(Once-daily temperature measurement between 9 a. m. and 2 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			--	--	32	40	37	59	58			
2			--	--	32	44	36	63	--			
3			--	32	--	40	54	69	56			
4			--	32	--	40	43	56	57			
5			--	--	--	--	--	43	58			
6			--	32	--	47	--	44	57			
7			--	--	34	38	43	52	63			
8			--	--	35	40	55	67	69			
9			--	--	37	38	49	71	72			
10			--	--	38	40	48	58	72	72		
11			--	32	37	37	53	69	64			
12			--	32	32	44	50	77	62			
13			--	32	--	47	50	63	59			
14			--	32	34	--	50	--	56			
15			35	--	35	36	42	--	66			
16			35	--	36	36	56	56	65			
17			32	--	35	51	59	56	66			
18			--	32	--	46	59	50	56			
19			--	32	35	38	46	70	72			
20			36	32	--	43	47	59	70			
21			34	--	36	47	44	52	78			
22			34	--	36	44	47	67	72			
23			32	--	38	35	48	66	60			
24			32	--	35	36	61	71	72			
25			--	32	43	36	57	72	60			
26			--	--	37	37	58	76	63			
27			32	--	43	49	55	70	75			
28			32	--	40	36	--	64	--			
29			32	--	--	--	--	69	--			
30			32	--	--	38	59	61	--			
31			32	32	--	37	--	68	--			
Average			--	--	--	41	50	63	65			

YELLOWSTONE RIVER BASIN--Continued

EAGLE DRAIN NEAR SHOSHONI, WYO.--Continued

Suspended sediment, December 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----							--	--	--
2-----							--	--	--
3-----							--	--	--
4-----							--	--	--
5-----							--	--	--
6-----							--	--	--
7-----							--	--	--
8-----							--	--	--
9-----							--	--	--
10-----							--	--	--
11-----							--	--	--
12-----							--	--	--
13-----							--	--	--
14-----							--	--	--
15-----							2.6	215	1.5
16-----							2.8	154	1.2
17-----							2.5	131	.9
18-----							2.5	--	1/8
19-----							2.6	--	1/8
20-----							2.6	127	.9
21-----							2.5	117	.8
22-----							2.0	78	.4
23-----							2.5	68	.5
24-----							2.3	136	.8
25-----							2.2	--	1/6
26-----							2.1	--	1/6
27-----							2.0	85	.5
28-----							2.0	64	.3
29-----							1.9	71	.4
30-----							1.9	60	.3
31-----							2.0	62	.3
Total-							39.0	--	11.6
Day	January			February			March		
	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	2.0	--		2.3	32		2.1	246	1.4
2-----	2.1	--		2.6	27		2.1	226	1.3
3-----	2.1	77		2.6	--		2.1	250	1.4
4-----	2.1	59		2.6	--	1/0.2	2.3	230	1.4
5-----	2.1	--		2.6	--		2.4	--	1/1.4
6-----	2.1	43	1/0.3	2.6	--		2.5	274	1.6
7-----	2.2	--		2.6	28	.2	2.6	317	2.2
8-----	2.3	--		2.3	33	.2	2.5	337	2.3
9-----	2.4	--		2.3	22	.1	2.5	330	2.2
10-----	2.5	--		2.5	20	.1	2.5	243	1.6
11-----	2.6	64	.4	2.3	33	.2	2.5	246	1.7
12-----	2.8	64	.5	2.3	42	.3	2.5	230	1.4
13-----	2.8	49	.4	2.2	--	1/3	2.3	262	1.6
14-----	2.8	70	.5	2.1	35	.2	2.4	--	1/1.7
15-----	2.8	--	1/3	2.0	27	.1	2.6	260	1.8
16-----	2.8	--	1/3	1.9	30	.2	2.3	260	1.6
17-----	2.8	--	1/3	1.9	56	.3	2.3	232	1.4
18-----	2.8	32	.2	2.0	50	.3	2.3	211	1.3
19-----	2.8	42	.3	2.0	97	.5	2.3	211	1.3
20-----	2.8	59	.4	2.0	--	1/7	2.6	297	2.1
21-----	2.8	--		1.9	124	.6	2.6	221	1.6
22-----	2.7	--		2.0	126	.7	2.5	217	1.5
23-----	2.6	--		2.1	152	.9	2.8	210	1.6
24-----	2.5	--		2.0	160	.9	2.5	164	1.1
25-----	2.5	60		2.3	160	1.0	2.8	250	1.9
26-----	2.5	--	1/4	2.1	128	.7	2.8	257	1.9
27-----	2.5	--		2.1	135	.8	2.5	231	1.6
28-----	2.6	--		2.1	197	1.1	2.5	162	1.1
29-----	2.6	--		--	--	--	2.3	172	1.1
30-----	2.6	--		--	--	--	2.3	197	1.2
31-----	2.6	37		--	--	--	2.2	191	1.1
Total-	78.2	--	11.0	62.3	--	11.6	75.3	--	48.6

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

EAGLE DRAIN NEAR SHOSHONI, WYO.--Continued

Suspended sediment, December 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2.2	184	1.1	2.3	58	0.4	9.4	840	21
2-----	2.2	166	1.0	2.2	49	.3	16	1,500	65
3-----	2.1	199	1.1	2.2	41	.2	9.4	385	9.8
4-----	2.0	178	1.0	2.2	39	.2	2.8	173	1.3
5-----	2.0	158	.9	2.2	50	.3	2.3	78	.5
6-----	2.2	109	.6	5.4	326	4.6	3.0	44	.4
7-----	2.2	94	.6	10	539	15	2.9	69	.5
8-----	2.2	106	.6	7.1	223	4.3	2.5	43	.3
9-----	2.2	92	.5	5.3	129	1.8	2.3	39	.2
10-----	2.2	117	.7	7.5	134	2.7	2.2	32	.2
11-----	2.3	97	.6	7.1	116	2.2	2.0	27	.1
12-----	2.3	120	.7	6.4	121	2.1	3.0	176	1.4
13-----	2.5	182	1.2	5.8	124	1.9	9.7	173	4.5
14-----	2.3	156	1.0	3.9	111	1.2	12	150	4.9
15-----	2.3	135	.8	4.2	123	1.4	13	330	12
16-----	2.3	156	1.0	5.8	109	1.7	14	1,040	39
17-----	2.2	129	.8	7.5	120	2.4	18	640	31
18-----	2.3	110	.7	9.4	365	9.3	20	1,210	65
19-----	2.3	64	.4	12	296	9.6	20	1,010	55
20-----	2.3	57	.4	9.0	250	6.1	16	809	35
21-----	2.2	74	.4	14	231	8.8	14	972	37
22-----	2.2	53	.3	12	260	8.4	14	1,000	38
23-----	2.2	66	.4	10	318	8.6	14	1,240	47
24-----	2.1	77	.4	9.7	542	14	14	1,260	48
25-----	2.2	49	.3	9.4	985	25	13	1,060	37
26-----	2.2	59	.4	7.9	677	14	16	1,040	45
27-----	2.2	50	.3	6.8	329	6.0	16	840	36
28-----	2.2	--	1/3	6.8	259	4.8	19	991	51
29-----	2.2	--	1/3	9.0	280	6.8	21	950	54
30-----	2.3	89	.6	7.9	165	3.5	21	1,130	67
31-----	--	--	--	6.8	162	3.0	--	--	--
Total--	66.6	--	19.4	217.8	--	171	342.5	--	807
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	21	1,760	100	27	1,760	128	14	1,330	50
2-----	25	1,970	133	29	1,930	151	12	1,620	52
3-----	12	1,120	36	27	1,850	135	14	1,520	57
4-----	2.6	630	4.4	25	1,980	134	15	1,470	60
5-----	2.6	250	1.8	23	1,500	93	16	1,320	57
6-----	2.5	160	1.1	23	1,410	88	16	1,330	57
7-----	20	1,970	106	23	1,580	98	16	1,400	60
8-----	24	2,540	165	27	1,800	131	16	1,700	73
9-----	17	2,090	96	29	2,800	219	14	850	32
10-----	11	1,420	42	29	2,390	187	9.7	1,170	31
11-----	9.0	1,230	30	28	2,190	166	6.4	1,020	18
12-----	12	1,800	58	25	2,080	140	7.4	1,020	20
13-----	13	1,020	36	26	2,200	154	8.4	1,040	24
14-----	16	1,130	49	25	2,180	147	9.4	736	19
15-----	19	1,770	91	27	2,350	171	7.9	547	12
16-----	21	1,660	94	27	2,180	159	8.6	436	10
17-----	20	1,540	83	30	2,040	165	9.0	423	10
18-----	24	1,840	119	28	2,270	172	7.1	--	1/10
19-----	25	1,740	117	25	1,570	106	5.8	599	9.4
20-----	25	2,200	148	27	1,500	109	5.3	632	9.0
21-----	24	2,280	148	29	1,320	103	5.8	608	9.5
22-----	27	1,830	133	29	1,590	109	7.1	577	11
23-----	29	1,840	144	27	1,280	93	5.8	824	13
24-----	26	1,660	117	26	1,320	83	5.8	--	1/9.5
25-----	24	1,590	103	20	1,390	75	7.9	--	1/12
26-----	25	1,630	110	18	1,380	67	7.1	419	8.0
27-----	26	1,940	136	18	1,160	56	7.9	400	8.5
28-----	28	2,100	159	21	1,080	61	6.4	280	4.8
29-----	28	1,520	115	19	880	45	8.2	430	9.5
30-----	27	1,580	115	16	880	38	7.9	360	7.7
31-----	26	1,650	116	14	1,270	48	--	--	--
Total--	611.7	--	2,910	767	--	3,640	287.9	--	764

Total discharge for period Dec. 15 to Sept. 30 (second-foot-days) ----- 2,548.3

Total load for period Dec. 15 to Sept. 30 (tons)----- 8,390

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

EAGLE DRAIN NEAR SHOSHONI, WYO.--Continued

Particle-size analyses of suspended sediment, August to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	
Aug. 25, 1949	1:00 p. m.	18	1,610	1,310	10	15	18	37	42	60	73	98	99		BW
Sept. 1	1:50 p. m.	15	1,160	799		20	27	36	47	66	84	98	--		BW
Sept. 14	3:00 p. m.	9.0	630	506		19	26	32	38	54	74	94	99		BW

MISSOURI RIVER BASIN

YELLOWSTONE RIVER BASIN--Continued

LATERAL P-34.9 WASTEWAY NEAR SHOSHONI, WYO.

LOCATION.--At gaging station 0.1 mile upstream from mouth and 5½ miles west of Shoshoni, Fremont County.

RECORDS AVAILABLE.--Sediment records: May to September 1949.

EXTREMES, May to September 1949.--Sediment concentrations: Maximum daily, 1,100 ppm July 10; minimum daily, no flow on many days.

REMARKS.--Records of discharge for period May to September 1949 given in Water-Supply Paper 1146:

Suspended sediment, May to September 1949

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----				0	--	0	2.2	30	0.2
2-----				0	--	0	4.1	175	1.9
3-----				0	--	0	6.9	122	2.3
4-----				0	--	0	.3	--	(1)
5-----				2.0	--	2.5	0	--	0
6-----				5.8	344	5.4	0	--	0
7-----				6.9	270	5.0	0	--	0
8-----				6.7	180	3.3	0	--	0
9-----				4.3	83	1.0	0	--	0
10-----				7.6	255	5.2	0	--	0
11-----				6.4	210	3.6	0	--	0
12-----				7.8	227	4.8	3.2	--	2.8
13-----				7.1	205	3.9	6.0	196	3.2
14-----				5.8	154	2.4	3.5	138	1.3
15-----				6.2	138	2.3	2.5	255	1.7
16-----				8.0	153	3.3	1.3	185	.6
17-----				7.8	128	2.7	1.4	220	.8
18-----				5.5	105	1.6	3.4	295	2.7
19-----				2.1	72	.4	2.2	134	.8
20-----				3.4	72	.7	3.2	146	1.3
21-----				4.1	87	1.0	3.7	98	1.0
22-----				4.3	75	.9	3.0	82	.7
23-----				4.3	71	.8	3.7	85	.8
24-----				4.5	87	1.1	2.5	58	.4
25-----				4.9	98	1.3	1.6	65	.3
26-----				3.5	77	.7	2.4	48	.3
27-----				3.4	80	.7	2.7	46	.3
28-----				4.3	63	.7	3.0	98	.8
29-----				4.3	47	.5	3.2	207	1.8
30-----				4.1	35	.4	1.8	610	3.0
31-----				7.6	259	5.3	--	--	--
Total-----				142.7	--	59.5	67.8	--	27.0
	July			August			September		
1-----	2.4	260	1.7	9.9	125	3.3	8.7	36	0.8
2-----	3.2	170	1.5	11	118	3.5	7.3	44	.9
3-----	.3	30	(1)	5.8	71	1.1	8.2	38	.8
4-----	0	--	0	3.5	58	.5	8.0	58	1.3
5-----	0	--	0	3.4	52	.5	7.8	48	1.0
6-----	0	--	0	3.2	73	.6	7.3	32	.6
7-----	5.7	580	8.9	3.5	81	.8	6.7	38	.7
8-----	4.2	240	2.7	4.9	80	1.1	7.3	35	.7
9-----	.3	--	2.3	7.1	72	1.4	8.0	38	.8
10-----	1.5	1,100	4.5	8.5	78	1.8	7.3	38	.7
11-----	1.7	455	2.1	8.2	62	1.4	7.6	39	.8
12-----	2.1	372	2.1	6.7	57	1.0	5.8	33	.5
13-----	3.0	180	1.5	5.6	51	.8	4.9	34	.4
14-----	3.0	160	1.3	5.8	52	.8	4.9	41	.5
15-----	2.8	140	1.1	5.3	49	.7	4.7	40	.5
16-----	2.4	290	1.9	3.7	78	.8	6.2	49	.8
17-----	2.0	250	1.4	3.0	52	.4	7.3	46	.9
18-----	2.5	202	1.4	5.3	58	.8	7.6	--	2.9
19-----	2.4	113	.7	7.1	106	2.0	7.6	46	.9
20-----	3.0	112	.9	7.1	107	2.1	7.6	42	.9
21-----	4.7	47	.6	5.8	63	1.0	6.2	33	.6
22-----	5.3	77	1.1	4.7	54	.7	4.9	28	.4
23-----	4.7	63	.8	3.9	55	.6	6.4	36	.6
24-----	4.9	39	.5	5.3	52	.7	7.6	--	2.4
25-----	4.1	32	.4	6.2	58	1.0	7.6	21	.4
26-----	2.2	12	(1)	4.7	59	.7	7.6	32	.7
27-----	3.7	31	.3	5.6	70	1.1	7.3	27	.5
28-----	7.1	79	1.5	7.8	81	1.7	8.0	36	.8
29-----	10	105	2.8	9.4	53	1.3	9.4	45	1.1
30-----	11	117	3.5	11	50	1.5	8.9	59	1.4
31-----	9.9	85	2.3	10	40	1.1	--	--	--
Total-----	110.1	--	47.9	193.0	--	36.8	214.7	--	22.3
Total discharge for period May 1 to Sept. 30 (second-foot-days) ----- 728.3									
Total load for period May 1 to Sept. 30 (tons) ----- 194									

YELLOWSTONE RIVER BASIN
YELLOWSTONE RIVER BASIN--Continued

375

LATERAL P-36.8 WASTEWAY NEAR SHOSHONI, WYO.

LOCATION.--At gaging station 100 feet upstream from mouth and 4½ miles west of Shoshoni, Fremont County.

RECORDS AVAILABLE.--Sediment records: May to September 1949.

EXTREMES, May to September 1949.--Sediment concentrations: Maximum daily, 902 ppm Sept. 29; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 24 tons Sept. 29; minimum daily, 0 tons on several days.

REMARKS.--Records of discharge for period May to September 1949 given in Water-Supply

Paper 1146.

Suspended sediment, May to September 1949

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----				0	--	0	4.0	98	1.1
2-----				0	--	0	8.0	206	4.4
3-----				0	--	0	8.7	230	5.4
4-----				0	--	0	.1	--	(i)
5-----				0	--	0	0	--	0
6-----				0	--	0	0	--	0
7-----				0	--	0	0	--	0
8-----				0	--	0	0	--	0
9-----				0	--	0	0	--	0
10-----				0	--	0	0	--	0
11-----				0	--	0	0	--	0
12-----				.4	300	.3	.4	--	(i)
13-----				5.8	800	9.4	2.5	174	1.2
14-----				9.0	620	15	4.1	140	1.5
15-----				11	620	18	3.0	172	1.4
16-----				11	480	14	3.5	315	3.0
17-----				7.7	240	5.0	2.2	186	1.1
18-----				7.7	128	2.7	5.8	246	3.9
19-----				6.8	112	2.1	6.4	282	4.9
20-----				9.7	272	7.1	6.1	210	3.5
21-----				12	393	13	4.6	200	2.5
22-----				12	410	13	2.6	165	1.2
23-----				14	517	20	1.5	138	.6
24-----				13	603	21	1.0	68	.2
25-----				12	495	16	1.4	81	.3
26-----				11	400	12	1.5	90	.4
27-----				7.7	165	3.4	2.3	88	.5
28-----				5.8	162	2.5	3.4	158	1.4
29-----				2.3	53	.3	6.4	192	3.3
30-----				2.0	152	.8	4.9	120	1.6
31-----				2.3	163	1.0	--	--	--
Total--				163.2	--	177	84.4	--	43.5
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2.7	85	0.6	6.4	162	2.8	7.1	218	4.2
2-----	.8	52	.1	5.8	148	2.3	7.4	163	3.3
3-----	.1	--	(i)	6.4	185	3.2	7.7	157	3.3
4-----	0	--	0	8	250	5.4	8.4	135	3.1
5-----	0	--	0	7.4	188	3.8	8.7	122	2.9
6-----	0	--	0	7.1	186	3.6	9.0	111	2.7
7-----	.1	--	(i)	7.7	211	4.4	9.0	119	2.9
8-----	0	--	0	8.4	209	4.7	8.0	238	5.1
9-----	0	--	0	11	312	9.3	7.7	250	5.2
10-----	0	--	0	13	508	18	5.8	105	1.6
11-----	.2	45	(i)	14	483	18	4.1	83	.9
12-----	4.9	194	2.6	14	--	2/17	3.8	85	.7
13-----	7.1	307	5.9	14	429	16	2.0	55	.3
14-----	3.9	123	1.3	14	485	18	1.0	35	(i)
15-----	2.3	60	.4	13	522	18	.6	53	(i)
16-----	1.6	52	.2	12	322	10	1.2	51	.2
17-----	.3	27	(i)	9.7	236	6.2	1.2	32	.1
18-----	0	--	0	8.7	177	4.2	1.2	--	(i)
19-----	0	--	0	8.7	246	5.8	.8	25	(i)
20-----	.5	--	(i)	8.7	220	5.2	1.0	28	(i)
21-----	1.9	51	.3	8.4	165	3.7	1.8	51	.2
22-----	4.6	108	1.3	8.4	172	3.9	3.8	108	1.1
23-----	8.4	158	3.6	10	335	9.0	4.1	102	1.1
24-----	7.7	109	2.3	9.4	330	8.4	4.1	--	2/1.1
25-----	5.5	60	.9	9.0	250	6.1	3.8	--	2/ .9
26-----	2.5	21	.1	8.7	166	3.9	4.1	85	.9
27-----	2.3	23	.1	6.8	123	2.3	4.1	138	1.5
28-----	2.3	32	.2	6.4	120	2.1	6.4	358	6.2
29-----	4.4	79	.9	6.4	132	2.3	9.7	902	24
30-----	6.4	138	2.4	7.7	215	4.5	8.4	590	13
31-----	6.8	159	2.9	8.0	199	4.3	--	--	--
Total--	77.3	--	26.2	287.2	--	226	146.0	--	86.9

Total discharge for period May 1 to Sept. 30 (second-foot-days) ----- 758.1

Total load for period May 1 to Sept. 30 (tons) ----- 560

(i)Sediment discharge less than 0.1 ton.

2/Estimated.

YELLOWSTONE RIVER BASIN--Continued

POISON CREEK NEAR SHOSHONI, WYO.

LOCATION.--At gaging station below bridge on U. S. Highway 26, 1 mile west of Shoshoni, Fremont County.

RECORDS AVAILABLE.--Water temperatures: March to June 1949.

Sediment records: March to September 1949.

EXTREMES, March to September 1949.--Sediment concentrations: Maximum daily, 38,000 ppm July 13; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 1,200 tons June 2; minimum daily, 0 tons on many days.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, water year
October 1948 to September 1949
/Once-daily temperature measurement
between 10 a. m. and 2 p. m./

Day	Mar.	Apr.	May	June	July
1	--	62	62	56	--
2	--	39	76	62	--
3	--	64	65	61	--
4	--	58	--	62	--
5	33	43	43	70	--
6	33	66	44	73	--
7	32	63	60	82	--
8	31	--	64	78	--
9	32	--	74	76	--
10	--	50	83	89	86
11	32	69	79	92	83
12	32	59	77	70	--
13	34	48	72	71	--
14	32	--	67	--	70
15	31	52	65	78	--
16	32	68	58	77	--
17	33	76	60	74	--
18	32	63	47	66	--
19	35	80	79	80	--
20	36	63	69	84	--
21	42	54	51	86	--
22	33	69	69	79	--
23	36	61	--	83	--
24	40	68	84	74	--
25	57	70	85	87	--
26	56	74	86	66	--
27	50	79	89	--	--
28	44	85	85	--	--
29	32	58	72	--	--
30	39	57	76	--	--
31	50	--	--	--	--
Average	37	62	69	75	--

Suspended sediment, March to September 1949

Day	Mean discharge (second-feet)	March	
		Suspended sediment	
		Mean concentration (ppm)	Tons per day
1-----	--	--	--
2-----	--	--	--
3-----	--	--	--
4-----	--	--	--
5-----	2.0	1,800	10
6-----	1.9	4,500	23
7-----	1.1	3,400	10
8-----	1.1	5,200	15
9-----	1.8	4,300	21
10-----	1.8	--	1/15
11-----	1.7	1,700	8
12-----	1.2	2,190	7
13-----	.6	1,750	3
14-----	.9	1,200	3
15-----	1.9	800	4
16-----	2.0	350	2
17-----	1.4	1,100	4
18-----	1.2	2,800	9
19-----	1.2	4,000	13
20-----	1.2	2,700	9
21-----	1.1	3,000	9
22-----	1.1	2,200	7
23-----	1.4	2,200	8
24-----	2.6	6,800	48
25-----	1.3	1,650	6
26-----	.9	1,200	3
27-----	.8	800	2
28-----	.8	650	1
29-----	.8	1,400	3
30-----	.8	1,300	3
31-----	.7	1,600	3
Total--	35.3	--	249

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

POISON CREEK NEAR SHOSHONI, WYO.--Continued

Suspended sediment, March to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.7	1,200	2	0.3	850	0.7	0.9	175	0.4
2-----	.7	1,200	2	.4	550	.6	17	25,500	1,200
3-----	.6	1,050	2	1.0	450	1	5.6	24,900	380
4-----	.6	900	1	1.0	4,200	11	2.9	14,000	110
5-----	.7	1,100	2	4.9	14,000	190	2.2	6,300	37
6-----	.9	900	2	2.9	12,300	96	1.9	1,600	8
7-----	.7	700	1	1.4	7,100	27	3.5	25,000	240
8-----	.5	650	.9	1.3	6,800	24	3.6	13,000	130
9-----	.4	450	.5	1.4	3,800	14	2.8	27,000	200
10-----	.2	590	.3	1.6	1,100	5	.1	7,800	2
11-----	.2	600	.3	1.6	1,100	5	.1	4,000	1
12-----	.2	500	.3	1.0	850	2	.7	3,200	6
13-----	.2	500	.3	.8	700	2	.2	880	.5
14-----	1.4	4,150	16	.8	350	.8	.3	--	1/.5
15-----	1.0	2,300	6	.8	400	.9	.5	320	.4
16-----	1.3	750	3	.8	400	.9	.3	200	.2
17-----	.7	500	.9	1.0	450	1	.3	390	.3
18-----	.7	450	.9	1.0	400	1	.3	570	.5
19-----	.7	450	.9	.7	600	1	.5	520	.7
20-----	.7	375	.7	2.8	800	6	.1	300	.1
21-----	.6	300	.5	5.9	14,200	230	.1	200	.1
22-----	.6	400	.6	3.3	10,900	97	.1	200	.1
23-----	.6	300	.5	1.0	1,000	3	.1	290	.1
24-----	.7	250	.5	.5	450	.6	.5	260	.4
25-----	.7	450	.9	1.0	400	1	.3	200	.2
26-----	.7	400	.8	.5	300	.4	.3	220	.2
27-----	.7	400	.8	0	--	0	.3	220	.2
28-----	.6	300	.5	.5	300	.4	.1	200	.1
29-----	.6	350	.6	0	--	0	.3	190	.2
30-----	.3	4,400	4	0	--	0	.1	120	0
31-----	--	--	--	.2	200	.1	--	--	--
Total-	19.2	--	52.7	40.4	--	722	46.0	--	2,320
	July			August			September		
1-----	0.1	90	0	0.3	300	0.2	0.4	180	0.2
2-----	.5	220	.3	.1	--	1/.1	.4	80	.1
3-----	.5	150	.2	.1	800	.2	.4	495	.5
4-----	.3	250	.2	.1	440	.1	.4	210	.2
5-----	.2	1,290	.7	.1	570	.2	.4	320	.3
6-----	.3	1,780	1	.1	--	1/.1	.3	150	.1
7-----	.4	1,540	2	.1	380	.1	.3	200	.2
8-----	.3	1,100	.9	0	--	0	.3	205	.2
9-----	.2	820	.4	.1	--	1/.1	.4	185	.2
10-----	.2	1,080	.6	.1	300	.1	.4	165	.2
11-----	1.1	27,500	82	.1	250	.1	.3	120	.1
12-----	1.6	3,400	15	.1	195	.1	.3	100	.1
13-----	2.5	38,000	270	.1	145	0	.3	105	.1
14-----	2.9	34,000	280	.1	120	0	.3	155	.1
15-----	.8	5,000	11	.1	--	1/0	.3	120	.1
16-----	.4	--	1/.9	.1	75	0	.3	115	.1
17-----	.1	--	1/.2	.2	160	.1	.3	60	0
18-----	.3	780	.6	.2	--	1/.1	.3	--	1/0
19-----	.2	750	.4	.2	175	.1	.3	145	.1
20-----	.7	--	1/2	.2	100	.1	.3	120	.1
21-----	.3	860	.7	.1	75	0	.3	130	.1
22-----	.9	450	1	.1	80	0	.3	140	.1
23-----	1.2	--	1/1	.1	--	1/0	.3	150	.1
24-----	1.3	--	1/1	.1	--	1/0	.3	--	1/.1
25-----	1.5	400	2	.1	100	0	.3	90	.1
26-----	1.5	350	1	.2	150	.1	.3	85	.1
27-----	1.3	--	1/1	.3	70	.1	.3	165	.1
28-----	.2	320	.2	.4	--	1/.1	.3	110	.1
29-----	.2	520	.3	.4	185	.2	.3	135	.1
30-----	.3	430	.3	.4	230	.2	.3	130	.1
31-----	.3	--	1/.3	.4	215	.2	--	--	--
Total-	22.6	--	677	5.1	--	2.7	9.7	--	4.0

Total discharge for period Mar. 5 to Sept. 30 (second-foot-days) ----- 178.3

Total load for period Mar. 5 to Sept. 30 (tons) ----- 4,030

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

BADWATER CREEK AT BONNEVILLE, WYO.

LOCATION.--At gaging station at Bonneville, Fremont County, 5½ miles upstream from mouth.
DRAINAGE AREA.--790 square miles.

RECORDS AVAILABLE.--Sediment records: October 1947 to September 1949.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 108,000 ppm July 11;
minimum daily, no flow on many days.

Sediment loads: Maximum daily, 69,800 tons June 2; minimum daily, 0 tons on many days.

EXTREMES, 1947-49.--Sediment concentrations: Maximum daily, 108,000 ppm July 11, 1949;
minimum daily, no flow on many days.

Sediment loads: Maximum daily, 69,800 tons June 2, 1949; minimum daily, 0 tons on
many days.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in
Water-Supply Paper 1146.

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis- charge (second- feet)	Suspended sediment		Mean dis- charge (second- feet)	Suspended sediment		Mean dis- charge (second- feet)	Suspended sediment	
		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day
1-----				0	--	0			
2-----				0	--	0			
3-----				0	--	0			
4-----				0	--	0			
5-----				0	--	0			
6-----				0	--	0			
7-----				0	--	0			
8-----				0	--	0			
9-----				0	--	0			
10-----				0	--	0			
11-----				1	}	1/5			
12-----				1					
13-----				1					
14-----				1					
15-----				1					
16-----				1					
17-----				1					
18-----				1					
19-----				1					
20-----				1					
21-----				0	--	0			
22-----				0	--	0			
23-----				0	--	0			
24-----				0	--	0			
25-----				0	--	0			
26-----				0	--	0			
27-----				0	--	0			
28-----				0	--	0			
29-----				0	--	0			
30-----				0	--	0			
31-----				--	--	--			
Total-	0	--	0	10	--	50	0	--	0

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

BADWATER CREEK AT BONNEVILLE, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	January			February			March		
	Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----				0	--	0	27	6,200	450
2-----				0	--	0	28	4,600	350
3-----				0	--	0	30	4,100	330
4-----				0	--	0	33	4,100	360
5-----				0	--	0	35	3,400	320
6-----				0	--	0	49	5,850	2/880
7-----				0	--	0	55	5,680	2/1,120
8-----				0	--	0	25	4,600	310
9-----				0	--	0	25	5,000	340
10-----				0	--	0	16	6,250	270
11-----				0	--	0	21	4,100	230
12-----				0	--	0	16	3,300	140
13-----				0	--	0	8.1	5,700	120
14-----				0	--	0	3.0	1,650	13
15-----				0	--	0	2.0	1,850	10
16-----				0	--	0	5.0	3,500	47
17-----				1	--	1/2	11	3,900	120
18-----				2	--	1/3	19	4,600	240
19-----				2	--	1/4	25	4,100	280
20-----				3	--	1/6	27	--	1/350
21-----				4	--	1/8	29	6,250	490
22-----				6	--	1/10	36	7,300	710
23-----				10	--	1/16	38	7,850	800
24-----				15	--	1/20	41	6,750	750
25-----				20	1,400	76	25	5,900	400
26-----				20	6,000	320	20	6,600	360
27-----				22	5,700	340	19	5,400	280
28-----				25	7,800	530	19	5,000	260
29-----				--	--	--	19	6,300	320
30-----				--	--	--	16	6,000	260
31-----				--	--	--	16	5,500	240
Total-	0	--	0	130	--	1,300	738.1	--	11,150
Day	April			May			June		
	Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	17	5,550	260	13	4,800	170	13	8,200	290
2-----	17	6,100	280	17	5,200	240	256	68,800	2/69,800
3-----	20	6,300	340	17	4,700	220	60	21,000	3,400
4-----	19	5,300	270	24	5,760	2/400	52	13,500	1,900
5-----	21	6,450	370	27	9,300	680	42	7,000	790
6-----	19	6,400	330	34	17,900	1,640	45	8,100	980
7-----	21	6,950	390	29	18,500	1,450	105	37,800	2/13,300
8-----	21	8,300	470	21	18,800	1,070	32	12,900	1,110
9-----	23	8,500	530	28	19,100	1,440	40	13,500	1,460
10-----	18	7,300	380	28	13,500	1,020	48	18,500	2,400
11-----	21	7,700	440	24	8,150	530	50	18,300	2,470
12-----	24	6,900	450	22	6,000	360	86	19,300	2/5,640
13-----	27	6,400	470	19	6,950	360	53	17,000	2,430
14-----	32	8,000	690	26	31,900	2/1,820	27	10,500	760
15-----	21	7,100	400	13	15,500	540	22	7,100	420
16-----	18	4,900	240	14	10,500	400	18	3,300	160
17-----	19	4,600	240	14	13,100	500	13	2,500	88
18-----	23	5,800	360	14	13,000	490	9.6	4,750	120
19-----	27	6,000	440	14	8,100	310	7.5	5,200	100
20-----	31	--	1/500	17	11,700	540	4.1	3,000	33
21-----	35	--	1/600	21	12,800	730	2.2	2,550	15
22-----	32	--	1/500	26	25,000	1,760	0	--	0
23-----	33	--	1/500	30	21,500	1,740	0	--	0
24-----	28	--	1/450	24	10,900	710	0	--	0
25-----	28	--	1/600	19	8,300	430	0	--	0
26-----	31	8,400	700	15	7,500	300	0	--	0
27-----	22	--	1/450	11	5,500	160	0	--	0
28-----	15	--	1/250	8.1	4,500	98	0	--	0
29-----	12	5,300	170	6.2	2,700	45	0	--	0
30-----	16	7,050	300	3.6	2,600	25	0	--	0
31-----	--	--	--	2.0	1,800	9	--	--	--
Total-	691	--	12,350	580.9	--	20,190	985.4	--	107,700

1/Estimated.

2/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

BADWATER CREEK AT BONNEVILLE, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0	--	0	0		0	0		0
2-----	0	--	0	0		0	0		0
3-----	0	--	0	0		0	0		0
4-----	.6	--	1/3	0		0	0		0
5-----	1.8	--	1/10	0		0	0		0
6-----	0	--	0	0		0	1.7		1/10
7-----	0	--	0	0		0	.7		1/3
8-----	0	--	0	0		0	0		0
9-----	0	--	0	0		0	0		0
10-----	13	30,900	7,210	1.0		1/5	0		0
11-----	125	108,000	2/38,300	0		0	.2		1/2
12-----	10	25,000	680	0		0	0		0
13-----	0	--	0	0		0	0		0
14-----	119	42,300	2/32,000	0		0	0		0
15-----	29	22,000	1,720	0		0	0		0
16-----	1.3	5,000	18	0		0	0		0
17-----	0	--	0	0		0	0		0
18-----	0	--	0	0		0	0		0
19-----	0	--	0	0		0	0		0
20-----	0	--	0	0		0	0		0
21-----	0	--	0	0		0	0		0
22-----	0	--	0	0		0	0		0
23-----	0	--	0	0		0	0		0
24-----	0	--	0	0		0	0		0
25-----	0	--	0	0		0	0		0
26-----	0	--	0	0		0	0		0
27-----	0	--	0	0		0	0		0
28-----	0	--	0	0		0	0		0
29-----	0	--	0	0		0	0		0
30-----	0	--	0	0		0	0		0
31-----	0	--	0	0		0	--		--
Total-	299.7	--	79,940	1.0		5	2.6		15

Total discharge for year (second-foot-days)----- 3,438.7

Total load for year (tons)----- 232,700

1/Estimated.

2/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

BADWATER CREEK AT BONNEVILLE, WYO.--Continued

Particle-size analyses of suspended sediment, May to July 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Instantaneous discharge (second-feet)	Suspended sediment										Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.500
May 6, 1949	11:53 a. m.	42	22,500	1,660	--	49	63	71	77	83	87	95	100	BW
May 12	12:30 p. m.	25	7,610	1,880	35	41	54	66	80	93	97	99	100	BW
June 2	12:05 p. m.	350	99,800	1,350	--	29	38	47	56	68	83	92	98	BW
July 11	8:00 a. m.	210	172,000	9,300	15	24	38	53	76	87	94	99	100	BW
July 16	8:00 a. m.	1.3	8,830	1,600	53	75	86	92	95	98	98	99	100	BW

YELLOWSTONE RIVER BASIN--Continued

MUDDY CREEK NEAR PAVILLION, WYO.

LOCATION.--At gaging station three-quarters of a mile upstream from Wyoming Canal syphon, 3 miles downstream from Sheep Creek, and 9½ miles northeast of Pavillion, Fremont County.

DRAINAGE AREA.--257 square miles.

RECORDS AVAILABLE.--Water temperatures: March to July 1949.

Sediment records: March to September 1949.

EXTREMES, March to September 1949.--Water temperatures (March to July 1949): Minimum, freezing point on several days in March.

Sediment concentrations: Maximum daily, 65,900 ppm July 12; minimum daily, not determined.

Sediment loads: Maximum daily, 90,400 tons July 11; minimum daily, less than 1 ton on many days.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, March to July 1949

/Once-daily temperature measurement between 11 a. m. and 4 p. m./

Day	Mar.	Apr.	May	June	July
1	--	42	55	51	--
2	--	43	--	53	--
3	--	47	--	--	--
4	--	49	51	57	69
5	--	44	42	71	--
6	--	42	51	67	--
7	--	49	61	75	82
8	33	--	66	69	--
9	33	--	72	72	--
10	32	52	65	79	--
11	32	60	71	58	--
12	32	53	78	70	77
13	32	45	66	57	--
14	32	47	77	73	84
15	32	51	60	74	--
16	32	54	58	--	--
17	--	64	56	--	--
18	32	64	48	--	--
19	32	64	65	63	74
20	33	51	67	79	--
21	33	56	52	80	--
22	33	53	62	68	--
23	31	58	65	65	--
24	33	63	64	72	--
25	32	59	63	71	--
26	32	--	--	--	--
27	35	69	69	--	--
28	35	--	79	--	--
29	32	64	70	65	--
30	--	58	76	--	--
31	37	--	57	--	--
Average	--	54	63	--	--

Suspended sediment, March to September 1949

Day	March		
	Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day
1-----	--	--	--
2-----	--	--	--
3-----	--	--	--
4-----	--	--	--
5-----	--	--	--
6-----	--	--	--
7-----	20	8,550	462
8-----	15	5,500	223
9-----	16	3,800	164
10-----	14	2,400	91
11-----	8.0	6,800	147
12-----	7.5	1,200	24
13-----	6.0	3,300	53
14-----	3.0	900	7
15-----	10	4,200	113
16-----	11	8,000	238
17-----	10	--	1/240
18-----	12	9,300	301
19-----	15	9,400	381
20-----	16	10,200	441
21-----	14	13,900	525
22-----	15	14,000	567
23-----	14	9,800	370
24-----	10	10,700	289
25-----	10	5,100	138
26-----	9.1	3,900	96
27-----	7.5	11,500	233
28-----	8.5	13,400	308
29-----	9.2	11,400	283
30-----	11	12,500	371
31-----	8.9	11,600	279
Total-	280.7	--	6,340

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

MUDDY CREEK NEAR PAVILLION, WYO.--Continued

Suspended sediment, March to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	9.6	14,200	368	5.8	3,300	52	5.0	--	1/50
2-----	13	17,300	607	5.6	2,350	36	16	--	1/1,900
3-----	14	16,500	624	5.6	2,300	35	14	14,000	2/629
4-----	13	14,500	509	6.0	3,400	55	5.6	4,500	68
5-----	12	15,000	486	5.8	3,200	50	94	--	1/77,000
6-----	12	11,300	366	5.2	2,600	37	75	--	1/21,000
7-----	13	11,000	386	5.0	1,850	25	40	--	1/1,900
8-----	12	10,600	343	5.0	2,500	34	33	--	1/5,400
9-----	14	10,200	386	5.0	1,800	24	14	12,800	2/584
10-----	14	10,500	397	4.8	1,500	19	9.8	3,100	82
11-----	14	10,500	397	9.2	22,300	2/637	59	39,500	2/31,700
12-----	14	10,500	397	5.2	3,900	55	16	38,000	1,700
13-----	14	9,800	370	4.5	3,000	36	48	40,600	2/16,500
14-----	14	7,000	265	5.6	4,200	64	24	6,800	441
15-----	14	7,500	284	4.2	3,300	37	4.2	2,150	24
16-----	14	6,000	227	5.6	4,400	67	4.2	1,100	12
17-----	14	5,800	219	9.8	8,600	228	3.0	1,150	9
18-----	16	5,600	242	8.6	7,300	170	3.0	2,900	23
19-----	15	6,200	251	19	37,000	2/5,270	9.2	5,050	125
20-----	13	7,400	260	9.2	38,500	992	5.0	2,300	31
21-----	13	6,000	211	9.2	8,000	199	4.6	940	12
22-----	12	5,000	162	9.2	6,850	170	9	480	1
23-----	12	6,000	194	6.8	4,050	74	2.6	625	4
24-----	12	5,400	175	6.2	3,780	63	5.0	540	7
25-----	12	4,900	159	4.2	3,100	35	5.6	340	5
26-----	9.6	--	1/110	3.8	2,800	29	3.4	--	1/3
27-----	8.5	3,200	73	2.6	2,200	15	3.8	580	6
28-----	7.4	3,200	64	2.2	2,650	16	4.2	560	6
29-----	6.7	2,750	50	2.6	1,880	13	3.4	500	5
30-----	6.7	3,300	60	2.2	1,750	10	2.6	360	3
31-----	--	--	--	3.8	1,900	19	--	--	--
Total-	368.5	--	8,640	187.5	--	8,570	518.1	--	164,000
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1.4	330	1	0.8	42	--	0.2	--	(s)
2-----	.9	360	(s)	.9	58	--	.1	--	(s)
3-----	.9	--	(s)	1.0	64	--	13	15,200	2/1,020
4-----	25	--	1/2,900	1.0	175	--	5.0	5,750	78
5-----	3.8	5,100	52	.8	136	--	3.8	2,300	24
6-----	3.4	1,500	14	.8	110	--	3.4	1,380	13
7-----	4.2	1,200	14	.8	70	--	3.8	--	1/10
8-----	3.0	700	6	.8	25	--	3.4	770	7
9-----	3.8	1,600	16	.8	--	--	3.4	700	6
10-----	15	16,600	2/2,600	.7	125	--	3.0	650	5
11-----	223	51,300	2/90,400	.4	--	--	3.8	--	1/7
12-----	116	65,900	2/56,100	.2	--	--	4.6	750	9
13-----	63	43,700	2/12,700	.1	73	--	5.6	1,200	18
14-----	8.0	3,520	76	.1	--	--	5.0	1,100	15
15-----	9.8	--	1/220	.1	--	--	4.6	800	10
16-----	4.6	2,200	27	.2	48	(s)	3.4	--	1/5
17-----	3.0	1,120	9	.2	--	--	2.6	410	3
18-----	2.2	780	5	.3	--	--	3.4	--	1/4
19-----	3.8	1,300	13	.6	85	--	3.8	590	6
20-----	2.2	400	2	.6	75	--	3.0	480	4
21-----	1.8	300	1	.5	40	--	3.0	560	5
22-----	1.4	220	(s)	.4	27	--	3.8	--	1/7
23-----	1.8	155	(s)	.3	23	--	3.8	750	8
24-----	1.0	--	--	.3	--	--	3.4	880	8
25-----	.9	--	--	.4	25	--	3.4	--	1/7
26-----	.7	--	--	.4	--	--	3.8	560	6
27-----	.8	--	--	.2	--	--	3.4	490	4
28-----	.9	63	(s)	.1	--	--	3.8	550	6
29-----	.9	--	--	.1	--	--	3.8	730	7
30-----	1.0	--	--	.3	28	--	4.2	740	8
31-----	.9	--	--	.2	--	--	--	--	--
Total-	509.1	--	165,200	14.4	--	2	115.3	--	1,310

Total discharge for period Mar. 7 to Sept. 30 (second-foot-days) ----- 1,993.6

Total load for period Mar. 7 to Sept. 30 (tons) ----- 354,100

1/Estimated.

2/Sediment discharge computed by subdividing day.

(s)Sediment discharge less than 1 ton.

YELLOWSTONE RIVER BASIN--Continued
MUDDY CREEK NEAR PAVILLION, WYO.--Continued

Particle-size analysis of suspended sediment, March to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	
Mar. 30, 1949	1:00 p. m.	13	12,400	7,220	--	14	21	30	42	58	75	90	96		BW
Apr. 15	12:30 p. m.	14	7,800	4,240	--	24	32	43	55	68	86	96	100		BW
Apr. 25	3:25 p. m.	11	4,900	1,150	--	29	38	48	57	70	88	96	100		BW
May 19	8:40 p. m.	156	168,000	2,110	--	20	29	41	55	71	89	98	100		BW
Sept. 3	3:00 p. m.	26	34,000	1,560	28	48	66	83	93	98	100	--	--		BW
Sept. 13	1:35 p. m.	4.6	1,260	1,765	15	22	36	50	61	69	80	85	92		BW

YELLOWSTONE RIVER BASIN--Continued

MUDDY CREEK NEAR SHOSHONI, WYO.

LOCATION.--At gaging station 5 miles upstream from mouth and 9 miles northwest of Shoshoni, Fremont County.

RECORDS AVAILABLE.--Water temperatures: March to July 1949.

Sediment records: March to September 1949.

EXTREMES, March to September 1949.--Water temperatures (March to July 1949): Minimum, freezing point on several days in March.

Sediment concentrations: Maximum daily, 171,000 ppm July 13; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 159,000 tons July 12; minimum daily, 0 tons on many days.

REMARKS.--Records of discharge for period March to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, water year October 1948 to September 1949

/Once-daily temperature measurement between 10 a. m. and 4 p. m./

Day	Mar.	Apr.	May	June	July	Aug.
1	--	38	63	54	--	
2	--	40	--	59	--	
3	--	54	73	--	--	
4	--	57	54	61	85	
5	34	44	44	76	--	72
6	33	48	51	55	--	
7	34	45	61	66	81	
8	32	--	69	71	--	
9	33	--	76	--	--	
10	32	53	72	82	--	
11	35	--	80	76	--	
12	33	--	73	70	70	
13	37	--	72	51	64	
14	32	49	72	54	75	
15	33	47	65	74	--	
16	32	59	54	66	--	
17	39	66	58	71	--	
18	32	68	--	62	--	
19	35	70	75	65	--	
20	42	53	66	84	--	
21	42	55	52	83	--	
22	34	51	69	72	--	
23	35	54	67	76	--	
24	36	--	68	70	--	
25	32	60	74	66	--	
26	44	70	--	--	--	
27	48	74	--	--	--	
28	32	68	80	--	--	
29	31	64	69	--	--	
30	32	62	77	--	--	
31	36	--	68	--	--	
Average	--	56	67	--	--	

Suspended sediment, March to September 1949

Day	March		
	Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day
1-----	12	--	1/200
2-----	14	--	1/260
3-----	15	--	1/300
4-----	14	--	1/240
5-----	12	6,400	207
6-----	4.0	9,000	97
7-----	2.9	6,700	52
8-----	6.2	5,500	92
9-----	14	14,600	552
10-----	2.7	4,500	33
11-----	3.5	6,800	64
12-----	12	7,200	233
13-----	14	7,000	265
14-----	2.9	2,400	19
15-----	3.5	1,800	17
16-----	8.6	3,200	74
17-----	10	4,400	119
18-----	11	11,500	342
19-----	14	24,000	907
20-----	18	18,700	909
21-----	14	20,500	775
22-----	14	17,700	669
23-----	18	21,000	1,020
24-----	16	18,500	799
25-----	17	12,000	550
26-----	18	16,500	802
27-----	17	17,000	780
28-----	16	18,200	786
29-----	13	20,000	702
30-----	13	18,500	649
31-----	14	21,000	794
Total-	364.3	--	13,310

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

MUDDY CREEK NEAR SHOSHONI, WYO.--Continued

Suspended sediment, March to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	12	15,200	492	3.3	6,800	61	3.0	3,100	25
2-----	14	18,500	699	2.6	6,700	47	20	19,800	1,070
3-----	14	19,000	719	2.6	5,000	35	25	52,000	2/3,770
4-----	14	21,300	805	2.7	5,900	43	12	27,000	875
5-----	14	23,700	896	3.5	5,200	49	8.6	16,000	372
6-----	14	22,500	850	3.5	4,800	45	179	128,000	2/130,000
7-----	13	18,000	632	4.0	6,400	69	35	74,500	2/8,400
8-----	12	20,000	648	3.5	5,000	47	10	53,000	1,480
9-----	12	20,600	667	2.7	4,400	32	26	87,900	2/7,650
10-----	14	20,200	764	2.7	4,200	31	10	22,000	594
11-----	14	21,700	820	2.9	4,500	35	6.3	8,000	136
12-----	14	19,200	726	4.6	8,500	106	36	102,000	2/15,100
13-----	16	--	1/800	1.9	18,300	94	7.0	28,000	529
14-----	14	18,500	699	1.0	8,200	22	51	117,000	2/24,000
15-----	12	15,500	502	.8	6,900	15	12	22,000	713
16-----	12	17,600	570	1.4	13,000	49	6.0	6,600	107
17-----	14	14,200	537	5.0	12,700	171	3.7	2,600	26
18-----	14	14,500	548	8.2	12,000	266	5.0	3,200	43
19-----	14	16,000	605	7.7	12,000	249	11	7,700	229
20-----	13	15,200	534	20	72,000	2/5,370	6.6	10,200	182
21-----	10	16,200	437	14	28,200	1,070	3.5	6,000	57
22-----	11	12,800	380	14	19,000	718	1.7	2,400	11
23-----	10	11,500	310	7.7	18,500	385	1.0	1,100	3
24-----	9.6	11,500	298	4.0	9,500	103	1.1	1,200	4
25-----	8.2	12,800	283	2.4	6,700	43	1.0	650	2
26-----	8.2	13,500	299	1.3	7,500	26	.8	--	(s)
27-----	7.2	13,700	266	1.4	4,700	18	1.0	300	(s)
28-----	4.8	10,400	135	2.2	8,200	49	2.2	800	5
29-----	4.0	9,000	97	1.7	4,100	19	1.7	1,800	8
30-----	4.2	8,800	100	1.4	3,800	14	.6	1,600	3
31-----	--	--	--	1.0	3,100	8	--	--	--
Total-	347.2	--	16,120	135.7	--	9,290	487.8	--	195,400
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.3	500	(s)				0	--	0
2-----	.1	300	(s)				0	--	0
3-----	.8	100	(s)				0	--	0
4-----	9.4	12,900	2/922				.9	19,600	2/115
5-----	6.6	32,500	601				1.0	32,000	90
6-----	.8	15,000	32				0	--	0
7-----	.4	4,000	4				0	--	0
8-----	.7	2,000	4				0	--	0
9-----	1.1	500	1				0	--	0
10-----	.4	--	(s)				0	--	0
11-----	11	37,700	2/1,790				0	--	0
12-----	274	146,000	2/159,000				0	--	0
13-----	187	171,000	2/143,000				0	--	0
14-----	17	35,000	1,670				0	--	0
15-----	8.2	9,300	206				0	--	0
16-----	7.0	8,200	155				0	--	0
17-----	2.4	7,350	48				0	--	0
18-----	1.1	2,000	6				0	--	0
19-----	.7	580	1				0	--	0
20-----	.7	1,600	3				0	--	0
21-----	.3	--	(s)				0	--	0
22-----	0	--	0				0	--	0
23-----	0	--	0				0	--	0
24-----	0	--	0				0	--	0
25-----	0	--	0				0	--	0
26-----	0	--	0				0	--	0
27-----	0	--	0				0	--	0
28-----	0	--	0				0	--	0
29-----	0	--	0				.1	--	(s)
30-----	0	--	0				.1	--	(s)
31-----	0	--	0				--	--	--
Total-	530.0	--	307,400	0	--	0	2.1	--	206

Total discharge for period Mar. 1 to Sept. 30 (second-foot-days) ----- 1,867.1

Total load for period Mar. 1 to Sept. 30 (tons) ----- 541,700

1/Estimated.

2/Computed by subdividing day.

(s)Sediment discharge less than 1 ton.

YELLOWSTONE RIVER BASIN--Continued

MUDDY CREEK NEAR SHOSHONI, WYO.--Continued

Particle-size analyses of suspended sediment, March to June 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.500
Mar. 26, 1949	1:15 p. m.	16	18,400	4,520	--	36	43	53	70	84	95	100	BW	
Mar. 30	3:50 p. m.	11	13,200	5,820	--	34	44	58	70	80	90	98	BW	
May 2	2:20 p. m.	52.3	6,650	2,740	--	42	56	68	80	90	93	100	BW	
June 6	5:50 p. m.	53	90,900	2,410	19	39	74	101	93	91	93	99	BW	
June 9	2:28 p. m.	28	76,200	1,950	34	53	74	84	92	94	96	100	BW	
June 12	5:40 a. m.	91	233,000	3,750	16	28	36	50	63	80	91	96	BW	

YELLOWSTONE RIVER BASIN--Continued

DRY COTTONWOOD CREEK NEAR BONNEVILLE, WYO.

LOCATION.--At gaging station 3 miles upstream from mouth, and 10 miles northwest of Bonneville, Fremont County.

RECORDS AVAILABLE.--Sediment records: March to September 1949.

EXTREMES, March to September 1949: Sediment concentrations: Maximum daily, 27,700 ppm June 2; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 6,880 tons June 2; minimum daily, 0 tons on many days.

REMARKS.--Records of discharge for period March to September 1949 given in Water-Supply Paper 1146.

Suspended sediment, March to September 1949

Day	January			February			March		
	Suspended sediment			Suspended sediment			Suspended sediment		
	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day
1-----							--	--	--
2-----							--	--	--
3-----							--	--	--
4-----							--	--	--
5-----							1.0	4,000	11
6-----							.2	1,100	(1)
7-----							0	--	0
8-----							0	--	0
9-----							0	--	0
10-----							0	--	0
11-----							0	--	0
12-----							0	--	0
13-----							0	--	0
14-----							0	--	0
15-----							0	--	0
16-----							0	--	0
17-----							0	--	0
18-----							0	--	0
19-----							0	--	0
20-----							0	--	0
21-----							0	--	0
22-----							0	--	0
23-----							0	--	0
24-----							0	--	0
25-----							0	--	0
26-----							0	--	0
27-----							0	--	0
28-----							0	--	0
29-----							0	--	0
30-----							0	--	0
31-----							0	--	0
Total-							1.2	--	12

(1) Sediment discharge less than 1 ton.

YELLOWSTONE RIVER BASIN--Continued

DRY COTTONWOOD CREEK NEAR BONNEVILLE, WYO.--Continued

Suspended sediment, March to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----				0	--	0	16	--	2/1,500
2-----				0	--	0	92	27,700	6,080
3-----				0	--	0	3.8	16,200	166
4-----				0	--	0	0	--	0
5-----				0	--	0	0	--	0
6-----				0	--	0	0	--	0
7-----				0	--	0	0	--	0
8-----				0	--	0	0	--	0
9-----				0	--	0	0	--	0
10-----				0	--	0	0	--	0
11-----				0	--	0	0	--	0
12-----				0	--	0	0	--	0
13-----				0	--	0	0	--	0
14-----				0	--	0	0	--	0
15-----				0	--	0	0	--	0
16-----				0	--	0	0	--	0
17-----				0	--	0	0	--	0
18-----				0	--	0	.3	--	2/6
19-----				0	--	0	2.1	6,700	3/43
20-----				0	--	0	.1	--	(i)
21-----				0	--	0	0	--	0
22-----				2.0	--	2/20	0	--	0
23-----				3.5	--	2/50	0	--	0
24-----				0	--	0	0	--	0
25-----				0	--	0	0	--	0
26-----				0	--	0	0	--	0
27-----				0	--	0	0	--	0
28-----				0	--	0	0	--	0
29-----				0	--	0	0	--	0
30-----				0	--	0	0	--	0
31-----				0	--	0	--	--	--
Total-	0	--	0	5.5	--	70	114.3	--	8,600
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0	--	0						
2-----	0	--	0						
3-----	0	--	0						
4-----	0	--	0						
5-----	0	--	0						
6-----	0	--	0						
7-----	0	--	0						
8-----	0	--	0						
9-----	0	--	0						
10-----	13	9,470	3/1,210						
11-----	2.6	11,700	2/170						
12-----	.7	--	2/12						
13-----	0	--	0						
14-----	0	--	0						
15-----	0	--	0						
16-----	0	--	0						
17-----	0	--	0						
18-----	0	--	0						
19-----	0	--	0						
20-----	.8	--	2/13						
21-----	0	--	0						
22-----	0	--	0						
23-----	0	--	0						
24-----	0	--	0						
25-----	0	--	0						
26-----	0	--	0						
27-----	0	--	0						
28-----	0	--	0						
29-----	0	--	0						
30-----	0	--	0						
31-----	0	--	0						
Total-	17.1	--	1,410	0	--	0	0	--	0

Total discharge for period Mar. 5 to Sept. 30 (second-foot-days) ----- 138.1

Total load for period Mar. 5 to Sept. 30 (tons) ----- 10,090

(i) Sediment discharge less than 1 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

SHOSHONE RIVER BELOW BUFFALO BILL RESERVOIR, WYO.

LOCATION.--At bridge on U. S. Highway 20, 1 mile above gaging station, 2 miles downstream from Buffalo Bill Reservoir, and 3½ miles west of Cody, Park County.

DRAINAGE AREA.--1,520 square miles.

RECORDS AVAILABLE.--Chemical analyses: April 1947 to September 1949.

Water temperatures: April 1947 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 419 micromhos July 24, Aug. 3.

Water temperatures: Maximum, 62°F July 22; minimum, freezing point on many days in December, January, and February.

EXTREMES, 1947-49.--Dissolved solids (1947): Maximum, 196 ppm Apr. 1-10, 1947; minimum, 81 ppm Aug. 1-10, 1947.

Specific hardness (1947): Maximum, 108 ppm Apr. 1-10, 1947; minimum, 40 ppm Sept. 1-18, 1947.

Water temperatures: Maximum, 419 micromhos Apr. 5, 1949; minimum, 107 micromhos July 24, Aug. 3, 1949.

Water temperatures: Maximum, 64°F July 31, Aug. 1, 1947; minimum, freezing point on many days during winter months.

REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebt. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids			Hardness as CaCO ₃		Per cent so- sodium carbonate	
															Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate		
Oct. 1-31, 1948	564	7.6	177	16	0.05	16	4.0	17	3.6	75	27	1.0	0.1	0.5	128	0.17	195	56	0	38	
Nov. 1-30	505	7.4	212	16	.05	16	3.6	21	1.2	82	28	2.0	.2	.4	106	.14	145	55	0	45	
Dec. 1-31	653	7.9	286	17	.04	27	6.5	23	1.6	106	50	2.0	.2	.6	172	.23	303	94	7	34	
Jan. 1-31, 1949	694	7.2	301	16	.07	32	6.7	21	2.0	118	52	3.5	.2	.2	206	.28	386	108	11	29	
Feb. 1-28	667	7.7	322	17	.02	30	9.4	22	5.2	124	58	3.0	.1	.5	17	204	.28	367	114	12	29
Mar. 1-29	642	7.6	350	18	.02	30	11	26	3.6	132	70	3.5	.1	.3	19	234	.32	412	120	12	31
Mar. 30-Apr. 30	558	7.8	315	17	.02	30	9.9	21	2.8	128	55	3.0	.1	.2	14	204	.28	305	116	11	28
May 1-31	1,269	8.0	235	19	.02	24	5.5	16	3.2	100	36	1.0	.2	.7	10	152	.21	521	83	1	29
June 1-13	1,160	7.8	172	20	.16	19	4.1	8.2	4.8	70	24	1.5	.1	.5	14	126	.17	395	65	8	20
June 14-20	2,850	7.7	144	19	.12	18	3.5	6.7	2.4	64	19	1.0	.1	.6	11	110	.15	846	60	8	19
June 21-30	4,140	7.7	128	19	.14	19	2.9	5.2	3.2	58	21	1.0	.1	.6	.08	96	.13	1,070	60	12	15
July 1-31	2,046	7.4	117	16	.10	11	2.3	9.9	3.2	54	14	1.0	.2	.9	20	92	.13	509	37	0	34
Aug. 1-31	1,268	7.1	133	19	.07	13	2.8	11	.4	60	14	1.5	.1	1.1	.04	102	.14	350	44	0	35
Sept. 1-30	806	7.0	161	14	.02	16	3.3	12	.8	67	21	1.8	.1	1.2	.06	110	.15	239	54	0	32
Weighted average	1,020	--	197	17	0.07	20	4.7	14	2.7	82	31	1.7	0.1	0.7	0.11	135	0.18	372	70	3	29

YELLOWSTONE RIVER BASIN--Continued

SHOSHONE RIVER BELOW BUFFALO BILL RESERVOIR, WYO.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 [Once-daily temperature measurement between 8 a.m. and 5 p.m.]

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	54	48	35	33	32	38	40	50	48	57	55	57
2	54	47	35	32	32	38	41	51	48	58	55	57
3	55	47	35	32	32	36	41	49	49	57	56	58
4	56	47	--	33	32	38	43	47	50	59	55	57
5	54	46	34	33	32	36	43	47	51	59	55	57
6	54	44	33	37	32	36	42	51	51	57	55	57
7	55	44	33	37	32	38	43	49	54	57	55	56
8	54	43	34	34	32	38	46	50	50	56	54	59
9	54	44	34	33	32	36	45	52	51	57	55	59
10	55	43	34	32	32	38	43	51	51	57	55	59
11	54	43	33	32	32	38	43	51	51	58	56	59
12	55	44	33	32	32	36	42	50	51	58	55	59
13	55	43	33	32	32	34	44	50	52	58	57	59
14	55	43	33	32	32	--	44	49	52	60	57	59
15	53	43	32	33	32	40	43	50	52	60	57	59
16	50	42	33	33	32	40	45	50	51	60	57	59
17	52	41	33	32	32	40	45	50	50	60	58	59
18	53	41	32	32	32	40	45	49	51	60	58	59
19	52	41	32	32	33	40	45	49	52	60	56	59
20	52	41	32	32	33	40	45	49	52	61	57	59
21	52	41	32	32	33	39	47	50	53	60	57	59
22	52	40	32	32	34	40	47	50	54	62	57	59
23	52	40	32	32	34	43	48	50	55	61	58	59
24	52	40	32	31	34	41	49	51	55	55	59	59
25	52	38	32	--	36	40	50	51	56	55	59	59
26	52	38	32	32	36	39	50	50	--	55	59	59
27	52	37	32	32	38	41	50	49	55	55	58	59
28	49	36	32	32	38	40	51	50	55	55	58	57
29	48	35	32	32	--	41	50	51	56	55	58	57
30	48	35	33	32	--	--	49	51	57	56	58	57
31	48	--	33	32	--	--	--	51	--	56	58	--
Average	53	42	33	33	33	39	45	50	52	58	57	58

YELLOWSTONE RIVER BASIN--Continued

SHOSHONE RIVER AT BYRON, WYO.

LOCATION.--At highway bridge at Byron, Big Horn County, 750 feet upstream from gaging station.
DRAINAGE AREA.--2,300 square miles.
RECORDS AVAILABLE.--Chemical analyses: March 1947 to September 1949.

Water temperatures: April 1947 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 1,080 micromhos Oct. 13-15; minimum, 283 micromhos June 24.
Water temperatures: Maximum, 78°F Aug. 12; minimum, freezing point on several days in December and January.

EXTREMES, 1947-49.--Dissolved solids (1947): Maximum, 678 ppm May 8-10, 1947; minimum, 165 ppm July 1-10, 1947.
Total hardness (1947): Maximum, 294 ppm Apr. 20-30, 1947; minimum, 82 ppm July 1-10, 1947.

Specific conductance: Maximum, 1,320 micromhos Apr. 18, 1948; minimum, 237 micromhos July 10, 1947.

Water temperatures: Maximum, 78°F Aug. 12, 1949; minimum, freezing point on several days during winter months.

REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carb. bicarbonate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Bo-ron (B)	Dissolved solids		Hardness as CaCO ₃		Percent sodium carbonate
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate
Oct. 1-31, 1948	508	8.1	943	25	0.05	71	21	108	2.0	0	237	278	12	0.8	5.4	0.07	860	0.90	905	264	70
Nov. 1-30	678	8.0	887	17	.02	71	22	88	2.0	0	225	238	10	.6	4.1	.00	542	.74	922	268	84
Dec. 1-31	853	8.4	736	20	.01	77	16	62	1.6	10	198	186	10	.5	4.0	.21	506	.69	1,170	258	79
Jan. 1-31, 1949	896	8.2	684	19	.01	72	15	62	2.0	4	206	166	8.7	.5	3.5	.22	468	.63	1,130	241	66
Jan. 25-31	908	8.3	669	20	.01	70	14	63	4.0	10	186	162	8.0	.3	2.9	.25	458	.62	1,130	232	55
Feb. 1-31	908	8.1	775	20	.02	68	22	33	2.0	0	220	171	8.3	.4	3.8	.26	538	.73	1,130	252	75
Feb. 24-28	931	8.1	775	20	.02	68	22	33	2.0	0	220	171	8.3	.4	3.8	.26	538	.73	1,130	252	75
Mar. 1-30	885	8.1	732	20	.02	70	23	72	2.6	0	222	213	8.3	.4	3.1	.17	550	.75	1,310	269	87
Mar. 31-Apr. 30	478	7.9	820	18	.02	54	29	84	8.0	0	182	272	11	.5	3.1	.31	592	.81	764	254	108
May 1-31	630	7.9	740	24	.02	50	15	83	7.2	0	189	203	7.5	.6	6.4	.30	510	.69	868	187	32
June 1-22	1,720	7.8	463	23	.02	37	9.5	44	7.2	0	142	111	4.5	.3	3.5	.30	324	.44	1,500	132	16
June 23-24	3,550	8.0	299	21	.02	26	7.0	23	6.4	0	108	60	1.0	.4	1.9	.20	214	.29	2,050	94	5
June 25-30	3,100	7.0	322	20	.02	24	7.2	29	5.6	0	104	70	3.0	.2	2.3	.20	222	.30	1,860	90	5
July 1-11	2,010	8.2	396	18	.06	36	8.5	39	3.2	3	117	106	4.0	.2	2.8	.30	272	.37	1,480	125	24
July 12-31	758	8.4	687	21	.04	48	15	81	2.4	10	157	190	7.0	.4	4.2	.35	466	.63	954	182	37
Aug. 1-24	605	8.0	764	22	.02	53	17	91	6.8	0	192	222	7.5	.5	6.0	.30	526	.72	859	202	45
Aug. 25	574	7.4	842	26	.02	48	16	119	119	0	212	242	9.0	.6	6.0	.--	578	.79	896	186	12
Aug. 26-31	558	8.3	838	24	.02	58	19	97	6.0	8	191	246	9.0	.6	5.8	.30	574	.78	885	223	53
Sept. 1-30	591	7.3	874	24	.02	68	21	91	2.8	0	214	265	12	.6	5.6	.--	626	.85	999	256	0
Weighted average	859	--	670	21	0.02	56	16	66	4.2	--	1/187	183	7.9	0.4	3.9	0.23	463	0.63	1,070	206	53

1/Includes carbonate as bicarbonate.

YELLOWSTONE RIVER BASIN--Continued

SHOSHONE RIVER AT BYRON, WYO.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 (Once-daily temperature measurement between 2 p. m. and 8 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	57	53	38	36	35	45	52	52	56	67	75	70
2	60	52	41	35	34	45	42	64	52	74	72	64
3	61	48	44	32	35	48	55	60	60	68	75	60
4	60	45	35	36	34	48	56	50	66	68	71	60
5	50	45	33	37	35	48	53	46	70	67	70	60
6	47	43	36	39	36	49	55	60	67	66	73	60
7	55	42	34	36	38	48	57	64	70	69	74	65
8	55	41	35	32	37	44	58	66	70	69	70	64
9	58	44	34	34	36	37	55	67	73	68	70	65
10	57	43	37	33	39	40	55	66	73	72	75	60
11	57	43	37	32	36	44	53	68	68	68	75	51
12	55	45	37	32	35	42	54	70	68	66	78	54
13	56	46	33	37	34	41	55	66	66	72	70	49
14	57	47	32	38	37	36	54	67	66	74	71	57
15	50	45	31	36	37	42	55	70	64	73	72	64
16	47	42	33	39	35	39	54	62	66	75	72	60
17	48	41	35	36	38	45	57	53	58	70	69	58
18	52	45	37	36	35	46	62	50	57	68	72	60
19	52	40	35	32	38	48	62	60	62	72	71	63
20	54	43	38	32	37	45	57	65	63	65	70	64
21	53	46	38	32	38	49	56	59	66	70	70	61
22	56	40	35	33	39	47	60	61	67	71	72	67
23	56	42	34	31	39	45	62	52	64	73	68	67
24	58	--	32	31	40	47	65	65	66	66	66	66
25	56	42	34	32	44	50	65	56	67	74	71	66
26	54	37	35	34	43	48	62	68	59	72	71	64
27	54	47	35	35	41	47	65	68	66	71	71	63
28	49	35	36	32	43	45	65	60	65	70	72	63
29	50	39	36	32	--	47	55	66	65	72	69	57
30	52	37	35	35	--	50	56	66	64	76	69	60
31	51	--	35	33	--	49	--	62	--	75	70	--
Average	54	43	35	34	37	45	57	62	65	70	71	61

YELLOWSTONE RIVER BASIN--Continued

TONGUE RIVER AT MILES CITY, MONT.

LOCATION --At gaging station 4 miles south of Miles City, Custer County, and 8 miles upstream from mouth.

RECORDS AVAILABLE.--Water temperatures: April to September 1949.

Sediment records: June 1946 to September 1949.

EXTRIMES, 1946-49.--Sediment concentrations: Maximum daily, 5,080 ppm Mar. 22; minimum, not determined.

EXTRIMES, 1946-49.--Sediment concentrations: Maximum daily, less than 1 ton on several days in July to September.

EXTRIMES, 1946-49.--Sediment concentrations: Maximum daily, 18,900 ppm Aug. 13, 1946; minimum daily, 1 ppm Aug. 19, 15, 1947.

EXTRIMES, 1946-49.--Sediment concentrations: Maximum daily, less than 1 ton on several days in August 1947 and July to September 1949.

Sediment loads: Maximum daily, 122,000 tons June 3, 1948; minimum daily, less than 1 ton on several days in August 1947 and July to September 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, September 1948 to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent non- car- bon- ate
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
Sept. 1, 1948 -----	72	8.0	794	14	0.0	59	38	57	57	254	204	40	0.3	0.4	0.07	554	0.75		303	95	29
Oct. 27 -----	574	7.9	742	10	.02	57	45	53	53	254	321	2.0	.3	.7	.10	544	.74		327	119	26
Dec. 21 -----	155	7.9	1,210	13	.12	100	68	74	74	382	352	5.5	.4	2.5	.13	830	1.13		529	216	23
Feb. 27, 1949 -----	115	7.1	898	14	.02	70	47	57	57	292	232	5.0	.3	3.7	.00	580	.79		368	129	25
May 3 -----	478	7.8	987	9.3	.05	75	53	76	76	281	318	5.0	.4	.8	--	716	.97		405	175	29
June 21 -----	1,220	7.7	341	11	.05	33	14	18	18	132	66	1.5	.1	1.2	--	219	.30		140	32	22
July 6 -----	325	8.0	492	12	.05	42	20	37	37	176	106	8.0	.2	.6	--	319	.43		188	44	30
Sept. 14 -----	14	8.2	1,520	14	.02	41	63	229	229	346	533	13	.3	1.1	--	1,060	1.44		362	78	58

YELLOWSTONE RIVER BASIN--Continued

TONGUE RIVER AT MILES CITY, MONT.--Continued

Temperature (°F) of water, April to September 1949

/Once-daily temperature measurement between 6 a. m. and 9 a. m. /

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							--	60	69	62	--	--
2							--	53	64	68	63	--
3							--	58	62	71	83	58
4							--	61	62	69	--	--
5							--	54	65	66	--	56
6							--	54	62	69	--	--
7							--	61	65	69	--	60
8							53	62	67	67	--	--
9							50	61	66	65	--	--
10							47	64	69	66	--	51
11							50	65	71	66	--	--
12							54	66	68	66	--	--
13							53	74	67	68	--	--
14							48	--	63	66	--	63
15							49	69	64	69	--	--
16							52	64	65	67	71	51
17							49	66	60	67	--	--
18							48	56	59	60	--	46
19							53	61	61	64	75	--
20							57	--	62	62	--	51
21							51	--	64	55	--	--
22							47	--	67	62	66	59
23							48	--	68	63	--	--
24							59	54	66	--	61	62
25							53	58	66	80	--	--
26							52	62	68	62	61	51
27							56	71	60	63	--	--
28							58	70	61	59	--	47
29							62	78	68	59	62	--
30							57	72	62	--	--	55
31							--	65	--	68	--	--
Average							--	63	65	65	--	--

YELLOWSTONE RIVER BASIN--Continued
TONGUE RIVER AT MILES CITY, MONT.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	65	7	1	636	172	296	210	40	
2-----	65	8	1	629	232	394	255	17	1/30
3-----	63	9	2	643	142	247	230	--	
4-----	67	8	1	657	137	243	150		
5-----	67	6	1	678	--	1/380	155		
6-----	70	4	(a)	650	153	268	160	--	1/18
7-----	69	6	1	636	--	1/190	165		
8-----	80	6	1	636	90	155	170		
9-----	85	6	1	636	--	1/140	190		
10-----	214	7	4	643	72	125	210		
11-----	206	16	9	650	--	1/180	225		
12-----	206	16	9	657	130	230	215	--	1/10
13-----	242	36	24	664	--	1/180	195		
14-----	246	--	1/28	650	72	126	175		
15-----	250	31	21	650	--	1/130	155		
16-----	238	16	10	636	119	204	130	--	
17-----	194	6	3	629	174	296	125	11	1/4
18-----	174	11	5	622	167	280	115	--	
19-----	238	42	27	615	--	1/290	110	--	
20-----	395	145	155	594	185	295	130	10	
21-----	442	215	256	532	--	1/180	155	--	1/6
22-----	514	220	305	490	65	86	160	--	
23-----	538	207	300	460	--	1/160	160	--	
24-----	556	195	293	430	185	215	165	20	
25-----	568	--	1/280	375	--	1/120	165	--	
26-----	568	163	250	355	62	59	170	--	
27-----	574	148	229	330	--	1/100	175	--	
28-----	562	130	197	330	155	138	180	16	1/8
29-----	574	155	240	295	--	1/130	185	--	
30-----	594	135	216	180	175	85	185	--	
31-----	629	170	289	--	--	--	190	16	
Total-	9,353	--	3,160	16,588	--	5,920	5,360	--	350
Day	January			February			March		
	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	170	--		115	--		400	--	1/50
2-----	150	--		100	--		700	71	134
3-----	150	--	1/7	100	--	1/6	900	130	316
4-----	160	--		100	22		1,000	--	1/1,200
5-----	170	20		100	--		1,150	--	1/6,000
6-----	180	12		100			5,200	--	1/25,000
7-----	190	--		110			4,370	1,980	23,400
8-----	150	34	1/9	120			3,000	2,290	18,600
9-----	165	--		130			1,500	1,100	4,460
10-----	180	--		140			800	600	1,300
11-----	200	--		140			600	310	502
12-----	215	--		120			500	120	162
13-----	230	16		120		1/5	450	--	1/150
14-----	220	--	1/10	120			500	--	1/180
15-----	210	--		140	--		550	--	1/220
16-----	210	--		150		1/10	600	--	1/260
17-----	205	--		135	32		700	--	1/320
18-----	170	14		125			800	--	1/380
19-----	135	--	1/9	115		1/4	895	--	1/460
20-----	110	--		105			1,270	1,800	6,170
21-----	100			90	14		2,690	3,340	24,200
22-----	95			95		1/3	3,060	5,060	42,000
23-----	90	--	1/5	95	--		2,990	4,820	3/40,500
24-----	95			100	--	1/10	1,740	2,790	13,100
25-----	105			105	45	13	1,330	2,200	7,900
26-----	115	--		110		1/14	1,310	2,690	9,500
27-----	120	--		115			1,160	--	1/8,400
28-----	130	14	1/6	120	47	15	874	2,000	4,720
29-----	135	--		--	--	--	762	1,390	2,860
30-----	140	--		--	--	--	643	1,110	1,930
31-----	140	--		--	--	--	568	770	1,180
Total-	4,835	--	240	3,215	--	200	43,012	--	245,600

1/Estimated.

(a)Sediment discharge less than 1 ton.

3/Sediment discharge computed by subdividing day.

YELLOWSTONE RIVER BASIN--Continued

TONGUE RIVER AT MILES CITY, MONT.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	574	560	867	430	69	80	1,080	1,390	3,980
2-----	720	655	1,270	460	72	89	1,050	1,220	3,460
3-----	706	715	1,360	478	69	89	1,010	1,080	2,940
4-----	692	492	920	514	108	150	970	530	1,390
5-----	678	315	576	544	298	438	1,030	445	1,240
6-----	671	320	580	532	242	348	1,460	1,050	4,140
7-----	650	300	526	568	91	140	1,530	855	3,540
8-----	643	235	408	538	115	167	1,560	775	3,270
9-----	629	158	268	636	196	337	1,350	695	2,530
10-----	601	135	219	727	370	726	1,340	535	1,940
11-----	601	115	187	867	675	1,580	1,330	562	2,020
12-----	601	93	151	895	450	1,090	1,360	620	2,280
13-----	601	87	141	853	455	1,050	1,340	618	2,240
14-----	556	60	90	860	--	1/1,300	1,370	635	2,350
15-----	550	136	202	678	2,250	4,120	1,350	485	1,770
16-----	532	78	112	671	1,670	3,030	1,350	520	1,890
17-----	514	35	49	790	520	1,110	1,480	621	2,480
18-----	502	70	95	874	560	1,320	1,530	600	2,480
19-----	496	58	78	839	580	1,310	1,610	649	2,820
20-----	490	24	32	994	--	1/3,800	1,500	550	2,230
21-----	360	86	84	1,550	2,440	10,200	1,280	400	1,380
22-----	290	30	23	1,470	2,200	8,730	1,110	324	970
23-----	265	35	25	1,060	680	1,950	1,070	280	809
24-----	246	30	20	1,010	370	1,010	1,060	230	659
25-----	238	13	8	1,010	495	1,350	1,030	247	686
26-----	234	31	20	986	445	1,180	1,030	230	639
27-----	295	32	25	978	415	1,100	899	175	330
28-----	320	25	22	970	295	772	544	105	154
29-----	335	33	30	978	330	871	478	65	84
30-----	345	37	34	986	492	1,310	345	56	52
31-----	--	--	--	994	1,130	3,030	--	--	--
Total-	14,935	--	8,420	25,740	--	53,780	35,226	--	56,740

Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	245	30	20	9	--	--	5.0	25	--
2-----	198	24	13	9.0	8	--	5	--	--
3-----	166	18	8	7.5	15	--	5.0	21	--
4-----	210	28	16	7	--	--	5	--	--
5-----	246	49	33	7	--	--	4.7	10	(a)
6-----	270	48	35	7	--	(a)	5	--	--
7-----	250	27	18	6	--	--	4.4	9	--
8-----	182	22	11	6	--	--	7	--	--
9-----	156	19	8	6	--	--	10	--	--
10-----	135	60	22	6	--	--	12	30	--
11-----	132	37	13	6	--	--	12	--	--
12-----	132	26	9	6	--	--	13	--	1/1
13-----	138	28	10	5	--	--	14	--	--
14-----	126	19	6	5	--	--	14	16	--
15-----	182	--	1/850	5	--	--	22	--	--
16-----	105	1,350	383	5.0	16	(a)	31	25	1/2
17-----	98	255	67	7.0	--	--	35	--	--
18-----	63	113	19	6.5	--	--	56	46	7
19-----	58	54	8	6.5	31	--	61	--	1/7
20-----	46	126	16	6	--	--	69	42	8
21-----	61	286	47	6	--	--	80	--	1/11
22-----	85	430	99	6.0	23	--	98	45	12
23-----	65	96	17	6	--	--	100	--	1/13
24-----	67	--	1/16	6.0	17	--	85	46	11
25-----	58	72	11	6	--	--	80	--	1/9
26-----	55	25	4	5.0	9	(a)	80	38	8
27-----	54	82	12	5	--	--	80	--	1/8
28-----	49	310	41	5	--	--	76	33	7
29-----	25	21	1	5.0	23	--	72	--	1/6
30-----	17	--	1/1	5	--	--	76	32	7
31-----	9.0	30	(a)	5	--	--	--	--	--
Total-	3,683.0	--	1,820	188.5	--	9	1,217.1	--	130

Total discharge for year (second-foot-days) ----- 163,352.6

Total load for year (tons) ----- 376,400

1/Estimated.

(a)Sediment discharge less than 1 ton.

YELLOWSTONE RIVER BASIN--Continued

POWDER RIVER AT ARVADA, WYO.

LOCATION--At county highway bridge, 0.1 mile south of Arvada, Sheridan County, a quarter of a mile upstream from Wildhorse Creek, and half a mile downstream from gaging station.

DRAINAGE AREA--6,050 square miles (above gaging station).

RECORDS AVAILABLE--Water temperatures: March to September 1949.

Sediment records: April 1946 to September 1949.

EXTREMES, 1948-49--Sediment concentrations: Maximum daily, 97,200 ppm Sept. 1; minimum daily, 0 tons on many days in July to September.

Sediment loads: Maximum daily, 382,000 tons June 8; minimum daily, 0 tons on many days in July to September.

EXTREMES, 1946-49--Sediment concentrations: Maximum daily, 97,200 ppm Sept. 1, 1949; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 1,200,000 tons June 18, 1948; minimum daily, 0 tons on many days each year.

REMARKS--No appreciable inflow between gaging station and sampling point except during periods of intense local rainfall. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, July 1948 to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent sodium
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
July 14, 1948	4,740	6.6	1,860	19	0.50	271	64	111	236	916	23	0.5	0.3	0.5	--	1,700	2.31	21,760	939	745	20
Nov. 3	102	8.0	1,620	9.0	.02	157	55	162	220	666	66	.7	2.6	0.12	0.12	1,230	1.67		618	438	36
Nov. 30	1/120	7.9	2,070	12	.05	209	85	214	311	924	82	.6	2.9	.28	.28	1,680	2.28		871	616	35
Mar. 3, 1949	1/1,500	7.3	1,360	9.8	.04	122	35	125	124	552	29	.4	3.0	.09	.09	938	1.28		448	346	38
Apr. 12	551	7.5	2,300	14	.02	175	68	298	207	1,060	61	.8	3.7	--	--	1,780	2.42		716	546	48
June 1	287	7.5	1,370	13	.02	123	34	147	179	532	43	.7	3.2	--	--	985	1.34		447	300	42
July 6	193	7.3	1,820	15	.02	201	57	162	210	800	57	.5	1.3	--	--	1,400	1.90		7.8	564	32
Sept. 12	1/2.0	7.6	3,100	4.4	.02	236	99	369	182	1,360	162	1.2	2.6	--	--	2,330	3.17		996	847	41

1/ Mean daily discharge.

YELLOWSTONE RIVER BASIN--Continued

POWDER RIVER AT ARVADA, WYO.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 6 p. m. and 7 p. m. 7

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1		46				--	50	64	60	76	--	66
2		--				--	49	76	57	84	--	64
3		--			32	--	54	73	66	77	--	55
4		--				--	55	56	68	79	--	57
5		--				--	52	42	75	75	--	56
6		--				--	56	59	67	80	--	60
7		--				--	63	55	69	68	--	58
8		--				--	52	65	70	78	--	--
9		--				--	43	64	78	79	--	--
10		--				--	57	70	78	75	--	--
11		--				33	62	--	75	70	--	--
12		--				--	46	--	67	81	--	56
13		--				--	42	70	65	72	--	--
14		--		32		--	52	71	71	77	--	--
15		--				--	57	74	74	81	--	--
16		--				--	56	63	70	77	--	--
17		--				--	62	61	60	74	65	--
18		--				--	66	54	61	74	--	--
19		--				--	49	65	74	76	--	--
20		--				40	54	64	73	65	--	--
21		--				--	54	62	80	75	--	--
22		--				42	60	61	73	78	--	--
23		--				36	69	56	71	79	--	65
24		--				35	67	66	77	78	--	72
25		--				42	63	71	79	78	--	50
26		--				45	66	74	70	78	--	59
27		--				42	71	72	75	60	--	60
28		--				43	71	77	73	73	--	65
29		--				43	64	71	74	63	--	52
30		32				44	50	74	75	66	--	65
31		--				49	--	70	--	--	--	--
Average		--				--	57	66	71	75	--	--

YELLOWSTONE RIVER BASIN--Continued

POWDER RIVER AT ARVADA, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	31	2,120	177	127	3,560	1,220	125	540	182
2-----	30	1,700	138	130	3,400	1,190	130	743	260
3-----	30	1,590	129	121	4,000	1,310	135	920	336
4-----	31	1,540	129	133	4,260	1,530	100	510	138
5-----	35	1,800	170	130	4,000	1,400	80	430	93
6-----	38	1,830	188	127	3,940	1,350	83	428	96
7-----	44	1,900	226	127	2,940	1,010	82	454	101
8-----	51	2,050	282	115	3,120	969	78	322	68
9-----	59	2,120	338	112	3,500	1,060	72	398	77
10-----	60	2,180	354	136	3,310	1,220	80	470	102
11-----	72	2,370	461	104	2,630	739	90	500	122
12-----	82	2,600	575	96	2,800	725	100	555	150
13-----	85	2,700	619	93	2,780	698	80	554	120
14-----	82	2,660	589	104	3,390	952	76	642	132
15-----	90	2,820	685	157	4,170	1,770	72	711	138
16-----	215	--	1/31,000	166	4,300	1,930	70	595	112
17-----	1,070	63,400	183,000	148	4,650	1,860	70	800	151
18-----	351	41,000	38,900	148	3,480	1,390	80	890	192
19-----	205	30,500	16,900	135	780	284	90	820	199
20-----	154	28,100	11,700	135	390	142	100	798	216
21-----	127	14,100	4,840	135	500	182	90	715	174
22-----	112	7,880	2,420	130	690	242	80	518	112
23-----	104	6,000	1,690	130	1,170	411	70	375	71
24-----	101	4,530	1,240	135	7,200	2,520	70	418	79
25-----	104	4,190	1,180	130	6,680	2,340	70	421	80
26-----	104	3,910	1,100	125	3,410	1,150	70	458	87
27-----	107	2,570	742	120	2,350	761	80	467	101
28-----	110	3,340	992	120	950	308	84	460	104
29-----	112	3,420	1,030	120	967	314	76	417	86
30-----	121	2,940	960	120	490	159	80	391	84
31-----	124	3,560	1,190	--	--	--	70	560	106
Total-	4,041	--	303,900	3,809	--	31,240	2,633	--	4,070
Day	January			February			March		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	76	718	147	56	225	34	720	2,150	4,180
2-----	68	663	122	53	--	1/33	1,410	3,050	11,600
3-----	60	546	88	54	283	41	1,500	4,000	16,200
4-----	62	490	82	56	300	45	1,650	5,800	25,800
5-----	65	499	88	58	313	49	1,800	6,300	30,600
6-----	70	560	106	58	272	43	1,930	11,500	59,900
7-----	80	591	128	60	257	42	1,880	12,800	65,000
8-----	60	375	61	64	265	46	1,350	12,400	45,200
9-----	52	140	20	66	280	50	1,000	9,050	24,400
10-----	50	130	18	70	272	51	700	7,950	15,000
11-----	54	263	38	60	259	42	820	5,950	13,200
12-----	60	320	52	56	288	44	935	3,400	8,590
13-----	66	263	47	52	282	40	880	2,250	5,350
14-----	66	267	48	56	332	50	416	950	1,070
15-----	66	249	44	62	615	103	446	600	723
16-----	58	239	37	66	510	91	933	1,250	3,150
17-----	56	235	36	72	367	71	913	2,750	6,780
18-----	54	291	42	66	281	50	1,050	4,300	12,200
19-----	52	348	49	62	251	42	1,010	7,800	21,200
20-----	50	--	1/50	62	261	44	869	14,300	33,600
21-----	50	398	54	66	260	46	716	18,300	35,400
22-----	54	--	1/55	76	269	55	689	24,700	45,900
23-----	52	--	1/42	80	248	54	648	25,600	44,800
24-----	50	--	1/34	78	266	56	572	19,400	30,000
25-----	49	238	31	76	267	55	518	17,800	24,900
26-----	54	251	37	80	260	56	400	14,900	16,100
27-----	56	248	39	170	1,230	565	333	10,300	9,260
28-----	56	219	33	330	2,050	1,830	291	10,300	8,100
29-----	62	194	27	--	--	--	299	9,600	7,750
30-----	64	195	34	--	--	--	311	9,100	7,650
31-----	60	215	35	--	--	--	307	8,300	6,890
Total-	1,824	--	1,720	2,165	--	3,730	27,296	--	640,500

1/Estimated.

YELLOWSTONE RIVER BASIN--Continued

POWDER RIVER AT ARVADA, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	311	7,980	6,700	422	10,600	12,100	324	10,500	9,190
2-----	283	5,020	5,020	464	13,700	17,100	935	53,000	139,000
3-----	275	7,240	5,370	558	14,600	22,000	761	43,500	92,700
4-----	279	6,700	5,050	506	11,200	15,300	1,380	58,800	227,000
5-----	268	6,430	4,650	494	11,600	15,500	624	42,500	74,300
6-----	244	6,300	4,150	494	12,300	16,400	632	42,700	75,600
7-----	283	6,870	5,250	524	16,200	22,900	913	47,700	122,000
8-----	324	7,250	6,340	588	16,300	29,300	2,120	64,400	382,000
9-----	342	7,860	7,250	608	21,400	35,100	1,630	67,000	306,000
10-----	370	8,570	8,560	537	19,400	28,200	1,510	55,700	236,000
11-----	356	9,320	8,960	524	18,700	26,400	1,390	58,500	228,000
12-----	342	9,320	8,600	482	15,400	20,000	770	42,000	90,600
13-----	351	8,120	7,700	470	13,000	16,500	656	29,000	51,400
14-----	351	7,560	7,170	458	14,400	17,800	858	30,200	70,000
15-----	360	7,810	7,590	452	13,300	16,200	707	29,000	55,400
16-----	360	7,940	7,710	422	15,600	17,800	632	22,900	39,100
17-----	360	8,840	8,590	452	13,000	15,900	512	18,000	24,900
18-----	356	7,710	7,410	648	27,700	48,400	464	15,500	19,400
19-----	346	8,500	7,940	446	13,700	16,500	405	12,700	13,900
20-----	320	6,830	5,900	579	13,100	20,500	370	10,500	10,500
21-----	320	7,480	6,460	716	25,500	49,300	405	8,400	9,190
22-----	324	7,510	6,560	1,010	31,300	85,400	390	7,200	7,580
23-----	324	7,170	6,270	836	28,400	64,100	333	6,300	5,660
24-----	315	6,440	5,470	1,180	30,000	95,500	279	5,190	3,910
25-----	303	5,670	4,640	869	28,700	67,400	230	4,050	2,520
26-----	291	4,700	3,690	600	25,200	40,800	196	3,790	2,000
27-----	291	8,000	6,280	416	19,900	22,400	172	3,170	1,470
28-----	356	8,080	7,760	328	13,600	12,000	154	3,470	1,440
29-----	452	9,130	11,100	311	11,400	9,570	130	4,720	1,660
30-----	380	9,410	9,650	342	19,500	18,000	112	3,320	1,000
31-----	--	--	--	299	11,100	8,960	--	--	--
Total-	9,837	--	203,800	17,040	--	903,300	19,994	--	2,303,000
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	101	3,420	934	0	--	0	12	97,200	3,270
2-----	110	2,800	832	0	--	0	9.3	92,300	2,400
3-----	96	2,000	518	0	--	0	7.0	50,500	990
4-----	85	2,090	480	0	--	0	8.8	48,800	1,200
5-----	124	4,340	1,450	0	--	0	7.0	33,200	628
6-----	214	19,400	11,200	0	--	0	5.2	4,900	69
7-----	196	15,800	8,360	0	--	0	2.4	482	3
8-----	169	6,300	2,880	0	--	0	.6	451	(s)
9-----	130	3,000	1,050	0	--	0	0	--	0
10-----	169	4,620	2,110	0	--	0	0	--	0
11-----	928	70,500	2,249,000	0	--	0	0	--	0
12-----	518	68,600	99,500	0	--	0	2.0	504	3
13-----	227	48,000	30,500	0	--	0	4.4	512	6
14-----	157	40,900	18,000	0	--	0	4.8	494	6
15-----	142	32,900	12,600	0	--	0	4.2	293	3
16-----	142	32,400	12,400	0	--	0	3.0	171	1
17-----	133	30,100	10,800	3.6	10,700	104	2.9	132	1
18-----	104	28,900	8,110	0	--	0	3.4	220	2
19-----	45	24,300	2,950	0	--	0	3.6	320	3
20-----	34	18,100	1,660	0	--	0	4.0	235	3
21-----	25	16,200	1,090	0	--	0	4.0	243	3
22-----	22	22,100	1,310	0	--	0	4.4	231	3
23-----	17	16,800	771	0	--	0	4.8	239	3
24-----	12	10,200	330	0	--	0	7.8	353	7
25-----	9.2	4,900	122	0	--	0	11	459	14
26-----	5.8	1,250	20	0	--	0	14	428	16
27-----	4.0	258	3	0	--	0	12	383	12
28-----	2.2	128	(s)	0	--	0	13	372	13
29-----	1.4	49	(s)	0	--	0	15	340	14
30-----	.3	11	(s)	0	--	0	14	296	11
31-----	0	--	0	.4	5,620	6	--	--	--
Total-	3,922.9	--	479,000	4.0	--	110	184.6	--	8,690
Total discharge for year (second-foot-days)-----									92,750.5
Total load for year (tons) -----									4,883,000

2/Sediment discharge computed by subdividing day.

(s)Sediment discharge less than 1 ton.

YELLOWSTONE RIVER BASIN--Continued
POWDER RIVER AT ARVADA, WYO.--Continued

Particle size analyses of suspended sediment, water year October 1948 to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000
Oct. 5, 1948	12:30 p. m.	35	1,760	2,700	--	--	10	--	94	95	95	98	99		BN
Oct. 5	12:30 p. m.	35	1,760	2,830	--	72	88	92	94	96	96	100	--		BW
Mar. 3, 1949	10:00 a. m.	1,430	2,680	1,000	--	14	24	38	40	48	63	86	98		BN
Mar. 3	10:00 a. m.	1,430	2,680	1,110	20	29	34	38	40	45	58	70	88		BW
Mar. 11	2:00 p. m.	500	4,170	1,870	--	6	44	56	63	73	88	100	--		BN
Mar. 11	2:00 p. m.	500	4,170	1,630	--	33	42	50	58	74	90	98	100		BW
Mar. 23	2:50 p. m.	656	11,400	1,190	--	38	56	70	85	97	100	--	--		BW
Apr. 12	2:30 p. m.	342	10,100	2,240	--	36	42	53	81	86	93	96	98		BW
May 21	11:30 a. m.	716	26,200	1,120	--	46	60	70	78	88	95	98	100		BW
June 3	12:42 p. m.	512	26,100	1,230	--	44	72	76	84	92	98	98	99		BW
June 10	10:30 a. m.	1,350	47,000	1,420	--	36	60	66	76	90	95	100	--		BW
July 6	1:00 p. m.	284	19,600	1,990	--	38	51	68	79	88	93	96	100		BW
July 19	1:30 p. m.	44	25,800	2,460	--	75	90	96	97	98	98	100	--		BW
Sept. 2	10:55 a. m.	9.8	94,200	3,840	--	4	6	96	100	--	--	--	--		BN
Sept. 2	9:40	9.8	94,200	4,000	42	68	94	100	--	--	--	--	--		BW
Sept. 2	5:15 p. m.	9.8	83,000	2,070	48	70	92	98	98	100	--	--	--		BW
Sept. 12	5:20 p. m.	4.0	387	277	20	36	64	92	97	99	100	--	--		BW

YELLOWSTONE RIVER BASIN--Continued

MIDDLE FORK POWDER RIVER ABOVE KAYCEE, WYO.

LOCATION.--At gaging station, 2 miles upstream from Red Fork, 2 miles downstream from Beaver Creek, about 10 miles southwest of Kaycee, and 4.6 miles southeast of Barnum, Johnson County.

DRAINAGE AREA.--450 square miles.

RECORDS AVAILABLE.--Water temperatures: June to September 1949.

Sediment records: April to September 1949.

EXTREMES, April to September, 1949.--Sediment concentrations: Maximum daily, 24,000 ppm

June 9; minimum daily, 13 ppm July 9.

Sediment loads: Maximum daily, 18,700 tons June 9; minimum daily, 1 ton on several days in July and August.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, water year October 1948 to September 1949
/Once-daily temperature measurement between 7 a. m. and 8 a. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1								--	49	--	--	--
2								--	48	59	70	66
3								--	49	70	71	56
4								--	49	--	61	54
5								--	54	63	63	63
6								--	56	63	63	--
7								--	53	68	--	--
8								--	55	64	--	65
9								--	50	68	--	66
10								--	69	74	70	57
11								--	58	62	61	54
12								--	--	61	62	47
13								--	53	68	57	55
14								--	49	61	65	47
15								--	56	--	73	51
16								--	54	--	62	54
17								--	--	--	63	--
18								--	56	59	--	56
19								--	52	64	60	--
20								--	57	60	64	58
21								--	56	75	70	50
22								--	58	58	64	--
23								--	54	58	62	60
24								--	57	67	63	61
25								--	63	64	60	59
26								--	59	62	--	54
27								--	56	62	--	--
28								--	--	58	67	48
29								--	69	62	72	51
30								--	56	64	56	55
31								--	59	--	63	--
Average								--	56	64	--	--

YELLOWSTONE RIVER BASIN--Continued

MIDDLE FORK POWDER RIVER ABOVE KAYCEE, WYO.--Continued

Suspended sediment, April to September 1949

Day	Mean dis-charge (second-foot)	April		Mean dis-charge (second-foot)	May		Mean dis-charge (second-foot)	June	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	--	--	--	201	1,990	1,080	128	6,600	2,280
2-----	--	--	--	169	1,870	853	160	2,600	1,120
3-----	--	--	--	217	2,540	1,490	136	520	191
4-----	--	--	--	277	2,400	1,800	138	510	190
5-----	--	--	--	264	4,050	2,890	136	290	107
6-----	--	--	--	193	2,060	1,070	149	3,440	1/1,440
7-----	--	--	--	174	940	442	144	1,480	575
8-----	--	--	--	181	1,010	494	155	20,000	1/9,800
9-----	--	--	--	193	1,020	532	216	24,000	1/18,700
10-----	--	--	--	219	1,140	675	134	1,220	441
11-----	--	--	--	224	1,160	702	118	390	124
12-----	--	--	--	246	1,350	896	160	--	2/1,700
13-----	--	--	--	230	828	514	132	1,620	577
14-----	--	--	--	222	638	382	126	1,020	347
15-----	--	--	--	209	719	406	113	810	248
16-----	--	--	--	224	628	380	101	780	213
17-----	--	--	--	198	600	320	96	--	2/230
18-----	--	--	--	193	434	226	99	1,120	300
19-----	--	--	--	166	505	226	101	1,560	425
20-----	--	--	--	157	365	155	88	860	204
21-----	--	--	--	169	1,440	656	80	1,150	248
22-----	84	548	124	209	940	530	74	830	166
23-----	77	426	89	201	550	298	72	680	132
24-----	99	1,420	380	174	388	182	71	154	30
25-----	128	2,570	890	164	373	165	68	319	59
26-----	138	1,880	700	157	260	110	67	610	110
27-----	153	2,350	970	146	207	82	64	180	31
28-----	176	2,560	1,220	142	224	86	58	641	100
29-----	240	3,640	2,360	138	232	86	55	122	18
30-----	264	3,690	2,830	138	5,030	1,870	53	70	10
31-----	--	--	--	126	254	86	--	--	--
Total-	1,379	--	9,560	5,921	--	19,680	3,292	--	40,120

Day	Mean dis-charge (second-foot)	July		Mean dis-charge (second-foot)	August		Mean dis-charge (second-foot)	September	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	51	--	2/7	29	--	2/3	31	32	3
2-----	48	58	8	29	14	1	29	20	2
3-----	48	63	8	29	25	2	38	214	1/24
4-----	48	--	2/9	27	41	3	45	165	20
5-----	49	48	6	26	46	3	45	80	10
6-----	46	34	4	25	24	2	44	--	2/8
7-----	41	22	2	26	--	2/1	43	--	2/9
8-----	40	23	2	25	--	2/1	43	--	2/11
9-----	39	13	1	26	--	2/2	40	74	8
10-----	42	18	2	102	--	2/440	40	68	7
11-----	42	26	3	42	1,240	141	40	84	9
12-----	42	35	4	35	345	33	42	94	11
13-----	47	126	16	31	220	18	44	70	8
14-----	54	474	69	29	114	9	44	87	10
15-----	45	283	34	29	91	7	42	57	6
16-----	41	142	16	29	80	6	41	53	6
17-----	40	60	6	30	57	5	41	--	2/3
18-----	38	39	4	30	--	2/3	40	32	3
19-----	35	27	3	30	45	4	41	--	2/5
20-----	35	14	1	30	41	3	40	67	7
21-----	34	19	2	30	33	3	40	81	9
22-----	35	30	3	29	--	2/4	44	--	2/7
23-----	33	37	3	28	44	3	44	41	5
24-----	29	40	3	29	48	4	42	32	4
25-----	27	59	4	29	54	4	42	29	3
26-----	27	69	5	29	--	2/3	42	48	5
27-----	29	31	2	29	--	2/2	41	56	6
28-----	28	126	10	29	25	2	42	49	6
29-----	28	225	17	30	47	4	40	47	5
30-----	28	108	8	30	59	5	40	35	4
31-----	29	61	5	31	77	6	--	--	--
Total-	1,198	--	267	982	--	727	1,230	--	224

Total discharge for period Apr. 22 to Sept. 30 (second-foot-days) ----- 14,002

Total load for period Apr. 22 to Sept. 30 (tons) ----- 70,600

1/Sediment discharge computed by subdividing day.

2/Estimated.

YELLOWSTONE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN YELLOWSTONE RIVER BASIN

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Dis-charge (second-foot)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- nesium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bon- ate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium
																	Parts per mil- lion	Tons per acre- foot	Total	Non- carbon- ate	

YELLOWSTONE RIVER AT MILES CITY, MONT.

Oct. 11, 1948	1/6,330	7.8	888	12	0.02	64	38	61	2.4	0	231	250	7.0	0.4	1.0	0.15	584	0.79	316	137	29	
Oct. 26	6,550	8.2	826	9.6	.04	70	28	84		6	208	258	14	.5	2.1	.20	628	.85	290	110	39	
Dec. 22	4,550	8.4	926	18	.08	84	29	78		10	224	264	14		6	3.3	20	628	.85	328	128	34
Feb. 27, 1949	3,840	7.4	745	20	.03	66	23	55		0	180	202	12	.4	3.2	.03	498	.68	259	111	32	
Apr. 25	8,590	7.2	648	17	.10	54	11	73		0	180	168	10	.4	1.8	--	450	.61	181	33	47	
May 26	22,900	7.0	414	16	.15	40	22	20		0	128	102	14	.3	1.8	--	276	.38	191	86	18	
June 24	35,100	7.1	302	13	.10	28	8.1	21		0	96	62	4.0	.2	1.3	--	196	.27	104	25	31	

YELLOWSTONE RIVER NEAR SIDNEY, MONT.

Oct. 17, 1948	6,400	7.5	878	16	0.02	66	29	87		0	220	260	13	0.5	2.4	0.24	616	0.84	284	104	40
Oct. 3, 1949	16,900	7.6	762	9.8	.02	60	20	83		0	162	250	11	.2	2.8	.12	531	.72	232	99	44
Apr. 28	9,030	7.6	787	13	.02	66	28	66		0	194	234	12	.4	2.2	.00	543	.74	279	120	34
June 10	37,300	6.8	436	14	.10	38	12	35		0	124	107	4.0	.3	1.8	--	286	.39	145	43	35
July 6	17,100	6.8	374	13	.05	32	11	28		0	108	87	4.0	.3	1.8	--	244	.33	126	37	33
Aug. 8	4,280	8.0	678	12	.05	47	14	81		0	167	190	10	.4	1.8	--	446	.61	175	38	50

POWDER RIVER NEAR LOCATE, MONT.

Aug. 31, 1948	53	7.6	1,910	14	0.01	179	60	204		0	244	860	28	0.6	0.8	0.18	1,470	2.00	693	483	39
Oct. 27	286	7.9	1,960	18	.04	176	82	245		0	238	924	48	.5	1.5	--	1,580	2.16	694	489	43
Dec. 21	80	7.5	2,220	16	.06	214	95	187		0	374	904	56	.5	3.9	.19	1,670	2.27	924	617	31
Feb. 27, 1949	80	7.5	1,630	18	.02	151	92	134		0	504	580	46	.4	3.8	.00	1,150	1.56	632	383	32
Mar. 7	11,400	7.7	940	9.0	.02	56	46	55		0	147	182	7.0	.5	3.9	.17	433	.96	206	85	37
Apr. 26	570	7.8	1,970	13	.02	146	63	198		0	238	776	95	.4	2.6	--	1,350	1.84	824	429	41
May 24	1,360	7.5	844	14	.02	89	36	76		0	136	312	16	.5	2.3	--	583	.93	327	189	34
June 27	709	7.6	810	14	.02	72	38	75		0	130	276	16	.5	2.3	--	583	.93	327	189	34
July 18	293	7.6	2,520	17	.02	216	75	275		0	236	1,130	52	.6	2.6	--	1,260	2.16	854	457	36
Sept. 14	1/44	7.4	2,010	10	.02	138	79	226		0	244	880	20	1.2	1.4	--	1,470	2.00	670	470	42

1/ Mean daily discharge.

YELLOWSTONE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN YELLOWSTONE RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued																						
Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)		Car- bon- ate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		
								Parts per mil- lion	Tons per acre- foot								Tons per day	Total	Non- carbon- ate			
MIDDLE FORK POWDER RIVER NEAR KAYCEE, WYO.																						
Mar. 2, 1949	1/330	7.7	1,060	13	0.04	91	33	87		0	158	360	31	0.3	2.7	0.09		751	1.02		362	232
May 31	221	7.7	707	13	.02	74	23	35		0	164	178	23	.3	1.8	--		491	.67		279	145
July 8	16	8.1	1,250	13	.02	108	42	110		0	226	390	62	.4	.7	--		922	1.25		442	257
Aug. 2	.3	7.7	1,630	15	.05	130	49	189		0	231	520	144	.4	2.6	--		1,160	1.58		526	337
Sept. 11	12	7.7	1,520	8.0	.04	135	53	148		0	222	560	79	.4	0	--		1,090	1.48		555	373
Sept. 20	40	7.8	891	11	.02	103	35	49		0	146	353	13	.2	1.5	.30		682	.93		401	281

1/Mean daily discharge.

YELLOWSTONE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN YELLOWSTONE RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)

FIFTEENMILE CREEK AT WORLAND, WYO.

Aug. 5, 1949-----	11.4	1,970	61
Aug. 15-----	8.06	692	15
Aug. 26-----	2.78	434	3.3
Sept. 6-----	67	2,960	535
Sept. 15-----	61.4	1,430	237
Sept. 23-----	74.8	970	196
Sept. 27-----	54.3	596	87

DRY CREEK AT GREYBULL, WYO.

Aug. 5, 1949-----	44.1	643	77
Aug. 11-----	33.9	310	28
Aug. 18-----	23.6	88	6
Aug. 25-----	36.6	131	13
Aug. 30-----	36.0	36	3
Sept. 8-----	41.2	75	8
Sept. 14-----	49.4	162	22
Sept. 22-----	31.7	49	4
Sept. 29-----	31.5	26	2

ALKALI CREEK AT RALSTON, WYO.

Aug. 4, 1949-----	16.4	3,580	158
Aug. 11-----	21.3	1,730	100
Aug. 18-----	15.6	731	31
Aug. 25-----	17.7	1,160	55
Aug. 30-----	28.0	2,550	193
Sept. 7-----	14.4	693	27
Sept. 14-----	14.1	428	16
Sept. 21-----	13.0	551	19
Sept. 28-----	18.9	371	19

BITTER CREEK NEAR GARLAND, WYO.

Aug. 4, 1949-----	169	408	186
Aug. 11-----	158	411	175
Aug. 18-----	159	516	222
Aug. 25-----	236	517	330
Aug. 30-----	195	416	219
Sept. 7-----	213	464	267
Sept. 14-----	200	184	99
Sept. 21-----	168	156	71
Sept. 28-----	161	71	31

SAGE CREEK NEAR LOVELL, WYO.

Aug. 3, 1949-----	130	1,470	516
Aug. 5-----	127	1,720	590
Aug. 11-----	164	1,380	611
Aug. 18-----	119	914	294
Aug. 25-----	164	1,660	735
Aug. 30-----	215	3,180	1,850
Sept. 7-----	231	3,750	2,340
Sept. 14-----	200	1,830	988
Sept. 21-----	148	1,320	527
Sept. 28-----	230	3,190	1,980

LITTLE MISSOURI RIVER BASIN

LITTLE MISSOURI RIVER AT ALZADA, MONT.

LOCATION.--At bridge on U. S. Highway 212, 1 mile northwest of Alzada, Carter County, 3 miles upstream from Thompson Creek, and 4 miles upstream from gaging station near Alzada.

DRAINAGE AREA--80 square miles (above gaging station).

RECORDS AVAILABLE.--Water temperatures: June to September 1949.

Sediment records: March to September 1949.

EXTREMES: Maximum daily 20,100 ppm May 21; minimum daily, no flow on many days.

Sediment loads: Maximum daily 14,900 tons May 19.

REMARKS.--Discharge records for gaging station near Alzada for water year October 1948 to September 1949 given in Water-Supply Paper 1146. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, May to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- di- um
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate
May 19, 1949 -----	362	6.3	1,280	18	0.01	82	41	154	84	806	2.5	2.5	1.0	0.5	0.28	949	1.29	373	304	47
July 19 -----	4.7	7.1	20	10	.02	42	16	84	141	230	2.0	2.0	.6	2.6	.20	480	.35	275	63	10
Aug. 1 -----	.1	7.8	994	10	.02	62	22	126	206	330	4.0	4.0	.8	3.4	.33	666	.93	245	16	3
Sept. 14 -----	.1	8.0	1,360	5.4	.02	88	36	187	244	339	6.5	6.5	.9	2.2	.31	990	1.33	368	168	53

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER AT ALZADA, MONT.--Continued

Temperature (*F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement in June and September between
 6 a. m. and 8 a. m.; in July and August at approximately 6 p. m./

Suspended sediment, March to September 1949

Day	Mar.	Apr.	May	June	July	Aug.	Sept.	Day	Mean dis-charge (second-foot)	Suspended sediment	
										Mean concen-tration (ppm)	Tons per day
1				--	71	77	61	1-----	--	--	--
2				--	68	73	63	2-----	--	--	--
3				--	75	--	60	3-----	--	--	--
4				--	73	77	--	4-----	--	--	--
5				--	70	82	--	5-----	--	--	--
6				--	72	81	--	6-----	--	--	--
7				--	73	--	--	7-----	--	--	--
8				--	70	--	--	8-----	--	--	--
9				--	69	--	--	9-----	500	740	999
10				--	70	75	--	10-----	400	560	605
11				--	69	79	--	11-----	300	429	347
12				--	70	77	--	12-----	200	385	208
13				--	71	76	--	13-----	150	358	145
14				--	69	78	51	14-----	100	304	82
15				--	66	74	51	15-----	90	186	45
16				--	68	73	54	16-----	80	236	51
17				--	72	72	59	17-----	70	104	20
18				--	67	68	51	18-----	60	108	18
19				--	69	72	60	19-----	65	142	25
20				--	69	75	66	20-----	50	110	15
21				--	63	77	52	21-----	300	--	1/340
22				--	68	71	53	22-----	1,780	1,920	2/9,630
23				--	64	81	56	23-----	2,070	2,530	14,100
24				--	65	--	56	24-----	1,840	2,020	10,000
25				--	65	79	59	25-----	1,800	1,650	8,020
26				--	64	81	74	26-----	1,400	1,760	6,650
27				--	63	76	72	27-----	559	1,970	2,970
28				--	65	73	--	28-----	498	2,060	2,770
29				--	67	72	--	29-----	598	1,950	3,150
30				--	65	78	70	30-----	610	1,800	2,960
31				--	78	62	--	31-----	461	1,570	1,950
Average				--	72	75	--	Total-	13,981	--	65,100

Day	Mean dis-charge (second-foot)	April		Mean dis-charge (second-foot)	May		Mean dis-charge (second-foot)	June	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	410	--	1/1,600	154	--	1/1,400	4.9	54	(s)
2-----	360	1,260	1,230	80	1,220	264	4.2	--	(s)
3-----	310	1,300	1,090	64	221	38	14	--	1/19
4-----	296	1,250	998	64	189	33	110	1,360	2/432
5-----	304	1,270	1,040	42	123	14	65	--	1/360
6-----	353	2,130	2,030	27	105	8	48	--	1/400
7-----	406	1,830	2,010	21	88	5	33	1,980	176
8-----	462	2,260	2,820	17	76	3	22	770	46
9-----	446	1,950	2,350	26	95	7	16	230	10
10-----	305	1,440	1,180	22			11	--	1/3
11-----	198	1,190	630	17			8.8	--	1/2
12-----	146	890	350	13			6.1		
13-----	204	--	1/1,000	10			5.3		
14-----	512	3,450	4,770	8.8		1/2	4.0		
15-----	624	--	1/3,900	7.9			3.2		
16-----	512	1,880	2,610	6.9			2.1		
17-----	207	1,490	832	6.6			1.8	--	(s)
18-----	101	840	229	22	--	1/86	1.8		
19-----	80	577	124	287	15,800	2/14,900	1.4		
20-----	66	400	71	162	17,900	7,830	1.2		
21-----	53	326	47	57	20,100	2/3,700	1.0		
22-----	48	270	35	26	--	1/150	.8		
23-----	45	195	24	20	--	1/34	.8		
24-----	40	152	16	15	--	1/6	.7		
25-----	33	120	11	12			.6		
26-----	28	84	6	9.9			.4	71	(s)
27-----	24	62	.4	8.2			.3		
28-----	20	44	2	7.1	--	1/1	.3		
29-----	16	38	2	6.1			.3		
30-----	19	180	9	5.1			.3		
31-----	--	--	--	4.9			--	--	--
Total-	6,626	--	31,020	1,229.5	--	28,500	369.3	--	1,450

1/Estimated.

2/Sediment discharge computed by subdividing day.

(s)Sediment discharge less than 1 ton.

LITTLE MISSOURI RIVER BASIN--Continued
LITTLE MISSOURI RIVER AT ALZADA, MONT.--Continued

Suspended sediment, March to September 1949--Continued									
Day	Mean discharge (second-foot)	July		Mean discharge (second-foot)	August		September		
		Suspended sediment			Suspended sediment		Suspended sediment		
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	0.3	77	(s)	0.1	27	(s)	0	--	0
2-----	.2	76	(s)	.1			0	--	0
3-----	.2	54	(s)	.1			0	--	0
4-----	.2	27	(s)	.1			0	--	0
5-----	13	--	1/2	.1			0	--	0
6-----	7.6	39	(s)	0	--	0	0	--	0
7-----	1.9	43	(s)	0	--	0	0	--	0
8-----	.5	54	(s)	0	--	0	0	--	0
9-----	.2	66	(s)	0	--	0	0	--	0
10-----	4.0	78	(s)	0	--	0	.1	19	(s)
11-----	24	74	5	0	--	0	.1		
12-----	80	358	2/136	0	--	0	.1		
13-----	163	6,080	2,680	0	--	0	.1		
14-----	116	7,060	2/2,490	0	--	0	.1		
15-----	28	1,250	94	0	--	0	.1		
16-----	17	628	29	0	--	0	.1	19	(s)
17-----	12	415	13	0	--	0	.1		
18-----	8.5	312	7	0	--	0	.1		
19-----	5.3	230	3	0	--	0	.1		
20-----	3.8	188	2	12	--	1/1	.1		
21-----	2.7	43	(s)	2.5	30	(s)	.1	19	(s)
22-----	1.4			.4	29	(s)	.1		
23-----	1.0			.2	33	(s)	.1		
24-----	.8			0	--	0	.1		
25-----	.7			0	--	0	.1		
26-----	.6	43	(s)	0	--	0	.1	19	(s)
27-----	.5			0	--	0	.1		
28-----	.4			0	--	0	.1		
29-----	.3			0	--	0	.1		
30-----	.2			0	--	0	.1		
31-----	.2			0	--	0	--	--	--
Total-	494.5	--	5,460	15.6	--	1	2.1	--	(s)
Total discharge for period Mar. 9 to Sept. 30 (second-foot-days) -----									22,718.0
Total load for period Mar. 9 to Sept. 30 (tons) -----									131,500

1/Estimated.

2/Sediment discharge computed by subdividing day.

(s)Sediment discharge less than 1 ton.

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.

LOCATION ---At gaging station at bridge on U. S. Highway 10, a quarter of a mile west of Medora, Billings County, and 1 mile upstream from Andrews Creek.
DRAINAGE AREA ---6,190 square miles.

RECORDS AVAILABLE ---Chemical analyses: March 1947 to September 1949.

Water temperatures: March 1947 to September 1949.

Sediment records: March 1946 to September 1949.

EXTREMES, 1948-49 ---Specific conductance: Maximum, 4,770 micromhos Jan. 1, 2; minimum, 296 micromhos Mar. 24, 25.

Water temperatures: Maximum, 88° F May 11, July 16; minimum, freezing point on many days during December to April.

Sediment concentrations: Maximum daily, 350,000 tons Mar. 28; minimum daily, not determined.

EXTREMES, 1946-49 ---Dissolved solids: Maximum, 1,470 ppm Sept. 9-30, 1947; minimum, 233 ppm Mar. 24, 1947.

Total hardness (1947): Maximum, 384 ppm Sept. 9-30, 1947; minimum, 90 ppm Mar. 24, 1947.

Specific conductance (1947-49): Maximum, 4,770 micromhos Jan. 1, 1949; freezing point on many days during winter months.

Water temperatures: Maximum, 88° F May 11, July 16, 1948; minimum, not determined.

Sediment concentrations: Maximum, 35,400 ppm June 24, 1947; minimum daily, less than 1 ton on many days.

Sediment loads: Maximum daily, 439,000 tons June 24, 1947; minimum daily, less than 1 ton on many days.

REMARKS ---Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids		Hardness as CaCO ₃		Percent carbonate
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate
Oct. 1-31, 1948 -----	12.7	8.5	1,930	13.01	0.01	88	37	345	6.0	14	324	788	9.7	0.5	0.3	0.14	1,480	2.0	51	372	83
Oct. 7 1/2 -----	8.5	8.3	1,930	11.01	0.1	78	37	350	11	10	323	784	8.6	8.3	0.3	0.38	1,450	2.0	33	347	66
Nov. 1-30 -----	42.9	8.5	1,970	12.01	0.1	53	21	321	5.6	14	336	608	8.2	5.6	1.7	1.12	1,210	1.6	140	219	0
Dec. 1-31, 1949 -----	8.0	8.2	2,740	22.01	0.1	80	42	514	7.2	12	576	996	12	5.5	1.3	0.41	1,980	2.7	43	372	0
Jan. 1-31, 1949 -----	9	8.2	2,380	18.01	0.1	91	42	431	8.0	8	422	932	9.0	2	1.3	0.31	1,750	2.4	4.3	400	41
Feb. 1-Mar. 3 -----	8.1	8.1	2,800	22.02	0.2	135	56	490	8.0	0	566	1,150	8.0	3	1.9	0.28	2,150	2.9	1.7	568	104
Mar. 4-22 -----	1,980	7.5	416	10.04	0.4	28	11	35	2.0	0	104	110	0	2	1.7	0.07	279	.38	1,480	116	31
Mar. 23-31 -----	12,020	7.7	338	12.00	0.5	25	12	25	1.6	0	124	67	0	2	1.6	1.1	225	.31	7,300	112	10
Apr. 1 -----	6,400	7.6	379	14.29	3.4	34	13	13	28	0	134	82	0	4	2.4	--	264	.36	4,560	139	29
Apr. 2-22 -----	2,350	7.7	581	13.00	0.1	38	16	55	3.2	0	135	170	0	2	1.6	0.07	383	.53	2,490	161	50
Apr. 23-May 7 -----	3,377	8.4	1,060	15.04	0.4	66	24	144	4.0	12	191	376	4.5	4	1.1	0.35	766	1.0	780	263	87
May 8-19 -----	174	8.0	1,920	16.05	0.4	74	27	210	9.6	0	314	476	5.5	5	1.8	0.35	997	1.4	468	296	39
May 20-June 4 -----	186	8.3	1,540	18.05	0.5	69	27	251	8.8	6	302	552	6.3	5	1.8	0.35	1,090	1.5	547	283	26
June 5-30 -----	57	8.0	1,740	13.02	7.2	34	284	14	0	334	620	7.0	5	1.6	0.4	0.4	1,210	1.6	186	320	46
July 1-19 -----	20	8.3	2,150	15.04	0.4	76	36	364	8.4	10	304	868	8.5	8	1.5	0.66	1,540	2.1	83	338	72
July 20-27 -----	35	8.5	2,170	20.04	0.4	78	32	386	9.6	16	252	888	8.5	8	2.9	1.1	1,570	2.1	148	326	93
July 28-Aug. 4 -----	99	8.3	1,970	20.02	0.2	56	20	296	6.4	8	264	616	6.5	2	3.0	0.50	1,160	1.6	310	222	0

1/Not included in weighted average.

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids		Hardness as CaCO ₃		Percent sodium
																	Parts per million	Tons per acre-foot	Total	Non-carbonate	
Aug. 5-20, 1949-----	11	8.2	2,080	20.02	77	30	353	9.6	6	332	776	11	0.8	2.4	0.38	1,450	2.0	43	316	34	70
Aug. 21-26 -----	41	8.4	1,860	22.02	49	18	344	8.0	10	298	664	11	.2	3.3	1.2	1,280	1.7	142	197	0	78
Aug. 27-31 -----	11	8.1	2,130	21.08	68	29	388	11	0	396	800	8.5	.3	2.3	.24	1,520	2.1	45	289	0	74
Sept. 1-30 -----	11.2	8.0	2,310	18.04	69	33	421	11	0	412	863	10	.4	3.5	.24	1,630	2.2	48	308	0	74
Weighted average ---	596	--	494	12.02	32	14	50	2.5	--	2/136	133	0.5	0.2	1.6	0.14	336	0.46	541	138	26	44

2/Includes carbonate as bicarbonate.

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 7 a. m. and 7 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	--	34	33	31	32	--	59	61	82	76	49
2	69	--	34	33	31	32	32	66	66	84	78	52
3	70	52	36	--	31	32	32	68	60	73	81	67
4	70	--	36	--	32	32	42	56	75	67	86	68
5	55	43	--	--	32	32	41	58	79	74	81	57
6	45	41	--	33	34	33	46	50	73	83	84	63
7	57	44	33	34	32	33	43	67	73	79	86	69
8	54	41	33	32	32	32	52	66	83	75	71	68
9	38	40	33	32	32	32	48	68	67	81	77	75
10	58	36	32	--	34	32	56	76	84	76	72	60
11	59	38	34	--	32	32	62	88	78	75	81	50
12	56	37	33	--	32	32	54	78	71	73	78	44
13	62	35	34	33	32	32	56	72	73	76	82	57
14	--	38	33	34	32	32	--	65	60	80	75	63
15	48	--	32	32	34	32	54	71	76	86	81	42
16	--	38	32	32	34	32	53	71	67	88	82	54
17	42	40	32	32	34	32	52	72	59	68	74	57
18	53	--	32	32	34	32	56	52	61	75	70	62
19	60	--	32	--	34	32	60	52	79	74	81	40
20	56	39	33	32	--	32	58	65	74	61	85	49
21	--	37	33	32	--	32	59	67	79	71	80	39
22	52	35	--	32	--	32	52	58	77	80	79	44
23	50	35	33	32	--	32	56	52	72	85	82	51
24	48	--	--	32	39	32	80	63	74	87	72	52
25	43	--	33	32	36	32	--	63	69	73	78	62
26	46	36	34	32	34	32	62	70	74	79	71	63
27	44	34	32	32	34	32	68	74	71	84	74	67
28	46	34	33	32	32	32	72	78	84	66	--	63
29	45	34	33	32	--	32	79	77	86	78	56	70
30	39	34	32	--	--	32	56	71	77	78	66	64
31	40	--	32	32	--	32	--	70	--	75	67	--
Average	52	--	33	--	33	32	54	67	73	77	77	57

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	9.0	11	(i)	19	18	(i)	33	598	53
2-----	26	42	3	17	13	(i)	32	503	43
3-----	11	22	(i)	18	15	(i)	40	334	36
4-----	9.0	12	(i)	25	20	1	30	346	28
5-----	16	14	(i)	40	1,690	183	20	288	16
6-----	22	18	1	51	2,020	278	10	274	7
7-----	8.5	15	(i)	51	1,260	174	8	245	5
8-----	12	38	1	50	1,100	148	7	240	4
9-----	11	40	1	45	1,480	180	6	--	2/3
10-----	9.8	45	1	40	3,350	362	3	162	2
11-----	9.8	38	1	35	2,860	270	4	--	2/2
12-----	8.5	35	(i)	31	1,080	90	4	134	1
13-----	8.0	41	(i)	26	1,050	74	4	65	(i)
14-----	9.0	52	1	26	1,240	87	4	--	(i)
15-----	11	47	1	56	2,220	336	3	--	
16-----	12	50	2	89	2,120	395	3	--	
17-----	15	43	2	95	1,940	498	3	--	
18-----	14	29	1	80	--	2/800	3	--	
19-----	11	23	(i)	73	4,100	808	3	--	
20-----	12	13	(i)	42	2,500	284	3	--	
21-----	12	--	(i)	30	2,240	181	3	19	
22-----	11	6	(i)	28	1,980	150	3	--	
23-----	11	10	(i)	28	1,990	150	2	--	
24-----	12	15	(i)	51	1,880	259	2	--	(i)
25-----	12	20	(i)	53	1,770	253	2	--	
26-----	12	21	(i)	51	1,200	165	2	--	
27-----	14	20	(i)	46	1,090	135	2	--	
28-----	14	21	(i)	40	900	97	2	--	
29-----	16	16	(i)	37	455	45	2	--	
30-----	17	18	(i)	35	527	50	2	--	
31-----	17	20	(i)	--	--	--	2	--	
Total-	392.6	--	27	1,288	--	6,460	249	--	206
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2			0.6			0.2	10	(i)
2-----	2			.6			.2	13	(i)
3-----	1			.4			.2	10	(i)
4-----	1			.4			2	700	4
5-----	1			.4			10	2,000	54
6-----	1			.4			100	388	105
7-----	1			.4			500	540	729
8-----	1			.4	8	(i)	2,000	1,540	8,320
9-----	1			.4			4,500	1,980	24,100
10-----	1			.4			4,000	1,200	13,000
11-----	1			.4			3,000	1,020	8,280
12-----	1			.4			4,500	1,280	15,600
13-----	.8			.4			4,500	1,340	16,300
14-----	.8	7		.4			3,000	1,530	12,400
15-----	.8			.2			700	600	1,130
16-----	.8			.2			500	430	580
17-----	.8	(i)		.2			400	440	475
18-----	.8			.2			350	105	99
19-----	.8			.2			350	80	76
20-----	.8			.2			350	250	236
21-----	.8			.2			3,000	1,890	15,300
22-----	.8			.2	8	(i)	5,500	4,240	63,000
23-----	.6			.2			11,800	4,480	143,000
24-----	.6			.2			12,600	3,400	116,000
25-----	.6			.2			11,800	4,800	153,000
26-----	.6			.2			12,600	6,040	205,000
27-----	.6			.2			14,000	8,190	310,000
28-----	.6			.2			13,700	9,460	350,000
29-----	.6			--	--	--	13,200	8,850	315,000
30-----	.6			--	--	--	10,300	8,660	241,000
31-----	.6			--	--	--	8,240	6,060	135,000
Total-	27.4		1	8.8	--	(i)	145,502.6	--	2,148,000

(i) Sediment discharge less than 1 ton.

2/ Estimated.

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	6,400	5,400	93,300	311	267	224	140	326	123
2-----	5,460	6,390	94,200	292	222	175	124	206	69
3-----	4,750	5,950	76,300	258	190	132	151	257	105
4-----	4,410	5,260	62,600	274	282	209	140	310	117
5-----	3,910	5,100	53,800	311	340	285	111	240	72
6-----	3,270	4,540	40,100	258	384	267	99	180	43
7-----	2,810	3,880	29,400	226	671	409	79	133	28
8-----	2,510	4,000	27,100	212	1,060	607	69	100	19
9-----	2,090	3,250	18,300	212	1,030	590	63	69	12
10-----	1,960	2,880	15,200	226	616	376	56	45	7
11-----	1,960	--	2/16,000	212	378	216	54	48	7
12-----	1,830	2,840	14,000	199	266	143	58	60	9
13-----	1,710	2,500	11,500	186	169	85	56	50	8
14-----	1,650	--	2/10,000	162	130	57	48	52	7
15-----	1,590	2,180	9,360	151	118	48	49	60	8
16-----	1,480	2,100	8,390	162	104	45	61	64	11
17-----	1,370	2,520	9,320	140	82	31	63	132	22
18-----	1,370	2,900	10,700	113	72	22	72	110	21
19-----	1,480	2,900	11,600	118	83	26	72	104	20
20-----	1,480	2,620	10,500	188	165	3/87	69	92	17
21-----	1,270	2,400	8,230	241	328	213	58	71	11
22-----	990	2,280	6,090	212	4,710	2,700	58	52	8
23-----	760	2,160	4,430	292	5,220	4,120	53	52	7
24-----	624	1,780	3,000	258	7,400	5,150	49	55	7
25-----	502	1,200	1,630	186	12,100	6,080	44	64	8
26-----	447	830	1,000	151	7,680	3,130	43	70	8
27-----	397	640	686	124	3,290	1,100	39	58	6
28-----	352	470	447	174	1,600	752	30	49	4
29-----	332	400	359	199	1,080	580	22	38	2
30-----	311	342	287	212	1,000	572	17	40	2
31-----	--	--	--	186	426	214	--	--	--
Total-	59,475	--	647,800	6,446	--	28,640	2,047	--	788
Day	July			August			September		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	16	33	1	113	20,000	6,100	7.8	56	1
2-----	16	24	1	80	11,500	2,480	7.4	70	1
3-----	14	18	(1)	59	10,600	1,690	7.0	86	2
4-----	14	11	(1)	41	7,000	775	6.7	90	2
5-----	15	10	(1)	28	2,380	180	7.0	80	2
6-----	22	84	5	18	436	21	9.0	110	3
7-----	14	72	3	14	215	8	10	136	4
8-----	11	40	1	14	186	7	11	115	3
9-----	9.8	29	(1)	12	130	4	11	182	5
10-----	21	40	2	11	170	5	11	170	5
11-----	33	50	4	9.8	340	9	12	198	6
12-----	33	59	5	9.8	217	6	14	293	11
13-----	33	1,640	146	7.8	190	4	24	500	32
14-----	42	3,510	398	6.7	128	2	31	3,050	255
15-----	26	540	38	6.7	120	2	22	5,920	352
16-----	22	180	11	6.4	189	3	20	3,440	186
17-----	14	146	6	6.1	102	2	15	3,180	129
18-----	12	100	3	6.4	100	2	14	5,080	192
19-----	12	123	4	6.4	110	2	11	5,400	160
20-----	34	9,130	3/1,200	15	246	2/13	11	5,910	176
21-----	73	9,570	3/1,860	95	5,900	1,510	9.8	3,500	93
22-----	50	4,000	3/3,609	59	20,100	3,200	8.2	778	17
23-----	24	1,000	65	34	21,900	2,010	8.2	380	8
24-----	18	270	13	24	15,500	1,000	8.6	340	8
25-----	23	280	17	17	8,500	390	8.6	1,020	24
26-----	28	280	21	15	4,200	170	6.7	820	15
27-----	28	300	23	13	670	24	6.1	260	4
28-----	106	11,800	3/3,750	12	--	2/18	6.1	120	2
29-----	108	16,500	3/5,020	11	448	13	6.1	180	3
30-----	109	6,100	1,800	9.4	217	6	6.7	200	4
31-----	174	17,200	8,080	8.2	120	3	--	--	--
Total-	1,154.8	--	23,090	768.7	--	19,660	337.0	--	1,700
Total discharge for year (second-foot-days)-----									217,696.9
Total load for year (tons)-----									2,876,000

(1) Sediment discharge less than 1 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

MISSOURI RIVER BASIN

LITTLE MISSOURI RIVER BASIN--Continued

LITTLE MISSOURI RIVER AT MEDORA, N. DAK.--Continued

Particle-size analyses of suspended sediment, November 1948 to August 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;

W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

[illegible]

LITTLE MISSOURI RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN LITTLE MISSOURI RIVER BASIN IN NORTH DAKOTA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Chemical analyses, in parts per million, water year October 1946 to September 1949																							
Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium	
																	Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate		
LITTLE MISSOURI RIVER AT MARMARTH																							
Oct. 15, 1948	7.6	8.3	1,360	26	0.06	34	20		289	16	428	388	8.0	0.5	1.1	0.38		992	1.35		187	0	75
Mar. 7, 1949	1,680	7.8	948	11	.02	17	11		36	0	110	72	5	.1	1.3			231	.31		88	0	47
May 12	117	8.2	1,330	13	.01	72	28		191	7	300	424	6.0	.5	.8			932	1.27		295	38	58
June 9	40	8.2	1,490	12	.01	49	25		263	8	322	488	7.5	.6	.6			1,020	1.39		226	0	72
July 14	14	8.2	1,750	7.7	.01	41	23		336	7	305	624	10	.5	1.2			1,200	1.63		197	0	79
July 28	224	8.0	1,220	17	.04	23	7.3		233	0	242	370	5.0	.6	3.5			806	1.10		88	0	85
Sept. 16	7.6	8.4	2,170	14	.10	41	18		466	13	474	730	11	.4	4.2			1,530	2.08		177	0	85
LITTLE MISSOURI RIVER NEAR WATFORD CITY																							
Mar. 4, 1949	1/2 0	7.3	1,200	9.2	0.01	42	14		212	0	210	414	7.5	0.5	1.1	0.04		872	1.19		163	0	74
Mar. 24	9,600	7.6	428	11	.10	33	8.5		47	0	132	102	1.0	.1	3.6			283	.38		118	10	46
Apr. 28	577	7.8	1,010	10	.05	61	25		124	0	191	348	4.0	.2	1.3	.18		698	.95		255	98	51
May 23	212	8.1	1,520	13	.01	69	33		251	0	349	536	5.0	.6	1.2	--		1,080	1.47		308	22	64
June 3	212	8.0	1,640	14	.01	66	27		289	0	360	576	5.5	.5	1.4	--		1,160	1.58		276	0	70
June 12	107	7.5	1,710	13	.01	67	35		289	0	322	640	5.0	.4	.7	--		1,210	1.65		311	47	67
July 18	71	7.9	1,960	14	.04	66	26		346	0	302	736	4.0	.3	5.3	.52		1,350	1.84		272	24	73
Sept. 8	113	8.1	2,030	16	.02	86	40		350	0	456	725	6.5	.4	2.2	.39		1,460	1.97		379	5	67
/Mean daily discharge.																							

1/ Mean daily discharge.

LITTLE MISSOURI RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN LITTLE MISSOURI RIVER BASIN IN NORTH DAKOTA--Continued

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)

LITTLE MISSOURI RIVER AT MARMARTH			
Oct. 15, 1948 -----	7.5	43	0.9
Oct. 27 -----	11.5	27	.8
Nov. 15 -----	83	2,740	614
Nov. 26 -----	50	489	66
Dec. 8 -----	4.5	93	1.1
Mar. 7, 1949 -----	1,780	3,380	16,200
Mar. 8 -----	3,600	1,640	15,900
Mar. 10 -----	3,160	1,310	11,200
Mar. 18 -----	356	147	141
Mar. 22 -----	5,480	3,300	48,800
Mar. 23 -----	8,850	4,030	96,300
Mar. 24 -----	10,600	6,080	174,000
Mar. 25 -----	11,400	6,280	193,000
Mar. 26 -----	8,850	5,710	136,000
Mar. 28 -----	9,620	5,550	144,000
Mar. 29 -----	6,490	4,580	80,300
Mar. 30 -----	5,060	3,590	49,000
Mar. 31 -----	4,090	3,260	36,000
Apr. 2 -----	2,950	2,710	21,600
Apr. 6 -----	2,230	2,580	15,500
Apr. 28 -----	215	190	110
May 12 -----	117	90	28
May 26 -----	182	421	207
June 9 -----	40	95	10
June 30 -----	13	24	.8
July 14 -----	13	84	2.9
July 28 -----	219	17,200	10,200
Aug. 11 -----	.96	52	.1
Aug. 25 -----	3.9	86	.9

LITTLE MISSOURI RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN LITTLE MISSOURI RIVER BASIN IN NORTH DAKOTA--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
LITTLE MISSOURI RIVER AT MARMARTH																
Nov. 15, 1948	4:30 p. m.	83	2,740	1,710	--	.1	9	--	--	99	100	--	--	--	--	EN
Nov. 26	10:00 a. m.	50	489	557	53	58	66	--	--	--	--	--	--	--	--	EW
Nov. 24, 1949	5:40 p. m.	10,600	6,080	2,280	18	34	48	58	69	76	84	90	90	90	90	EN
Mar. 25	5:30 p. m.	11,400	6,280	2,630	17	25	35	44	55	67	80	93	93	93	93	EN
Mar. 26	4:00 p. m.	8,850	5,710	2,550	8	23	40	47	57	67	79	88	88	88	88	EN
Mar. 28	1:50 p. m.	9,620	5,550	2,250	11	28	46	55	64	74	80	86	86	86	86	EN
Mar. 29	4:00 p. m.	6,490	4,580	2,100	21	34	45	53	63	71	77	86	86	86	86	EN
Mar. 30	2:10 p. m.	5,060	3,590	1,610	19	40	55	61	69	74	82	90	90	90	90	EN
Mar. 31	4:00 p. m.	4,090	3,260	1,400	22	45	60	66	73	77	82	88	88	88	88	EN
Apr. 2	4:30 p. m.	2,950	2,710	1,370	8	23	76	78	81	86	90	94	94	94	94	EN
Apr. 6	4:50 p. m.	2,230	2,580	1,970	10	15	68	73	79	83	88	93	93	93	93	EN
May 26	11:25 a. m.	182	421	905	10	13	35	--	85	87	88	91	91	91	91	EN
July 28	11:00 a. m.	219	17,200	2,760	2	3	4	--	--	100	--	--	--	--	--	EN
July 28	11:00 a. m.	219	17,200	2,810	61	76	92	98	--	100	--	--	--	--	--	EW

KNIFE RIVER BASIN
KNIFE RIVER NEAR GOLDEN VALLEY, N. DAK.

LOCATION.--At gaging station at highway bridge, 2½ miles downstream from Elm Creek, and 10 miles so tn of Golden Valley, Mercer County. DRAINAGE AREA.--1,230 square miles.

RECORDS AVAILABLE.--Sediment records: June 1946 to September 1949 (discontinued).

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 1,760 ppm Apr. 3; minimum daily, not determined.

Sediment loads: Maximum daily, 23,800 tons Apr. 4; minimum daily, less than 1 ton on many days.

EXTREMES, 1946-49.--Sediment loads: Maximum daily, 29,660 tons June 23, 1947; minimum daily, less than 1 ton on many days each year.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, October 1948 to July 1949

Chemical analyses, in parts per million, October 1946 to July 1949																						
Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- lids
																	Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
Oct. 19, 1948-----	6.3	8.2	1,870	23	0.11	41	35	398		20	664	502	6.0	0.6	1.0	0.14	1,360	1.85		246	0	78
Mar. 30, 1949-----	2,540	8.0	302	6.0	.05	19	8.7	32		0	98	61	3.0	.5	4.5	.01	218	.30		84	4	45
May 3-----	64	8.1	1,370	14	.01	67	25	240		0	458	392	4.0	.4	1.4	--	982	1.34		270	0	66
May 31-----	25	7.9	1,720	11	.01	48	33	336		0	578	484	4.4	.5	1.5	--	1,210	1.65		256	0	74
June 28-----	16	8.0	1,850	12	.03	34	32	383		0	599	528	4.4	.5	1.8	--	1,300	1.77		217	0	79
July 26-----	23	8.3	1,950	11	.02	40	28	374		18	522	536	5.0	.5	2.8	--	1,280	1.74		215	0	79

KNIFE RIVER BASIN--Continued

KNIFE RIVER NEAR GOLDEN VALLEY, N. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	4.5	--	(i)	9.5	28	(i)	8	--	(i)
2-----	4.2			9.8			8	34	(i)
3-----	4.8			9.8			8		
4-----	4.8			9.8			8		
5-----	4.8	52	(i)	11			7	--	(i)
6-----	7.2			11			7	38	(i)
7-----	7.2			11			6		
8-----	6.6			10			6		
9-----	6.6	34	(i)	11	24	(i)	6	--	(i)
10-----	6.6			11			6	42	(i)
11-----	6.3			10			6		
12-----	6.3			9			6		
13-----	6.3	(i)	(i)	9			6	--	(i)
14-----	6.3			11			6	27	(i)
15-----	6.3			11			6		
16-----	6.3			10			6		
17-----	5.7	38	(i)	9	--	(i)	5	--	(i)
18-----	6.0			9			5	33	(i)
19-----	6.3			8			5		
20-----	5.7			7			5		
21-----	6.0	30	(i)	9	17	(i)	5	--	(i)
22-----	6.0			9			5	36	(i)
23-----	6.0			10			5		
24-----	6.0			10			5		
25-----	6.6	28	(i)	9	14	(i)	5	--	(i)
26-----	6.9			8			4	26	(i)
27-----	7.2			8			4		
28-----	7.5			7			4		
29-----	7.9	27	(i)	8	9	(i)	4	12	2/70
30-----	8.8			8			4		
31-----	8.8			--			4	--	(i)
Total-	196.5	--	19	282.9	--	17	175	--	16
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	4	20	(i)	2	20	(i)	2	--	(i)
2-----	4			2			2	15	15
3-----	4			2			3		
4-----	4			2			4		
5-----	4	(i)	(i)	2	2	(i)	5	--	(i)
6-----	4			2			7	87	231
7-----	4			2			10		
8-----	3			2			9		
9-----	3	2	(i)	2	2	(i)	8	501	1,080
10-----	3			2			7		
11-----	3			2			7		
12-----	3			2			8		
13-----	3	3	(i)	2	2	(i)	7	300	2,300
14-----	3			2			7		
15-----	3			2			10		
16-----	3			2			20	800	555
17-----	3	3	(i)	2	2	(i)	15		
18-----	3			2			12		
19-----	3			2			11		
20-----	3			2	20	(i)	10	560	4,540
21-----	3	3	(i)	2			10		
22-----	3			2			10		
23-----	3			2			10		
24-----	3	3	(i)	2	2	(i)	10	50	12
25-----	3			2			10		
26-----	3			2			50		
27-----	3			2			150	--	2/70
28-----	3	3	(i)	2			300	285	231
29-----	3			--			800	501	1,080
30-----	3			--			2,300	555	3,450
31-----	3			--			3,000	560	4,540
Total-	100	--	5	56	--	3	6,814	--	9,390

(i) Sediment discharge less than 1 ton.

2/Estimated.

KNIFE RIVER BASIN--Continued

KNIFE RIVER NEAR GOLDEN VALLEY, N. DAK.--Continued

Suspended sediment, water year October 1943 to September 1949--Continued

Day	Mean discharge (second-foot)	April		Mean discharge (second-foot)	May		Mean discharge (second-foot)	June	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	3,000	700	5,670	63	--	2/16	34	--	2/15
2-----	3,300	940	8,380	57	92	14	47	--	2/20
3-----	3,800	1,560	16,000	60	100	16	50	--	2/20
4-----	5,300	1,660	23,800	55	--	2/15	35	--	2/15
5-----	5,000	1,760	23,800	53	--	2/14	29	--	2/10
6-----	4,000	1,660	17,900	50	--	2/13	25	--	2/8
7-----	3,420	1,400	12,900	47	--	2/13	22	--	2/6
8-----	2,340	1,180	7,460	44	--	2/12	21	98	6
9-----	1,440	1,170	4,550	41	--	2/12	20	--	2/5
10-----	930	1,020	2,560	39	--	2/11	19	86	4
11-----	681	740	1,360	37	--	2/11	17	--	2/4
12-----	560	533	806	35	--	2/10	17	--	2/4
13-----	435	518	808	33	--	2/10	17	--	2/4
14-----	375	415	420	32	108	9	17	73	3
15-----	319	379	326	30	--	--	16	--	2/4
16-----	251	--	2/250	29	--	2/9	17	--	2/4
17-----	200	--	2/180	28	--	--	28	--	2/6
18-----	164	--	2/130	33	--	--	27	94	7
19-----	142	--	2/100	32	104	9	33	106	9
20-----	133	230	83	30	--	--	31	--	2/9
21-----	124	188	63	30	--	--	32	107	9
22-----	111	--	2/44	30	--	2/8	48	129	17
23-----	99	132	35	30	--	--	34	--	2/10
24-----	94	--	2/30	32	--	--	26	--	--
25-----	88	--	2/26	30	--	--	25	--	--
26-----	81	--	2/24	28	--	--	21	87	5
27-----	72	--	2/22	27	--	2/7	18	--	--
28-----	67	--	2/19	26	--	--	17	--	--
29-----	62	--	2/17	26	--	--	16	--	2/4
30-----	58	--	2/15	25	--	2/6	15	--	2/4
31-----	--	--	--	25	84	--	--	--	--
Total--	36,646	--	127,600	1,137	--	310	774	--	230
Day	Mean discharge (second-foot)	July		Mean discharge (second-foot)	August		Mean discharge (second-foot)	September	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	14	123	5	14	--	2/4	7.5	--	2/2
2-----	14	--	2/4	13	--	2/3	7.2	72	1
3-----	13	--	--	12	--	2/2	6.9	90	2
4-----	13	--	--	10	--	2/2	6.9	--	2/2
5-----	13	82	3	11	--	2/2	6.9	--	2/2
6-----	14	--	--	11	65	2	6.9	--	2/1
7-----	13	--	--	9.1	--	2/2	7.2	--	2/1
8-----	14	--	2/3	8.2	--	2/1	6.9	52	1
9-----	13	70	2	6.9	65	1	6.6	--	2/1
10-----	13	78	3	7.9	--	2/7	6.6	70	1
11-----	13	--	2/3	13	412	14	11	--	2/4
12-----	13	139	5	13	253	9	7.2	--	2/2
13-----	26	205	14	51	500	3/72	6.3	--	--
14-----	24	94	6	88	766	182	6.3	--	--
15-----	35	115	11	128	820	283	6.0	--	2/1
16-----	36	144	14	72	514	3/104	6.3	--	--
17-----	30	--	2/12	40	423	46	6.0	--	--
18-----	23	--	2/10	26	--	2/25	6.0	--	--
19-----	22	--	2/8	21	--	2/15	5.4	--	--
20-----	25	--	--	20	217	12	5.4	50	--
21-----	26	--	--	18	185	9	5.4	--	--
22-----	27	146	10	16	--	2/7	5.7	--	--
23-----	22	--	--	14	167	6	6.0	50	--
24-----	26	--	10	13	145	5	5.7	--	--
25-----	24	--	--	11	120	4	6.0	--	(1)
26-----	22	--	--	11	--	2/4	5.7	--	--
27-----	20	116	6	10	118	3	5.4	--	--
28-----	22	--	--	9.8	83	2	4.5	--	--
29-----	19	--	--	9.1	--	2/2	4.5	--	--
30-----	17	--	--	8.8	78	2	5.1	--	--
31-----	15	--	2/4	8.5	72	2	--	--	--
Total--	621	--	205	704.3	--	834	189.5	--	35
Total discharge for year (second-foot-days)									47,696.2
Total load for year (tons)									138,700

(1) Sediment discharge less than 1 ton.

2/ Estimated.

3/ Sediment discharge computed by subdividing day.

KNIFE RIVER BASIN--Continued

KNIFE RIVER NEAR GOLDEN VALLEY, N. DAK.--Continued

Particle-size analyses of suspended sediment, March to April 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters								2.000		
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	
Mar. 30, 1949 -----	5:10 p. m.	2,540	862	1,930	19	29	41	52	71	89	96	99	100	BN	
Apr. 1 -----	12:00 m.	3,000	758	1,430	13	25	36	45	58	80	91	97	99	BN	
Apr. 5 -----	6:00 p. m.	4,670	1,800	517	18	29	44	58	72	85	92	95	97	BN	
Apr. 7 -----	12:00 m.	3,470	1,550	1,690	20	30	43	54	71	77	87	93	97	BN	
Apr. 9 -----	3:45 p. m.	1,310	1,180	1,120	25	40	54	66	81	92	98	99	100	BN	
Apr. 11 -----	11:30 a. m.	663	775	236	30	49	62	75	86	93	96	99	100	BN	
Apr. 14 -----	11:30 a. m.	375	408	863	15	32	60	79	89	95	97	99	100	BN	

KNIFE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN KNIFE RIVER BASIN IN NORTH DAKOTA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Dis-charge (second-foot)	pH	Specific conduct- ance (micro- mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium
																	Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
KNIFE RIVER AT HAZEN																						
Mar. 3, 1949	1 7/10	7.9	1,530	25	0.05	76	38	249	0	662	324	4.4	0.4	0.8	0.28	1,050	1.43	346	0	61		
Mar. 31	2,980	7.7	1,386	5.3	.06	23	8.7	47	0	136	76	1.0	4.1	4.1	.03	266	.36	94	0	52		
May 3	170	7.8	1,180	16	.01	50	26	186	0	428	282	2.4	3.4	2.0	--	856	1.16	257	0	61		
May 31	181	7.9	1,870	10	.01	50	33	336	0	632	488	3.4	6.1	1.6	--	1,260	1.71	261	0	75		
June 24	52	7.7	1,430	16	.02	46	31	264	0	513	368	4.0	5.5	1.9	--	988	1.34	243	0	70		
July 27	52	8.4	1,440	19	.02	43	32	233	16	458	362	4.5	5.5	2.5	--	964	1.31	239	0	70		

1/ Mean daily discharge.

HEART RIVER BASIN

HEART RIVER NEAR SOUTH HEART, N. DAK.

LOCATION.--At gaging station half a mile downstream from North Creek, three-quarters of a mile south of U. S. Highway 10, and 2 miles east of South Heart, Stark County.

DRAINAGE AREA.--315 square miles.

RECORDS AVAILABLE.--Chemical analyses: May 1947 to September 1948, March to September 1949.

Water temperatures: May 1947 to September 1948, March to September 1949.

Sediment records: May 1947 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 2,760 micromhos Mar. 16, 17; minimum, 127 micromhos Apr. 1.

Water temperatures: Maximum, 70°F July 17, 14, 200 ppm Nov. 8; minimum daily, not determined.

Sediment concentrations: Maximum daily, 3,200 tons Apr. 4; minimum daily, less than 0.1 ton on many days.

EXTREMES, 1947-49.--Specific conductance: Maximum, 3,360 micromhos Jan. 12, 1948; minimum, 111 micromhos Mar. 20, 21, 1948.

Water temperatures: Maximum, 80°F July 2, 1948; minimum, 40°F Jan. 12, 1948; freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 17,300 ppm Aug. 13, 1947; minimum daily, 0.1 ton on many days.

Water temperatures: Maximum daily, 78°F June 23, 1947; minimum daily, 40°F Jan. 12, 1948; freezing point on many days during winter months.

REMARKS: Daily samples for chemical analyses composited by discharge for water year 1948 to September 1949 given in regional office at Lincoln, Neb. Records of discharge for water year 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, March to September 1949

Date of collection	Mean discharge (second-foot)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbo-nate (CO ₃)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids		Hardness as CaCO ₃		Per-cent non-carbon-ate
																	Parts per million	Tons per acre-foot	Total	Non-carbon-ate	
																	per ton	per day			
Mar. 1-5, 1949	0.4	9.0	1,840	25	0.02	14	13	448	4.4	73	622	410	5.0	0.7	3.4	1.00	1,310	1.8	1.4	89	0
Mar. 6	1.2	7.3	1,326	8.0	40	8.0	2.7	63	6.0	0	124	60	1.0	4	2.3	1.00	212	.03	.4	31	0
Mar. 7-24	63	8.1	1,490	16	0.02	26	13	320	3.2	0	495	384	3.0	8	2.8	1.00	1,020	1.4	3.3	119	0
Mar. 25-27	873	7.2	1,388	16	40	11	3.8	65	3.2	0	118	89	7	6	2.5	1.00	264	.36	45	43	0
Mar. 28-30	2,060	7.6	1,600	9.8	80	9.0	2.5	22	4.8	0	54	35	1.0	4	1.6	1.00	134	.18	316	33	0
Mar. 31-Apr. 2	2,070	7.6	1,336	7.9	24	10	1.9	15	3.2	0	46	26	1.0	6	2.7	1.00	112	.15	623	33	0
Apr. 3-5	1,080	7.6	1,600	15	12	14	2.8	12	1.6	0	46	21	11	4	1.6	1.00	118	.05	116	659	9
Apr. 6	1,080	7.6	1,490	16	40	12	3.4	21	4.0	0	68	30	1.0	4	2.0	1.00	116	.16	338	44	0
Apr. 7-17	9.1	7.9	1,300	15	0.04	26	8.2	65	216	4.0	140	124	1.0	4	6	1.00	308	.42	58	99	0
Apr. 24	7.3	8.2	1,450	18	0.08	67	27	250	4.8	14	442	424	4.8	6	1.1	1.00	898	1.2	22	236	0
Apr. 25-30	3.09	8.4	1,830	13	12	62	30	353	4.0	26	546	508	4.5	6	1.1	1.00	1,030	1.4	20	278	0
May 1-31	1.56	8.5	2,260	12	14	45	31	448	4.0	23	683	616	6.0	6	1.6	1.00	1,280	1.7	11	278	0
June 1-30	1.4	8.3	2,340	15	10	43	28	483	6.8	24	710	624	6.0	1.0	2.0	1.00	1,530	2.1	6.6	240	0
July 1-21	5.3	7.6	1,450	22	10	20	6.8	299	6.4	0	440	350	2.0	1.0	1.7	1.00	51	.580	2.1	60	0
July 22-24	1.6	7.1	1,200	28	10	15	4.2	254	4.4	0	430	352	2.5	6	2.1	1.00	400	1.3	14	78	0
Aug. 25-Aug. 11	4.8	7.4	1,716	20	60	11	3.3	151	3.6	0	256	134	2.0	6	3.6	1.00	808	.86	3.5	55	0
Aug. 12-15	5	8.3	1,400	16	10	28	12	278	3.6	10	450	326	3.3	8	2.7	1.00	300	1.6	6.2	41	0
Aug. 16-31	2/85	8.3	2,000	21	10	32	14	420	4.8	28	712	444	4.5	3	2.6	1.00	594	1.3	2.1	120	0
Sept. 1-27	2/85	--	198	11	0.28	13	3.1	24	2.8	--	3/64	39	4.7	0.5	2.0	1.00	148	0.20	34	45	0
Weighted average 1/	2/85	--	198	11	0.28	13	3.1	24	2.8	--	3/64	39	4.7	0.5	2.0	1.00	148	0.20	34	45	0

1/Weighted average for period sampled only.

2/Mean discharge for water year was 49.4 second-feet.

3/Includes carbonate as bicarbonate.

HEART RIVER BASIN--Continued

HEART RIVER NEAR SOUTH HEART, N. DAK.--Continued

Temperature (°F) of water, March to September 1949
 /Once-daily temperature measurement between 6 a. m. and 9 a. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1						32	35	55	62	65	62	52
2						32	34	54	62	68	63	55
3						32	37	56	60	69	60	57
4						32	38	56	56	68	62	59
5						33	38	52	62	68	68	55
6						32	39	51	64	68	66	55
7						32	--	54	61	68	68	52
8						32	43	55	60	68	66	51
9						--	48	50	64	65	65	54
10						32	41	56	68	65	66	56
11						32	--	58	69	68	67	52
12						32	49	58	62	68	65	46
13						32	--	50	64	66	67	39
14						32	42	56	62	68	68	42
15						32	46	52	61	65	65	45
16						32	48	64	63	68	67	50
17						32	44	65	60	70	67	49
18						32	--	46	58	65	66	48
19						32	--	44	57	65	64	45
20						32	--	50	62	63	64	48
21						32	--	55	62	61	64	46
22						32	--	45	65	62	66	45
23						32	--	39	68	64	68	48
24						33	48	50	64	69	68	49
25						34	--	54	65	65	62	54
26						34	55	54	64	67	61	51
27						35	--	56	51	67	59	48
28						33	54	56	68	--	57	--
29						34	56	52	68	63	58	--
30						33	58	52	67	63	54	--
31						32	--	64	--	67	54	--
Average						32	--	54	63	66	64	50

HEART RIVER BASIN--Continued

HEART RIVER NEAR SOUTH HEART, N. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.7			0.8	43	0.1	0.7		
2-----	.7			.8	72	.2	.7		
3-----	.7			.8	86	.2	.8		
4-----	.7			1.1	90	.3	.8		
5-----	.8			1.3	92	.3	.7		
6-----	.9	55	0.1	2.6	--	1/30	.5	137	0.2
7-----	.9			4.3	5,500	64	.4		
8-----	1.1			2.0	14,200	77	.4		
9-----	1.2			1.4	310	1.2	.4		
10-----	1.1			1.1	90	.3	.4		
11-----	1.1	46	.1	.9	98	.4	.4	157	.2
12-----	1.0			.9	90	.2	.4		
13-----	.9			1.0	90	.2	.4		
14-----	.9			1.1	98	.3	.4		
15-----	1.0			1.3	368	1.3	.4		
16-----	.9			3.7	3,980	40	.4		
17-----	.9			2.2	3,720	22	.4		
18-----	.8			1.3	730	2.6	.4		
19-----	.8			1.2	100	.3	.4		
20-----	.7			1.0			.4		
21-----	.7	35	(a)	.9			.4	128	.1
22-----	.8			.9			.4		
23-----	.8			.9			.4		
24-----	.8			1.0			.4		
25-----	.8			.9	96	.2	.4		
26-----	.8			.9			.3		
27-----	.8			.9			.3		
28-----	.8			.8			.3		
29-----	.8			.7			.3		
30-----	.8			.7			.3		
31-----	.8			--	--	--	.3		
Total-----	26.5	--	2.9	39.4	--	243	13.6	--	5.1
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.3			0.3	--		0.4		
2-----	.3	66	(a)	.3	52		.4	39	(a)
3-----	.3			.3	--		.4		
4-----	.3			.3	--		.5		
5-----	.3			.3	--		.5		
6-----	.3			.3	--		.7		
7-----	.3	--	(a)	.3	--		1	225	0.4
8-----	.3			.3	--		1	259	.7
9-----	.3			.3	--		1	38	.1
10-----	.3			.3	--		1	17	(a)
11-----	.3			.3	--		1	45	.1
12-----	.3			.3	--		1	40	.1
13-----	.3			.3	--		1	78	.2
14-----	.3			.3	--		1	36	(a)
15-----	.3			.3	--		1	40	.1
16-----	.3			.3	--	(a)	1	33	(a)
17-----	.3	--	(a)	.3	--		1	95	.3
18-----	.3			.3	--		1	140	.4
19-----	.3			.3	--		1	253	.7
20-----	.3			.3	--		1	392	1.1
21-----	.3			.3	--		1	390	1.1
22-----	.3			.3	--		1	119	.3
23-----	.3			.3	--		2	66	.4
24-----	.3			.3	--		2	155	.8
25-----	.3			.4	41		3	174	1.4
26-----	.3			.4	--		20	147	7.9
27-----	.3	--	(a)	.4	--		50	240	32
28-----	.3			.4	--		120	380	123
29-----	.3			.4	--		500	317	428
30-----	.3			--	--	--	850	175	402
31-----	.3			--	--	--	1,270	202	693
Total-----	9.3	--	2	8.9	--	1	4,694.9	--	2,770

1/Estimated.

(a)Sediment discharge less than 0.1 ton.

HEART RIVER BASIN--Continued

HEART RIVER NEAR SOUTH HEART, N. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2,220	281	1,680	6.8	56	1.0	1.7	69	0.3
2-----	2,090	355	2,000	7.5	60	1.2	1.6		
3-----	2,120	420	2,400	5.9	35	.6	1.6		
4-----	2,260	525	3,200	4.6	48	.6	1.5		
5-----	1,840	558	2,770	4.1	68	.8	1.4		
6-----	1,080	630	1,840	4.0	60	.6	1.3	78	.2
7-----	515	643	894	3.8	46	.5	1.4		
8-----	210	627	356	3.7	32	.3	1.2		
9-----	119	515	165	3.5	27	.3	1.2		
10-----	85	580	133	3.1	34	.3	1.1		
11-----	64	405	70	3.0	48	.4	1.2		
12-----	55	310	46	3.0	40	.3	1.2		
13-----	46	308	38	2.7	37	.3	1.2		
14-----	38	208	21	2.6	30	.2	1.2		
15-----	32	165	14	2.5	28	.2	1.2		
16-----	27	120	8.7	2.2	40	.2	1.2	84	3
17-----	23	92	5.7	2.2	30	.2	1.4		
18-----	20	82	4.4	2.3	28	.2	1.4		
19-----	17	63	2.9	3.0	32	.3	1.7		
20-----	15	65	2.6	3.0	35	.3	1.7		
21-----	13	70	2.5	2.6	57	.4	1.5		
22-----	12	62	2.0	2.2	58	.3	1.4		
23-----	10	48	1.3	2.2	63	.4	1.6		
24-----	9.1	41	1.0	2.1	61	.3	1.4		
25-----	8.4	45	1.0	2.0	62	.3	1.3		
26-----	7.9	37	.8	2.0	55	.3	1.6	79	.8
27-----	7.5	40	.8	1.9	70	.4	3.8		
28-----	7.0	39	.7	1.8	58	.3	3.0		
29-----	6.8	50	.9	1.8	62	.3	2.2		
30-----	6.4	43	.7	1.8	62	.3	1.7		
31-----	--	--	--	1.8	62	.3	--	--	--
Total-	12,964.1	--	15,660	95.7	--	12.4	46.9	--	9.6

Day	July			August			September				
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment			
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		
1-----	1.2	76	0.2	1.3	2,650	9.3	0.4	55	(a)		
2-----	1.1			.9	--	1/6	.4				
3-----	1.0			.8	--	1/5	.4				
4-----	.9			.8	--	1/4	.4				
5-----	1.0			.7	--	1/3	.5				
6-----	1.0			.6	--	1/3	.5				
7-----	.9			.5	1,750	2.4	.5				
8-----	.9			.5	1,800	2.4	.5				
9-----	.9			.5	1,800	2.4	.5				
10-----	.9			.5	1,750	2.4	.5				
11-----	.9	2.3	4,860	3/31	.5	49	(a)				
12-----	.9			13	3/194			.5			
13-----	1.5			92	.4			3.2	596	5.1	.5
14-----	1.8			60	.3			1.8	130	.6	.5
15-----	4.6			86	1.1			1.2	136	.4	.5
16-----	2.0			79	.4			.9	97	.2	.5
17-----	1.6			50	.2			.8	71	.2	.5
18-----	1.1			51	.2			.8	77	.2	.5
19-----	1.0			60	.2			.9	71	.2	.5
20-----	1.1			67	.2			.9	68	.2	.5
21-----	3.4	536	3/11	2.3	86	.5	.5	45	(a)		
22-----	11	4,900	146	1.6	61	.3	.6				
23-----	3.2	4,200	36	1.0			.7				
24-----	1.8	150	.7	.7			.5				
25-----	1.2	83	.3	.5			.4				
26-----	.9	80	.2	.5	43	(a)	.4				
27-----	.8	80	.2	.5			.4				
28-----	1.2	115	.4	.4			.5				
29-----	9.7	2,080	3/65	.4			.5				
30-----	4.5	9,400	114	.4			.5				
31-----	1.9	6,000	31	.4			--	--	--		
Total-	65.9	--	410	41.6	--	273	14.6	--	1.9		
Total discharge for year (second-foot-days)-----											
Total load for year (tons)-----											

HEART RIVER BASIN--Continued

HEART RIVER NEAR SOUTH HEART, N. DAK.--Continued

Particle-size analyses of suspended sediment, November 1948 to August 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment													Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Nov. 7, 1948	4:20 p. m.	3.2	5,000	3,700	79	95	--	--	--	--	--	--	--	--	--	BW
Mar. 28, 1949	742		318	869	62	73	85	89	96	98	99	100	--	--	--	BN
Mar. 30	1:210		287	702	34	40	63	77	86	94	98	100	--	--	--	BN
Apr. 1	2,180		305	716	29	44	59	70	83	91	96	99	100	100	100	BN
Apr. 2	11:43 p. m.		406	1,050	30	44	59	71	84	93	96	99	100	100	100	BN
Apr. 5	3:40 p. m.		555	712	46	62	81	89	93	96	98	100	--	--	--	BN
Apr. 7	12:30 p. m.	1,820	713	1,560	30	58	--	94	97	98	99	100	--	--	--	BN
Apr. 22	4:45 p. m.	425	5,000	1,770	93	96	98	99	100	--	--	--	--	--	--	BW
Aug. 8	6:40 a. m.	15	1,880	1,090	38	57	68	83	96	99	100	--	--	--	--	BW
Aug. 11	5:15 a. m.	.5	1,740	1,570	32	53	73	93	100	--	--	--	--	--	--	BW
Aug. 11	8:00 a. m.	.7														BW

HEART RIVER BASIN--Continued

HEART RIVER NEAR RICHARDTOWN, N. DAK.

LOCATION --At gaging station at bridge on State Highway 8, half a mile downstream from Blacktail Creek, and 9½ miles south of Richardton, Stark County.

DRAINAGE AREA --1,310 square miles.

RECORDS AVAILABLE --Sediment records: March 1946 to September 1949.

EXTREMES 1948-49 --Sediment concentrations: Maximum daily, 3,520 ppm Apr. 3; minimum daily, not determined.

Sediment loads: Maximum daily, 50,400 tons Apr. 4; minimum daily, less than 1 ton on many days.

EXTREMES 1946-49 --Sediment concentrations: Maximum daily, 5,910 ppm June 4, 1948; minimum daily, not determined.

Sediment loads: Maximum daily, 50,400 tons Apr. 4, 1949; minimum daily, less than 1 ton on many days each year.

REMARKS --Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent sodium	
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate		
Oct. 8, 1948 -----	6.5	8.4	1,340	6.8	0.05	51	39	222		1/392	418	9.0	0.5	0.8	0.26		996	1.35		288	0	63
Mar. 2, 1949 -----	2/1.0	7.8	2,270	19	.02	122	71	401		780	772	14	.6	4.2	.47		1,780	2.43		596	0	59
Mar. 28 -----	2,940	7.3	272	8.2	.05	27	8	20		112	43	1.0	.3	4.6	--		180	.24		101	9	30
May 5 -----	68	7.7	1,290	7.8	.03	76	40	184		382	410	8.0	.4	1.3	--		934	1.27		354	41	53
May 25 -----	40	7.9	1,260	9.6	.03	52	37	204		408	364	7.0	.5	.9	--		900	1.22		282	0	61
June 23 -----	19	7.8	1,260	11	.03	61	36	192		364	372	9.0	.6	.9	--		902	1.23		300	0	58
July 25 -----	15	8.4	1,100	11	.02	50	27	182		3/304	308	11	.4	2.1	--		746	1.01		236	0	60
Sept. 12 -----	3.8	8.3	1,010	10	.02	50	11	180		5/325	271	7.0	.2	2.3	--		699	.95		170	0	70

1/Includes equivalent of 17 parts per million carbonate (CO₃).

2/Mean daily discharge.

3/Includes equivalent of 11 parts per million carbonate (CO₃).

4/Includes equivalent of 9 parts per million carbonate (CO₃).

HEART RIVER BASIN--Continued

HEART RIVER NEAR RICHARDTON, N. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	4.1			11			14	12	
2-----	4			12			13	--	
3-----	4			12			14	--	
4-----	4			13			12	--	
5-----	4			15			8	--	
6-----	5	21	(i)	19	22	(i)	7	--	
7-----	6			21			7	--	
8-----	6.5			17			7	--	
9-----	6			15			6	--	
10-----	6			14			6	--	
11-----	6			11			6	--	
12-----	7			10			5	--	
13-----	8			10			5	--	
14-----	9			12			5	--	
15-----	9			15					
16-----	8			21	16	(i)	5	11	(i)
17-----	8	22	(i)	20			5	--	
18-----	8			18			5	--	
19-----	8			12			4	--	
20-----	7			11			4	--	
21-----	7.5			10			4	--	
22-----	9.0			10			4	--	
23-----	16			13			4	--	
24-----	14			16			4	--	
25-----	13			17	--	(i)	3	--	
26-----	12			14			3	--	
27-----	12	35	1	10			3	--	
28-----	12			11			3	--	
29-----	11			14			3	--	
30-----	11			12			3	--	
31-----	11			--	--	--	3	--	
Total-	256.1	--	18	416	--	18	180	--	5
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	3			1			1	--	(i)
2-----	3			1			1	--	(i)
3-----	2			1			2	--	(i)
4-----	2			1			3	--	(i)
5-----	2			1			5	--	(i)
6-----	2			1			8	--	(i)
7-----	2			1			20	14	(i)
8-----	2			1			50	36	
9-----	2			1			100	15	5
10-----	2			1			150	18	4
11-----	2			1			130	32	7
12-----	2			1			100	26	11
13-----	2			1			80	29	7
14-----	2			1			60	29	6
15-----							50	19	5
16-----	2	--	(i)	1	(i)		40	17	3
17-----	2			1			30	14	2
18-----	2			1			25	12	1
19-----	2			1			23	10	(i)
20-----	2			1			21	10	(i)
21-----	2			1			21	8	(i)
22-----	2			1			25	41	
23-----	2			1			30	36	3
24-----	1			1			70	33	3
25-----	1			1	6		200	58	6
26-----	1			1			500	93	31
27-----	1			1			1,100	485	126
28-----	1			1			3,000	1,110	1,440
29-----	1			--	--	--	2,690	1,290	8,990
30-----	1			--	--	--	3,260	1,960	9,370
31-----	1			--	--	--	3,600	2,520	17,300
Total-	56	--	2	28		1	15,395	--	24,500

(i) Sediment discharge less than 1 ton.

HEART RIVER BASIN--Continued

HEART RIVER NEAR RICHARDTON, N. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	3,870	2,930	30,600	83	58	13	74	145	29
2-----	4,590	3,260	40,400	87	58	14	48	116	15
3-----	5,260	3,520	49,900	79	52	11	35	94	9
4-----	5,660	3,300	50,400	68	50	9	28	71	5
5-----	5,980	2,880	46,500	66	59	11	26	86	6
6-----	6,050	2,910	47,500	59	69	11	24	71	5
7-----	4,110	2,570	28,500	56	51	8	21	63	4
8-----	2,150	2,010	11,700	55	51	8	20	68	4
9-----	1,140	1,410	4,340	51	55	8	19	60	3
10-----	713	970	1,870	48	50	6	19	65	3
11-----	518	570	797	47	40	5	19	71	4
12-----	430	428	497	45	39	5	19	87	4
13-----	344	254	236	41	44	5	19	71	4
14-----	282	180	137	40	42	4	19	79	4
15-----	242	138	90	38	36	4	18	69	3
16-----	216	137	80	37	31	3	19	65	3
17-----	194	117	61	38	39	4	20	60	3
18-----	167	87	39	40	30	3	20	57	3
19-----	153	73	30	44	30	4	21	57	3
20-----	148	74	30	93	60	15	22	58	3
21-----	129	74	26	72	39	8	21	59	3
22-----	110	84	25	56	34	5	21	50	3
23-----	101	50	14	48	29	4	19	54	3
24-----	99	57	15	42	30	3	18	76	4
25-----	97	43	11	40	31	3	17	91	4
26-----	93	36	9	37	58	6	17	88	4
27-----	87	33	8	33	53	5	15	95	4
28-----	81	27	6	31	53	4	13	82	3
29-----	79	28	6	44	--	2/65	14	111	4
30-----	68	39	7	80	1,170	3/309	11	111	3
31-----	--	--	--	50	324	44	--	--	--
Total--	43,161	--	313,800	1,648	--	607	676	--	152
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	10	63	2	11	100	3	7.5		
2-----	9.7	48	1	9.3	121	3	7.1		
3-----	11	80	2	14	100	4	6.6		
4-----	9.3	81	2	12	84	3	6.2		
5-----	9.7	64	2	9.3	96	2	7.5		
6-----	11	44	1	7.9	89	2	8.4	40	(i)
7-----	11	57	2	7.1	80	2	8.4		
8-----	11	80	2	4.7	102	1	8.4		
9-----	9.7	89	2	4.4	91	1	6.6		
10-----	9.3	95	2	4.4	83	(i)	5.3		
11-----	9.3	78	2	4.7	89	1	4.7		
12-----	9.3	91	2	153	2,100	3/1,110	3.8		
13-----	19	96	5	35	1,160	3/129	3.1		
14-----	19	87	4	15	323	13	2.8		
15-----	23	73	4	9.3	213	5	4.4		
16-----	21	79	4	7.5	142	3	5.3	49	(i)
17-----	17	90	4	5.7	109	2	5.7		
18-----	13	81	3	8.8	97	2	4.7		
19-----	12	81	3	8.8	70	2	4.1		
20-----	17	114	5	8.4	63	1	3.4		
21-----	70	254	3/58	28	--	2/13	4.1		
22-----	25	219	15	94	179	3/50	4.1		
23-----	23	102	6	31	103	9	3.1		
24-----	17	71	3	19	81	4	2.5		
25-----	14	82	3	12	70	2	2.5	45	(i)
26-----	14	88	3	9.7	67	2	2.8		
27-----	18	97	5	7.9	57	1	2.8		
28-----	17	131	6	7.1	41	(i)	3.1		
29-----	14	110	4	6.2	47	(i)	2.8		
30-----	12	105	3	6.2	52	(i)	3.1		
31-----	11	93	3	6.2	52	(i)	--	--	--
Total--	496.3	--	163	567.6	--	1,380	144.9	--	18
Total discharge for year (second-foot-days)									63,024.9
Total load for year (tons)									378,000

(i) Sediment discharge less than 1 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

HEART RIVER BASIN--Continued

HEART RIVER NEAR RICHARDTON, N. DAK.--Continued

Particle-size analyses of suspended sediment, March to April 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment													Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Mar. 28, 1949	12:45 p. m.	2,940	1,570	1,010	5	12	21	32	49	72	86	95	97		BN	
Mar. 29	5:15 p. m.	2,540	2,000	2,210	11	14	23	32	47	70	85	93	98		BN	
Apr. 1	12:20 p. m.	3,870	3,570	2,992	8	14	23	34	48	65	78	88	95		BN	
Apr. 3	3:30 p. m.	5,200	3,020	2,310	11	17	26	36	49	65	73	87	--		BN	
Apr. 5	2:15 p. m.	5,850	3,080	2,290	14	19	30	42	58	70	84	90	--		BN	
Apr. 7	12:00 p. m.	4,110	2,560	690	8	16	26	39	48	64	76	90	95		BN	
Apr. 8	2:35 p. m.	1,920	1,800	1,970	15	23	35	49	64	75	86	94	98		BN	
Apr. 9	3:30 p. m.	1,030	1,210	2,620	10	17	36	52	67	77	86	95	97		BN	

HEART RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN HEART RIVER BASIN IN NORTH DAKOTA
Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Dis-charge (second-foot)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent Non- carbon- ate	
																Parts per mil- lion	Tons per acre- foot day	Total	Non- carbon- ate		
RAILROAD RESERVOIR NEAR DICKINSON																					
Apr. 29, 1949		7.6	540	7.1	0.04	23	13	78		0	192	114	3.0	0.1	1.5	0.10	347	0.47	111	0	61
May 23		7.4	543	4.3	.01	31	17	65		0	243	82	1.4	2	1.8		372	.51	148	0	41
July 1		7.6	546	4.5	.02	15	12	87		0	176	120	2.4	3	2.7		378	.51	87	0	68
July 29		8.3	539	8.2	.02	15	13	92		6	178	124	2.5	3	2.4		350	.48	91	0	61
Sept. 30		7.3	643	4.8	.02	28	18	94		0	96	123	4.0	3	3.6		404	.55	144	0	59
HEART RIVER BELOW HEART BUTTE DAM NEAR GLEN ULLIN (Formerly Heart River near Glen Ullin)																					
Oct. 8, 1948	1/11	8.2	1,410	8.7	0.06	40	34	243		11	450	354	7.0	0.5	0.8	0.31	986	1.34	240	0	69
Mar. 2, 1949	1/1.0	7.7	1,300	13	.02	62	28	239		0	622	260	5.0	4	2.0	.41	924	1.26	270	0	66
Mar. 28	6,470	7.4	1,300	7.8	.05	34	7.5	21		0	146	36	1.0	1	3.6	--	190	.25	116	0	28
Apr. 25	90	7.8	1,050	8.2	.03	62	33	132		0	320	284	6.5	2	.5	.18	717	.98	296	28	54
May 25	59	7.8	1,270	7.2	.03	57	37	201		0	366	378	8.0	4	7	--	906	1.23	254	0	60
June 24	26	7.9	1,310	11	.03	50	34	223		0	424	376	7.0	4	9	--	938	1.28	265	0	65
July 26	26	8.3	1,470	12	.02	47	36	251		8	394	440	11	5	1.5	--	1,000	1.36	266	0	67
Sept. 12	22	7.9	1,410	8.2	.02	40	32	253		0	464	368	11	5	2.0	--	956	1.30	232	0	70
HEART RIVER NEAR MANDAN																					
Apr. 29, 1948	262	7.3	853	9.4	0.07	54	22	101		0	272	200	5.0	0.5	5.8	0.17	805	0.82	225	2	49
Mar. 26, 1949	163	7.2	619	7.4	.02	30	13	93		0	206	148	3.5	1	2.1	.07	417	.57	129	0	61
Apr. 5	9,800	7.8	336	10	.05	37	8.7	21		0	144	49	6	2	3.6	--	214	.29	129	11	26
Aug. 2	31	8.0	1,400	13	.05	37	29	288		0	413	386	13	5	1.0	--	561	1.31	212	0	73
Sept. 24	13	8.4	1,450	10	.02	27	32	250		13	364	370	13	4	2.5	--	940	1.28	199	0	75

1/Meen daily discharge.

1/ Mean daily discharge.

HEART RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN HEART RIVER BASIN IN NORTH DAKOTA--Continued

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949

Periodic determinations of suspended-sediment discharge, water year October 1946 to September 1949			
Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)
HEART RIVER BELOW HEART BUTTE DAM NEAR GLEN ULLIN (Formerly published as Heart River near Glen Ullin)			
Oct. 8, 1948-----	11	15	0.4
Oct. 21-----	10	25	.7
Oct. 28-----	20	36	1.9
Nov. 4-----	24	31	2.0
Nov. 19-----	26	37	2.6
Dec. 3-----	22	30	1.8
Dec. 17-----	6.5	78	1.4
Jan. 12, 1949-----	1.5	85	.3
Feb. 4-----	.4	33	.04
Mar. 18-----	48	25	3.2
Mar. 27-----	4,400	1,840	21,900
Mar. 28-----	6,470	2,520	44,000
Mar. 30-----	5,820	3,850	60,500
Apr. 1-----	5,090	3,100	42,600
Apr. 2-----	5,090	5,900	81,100
Apr. 4-----	6,210	5,640	94,600
Apr. 6-----	6,860	5,760	107,000
Apr. 8-----	3,290	3,660	32,500
Apr. 9-----	1,720	2,150	9,980
Apr. 11-----	769	1,160	2,410
Apr. 14-----	449	382	463
Apr. 25-----	90	84	20
May 12-----	62	112	19
May 25-----	59	82	13
June 10-----	34	72	6.6
June 24-----	26	127	8.9
July 8-----	15	50	2.0
July 25-----	26	114	8.0
Aug. 10-----	7.0	80	1.5
Aug. 25-----	44	89	11
Sept. 12-----	21	108	6.1
Sept. 26-----	7.4	59	1.2

HEART RIVER BASIN--Continued.
MISCELLANEOUS ANALYSES OF STREAMS IN HEART RIVER BASIN IN NORTH DAKOTA--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
HEART RIVER BELOW HEART BUTTE DAM NEAR GLEN ULLIN (Formerly published as Heart River near Glen Ullin)															
Mar. 28, 1949	5:15 p.m.	6,470	2,520	3,140	8	11	17	--	--	60	75	89			BN
Mar. 30	2:45 p.m.	5,820	3,850	2,050	7	13	18	26	40	63	78	89			BN
Apr. 1	6:00 p.m.	5,080	3,100	1,862	8	18	31	50	73	93	99	100			BN
Apr. 2	1:20 p.m.	5,050	5,900	1,860	11	14	21	30	43	64	79	94			BN
Apr. 4	3:45 p.m.	6,210	5,640	1,710	8	13	22	34	49	64	82	91			BN
Apr. 6	3:45 p.m.	6,860	5,760	1,670	13	19	28	38	49	62	76	89			BN
Apr. 8	12:15 p.m.	3,390	3,660	1,130	10	16	25	38	50	64	76	86			BN
Apr. 9	4:10 p.m.	1,720	2,150	2,490	12	22	39	54	69	77	88	93			BN
Apr. 11	2:05 p.m.	1,769	1,160	2,610	7	13	38	56	72	82	89	94			BN

CANNONBALL RIVER BASIN

CANNONBALL RIVER NEAR NEW LEIPZIG, N. DAK.

LOCATION.--At gaging station at bridge on State Highway 49, 2 1/2 miles south of New Leipzig, Grant County, and 8 miles downstream from Thirtymile Creek. DRAINAGE AREA.--1,180 square miles.

RECORDS AVAILABLE.--Sediment records: April 1946 to September 1949.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 3,180 ppm Mar. 30; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 42,400 tons Mar. 30; minimum daily, 0 tons on several days.

EXTREMES, 1946-49.--Sediment concentrations: Maximum daily, 4,650 ppm Apr. 12, 1947; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 42,400 tons Mar. 30, 1949; minimum daily, 0 tons on several days.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
Oct. 13, 1948	2.9	8.1	1,030	22	0.05	50	30	152		368	258	5.0	0.5	0.5	0.34		724	0.98		248	0
Mar. 28, 1949	3,360	7.8	209	4.6	.07	23	8.3	8.5		96	25	1.5	.4	3.1	.00		144	.20		92	13
Apr. 2	3,840	7.8	231	5.7	.05	24	7.6	12		98	29	1.5	.3	4.1	.00		158	.21		92	12
Apr. 26	70	7.9	880	9.7	.02	56	26	108		286	224	4.0	.1	.9	.27		593	.81		246	3
May 23	25	7.9	1,130	8.2	.02	65	30	156		386	290	3.6	.4	1.3	--		764	1.04		286	0
June 6	42	7.8	1,380	9.6	.02	66	37	200		408	392	4.8	.4	1.4	--		958	1.30		317	0
July 8	9.3	7.9	1,050	14	.02	56	30	176		356	334	4.0	.4	1.0	--		818	1.11		263	0
Sept. 13	5.0	7.8	1,020	9.6	.02	44	33	140		304	278	6.6	.3	2.0	--		692	.94		246	0
																					55

CANNONBALL RIVER BASIN--Continued

CANNONBALL RIVER NEAR NEW LEIPZIG, N. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2.9	25	(i)	9.3	16	(i)	7	11	(i)
2-----	2.9			8.8			7		
3-----	2.9			8.8			7		
4-----	2.9			9.3			6		
5-----	2.9			12			5		
6-----	3.4	26	(i)	12	8	(i)	5	32	(i)
7-----	4.1			11			4		
8-----	3.7			11			4		
9-----	3.2			10			4		
10-----	3.2			10			3		
11-----	3.2	21	(i)	9	6	(i)	3	39	(i)
12-----	2.9			9			3		
13-----	2.9			8			3		
14-----	2.9			8			3		
15-----	2.7			9			3		
16-----	2.5	15	(i)	10	--	--	3	--	6
17-----	2.5			9.8			3		
18-----	2.5			9.8			3		
19-----	2.7			9.3			3		
20-----	4.5			8.8			2		
21-----	4.9	0.5	(i)	9.3	0.1	(i)	2	39	1
22-----	4.9			8.2			2		
23-----	4.9			9.3			2		
24-----	5.3			8.8			2		
25-----	5.3			8.8			2		
26-----	5.7	1	(i)	8.2	--	--	2	102, 100	81
27-----	6.5			7.7			2		
28-----	16			7.3			2		
29-----	18			7			1		
30-----	14			7			1		
31-----	11			--			1		
Total-	157.9	--	9	274.5	--	7	100	--	6
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.5	(i)	0.1	--	(i)	--	0	--	0
2-----				--			0	--	0
3-----				--			0	--	0
4-----				--			0	--	0
5-----				--			0	--	0
6-----				--			0	--	0
7-----				--			10	34	(i) 4
8-----				--			40	34	3
9-----				--			50	25	3
10-----				--			30	42	3
11-----				--			20	39	2
12-----				--			15	--	2/2
13-----				--			13	--	2/1
14-----				--			12	--	2/1
15-----				--			11	--	2/1
16-----	19, 726	(i)	2.8	--	(i)	--	10	39	1
17-----				--			10		
18-----				--			10		
19-----				--			11		
20-----				--			12		
21-----				--			12	--	2/1
22-----				--			40	--	2/1
23-----				--			70	5	(i) 1
24-----				--			100	--	2/5
25-----				--			150	--	2/20
26-----				--			300	100	81
27-----				--			1,500	600	2,430
28-----				--			3,200	1,140	9,850
29-----				--			4,420	1,940	23,200
30-----				--			4,910	3,180	42,200
31-----				--			4,770	1,890	24,300
Total-	19.5	1	1	2.8	--	(i)	19,726	--	102, 100

(i) Sediment discharge less than 1 ton.

2/ Estimated.

CANNONBALL RIVER BASIN--Continued

CANNONBALL RIVER NEAR NEW LEIPZIG, N. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	Mean discharge (second-foot)	April		Mean discharge (second-foot)	May		Mean discharge (second-foot)	June			
		Suspended sediment			Suspended sediment			Suspended sediment			
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		
1-----	4,770	1,510	19,400	68	34	5	28	42	5		
2-----	3,970	1,300	13,900	68			50				
3-----	3,780	1,480	15,100	60			58				
4-----	3,360	1,520	13,800	55			63				
5-----	2,860	1,690	13,100	53			52				
6-----	2,080	1,520	8,540	49			42				
7-----	1,370	1,220	4,510	46			35				
8-----	887	810	1,940	43			29				
9-----	659	440	783	40			27				
10-----	466	320	403	37			24				
11-----	362	286	280	35	47	4	20	45	2		
12-----	280	218	165	34			18				
13-----	243	135	89	34			21				
14-----	201	130	71	32			22				
15-----	174	116	54	30			14				
16-----	153	110	45	29			11				
17-----	135	109	40	30			11				
18-----	117	89	28	29			22				
19-----	107	60	17	28			15				
20-----	101	54	15	27			--			2/3	21
21-----	97	59	15	27	--	2/3	17				
22-----	89	58	14	24	--	2/3	14				
23-----	81	53	12	27	--	2/3	13				
24-----	76	43	9	28	47	3	14				
25-----	73	36	7	25			9.8				
26-----	69	40	8	24			7.3				
27-----	63	85	14	23			5.6				
28-----	41	98	11	22			4.8				
29-----	53	107	15	22			4.0				
30-----	57	58	9	22			3.6				
31-----	--	--	--	25			--	--	--	--	--
Total-	26,774	--	92,390	1,096	--	122	676.1	--	80		
		July			August			September			
1-----	3.4	42	(i)	8.4	331	8	8.9	48	(i)		
2-----	3.4	41	(i)	11	216	6	7.6				
3-----	6.2	--	(i)	9.3	155	4	6.5				
4-----	5.9	--	(i)	8.0	123	3	6.2				
5-----	6.5	37	(i)	6.5	86	1	5.3				
6-----	8.0			5.9			6.2				
7-----	10			4.5			6.5				
8-----	9.3			3.8			5.9				
9-----	7.6			3.6			5.3				
10-----	9.8	--	2/1	4.5			4.8				
11-----	12	43	1	4.0			6.2	42	(i)		
12-----	11			4.5			5.0				
13-----	13			4.5			5.0				
14-----	12			5.9			4.5				
15-----	9.8			37	80	8	4.5				
16-----	8.0	2/1	2/1	19	85	4	4.5				
17-----	7.6			9.3	113	3	4.0				
18-----	6.9			6.9	443	8	3.6				
19-----	7.3			6.5	507	9	3.6				
20-----	6.9			6.9	486	9	3.6				
21-----	6.2	52	(i)	602	--	2/1, 100	3.1	31	(i)		
22-----	5.3			100	658	3/183	3.4				
23-----	5.0			88	605	144	3.6				
24-----	4.8			59	600	3/98	3.3				
25-----	4.5	46	(i)	40	212	23	3.3				
26-----	4.3	47	(i)	26	191	13	2.9				
27-----	7.3	--	2/2	19	136	7	2.9				
28-----	47	--	2/130	16	108	5	3.1				
29-----	40	1,060	3/120	12	91	3	3.1				
30-----	15	745	30	11	76	2	3.3				
31-----	9.3	398	10	11	63	2	--	--	--		
Total-	313.3	--	314	1,154	--	1,650	139.7	--	16		

Total discharge for year (second-foot-days) ----- 50,429.8
 Total load for year (tons) ----- 196,700

(i) Sediment discharge less than 1 ton.

2/ Estimated.

3/ Sediment discharge computed by subdividing day.

CANNONBALL RIVER BASIN--Continued
CANNONBALL RIVER NEAR NEW LEIPZIG, N. DAK.--Continued

Particle-size analyses of suspended sediment, April 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment													Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
Apr. 2, 1949	5:40 p. m.	3,840	1,420	3,230	12	19	28	40	56	71	78	90	95			BN
Apr. 5	2:45 p. m.	2,800	1,670	798	18	28	47	61	76	86	92	96	98			BN
Apr. 8	4:45 p. m.	819	788	1,720	21	28	48	68	86	92	95	96	97			BN

LOCATION.--At gaging station at county highway bridge, 7 miles north of Keldron, S. Dak., 10½ miles south of Pretty Rock, Grant County, and 15 miles downstream from Timber Creek.

DRAINAGE AREA.--1,260 square miles.

RECORDS AVAILABLE.--Sediment concentrations: May 1946 to September 1949 (discontinued).

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 1,450 ppm Apr. 4; minimum daily, no flow on many days.

EXTRIMES, 1948-49.--Sediment concentrations: Maximum daily, 11,300 tons Apr. 2; minimum daily, 0 tons on many days during October, March, August, and September.

EXTRIMES, 1946-49.--Sediment concentrations: Maximum daily, 11,300 tons Apr. 2; minimum daily, no flow on many days in October, March, August, and September 1949.

EXTREMES, 1946-49.--Sediment concentrations: Maximum daily, 18,500 tons June 23, 1947; not determined, minimum daily, 0 tons on many days in October, March, August, and September 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, March to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids			Hardness as CaCO ₃		Per- cent Non- carbon- ate	
															Bor- on (B)	Parts per mil- lion	Tons per acre- foot	Tons per day	Total		
Mar. 10, 1949	470	6.7	303	7.3	0.12	14	7.5		31	66	72	1.0	0.2	1.6	0.06	186	0.25		66	12	50
May 23	19	7.7	1,740	7.3	.04	75	50	270	400	400	616	6.0	.5	1.0		1,230	1.67		393	65	60
June 6	11	7.7	1,450	7.4	.02	60	43	228	401	401	464	6.0	.5	1.2		1,010	1.37		327	0	60
July 8	1.9	8.0	1,560	7.5	.02	53	43	254	391	391	508	7.0	.5	1.4		1,070	1.46		309	0	64
Sept. 13	.4	7.8	648	8.0	.02	40	16	82	232	232	143	2.2	.2	2.5		416	.57		166	0	52

CANNONBALL RIVER BASIN--Continued

CEDAR CREEK NEAR PRETTY ROCK, N. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.1	15	(1)	0.5			4.3		
2-----	0	--	0	.3			4.3		
3-----	0	--	0	.4			4.3		
4-----	0	--	0	.7	10	(1)	4.3		
5-----	0	--	0	1.9			3.8		
6-----	.1			2.2			4.3	8	0.1
7-----	.1			4.3			3.0		
8-----	.1			4.7			2.7		
9-----	.1	17	(1)	5.1			2.4		
10-----	.1			4.7			2.2		
11-----	.1			4.7	13	0.2	2.4		
12-----	0	--	0	4.7			2.7		
13-----	0	--	0	5.1			2.7		
14-----	0	--	0	5.7			2.4		
15-----	0	--	0	5.7			2.4		
16-----	0	--	0	5.1			2.2	9	.1
17-----	0	--	0	4.7			1.9		
18-----	0	--	0	4.3			1.9		
19-----	0	--	0	4.3			1.9		
20-----	0	--	0	4.3			2		
21-----	0	--	0	4.3	11	.1	2		
22-----	.1			4.3			2		
23-----	.1			4.3			2		
24-----	.2			4.3			2		
25-----	.2			4.7			2	10	.1
26-----	.2	14	(1)	4.7			2		
27-----	.1			4.7			1.9		
28-----	.3			3.8	7	(1)	1.9		
29-----	.2			3.8			1.4	--	(1)
30-----	.3			4.3			1.4	--	(1)
31-----	.6			--	--	--	1.3	--	(1)
Total--	3.0	--	0.1	116.6	--	3.5	78.0	--	2.9
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----							0	--	0
2-----							0	--	0
3-----							0	--	0
4-----							0	--	0
5-----							2	53	.3
6-----							20	56	3
7-----							200	64	35
8-----							680	84	136
9-----							900	59	143
10-----							550	54	80
11-----							400	56	60
12-----							300	37	30
13-----							200	27	15
14-----							150	22	8.9
15-----				0.1	--	(1)	100	21	5.7
16-----	0.4	--	(1)				80	14	2.0
17-----							60	18	2.9
18-----							50	22	3.0
19-----							50	25	3.4
20-----							40	16	1.7
21-----							40	16	1.7
22-----							30	13	1.1
23-----							40	17	1.2
24-----							100	17	4.6
25-----							300	34	28
26-----							800	38	82
27-----							1,500	206	810
28-----							2,400	300	1,940
29-----				--	--	--	2,400	582	3,840
30-----				--	--	--	2,900	675	4,500
31-----				--	--	--	3,000	600	4,800
Total--	12.4	--	1	2.8	--	1	17,212	--	16,600

(1) Sediment discharge less than 0.1 ton.

CANNONBALL RIVER BASIN--Continued

CEDAR CREEK NEAR PRETTY ROCK, N. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	3,000	730	5,910	50		8.5	15		
2-----	3,500	1,200	11,300	56		2/5	20		
3-----	2,880	1,130	8,790	57		4.6	19		
4-----	1,990	1,450	7,790	53		2/5	15	35	1.5
5-----	1,440	1,440	5,600	48			12		
6-----	1,120	1,280	3,870	43			12		
7-----	851	1,180	2,710	38			9.4	--	2/1.2
8-----	678	1,000	1,830	36	49	4.8	9.4		
9-----	528	755	1,080	32			8.7		
10-----	414	580	648	30			8.0		
11-----	314	398	337	29			6.8	41	.8
12-----	256	300	207	27	--	2/4	6.3		
13-----	210	226	128	24	--	2/3	5.7		
14-----	181	177	86	22			5.7		
15-----	154	140	58	21			6.3		
16-----	135	118	43	20			5.7		
17-----	118	100	32	21			5.1	41	.6
18-----	104	80	22	21	23	1.6	4.7		
19-----	94	63	16	19			5.1		
20-----	84	57	13	19			6.8		
21-----	78	38	8.0	18			18	41	2.0
22-----	70	35	6.6	19			12	--	2/1.5
23-----	63	38	6.1	19			8.0		
24-----	57	30	4.6	19			7.4		
25-----	55	27	4.0	20			5.1		
26-----	50	24	3.2	19			4.3	51	.6
27-----	47	32	4.1	18	40	1.7	3.8		
28-----	44	32	3.8	15			3.4		
29-----	42	30	3.4	14			2.7		
30-----	45	40	4.9	14			2.4		
31-----	--	--	--	16			--	--	--
Total--	18,602	--	50,520	857	--	61.5	253.8	--	28.1
	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1.9			0.3			1.1		
2-----	2.2			.3			.7		
3-----	2.2			.3			.6		
4-----	1.9			.2	20	(i)	.5		
5-----	1.6			.1			.4		
6-----	1.9	41	0.2	.1			.6	50	0.1
7-----	1.9			.1			.6		
8-----	1.9			0	--	0	.5		
9-----	1.6			0	--	0	.5		
10-----	1.4			0	--	0	.5		
11-----	1.6			0	--	0	.6		
12-----	1.6			0	--	0	.5		
13-----	4.3			0	--	0	.4		
14-----	3.8			0	--	0	.4		
15-----	3.0			0	--	0	.3	36	(i)
16-----	2.4	32	.2	0	--	0	.4		
17-----	1.9			.1			.2		
18-----	1.4			1.6			.1		
19-----	1.3			1.4	33	(i)	.1		
20-----	1.0			1.1			.1		
21-----	.6			158	--	2/280	0	--	0
22-----	.8			59	455	72	0	--	0
23-----	.8	24	(i)	18	192	9.3	0	--	0
24-----	1.0			8.7	180	3.8	0	--	0
25-----	.7			4.7	121	1.5	0	--	0
26-----	.7			2.7	106	.8	0	--	0
27-----	.7			1.9	103	.5	0	--	0
28-----	.7			3.0	101	.8	0	--	0
29-----	.7	25	(i)	2.7	80	.7	0	--	0
30-----	.6			2.2	69	.4	0	--	0
31-----	.5			1.4	58	.2	--	--	--
Total--	48.6	--	4.5	265.9	--	37.0	9.0	--	1.5

Total discharge for year (second-foot-days)-----

37,461.1

Total load for year (tons)-----

87,620

(i) Sediment discharge less than 0.1 ton.

2/Estimated.

CANNONBALL RIVER BASIN--Continued
CEDAR CREEK NEAR PRETTY ROCK, N. DAK.--Continued

Particle-size analyses of suspended sediment, March to April 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, Chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500		1.000	2.000
Mar. 28, 1949	12:10 p. m.	2,570	243	567	22	33	48	60	78	88	94	98	99			BW
Mar. 30	4:30 p. m.	2,880	598	706	24	39	55	72	88	97	99	100	--			BW
Apr. 1	2:00 p. m.	2,790	688	670	15	27	50	71	82	84	85	91	95			BN
Apr. 1	2:00 p. m.	2,790	688	680	27	40	61	77	94	98	98	99	100			BW
Apr. 2	4:00 p. m.	3,320	1,240	739	19	23	37	53	71	86	95	99	100			BW
Apr. 3	1:15 p. m.	2,880	1,010	1,070	27	43	61	80	94	99	100	--	--			BW
Apr. 5	9:45 a. m.	1,480	1,390	810	18	25	42	60	78	88	95	99	100			BN
Apr. 5	9:45 a. m.	1,480	1,390	812	21	37	52	65	81	91	95	98	100			BW
Apr. 11	1:30 p. m.	312	390	966	37	55	77	90	98	99	100	--	--			BW

CANNONBALL RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN CANNONBALL RIVER BASIN IN NORTH DAKOTA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	
																	Parts per mil- lion	Tons per acre- foot	Total	Non- carbon- ate		
CANNONBALL RIVER AT BREIEN																						
Mar. 28, 1949-----	5,700	7.7	276	14	0.02	28	1.5	31	0	122	38	0.2	0.0	3.8	--			180	0.24	76	0	47
Aug. 2-----	21	7.6	1,050	19	.05	32	10	193	0	286	282	6.5	.4	3.8	0.76	0.76	728	.99	121	0	78	
Sept. 24-----	6.2	8.3	1,130	9.6	.02	37	21	208	14	376	273	10	.5	1.3	.28	.28	756	1.03	179	0	72	

GRAND RIVER BASIN

GRAND RIVER AT SHADEHILL, S. DAK.

LOCATION. --At gaging station at bridge on State Highway 73 at Shadehill, Perkins County, 5 miles downstream from confluence of North Fork and South Fork, and 12 miles south of Lemmon, N. Dak.

DRAINAGE AREA. 3,120 square miles.

RECORDS AVAILABLE. --Chemical analyses: October 1945 to September 1949.

Water temperatures: October 1945 to September 1949.

EXTREMES. 1948-49: Maximum, 4,970 micromhos Dec. 11; minimum, 227 micromhos Mar. 7.

Water temperatures: Maximum, 76°F June 16; minimum, Mar. 28.

Sediment concentrations: Maximum daily, 3.07 ppm Mar. 28; minimum daily, 0 tons on many days during year.

Sediment loads: Maximum daily, 37,300 tons Mar. 28; minimum daily, 0 tons on many days during year.

EXTREMES. 1945-49: --Dissolved solids (1945-47): Maximum, 3,910 ppm Jan. 11-20, 1946; minimum, 188 ppm Mar. 24-31, 1947.

Total hardness (1945-47): Maximum, 590 ppm Feb. 1-5, 1946; minimum, 39 ppm Sept. 11-20, 1946.

Specific conductance: Maximum, 6,520 micromhos Jan. 12, 1946; minimum, 201 micromhos Mar. 24, 1947.

Water temperatures: Maximum, 80°F July 11, 1946; minimum, freezing point on many days during winter months.

Sediment concentrations (1946-49): Maximum daily, 18,600 ppm May 5, 1946; minimum daily, no flow on many days.

Sediment loads (1946-49): Maximum daily, 83,800 tons June 24, 1947; minimum daily, 0 tons on many days in February 1948 and during 1949.

REMARKS. --Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids		Hardness as CaCO ₃		Percent non-carbonate
																	Parts per million	Tons per acre-foot	Tons per day	Total	
Oct. 1-31, 1948	9.68	8.7	2,540	5.6	0.03	15	12	626	5.6	65	774	648	18	0.5	0.7	--	1,780	2.42	47	87	0
Nov. 1-30	17.5	8.5	2,200	13	.05	23	16	488	4.8	23	625	558	11	.4	3.1	0.18	1,450	1.97	70	124	0
Dec. 1-31	7.9	8.2	4,150	13	.03	75	59	885	15	29	1,060	1,320	26	.6	2.3	.67	2,960	4.03	63	430	0
Jan. 1-31, 1949	7.9	7.9	2,940	15	.05	67	46	628	8.8	0	1,060	722	59	1.2	2.3	.77	2,080	2.83	11	356	0
Feb. 1-3	8.9	8.9	3,740	29	.20	3.0	59	857	27	153	1,270	724	120	.4	3.3	--	2,610	3.55	0	250	0
Mar. 6-7	1,750	8.0	289	8.6	.50	13	4.3	36	7.2	0	72	66	1.0	.8	3.9	--	184	.25	869	50	0
Mar. 8	3,800	7.1	300	11	.50	16	3.9	55	5.6	0	98	84	1.0	.4	5.5	--	218	.30	2,240	56	0
Mar. 10	1,250	7.9	228	9.2	--	13	2.6	30	5.6	0	80	46	.6	.4	3.0	--	166	.23	580	43	0
Mar. 12-22	272	7.9	368	11	--	18	5.9	45	9.2	0	126	76	1.0	.2	2.3	.26	258	.35	189	70	0
Mar. 23-27	3,520	7.3	288	11	.24	23	8.6	32	5.2	0	114	48	1.0	.2	2.4	.17	288	.26	1,580	66	0
Mar. 28	1,500	7.4	358	11	.24	23	8.6	32	5.2	0	142	56	2.0	.2	3.5	--	226	.31	2,750	106	0
Mar. 29-Apr. 8	1,610	8.0	368	8.5	.20	22	6.7	44	6.8	0	132	74	1.0	.2	1.8	.10	234	.32	1,020	83	0
Apr. 9-30	260	8.3	971	11	.02	30	15	162	9.6	16	228	288	3.0	.4	2.8	.36	650	.88	456	137	0
May 1-31	64	8.3	1,920	8.3	.06	37	24	373	4.0	30	446	588	7.5	.4	1.4	.47	1,300	1.77	225	191	0
Jun. 1-30	22.4	8.9	2,320	8.3	.02	24	24	506	3.6	43	544	718	12	.4	1.5	.77	1,620	2.20	96	139	0
July 1-12	5.0	8.8	2,760	9.1	.02	24	24	506	3.6	43	544	718	12	.4	1.5	.77	1,620	2.20	96	139	0
July 13-24	27	8.8	2,610	11	.02	22	21	572	7.2	43	568	728	14	.2	2.0	.90	1,770	2.57	126	144	0
July 25-31	3.6	8.9	2,340	10	.02	26	21	494	6.8	47	503	720	16	.2	2.7	.20	1,590	2.16	15	152	0

1/Practically no flow.

Aug. 1-31 -----	.45	8.7	2,350	10	.02	19	20	498	8.4	51	592	625	33	1.2	1.0	.94	1,560	2.12	2.1	130	0	89
Sept. 1-13 -----	.3	8.5	1,940	6.6	.04	16	16	403	8.0	20	576	440	39	.9	1.8	.71	1,230	1.97	1.0	106	0	88
Sept. 14 -----	.3	8.1	1,460	8.2	.10	23	11	299	3.2	0	455	360	25	.6	2.3	--	984	1.34	.8	103	0	86
Sept. 15-30 -----	.2	8.5	1,720	7.0	.02	18	14	357	7.2	28	528	368	40	.9	1.4	.53	1,100	1.50	.6	103	0	87
Weighted average 2/	3/185	--	518	10	0.22	21	7.8	80	6.6	--	4/165	125	2.0	0.3	2.6	0.20	344	0.47	172	85	0	65

2/Weighted average for period sampled only.

3/Mean discharge for water year was 170 second-feet.

4/Includes carbonate as bicarbonate.

GRAND RIVER BASIN--Continued

GRAND RIVER AT SHADEHILL, S. DAK.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

/Once-daily temperature measurement between 6 a. m. and 9 a. m.7

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	51	43	32	32	31	--	34	48	62	66	68	56
2	47	40	32	33	31	--	--	51	64	72	66	59
3	48	38	32	32	31	--	36	56	61	73	64	62
4	53	41	32	--	--	--	40	58	60	68	70	58
5	55	38	--	--	--	--	40	53	64	65	69	58
6	48	32	32	31	--	33	44	--	64	72	66	55
7	40	39	32	33	--	33	44	55	59	70	70	50
8	42	32	31	32	--	32	44	55	58	68	69	55
9	40	31	31	32	--	32	46	55	65	68	65	58
10	46	34	32	--	--	32	44	57	67	66	66	60
11	48	32	32	31	--	32	46	61	69	65	70	56
12	40	31	31	32	--	32	51	63	69	70	70	45
13	39	31	32	33	--	32	50	64	62	67	68	40
14	41	32	31	32	--	32	45	59	59	65	71	47
15	46	32	31	32	--	32	43	60	61	69	65	50
16	48	33	31	32	--	--	46	64	62	76	69	56
17	31	33	31	32	--	33	44	64	61	72	--	50
18	34	33	31	32	--	34	43	57	57	68	66	49
19	35	31	31	31	--	33	45	50	74	66	66	48
20	36	31	33	31	--	33	52	53	65	67	67	53
21	36	32	33	--	--	34	54	59	59	60	67	49
22	40	32	32	--	--	33	48	56	65	64	68	49
23	48	33	32	--	--	33	45	50	68	72	72	52
24	36	33	32	--	--	33	48	47	65	70	67	53
25	41	33	33	--	--	32	51	57	65	67	68	55
26	38	32	32	--	--	33	50	59	71	69	63	54
27	38	32	32	31	--	32	52	59	61	70	62	49
28	38	32	32	31	--	33	57	65	61	64	60	46
29	48	--	32	--	--	34	58	66	69	66	60	47
30	48	32	32	32	--	34	59	68	64	66	58	51
31	42	--	32	32	--	33	--	69	--	68	56	--
Average	43	34	32	--	--	33	47	58	64	68	68	52

GRAND RIVER BASIN--Continued

GRAND RIVER AT SHADEHILL, S. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	5.6	39	(i)	13	84	3	10	154	4
2-----	6.1	32	(i)	12	77	2	9	160	4
3-----	6.1	32	(i)	12	99	3	10	148	4
4-----	6.1	37	(i)	19	178	9	10	123	3
5-----	7.5	113	2	32	880	76	10	109	3
6-----	10	280	8	33	1,120	100	9	120	3
7-----	12	216	7	35	650	61	9	140	3
8-----	12	55	2	30	1,340	109	8	120	3
9-----	10	42	1	20	635	34	8	108	2
10-----	10	44	1	15	680	28	8	113	2
11-----	10	39	1	12	610	20	8	77	2
12-----	9.2	36	(i)	15	630	26	8	101	2
13-----	9.2	38	(i)	15	1,060	43	8	92	2
14-----	9.2	41	1	14	840	32	8	91	2
15-----	10	56	2	13	1,300	46	8	69	2
16-----	10	103	3	15	2,240	91	8	58	1
17-----	11	97	3	14	1,850	70	7	65	1
18-----	10	61	2	13	1,400	49	7	89	2
19-----	10	50	1	12	515	17	7	77	2
20-----	9.2	56	1	12	370	12	7	69	1
21-----	9.2	64	2	15	330	13	7	63	1
22-----	9.2	60	2	20	200	11	7	75	1
23-----	9.2	52	1	21	202	11	7	70	1
24-----	9.2	50	1	20	167	9	7	65	1
25-----	10	79	2	20	124	7	7	52	(i)
26-----	11	94	3	20	137	7	7	59	1
27-----	10	100	3	16	93	4	7	71	1
28-----	10	90	2	14	89	3	7	89	2
29-----	11	102	3	12	150	5	7	123	2
30-----	14	118	4	11	117	4	7	127	2
31-----	14	95	4	--	--	--	7	90	2
Total-	300	--	66	525	--	905	244	--	63
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	6	90	2				0	--	0
2-----	6	71	1				0	--	0
3-----	5	51	(i)				0	--	0
4-----	5	48	(i)				20	--	2/10
5-----	4	58	(i)				100	--	2/80
6-----	4	49	(i)				1,000	703	1,900
7-----	4	69	(i)				2,500	628	5,590
8-----	4	87	(i)				3,800	743	7,620
9-----	3	68	(i)				2,300	378	2,350
10-----	3	79	(i)				1,000	412	1,110
11-----	2						450	260	316
12-----	2						400	190	205
13-----	2						350	410	387
14-----	2						300	300	243
15-----	1						250	120	81
16-----	1	47	(i)				200	95	51
17-----	1						150	127	51
18-----	1						150	126	51
19-----	1						150	157	64
20-----	1						150	164	66
21-----	0	--	0				200	490	265
22-----	0	--	0				700	911	1,720
23-----	0	--	0				2,000	1,200	6,480
24-----	0	--	0				3,500	896	8,470
25-----	0	--	0				3,000	1,240	10,000
26-----	0	--	0				3,300	2,070	18,400
27-----	0	--	0				3,800	2,700	27,700
28-----	0	--	0				4,500	3,070	37,300
29-----	0	--	0				3,900	2,440	25,700
30-----	0	--	0				3,100	2,120	17,700
31-----	0	--	0				2,200	1,530	9,090
Total-	58	--	10	0	--	0	43,470	--	183,000

(i) Sediment discharge less than 1 ton.

2/Estimated.

GRAND RIVER BASIN--Continued

GRAND RIVER AT SHADEHILL, S. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	Mean discharge (second-foot)	April		Mean discharge (second-foot)	May		Mean discharge (second-foot)	June	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,640	1,320	5,840	134	190	69	34	36	3
2-----	1,250	875	2,950	134	220	80	36	37	4
3-----	1,060	727	2,080	119	154	49	36	34	3
4-----	964	607	1,560	130	159	56	34	38	4
5-----	935	754	1,900	111	129	39	32	30	3
6-----	935	772	1,950	93	153	38	28	29	2
7-----	906	865	2,120	86	118	27	27	33	2
8-----	850	950	2,180	79	77	16	25	41	3
9-----	694	853	1,600	77	79	16	25	42	3
10-----	591	678	1,080	70	79	15	25	39	3
11-----	511	527	727	67	58	10	23	35	2
12-----	447	493	595	64	32	6	21	40	2
13-----	394	424	451	64	30	5	12	48	2
14-----	356	330	317	59	34	5	17	62	3
15-----	352	309	294	50	38	5	17	43	2
16-----	337	382	348	47	37	5	15	40	2
17-----	276	437	326	46	34	4	14	43	2
18-----	237	420	269	45	37	4	15	41	2
19-----	198	310	166	47	40	5	17	69	3
20-----	180	231	112	44	38	4	23	131	8
21-----	160	217	94	42	38	4	22	48	3
22-----	145	188	74	45	49	6	25	60	4
23-----	125	150	51	46	48	6	25	70	5
24-----	117	110	35	45	59	7	29	52	4
25-----	109	98	29	42	53	6	24	53	3
26-----	101	80	22	41	50	6	18	62	3
27-----	101	69	19	36	41	4	17	50	2
28-----	97	61	16	34	44	4	14	61	2
29-----	95	62	16	32	42	4	12	59	2
30-----	97	100	26	32	27	2	9.2	52	1
31-----	--	--	--	32	30	3	--	--	--
Total-	14,260	--	27,270	1,993	--	510	671.2	--	87
July									
1-----	7.5	50	1	2.4	60	(i)	0	--	0
2-----	6.6	49	(i)	1.5			0	--	0
3-----	6.1	40	(i)	1.0			0	--	0
4-----	5.6	49	(i)	.8			.2	40	(i)
5-----	5.1	39	(i)	.8			.2		
6-----	4.7	28	(i)	.6	.6				
7-----	3.7	30	(i)	.5	.6				
8-----	3.2	31	(i)	.2	.3				
9-----	2.6	36	(i)	0	.2				
10-----	3.4	85	(i)	0	.2				
11-----	4.2	119	1	.1	66	(i)	.8	34	(i)
12-----	7.5	50	1	.3			.8		
13-----	13	670	24	.3			.4		
14-----	17	123	6	.4			.3		
15-----	34	120	11	.4			.2		
16-----	46	130	16	.3	.3	45	(i)	.3	
17-----	33	116	10	.2	.2				
18-----	54	109	16	.5	.2				
19-----	42	81	9	.7	.1				
20-----	28	74	6	.9	.1				
21-----	20	48	3	.7	27	(i)	.1	22	(i)
22-----	16	46	2	.4			.1		
23-----	13	56	2	.2			.1		
24-----	10	73	2	.2			.2		
25-----	7.1	76	2	.2			.3		
26-----	2.9	54	(i)	.1	0	0	.2	0	0
27-----	1.4	105	(i)	0			0		
28-----	1.0	261	(i)	0			0		
29-----	5.4	97	3/2	.2			.1		
30-----	4.7	91	1	.1			.2		
31-----	2.9	81	(i)	.1			--	--	--
Total-	411.6	--	123	14.1	--	2	7.0	--	(i)
Total discharge for year (second-foot-days) ----- 61,953.9									
Total load for year (tons) ----- 212,000									

(i) Sediment discharge less than 1 ton.

3/2 Sediment discharge computed by subdividing day.

GRAND RIVER BASIN--Continued
GRAND RIVER AT SHADEHILL, S. DAK.--Continued

Particle-size analyses of suspended sediment, March to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment												Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	
Mar. 24, 1949	7:30 p. m.	3,300	833	877	28	48	61	67	71	74	77	84		94	BN
Mar. 25	10:25 a. m.	2,810	1,050	319	27	33	42	47	58	68	78	88		93	BN
Mar. 27	6:00 p. m.	3,960	3,710	2,320	8	17	30	39	52	67	81	90		93	BN
Mar. 29	10:25 a. m.	3,960	2,020	2,250	16	26	41	50	62	74	81	88		93	BN
Mar. 31	4:30 p. m.	2,110	1,370	842	21	30	43	53	64	75	85	92		95	BN
Mar. 31	4:30 p. m.	2,110	1,370	903	27	36	44	52	63	73	85	94		97	BN
Apr. 2	12:15 p. m.	1,280	827	1,650	13	29	55	66	77	79	80	84		87	BN
Apr. 4	3:30 p. m.	935	587	770	26	46	69	75	81	88	93	97		99	BN
Apr. 11	5:30 p. m.	485	470	890	4	7	33	--	--	97	98	100		--	BN

GRAND RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN GRAND RIVER BASIN IN SOUTH DAKOTA

Chemical analyses, in parts per million, water year October 1948 to September 1949																						
Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃) (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent Non- so- dium	
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	carbon- ate		
NORTH FORK GRAND RIVER NEAR WHITE BUTTE																						
Mar. 26, 1949	2,070	7.1	289	10	0.12	21	6.1	30	0	111	46	0.2	0.5	3.2	0.47	198	0.27			18	0	46
Apr. 25	56	7.9	1,330	8.6	.02	49	26	234	0	338	436	5.0	.2	.8		934	1.27		230	0	69	
May 9	31	7.8	1,760	13	.01	51	29	316	0	429	550	5.0	.6	1.0		1,180	1.60		246	0	74	
June 7	12	8.1	2,110	8.0	.01	36	32	411	0	439	700	5.0	.6	1.3		1,420	1.93		222	0	80	
July 12	.9	8.3	2,470	7.5	.02	40	41	490	20	432	896	8.0	.7	.8		1,720	2.34		269	0	80	
GRAND RIVER NEAR WAKALA																						
Mar. 21, 1949	1,000	6.9	255	7.8	0.10	8.5	10	30	0	85	54	0.2	0.0	2.6	0.09	205	0.28		82	0	51	
Mar. 26	7,060	7.3	341	13	.10	22	4.5	45	0	125	62	1.0	.5	2.2	--	218	.30		74	0	57	
Apr. 25	251	7.7	1,090	8.7	.01	45	17	184	0	298	316	6.5	.1	1.1	.20	746	1.01		183	0	69	
May 5	449	7.6	553	11	.05	26	9.6	81	0	180	124	.2	.1	2.8	.04	387	.53		105	0	63	
May 24	83	8.2	1,680	13	.01	46	20	319	11	407	504	9.0	.5	1.0	--	1,330	1.94		197	0	78	
July 12	18	8.5	1,820	9.2	.02	43	23	354	13	349	620	12	.3	1.0	--	1,230	1.70		202	0	79	
SOUTH FORK GRAND RIVER NEAR CASH																						
Mar. 9, 1949	1,080	6.7	183	7.6	0.05	7.5	3.9	29	0	72	31	.0	0.3	3.0	0.03	139	0.19		35	0	64	
Apr. 25	34	8.3	1,740	11	.05	32	15	371	19	519	460	8.5	.2	.9	.32	1,180	1.60		142	0	85	
May 9	23	8.2	2,150	13	.02	23	15	472	16	622	574	6.0	.5	1.9	--	1,430	1.94		119	0	90	
June 8	11	8.7	2,590	6.3	.01	8.0	13	621	50	797	644	9.0	.7	1.3	--	1,750	2.38		74	0	95	
July 12	8.2	8.9	3,210	7.6	.02	7.0	14	782	92	873	848	13	.9	1.3	--	2,200	2.99		75	0	96	
Sept. 15	1/13	8.7	1,900	14	.10	14	5.4	448	33	553	490	6.5	.4	4.2	.48	1,290	1.75		57	0	94	

1/ Mean daily discharge.

GRAND RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN GRAND RIVER BASIN IN SOUTH DAKOTA--Continued

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)
NORTH FORK GRAND RIVER NEAR WHITE BUTTE			
Nov. 11, 1948-----	4.9	12	0.2
Nov. 22 -----	5.3	26	.4
Dec. 7 -----	2.9	18	.1
Dec. 27 -----	1.7	70	.3
Mar. 8, 1949 -----	808	74	161
Mar. 26-----	2,070	851	4,760
Mar. 27 -----	2,420	1,380	9,020
Mar. 31 -----	1,540	640	2,660
Apr. 3 -----	720	265	515
Apr. 11 -----	247	231	134
Apr. 25 -----	56	78	12
May 9 -----	31	72	6.0
May 25 -----	20	60	3.2
June 7 -----	12	60	1.9
June 28 -----	4.1	40	.4
July 12 -----	.9	63	.2
July 26 -----	2.6	78	.5
Aug. 9 -----	.06	59	.01

SOUTH FORK GRAND RIVER NEAR CASH

Oct. 14, 1948-----	10	144	3.9
Oct. 26 -----	9	145	3.6
Nov. 9 -----	11	4,620	137
Nov. 23 -----	15	210	8.5
Dec. 6 -----	5	113	1.5
Mar. 7, 1949 -----	1,670	1,560	7,030
Mar. 9 -----	1,080	379	1,110
Mar. 11 -----	255	350	241
Mar. 22 -----	1,520	1,570	6,440
Mar. 25 -----	682	1,190	2,190
Mar. 29 -----	703	1,260	2,390
Apr. 4 -----	344	924	858
Apr. 11 -----	199	908	488
Apr. 25 -----	34	106	9.7
May 9 -----	23	142	8.8
May 24 -----	17	199	9.1
June 8 -----	11	97	2.9
June 28 -----	8.2	128	2.8
July 12 -----	8.2	84	1.9
July 27 -----	4.3	82	1.0
Aug. 24 -----	8.6	226	5.2
Sept. 15 -----	12	898	29

GRAND RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN GRAND RIVER BASIN IN SOUTH DAKOTA--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; F, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500
NORTH FORK GRAND RIVER NEAR WHITE BUTTE															
Mar. 26, 1949	9:50 a. m.	2,070	851	925	16	21	28	35	46	63	79	95		98	BW
Mar. 27	11:10 a. m.	2,420	1,390	756	7	10	16	29	43	71	80	89		96	BW
Mar. 27	11:10 a. m.	2,470	1,390	836	13	16	24	33	45	67	85	95		98	BW
Mar. 31	12:00 m.	1,540	640	714	28	39	50	64	76	88	94	98		99	BW
SOUTH FORK GRAND RIVER NEAR CASH															
Nov. 9, 1948	1:45 p. m.	11	4,620	4,120	86	92	96								BW
Mar. 21, 1949	3:00 p. m.	1,520	1,570	927	12	35	63	71	81	88	94	98		99	BW
Mar. 22	3:00 p. m.	1,530	967	42	48	60	71	79	86	92	96	98		98	BW
Mar. 25	3:45 p. m.	682	1,190	826	56	62	73	82	89	92	96	99		100	BW
Mar. 29	4:15 p. m.	703	1,260	860	58	71	81	89		97	98	100			BW
Mar. 29	4:15 p. m.	703	1,260	719	24	62	79	88	94	96	97	99		100	BW
Apr. 11	12:15 p. m.	199	908	678	69	89	91	96	98			100			BW

MOREAU RIVER BASIN

MOREAU RIVER AT BIXBY, S. DAK.

LOCATION.--At gaging station at county highway bridge, a quarter of a mile east of Bixby, Perkins County.

DRAINAGE AREA.--1,570 square miles.

RECORDS AVAILABLE.--Chemical analyses: March to September 1949.

Water temperatures: April to September 1949.

Sediment records: April to September 1949.

EXTREMES, March to September 1949.--Specific conductance: Maximum for days of no flow, 5,930 microhmhos Aug. 15, 16; maximum for days of flow, 4,530 microhmhos, Sept. 14; minimum, 166 microhmhos Mar. 27.

Water temperatures (April to September 1949): Maximum, 88°F June 11.

Sediment concentrations (April to September 1949): Maximum daily, 4,970 ppm May 4; minimum daily, no flow on many days.

Sediment loads (April to September 1949): Maximum daily, 1,300 tons May 4; minimum daily, 0 tons on many days.

REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, March to September 1949

Date of collection	Mean discharge (second-sec)	pH	Specific conductance (microhmhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Copper (Cu)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids			Hardness as CaCO ₃		Per cent sodium carbonate
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Mar. 6, 1949	50	8.0	661	12	0.02	19	6.8	3.07	5.2	0	172	180	4.9	0.2	2.1	0.11	426	0.58	58	76	58	74
Mar. 7	150	7.6	333	14	0.03	13	5.0	4.8	3.6	0	100	72	2.9	1.1	1.2	--	224	.30	91	53	0	64
Mar. 8	280	7.8	225	14	0.30	8.9	3.5	3.6	2.8	0	69	42	6.0	2.2	2.9	.80	160	.22	86	28	0	71
Mar. 9	300	8.1	362	28	0.03	12	9.9	6.4	4.0	0	96	64	7.6	2.2	1.6	.02	258	.85	209	34	0	78
Mar. 30	500	7.6	472	39	0.06	14	4.5	7.1	2.0	0	44	85	--	2.2	1.4	.05	366	.42	413	54	18	73
Mar. 31	466	7.9	364	21	0.12	11	2.6	6.3	2.0	0	32	66	4.6	2.2	1.4	.03	244	.33	264	38	0	77
Mar. 12	300	7.8	320	24	0.20	9.9	1.1	5.6	3.2	0	62	73	19	2	1.3	.04	232	.32	188	29	0	79
Mar. 13-14	225	6.9	597	71	0.12	16	6.0	92	3.6	0	50	486	--	2	1.6	.04	446	.61	271	70	29	73
Mar. 15-16	140	7.3	529	96	0.02	20	4.6	78	3.5	0	306	160	5.3	4	1.3	--	366	.50	138	66	0	65
Mar. 17	120	7.6	401	30	0.05	16	3.0	55	6.0	0	194	98	2.9	4	1.7	--	276	.38	89	66	0	62
Mar. 18	110	7.6	377	46	0.02	15	3.4	58	6.0	0	102	98	4.6	4	1.1	.00	278	.38	83	40	0	65
Mar. 19-20	300	7.6	352	29	0.02	14	4.0	58	3.6	0	301	92	2.0	4	1.4	--	244	.33	66	32	0	68
Mar. 21	300	7.7	346	35	0.02	14	5.0	52	7.6	0	96	90	2.7	4	1.3	--	246	.34	67	56	0	63
Mar. 22, 11:40 a.m.	3,700	7.9	236	30	0.02	11	3.3	59	6.4	0	100	46	1.5	4	1.0	--	180	.26	1/2,290	51	0	63
Mar. 23, 4:40 p.m.	3,700	7.5	420	36	0.03	19	4.4	55	3.0	0	33	104	16	5	1.1	.04	300	.41	174	6	59	64
Mar. 24, 10:20 a.m.	2,700	7.3	360	74	0.03	14	4.4	36	3.0	0	60	94	4.3	5	1.0	--	276	.36	1/2,010	37	1	56
Mar. 24, 1:30 p.m.	2,700	7.3	304	60	0.02	14	4.4	36	3.2	0	60	94	4.3	5	1.0	--	276	.36	1/2,010	37	1	56
Mar. 24, 4:10 p.m.	2,760	7.3	377	32	0.02	20	2.3	40	4.4	0	64	114	2.3	4	1.3	--	238	.35	--	84	32	49

MOREAU RIVER BASIN--Continued

MOREAU RIVER AT BIXBY, S. DAK.--Continued

Chemical analyses, in parts per million, March to September 1949--Continued

Date of collection	Mean discharge (second-foot)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Mar. 25, 1949	2,710	7.3	613	12	0.10	36	17	62	5.6	0	96	206	4.0	0.4	1.6	--	414	0.56	3,030	160	81	45
Mar. 26	1,780	6.9	530	9.0	.20	34	13	49	5.6	0	108	148	3.0	.4	1.3	--	346	.47	1,660	139	50	42
Mar. 27, 11:45 a. m.	1,780	7.0	168	10	--	8.0	1.5	31	4.8	0	80	22	1.8	.6	1.9	--	148	.20	1,180	28	0	60
Mar. 27, 4:55 p. m.	1,780	7.1	504	12	.10	33	12	45	4.8	0	92	144	2.2	.4	1.4	--	334	.45	--	132	57	42
Mar. 28, 9:45 a. m.	2,190	7.3	560	9.0	.02	29	13	68	.4	0	79	196	2.6	.2	1.2	0.09	376	.51	1/2,580	126	61	54
Mar. 28, 12:00 m. ---	2,190	7.2	762	8.8	.10	45	21	81	81	0	106	270	3.2	.4	1.9	--	530	.72	--	199	112	47
Mar. 28, 2:15 p. m. ---	2,190	7.2	583	11	.01	37	15	66	66	0	89	207	3.5	.3	2.2	.05	404	.55	--	154	81	48
Mar. 29, 10:00 a. m.	1,910	7.3	607	9.8	.01	25	13	79	3.6	0	72	218	3.0	.2	1.3	.10	411	.58	1/2,160	116	57	59
Mar. 29, 3:45 p. m. ---	1,910	7.2	606	8.0	.01	37	17	64	4.8	0	80	218	4.5	.3	2.5	.00	425	.58	--	163	97	46
Mar. 30	1,500	7.3	657	15	.10	38	16	71	4.8	0	100	224	3.2	.3	.9	--	452	.61	1,830	161	79	48
Mar. 31	1,120	7.0	758	12	.10	37	17	71	4.8	0	88	240	2.6	.4	.7	--	454	.62	1,370	163	91	48
Apr. 1-2	763	7.5	821	15	.20	44	20	78	4.0	0	92	280	4.2	.2	1.4	--	526	.72	1,080	193	118	46
Apr. 3	595	7.2	848	10	.10	45	22	92	4.8	0	88	310	4.0	.4	.9	--	582	.79	935	203	131	49
Apr. 4	580	7.5	908	15	.40	48	22	106	1.6	0	102	333	4.6	.2	1.0	--	618	.94	934	211	127	52
Apr. 5-8	741	7.8	911	13	.02	50	23	107	4.8	0	99	364	3.4	.2	1.5	.20	648	.83	1,300	220	139	51
Apr. 9	708	7.1	858	11	.10	50	21	100	1.6	0	111	320	2.2	.3	1.2	--	618	.84	1,180	212	121	51
Apr. 10	550	7.4	794	15	.01	39	18	100	1.6	0	88	300	3.7	.2	1.0	.06	559	.76	830	172	100	56
Apr. 11-12	417	7.5	934	11	.02	51	23	112	4.4	0	116	364	3.6	.3	1.8	--	664	.90	748	222	127	52
Apr. 12 2/	374	7.0	706	12	.02	37	12	88	.8	0	115	234	4.0	.0	1.6	--	476	.65	481	142	48	57
Apr. 13-15	305	7.2	1,070	14	.02	52	24	137	4.0	0	127	408	3.6	.1	1.3	--	770	1.05	634	229	125	56
Apr. 13 2/	305	7.5	1,100	11	.01	50	30	140	2.8	0	107	442	5.0	.3	.8	.22	784	1.07	645	248	160	55

Apr. 16	311	7.1	1,250	11	.02	60	33	169	0	142	508	4.0	.1	1.5	--	924	1.26	776	285	169	56	
Apr. 17-18	168	7.5	1,480	12	.02	73	43	187	3.2	0	134	640	6.4	.1	1.3	--	1,030	1.40	467	359	249	53
Apr. 19-23	77	7.4	1,460	12	.02	65	39	202	6.0	0	190	584	6.4	.3	1.0	--	1,010	1.37	210	323	167	57
Apr. 24-May 2	46	7.7	1,720	14	.02	75	40	266	5.6	0	297	660	7.6	.3	1.2	.37	1,220	1.66	152	352	108	62
May 3-5	93	7.7	1,720	16	.02	65	33	294	6.4	0	331	646	5.6	.2	2.2	--	1,230	1.67	309	298	27	68
May 6-9	37	7.6	2,210	15	.02	88	50	356	8.8	0	307	900	6.2	.4	1.8	--	1,580	2.15	158	425	173	64
May 10-19	15	8.0	2,390	13	.02	68	50	397	8.6	0	337	943	10	.4	.7	.31	1,660	2.26	67	375	99	69
May 20-31	12	8.0	2,430	8.8	.02	42	49	459	7.6	0	442	904	12	.5	.9	.34	1,710	2.33	55	307	0	76
June 1-10	9.6	8.3	2,640	7.2	.02	55	48	498	10	31	362	976	12	.6	.7	.43	1,820	2.48	47	335	0	76
June 11-19	6.6	8.4	2,850	6.8	.02	40	48	535	13	28	435	1,050	14	.8	.9	.48	1,950	2.65	35	298	0	79
June 20-23	4.6	8.7	3,070	7.1	.08	54	59	585	7.2	28	382	1,260	15	.6	.8	--	2,210	3.01	27	380	20	77
June 24-29	3.2	8.6	3,150	8.8	.08	54	54	630	9.6	24	427	1,280	16	.6	1.0	.45	2,290	3.11	20	397	0	79
June 30-July 1	1.9	8.3	3,280	6.3	.12	41	50	675	10	10	489	1,330	18	.7	.8	--	2,390	3.25	12	308	0	82
July 2-3	1.7	8.5	3,140	8.2	.04	40	50	699	16	26	456	1,320	17	1.0	1.9	.60	2,410	3.28	11	306	0	82
July 4-6	4.4	8.8	3,290	9.0	.04	39	44	717	12	47	488	1,280	18	1.2	1.9	.67	2,410	3.28	29	279	0	84
July 7-31	1.4	8.4	3,570	7.7	.02	25	42	828	15	25	701	1,340	21	1.0	.8	.70	2,600	3.62	10	235	0	88
Aug. 1-8	3/0	8.8	4,730	9.4	.10	16	50	1,150	12	92	858	1,720	32	1.4	3.8	1.00	3,520	4.79	0	246	0	91
Aug. 9-31	3/0	8.9	5,430	9.8	.16	19	54	1,360	14	126	954	2,050	36	1.2	3.5	1.14	4,160	5.66	0	270	0	91
Sept. 14-30	1.4	8.9	4,140	7.0	.06	17	35	991	11	87	756	1,460	30	.8	1.7	.79	3,020	4.11	11	187	0	91
Weighted average 4/	5/171	--	698	22	0.07	35	16	87	4.9	--	6/105	242	6.2	0.3	1.4	--	487	0.66	225	154	68	54

1/Weighted mean for day.

2/Not included in weighted average.

3/Practically no flow.

4/Weighted average for period sampled only.

5/Mean discharge for water year was 97.0 second-feet.

6/Includes carbonate as bicarbonate.

MOREAU RIVER BASIN--Continued

MOREAU RIVER AT BIXBY, S. DAK.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

/Once-daily temperature measurement between 10 a. m. and 4 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							39	--	74	83	74	--
2							--	--	71	83	80	--
3							--	--	68	79	78	--
4							--	59	64	--	73	--
5							--	60	62	76	75	--
6							40	65	76	82	76	--
7							40	61	59	80	76	--
8							40	71	73	74	71	--
9							48	70	81	74	66	--
10							--	72	75	--	71	--
11							52	76	88	71	74	--
12							58	65	73	81	72	--
13							48	71	61	73	69	--
14							50	69	69	72	--	65
15							55	76	78	74	78	59
16							54	69	69	76	69	61
17							49	70	81	83	70	54
18							56	59	62	71	67	64
19							59	55	70	72	67	54
20							65	67	72	85	71	56
21							59	66	72	67	70	53
22							57	63	78	66	70	63
23							60	50	73	78	70	53
24							59	48	72	80	69	54
25							60	74	--	69	81	73
26							67	77	77	85	67	57
27						36	69	74	76	--	64	50
28							69	77	70	75	68	47
29							70	78	76	69	68	60
30							58	84	82	73	59	62
31							--	71	--	86	70	--
Average							55	68	71	76	71	--

MOREAU RIVER BASIN--Continued

MOREAU RIVER AT BIXBY, S. DAK.--Continued

Suspended sediment, April to September 1949

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	--	--	--	59	--	1/100	9.0	10	0.2
2-----	--	--	--	91	1,720	423	9.5	11	.3
3-----	--	--	--	98	--	1/1,000	11	27	.8
4-----	--	--	--	97	4,970	1,300	9.5	13	.3
5-----	--	--	--	84	1,750	397	9.0	9	.2
6-----	--	--	--	54	3,290	480	8.5	10	.2
7-----	--	--	--	39	1,390	146	9.0	10	.2
8-----	--	--	--	30	177	14	11	13	.4
9-----	--	--	--	24	100	6.5	9.5	20	.5
10-----	--	--	--	21	81	4.6	10	21	.6
11-----	--	--	--	18	57	2.8	9.5	20	.5
12-----	--	--	--	17	37	1.7	7.5	29	.6
13-----	--	--	--	14	28	1.1	7.0	28	.5
14-----	--	--	--	14	40	1.5	6.6	33	.6
15-----	--	--	--	13	33	1.2	6.2	40	.7
16-----	--	--	--	13	39	1.4	6.2	29	.5
17-----	--	--	--	13	40	1.4	5.4	30	.4
18-----	--	--	--	12	44	1.4	5.4	31	.5
19-----	--	--	--	11	32	1.0	5.4	34	.5
20-----	--	--	--	11	32	1.0	5.0	13	.2
21-----	--	--	--	12	42	1.4	5.0	20	.3
22-----	--	--	--	12	39	1.3	4.4	21	.2
23-----	--	--	--	12	32	1.0	4.0	27	.3
24-----	--	--	--	13	47	1.6	4.0	37	.4
25-----	--	--	--	12	59	1.9	3.7	27	.3
26-----	--	--	--	11	37	1.1	3.1	30	.3
27-----	--	--	--	12	41	1.3	3.1	40	.3
28-----	33	68	6.1	12	41	1.3	2.8	40	.3
29-----	31	108	9.0	11	28	.8	2.6	26	.2
30-----	26	64	4.5	11	33	1.0	1.8	18	(a)
31-----	--	--	--	10	19	.5	--	--	--
Total-	90	--	19.6	861	--	3,900	194.7	--	11.4
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2.0	21	0.1				0	--	0
2-----	1.8	13	(a)				0	--	0
3-----	1.5	18	(a)				0	--	0
4-----	5.0	13	.2				0	--	0
5-----	4.4	14	.2				0	--	0
6-----	3.7	13	.1				0	--	0
7-----	2.8	18	.1				0	--	0
8-----	2.3	20	.1				0	--	0
9-----	2.0	20	.1				0	--	0
10-----	1.8	--	1/.1				0	--	0
11-----	1.8	20	(a)				0	--	0
12-----	2.0	19	.1				0	--	0
13-----	2.0	31	.2				3.2	--	1/.5
14-----	2.3	50	.3				3.7	74	.7
15-----	2.0	36	.2				2.8	67	.5
16-----	2.0	33	.2				2.6	33	.2
17-----	1.5	30	.1				2.3	20	.1
18-----	2.0	30	.2				2.0	41	.2
19-----	1.8	28	.1				1.8	37	.2
20-----	2.0	40	.2				1.5	28	.1
21-----	2.3	52	.3				1.3	23	(a)
22-----	1.5	29	.1				.8	29	(a)
23-----	1.3	32	.1				.8	21	(a)
24-----	1.0	20	(a)				.7	18	(a)
25-----	.8	22	(a)				.7	17	(a)
26-----	.4	28	(a)				.5	18	(a)
27-----	.1	--	(a)				.4	17	(a)
28-----	0	--	0				.4	14	(a)
29-----	0	--	0				.5	16	(a)
30-----	0	--	0				.5	18	(a)
31-----	0	--	0				--	--	--
Total-	54.1	--	3.5	0	--	0	26.5	--	2.8

Total discharge period Apr. 28 to Sept. 30 (second-foot-days) ----- 1,226.3

Total load for period Apr. 28 to Sept. 30 (tons) ----- 3,940

1/Estimated.

(a)Sediment discharge less than 0.1 ton.

MOREAU RIVER BASIN--Continued

MOREAU RIVER AT BIXBY, S. DAK.--Continued

Particle-size analyses of suspended sediment, March to May 1949
 (Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
 W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500		1.000
Mar. 24, 1949		2,710	3,430	1,872	10	20	--	58	70	79	86	95	97		BN
Mar. 24	1:00 p. m.	2,710	3,430	1,900	32	41	49	58	69	76	86	93	95		BW
Apr. 13	2:00 p. m.	288	1,740	2,055	55	72	86	94	--	98	99	100	--		BW
Apr. 13	2:00 p. m.	298	1,740	2,100	--	5	15	--	--	98	98	100	--		BN
May 4		85	5,130	1,770	24	47	84	91	96	98	100	--	--		BW
May 5	2:15 p. m.	79	1,150	780	48	74	--	--	--	--	--	--	--		BW
May 6	2:15 p. m.	50	3,920	1,512	21	28	85	--	--	--	--	--	--		BW
May 6	2:15 p. m.	50	3,920	1,420	11	12	15	45	--	--	--	--	--		BN

MOREAU RIVER BASIN--Continued
MOREAU RIVER NEAR FAITH, S. DAK.

LOCATION.--At gaging station at bridge on State Highway 73 at Usta, 2½ miles downstream from Rabbit Creek, and 13½ miles northwest of Faith, Meade County.
DRAINAGE AREA.--2,660 square miles.

RECORDS AVAILABLE.--Chemical analyses: April 1947 to September 1949.
Water temperatures: April 1947 to September 1949.

Sediment records: August 1946 to September 1949 (discontinued).

EXTREMES, 1946-49.--Specific conductance: Maximum for days of no flow, 7,870 micromhos Aug. 9; maximum for days of flow, 7,680 micromhos Dec. 28; minimum, 133 micromhos Mar. 9.

Water temperatures: Maximum, 76°F July 3; minimum, freezing point on many days during December to March.

Sediment concentrations: Maximum daily, 7,350 ppm Mar. 29; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 60,000 tons Mar. 29; minimum daily, 0 tons on many days.

EXTREMES, 1946-49.--Dissolved solids (1947-48): Maximum, 2,800 ppm Jan. 8-12, 1948; minimum, 138 ppm Mar. 15, 1948.

Total hardness (1947-48): Maximum, 599 ppm May 24, 1948; minimum, 45 ppm Mar. 15, 1948.

Specific conductance (1947-49): Maximum for days of no flow, 7,870 micromhos Aug. 9, 1949; maximum for days of flow, 7,680 micromhos Dec. 28, 1948; minimum, 133 micromhos Mar. 9, 1949.

Water temperatures: Maximum, 77°F July 7, 1948; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 16,500 ppm Apr. 21, 1948; minimum daily, no flow on many days each year.

Sediment loads: Maximum daily, 3,000 tons June 24, 1947; minimum daily, 0 tons on many days each year.

REMARKS.--Daily sample for chemical analysis composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water year October 1946 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbo-nate (CO ₃)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Bor-on (B)	Dissolved solids			Hardness as CaCO ₃		Per-cent so-dium	
																	Parts per mil-lion	Tons per acre-foot	Tons per day	Total	Non-carbonate		
Oct. 8-31, 1948-----	4.0	8.5	2,980	7.8	0.02	35	26	628	8.4	26	567	944	22	0.8	1.1	0.65	1,980	2.69	21	194	0	87	
Nov. 1-30-----	20.1	8.5	2,100	12	.02	25	13	456	6.0	22	582	518	13	.7	2.5	.09	1,960	1.85	73	116	0	89	
Dec. 1-31-----	3.1	8.3	3,800	14	.02	46	31	889	8.0	31	1,140	1,040	24	.6	2.7	.02	2,860	3.62	22	242	0	88	
Jan. 1-20, 1949-----	5	7.9	5,460	25	.01	22	64	1,350	10	0	1,620	1,820	36	1.2	8	1.20	4,140	5.63	6	318	0	90	
Mar. 4-----	1/0	8.4	1,600	48	.02	25	17	296	8.0	14	336	452	11	1.2	1.5	.18	1,040	1.41	0	132	0	82	
Mar. 5-----	50	7.8	248	51	.03	12	5.2	29	4.8	0	88	40	3.0	2.2	1.6	.08	220	30	30	52	0	52	
Mar. 6, 10:00 a.m.---	300	7.8	271	44	.05	13	4.2	41	4.0	0	96	60	1.0	2.1	1.4	.04	228	31	2/153	50	0	62	
Mar. 6, 12:00 m.---	300	7.2	258	11	--	14	8.7	21	4.8	0	82	44	4.0	8	2.0	--	182	25	--	71	4	37	
Mar. 6, 5:00 p.m.---	300	7.2	219	8.6	--	10	8.7	23	4.8	0	86	34	1.0	8	3.6	--	156	21	--	61	0	45	
Mar. 7, 7:00 a.m.---	1,500	7.2	276	8.8	--	14	9.2	35	1.6	0	106	58	1.0	8	1.3	--	188	26	2/774	73	0	51	
Mar. 7, 12:00 m.---	1,500	7.3	242	10	--	13	9.6	32	1.6	0	98	48	1.0	8	.8	--	166	23	--	132	0	52	
Mar. 7, 2:00 p.m.---	1,500	7.9	248	49	.02	14	5.2	32	6.0	0	100	44	2.0	2	1.5	.00	218	30	--	56	0	52	
Mar. 8, 6:00 a.m.---	2,200	7.0	159	9.1	--	13	9.0	21	8.0	0	74	20	2.0	3	1.7	--	120	16	2/701	70	9	20	
Mar. 8, 1:20 p.m.---	2,200	7.5	145	5.0	.07	4.0	4.8	21	0	53	25	2.0	2.0	3.0	2.0	.00	122	17	--	30	0	61	
Mar. 8, 2:00 p.m.---	2,200	7.6	164	10	.04	9.9	1.7	19	5.2	0	61	24	1.8	2	1.9	.14	112	15	--	32	0	52	
Mar. 8, 5:00 p.m.---	2,200	7.0	152	8.1	--	11	7.9	11	1.6	0	68	24	1.0	8	1.0	--	116	16	--	60	4	27	

2/Weighted mean for day.

1/Practically no flow.

MOREAU RIVER BASIN--Continued
MOREAU RIVER NEAR FAITH, S. DAK.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron. (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Mar. 9, 1946, 9:00 a.m.	1,700	7.0	133	7.8	--	9.2	9.2	8.3	0	65	20	1.0	0.8	104	1.3	--	0.14	2/514	61	8	23
Mar. 9, 2:00 p.m.	1,700	7.4	172	14	.02	7.9	3.2	21	4.4	0	45	23	15	120	1.7	.00	.16	--	32	0	55
Mar. 9, 5:00 p.m.	1,700	6.8	130	9.0	--	10	7.9	8.7	0	60	22	1.0	.6	112	2.0	--	.15	--	36	9	25
Mar. 10, 9:00 a.m.	1,000	7.0	130	7.0	--	9.0	9.6	10	4.8	0	65	26	.4	106	1.1	--	.14	2/324	62	9	24
Mar. 10, 2:00 p.m.	1,000	7.9	179	31	.04	13	4.0	16	5.6	0	72	20	6.8	136	1.5	.00	.18	--	49	0	38
Mar. 10, 5:00 p.m.	1,000	7.2	158	9.2	--	12	7.9	12	5.6	0	76	22	1.0	118	2.4	--	.16	--	63	1	27
Mar. 11, 8:30 a.m.	800	7.0	315	9.0	--	14	9.2	36	4.8	0	86	74	0	204	1.7	--	.28	2/570	73	2	30
Mar. 11, 2:00 p.m.	800	7.0	484	26	16	16	2.8	83	4.0	0	113	129	5.4	326	1.5	.06	.44	--	52	0	76
Mar. 11, 5:00 p.m.	800	7.1	398	9.7	--	16	7.4	53	5.6	0	114	94	0	262	1.4	--	.36	--	71	0	60
Mar. 12, 8:30 a.m.	600	7.0	260	9.8	--	12	6.1	35	4.8	0	86	56	0	170	1.3	--	.23	2/284	55	0	55
Mar. 12, 5:00 p.m.	600	7.0	270	10	--	16	6.6	28	2.4	0	98	48	0	180	1.2	--	.24	--	67	0	47
Mar. 13	500	7.0	226	8.5	--	13	6.6	29	2.4	0	80	56	0	154	1.4	--	.21	208	60	0	50
Mar. 14	400	7.0	264	9.5	--	17	7.9	21	4.0	0	92	46	0	182	1.6	--	.25	197	75	0	37
Mar. 15	350	7.0	283	9.1	--	14	7.4	25	4.8	0	90	44	0	178	1.6	--	.24	168	66	0	43
Mar. 16	300	7.0	276	10	--	16	7.0	35	3.2	0	94	58	0	186	1.5	--	.25	151	69	0	47
Mar. 17	270	7.0	265	9.2	--	16	8.3	32	4.0	0	90	66	0	182	1.3	--	.25	133	74	0	41
Mar. 18	240	7.1	468	8.3	--	24	10	50	3.2	0	106	124	3.0	308	1.2	--	.42	200	101	14	51
Mar. 19	220	7.1	452	11	--	20	9.0	57	2.4	0	110	126	.4	297	.8	--	.40	176	87	0	58
Mar. 20	200	7.1	362	6.0	--	18	7.2	45	.8	0	108	86	1.0	234	.9	--	.32	126	75	0	56
Mar. 21	200	7.2	352	11	--	19	7.2	44	2.4	0	118	78	1.0	232	.5	--	.32	125	77	0	54
Mar. 22	300	7.0	284	10	--	13	5.2	36	3.2	0	92	60	1.0	174	1.1	--	.24	141	54	0	58
Mar. 23	2,120	7.2	246	11	--	16	6.1	20	4.0	0	94	34	.4	161	.9	--	.22	922	65	0	39
Mar. 24	4,160	7.3	333	14	--	23	8.1	36	4.0	0	112	78	1.0	222	.4	--	.30	2,490	91	0	45
Mar. 25, 8:30 a.m.	3,810	7.1	327	11	--	22	8.5	35	2.4	0	84	94	0	209	.4	--	.28	2/2,010	90	21	45
Mar. 25, 4:30 p.m.	3,810	7.3	288	12	--	19	7.9	29	1.6	0	96	62	1.0	181	.5	--	.25	--	80	1	43
Mar. 26, 7:30 a.m.	3,120	7.3	484	12	--	29	13	50	4.8	0	84	160	0	312	.2	--	.42	2/2,530	126	57	45
Mar. 26, 12:30 p.m.	3,120	7.4	459	11	--	31	12	45	5.6	0	94	140	1.0	289	.3	--	.41	--	127	50	42
Mar. 26, 5:00 p.m.	3,120	7.3	438	9.6	--	30	14	36	4.0	0	96	124	0	288	.4	--	.39	--	133	54	36

2/Weighted mean for day.

Mar. 27, 8:00 a.m. ---	2,720	7.2	398	9.4	--	22	12	36	5.6	0	88	114	0	.4	.6	--	262	.36	2/1,900	105	3	41
Mar. 27, 5:00 p.m. --	2,720	7.2	365	11	--	24	11	32	4.0	0	104	94	0	.4	1.0	--	256	.35	--	106	21	39
Mar. 28, 7:30 a.m. --	3,070	7.2	389	9.8	--	22	10	39	2.4	0	100	96	0	.4	.7	--	258	.35	2/2,170	96	14	46
Mar. 28, 5:00 p.m. --	3,070	7.3	395	11	--	27	10	41	5.6	0	114	106	0	.4	.9	--	266	.36	--	109	16	44
Mar. 29, 7:4	3,070	7.4	469	13	.10	32	10	56	5.6	0	100	154	0	.4	1.6	--	338	.46	2,800	121	39	49
Mar. 30, 7:2	2,470	7.2	462	11	.01	32	6.5	58	4.8	0	96	159	0	.0	.9	--	347	.47	2,310	107	28	53
Mar. 31-Apr. 1	1,480	7.3	543	10	.01	35	11	63	4.8	0	102	174	1.0	.4	.8	--	368	.50	1,470	133	49	90
Apr. 2-10	1,010	7.3	659	12	.01	40	16	77	1.2	0	304	232	3.0	.2	1.0	0.16	432	.61	1,230	166	81	90
Apr. 11-18	462	7.8	851	14	.01	44	20	118	2.8	0	136	304	3.0	.3	1.6	.36	592	.60	738	193	81	97
Apr. 12 3/	575	7.6	765	11	.01	33	14	104	4.0	0	113	382	3.6	.2	1.0	.14	505	.69	764	140	47	61
Apr. 19-30	108	7.8	1,340	14	.01	64	33	200	1.6	0	230	496	4.4	.4	1.3	.25	964	1.31	281	295	106	99
May 1-12	91	8.6	1,530	18	.10	50	20	274	3.2	18	308	504	6.5	.4	1.3	.41	1,050	1.43	258	308	0	74
May 13-June 2	271	8.5	2,080	11	.08	51	35	365	3.2	21	368	728	12	.4	1.1	.62	1,440	1.96	105	272	0	73
June 3-30	12	8.7	2,280	7.4	.10	28	28	466	4.0	37	418	780	14	.4	1.0	.22	1,540	2.42	91	272	0	84
July 1-Aug. 9	1.1	8.7	4,460	12	.02	20	45	1,070	18	49	710	1,680	34	1.4	2.0	.30	3,200	4.52	10	232	0	93
Sept. 7-30	1.0	7.2	1,510	30	.12	19	1.0	341	12	0	332	460	14	1.0	2.9	.30	1,070	1.42	9	32	0	92
Weighted average 1/	152	--	246	12	--	29	12	72	3.4	--	5/122	168	2.0	0.4	1.1	--	374	0.51	153	122	22	55

1/Practically no flow.

2/Weighted mean for day.

3/Not included in weighted average.

4/Weighted average for period sampled only.

5/Includes carbonate as bicarbonate.

MOREAU RIVER BASIN--Continued

MOREAU RIVER NEAR FAITH, S. DAK.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 6 a. m. and 9 a. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	44	34	32		--	37	40	62	--	64	--
2	--	40	34	32		--	35	50	62	74	60	--
3	--	40	34	32		--	38	56	60	76	60	--
4	--	40	34	--		--	38	54	56	66	64	--
5	--	36	33	32		--	38	54	62	66	64	--
6	--	36	33	32		36	46	52	62	74	64	--
7	--	34	33	32		33	42	52	60	74	70	50
8	42	34	33	32		32	44	56	58	70	66	54
9	40	34	32	32		34	44	55	66	66	62	56
10	40	34	32	32		33	44	58	70	70	--	62
11	38	36	32	32		32	46	60	72	66	--	56
12	38	--	34	32		33	50	62	68	68	--	45
13	44	--	34	32		32	48	64	62	70	--	44
14	--	--	33	32		32	46	56	58	65	--	46
15	--	--	32	32		32	44	62	60	68	--	48
16	--	--	32	32		32	46	64	64	72	--	56
17	36	--	32	32		32	--	60	62	70	--	52
18	34	--	32	32		32	50	54	56	64	--	46
19	36	--	34	32		32	46	50	64	65	--	52
20	40	--	34	--		34	52	50	66	68	--	54
21	36	--	33	--		34	54	54	64	56	--	50
22	42	--	32	--		34	50	54	72	62	--	54
23	42	--	32	--		36	46	52	66	70	--	46
24	42	35	34	--		34	50	45	64	70	--	52
25	44	34	32	--		36	52	58	64	68	--	46
26	42	34	32	--		34	50	60	64	68	--	38
27	42	33	32	--		34	50	60	60	68	--	46
28	42	--	32	--		34	56	66	65	64	--	42
29	48	34	32	--		34	52	65	68	62	--	44
30	46	34	32	--		36	58	66	64	--	--	52
31	42	--	32	--		36	--	66	--	70	--	--
Average	--	--	33	--		34	47	57	63	68	--	50

MOREAU RIVER BASIN--Continued

MOREAU RIVER NEAR FAITH, S. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0	--	0	10	250	6.8	8	84	1.4
2-----	0	--	0	12	250	8.1	9	80	1.9
3-----	0	--	0	13	190	6.7	10	54	1.5
4-----	0	--	0	21	1,520	86	8	85	1.4
5-----	0	--	0	62	7,210	1,210	5	66	.9
6-----	0	--	0	32	3,200	276	6	65	1.1
7-----	0	--	0	30	1,500	122	5	--	--
8-----	2.2	25	.1	25	930	63	4	--	--
9-----	2.2	15	(1)	23	810	50	4	--	--
10-----	2.2	12	(1)	33	570	51	3	--	--
11-----	2.2	10	(1)	30	690	56	3	--	--
12-----	2.2	15	(1)	27	460	34	3	--	--
13-----	2.5	15	.1	25	210	14	2	--	--
14-----	2.2	18	.1	23	800	50	2	--	--
15-----	2.8	39	.3	21	1,060	60	2	--	--
16-----	3.1	47	.4	25	458	31	2	--	--
17-----	3.1	32	.3	16	230	9.9	2	--	--
18-----	3.1	28	.2	18	154	7.5	2	--	--
19-----	3.4	23	.2	19	86	4.4	2	--	--
20-----	3.7	25	.2	17	81	3.7	2	--	--
21-----	3.4	25	.2	15	100	4.0	1	--	--
22-----	3.7	30	.3	15	90	3.6	1	--	--
23-----	3.7	32	.3	13	92	3.2	1	--	--
24-----	3.7	32	.3	15	78	3.2	1	--	--
25-----	4.0	42	.5	15	43	1.7	1	--	--
26-----	4.0	45	.5	12	138	4.5	1	--	--
27-----	4.6	35	.4	10	168	4.5	1	--	--
28-----	6	35	.6	9	78	1.9	1	--	--
29-----	6	72	1.2	8	88	1.9	1	--	--
30-----	12	2,370	77	8	108	2.3	1	--	--
31-----	11	560	17	--	--	--	1	--	--
Total-	97.0	--	100	602	--	2,180	95	--	3/20
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1	--	--				0	--	0
2-----	1	--	--				0	--	0
3-----	1	--	--				0	--	0
4-----	1	--	--				0	--	0
5-----	1	--	--				50	178	24
6-----	1	--	--				300	740	599
7-----	1	--	--				1,500	787	3,190
8-----	1	--	--				2,200	574	3,410
9-----	1	--	--				1,700	275	1,260
10-----	1	--	--				1,000	297	802
11-----	0	0	0				800	542	1,170
12-----	0	0	0				600	570	923
13-----	0	0	0				500	150	202
14-----	0	0	0				400	110	119
15-----	0	0	0				350	105	99
16-----	0	0	0				300	75	61
17-----	0	0	0				270	45	33
18-----	0	0	0				240	40	26
19-----	0	0	0				220	52	31
20-----	0	0	0				200	85	46
21-----	0	0	0				200	165	89
22-----	0	0	0				300	300	243
23-----	0	0	0				2,120	3,400	2/31,400
24-----	0	0	0				4,160	4,390	2/50,800
25-----	0	0	0				3,810	3,880	39,900
26-----	0	0	0				3,120	4,200	2/34,600
27-----	0	0	0				2,720	5,400	39,700
28-----	0	0	0				3,070	6,220	51,600
29-----	0	0	0				3,070	7,350	60,900
30-----	0	0	0				2,470	6,280	41,900
31-----	0	0	0				1,760	5,560	26,700
Total-	10		2/1	0		0	37,450	--	389,800

(1) Sediment discharge less than 0.1 ton.

2/ Sediment discharge computed by subdividing day.

3/ Includes estimated load for missing days.

MOREAU RIVER BASIN--Continued

MOREAU RIVER NEAR FAITH, S. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,170	4,820	15,200	152	5,170	2/2,200	29	147	12
2-----	1,050	5,010	14,200	95	1,640	421	42	439	50
3-----	1,300	3,080	10,800	113	1,980	604	20	158	8.5
4-----	1,050	2,740	7,770	134	3,580	1,300	20	48	2.6
5-----	875	2,840	6,710	131	870	308	20	29	1.6
6-----	930	2,660	6,680	118	1,840	586	19	21	1.1
7-----	1,050	3,020	8,560	84	2,350	533	15	38	1.5
8-----	1,050	3,680	10,400	68	540	99	14	47	1.8
9-----	990	3,740	10,000	61	180	30	14	42	1.6
10-----	820	3,330	7,370	52	132	19	14	36	1.4
11-----	669	2,870	5,180	44	105	12	14	40	1.5
12-----	575	2,020	3,140	39	43	4.5	13	50	1.8
13-----	530	1,710	2,450	36	37	3.6	14	40	1.5
14-----	466	1,510	1,900	33	46	4.1	13	35	1.2
15-----	405	1,400	1,530	31	47	3.9	13	38	1.3
16-----	405	1,250	1,370	29	45	3.5	12	40	1.3
17-----	366	1,250	1,240	29	38	3.0	11	33	1.0
18-----	278	1,060	796	28	51	3.9	11	40	1.2
19-----	200	832	449	28	32	2.4	10	43	1.2
20-----	174	670	315	26	34	2.4	10	40	1.1
21-----	160	556	240	25	56	3.8	10	34	.9
22-----	136	446	164	25	82	5.5	9.0	31	.8
23-----	113	350	107	25	65	4.4	9.0	32	.8
24-----	95	273	70	26	56	3.9	9.0	28	.7
25-----	89	202	49	25	55	3.7	11	33	1.0
26-----	78	160	34	25	53	3.6	9.0	36	.9
27-----	68	145	27	24	40	2.6	9.0	40	1.0
28-----	64	112	19	23	40	2.5	7.0	33	.6
29-----	59	76	12	20	33	1.8	4.8	66	.9
30-----	59	--	4/240	20	20	1.1	4.3	40	.5
31-----	--	--	--	21	18	1.0	--	--	--
Total--	15,274	--	117,000	1,590	--	6,180.0	410.1	--	103
	July			August			September		
1-----	4.3	28	0.3				0		0
2-----	3.4	33	.3				0		0
3-----	1.6	25	.1				0		0
4-----	.8	22	(u)				0		0
5-----	1.6	22	(u)				5.3		--
6-----	1.3	25	(u)				.5		--
7-----	1.3	23	(u)				.1		--
8-----	.8	22	(u)				0		0
9-----	.8	21	(u)				0		0
10-----	2.2	30	.2				0		0
11-----	4.3	27	.3				0		0
12-----	4.3	31	.4				0		0
13-----	4.8	50	.6				.3		--
14-----	4.8	129	1.7				.5		--
15-----	3.8	62	.6				0		0
16-----	2.6	83	.6				0		0
17-----	1.9	60	.3				0		0
18-----	1.0	98	.3				0		0
19-----	.1	79	(u)				0		0
20-----	0	--	0				0		0
21-----	0	--	0				0		0
22-----	0	--	0				0		0
23-----	0	--	0				0		0
24-----	0	--	0				0		0
25-----	0	1	0				0		0
26-----	0	--	0				0		0
27-----	0	--	0				0		0
28-----	0	--	0				0		0
29-----	0	--	0				0		0
30-----	0	--	0				0		0
31-----	0	--	0				--		--
Total--	45.7	--	6.1	0		0	6.7	--	2/10

Total discharge for year (second-foot-days)-----55,580.5

Total load for year (tons)-----3/515,400

(u) Sediment discharge less than 0.1 ton.

3/Includes estimated load for missing days.

(a) Sediment discharge computed by subdividing day.

4/Estimated.

MOREAU RIVER BASIN--Continued
MOREAU RIVER NEAR FAITH, S. DAK.--Continued

Particle-size analyses of suspended sediment, November 1948 to May 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; F, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters								1.000	
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		
Nov. 5, 1948	8:00 a. m.	73	9,160	1,870	77	89	98	100	--	--	--	--	--	BW
Nov. 6	8:00 a. m.	35	3,560	1,362	90	98	99	--	--	--	--	--	--	BW
Nov. 9	4:40 p. m.	24	575	550	86	93	96	97	100	--	--	--	--	BW
Mar. 24, 1949	12:00 m.	3,620	3,850	1,550	8	20	57	66	76	86	92	96	98	BN
Mar. 24	12:00 m.	3,620	3,850	1,750	36	45	55	66	77	86	93	98	99	BW
Apr. 12	11:40 a. m.	575	1,980	1,260	52	69	79	87	91	94	95	99	100	BW
Apr. 12	11:20 a. m.	575	1,980	2,450	49	67	82	88	93	95	97	99	100	BW
Apr. 12	11:20 a. m.	575	1,990	2,340	2	5	14	--	--	96	97	99	100	BN
May 1	7:00 a. m.	171	6,800	1,450	60	81	91	97	100	--	--	--	--	BW
May 2	6:30 a. m.	102	1,850	1,520	66	83	99	99	100	--	--	--	--	BW
May 3	6:00 a. m.	104	1,170	963	57	86	96	98	100	--	--	--	--	BW
May 4	6:30 a. m.	136	4,710	1,990	72	91	98	100	--	--	--	--	--	BW
May 4	6:30 a. m.	136	4,710	1,880	3	4	4	--	--	--	--	--	--	BN

MOREAU RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN MOREAU RIVER BASIN IN SOUTH DAKOTA

Chemical analyses, in parts per million, water year October 1948 to September 1949																						
Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent non- car- bon- ate	
																	Parts per mil- lion	Tons per acre- foot	Tons per day	Total		
MOREAU RIVER NEAR DUPREE																						
Mar. 4, 1949-----		8.1	759	39	0.02	22	11		115	0	124	238	4.0	0.3	0.9	0.10	520	0.71		100	0	70
Mar. 5 -----		7.9	493	41	.02	24	8.5		59	0	82	152	3.0	.2	.8	.08	352	.48		95	28	55
Mar. 6 -----		7.6	473	43	.02	19	7.6		66	0	84	148	2.0	.1	1.6	.03	352	.48		78	9	63
Mar. 7 -----		7.6	231	41	.03	16	6.1		14	0	78	32	2.0	.2	1.3	.02	196	.27		65	1	29
MOREAU RIVER NEAR EAGLE BUTTE																						
Mar. 8, 1949-----	3,280	7.6	349	7.6	0.05	34	3.3		38	0	118	78	1.0	0.1	3.0	0.06	234	0.32		99	2	46
Mar. 22 -----	610	7.5	456	10	.03	32	3.5		63	0	129	116	1.0	.3	2.4		294	.40		95	0	59
Mar. 27 -----	9,010	7.6	481	10	.02	60	7.2		27	0	119	130	1.0	.3	1.9		304	.41		179	81	24
May 4 -----	366	7.6	1,040	13	.02	28	15		186	0	235	320	5.0	.3	2.6		696	.95		132	0	75
May 26 -----	40	8.0	1,890	12	.01	65	32		331	0	326	696	13	.7	.8		1,310	1.78		294	27	71
July 14 -----	8.0	8.0	3,100	6.2	.02	120	41		581	0	224	1,450	26	.5	1.2		2,340	3.18		468	284	73
MOREAU RIVER AT PROMISE																						
Mar. 8, 1949 -----	4,600	7.6	503	9.9	0.02	48	7.7		49	0	108	158	1.5	0.1	3.2	0.05	345	0.47		152	63	41
Mar. 22 -----	1,070	7.5	321	8.0	.02	16	7.9		39	0	63	84	.2	.2	2.2	.00	214	.29		73	5	54
Apr. 12 -----	1,620	7.8	575	8.3	.01	46	12		64	0	113	196	4.0	.3	1.9	.07	422	.57		165	72	46

CHEYENNE RIVER BASIN

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.

LOCATION.--At gaging station at bridge on State Highway 87, a quarter of a mile downstream from Cascade Creek, and 10 miles southwest of Hot Springs, Fall River County.

DRAINAGE AREA.--8,710 square miles.

RECORDS AVAILABLE.--Chemical analyses: April 1947 to September 1949.

Water temperatures: April 1946 to September 1949.

Sediment records: April 1946 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 3,860 micromhos Nov. 27; minimum, 726 micromhos Feb. 28.

Water temperatures: Maximum, 84° July 6; 73.0 minimum, 53° July 27, 30 pm; freezing point Mar. 6, 10 pm Sept. 30.

Sediment concentrations: Maximum, 84° July 6; 73.0 minimum, 53° July 27, 30 pm; freezing point Mar. 6, 10 pm Sept. 30.

EXTREMES, 1946-49.--Specific conductance: Maximum, 3,860 micromhos Nov. 27, 1949; minimum, 713 micromhos Aug. 18, 1948.

Water temperatures: Maximum, 85° July 5, 1948; minimum, freezing point on several days during winter months.

Sediment concentrations: Maximum daily, 46,500 ppm Aug. 2, 1947; minimum daily, 1 ppt Sept. 30, 1949.

Sediment loads: Maximum daily, 476,000 tons June 19, 1946; minimum daily, less than 1 ton on many days each year.

REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Bo-ron (B)	Dissolved solids			Hardness as CaCO ₃		Per-cent so-dium
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Oct. 1-31, 1948 ---	21.9	7.8	2,540	22	0.01	485	96	128	19	181	1,460	151	0.7	1.0	0.23	2,430	3.30	144	1,600	1,450	15
Nov. 1-30 -----	36.5	8.1	2,820	21	.01	323	83	301	8.8	199	1,160	287	.9	1.4	.05	2,300	3.13	230	1,150	887	36
Dec. 1-31 -----	25.5	8.2	3,240	24	.40	460	90	250		1,281	1,480	247	1.0	1.2	.25	2,960	3.66	189	1,520	1,310	26
Jan. 1-31, 1949 ----	23.7	7.9	2,650	21	.20	509	90	79	10	178	1,500	75	1.0	.2	.24	2,370	3.22	154	1,640	1,490	9
Feb. 1-24 -----	23	7.6	2,200	20	.01	456	80	24	6.0	183	1,260	36	1.0	1.6	.13	1,970	2.68	149	1,470	1,320	3
Feb. 25-Mar. 10 --	1,559	8.1	1,899	14	.01	100	23	37	.4	129	318	20	.4	1.9	.12	1,637	.89	2,750	344	238	26
Mar. 11-22 -----	1,560	7.8	1,960	14	.01	188	46	111	3.6	149	656	68	.5	3.1	.00	1,660	1.60	558	658	536	27
Mar. 23-26 -----	1,060	8.0	1,270	12	.01	121	33	106	1.6	140	476	31	.5	1.2	-.01	1,749	1.29	2,770	438	323	35
Mar. 27-Apr. 30 --	1,185	7.6	1,890	14	.01	238	53	114	3.6	180	784	90	.7	2.0	.02	1,370	1.66	610	787	664	23
May 1-21 -----	168	7.8	2,150	25	.02	332	35	183	12	139	1,020	60	.7	2.8	.30	1,670	2.27	758	830	716	32
May 22-24 -----	697	8.1	1,530	28	.04	126	35	170	14	208	836	27	1.0	3.6	.30	1,140	1.55	1,960	459	288	44
May 25-31 -----	132	7.8	1,820	23	.03	226	53	138	11	140	908	41	.7	3.0	.30	1,470	2.00	524	767	652	28
June 1-6 -----	232	7.1	1,870	12	.04	216	52	155	14	164	828	68	.7	2.2	.10	1,430	1.94	973	753	619	30
June 7-8 -----	1,100	7.1	1,220	14	.04	106	28	119	5.6	188	420	42	.7	1.6	.10	870	1.18	2,580	380	226	40
June 9-30 -----	173	7.3	1,850	17	.06	219	48	133	8.0	176	760	78	.7	2.0	.10	1,350	1.84	631	744	600	28
July 1-31 -----	31.8	7.6	2,500	24	.02	468	81	72	6.8	142	1,390	59	1.0	1.3	.20	2,170	2.95	187	1,500	1,380	9
Aug. 1-31 -----	29.6	7.5	2,640	21	.02	479	86	62	6.4	146	1,420	61	1.0	1.7	.20	2,220	3.02	180	1,560	1,430	8
Sept. 1-30 -----	19.9	7.5	2,470	20	.02	481	81	44	6.4	148	1,420	44	1.0	1.3	.30	2,170	2.95	117	1,530	1,410	6
Weighted average -	154	--	1,490	16	0.03	185	42	102	4.5	149	637	55	0.6	2.0	0.13	1,150	1.56	478	634	512	26

1/Includes equivalent of 7 parts per million of carbonate (CO₃).

CHEYENNE RIVER BASIN--Continued

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 8 a. m. and 7 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	66	46	37	45	45	35	40	67	75	75	67	70
2	67	40	36	40	47	35	50	72	65	80	--	72
3	68	50	35	40	42	35	50	61	69	72	77	70
4	70	--	35	--	42	35	60	63	65	72	75	67
5	62	42	40	40	40	--	60	57	62	73	--	68
6	55	44	35	40	40	31	49	60	63	84	74	68
7	58	37	50	40	42	37	58	63	58	72	74	68
8	60	40	36	39	45	35	52	60	66	75	72	--
9	65	45	35	38	48	35	50	63	68	72	70	73
10	58	42	39	37	55	33	53	65	69	75	73	68
11	61	40	40	40	52	33	55	62	72	77	70	68
12	69	42	40	--	45	40	58	67	71	75	72	61
13	67	42	38	--	42	35	50	67	59	84	71	64
14	58	42	38	48	50	33	53	70	63	76	75	69
15	55	42	37	42	48	42	55	64	70	72	72	67
16	55	40	37	38	50	38	56	66	68	78	70	67
17	55	35	36	42	60	42	51	61	67	76	75	63
18	55	37	37	42	50	40	55	54	--	75	71	64
19	52	35	40	40	46	39	66	53	75	73	72	63
20	55	35	40	38	46	41	63	59	73	73	77	63
21	56	35	40	42	55	46	62	62	67	70	75	63
22	55	37	43	39	55	44	66	62	70	77	72	64
23	63	37	39	38	48	42	70	53	71	76	71	65
24	61	36	40	37	50	40	63	57	71	77	71	69
25	58	37	43	36	36	35	66	63	75	70	69	69
26	60	35	42	42	37	41	63	66	73	75	70	64
27	55	33	43	42	34	41	65	70	--	77	--	65
28	50	34	45	40	33	41	67	60	70	72	69	64
29	--	34	45	45	--	41	60	72	--	--	67	67
30	50	34	40	47	--	40	57	75	62	78	73	67
31	50	--	41	45	--	39	--	69	--	70	70	--
Average	59	39	39	41	46	38	57	63	68	75	72	67

CHEYENNE RIVER BASIN--Continued

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	20	13	(i)	111	19,600	5,870	31	102	9
2-----	20			58	9,700	1,520	36	153	15
3-----	20			48	6,350	823	34	144	13
4-----	20			44	2,850	339	34	108	10
5-----	23			33	980	87	24	33	2
6-----	22	6	(i)	32	543	47	26	48	3
7-----	20			32	232	20	25	22	1
8-----	20			29	212	17	25	47	3
9-----	20			25	112	8	25	53	4
10-----	20			31	228	19	27	24	2
11-----	18	6	(i)	34	286	26	27	14	1
12-----	15			33	352	31	30	29	2
13-----	15			32	352	30	28	24	2
14-----	15			32	236	20	30	24	2
15-----	14			33	145	13	28	28	2
16-----	14	6	(i)	32	129	11	24	28	2
17-----	15			33	163	15	24	31	2
18-----	16			32	158	14	24	29	2
19-----	16			29	74	6	24	29	2
20-----	16			27	45	3	22	17	1
21-----	16	6	(i)	29	58	5	22	15	(i)
22-----	16			29	42	3	22	23	1
23-----	16			29	89	7	23	25	2
24-----	16			32	115	10	23	20	1
25-----	16			33	163	15	22	30	2
26-----	25	6	(i)	33	185	16	23	10	(i)
27-----	25	13	(i)	37	148	15	22		
28-----	24	87	6	36	212	21	22		
29-----	25	--	2/9	35	197	19	21		
30-----	41	158	17	41	150	17	21		
31-----	101	10,600	3/4, 290	--	--	--	23		
Total-	680	--	4,330	1,094	--	9,050	792	--	91
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	23	12	(i)	26	18	1	1,360	4,780	17,500
2-----	24			23			2,070	5,870	32,800
3-----	23			22			1,660	4,800	21,500
4-----	23			22			1,800	5,400	26,200
5-----	23			23			2,070	5,890	32,900
6-----	23	30	2	23	14	1	2,070	6,600	36,900
7-----	23			23			1,800	6,210	30,200
8-----	23			22			1,540	5,630	24,200
9-----	23			24			1,140	4,300	13,200
10-----	23			29			895	3,800	9,180
11-----	24	40	3	29	14	1	650	2,340	4,110
12-----	24			29			408	1,460	1,610
13-----	24			29			350	950	898
14-----	24			28			282	1,060	806
15-----	24			28			95	233	60
16-----	24	8	(i)	28	14	1	128	231	80
17-----	24			30			165	500	222
18-----	23			27			193	645	336
19-----	23			28			179	612	296
20-----	24			27			350	1,290	3/1,350
21-----	24	8	(i)	27	18	1	560	2,900	4,390
22-----	24			37	83	8	880	3,600	6,610
23-----	24			55	298	44	1,040	6,300	17,700
24-----	24			42	112	13	1,300	10,200	35,800
25-----	24			942	2,780	3/10,600	1,140	7,600	23,400
26-----	24	8	(i)	1,360	4,110	15,100	850	6,380	14,600
27-----	24			1,540	5,910	3/25,700	471	3,800	4,830
28-----	24			1,420	4,080	15,600	304	2,640	2,160
29-----	24			--	--	--	333	2,720	2,440
30-----	25			--	--	--	396	3,150	3,370
31-----	25			--	--	--	277	3,460	2,590
Total-	735	--	21	5,945	--	67,090	26,556	--	372,200

(i) Sediment discharge less than 1 ton.

2/Estimated

3/Sediment discharge computed by subdividing day.

CHEYENNE RIVER BASIN--Continued

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Suspended sediment, water year October 1948 to September 1949--Continued									
Day	Mean discharge (second-foot)	April		Mean discharge (second-foot)	May		Mean discharge (second-foot)	June	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	225	1,980	1,200	73	76	15	60	314	51
2-----	190	--	2/850	221	2,010	1,200	81	271	45
3-----	165	--	2/600	200	4,000	2,160	111	3,310	3/1,580
4-----	162	--	2/380	225	2,780	1,890	309	15,200	12,700
5-----	159	--	2/260	162	2,160	944	485	11,900	15,600
6-----	159	--	2/220	118	1,210	386	485	13,100	17,100
7-----	172	659	306	107	720	208	990	20,100	3/101,000
8-----	190	1,020	524	204	2,150	1,180	1,200	18,800	3/75,500
9-----	229	1,280	791	229	3,940	2,440	443	13,000	15,500
10-----	217	1,520	891	204	4,520	2,490	363	10,200	10,000
11-----	193	1,180	614	128	2,880	995	436	8,300	9,790
12-----	252	1,640	1,120	126	1,840	626	252	4,350	2,960
13-----	168	1,170	531	86	680	158	234	2,200	1,390
14-----	145	620	242	72	349	68	182	2,250	1,100
15-----	126	720	245	77	217	45	252	2,770	1,880
16-----	126	1,090	371	118	23,800	7,580	262	12,400	8,780
17-----	193	2,190	1,140	99	18,000	4,810	229	12,200	7,540
18-----	136	795	292	422	17,300	19,700	170	6,150	2,820
19-----	99	375	100	272	14,800	10,900	130	3,560	1,180
20-----	89	288	69	182	11,600	5,700	109	1,710	503
21-----	80	206	44	213	10,100	5,810	103	940	261
22-----	80	199	43	680	15,600	28,600	93	500	126
23-----	70	134	25	850	27,300	62,700	87	668	157
24-----	62	43	7	382	22,200	22,900	84	792	180
25-----	54	14	2	225	12,800	7,770	78	483	102
26-----	46	7	(i)	148	7,030	2,820	67	530	96
27-----	46	7	(i)	168	6,380	2,890	60	238	39
28-----	46	12	1	121	2,200	719	67	168	34
29-----	46	38	5	93	1,010	254	60	85	14
30-----	64	61	11	87	642	151	55	21	3
31-----	--	--	--	84	442	100	--	--	--
Total-	3,989	--	10,890	6,376	--	198,000	7,517	--	288,000
July									
1-----	50	22	3	14	16	(i)	14	11	(i)
2-----	50	17	2	14	15	(i)	14		
3-----	45	32	4	16	20	(i)	14		
4-----	45	25	3	14	32	1	14		
5-----	40	58	6	14	43	2	13		
6-----	68	1,680	308	13	31	1	13		
7-----	66	1,580	281	13	46	2	13		
8-----	57	227	35	12	53	2	13		
9-----	45	72	9	14	35	1	57	20,100	3,100
10-----	40	45	5	14	30	1	41	20,600	2,280
11-----	26	112	8	14	21	(i)	27	4,380	320
12-----	44	488	58	16	12	(i)	26	1,680	118
13-----	30	170	14	16	17	(i)	25	230	16
14-----	25	48	3	15	12	(i)	23	210	13
15-----	50	720	97	18	9	(i)	26	1,940	136
16-----	27	345	25	20	5	(i)	26	1,460	102
17-----	24	131	8	20	6	(i)	16	*172	7
18-----	23	65	4	20	8	(i)	18	59	3
19-----	23	49	3	40	1,500	162	16	26	1
20-----	22	47	3	103	16,800	4,670	17	19	(i)
21-----	20	26	1	62	9,100	1,520	19	12	(i)
22-----	19	18	(i)	150	11,700	4,740	19	11	(i)
23-----	18	14	(i)	72	2,110	410	18	11	(i)
24-----	18	15	(i)	60	950	154	17	9	(i)
25-----	17	12	(i)	37	123	12	16	6	(i)
26-----	17	14	(i)	31	33	3	17	5	(i)
27-----	16	16	(i)	20	23	1	17	5	(i)
28-----	16	9	(i)	20	14	(i)	18	5	(i)
29-----	15	9	(i)	16	6	(i)	16	3	(i)
30-----	15	7	(i)	16	7	(i)	17	1	(i)
31-----	14	7	(i)	15	6	(i)	--	--	--
Total-	985	--	886	919	--	11,690	598	--	6,100
Total discharge for year (second-foot-days)-----									56,186
Total load for year (tons)-----									966,700

(1) Sediment discharge less than 1 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

CHEYENNE RIVER BASIN--Continued

CHEYENNE RIVER NEAR HOT SPRINGS, S. DAK.--Continued

Particle-size analyses of suspended sediment, November to June 1949
 (Methods of analysis: B, by sedimentation; C, by centrifugation; D, by sedimentation; E, by sedimentation; F, by sedimentation; G, by sedimentation; H, by sedimentation; I, by sedimentation; J, by sedimentation; K, by sedimentation; L, by sedimentation; M, by sedimentation; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters								1. 000	
					0. 002	0. 004	0. 008	0. 016	0. 031	0. 062	0. 125	0. 250		
Nov. 3, 1948 -----	9:10 a. m.	50	6,220	--	63	84	95	97	98	99	99	100	--	BW
Mar. 4, 1949 -----	3:45 p. m.	2,070	5,420	2,130	--	8	28	--	38	47	62	88	98	BN
Mar. 4 -----	3:45 p. m.	2,070	5,420	1,910	14	22	--	--	41	50	61	94	--	BW
Mar. 10 -----	1:45 p. m.	942	4,580	1,470	24	38	50	57	61	64	64	70	--	BW
Apr. 13 -----	7:50 a. m.	196	1,300	1,150	51	75	89	95	96	96	97	99	100	BW
May 18 -----	12:40 p. m.	560	17,600	1,590	42	65	82	92	96	98	98	100	--	BW
June 8 -----	8:05 a. m.	1,480	19,800	2,070	37	48	66	72	79	87	83	98	100	BW

CHEYENNE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN CHEYENNE RIVER BASIN

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium	
																	Parts per mil- lion	Tons per acre- foot	Tons per day	Total		Non-carbon- ate
																	CHEYENNE RIVER NEAR WASTA, S. DAK.					
Mar. 2, 1949	1,500	7.4	933	14	0.02	109	23	63	0	130	356	17		0.4	2.9	0.01	655	0.89		366	259	27
Mar. 17	547	7.5	1,360	13	.03	145	43	115	0	163	572	40		.4	2.5	.08	1,010	1.37		559	405	32
Apr. 19	429	7.8	1,570	14	.01	159	49	139	0	200	640	47		.6	1.7	--	1,150	1.56		598	434	34
May 9	349	7.7	1,700	14	.01	156	50	158	0	186	676	55		1.1	1.1	--	1,200	1.63		595	443	37
May 31	277	7.5	1,610	16	.01	157	47	153	0	182	680	40		.8	1.9	--	1,190	1.62		585	436	36
July 13	170	7.8	1,260	30	.01	86	16	166	0	168	436	33		.7	1.8	--	938	1.28		281	143	56
Aug. 3	22	8.0	2,360	23	.05	247	68	247	0	134	1,150	87		.7	.6	--	1,890	2.57		896	786	37
Sept. 12	92	7.8	1,720	24	.06	187	48	164	0	158	785	48		.8	4.7	--	1,340	1.82		664	534	35

BEAVER CREEK NEAR NEWCASTLE, WYO.

Mar. 3, 1949	1/225	7.1	1,230	10	0.02	109	31	117	0	112	446	66		0.3	2.9	0.20	872	1.19			400	308	39
Sept. 20	6.8	7.4	6,960	3.0	.02	503	107	1,110	0	75	1,780	1,550		.5	1.1	.40	5,090	6.92			1,700	1,640	59

BELLE FOURCHE RIVER BELOW MOORCROFT, WYO.

Mar. 3, 1949	1/2.0	7.7	2,540	13	0.08	128	77	396	0	558	980	12		0.5	2.1	0.10	1,990	2.57			636	178	58
Apr. 12	43	7.3	997	17	.01	72	34	109	0	196	572	3.0		.4	1.6	--	742	1.01			320	136	43
May 20	109	7.0	1,800	14	.02	200	64	142	0	342	748	6.0		.6	2.0	--	1,550	1.84			762	462	29
July 8	3	7.7	1,890	20	.02	107	54	289	0	424	724	9.4		.6	1.0	--	1,420	1.93			489	141	56
Aug. 1	1.1	8.3	1,250	17	.02	96	32	168	12	298	354	7.5		.5	1.4	.80	975	1.19			321	57	53
Sept. 12	2/0	8.0	1,700	10	.02	71	44	282	0	284	689	13		.4	1.0	--	1,250	1.70			358	125	63

BELLE FOURCHE RIVER NEAR ELM SPRINGS, S. DAK.

Mar. 4, 1949	1,000	7.1	1,160	10	0.02	140	43	53	0	145	486	8.5		0.4	4.1	0.24	894	1.22			526	407	18
Apr. 1	3,290	6.9	918	12	.02	95	22	66	0	83	374	6.4		.4	3.4		702	.95			328	260	30
Apr. 19	835	6.9	1,380	14	.02	147	55	105	0	159	644	11		.6	3.0		1,060	1.44			593	463	28
May 4	552	6.9	2,020	14	.02	190	87	199	0	176	1,030	27		.7	9.0		1,640	2.23			832	688	34
May 31	280	6.9	1,680	12	.02	118	76	207	0	144	880	14		.6	2.0		1,380	1.87			607	489	43
July 13	387	7.0	1,770	14	.02	214	81	116	0	157	928	15		.8	3.0		1,450	1.97			867	738	23
Aug. 3	220	8.1	2,040	14	.05	238	90	143	0	144	1,060	17		.7	3.4		1,630	2.22			939	821	25
Sept. 12	249	7.9	1,990	8.4	.02	217	93	126	0	132	1,020	16		.8	4.4		1,550	2.11			924	816	23

1/ Mean daily discharge.

2/ Practically no flow.

CHEYENNE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN CHEYENNE RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949

Periodic determinations of suspended sediment discharge, water, year October 1946 to September 1949			
Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)
BEAVER CREEK NEAR NEWCASTLE, WYO.			
Sept. 2, 1949 -----	4.0	42	0.5
Sept. 20 -----	6.8	28	.5
BELLE FOURCHE RIVER BELOW MOORCROFT, WYO.			
Mar. 11, 1949 -----	1/300	702	589
Mar. 22 -----	1/250	2,280	1,540
Mar. 23 -----	1/650	1,480	2,600
Mar. 25 -----	1/100	1,630	440
Mar. 28 -----	1/240	1,400	907
Apr. 1 -----	195	376	198
Apr. 5 -----	118	477	152
Apr. 6 -----	113	651	199
Apr. 8 -----	104	353	99
Apr. 8 -----	102	411	113
Apr. 12 -----	43	193	22
Apr. 12 -----	43	199	23
Apr. 15 -----	36	119	12
Apr. 19 -----	20	98	5.2
Apr. 22 -----	16	82	3.5
Apr. 26 -----	11	73	2.2
May 3 -----	14	68	2.6
May 6 -----	14	85	3.2
May 9 -----	26	6,290	442
May 13 -----	14	218	8.2
May 16 -----	10.4	105	2.9
May 18 -----	9.2	74	1.8
May 19 -----	8.0	130	2.9
May 20 -----	110	1,080	321
May 21 -----	29	428	34
May 24 -----	87	1,540	362
May 25 -----	29	3,090	242
May 27 -----	18	970	47
May 31 -----	49	19,700	2,610
June 1 -----	29	17,700	1,390
June 2 -----	14	6,850	259
June 3 -----	107	6,640	2,500
June 3 -----	123	8,680	2,880
June 3 -----	137	9,140	3,380
June 3 -----	172	9,320	4,330
June 3 -----	250	11,300	7,630
June 3 -----	266	11,100	7,970
June 3 -----	273	11,300	8,330
June 3 -----	280	11,700	8,850
June 3 -----	290	12,200	9,550
June 6 -----	27	4,980	363
June 9 -----	13	916	32
June 10 -----	10.1	678	18
June 13 -----	4.7	387	4.9
June 15 -----	26	482	34
June 21 -----	2.3	90	.6
June 22 -----	1.4	100	.4
June 23 -----	1.4	228	.9
June 24 -----	1.0	434	1.2
June 29 -----	.4	210	.2
July 6 -----	.3	58	.05
July 6 -----	.3	49	.04
July 8 -----	.3	74	.06
July 11 -----	585	7,910	12,500
July 12 -----	40	3,440	372
July 18 -----	7.4	2,340	47
July 19 -----	2.5	1,150	7.8
July 21 -----	.8	351	.8
July 28 -----	.2	66	.04
Aug. 1 -----	.1	66	.02
Aug. 4 -----	.1	83	.02

1/ Mean daily discharge.

CHEYENNE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN CHEYENNE RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; R, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.500	1.000	2.000
BELLE FOURCHE RIVER BELOW MOORCROFT, WYO.																
June 23, 1948	4:05 p. m.	55	1,660	4,130	12	36	99	100	--	--	--	--	--	--	--	BN
June 24	11:00 a. m.	850	8,600	4,560	42	73	86	94	97	100	98	100	98	100	98	BN
Mar. 23, 1949	11:20 a. m.	1/650	1,480	775	52	--	--	92	--	--	--	--	--	--	--	BW
May 20	6:46 p. m.	110	1,080	1,250	52	70	--	--	94	97	98	100	98	100	98	BW
June 1	12:10 p. m.	29	17,700	1,800	74	82	--	--	100	--	--	--	--	--	--	BW

1/Mean daily discharge.

BAD RIVER BASIN
MISCELLANEOUS ANALYSES OF STREAMS IN BAD RIVER BASIN IN SOUTH DAKOTA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium
																	Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
BAD RIVER NEAR FORT PIERRE																						
Mar. 8, 1949-----	720	7.4	1,990	13	0.04	139	32	302	83	0	100	968	27	0.7	5.3	0.30	1,540	2.09		478	396	58
Mar. 26-----	3,110	7.4	883	11	.05	89	17			0	149	323	8.0	.3	1.9	.17	654	.89		292	170	38
May 2-----	19	7.7	1,590	8.8	.05	91	30	240	0	212	616	39	3	.8	.25	1,130	1.54		351	177	60	
May 16-----	12	7.5	1,900	11	.02	152	33	232	0	201	760	43	.5	.7	--	1,330	1.81		515	350	49	
June 1-----	1,360	7.8	2,600	16	.02	233	46	303	0	210	1,160	33	1.0	1.0	--	1,900	2.58		771	599	46	
July 1-----	2	8.0	2,720	8.4	.02	213	52	356	0	136	1,260	66	.7	.6	--	2,020	2.75		746	634	51	

BAD RIVER NEAR FORT PIERRE

WHITE RIVER BASIN

WHITE RIVER NEAR OGLALA, S. DAK.

LOCATION.--At gaging station at bridge on U. S. Highway 18, 1 mile downstream from Blacktail Creek, and 6½ miles northwest of Oglala, Shannon County.

DRAINAGE AREA.--2,200 square miles.

RECORDS AVAILABLE.--Water temperatures: April to September 1949.

Sediment records: March 1947 to September 1949.

EXTREMES, 1948-49.--Water temperatures (April to September 1949): Maximum, 79°F July 6, August 7.

Sediment concentrations: Maximum daily, 34,400 ppm Nov. 2; minimum daily, 9 ppm Feb. 2.

Sediment loads: Maximum daily, 36,400 tons May 24; minimum daily, 0.3 ton Jan. 19, Feb. 2.

EXTREMES, 1947-49.--Sediment concentrations: Maximum daily, 34,400 ppm Nov. 2, 1949; minimum daily, 9 ppm Feb. 2, 1949.

Sediment loads: Maximum daily, 36,400 tons May 24, 1949; minimum daily, 0.3 ton Jan. 19, Feb. 2, 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, March to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- nes- ium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium
																Parts per mil- lion	Tons per acre- foot day	Total	Non- carbon- ate	
Mar. 3, 1949	1,020	7.6	423	18	0.03	46	7.3	31		130	95	2.5	0.2	3.0	0.10	286	0.39	145	38	32
Mar. 7	2,480	7.4	432	16	.02	47	7.4	33		124	108	2.0	.2	2.3	.12	291	.40	148	46	33
Mar. 28	313	7.5	889	21	.02	72	17	95		156	304	7.0	.2	1.9	.12	618	.84	250	122	45
May 10	112	7.5	918	37	.05	82	13	111		271	244	13	.6	3.9	--	654	.89	258	36	48
June 18	90	7.4	668	43	.03	45	5.0	96		242	127	7.0	.6	3.5	--	460	.63	133	0	61
July 12	47	7.3	783	43	.02	55	5.4	112		227	192	8.0	.5	3.0	--	550	.75	159	0	60
Aug. 1	23	7.6	859	47	.02	63	2.0	129		240	221	12	.5	1.8	--	606	.82	165	0	63
Sept. 20	14	7.3	813	36	.02	72	10	89		270	170	10	.6	1.7	--	546	.74	221	0	47

WHITE RIVER BASIN--Continued

WHITE RIVER NEAR OGLALA, S. DAK.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

/Once-daily temperature measurement between 6 a. m. and 9 a. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			32				--	55	64	72	69	64
2		44					--	55	63	70	68	59
3							--	58	62	73	71	63
4							--	60	63	74	73	62
5							--	57	63	74	71	61
6	51						50	53	65	79	73	62
7							--	57	60	75	79	60
8							--	56	62	72	72	58
9							--	58	66	70	70	60
10							--	59	65	70	70	64
11							--	58	65	70	69	62
12							--	62	--	--	74	50
13							50	62	64	73	69	50
14							--	64	60	71	69	55
15							--	61	67	73	65	51
16							--	63	69	71	67	61
17							--	61	--	70	70	59
18							--	60	63	69	69	52
19							--	58	66	72	68	67
20							--	59	67	73	68	58
21							--	58	61	68	69	--
22							--	58	71	67	70	50
23							--	57	64	71	74	57
24							--	55	66	73	72	49
25							--	58	68	73	72	56
26							--	59	69	69	68	58
27							--	61	70	71	68	49
28							57	64	72	71	63	58
29							60	65	68	69	63	49
30							60	66	66	72	61	50
31							--	67	--	73	59	--
Average							--	59	65	72	69	57

MISSOURI RIVER BASIN

WHITE RIVER BASIN--Continued

WHITE RIVER NEAR OGLALA, S. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	11	72	2.1	141	11,000	1,650	24	76	4.9
2-----	10	63	1.7	131	34,400	1,320	25	91	6.1
3-----	10	73	2.0	47	21,500	2,730	26	85	6.0
4-----	8	52	1.1	34	16,100	1,480	28	109	8.2
5-----	7	49	.9	33	12,000	1,070	28	109	8.2
6-----	7	51	1.0	35	8,300	784	27	81	5.9
7-----	7	53	1.0	34	4,600	422	26	79	5.5
8-----	7	54	1.0	30	1,510	122	25	109	7.4
9-----	9	67	1.6	29	700	55	24	131	8.5
10-----	8	55	1.2	29	480	38	24	128	8.3
11-----	9	48	1.2	26	436	31	25	96	6.5
12-----	8	40	.9	27	389	28	27	90	6.6
13-----	9	40	1.0	37	444	44	30	79	6.4
14-----	13	72	2.5	27	369	27	28	77	5.8
15-----	10	63	1.7	25	330	22	27	98	7.1
16-----	10	56	1.5	27	210	15	24	70	4.5
17-----	9	70	1.7	28	225	17	23	68	4.2
18-----	8	65	1.4	26	215	15	23	83	3.9
19-----	7	40	.8	26	169	12	23	77	4.8
20-----	7	40	.8	24	168	11	25	64	4.3
21-----	9	35	.8	22	122	7.2	27	60	4.4
22-----	9	37	.9	21	112	6.4	26	57	4.0
23-----	14	43	1.6	21	118	6.7	25	51	3.4
24-----	13	35	1.2	22	120	7.1	24	53	3.4
25-----	13	34	1.2	24	172	11	23	46	2.9
26-----	22	105	6.2	26	137	9.6	23	38	2.4
27-----	20	107	5.8	26	128	9.0	24	38	2.5
28-----	14	80	3.0	25	98	6.6	24	57	3.7
29-----	16	2,190	1/119	25	132	8.9	22	62	3.7
30-----	26	4,850	340	24	107	6.9	19	73	3.7
31-----	23	1,830	114	--	--	--	18	55	2.7
Total-	353	--	621	1,052	--	26,790	767	--	160
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	17	60	2.8	13	--	2/0.5	600	855	1,380
2-----	17	--	2/2.8	14	9	.3	800	685	1,480
3-----	17	--	2/2.8	16	17	.7	1,000	664	1,790
4-----	16	--	2/2.7	18	18	.9	2,370	665	4,260
5-----	15	65	2.6	20	29	1.6	2,320	910	5,700
6-----	15	67	2.7	24	33	2.1	2,320	1,100	6,890
7-----	16	70	3.0	28	13	1.0	2,490	1,150	7,730
8-----	16	69	3.0	34	12	1.1	2,270	1,360	8,340
9-----	14	68	2.6	40	12	1.3	1,850	1,670	8,340
10-----	10	34	.9	45	12	1.5	1,000	2,700	7,290
11-----	7	35	.7	54	--	2/8.5	475	3,510	4,500
12-----	7	33	.6	60	77	12	345	2,780	2,590
13-----	7	23	.4	50	52	7.0	305	1,950	1,610
14-----	8	27	.6	45	45	5.5	273	1,200	885
15-----	9	23	.6	50	--	2/6.2	229	810	501
16-----	10	18	.5	55	48	7.1	201	600	434
17-----	9	19	.5	70	40	7.6	175	670	316
18-----	8	18	.4	80	13	2.8	158	750	320
19-----	7	15	.3	75	12	2.4	194	1,600	838
20-----	7	24	.5	70	15	2.8	372	2,810	2,820
21-----	7	25	.5	80	13	2.8	683	4,800	8,850
22-----	7	25	.5	100	11	3.0	832	5,100	11,500
23-----	6	28	.5	150	128	52	722	4,890	9,540
24-----	5	28	.4	200	98	53	670	3,920	7,090
25-----	5	31	.4	175	29	14	574	3,720	5,760
26-----	6	33	.5	150	230	93	435	2,840	3,330
27-----	8	31	.7	150	390	158	363	2,590	2,540
28-----	9	20	.5	150	234	95	313	1,970	1,670
29-----	10	25	.7	--	--	--	273	1,720	1,270
30-----	11	--	2/7	--	--	--	215	1,590	923
31-----	12	--	2/7	--	--	--	175	1,170	553
Total-	318	--	37.1	2,016	--	544	25,002	--	121,000

1/Sediment discharge computed by subdividing day.

2/Estimated.

WHITE RIVER BASIN--Continued

WHITE RIVER NEAR OGLALA, S. DAK.--Continued

Suspended sediment, water year October 1948 to September 1949.--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	152	890	365	128	9,100	3,140	88	531	126
2-----	136	--	2/280	110	1,900	564	98	580	153
3-----	130	600	211	136	1,500	551	90	510	124
4-----	128	--	2/190	136	2,550	936	92	481	120
5-----	138	--	2/260	100	13,700	3,700	88	470	112
6-----	136	550	202	105	9,750	2,760	90	920	224
7-----	141	623	237	108	4,930	1,450	98	2,830	749
8-----	133	620	222	118	1,800	573	102	1,850	510
9-----	128	680	235	128	3,700	1,280	188	4,690	1/4, 560
10-----	130	575	202	112	2,350	710	215	22,000	12,800
11-----	130	565	198	112	1,950	589	130	11,800	4,140
12-----	125	500	169	372	10,800	1/1,600	108	--	2/2,000
13-----	118	492	157	234	5,700	1/3,910	102	--	2/1,200
14-----	108	455	133	120	1,980	641	102	1,750	482
15-----	100	545	147	98	910	241	98	1,350	357
16-----	98	500	132	92	690	172	128	4,000	1,380
17-----	100	452	122	92	1,370	340	133	--	2/6,700
18-----	95	337	86	92	520	129	90	10,500	2,550
19-----	98	361	96	100	520	140	78	7,900	1,680
20-----	95	340	87	120	2,700	875	76	3,800	780
21-----	98	575	152	102	1,540	424	76	1,800	369
22-----	100	865	234	229	10,200	6,300	78	1,350	284
23-----	100	570	154	408	9,520	10,500	74	770	154
24-----	98	1,250	331	586	23,000	36,400	88	1,320	314
25-----	90	565	137	354	11,200	10,700	83	700	157
26-----	85	505	116	194	5,600	2,940	85	600	138
27-----	76	363	74	146	2,580	1,020	83	455	102
28-----	76	290	60	120	1,960	635	76	530	109
29-----	76	330	68	110	1,770	525	122	--	2/4,600
30-----	92	2,500	621	98	1,010	267	138	13,700	5,100
31-----	--	--	--	92	675	168	--	--	--
Total--	3,310	--	5,680	5,052	--	104,200	3,097	--	52,050
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	130	5,300	1,860	23	475	30	13	239	8.4
2-----	110	4,200	1,250	22	328	19	14	218	8.2
3-----	74	2,170	434	29	455	36	15	181	7.3
4-----	61	1,450	239	27	369	27	16	160	6.9
5-----	61	950	156	23	303	19	16	110	4.8
6-----	80	--	2/500	19	198	10	20	6,500	351
7-----	95	13,300	1/3,640	16	190	8.2	45	8,600	1/818
8-----	138	6,900	2,570	15	170	6.9	20	6,500	351
9-----	76	14,400	2,950	14	168	6.4	32	2,500	216
10-----	69	18,300	3,410	13	165	5.8	34	2,810	258
11-----	57	9,800	1,510	13	159	5.6	65	--	2/3,600
12-----	47	4,200	533	16	222	9.6	39	30,200	3,180
13-----	46	4,400	546	21	380	22	26	19,500	1,370
14-----	74	7,000	1,400	21	485	28	21	6,650	377
15-----	55	3,500	520	14	390	15	18	6,400	311
16-----	108	11,900	3,470	15	435	18	17	650	30
17-----	49	16,500	2,180	53	3,880	1/624	17	660	30
18-----	63	26,000	4,420	25	2,500	169	17	508	23
19-----	44	16,000	1,900	18	1,900	92	15	382	15
20-----	34	8,100	743	15	1,490	60	14	321	12
21-----	33	1,300	116	13	810	28	12	--	2/9
22-----	33	750	67	19	800	41	13	290	10
23-----	33	1,400	125	26	1,820	128	16	320	14
24-----	30	885	72	18	1,030	50	16	267	12
25-----	27	455	33	16	575	25	15	215	8.7
26-----	26	330	23	14	408	15	15	201	8.1
27-----	25	298	20	12	305	9.9	14	150	5.7
28-----	27	270	20	12	307	10	15	130	5.3
29-----	26	240	17	12	360	12	13	118	4.1
30-----	25	218	15	13	337	12	10	139	3.8
31-----	27	390	28	13	298	10	--	--	--
Total--	1,783	--	34,770	580	--	1,560	613	--	11,060
Total discharge for year (second-foot-days) -----									43,943
Total load for year (tons) -----									358,500

1/Sediment discharge computed by subdividing day.

2/Estimated.

WHITE RIVER BASIN--Continued

WHITE RIVER NEAR OGLALA, S. DAK.--Continued

Particle-size analyses of suspended sediment, November 1948 to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Nov. 2, 1948	3:40 p. m.	90	30,400	5,590	--	4	8	--	99	100	--	--	--	--	--	BN
Nov. 2	3:40 p. m.	90	30,400	5,430	--	66	86	96	98	100	--	--	--	--	--	BW
Apr. 13, 1949	11:10 a. m.	118	478	600	--	50	72	82	92	97	98	100	--	--	--	BW
June 8	11:20 a. m.	98	2,450	2,120	58	80	88	94	98	100	--	--	--	--	--	BW
July 13	12:20 p. m.	42	3,080	841	63	81	96	98	100	--	--	--	--	--	--	BW
Aug. 23	7:40 a. m.	29	1,180	1,280	54	68	88	95	98	99	100	--	--	--	--	BW
Aug. 23	7:40 a. m.	29	1,180	1,230	8	28	--	--	--	99	100	--	--	--	--	BN
Sept. 12	6:00 p. m.	33	27,400	1,460	60	76	96	98	100	--	--	--	--	--	--	BW
Sept. 22	5:30 p. m.	16	301	249	53	57	64	80	90	96	97	.99	--	100	--	BW

WHITE RIVER BASIN--Continued

WHITE RIVER NEAR KADOKA, S. DAK.

LOCATION.--At gaging station at bridge on State Highway 73, 5 miles downstream from Cottonwood Creek, 6 miles south of Kadoka, Jackson County, and 7 miles upstream from Pass Creek.

DRAINAGE AREA.--5,000 square miles.

RECORDS AVAILABLE.--Chemical analyses: March to September 1949.

Water temperatures: April to September 1949.

Sediment records: April to September 1949.

EXTREMES, April to September 1949.--Water temperatures (April to September 1949): Maximum, 84°F August 11.

Sediment concentrations: Maximum daily, 55,300 ppm Aug. 18; minimum daily, 14 ppm Sept. 28.

Sediment loads: Maximum daily, 478,000 tons Aug. 18; minimum daily, less than 1 ton on several days.

REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, March to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium carbonate
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Mar. 3, 1949	3,300	8.1	333	21	0.03	14	0.5	66		0	174	30	2.0	0.2	2.7	0.13	245	0.33	2,180	37	0	79
Apr. 7-May 1	304	8.6	781	40	0.03	54	7.0	112	66	15	209	194	8.4	8.4	2.0	0.38	548	75	1,450	164	0	58
May 2	1,230	8.1	666	50	0.04	22	3.8	142		0	308	114	5.6	4.4	0	--	496	67	1,650	71	0	81
May 3, 8:00 a. m.	518	7.9	596	43	0.02	9.0	6	128		0	260	80	4.0	4	9	--	444	60	1,585	25	0	92
May 3, 4:30 p. m.	518	8.2	530	42	0.02	10	2	115	4.0	4	246	66	4.5	6	5	--	392	53	25	25	0	89
May 4-5	383	8.4	600	40	0.04	10	1.0	127	3.2	12	224	91	6.0	--	4.7	--	410	56	424	29	0	89
May 6	1,210	7.8	661	37	0.02	11	3.6	139		0	280	90	4.4	4	6	--	456	62	1,490	29	0	91
May 7-23	275	8.1	797	34	0.02	31	3.6	131	5.6	0	236	183	7.6	6	3.0	0.37	558	76	414	93	0	74
May 24	1,420	7.4	758	38	0.02	23	1.5	148		0	292	128	6.0	5	3.0	--	524	71	2,010	64	0	84
May 25-31	494	8.4	770	37	0.02	27	3.2	133	11	16	196	178	6.0	5	3.8	--	554	75	739	81	0	75
May 27	751	7.5	950	38	0.02	30	1.0	185		0	237	266	6.0	6	6	--	662	90	1,340	79	0	84
June 1-29	194	7.8	729	42	0.04	29	3.6	123	8.0	0	242	146	8.0	6	3.5	0.20	494	67	259	88	0	73
June 17	220	7.6	597	39	0.10	25	2.0	117		0	266	90	6.0	5	4.5	--	438	60	260	71	0	78
June 30	1,080	7.6	747	46	0.04	31	3.0	155		0	312	152	8.4	6	5	--	564	77	1,640	90	0	79
July 1	416	8.0	610	46	0.20	18	2	130		0	276	90	5.0	2	1.1	0.10	462	63	519	46	0	86
July 2	190	8.3	529	53	0.60	11	2	123		10	250	64	3.0	2	1.4	0.20	416	57	213	28	0	91
July 3-6	126	8.4	730	60	0.20	24	4	137	4.8	10	242	134	8.0	6	2.3	0.20	532	67	181	62	0	82

1/Weighted mean for day.

WHITE RIVER BASIN--Continued
WHITE RIVER NEAR KADOKA, S. DAK.--Continued

Chemical analyses, in parts per million, March to September 1949--Continued

Date of collection	Mean discharge (second-foot)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium carbonate
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
July 6, 1949	105	7.6	934	42	0.03	25	0.2	192		0	238	260	9.0	0.6	2.7	--	652	0.89	185	64	0	87
July 7	340	7.6	1,260	48	.10	90	3.8	182		0	224	420	8.0	.6	2.5	0.20	867	1.18	796	240	56	52
July 8-23	90	8.5	809	61	.08	26	2.1	148	6.4	14	216	178	7.0	.8	3.8	.20	588	.81	145	74	0	80
July 24-31	17	8.3	962	57	.10	52	3.8	151	9.2	12	206	268	13	1.0	3.5	.40	708	.96	32	146	0	68
Aug. 1-15	7.3	7.7	1,310	61	.04	35	4.6	240	12	0	292	360	19	1.0	2.2	.30	896	1.22	18	107	0	81
Aug. 16-17	166	7.7	713	--	--	15	.8	137	7.2	0	278	103	8.0	--	5.2	--	498	.68	223	40	0	86
Aug. 18-23	1,210	7.0	605	48	--	14	.2	124	4.8	0	282	96	5.0	1.2	4.9	.20	442	.60	1,440	36	0	87
Aug. 24-Sept. 10	21	7.7	774	51	.04	18	.2	153	4.8	0	262	146	7.4	.7	6.2	.30	530	.72	40	46	0	86
Sept. 11-30	27	7.6	997	44	.04	33	2.9	173	7.2	0	240	263	14	.6	4.1	.30	686	.93	50	35	0	78

WHITE RIVER BASIN--Continued

WHITE RIVER NEAR KADOKA, S. DAK.--Continued

Temperature (°F) of water, April to September 1949
 /Once-daily temperature measurement between 7 a. m. and 9 a. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							--	48	76	66	67	58
2							--	49	63	76	63	61
3							--	58	64	76	73	53
4							--	58	64	75	75	54
5							--	52	69	74	68	50
6							--	49	67	75	--	53
7							49	49	57	77	78	52
8							46	53	59	72	78	51
9							46	53	65	69	75	51
10							45	56	68	73	81	57
11							45	59	73	67	84	55
12							49	62	72	68	82	38
13							49	61	62	70	79	36
14							43	56	72	69	80	41
15							45	62	65	72	80	44
16							46	59	68	74	80	46
17							47	56	66	72	78	43
18							--	50	63	64	67	49
19							49	54	70	68	67	36
20							52	58	72	71	70	49
21							54	62	72	68	70	35
22							52	59	75	71	72	37
23							49	54	69	80	72	38
24							55	58	68	78	71	38
25							54	55	68	72	66	45
26							52	59	76	73	75	44
27							54	66	65	74	66	36
28							56	69	67	71	66	36
29							55	68	76	66	63	36
30							58	70	66	70	62	41
31							--	68	--	74	58	--
Average							--	58	68	72	70	45

WHITE RIVER BASIN--Continued

WHITE RIVER NEAR KADOKA, S. DAK.--Continued

Suspended sediment, April to September 1949

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	--	--	--	1,030	17,800	93,500	173	2,700	1,260
2-----	--	--	--	1,230	49,700	171,000	366	13,800	1/17,600
3-----	--	--	--	518	30,500	42,600	459	15,300	19,000
4-----	--	--	--	302	21,900	17,900	273	16,300	12,000
5-----	--	--	--	464	20,800	1/29,100	151	16,700	6,810
6-----	355	1,890	1,810	1,210	43,300	147,000	128	12,700	4,390
7-----	355	2,100	2,020	476	25,200	32,400	118	3,900	1,240
8-----	355	2,403	2,300	306	12,300	10,200	115	1,600	497
9-----	380	3,280	3,360	212	5,250	3,000	120	1,200	388
10-----	571	7,190	11,100	220	4,150	2,460	160	1,580	683
11-----	571	7,550	11,600	163	3,600	1,580	178	2,200	1,050
12-----	406	7,840	8,590	166	5,950	2,660	128	3,750	1,300
13-----	306	5,090	4,200	166	3,700	1,660	276	6,930	5,160
14-----	355	4,130	3,960	148	1,800	719	274	4,780	3,540
15-----	355	2,940	2,820	321	--	2/6,500	252	5,850	3,980
16-----	316	2,800	2,390	514	9,150	12,700	297	15,500	12,400
17-----	235	2,760	1,750	466	22,100	1/32,200	220	15,500	9,200
18-----	212	1,320	755	220	8,100	4,810	186	10,400	5,220
19-----	193	1,120	584	270	3,980	2,900	157	6,390	2,710
20-----	183	800	395	232	2,980	1,870	216	6,050	3,530
21-----	186	670	336	193	6,950	3,620	163	6,600	2,900
22-----	183	620	306	197	4,960	2,640	131	3,900	1,380
23-----	223	675	407	408	28,200	31,100	299	11,900	1/10,200
24-----	239	1,600	1,030	1,420	50,500	201,000	212	20,600	11,800
25-----	183	2,470	1,220	834	36,200	84,500	136	14,400	5,290
26-----	163	2,620	1,150	630	22,700	38,600	133	14,000	5,020
27-----	166	1,130	506	751	17,300	35,100	115	7,950	2,470
28-----	160	710	306	530	16,400	23,400	89	3,150	757
29-----	151	700	286	311	13,900	11,700	110	3,400	1,010
30-----	133	750	269	223	8,100	4,880	1,080	50,800	1/168,000
31-----	--	--	--	180	4,550	2,210	--	--	--
Total-	6,935	--	63,450	14,311	--	1,056,000	6,713	--	318,800
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	416	33,600	39,100	10	1,400	38	10	773	21
2-----	190	22,500	11,500	10	750	20	6	390	6
3-----	154	17,900	7,440	8	2,050	44	4.6	238	3
4-----	126	14,000	4,760	17	777	1/34	5	175	2
5-----	118	6,750	2,150	14	629	24	4.6	123	2
6-----	105	3,350	950	9	612	15	4.6	99	1
7-----	340	22,900	1/24,200	5	510	7	2.0	105	(a)
8-----	148	31,500	12,600	3.5	398	4	3.2	98	(b)
9-----	81	20,300	4,440	2.3	242	2	3.8	100	1
10-----	64	15,900	2,750	3.5	200	2	20	388	1/38
11-----	108	8,450	2,460	1.1	192	(a)	30	602	49
12-----	154	5,800	2,410	2.6	845	6	47	592	75
13-----	193	26,000	13,600	13	43,500	1,580	36	5,300	515
14-----	180	35,300	17,800	6	37,800	635	58	6,110	958
15-----	79	14,500	3,100	4.1	33,000	379	110	6,740	2,000
16-----	62	16,700	2,800	155	35,500	15,400	87	13,700	3,220
17-----	64	21,000	3,630	176	25,100	1/15,600	49	5,870	777
18-----	37	14,000	1,400	3,090	55,300	478,000	31	1,650	138
19-----	47	9,200	1,170	1,780	43,800	218,000	19	792	41
20-----	79	5,100	1,090	1,140	32,500	104,000	13	758	27
21-----	56	6,700	1,010	782	15,900	33,600	10	640	17
22-----	44	2,250	287	330	19,400	17,300	8	450	10
23-----	47	1,590	202	151	13,200	5,380	6	202	3
24-----	33	1,440	128	94	10,500	2,660	6	189	3
25-----	23	1,780	110	62	9,050	1,520	5	112	2
26-----	18	960	47	42	9,150	1,040	4.6	37	(a)
27-----	13	1,250	44	34	9,350	858	3.2	24	(b)
28-----	14	6,750	255	21	8,500	482	2.9	14	(c)
29-----	13	9,600	337	31	8,100	878	2.3	21	(b)
30-----	13	2,700	95	18	7,250	352	2.0	16	(a)
31-----	12	2,400	78	14	2,050	78	--	--	--
Total-	3,031	--	161,900	8,029.1	--	897,700	593.8	--	7,910

Total discharge for period Apr. 6 to Sept. 30 (second-foot-days) ----- 39,612.9

Total load for period Apr. 6 to Sept. 30 (tons) ----- 2,506,000

1/Sediment discharge computed by subdividing day.

2/Estimated.

(a)Sediment discharge less than 1 ton.

PONCA CREEK BASIN
MISCELLANEOUS ANALYSES OF STREAMS IN PONCA CREEK BASIN IN NEBRASKA

Chemical analyses, in parts per million, water year October 1948 to September 1949

Chemical analyses, in parts per million, water year October 1949 to September 1950																					
Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium
																	Parts per mil- lion	Tons per acre- foot	Total	Non- carbon- ate	
Apr. 7, 1949-----	606	7.3	534	14	0.05	68	15		34	0	189	150	5.5	0.3	0.9	0.03	368	0.50	231	92	24
May 12-----	24	7.9	795	18	.03	96	36		28	0	244	218	9.0	.4	4.4	.30	554	.75	388	188	13
July 8-----	1.8	8.0	864	20	.02	102	35		32	0	138	328	8.5	.3	1.9	.20	632	.89	399	286	15
July 19-----	1.1	7.9	905	21	.02	125	38		34	0	203	348	8.0	.3	1.4	.44	707	.96	468	302	14
Sept. 16-----	.5	8.0	912	18	.02	109	35		33	0	146	340	8.5	.3	2.0	.43	672	.91	416	296	15

1/ Mean daily discharge.

PONCA CREEK AT ANOKA

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)
May 3, 1949-----	31		373
May 12-----	25		347
May 27-----	19		174
June 9-----	16		254
July 8-----	.9		44

Particle-size analyses of suspended sediment, water year October 1948 to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second-feet)	Suspended sediment											Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	
May 3, 1949 -----	10:00 a. m.	31	373	793	41	51	62	77	87	94	98			BW
May 27 -----	10:55 a. m.	19	174	350	29	39	53	66	93	100				BW

NIOBRARA RIVER BASIN

NIOBRARA RIVER NEAR GORDON, NEBR.

LOCATION --At bridge on State Highway 27, just upstream from gaging station which is about 4 miles downstream from Rush Creek and 11 miles south of Gordon, Nebraska.

DRAINAGE AREA --2,595 square miles.

RECORDS AVAILABLE --Sediment records: October 1947 to September 1949.

EXTREMES 1948-49 --Sediment concentrations: Maximum daily, not determined; minimum daily, not determined.

Sediment loads: Maximum daily 15,000 tons Feb. 27; minimum daily 4 tons Jan. 24.

EXTREMES 1947-49 --Sediment concentrations: Maximum daily, not determined; minimum daily, not determined.

Sediment loads: Maximum daily 22,900 tons June 17, 1948; minimum daily 4 tons Jan. 24, 1949.

REMARKS --Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, March to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dio- m
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
Mar. 12, 1949 -----	323	8.0	332	42	0.02	40	3.5	22	22	182	7.2	2.0	0.4	2.7	0.13	230	0.31		114	0	30
May 17 -----	228	7.7	317	46	.02	41	4.8	22	23	177	18	2.0	.5	2.3		231	.31		122	0	28
July 5 -----	88	7.9	282	53	.02	35	4.6	23	23	162	18	1.5	.5	1.0		223	.30		107	0	32
Sept. 13 -----	105	7.5	218	40	.04	34	5.3	20	20	156	15	3.2	.4	1.7		210	.29		107	0	29

NIOBRARA RIVER BASIN--Continued

NIOBRARA RIVER NEAR GORDON, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	88	290	89	85	640	150	138	430	160
2-----	88	380	90	96	380	98	153	840	350
3-----	99	290	78	91	--	1/100	168	920	420
4-----	108	190	55	99	530	140	128	810	280
5-----	108	140	41	68	640	120	131	610	220
6-----	108	140	41	80	610	130	138	520	190
7-----	105	100	28	118	500	160	138	470	180
8-----	102	300	83	99	400	110	172	310	140
9-----	99	260	69	85	610	140	145	480	190
10-----	96	360	93	96	770	200	153	360	150
11-----	96	520	130	96	540	140	176	280	130
12-----	105	130	37	91	470	120	164	530	230
13-----	118	90	29	99	480	130	149	580	230
14-----	121	330	110	111	--	1/150	161	520	230
15-----	121	440	140	135	520	190	145	510	200
16-----	121	260	85	108	540	160	135	410	150
17-----	121	600	200	157	680	290	145	550	220
18-----	111	470	140	153	650	270	135	530	190
19-----	111	540	160	121	420	140	111	540	160
20-----	105	400	110	118	340	110	125	450	150
21-----	102	330	91	114	730	220	108	460	130
22-----	102	360	99	111	1,000	300	121	340	110
23-----	102	430	120	145	730	290	121	490	160
24-----	105	320	91	138	520	190	135	--	1/280
25-----	108	240	70	164	410	180	128	640	220
26-----	108	290	85	172	240	110	120	540	170
27-----	105	300	85	142	220	84	110	--	1/120
28-----	105	240	68	135	780	280	116	260	78
29-----	125	460	160	131	740	260	120	410	130
30-----	135	380	140	128	860	300	120	540	170
31-----	102	730	200	--	--	--	120	690	220
Total-	3,330	--	3,000	3,486	--	5,260	4,223	--	5,960
Day	January			February			March		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	120	980	320	110	17	5	961	2,300	6,000
2-----	120	320	100	120	22	7	788	1,900	4,000
3-----	120	--	1/32	120	26	8	670	2,500	4,500
4-----	120	--	1/17	110	26	8	670	2,600	4,700
5-----	140	--	1/14	120	25	8	578	2,200	3,400
6-----	130	--	1/13	120	25	8	479	1,600	2,100
7-----	120	--	1/10	120	26	8	416	1,200	1,300
8-----	120	--	1/10	130	24	8	371	900	900
9-----	120	--	1/10	140	28	11	300	980	790
10-----	120	--	1/10	150	32	13	273	1,000	740
11-----	120	--	1/10	160	28	12	263	860	610
12-----	120	--	1/8	160	36	16	312	880	740
13-----	120	19	6	140	56	21	268	980	710
14-----	110	19	6	140	39	15	253	--	1/800
15-----	100	25	7	160	41	18	206	1,600	890
16-----	100	30	8	170	43	20	248	1,500	1,000
17-----	100	--	1/9	190	35	18	248	820	550
18-----	90	38	9	200	42	23	233	950	600
19-----	80	24	5	190	46	24	224	830	500
20-----	90	38	9	190	47	24	233	740	470
21-----	90	36	9	190	46	24	233	840	530
22-----	90	37	9	220	74	44	253	830	570
23-----	80	--	1/5	240	120	78	253	740	510
24-----	80	--	1/4	250	210	140	263	400	280
25-----	90	--	1/5	280	700	530	263	700	500
26-----	90	20	5	1,100	--	1/12,000	284	1,000	770
27-----	90	22	5	1,600	--	1/15,000	268	930	670
28-----	90	23	6	1,240	2,600	8,700	268	950	690
29-----	90	27	7	--	--	--	295	850	680
30-----	90	22	5	--	--	--	253	660	450
31-----	100	19	5	--	--	--	268	660	480
Total-	3,240	--	678	8,060	--	36,800	10,895	--	41,430

1/Estimated.

NIOBRARA RIVER BASIN--Continued

NIOBRARA RIVER NEAR GORDON, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	243	1,200	790	157	890	380	128	750	260
2-----	248	920	620	128	--	1/240	121	450	150
3-----	253	1,100	750	153	620	260	121	360	120
4-----	258	1,400	980	149	840	340	118	310	99
5-----	278	1,100	830	161	1,400	610	125	280	95
6-----	224	920	560	145	1,100	430	145	460	180
7-----	224	1,000	600	164	610	270	157	--	1/1,100
8-----	206	1,400	780	145	--	1/240	149	950	380
9-----	215	1,400	810	149	690	280	168	1,700	770
10-----	197	1,000	530	157	730	310	161	1,000	430
11-----	206	730	410	180	480	230	176	740	350
12-----	206	940	520	197	920	490	180	640	310
13-----	153	650	270	180	1,700	830	180	620	300
14-----	161	540	230	188	1,000	510	168	610	280
15-----	153	870	360	206	650	360	164	460	200
16-----	164	1,200	530	206	480	270	149	320	130
17-----	145	1,000	390	238	840	540	138	310	120
18-----	153	860	360	210	570	320	135	430	160
19-----	149	640	260	202	320	170	125	380	130
20-----	149	900	360	114	520	160	118	300	96
21-----	145	970	380	108	750	220	108	340	99
22-----	125	1,000	340	142	1,700	650	99	390	100
23-----	121	830	270	181	1,700	740	105	380	100
24-----	121	880	290	142	1,000	380	111	320	96
25-----	121	940	310	149	800	320	102	440	120
26-----	128	510	180	138	1,100	410	96	580	150
27-----	131	680	240	164	970	430	94	470	120
28-----	138	1,000	370	149	960	390	88	160	38
29-----	135	730	270	149	390	160	77	120	25
30-----	153	880	360	131	390	140	80	180	39
31-----	--	--	--	135	700	260	--	--	--
Total--	5,303	--	13,950	4,997	--	11,340	3,886	--	6,550

Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	88	260	62	91	270	66	91	200	49
2-----	91	340	84	88	300	71	91	110	27
3-----	82	310	69	88	230	55	85	170	39
4-----	85	240	55	85	170	39	85	310	71
5-----	88	220	52	91	220	54	82	240	53
6-----	114	570	180	82	240	53	99	150	40
7-----	96	380	99	75	200	41	102	210	58
8-----	91	220	54	72	120	23	96	240	62
9-----	88	160	38	77	200	42	99	240	64
10-----	82	150	33	91	250	61	99	200	53
11-----	85	200	46	88	300	71	102	160	44
12-----	88	160	38	88	310	74	105	140	40
13-----	99	380	100	99	430	110	102	300	83
14-----	85	270	62	94	410	100	94	230	58
15-----	80	440	95	99	330	88	85	300	69
16-----	88	460	110	105	260	74	82	160	35
17-----	85	230	53	94	300	76	77	99	21
18-----	91	210	52	99	250	67	82	140	31
19-----	88	210	50	105	260	74	82	300	66
20-----	82	140	31	105	240	68	82	190	42
21-----	80	200	43	99	140	37	80	220	48
22-----	77	260	54	91	120	29	77	420	87
23-----	75	270	55	72	120	23	77	360	75
24-----	70	180	34	75	140	28	75	370	75
25-----	70	160	30	77	260	54	75	270	55
26-----	75	160	32	72	300	58	75	200	41
27-----	75	180	36	72	180	35	72	150	29
28-----	72	130	25	80	240	52	75	160	32
29-----	85	170	39	91	320	79	75	200	41
30-----	94	390	99	94	210	53	72	290	56
31-----	94	300	76	91	270	66	--	--	--
Total--	2,643	--	1,890	2,730	--	1,820	2,575	--	1,540

Total discharge for year (second-foot-days)----- 55,368

Total load for year (tons)----- 130,200

1/Estimated.

NIOBRARA RIVER BASIN--Continued
NIOBRARA RIVER NEAR GORDON, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500
Oct. 11, 1948	4:20 p. m.	105	351	643			--	--	6	7	17	43	--		BN
Oct. 26	1:40 p. m.	105	523	1,110			--	--	4	6	10	25	62		BN
Nov. 15	12:15 p. m.	135	522	1,010			--	--	8	11	18	29	72		BN
Nov. 15	12:30 p. m.	135	524	1,370			--	--	13	16	25	36	78		BW
Dec. 3	3:40 p. m.	193	798	1,540			--	--	9	13	18	28	41	91	BW
Dec. 21	1:40 p. m.	99	838	1,610			--	--	--	--	16	27	84		BW
Feb. 26, 1949	2:20 p. m.	1,540	5,500	3,020			7	8	12	33	64	99			BW
Mar. 15	4:10 p. m.	1,206	1,520	1,020			--	--	--	34	45	86			BW
Apr. 27	2:40 p. m.	135	806	1,443			--	--	--	25	36	89			BW
May 17	1:50 p. m.	238	957	1,940			6	9	14	26	46	90			BW
May 22	3:40 p. m.	164	2,450	1,760			6	8	14	34	68	93			BW
June 7	1:45 p. m.	142	2,440	1,830	31	40	47	52	54	64	80	90			BW
June 8	5:10 p. m.	180	706	1,582			21	23	25	40	65	96			BW
June 17	12:40 p. m.	135	287	542			--	--	--	38	55	86			BW
July 23	1:10 p. m.	77	232	494			--	--	29	34	48	93			BW
Aug. 26	9:40 a. m.	70	161	302			--	--	--	28	35	89			BW
Sept. 13	9:00 a. m.	102	369	683			--	--	17	20	27	69			BW

NIOBRARA RIVER BASIN--Continued

NIOBRARA RIVER NEAR CODY, NEBR.

LOCATION.--At county bridge a quarter of a mile downstream from gaging station which is 3 miles upstream from Medicine Creek, 5 miles downstream from Bear Creek, and 10 miles south of Cody, Cherry County.

RECORDS AVAILABLE.--Water temperatures: October 1948 to September 1949.

Sediment records: April 1948 to September 1949.

EXTREMES, 1948-49.--Water temperatures: Maximum, 77°F Aug. 9; minimum daily, not determined; minimum daily, not determined; minimum daily, not determined.

Sediment concentrations: Maximum daily, 6,000 ppm Mar. 5; minimum daily, not determined.

Sediment loads: Maximum daily, 23,000 tons Feb. 28; minimum daily, not determined.

EXTREMES, April 1948 to September 1949.--Sediment concentrations: Maximum daily, not determined; minimum daily, not determined.

Sediment loads: Maximum daily, 58,000 tons June 18, 1948; minimum daily, not determined.

REMARKS.--Investigations indicate that practically all the total sediment load is transported in suspension at this contracted section of the river.

Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, March to July 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent non- so- dium
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
Mar. 3, 1949	972	7.5	232	29	0.10	36	1.8	11	129	11	1.0	0.2	3.7	0.07	178	0.24			98	0	20
Mar. 8	728	7.5	262	35	.07	36	5.2	12	142	14	2.0	.2	3.3	.03	190	.26			112	0	19
May 16	477	7.5	271	49	.05	35	4.0	18	153	12	1.5	.4	1.8	--	209	.28			104	0	27
June 27	268	8.0	254	53	.03	32	3.4	18	146	9.6	1.5	.4	1.0	--	202	.27			94	0	30
July 27	210	7.8	238	60	.02	31	2.3	18	138	8.0	2.0	.4	.9	--	194	.26			87	0	31

NIOBRARA RIVER BASIN--Continued

NIOBRARA RIVER NEAR CODY, NEBR.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

(Once-daily temperature measurement at approximately 8 a. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	55	43	35	--	33	34	35	48	68	72	68	54
2	49	42	--	34	32	35	39	49	62	69	65	61
3	51	42	--	33	32	35	43	58	60	72	67	64
4	53	45	--	32	32	38	41	61	62	71	69	61
5	55	35	--	32	33	35	43	55	60	73	70	59
6	50	34	--	33	33	40	47	52	66	68	69	61
7	40	38	--	34	32	40	47	52	57	68	68	60
8	38	31	33	32	32	41	49	54	56	75	67	58
9	45	31	--	32	32	40	49	53	63	68	77	59
10	45	37	--	34	34	36	45	55	62	68	68	63
11	40	31	34	--	34	41	41	60	62	67	70	59
12	41	34	34	32	33	37	48	62	69	68	69	53
13	44	34	32	34	34	36	50	63	61	75	69	47
14	42	35	--	34	33	33	41	71	59	66	70	53
15	49	37	--	33	33	34	40	--	64	66	68	55
16	40	39	--	33	33	37	41	61	64	68	67	58
17	35	39	--	32	33	37	41	60	69	68	68	54
18	47	35	--	33	33	36	43	62	62	66	67	52
19	39	32	--	33	32	39	53	57	68	67	69	50
20	41	32	34	32	32	42	56	59	69	68	65	55
21	40	31	32	33	33	42	57	57	66	63	65	53
22	42	32	33	32	33	39	52	58	68	65	68	55
23	41	36	31	33	33	44	47	55	69	69	68	51
24	42	34	--	32	34	42	52	--	63	71	67	55
25	49	37	32	32	34	36	55	60	65	71	68	52
26	43	37	32	33	35	42	54	60	67	64	66	58
27	42	32	32	32	33	38	54	62	75	68	64	51
28	44	35	32	32	33	42	54	67	67	69	60	50
29	50	32	32	32	--	40	53	62	67	66	61	50
30	47	34	32	33	--	40	53	64	68	66	60	54
31	53	--	34	32	--	33	--	66	--	69	59	--
Average	45	35	--	33	33	38	47	59	65	69	67	56

NIOBRARA RIVER BASIN--Continued

NIOBRARA RIVER NEAR CODY, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	263	1,300	920	345	1,300	1,200	324	700	610
2-----	258	860	600	324	1,100	960	329	1,700	1,500
3-----	263	790	560	308	1,500	1,200	345	1,900	1,800
4-----	258	980	680	329	1,400	1,200	361	1,800	1,800
5-----	268	980	710	366	1,500	1,500	329	--	1/1,500
6-----	278	990	740	350	1,400	1,300	308	--	1/1,200
7-----	263	990	700	345	1,600	1,500	268	--	1/850
8-----	258	1,400	980	340	760	700	288	--	1/1,100
9-----	263	1,000	710	334	1,200	1,100	288	--	1/1,200
10-----	273	1,100	810	334	800	720	288	--	1/1,300
11-----	273	1,200	880	334	1,300	1,200	308	1,800	1,500
12-----	278	1,200	900	329	1,900	1,700	340	1,800	1,700
13-----	278	1,300	980	329	1,800	1,600	361	1,800	1,800
14-----	278	1,300	980	324	1,800	1,600	345	--	1/1,600
15-----	293	1,200	950	324	1,700	1,500	319	--	1/1,400
16-----	278	1,600	1,200	324	1,900	1,700	303	--	1/1,200
17-----	278	1,500	1,100	324	1,800	1,600	283	--	1/950
18-----	278	1,600	1,200	329	2,200	2,000	293	--	1/1,000
19-----	283	1,400	1,100	319	1,900	1,600	298	--	1/1,000
20-----	293	1,800	1,300	303	2,200	1,800	298	1,300	1,000
21-----	288	1,400	1,100	298	1,800	1,400	319	1,300	1,100
22-----	283	1,700	1,300	324	2,300	1,700	303	1,400	1,100
23-----	283	1,500	1,100	345	1,700	1,600	314	1,800	1,500
24-----	283	1,400	1,100	350	1,500	1,400	248	--	1/1,100
25-----	283	1,300	1,000	361	1,400	1,400	214	--	1/900
26-----	288	1,300	1,000	371	760	760	200	1,400	760
27-----	293	1,200	950	350	1,600	1,500	187	1,100	560
28-----	298	1,400	1,100	319	1,800	1,600	200	--	1/750
29-----	366	1,800	1,600	324	1,300	1,100	200	--	1/1,000
30-----	350	1,900	1,800	298	1,200	970	253	1,600	1,100
31-----	361	1,700	1,700	--	--	--	278	1,600	1,200
Total-	8,831	--	32,000	9,954	--	41,100	8,992	--	37,100
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	288	1,400	1,100	--	--	--	1,540	4,100	17,000
2-----	308	1,500	1,200	--	--	--	1,150	4,900	15,000
3-----	200	--	--	--	--	--	1,080	4,800	14,000
4-----	240	--	--	--	--	--	1,130	5,100	16,000
5-----	260	--	--	--	--	--	1,250	6,000	20,000
6-----	300	--	--	280	--	1/550	1,000	5,300	14,000
7-----	320	--	--	--	--	--	868	4,400	10,000
8-----	330	--	--	--	760	--	752	4,300	8,760
9-----	310	--	--	--	--	--	657	4,400	7,800
10-----	290	--	--	--	--	--	566	3,900	6,000
11-----	250	--	--	1,200	--	--	514	2,300	3,200
12-----	250	--	--	--	--	--	520	2,400	3,400
13-----	270	--	--	1,400	890	--	572	2,500	3,900
14-----	320	--	--	1,400	--	--	520	--	1/3,700
15-----	300	--	--	760	--	--	407	3,100	2/3,900
16-----	--	--	--	--	950	--	442	2,200	2,600
17-----	--	--	--	--	980	--	480	3,000	3,900
18-----	290	--	1/480	1,100	--	860	464	2,600	3,300
19-----	--	--	--	--	--	--	508	2,300	3,200
20-----	--	--	--	--	--	--	520	2,800	3,900
21-----	--	--	--	400	910	980	520	2,500	3,500
22-----	--	--	--	420	1,000	1,100	508	2,800	3,800
23-----	--	--	--	480	1,400	1,800	537	2,600	3,800
24-----	--	--	--	503	1,300	1,800	584	2,600	4,100
25-----	--	--	--	497	1,100	1,500	566	2,900	4,400
26-----	280	--	--	800	3,300	2/8,400	531	3,200	4,600
27-----	--	--	--	1,700	4,300	2/21,000	531	2,600	3,700
28-----	--	--	--	1,870	4,500	23,000	526	2,600	3,700
29-----	--	--	--	--	--	--	503	2,500	3,400
30-----	--	--	--	--	--	--	492	2,000	3,500
31-----	--	--	--	--	--	--	464	2,600	3,300
Total-	8,766	--	16,00	12,420	--	73,800	20,702	--	205,000

1/Estimated.

2/Sediment discharge computed by subdividing day.

1,100

NIOBRARA RIVER BASIN--Continued

NIOBRARA RIVER NEAR CODY, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	452	2,400	2,900	392	1,600	1,700	345	1,700	1,600
2-----	442	2,300	2,700	382	1,600	1,700	320	1,700	1,500
3-----	436	2,500	2,900	376	1,400	1,400	324	1,500	1,300
4-----	420	2,500	2,800	366	1,400	1,400	319	1,600	1,400
5-----	414	2,400	2,700	382	1,300	1,300	319	1,500	1,300
6-----	371	2,100	2,100	398	1,600	1,700	329	1,600	1,400
7-----	350	1,600	1,500	430	1,700	2,000	442	1,700	2/2,300
8-----	387	1,800	1,900	403	1,800	2,000	532	2,100	3,000
9-----	425	2,000	2,300	398	1,800	1,900	436	2,600	3,100
10-----	436	2,100	2,500	387	1,700	1,800	382	2,000	2,100
11-----	425	2,100	2,400	382	1,600	1,700	366	1,800	1,800
12-----	398	1,900	2,000	382	1,400	1,400	387	1,800	1,900
13-----	420	2,200	2,500	414	1,600	1,800	382	1,700	1,800
14-----	436	2,400	2,800	447	--	1/2,500	382	1,900	1,900
15-----	430	2,000	2,300	382	--	1/1,900	355	1,900	1,800
16-----	408	2,800	3,100	425	1,500	1,700	355	1,900	1,800
17-----	387	2,400	2,500	403	1,700	1,800	345	1,700	1,600
18-----	376	1,800	1,800	403	2,100	2,300	324	1,700	1,500
19-----	361	1,700	1,700	398	1,800	1,900	314	1,600	1,400
20-----	350	1,800	1,700	392	2,000	2,100	298	1,500	1,200
21-----	345	1,600	1,500	436	1,900	2,200	308	1,500	1,200
22-----	361	2,100	2,000	425	1,800	2,100	288	1,400	1,100
23-----	350	1,900	1,800	620	3,500	2/6,100	268	1,100	800
24-----	340	1,600	1,500	614	3,900	6,500	268	1,400	1,000
25-----	350	1,500	1,400	520	2,300	3,200	273	1,000	740
26-----	340	1,700	1,600	458	3,100	3,800	268	1,500	1,100
27-----	350	--	1/1,500	403	2,100	2,300	258	1,000	700
28-----	340	1,600	1,500	392	2,100	2,200	253	1,100	750
29-----	361	1,400	1,400	366	1,600	1,600	258	1,100	770
30-----	366	1,700	1,700	360	1,400	1,400	243	1,200	790
31-----	--	--	--	350	1,700	1,600	--	--	--
Total-	11,627	--	63,000	12,886	--	69,000	9,950	--	44,600
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	234	860	540	258	980	680	243	1,100	720
2-----	229	810	500	248	910	610	238	900	580
3-----	229	780	480	243	780	510	238	780	500
4-----	234	1,200	760	238	860	550	248	960	640
5-----	278	1,000	750	234	620	390	258	1,400	980
6-----	361	2,100	2,000	234	580	370	283	1,200	920
7-----	278	1,600	1,200	234	690	440	278	1,200	900
8-----	308	1,600	1,300	219	640	380	288	1,300	1,000
9-----	303	1,200	980	224	620	370	278	1,400	1,100
10-----	263	940	670	224	660	400	278	1,400	1,100
11-----	253	1,000	680	229	720	450	268	1,100	800
12-----	248	860	580	243	1,100	720	293	1,400	1,100
13-----	248	780	520	253	1,100	750	273	1,400	1,000
14-----	253	1,000	680	273	1,100	810	258	1,400	980
15-----	263	1,000	710	263	1,200	850	263	1,100	780
16-----	248	880	590	288	1,300	1,000	258	1,000	700
17-----	234	1,300	820	263	1,000	710	243	1,200	790
18-----	229	740	460	278	990	740	234	930	590
19-----	234	870	550	273	1,000	740	229	870	540
20-----	293	990	780	283	1,400	1,100	229	920	570
21-----	253	840	570	268	1,100	800	234	900	570
22-----	234	660	420	263	990	700	238	800	510
23-----	219	660	390	243	930	610	243	930	610
24-----	210	570	320	234	740	470	243	910	600
25-----	210	660	370	224	740	450	243	840	550
26-----	214	750	430	219	700	410	248	930	620
27-----	214	560	320	219	630	370	248	860	580
28-----	214	600	350	214	690	400	243	--	1/520
29-----	229	740	460	229	820	510	248	800	540
30-----	229	690	430	238	820	530	263	990	700
31-----	273	930	690	248	930	620	--	--	--
Total-	7,719	--	20,300	7,601	--	18,400	7,629	--	22,100

Total discharge for year (second-foot-days) ----- 127,077
 Total load for year (tons) ----- 642,000

1/Estimated.

2/Sediment discharge computed by subdividing day.

NIOBRARA RIVER BASIN--Continued

NIOBRARA RIVER NEAR CODY, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment													Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters												
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000		
Oct. 13, 1948																	
Oct. 13, 1948	3:47 p. m.	263	1,180	1,250			2	3	6		14	69		97	--	BN	
Nov. 3	2:26 p. m.	319	1,610	1,950			4	4	7		14	49		87	--	BN	
Mar. 8, 1949	2:15 p. m.	720	3,240	3,020			4	7	13		27	53		85	--	BN	
Apr. 8	10:58 a. m.	420	2,030	2,590			2	3	10		25	87		99	--	BN	
May 5	11:42 a. m.	388	1,700	2,290			6	7	13		31	79		97	--	BN	
June 6	10:33 a. m.	334	1,520	2,020			--	5	9		19	57		93	--	BN	
July 13	11:07 a. m.	258	970	1,180			--	--	7		15	58		99	BN		
Sept. 16	12:20 p. m.	268	1,020	1,030			--	12	14		20	61		88	97	BW	

NIORARA RIVER BASIN--Continued
NIORARA RIVER NEAR SPARKS, NEBR.

LOCATION.--At gaging station at bridge on State Highway 7, 2.2 miles downstream from Big Beaver Creek, 5½ miles downstream from Minnechadza Creek, and 6½ miles southwest of Sparks, Cherry County.
DRAINAGE AREA.--6,406 square miles.
RECORDS AVAILABLE.--Sediment records: May 1947 to September 1949.
EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 6,300 ppm May 30; minimum daily, not determined.
Sediment loads: Maximum daily, 38,000 tons May 30; minimum daily, not determined.
EXTREMES, 1947-49.--Sediment concentrations: Maximum daily, 6,300 ppm May 30, 1949; minimum daily, not determined.
Sediment loads: Maximum daily, 38,000 tons May 30, 1949; minimum daily, not determined.
REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, March to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium
																Parts per mil- lion	Tons per acre- foot	Tc's per day	Total	Non- carbon- ate	
Mar. 2, 1949-----	3,520	8.1	216	38	0.08	31	2.3	11	116	12	0.5	0.5	0.3	3.4	0.02	171	0.23		87	0	22
Mar. 7 "-----	1,710	7.5	242	38	10	31	4.0	15	130	12	3.0	3.0	.2	3.3		180	.24		94	0	25
May 11 "-----	958	8.0	249	53	.04	35	3.4	14	142	12	1.0	1.0	.4	1.1		197	.27		102	0	23
May 24 "-----	1,340	7.8	257	49	.04	36	3.9	14	148	10	1.0	1.0	.4	1.8		203	.28		106	0	22
June 30 "-----	1,750	7.9	226	56	.02	32	2.8	13	131	8.8	1.0	1.0	.4	1.0		186	.25		92	0	24
Aug. 2 "-----	680	8.1	208	56	.10	28	3.1	16	124	11	1.0	1.0	.4	1.2		184	.25		83	0	29
Sept. 10 "-----	730	7.8	201	46	.02	28	5.0	9.4	124	6.8	.2	.2	.3	1.1		172	.23		91	0	18

NIOBRARA RIVER BASIN--Continued

NIOBRARA RIVER NEAR SPARKS, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December					
	Mean dis- charge (second- feet)	Suspended sediment		Mean dis- charge (second- feet)	Suspended sediment		Mean dis- charge (second- feet)	Suspended sediment				
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day			
1-----	740	1,200	2,400	958	1,900	4,900	782	1,200	2,500			
2-----	771	1,100	2,300	837	1,700	3,800	771	1,400	2,900			
3-----	740	1,700	1/3,900	859	1,200	2,800	804	1,100	2,400			
4-----	750	1,000	2,000	859	1,300	3,000	815	960	2,100			
5-----	740	1,000	2,000	936	1,700	4,300	740	940	1,900			
6-----	815	1,200	2,600	903	1,700	4,100	640	1,000	1,700			
7-----	760	1,200	2,500	859	2,300	5,300	720	780	1,500			
8-----	750	930	1,900	870	1,600	3,800	782	690	1,500			
9-----	730	1,200	2,400	870	1,500	3,500	700	720	1,400			
10-----	760	1,600	1/3,600	881	1,400	3,300	720	810	1,600			
11-----	760	1,300	2,700	859	1,200	2,800	859	990	2,300			
12-----	760	1,100	2,300	859	1,300	3,000	958	1,100	2,800			
13-----	750	1,100	2,200	859	1,300	3,000	958	900	2,300			
14-----	760	1,100	2,300	826	1,600	3,600	936	--	2/2,400			
15-----	782	1,100	2,300	848	1,100	2,500	903	--	2/2,400			
16-----	782	1,100	2,300	826	780	1,700	804	990	2,100			
17-----	760	1,400	2,900	826	1,400	3,100	750	870	1,800			
18-----	760	1,300	2,700	848	2,000	4,600	892	970	2,300			
19-----	760	1,200	2,500	804	1,900	4,100	837	840	1,900			
20-----	771	1,300	2,700	815	1,700	3,700	936	720	1,800			
21-----	793	1,300	2,800	815	1,400	3,100	936	510	1,300			
22-----	804	1,300	2,800	826	1,200	2,700	936	480	1,200			
23-----	793	1,100	2,400	826	1,200	1/2,900	914	--	2/1,200			
24-----	782	990	2,100	815	990	2,200	793	--	2/1,000			
25-----	804	1,100	2,400	837	810	1,800	670	--	2/700			
26-----	826	1,400	3,100	826	1,100	2,500	740	--	2/800			
27-----	826	1,300	2,900	826	630	1,400	650	--	2/600			
28-----	815	1,600	3,500	771	1,300	2,700	600	550	890			
29-----	903	1,500	3,700	782	1,200	2,500	600	870	1,400			
30-----	969	1,600	4,200	782	1,000	2,100	600	490	790			
31-----	892	2,100	5,100	--	--	--	650	850	1,500			
Total-	24,408	--	85,500	25,308	--	94,800	24,396	--	52,980			
	January			February			March					
1-----	700	710	1,300	800	--	2/440	2,600	900	6,300			
2-----	700	670	1,300				2,600	2,200	1/17,000			
3-----	600	--	2/900				2,320	2,100	13,000			
4-----	400	--	2/320				*2,270	1,400	8,600			
5-----	300	--	2/110				2,510	3,000	1/27,000			
6-----	500	--	2/220				2,000	2,400	13,000			
7-----	600	200	320				1,740	1,900	8,900			
8-----	650	--	2/440				1,570	2,200	9,300			
9-----	700	--	2/550				1,420	2,100	8,100			
10-----	750	--	2/600				1,330	2,300	8,300			
11-----	800	--	2/340				1,210	1,800	5,900			
12-----	750	90	180				1,170	1,700	5,400			
13-----	700	84	160				1,200	1,600	5,200			
14-----	650	72	130				1,230	1,700	5,600			
15-----	650	66	120				1,040	2,100	1/7,500			
16-----	650	--	2/120				1,060	1,300	3,700			
17-----	600	--	2/180				1,120	1,700	5,100			
18-----							1,120	1,800	5,400			
19-----							1,120	1,900	5,700			
20-----							1,150	2,000	6,200			
21-----							1,140	2,100	6,500			
22-----							1,160	2,300	7,200			
23-----							1,200	2,500	8,100			
24-----							1,320	2,600	9,300			
25-----							1,300	2,500	8,800			
26-----							1,270	2,200	7,500			
27-----							1,230	2,500	8,300			
28-----							1,260	2,200	7,500			
29-----							1,240	2,100	7,000			
30-----							1,270	1,600	5,500			
31-----							1,220	1,600	5,300			
Total-	19,100	--	9,800	22,400	--	12,300	45,390	--	256,200			

1/Sediment discharge computed by subdividing day.

2/Estimated.

NIOBRARA RIVER BASIN--Continued

NIOBRARA RIVER NEAR SPARKS, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,120	1,700	5,100	1,090	1,300	3,800	1,110	2,700	1/8,500
2-----	1,150	1,600	5,000	992	900	2,400	1,020	2,000	5,500
3-----	1,150	2,000	6,200	947	750	1,900	859	1,900	4,400
4-----	1,110	2,000	6,000	958	1,500	3,900	914	1,400	3,500
5-----	1,120	1,800	5,400	992	1,200	3,200	881	1,400	3,300
6-----	1,110	1,600	4,800	1,030	1,000	2,800	848	1,100	2,500
7-----	1,030	2,100	5,800	980	2,100	5,600	892	1,300	3,100
8-----	1,020	2,000	5,500	1,030	1,000	2,800	1,040	1,600	4,500
9-----	1,120	1,800	5,700	969	990	2,600	1,110	1,300	3,900
10-----	1,140	2,200	6,800	947	1,000	2,600	914	1,800	4,400
11-----	1,020	1,800	5,000	903	780	1,900	925	1,200	3,000
12-----	1,000	1,600	4,300	958	1,200	3,100	848	1,000	2,300
13-----	1,020	1,900	5,200	903	1,500	3,700	881	1,100	2,600
14-----	1,100	1,900	5,600	1,150	1,900	6,300	892	1,100	2,600
15-----	1,020	1,600	4,400	992	1,000	2,700	859	780	1,800
16-----	992	1,500	4,000	1,000	1,200	3,200	826	840	1,900
17-----	925	1,400	3,500	1,080	1,300	3,800	782	1,700	3,600
18-----	903	1,300	3,200	1,040	1,300	3,700	815	990	2,200
19-----	903	1,200	2,900	958	1,200	3,100	815	630	1,400
20-----	870	1,000	2,300	958	1,100	2,800	760	780	1,600
21-----	881	990	2,100	1,080	1,500	4,400	780	810	1,700
22-----	881	930	2,200	1,090	1,700	1/5,300	771	720	1,500
23-----	892	840	2,000	1,120	1,400	4,200	815	810	1,800
24-----	870	1,600	3,800	1,330	1,400	5,000	730	1,200	2,400
25-----	881	1,000	2,400	1,170	840	2,700	760	750	1,500
26-----	892	840	2,000	1,090	840	2,500	771	570	1,200
27-----	881	840	2,000	958	1,600	4,100	771	660	1,400
28-----	892	720	1,700	947	960	2,500	740	1,000	2,000
29-----	848	1,300	3,000	1,090	2,200	1/9,700	793	900	1,900
30-----	1,110	1,800	5,400	1,880	6,300	1/38,000	804	720	1,600
31-----	--	--	--	1,180	2,700	8,600	--	--	--
Total-	29,851	--	123,300	32,812	--	152,900	25,706	--	83,600
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	700	900	1,700	710	900	1,700	650	780	1,400
2-----	771	630	1,300	690	450	840	630	960	1,600
3-----	750	450	910	660	570	1,000	710	990	1,900
4-----	826	570	1,300	660	840	1,500	710	840	1,600
5-----	793	840	1,800	620	1,100	1,800	710	660	1,300
6-----	859	810	1,900	650	690	1,200	730	690	1,400
7-----	848	720	1,600	650	800	1,100	730	840	1,700
8-----	782	720	1,500	620	800	1,000	760	1,100	2,300
9-----	848	750	1,700	610	800	990	710	1,200	2,300
10-----	750	730	1,600	690	580	1,100	730	750	1,500
11-----	760	780	1,600	630	570	970	771	1,000	2,100
12-----	710	660	1,300	650	630	1,100	826	1,100	2,500
13-----	760	570	1,200	700	610	1,200	804	1,000	2,200
14-----	740	1,000	2,000	700	860	1,200	720	840	1,600
15-----	700	1,100	2,100	680	600	1,100	710	950	1,800
16-----	720	660	1,300	700	590	1,100	690	950	1,800
17-----	690	570	1,100	710	650	1,200	720	750	1,500
18-----	660	540	960	760	1,200	2,500	720	870	1,700
19-----	670	590	1,100	760	1,300	1/2,900	670	840	1,500
20-----	804	990	2,100	782	870	1,800	660	870	1,600
21-----	804	720	1,600	760	720	1,500	690	810	1,500
22-----	670	1,100	2,000	690	710	1,300	700	1,000	1,900
23-----	700	660	1,200	690	720	1,300	680	910	1,700
24-----	690	690	1,300	650	660	1,200	700	660	1,200
25-----	620	690	1,200	620	570	950	710	870	1,700
26-----	680	780	1,400	700	960	1,800	670	990	1,800
27-----	680	570	1,000	650	780	1,400	710	750	1,400
28-----	640	420	730	650	750	1,300	720	780	1,500
29-----	750	420	850	660	750	1,300	690	760	1,400
30-----	690	610	1,100	640	690	1,200	710	1,200	2,300
31-----	690	720	1,300	650	600	1,100	--	--	--
Total-	22,755	--	43,750	20,992	--	41,650	21,341	--	51,700
Total discharge for year (second-foot days)-----									314,459
Total load for year (tons)-----									1,008,000

1/Sediment discharge computed by subdividing day.

NIOBRARA RIVER BASIN--Continued

NIOBRARA RIVER NEAR SPARKS, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;

W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Oct. 8, 1948	1:40 p. m.	760	528	1,130				11	13	19	28	---			BN
Oct. 8	12:20 p. m.	730	619	1,160				5	9	14	27	---			BN
Nov. 8	2:35 p. m.	871	1,680	2,480				3	7	14	27	---			BN
Nov. 24	2:30 p. m.	837	1,260	2,360				4	8	16	34	---			BW
Feb. 25, 1949	3:45 p. m.	1,600	804	2,520				--	--	34	56	94			BW
Mar. 7	4:00 p. m.	1,710	1,650	2,920				14	22	34	48	81			BW
Apr. 23	2:55 p. m.	815	284	550				12	21	26	45	---			BW
May 3	2:20 p. m.	903	509	1,320				7	9	18	41	---			BW
May 11	10:50 a. m.	958	668	1,280				8	9	15	33	---			BW
June 16	5:30 p. m.	720	360	1,779				26	34	50	62	93			BW
June 30	4:30 p. m.	750	683	1,300				--	--	18	32	---			BW
July 16	9:20 a. m.	771	1,150	2,140				--	--	21	36	---			BW
Aug. 2	12:00 m.	680	492	745				--	--	22	36	85		100	BW
Aug. 24	10:20 a. m.	660	440	847				--	--	25	40	83			BW
Sept. 26	4:00 p. m.	680	525	991				--	22	31	52	---			BW

1/ Mean-daily discharge.

NIOBRARA RIVER BASIN--Continued

LONG PINE CREEK NEAR RIVERVIEW, NEBR.

LOCATION.--At gaging station at county highway bridge, about a mile downstream from Bone Creek, and 5½ miles southwest of Riverview, Keya Paha County.

DRAINAGE AREA.--390 square miles.

RECORDS AVAILABLE.--Sediment concentrations: Maximum daily, 6,900 ppm July 8; minimum daily, not determined.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 16 tons Jan. 5.

Sediment loads: Maximum daily, 7,000 tons June 12; minimum daily, 6,900 ppm July 8, 1949; minimum daily, not determined.

EXTREMES, April 1948 to September 1949.--Sediment concentrations: Maximum daily, 14 tons June 10, 1948.

Sediment loads: Maximum daily, 7,000 tons June 12, 1949; minimum daily, 6,900 ppm July 8, 1949; minimum daily, not determined.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply paper 1146.

Chemical analyses, in parts per million, April to July 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- lids
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
Apr. 6, 1949	259	7.8	180	27	0.06	23	5.5	12	3.0	103	16	1.0	0.5	2.0	0.06	174	0.24	80	80	0	24
May 3	112	7.4	171	54	.02	28	2.3	10	3.0	95	3.6	1.5	.2	2.3		146	.20	80	80	2	8
May 25	138	8.0	171	48	.02	24	1.0	10	6.7	99	.4	.8	.6	2.7		152	.21	64	64	0	26
June 12	228	7.1	217	28	.04	34	4.0	11		131	4.0	1.0	.2	3.0		164	.22	102	102	0	13
July 25	98	7.3	161	58	.05	22	.5			92	1.4	1.5	.2	1.3		143	.19	57	57	0	29

NIOBRARA RIVER BASIN--Continued

LONG PINE CREEK NEAR RIVERVIEW, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	91	450	110	100	300	81	100	530	140
2-----	91	310	78	103	320	89	107	610	180
3-----	91	270	68	103	330	92	107	570	160
4-----	91	270	66	101	350	95	107	560	160
5-----	98	280	74	105	420	120	105	520	150
6-----	101	300	82	101	390	110	105	470	130
7-----	101	260	71	100	380	100	109	430	130
8-----	100	260	70	100	410	110	109	390	110
9-----	98	240	64	98	450	120	109	370	110
10-----	98	230	61	101	480	130	105	500	140
11-----	98	230	61	101	470	130	110	530	160
12-----	96	220	57	100	420	110	110	540	160
13-----	101	220	60	100	420	110	112	500	150
14-----	101	200	55	101	420	110	112	530	160
15-----	103	180	50	101	450	120	107	460	130
16-----	105	210	60	101	470	130	107	420	120
17-----	105	210	60	103	540	150	107	420	120
18-----	105	220	62	101	720	200	109	480	140
19-----	103	230	64	101	--	1/220	110	490	150
20-----	102	250	70	101	--	1/220	110	500	150
21-----	103	260	72	103	--	1/200	107	510	150
22-----	103	270	75	107	--	1/170	112	620	190
23-----	101	270	74	103	570	160	114	540	170
24-----	101	290	79	103	510	140	114	360	110
25-----	101	290	79	98	460	120	110	570	170
26-----	103	300	83	98	470	120	110	710	210
27-----	103	340	95	98	420	110	110	680	200
28-----	103	340	95	101	420	110	109	430	130
29-----	103	340	95	100	420	110	109	--	1/140
30-----	103	360	110	105	580	160	110	460	140
31-----	103	340	95	--	--	--	109	420	120
Total-	3,107	--	2,290	3,038	--	3,950	3,371	--	4,580
Day	January			February			March		
	Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	109	430	130	110	1,800	530	138	980	370
2-----	112	380	110	110	1,600	480	132	1,000	360
3-----	95	--	1/55	103	1,200	330	142	1,000	380
4-----	100	--	1/22	109	1,300	380	149	1,100	440
5-----	105	--	1/16	110	910	270	144	1,400	540
6-----	115	--	1/50	112	660	200	134	1,100	400
7-----	125	1,400	470	114	530	160	124	900	300
8-----	120	640	210	114	500	150	120	820	270
9-----	115	--	1/150	112	460	140	112	720	220
10-----	115	--	1/150	114	610	190	110	620	180
11-----	110	--	1/170	116	460	140	116	700	220
12-----	107	680	200	114	--	1/130	116	590	180
13-----	110	480	140	114	--	1/170	116	610	190
14-----	110	400	120	114	530	160	114	610	190
15-----	107	400	120	114	480	150	105	670	190
16-----	95	--	1/95	114	440	140	107	700	200
17-----	95	480	120	116	460	140	112	670	200
18-----	100	--	1/150	116	460	140	118	780	250
19-----				112	420	130	122	1,000	330
20-----				112	540	160	128	1,200	410
21-----				112	440	130	134	1,200	430
22-----				116	610	190	124	1,200	400
23-----				124	1,200	400	128	1,100	380
24-----				140	1,100	420	126	1,100	370
25-----				128	1,200	410	120	760	250
26-----				138	1,300	480	149	960	390
27-----				138	1,200	450	166	1,200	600
28-----				130	1,000	350	193	2,000	1,000
29-----				--	--	--	155	1,200	500
30-----				--	--	--	149	900	360
31-----				--	--	--	130	1,000	350
Total-	3,245	--	4,400	3,276	--	7,120	4,053	--	10,850

1/Estimated.

NIOBRARA RIVER BASIN--Continued

LONG PINE CREEK NEAR RIVERVIEW, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949 --Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	154	780	280	120	850	280	122	1,600	530
2-----	140	720	270	120	780	250	122	1,100	360
3-----	136	780	290	100	580	160	112	880	270
4-----	159	1,100	470	107	660	190	110	720	210
5-----	247	3,900	2/2,800	114	900	280	109	740	220
6-----	264	2,800	2,000	112	900	270	107	620	180
7-----	205	1,800	1,000	112	900	270	107	870	190
8-----	155	1,800	750	112	660	200	109	720	210
9-----	162	2,000	870	109	850	250	118	940	300
10-----	218	3,000	1,800	109	900	260	120	900	290
11-----	193	2,900	1,500	105	700	200	114	610	190
12-----	170	1,200	550	103	560	160	216	4,800	2/7,000
13-----	134	1,300	470	103	740	210	182	2,300	1,100
14-----	138	840	310	103	930	260	209	2,200	1,200
15-----	138	720	270	103	540	150	153	1,100	450
16-----	144	900	350	105	480	140	120	990	320
17-----	130	770	270	100	460	120	114	770	240
18-----	112	560	170	103	640	180	107	530	150
19-----	110	720	210	109	930	270	109	530	160
20-----	110	960	290	107	1,000	290	109	450	130
21-----	112	1,200	360	124	730	240	112	350	110
22-----	110	880	260	149	650	260	107	300	87
23-----	112	960	290	159	760	330	93	340	85
24-----	114	960	300	149	610	250	107	400	120
25-----	116	720	230	138	450	170	101	740	200
26-----	116	720	230	130	550	190	96	770	200
27-----	114	1,100	340	114	570	180	103	670	190
28-----	114	700	220	126	480	160	96	670	170
29-----	112	530	160	112	540	160	96	690	180
30-----	112	700	210	114	690	210	96	1,000	260
31-----	--	--	--	122	920	300	--	--	--
Total-	4,331	--	17,520	3,593	--	6,840	3,576	--	15,300
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	90	450	110	93	900	230	93	560	140
2-----	90	430	100	88	900	210	91	590	140
3-----	90	530	130	90	1,300	320	94	580	150
4-----	85	540	120	88	1,200	290	109	530	160
5-----	85	530	120	83	1,100	250	101	450	120
6-----	85	580	130	82	960	210	105	610	170
7-----	93	1,200	2/430	80	560	120	101	430	120
8-----	243	6,900	2/6,200	82	830	180	98	380	100
9-----	116	2,200	690	115	4,700	2/2,100	96	640	170
10-----	101	1,300	350	142	5,200	2,000	103	1,300	360
11-----	96	830	220	103	1,000	280	105	720	200
12-----	96	590	150	96	670	170	105	700	200
13-----	100	610	160	96	620	160	100	670	180
14-----	98	610	160	96	450	120	98	540	140
15-----	96	780	200	100	590	160	94	590	150
16-----	96	830	220	96	450	120	96	1,200	310
17-----	96	640	170	101	380	100	93	--	1/260
18-----	93	660	170	98	1,600	420	90	--	1/170
19-----	93	780	200	107	1,000	290	91	450	110
20-----	101	1,100	300	93	420	110	90	340	83
21-----	96	--	1/200	86	370	86	91	540	130
22-----	91	--	1/160	86	370	86	93	560	140
23-----	90	540	130	86	320	74	91	510	130
24-----	93	530	130	90	220	54	93	900	230
25-----	90	560	140	93	260	65	93	700	180
26-----	94	530	130	91	290	71	91	510	130
27-----	93	580	150	91	320	79	93	350	88
28-----	94	880	220	90	240	58	91	270	66
29-----	100	800	220	94	160	41	91	400	98
30-----	94	820	210	94	140	36	94	640	160
31-----	91	830	200	93	420	110	--	--	--
Total-	3,069	--	12,220	2,923	--	8,600	2,874	--	4,780
Total discharge for year (second-foot-days) -----									40,456
Total load for year (tons) -----									98,450

1/Estimated.

2/Sediment discharge computed by subdividing day.

NIOBRARA RIVER BASIN--Continued
LONG PINE CREEK NEAR RIVERVIEW, NEBR.--Continued

Particle-size analyses of suspended sediment water year October 1948 to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)		Concentration of suspension analyzed (ppm)		Percent finer than indicated size, in millimeters									
			0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500		1.000		
Oct. 4, 1948	4:55 p. m.	98	212	453	--	--	--	15	22	31	40	87		99		BN
Oct. 13	2:20 p. m.	101	196	372	--	--	--	12	17	25	40	88		98		BN
Nov. 2	4:20 p. m.	103	334	669	--	--	--	9	12	18	29	63		91		BN
Nov. 23	2:00 p. m.	103	406	880	--	--	--	8	11	18	37	65		89		BN
Dec. 9	2:00 p. m.	105	354	672	--	--	--	9	11	18	32	82		97		BN
Mar. 7, 1949	1:15 p. m.	124	1,400	2,470	--	--	--	--	8	14	20	54		--		EW
Apr. 6	11:20 a. m.	269	2,770	2,860	--	14	16	21	30	45	65	--		--		EW
Apr. 6	11:20 a. m.	289	2,770	2,950	--	14	18	23	30	45	62	--		--		BN
May 3	9:40 a. m.	114	740	1,450	--	--	--	--	12	24	31	85		--		EW
May 25	11:35 a. m.	138	448	813	--	--	--	11	14	24	41	--		--		EW
June 12	4:40 p. m.	1,068	31,550	9,870	17	24	32	40	50	69	86	--		--		EW
June 12	6:15 p. m.	518	18,300	5,340	19	28	38	46	56	76	96	--		--		EW
June 12	6:15 p. m.	518	18,300	5,340	14	24	37	48	60	84	95	--		--		BN
June 12	8:20 p. m.	269	9,890	5,820	28	40	54	64	75	87	96	--		--		EW
June 22	5:10 p. m.	107	529	1,220	--	--	--	--	--	19	25	53		--		EW
July 12	1:10 p. m.	105	695	1,130	--	--	--	--	23	34	44	74		--		EW
Aug. 13	4:00 p. m.	107	488	794	--	--	--	--	--	39	59	--		--		EW
Aug. 23	2:50 p. m.	93	298	675	--	--	--	--	--	30	48	93		--		EW
Sept. 7	3:50 p. m.	105	445	885	--	--	--	--	--	21	32	--		--		EW

NIORARA RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN NIOBRARA RIVER BASIN

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium
																	Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- car- bon- ate

Snake River near Burge, NEBR.

Mar. 7, 1949	355	7.3	183	48	0.10	24	3.6	11	0	96	14	2.0	0.2	0.2	2.5	0.06	162	0.32	75	0	24
May 9	279	7.5	203	54	.02	22	3.3	14	0	102	12	1.0	.4	1.6	1.3		154	.21	69	0	32
June 15	253	7.5	184	57	.01	21	.3	18	0	100	8.0	.2	.3	1.3	1.0		166	.23	54	0	47
July 14	227	7.7	176	55	.05	20	1.0	19	0	95	14	.2	.4	1.0	1.6		158	.21	54	0	43

Minnehaduz Creek at Valentine, NEBR.

Oct. 1, 1948	7	8.1	308	45	0.04	44	6.0	16	0	188	12	1.0	0.3	0.6	0.3	0.03	224	0.30	134	0	21
Mar. 2, 1949	108	7.5	268	29	.03	35	5.0	16	0	152	10	3.0	.1	3.0	.06		196	.27	108	0	24
May 24	92	8.2	294	35	.03	46	4.3	14	5	176	7.2	.7	.6	2.7	--		220	.30	133	0	15
June 30	28	7.7	280	42	.02	44	4.6	7.8	0	172	2.4	.2	.4	1.6	--		214	.29	129	0	12

Plum Creek near Meadville, NEBR.

Oct. 4, 1948	81	7.8	175	59	0.04	25	3.0	14	0	109	12	1.0	0.3	1.2	0.00		160	0.22	75	0	29
Mar. 13, 1949	99	7.4	207	51	.05	34	3.0	4.1	0	120	4.0	1.0	.3	1.8	.05		171	.23	98	0	8
Apr. 29	89	7.5	194	53	.05	31	4.4	2.8	0	116	3.2	.8	.3	1.0	.16		167	.23	96	1	6
June 22	97	7.2	231	53	.02	29	4.7	14	0	138	6.4	.8	.5	1.8	--		188	.26	92	0	26
Aug. 1	85	8.0	176	60	.05	26	2.1	10	0	109	3.4	.5	.4	1.6	--		169	.23	74	0	23
Sept. 22	14	8.1	183	56	.04	27	2.3	6.9	0	108	1.0	.5	.3	1.3	--		162	.22	77	0	16

Keyapaha River near Hidden Timber, S. Dak.

Mar. 1, 1948	50	7.0	253	22	0.05	30	5.0	19	0	144	12	2.0	0.0	3.4	0.00		180	0.34	95	0	20
Mar. 7	75	7.0	258	21	.08	30	3.2	21	0	146	10	1.0	.1	3.8	.00		198	.36	98	0	35
May 4	23	7.7	459	28	.02	55	11	29	0	284	8.8	2.2	.5	2.0	.11		312	.42	182	0	28
May 26	31	7.9	448	36	.08	55	8.2	43	0	296	15	2.2	.5	2.0	--		332	.45	171	0	35
July 18	9.0	7.9	398	48	.10	47	6.6	36	0	249	12	2.6	.4	1.8	--		298	.41	145	0	35
Sept. 8	6.0	8.3	393	50	.02	50	6.5	29	20	212	2.5	3.0	.4	.4	--		280	.38	152	0	30

NIOBRARA RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN NIOBRARA RIVER BASIN--Continued
Chemical analyses, in parts per million, water year October 1948 to September 1949--Continued

Date of collection	Dis-charge (second-foot)	pH	Specific conductance (micro-mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Car-bonate (CO ₃)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids		Hardness as CaCO ₃		Per-cent so-dium
																	Parts per mil-lion	Tons per acre-foot	Tons per day	Total	Non-carbon-ate

KEYAPAPA RIVER AT WEWELA, S. DAK.

Mar. 1, 1949	330	7.4	259	23	0.05	28	3.8	25		0	134	24	1.0	0.0	4.0	0.03	189	0.26		86	0	39
May 4	69	8.5	468	43	.03	53	7.3	45		18	250	19	2.5	.5	1.5		326	.44		163	0	38
May 25	79	8.3	431	42	.08	56	3.7	44		8	265	14	2.0	.5	1.5		314	.43		155	0	38
July 7	23	8.2	461	48	.02	53	5.8	46		12	258	19	2.0	.5	1.7		336	.46		157	0	39
Sept. 7	27	7.2	418	48	.02	52	6.2	29		0	253	6.0	2.3	.4	1.4		280	.38		156	0	29
Sept. 27	18	8.2	417	44	.02	56	6.5	28		14	236	5.0	2.7	.4	.9		286	.39		166	0	27

VERDIGRE RIVER NEAR VERDIGRE, NEBR.

Mar. 1, 1949	21	7.7	301	39	0.10	47	6.7	2.8		0	166	5.6	2.0	0.2	6.5	0.05	220	0.30		144		4
Mar. 6	---	---	316	28	.04	48	7.4	6.0		0	140	36	3.0	.2	8.6	.03	220	.30		150		8
Mar. 22	306	7.5	349	25	.05	53	5.2	15		0	156	45	2.5	.1	10	.01	245	.33		154		18
Apr. 1	481	7.5	418	31	.01	60	8.6	12	4.4		0	168	64	3.3	.1	.00	300	.41		185		47
July 12	---	8.4	307	45	.02	44	5.1	16		10	148	19	1.5	.2	6.3		240	.33		131		21
Sept. 11	---	7.3	277	21	.04	44	5.2	12		0	156	25	.9	.4	1.1		186	.25		132		4
Sept. 27	104	8.0	322	38	.02	51	6.5	12		0	178	24	.6	.2	7.8		238	.32		154		8

NIOBRARA RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN NIOBRARA RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)
SNAKE RIVER NEAR BURGE, NEBR.			
Oct. 9, 1948-----	236	743	473
Oct. 14-----	241	774	504
Oct. 28-----	256	642	444
Nov. 4-----	250	1,160	783
Nov. 16-----	260	537	377
Dec. 2-----	256	562	388
Dec. 16-----	241	779	507
Mar. 7, 1949-----	355	1,030	987
Apr. 7-----	286	524	405
May 4-----	260	486	341
May 9-----	272	686	504
May 23-----	332	638	572
June 8-----	328	573	507
June 15-----	253	533	364
June 29-----	224	602	364
July 14-----	224	420	254
July 28-----	198	389	208
Aug. 22-----	221	408	243
Aug. 26-----	221	549	328
Sept. 6-----	260	289	203
Sept. 15-----	241	371	241
Sept. 20-----	227	482	295
KEYAPAHA RIVER NEAR HIDDEN TIMBER, S. DAK.			
Aug. 6, 1948-----	7.3	80	1.6
Oct. 6-----	5.8	27	.4
May 4, 1949-----	15.5	170	7.1
May 26-----	23.1	176	11.0
June 7-----	2.1	140	.8
June 16-----	6.8	101	1.9
Sept. 8-----	1.9	66	.3
Sept. 28-----	1.9	82	.4
KEYAPAHA RIVER AT WEWELA, S. DAK.			
Aug. 5, 1948-----	27.6	115	8.6
Oct. 6-----	20.2	37	2.0
Mar. 1, 1949-----	330	324	289
Mar. 10-----	125	234	79
Apr. 5-----	196	598	316
May 3-----	75.0	193	39
May 4-----	69.3	231	43
May 25-----	80.0	1,640	354
June 8-----	8.6	121	2.8
June 15-----	44.6	176	21
Sept. 7-----	26.5	78	5.6
Sept. 21-----	17.3	53	2.5
VERDIGRE RIVER AT VERDIGRE, NEBR.			
Oct. 13, 1948-----	78	1,640	345
Oct. 26-----	77	1,330	277
Nov. 9-----	93	1,250	314
Dec. 7-----	88	1,210	287
Dec. 20-----	99	1,130	302
Mar. 22, 1949-----	306	6,600	5,450
Apr. 1-----	481	5,140	6,680
Apr. 12-----	264	1,900	1,350
Apr. 25-----	165	1,300	579
May 10-----	154	1,940	807
May 24-----	191	1,520	784
June 7-----	121	778	254
June 22-----	94	846	215
July 7-----	78	706	149
July 18-----	66	847	151
Aug. 15-----	100	1,040	281
Aug. 30-----	78	799	168
Sept. 12-----	367	3,960	3,920
Sept. 27-----	104	1,860	522

NIOBRARA RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN NIOBRARA RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500
SNAKE RIVER NEAR BURGE, NEBR.															
Oct. 9, 1948	1:10 p. m.	236	743	1,410				4	6	10	24	84		97	BN
Oct. 14	11:15 a. m.	241	774	--				--	4	8	17	72		94	BN
Oct. 28	12:40 p. m.	256	642	1,280				10	11	17	30	82		99	BN
Nov. 4	10:20 a. m.	250	1,180	--				--	--	6	13	58		90	BN
Mar. 7, 1949	2:35 p. m.	355	1,030	2,110				6	8	14	28	63		92	BN
Apr. 7	2:35 p. m.	286	524	1,710				12	12	22	42	100		--	BN
May 4	12:45 p. m.	260	486	1,430				5	12	22	48	97		99	BN
May 9	12:45 p. m.	272	686	1,390				--	--	--	38	91		98	BN
May 23	1:00 p. m.	332	638	1,180				--	--	28	34	93		99	BN
June 8	12:30 p. m.	328	573	1,460				--	--	--	33	60		95	BN
June 15	1:20 p. m.	253	533	1,070				--	--	21	30	84		97	BN
July 14	12:35 p. m.	224	420	1,400				--	--	14	24	73		96	BN
July 28	11:20 a. m.	198	389	729				--	7	11	21	78		93	BN
Aug. 22	12:15 p. m.	221	408	883				--	--	--	23	79		97	BN
Sept. 6	12:50 p. m.	260	289	548				--	--	--	12	75		99	BN
Sept. 20	8:25 a. m.	227	482	1,090				--	4	6	15	97		99	BN

KEYAPAH RIVER NEAR HIDDEN TIMBER, S. DAK.

May 4, 1949	2:30 p. m.	15.5	170	317	23	29	36	45	57	75	89	90	95
May 26	12:25 p. m.	23.1	176	405	30	41	49	50	57	73	82		

KEYAPAH RIVER AT MEWELE, S. DAK.

Mar. 1, 1949	3:00 p. m.	330	324	672	--	45	53	59	67	77	87	--	98
Mar. 10	6:15 p. m.	125	234	473	29	32	43	54	63	71	75	90	98
Apr. 5	12:45 p. m.	196	598	1,230	6	11	16	23	32	41	58	84	98
May 25	6:40 p. m.	80	1,640	3,560	4	6	7	8	10	11	15	97	--
June 15	5:30 p. m.	44.6	176	352	31	39	42	56	65	73	89	--	--

VERDIGRE RIVER AT VERDIGRE, NEBR.

Dec. 7	11:10 a.m.	88	1,210	2,330		--	4	6	10	23	85	--	BN
Dec. 20	5:30 p.m.	99	1,130	2,580		--	--	6	10	14	31	66	BN
Mar. 22, 1949	10:00 a.m.	306	6,600	4,760		9	11	20	24	41	83	90	BW
Mar. 22	10:00 a.m.	306	6,600	4,310	11	14	16	20	25	36	70	--	BN
May 24	2:50 p.m.	191	1,520	2,880		12	14	22	35	75	82	--	BW
June 22	9:30 a.m.	94	846	1,750		14	18	22	31	47	97	--	BW
July 7	9:00 a.m.	78	706	1,370		16	19	23	33	46	90	--	BW
July 18	3:20 p.m.	66	847	1,960		10	14	18	24	36	75	80	BW
Aug. 30	9:30 a.m.	78	799	1,390		9	14	18	23	40	62	94	BW
Sept. 27	9:30 a.m.	104	1,860	2,120		7	10	14	20	40	59	--	BW

JAMES RIVER BASIN
MISCELLANEOUS ANALYSES OF STREAMS IN JAMES RIVER BASIN

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids			Hardness as CaCO ₃	
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate

JAMES RIVER AT JAMESTOWN, N. DAK.

Mar. 12, 1949	72	6.5	173	7.3	0.05	15	5.0	13		0	53	30	4.5	0.0	6.5	0.08	125	0.17	58	15
Apr. 18	1,742	7.5	387	11	.05	27	15	30		0	154	52	8.0	2	3.0	.13	246	.33	129	3
May 4	233	7.2	415	8.9	.03	32	16	31		0	168	60	8.0	.2	2.1	.88	248	.34	146	8
July 25	8.1	8.1	756	28	.05	61	24	89		0	342	126	21	.2	2.8	.98	524	.71	251	0
Sept. 27	1.9	7.7	1,110	20	.02	87	69	59		0	452	200	33	.1	4.0	.47	756	1.03	501	130

JAMES RIVER AT COLUMBIA, S. DAK.

June 1, 1949	116	7.3	642	17	0.04	48	25	60		0	285	91	17	0.3	0.8	1.5	410	0.56	223	0
Aug. 9	6.9	8.2	647	14	.04	37	31	67		0	258	110	24	.3	6.4	.54	448	.61	220	8

JAMES RIVER AT HURON, S. DAK.

Mar. 17, 1949	53	7.4	1,110	15	0.03	77	35	126		0	324	240	65	0.2	3.6	0.17	751	1.02	336	70
June 2	594	7.7	695	15	.02	47	24	73		0	241	130	27	.6	3.2	.28	460	.63	216	18
June 30	146	7.3	961	19	.02	65	34	99		0	309	182	50	.5	2.7	.21	640	.87	302	49
Aug. 12	43	8.5	1,000	13	.04	67	39	119		20	346	178	54	.3	7.9	.58	712	.97	328	11

1/ Mean daily discharge.

PLATTE RIVER BASIN

NORTH PLATTE RIVER BELOW CASPER, WYO.

LOCATION --Five hundred feet upstream from gaging station which is 6½ miles east of Casper, Natrona County, and 7½ miles downstream from Casper Creek.

DRAINAGE AREA --12,600 square miles.

RECORDS AVAILABLE --Water temperatures: June to September 1949.

Sediment records: April 1947 to September 1949.

EXTREMES 1948-49 --Water temperatures (June to September 1949): Maximum, 72°F July 24.

Sediment concentrations: Maximum daily, 26,200 ppm June 7; minimum daily, 1 ppm Oct. 3, Nov. 5.

Sediment loads: Maximum daily, 269,000 tons July 11, minimum daily, less than 1 ton on several days.

EXTREMES 1947-49 --Sediment concentrations: Maximum daily, 26,200 ppm June 7, 1949; minimum daily, 1 ppm Oct. 3, Nov. 5, 1948.

Sediment loads: Maximum daily, 269,000 tons July 11, 1949; minimum daily, less than 1 ton on several days.

REMARKS --Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year June to August 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium
																Parts per mil- lion	Tons per ac- re- foot	Tons per day	Total	Non- carbon- ate	
June 1, 1949 -----	61	6.9	1,520	16	0.02	125	42	158		189	560	60	0.4	7.0	0.51	1,060	1.44		485	330	42
July 1 -----	5,550	7.3	533	15	.02	55	19	27		153	130	8.0	.3	1.3	.27	362	.49		216	91	21
Aug. 3 -----	5,140	7.9	532	13	.02	58	17	30		146	131	16	.4	1.4	.30	358	.49		215	95	24

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER BELOW CASPER, WYO.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 6 a.m. and 9 a.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			36				--	--	60	67	64	64
2						46	--	56	55	--	54	63
3							--	--	55	--	64	62
4							--	--	57	--	65	66
5							56	--	58	63	66	63
6							--	--	58	68	67	64
7							51	--	54	70	68	66
8							--	--	58	65	68	--
9							--	--	63	70	66	62
10							--	--	66	68	65	62
11							--	--	68	68	66	64
12							--	--	66	69	66	56
13							--	--	62	70	64	64
14							--	--	67	67	66	63
15							--	--	69	67	66	68
16							--	--	68	--	66	63
17							--	--	67	66	66	63
18							--	--	62	67	67	63
19							--	65	66	68	65	64
20							--	--	63	68	65	65
21							--	--	68	68	66	63
22							--	--	68	65	66	66
23							--	--	--	70	66	64
24							--	--	--	72	66	68
25							--	--	--	68	68	68
26							--	--	--	71	68	60
27							--	--	--	68	67	66
28							--	--	--	68	66	66
29							66	--	--	65	65	68
30	35						--	--	60	68	63	64
31							--	--	--	66	64	--
Average						--	--	--	--	68	65	64

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER BELOW CASPER, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	174	3	1	80	17	4	61	5	(i)
2-----	147	2	(i)	80	23	5	55	--	(i)
3-----	135	1	(i)	80	15	3	62	--	2/1
4-----	126	6	2	82	3	(i)	65	--	
5-----	120	3	(i)	85	1	(i)	65	--	
6-----	120	3	1	80	2	(i)	61	--	2/2
7-----	111	6	2	88	4	(i)	60	--	
8-----	105	5	1	82	4	(i)	60	--	
9-----	105	4	1	70	8	2	50	--	2/1
10-----	102	4	1	88	9	2	65	--	
11-----	99	4	1	88	7	2	61	--	
12-----	99	5	1	80	18	4	59	--	
13-----	96	8	2	78	26	5	61	--	
14-----	93	9	2	75	25	5	59	--	
15-----	105	10	3	72	23	4	57	--	2/2
16-----	108	12	4	72	--	(i)	58	--	
17-----	99	10	3	72	8	2	56	--	
18-----	93	6	2	68	8	1	58	--	
19-----	90	11	3	59	10	2	59	--	
20-----	90	10	2	65	9	2	60	--	
21-----	88	7	2	88	9	2	54	--	
22-----	85	4	(i)	55	13	2	52	--	
23-----	85	8	2	72	12	2	52	--	
24-----	80	8	2	78	10	2	54	--	2/1
25-----	78	8	2	68	7	1	52	--	
26-----	82	7	2	51	3	(i)	55	--	
27-----	80	9	2	68	8	1	58	--	2/2
28-----	80	9	2	78	6	1	56	--	
29-----	80	13	3	61	4	(i)	54	--	
30-----	82	11	2	80	8	2	55	--	2/1
31-----	80	15	3	--	--	--	54	--	
Total--	3,117	--	57	2,243	--	61	1,789	--	48
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	55			48			75	--	2/3
2-----	52			50			90	7	2
3-----	52			52			108	10	3
4-----	54			62			120	17	6
5-----	54			62			132	23	8
6-----	56	--	2/1	50	--	2/2	138	18	7
7-----	60			62			141	18	7
8-----	54			62			141	18	7
9-----	48			62			129	25	9
10-----	46			80			108	26	8
11-----	46			54			90	18	4
12-----	47			52			90	13	3
13-----	50			50			85	10	2
14-----	50			62	--	2/2	80	11	2
15-----	52			62			99	19	5
16-----	50	--	2/1	59			90	15	4
17-----	48			70			82	8	2
18-----	50			90			78	9	2
19-----	49			82			88	10	2
20-----	47			78			93	18	5
21-----	49			82	--	2/3	117	12	4
22-----	50			80			129	--	2/4
23-----	42			78			126	11	4
24-----	35			80			111	8	2
25-----	40			80			105	10	3
26-----	47	--	2/1	78			96	9	2
27-----	47			75	--	2/2	85	16	4
28-----	48			78	--	2/3	80	--	2/3
29-----	45			--	--	--	80	13	3
30-----	52			--	--	--	82	19	4
31-----	52			--	--	--	75	23	5
Total--	1,528	--	31	1,870	--	66	3,143	--	129

(i) Sediment discharge less than 1 ton.

2/Estimated.

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER BELOW CASPER, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	75	21	4	90	6	1	61	3	(i)
2-----	72	18	3	80	4	(i)	2,010	6,420	3/47,200
3-----	68	14	3	70	6	1	3,230	2,810	24,500
4-----	68	13	2	65	7	1	2,600	985	6,910
5-----	70	12	2	117	56	18	2,230	524	3,160
6-----	70	13	2	162	50	22	2,540	19,000	3/139,000
7-----	82	13	3	147	14	6	1,770	26,200	3/117,000
8-----	93	15	4	126	15	5	700	8,300	15,700
9-----	102	15	4	111	27	8	620	1,600	2,680
10-----	114	13	4	105	56	16	324	4,100	3,590
11-----	108	14	4	99	200	54	226	5,230	3,190
12-----	93	11	3	93	232	58	212	450	258
13-----	102	9	2	93	103	26	204	300	165
14-----	129	13	5	88	68	16	270	832	3/945
15-----	126	12	4	96	65	17	727	1,790	3,510
16-----	102	8	2	123	107	36	652	1,240	2,180
17-----	88	10	2	126	59	20	477	500	644
18-----	80	9	2	135	48	18	864	717	2,220
19-----	88	6	1	250	163	110	1,260	1,300	4,420
20-----	99	6	2	217	64	37	1,270	915	3,140
21-----	105	5	1	147	48	19	1,270	700	2,400
22-----	108	5	1	129	59	21	1,520	1,150	4,720
23-----	105	8	2	275	130	97	2,120	3,450	19,700
24-----	88	7	2	275	145	108	2,690	3,180	23,100
25-----	82	6	1	154	40	17	3,020	3,010	24,600
26-----	90	11	3	114	26	8	3,800	2,150	22,000
27-----	108	11	3	96	9	2	3,740	1,480	14,900
28-----	99	8	2	82	7	2	4,120	1,370	15,200
29-----	90	6	1	72	9	2	4,720	1,250	15,900
30-----	90	6	1	75	8	2	5,080	1,150	15,800
31-----	--	--	--	65	6	1	--	--	--
Total-	2,794	--	75	3,877	--	750	54,327	--	538,700
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	5,550	935	14,000	5,180	98	1,370	4,960	78	1,040
2-----	5,740	823	12,800	5,160	86	1,200	4,900	92	1,220
3-----	5,860	635	10,500	5,140	97	1,350	4,800	64	829
4-----	5,890	477	7,590	5,140	96	1,330	4,520	58	708
5-----	5,890	502	7,980	5,120	83	1,150	4,080	55	606
6-----	5,820	310	4,870	5,100	64	881	3,840	49	508
7-----	5,820	305	4,790	5,120	77	1,060	3,370	--	2/440
8-----	5,840	290	4,570	5,140	94	1,300	2,420	--	2/300
9-----	5,860	320	5,060	5,200	94	1,320	1,890	42	214
10-----	5,930	330	5,280	5,220	124	1,750	1,750	35	165
11-----	6,830	14,600	269,000	5,220	134	1,890	1,680	25	114
12-----	3,570	2,140	20,600	5,160	93	1,300	1,710	--	2/120
13-----	4,800	910	11,800	5,280	114	1,620	1,740	29	136
14-----	5,220	1,190	16,800	5,300	105	1,500	1,720	29	135
15-----	5,490	862	12,800	5,320	95	1,360	1,720	27	125
16-----	5,400	636	9,270	5,340	89	1,280	1,690	81	141
17-----	4,960	329	4,400	5,340	104	1,500	1,650	28	125
18-----	4,960	228	3,050	5,260	92	1,310	1,630	24	106
19-----	4,980	266	3,840	5,280	73	1,040	2,430	55	361
20-----	4,960	323	4,320	5,280	53	756	2,620	36	255
21-----	5,340	242	3,480	5,300	151	2,160	2,620	40	283
22-----	5,380	198	2,880	5,320	86	1,240	2,850	45	346
23-----	5,220	181	2,550	5,340	88	1,270	2,930	53	419
24-----	5,260	184	2,610	5,340	88	1,270	2,980	--	2/300
25-----	5,300	208	2,980	5,300	76	1,090	2,980	--	2/190
26-----	5,240	256	3,620	5,260	79	1,120	2,050	22	122
27-----	5,200	214	3,000	5,280	72	1,030	1,360	25	92
28-----	5,100	173	2,380	5,300	69	987	676	21	38
29-----	5,160	204	2,840	5,060	84	1,150	364	13	13
30-----	5,180	212	2,960	5,020	144	1,950	270	6	4
31-----	5,200	90	1,260	4,960	68	910	--	--	--
Total-	166,950	--	463,900	161,780	--	40,440	74,190	--	9,460

Total discharge for year (second-foot-days)----- 477,608
 Total load for year (tons) ----- 1,054,000

(i) Sediment discharge less than 1 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER BELOW CASPER, WYO.--Continued

Particle-size analyses of suspended sediment, June to July 1949
 (Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
 W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500
June 3, 1949	2:40 p. m.	3,250	2,270	1,780	32	52	60	80	91	96	98	100			BW
July 1	2:45 p. m.	5,550	801	694	15	19	30	40	51	68	90	100			BW
July 12	1:45 p. m.	3,370	719	1,050	18	29	40	50	65	85	100	--			BW

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER ABOVE BEDTICK CREEK NEAR DOUGLAS, WYO.

LOCATION--At county highway bridge 1 mile upstream from Bedtick Creek, 2½ miles south of Douglas, Converse County, and 2½ miles upstream from gaging station near Douglas.

DRAINAGE AREA--14,500 square miles above gaging station.

RECORDS AVAILABLE--Water temperatures: June to September 1949.

Sediment records: April 1947 to September 1949.

EXTREMES, 1948-49--Sediment concentrations: Maximum daily, 18,700 ppm July 12; minimum daily, 2 ppm Jan. 2.

Sediment loads: Maximum daily, 349,000 tons July 12; minimum daily, less than 1 ton Jan. 11, 12.

EXTREMES, 1947-49--Sediment concentrations: Maximum daily, 18,700 ppm July 12, 1949; minimum daily, not determined.

Sediment loads: Maximum daily, 349,000 tons July 12, 1949; minimum daily, less than 1 ton Jan. 11, 12, 1949.

REMARKS--Sampling point at gaging station prior to Aug. 26, 1949. Discharge records for gaging station near Douglas for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, June to August 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- di- um
																Parts per mil- lion	Tons per acre- foot	Tons per acre- day	Total	Non- carbon- ate	
June 1, 1949	316	7.6	683	15	0.02	55	18	66		159	198	12	0.4	1.0	--		476	0.65	212	82	41
July 1	4,940	7.3	571	14	.02	64	18	21		172	120	8.0	.6	.32	.398		398	.54	234	93	16
Aug. 3	5,070	7.2	520	12	.02	59	16	27		144	130	11	.4	1.3	.30		340	.46	213	95	21

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER ABOVE BEDTICK CREEK NEAR DOUGLAS, WYO.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 (Once-daily temperature measurement between 4 p. m. and 8 p. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			32		32		--	--	66	--	72	68
2							--	--	--	66	70	68
3		45					--	--	54	69	70	59
4							--	--	60	--	71	63
5							56	--	64	--	72	68
6							58	--	66	68	73	62
7							--	--	58	72	70	60
8							--	--	59	71	70	68
9						32	--	--	70	71	69	71
10							--	--	--	67	70	61
11							--	--	--	70	70	67
12							--	--	--	68	--	59
13				32			--	--	--	--	70	59
14							--	--	--	68	69	61
15							--	--	--	--	69	64
16							--	--	--	--	70	67
17							--	63	--	--	69	59
18							--	--	--	--	70	59
19							--	61	--	--	70	64
20							--	--	--	--	69	--
21							--	--	--	--	69	60
22							--	--	--	--	70	62
23							--	--	65	--	69	61
24							--	--	74	--	70	65
25							--	--	72	--	69	62
26							--	--	69	--	67	60
27							--	--	69	--	65	62
28							--	--	62	--	70	--
29							60	--	65	--	65	64
30							--	--	67	--	67	59
31							--	--	--	--	68	--
Average							--	--	--	--	69	63

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER ABOVE BEDTICK CREEK NEAR DOUGLAS, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949									
Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	322	6	5	175	16	8	227	36	22
2-----	301	6	5	170	8	4	236	55	35
3-----	284	6	5	170	9	4	239	65	42
4-----	259	5	3	172	24	11	245	68	45
5-----	245	5	3	168	52	24	150	68	28
6-----	236	6	4	170	33	15	160	38	16
7-----	227	6	4	170	22	10	160	32	14
8-----	230	4	2	165	26	12	160	58	25
9-----	227	5	3	140	25	9	150	36	15
10-----	227	10	6	150	19	8	220	41	24
11-----	230	8	5	172	31	14	200	54	29
12-----	227	15	9	203	26	14	200	65	35
13-----	221	22	13	224	20	12	190	77	40
14-----	221	8	5	188	11	6	180	25	12
15-----	227	50	31	172	12	6	170	40	18
16-----	233	33	21	178	11	5	170	38	17
17-----	239	30	19	175	21	10	160	29	13
18-----	233	14	9	165	17	8	160	40	17
19-----	218	8	5	100	11	3	160	27	12
20-----	209	9	5	118	22	7	190	27	14
21-----	203	11	6	165	18	8	160	29	13
22-----	206	12	7	215	23	13	140	41	15
23-----	197	11	6	215	15	9	160	34	15
24-----	191	8	4	280	48	36	170	29	13
25-----	188	7	4	224	36	22	130	24	8
26-----	185	9	4	154	32	13	140	23	9
27-----	182	7	3	140	33	12	150	23	9
28-----	180	9	4	160	18	8	180	25	12
29-----	203	45	25	178	5	2	160	29	13
30-----	200	18	10	175	4	2	170	34	16
31-----	182	12	6	--	--	--	160	28	12
Total-	6,933	--	241	5,251	--	315	5,447	--	608
Day	January			February			March		
	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	180	25	12	98	6	2	220	117	69
2-----	160	12	5	98	36	10	230	160	99
3-----	130	8	3	100	41	11	400	182	200
4-----	130	8	3	110	59	18	540	374	540
5-----	140	16	6	120	53	17	515	523	730
6-----	160	23	10	120	65	21	485	613	800
7-----	180	15	6	130	59	21	420	524	590
8-----	160	9	4	135	31	11	356	121	120
9-----	120	11	4	140	36	14	312	84	71
10-----	120	12	4	150	47	19	312	105	88
11-----	90	4	(i)	160	50	22	276	89	66
12-----	100	2	(i)	130	32	11	268	95	69
13-----	105	15	4	110	34	10	244	81	53
14-----	115	37	11	120	35	11	206	87	48
15-----	130	39	14	130	26	9	195	92	48
16-----	105	32	9	130	30	11	254	118	81
17-----	90	33	8	240	16	10	215	240	140
18-----	110	36	11	220	16	10	234	300	190
19-----	100	33	9	200	16	9	230	144	89
20-----	95	29	7	200	16	9	237	112	72
21-----	85	28	6	220	16	10	248	82	55
22-----	100	17	5	240	34	22	272	80	59
23-----	96	15	4	260	46	32	293	71	56
24-----	90	16	4	230	82	51	300	51	41
25-----	96	16	4	220	106	63	290	52	41
26-----	96	11	3	220	88	52	262	66	47
27-----	98	6	2	210	88	50	240	63	41
28-----	100	6	2	220	123	73	224	40	24
29-----	96	9	2	--	--	--	212	33	19
30-----	98	7	2	--	--	--	209	24	14
31-----	100	8	2	--	--	--	198	18	10
Total-	3,555	--	168	4,661	--	609	8,897	--	4,570

(i) Sediment discharge less than 1 ton.

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER ABOVE BEDTICK CREEK NEAR DOUGLAS, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	192	20	10	717	77	150	324	22	19
2-----	188	12	6	610	39	64	304	24	20
3-----	190	9	5	500	8	11	1,320	--	2/20,000
4-----	192	13	7	485	40	52	2,830	3,400	26,000
5-----	195	20	11	654	1,030	3/1,950	2,430	2,370	15,600
6-----	195	17	9	1,130	1,730	5,280	2,300	--	2/12,000
7-----	209	20	11	1,130	645	1,970	2,600	1,830	12,800
8-----	240	24	16	1,080	218	640	2,110	--	2/23,000
9-----	286	27	21	1,040	57	160	1,220	--	2/12,000
10-----	320	24	21	1,040	63	180	1,130	--	2/12,000
11-----	328	17	15	986	41	110	858	--	2/4,600
12-----	320	22	19	938	30	76	580	--	2/1,600
13-----	376	51	52	906	30	73	544	--	2/1,900
14-----	465	88	111	843	61	140	550	--	2/1,500
15-----	425	23	26	759	52	110	505	--	2/1,400
16-----	372	26	26	696	47	88	745	--	2/8,400
17-----	356	30	29	794	71	150	1,020	--	2/7,400
18-----	372	27	27	731	42	83	710	--	2/3,000
19-----	440	62	74	866	58	140	808	--	2/4,400
20-----	538	66	96	858	40	93	1,280	--	2/9,800
21-----	604	60	98	890	78	190	1,270	--	2/5,400
22-----	634	54	92	914	102	250	1,240	--	2/3,400
23-----	604	68	110	1,070	720	2,080	1,350	915	3,340
24-----	580	--	2/110	978	200	530	1,810	2,410	11,800
25-----	689	55	100	986	285	760	2,370	3,030	19,400
26-----	787	75	160	787	73	160	3,050	3,050	25,100
27-----	731	103	200	634	79	140	3,450	2,840	26,400
28-----	661	38	68	538	377	550	3,520	2,670	25,400
29-----	628	35	59	465	351	440	3,940	1,290	13,700
30-----	682	54	99	420	75	85	4,090	1,570	17,800
31-----	--	--	--	368	19	19	--	--	--
Total-	12,799	--	1,690	24,813	--	16,720	50,258	--	328,700
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	4,680	1,670	21,100	5,140	310	4,300	4,720	138	1,760
2-----	5,000	1,690	22,800	5,050	--	2/3,600	4,700	120	1,520
3-----	5,500	1,080	16,000	5,070	210	2,880	4,560	118	1,450
4-----	5,760	--	2/38,000	5,050	234	3,190	4,420	128	1,530
5-----	5,910	--	2/46,000	4,990	--	2/2,700	4,140	288	3,220
6-----	5,630	587	8,910	5,030	246	3,340	4,000	890	9,600
7-----	5,630	440	6,680	4,960	--	2/4,000	3,500	375	3,540
8-----	5,610	435	6,580	4,990	--	2/5,500	3,050	160	1,320
9-----	5,520	406	6,050	5,030	448	6,080	2,380	160	1,030
10-----	5,520	334	4,980	5,120	245	3,380	1,990	91	490
11-----	6,390	--	2/62,000	5,070	350	4,790	1,860	68	340
12-----	6,680	18,700	3/349,000	5,070	--	2/6,500	1,790	78	380
13-----	4,080	--	2/86,000	4,960	--	2/3,500	1,760	71	340
14-----	5,100	2,100	2/28,900	5,140	640	8,880	1,770	87	420
15-----	5,460	--	2/37,000	5,190	--	2/8,800	1,750	99	470
16-----	5,720	--	2/15,000	5,210	430	6,050	1,740	98	460
17-----	5,480	--	2/7,400	5,240	195	2,760	1,670	93	420
18-----	4,940	--	2/4,000	5,190	100	1,400	1,630	84	370
19-----	4,920	--	2/2,500	5,100	150	2,060	1,600	52	220
20-----	4,880	--	2/2,100	5,140	185	2,570	2,250	--	2/710
21-----	4,920	--	2/3,100	5,160	190	2,650	2,550	101	700
22-----	5,310	--	2/3,600	5,210	190	2,670	2,590	106	740
23-----	5,310	--	2/2,400	5,210	163	2,300	2,790	120	900
24-----	5,140	--	2/2,400	5,260	130	1,850	2,870	88	680
25-----	5,240	--	2/2,700	5,260	77	1,090	2,900	94	740
26-----	5,240	--	2/2,800	5,190	117	1,640	2,900	107	840
27-----	5,140	--	2/2,800	5,140	118	1,640	2,170	64	370
28-----	5,050	--	2/2,400	5,210	--	2/2,100	1,650	--	2/230
29-----	5,070	--	2/2,500	5,100	130	1,790	1,090	27	79
30-----	5,100	--	2/2,800	4,860	135	1,770	622	18	30
31-----	5,120	--	2/3,000	4,800	131	1,700	--	--	--
Total-	165,050	--	801,500	158,140	--	107,500	77,412	--	34,900
Total discharge for year (second-foot-days) -----									523,216
Total load for year (tons) -----									1,298,000

2/Estimated.

3/Sediment discharge computed by subdividing day.

PLATTE RIVER BASIN--Continued
NORTH PLATTE RIVER ABOVE BEDTICK CREEK NEAR DOUGLAS, WYO.--Continued

Particle-size analyses of suspended sediment, June to July 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Instantaneous discharge (second-feet)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
June 7, 1949	4:06 p. m.	2,580	1,380	646	--	--	--	40	56	74	95	100			BW
July 1	12:15 p. m.	4,880	1,520	1,280	16	24	36	48	68	84	93	98		100	BW
July 12	3:55 p. m.	5,330	17,300	1,680	31	50	78	90	98	100	--	--			BW

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER NEAR CASSA, WYO.

LOCATION.--Four hundred feet upstream from gaging station, which is 1½ miles south of Cassa, Platte County, 4½ miles downstream from Horseshoe Creek, and 6 miles upstream from high-water line of Guernsey Reservoir.
DRAINAGE AREA.--15,700 square miles.
RECORDS AVAILABLE.--Water temperatures: June to September 1949.

Sediment records: March 1947 to September 1949.
EXTREMES, 1948-49.--Water temperatures: Maximum 77°F Aug. 5, 6, 7.

Sediment concentrations: Maximum daily, 10,500 ppm July 13; minimum daily, 3 ppm Nov. 23.
Sediment loads: Maximum daily, 121,000 tons July 13; minimum daily, not determined.

EXTREMES, 1947-49.--Sediment concentrations: Maximum daily, 10,500 ppm July 13, 1949; minimum daily, 3 ppm Nov. 23, 1949.
Sediment loads: Maximum daily, 121,000 tons July 13, 1949; minimum daily, not determined.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, June to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent non- car- bon- ate
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non-	
June 1, 1949-----	670	7.5	582	20	0.02	60	16	39	156	152	152	8.0	0.2	1.2	0.33	424	0.58		216	88	28
July 1-----	4,240	7.2	578	15	.02	63	18	33	175	140	140	9.0	.2	1.2	.27	408	.55		231	87	24
Aug. 3-----	4,820	7.7	526	12	.02	55	16	34	145	135	135	11	.3	1.2	.20	344	.47		204	85	27

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER NEAR CASSA, WYO.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 7 a. m. and 12 m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							--		64	66	74	64
2							--		55	76	70	65
3						35	--		56	71	70	64
4							49		57	70	68	65
5							--		57	68	77	65
6							--		61	69	77	63
7							--		59	70	77	62
8							--		62	68	72	65
9							--		64	70	70	66
10							--		65	69	68	66
11							--		69	67	68	68
12							--		67	70	75	58
13							--		61	67	68	59
14							--		62	70	71	52
15							--		65	71	69	56
16							--		65	70	72	65
17							--		65	69	68	58
18							--		62	68	--	61
19							--	59	64	72	72	62
20							--		64	72	68	60
21							--		65	72	73	57
22							--		66	72	72	62
23							--		65	73	68	63
24							--		65	70	68	65
25							--		68	73	68	60
26							--		68	75	67	61
27							--		68	72	66	56
28							--		68	72	66	57
29							51		66	73	68	54
30		32					--		65	69	69	57
31							--		--	71	70	--
Average							--		64	70	70	61

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER NEAR CASSA, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	454	28	34	237	36	23	332		
2-----	422	38	43	229	16	10	324		
3-----	390	29	31	225	17	10	360		
4-----	365	32	32	225	12	7	320		
5-----	342	14	13	233	6	4	280		
6-----	324	16	14	216	6	4	290		
7-----	314	19	16	229	8	5	270		
8-----	306	19	16	233	11	7	270		
9-----	296	17	14	233	11	7	250		
10-----	288	10	8	187	12	6	320		
11-----	278	18	14	194	8	4	300		
12-----	265	26	19	208	7	4	300		
13-----	261	26	18	241	10	7	290		
14-----	257	31	22	253	--	1/5	280		
15-----	257	40	28	229	5	3	260	--	1/19
16-----	283	36	28	222	6	4	250		
17-----	278	22	17	225	9	5	250		
18-----	270	53	39	225	11	7	260		
19-----	278	28	21	175	10	5	260		
20-----	261	19	13	163	8	4	270		
21-----	257	23	16	150	8	3	280		
22-----	253	17	12	160	5	2	270		
23-----	249	11	7	229	3	2	260		
24-----	245	8	5	281	10	7	260		
25-----	241	6	4	274	13	10	150		
26-----	237	9	6	197	8	4	180		
27-----	233	14	9	160	6	3	220		
28-----	233	10	6	261	25	18	270		
29-----	253	12	8	310	--	1/19	220		
30-----	249	20	13	278	16	12	230		
31-----	253	41	28	--	--	--	200		
Total-	8,892	--	554	6,664	--	211	8,276	--	590
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	220			110			460	--	1/140
2-----	220			110			500	--	1/180
3-----	170			110			540	134	195
4-----	170			120			570	149	229
5-----	190			130			560	325	492
6-----	200			130			560	610	922
7-----	200			140			600	451	730
8-----	200			140			500	186	251
9-----	170			150			450	190	231
10-----	140			160			400	115	124
11-----	140			170			400	88	95
12-----	140			130			420	133	151
13-----	150			100			420	144	163
14-----	160			115			380	74	76
15-----	160			120	--	1/29	350	107	101
16-----	160	--	1/7	180			380	94	96
17-----	140			300			390	74	78
18-----	150			280			400	76	82
19-----	130			270			410	136	151
20-----	120			260			410	242	268
21-----	110			300			410	304	336
22-----	140			350			426	187	212
23-----	130			400			432	--	1/120
24-----	120			465			449	109	132
25-----	120			430			449	121	146
26-----	120			430			432	62	72
27-----	130			430			410	55	61
28-----	130			430			395	51	54
29-----	110			--	--	--	385	30	31
30-----	130			--	--	--	375	31	31
31-----	130			--	--	--	360	37	36
Total-	4,700	--	220	6,460	--	810	13,617	--	5,990

1/Estimated.

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER NEAR CASSA, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	346	33	31	1,250	107	361	688	120	223
2-----	337	29	26	1,190	114	366	622	73	123
3-----	332	25	22	994	83	228	369	42	64
4-----	324	23	20	850	103	236	2,016	2,230	2/18,600
5-----	319	18	15	900	72	175	3,220	3,600	31,300
6-----	324	21	18	1,290	430	1,500	3,110	3,050	25,600
7-----	332	33	30	1,650	1,630	7,260	3,180	2,000	17,200
8-----	355	34	33	1,620	812	3,550	3,180	2,210	19,000
9-----	390	39	41	1,700	395	1,810	2,390	5,200	33,600
10-----	444	38	46	1,750	308	1,450	1,620	1,770	7,750
11-----	478	36	46	1,750	260	1,230	1,480	7,500	30,000
12-----	502	36	49	1,630	192	845	1,230	3,000	10,100
13-----	520	37	52	1,580	167	714	972	909	2,380
14-----	630	71	121	1,610	192	835	981	1,140	2,960
15-----	742	115	230	1,500	131	531	870	1,260	2,960
16-----	706	87	186	1,460	340	1,340	805	580	1,260
17-----	662	64	114	1,660	430	2,020	961	378	1,500
18-----	646	62	108	1,610	280	1,220	1,130	1,560	4,760
19-----	697	77	145	1,510	178	718	850	1,160	2,660
20-----	769	111	230	1,610	1,430	6,210	920	645	1,600
21-----	900	162	394	2,030	4,550	24,900	1,340	1,580	5,710
22-----	1,030	181	504	1,700	1,220	5,600	1,350	1,360	4,960
23-----	1,100	156	463	1,750	510	2,410	1,300	910	3,190
24-----	1,070	132	382	1,820	1,200	5,900	1,480	930	3,720
25-----	1,110	148	444	1,630	420	1,850	2,080	2,100	11,800
26-----	1,260	182	619	1,560	230	968	2,890	3,170	24,800
27-----	1,360	193	709	1,310	150	530	3,900	3,550	33,600
28-----	1,280	129	446	1,200	320	1,680	3,780	3,080	31,400
29-----	1,200	106	344	1,060	850	1,860	4,020	2,280	24,800
30-----	1,160	79	248	983	520	1,380	4,220	2,040	23,200
31-----	--	--	--	733	272	538	--	--	--
Total-	21,325	--	6,100	44,890	--	80,220	56,748	--	381,000
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	4,440	1,390	19,000	4,860	273	3,610	4,730	206	2,630
2-----	5,130	1,980	27,400	4,840	398	5,200	4,690	184	2,330
3-----	5,500	1,640	24,400	4,840	319	4,170	4,690	146	1,850
4-----	5,810	1,580	24,800	4,860	259	3,400	4,620	212	2,640
5-----	6,180	3,140	52,400	4,820	230	3,260	4,460	156	1,880
6-----	5,830	1,820	28,600	4,820	229	2,980	4,440	283	3,390
7-----	5,720	823	12,700	4,820	300	3,900	4,000	940	10,100
8-----	5,700	890	10,600	4,800	209	2,710	3,620	363	3,550
9-----	5,680	585	8,960	4,890	179	2,360	3,110	325	2,730
10-----	5,770	695	10,800	4,910	181	2,400	2,460	250	1,660
11-----	6,030	810	13,200	4,930	227	3,020	2,110	133	758
12-----	7,500	1,660	34,000	4,930	343	4,560	2,010	150	814
13-----	4,260	10,500	121,000	4,890	398	5,250	1,980	153	818
14-----	4,440	4,050	48,600	4,950	247	3,300	2,010	128	694
15-----	4,890	1,760	23,200	5,040	251	3,420	2,030	121	664
16-----	5,130	2,050	28,400	5,060	299	4,080	2,000	97	824
17-----	5,240	1,180	16,700	5,060	138	1,890	1,960	85	450
18-----	4,800	664	8,660	5,060	--	1/1,900	1,800	97	498
19-----	4,670	430	5,680	5,020	253	3,430	1,880	103	523
20-----	4,640	452	5,660	5,000	265	3,580	1,880	146	740
21-----	4,600	377	4,680	5,020	240	3,250	2,390	210	1,470
22-----	4,820	393	5,110	5,040	229	3,120	2,680	190	1,370
23-----	5,060	430	5,880	5,060	211	2,680	2,700	172	1,250
24-----	4,970	376	5,050	5,080	212	2,910	2,910	152	1,190
25-----	4,930	379	5,040	5,080	221	3,030	2,930	123	973
26-----	4,970	397	5,330	5,040	266	3,620	2,970	97	778
27-----	4,970	334	4,480	5,000	220	2,970	2,800	82	620
28-----	4,910	296	3,920	5,040	262	3,560	2,060	43	239
29-----	4,890	416	5,490	5,190	790	11,000	1,580	37	156
30-----	4,820	370	4,810	4,930	330	4,390	1,130	44	134
31-----	4,820	277	3,600	4,780	203	2,620	--	--	--
Total-	161,120	--	578,100	153,660	--	111,800	84,910	--	47,420

Total discharge for year (second-foot-days)----- 571,262

Total load for year (tons)----- 1,213,000

1/Estimated.

2/Sediment discharge computed by subdividing day.

PLATTE RIVER BASIN--Continued
NORTH PLATTE RIVER NEAR CASSA, WYO.--Continued

Particle-size analyses of suspended sediment, water year June to August 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analyses	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350
June 7, 1949	6:40 p. m.	3,000	1,420	1,000	22	40	51	64	78	88	92	--	BW	
July 1	10:10 a. m.	4,260	1,580	1,110	18	29	38	52	68	84	90	96	BW	
July 12	5:50 p. m.	8,200	2,740	1,980	32	48	61	71	79	86	91	94	BW	
Aug. 3	7:00 a. m.	4,820	743	1,150	--	--	10	14	18	24	32	49	BW	

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER BELOW GUERNSEY RESERVOIR, WYO.

LOCATION.--Three hundred feet downstream from gaging station which is three-quarters of a mile downstream from Guernsey Dam, and 1 mile northwest of Guernsey, Platte County. DRAINAGE AREA.--16,200 square miles.

RECORDS AVAILABLE.--Sediment records: April 1947 to September 1949.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, not determined; minimum daily, not determined.

Sediment loads: Maximum daily, 1,000 tons July 2; minimum daily, not determined. EXTREMES, 1947-49.--Sediment concentrations: Maximum daily, 1,370 ppm July 16, 1947; minimum daily, not determined.

Sediment loads: Maximum daily, 16,600 tons July 16, 1947; minimum daily, less than 1 ton on some days during fall and winter months.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	49			225	--		218		
2-----	20			206	--		216		
3-----	20			188	8		211		
4-----	72			262	--		210		
5-----	187			215	--		239		
6-----	89			224	--		215		
7-----	71			227	--		220		
8-----	76			245	--		214		
9-----	61			236	--		218		
10-----	20			269	--		174		
11-----	76			229	--		164		
12-----	131			262	--		164		
13-----	70			278	--		192		
14-----	104			214	--		192		
15-----	204			278	--	1/7	209		
16-----	65	--	1/4	260	--		228	--	1/8
17-----	226			322	--		232		
18-----	226			234	--		215		
19-----	299			276	11		218		
20-----	227			269	--		218		
21-----	228			199	--		220		
22-----	227			294	--		210		
23-----	228			256	--		241		
24-----	240			266	--		207		
25-----	228			116	--		226		
26-----	244			218	--		251		
27-----	229			235	--		231		
28-----	227			244	--		229		
29-----	260			203	--		208		
30-----	213			212	--		208		
31-----	233			--	--	--	212		
Total--	4,850	--	120	7,162	--	210	6,610	--	190

1/Estimated.

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER BELOW GUERNSEY RESERVOIR, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	January			February			March		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	204			250			20	--	
2-----	207			246			20	--	
3-----	231			246			20	10	
4-----	229			246			20	--	
5-----	220			246			20	--	
6-----	234			248			20	--	
7-----	234			237			20	--	
8-----	239			246			20	--	
9-----	233			252			20	--	
10-----	235			235			20	--	
11-----	246			230			20	--	
12-----	247			230			20	--	
13-----	260			235			20	--	
14-----	258			249			20	--	
15-----	257			249			20	--	
16-----	271	--	1/7	225	--	1/5	20	--	1/1
17-----	261			225			20	--	
18-----	253			226			20	--	
19-----	230			225			20	--	
20-----	253			216			20	--	
21-----	252			198			20	--	
22-----	254			183			20	--	
23-----	257			152			20	--	
24-----	266			114			20	--	
25-----	261			96			20	--	
26-----	258			20			20	--	
27-----	260			20			20	--	
28-----	256			20			20	--	
29-----	267			--	--	--	20	--	
30-----	267			--	--	--	182	--	
31-----	268			--	--	--	494	--	
Total-	7,668	--	220	5,565	--	140	1,256	--	31
Day	April			May			June		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	500	16	22	1,080	5	15	3,130	8	68
2-----	377	--	1/14	1,080	--	1/15	3,150	10	85
3-----	360	--	1/9	1,070	5	14	2,790	16	121
4-----	382	6	6	1,100	8	24	1,680	--	1/110
5-----	500	5	7	1,130	7	21	1,690	--	1/130
6-----	488	4	5	1,130	10	30	1,330	25	90
7-----	657	7	12	1,130	--	1/28	530	--	1/26
8-----	830	6	13	1,140	--	1/24	542	20	29
9-----	966	--	1/34	1,130	6	18	518	19	27
10-----	966	--	1/10	1,140	--	1/18	596	17	27
11-----	982	3	8	1,150	6	19	1,120	--	1/55
12-----	990	4	11	1,260	--	1/20	1,840	--	1/30
13-----	998	5	13	1,270	--	1/20	1,810	13	64
14-----	1,010	6	16	1,280	--	1/22	1,470	9	36
15-----	1,020	8	22	1,280	--	1/22	1,490	8	32
16-----	1,030	--	1/22	1,260	6	20	1,510	--	1/32
17-----	1,030	--	1/22	1,200	7	23	1,510	8	33
18-----	1,060	7	20	1,190	7	22	1,470	--	1/28
19-----	1,060	5	14	1,190	8	26	1,440	--	1/24
20-----	1,050	8	23	1,240	10	33	1,430	6	23
21-----	1,050	8	23	1,240	--	1/34	1,520	--	1/28
22-----	1,060	6	17	1,250	--	1/34	1,800	8	39
23-----	1,070	--	1/14	1,280	12	41	2,000	8	43
24-----	1,070	5	14	1,290	15	52	2,610	9	63
25-----	1,080	--	1/15	1,330	18	65	3,320	--	1/110
26-----	1,080	6	17	1,430	18	69	3,610	--	1/160
27-----	1,080	--	1/12	1,500	17	69	4,020	--	1/300
28-----	1,080	3	9	1,900	--	1/60	4,360	38	447
29-----	1,070	5	14	2,430	--	1/65	4,840	--	1/480
30-----	1,070	--	1/12	2,870	--	1/60	4,810	44	572
31-----	--	--	--	3,130	--	1/75	--	--	--
Total-	26,966	--	429	43,100	--	1,120	63,726	--	3,370

1/Estimated.

PLATTE RIVER BASIN--Continued

NORTH PLATTE RIVER BELOW GUERNSEY RESERVOIR, WYO.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Suspended sediment, water year October 1946 to September 1947—Continued									
Day	Mean dis-charge (second-foot)	July		Mean dis-charge (second-foot)	August		Mean dis-charge (second-foot)	September	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	4,980	62	833	4,850	20	262	4,560	--	1/200
2-----	5,040	--	1/1,000	4,850	20	262	4,440	16	192
3-----	5,110	--	1/950	4,830	28	365	4,260	--	1/180
4-----	5,110	--	1/850	4,810	24	312	4,090	--	1/180
5-----	5,090	51	700	4,860	21	276	4,000	--	1/160
6-----	4,900	40	529	4,880	--	1/260	3,660	15	148
7-----	4,810	--	1/420	4,880	--	1/240	3,220	14	122
8-----	4,850	27	354	4,880	16	211	3,100	12	100
9-----	4,920	--	1/340	4,880	22	290	3,050	14	115
10-----	4,980	--	1/400	4,880	32	421	2,950	--	1/100
11-----	4,880	30	395	4,880	20	264	2,820	--	1/90
12-----	4,810	24	312	4,860	21	276	2,670	11	79
13-----	4,690	24	304	4,830	--	1/320	2,430	16	105
14-----	4,640	35	438	4,830	--	1/340	2,310	18	112
15-----	4,380	33	390	4,830	28	365	2,300	14	87
16-----	4,350	--	1/360	4,850	32	419	2,270	10	61
17-----	4,360	--	1/360	4,770	22	284	2,400	--	1/70
18-----	4,560	28	345	4,690	23	291	2,520	--	1/80
19-----	4,810	27	351	4,690	20	253	2,560	12	83
20-----	4,960	20	268	4,690	--	1/260	2,610	--	1/90
21-----	4,880	--	1/400	4,690	--	1/240	2,560	14	97
22-----	4,860	39	512	4,660	18	226	2,340	--	1/88
23-----	4,880	--	1/460	4,690	14	177	2,130	14	80
24-----	4,850	--	1/360	4,750	11	141	1,890	--	1/65
25-----	4,830	22	286	4,730	15	192	1,530	--	1/50
26-----	4,830	20	261	4,680	19	240	1,520	12	49
27-----	4,830	24	313	4,860	--	1/240	1,480	8	32
28-----	4,860	30	394	4,620	--	1/240	1,360	10	37
29-----	4,880	27	354	4,620	19	237	1,160	8	25
30-----	4,850	--	1/340	4,640	--	1/240	1,100	10	30
31-----	4,850	24	314	4,620	--	1/240	--	--	--
Total--	149,610	--	13,890	147,880	--	8,380	79,290	--	2,910

Total discharge for year (second-foot-days)----- 543,683

Total load for year (tons)----- 31,010

1/Estimated.

PLATTE RIVER BASIN--Continued
SOUTH PLATTE RIVER AT JULESBURG, COLO.

LOCATION.--At gaging station at bridge on State Highway 51, 0.5 mile east of Julesburg, Sedgwick County, and 4 miles upstream from Colorado-Nebraska State line.

DRAINAGE AREA.--22,800 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1949.

Water temperatures: October 1945 to April 1946, September 1946 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 2,070 micromhos Mar. 28; minimum, 744 micromhos June 19.

Water temperatures: Maximum, 82° F June 29, July 6; minimum, freezing point on many days during December to March.

EXTREMES, 1945-49.--Dissolved solids (1945-47): Maximum, 1,510 ppm Jan. 1-10, 1947; minimum, 686 ppm June 21-30, 1947.

Total hardness (1945-47): Maximum, 170 ppm Jan. 1-10, 1947; minimum, 173 ppm Mar. 1-12, 1947.

Specific conductance: Maximum, 2,140 micromhos Dec. 30, 1946; minimum, 744 micromhos, June 19, 1949.

Water temperatures: Maximum, 84° F Aug. 8, 15, 1948; minimum, freezing point on many days during winter months.

REMARKS.--Daily samples for chemical analysis composited by discharge. Daily samples collected from channel 2, the main channel. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids		Hardness as CaCO ₃		Percent non-carbonate
																Parts per million	Tons per acre-foot	Total	Non-carbonate	
Oct. 1-31, 1948----	126	8.1	1,720	40	0.05	180	50	171	13	298	660	70	1.4	5.4	0.26	1,340	1.82	655	411	36
Oct. 1, Ch. 2 1/2----	46	--	1,450	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 1, Ch. 4 1/2----	11	--	1,450	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 15, Ch. 1 1/2----	--	--	1,640	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 15, Ch. 2 1/2----	114	--	1,640	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Oct. 15, Ch. 4 1/2----	30	--	1,600	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 1-11-----	261	8.1	1,900	41	.01	190	52	183	15	328	696	68	.6	5.0	.37	1,410	1.92	688	419	36
Nov. 1, Ch. 1 1/2----	--	--	1,900	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 1, Ch. 2 1/2----	137	--	1,880	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nov. 1, Ch. 4 1/2----	32	--	1,870	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Dec. 26-31-----	238	8.1	1,880	32	.01	170	51	195	7.6	256	740	64	.7	4.2	.31	1,390	1.89	893	422	40
Jan. 13-31, 1949----	538	8.2	1,840	28	.01	163	51	193	11	2/292	700	59	.8	4.4	.34	1,360	1.85	1,980	616	377
Jan. 15, Ch. 2 1/2----	373	--	1,790	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Jan. 15, Ch. 4 1/2----	110	--	1,780	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 1-27-----	861	7.7	1,650	27	.02	143	54	160	13	236	648	57	.6	4.5	.30	1,230	1.67	2,860	579	383
Feb. 1, Ch. 2 1/2----	450	--	1,840	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 1, Ch. 4 1/2----	160	--	1,840	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

1/Not included in weighted average.

2/Includes equivalent of 8 parts per million carbonate (CO₃).

PLATTE RIVER BASIN--Continued
SOUTH PLATTE RIVER AT JULESBURG, COLO.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949.--Continued

Date of collection	Mean discharge (second-foot)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids		Hardness as CaCO ₃		Percent sodium carbonate
																Parts per million	Tons per acre-foot	Total	Non-carbonate	
Feb. 28-Mar. 31, 1949	467	7.5	1,730	30	0.02	146	55	164	8.8	186	716	61	0.7	3.2	0.43	1,280	1.74	591	430	37
Mar. 1, Ch. 1 1/2	528	--	1,790	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mar. 1, Ch. 2 1/2	110	--	1,780	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mar. 1, Ch. 4 1/2	346	--	1,940	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mar. 15, Ch. 1 1/2	88	--	1,950	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mar. 15, Ch. 2 1/2	--	--	1,890	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Mar. 15, Ch. 4 1/2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 1-30	363	7.7	1,700	26	0.2	139	51	175	10	186	716	61	.7	2.2	.25	1,280	1.74	557	404	41
Apr. 1, Ch. 1 1/2	342	--	1,780	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 1, Ch. 2 1/2	93	--	1,760	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 1, Ch. 4 1/2	304	--	1,820	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 15, Ch. 1 1/2	--	--	1,820	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 15, Ch. 2 1/2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 27-June 5	336	7.8	1,650	38	.02	161	43	162	16	257	616	56	.8	2.2	.50	1,220	1.66	579	368	37
June 1, Ch. 1 1/2	246	--	1,720	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 1, Ch. 2 1/2	71	--	1,730	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 1, Ch. 4 1/2	4,570	8.4	1,700	--	.02	89	23	70	11	3/188	272	22	.9	.7	.30	842	.87	317	163	32
June 6-14	2,410	7.5	1,100	26	.04	120	23	93	93	236	348	26	.9	1.8	.30	826	1.12	394	200	34
June 10 1/2	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 15-30	9,860	7.5	858	24	.02	84	20	68	8.0	190	268	19	.9	1.4	.30	614	.84	282	136	33
June 15, Ch. 1 1/2	7,510	--	966	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 15, Ch. 2 1/2	1,800	--	1,964	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 15, Ch. 4 1/2	667	8.3	1,980	26	.02	132	41	129	14	4/222	504	43	.9	3.4	.30	1,000	1.36	496	316	35
July 1-31	2,680	--	1,830	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 1, Ch. 1 1/2	558	--	1,830	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 1, Ch. 2 1/2	--	--	1,830	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 1, Ch. 4 1/2	--	--	1,200	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--

1/Not included in weighted average.
2/Includes equivalent of 10 parts per million carbonate (CO₃).
3/Includes equivalent of 9 parts per million carbonate (CO₃).

PLATTE RIVER BASIN--Continued

SOUTH PLATTE RIVER AT JULESBURG, COLO.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 6 a. m. and 7 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	53	46	--	32	32	36	44	64	69	73	80	72
2	59	41	--	32	32	42	--	72	--	73	75	--
3	67	43	--	--	32	--	62	57	69	75	78	71
4	51	40	--	--	32	--	60	--	60	78	79	72
5	53	38	--	--	32	--	39	--	69	81	79	--
6	47	39	--	--	32	--	58	--	68	82	--	--
7	43	34	--	--	32	--	60	--	68	80	78	73
8	41	35	--	--	32	--	48	--	61	76	--	68
9	39	33	--	--	32	38	46	--	--	80	--	59
10	53	33	--	--	--	38	38	--	69	77	80	75
11	41	33	--	--	--	35	50	--	70	78	80	76
12	45	--	--	--	--	36	45	--	72	70	73	62
13	45	--	--	32	--	43	50	--	68	78	74	63
14	48	--	--	32	--	38	46	--	68	77	74	65
15	49	--	--	32	--	32	40	--	74	68	75	70
16	48	--	--	32	--	32	55	--	74	79	--	68
17	46	--	--	32	--	40	56	--	--	--	73	--
18	47	--	--	32	32	49	56	--	68	76	--	62
19	49	--	--	32	32	45	46	--	70	80	76	67
20	46	--	--	32	32	--	57	--	--	80	--	66
21	46	--	--	32	32	49	62	--	76	75	--	64
22	47	--	--	32	32	41	56	--	80	79	--	63
23	--	--	--	32	32	54	--	--	76	80	76	62
24	62	--	--	32	32	38	57	--	77	80	78	61
25	49	--	--	32	34	35	67	--	78	75	76	60
26	47	--	32	32	35	42	54	--	73	79	76	--
27	46	--	32	32	--	36	61	76	75	79	70	53
28	48	--	32	32	33	45	68	70	76	79	70	61
29	48	--	32	32	--	38	54	66	82	78	67	--
30	46	--	32	32	--	35	54	79	--	--	63	55
31	55	--	32	32	--	42	--	75	--	--	71	--
Average	49	--	--	--	--	--	53	--	72	77	--	65

PLATTE RIVER BASIN--Continued

WOOD RIVER NEAR RIVERDALE, NEBR.

LOCATION.--At gaging station at bridge on State Highway 40, 1½ miles northwest of Riverdale, Buffalo County.

DRAINAGE AREA.--379 square miles.

RECORDS AVAILABLE.--Sediment records: March 1947 to September 1949.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, not determined; minimum daily, not determined.

Sediment loads: Maximum daily, 9,790 tons June 7; minimum daily, less than 0.1 ton on many days.

EXTREMES, 1947-49.--Sediment concentrations: Maximum daily, 9,840 ppm June 22, 1947; minimum daily, not determined.

Sediment loads: Maximum daily, 356,000 tons June 22, 1947; minimum daily, less than 0.1 ton on many days during 1947 and 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)
	Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day	
1-----	--		1.3	50	0.2	2.6	105	0.7	
2-----	78		1.4	--	1/.3	2.6	--	1/.5	
3-----	--		1.5	93	.4	2.9	--	1/.4	
4-----	80		2.0	--	1/.5	2.9	36	.3	
5-----	--		2.0	--	1/.4	3.2	--	1/.3	
6-----	0.7	1/0.1	2.2	45	.3	3.2	45	.4	
7-----	--		2.2	--	1/.2	2.9	--	1/.4	
8-----	49		2.0	24	.1	2.6	53	.4	
9-----	--		2.2	--	1/.1	2.6	--	1/.3	
10-----	40		2.2	25	.1	2.6	29	.2	
11-----	--		2.9	--	1/.2	2.6	--	1/.2	
12-----	.8		1.5	26	.1	2.6	36	.3	
13-----	.8		1.7	--	1/.1	2.6	--	1/.3	
14-----	.8	25	2.0	16	(a)	2.6	35	.2	
15-----	.8	--	2.0	--	1/.1	2.6	--	1/.4	
16-----	1.0	37	1.7	--	1/.2	2.9	81	.6	
17-----	1.0	--	2.6	--	1/.3	2.9	--	1/.6	
18-----	1.0	25	--	--	--	--	43	--	
19-----	1.2	--	--	--	--	--	--	--	
20-----	1.1	25	--	--	--	--	41	--	
21-----	.9	--	--	--	--	--	--	--	
22-----	1.1	43	.1	--	--	--	--	--	
23-----	.9	--	1/.1	--	--	--	--	--	
24-----	1.0	--	1/.2	2.5	--	1/.7	18	--	
25-----	1.0	--	1/.2	--	--	2.5	10	1/.3	
26-----	1.0	61	.2	--	--	--	--	--	
27-----	1.0	--	1/.2	--	--	--	--	--	
28-----	1.2	39	.1	--	--	--	--	--	
29-----	1.2	--	1/.1	135	--	--	66	--	
30-----	1.2	55	.2	--	--	--	--	--	
31-----	1.3	--	1/.2	--	--	--	--	--	
Total-	28.0	--	3.4	65.9	--	13	81.9	--	11

1/Estimated.

(a) Sediment discharge less than 0.1 ton.

PLATTE RIVER BASIN--Continued

WOOD RIVER NEAR RIVERDALE, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2.0	--	1/0.4	1.7	--	(a)	60	105	17
2-----		--		1.7	--	(a)	35	--	1/11
3-----		--		1.7	34	0.2	30	116	9.4
4-----		--		1.7	--	1/3	50	--	1/28
5-----		75		1.7	83	.4	45	232	28
6-----	2.2	--	1/0.4	1.7	--	1/3	30	--	1/17
7-----		60		1.7	40	.2	25	220	15
8-----		--		1.7	--	1/1	22	--	1/12
9-----		--		1.7	36	.2	21	--	1/8.0
10-----		20		1.7	--	1/2	13	88	3.1
11-----	2.6	--	1/1	1.7	--	1/2	8.9	--	1/1.8
12-----	2.6	20	.1	1.7	--	1/2	7.6	70	1.4
13-----	2.6	--	1/2	--	47	--	8.5	--	1/1.1
14-----	2.6	--	1/2	--	--	--	8.0	21	.5
15-----	2.2	27	.2	--	--	--	--	--	--
16-----	2.2	--	1/1	--	85	--	--	62	--
17-----		--		--	--	1/3	--	--	--
18-----		16		1.5	111	--	8.0	65	1/9
19-----		26		--	--	--	--	--	--
20-----		--		--	--	--	--	15	--
21-----	2.0	22	1/1	--	89	--	--	--	--
22-----		--		13	--	1/3.8	10	32	.9
23-----		--		125	253	3/113	9.9	--	1/9
24-----		14		219	355	3/221	8.9	31	.7
25-----		--		219	427	250	7.6	--	1/7
26-----	1.5	62	(a)	254	375	3/263	10	41	1.1
27-----		--		162	220	.96	17	--	1/2.6
28-----		10		95	--	1/34	12	--	1/1.6
29-----		--		--	--	--	9.4	45	1.1
30-----		--		--	--	--	10	--	1/1.2
31-----	--	--	--	--	--	--	12	40	1.3
Total--	62.6	--	5.7	1,120.9	--	986	526.8	--	170
Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	10	26	1/0.7	5.0	--	1/2.4	4.2	--	1/2.2
2-----		--		5.5	--	1/2.4	14	--	1/34
3-----		--		4.6	137	1.7	8.9	220	5.3
4-----		26		4.0	--	1/1.4	5.0	--	1/4.8
5-----		11		4.6	155	1.9	1.9	--	1/2.8
6-----	12	52	1.7	8	--	1/3.6	23	--	1/460
7-----	11	--	1/1.7	5	160	2.2	729	5,370	3/6,790
8-----	10	59	1.6	15	--	1/4.8	297	2,970	3/2,600
9-----	10	--	1/1.6	12	75	2.4	346	4,320	3/4,160
10-----	11	--	1/1.8	10	--	1/1.8	713	2,230	3/4,600
11-----	10	54	1.5	9	--	1/1.9	41	1,200	3/141
12-----	9.4	--	1/1.3	8.4	105	2.4	18	--	1/65
13-----	12	65	2.1	6.0	--	1/2.0	15	--	1/100
14-----	18	--	1/5.0	5.0	134	1.8	174	6,480	3/3,140
15-----	14	150	5.7	4.6	--	1/1.4	28	--	1/220
16-----	12	--	1/3.8	6.3	87	1.5	22	425	25
17-----	9.9	86	2.3	5.5	--	1/1.3	15	--	1/9
18-----	7.2	--	1/1.4	42	--	1/1,200	18	--	1/60
19-----	6.3	--	1/1.1	17	400	18	70	--	1/950
20-----	6.3	60	1.0	8.9	--	1/7.0	103	--	1/1,600
21-----	5.9	--	1/1.0	28	979	3/115	36	--	1/260
22-----	5.9	85	1.4	26	1,990	3/144	22	--	1/100
23-----	5.9	--	1/1.6	11	--	1/24	16	1,200	52
24-----	5.5	114	1.7	6.8	370	6.8	11	--	1/20
25-----	5.5	--	1/1.8	8.0	--	1/5.0	8.2	310	6.9
26-----	5.0	130	1.8	4.6	120	1.5	6.6	--	1/3.4
27-----	5.0	--	1/1.9	4.0	--	1/1.1	8.2	130	2.9
28-----	5.0	--	1/2.0	3.5	--	1/9	124	4,360	3/1,780
29-----	5.0	--	1/2.2	3.3	90	.8	46	--	1/340
30-----	5.0	177	2.4	3.5	--	1/1.0	13	--	1/50
31-----	--	--	--	3.5	130	1.2	--	--	--
Total--	263.8	--	55	288.6	--	1,600	2,937.0	--	30,600

1/Estimated.

(a)Sediment discharge less than 0.1 ton.

3/Sediment discharge computed by subdividing day.

PLATTE RIVER BASIN--Continued

WOOD RIVER NEAR RIVERDALE, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	7.8	320	6.7	1.2	--	1/0.4	1.2	--	1/0.2
2-----	5.7	--	1/1.5	1.0	--	1/3	1.2	66	.2
3-----	4.9	--	1/1.2	1.2	116	.4	1.2	--	1/3
4-----	5.7	90	1.4	1.4	--	1/4	4.8	80	3/1.3
5-----	7.0	--	1/1.7	1.2	--	1/3	7.8	--	1/2.4
6-----	13	400	14	1.1	104	.3	32	1,320	3/194
7-----	14	--	1/4.6	1.2	--	1/4	29	1,290	3/106
8-----	62	3,820	3/868	1.2	135	.4	77	--	1/360
9-----	37	--	1/170	1.2	172	.6	30	--	1/110
10-----	29	--	1/240	1.1	--	1/5	38	--	1/320
11-----	87	--	1/1800	1.0	--	1/3	226	4,590	3/3,060
12-----	36	2,790	3/290	1.2	--	1/2	20	1,500	3/91
13-----	23	--	1/60	1.0	57	.2	6.6	--	1/11
14-----	18	370	18	1.0	--	1/2	2.2	--	1/2.2
15-----	17	--	1/8.5	.9	--	1/2	1.4	285	1.1
16-----	13	140	4.1	1.0	--	1/2	1.1	--	1/6
17-----	12	--	1/3.2	1.6	--	1/4	.9	143	.3
18-----	10	--	1/2.4	6.6	110	2.0	.9	--	1/3
19-----	5.0	--	1/1.2	3.2	--	1/7	.8	--	1/2
20-----	2.5	--	1/5	1.8	58	.3	.9	90	.2
21-----	4.5	77	.9	1.2	--	1/2	.8	74	.2
22-----	12	--	1/4.6	1.2	65	.2	.8	91	.2
23-----	11	--	1/4.4	1.4	--	1/3	.7	--	1/2
24-----	6.5	--	1/2.4	1.2	80	.3	.7	100	.2
25-----	3.0	--	1/1.1	1.0	--	1/2	.7	--	1/2
26-----	1.6	134	.6	1.2	95	.3	.8	--	1/1
27-----	1.4	124	.5	1.2	--	1/3	.8	52	1
28-----	1.4	--	1/5	1.2	--	1/3	.7	--	1/1
29-----	1.4	152	.6	1.1	--	1/2	.7	--	1/1
30-----	1.2	--	1/4	1.2	48	.2	.7	--	1/2
31-----	1.2	115	.4	1.2	--	1/1	--	--	--
Total-	454.8	--	3,500	44.2	--	11	490.4	--	4,300

Total discharge for year (second-foot-days) ----- 6,364.9

Total load for year (tons) ----- 41,260

1/Estimated.

3/Sediment discharge computed by subdividing day.

PLATTE RIVER BASIN--Continued
WOOD RIVER NEAR RIVERDALE, NEBR.--Continued

Particle-size analyses of suspended sediment, February to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Feb. 26, 1949	10:35 a. m.	284	390	300	16	36	54	68	85	--	--	--	--	--	--	BW
May 18	7:10 p. m.	37	7,680	3,220	37	58	75	84	91	99	100	100	100	100	100	BW
May 18	7:10 p. m.	37	7,680	3,190	11	22	75	84	91	98	95	100	100	100	100	BN
May 21	5:40 p. m.	56	780	531	46	65	83	94	--	--	--	--	--	--	--	BW
May 22	8:20 a. m.	24	2,200	1,370	74	89	97	99	100	--	--	--	--	--	--	BW
June 7	1:20 p. m.	710	4,520	3,990	52	73	83	89	95	98	100	100	100	100	100	BW
June 7	5:30 p. m.	1,070	3,810	11,000	64	78	87	91	95	99	100	100	100	100	100	BW
June 9	6:00 p. m.	602	5,770	7,530	--	60	76	86	94	99	100	100	100	100	100	BW
June 9	6:00 p. m.	602	5,770	7,430	36	59	75	85	93	98	100	100	100	100	100	BN
June 10	8:30 a. m.	950	2,280	1,720	66	84	91	95	97	97	97	97	97	97	97	BW
June 10	4:40 p. m.	469	2,100	1,670	72	82	90	93	98	99	100	100	100	100	100	BW
June 14	9:15 a. m.	245	6,400	2,470	44	64	78	86	93	97	99	99	99	99	99	BW
June 14	9:15 a. m.	245	6,400	2,520	38	59	76	87	94	97	98	97	98	97	98	BN
June 14	5:05 p. m.	136	5,640	4,490	56	80	91	98	--	--	--	--	--	--	--	BW
June 20	10:45 a. m.	110	4,800	1,620	55	75	87	93	96	99	100	100	100	100	100	BW
June 20	10:45 a. m.	110	4,800	1,570	21	61	91	93	97	99	100	100	100	100	100	BN
June 28	9:50 a. m.	206	6,750	5,370	40	63	80	88	95	98	--	--	--	--	--	BW
June 28	12:05 p. m.	188	8,860	3,340	42	56	77	86	97	99	--	--	--	--	--	BW
June 28	12:05 p. m.	188	8,860	3,570	28	49	72	86	96	--	--	--	--	--	--	BN
June 29	10:20 a. m.	55	3,000	2,830	48	64	86	96	99	--	--	--	--	--	--	BW
July 8	5:45 p. m.	102	4,740	1,780	52	68	86	92	98	100	--	--	--	--	--	BW
July 8	5:45 p. m.	102	4,740	1,760	12	24	78	95	98	100	--	--	--	--	--	BN
Sept. 6	11:50 a. m.	9.5	346	659	74	88	98	100	--	--	--	--	--	--	--	BW
Sept. 6	5:45 p. m.	74	2,360	1,650	48	69	83	94	98	99	100	100	100	100	100	BW
Sept. 7	8:20 a. m.	29	1,640	1,090	57	77	92	97	99	100	--	--	--	--	--	BW
Sept. 11	3:45 p. m.	246	3,300	2,220	41	67	78	87	92	98	99	99	99	99	99	BW
Sept. 11	8:30 p. m.	179	2,890	1,490	51	70	31	92	95	99	100	100	100	100	100	BW
Sept. 12	8:20 a. m.	20	1,700	1,170	70	88	97	--	--	--	--	--	--	--	--	BW
Sept. 12	4:15 p. m.	13	1,210	710	77	91	97	99	100	--	--	--	--	--	--	BW
Sept. 12	6:30 p. m.	12	1,100	624	81	95	97	100	--	--	--	--	--	--	--	BW
Sept. 12	6:45 p. m.	112	1,090	1,020	71	94	97	99	100	--	--	--	--	--	--	BW

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT DUNNING, NEBR.

LOCATION.--At county bridge at north limits of Dunning, Blaine County, 50 feet upstream from gaging station which is 1½ miles upstream from Dismal River.

DRAINAGE AREA.--1,760 square miles, of which about 80 square miles contribute directly to surface runoff.

RECORDS AVAILABLE.--Water temperatures: April 1948 to September 1949.

Sediment records: April 1946 to September 1949.

EXTREMES, April to September 1948.--Water temperatures: Maximum, 77°F July 26.

EXTREMES, 1948-49.--Water temperatures: Maximum, 75°F July 8, Aug. 14; minimum, freezing point on many days during November to March.

Sediment concentrations: Maximum daily, 5,160 ppm Dec. 7; minimum daily, 42 tons Jan. 4.

Sediment loads: Maximum daily, 5,400 tons Dec. 6-7; minimum daily, 42 tons Jan. 4.

EXTREMES, 1946-49.--Water temperatures (April 1948 to September 1949): Maximum, 77°F July 26, 1948; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 5,160 ppm Dec. 7, 1949; minimum daily, 40 ppm Jan. 9-10, 1949.

Sediment loads: Maximum daily, 5,400 tons Dec. 6-7, 1949; minimum daily, 42 tons Jan. 4, 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Temperature (°F) of water, April to September 1948
/Once-daily temperature measurement at approximately 7 a. m. /

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1							--	56	60	65	66	--
2							--	52	65	--	64	--
3							41	54	65	--	66	--
4							59	50	65	69	59	65
5							48	50	70	70	64	63
6							50	42	65	71	63	65
7							48	51	68	70	65	58
8							38	54	67	69	67	54
9							42	53	66	67	68	55
10							48	43	66	70	69	--
11							47	45	65	71	66	60
12							46	47	65	71	67	62
13							49	54	60	69	67	62
14							43	58	62	70	68	61
15							56	54	62	63	69	61
16							52	55	68	68	72	58
17							49	55	65	65	69	60
18							46	59	62	65	68	63
19							56	68	57	70	70	64
20							49	--	59	71	69	64
21							48	--	58	70	65	61
22							55	--	60	67	67	59
23							58	65	60	63	69	57
24							57	62	61	66	68	56
25							51	60	62	69	68	56
26							50	63	68	77	68	53
27							48	59	62	69	67	50
28							53	60	61	70	68	51
29							55	54	61	71	69	50
30							55	58	62	60	--	51
31							--	60	--	67	--	--
Average							50	55	63	68	67	58

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT DUNNING, NEBR.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement, between 7 a. m. and 9 a. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	44	32	--	32	32	33	47	63	69	65	55
2	--	43	33	32	32	32	--	54	60	74	65	60
3	50	45	35	32	32	34	--	58	61	70	68	64
4	50	47	33	--	32	38	--	64	62	70	65	61
5	50	37	32	--	32	34	42	62	60	72	67	61
6	49	32	32	32	32	40	45	52	64	72	68	61
7	40	37	32	32	33	37	47	53	58	72	67	61
8	40	32	32	32	33	39	48	53	56	75	67	58
9	45	32	32	32	32	32	47	51	62	70	69	57
10	45	32	--	32	32	33	42	55	64	68	69	60
11	41	32	32	32	33	33	46	58	68	66	70	60
12	43	32	32	32	32	34	47	60	69	68	72	58
13	44	34	33	32	32	35	50	61	63	71	70	46
14	45	36	33	32	32	35	38	60	63	66	75	55
15	49	39	32	32	32	32	37	62	62	69	70	55
16	41	39	32	32	32	32	42	62	64	69	66	58
17	35	38	32	32	33	33	47	62	68	69	68	57
18	39	34	32	32	32	33	43	59	61	70	70	55
19	41	--	32	32	32	35	46	57	64	67	63	52
20	43	--	32	32	32	43	48	56	70	71	64	57
21	42	32	32	32	32	43	51	50	68	67	66	53
22	43	32	32	--	32	37	52	57	68	67	67	53
23	41	35	32	32	32	44	49	55	68	67	68	52
24	--	32	32	32	32	43	--	51	63	70	64	55
25	--	36	32	32	32	34	58	57	65	70	70	55
26	--	32	32	32	33	41	55	60	67	71	65	67
27	--	32	32	32	32	35	52	64	67	69	64	51
28	--	32	32	32	32	42	54	63	68	70	64	48
29	52	32	32	--	--	37	52	63	68	66	61	49
30	44	33	32	32	--	34	56	63	72	66	61	50
31	48	--	32	32	--	33	--	68	--	67	62	--
Average	--	1/35	32	1/32	32	36	47	58	65	69	67	56

1/Includes estimated temperature, 32°F, on missing days.

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT DUNNING, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	381	720	700	412	700	780	403	970	1,100
2-----	341	880	810	391	580	610	394	870	930
3-----	341	590	540	394	750	800	424	770	880
4-----	338	610	560	428	970	1,100	476	710	910
5-----	347	600	560	412	1,120	1,200	437	3,120	3,700
6-----	350	630	600	358	960	930	390	5,100	5,400
7-----	307	840	700	373	740	740	390	5,160	5,400
8-----	302	650	530	370	870	870	390	4,860	5,100
9-----	350	540	510	387	1,060	1,100	390	4,020	4,200
10-----	373	490	490	388	1,070	1,100	370	2,520	2,500
11-----	370	500	500	379	1,070	1,100	390	1,380	1,500
12-----	397	620	660	415	1,080	1,200	410	1,440	1,600
13-----	385	760	790	388	1,020	1,100	388	960	1,000
14-----	379	700	720	415	880	990	409	930	1,000
15-----	364	590	580	406	800	880	400	930	1,000
16-----	347	740	690	428	780	900	390	1,860	2,000
17-----	347	820	770	418	560	740	390	1,740	1,800
18-----	336	700	640	440	1,030	1,200	390	1,380	1,500
19-----	376	960	970	370	1,210	1,200	390	2,160	2,300
20-----	409	1,200	1,300	380	1,230	1,300	390	1,620	1,700
21-----	403	1,230	1,300	410	1,190	1,300	406	1,290	1,400
22-----	379	1,250	1,300	400	1,170	1,300	421	1,080	1,200
23-----	361	1,060	1,000	397	1,030	1,100	421	1,440	1,600
24-----	385	960	1,000	415	930	1,000	390	2,340	2,500
25-----	409	940	1,000	421	670	760	390	1,260	1,300
26-----	403	940	1,000	421	690	780	370	1,560	1,600
27-----	409	970	1,100	380	910	930	350	1,440	1,400
28-----	424	1,050	1,200	350	1,090	1,000	300	600	490
29-----	440	940	1,100	390	860	910	250	130	88
30-----	412	720	800	388	810	850	290	110	86
31-----	406	740	810	--	--	--	280	90	68
Total-	11,551	--	25,200	11,904	--	28,800	11,879	--	57,300
Day	January			February			March		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	280	75	57	400	210	230	510	580	800
2-----	270	210	150	400	130	140	550	500	740
3-----	260	65	46	380	120	120	500	900	1,200
4-----	240	65	42	380	200	210	460	2,010	2,500
5-----	220	95	56	380	270	280	513	2,090	2,900
6-----	160	190	82	380	300	310	489	1,350	1,800
7-----	190	240	120	390	320	340	460	1,120	1,400
8-----	390	140	150	380	320	330	469	1,220	1,500
9-----	430	40	46	400	140	150	428	1,700	2,000
10-----	430	40	46	370	150	150	418	2,080	2,300
11-----	370	60	60	390	280	290	424	1,460	1,700
12-----	380	110	110	410	320	350	456	1,130	1,400
13-----	380	150	150	320	330	290	453	1,320	1,600
14-----	370	150	150	280	180	140	450	1,730	2,100
15-----	380	160	160	430	100	120	430	2,000	2,300
16-----	360	210	200	450	110	130	430	1,870	2,200
17-----	300	180	150	460	150	190	421	1,440	1,600
18-----	280	120	91	490	240	320	434	1,150	1,300
19-----	320	80	69	420	360	410	447	660	800
20-----	310	110	92	370	460	460	472	1,080	1,400
21-----	280	160	120	390	260	270	513	1,350	1,900
22-----	280	170	130	440	180	210	476	1,230	1,600
23-----	350	140	130	500	180	240	509	1,320	1,800
24-----	340	130	120	540	230	340	492	1,620	2,200
25-----	290	130	100	540	260	380	485	1,570	2,100
26-----	320	140	120	570	350	540	536	1,260	1,800
27-----	380	140	140	540	650	950	519	1,200	1,700
28-----	380	90	90	520	730	1,000	540	1,300	1,900
29-----	340	140	130	--	--	--	540	1,540	2,200
30-----	330	140	120	--	--	--	520	1,610	2,300
31-----	370	190	190	--	--	--	450	1,650	2,000
Total-	9,980	--	3,400	11,920	--	8,900	14,791	--	55,000

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT DUNNING, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	421	2,100	2,400	469	890	1,100	391	680	720
2-----	434	1,060	1,200	428	980	1,100	379	840	860
3-----	450	870	1,100	434	830	970	352	840	610
4-----	460	850	1,100	424	550	630	352	830	790
5-----	499	1,120	1,500	456	860	1,100	358	720	700
6-----	530	1,450	2,100	456	1,320	1,600	385	460	480
7-----	513	1,250	1,700	388	1,380	1,400	460	820	1,000
8-----	492	1,150	1,500	409	960	1,100	406	870	950
9-----	543	1,300	1,900	394	1,190	1,300	409	700	770
10-----	476	1,300	1,700	391	960	1,000	428	800	920
11-----	409	1,110	1,200	409	650	720	431	800	930
12-----	424	1,030	1,200	406	520	570	440	860	1,000
13-----	447	1,300	1,600	412	530	590	456	950	1,200
14-----	434	1,550	1,800	400	600	650	424	940	1,100
15-----	406	1,240	1,400	397	700	750	394	790	840
16-----	388	1,100	1,200	418	730	820	376	590	600
17-----	415	940	1,100	424	690	790	379	450	460
18-----	397	900	960	415	1,000	1,100	373	560	560
19-----	394	970	1,000	397	1,060	1,100	373	450	450
20-----	403	930	1,000	388	1,140	1,200	379	420	430
21-----	415	760	850	453	1,150	1,400	379	440	450
22-----	406	800	880	450	750	910	376	450	460
23-----	397	770	830	403	710	770	373	460	460
24-----	391	660	700	364	870	860	373	400	400
25-----	403	790	860	370	1,010	1,000	367	460	460
26-----	391	910	960	379	1,000	1,000	347	510	480
27-----	394	830	880	373	860	870	367	560	550
28-----	388	690	720	385	710	740	350	620	590
29-----	397	680	730	358	640	620	352	440	420
30-----	412	680	760	355	680	650	350	450	430
31-----	--	--	--	370	890	890	--	--	--
Total-	12,929	--	36,800	12,575	--	29,300	11,579	--	20,100

Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	344	500	460	341	510	470	341	510	470
2-----	358	380	370	336	460	420	333	510	460
3-----	352	310	290	336	440	400	388	540	560
4-----	341	290	270	333	420	380	428	530	610
5-----	336	430	390	327	470	410	391	670	710
6-----	379	490	500	327	500	440	409	650	720
7-----	400	600	650	327	350	310	394	590	630
8-----	393	690	1/740	330	400	360	391	530	560
9-----	344	560	520	353	470	1/460	388	570	600
10-----	330	610	540	373	400	400	420	540	610
11-----	333	690	620	350	290	270	445	530	640
12-----	344	540	500	336	280	250	394	540	570
13-----	358	510	490	350	280	260	373	500	500
14-----	350	480	450	352	360	340	379	460	470
15-----	361	410	400	341	300	280	376	420	430
16-----	358	370	360	347	270	250	379	450	460
17-----	358	390	380	376	350	360	387	520	520
18-----	352	430	410	385	480	500	358	520	500
19-----	355	430	410	382	600	620	347	380	360
20-----	379	500	510	358	580	560	350	450	430
21-----	376	520	530	338	480	440	344	520	480
22-----	361	450	440	333	480	430	347	600	560
23-----	358	420	410	333	490	440	344	480	450
24-----	358	370	360	322	460	400	355	460	440
25-----	361	500	490	359	510	520	352	410	390
26-----	355	660	630	386	730	760	352	500	480
27-----	352	760	720	350	420	400	355	550	530
28-----	355	510	490	341	450	410	341	500	460
29-----	379	570	580	352	720	680	330	550	490
30-----	385	550	570	355	510	490	320	490	420
31-----	358	500	480	367	380	380	--	--	--
Total-	11,123	--	15,000	10,796	--	13,100	11,091	--	15,500

Total discharge for year (second-foot-days)-----142,118

Total load for year (tons)-----309,000

1/Sediment discharge computed by subdividing day.

PLATTE RIVER BASIN--Continued
MIDDLE LOUP RIVER AT DUNNING, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Water tem- pera- ture (°F)	Suspended sediment										Methods of analysis	
				Concentra- tion of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
						0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350
Oct. 15, 1948	12:45 p. m.	367	--	--	--		--	2	4	14	79		99	BN	
Oct. 15	4:20 p. m.	370	--	--	--		--	4	9	27	97		100	BN	
Oct. 19	12:00 m.	350	45	908	1,740		4	4	8	18	74		96	BN	
Nov. 2	6:15 p. m.	379	--	634	1,340		6	4	10	22	61		94	BN	
Dec. 1	4:00 p. m.	412	--	976	1,780		4	5	11	26	78		98	BN	
Jan. 13, 1949	2:35 p. m.	380	--	162	335		7	12	21	38	63		86	BN	
Mar. 22	11:20 a. m.	466	--	1,040	1,890		12	15	21	46	--		--	BW	
May 17	12:10 p. m.	431	--	508	1,120		6	8	14	29	94		100	BW	
June 4	1:45 p. m.	350	--	571	988		7	11	32	--	--		--	BN	
June 14	11:30 a. m.	424	--	754	1,540		20	24	33	48	--		--	BW	
June 28	12:55 p. m.	352	--	382	809		--	24	31	45	--		--	BW	
July 15	1:45 p. m.	364	78	325	--		--	17	24	35	--		--	BN	
Aug. 4	10:00 a. m.	330	--	446	1,170		6	8	16	38	100		--	BN	
Aug. 9	5:00 p. m.	333	--	338	1,140		14	18	28	36	--		--	BW	
Aug. 25	10:15 a. m.	336	--	508	1,430		7	9	18	34	--		--	BN	
Sept. 13	12:05 p. m.	379	53	586	1,840		4	5	10	24	--		--	BW	
Sept. 20	4:10 p. m.	344	--	458	812		--	--	--	30	--		--	BW	

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT ST. PAUL, NEBR.

LOCATION.--At bridge on U. S. Highway 281 at St. Paul, Howard County, 600 feet downstream from gaging station which is 6 miles upstream from confluence with North Loup River.

DRAINAGE AREA.--7,720 square miles, of which only 3,200 square miles contribute directly to surface runoff.

RECORDS AVAILABLE.--Temperature records: April 1948 to September 1949.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 8.170 ppm June 9; minimum daily, not determined.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 8.170 ppm June 9; minimum daily, not determined.

Sediment loads, 1948-49.--Sediment concentrations: Maximum daily, not determined; minimum daily, not determined.

EXTREMES, 1946-49.--Sediment concentrations: Maximum daily, not determined; minimum daily, not determined.

Sediment loads, 1946-49.--Sediment concentrations: Maximum daily, not determined; minimum daily, not determined.

REMARKS.--Records of discharge for water year 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, March to June 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
Mar. 5, 1949-----	3,100	7.5	198	32	0.12	29	4.2	5.5	4.6	112	4.8	2.0	0.3	1.3	0.07	158	0.21		90	0	12
Mar. 6 -----	3,050	7.5	198	32	1.10	31	5.3	4.6	4.6	120	7.2	1.5	3	9	.04	162	.22		100	2	9
June 7 -----	7,250	7.2	242	35	1.10	32	4.7	14	14	148	6.4	1.5	3	2	--	173	.24		100	0	23
June 9 -----	7,940	7.2	242	28	1.10	35	4.2	12	12	140	12	1.0	3	3	--	167	.23		105	0	19

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT ST. PAUL, NEBR.--Continued

Temperature (°F) of water, April to November 1948
 [Once-daily temperature measurement between 7 a. m. and 8 a. m.]

Day	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	40	60	68	70	71	--	56	54				
2	41	55	68	69	68	73	57	53				
3	44	60	67	78	65	73	60	--				
4	48	66	70	75	63	72	54	--				
5	51	57	73	85	68	--	52	--				
6	52	50	79	79	--	79	50	--				
7	52	56	73	80	65	65	45	43				
8	44	57	70	74	70	58	--	40				
9	45	--	69	71	72	68	58	36				
10	50	51	72	74	73	--	55	40				
11	50	48	70	80	71	66	53	38				
12	50	49	68	77	71	71	52	37				
13	47	58	66	76	68	75	48	38				
14	48	61	70	76	73	68	47	39				
15	56	62	72	73	66	65	49	38				
16	55	67	72	71	73	68	48	37				
17	53	60	--	70	74	64	45	38				
18	58	65	68	--	73	68	48	36				
19	60	65	62	73	75	74	42	--				
20	55	66	64	73	74	70	45	--				
21	54	70	63	75	70	67	45	--				
22	58	68	61	73	74	66	45	32				
23	60	70	65	67	70	64	43	--				
24	63	65	67	70	73	58	47	--				
25	--	64	70	68	71	58	47	--				
26	57	65	--	--	73	58	46	--				
27	57	64	--	75	71	56	47	--				
28	58	64	--	74	73	56	49	--				
29	61	60	--	71	69	56	48	--				
30	58	--	--	69	70	56	48	--				
31	--	--	--	70	--	--	55	--				
Average	53	61	69	74	71	66	49	--				

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT ST. PAUL, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	780	480	1,010	931	--	1/2, 800	1, 120	--	1/1, 800
2-----	762	820	1, 690	931	--	1/3, 000	1, 190	--	1/1, 900
3-----	825	800	1, 780	891	--	1/3, 000	4, 210	--	1/2, 000
4-----	816	--	1/2, 100	961	1, 250	3, 240	1, 490	--	1/3, 400
5-----	762	--	1/1, 800	1, 170	1, 260	3, 980	1, 550	--	1/4, 000
6-----	762	700	1, 440	1, 050	1, 240	3, 520	1, 400	--	1/2, 600
7-----	816	680	1, 500	1, 020	1, 150	3, 170	1, 100	--	1/1, 800
8-----	921	--	1/3, 000	981	--	1/2, 800	900	--	1/1, 300
9-----	872	1, 160	2, 730	931	950	2, 390	840	--	1/900
10-----	727	810	1, 590	1, 030	--	1/4, 400	600	--	1/500
11-----	710	710	1, 360	1, 030	1, 540	4, 280	510	--	1/400
12-----	780	--	1/1, 700	1, 040	1, 150	3, 230	640	--	1/900
13-----	835	760	1, 710	1, 040	1, 420	3, 990	660	--	1/1, 400
14-----	844	660	1, 500	1, 040	1, 520	4, 270	710	--	1/1, 900
15-----	853	820	1, 890	1, 040	1, 160	3, 260	880	1, 140	2, 710
16-----	863	870	2, 030	1, 050	1, 450	4, 110	900	--	1/3, 400
17-----	891	830	2, 000	1, 050	1, 420	4, 030	900	--	1/4, 200
18-----	921	820	2, 040	1, 010	1, 300	3, 550	900	--	1/4, 200
19-----	863	750	1, 750	480	--	1/1, 500	940	--	1/4, 100
20-----	797	--	1/1, 400	160	--	1/380	980	--	1/4, 200
21-----	788	610	1, 300	190	--	1/420	990	--	1/3, 700
22-----	863	--	1/1, 400	210	--	1/280	1, 000	1, 300	3, 510
23-----	872	600	1, 410	970	--	1/2, 600	980	--	1/3, 900
24-----	863	620	1, 440	2, 000	1, 310	2/7, 190	760	--	1/3, 300
25-----	853	500	1, 150	2, 050	--	1/4, 200	620	--	1/2, 600
26-----	853	--	1/1, 100	1, 780	--	1/3, 400	570	--	1/2, 200
27-----	872	640	1, 510	1, 630	--	1/3, 100	510	--	1/2, 000
28-----	863	900	2, 100	1, 260	--	1/2, 300	510	--	1/1, 900
29-----	921	830	2, 060	1, 170	--	1/2, 000	410	--	1/1, 400
30-----	961	1, 030	2, 670	1, 150	--	1/1, 900	400	--	1/1, 500
31-----	961	--	1/2, 800	--	--	--	380	1, 300	1, 330
Total-	26, 070	--	54, 960	31, 246	--	92, 300	26, 550	--	75, 000
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	400	--	1/1, 500	780	--	1/850	2, 100	--	1/1, 900
2-----	590	--	1/2, 200	750			2, 100	300	1, 700
3-----	500	--	1/1, 400	790			2, 100	--	1/1, 900
4-----	600	--	1/700	790			2, 300	--	1/2, 600
5-----	760	--	1/750	800			2, 600	640	4, 490
6-----	830	270	600	800	--	1/950	2, 700	1, 430	2/10, 600
7-----	840	}	{	850			3, 200	1, 360	2/11, 900
8-----	860			850			3, 300	2, 960	2/26, 400
9-----	650			900			2, 370	--	1/15, 000
10-----	620			900			2, 020	1, 950	10, 600
11-----	640	}	{	940			1, 780	1, 600	7, 690
12-----	680			890			1, 590	--	1/6, 300
13-----	820			870			1, 620	1, 850	8, 090
14-----	940			850			1, 550	1, 600	6, 700
15-----	1, 000			850			1, 110	--	1/3, 400
16-----	940	--	1/2, 000	880	460	1, 090	1, 120	--	1/5, 100
17-----	960	--	1/1, 800	910	--	1/850	1, 100	1, 800	5, 350
18-----	1, 000	--	1/1, 700	870	--	1/400	1, 080	2, 100	6, 120
19-----	960	--	1/1, 500	870	90	210	2, 120	2, 850	16, 300
20-----	900	--	1/1, 400	860	--	1/190	2, 760	3, 650	27, 200
21-----	790	--	1/1, 200	930	--	1/280	2, 810	3, 900	29, 600
22-----	770	--	1/1, 100	990	160	430	2, 000	2, 570	13, 900
23-----	840	--	1/1, 200	1, 200	--	1/750	1, 900	2, 100	10, 800
24-----	850	--	1/1, 000	1, 500	500	2, 030	1, 690	1, 800	8, 210
25-----	780	}	{	2, 300	--	1/4, 300	1, 810	1, 650	8, 060
26-----	780			2, 200	--	1/4, 000	1, 740	1, 750	8, 220
27-----	810			2, 100	--	1/3, 200	2, 200	2, 300	13, 700
28-----	800			2, 000	--	1/2, 400	2, 150	2, 100	12, 200
29-----	800			--	--	--	1, 840	1, 800	8, 940
30-----	790			--	--	--	2, 140	2, 500	14, 400
31-----	780			--	--	--	2, 200	2, 650	15, 700
Total-	24, 280	--	32, 700	30, 220	--	33, 800	63, 100	--	323, 100

1/Estimated.

2/Sediment discharge computed by subdividing day.

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT ST. PAUL, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,580	2,200	9,390	1,010	840	2,290	2,100	--	1/20,000
2-----	2,230	3,050	2/15,600	1,040	930	2,610	2,320	--	1/33,000
3-----	1,860	2,400	12,100	981	1,050	2,780	1,580	1,350	5,780
4-----	1,820	2,000	9,830	981	--	1/2,500	1,840	1,000	4,970
5-----	1,810	1,650	8,060	991	800	2,140	1,810	820	4,010
6-----	1,860	1,400	7,030	1,390	1,390	5,210	1,930	740	3,860
7-----	2,150	1,950	11,300	1,410	1,050	4,000	5,350	7,540	2/140,000
8-----	2,260	1,600	9,760	1,590	1,050	4,510	3,910	5,600	59,100
9-----	2,000	1,650	8,910	1,520	1,250	5,130	6,860	8,170	2/166,000
10-----	2,890	3,000	2/23,600	1,330	900	3,230	5,390	7,070	2/105,000
11-----	2,760	--	1/18,000	1,190	1,000	3,210	1,990	4,200	2/23,200
12-----	2,220	2,450	14,700	1,160	770	2,410	1,370	1,900	7,030
13-----	1,750	1,900	8,980	1,130	730	2,230	1,480	--	1/8,700
14-----	1,930	1,750	9,120	1,050	660	1,870	1,740	2,670	2/13,200
15-----	1,680	1,750	7,940	1,060	580	1,660	1,590	1,710	2/7,450
16-----	1,360	1,750	6,430	1,060	650	1,860	1,620	2,400	10,500
17-----	1,040	1,650	4,630	1,080	960	2,800	1,280	2,050	7,080
18-----	1,100	1,500	4,460	1,360	--	1/7,000	1,450	1,670	6,540
19-----	1,210	1,380	4,510	1,220	--	1/5,300	1,400	1,360	5,140
20-----	1,190	1,200	3,860	1,100	1,150	3,420	1,140	1,050	3,230
21-----	1,370	1,050	3,880	1,650	1,810	2/8,270	1,280	--	1/5,900
22-----	1,290	1,000	3,480	2,000	2,150	11,600	1,150	1,260	3,810
23-----	1,280	950	3,230	1,860	2,200	11,000	991	650	1,740
24-----	1,170	910	2,870	1,590	--	1/9,400	1,030	800	2,220
25-----	981	1,000	2,650	1,450	2,650	10,400	1,040	710	1,990
26-----	991	1,490	2/3,980	1,110	1,850	5,540	1,080	600	1,750
27-----	1,110	--	1/4,300	1,130	1,330	4,060	1,010	480	1,310
28-----	941	920	2,340	1,310	1,100	3,890	1,370	--	1/5,800
29-----	911	700	1,720	1,340	950	3,440	1,560	--	1/22,000
30-----	971	730	1,916	1,480	880	3,520	1,280	2,200	7,600
31-----	--	--	--	1,520	--	1/4,100	--	--	--
Total-----	47,695	--	228,600	40,093	--	141,400	59,941	--	688,000
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,170	1,300	4,110	576	380	590	762	430	880
2-----	981	870	2,300	640	350	600	806	460	1,000
3-----	911	650	1,600	618	350	580	788	410	870
4-----	825	520	1,160	611	340	560	844	380	870
5-----	762	480	990	569	300	460	853	430	990
6-----	771	450	940	543	250	370	3,040	--	1/45,000
7-----	806	430	940	500	220	300	4,160	5,360	2/61,100
8-----	844	520	1,180	465	220	280	2,300	3,760	2/23,700
9-----	1,000	800	2,180	448	210	250	1,450	2,600	10,200
10-----	1,340	--	1/6,200	459	220	270	1,380	1,750	6,520
11-----	1,000	900	2,430	459	250	310	1,230	--	1/5,600
12-----	1,090	1,220	3,580	483	280	380	1,280	--	1/8,600
13-----	901	900	2,190	611	320	530	1,280	--	1/6,600
14-----	806	700	1,520	543	350	510	1,210	1,400	4,570
15-----	806	500	1,090	556	400	600	1,000	850	2,300
16-----	780	420	880	1,130	--	1/8,200	1,000	850	2,300
17-----	687	390	720	825	1,100	2,450	961	850	1,690
18-----	648	320	560	816	770	1,700	1,000	620	1,670
19-----	604	260	420	882	640	1,520	961	600	1,560
20-----	556	250	380	961	640	1,660	911	550	1,350
21-----	562	260	400	1,020	600	1,650	844	520	1,180
22-----	556	280	420	941	470	1,190	806	500	1,090
23-----	471	300	380	870	360	850	853	530	1,220
24-----	494	320	430	780	360	760	872	550	1,290
25-----	483	310	400	702	440	830	797	530	1,140
26-----	483	250	330	663	410	730	797	500	1,080
27-----	488	250	330	671	400	720	806	470	1,020
28-----	512	320	440	771	460	960	863	460	1,070
29-----	519	270	380	853	450	1,040	844	450	1,030
30-----	512	300	410	788	420	890	806	450	980
31-----	550	380	560	771	380	790	--	--	--
Total-----	22,918	--	39,840	21,525	--	32,530	35,504	--	196,500
Total discharge for year (second-foot-days)-----									429,142
Total load for year (tons)-----									1,939,000

1/Estimated.

2/Sediment discharge computed by subdividing day.

PLATTE RIVER BASIN--Continued

MIDDLE LOUP RIVER AT ST. PAUL, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis	
			Concentration of sample - (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000
Oct. 1, 1948	10:35 a. m.	797	476	1,230	--	--	--	21	30	42	55	96	100	BW/C	
	1:30 p. m.	911	745	1,930	--	11	15	25	40	52	87	98	BW/C		
	Oct. 31	931	1,560	4,120	--	--	7	13	20	28	58	--	BN		
	8:40 a. m.	961	1,270	3,380	--	--	--	5	7	13	22	59	BN		
	Dec. 15	920	1,150	2,270	--	--	--	5	8	13	21	65	BN		
	Jan. 14, 1949	3:30 p. m.	967	377	974	--	--	20	24	34	46	60	95	BW	
		2:10 p. m.	1,070	1,120	2,210	--	--	10	14	24	41	56	80	92	BW
		Jan. 15	3,070	656	1,680	--	--	35	42	57	63	76	91	99	BW
		4:45 p. m.	2,650	1,760	4,240	--	--	13	16	28	33	41	--	BW	
		Mar. 6	2,120	2,800	7,440	--	--	--	8	12	25	36	83	98	BW
		Mar. 19	1,810	1,780	4,190	--	--	15	16	22	33	52	91	--	BW
		Mar. 29	2,080	1,730	2,470	--	--	--	16	23	32	43	--	--	BW
Apr. 9		872	623	1,460	--	--	10	14	28	52	69	98	100	BW	
Apr. 29		1,090	972	2,020	--	6	10	14	23	35	50	62	--	BW	
May 11		1,420	2,200	5,560	27	40	49	55	60	66	72	86	--	BW	
May 18		2,240	2,410	5,080	13	18	23	28	42	59	78	92	--	BW	
May 22		1,060	1,210	1,750	--	12	15	27	36	42	49	63	--	BN	
May 27	1,060	1,210	1,640	--	17	21	27	34	43	52	62	--	BW		
May 27	6:10 p. m.	4,300	6,140	7,550	30	39	45	51	60	70	82	--	BW		
June 8	7:15 a. m.	10,400	11,300	6,250	22	30	37	45	59	77	85	--	BW		
June 9	1:15 p. m.	10,400	11,300	6,470	20	29	37	44	54	73	87	95	BN		
June 10	12:00 p. m.	6,280	7,350	8,550	20	33	44	51	59	74	80	89	BN		
June 10	12:00 m.	6,280	7,330	9,010	32	36	46	51	63	72	80	97	BW		
June 14	7:00 a. m.	2,080	3,120	7,760	16	22	26	30	36	44	52	78	96	BW	
June 16	5:15 p. m.	2,480	2,480	6,500	35	48	58	63	70	75	83	99	--	BW	
June 19	10:45 a. m.	1,410	1,310	3,190	--	15	20	26	35	50	61	70	--	BW	
June 29	7:10 a. m.	1,810	5,740	6,890	--	--	28	54	61	71	84	90	--	BN	
June 29	7:10 a. m.	1,810	5,740	6,900	33	45	55	62	72	82	87	95	--	BW	
June 30	1:50 p. m.	1,310	1,930	4,180	39	54	63	70	76	82	90	99	--	BW	

July 10	7:00 p. m.	1,410	1,770	4,480	9	13	16	20	32	43	59	81	91	55	BW
July 11	5:30 p. m.	1,850	1,890	3,050	32	46	53	59	79	73	81	84	95	56	BW
July 12	2:30 p. m.	1,970	1,870	2,150	36	48	54	62	69	73	81	84	95	56	BW
July 13	5:30 p. m.	1,970	1,870	2,150	36	48	54	62	69	73	81	84	95	56	BW
July 14	5:30 p. m.	1,970	1,870	2,150	36	48	54	62	69	73	81	84	95	56	BW
July 15	5:30 p. m.	1,970	1,870	2,150	36	48	54	62	69	73	81	84	95	56	BW
July 16	5:30 p. m.	1,970	1,870	2,150	36	48	54	62	69	73	81	84	95	56	BW
July 17	5:30 p. m.	1,970	1,870	2,150	36	48	54	62	69	73	81	84	95	56	BW
Aug. 5	6:15 p. m.	569	253	573	--	22	25	34	52	62	77	89	75	90	BW
Aug. 6	5:30 p. m.	931	1,170	4,110	18	24	34	40	49	62	68	75	75	90	BW
Aug. 16	5:30 p. m.	853	1,110	2,930	19	28	36	43	48	56	61	73	73	83	BW
Aug. 17	5:30 p. m.	853	1,110	2,930	19	28	36	43	48	56	61	73	73	83	BW
Sept. 6	1:45 p. m.	5,810	5,570	8,660	--	5	6	8	16	39	61	81	81	98	BW
Sept. 7	1:45 p. m.	5,810	5,570	8,660	--	5	6	8	16	39	61	81	81	98	BW
Sept. 8	5:40 p. m.	1,760	4,160	4,800	--	18	35	38	46	52	60	91	90	98	BN
Sept. 8	5:40 p. m.	1,760	4,160	4,800	--	18	35	38	46	52	60	91	90	98	BN
Sept. 8	5:40 p. m.	1,760	4,160	4,800	--	18	35	38	46	52	60	91	90	98	BN
Sept. 13	5:30 p. m.	1,330	1,500	3,140	7	9	9	12	16	26	36	90	90	99	BW
Sept. 14	4:15 p. m.	1,120	810	1,980	--	12	14	17	24	33	50	97	97	--	BW
Sept. 18	2:20 p. m.	991	617	1,680	10	12	16	19	25	33	46	95	95	99	BW
Sept. 25	2:05 p. m.	762	443	1,060	12	13	17	21	30	41	56	93	93	99	BW
Sept. 28	7:00 a. m.	863	510	1,430	--	10	13	18	22	37	53	91	91	99	BW

PLATTE RIVER BASIN--Continued

SOUTH LOUP RIVER AT ST. MICHAEL, NEBR.

LOCATION.--At gaging station, at county highway bridge, 0.8 mile northeast of St. Michael, Buffalo County, and 5 miles upstream from Sweet Creek.

DRAINAGE AREA.--2,560 square miles, of which only about 1,650 square miles contribute directly to surface runoff.

RECORDS AVAILABLE.--Sediment records: June 1946 to September 1949.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 15,200 ppm June 9; minimum, daily, 30 ppm Nov. 20-21.

Sediment loads: Maximum daily, 91,700 tons June 9; minimum daily, 14 tons Nov. 20.

EXTREMES, 1946-49.--Sediment concentrations: Maximum daily, 19,100 ppm June 19, 1946; minimum daily, 30 ppm Nov. 20-21, 1948.

Sediment loads: Maximum daily, 672,000 tons June 22, 1947; minimum daily, 14 tons Nov. 20, 1948.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in water-Supply Paper 1146.

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	122	290	96	170	300	140	190	150	77
2-----	124	--	1/90	168	320	150	200	100	54
3-----	124	250	84	168	320	150	220	160	95
4-----	127	220	75	172	330	150	240	380	250
5-----	126	190	65	185	530	260	210	250	140
6-----	124	170	57	178	350	170	160	140	60
7-----	126	180	61	174	270	130	160	140	60
8-----	126	200	68	166	250	110	160	170	73
9-----	126	210	71	166	290	130	160	120	52
10-----	127	210	72	168	330	150	160	70	30
11-----	127	220	75	170	340	160	150	75	30
12-----	124	230	77	172	340	160	160	--	1/65
13-----	130	230	81	174	330	160	180	260	130
14-----	134	220	80	170	330	150	180	210	100
15-----	134	210	76	170	330	150	180	160	78
16-----	138	--	1/80	166	340	150	180	130	63
17-----	138	210	78	166	330	150	170	120	55
18-----	142	210	81	168	--	1/75	170	130	60
19-----	148	210	84	160	50	22	170	170	78
20-----	148	220	88	170	30	14	180	220	110
21-----	150	230	93	180	30	15	190	270	140
22-----	152	230	94	190	60	31	200	240	130
23-----	150	230	93	200	70	38	180	300	150
24-----	148	230	92	280	350	260	160	--	1/110
25-----	148	230	92	260	340	240	140	--	1/70
26-----	148	250	100	210	460	260	160	--	1/70
27-----	154	270	110	230	570	350	140	--	1/55
28-----	156	280	120	190	300	150	150	--	1/50
29-----	166	280	130	190	100	51	160	130	56
30-----	168	290	130	190	200	100	140	130	49
31-----	170	290	130	--	--	--	150	120	49
Total-	4,325	--	2,720	5,521	--	4,230	5,350	--	2,590

1/Estimated.

PLATTE RIVER BASIN--Continued

SOUTH LOUPE RIVER AT ST. MICHAEL, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	130	100	35	150	90	36	480	240	310
2-----	140	100	38	150	90	36	570	380	580
3-----	170	--	1/100	150	85	34	610	490	810
4-----	170	220	100	160	90	39	920	450	1,120
5-----	160	140	60	160	90	39	1,200	1,670	5,410
6-----	150	120	49	160	85	37	980	--	1/6,600
7-----	140	110	42	160	85	37	720	2,340	4,550
8-----	150	110	45	160	80	35	460	--	1/2,600
9-----	150	110	45	170	90	41	410	2,220	2,460
10-----	150	150	61	170	120	55	380	1,820	1,870
11-----	160	130	56	160	110	48	389	1,530	1,520
12-----	180	130	56	160	90	39	355	1,610	1,540
13-----	180	120	52	170	80	37	328	1,580	1,400
14-----	150	110	45	160	100	43	341	1,310	1,210
15-----	170	130	60	160	110	48	300	830	670
16-----	130	--	1/38	150	90	36	310	1,100	920
17-----	130	110	39	150	110	45	310	970	810
18-----	130	130	46	160	90	39	312	1,220	1,030
19-----	120	140	45	160	80	35	315	1,350	1,150
20-----	120	110	36	190	100	51	322	1,040	900
21-----	130	110	39	210	130	74	338	1,190	1,090
22-----	130	90	32	230	160	99	358	1,340	1,300
23-----	140	90	30	270	180	130	344	1,380	1,280
24-----	140	90	34	700	--	1/3,800	344	1,180	1,100
25-----	140	90	34	830	--	1/2,800	344	1,290	1,200
26-----	140	95	36	890	--	1/2,400	373	1,740	1,750
27-----	140	80	30	750	400	810	528	3,200	4,560
28-----	140	70	26	510	250	340	474	3,020	3,860
29-----	150	60	24	--	--	--	447	2,050	2,470
30-----	150	70	28	--	--	--	528	2,260	3,220
31-----	150	80	32	--	--	--	550	2,270	3,370
Total-	4,490	--	1,390	7,600	--	11,300	14,620	--	62,660
Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	420	1,400	1,590	255	740	510	277	1,150	860
2-----	396	1,420	1,520	252	760	520	274	880	650
3-----	483	2,750	3,590	233	--	1/460	263	500	360
4-----	447	2,270	2,740	233	760	480	263	480	340
5-----	408	1,880	2,070	233	930	580	266	670	480
6-----	452	2,250	2,750	242	780	510	258	810	560
7-----	478	2,720	3,510	252	540	370	1,780	11,100	2/71,200
8-----	542	2,760	4,040	290	900	700	762	6,130	2/13,200
9-----	600	3,780	6,120	325	1,340	1,180	2,320	15,200	2/91,700
10-----	550	--	1/5,700	328	1,230	1,090	2,020	8,170	2/52,000
11-----	496	--	1/4,400	286	980	760	875	3,500	8,270
12-----	528	2,160	3,080	272	830	610	672	--	1/6,300
13-----	496	2,150	2,880	260	760	530	590	--	1/8,300
14-----	524	2,340	3,310	258	800	560	488	3,000	3,950
15-----	442	2,280	2,720	250	760	510	542	--	1/3,700
16-----	420	1,970	2,230	258	820	570	524	4,100	5,800
17-----	384	1,750	1,810	290	740	580	315	3,100	2,640
18-----	351	1,330	1,260	352	2,800	2,700	355	1,800	1,730
19-----	315	960	810	341	1,180	1,090	322	1,800	1,560
20-----	306	--	1/900	309	1,000	830	277	1,010	760
21-----	306	1,280	1,060	465	3,650	2/5,100	252	850	580
22-----	283	1,040	800	474	2,700	3,460	242	700	460
23-----	269	--	1/650	580	3,700	5,790	226	540	330
24-----	263	890	630	649	5,800	10,200	226	500	310
25-----	258	900	630	550	3,200	4,750	223	480	290
26-----	255	--	1/600	412	2,500	2,780	206	440	240
27-----	266	860	620	369	1,550	1,540	206	500	280
28-----	263	920	650	338	1,020	930	322	--	1/1,300
29-----	263	790	560	322	1,020	890	299	4,000	3,230
30-----	255	--	1/500	318	1,010	870	272	2,100	1,540
31-----	--	--	--	280	960	730	--	--	--
Total-	11,719	--	63,730	10,276	--	52,180	15,917	--	282,900

1/Estimated.

2/Sediment discharge computed by subdividing day.

PLATTE RIVER BASIN--Continued

SOUTH LOUP RIVER AT ST. MICHAEL, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	Mean dis- charge (second- feet)	July		Mean dis- charge (second- feet)	August		Mean dis- charge (second- feet)	September	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day
1-----	228	1,050	650	137	220	81	126	220	75
2-----	228	890	550	121	210	69	122	210	69
3-----	211	660	380	122	210	69	119	210	67
4-----	176	520	250	118	170	54	138	240	89
5-----	164	550	240	111	160	48	135	250	91
6-----	162	550	240	107	160	46	2,310	10,200	2/69,800
7-----	160	440	190	104	160	45	3,010	7,820	2/65,600
8-----	168	--	1/200	102	150	41	819	4,030	2/9,530
9-----	170	730	340	99	150	40	434	1,900	2,230
10-----	178	680	330	102	160	44	322	1,200	1,040
11-----	260	3,080	2/2,340	99	--	1/42	283	1,000	760
12-----	242	--	1/2,300	99	--	1/40	255	830	570
13-----	192	1,300	670	99	140	37	226	580	350
14-----	178	--	1/400	118	--	1/220	214	520	300
15-----	166	440	200	195	--	1/1,400	206	480	270
16-----	156	320	130	185	1,550	770	192	440	230
17-----	148	240	96	156	700	290	182	400	200
18-----	137	230	85	152	340	140	182	370	180
19-----	134	--	1/85	148	310	120	178	350	170
20-----	127	230	79	142	290	110	170	320	150
21-----	124	220	74	146	280	110	168	290	130
22-----	130	210	74	140	350	130	168	280	130
23-----	130	210	74	129	260	91	162	270	120
24-----	137	260	96	122	240	79	154	260	110
25-----	127	250	86	114	210	65	146	260	100
26-----	121	220	72	114	210	65	140	250	95
27-----	124	190	64	113	230	70	138	240	89
28-----	122	180	59	116	250	78	137	240	89
29-----	130	200	70	116	260	81	137	240	89
30-----	130	180	63	113	230	70	137	240	89
31-----	127	190	65	116	220	69	--	--	--
Total--	4,987	--	10,550	3,855	--	4,610	11,110	--	152,800
Total discharge for year (second-foot-days) -----									99,770
Total load for year (tons) -----									651,700

1/Estimated.

2/Sediment discharge computed by subdividing day.

PLATTE RIVER BASIN--Continued
SOUTH LOUP RIVER AT ST. MICHAEL, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Oct. 12, 1948	2:15 p. m.	124	232	449	--	--	54	62	74	83	89	94		98		BN
Oct. 26	4:50 p. m.	168	310	231	--	--	46	56	69	80	82	90		96		BN
Nov. 9	4:30 p. m.	289	472	648	--	--	48	62	72	80	87	92		--		BN
Nov. 24	12:45 p. m.	289	472	583	--	--	18	42	70	86	94	96		99		BW
Nov. 24	12:45 p. m.	289	472	556	--	15	21	32	73	90	95	97		99		BN
Feb. 24, 1949	10:15 a. m.	690	1,810	1,090	--	8	15	23	40	67	84	94		--		BW
Mar. 1	10:45 a. m.	515	244	644	--	51	57	66	78	88	92	96		--		BW
Mar. 22	4:00 p. m.	358	1,340	1,910	--	--	9	16	33	75	84	94		98		BN
Mar. 22	4:00 p. m.	358	1,340	1,920	--	--	12	19	44	71	82	96		100		BW
Apr. 25	6:15 p. m.	266	908	771	--	--	17	24	45	73	84	95		99		BW
May 4	12:00 m.	233	616	1,020	--	14	20	30	48	80	90	99		100		BW
May 18	11:30 a. m.	362	3,300	6,560	--	6	8	13	36	78	88	96		98		BW
May 24	5:45 p. m.	732	6,080	1,960	--	--	8	12	21	39	72	84	95	98		BN
May 24	5:45 p. m.	732	6,080	2,020	--	17	19	25	38	72	85	96		--		BW
May 26	9:30 a. m.	416	2,640	1,680	45	54	62	66	74	88	96	99		--		BW
May 29	11:10 a. m.	322	990	688	--	--	30	34	43	63	83	96		--		BW
May 31	10:10 a. m.	280	880	612	--	--	31	39	53	74	81	96		--		BW
June 7	9:15 a. m.	3,280	12,000	9,150	26	33	40	46	57	77	91	99		--		BW
June 7	10:30 a. m.	3,560	15,700	6,050	14	32	42	50	63	82	95	99		--		BN
June 9	10:30 a. m.	3,560	15,700	5,860	--	34	42	52	62	82	93	99		--		BW
June 9	11:25 a. m.	3,560	14,600	4,290	18	26	38	45	59	76	89	96		--		BN
June 9	11:25 a. m.	3,560	14,600	4,230	22	32	40	49	61	79	90	100		--		BW
June 22	1:05 p. m.	308	1,810	1,230	24	31	39	50	63	86	91	96		100		BW
June 29	8:15 a. m.	308	4,320	2,930	42	54	66	74	82	92	96	98		100		BW
June 30	12:00 m.	283	2,080	2,040	6	17	61	70	80	91	97	98		99		BN
June 30	12:00 m.	283	2,080	2,080	30	49	60	69	81	91	97	99		100		BW
July 13	2:30 p. m.	194	1,240	1,190	45	58	72	78	83	89	94	98		99		BW
July 13	2:30 p. m.	194	1,240	1,240	29	51	74	80	85	92	96	98		99		BN
Aug. 3	3:40 p. m.	119	219	415	--	--	29	48	66	84	93	100		--		BW
Aug. 16	2:30 p. m.	176	1,460	2,400	34	48	65	74	85	94	98	100		--		BW
Aug. 29	2:00 p. m.	114	261	588	20	26	37	50	66	78	86	93		99		BW

PLATTE RIVER BASIN--Continued
SOUTH LOUP RIVER AT ST. MICHAEL, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Sept. 6, 1949	12:00 m.	2,480	13,200	10,400	13	20	28	35	45	65	79	98		100		BW
Sept. 6	12:00 m.	2,480	13,200	10,100	--	2	4	24	53	64	77	90		97		BN
Sept. 6	6:00 p. m.	3,630	9,940	3,230	20	31	40	46	61	80	90	98		100		BW
Sept. 6	6:00 p. m.	3,630	9,940	3,310	5	8	19	53	60	79	92	99		100		BN
Sept. 7	8:55 a. m.	3,520	7,220	5,120	16	23	28	33	44	61	82	94		99		BW
Sept. 7	5:00 p. m.	2,510	7,540	6,270	20	28	33	38	48	70	82	94		99		BW
Sept. 7	5:00 p. m.	2,510	7,540	6,020	3	8	34	38	51	68	80	92		96		BN
Sept. 7	7:05 p. m.	2,130	7,550	4,980	21	29	37	43	55	73	84	94		97		BW
Sept. 8	6:15 p. m.	560	2,980	7,750	32	42	49	56	65	86	95	98		--		BW
Sept. 10	3:30 a. m.	334	1,210	699	41	51	60	67	77	95	99	100		--		BW
Sept. 14	3:00 p. m.	214	509	1,090	20	29	40	51	64	81	92	99		100		BW
Sept. 28	11:00 a. m.	135	233	419	27	38	48	57	69	84	91	98		100		BW

PLATTE RIVER BASIN--Continued

NORTH LOUP RIVER NEAR ST. PAUL, NEBR.

LOCATION.--At bridge on U. S. Highway 281, 60 feet upstream from gaging station which is 3 miles north of St. Paul, Howard County and 4 miles upstream from confluence with Middle Loup River.

DRAINAGE AREA.--4,460 square miles, of which only about 1,270 square miles contribute directly to surface runoff.

RECORDS AVAILABLE.--Water temperatures: April to November 1948.

Sediment records: April 1946 to September 1949.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, not determined; minimum daily, not determined.

EXTREMES, 1946-49.--Sediment concentrations: Maximum daily, 42,000 tons June 13; minimum daily, 75 tons Aug. 11.

Sediment loads: Maximum daily, 17,000 ppm Aug. 12, 1948; minimum daily, not determined.

EXTREMES, 1946-49.--Sediment concentrations: Maximum daily, 20 tons Aug. 3, 1946.

Sediment loads: Maximum daily, 463,000 tons June 22, 1947; minimum daily, 20 tons Aug. 3, 1946.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, July 1948 to October 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
July 29, 1948 -----	2,110	7.5	255	40	0.40	43	5.5	5.1	149	16	1.0	0.3	0.0	0.06	0.06	208	0.38		130	8	8
Mar. 3, 1949 -----	3,250	7.4	226	35	.07	28	4.6	5.3	109	4.0	3.5	0	0	.06	.06	176	.24		89	0	11
Mar. 6 -----	2,650	7.4	155	33	.10	26	4.6	6.2	107	5.6	1.5	0	0	.08	.08	148	.20		84	0	14
Oct. 6 -----	730	8.2	205	53	.02	28	3.1	10	119	3.0	1.5	0	0	1.5	--	175	.24		83	0	21

PLATTE RIVER BASIN--Continued

NORTH LOUP RIVER NEAR ST. PAUL, NEBR.--Continued

Temperature (*F) of water, April to November 1948

/Once-daily temperature measurement between 1 p. m. and 6 p. m./

Day	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	--	63	78	82	--	--	68	53				
2	--	--	78	83	69	84	61	52				
3	--	68	79	82	68	85	63	54				
4	--	68	85	--	78	80	63	53				
5	62	55	82	--	78	78	62	--				
6	60	65	--	--	64	77	55	52				
7	60	68	83	87	68	69	50	42				
8	62	65	81	81	--	--	--	--				
9	62	58	84	80	83	71	57	38				
10	55	52	85	81	84	71	56	36				
11	--	55	79	--	84	76	56	37				
12	54	66	68	90	68	--	58	37				
13	60	73	--	91	--	78	57	36				
14	63	75	83	81	78	78	59	--				
15	67	73	85	85	68	76	--	43				
16	65	--	80	79	84	74	54	40				
17	63	76	--	79	83	78	--	40				
18	--	78	71	87	84	77	52	38				
19	72	78	68	87	85	--	53	--				
20	63	82	66	84	80	78	54	--				
21	64	78	70	87	79	77	54	--				
22	68	78	--	79	--	74	51	--				
23	68	--	--	81	87	69	50	32				
24	66	75	87	--	87	66	--	--				
25	66	79	82	75	84	64	50	--				
26	66	79	--	85	80	--	55	--				
27	69	80	--	87	84	64	54	--				
28	68	75	--	88	83	68	53	--				
29	68	70	--	87	--	67	50	--				
30	72	--	--	80	74	68	52	--				
31	--	74	--	78	--	--	53	--				
Average	64	71	--	83	79	74	56	--				

PLATTE RIVER BASIN--Continued

NORTH LOUP RIVER NEAR ST. PAUL, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	605	510	830	763	630	1,300	900		
2-----	596	430	690	828	680	1,520	880		
3-----	596	380	610	752	610	1,240	940		
4-----	643	310	540	816	620	1,370	960	--	1/1,000
5-----	690	330	610	1,010	1,360	3,710	850		
6-----	742	--	1/1,000	1,110	1,400	4,200	840		
7-----	700	670	1,270	959	750	1,540	690		
8-----	700	530	1,000	920	760	1,890	650		
9-----	710	480	920	828	630	1,410	510		
10-----	681	430	790	805	600	1,300	430	--	1/600
11-----	681	430	790	840	730	1,660	340		
12-----	634	430	740	784	600	1,270	490		
13-----	596	410	660	784	650	1,380	790		
14-----	614	470	780	794	540	1,160	820		
15-----	634	--	1/1,000	794	510	1,090	850		
16-----	643	720	1,250	886	570	1,360	850		
17-----	614	560	930	851	660	1,520	760	--	1/900
18-----	624	500	840	908	560	1,370	710		
19-----	652	500	890	760	--	1/850	750		
20-----	614	450	750	590	--	1/650	730		
21-----	643	520	900	420	--	1/460	800		
22-----	652	600	1,660	300	470	380	870		
23-----	662	580	1,040	670	--	1/750	1,060	--	1/1,200
24-----	681	940	1,730	850	--	1/850	850	--	1/950
25-----	690	580	1,080	1,000	--	1/1,100	720		
26-----	700	500	940	1,250	--	1/1,400	500		
27-----	690	500	930	1,350	--	1/1,600	550		
28-----	681	440	810	1,050	--	1/1,200	700	--	1/600
29-----	710	450	860	970	--	1/1,100	630		
30-----	742	580	1,160	560	--	1/1,100	500		
31-----	763	610	1,260	--	--	--	320		
Total--	20,583	--	28,650	25,602	--	42,130	22,240	--	25,000
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	500	--		710			1,600	--	1/2,500
2-----	560	--		730			1,600	--	1/2,200
3-----	570	--		710			1,700	--	1/2,700
4-----	660	--					1,950	--	1/3,900
5-----	580	--					2,600	1,180	2/8,070
6-----	530	--					3,400	620	5,690
7-----	520	340		680			4,050	--	1/15,000
8-----	460	--	1/650				2,900	860	2/7,140
9-----	570	--					2,100	590	3,350
10-----	660	--					1,700	530	2,430
11-----	630	--		650	--	1/800	1,500	460	1,860
12-----	610	430		650			1,500	--	1/2,500
13-----	670	--		660			1,350	580	2,110
14-----	670	320		660			1,300	--	1/3,100
15-----	630	460		670			1,050	--	1/2,800
16-----	650			680			930	850	2,130
17-----	700			670			1,150	860	2,670
18-----	720			710			1,300	1,000	3,510
19-----	710			720			1,350	1,350	4,920
20-----	710			780			1,350	1,420	5,180
21-----	680			800	330	710	1,350	2,050	7,470
22-----	680			840	--	1/750	1,330	1,900	6,820
23-----	690			870	330	780	1,250	1,450	4,890
24-----	690	--	1/800	990	--	1/1,100	1,330	1,270	4,560
25-----	700			1,050	--	1/1,200	1,330	1,240	4,450
26-----	700			1,200	--	1/1,400	1,360	1,550	5,690
27-----	730			1,400	--	1/1,600	1,680	1,590	7,210
28-----	740			1,450	420	1,640	1,620	1,540	6,740
29-----	740			--	--	--	1,610	1,210	5,260
30-----	690			--	--	--	1,880	2,250	11,400
31-----	710			--	--	--	1,610	2,510	10,900
Total--	20,060	--	22,600	22,360	--	25,200	52,730	--	159,200

1/Estimated.

2/Sediment discharge computed by subdividing day.

PLATTE RIVER BASIN--Continued

NORTH LOUP RIVER NEAR ST. PAUL, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,200	1,120	3,630	908	740	1,810	1,020	2,600	2/8,270
2-----	1,430	--	1/8,800	972	530	1,390	920	1,100	2,730
3-----	1,390	--	1/6,700	933	380	960	920	430	1,070
4-----	1,530	1,900	7,850	959	400	1,040	920	420	1,040
5-----	1,680	1,870	8,480	840	420	950	908	380	930
6-----	1,860	1,430	7,180	920	580	1,440	897	310	750
7-----	1,980	1,400	7,480	985	710	1,890	1,220	2,370	2/7,910
8-----	2,070	1,410	7,880	1,280	1,080	3,730	1,700	--	1/13,000
9-----	1,980	1,580	8,450	1,260	590	2,010	1,720	--	1/14,000
10-----	1,880	1,700	8,630	1,200	500	1,620	1,610	1,980	8,610
11-----	1,880	1,720	8,730	1,100	350	1,040	1,500	680	2,750
12-----	1,640	970	4,300	1,020	350	960	1,250	--	1/3,700
13-----	1,590	1,020	4,380	920	450	1,120	2,750	--	1/42,000
14-----	1,700	--	1/7,800	908	550	1,350	1,640	3,100	13,700
15-----	1,550	1,200	5,020	920	460	1,140	1,300	1,000	3,510
16-----	1,300	830	2,910	946	400	1,020	1,230	830	2,820
17-----	1,200	760	2,460	1,020	--	1/3,200	1,040	340	950
18-----	1,050	710	2,010	972	730	1,920	1,200	910	2,950
19-----	1,020	610	1,680	908	420	1,030	1,180	1,520	4,840
20-----	998	570	1,540	908	600	1,470	972	450	1,180
21-----	985	540	1,440	1,140	1,460	4,490	897	280	680
22-----	959	500	1,290	1,680	--	1/11,000	805	250	540
23-----	933	450	1,130	1,590	1,500	6,440	784	290	610
24-----	920	430	1,070	1,340	800	2,890	763	280	580
25-----	886	400	960	1,140	500	1,540	763	250	520
26-----	886	390	930	1,050	430	1,220	752	250	510
27-----	933	430	1,080	946	400	1,020	1,110	--	1/6,800
28-----	920	490	1,220	862	350	810	1,140	2,320	2/9,170
29-----	874	480	1,130	874	390	920	985	--	1/5,200
30-----	851	--	1/1,100	959	710	1,840	1,050	--	1/5,200
31-----	--	--	--	886	380	910	--	--	--
Total--	40,075	--	127,100	32,346	--	64,170	34,946	--	166,500

Day	July			August			September		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	920	--	1/1,900	506	350	480	614	230	380
2-----	784	340	720	472	300	380	596	170	270
3-----	742	280	560	490	270	360	605	230	380
4-----	721	250	490	447	190	230	700	370	700
5-----	710	270	520	430	190	220	784	--	1/850
6-----	700	250	470	374	130	130	874	610	1,440
7-----	672	300	540	350	120	110	985	650	1,730
8-----	700	--	1/750	320	110	95	828	430	960
9-----	794	590	1,280	290	130	100	784	410	870
10-----	794	530	1,140	268	110	80	828	--	1/1,500
11-----	920	680	1,690	254	110	75	742	520	1,040
12-----	721	350	680	282	180	140	763	440	910
13-----	652	270	480	320	190	160	874	430	1,010
14-----	700	370	700	328	160	140	874	410	970
15-----	662	270	480	350	210	200	851	340	780
16-----	596	230	370	382	--	1/1,000	816	280	620
17-----	569	220	340	430	640	740	784	240	510
18-----	551	210	310	542	--	1/1,100	742	270	540
19-----	524	170	240	920	--	1/5,100	721	350	680
20-----	430	170	200	1,080	1,500	4,370	700	340	640
21-----	524	390	550	998	--	1/2,700	662	310	550
22-----	481	280	360	886	--	1/1,500	634	270	460
23-----	422	160	180	742	390	780	643	220	380
24-----	382	120	120	662	350	630	652	200	350
25-----	342	110	100	578	290	450	681	250	460
26-----	459	--	1/2,500	578	260	410	710	290	560
27-----	422	690	790	578	270	420	721	370	720
28-----	422	330	380	605	300	490	681	330	610
29-----	382	250	260	652	310	550	710	280	540
30-----	374	180	180	700	--	1/900	732	280	550
31-----	430	260	300	652	420	740	--	--	--
Total--	18,502	--	19,560	16,466	--	24,780	22,291	--	21,960

Total discharge for year (second-foot-days) -----

Total load for year (tons) -----

328,201

727,000

1/Estimated.

2/Sediment discharge computed by subdividing day.

PLATTE RIVER BASIN--Continued

NORTH LOUP RIVER NEAR ST. PAUL, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters								
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	
Oct. 1, 1948	9:25 a. m.	614	514	1,310	--	--	--	19	32	55	61	70	BN
Oct. 7	1:45 p. m.	710	726	1,860	--	--	--	20	31	56	66	78	BN
Oct. 13	2:30 p. m.	605	404	1,920	--	--	--	17	33	39	67	76	BN
Oct. 25	6:00 p. m.	681	554	1,260	--	--	--	15	28	47	58	75	BN
Nov. 16	1:30 p. m.	888	562	1,400	--	--	--	19	30	54	66	78	BN
Jan. 14, 1949	4:30 p. m.	660	315	738	--	--	--	22	41	57	68	82	BWC
Feb. 4	1:30 p. m.	1,680	634	1,920	--	--	--	14	30	58	65	88	BW
Feb. 23	1:30 p. m.	870	317	841	--	--	--	15	28	38	44	70	BW
Mar. 21	2:50 p. m.	1,360	2,110	2,700	--	--	--	14	32	60	77	96	BW
Mar. 30	1:15 p. m.	1,940	2,420	5,950	--	--	--	7	13	39	55	78	BN
Apr. 4	3:00 p. m.	1,680	1,370	1,580	--	--	--	6	26	49	64	83	BN
Apr. 4	3:00 p. m.	1,680	1,370	1,830	--	--	--	14	27	51	67	--	BW
Apr. 24	9:50 a. m.	897	444	1,070	--	--	--	--	19	31	44	94	BN
May 4	3:10 p. m.	897	376	870	--	--	--	--	31	54	65	97	BW
May 24	2:00 p. m.	1,340	716	847	--	--	--	23	31	49	60	76	BN
May 26	4:00 p. m.	1,050	441	1,300	--	--	--	12	22	49	63	--	BN
June 7	10:10 a. m.	1,340	2,920	6,850	16	29	38	52	68	86	94	98	BW
June 8	10:45 a. m.	1,800	2,050	4,880	--	12	15	19	27	58	93	100	BW
June 9	10:15 a. m.	1,800	3,370	3,330	--	25	36	50	66	84	94	97	BN
June 9	10:15 a. m.	1,800	3,370	3,350	--	30	40	51	66	81	88	94	BN
June 10	1:00 p. m.	1,640	2,040	3,770	20	29	39	45	53	70	73	83	BW
June 13	4:00 p. m.	3,970	6,640	15,200	16	26	32	40	48	67	79	84	BW
June 19	5:45 p. m.	1,040	960	2,190	--	48	64	72	77	86	--	--	BW
June 27	6:35 p. m.	1,170	1,640	4,130	12	20	27	37	53	84	93	98	BN
June 27	6:15 p. m.	1,480	3,770	4,130	20	29	46	59	74	89	96	98	BN
June 28	6:15 p. m.	1,480	3,770	4,160	22	31	46	60	72	89	98	--	BW
June 28	4:55 p. m.	897	2,470	2,620	32	42	62	73	85	92	96	98	BW
June 28	4:55 p. m.	897	2,470	2,510	25	42	59	72	85	94	96	98	BN
June 30	12:30 p. m.	972	1,710	3,890	22	34	44	56	74	86	90	95	BW
June 30	6:35 p. m.	985	1,290	3,000	36	47	59	66	76	86	91	97	BW

1/ Mean daily discharge.

PLATTE RIVER BASIN--Continued
NORTH LOUP RIVER NEAR ST. PAUL, NEBR.--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment													Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
July 9, 1949	4:10 p. m.	805	604	1,190	--	--	20	31	50	80	91	96			BW	
July 16, -----	6:00 p. m.	542	203	539	--	--	33	40	59	73	86	96		99	BW	
July 26, -----	4:00 p. m.	681	4,040	4,780	--	11	18	28	52	75	85	90		95	BW	
July 26, -----	4:00 p. m.	681	4,040	5,320	7	14	21	30	50	73	78	86		95	BW	
July 27, -----	4:40 p. m.	350	652	1,530	--	44	57	68	79	90	96	99		100	BW	
Aug. 9, -----	6:35 p. m.	268	124	299	--	--	--	--	59	79	87	97		100	BW	
Aug. 16, -----	6:05 p. m.	335	1,240	1,810	34	50	67	78	88	96	98	99		100	BW	
Aug. 17, -----	6:15 p. m.	456	450	1,020	--	17	26	38	52	77	93	100		--	BW	
Sept. 10, -----	6:05 p. m.	828	644	1,600	--	16	20	24	33	47	54	73		--	BW	
Sept. 20, -----	6:00 p. m.	690	327	706	--	--	11	15	28	54	74	86		--	BW	
Sept. 30, -----	6:10 p. m.	742	293	732	--	--	14	17	28	50	66	80		--	BW	

PLATTE RIVER BASIN--Continued

BEAVER CREEK AT LORETTO, NEBR.

LOCATION.--At gaging station at county highway bridge at west edge of Loretto, Boone County.
DRAINAGE AREA.--311 square miles.

RECORDS AVAILABLE.--Water temperatures: April 1948 to March 1949.

Sediment records: June 1946 to September 1949.

EXTREMES, April to September 1948.--Water temperatures: Maximum, 89°F July 6.

EXTREMES, April to September 1948.--Sediment concentrations: Maximum daily, 8,000 ppm June 29; minimum daily, not determined.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, not determined.

EXTREMES, 1946-49.--Sediment concentrations: Maximum daily, 11,200 ppm May 15, 1947, June 22, 1948; minimum daily, not determined.

EXTREMES, 1946-49.--Sediment concentrations: Maximum daily, not determined.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, March to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bor- on (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium	
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate		
Mar. 3, 1949	95	7.2	224	35	0.11	31	5.2	8.5	8.5	132	5.6	1.0	0.3	1.5	0.03		162	0.22		99	0	16
Mar. 7	619	7.0	193	16	.02	26	2.7	8.7	8.7	102	4.0	2.0	.1	5.2	.00		139	.19		76	0	20
May 23	311	8.0	225	27	.03	35	4.2	8.5	8.5	127	15	.5	.2	3.8	--		166	.23		105	1	15
Sept. 27	39	7.7	274	38	.08	31	5.4	7.6	7.6	136	1.6	1.4	.2	.8	--		158	.21		100	0	14

PLATTE RIVER BASIN--Continued
 BEAVER CREEK AT LORETTO, NEBR.--Continued

Temperature (°F) of water, April 1948 to March 1949
 /Once-daily temperature measurement between 5 p. m. and 7 p. m./

Day	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.
1	--	59	76	84	82	77	60	54	43	43	--	35
2	--	64	75	81	68	79	60	54	45	45	--	36
3	--	63	78	84	67	80	61	55	47	48	--	--
4	--	62	83	86	71	80	60	53	--	--	--	--
5	--	64	74	88	71	79	60	49	36	--	--	--
6	--	62	80	89	63	78	58	48	34	48	--	--
7	--	64	80	79	68	62	57	47	38	46	--	--
8	--	65	79	77	75	67	59	49	37	--	--	--
9	50	56	80	78	79	67	56	40	36	--	--	--
10	57	52	80	83	80	70	54	43	37	--	--	--
11	55	52	75	82	73	74	55	41	39	--	--	--
12	53	60	65	86	77	76	58	42	38	--	--	--
13	57	71	72	84	80	73	51	45	41	--	--	--
14	61	72	79	78	82	76	55	48	40	--	--	--
15	61	74	76	78	75	75	60	50	43	--	--	--
16	62	69	75	74	80	73	48	48	42	--	--	--
17	64	71	73	77	82	75	51	45	44	--	--	--
18	69	74	68	80	79	76	54	--	45	--	--	--
19	68	75	72	82	80	77	55	--	47	--	--	--
20	67	78	64	81	75	72	53	--	48	--	--	--
21	63	78	69	84	77	72	51	--	50	--	--	--
22	63	78	66	77	81	68	51	--	48	--	32	--
23	67	58	74	78	83	68	51	--	--	--	32	--
24	64	72	76	80	83	64	52	--	--	--	35	--
25	62	76	76	83	79	65	51	35	--	--	35	--
26	63	73	68	84	79	68	50	36	47	--	34	--
27	64	74	69	84	72	64	54	37	48	--	34	--
28	67	73	80	76	64	64	55	36	44	--	35	--
29	65	65	76	76	66	66	54	38	42	--	--	--
30	65	64	77	76	66	68	56	40	45	--	--	--
31	--	71	--	80	77	--	55	--	46	--	--	--
Average	--	67	74	81	81	72	55	--	43	--	--	--

PLATTE RIVER BASIN--Continued

BEAVER CREEK AT LORETTO, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	36	140	14	48	110	14	55	--	1/26
2-----	36	120	12	48	100	13	55	140	21
3-----	36	120	12	47	120	15	55	150	22
4-----	37	120	12	48	110	14	55	--	1/26
5-----	36	120	12	50	94	13	55	170	25
6-----	37	130	13	53	140	20	40	120	13
7-----	39	110	12	52	92	13	60	84	14
8-----	42	120	14	51	77	11	65	130	23
9-----	42	130	15	49	77	10	150	150	
10-----	41	120	13	47	76	10	110	110	
11-----	40	110	12	48	68	9	70	82	19
12-----	40	110	12	48	63	8		140	
13-----	40	110	11	49	68	9		70	
14-----	40	120	13	49	61	8	60	70	1/12
15-----	40	190	21	49	73	10		73	
16-----	40	130	14	48	86	11		54	
17-----	40	90	10	49	64	8	55	66	12
18-----	41	81	9	47	--	1/8		54	
19-----	42	88	10	35	--	1/8		54	
20-----	41	99	11	30	--	1/8	60	96	1/12
21-----	41	100	11	40	--	1/11		69	
22-----	41	90	10	65	--	1/22		58	
23-----	42	79	9	65	--	1/36	55	--	12
24-----	42	76	9	65	--	1/55		--	
25-----	42	68	8	70	360	68		--	
26-----	42	72	8	75	340	69	55	120	12
27-----	43	87	10	75	210	43		90	
28-----	43	130	15	65	180	32		94	
29-----	46	220	27	60	190	31	55	67	12
30-----	53	150	21	60	190	31		65	
31-----	50	120	16	--	--	--		52	
Total-	1,271	--	397	1,585	--	618	1,895	--	495
Day	January			February			March		
	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	45	51	6	60	--	--	80	61	13
2-----	45	52	6	55	--	--	80	100	22
3-----	45	--	--	55	--	--	100	260	70
4-----	50	--	--	55	--	--	137	550	200
5-----	50	--	--	55	--	--	193	750	390
6-----	55	--	--	55	--	--	316	720	610
7-----	55	--	--	55	--	--	458	490	610
8-----	55	--	--	55	--	--	500	340	460
9-----	55	--	--	55	--	--	437	680	800
10-----	50	--	--	55	--	--	247	1,000	670
11-----	50	--	--	55	--	1/7	157	610	260
12-----	50	--	--	55	--	--	125	470	160
13-----	50	--	--	50	--	--	113	400	120
14-----	50	--	--	55	--	--	106	290	83
15-----	55	--	--	60	--	--	95	320	82
16-----	50	--	1/5	60	--	--	94	390	99
17-----	40	--	--	60	--	--	89	310	74
18-----	55	--	--	60	--	--	88	540	130
19-----	50	--	--	65	--	--	93	940	240
20-----	50	--	--	65	--	--	119	1,200	390
21-----	50	--	--	65	--	--	210	1,900	1,100
22-----	50	--	--	70	63	12	271	1,200	880
23-----	55	--	--	75	72	15	273	900	660
24-----	55	--	--	75	73	15	255	860	590
25-----	50	--	--	80	58	13	264	740	530
26-----	50	--	--	80	96	21	298	1,000	800
27-----	55	--	--	80	101	22	354	830	790
28-----	50	--	--	80	56	12	389	790	830
29-----	40	--	--	--	--	--	368	760	760
30-----	45	--	--	--	--	--	315	700	600
31-----	55	--	--	--	--	--	318	580	500
Total-	1,560	--	157	1,745	--	257	6,942	--	13,520

1/Estimated.

PLATTE RIVER BASIN--Continued

BEAVER CREEK AT LORETTO, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	235	670	430	70	180	34	104	290	81
2-----	260	610	430	71	170	33	97	230	60
3-----	341	570	520	65	160	28	89	220	53
4-----	357	530	510	62	210	35	83	180	40
5-----	386	590	610	60	250	40	77	160	33
6-----	448	460	560	62	230	39	74	140	28
7-----	464	340	430	64	230	40	73	--	1/28
8-----	333	650	580	66	200	36	101	330	99
9-----	217	580	340	94	270	69	190	640	330
10-----	218	470	280	89	220	53	230	680	510
11-----	247	500	330	71	160	31	304	630	520
12-----	198	420	220	64	150	25	243	580	380
13-----	149	380	150	58	140	22	189	470	240
14-----	136	330	120	56	150	23	182	470	230
15-----	167	380	170	64	160	28	192	400	210
16-----	244	600	400	68	170	31	118	--	1/90
17-----	301	590	480	68	--	1/32	95	240	62
18-----	228	430	260	66	170	30	83	190	43
19-----	145	360	140	57	130	20	76	160	33
20-----	116	240	75	55	100	15	70	140	26
21-----	104	220	62	128	1,700	2/830	72	160	31
22-----	97	220	58	222	1,000	600	76	170	35
23-----	88	220	52	305	790	650	62	130	22
24-----	80	220	48	300	680	550	57	120	18
25-----	76	190	39	248	610	410	54	150	22
26-----	74	180	36	180	490	240	51	140	19
27-----	70	170	32	141	370	140	58	510	2/83
28-----	67	130	24	123	310	100	59	380	510
29-----	65	140	25	117	280	88	147	8,000	2/4,500
30-----	63	180	31	129	300	100	64	1,500	260
31-----	--	--	--	117	--	1/88	--	--	--
Total-	5,974	--	7,440	3,340	--	4,460	3,370	--	8,700
	July			August			September		
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	54	290	42	35	99	9	36	130	13
2-----	53	230	33	34	65	6	36	130	13
3-----	51	220	30	32	59	5	35	110	10
4-----	47	220	28	32	81	7	42	140	16
5-----	45	160	19	31	110	9	46	450	56
6-----	44	150	18	31	130	11	51	300	41
7-----	43	160	19	31	140	12	61	200	33
8-----	43	170	20	30	150	12	54	150	22
9-----	47	180	23	31	--	1/12	51	140	19
10-----	55	250	2/39	33	140	12	53	160	23
11-----	74	290	58	33	130	12	56	180	27
12-----	56	180	27	31	130	11	55	170	25
13-----	49	140	19	31	120	10	52	140	20
14-----	47	120	15	32	110	10	51	130	18
15-----	45	99	12	32	130	11	47	130	16
16-----	43	110	12	32	130	11	46	140	17
17-----	41	140	15	37	150	15	43	150	17
18-----	39	160	17	39	140	15	40	120	13
19-----	38	150	15	47	190	24	39	110	12
20-----	38	94	10	55	290	43	39	110	12
21-----	37	81	8	46	190	24	38	100	10
22-----	35	76	7	41	170	19	37	94	9
23-----	35	99	9	39	180	19	38	82	8
24-----	36	100	10	36	150	15	39	88	9
25-----	34	99	9	35	150	14	38	110	11
26-----	34	99	9	37	150	15	38	99	10
27-----	36	99	10	37	130	13	38	86	9
28-----	35	94	9	39	120	13	39	86	9
29-----	35	94	9	39	140	15	40	84	9
30-----	38	--	1/11	39	130	14	41	--	1/9
31-----	37	120	12	37	110	11	--	--	--
Total-	1,344	--	574	1,114	--	429	1,319	--	516
Total discharge for year (second-foot-days) -----									31,459
Total load for year (tons) -----									37,560

1/Estimated.

2/Sediment discharge computed by subdividing day.

PLATTE RIVER BASIN--Continued
 BEAVER CREEK AT LORETTO, NEBR.--Continued
 Particle-size analyses of suspended sediment, March to September 1949
 (Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
 W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500
Mar. 28, 1949	5:30 p. m.	394	901	654	--	--	2	8	26	63	82	--	--	--	BW
Apr. 18	12:30 p. m.	227	412	817	--	--	--	4	17	55	85	--	--	--	BW
May 9	12:30 p. m.	100	350	639	12	16	25	31	48	76	92	--	--	--	BW
May 21	7:50 p. m.	240	5,160	1,800	28	39	58	72	80	93	97	99	--	--	BN
May 21	7:50 p. m.	240	5,160	1,770	32	41	60	77	82	93	97	99	--	--	BN
May 23	1:10 p. m.	312	751	495	--	--	11	17	32	70	90	--	--	--	BW
May 23	6:45 p. m.	316	973	748	--	--	--	22	35	63	82	--	--	--	BW
May 25	7:00 p. m.	227	713	457	--	--	--	--	31	68	93	--	--	--	BW
May 26	7:50 p. m.	161	533	390	--	--	17	27	38	63	83	98	--	--	BW
June 8	1:10 p. m.	102	376	732	--	--	--	26	48	82	96	--	--	--	BW
June 10	8:15 p. m.	307	786	578	--	--	--	19	34	68	89	99	--	--	BW
June 21	1:45 p. m.	73	212	382	--	24	32	41	60	78	93	--	--	--	BN
June 27	8:00 p. m.	62	898	314	47	63	88	95	96	99	--	--	--	--	BN
June 27	8:00 p. m.	184	11,200	284	44	58	86	89	91	98	--	--	--	--	BN
June 29	5:50 p. m.	184	11,200	3,530	35	48	72	88	95	98	--	--	--	--	BN
June 29	5:50 p. m.	184	11,200	3,680	38	54	76	90	95	98	--	--	--	--	BW
July 11	8:55 p. m.	67	306	625	--	--	30	43	60	--	--	--	--	--	BW
Sept. 17	3:15 p. m.	42	126	216	--	--	--	32	52	60	74	84	--	--	BW

PLATTE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- tride (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- di- um car- bon- ate
																	Parts per mil- lion	Tons per acre- foot	Total	Non- carbon- ate	

MC CONAUGHY LAKE NEAR KEYSTONE, NEBR.

June 4, 1949		7.8	666	19	0.02	32	17	86		0	193	145	18	0.5	2.3	0.30	432	0.59		150	0	56
July 12		8.1	660	14	.02	35	17	85		0	195	146	19	.6	1.2	.20	422	.57		158	0	54

PLATTE RIVER NEAR COZAD, NEBR.

Dec. 2, 1948	211	7.8	650	36	0.05	67	18	51		0	232	130	17	0.4	2.2	0.17	458	0.62		241	51	32
Mar. 23, 1949	587	6.2	594	36	.02	53	12	56		0	206	124	15	.4	2.4	--	428	.56		207	26	36
May 30	290	7.4	678	37	.02	71	18	51		0	240	134	17	.4	2.0	--	476	.65		251	54	31

PLATTE RIVER NEAR ODESSA, NEBR.

Mar. 23, 1949	2,520	7.6	974	28	0.02	93	27	80		0	238	270	27	0.4	2.5		730	0.99		343	148	34
May 8	3,120	7.2	793	25	.02	71	5.0	97		0	196	206	22	.4	1.3		598	.81		198	37	52
May 30	958	7.2	848	24	.02	75	23	72		0	224	212	23	.5	1.0		588	.80		282	98	36

SOUTH PLATTE RIVER NEAR KERSEY, COLO.

Feb. 27, 1949	634	7.7	1,550	20	0.05	139	66	136		0	309	568	42	1.1	8.8		1,140	1.55		618	365	32
May 2	339	7.6	1,460	14	.04	129	65	116		0	276	520	46	1.0	8.8	0.14	1,040	1.41		589	363	30
June 3	275	7.5	1,490	20	.02	146	61	105		0	284	534	33	1.0	7.6		1,050	1.43		616	383	27
July 4	870	7.5	1,100	17	.02	96	46	78		0	207	366	29	.8	5.4		848	1.15		429	259	28
July 20	1,240	8.3	1,240	35	.02	109	50	106		8	224	440	33	9	7.1		930	1.26		478	281	33
Aug. 1	1,630	7.6	1,630	18	.02	145	77	112		0	298	588	40	1.0	7.6		1,140	1.55		679	435	26
Sept. 1	1,229	7.6	1,630	39	.08	126	78	165		0	224	712	42	1.0	9.7		1,280	1.74		635	451	36

LAKE MALONEY NEAR NORTH PLATTE, NEBR.

May 21, 1948, inlet		7.5	1,050	15	0.03	84	32	104		0	200	334	37	0.8	2.0	0.19	754	1.03		341	177	40
May 21, center		7.7	1,140	12	.03	96	37	115		0	184	412	42	.9	1.0	.21	862	1.17		332	241	39
July 22, center		7.8	975	17	.04	73	28	104		0	206	294	33	.6	.6	--	702	.95		297	128	43
Aug. 21, outlet		7.8	779	19	.07	46	19	104	3.2	0	204	200	25	.5	1.8		.09	.528	.72	193	26	53
Sept. 15, outlet		8.0	730	33	.05	49	18	84		0	220	158	23	.5	.7	.12	461	.65		196	16	46
Feb. 11, 1949, inlet		7.9	1,250	25	.02	121	29	140		0	288	412	40	.8	2.6	--	968	1.32		421	185	42
July 6, inlet		7.2	854	14	.02	68	54	77		0	186	228	24	.6	1.0	--	572	.76		268	107	36
July 6, outlet		7.3	859	11	.02	66	25	81		0	196	236	24	.6	1.0	--	570	.76		268	107	40

1/ Mean daily discharge.

LAKE MALONEY NEAR NORTH PLATTE, NEBR.--Continued

Aug. 1, 1949, outlet--	7.1	1,070	12	0.02	90	31	98	0	193	344	32	0.7	1.3	--	752	1.02	352	194	38
Aug. 1, inlet-----	7.3	1,090	13	.02	92	31	99	0	199	346	32	.7	1.6	--	760	1.03	357	194	38
Sept. 3, inlet-----	7.6	892	14	.03	45	19	74	0	201	152	16	.5	1.3	--	492	.61	191	26	40

BUFFALO CREEK NEAR ELM CREEK, NEBR.

Mar. 23, 1949-----	7.5	541	35	0.02	63	14	35	0	209	93	11	0.1	6.5		359	0.46	215	44	26
Apr. 26-----	7.8	911	16	.02	86	30	78	0	314	204	25	.1	1.2	0.14	620	.84	338	81	33

ELKHORN RIVER AT EWING, NEBR.

Oct. 12, 1948-----	55	193	40	0.04	26	3.6	14	0	115	10	3.0	0.2	0.7	0.05	160	0.22	80	0	28
Mar. 9, 1949-----	2,720	6.8	148	17	.05	18	3.4	8.3	0	76	7.2	3.0	.0	3.6	108	.15	59	6	23
May 2-----	195	7.5	259	28	.02	34	7.2	9.0	0	152	7.2	.2	.3	1.4	151	.26	115	0	15

ELKHORN RIVER AT WATERLOO, NEBR.

July 23, 1948-----	1/1,070	7.5	281	23	0.05	41	11	4.7	0	161	19	1.2	0.3	4.4	226	0.31	148	16	6
Oct. 26-----	2,467	7.8	453	30	.05	64	13	21	0	262	32	6.0	.2	1.9	288	.41	213	0	18
Mar. 6, 1949-----	1/15,800	7.6	192	15	.05	22	2.5	14	0	90	16	1.3	.3	4.8	136	.18	66	0	32

1/ Mean daily discharge.

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)
PLUM CREEK NEAR SMITHFIELD, NEBR.			
July 31, 1948 -----	854	1,880	4,330
Mar. 23, 1949 -----	.66	308	.5
June 3 -----	.08	346	.07
June 8 -----	1.69	2,140	9.8
June 20 -----	30.6	3,880	321
July 28 -----	2.03	638	3.5
Aug. 18 -----	1.61	1,370	6.0
MIDDLE LOUP RIVER NEAR SENECA, NEBR.			
July 26, 1949 -----	199	587	315
Aug. 3 -----	188	306	155
Sept. 14 -----	184	690	343
MIDDLE LOUP RIVER AT MILBURN, NEBR.			
July 26, 1949 -----	614	415	688
Aug. 18 -----	906	407	996
Aug. 22 -----	653	283	499
Aug. 24 -----	661	415	741
Aug. 29 -----	750	428	867
Sept. 1 -----	708	444	849
Sept. 6 -----	729	405	797
Sept. 8 -----	768	563	1,170
Sept. 12 -----	764	601	1,240
MIDDLE LOUP RIVER AT WALWORTH, NEBR.			
July 19, 1949 -----	662	496	887
July 26 -----	736	702	1,400
Aug. 29 -----	786	557	1,180
Aug. 31 -----	752	1,030	2,090
MIDDLE LOUP RIVER AT ARCADIA, NEBR.			
Oct. 12, 1948 -----	638	662	1,140
Nov. 5 -----	1,040	2,010	5,640
May 6, 1949 -----	910	1,220	3,000
June 4 -----	812	714	1,570
June 22 -----	638	844	1,450
July 16 -----	554	474	709
July 19 -----	458	344	425
July 26 -----	369	282	281
Aug. 22 -----	624	485	817
Aug. 29 -----	631	376	641
Aug. 31 -----	821	682	1,510
MIDDLE LOUP RIVER AT LOUP CITY, NEBR.			
July 19, 1949 -----	410	206	228
July 26 -----	353	124	118
Aug. 22 -----	610	278	458
Aug. 29 -----	610	338	557
Aug. 31 -----	670	644	1,160
Sept. 12 -----	1,070	714	2,060
DISMAL RIVER NEAR GEM, NEBR.			
July 26, 1949 -----	250	401	271
Sept. 7 -----	261	733	517
DISMAL RIVER AT DUNNING, NEBR.			
July 19, 1948 -----	360	799	777
Sept. 14 -----	289	472	368
Oct. 15, 1948 -----	321	914	792
Nov. 5 -----	321	1,630	1,410
Apr. 9, 1949 -----	466	2,160	2,720
Apr. 29 -----	294	871	691
May 6 -----	312	1,140	960
May 15 -----	324	666	583
June 4 -----	283	1,230	940
June 21 -----	321	820	711
July 26 -----	292	574	453
Aug. 4 -----	297	393	315
Aug. 19 -----	315	704	599

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949--Continued

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)

DISMAL RIVER AT DUNNING, NEBR.--Continued

Aug. 23-----	298	416	335
Aug. 25-----	278	402	302
Aug. 30-----	316	454	387
Aug. 31-----	300	376	305
Sept. 7-----	300	713	578
Sept. 13-----	314	850	721

SOUTH LOUP RIVER NEAR CUMRO, NEBR.

Oct. 12, 1948-----	108	250	73
Apr. 9, 1949-----	341	2,760	2,540
June 3-----	210	630	357
June 29-----	141	509	194
Aug. 31-----	108	320	93
Sept. 12-----	144	507	197

NORTH LOUP RIVER AT BREWSTER, NEBR.

Oct. 15, 1948-----	311	373	313
Nov. 5-----	396	1,200	1,280
Mar. 29, 1949-----	666	1,390	2,500
Apr. 29-----	356	279	268
May 6-----	434	1,380	1,620
May 15-----	413	508	566
May 23-----	585	546	862
June 4-----	451	468	570
June 21-----	380	539	553
July 15-----	349	303	285
Aug. 24-----	318	324	278

NORTH LOUP RIVER AT TAYLOR, NEBR.

Mar. 29, 1949-----	780	1,390	2,920
May 24-----	650	592	1,040

NORTH LOUP RIVER AT BURWELL, NEBR.

Apr. 25, 1949-----	522	366	516
May 7-----	800	714	1,540
May 24-----	631	464	791

NORTH LOUP RIVER AT ORD, NEBR.

Mar. 30, 1949-----	740	1,170	2,340
May 25-----	1,160	496	1,550

NORTH LOUP RIVER AT SCOTIA, NEBR.

Apr. 1, 1949-----	1,100	868	2,580
May 26-----	996	401	1,080

CALAMUS RIVER NEAR BURWELL, NEBR.

Apr. 25, 1949-----	263	140	99
May 7-----	279	292	220
May 25-----	380	290	298

SHELL CREEK NEAR COLUMBUS, NEBR.

Oct. 7, 1948-----	7.4	85	1.7
Nov. 4-----	7.4	114	2.3
Dec. 3-----	12.7	42	1.4
Mar. 6, 1949-----	233	805	506
Mar. 7-----	205	661	366
Mar. 10-----	84	341	77
Apr. 4-----	43	245	28
Apr. 19-----	29	98	7.7
May 2-----	18	89	4.3
May 11-----	24	229	15
June 2-----	1,060	23,200	66,400
June 9-----	118	1,410	449
July 11-----	32	7,320	632
July 12-----	20	3,060	165
Aug. 12-----	3.0	1,830	15
Aug. 27-----	7.8	111	2.3
Sept. 17-----	10	126	3.4

MISSOURI RIVER BASIN
 PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949--Continued

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)

ELKHORN RIVER AT EWING, NEBR.

Oct. 12, 1948 -----	55	29	4.3
Nov. 2 -----	52	19	2.6
Mar. 7, 1949 -----	437	559	660
Mar. 9 -----	2,570	1,020	7,080
Mar. 9 -----	3,390	1,050	9,610
Apr. 4 -----	2,020	508	2,770
Apr. 5 -----	3,300	506	4,510
May 2 -----	195	58	31
June 9 -----	283	139	106
July 12 -----	1/94	35	8.9
Aug. 27 -----	1/46	29	3.6
Sept. 17 -----	1/80	22	4.8

ELKHORN RIVER AT NELIGH, NEBR.

July 23, 1948 -----	121	80	26
Aug. 27, 1949 -----	136	121	44
Sept. 17 -----	231	175	109

ELKHORN RIVER AT WATERLOO, NEBR.

Oct. 5, 1948 -----	437	248	293
Oct. 12 -----	446	213	256
Oct. 19 -----	429	160	185
Oct. 26 -----	442	148	177
Nov. 2 -----	587	376	596
Nov. 9 -----	515	258	359
Nov. 16 -----	520	282	396
Nov. 23 -----	376	200	203
Dec. 1 -----	562	353	536
Dec. 6 -----	502	509	690
Dec. 13 -----	480	400	518
Feb. 23, 1949 -----	502	114	154
Mar. 6 -----	17,000	6,810	313,000
Mar. 7 -----	18,700	6,590	333,000
Mar. 7 -----	19,000	7,110	365,000
Mar. 21 -----	10,900	15,300	450,000
Mar. 28 -----	7,020	7,300	138,000
Apr. 6 -----	4,940	4,680	62,400
Apr. 12 -----	9,140	5,650	139,000
Apr. 18 -----	4,830	3,980	51,900
Apr. 25 -----	2,160	1,440	8,400
May 2 -----	1,710	814	3,760
May 9 -----	1,360	1,090	4,000
May 17 -----	1,210	1,230	4,020
May 24 -----	5,330	5,850	84,200
May 26 -----	4,300	3,500	40,600
June 1 -----	1,960	3,510	18,600
June 3 -----	10,100	9,650	263,000
June 7 -----	2,490	2,380	16,000
June 21 -----	2,450	4,390	29,000

BEAVER CREEK NEAR BEAVER CITY, NEBR.

May 30, 1948 -----	19	1,540	79
May 31 -----	27	914	67
June 23 -----	1,480	3,450	13,800
Mar. 10, 1949 -----	21	592	34
Apr. 19 -----	47	567	72
May 5 -----	16	248	11
May 6 -----	490	5,660	7,490
May 12 -----	189	3,630	1,850
May 16 -----	145	2,560	1,000
May 21 -----	586	7,100	11,200
May 25 -----	258	5,560	3,870
June 7 -----	266	5,790	4,160
June 10 -----	175	5,240	2,480
June 10 -----	1,360	7,130	26,200
June 13 -----	440	4,960	5,890
June 13 -----	314	3,730	3,160
June 13 -----	242	3,100	2,020

1/ Mean daily discharge.

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949--Continued

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)

BEAVER CREEK NEAR BEAVER CITY, NEBR.--Continued

July 8, 1949-----	54	1,190	174
Aug. 18-----	608	6,600	10,800
Aug. 18-----	450	5,920	7,190
Aug. 21-----	189	7,520	3,840

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949
 (Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
 W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000
PLUM CREEK NEAR SMITHFIELD, NEBR.															
June 8, 1949	4:30 p. m.	1.69	2,140	980	72	87	94	97	98	99	100	--			BW
June 20	2:25 p. m.	30.6	3,880	3,930	59	76	90	96	97	99	99	100			BW
June 20	2:25 p. m.	30.6	3,880	3,350	25	61	94	95	98	99	99	100			BN
Aug. 18	7:35 a. m.	1.61	1,370	986	78	94	100	--	--	--	--	--			BW
MIDDLE LOUP RIVER NEAR SENECA, NEBR.															
July 26, 1949	10:05 a. m.	199	587	1,170				4	6	14	41				BN
Aug. 3	7:00 p. m.	188	306	2,030				4	6	31	58				BN
Sept. 14	5:30 p. m.	184	690	1,840				--	12	18	41				BW
MIDDLE LOUP RIVER AT MILBURN, NEBR.															
July 26, 1949	10:20 a. m.	614	415	1,190				--	11	21	38	96		100	BN
Aug. 24	11:30 a. m.	661	415	3,460				8	10	18	36	88		97	BN
Sept. 12	4:00 p. m.	764	601	5,610				5	7	15	41	90		98	BW
MIDDLE LOUP RIVER AT ARCADIA, NEBR.															
Oct. 12, 1948	4:55 p. m.	638	662	1,690				12	14	22	44	90		98	BN
Nov. 5	4:20 p. m.	1,040	2,010	3,490					7	10	19	41		98	BN
May 6, 1949	6:10 p. m.	910	1,220	3,300				7	10	16	35	--		--	BW
June 4	8:45 a. m.	812	714	1,430				--	19	25	44	--		--	BW
June 22	10:05 a. m.	638	844	1,680				8	11	23	32	80		--	BW
July 16	9:15 a. m.	554	474	977				--	17	34	50	--		--	BW
July 19	12:10 p. m.	458	344	1,050				15	17	22	40	92		99	BN
July 26	1:00 p. m.	369	282	769				13	19	29	50	--		--	BN
Aug. 22	6:45 p. m.	624	485	1,500			14	16	19	26	41	--		--	BW
MIDDLE LOUP RIVER AT LOUP CITY, NEBR.															
July 19, 1949	4:15 p. m.	410	206	513				28	35	--	--	--		--	BN
July 26	5:20 p. m.	353	124	328				27	36	49	64	90		100	BN
Aug. 22	5:25 p. m.	610	278	969				21	28	42	50	84		42	BW
Sept. 12	7:35 p. m.	1,070	714	2,030				11	16	26	50	90		--	BW

DISMAL RIVER NEAR GEM, NEBR.

July 26, 1949-----	4:15 p. m.	250	401	746		8	13	27	49	97	100	BN
Sept. 7 -----	12:45 p. m.	201	733	1,870		5	6	14	32	87	98	BW

DISMAL RIVER AT DUNNING, NEBR.

Oct. 15, 1948 -----	5:00 p. m.	321	914	1,660		--	7	14	32	91	99	BN
Nov. 5 -----	1:45 p. m.	321	1,630	2,540		2	4	10	23	83	98	BN
Apr. 29, 1949 -----	5:45 p. m.	294	1,871	1,680		6	10	19	41	84	98	BN
May 6 -----	4:00 p. m.	312	1,140	2,060		9	11	18	33	--	--	BN
June 21 -----	9:30 a. m.	321	820	1,230		7	10	19	38	--	--	BW
July 26 -----	6:30 p. m.	292	574	1,040		8	11	22	46	--	--	BN
Aug. 4 -----	11:30 a. m.	297	393	2,260		7	11	28	59	--	--	BN
Aug. 25 -----	5:15 p. m.	278	402	1,890		4	9	17	41	--	--	BN
Sept. 13 -----	12:30 p. m.	314	850	3,370		4	6	12	34	--	--	BW

SOUTH LOUP RIVER NEAR CUMRO, NEBR.

Apr. 9, 1949 -----	6:00 p. m.	341	2,760	4,520	7	9	14	20	36	100	--	BW
June 3 -----	5:45 p. m.	210	630	1,200	13	16	24	44	71	82	90	BW
June 29 -----	7:10 p. m.	141	509	787	16	21	32	49	73	81	94	BW
Aug. 31 -----	3:00 p. m.	108	320	678	24	30	37	48	70	84	91	BW

NORTH LOUP RIVER AT BREWSTER, NEBR.

Oct. 15, 1948 -----	11:45 a. m.	311	373	580		--	18	25	42	77	94	BN
Nov. 5 -----	12:00 m.	396	1,200	1,790		7	7	10	24	44	74	BN
Mar. 29, 1949 -----	11:10 a. m.	666	1,390	7,820		4	4	7	18	--	--	BN
Apr. 29 -----	4:20 p. m.	356	1,279	1,460		4	8	17	35	78	96	BN
May 6 -----	11:30 a. m.	434	1,360	2,060		1	3	11	31	91	95	BN
May 23 -----	5:50 p. m.	595	546	1,510		2	5	15	34	--	--	BN
June 21 -----	10:45 a. m.	399	539	392		--	--	17	30	74	--	BW
July 15 -----	8:50 a. m.	349	303	594		--	--	26	44	93	--	BW
Aug. 24 -----	9:10 a. m.	318	324	520		--	--	17	31	79	--	BW

PLATTE RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters								0.500	1.000	
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250			0.350
NORTH LOUP RIVER AT TAYLOR, NEBR.															
Mar. 29, 1949	--	780	1,390	6,960				4	4	8	21	72		92	BN
Mar. 24	11:00 a. m.	650	592	1,460					2	8	37				BN
NORTH LOUP RIVER AT BURWELL, NEBR.															
Apr. 25, 1949	12:45 p. m.	522	366	848				10	12	22	52				BN
May 7	10:40 a. m.	800	714	1,120				5	8	19	40	99		100	BN
May 24	5:00 p. m.	631	464	1,310				4	6	16	38				BN
NORTH LOUP RIVER AT ORD, NEBR.															
Mar. 30, 1949	--	740	1,170	7,730				6	8	16	28	57		83	BN
Mar. 25	4:30 p. m.	1,160	496	1,570				5	9	20	38				BN
NORTH LOUP RIVER AT SCOTIA, NEBR.															
Apr. 1, 1949	3:40 p. m.	1,100	868	4,520				10	15	33	52	82		94	BN
May 26	10:30 a. m.	996	401	1,540				6	10	23	41				BN
CALAMUS RIVER NEAR BURWELL, NEBR.															
Apr. 25, 1949	3:00 p. m.	263	140	322				21	24	42	64	97		99	BN
May 7	9:15 a. m.	279	292	929				--	--	4	26				BN
May 25	10:30 a. m.	380	290	1,190				3	5	12	30				BN
SHELL CREEK NEAR COLUMBUS, NEBR.															
Oct. 7, 1948	10:15 a. m.	7.4	85	399	--	--	--	14	19	25	50	94		99	BN
Nov. 4	9:30 a. m.	233	114	360	--	--	--	4	4	20	54	--			BN
Mar. 6, 1949	3:30 p. m.	205	805	1,400	--	19	30	45	66	91	97	99			BN
Mar. 7	1:00 p. m.	84	661	1,130	--	23	31	48	69	96	99	--			BN
Mar. 10	1:30 p. m.		341	555	--	28	37	48	56	60	68	77			BN

SHELL CREEK NEAR COLUMBUS, NEBR.--Continued

Apr. 4, 1948	12:30 p.m.	43	245	307	--	--	74	80	91	96	--	96	--	96	EN
June 2	10:40 a.m.	1,060	23,200	11,800	26	40	54	65	78	--	--	--	--	91	EN
June 9	10:40 a.m.	1,060	23,200	11,300	32	45	63	74	84	57	59	--	--	95	EN
June 9	5:10 p.m.	118	1,410	2,260	40	54	68	81	95	98	99	--	--	95	EN
July 11	6:40 p.m.	32	7,320	12,700	63	81	96	--	--	--	--	--	--	95	EN
Aug. 12	2:10 p.m.	3.0	1,830	3,670	56	75	93	98	--	--	--	--	--	98	EN

ELKHORN RIVER AT EWING, NEBR.

Mar. 7, 1949	8:00 a.m.	437	559	3,250	--	--	--	1	2	4	8	32	85	EN
Mar. 9	2:15 p.m.	2,570	1,020	1,800	--	--	--	1	4	10	23	75	95	EN
Mar. 9	8:00 p.m.	3,390	1,050	1,420	--	--	--	--	1	4	9	47	90	EN
Apr. 5	8:10 a.m.	3,300	506	1,440	--	--	--	--	5	7	10	45	87	EN

ELKHORN RIVER AT WATERLOO, NEBR.

Nov. 23, 1948	3:00 p.m.	376	200	360	--	--	--	36	42	55	63	82	96	EN
Dec. 13	3:30 p.m.	460	400	363	--	--	21	34	48	59	67	--	95	EN
Mar. 6, 1949	2:00 p.m.	17,000	6,810	9,360	--	8	12	16	24	36	53	91	100	EN
Mar. 6	3:00 p.m.	17,000	6,810	10,400	--	11	15	20	28	38	56	92	100	EN
Mar. 7	2:40 p.m.	18,700	6,590	8,400	--	12	16	23	35	66	74	92	96	EN
Mar. 7	2:40 p.m.	18,700	6,590	8,490	--	16	22	28	39	64	73	92	98	EN
Mar. 7	5:20 p.m.	19,000	7,110	2,900	--	13	17	24	39	57	68	97	100	EN
Mar. 21	2:10 p.m.	10,900	15,300	17,200	--	8	15	23	43	74	86	97	100	EN
Mar. 21	2:10 p.m.	10,900	15,300	9,310	--	14	19	27	43	75	82	99	100	EN
Mar. 21	2:10 p.m.	10,900	15,300	9,820	--	26	33	39	51	71	94	--	100	BWCM
Mar. 28	5:00 p.m.	7,020	7,300	8,570	--	9	15	21	36	58	74	85	96	EN
Mar. 28	5:00 p.m.	7,020	7,300	8,610	--	13	19	24	37	67	82	98	99	EN
Apr. 12	1:30 p.m.	9,140	5,650	7,930	--	13	17	21	31	58	73	--	--	EN
Apr. 12	1:30 p.m.	9,140	5,650	7,640	20	22	25	29	39	61	77	--	--	BWCM
Apr. 25	12:40 p.m.	2,160	1,440	3,170	--	11	17	25	37	59	72	91	98	EN

PLATTE RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN PLATTE RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1948 to September 1949--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
ELKHORN RIVER AT WATERLOO, NEBR.--Continued																
May 2, 1949	1:45 p.m.	1,710	814	1,250	--	11	17	25	37	56	75	97		100		BN
May 17	2:50 p.m.	1,210	1,230	1,850	--	20	36	53	64	73	78	85		96		BN
May 26	4:00 p.m.	4,300	3,900	4,600	20	26	32	40	53	70	83	91		100		BN
June 1	3:20 p.m.	1,960	3,510	5,780	28	46	58	66	75	87	92	95		97		BN
June 3	4:15 p.m.	10,100	9,650	9,560	6	21	46	50	61	76	91	96		100		BN
June 3	4:15 p.m.	10,100	9,650	9,030	27	37	44	50	60	78	90	98		100		BN
June 7	3:20 p.m.	2,400	2,980	4,230	22	33	40	49	60	76	87	95		98		BN
June 21	4:45 p.m.	2,450	4,390	4,660	10	24	52	66	79	86	93	97		99		BN
June 21	4:45 p.m.	2,450	4,390	4,560	25	38	53	68	78	88	93	97		99		BN
BEAVER CREEK NEAR BEAVER CITY, NEBR.																
June 7, 1949	2:45 p.m.	266	5,790	3,710	18	28	36	48	60	70	77	89		97	100	EW
July 8	8:30 p.m.	54	1,190	761	36	53	72	83	91	94	96	98		100		EW
Aug. 18	10:20 a.m.	450	5,920	3,840	32	48	65	76	87	93	98	99		100		EW

KANSAS RIVER BASIN
ARIKAREE RIVER AT HAIGLER, NEBR.

LOCATION.--At bridge on U. S. Highway 34, a quarter of a mile upstream from gaging station, three-quarters of a mile upstream from confluence with North Fork Republican River, and 1 mile northwest of Haigler, Dundy County.

DRAINAGE AREA.--1,460 square miles, of which only 1,300 square miles contribute directly to surface runoff.

RECORDS AVAILABLE.--Sediment records: March 1947 to September 1949.

EXTREMES, 1948-49.--Sediment loads: Maximum daily, 13,000 tons May 21; minimum daily, 0 tons on some days in July and August.

EXTREMES, 1947-49.--Sediment loads: Maximum daily, 50,000 tons June 16, 1948; minimum daily, 0 tons on some days during 1947 and 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, March to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent non- car- bon- ate
																Parts per mil- lion	Tons per acre- foot	Total	Non- carbon- ate	
Mar. 1, 1949-----	50	7.8	556	40	0.05	54	17	47		251	84	7.0	1.0	2.2	0.24	369	.50	204		0
Apr. 4-----	78	7.8	740	41	.05	74	24	55		278	150	10	1.0	2.4	.13	509	.69	283		55
Apr. 26-----	11	7.7	1,020	45	.02	92	41	73		296	285	12	.6	.0	--	730	.99	398		29
May 21-----	451	7.2	411	31	.20	56	12	19		234	32	1.8	.6	.0	--	279	.38	189		0
June 28-----	373	7.9	389	23	.02	48	9.2	21		200	30	4.5	.6	1.1	--	246	.33	158		18
Sept. 27-----	1.4	7.9	1,790	41	.02	158	77	164		247	800	19	1.3	1.2	--	1,386	1.88	712		33

Monthly and annual summary of water and suspended sediment discharge, water year October 1948 to September 1949

Month	Water discharge (second-foot)	Runoff (acre-feet)	Suspended sediment					
			Load (tons)	Daily load (tons)			Concentration (ppm)	
				Mean	Maximum	Minimum	Weighted mean	Maximum daily
October-----	333.3	661	74	2.4	--	(t)	82	--
November-----	185.6	368	28	.9	3	(t)	56	195
December-----	337.1	669	104	3.4	14	(t)	114	--
Calendar year 1948 -	12,919.3	25,630	--	--	--	--	--	--
January-----	57.5	114	4	.1	--	(t)	26	--
February-----	1,347.5	2,670	1,270	45	240	(t)	349	1,060
March-----	1,210	2,400	980	64	220	(t)	606	1,240
April-----	1,614	3,200	3,350	112	600	4	769	--
May-----	2,732.0	5,420	56,200	1,810	15,000	3	7,620	--
June-----	1,782	3,530	20,200	673	8,600	5	4,200	--
July-----	441.4	876	6,300	203	3,400	0	5,290	--
August-----	621.9	1,230	15,600	503	7,000	0	9,290	8,240
September-----	413.5	820	677	23	160	(t)	606	2,180
Water year 1948-49 -	11,075.8	21,960	105,800	290	15,000	0	--	--

1/ Sediment discharge less than 1.0 ton.

KANSAS RIVER BASIN--Continued

ARIKAREE RIVER AT HAIGLER, NEBR.--Continued

Particle-size analyses of suspended sediment, March to August 1949
 (Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
 W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Mar. 27, 1949	1:15 p. m.	72	733	373	14	24	40	54	69	82	97	100				BN
Apr. 1	12:15 p. m.	44	1,240	785	--	18	30	42	52	69	92	99		100		BN
Apr. 7	12:40 p. m.	102	1,070	735	14	18	24	33	44	62	72	91		97		BN
May 12	12:45 p. m.	51	5,540	3,960	41	62	78	88	96	99	100	--		--		BN
May 14	6:45 p. m.	69	2,900	2,040	39	52	69	79	89	96	98	100		--		BN
June 28	9:50 a. m.	373	6,050	9,490	16	24	30	35	41	53	85	98		99		BN
June 28	9:50 a. m.	373	6,050	9,420	4	6	12	40	44	60	85	97		99	100	BN
July 8	5:05 p. m.	36	2,820	1,750	42	60	76	84	88	91	95	98		100		BN
July 12	7:50 a. m.	202	6,540	6,260	4	6	14	--	64	68	72	87		95	98	BN
July 12	7:50 a. m.	202	6,540	5,900	22	38	51	58	66	72	80	93		99		BN
July 15	1:10 p. m.	34	3,520	2,810	38	60	76	84	88	91	94	99		100	--	BN
Aug. 16	10:00 a. m.	26	5,130	5,360	46	64	79	88	88	95	96	99		100	--	BN
Aug. 18	6:10 p. m.	25	3,850	2,540	41	60	82	92	97	98	98	99		100	--	BN
Aug. 29	3:10 p. m.	48	8,980	2,540	37	53	68	80	88	92	93	98		100	--	BN
Aug. 31	2:00 p. m.	484	10,600	3,360	36	44	58	71	82	94	98	99		100	--	BN
Aug. 31	2:00 p. m.	484	10,600	3,220	11	16	41	68	82	96	99	100		--	--	BN

KANSAS RIVER BASIN--Continued
REPUBLICAN RIVER AT TRENTON, NEBR.

LOCATION --At gaging station at bridge on State Highway 25, about half a mile upstream from Elm Creek and three-quarters of a mile south of Trenton, Hiawatha County, Nebraska.

DRAINAGE AREA --8,120 square miles, of which only 4,910 square miles contribute directly to surface runoff.

RECORDS AVAILABLE --Chemical analyses: November 1946 to September 1949.

Water temperatures: November 1946 to May 1947 April to August 1948, April to September 1949.

Sediment records: November 1946 to September 1949.

EXTREMES, 1948-49 --Specific conductance: Maximum, 771 micromhos July 8; minimum, 292 micromhos Aug. 18.

Water temperatures: Minimum, freezing point on several days in November to February.

Sediment concentrations: Maximum, daily 18,100 ppm Aug. 17; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 98,400 tons Aug. 17; minimum daily, 0 tons on many days.

EXTREMES, 1946-49 --Dissolved solids (1946-47): Maximum, 504 ppm Jan. 2-10, 1947; minimum, 308 ppm June 24, 1947.

Total hardness (1946-47): Maximum, 308 ppm Jan. 2-10, 1947; minimum, 196 ppm June 13-23, 1947.

Specific conductance: Maximum, 811 micromhos Aug. 30, 1948; minimum, 292 micromhos, Aug. 18, 1949.

Water temperatures: Minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, not determined.

Sediment loads: Maximum daily, 492,000 tons June 16, 1948; minimum daily, 0 tons on many days each year.

REMARKS --Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Car-bonate (CO ₃)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Bo-ron (B)	Dissolved solids			Hardness as CaCO ₃		Per-cent so-dium
																	Parts per mil-lion	Tons per acre-foot	Tons per day	Total	Non-carbonate	
Oct. 11-26, 1948 -----	33	8.3	618	62	0.05	55	19	43	10	6	254	86	9.5	1.2	0.5	0.22	432	0.59	30	215	0	29
Nov. 5-30 -----	117	8.5	600	55	.04	62	17	35	8.8	13	244	78	7.7	1.2	2.8	.10	402	.55	127	224	3	24
Dec. 1-13 -----	155	8.2	574	51	.03	57	17	38	6.8	8	240	70	7.5	1.2	2.8	.15	380	.52	159	212	2	27
Dec. 3, Sta. 25 1/2 -----	222	-----	555	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Dec. 3, Sta. 48 1/2 -----	222	-----	569	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Dec. 3, Sta. 93 1/2 -----	222	-----	556	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Dec. 3, Sta. 120 1/2 -----	222	-----	549	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----
Dec. 21, Sta. 90 -----	160	8.4	554	70	.20	66	18	32	14	227	80	8.2	1.2	1.8	1.8	---	416	.57	180	238	29	23
Dec. 21, Sta. 120 1/2 -----	160	-----	574	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	---	---	---	---	---	---	---
Dec. 21, Sta. 150 1/2 -----	160	-----	573	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	---	---	---	---	---	---	---
Dec. 21, Sta. 180 1/2 -----	160	-----	583	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	---	---	---	---	---	---	---
Jan. 6-26, 1948 -----	66	8.5	557	61	.02	44	22	30	9.6	12	214	79	7.0	1.2	3.1	.20	390	.53	69	201	6	24
Feb. 12-17 -----	140	8.3	475	57	.04	30	18	34	6.4	10	158	77	7.0	1.2	2.5	.30	340	.46	129	149	3	32
Feb. 16 -----	230	8.0	587	46	.06	59	18	35	12	0	268	74	8.0	1.2	2.9	.30	330	.54	245	221	1	24
Mar. 2-5 -----	364	8.0	505	45	.08	51	14	33	6.4	0	232	64	6.0	1.2	3.9	.29	350	.48	344	185	0	27
Mar. 6-29 -----	307	8.0	578	50	.14	58	16	34	13	0	258	78	8.0	1.4	4.5	---	402	.55	333	211	0	25
Apr. 4-30 -----	354	8.6	584	51	.02	57	19	39	11	16	234	86	8.4	1.6	2.9	.57	414	.56	396	220	2	27

1/Not included in weighted average.

KANSAS RIVER BASIN--Continued
 REPUBLICAN RIVER AT TRENTON, NEBR.--Continued

Chemical analyses, in parts per million, water year October, 1948 to September 1949--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbonate (CO ₃)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids		Hardness as CaCO ₃		Percent sodium carbonate
																Parts per million	Tons per acre-foot	Total	Non-carbonate	
Apr. 13, 1949, Sta. 30 1/2	414	--	622	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 13, Sta. 50 1/2	414	--	616	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 13, Sta. 140 1/2	414	--	620	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Apr. 13, Sta. 180 1/2	414	--	622	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May 1-17	383	8.1	577	55	0.02	54	17	39	18	0	270	78	8.5	1.2	1.8	420	57	434	205	0
May 18-28	467	8.3	548	50	0.04	58	16	32	8.8	11	232	74	8.0	1.1	1.8	396	54	499	211	3
May 29-June 28	459	8.2	485	46	0.05	46	14	34	7.6	10	212	51	7.0	0.9	1.2	341	46	423	173	0
June 7, Sta. 30 1/2	896	7.5	400	43	0.30	45	11	31	--	0	228	28	5.0	0.8	0.5	288	41	188	0	30
June 7, Sta. 175 1/2	896	8.0	420	45	--	44	11	35	--	0	212	48	6.0	--	0.2	290	39	155	0	33
June 7, Sta. 225 1/2	896	7.5	388	35	0.60	46	11	28	--	0	218	34	4.0	0.8	0.2	278	38	160	0	28
June 21, Sta. 18 1/2	234	--	564	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 21, Sta. 48 1/2	234	--	559	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 21, Sta. 90 1/2	234	--	547	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 21, Sta. 170 1/2	234	--	555	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 29-July 26	100	7.6	476	47	0.04	54	14	31	9.6	0	228	58	9.0	0.8	3.2	368	90	193	6	25
July 6, Sta. 30 1/2	49	--	506	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 6, Sta. 46 1/2	49	--	525	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 6, Sta. 135 1/2	49	--	520	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 6, Sta. 180 1/2	49	--	522	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 19, Sta. 20 1/2	37	--	520	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 19, Sta. 48 1/2	37	--	515	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 19, Sta. 60 1/2	37	--	515	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Aug. 17, 8:00 a. m.	1,720	7.3	400	32	0.16	53	12	22	6.4	0	264	23	5.0	--	0.4	312	42	1,450	182	0
Aug. 17, 11:40 a. m.	1,720	7.3	378	28	0.14	57	10	20	--	0	244	18	2.0	0.6	2.8	270	37	183	0	19
Aug. 17, Sta. 48 1/2	1,720	7.5	398	36	0.34	54	11	27	--	0	260	21	1.0	0.6	2.2	294	40	181	0	25
Aug. 17, Sta. 140 1/2	1,720	7.4	341	32	0.60	42	10	30	--	0	224	21	1.0	0.6	3.6	284	39	146	0	31
Aug. 17, Sta. 230 1/2	1,720	7.5	352	31	0.50	49	10	7.6	--	0	188	21	1.0	0.4	1.8	236	32	164	10	9
Aug. 18, 8:00 a. m.	1,870	7.4	419	28	0.06	61	9.0	11	9.6	0	238	19	2.0	--	7.4	300	41	2/1,310	189	0
Aug. 18, 9:50 a. m.	1,870	7.5	409	32	0.40	55	11	19	6.4	0	244	24	4.0	--	1.8	304	41	183	0	18
Aug. 18, 10:10 a. m.	1,870	7.5	340	36	0.34	46	9.8	26	9.9	0	170	28	3.0	0.6	3.4	232	32	156	17	12
Aug. 18, 10:50 a. m.	1,870	7.5	348	30	0.30	44	9.8	26	--	0	218	23	1.0	0.4	1.5	246	33	151	0	27
Aug. 19-30	1,191	7.7	420	39	0.02	39	12	26	14	0	196	46	6.0	0.8	1.7	280	38	147	0	26

1/Not included in weighted average.

2/Weighted mean for day.

KANSAS RIVER BASIN--Continued

REPUBLICAN RIVER AT TRENTON, NEBR.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 8 a. m. and 5 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--	--	32	--	--	--	--	50	65	75	--	61
2	--	--	34	--	32	33	--	53	60	86	--	--
3	--	--	35	--	--	38	--	60	60	87	--	--
4	--	--	--	--	--	47	55	63	63	--	--	64
5	--	36	33	--	--	--	60	62	65	75	--	63
6	--	--	33	32	--	--	--	54	67	75	--	62
7	--	--	33	--	--	49	65	56	61	75	--	63
8	--	33	35	--	--	40	53	--	61	--	--	58
9	--	--	33	--	--	--	--	51	62	81	--	57
10	--	33	32	--	--	--	--	55	65	83	--	63
11	45	34	--	--	--	--	63	59	69	70	--	65
12	--	33	33	--	34	--	69	60	74	71	--	64
13	--	--	33	--	33	--	54	60	64	72	--	50
14	--	--	32	--	--	--	48	42	65	65	--	54
15	--	35	--	--	--	39	42	42	65	69	--	54
16	--	38	--	--	33	--	48	62	65	78	--	58
17	--	39	--	--	--	--	51	60	70	91	69	58
18	--	--	--	--	--	--	48	61	62	68	66	53
19	--	--	--	--	--	--	47	59	66	69	65	52
20	--	32	--	32	--	--	47	55	72	73	67	57
21	--	--	32	--	--	--	53	68	--	66	67	54
22	--	32	--	--	--	--	55	63	72	67	70	54
23	--	33	--	--	--	--	52	60	72	--	67	52
24	--	33	--	--	--	--	67	56	67	--	64	55
25	--	--	--	--	--	--	58	60	73	--	69	54
26	45	32	--	32	--	--	58	64	86	--	67	56
27	--	32	--	--	--	--	52	62	72	--	66	51
28	--	34	--	--	--	--	56	57	70	--	66	49
29	--	--	--	--	--	36	--	78	70	--	63	49
30	--	--	--	--	--	--	57	83	73	--	66	71
31	--	--	--	--	--	--	--	69	--	--	65	--
Average	--	--	--	--	--	--	--	59	67	--	--	57

KANSAS RIVER BASIN--Continued

REPUBLICAN RIVER AT TRENTON, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0	--	0	72	--	1/140	220	1,920	1,140
2-----	0	--	0	69	--	1/140	228	2,200	1,350
3-----	0	--	0	75	--	1/170	222	2,670	1,600
4-----	0	--	0	80	860	186	234	--	1/1,500
5-----	0	--	0	96	1,580	409	200	--	1/2,300
6-----	0	--	0	103	--	1/360	140	2,390	903
7-----	.7	--	(a)	99	--	1/280	120	--	1/650
8-----	3.2	--	(a)	96	1,000	259	100	1,990	537
9-----	7.6	--	1/2	99	--	1/300	100	2,640	713
10-----	11	--	1/2	110	1,140	339	80	1,400	302
11-----	15	80	3	121	1,320	431	85	--	1/360
12-----	21	--	1/5	103	1,480	412	130	--	1/800
13-----	23	--	1/7	124	--	1/600	160	--	1/800
14-----	25	--	1/9	132	--	1/700	170	1,230	564
15-----	26	--	1/10	132	1,780	634	160	2,220	959
16-----	23	--	1/10	114	1,550	477	150	3,150	1,280
17-----	22	--	1/10	106	1,560	446	120	--	1/600
18-----	25	--	1/13	162	--	1/850	110	--	1/360
19-----	30	--	1/17	150	--	1/550	100	--	1/130
20-----	37	--	1/22	75	--	1/34	120	300	97
21-----	40	238	26	55	--	1/6	160	320	138
22-----	45	--	1/32	10	--	1/2	180	--	1/180
23-----	47	--	1/38	45	131	16	180	420	204
24-----	47	--	1/42	120	226	73	160	--	1/200
25-----	52	--	1/50	200	310	167	150	--	1/190
26-----	52	406	57	180	--	1/440	80	--	1/110
27-----	49	--	1/60	130	760	266	45	--	1/42
28-----	52	--	1/70	150	1,440	583	25	--	1/8
29-----	54	--	1/80	140	1,860	703	45	--	1/12
30-----	58	--	1/95	180	1,490	724	25	--	1/7
31-----	69	--	1/120	--	--	--	15	--	1/4
Total-	834.5	--	780	3,328	--	10,700	4,014	--	18,000
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	35	--	1/9	70	--	1/24	380	--	1/3,500
2-----	60	--	1/15	60	116	19	380	4,190	4,300
3-----	55	--	1/13	60	--	1/16	440	6,670	7,920
4-----	40	--	1/10	75	--	1/19	380	--	1/4,700
5-----	30	--	1/7	75	--	1/17	257	--	1/2,000
6-----	35	86	8	95	--	1/19	240	--	1/1,600
7-----	45	--	1/9	95	--	1/17	257	--	1/1,800
8-----	60	--	1/10	100	--	1/16	269	--	1/1,800
9-----	50	--	1/8	110	--	1/32	288	--	1/2,200
10-----	40	--	1/6	130	--	1/75	252	--	1/2,900
11-----	35	--	1/6	130	--	1/120	252	4,680	3,180
12-----	50	--	1/8	150	--	1/180	207	--	1/2,200
13-----	70	--	1/14	130	532	187	275	--	1/2,800
14-----	100	--	1/28	140	--	1/190	322	3,800	3,300
15-----	110	--	1/42	170	--	1/190	322	--	1/4,400
16-----	100	--	1/42	230	--	276	295	--	1/6,000
17-----	90	--	1/38	310	445	1/280	350	4,420	4,180
18-----	80	--	1/34	390	--	1/360	316	4,010	3,420
19-----	70	--	1/30	410	--	1/400	288	--	1/3,200
20-----	65	156	27	420	--	1/440	288	--	1/3,300
21-----	65	--	1/28	470	--	1/800	281	4,200	3,190
22-----	65	--	1/30	570	880	1,350	329	4,780	4,250
23-----	65	--	1/32	740	--	1/1,800	269	--	1/5,800
24-----	65	--	1/34	820	--	1/2,300	234	--	1/6,700
25-----	65	--	1/36	820	--	1/3,300	246	9,780	6,500
26-----	65	202	35	700	--	1/3,800	406	--	1/13,000
27-----	60	--	1/32	550	--	1/3,700	560	--	1/16,000
28-----	60	--	1/30	420	--	1/3,300	439	--	1/8,500
29-----	65	--	1/30	--	--	--	390	3,900	4,110
30-----	65	--	1/28	--	--	--	187	--	1/1,300
31-----	70	--	1/26	--	--	--	352	--	1/8,800
Total-	1,930	--	700	8,440	--	23,200	9,751	--	147,000

1/Estimated.

(a) Sediment discharge less than 1.0 ton.

MISSOURI RIVER BASIN

KANSAS RIVER BASIN--Continued

REPUBLICAN RIVER AT TRENTON, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	336	6,780	6,150	176	920	437	422	7,600	8,660
2-----	600	--	1/14,000	154	1,020	424	288	4,700	3,650
3-----	466	--	1/9,600	145	940	368	269	3,650	2,650
4-----	550	--	1/11,000	150	620	251	302	2,820	2,300
5-----	600	7,430	12,000	150	1,000	405	350	2,840	2,680
6-----	686	--	1/14,000	234	860	543	762	--	1/23,000
7-----	708	7,030	13,400	316	1,310	3/1,200	896	11,200	3/28,100
8-----	600	--	1/10,000	730	9,700	3/19,600	1,060	--	1/33,000
9-----	530	--	1/8,200	570	7,980	12,300	713	8,870	3/17,000
10-----	550	--	1/7,400	448	3,500	4,230	963	--	1/29,000
11-----	502	4,800	6,500	390	2,500	2,630	642	7,480	13,000
12-----	430	4,920	5,710	676	--	1/19,000	708	--	1/15,000
13-----	414	4,470	5,000	430	7,300	8,480	556	7,340	3/11,100
14-----	336	3,980	3,610	538	--	1/13,000	574	--	1/12,000
15-----	281	3,400	2,580	511	--	1/11,000	524	6,090	3/8,720
16-----	252	2,940	2,000	475	5,300	6,800	422	4,450	5,070
17-----	257	2,990	2,070	414	4,260	4,760	430	4,700	3/5,600
18-----	228	3,100	1,910	382	2,900	2,990	762	--	1/18,000
19-----	217	2,080	1,220	502	4,810	6,520	414	4,980	3/5,620
20-----	240	3,220	2,090	568	5,900	3/9,540	316	2,750	2,350
21-----	252	2,150	1,460	626	--	1/11,000	234	1,360	859
22-----	269	2,070	1,500	503	6,760	3/14,000	202	970	529
23-----	263	1,700	1,210	439	3,420	4,050	176	660	314
24-----	240	1,400	907	520	--	1/7,400	158	540	230
25-----	202	1,320	720	439	4,230	5,010	137	550	203
26-----	186	930	467	374	2,980	3,010	121	850	278
27-----	191	1,200	619	390	2,130	2,240	106	1,050	300
28-----	191	1,780	918	398	2,640	2,840	328	--	1/6,600
29-----	186	1,420	713	382	1,800	1,860	422	6,010	6,850
30-----	196	1,010	534	422	1,740	1,980	275	5,300	3,940
31-----	--	--	--	575	8,740	3/14,800	--	--	--
Total-	10,959	--	147,500	13,027	--	192,700	13,532	--	266,600
Day	July			August			September		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	171	2,240	1,030	0	--	0	1,820	14,800	3/82,500
2-----	128	1,510	522	0	--	0	466	4,640	5,840
3-----	132	1,080	388	0	--	0	366	2,440	2,410
4-----	106	--	1/300	0	--	0	302	2,300	1,880
5-----	66	1,040	185	0	--	0	228	2,040	1,260
6-----	49	360	48	0	--	0	217	1,480	867
7-----	40	260	28	0	--	0	217	840	492
8-----	26	220	15	0	--	0	222	1,530	917
9-----	90	--	1/1,000	0	--	0	222	1,390	833
10-----	222	3,120	1,870	0	--	0	222	1,010	605
11-----	110	2,560	760	0	--	0	196	1,020	540
12-----	58	3,720	582	0	--	0	154	850	353
13-----	112	--	1/1,500	0	--	0	141	890	339
14-----	217	3,550	2,080	0	--	0	137	860	318
15-----	162	2,420	1,060	0	--	0	174	755	253
16-----	128	2,180	753	107	--	1/5,800	106	970	278
17-----	114	1,910	588	1,720	18,100	3/98,400	96	770	200
18-----	80	770	166	1,870	13,200	3/80,200	92	565	140
19-----	37	635	63	570	8,890	3/14,700	89	505	121
20-----	21	--	1/75	350	5,970	3/6,810	83	318	71
21-----	16	480	21	212	2,300	1,320	83	305	68
22-----	8.2	260	6	145	1,380	540	86	335	78
23-----	5.5	--	1/3	99	780	208	83	205	46
24-----	.8	--	(2)	80	350	76	80	202	44
25-----	.4	--	(2)	58	--	1/36	69	315	59
26-----	0	--	0	52	210	29	56	342	52
27-----	0	--	0	45	170	21	58	230	36
28-----	0	--	0	49	260	34	58	220	34
29-----	0	--	0	185	--	1/3,200	58	215	34
30-----	0	--	0	448	6,120	7,400	58	280	44
31-----	0	--	0	1,040	6,520	3/52,600	--	--	--
Total-	2,099.9	--	13,040	7,030	--	271,400	6,189	--	100,700
Total discharge for year (second-foot-days)-----									81,134.4
Total load for year (tons)-----									1,192,000

1/Estimated.

(2) Sediment discharge less than 1.0 ton.

3/ Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued
REPUBLICAN RIVER AT TRENTON, NEBR.--Continued

Particle-size analyses of suspended sediment, May to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.500	1.000	2.000
May 13, 1949	8:00 a. m.	422	7,680	6,710	29	38	48	52	54	61	68	82	91			BV
May 20	8:00 a. m.	610	6,720	5,350	12	18	24	28	32	40	43	60	75			BW
June 2	8:00 a. m.	302	4,860	4,090	24	34	47	52	54	58	64	73	83			BW
June 7	2:25 p. m.	580	5,880	5,590	14	20	24	27	30	36	45	54	62			BW
June 7	2:25 p. m.	580	5,880	4,770	4	8	21	34	37	45	52	59	69			BN
July 10	5:30 p. m.	181	2,620	2,160	38	62	82	88	92	97	98	99	100			BW
July 14	8:00 a. m.	288	4,080	2,950	36	51	62	70	75	82	88	94	98			BW
July 18	8:00 a. m.	89	865	637	38	59	69	74	78	84	90	92	97			BW
July 19	1:05 p. m.	37	395	939	38	56	74	77	80	83	86	88	94			BW
Aug. 17	8:00 a. m.	2,470	23,700	11,100	18	26	32	38	44	56	75	90	99			BW
Aug. 17	11:40 a. m.	1,580	14,700	8,720	28	36	46	52	57	63	72	79	86			BW
Aug. 17	11:40 a. m.	1,580	14,700	5,260	4	6	38	53	56	64	69	73	78			BN
Aug. 18	4:580	4,580	24,800	6,630	12	18	24	28	35	59	69	86	95			BW
Aug. 18	10:10 a. m.	4,580	24,800	10,200	2	4	15	18	22	33	41	55	70			BN
Aug. 22	9:00 a. m.	167	1,640	1,010	30	39	44	48	50	55	60	75	91			BW
Aug. 30	3:15 p. m.	448	4,710	3,150	27	35	52	57	63	68	75	85	96			BW
Aug. 30	3:15 p. m.	448	4,710	5,990	2	5	20	58	63	68	71	77	92			BN
Aug. 31	9:30 p. m.	7,530	32,400	17,900	8	10	12	16	22	50	64	75	91			BW
Sept. 7	8:00 a. m.	240	704	382	33	42	50	55	60	62	65	70	81			BW
Sept. 12	9:35 a. m.	176	800	2,310	26	36	46	51	56	59	64	67	82			BW

KANSAS RIVER BASIN--Continued

SOUTH FORK REPUBLICAN RIVER NEAR COLORADO-KANSAS STATE LINE

LOCATION.--At gaging station at bridge on county road, 2 miles downstream from Colorado-Kansas State line, 5 miles downstream from Beaver Creek, and 15 miles southwest of St. Francis, Cheyenne County, Kans.

DRAINAGE AREA.--1,860 square miles.

RECORDS AVAILABLE.--Sediment records: June 1946 to September 1949.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 7,690 ppm May 30; minimum daily, no flow Aug. 7-14.

Sediment loads: Maximum daily, 32,100 tons Aug. 17; minimum daily, 0 tons Aug. 7-14.

EXTREMES, 1946-49.--Sediment concentrations: Maximum daily, 17,200 ppm May 29, 1947; minimum daily, no flow on some days in 1947 and 1949.

Sediment loads: Maximum daily, 84,100 tons July 19, 1946; minimum daily, 0 tons on some days in 1947 and 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, April to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
Apr. 5, 1949-----	110	7.9	432	41	0.05	49	11	33	33	234	30	6.5	1.2	3.8	0.05	291	0.40		167	0	30
Apr. 25-----	55	7.9	435	46	.02	49	13	38	38	234	30	5.0	1.0	4.4		294	.40		151	0	35
Apr. 26-----	61	7.8	371	42	.02	49	13	38	38	234	30	5.0	1.0	4.4		294	.40		151	0	35
May 23-----	556	7.2	321	41	.25	32	15.9	28	28	192	28.0	1.0	1.0	1.2		208	.28		155	0	35
June 27-----	29	8.5	389	47	.04	42	13	30	30	1/216	28	5.0	1.0	3.0		292	.40		155	0	35
Sept. 26-----	29	8.1	423	47	.03	46	13	28	28	228	28	5.5	1.2	3.5		291	.40		169	0	27

1/Includes equivalent of 16 parts per million of carbonate (CO₃).

KANSAS RIVER BASIN--Continued

SOUTH FORK REPUBLICAN RIVER NEAR COLORADO-KANSAS STATE LINE--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	12	83	3	39	176	18	65	194	34
2-----	14	122	5	43	267	31	60	376	61
3-----	14	170	6	47	218	28	65	348	61
4-----	12	106	3	47	150	19	55	224	33
5-----	12	110	4	50	132	18	45	--	1/32
6-----	16	92	4	51	178	24	50	348	47
7-----	17	126	6	39	134	14	50	402	54
8-----	19	184	8	40	131	14			
9-----	20	200	11	45	146	18			
10-----	24	172	11	45	170	21			
11-----	30	226	18	50	202	27			
12-----	34	200	18	50	204	28	65	464	81
13-----	31	114	10	50	205	28			
14-----	33	168	15	55	206	30	55	--	1/43
15-----	34	140	13	55	162	24	70	158	30
16-----	39	138	14	50	175	24	65	--	1/18
17-----	33	198	18	53	154	22	65	49	8
18-----	27	230	17	45	--	1/22	55	25	4
19-----	34	188	17	40	--	1/24	70	55	10
20-----	31	182	15	40	262	28	150	102	41
21-----	33	188	17	55	246	36	55	--	1/22
22-----	37	196	20	55	192	28	50	--	1/24
23-----	47	176	22	55	172	26	40	--	1/22
24-----	45	169	20	55	235	35	35	216	20
25-----	39	166	17	55	376	56	45	152	18
26-----	40	192	21	55	278	41	40	152	16
27-----	40	200	22	45	170	21	30	145	12
28-----	45	200	24	55	108	16	20	136	7
29-----	55	216	32	55	138	20	25	132	9
30-----	50	198	27	55	141	21	30	288	23
31-----	43	180	21	--	--	--	30	225	18
Total-	960	--	459	1,474	--	762	1,635	--	1,020
Day	January			February			March		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	30	346	28	30	232	19	48	255	33
2-----	25	288	19	30	365	30	59	238	38
3-----	20	--	1/16	30	404	33	70	278	52
4-----	25	--	1/22	30	388	31	72	300	58
5-----	25	--	1/26	35	299	22	61	290	48
6-----	30	--	1/36	50	125	17	61	290	48
7-----	30	--	1/40	55	--	1/16	59	450	72
8-----	30	525	43	60	145	23	68	483	89
9-----	30	425	34	70	290	55	76	305	62
10-----	30	132	11	65	260	46	68	239	44
11-----	30	302	24	65	--	1/36	57	238	37
12-----	30	290	23	60	160	26	55	235	35
13-----	30	98	8	40	88	10	55	202	30
14-----	30	138	11	35	144	14	50	88	12
15-----	30	632	51	50	122	16	50	100	14
16-----	30	665	54	65	104	18	55	180	27
17-----	30	245	20	95	118	30	55	202	30
18-----	30	50	4	100	206	56	64	211	36
19-----	30	--	1/130	90	324	79	70	216	41
20-----	30	1,490	121	75	172	35	66	219	39
21-----	30	556	45	75	194	39	66	--	1/46
22-----	30	230	19	100	428	116	62	290	48
23-----	30	76	6	110	1,580	469	57	188	29
24-----	30	74	6	74	1,040	208	57	252	39
25-----	30	150	12	66	720	128	61	224	37
26-----	30	1,890	153	72	722	140	90	385	94
27-----	30	2,150	174	62	381	64	87	285	67
28-----	30	1,740	141	61	222	36	74	322	64
29-----	30	1,540	125	--	--	--	76	360	74
30-----	25	775	52	--	--	--	75	--	1/260
31-----	25	262	18	--	--	--	90	--	1/280
Total-	895	--	1,470	1,750	--	1,810	2,014	--	1,880

1/Estimated.

KANSAS RIVER BASIN--Continued

SOUTH FORK REPUBLICAN RIVER NEAR COLORADO-KANSAS STATE LINE--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	101	--	1/320	55	--	1/22	122	648	213
2-----	94	808	205	50	202	27	106	422	121
3-----	87	306	72	48	208	27	92	368	91
4-----	87	370	87	48	166	22	115	--	1/150
5-----	110	809	240	50	248	33	127	710	243
6-----	117	642	203	70	116	22	99	339	91
7-----	110	--	1/150	103	--	1/260	99	880	235
8-----	110	381	113	150	--	1/650	140	--	1/1,000
9-----	100	210	57	106	1,160	332	238	5,860	2/4,870
10-----	100	200	54	90	350	85	115	779	242
11-----	95	200	51	79	--	1/70	87	--	1/60
12-----	93	180	45	79	428	91	72	229	44
13-----	79	122	26	83	251	56	76	351	72
14-----	68	102	19	137	--	1/900	90	308	75
15-----	61	142	23	101	864	236	83	218	49
16-----	48	160	21	87	585	137	74	178	36
17-----	55	178	26	83	428	96	68	167	31
18-----	61	251	41	83	308	69	68	161	30
19-----	59	140	22	90	562	136	70	160	30
20-----	59	114	18	81	457	100	61	144	24
21-----	59	140	22	81	525	115	64	128	22
22-----	57	166	26	70	308	58	57	138	21
23-----	50	180	24	66	237	42	48	188	24
24-----	51	192	26	64	476	82	45	156	19
25-----	55	206	30	74	--	1/90	42	121	14
26-----	50	158	21	62	236	40	39	118	12
27-----	53	149	21	59	160	25	48	--	1/550
28-----	57	150	23	74	--	1/250	56	--	1/420
29-----	61	152	25	66	530	94	40	285	31
30-----	62	151	25	494	7,690	2/15,800	37	--	1/34
31-----	--	--	--	172	2,020	938	--	--	--
Total-	2,249	--	2,040	2,955	--	20,900	2,478	--	8,850

Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	47	--	1/70	1.4	56	(*)	170	--	1/320
2-----	37	461	46	2.5	94	(*)	95	--	1/100
3-----	33	--	1/42	8.2	33	(*)	75	--	1/50
4-----	26	--	1/36	8.4	50	1	70	169	32
5-----	22	526	31	3.3	52	(*)	66	150	27
6-----	24	248	16	4	--	(*)	61	146	24
7-----	37	2,870	2/566	0	--	0	55	150	22
8-----	24	1,860	120	0	--	0	55	146	22
9-----	26	230	16	0	--	0	57	158	24
10-----	26	132	9	0	--	0	55	146	22
11-----	32	--	1/320	0	--	0	47	117	15
12-----	64	--	1/1,200	0	--	0	45	162	20
13-----	27	135	10	0	--	0	43	149	17
14-----	34	132	12	0	--	0	43	132	15
15-----	44	--	1/90	157	--	1/3,300	40	--	1/13
16-----	24	78	5	168	2,320	1,050	39	--	1/12
17-----	19	166	8	768	5,320	2/32,100	39	101	11
18-----	14	122	5	478	3,840	2/9,500	34	98	9
19-----	14	67	2	62	580	97	37	156	16
20-----	14	56	2	47	252	32	37	109	11
21-----	12	122	4	57	--	1/85	37	110	11
22-----	12	71	2	41	484	54	40	89	10
23-----	14	284	11	33	144	13	34	101	9
24-----	7.1	228	4	36	293	28	37	85	8
25-----	4.3	--	--	47	396	50	36	90	9
26-----	7.1	--	--	63	--	1/190	31	64	5
27-----	5.3	--	--	80	--	1/190	34	77	7
28-----	2.1	43	(*)	114	--	1/1,200	33	84	7
29-----	2.6	--	--	124	2,480	2/1,110	34	41	4
30-----	3.2	--	--	91	1,880	2/743	37	29	3
31-----	2.3	--	--	1,150	6,380	2/28,200	--	--	--
Total-	660.0	--	2,630	3,540.2	--	77,940	1,516	--	855

Total discharge for year (second-foot-days) ----- 22,126.2
 Total load for year (tons) ----- 120,600

1/Estimated.

2/Sediment discharge computed by subdividing day.

(*)Sediment discharge less than 1.0 ton.

KANSAS RIVER BASIN--Continued

SOUTH FORK REPUBLICAN RIVER NEAR COLORADO-KANSAS STATE LINE--Continued

Particle-size analyses of suspended sediment, May to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350
May 16, 1949	3:20 p. m.	85	564	1,190	6	16	30	50	60	67	80	90		BW
	5:00 p. m.	64	530	412	15	37	54	71	78	84	91	94	97	BW
	May 30	516	9,890	8,130	30	44	52	57	62	66	69	71	78	BW
	3:10 p. m.	316	9,890	7,620	2	6	40	62	66	68	72	75	80	BN
	7:00 a. m.	313	9,200	4,240	23	36	44	54	58	66	78	89	94	BW
	June 9	313	9,200	4,500	0	5	32	52	54	56	62	66	78	BN
	July 11	24	120	300	10	12	23	38	54	66	78	86	95	BW
	8:00 p. m.	584	6,210	3,470	22	37	54	76	84	92	96	98	99	BW
	8:00 p. m.	142	1,800	3,010	33	49	70	79	86	89	95	97	98	BW
	Aug. 17	2,020	15,700	3,310	13	25	38	50	66	82	88	95	98	BW
	8:10 p. m.	2,020	15,700	3,320	8	14	28	45	62	81	92	96	98	BN
	5:15 a. m.	770	6,640	1,720	30	48	60	67	74	85	91	94	96	BW
	Aug. 29	110	2,280	1,940	32	47	62	72	79	88	92	98	100	BW
	9:50 a. m.	155	5,680	2,750	20	34	50	64	72	79	87	95	98	BW
	Aug. 31	3,060	13,300	2,600	18	30	42	56	65	75	83	91	97	BW
	7:00 a. m.	3,060	13,300	2,610	10	18	38	54	64	72	84	91	96	BN
	Sept. 5	66	166	504	24	29	38	49	56	60	68	74	81	BW
	4:50 p. m.	45	217	476	24	32	36	43	47	51	54	62	68	BW
	Sept. 12	36	174	374	22	28	34	46	52	56	66	74	78	BW
	Sept. 19	34	109	301	18	20	25	32	36	39	43	50	56	BW
	1:00 p. m.													

KANSAS RIVER BASIN--Continued
MEDICINE CREEK AT CAMBRIDGE, NEBR.

LOCATION --At bridge in City Park at east edge of Cambridge, Furnas County, about 500 feet upstream from bridge on U. S. Highways 6 and 34, $\frac{1}{2}$ mile upstream from mouth, 2 miles downstream from gaging station at Cambridge and 9 $\frac{1}{2}$ miles downstream from Medicine Creek Dam.
DRAINAGE AREA --1,070 square miles above gaging station of which only about 680 miles contribute directly to surface runoff.
RECORDS AVAILABLE --Sediment records: November 1945 to September 1949.
EXTREMES 1948-49 --Sediment concentrations: Maximum daily, not determined; minimum daily, 20 ppm Aug. 28.
Sediment loads: Maximum daily, 21,000 tons June 18; minimum daily, less than 1.0 ton on some days.
EXTREMES 1945-49 --Sediment concentrations: Maximum daily, not determined; minimum daily, not determined.
Sediment loads: Maximum daily, 3,700,000 tons June 22, 1947; minimum daily, less than 1.0 ton on some days in August and September 1949.
REMARKS --Discharge records for gaging station at Cambridge for water year October 1948 to September 1949 given in Water-Supply Paper 1146. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, June 1948 to April 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium	
															Bo- ron (B)	Parts per mil- lion	Tons per acre- foot	Tons per day	Total		Non- carbon- ate
June 22, 1948 -----	6,290	7.3	266	36	0.15	36	6.4	12	156	10	1.3	0.5	0.5	1.4	0.05	199	0.27		116	0	19
Oct. 1 -----	42	7.7	413	48	.02	55	11	22	266	2.4	3.0	.6	4.3	.05	.05	300	.41		182	0	20
Apr. 26, 1949 -----	77	7.1	459	48	.02	63	15	16	264	26	4.4	.6	3.9	--	--	306	.42		219	3	14

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT CAMBRIDGE, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-foot)	Suspended sediment Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Suspended sediment Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Suspended sediment Mean concentration (ppm)	Tons per day
1-----	43	900	104	57	1,580	243	65	1,490	261
2-----	43	1,020	118	55	1,680	246	70	1,640	310
3-----	41	1,020	113	54	1,780	280	70	1,750	331
4-----	39	933	98	58	1,880	294	70	1,800	340
5-----	38	940	96	60	1,890	306	65	1,980	347
6-----	37	988	99	58	1,820	285	60	2,660	431
7-----	36	980	95	60	1,760	285	55	1,070	159
8-----	38	937	96	60	1,690	274	50	1,170	158
9-----	38	917	94	60	--	1/260	50	1,080	146
10-----	39	868	91	61	1,490	245	45	1,880	228
11-----	40	812	88	62	1,260	211	55	--	1/180
12-----	42	892	101	62	1,280	211	70	865	163
13-----	43	1,010	117	62	1,200	201	75	--	1/180
14-----	44	1,020	121	63	1,680	286	65	604	106
15-----	45	1,190	144	62	1,840	308	70	446	84
16-----	44	1,230	146	62	1,850	310	60	600	97
17-----	45	934	113	62	1,850	310	55	614	91
18-----	48	966	125	58	--	1/280	60	512	83
19-----	48	1,000	130	48	800	104	60	1,000	162
20-----	49	1,120	148	30	300	24	65	1,190	209
21-----	50	1,420	192	40	670	72	70	1,050	198
22-----	51	1,650	227	40	712	77	70	1,210	229
23-----	52	1,520	213	55	--	1/120	60	613	99
24-----	53	1,340	192	65	--	1/180	50	382	52
25-----	55	1,390	206	70	1,070	202	45	246	30
26-----	56	1,420	215	65	1,210	212	40	176	19
27-----	58	1,190	186	65	1,740	305	35	158	15
28-----	58	1,430	224	60	--	1/320	35	232	22
29-----	63	2,800	476	60	1,800	292	35	161	15
30-----	59	1,790	285	60	1,600	259	35	258	24
31-----	58	1,610	252	--	--	--	40	254	27
Total--	1,453	--	4,900	1,734	--	6,980	1,750	--	4,800
Day	January			February			March		
	Mean dis-charge (second-foot)	Suspended sediment Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Suspended sediment Mean concentration (ppm)	Tons per day	Mean dis-charge (second-foot)	Suspended sediment Mean concentration (ppm)	Tons per day
1-----	40	289	31	55	692	103	130	1,560	548
2-----	45	243	30	55	674	100	140	3,230	1,220
3-----	40	244	26	60	614	99	140	4,700	1,780
4-----	35	275	26	55	603	90	130	--	1/2,400
5-----	30	233	19	55	601	89	120	10,300	3,340
6-----	30	230	19	55	570	85	99	8,430	2,250
7-----	45	476	58	55	514	76	92	6,500	1,610
8-----	50	412	56	50	470	63	87	5,400	1,270
9-----	55	406	60	55	700	104	86	6,390	1,480
10-----	65	418	73	50	854	115	82	4,760	1,050
11-----	65	425	74	50	1,110	150	78	3,510	739
12-----	65	474	83	45	1,180	141	75	3,220	652
13-----	65	438	77	45	1,030	125	74	3,760	751
14-----	65	484	85	45	775	94	72	3,190	620
15-----	60	561	91	50	880	119	65	1,720	302
16-----	60	645	104	50	1,020	138	77	2,680	557
17-----	50	684	92	50	1,080	146	78	--	1/1,000
18-----	50	650	88	70	1,600	302	76	--	1/1,600
19-----	45	588	71	95	1,290	331	76	6,800	1,340
20-----	40	528	57	110	965	286	77	5,330	1,110
21-----	45	491	60	130	1,230	432	80	--	1/1,300
22-----	45	568	69	160	3,600	1,560	82	4,790	1,060
23-----	50	--	1/85	360	6,550	6,370	84	5,780	1,310
24-----	45	--	1/70	560	--	1/6,000	81	5,600	1,220
25-----	45	552	67	330	6,400	5,700	78	4,850	1,020
26-----	50	654	88	170	3,440	1,580	86	5,320	1,240
27-----	50	669	90	130	2,650	930	90	5,340	1,300
28-----	50	657	89	110	1,620	481	98	8,720	2,310
29-----	50	680	92	--	--	--	93	7,520	1,890
30-----	50	692	93	--	--	--	93	--	1/1,900
31-----	50	648	87	--	--	--	70	7,900	1,490
Total--	1,530	--	2,110	3,105	--	35,810	2,788	--	41,660

1/Estimated.

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT CAMBRIDGE, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	86	8,990	2,090	64	3,320	574	58	3,320	520
2-----	90	10,300	2,500	59	2,650	422	60	3,350	543
3-----	95	8,990	2,300	60	3,140	509	58	3,180	498
4-----	91	8,200	2,010	58	4,040	633	59	2,750	438
5-----	92	7,600	1,890	61	4,600	758	91	--	1/2, 200
6-----	95	10,700	2,740	67	4,280	774	70	3,440	650
7-----	102	12,800	3,520	67	3,450	624	191	19,300	2/11, 400
8-----	101	9,380	2,560	132	13,400	2/5, 350	98	8,550	2,260
9-----	97	7,800	2,040	157	13,200	5,600	91	5,020	1,230
10-----	93	6,780	1,700	130	10,600	3,720	83	4,510	1,010
11-----	87	6,070	1,420	100	5,750	1,550	76	3,880	796
12-----	84	6,000	1,360	84	4,790	1,090	70	6,600	1,250
13-----	80	5,780	1,250	128	--	1/4, 500	73	6,170	1,220
14-----	76	4,300	882	80	4,580	989	77	6,620	1,380
15-----	70	3,760	710	74	4,000	799	75	3,970	804
16-----	70	3,750	709	114	13,400	2/4, 230	70	3,020	571
17-----	68	3,610	663	95	9,920	2,540	64	3,430	613
18-----	64	3,300	570	85	8,020	1,840	280	--	1/21, 000
19-----	64	3,180	549	81	5,000	1,090	168	15,900	2/7, 520
20-----	68	3,620	664	104	--	1/2, 600	76	6,320	1,300
21-----	68	3,590	659	104	7,400	2,080	66	3,220	574
22-----	66	--	1/600	89	6,000	1,440	60	2,440	395
23-----	65	3,440	604	89	6,300	1,510	54	2,680	391
24-----	66	4,760	848	83	5,180	1,160	54	--	1/380
25-----	64	--	1/700	76	4,000	821	52	2,210	310
26-----	68	5,080	933	70	3,750	709	51	1,920	264
27-----	66	4,400	784	68	3,470	637	51	1,930	266
28-----	64	3,220	556	62	2,820	472	54	2,300	335
29-----	62	2,930	490	62	2,740	459	105	10,100	2/4, 280
30-----	62	2,510	420	62	3,920	656	132	12,100	2/4, 400
31-----	--	--	--	58	2,760	432	--	--	--
Total-	2,324	--	38,720	2,623	--	50,570	2,565	--	68,800
Day	July			August			September		
	Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment		Mean dis-charge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	93	7,110	1,780	38	1,350	138	2.8	28	(s)
2-----	74	3,470	693	38	1,670	171	3.0	31	(s)
3-----	87	2,140	387	39	1,720	181	4.3	86	1
4-----	64	2,390	413	39	1,390	146	5.2	158	2
5-----	63	2,140	364	38	1,210	124	4.0	52	(s)
6-----	64	2,940	508	36	1,140	111	5.0	88	1
7-----	70	--	1/850	36	1,000	97	5.0	80	1
8-----	178	--	1/14,000	26	574	40	5.2	125	2
9-----	269	--	1/12,000	5.0	158	2	5.0	123	2
10-----	62	3,040	509	5.5	107	2	5.0	77	1
11-----	56	1,970	298	5.0	92	1	4.8	45	(s)
12-----	52	1,580	222	5.2	98	1	4.2	44	(s)
13-----	52	1,300	162	8.2	--	1/6	4.8	52	(s)
14-----	56	1,960	296	5.8	96	2	4.5	52	(s)
15-----	58	2,090	327	5.5	130	2	4.5	47	(s)
16-----	48	1,570	203	6.2	100	2	3.8	42	(s)
17-----	46	1,820	226	17	--	1/400	4.0	46	(s)
18-----	44	1,660	197	13	2,510	2/134	3.8	45	(s)
19-----	42	1,580	179	6.2	271	4	3.0	33	(s)
20-----	42	1,520	172	5.8	146	2	2.0	31	(s)
21-----	41	1,430	158	5.5	92	1	2.4	48	(s)
22-----	40	1,210	131	5.2	71	1	3.8	70	(s)
23-----	41	1,180	131	5.0	51	(s)	3.0	58	(s)
24-----	41	1,120	124	5.0	69	(s)	4.2	72	(s)
25-----	42	1,050	119	5.0	65	(s)	3.8	71	(s)
26-----	46	1,280	159	5.0	46	(s)	3.8	52	(s)
27-----	45	1,250	152	4.8	32	(s)	3.2	44	(s)
28-----	42	1,300	147	3.2	20	(s)	3.5	40	(s)
29-----	42	1,220	138	3.8	37	(s)	3.2	39	(s)
30-----	41	1,170	130	3.8	28	(s)	3.0	37	(s)
31-----	39	1,300	137	2.8	28	(s)	--	--	--
Total-	1,960	--	35,300	427.5	--	1,570	117.8	--	21
Total discharge for year (second-foot-days)-----									22,377.3
Total load for year (tons)-----									291,200

1/Estimated.

2/Sediment discharge computed by subdividing day.

(s)Sediment discharge less than 1.0 ton.

KANSAS RIVER BASIN--Continued

MEDICINE CREEK AT CAMBRIDGE, NEBR.--Continued

Particle-size analyses of suspended sediment, March to August 1949
 (Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
 W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment												Methods or analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	
Mar. 7, 1949	3:55 p. m.	90	5,780	2,620	6	10	18	29	50	74	84	94		100	BN
Mar. 9	12:50 p. m.	93	7,220	4,510	5	7	10	16	22	36	56	81		91	BW
Mar. 10	5:30 p. m.	94	6,480	4,270	4	6	8	11	18	33	51	71		--	BW
Apr. 24	6:15 p. m.	66	5,140	3,320	4	6	7	10	16	39	52	64		--	BW
May 2	8:50 a. m.	60	2,500	5,070	4	7	10	14	22	49	78	98		100	BW
May 8	6:05 p. m.	192	19,300	3,790	9	10	12	18	28	50	65	--		--	BW
May 22	5:30 p. m.	90	6,490	5,280	6	8	10	14	25	50	70	--		--	BW
June 8	6:10 p. m.	96	6,440	4,100	16	23	30	37	44	60	79	90		98	BW
June 16	8:00 p. m.	68	2,950	2,200	5	10	12	18	24	42	64	82		--	BW
June 30	10:45 a. m.	130	12,400	3,920	16	24	43	54	62	70	78	84		93	BW
June 30	10:45 a. m.	130	12,400	3,150	15	28	40	50	58	70	84	94		100	BN
June 30	6:00 p. m.	121	11,200	2,240	20	27	35	42	49	63	78	94		100	BW
July 7	5:50 p. m.	74	4,840	3,890	9	12	16	22	29	42	54	64		71	BW
July 13	2:10 p. m.	51	1,180	2,040	16	23	33	46	58	68	76	86		94	BW
July 23	6:50 p. m.	40	1,180	759	18	22	29	36	44	55	72	84		91	BW
July 27	10:15 a. m.	46	1,140	2,400	14	18	23	29	35	46	60	73		--	BW
Aug. 2	6:00 p. m.	38	1,960	1,070	8	12	16	21	27	41	62	86		--	BW
Aug. 7	6:00 p. m.	34	978	569	16	19	26	32	38	48	70	87		--	BW
Aug. 17	1:00 p. m.	26	11,500	4,260	19	29	40	50	56	65	73	81		86	BW
Aug. 17	1:00 p. m.	26	11,500	4,040	10	18	34	46	56	66	78	86		--	BN
Aug. 17	3:10 p. m.	11	5,900	4,190	39	53	69	78	86	93	98	99		100	BW
Aug. 18	3:15 a. m.	26	5,950	3,590	34	48	62	70	75	84	91	96		100	BW
Aug. 18	1:00 p. m.	8.2	803	463	58	72	86	89	90	93	96	98		100	BW

KANSAS RIVER BASIN--Continued

SAPPA CREEK NEAR BEAVER CITY, NEBR.

LOCATION --At bridge on U. S. Highway 283, 200 feet upstream from gaging station which is 7 miles southwest of Beaver City Furnas County.
 RECORDS AVAILABLE--Chemical analyses: October 1948 to September 1949.

Water temperatures: January to September 1949.

Sediment records: April 1947 to September 1949.

EXTREMES, 1948-49 --Water temperatures: Minimum, freezing point on many days in January, February, and March.

Sediment concentrations: Maximum daily, 14,500 ppm June 18; minimum daily, not determined.

Sediment loads: Maximum daily, 36,900 tons June 18; minimum daily, less than 1.0 ton on many days.

EXTREMES, 1947-49 --Sediment concentrations: Maximum daily, 14,500 ppm June 18, 1949, minimum daily, not determined.

Sediment loads: Maximum daily, 42,700 tons June 22, 1947; minimum daily, less than 1.0 ton on many days.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, October 1948 to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bor- on (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent non- car- bon- ate
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
Oct. 1, 1948 -----	9.0	7.7	623	25	0.01	82	17	29	19	350	46	15	0.6	2.1	0.07	388	0.54		274	0	17
Mar. 12, 1949 -----	50	7.7	343	16	.02	43	6.3	21		184	13	6.5	.2	5.4	.08	220	.30		134	0	25
Apr. 13 -----	39	7.3	634	22	.05	70	18	44	23	334	44	16	.6	2.1	--	384	.52		249	0	28
May 6 -----	405	7.1	360	36	.05	46	8.1	23	22	222	8.4	4.0	.3	3.3	--	236	.32		149	0	26
May 21 -----	781	7.1	294	30	.05	39	6.4	18		180	6.8	3.8	.3	3.3	--	200	.27		124	0	24
June 7 -----	546	7.4	237	27	.30	37	6.4	7.8		156	6.2	.0	.3	.6	--	164	.22		119	0	13
June 9 -----	1,230	7.1	258	23	.15	42	5.9	3.9		156	8.0	.0	.3	.6	--	204	.28		130	2	6
June 12 -----	1,520	6.9	237	26	.30	37	5.9	11		162	6.6	.0	.3	.6	--	180	.24		117	0	17
July 28 -----	35	8.0	400	26	.02	51	8.5	26		222	21	6.0	.4	6.4	--	262	.36		163	0	26
Sept. 19 -----	34	8.3	532	30	.10	66	12	44		1/312	33	9.4	.5	4.3	--	366	.50		214	0	31

1/Includes equivalent of 14 parts per million of carbonate (CO₃).

1/Includes equivalent of 14 parts per million of carbonate (CO₃).

KANSAS RIVER BASIN--Continued

SAPPA CREEK NEAR BEAVER CITY, NEBR.--Continued

Temperature (*F) of water, January to September 1949
 /Once-daily temperature measurement between 8 a. m. and 5 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1				33	32	34	41		--	--	--	--
2				35	32	34	38		--	--	--	--
3				--	32	34	42		--	--	--	--
4				--	32	34	48		--	--	73	--
5				--	32	34	48		--	--	--	--
6				32	34	--	57		--	--	--	--
7				36	34	36	--		--	--	--	--
8				33	33	34	53		--	78	--	--
9				--	34	32	--		66	--	79	--
10				--	32	32	40		--	--	--	--
11				32	36	32	53		--	--	--	--
12				33	33	34	--		67	--	66	--
13				--	32	34	49		--	--	--	--
14				34	32	33	--		--	--	--	--
15				32	34	34	--		--	--	--	--
16				32	33	33	--		--	--	74	--
17				32	32	34	--		--	--	69	--
18				32	35	--	--		68	--	--	--
19				32	35	41	--		--	--	66	62
20				32	34	46	--		--	--	--	--
21				32	32	43	--	60	--	--	73	63
22				32	33	47	--		--	--	--	--
23				32	35	52	--		--	--	--	64
24				32	35	47	--		--	--	--	58
25				32	34	48	--		--	--	--	58
26				32	34	40	--		--	76	--	56
27				32	34	51	--		--	73	--	55
28				32	33	--	--		--	75	--	53
29				32	--	43	--		--	--	--	51
30				32	--	36	--		75	--	--	54
31				33	--	41	--		--	--	--	--
Average				32	33	38	--		--	--	--	--

MISSOURI RIVER BASIN

KANSAS RIVER BASIN--Continued

SAPPA CREEK NEAR BEAVER CITY, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1.8	57		2.7	--		5		
2-----	1.1	--		1.2	--		5		
3-----	.6	--		5.4	--		5		
4-----	.5	--		6.9	--		5		
5-----	.4	--		4.7	--		5		
6-----	.4	--		2.3	13		5		
7-----	.4	35		1.6	--		5		
8-----	.3	--		1.2	--		4		
9-----	.2	--		.7	--		4		
10-----	.1	--		.9	5		4		
11-----	.1	--		1.8	--		4		
12-----	.1	--		1.8	--		4		
13-----	.1	--		1.2	5		4		
14-----	.1	113		1.4	5		4		
15-----	.1	--		1.1	--		4		
16-----	.1	--	(1)	1.1	7	(1)	4	11	(1)
17-----	.1	--		1.4	11		4		
18-----	.1	--		3.7	--		4		
19-----	.1	--		4.7	--		4		
20-----	.1	--		5	--		4		
21-----	.1	--		5	--		4		
22-----	.1	--		5	--		4		
23-----	.1	--		5	8		3		
24-----	.1	--		5	--		3		
25-----	.1	--		5	--		3		
26-----	.1	--		5	20		3		
27-----	.1	--		5	52		3		
28-----	.2	--		5	32		3		
29-----	.4	--		5	16		3		
30-----	.4	16		5	7		3		
31-----	2.7	66		--	--		3		
Total-	11.2	--		100.8	--		122		
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	3			1			110	233	69
2-----	3			1			70	324	61
3-----	3			1			60	335	54
4-----	3			1			60	429	69
5-----	3			1			60	359	58
6-----	3			1			60	--	2/60
7-----	3			1	11	(1)	55	662	98
8-----	3			1			45	840	102
9-----	2			1			40	585	63
10-----	1			1			35	562	53
11-----	1			1			30	465	38
12-----	1			2			25	462	31
13-----	2			2			20	447	24
14-----	3			2			20	309	17
15-----	3			50	206	28	20	277	15
16-----	3	6	(1)	60	95	15	20	203	11
17-----	3			40	122	13	20	148	8
18-----	2			50	225	30	25	295	20
19-----	2			170	167	77	31	464	39
20-----	1			185	87	43	31	468	39
21-----	1			230	70	43	28	320	24
22-----	1			220	394	234	24	210	14
23-----	1			385	950	988	24	215	14
24-----	1			320	750	648	25	228	15
25-----	1			245	614	406	21	240	14
26-----	1			200	566	306	21	250	14
27-----	1			120	505	164	24	228	15
28-----	1			60	270	58	24	217	14
29-----	1			--	--	--	22	195	12
30-----	1			--	--	--	25	304	20
31-----	1			--	--	--	31	315	26
Total-	59	--	1	2,372	--	3,050	1,106	--	1,110

(1) Sediment discharge less than 1.0 ton.

2/ Estimated.

KANSAS RIVER BASIN--Continued

SAPPA CREEK NEAR BEAVER CITY, NEBR--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	25	238	16	14	148	6	59	1,640	3/328
2-----	24	226	15	16	183	8	56	5,210	788
3-----	37	380	3/42	18	158	7	72	2,270	441
4-----	33	338	30	18	230	11	281	6,480	3/5,010
5-----	20	232	12	51	3,690	3/1,900	189	5,440	3/2,930
6-----	20	233	12	315	14,100	3/12,000	122	2,880	949
7-----	24	240	16	191	9,860	3/5,510	363	8,490	3/9,310
8-----	24	222	14	781	12,100	3/25,600	506	8,220	3/11,300
9-----	25	190	13	606	8,840	3/14,200	616	11,600	3/20,900
10-----	33	260	23	546	6,910	3/10,300	666	7,590	3/13,800
11-----	36	340	33	365	5,240	5,160	269	4,790	3/3,860
12-----	36	350	34	335	4,520	4,090	444	8,880	3/18,800
13-----	33	281	25	244	3,500	2,300	1,240	5,980	3/20,200
14-----	33	235	21	132	2,570	916	960	5,680	3/14,900
15-----	29	219	17	96	1,880	487	209	7,210	3/4,160
16-----	29	220	17	212	9,020	3/6,540	112	3,270	989
17-----	25	191	13	75	1,980	401	277	6,420	5,080
18-----	24	155	10	60	1,010	164	946	14,500	3/36,900
19-----	23	138	9	72	990	192	862	8,590	20,000
20-----	22	118	7	99	3,590	3/1,750	450	8,180	3/9,890
21-----	21	114	6	509	10,800	16,800	160	4,480	3/2,060
22-----	19	112	6	570	8,900	3/13,800	112	2,480	750
23-----	19	114	6	460	6,270	3/7,940	93	1,520	382
24-----	19	118	6	325	4,550	3,990	82	980	217
25-----	19	128	7	244	3,200	2,110	75	675	137
26-----	16	148	6	143	2,350	907	68	573	105
27-----	16	132	6	96	1,750	454	64	470	81
28-----	17	149	7	78	1,400	295	60	390	63
29-----	18	150	7	72	1,150	224	56	303	46
30-----	18	180	8	65	925	162	52	265	37
31-----	--	--	--	56	575	87	--	--	--
Total -	737	--	444	6,862	--	138,300	9,521	--	204,200
	July			August			September		
1-----	49	309	41	20	220	12	56	390	59
2-----	48	337	44	19	205	10	51	300	41
3-----	49	420	56	17	183	8	48	300	39
4-----	53	468	67	16	165	7	94	1,310	3/367
5-----	56	475	72	15	176	7	128	3,260	1,110
6-----	62	776	130	13	137	5	160	1,520	657
7-----	63	670	114	12	122	4	118	1,030	328
8-----	62	691	116	13	117	4	75	840	170
9-----	54	525	76	12	107	4	61	710	117
10-----	44	430	51	11	86	3	54	847	123
11-----	41	350	39	10	63	2	105	5,750	1,630
12-----	66	520	95	10	86	2	54	3,600	525
13-----	52	580	61	34	1,150	3/200	41	1,630	160
14-----	94	2,220	3/1,370	70	4,300	3/690	36	473	46
15-----	266	12,600	3/10,100	33	3,700	330	30	347	28
16-----	78	4,800	3/1,090	293	11,000	3/12,300	29	295	23
17-----	51	1,040	143	325	14,200	3/12,600	29	253	20
18-----	38	950	97	477	11,900	15,300	29	242	19
19-----	35	550	52	672	9,700	17,800	29	222	17
20-----	93	1,400	352	506	6,150	3/8,600	25	195	13
21-----	93	1,550	389	435	6,200	3/7,490	21	157	9
22-----	62	1,050	176	642	5,600	3/9,620	21	133	8
23-----	43	712	83	703	4,150	7,880	20	114	6
24-----	42	685	78	373	3,530	3/3,670	20	116	6
25-----	38	541	55	146	2,660	3/1,080	17	122	6
26-----	31	468	39	99	1,850	494	18	97	5
27-----	46	689	86	85	1,140	262	17	93	4
28-----	28	627	47	75	630	168	18	90	4
29-----	23	490	30	70	710	134	18	86	4
30-----	24	313	20	68	520	95	16	93	4
31-----	20	250	14	60	420	68	--	--	--
Total -	1,806	--	15,200	5,340	--	99,050	1,436	--	5,570

Total discharge for year (second-foot-days) ----- 29,473.0

Total load for year (tons) ----- 466,900

3/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued
SAPPA CREEK NEAR BEAVER CITY, NEBR.--Continued

Particle-size analyses of suspended sediment, May to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350
May 5, 1949	10:40 p. m.	220	21,100	17,200	20	30	42	57	74	97	99	100	--	BW
May 6	3:00 p. m.	405	16,700	15,800	21	30	42	56	69	84	95	98	100	BW
May 6	3:00 p. m.	405	16,700	15,800	21	3	8	29	60	84	88	94	99	BN
May 9	11:25 p. m.	606	8,060	10,800	22	32	44	56	70	88	96	99	100	BW
May 20	9:00 p. m.	269	10,900	8,930	18	26	36	48	62	89	99	100	--	BW
May 21	1:15 p. m.	703	16,400	15,800	15	23	30	42	56	78	--	--	--	BW
May 21	1:15 p. m.	703	16,400	15,800	--	2	5	19	48	74	88	96	--	BN
May 21	4:00 p. m.	781	15,200	11,800	18	28	41	54	68	86	96	99	100	BW
June 5	12:15 p. m.	171	4,860	3,180	26	38	56	68	82	92	96	99	100	BW
June 7	1:35 p. m.	570	10,200	3,470	28	38	45	54	72	94	99	100	--	BWC
June 7	2:10 p. m.	522	8,750	2,810	--	42	46	58	76	97	100	--	--	BWC
June 9	12:30 p. m.	1,230	12,900	10,700	16	22	32	41	56	80	98	--	--	BW
June 12	10:00 p. m.	1,520	11,800	8,720	20	30	41	51	65	83	89	98	100	BW
June 12	10:25 p. m.	1,520	17,000	13,600	18	26	36	48	60	87	97	99	100	BW
June 13	9:50 a. m.	1,180	5,990	3,730	30	42	52	62	74	88	96	99	100	BW
June 17	6:15 p. m.	305	5,400	4,030	16	22	34	50	71	97	100	--	--	BW
June 18	10:20 a. m.	876	16,600	13,100	14	20	29	38	55	90	100	--	--	BW
June 19	6:00 p. m.	960	8,270	4,920	30	40	52	62	72	84	95	99	100	BW
July 8	7:50 p. m.	59	1,370	1,980	26	33	42	54	71	88	96	98	100	BW
July 8	7:50 p. m.	59	1,370	2,160	13	20	38	52	70	80	86	90	--	BN
July 12	7:50 a. m.	63	522	370	34	46	58	68	81	91	95	98	99	BW
July 14	3:45 p. m.	62	782	551	30	38	46	64	76	87	92	98	98	BW
July 15	5:40 p. m.	171	9,520	3,420	20	32	48	64	78	89	94	98	99	BW
July 15	5:40 p. m.	171	9,520	3,330	12	21	40	60	76	91	96	98	99	BN
July 16	5:40 p. m.	68	3,230	2,500	29	40	58	72	86	94	96	98	98	BW
July 18	6:30 a. m.	40	1,070	796	52	66	79	88	92	96	98	99	100	BW
July 24	9:40 a. m.	41	677	524	48	68	78	87	92	96	97	98	99	BW
July 28	9:45 a. m.	28	652	503	46	60	72	82	92	97	96	99	100	BW

Aug. 14	2:40 p. m.	136	4,340	3,400	24	35	52	70	88	94	96	98	99	BW
Aug. 15	6:10 a. m.	244	8,760	3,760	70	92	70	92	88	94	96	98	99	BW
Aug. 16	10:40 a. m.	244	13,760	4,760	9	34	79	88	94	97	98	100	100	BW
Aug. 16	10:40 a. m.	244	13,760	4,760	6	9	34	79	88	94	97	98	100	BW
Aug. 16	1:10 p. m.	466	26,000	3,790	--	40	60	79	90	96	98	99	100	BW
Aug. 16	1:10 p. m.	466	26,000	3,790	--	26	38	52	69	79	86	95	--	BW
Aug. 16	5:00 p. m.	546	14,000	5,130	11	18	38	54	72	84	90	97	99	BW
Aug. 16	5:00 p. m.	546	14,000	5,130	12	19	30	68	82	89	96	98	99	BW
Aug. 16	9:45 p. m.	425	14,200	4,960	13	20	34	52	72	82	88	94	98	BW
Aug. 17	8:15 a. m.	269	15,500	2,620	12	18	30	48	68	82	89	96	98	BW
Aug. 17	2:10 p. m.	355	16,500	2,550	15	22	38	55	72	83	90	97	98	BW
Aug. 17	2:10 p. m.	355	16,500	2,620	20	30	42	59	72	82	90	97	98	BW
Aug. 17	6:25 p. m.	220	12,900	5,030	20	31	48	65	83	92	96	--	--	BW
Aug. 17	10:30 p. m.	228	11,500	4,420	20	28	43	59	72	81	86	96	--	BW
Aug. 18	4:30 a. m.	345	12,600	4,820	17	26	41	56	70	80	86	92	--	BW
Aug. 18	7:40 a. m.	335	10,900	3,870	18	28	42	56	74	94	98	99	100	BW
Aug. 18	10:40 a. m.	405	10,900	3,420	12	20	32	46	60	70	76	85	--	BW
Aug. 18	10:40 a. m.	405	10,900	3,500	14	22	34	48	62	72	77	88	--	BW
Aug. 18	11:10 a. m.	425	10,800	4,500	14	20	31	43	61	72	79	88	--	BW
Aug. 18	6:45 p. m.	606	11,800	4,610	19	29	41	56	72	82	88	94	97	BW
Aug. 19	12:15 a. m.	678	11,500	3,980	18	26	38	54	70	84	88	--	--	BW
Aug. 19	9:25 a. m.	690	9,310	2,450	14	22	37	54	72	86	94	98	99	BW
Aug. 19	9:25 a. m.	690	9,310	2,520	26	37	50	66	78	93	94	96	--	BW
Aug. 20	7:30 a. m.	584	6,860	2,240	23	32	44	58	73	86	93	96	--	BW
Aug. 21	12:50 p. m.	445	5,950	4,240	22	28	35	46	61	80	92	97	99	BW
Aug. 21	3:25 p. m.	477	6,570	3,700	26	34	41	51	66	85	95	98	100	BW
Aug. 21	4:00 p. m.	488	7,470	4,420	18	26	34	46	62	82	88	96	--	BW
Aug. 21	11:05 p. m.	558	7,600	5,130	28	36	43	52	67	84	92	96	--	BW

KANSAS RIVER BASIN--Continued

SAPPA CREEK NEAR BEAVER CITY, NEBR.--Continued

Particle-size analyses of suspended sediment, May to September 1949--Continued

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;

W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis			
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500	1.000
Aug. 22, 1949-----	10:05 a. m.	642	5,690	4,800	22	28	34	44	52	64	77	84				BW
Aug. 23 -----	12:20 p. m.	726	3,960	1,500	20	25	33	44	54	65	74	83				BW
Aug. 23 -----	12:20 p. m.	729	3,960	1,520	22	28	35	45	56	67	73	88				BW
Aug. 24 -----	5:25 p. m.	244	3,310	2,180	26	30	38	50	66	78	84	91				BW
Aug. 26 -----	3:00 p. m.	96	1,710	1,180	27	34	46	62	78	87	93	98		99		BW
Aug. 28 -----	6:00 p. m.	83	1,610	1,979	40	50	61	73	84	90	95	98				BW
Aug. 30 -----	7:00 a. m.	70	524	389	25	37	53	70	78	90	94	97				BW
Sept. 4 -----	3:30 p. m.	112	860	622	24	32	45	58	72	83	92	98				BW
Sept. 4 -----	7:00 p. m.	118	3,350	1,850	24	36	56	74	86	94	96	98				BW
Sept. 6 -----	9:00 a. m.	164	1,580	1,340	19	28	41	61	79	90	94	98				BW
Sept. 8 -----	11:30 a. m.	75	772	536	48	62	74	87	94	97	98	99		100		BW
Sept. 11 -----	7:40 a. m.	122	7,190	5,110	21	32	48	69	85	94	96	98				BW
Sept. 13 -----	9:40 a. m.	41	2,060	1,160	54	77	92	96	99	--	--	--				BW
Sept. 19 -----	3:10 p. m.	28	221	501	46	66	82	92	97	98	99	100				BW

KANSAS RIVER BASIN--Continued

SAPPA CREEK NEAR STAMFORD, NEBR.

LOCATION.--At county highway bridge, 500 feet upstream from gaging station which is 2 miles east of Stamford, Harlan County, and 5, miles upstream from mouth. DRAINAGE AREA.--3,840 square miles of which only 3,560 square miles contribute directly to surface runoff.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

Sediment records: March 1947 to September 1949.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 15,900 ppm Mar. 3; minimum daily, not determined.

Sediment loads: Maximum daily, 35,100 tons May 9; minimum daily, less than 1 ton daily, less than 1 ton daily, less than 1 ton daily.

EXPOSURE, 1947-49.--Sediment concentrations: Maximum daily, 15,900 ppm Mar. 3, 1949; minimum daily, not determined.

Sediment loads: Maximum daily, 35,100 tons May 9; minimum daily, less than 1 ton on many days during 1948 and 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Dissolved solids			Hardness as CaCO ₃		Fer- cent so- dium
															Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
Oct. 1, 1948	1.3	7.4	580	31	0.01	83	17	16	16	328	54	8.2	0.6	2.1	0.10	380	0.52	277	8	10
Mar. 12, 1949	162	7.4	374	24	.05	47	5.0	24	24	189	23	6.0	.4	1.6	.08	235	.32	138	0	27
Apr. 13	154	7.6	623	26	.02	69	13	57	57	330	50	15	.8	5.5	--	408	.55	226	0	36
May 6	1,010	7.2	354	32	.25	32	5.0	22	22	236	1.0	1.1	.6	.4	--	226	.31	151	0	24
May 7	1,140	8.0	267	16	.03	36	7.9	6.4	6.4	153	4.0	3.5	.5	.9	.04	188	.26	123	0	10
May 21	1,260	7.8	239	12	.04	30	6.3	10	129	11	11	3.0	.3	1.7	.06	148	.20	101	0	18
May 22	955	7.3	337	22	.05	46	6.1	20	168	17	8.0	8.0	.3	.6	--	216	.29	140	0	23
June 5	545	7.2	411	25	.20	50	6.7	33	224	27	8.0	8.0	.3	.3	--	264	.36	153	0	32
July 28	107	7.7	486	30	.02	63	12	27	262	31	8.5	8.5	.6	4.9	--	328	.45	207	0	22
Sept. 19	123	8.3	436	27	.02	54	7.4	35	1/244	28	5.0	5.0	.5	4.3	--	294	.40	166	0	31

L/Includes equivalent of 1.1 parts per million of carbonate (CO₃).

KANSAS RIVER BASIN--Continued

SAPPA CREEK NEAR STAMFORD, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1.3	44		0.7	--		7	18	
2-----	.9	114		.8	--		7	--	
3-----	.8	--		.6	41		5	38	
4-----	.7	--		.7	--		5	--	
5-----	.6	--		2.0	62	(i)	5	--	
6-----	.6	90		.9	--		8	71	(i)
7-----	.6	--		.6	46		5	--	
8-----	.6	--		3.7	--		4	--	
9-----	.6	--		5.8	--	2/2	3	54	
10-----	.6	160		4.5	43		4	--	
11-----	.5	--		3.5	--		5	--	
12-----	.5	--		3.3	--		3	298	
13-----	.4	--		4.8	27		4	--	
14-----	.4	93		5.5	--		5	--	
15-----	.4	--		4.3	29		5	--	
16-----	.4	--	(i)	3.7	--		4	220	2/2
17-----	.4	--		4.1	--		4	--	
18-----	.3	47		5.0	21		3	153	
19-----	.3	--		6.0	30		4	--	
20-----	.3	--		5.8	--	(i)	5	132	
21-----	.3	--		8.2	26		5	--	
22-----	.2	143		8.8	--		5	51	
23-----	.2	--		8	26		6	--	
24-----	.2	--		6	--		4	--	
25-----	.2	--		6	22		3	--	
26-----	.1	140		7	--		3	--	
27-----	.1	--		7	20		3	--	(i)
28-----	.1	--		5	--		3	--	
29-----	.1	--		6	17		1	42	
30-----	.3	--		6	--		2	--	
31-----	.4	--		--	--		2	--	
Total-	13.4	--	4	135.3	--	12	132	--	36
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2	204		1	--		186	--	2/3, 600
2-----	2	--		1	--		163	--	2/5, 400
3-----	2	--		1	--		167	15,900	7,170
4-----	2	--		1	--		165	10,200	4,540
5-----	2	--		1	--		143	10,700	4,130
6-----	2	--		1	--		124	10,500	3,520
7-----	2	223		1	--		118	12,400	3,950
8-----	2	--		1	71		122	4,870	1,640
9-----	2	--		1	--		106	3,160	904
10-----	2	--		1	120	(i)	100	1,400	378
11-----	2	--	2/1	1	44		83	1,030	231
12-----	2	--		1	--		96	2,490	645
13-----	2	--		1	--		96	2,070	536
14-----	2	211		1	--		96	1,540	399
15-----	2	--		1	--		73	972	192
16-----	2	197		1	75		77	278	58
17-----	2	--		2	52		87	322	76
18-----	2	--		60	596	96	74	304	61
19-----	2	--		60	256	41	81	1,280	280
20-----	2	--		40	242	26	83	1,240	278
21-----	2	--		120	273	88	80	1,080	233
22-----	2	--		160	124	54	78	1,080	227
23-----	1	--		330	395	352	77	888	185
24-----	1	--		774	1,080	3/2, 270	70	828	175
25-----	1	--		645	1,150	3/2, 050	64	665	115
26-----	1	68	(i)	391	887	936	64	--	2/95
27-----	1	--		298	2,050	1,650	66	522	93
28-----	1	--		209	--	2/2, 400	64	543	94
29-----	1	--		--	--	--	62	460	77
30-----	1	--		--	--	--	65	525	92
31-----	1	--		--	--	--	72	718	140
Total-	53	--	23	3,105	--	9,970	3,002	--	39,510

(i) Sediment discharge less than 1.0 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued

SAPPA CREEK NEAR STAMFORD, NEBR.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	Mean discharge (second-foot)	April		Mean discharge (second-foot)	May		Mean discharge (second-foot)	June	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	69	564	105	58	388	61	131	--	2/650
2-----	73	522	103	58	290	45	168	3,350	1,520
3-----	69	--	2/90	53	289	41	230	3,780	2,350
4-----	65	470	82	49	352	46	162	3,010	1,320
5-----	74	450	90	191	2,600	3/6,650	351	4,800	3/4,910
6-----	77	443	92	737	13,800	3/28,300	318	5,080	4,380
7-----	63	552	94	915	9,190	3/22,400	365	--	3/5,100
8-----	63	698	119	1,130	10,400	3/32,800	780	8,350	3/18,200
9-----	64	609	105	1,900	6,540	3/33,100	902	7,650	3/17,900
10-----	61	--	2/100	1,340	6,070	22,000	950	7,570	3/19,500
11-----	65	768	135	1,120	6,390	19,300	1,060	6,880	19,700
12-----	85	1,140	262	654	5,770	10,200	595	6,270	3/10,400
13-----	93	1,200	301	487	5,650	7,430	1,340	6,590	23,800
14-----	88	--	2/280	373	4,690	4,720	1,380	5,020	18,400
15-----	81	--	3/240	208	--	2/1,300	1,380	4,020	15,000
16-----	80	--	2/220	286	4,360	3/3,600	622	5,080	3/8,600
17-----	79	--	2/190	602	--	2/11,000	259	4,140	2,900
18-----	78	796	168	190	3,900	3/2,080	738	--	2/16,000
19-----	76	687	141	123	2,610	867	1,260	5,620	19,100
20-----	73	585	115	204	2,670	3/2,830	1,500	5,190	21,000
21-----	69	545	102	672	7,630	13,800	969	6,380	3/16,400
22-----	67	514	93	988	6,220	16,000	438	5,710	6,750
23-----	64	389	67	919	8,210	20,400	305	3,940	3,240
24-----	61	262	43	829	7,880	17,600	226	2,850	1,740
25-----	61	419	69	594	5,600	8,980	195	2,450	1,290
26-----	59	468	74	483	5,040	6,570	172	1,910	890
27-----	58	412	64	322	3,490	3,030	152	1,380	566
28-----	56	360	54	208	--	2/1,500	136	1,000	376
29-----	55	474	54	189	2,380	1,210	132	782	279
30-----	56	472	71	162	2,060	901	125	796	269
31-----	--	--	--	146	1,730	682	--	--	--
Total--	2,082	--	3,740	16,190	--	300,000	17,321	--	262,500
		July			August			September	
1-----	117	713	225	48	443	57	88	810	192
2-----	111	634	190	45	353	43	76	690	142
3-----	106	554	158	46	298	37	77	--	2/280
4-----	141	--	2/500	43	284	33	97	--	2/700
5-----	153	1,330	549	38	263	27	103	2,100	584
6-----	132	--	2/420	36	243	24	149	2,530	1,020
7-----	151	--	2/500	33	222	20	248	2,550	1,710
8-----	130	952	334	31	204	17	272	4,020	2,950
9-----	120	884	286	30	197	16	207	3,430	1,920
10-----	118	998	318	37	--	2/200	172	2,640	1,230
11-----	97	1,240	325	28	--	2/55	228	3,030	3/1,940
12-----	89	--	2/280	24	240	16	326	--	2/5,500
13-----	88	--	2/220	74	--	2/2,500	173	3,580	1,670
14-----	107	659	190	94	--	2/2,400	120	1,850	599
15-----	96	510	132	69	4,440	827	106	1,380	395
16-----	286	5,250	3/4,580	165	--	2/4,600	91	1,360	334
17-----	161	3,990	1,730	252	11,800	3/8,470	82	805	178
18-----	103	3,430	954	637	11,500	3/19,500	76	608	125
19-----	83	2,080	466	759	8,450	17,300	72	525	102
20-----	73	1,000	197	785	8,080	17,100	70	461	87
21-----	86	920	214	666	6,290	11,300	66	400	71
22-----	138	1,160	432	556	6,100	9,160	60	340	55
23-----	164	--	2/2,300	822	6,700	14,900	53	288	41
24-----	109	--	2/1,200	945	4,670	11,900	50	--	2/34
25-----	71	1,160	222	717	4,270	8,270	46	236	29
26-----	94	--	2/900	391	3,820	4,030	44	--	2/24
27-----	92	4,220	3/1,160	282	--	2/1,800	39	--	3/19
28-----	65	918	161	187	--	2/950	36	153	15
29-----	66	--	2/110	140	1,680	635	35	--	3/13
30-----	52	408	57	117	1,280	404	33	118	10
31-----	48	637	82	106	1,040	298	--	--	--
Total--	3,447	--	19,390	8,203	--	136,900	3,295	--	21,970
Total discharge for year (second-foot-days) -----									56,978.7
Total load for year (tons) -----									794,100

3/Estimated.

3/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued
SAPPA CREEK NEAR STAMFORD, NEBR.--Continued

Particle-size analyses of suspended sediment, March to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Mar. 4, 1949	4:00 p. m.	167	8,560	5,900	4	6	8	11	20	42	64	82		100	BN
Apr. 13	3:35 p. m.	94	1,180	2,220	16	24	36	50	66	82	90	98		100	BN
Apr. 13	4:00 p. m.	82	1,220	862	14	22	32	46	59	75	83	87		100	BN
May 5	11:05 a. m.	48	273	608	16	19	37	46	62	84	96	100		--	BN
May 6	2:15 a. m.	1,420	15,000	7,970	15	23	34	48	62	79	84	86		88	BW
May 6	2:15 a. m.	1,420	15,000	8,140	9	16	25	35	56	82	90	94		97	BN
May 6	2:35 a. m.	1,420	16,300	7,350	16	24	35	48	66	86	92	96		98	BW
May 7	12:45 p. m.	1,040	8,220	5,260	26	37	49	61	73	82	87	93		97	BW
May 7	12:45 p. m.	1,040	8,220	5,240	4	10	37	50	62	72	77	84		94	BN
May 9	2:15 p. m.	2,080	4,920	1,470	28	43	54	66	75	83	88	94		97	BW
May 9	2:15 p. m.	2,080	4,920	1,750	25	34	48	58	66	76	82	88		96	BN
May 9	3:10 p. m.	2,040	4,690	1,720	31	40	52	60	72	83	89	93		96	BW
May 21	1:05 a. m.	1,060	7,680	4,680	24	32	43	56	72	84	92	97		98	BWC
May 21	1:05 a. m.	1,060	7,680	4,550	9	17	31	45	62	78	90	95		98	BN
May 21	5:20 p. m.	608	7,030	8,300	16	26	36	53	65	80	88	92		96	BW
May 21	5:20 p. m.	608	7,030	7,890	2	9	44	58	76	91	96	97		100	BN
May 22	12:55 a. m.	826	5,970	4,560	24	34	51	64	76	90	96	98		100	BW
May 22	12:55 a. m.	826	5,970	4,650	10	19	51	62	73	86	93	96		98	BN
June 2	4:40 p. m.	170	2,810	1,200	22	34	52	72	88	95	96	97		98	BW
June 5	7:00 p. m.	443	6,010	3,570	20	27	44	60	76	91	96	--		--	BW
June 5	7:00 p. m.	443	6,010	3,500	9	15	38	58	78	91	95	96		--	BN
June 5	6:53 p. m.	443	6,010	2,160	46	54	62	74	88	98	99	--		--	BWC
June 10	4:10 p. m.	1,150	8,060	3,050	18	26	37	52	66	82	88	96		100	BW
June 10	4:10 p. m.	1,150	8,060	3,100	13	25	41	53	70	86	94	97		100	BN
June 13	4:45 p. m.	1,420	4,770	2,850	32	40	48	58	70	81	87	92		--	BWC
June 17	4:20 p. m.	238	3,770	2,600	24	38	54	71	83	91	94	98		99	BW
June 21	11:00 a. m.	1,010	6,290	2,290	23	28	37	58	71	84	90	96		98	BW
June 21	11:00 a. m.	1,010	6,290	1,810	14	18	26	37	54	65	78	90		98	BN
June 30	8:00 p. m.	122	815	1,320	32	40	49	81	90	94	96	96		98	BW

July 11	8:15 p. m.	92	1,260	951	40	56	--	94	97	98	98	98	100	BW
July 22	7:15 p. m.	133	1,220	534	10	28	40	56	68	76	90	95	96	BW
July 28	11:30 a. m.	61	685	917	36	45	54	--	88	95	96	98	99	BW
July 28	11:30 a. m.	61	685	877	9	18	--	--	82	93	95	96	98	BN
Aug. 16	7:15 p. m.	207	8,100	8,310	31	38	61	76	90	99	100	--	--	BW
Aug. 16	7:15 p. m.	207	8,100	8,240	2	6	25	78	92	97	98	99	100	BN
Aug. 17	3:30 p. m.	259	14,800	6,060	34	42	68	82	91	96	97	98	100	BN
Aug. 17	3:30 p. m.	259	14,800	6,180	2	6	36	85	93	96	99	100	--	BN
Aug. 17	4:30 p. m.	292	13,700	9,370	46	55	70	82	99	93	94	96	98	BWC
Aug. 17	9:30 p. m.	386	15,800	5,150	30	39	58	76	88	94	98	99	100	BW
Aug. 17	9:30 p. m.	386	13,800	4,940	5	11	33	73	86	94	97	98	99	BN
Aug. 18	2:50 a. m.	436	12,000	4,460	20	27	40	78	88	95	97	98	100	BN
Aug. 18	5:15 a. m.	436	12,000	1,960	1	26	42	78	88	95	96	98	99	BN
Aug. 18	5:15 a. m.	443	12,700	1,960	23	26	56	76	86	90	95	96	98	BW
Aug. 18	6:00 a. m.	443	12,600	2,210	26	41	60	80	87	92	95	98	99	BW
Aug. 18	12:20 p. m.	765	11,400	2,230	28	42	62	81	88	94	97	99	100	BW
Aug. 18	12:20 p. m.	765	11,400	2,180	--	25	54	82	88	93	96	98	99	BN
Aug. 18	4:20 p. m.	792	10,800	4,800	25	40	57	76	88	95	96	98	99	BW
Aug. 19	1:20 a. m.	708	9,170	2,640	30	45	61	78	84	90	94	98	99	BW
Aug. 21	2:30 p. m.	654	6,050	3,790	26	42	53	72	80	92	96	97	98	BW
Aug. 26	2:25 p. m.	383	3,700	2,140	34	44	52	66	74	86	92	96	98	BW
Sept. 6	7:45 p. m.	147	1,460	559	30	45	60	72	80	86	92	96	98	BW
Sept. 8	8:00 p. m.	268	4,260	2,760	40	54	68	79	88	92	95	96	98	BW
Sept. 10	7:20 p. m.	187	2,540	1,450	44	61	70	82	90	95	96	98	99	BW
Sept. 14	7:05 p. m.	112	1,590	1,030	43	64	77	88	96	98	100	99	--	BW
Sept. 19	5:00 p. m.	72	493	879	41	62	78	88	94	96	97	100	--	BW

KANSAS RIVER BASIN--Continued

PRAIRIE DOG CREEK AT NORTON, KANS.

LOCATION.--At gaging station at bridge on U. S. Highway 283, half a mile south of Norton, Norton County.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949.

Water temperatures: March 1947 to September 1949.

Sediment records: March 1947 to September 1949.

EXTREMES, 1948-49.--Water temperatures: Maximum, 83°F July 18, June 30; minimum, freezing point on many days in December, January, and February.

Sediment concentrations: Maximum daily, 14,100 ppm May 9; minimum daily, not determined.

Sediment loads: Maximum daily, 42,400 tons June 18, minimum daily, less than 10 tons on many days.

EXTREMES, 1947-49.--Sediment concentrations: Maximum daily, 14,100 ppm May 9; minimum daily, not determined.

Sediment loads: Maximum daily, 42,400 tons June 18, minimum daily, less than 10 tons on many days.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent so- dium
																Parts per mil- lion	Tons per acre- foot	Total	Non- carbon- ate	
Oct. 7, 1948 -----	2.0	8.5	512	33	0.02	69	16	30		1/320	26	8.0	0.5	1.2	0.09	332	0.45	238	0	21
Mar. 19, 1949 -----	18	7.9	498	35	.04	84	13	27		282	24	8.0	.4	4.8	.06	318	.43	213	0	22
May 6 -----	1,280	7.5	390	25	.02	66	10	10		286	8.4	.5	.3	3.3	--	259	.35	208	0	10
May 18 -----	1,880	8.0	330	22	.02	52	8.5	7.1		207	8.8	.5	.2	1.4	--	209	.28	165	0	9
May 21 -----	1,600	7.9	264	24	.02	40	6.3	6.4		160	5.6	.5	.3	1.7	--	169	.23	126	0	10
June 7 -----	790	7.2	257	26	.03	36	5.4	17		164	5.2	3.0	.4	2.9	--	178	.24	112	0	24
June 9 -----	2,440	7.7	177	23	.02	24	6.1	3.5		104	3.8	.5	.3	2.4	--	126	.17	85	0	8
June 18 -----	2,670	7.3	308	25	.02	46	8.3	6.7		188	6.2	1.0	.3	.6	--	196	.27	149	0	9
July 9 -----	86	7.8	288	26	.02	4.9	8.1	5.8		189	9.2	2.0	.3	.1	--	200	.27	156	1	7
July 14 -----	790	7.9	260	24	.02	45	7.4	4.6		176	6.6	.5	.3	.6	--	188	.26	143	0	7
July 26 -----	1,280	7.9	284	24	.02	41	5.0	16		164	4.8	1.0	.4	1.4	--	180	.24	123	0	14
Sept. 19 -----	7.0	8.1	547	41	.02	84	16			326	28	8.0	.4	2.4	--	359	.49	276	9	11

1/Includes equivalent of 17 parts per million carbonate (CO₃).

KANSAS RIVER BASIN--Continued

PRAIRIE DOG CREEK AT NORTON, KANS.--Continued

Temperature (°F) of water, December 1948 to September 1949

/After April 4, once-daily temperature measurement at approximately 7:30 a.m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1			--	--	--	34	41	54	65	74	68	58
2			--	--	--	36	41	73	62	--	65	60
3			--	--	--	36	44	80	61	--	67	68
4			--	--	32	40	50	64	63	--	63	67
5			--	32	--	35	42	64	62	73	65	63
6			--	--	--	--	--	52	63	73	73	63
7			--	33	33	34	50	55	61	--	--	65
8			--	--	--	36	49	53	61	75	79	59
9			--	--	33	38	47	52	62	73	75	58
10			--	--	35	33	43	58	--	69	69	63
11			--	--	37	33	40	--	68	72	73	67
12			--	32	--	33	--	--	71	70	72	67
13			36	--	32	--	50	--	65	76	72	--
14			35	--	33	34	43	62	66	64	78	54
15			32	--	35	--	--	61	65	67	72	--
16			34	--	35	33	46	60	66	71	69	59
17			--	--	37	33	51	71	69	75	66	62
18			--	32	36	38	48	62	64	83	68	57
19			--	32	33	44	47	--	69	--	66	70
20			34	--	--	--	47	60	69	74	68	59
21			--	32	34	45	52	55	71	68	69	58
22			33	--	38	--	51	58	71	68	67	53
23			32	--	36	53	54	60	71	74	68	54
24			--	--	36	47	63	56	69	75	66	57
25			--	--	35	38	61	59	69	80	68	57
26			--	--	34	43	61	60	79	73	69	56
27			32	--	--	38	56	74	--	77	68	66
28			--	--	33	--	54	66	68	71	74	52
29			32	--	--	--	54	65	--	72	65	49
30			32	--	--	--	59	68	83	69	64	52
31			--	--	--	41	--	69	--	73	63	--
Average			--	1/32	1/34	--	50	62	67	73	69	60

1/Includes estimated temperature, 32°F, on missing days.

KANSAS RIVER BASIN--Continued

PRAIRIE DOG CREEK AT NORTON, KANS.--Continued

Suspended sediment, water year October 1948 to September 1949										
Day	October			November			December			
	Mean dis- charge (second- feet)	Suspended sediment		Mean dis- charge (second- feet)	Suspended sediment		Mean dis- charge (second- feet)	Suspended sediment		
		Mean con- cen- tra- tion (ppm)	Tons per day		Mean con- cen- tra- tion (ppm)	Tons per day		Mean con- cen- tra- tion (ppm)	Tons per day	
1-----	2	38	(i)	3	6	(i)	8	--	(i)	
2-----	2	25		3	5		8	15		
3-----	2	--		2	5		8	19		
4-----	2	20		3	5		4	14		
5-----	2	20		3	8		3	--		
6-----	2	20		3	4		3	19		
7-----	2	20		3	--		4	18		
8-----	2	20		4	3		4	17		
9-----	2	23		3	5		3	15		
10-----	2	--		3	11		3	7		
11-----	2	16		3	--		3	13		
12-----	2	15		3	--		2	--		
13-----	2	--		3	7		2	8		
14-----	2	11		3	--		2	8		
15-----	2	--		3	5		2	8		
16-----	2	13		3	--		2	8		
17-----	2	--		3	--		2	--		
18-----	2	9		3	12		2	--		
19-----	2	--		4	--		2	--		
20-----	2	14		6	15		3	11		
21-----	2	--		9	16		3	--		
22-----	2	12		9	12		3	7		
23-----	2	--		7	14		4	5		
24-----	2	--		6	11		3	--		
25-----	2	18		5	--		3	--		
26-----	2	--		5	48		4	--		
27-----	2	12		4	29		4	7		
28-----	2	--		6	--		4	--		
29-----	3	21		7	26		2	7		
30-----	2	9		7	18		6	8		
31-----	3	--		--	--		6	--		
Total-----	64	--	3	129	--	5	112	--	3	
January			February			March				
1-----	6	--	(i)	2	--	(i)	79	330	70	
2-----	5	--		2	--		66	465	83	
3-----	2	--		2	--		64	1,540	266	
4-----	2	--		2	4		215	4,080	2,370	
5-----	3	16		2	--		67	1,700	308	
6-----	6	--		2	--		34	--	2/65	
7-----	6	11		2	5		59	1,040	166	
8-----	5	10		2	6		34	1,290	110	
9-----	4	--		2	7		27	740	54	
10-----	2	--		2	3		25	440	30	
11-----	2	--		5	20		22	560	33	
12-----	3	3		90	--		22	428	25	
13-----	4	--		25	104		7	20	290	16
14-----	6	5		20	59		3	17	209	10
15-----	6	--		20	57		3	13	226	8
16-----	3	33		15	62		3	21	120	7
17-----	3	10		10	106		3	22	--	2/17
18-----	1	7		250	300		202	21	414	23
19-----	2	12		250	146		98	19	340	17
20-----	2	--		200	63		34	17	309	14
21-----	3	8		130	38		13	17	318	14
22-----	1	--		150	--		2/400	17	274	12
23-----	4	--		349	1,120		3/1,100	18	285	14
24-----	4	--		240	1,060		2/673	17	275	13
25-----	3	--		168	645		293	17	223	10
26-----	3	--		99	360		96	19	256	13
27-----	2	--		57	185		28	18	226	11
28-----	2	--		90	334		81	16	192	8
29-----	2	--		--	--		--	16	164	7
30-----	1	--		--	--		--	20	398	21
31-----	1	--		--	--		--	19	326	17
Total-----	100	--	3	2,188	--	3,090	1,058	--	3,830	

(i) Sediment discharge less than 1.0 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued

PRAIRIE DOG CREEK AT NORTON, KANS.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	18	276	13	13	23	(i)	25	386	30
2-----	19	240	12	13	21	(i)	27	372	27
3-----	17	196	9	12	23	(i)	26	346	24
4-----	18	152	7	11	52	2	42	1,050	3/154
5-----	19	195	10	55	4,010	3/3,180	45	1,440	175
6-----	19	190	10	371	5,960	3/15,800	34	680	62
7-----	18	170	8	32	3,000	259	540	9,270	3/15,000
8-----	18	165	8	326	8,000	3/8,450	228	5,670	3/3,600
9-----	18	128	6	94	4,320	3/1,350	1,100	6,780	3/21,700
10-----	18	105	5	31	1,110	93	322	4,920	3/4,520
11-----	17	103	5	25	615	42	100	2,500	675
12-----	17	115	5	25	560	38	106	2,270	3/1,270
13-----	17	163	7	21	372	21	1,190	7,440	3/24,000
14-----	17	110	5	17	270	12	884	5,600	3/12,200
15-----	15	72	3	14	208	8	355	5,110	3/5,210
16-----	15	70	3	38	4,100	3/537	272	4,580	3,360
17-----	15	70	3	15	2,310	94	177	2,990	3/1,450
18-----	15	69	3	293	4,210	3/3,000	1,610	10,400	3/42,700
19-----	15	68	3	852	14,100	3/33,800	195	4,740	3/2,740
20-----	16	70	3	930	6,410	3/16,300	124	2,180	730
21-----	15	78	3	990	5,550	3/15,700	94	1,060	269
22-----	14	52	2	402	6,240	3/6,990	75	684	138
23-----	14	48	2	215	6,130	3/3,860	63	542	92
24-----	14	47	2	128	3,810	1,320	55	455	68
25-----	13	44	2	87	2,350	552	49	415	55
26-----	13	48	2	67	1,350	244	45	406	49
27-----	14	53	2	54	791	115	41	400	44
28-----	13	39	1	44	608	72	40	403	44
29-----	13	33	1	38	527	54	37	303	30
30-----	13	36	1	34	481	44	35	267	25
31-----	--	--	--	32	445	38	--	--	--
Total-	477	--	146	5,279	--	122,000	7,940	--	140,400
Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	34	299	27	19	182	9	14	116	4
2-----	32	258	22	18	149	7	13	93	3
3-----	30	--	2/19	17	144	7	12	80	3
4-----	29	--	2/17	16	122	5	13	--	2/7
5-----	38	522	54	15	122	5	12	189	6
6-----	33	413	37	14	124	5	11	92	3
7-----	30	270	22	14	94	4	11	86	3
8-----	44	2,480	3/410	14	81	3	11	117	3
9-----	102	--	2/2,000	14	80	3	11	84	2
10-----	83	--	2/1,300	14	75	3	11	75	2
11-----	100	3,550	958	13	55	2	11	72	2
12-----	58	1,800	282	12	120	3/4	10	85	2
13-----	63	2,050	349	42	--	2/700	11	85	3
14-----	366	9,220	3/11,100	27	--	2/170	10	84	2
15-----	56	2,970	449	27	2,230	3/143	9	54	1
16-----	37	950	95	43	4,360	3/635	9	53	1
17-----	31	510	43	215	10,200	3/6,870	9	47	1
18-----	29	460	36	262	8,000	3/5,720	8	--	--
19-----	36	1,170	114	150	6,120	2,480	8	--	--
20-----	36	920	89	138	4,680	3/1,850	7	--	--
21-----	30	868	70	54	2,730	398	7	--	--
22-----	26	586	41	33	1,720	153	7	--	--
23-----	24	351	23	25	1,000	68	6	--	--
24-----	23	250	16	21	550	31	7	33	(i)
25-----	21	238	13	18	364	18	6	--	--
26-----	204	4,560	3/9,390	17	290	13	6	--	--
27-----	206	6,020	3/5,060	16	224	10	6	--	--
28-----	30	1,040	84	14	206	8	6	--	--
29-----	24	343	22	15	158	6	6	--	--
30-----	21	238	13	14	155	6	6	--	--
31-----	19	186	10	14	129	5	--	--	--
Total-	1,895	--	32,160	1,320	--	19,340	274	--	56

Total discharge for year(second-foot-days)----- 20,836

Total load for year (tons)----- 321,000

(i) Sediment discharge less than 1.0 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued
PRAIRIE DOG CREEK AT NORTON, KANS.--Continued

Particle-size analyses of suspended sediment, February to August, 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Feb. 24, 1949-----	5:05 p. m.	272	1,820	1,180	22	31	42	60	80	94	99	100		--		BN
Mar. 3-----	3:35 p. m.	95	1,770	1,190	28	40	46	65	79	90	95	97		59		BN
Mar. 5-----	8:30 p. m.	112	14,200	9,930	23	34	45	58	71	91	98	100		--		BW
May 5-----	8:45 p. m.	120	13,100	5,610	50	60	70	80	99	98	99	100		--		BWC
May 6-----	2:40 a. m.	1,250	16,700	5,510	21	32	44	56	70	92	98	100		--		BW
May 6-----	5:10 a. m.	790	13,000	8,750	24	35	46	58	72	90	98	100		--		BW
May 18-----	9:30 p. m.	1,750	20,500	4,280	15	24	34	49	74	99	100	--		--		BN
May 18-----	9:30 p. m.	1,750	20,500	3,970	8	14	27	44	71	94	99	100		--		BN
May 18-----	10:15 p. m.	1,880	17,300	4,920	20	27	42	60	82	99	100	--		--		BN
May 18-----	10:15 p. m.	1,880	17,300	4,460	8	14	28	54	81	99	100	--		--		BN
May 18-----	10:55 p. m.	1,880	13,800	8,140	20	28	41	54	72	94	99	100		--		BW
May 20-----	9:50 a. m.	810	6,220	3,970	39	50	63	70	82	96	100	--		--		BW
May 20-----	11:00 p. m.	1,540	6,660	5,250	29	39	52	62	76	97	100	--		--		BW
May 21-----	1:40 a. m.	1,600	7,080	5,330	34	42	56	68	82	97	100	--		--		BW
May 21-----	1:40 a. m.	1,600	7,080	5,670	16	28	50	65	81	96	100	--		--		BN
June 7-----	7:25 a. m.	810	9,080	2,610	38	44	50	58	77	98	100	--		--		BWC
June 7-----	8:10 a. m.	810	8,810	3,830	39	44	50	60	76	98	100	--		--		BWC
June 7-----	8:30 a. m.	790	10,400	8,030	18	24	36	46	60	89	100	--		--		BW
June 7-----	8:30 a. m.	790	10,400	8,230	8	16	32	44	60	93	100	--		--		BN
June 7-----	10:30 a. m.	830	9,040	3,600	38	46	52	60	76	96	100	--		--		BWC
June 9-----	1:15 p. m.	2,030	8,160	4,440	25	35	47	59	72	91	98	100		--		BW
June 9-----	2:10 p. m.	2,320	8,130	5,830	20	29	39	51	63	75	85	91		96		BW
June 9-----	4:05 p. m.	2,360	5,500	3,960	30	41	54	66	78	91	96	98		100		BW
June 9-----	4:05 p. m.	2,360	5,500	3,950	32	44	58	70	80	93	97	99		100		BW
June 13-----	3:00 a. m.	1,190	11,200	6,920	21	30	41	53	66	84	96	98		100		BW
June 13-----	4:30 a. m.	1,230	7,480	5,740	20	32	48	58	68	90	98	100		--		BN
June 13-----	5:10 a. m.	1,230	6,890	4,170	30	42	56	68	77	88	94	98		100		BW
June 13-----	4:20 p. m.	1,260	6,400	4,690	26	40	55	66	75	81	87	95		98		BN
June 13-----	5:30 p. m.	1,260	6,140	4,580	28	40	51	62	69	82	90	95		98		BN
June 14-----	6:30 a. m.	1,440	3,880	2,830	43	57	67	71	80	92	95	97		98		BW

June 17	6:45 p. m.	168	2,220	1,730	36	45	54	65	79	92	96	98	99	BN
June 18	2:50 a. m.	2,290	13,500	9,780	6	11	29	44	60	84	97	99	100	BN
June 18	4:25 a. m.	2,770	13,000	8,340	22	32	43	56	70	91	98	100	99	BN
June 18	5:00 a. m.	2,850	10,500	8,540	9	16	41	58	72	91	98	100	99	BN
June 18	6:00 a. m.	2,990	10,600	7,730	31	42	58	70	81	98	100	98	99	BN
June 18	7:45 a. m.	2,940	7,980	2,770	28	42	60	71	82	90	96	98	99	BN
June 18	7:45 a. m.	2,940	7,980	2,830	25	36	56	70	82	94	96	98	99	BN
June 18	12:40 p. m.	1,910	6,280	4,500	30	45	60	72	82	94	97	98	99	BN
June 18	5:30 p. m.	880	8,480	2,410	26	37	50	62	77	96	100	100	99	BN
June 18	5:30 p. m.	880	8,480	2,320	18	30	44	59	76	98	100	100	99	BN
June 18	1:25 p. m.	182	3,580	1,200	34	50	62	79	87	98	100	98	99	BN
June 19	1:25 p. m.	182	3,580	1,100	24	39	54	72	87	97	99	100	99	BN
July 8	4:50 p. m.	75	4,100	4,730	12	22	36	51	72	90	98	96	100	BN
July 14	7:15 a. m.	790	12,500	4,440	24	32	47	58	72	92	96	98	99	BN
July 14	7:15 a. m.	790	12,500	4,580	15	26	44	58	72	90	95	97	99	BN
July 14	8:25 a. m.	690	10,400	7,080	26	36	50	63	76	93	98	99	100	BN
July 14	8:30 a. m.	690	10,400	5,850	20	30	47	60	74	94	99	100	99	BN
July 14	5:25 p. m.	152	6,180	3,530	35	49	64	76	90	97	99	100	99	BN
July 16	9:30 a. m.	38	1,030	202	26	46	62	80	96	98	99	100	99	BN
July 20	8:00 a. m.	38	946	564	54	65	79	90	94	98	98	99	100	BN
July 22	7:50 a. m.	27	642	437	72	82	90	94	97	99	--	--	--	BN
July 26	5:50 p. m.	31	4,870	1,710	22	37	60	85	95	98	99	100	--	BN
July 26	5:50 p. m.	31	4,870	1,590	10	18	50	82	94	97	98	99	100	BN
July 26	10:20 p. m.	1,230	16,800	5,440	20	27	43	56	77	99	100	--	--	BN
July 26	10:20 p. m.	1,230	16,800	5,760	14	20	36	51	68	82	94	98	100	BN
July 26	11:45 p. m.	1,250	12,300	10,200	40	50	64	72	84	92	98	99	100	BWC
July 26	11:45 p. m.	1,250	12,300	10,900	8	17	45	58	72	90	98	99	100	BN
July 27	4:00 a. m.	324	9,280	3,460	36	44	64	78	88	96	98	--	--	BN
July 27	4:00 a. m.	324	9,280	3,160	20	32	56	73	85	94	97	98	99	BN
July 27	4:30 p. m.	46	4,240	6,980	44	62	83	92	99	100	--	--	--	BN
July 28	8:05 a. m.	30	1,180	968	43	66	84	90	95	98	99	100	--	BN

KANSAS RIVER BASIN--Continued
PRAIRIE DOG CREEK AT NORTON, KANS.--Continued

Particle-size analyses of suspended sediment, February to August 1949--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Aug. 13, 1949-----	9:40 a. m.	78	7,060	4,480	30	48	68	80	89	94	98	99		100	BW
Aug. 13-----	2:15 p. m.	33	3,430	1,980	42	58	76	88	94	97	99	--		--	BW
Aug. 13-----	6:55 p. m.	21	721	423	52	67	82	90	96	98	98	99		100	BW
Aug. 14-----	11:00 a. m.	32	751	1,423	10	19	38	63	82	96	98	99		100	BW
Aug. 15-----	9:20 p. m.	34	2,700	1,650	30	37	56	71	85	93	96	99		100	BW
Aug. 15-----	10:30 p. m.	48	7,430	2,870	30	45	66	82	91	96	97	99		100	BW
Aug. 15-----	10:30 p. m.	48	7,430	2,290	26	40	64	85	94	97	98	99		100	BN
Aug. 15-----	11:10 p. m.	36	2,950	1,810	29	48	70	86	94	97	98	99		100	BW
Aug. 16-----	9:10 a. m.	78	7,620	2,490	44	61	84	90	98	98	99	100		--	BW
Aug. 16-----	9:10 a. m.	78	7,620	2,630	30	44	68	82	92	99	100	--		--	BN
Aug. 16-----	9:50 a. m.	85	8,010	2,560	25	36	51	63	75	85	94	98		100	BW
Aug. 16-----	9:50 a. m.	85	8,010	2,400	21	34	53	70	87	94	97	98		100	BN
Aug. 17-----	9:45 a. m.	152	8,870	5,780	61	68	79	86	94	98	99	100		--	BW/C
Aug. 17-----	9:45 a. m.	152	8,870	5,310	17	30	58	72	86	98	99	--		--	BN
Aug. 17-----	11:50 a. m.	235	10,400	7,140	20	30	44	56	68	78	84	92		100	BW
Aug. 17-----	6:55 p. m.	349	14,000	5,410	21	30	45	57	72	83	88	92		100	BW
Aug. 17-----	6:55 p. m.	349	14,000	5,050	7	14	38	60	80	89	94	100		--	BN
Aug. 17-----	10:50 p. m.	272	10,400	3,660	33	46	66	77	90	98	99	100		--	BW
Aug. 17-----	10:50 p. m.	272	10,400	3,500	21	32	59	71	87	98	99	100		--	BN
Aug. 18-----	1:15 a. m.	245	9,400	2,620	35	48	66	78	89	94	98	98		100	BW
Aug. 18-----	5:00 a. m.	272	7,770	4,310	33	46	64	75	84	91	96	99		100	BW
Aug. 18-----	8:20 a. m.	300	7,800	6,060	32	44	60	70	81	88	93	97		100	BW
Aug. 18-----	8:55 a. m.	300	8,840	2,710	32	45	61	73	82	91	96	98		99	BW
Aug. 18-----	9:30 a. m.	289	8,540	2,840	28	41	59	70	81	90	96	98		99	BN
Aug. 18-----	11:40 a. m.	289	8,770	3,540	37	46	61	74	82	93	97	98		99	BW
Aug. 18-----	11:40 a. m.	289	8,770	3,460	22	36	55	70	82	93	96	98		99	BN
Aug. 18-----	3:00 p. m.	300	8,160	3,000	34	49	61	73	82	94	98	99		100	BW
Aug. 18-----	3:00 p. m.	300	8,160	3,290	25	40	57	71	81	90	94	98		99	BN
Aug. 18-----	4:55 p. m.	289	7,920	5,270	33	46	62	72	85	96	99	100		--	BW
Aug. 18-----	11:30 p. m.	156	6,420	5,540	37	53	69	80	90	98	100	--		--	BW

Aug. 19	8:00 a. m.	144	5,800	4,600	36	52	66	78	86	93	97	98	98	BW
Aug. 19	1:10 p. m.	152	5,600	2,150	37	50	63	76	87	93	96	98	98	BW
Aug. 19	1:10 p. m.	152	5,600	2,000	32	46	63	73	84	90	95	98	99	BN
Aug. 19	6:45 p. m.	177	6,920	5,310	36	52	72	79	84	90	95	97	98	BW
Aug. 20	2:10 p. m.	120	4,370	7,390	40	53	63	68	76	83	84	87	100	BW
Aug. 20	2:10 p. m.	120	4,370	6,620	16	37	64	69	75	82	84	90	100	BN
Aug. 20	5:30 p. m.	103	3,730	1,180	50	82	73	80	87	91	94	96	100	BW
Aug. 20	5:30 p. m.	103	3,730	1,050	42	55	66	77	86	93	96	98	99	BN
Aug. 21	10:00 a. m.	57	2,880	2,310	54	67	78	84	90	96	98	99	100	BW

KANSAS RIVER BASIN--Continued
SMOKY HILL RIVER NEAR ELLIS, KANS.

LOCATION.--At gaging station at county bridge 11½ miles south of Ellis, Ellis County.
DRAINAGE AREA.--5,630 square miles.
RECORDS AVAILABLE.--Sediment records: March 1947 to September 1949.
EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 12,700 ppm Aug. 15; minimum daily, not determined.
Sediment loads: Maximum daily, 87,000 tons June 6; minimum daily, not determined.
EXTREMES, 1947-49.--Sediment concentrations: Maximum daily, 12,700 ppm Aug. 15, 1949; minimum daily, not determined.
Sediment loads: Maximum daily, 87,000 tons June 6, 1949; minimum daily, not determined.
REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium	
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate		
Oct. 2, 1948 ----	6	7.5	919	22	0.03	121	26	41		156	334	15	0.8	0.1	0.09		702	0.95		409	281	18
Mar. 8, 1949 ----	59	8.0	907	24	.02	129	22	40		194	304	15	.8	2.5	.05		676	.92		412	253	18
Mar. 18 ----	49	7.7	962	24	.05	133	25	47		204	332	15	.7	2.3	.13		721	.88		435	268	19
May 4 ----	39	7.5	1,130	22	.02	168	30	59		170	480	19	.6	2.8	--		906	1.23		543	404	19
May 22 ----	450	8.0	585	15	.02	90	11	14		121	182	6.0	.4	3.7	--		410	.56		270	171	10
May 29 ----	1,540	7.9	431	17	.02	73	5.8	15		154	100	3.5	.3	2.8	--		288	.41		206	80	14
June 6 ----	4,700	7.9	599	18	.02	105	11	10		137	200	3.0	.4	4.1	--		446	.61		308	196	7
July 22 ----	58	7.5	988	27	.02	133	24	57		173	368	18	.7	1.3	--		764	1.04		431	289	22
Sept. 19 ----	136	7.3	841	23	.02	105	19	61		184	284	16	.9	1.5	--		632	.86		340	189	23

KANSAS RIVER BASIN--Continued

SMOKY HILL RIVER NEAR ELLIS, KANS.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	8			6			8	10	(i)
2-----	8			6			8	12	(i)
3-----	8			6			8	12	(i)
4-----	7			6			8	9	(i)
5-----	7			8	7	(i)	17	50	2
6-----	8	20	(i)	8			8	33	(i)
7-----	8			7			9	11	(i)
8-----	8			7			8		
9-----	7			7			8		
10-----	7			7					
11-----	7			7			8	49	1
12-----	7			7					
13-----	7			7					
14-----	7			7					
15-----	6	6	(i)	7	24	(i)			
16-----	6			6			10	53	1
17-----	6			6			12	--	2/2
18-----	6			7			14	72	3
19-----	6			7			20	--	2/3
20-----	6			11	42	1	24	41	3
21-----	6			14	41	2	18	--	2/2
22-----	6			15	40	2	13	44	2
23-----	6			19	46	2	14	51	2
24-----	6			15	50	2	14	52	2
25-----	6	2	(i)	11	58	2	10	50	1
26-----	5			9	66	2			
27-----	5			10	28	(i)			
28-----	5			12	25	(i)			
29-----	5			15	32	1	10	47	1
30-----	6			9	--	(i)			
31-----	5			--	--	--			
Total-----	201	--	6	269	--	22	339	--	39
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----		--					86	282	66
2-----		--					83	211	47
3-----		--					78	195	41
4-----		--					77	194	40
5-----		--		10	--	(i)	78	192	40
6-----	5	--	--				78	187	39
7-----		--					68	169	31
8-----		3					85	149	26
9-----		--					62	151	25
10-----		--		21	62	4	61	147	24
11-----				60	146	24	61	97	16
12-----				100	126	34	57	92	14
13-----	1	--	--	50	80	11	55	92	14
14-----				50	92	12	54	93	13
15-----				50	--	2/30	36	96	10
16-----				50	408	55	53	98	14
17-----				237	402	257	52	74	10
18-----				1,150	389	1,210	50	105	14
19-----				2,260	418	2,550	50	76	10
20-----				819	552	1,220	45	79	10
21-----				268	585	423	42	--	2/14
22-----				231	790	493	42	170	19
23-----				891	3,850	9,260	40	144	16
24-----	5	--	--	320	1,340	1,160	40	104	11
25-----				200	815	440	38	71	7
26-----				172	800	372	43	--	2/13
27-----				126	310	105	44	182	22
28-----				102	277	76	41	171	19
29-----				--	--	--	37	82	8
30-----				--	--	--	53	110	16
31-----				--	--	--	58	158	25
Total-----	135	--	2/3	7,247	--	17,740	1,727	--	674

(i) Sediment discharge less than 1.0 ton.
2/Estimated.

MISSOURI RIVER BASIN

KANSAS RIVER BASIN--Continued

SMOKY HILL RIVER NEAR ELLIS, KANS.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	Mean discharge (second-foot)	April		Mean discharge (second-foot)	May		Mean discharge (second-foot)	June	
		Suspended sediment			Suspended sediment			Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	53	257	37	45	4,520	549	172	770	358
2-----	47	223	28	65	3,980	698	132	610	217
3-----	44	221	26	52	--	2/240	115	530	165
4-----	41	201	22	42	798	90	198	--	2/1,100
5-----	37	130	13	39	522	55	926	--	2/31,000
6-----	35	114	8	44	445	53	3,560	8,420	3/87,000
7-----	33	71	6	41	--	2/32	3,850	4,370	3/46,300
8-----	31	63	5	52	--	2/340	4,000	4,650	3/55,200
9-----	30	63	5	61	2,070	341	2,840	3,790	3/32,100
10-----	29	55	4	65	--	2/380	1,490	1,550	6,240
11-----	28	43	3	67	--	2/400	1,380	1,840	6,880
12-----	28	36	3	65	2,260	397	1,120	1,440	4,350
13-----	28	39	3	63	1,410	240	1,130	1,600	4,880
14-----	29	41	3	58	1,120	175	945	1,490	3,800
15-----	27	30	2	55	--	2/140	650	800	1,400
16-----	27	12	(i)	236	3,620	2/2,440	574	748	1,160
17-----	25	20	1	413	4,010	3/4,760	484	617	806
18-----	24	31	2	144	1,120	435	400	478	516
19-----	24	44	3	90	525	128	348	375	352
20-----	27	80	6	101	1,940	3/1,060	306	355	293
21-----	27	32	2	2,760	8,860	3/69,900	282	311	237
22-----	29	14	1	744	2,120	3/5,890	255	288	198
23-----	31	35	3	460	2,120	3/2,700	240	301	195
24-----	30	30	2	324	1,350	3/1,220	225	291	177
25-----	28	28	2	228	393	242	237	--	2/240
26-----	26	34	2	172	309	143	228	--	2/240
27-----	27	73	5	140	270	102	316	1,390	1,190
28-----	35	129	12	506	--	2/10,000	878	--	2/8,700
29-----	36	82	8	869	4,690	3/7,840	1,610	5,250	3/25,400
30-----	40	--	2/160	296	2,300	1,840	470	1,680	3/2,220
31-----	--	--	--	222	630	498	--	--	--
Total-	956	--	378	8,519	--	113,300	29,361	--	322,900
	July			August			September		
1-----	285	493	379	43	100	12	175	1,810	855
2-----	217	291	170	37	94	9	168	1,770	803
3-----	182	262	129	35	91	8	130	860	302
4-----	157	252	107	33	90	8	480	3,370	3/4,720
5-----	136	242	89	31	90	8	556	2,920	4,380
6-----	119	225	72	27	90	6	420	1,600	1,810
7-----	110	212	63	26	86	6	336	990	898
8-----	102	210	58	22	70	4	299	895	723
9-----	101	--	2/80	22	56	3	249	573	385
10-----	104	--	2/85	20	53	3	217	424	248
11-----	170	--	2/320	23	--	2/24	195	361	190
12-----	152	--	2/240	90	1,420	3/433	175	322	152

(1) Sediment discharge less than 1.0 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued
SMOKY HILL RIVER NEAR ELLIS, KANS.--Continued

Particle-size analyses of suspended sediment, February to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500
Feb. 20, 1949	4:40 p. m.	601	566	1,220	34	52	74	92	95	96	98	100		--	BN
May 4	10:50 a. m.	42	498	1,080	53	66	92	96	98	98	100			--	BW
May 23	4:25 p. m.	508	2,980	3,250	40	58	78	86	93	96	98	99		100	BW
May 23	4:25 p. m.	508	2,980	3,240	6	14	43	81	89	94	96	98		100	BN
May 29	3:50 a. m.	1,440	5,870	9,270	24	35	54	66	86	92	95	98		100	BW
May 29	3:50 a. m.	1,440	5,870	10,000	24	10	24	60	78	86	93	98		100	BW
May 29	7:00 a. m.	1,170	4,810	3,550	47	60	82	90	96	97	98	100		100	BW
May 29	11:15 a. m.	837	4,980	6,560	44	64	88	93	98	98	99	100		--	BW
June 6	12:20 a. m.	5,000	12,800	5,470	32	49	69	79	88	96	98	99		100	BW
June 6	12:20 a. m.	5,000	12,800	5,600	6	10	28	82	92	98	98	99		100	BW
June 6	1:10 a. m.	5,200	12,100	3,930	23	35	51	67	80	88	92	94		--	BW
June 6	4:50 a. m.	4,500	11,000	9,240	29	49	72	78	89	94	96	99		100	BW
June 6	4:50 a. m.	4,500	11,000	9,610	2	4	10	--	--	94	96	98		100	BN
June 8	10:50 a. m.	2,550	2,980	1,810	31	42	58	75	87	92	95	98		100	BW
June 16	6:40 p. m.	562	721	1,449	54	77	90	94	98	99	100	--		--	BWC
June 21	3:40 p. m.	278	304	603	30	38	55	65	82	91	96	98		100	BW
June 29	2:30 p. m.	1,210	4,440	1,610	43	60	72	80	88	94	97	98		99	BW
July 1	4:10 p. m.	272	400	284	66	82	95	--	--	--	--	--		--	BWC
July 22	3:55 p. m.	58	204	392	28	32	51	65	80	89	95	98		100	BW
Aug. 2	6:00 p. m.	36	95	284	14	18	37	62	78	90	96	98		100	BW
Aug. 12	3:35 p. m.	106	1,600	1,280	36	52	76	91	97	98	98	99		100	BW
Aug. 13	11:15 a. m.	63	650	464	47	68	87	96	98	99	100	--		--	BW
Aug. 15	10:25 a. m.	706	16,200	6,290	36	61	82	93	96	98	98	100		--	BW
Aug. 16	8:30 a. m.	214	1,880	1,110	42	66	82	90	94	98	98	100		--	BW
Aug. 18	7:30 p. m.	170	1,840	1,270	45	69	87	94	96	98	98	100		--	BW
Aug. 18	7:50 a. m.	157	2,580	3,410	43	66	88	96	98	98	98	99		--	BW
Aug. 19	9:00 a. m.	132	1,840	1,150	49	64	89	96	98	98	98	99		100	BW
Aug. 20	8:45 a. m.	478	6,820	2,630	42	70	92	95	97	98	99	100		--	BW
Aug. 20	8:45 a. m.	478	6,820	2,350	8	16	57	96	96	98	99	100		--	BN

KANSAS RIVER BASIN--Continued

SMOKY HILL RIVER NEAR ELLIS, KANS.--Continued

Particle-size analyses of suspended sediment, February to September 1949--Continued

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment													Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Aug. 20, 1949	9:00 p. m.	410	3,820	2,580	48	73	89	96	96	97	98	100				BW
Aug. 21	8:30 a. m.	580	4,230	2,550	45	60	75	85	93	98	99	100			--	BW
Aug. 21	7:50 p. m.	690	4,040	2,910	37	58	72	84	91	96	96	98		100		BW
Aug. 22	8:00 a. m.	556	2,210	742	38	42	60	74	86	92	96	98		100		BW
Aug. 22	8:30 p. m.	445	1,150	715	45	63	78	88	93	97	98	100		--		BW
Aug. 23	8:45 a. m.	324	1,150	705	35	44	54	71	80	95	99	100		--		BW
Aug. 25	2:00 p. m.	180	431	314	57	69	80	86	94	97	98	100		--		BW
Aug. 31	5:30 p. m.	163	1,030	642	50	64	85	88	92	96	98	100		--		BW
Sept. 1	11:00 a. m.	172	1,120	1,120	42	58	72	84	92	95	98	99		100		BW
Sept. 2	4:15 p. m.	157	1,500	2,070	30	56	72	84	92	96	98	98		100		BW
Sept. 2	4:15 p. m.	157	1,500	2,060	8	14	38	87	92	96	98	98		100		BN
Sept. 2	7:00 p. m.	152	1,830	1,200	43	56	72	82	90	94	96	--		--		BN
Sept. 4	9:30 a. m.	508	2,940	933	35	50	62	78	88	94	96	99		100		BW
Sept. 4	9:30 a. m.	508	2,940	1,040	19	47	58	75	85	92	94	98		100		BN
Sept. 5	10:30 a. m.	562	2,870	989	32	44	59	70	82	92	95	98		100		BW
Sept. 5	10:30 a. m.	562	2,870	935	23	41	73	85	91	95	96	99		100		BN
Sept. 6	10:10 a. m.	440	1,870	1,280	38	55	69	83	90	95	96	99		100		BW
Sept. 7	9:30 a. m.	340	1,000	649	36	42	55	69	82	90	95	96		98		BW
Sept. 8	9:20 a. m.	306	902	586	36	46	58	72	84	90	94	96		100		BW
Sept. 9	5:30 p. m.	240	458	30	38	53	66	82	90	94	97	97		100		BW
Sept. 19	8:55 a. m.	100	420	811	47	65	84	97	100	--	--	--		--		BW

KANSAS RIVER BASIN--Continued

ROSE CREEK NEAR WALLACE, KANS.

LOCATION.--At gaging station at bridge, 1 mile above mouth and 2½ miles southwest of Wallace, Wallace County.
 RECORDS AVAILABLE.--Chemical analyses: April to September 1949.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, April to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate	
Apr. 4, 1949	56	7.0	423	26	0.02	49	8.0	39		238	28	4.6	1.2	7.9	--	308	0.42		156	0	35
Apr. 7	24	7.6	441	25	.02	50	10	36		242	31	4.4	1.3	4.0	--	310	.42		166	0	32
Apr. 11	44	7.9	451	27	.02	48	11	40		246	34	6.5	1.2	3.0	--	283	.38		165	0	34
May 2	4.0	7.3	448	26	.02	49	9.0	43		250	33	4.4	1.3	3.6	--	306	.42		160	0	37
May 16	4.0	7.6	432	26	.02	49	12	36		250	31	5.0	1.2	2.6	--	294	.40		172	0	31
May 29	37	7.1	301	26	.02	42	3.5	19		176	12	.0	.6	3.1	--	214	.29		120	0	26
June 5																					
June 27	256	7.1	264	22	.02	38	3.5	15		153	12	.0	.5	2.8	--	182	.25		110	0	23
Aug. 11	5.0	7.6	488	30	.02	51	9.8	44		247	42	7.0	1.3	5.4	0.38	309	.42		168	0	36
Aug. 11	3.0	8.4	458	31	.05	47	12	37		1/233	39	6.0	1.2	4.2	--	301	.41		167	0	32
Aug. 15	7.3	7.3	422	29	.06	47	8.3	40		222	37	9.8	1.0	3.8	.30	288	.39		154	0	36
Sept. 4	8.0	7.8	554	37	.02	66	13	43		294	50	9.0	1.2	4.2	--	368	.50		218	0	39

L/Includes equivalent of 8 parts per million carbonate (CO₃).

1/Includes equivalent of 8 parts per million carbonate (CO₃).

KANSAS RIVER BASIN--Continued
SALINE RIVER NEAR RUSSELL, KANS.

LOCATION.---At gaging station at bridge on U. S. Highway 281, 2 miles downstream from Salt Creek, and 5 miles north of Russell, Russell County.
DRAINAGE AREA.--1,502 square miles.

RECORDS AVAILABLE.--Chemical analyses: January 1946 to September 1949.

Water temperatures: January 1946 to September 1949.

Sediment records: May 1946 to September 1949.

EXTREMES, 1948-49.--Specific conductance: Maximum, 5,270 micromhos Oct. 11; minimum, 341 micromhos Feb. 20.

Water temperatures: Maximum, 78°F July 7; minimum, freezing point on many days in December, January, and February.

Sediment concentrations: Maximum daily, not determined; minimum, daily, not determined.

Sediment loads: Maximum daily, 21,000 tons June 9; minimum daily, less than 1 ton on many days.

EXTREMES, 1946-49.--Dissolved solids (1946-47): Maximum, 4,200 ppm Sept. 18-30, 1947; minimum, 367 ppm June 5-14, 1947.

Total hardness (1946-47): Maximum, 378 ppm Sept. 18-30, 1947; minimum, 186 ppm Oct. 1-10, 1946.

Specific conductance: Maximum, 11,000 micromhos June 19, 1946; minimum, 203 micromhos Oct. 9, 1946.

Water temperatures: Maximum, 80°F July 8, 1947; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, not determined; minimum daily, not determined.

Sediment loads: Maximum daily, 112,000 tons Oct. 9, 1946; minimum daily, less than 1 ton on many days each year.

REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boron (B)	Dissolved solids		Hardness as CaCO ₃	
																Parts per million	Tons per acre-foot	Total	Non-carbonate
Oct. 1-31, 1948----	15.8	8.1	4,780	18	0.02	194	72	774	7.2	292	494	1,240	0.5	3.1	0.37	2,950	4.01	780	541
Nov. 1-30-----	25.0	8.1	3,810	20	.02	182	57	575	6.0	305	414	932	.5	2.7	.27	2,340	3.18	588	338
Dec. 1-Jan. 3, 1949	21	7.7	3,400	22	.02	132	53	521	13	100	428	785	.4	2.3	.47	2,040	2.77	116	548
Feb. 10-12-----	244	7.9	704	16	.02	61	9.5	55	8.0	140	72	97	.4	4.3	--	428	.58	279	191
Feb. 13-14-----	500	7.8	535	15	.06	54	8.5	36	9.6	152	60	53	.4	3.0	.15	332	.45	448	170
Feb. 15-17-----	250	7.7	793	12	.20	58	9.0	88	10	132	77	124	.2	2.4	.10	472	.64	319	162
Feb. 18-20-----	1,566	7.5	410	14	.04	48	5.1	19	10	146	35	32	.2	1.6	.15	256	.35	1,080	141
Feb. 21-23-----	575	8.2	--	14	--	48	9.0	19	11	142	42	39	.1	2.0	--	292	.40	453	157
Feb. 24-25-----	1,270	7.9	370	20	--	83	9.0	15	14	165	34	29	.3	3.7	--	284	.39	974	30
Feb. 26-Mar. 8-----	219	7.9	793	22	--	69	9.5	63	14	174	83	95	.2	2.6	--	482	.66	285	211
Mar. 9-31-----	80	8.0	1,930	22	.01	134	28	209	12	250	230	333	.4	2.9	.37	1,100	1.50	238	245
Apr. 1-30-----	54.4	8.1	2,350	16	.01	149	38	280	11	241	298	439	.4	1.4	.35	1,330	1.81	194	529
May 1-31-----	97.1	7.8	1,650	21	.01	120	26	161	14	201	238	264	.4	2.1	.02	932	1.31	252	406
May 3 1/2-----	61	7.3	1,930	19	.03	144	33	217	9.2	214	298	350	.5	2.1	--	1,180	1.60	194	491
June 1-7-----	229	8.2	1,280	27	.20	105	26	139	8.8	190	214	203	.6	4.1	.30	862	1.17	533	369
June 6 1/2-----	276	7.3	1,010	19	.05	112	19	70	11	186	231	100	.5	1.0	--	656	.89	489	358
June 7, 2:35 p.m. 1/	875	7.3	1,080	22	.03	99	19	102	5.6	205	182	135	.4	1.3	--	680	.92	450	325
June 7, 3:50 p.m. 1/	875	7.3	1,080	22	.03	97	17	88	3.2	205	142	126	.4	1.0	--	624	.85	342	144
June 7, 4:30 p.m. 1/	875	7.3	547	21	.03	93	9.5	31	2.8	230	90	37	.3	.0	--	421	.57	--	271
June 7, 5:40 p.m. 1/	875	7.4	716	17	.05	96	10	39	3.2	178	118	78	.4	.2	--	484	.67	--	281
June 7, 9:05 p.m. 1/	875	7.5	602	16	.03	86	9.9	226	3.6	164	120	35	.4	.5	--	394	.54	--	255

1/Not included in weighted average.

June 8-11-----	1,230	8.0	528	30	.06	64	6.7	26	7.2	151	64	43	.3	1.8	.20	350	.48	1,160	187	63	22
June 8, 2:00 a. m. 1/	1,420	7.6	679	17	.03	78	12	44	6.4	168	103	66	.5	1.3	--	422	.57	--	244	106	27
June 8, 6:45 a. m. 1/	1,420	7.5	587	15	.03	75	10	29	4.4	156	91	46	.3	1.0	--	372	.51	--	228	100	21
June 8, 12:35 p. m. 1/	1,420	7.4	620	18	.05	82	9.5	31	5.6	156	104	54	.3	1.0	--	400	.54	--	244	116	21
June 8, 7:15 p. m. 1/	1,420	7.4	654	20	.03	82	8.5	36	8.8	174	88	63	.3	1.7	--	418	.57	--	240	97	24
June 9 1/-----	1,690	7.4	581	19	.04	79	9.0	20	10	180	80	40	.3	1.2	--	378	.51	1,720	234	86	15
June 10 1/-----	1,170	7.6	478	19	.03	67	7.0	16	4.8	164	58	30	.2	1.0	--	308	.42	973	186	62	15
June 11 1/-----	544	7.6	621	16	.03	78	11	33	5.2	160	96	54	.3	1.9	--	408	.55	710	240	109	23
June 12, 20-----	597	8.0	677	30	.14	75	11	40	7.6	170	90	56	.4	1.9	.20	448	.61	722	233	94	26
June 12, 7:10 a. m. 1/	426	7.9	736	30	.03	84	13	46	7.6	176	124	73	.3	2.2	--	468	.64	--	249	119	29
June 12, 8:35 p. m. 1/	426	7.8	783	16	.04	84	13	53	12	176	124	73	.3	2.2	--	468	.64	--	249	119	29
June 16 1/-----	728	7.7	573	17	.04	63	10	32	4.8	148	72	56	.3	2.3	--	355	.48	694	263	174	25
June 19 1/-----	370	7.7	960	17	.03	98	15	65	6.8	200	137	110	.3	1.4	--	604	.82	603	306	142	32
June 21-July 1-----	286	8.0	874	26	.06	85	9.5	71	8.4	182	114	108	.4	2.0	.20	562	.76	434	251	102	37
June 22 1/-----	195	7.8	1,220	22	.02	113	20	103	222	178	161	161	.4	4.2	--	824	1.12	--	365	183	39
July 2-31-----	81	8.1	1,910	28	.06	132	24	226	9.2	220	220	344	.4	2.3	.20	1,100	1.50	241	428	248	53
Aug. 1-21-----	32	7.5	3,230	22	.04	164	49	461	9.6	250	402	700	.5	1.0	.38	1,930	2.62	137	611	406	62
Aug. 22-Sept. 6-----	56	7.5	1,290	24	.05	82	21	154	8.4	200	168	226	.5	1.4	.20	800	1.09	121	291	127	53
Sept. 7-----	307	7.4	609	11	.40	60	5.7	466	61	157	66	76	.2	1.4	--	384	.52	318	173	44	43
Sept. 8-30-----	29	7.7	3,070	22	.04	149	44	466	4.8	260	372	680	.5	1.0	.30	1,870	2.54	146	553	340	64
Weighted average 2/	3/129	--	1,170	23	0.07	88	17	119	9.8	4/183	140	202	0.3	2.2	0.21	702	0.95	245	290	140	46

1/Not included in weighted average.

2/Weighted average for period sampled only.

3/Mean discharge for water year was 118 second-feet.

4/Includes carbonate as bicarbonate.

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR RUSSELL, KANS.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 (Once-daily temperature measurement between 6 a. m. and 9 a. m.)

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	53	52	33	33	--	33	39	54	67	76	72	55
2	56	46	34	32	--	35	41	56	65	76	64	61
3	56	40	35	34	--	36	39	65	65	76	67	66
4	54	54	45	--	--	37	43	69	66	75	66	68
5	57	45	34	--	--	41	44	64	65	75	63	68
6	56	39	33	--	--	41	59	60	68	76	68	68
7	44	40	33	--	--	40	52	59	70	78	71	64
8	44	40	34	--	--	--	57	58	67	77	70	61
9	48	34	32	--	--	34	49	54	68	76	70	62
10	48	45	33	--	33	34	44	55	68	71	71	63
11	41	39	34	--	34	35	44	59	71	74	--	65
12	44	38	33	--	33	35	48	61	71	73	--	70
13	49	36	33	--	33	36	53	62	73	74	--	56
14	46	39	35	--	33	36	45	61	70	71	--	59
15	52	40	34	--	33	33	44	64	69	69	--	56
16	48	45	33	--	33	34	47	64	68	71	--	58
17	40	41	33	--	34	33	54	61	72	72	--	63
18	40	40	33	--	34	34	50	62	75	72	--	60
19	42	--	33	--	33	38	52	64	72	73	--	57
20	47	33	33	--	33	44	49	63	74	73	--	60
21	47	34	33	--	33	50	53	57	76	72	--	60
22	45	33	33	--	34	40	55	58	76	70	--	54
23	42	34	33	--	34	47	57	63	75	74	--	54
24	41	39	33	--	34	49	62	60	74	74	--	58
25	44	39	33	--	34	43	61	--	73	72	--	55
26	46	43	33	--	34	46	63	65	74	72	--	54
27	47	39	33	--	34	41	56	66	75	70	--	55
28	51	42	34	--	34	46	54	69	74	71	--	54
29	55	--	32	--	--	45	57	67	73	74	--	52
30	46	33	34	--	--	43	59	66	75	69	--	51
31	46	--	32	--	--	47	--	73	--	71	--	--
Average	48	40	34	--	--	40	51	62	71	73	--	60

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR RUSSELL, KANS.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	16			19	48	2	27		
2-----	15			19	20	1	27		
3-----	15			19	23	1	27		
4-----	15			19	57	3	26		
5-----	15			20	70	4	27		
6-----	18			22	25	1	26		
7-----	16			22	16	(i)	25		
8-----	16			22	22	1	24		
9-----	15			22	20	1	23	51	3
10-----	15			22	17	1	20		
11-----	15			22			23		
12-----	15			21			22		
13-----	15			19			25		
14-----	15			19			24		
15-----	15			19			24		
16-----	15	16	(i)	20	9	(i)	20		
17-----	15			20			17		
18-----	15			21			21		
19-----	15			37			20		
20-----	15			44	20	2	20		
21-----	15			46	31	4	24		
22-----	15			37	37	4	22		
23-----	16			28	77	6	24		
24-----	16			25	38	3	20	43	2
25-----	17			25	12	(i)	18		
26-----	17			26	9	(i)	18		
27-----	17			29	15	1	18		
28-----	18			31	31	3	18		
29-----	18			27	60	4	17		
30-----	18			28	56	4	16		
31-----	18			--	--	--	15		
Total--	491	--	21	750	--	52	678	--	78
Day	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----		41					217	682	400
2-----		31					185	508	254
3-----		22		10	--	(i)	171	450	208
4-----		--					168	392	178
5-----		--					155	373	156
6-----	15	--	(i)				146	280	110
7-----		10		20	--	2/7	134	240	87
8-----		7		30	--	2/14	127	212	73
9-----		--		30	--	2/10	116	141	44
10-----		--		180	172	84	110	110	33
11-----		--		250	317	214	102	84	23
12-----		--		300	551	446	98	62	16
13-----		--		600	502	813	91	52	13
14-----		--		400	248	268	87	48	11
15-----		--		250	157	106	83	58	13
16-----	10	--	2/2	200	149	80	79	50	11
17-----		--		300	--	2/400	75	40	8
18-----		--		1,800	--	2/8,200	71	68	13
19-----		--		1,230	1,480	3/4,880	71	88	17
20-----		145		1,660	805	3/3,620	90	264	64
21-----		--		829	277	3/661	81	153	33
22-----		--		426	550	633	74	70	14
23-----	30	--	2/20	470	1,130	3/1,570	68	43	8
24-----	100	--	2/55	1,610	3,980	3/18,900	66	35	6
25-----	60	--	2/24	939	3,830	3/9,600	66	28	5
26-----	40	--	2/11	500	2,980	3/4,060	71	28	5
27-----	30	--	2/5	342	1,940	1,790	67	13	2
28-----	25	--	2/1	262	1,090	771	67	12	2
29-----	20	--	(i)	--	--	--	66	4	(i)
30-----	15	--	(i)	--	--	--	67	8	1
31-----	10	--	(i)	--	--	--	66	15	3
Total--	600	--	148	12,688	--	57,130	3,135	--	1,810

(i) Sediment load less than 1.0 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR RUSSELL, KANS.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	75	30	6	70	--	2/160	84	471	107
2-----	79	108	23	74	1,130	226	91	600	147
3-----	78	82	19	61	328	54	85	368	83
4-----	74	82	16	54	148	22	91	352	86
5-----	71	72	14	49	128	17	102	--	2/360
6-----	67	62	11	55	--	2/130	276	4,280	3/3,670
7-----	62	52	9	83	839	188	875	4,190	3/15,900
8-----	58	53	8	77	567	118	1,420	4,190	3/16,400
9-----	56	88	13	71	405	78	1,690	4,620	3/21,000
10-----	56	89	13	62	300	50	1,170	3,260	3/10,600
11-----	52	69	10	62	203	34	644	2,050	3,560
12-----	50	87	12	58	170	27	426	1,380	1,590
13-----	51	123	17	56	162	24	396	990	1,080
14-----	63	198	34	52	150	21	856	3,520	3/8,550
15-----	55	125	18	51	162	22	1,510	4,900	3/20,600
16-----	54	95	14	200	--	2/2,200	728	2,490	3/5,080
17-----	49	79	10	107	1,820	3/617	455	1,230	1,510
18-----	46	85	10	132	1,360	3/515	333	740	865
19-----	45	90	11	166	1,700	762	370	--	2/2,300
20-----	45	50	6	136	1,770	650	298	1,020	2/875
21-----	44	50	6	195	2,600	3/1,200	227	420	257
22-----	46	66	8	212	4,000	3/2,600	195	380	200
23-----	48	45	6	168	2,060	3/988	242	--	2/800
24-----	46	68	8	138	917	342	187	800	404
25-----	43	58	7	115	705	219	162	415	182
26-----	41	69	8	101	516	141	309	--	2/2,700
27-----	44	67	8	90	385	94	230	2,030	1,260
28-----	43	88	10	85	273	63	321	--	2/4,600
29-----	43	77	9	80	230	50	800	--	2/16,000
30-----	48	122	16	76	248	51	295	2,150	3/1,850
31-----	--	--	--	74	229	46	--	--	--
Total-	1,632	--	360	3,010	--	11,710	12,868	--	142,400
Day	July			August			September		
	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day	Mean discharge (second-foot)	Mean concentration (ppm)	Tons per day
1-----	178	780	375	49	215	28	30	40	3
2-----	138	382	142	43	160	18	28	48	4
3-----	122	287	94	39	50	5	27	68	5
4-----	112	242	73	36	49	5	29	110	9
5-----	104	226	63	34	38	3	27	26	2
6-----	98	230	61	32	58	5	52	--	2/500
7-----	91	195	48	31	57	5	307	--	2/4,600
8-----	115	--	2/380	29	57	4	84	383	87
9-----	101	675	184	28	50	4	51	55	8
10-----	128	--	2/600	27	17	1	40	50	5
11-----	127	1,320	2/469	27	14	1	36	128	12
12-----	97	435	114	26	15	1	33	58	5
13-----	91	325	80	25	48	3	32	13	1
14-----	85	261	60	25	55	4	32	10	(i)
15-----	80	270	58	25	32	2	30	14	1
16-----	79	264	56	29	36	3	29	28	2
17-----	78	228	48	29	25	2	27	18	1
18-----	70	210	40	32	22	2	27	11	(i)
19-----	63	208	35	27	20	1	25	29	2
20-----	57	176	27	24	41	3	25	38	3
21-----	55	180	27	59	--	2/700	23	37	2
22-----	50	178	24	175	4,080	3/2,030	23	21	1
23-----	48	124	16	116	1,780	3/572	22	19	1
24-----	44	122	14	87	1,000	235	21	18	1
25-----	40	129	14	67	565	102	20	18	(i)
26-----	39	143	15	55	290	43	19	15	(i)
27-----	41	196	22	50	279	38	18		
28-----	39	121	13	42	100	11	17		
29-----	90	--	2/550	37	72	7	17		
30-----	84	1,330	302	34	53	5	16	--	--
31-----	62	384	64	32	62	5	--	--	--
Total-	2,606	--	4,070	1,371	--	3,850	1,167	--	5,280
Total discharge for year (second-foot-days)-----									42,996
Total load for year (tons)-----									226,900

(i) Sediment load less than 1.0 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued
SALINE RIVER NEAR RUSSELL, KANS.--Continued

Particle-size analyses of suspended sediment, February to September 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; F, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350	0.500
Feb. 19, 1949	10:45 p. m.	1,100	1,310	964	31	44	58	67	72	76	79	81		83	BN
Feb. 24	4:50 p. m.	2,130	4,030	2,230	22	33	48	62	68	82	84	85		86	BN
May 16	6:35 a. m.	200	4,540	1,180	34	46	62	79	88	92	96	97		98	BN
May 16	6:35 a. m.	200	4,540	1,120	12	18	58	90	94	96	97	98		100	BN
May 19	7:20 a. m.	187	1,740	1,140	34	49	66	82	88	94	96	97		98	BN
May 22	6:30 p. m.	282	3,830	1,240	36	50	66	80	88	92	96	97		98	BN
May 22	6:30 p. m.	282	3,830	1,350	10	16	48	82	86	90	94	96		98	BN
May 23	6:20 p. m.	138	1,300	1,050	32	46	66	78	85	92	94	96		98	BN
June 2	7:10 a. m.	95	688	421	31	44	57	70	79	86	92	94		98	BW
June 6	6:30 a. m.	386	5,420	1,850	3	7	36	80	86	91	94	96		97	BN
June 7	5:50 p. m.	2,670	8,210	3,640	20	26	42	53	67	78	84	88		93	BN
June 8	3:10 a. m.	1,860	5,440	3,850	37	46	68	77	86	92	94	95		97	BW
June 8	1:510	1,880	4,000	1,880	32	44	62	74	82	88	92	96		97	BW
June 9	8:15 a. m.	1,860	4,600	2,930	39	53	67	76	84	90	94	95		97	BW
June 14	3:15 p. m.	1,000	4,390	3,330	33	44	56	64	70	76	82	84		90	BW
June 15	10:15 a. m.	1,790	5,720	1,610	17	28	53	67	76	82	86	88		94	BN
June 15	10:15 a. m.	1,790	5,720	1,740	16	28	31	66	76	84	89	94		96	BN
June 22	8:45 a. m.	195	380	824	35	49	64	72	78	80	85	--		--	BW
June 29	6:45 a. m.	856	8,360	3,010	36	52	70	83	92	95	96	98		98	BW
June 29	6:45 a. m.	856	8,360	3,060	6	9	53	89	92	94	96	98		98	BN
July 1	2:05 p. m.	168	614	289	34	42	53	66	79	86	90	91		94	BW
July 11	7:15 a. m.	136	1,520	930	41	60	80	86	90	94	94	94		99	BW
July 22	8:00 p. m.	48	202	440	40	42	54	63	73	78	85	91		99	BW
July 30	7:05 a. m.	91	1,600	998	50	70	88	94	96	96	98	99		100	BW

KANSAS RIVER BASIN--Continued
SALINE RIVER NEAR RUSSELL, KANS.--Continued

Particle-size analyses of suspended sediment February to September 1949--Continued

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment													Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
Aug. 22, 1949	7:10 a. m.	207	4,740	1,490	41	46	53	68	86	95	98	99		100		BW
Aug. 22	7:10 a. m.	207	4,740	1,400	16	28	66	93	96	--	--	--		--	--	BN
Aug. 22	12:30 p. m.	178	3,660	1,080	43	62	80	90	95	97	98	100		--	--	BW
Aug. 22	12:30 p. m.	178	3,660	1,070	18	38	68	86	92	94	98	100		--	--	BN
Aug. 23	7:25 a. m.	123	1,980	1,080	38	52	68	79	90	92	96	98		100		BW
Aug. 24	7:35 a. m.	91	1,060	744	54	64	80	87	93	96	98	99		100		BW
Aug. 25	7:15 a. m.	71	638	437	60	67	88	92	96	98	99	100		--	--	BW
Sept. 7	7:35 a. m.	500	5,320	3,370	30	45	62	76	86	92	96	98		100		BW
Sept. 8	7:40 a. m.	88	367	277	48	60	71	86	90	94	98	99		100		BW

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR WILSON, KANS.

LOCATION.--At highway bridge just downstream from gaging station which is three-quarters of a mile upstream from Hell Creek and 8 miles northwest of Wilson, Ellsworth County, 900 square miles.

DRAINAGE AREA.--900 square miles.

RECORDS AVAILABLE.--Chemical analyses: February 1948 to September 1949.

Water temperatures: March 1948 to September 1949.

EXTRIMES 1948-49.--Specific conductance: Maximum, 8,000 micromhos Oct. 17; minimum, 386 micromhos Feb. 21.

Water temperatures: Maximum 91°F Aug. 16; minimum, freezing point on several days during November to March.

EXTRIMES, February 1948 to September 1949.--Specific conductance: Maximum, 8,210 micromhos May 22, 24, 26, 28, 29, 1948; minimum, 386 micromhos Feb. 21, 1949.

Water temperatures: Maximum 91°F Aug. 16, 1949; minimum, freezing point on several days during months.

REMARKS.--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids			Hardness as CaCO ₃	
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate
Oct. 1-31, 1948----	22.2	8.0	6,870	12	0.03	166	95	1,340	14	311	716	2,020	0.5	2.7	--	4,520	6.15	268	805	550
Nov. 1-Dec. 20----	34	8.1	5,260	25	.02	165	66	885	6.4	322	512	1,320	.4	2.4	0.38	3,140	4.27	288	541	277
Feb. 8-Mar. 5, 1949	668	7.9	5,58	16	.10	63	8.5	34	7.2	176	53	54	.2	3.0	.03	338	.49	646	192	48
Feb. 19 1/3-----	1,600	7.3	447	14	.06	56	7.6		26	156	48	34	.3	1.3	.02	286	.39	1,240	171	43
Mar. 6-31-----	126	8.1	2,350	22	.01	108	30	316	15	262	248	1,465	.4	3.6	.30	1,340	1.82	456	393	178
Apr. 1-30-----	70.8	7.5	3,340	14	.02	112	47	527	13	180	372	800	.5	1.4	.30	1,980	2.69	380	473	317
May 1-16-----	79	8.2	3,010	21	.02	142	43	442	8.8	2,232	348	662	1.4	2.7	.35	1,800	2.45	384	532	325
May 17-----	191	7.7	2,030	25	.04	117	28	274		240	250	382	.8	5.7	.20	1,200	1.63	619	407	210
May 18-----	152	7.7	1,330	24	.10	114	20	141		200	234	184	1.0	4.5	.20	872	1.19	358	367	203
May 19-21-----	180	8.3	1,400	25	.08	112	22	144	9.2	3,206	204	227	1.4	6.1	.30	886	1.20	431	370	201
May 22-----	473	7.5	1,180	26	.08	123	16	110		282	174	140	.8	.0	.20	762	1.04	973	373	142
May 23-27-----	185	8.1	1,400	27	.05	117	23	146	9.6	200	210	223	.3	4.9	.30	923	1.26	461	387	223
May 28-June 6-----	108	8.1	2,480	27	.05	128	37	376	10	240	286	540	.4	4.8	.20	1,530	2.08	446	472	275
June 7-----	938	7.4	938	25	.16	100	17			196	172	98	.4	3.7	--	628	.85	549	320	189
June 8-10-----	1,880	7.7	580	25	.20	76	8.7	34	8.0	194	74	48	.4	3.2	.30	396	.54	2,010	226	67
June 8 1/3-----	2,010	7.3	667	20	.02	84	8.8	39	7.6	196	114	50	.4	1.9	--	483	.59	2,350	246	85
June 11-14-----	699	7.8	986	23	.03	83	10	43	10	180	100	43	.6	2.5	.20	458	.62	860	248	92
June 15-16-----	1,064	7.3	1,064	23	.08	93	12	28	11	208	130	145	.5	4.7	.30	389	.59	1,170	239	77
June 17-29-----	332	7.9	1,064	23	.08	93	12	28	11	208	130	145	.5	4.7	.30	389	.59	1,170	239	77
June 30-----	885	7.3	716	29	.10	97	12	48		262	90	60	.2	2.2	--	504	.69	1,200	292	77

1/Not included in weighted average.

2/Includes equivalent of 6 parts per million of carbonate (CO₃).

3/Includes equivalent of 10 parts per million of carbonate (CO₃).

KANSAS RIVER BASIN--Continued
SALINE RIVER NEAR WILSON, KANS.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949 --Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Boiron (B)	Dissolved solids			Hardness as CaCO ₃		Percent sodium
																Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate	
July 1-31, 1949 ----	114	8.3	2,390	48	0.05	120	34	358	11	4/212	278	532	0.5	4.5	0.30	1,490	2.03	459	440	266	63
Aug. 1-22 -----	43	7.5	5,010	22	.02	145	62	890	12	254	512	1,260	.5	1.7	.30	3,030	4.12	352	617	409	75
Aug. 23-Sept. 6 ---	61	8.1	2,860	21	.02	100	40	437	11	228	290	640	.5	3.0	.30	1,660	2.26	274	414	227	69
Sept. 7-12 -----	123	7.5	3,360	18	.04	132	45	552	5.6	254	368	770	.4	2.1	.30	2,020	2.75	671	515	307	70
Sept. 13-30 -----	33	8.0	5,330	18	.02	132	68	943	9.6	286	548	1,390	.5	1.7	.54	3,270	4.45	291	659	424	75
Weighted average ^{5/}	5/167	---	1,540	23	0.06	92	22	205	9.1	208	171	304	0.4	3.3	0.20	952	1.29	429	320	149	57

^{4/}Includes equivalent of 4 parts per million of carbonate (CO₃).

^{5/}Weighted average for period sampled only.

^{6/}Mean discharge for water year was 148 second-feet.

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR WILSON, KANS.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 7 a. m. and 7 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	62	55	36	--	--	41	44	64	85	79	83	70
2	68	--	--	--	--	36	--	76	82	88	84	78
3	69	--	41	--	--	39	41	74	67	85	83	80
4	61	53	42	--	--	50	44	73	68	--	85	70
5	65	46	39	--	--	47	60	79	67	79	84	68
6	57	49	40	--	--	50	57	63	80	79	86	75
7	48	--	--	33	--	46	--	61	74	82	87	67
8	65	41	40	--	32	44	--	63	68	79	79	62
9	--	43	33	--	--	37	55	57	70	78	77	68
10	61	47	33	--	33	36	--	58	69	75	81	66
11	57	43	33	--	34	37	51	77	77	75	--	69
12	64	39	39	--	32	38	59	80	75	85	65	71
13	--	38	37	--	32	37	62	69	73	88	90	69
14	65	43	--	--	--	38	--	72	72	79	75	67
15	--	51	35	--	33	32	50	67	74	84	87	--
16	55	--	32	--	32	35	59	64	71	87	91	72
17	55	47	32	--	34	32	--	67	81	84	--	69
18	--	41	--	--	34	34	57	65	78	89	82	66
19	60	--	--	--	--	44	55	67	75	--	72	--
20	64	32	33	--	32	49	52	64	80	75	--	77
21	61	35	--	--	32	46	--	63	85	75	75	62
22	60	33	--	--	33	46	--	62	78	--	88	--
23	41	38	--	--	35	49	69	65	81	86	--	--
24	58	38	--	--	37	56	78	--	76	82	70	68
25	61	41	--	--	33	46	71	78	87	77	68	72
26	62	46	--	--	34	51	66	81	81	77	--	--
27	62	39	--	--	34	59	63	77	80	86	77	66
28	54	41	--	--	34	52	67	72	78	--	78	--
29	62	34	--	32	--	46	69	71	--	74	--	67
30	--	37	--	--	--	48	63	72	78	83	77	59
31	--	--	--	--	--	43	--	78	--	87	73	--
Average	60	42	--	--	--	43	--	69	76	81	80	69

KANSAS RIVER BASIN--Continued

SALINE RIVER NEAR WILSON, KANS.--Continued

Periodic determinations of suspended-sediment discharge, February 1948 to September 1949

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)
Feb. 19, 1948 -----	40	1,450	157
Mar. 17-----	82	463	102
Mar. 17-----	82	444	98
Mar. 31-----	50	220	30
Apr. 27-----	36	168	16
June 8 -----	33	343	30
June 28 -----	798	6,580	14,200
Aug. 24 -----	74	57	11
Aug. 29 -----	59	96	15
Oct. 2 -----	22	24	1.4
Apr. 1, 1949 -----	87	61	14
May 3-----	95	142	36
June 2 -----	87	260	61
Aug. 2 -----	63	204	35
Sept. 3 -----	36	170	16

LOCATION--At gaging station at bridge on U. S. Highway 281, 4½ miles southeast of Paradise, Russell County.
 DRAINAGE AREA--212 square miles.
 RECORDS AVAILABLE--Chemical analyses: March to September 1947, March to September 1948, February to September 1949.
 Water temperatures: June to September 1947, March to September 1948, February to September 1949.
 Sediment records: June to September 1947, March to September 1948, February to September 1949.

EXTREMES, 1948-49--Water temperatures: Maximum, 85°F July 18.

Sediment concentrations: Maximum daily, 7,540 ppm June 29; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 7,260 tons June 29; minimum daily 0 tons on many days.

EXTREMES, 1947-49--Dissolved solids (1947): Maximum, 1,040 ppm Apr. 25, 1947; minimum, 238 ppm June 25-30, 1947.

Total hardness (1947): Maximum, 700 ppm Apr. 25, 1947; minimum, 168 ppm June 25-30, 1947.

Specific conductance (1947-48): Maximum, 1,590 micromhos May 30, 1947; minimum, 228 micromhos June 16, 1948.

Sediment concentrations: Maximum daily, 13,900 ppm Apr. 10, 1947; minimum daily, no flow on many days each year.

Sediment loads: Maximum daily, 22,200 tons Apr. 10, 1947; minimum daily, 0 tons on many days each year.

REMARKS--Daily samples for chemical analysis composited by discharge. Records of specific conductance of daily samples available in regional office at Lincoln, Nebr. Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Mean dis- charge (second- feet)	pH	Specific conduc- tance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- dium
																	Parts per mil- lion	Tons per acre- foot	Tons per per day	Total	Non- carbon- ate	
Oct. 1-Nov. 13, 1948	1/0	8.0	953	19	0.10	120	17	60	4.4	0	172	280	60	0.2	0.4	0.04	732	0.10	0	370	229	26
Feb. 11, 1949	340	--	298	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 22	20	--	269	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 23, 10:30 a. m.	40	--	323	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 23, 1:45 p. m.	40	--	376	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 24, 8:24 a. m.	110	--	317	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 24, 5:22 p. m.	110	--	326	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Feb. 25-28	30	8.4	377	19	.06	61	4.5	8.1	9.6	6	169	30	2.0	.1	6.5	--	248	34	20	171	23	9
Mar. 1-27	5.0	7.7	623	23	1.10	92	9.8	13	26	1	210	122	12	.1	7.5	.03	420	57	5.7	270	98	9
May 22-23	6.8	7.4	655	18	1.10	95	12	16	26	0	180	167	13	.2	4.5	--	456	62	8.4	287	139	17
May 22	8.6	7.5	604	14	.08	93	14	16	6.8	0	169	166	14	.5	3.7	--	429	58	10	290	151	11
May 24-June 5	7.6	8.4	840	25	.05	132	12	32	12	12	240	216	21	.5	2.9	.30	603	82	12	379	163	15
June 6-9	180	8.4	463	23	.05	80	3.0	8.4	14	10	166	81	4.5	.5	2.4	.30	315	43	153	212	59	7
June 10-18	42	8.4	512	25	.05	80	6.0	14	10	13	178	80	11	.4	5.3	.20	352	48	40	224	57	11
June 19-28	8.0	8.1	755	28	.05	108	12	35	9.6	0	239	170	24	.5	4.8	.30	533	72	12	319	123	19
June 22	8.9	8.0	1,360	20	.02	96	21	167	9.6	0	247	240	166	.1	2.1	.11	884	1.20	21	326	123	53
June 29-July 1	174	8.3	366	25	.08	59	1.2	17	9.6	9	175	26	6.3	.4	3.2	.30	239	.33	112	152	0	18
July 2-15	11	8.6	602	25	.02	87	7.8	24	10	16	204	96	17	.4	5.7	.30	484	.56	12	249	55	17
July 16-31	1.5	8.4	737	24	.02	102	13	31	8.8	10	182	170	27	.5	3.1	.25	518	.70	2.1	308	142	17
Aug. 1-31	1.96	7.7	1,090	25	.02	144	21	58	9.6	0	256	266	63	.2	1.6	.20	758	1.03	2.0	446	236	22
Sept. 1-5	1.7	7.7	1,150	26	.02	146	22	68	7.2	0	251	269	79	.4	1.3	.30	784	1.07	3.6	455	249	24
Sept. 7	7.7	7.4	410	22	.02	69	7.0	7	3.7	0	176	48	3.0	.4	12	.20	282	.38	5.9	201	57	4

1/Practically no flow.

KANSAS RIVER BASIN--Continued

PARADISE CREEK NEAR PARADISE, KANS.--Continued

Chemical analyses, in parts per million, water year October 1948 to September 1949.--Continued

Date of collection	Mean discharge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbo-nate (CO ₃) (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids		Hardness as CaCO ₃		Per-cent so-dium
															Parts per million	Tons per acre-foot	Total	Non-carbonate	
Sept. 8-10, 1949----	1.4	7.9	687	18	0.02	100	14	16	11	0	182	24	0.4	4.6	478	0.65	307	158	10
Sept. 17 -----	1/0	7.5	994	18	.02	141	19	52	0	252	238	61	.4	2.2	704	.96	430	223	21
Sept. 28-30-----	1/0	7.6	1,140	15	.04	135	22	67	14	0	247	83	.4	1.2	784	1.07	438	225	25

1/Practically no flow.

KANSAS RIVER BASIN--Continued

PARADISE CREEK NEAR PARADISE, KANS.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 7 a. m. and 6 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1	--				--	--		--	68	74	76	64
2	51				--	--		--	65	73	74	65
3	--				--	52		--	64	79	68	74
4	--				--	62		--	65	79	75	68
5	--				--	61		--	70	80	72	--
6	--				--	--		--	70	81	78	--
7	--				--	--		--	67	80	72	66
8	--				--	64		--	66	83	80	63
9	--				--	70		--	68	76	71	62
10	--				33	70		--	70	71	74	65
11	--				38	--		--	69	72	78	--
12	--				--	--		--	72	73	77	--
13	--	39			--	--		--	--	75	77	--
14	--				--	69		--	68	72	76	--
15	50				--	--		--	68	67	78	--
16	--				--	--		--	67	68	76	--
17	--				--	60		--	70	75	77	67
18	--				--	35		--	70	85	77	--
19	--				34	--		--	74	84	78	--
20	--				--	--		--	75	80	74	--
21	--				--	--		--	77	73	72	--
22	--				--	43		69	77	82	70	--
23	--				--	--		67	78	76	68	--
24	--				--	50		72	76	84	72	--
25	--				--	--		60	73	78	71	--
26	--				--	--		65	71	80	73	--
27	--				--	46		68	75	72	70	--
28	--				--	--		68	75	74	69	56
29	--				--	--		67	74	78	70	--
30	--				--	--		68	72	71	72	61
31	--				--	--		74	--	74	67	--
Average	--				--	--		--	71	76	74	--

KANSAS RIVER BASIN--Continued

PARADISE CREEK NEAR PARADISE, KANS.--Continued

Suspended sediment water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0	--	0	0	--	0	0.1	35	
2-----	0	--	0	0	--	0	.1	--	
3-----	0	--	0	0	--	0	.1	--	
4-----	0	--	0	0	--	0	.1	--	
5-----	0	--	0	.1	--		.1	--	
6-----	.2	}	(i)	.1	--		.1	--	
7-----	.1			.1	--		.1	--	
8-----	.1			.1	--		.1	--	
9-----	.1			.1	--		.1	--	
10-----	.1			.1	--		.1	--	
11-----	.1			.1	--		.1	--	
12-----	0	--	0	.1	--		.1	--	
13-----	0	--	0	.1	17		.1	--	
14-----	0	--	0	.1	--		.1	--	
15-----	0	--	0	.1	--		.1	--	
16-----	.1	32	(i)	.1	--		.2	--	(i)
17-----	0	--	0	.1	--	(i)	.2	--	
18-----	0	--	0	.1	--		.2	--	
19-----	0	--	0	.5	--		.3	--	
20-----	.1	--	(i)	.4	--		.2	--	
21-----	.1	--	(i)	.3	--		.2	--	
22-----	0	--	0	.2	--		.1	--	
23-----	0	--	0	.2	--		.2	--	
24-----	0	--	0	.2	--		.1	--	
25-----	0	--	0	.2	--		.1	--	
26-----	0	--	0	.2	--		.1	--	
27-----	0	--	0	.3	--		.1	--	
28-----	0	--	0	.3	--		.1	--	
29-----	0	--	0	.1	--		.1	--	
30-----	0	--	0	.1	--		.1	--	
31-----	0	--	0	--	--		.1	--	
Total-	1.0	--	0.1	4.4	--	0.6	3.9	--	0.4
Day	January			February			March		
	Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment		Mean discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.1	}	(i)	0	--	0	9.8	--	2/4.8
2-----	.1			0	--	0	11	145	4.3
3-----	.1			1	--		11	174	5.2
4-----	.3			1	--		11	182	5.4
5-----	.4			2	--	2/.2	11	221	6.6
6-----	.4	}	(i)	3	--		8.6	200	4.6
7-----	.3			4	--		7.0	165	3.1
8-----	.2			30	--	2/32	6.6	121	2.2
9-----	.2			78	--	2/80	5.2	78	1.1
10-----	.2			200	398	215	4.8	36	
11-----	.3	}	(i)	340	585	537	4.1	--	
12-----	1			300	--	2/360	3.9	--	
13-----	1			40	--	2/28	3.4	--	
14-----	1			6	--	2/3.4	3.4	15	
15-----	4			2	--	2/1.0	3.9	--	
16-----	8	}	2/.4	2	--	2/1.0	2.6	--	
17-----	6			180	--	2/260	2.4	12	
18-----	4			800	868	1,870	3.5	25	
19-----	2			350	598	565	2.9	--	
20-----	2			150	301	122	2.7	--	2/.2
21-----	2	}	2/300	45	197	24	2.9	--	
22-----	5			20	837	45	2.6	21	
23-----	163			40	2,140	231	2.3	--	
24-----	30			110	2,030	603	1.9	23	
25-----	15			55	1,470	218	1.7	--	
26-----	8	}	2/.6	25	590	40	2.1	--	
27-----	4			24	--	2/20	2.1	26	
28-----	2			16	--	2/10	2.4	--	
29-----	1			--	--	--	2.1	--	
30-----	0	--	0	--	--	--	2.3	--	
31-----	0	--	0	--	--	--	2.3	--	
Total-	261.6	--	318	2,824	--	5,270	143.5	--	41.7

(i) Sediment load less than 0.1 ton.

2/Estimated.

KANSAS RIVER BASIN--Continued

PARADISE CREEK NEAR PARADISE, KANS.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	2.3	--		11	--	2/5.5	0.8	54	0.1
2-----	2.4	--		11	--	2/6.0	.7	49	.1
3-----	2.6	--		5.2	102	1.4	.8	55	.1
4-----	2.9	--		4.3	69	.8	1.6	77	.3
5-----	2.9	--		3.9	65	.7	80	--	2/1,400
6-----	2.7	--		5.2	--	2/2.0	56	3,450	3/705
7-----	2.4	--		9.2	--	2/7.0	161	4,380	3/2,120
8-----	2.4	--		11	--	2/9.0	263	6,630	3/4,810
9-----	2.4	27		13	--	2/9.5	240	3,360	3/2,400
10-----	2.6	--		7.3	245	4.8	73	1,250	3/271
11-----	2.3	--		5.4	--	2/3.0	48	888	115
12-----	2.3	--		3.9	--	2/1.9	28	840	64
13-----	2.1	--		3.4	--	2/1.4	48	1,450	3/203
14-----	2.1	--		3.2	--	2/1.0	68	1,860	3/354
15-----	1.7	--		10	--	2/32	56	1,480	224
16-----	1.6	--	2/0.2	9.8	--	2/9.0	26	592	42
17-----	1.4	--		5.0	--	2/2.0	17	251	12
18-----	1.3	--		3.1	--	2/1.0	13	158	5.5
19-----	1.3	--		2.7	--	2/.8	12	231	7.5
20-----	1.3	46		13	--	2/90	10	144	3.9
21-----	1.3	--		64	--	2/420	9.8	190	5.0
22-----	1.3	--		8.6	430	3/12	8.9	93	2.2
23-----	1.2	--		5.0	150	2.0	7.8	166	3.5
24-----	1.2	--		3.2	66	.6	6.8	160	2.9
25-----	1.2	--		2.4	86	.6	6.3	128	2.2
26-----	1.2	--		2.1	70	.4	6.0	129	2.1
27-----	1.3	--		1.9	60	.3	5.8	122	1.9
28-----	1.2	--		1.6	51	.2	6.6	145	2.6
29-----	1.2	--		1.2	41	.1	290	7,540	3/7,260
30-----	2.1	--		1.1	47	.1	194	3,750	3/2,280
31-----	--	--	--	1.0	41	.1	--	--	--
Total-	56.2	--	6.0	232.7	--	625	1,744.9	--	22,300

Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	37	1,240	144	0.5			1.7	75	0.3
2-----	18	334	16	.4			1.7	87	.4
3-----	13	210	7.4	.2			1.7	64	.3
4-----	10	201	5.4	.2			1.7	63	.3
5-----	8.6	165	3.8	.2	113	0.1	1.7	63	.3
6-----	7.3	182	3.6	.3			3.4	--	2/18
7-----	6.6	169	3.0	.3			7.7	--	2/70
8-----	5.8	149	2.3	.4			2.6	269	1.9
9-----	23	--	2/100	.4			.7	64	.1
10-----	26	--	2/90	.6			.8	55	.1
11-----	13	624	22	.7			.5	49	.1
12-----	8.3	330	7.4	.7			.2	--	
13-----	6.0	186	3.0	.8			.2	--	(i)
14-----	5.2	104	1.5	.8			.1	--	
15-----	4.5	91	1.1	.9			.1	--	
16-----	3.9	109	1.1	.9			0	--	0
17-----	3.4	99	.9	1.0	81	.2	0	--	0
18-----	2.7	87	.6	1.1			0	--	0
19-----	2.1	106	.6	1.1			0	--	0
20-----	1.7	101	.5	1.2			0	--	0
21-----	1.3	78	.3	1.3			0	--	0
22-----	1.3	74	.2	1.2			0	--	0
23-----	1.1	67	.2	1.2			0	--	0
24-----	1.0	51	.1	1.2			0	--	0
25-----	.9	62	.1	1.3	79	.3	0	--	0
26-----	.9	69	.2	1.9	130	.7	0	--	0
27-----	.9	78	.2	1.8	113	.5	0	--	0
28-----	.8	67	.1	1.8	96	.5	0	--	0
29-----	1.0	66	.2	1.8	79	.4	0	--	0
30-----	1.0	85	.2	1.8	92	.4	0	--	0
31-----	.6	87	.1	1.7	100	.4	--	--	--
Total-	216.9	--	416	29.7	--	7.1	24.8	--	92

Total discharge for year (second-foot-days)----- 5,543.6
 Total load for year (tons)----- 29,080

(i) Sediment load less than 0.1 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued

PARADISE CREEK NEAR PARADISE, KANS.--Continued

Particle-size analyses of suspended sediment, February to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water; W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters										
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500
Feb. 24, 1949	5:15 p. m.	1/110	3,720	2,290	15	20	28	36	48	70	82	90			BN
June 6	8:50 a. m.	69	4,310	2,980	38	52	64	72	79	82	84	90		--	BW
June 6	2:25 p. m.	121	3,060	1,770	35	48	59	67	74	77	79	83		--	BW
June 7	9:45 p. m.	345	5,070	4,740	30	38	48	58	68	84	92	99	100		BW
June 7	9:45 p. m.	345	5,070	4,330	--	10	34	52	65	82	90	94	100		BN
June 8	5:45 p. m.	414	6,480	5,480	23	30	39	46	57	70	77	92		99	BW
June 10	10:55 a. m.	72	1,140	824	45	58	72	80	88	94	96	98	100		BW
June 29	8:30 a. m.	268	18,400	12,500	30	41	56	67	78	88	93	97		98	BW
June 29	3:00 p. m.	414	8,410	3,560	24	33	44	53	67	80	83	88		--	BW
June 29	3:00 p. m.	414	8,410	2,860	12	20	36	53	62	70	89	99	100		BN
June 30	10:30 a. m.	154	3,760	2,740	32	45	58	71	84	90	96	98		99	BW
July 1	7:30 a. m.	44	1,520	1,230	42	60	74	84	92	95	97	99	100		BW
July 10	8:15 a. m.	12	1,888	674	48	68	84	90	94	96	97	99	100		BW
Sept. 7	10:30 a. m.	6	3,320	2,330	38	54	64	78	87	93	96	99		--	BW

1/ Mean daily discharge.

KANSAS RIVER BASIN--Continued
WOLF CREEK NEAR SYLVAN GROVE, KANS.

LOCATION.--At gaging station at bridge 3 miles upstream from mouth and 4½ miles west of Sylvan Grove, Lincoln County.

DRAINAGE AREA.--261 square miles.

RECORDS AVAILABLE.--Water temperatures: February to September 1949.

Sediment records: April 1947 to September 1949.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, 5,860 ppm May 21; minimum daily, not determined.

Sediment loads: Maximum daily, 23,800 tons June 9; minimum daily, less than 1 ton on many days.

EXTREMES, 1947-49.--Sediment concentrations: Maximum daily, 16,600 ppm Apr. 10, 1947; minimum daily, not determined.

Sediment loads: Maximum daily, 36,800 tons Apr. 10, 1947; minimum daily, less than 1 ton on many days each year.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- lids	
																Parts per mil- lion	Tons per acre- foot	Tons per day	Total	Non- carbon- ate		
Oct. 2, 1948 -----	0.6	8.0	7,490	6.5	0.01	91	89	1,540	9.6	222	776	2,000	0.4	2.0	0.62		4,630	6.30		593	411	85
Mar. 18, 1949 -----	6.3	7.9	2,750	19	.04	145	31	427		374	350	522	.3	12	.23		1,690	2.30		490	183	65
May 3 -----	5.2	7.6	2,270	12	.02	111	25	351		261	328	416	.1	2.8	--		1,380	1.88		380	166	67
June 2 -----	4.3	6.9	2,810	19	.02	100	33	459		272	288	608	.1	2.0	--		1,650	2.24		385	162	72
June 7 -----	131	7.0	289	16	.02	45	3.6	6.7		144	8.0	10	.4	1.9	--		186	.25		128	10	10
June 9 -----	2,650	6.9	280	16	.02	44	3.8	8.5		145	21	8	.4	1.0	--		184	.25		126	7	13
June 22 -----	15	7.5	1,600	23	.02	149	22	165		321	256	200	.4	11	--		987	1.34		463	200	44
July 22 -----	2.8	7.1	3,210	11	.05	116	38	629		281	610	670	.4	2.3	--		2,220	3.02		446	216	75
Sept. 19 -----	.7	7.2	4,290	7.2	.05	93	55	933		319	738	1,030	.3	3.7	--		3,020	4.11		463	201	81

KANSAS RIVER BASIN--Continued

WOLF CREEK NEAR SYLVAN GROVE, KANS.--Continued

Temperature (°F) of water, water year October 1948 to September 1949

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					--	33	--	57	--	85	--	--
2					--	34	42	69	76	--	74	--
3					--	--	46	76	--	--	--	76
4					--	--	51	78	69	--	--	--
5					--	--	--	--	--	87	79	71
6					--	--	63	64	75	87	--	--
7				32	--	--	65	61	69	85	--	69
8					--	--	60	61	68	80	77	--
9					32	--	54	62	65	75	75	--
10					32	35	49	66	68	74	81	68
11					35	--	56	68	76	73	--	74
12					--	34	--	--	75	79	--	64
13					--	--	66	69	69	79	--	63
14					--	36	--	69	67	75	80	60
15					--	36	56	70	73	--	83	--
16					--	--	62	87	73	79	82	--
17					--	--	--	69	74	--	--	--
18					34	--	61	76	--	85	--	--
19					--	51	--	63	72	87	75	75
20					32	--	59	80	76	87	77	72
21					32	45	64	59	--	76	--	--
22					35	48	--	63	82	84	--	--
23					36	60	--	65	81	--	75	--
24					35	--	76	65	--	85	77	--
25					36	50	74	70	80	78	77	--
26					34	50	70	--	--	--	73	--
27					34	54	--	72	--	84	70	59
28					34	58	70	74	77	75	71	--
29					--	46	70	--	83	81	--	52
30					--	--	--	68	84	--	74	--
31					--	46	--	76	--	83	72	--
Average					--	--	--	67	--	--	--	--

KANSAS RIVER BASIN--Continued

WOLF CREEK NEAR SYLVAN GROVE, KANS.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.6	--		0.6	--		0.5	18	
2-----	.6	--		.7	--		.5	18	
3-----	.6	--		.7	--		.6	18	
4-----	.6	20		.6	--		.6	--	
5-----	.6	--		.6	--		.6	--	
6-----	.7	26		.6	32		.5	--	
7-----	.8	22		.6	--		.5	17	
8-----	.8	15		.6	--		.5	27	
9-----	.8	14		.5	34		.5	21	
10-----	.8	--		.5	--		.4	--	
11-----	.8	10		.5	13		.5	--	
12-----	.8	--		.5	13		.4	--	
13-----	.8	24		.5	--		.5	12	
14-----	.9	--		.5	13		.5	--	
15-----	.9	40		.5	21		.5	--	
16-----	.9	17	(i)	.5	--	(i)	.4	5	(i)
17-----	1.0	--		.5	--		.6	--	
18-----	1.0	17		.5	--		.5	7	
19-----	.9	--		.6	--		.5	6	
20-----	.8	--		.7	17		.5	6	
21-----	.8	--		.7	--		.5	--	
22-----	.6	--		.7	10		.5	5	
23-----	.5	--		.7	--		.5	--	
24-----	.5	--		.6	16		.5	4	
25-----	.6	--		.6	--		.5	--	
26-----	.6	--		.6	11		.5	--	
27-----	.6	--		.6	--		.5	--	
28-----	.6	--		.6	10		.5	--	
29-----	.8	--		.6	9		.4	--	
30-----	.6	--		.6	8		.4	--	
31-----	.5	25		--	--		.4	--	
Total-	22.4	--	1	17.6	--	(i)	15.3	--	(i)
	January			February			March		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	0.4	--		5	--		15	274	11
2-----	.4	--	(i)	5	--	(i)	14	278	11
3-----		--		5	--		12	--	2/9
4-----		--		5	--		11	--	2/6
5-----		--		10	--		9.4	--	2/3
6-----	.3	32		15	--	2/2	8.7	--	2/1
7-----	.4	43		30	--	2/8	8.0	--	2/1
8-----	.4	20		180	--	2/45	7.5	--	
9-----	.5	--		250	--	2/60	7.1	--	
10-----	.4	--		350	--	2/95	6.7	16	
11-----	.4	--		400	--	2/190	6.5	--	
12-----	.4	--		500	--	2/420	6.3	43	(i)
13-----	.4	--		330	--	2/160	6.2	--	
14-----	.4	92	(i)	220	--	2/100	6.1	47	
15-----	.5	--		140	--	2/65	5.8	60	
16-----	.6	--		40	--	2/30	6.0	--	
17-----	.6	70		200	--	2/460	5.9	--	
18-----	.7	--		1,220	1,520	5,010	5.7	68	2/1
19-----	.8	--		663	690	1,240	6.2	61	
20-----	.7	--		280	310	234	5.9	--	
21-----	.5	--		120	250	81	6.0	42	
22-----	.5	--		80	340	73	6.3	32	
23-----	407	--	2/700	60	520	84	6.0	32	
24-----	580	--	2/300	70	1,040	197	5.6	28	
25-----	120	--	2/30	308	790	657	5.1	24	(i)
26-----	75	--	2/10	109	767	226	5.0	37	
27-----	50	--	2/4	29	675	53	5.2	36	
28-----	30	--	2/2	22	509	30	5.0	17	
29-----	20	--	2/2	--	--	--	4.6	10	
30-----	20	--	2/3	--	--	--	4.3	--	(i)
31-----	10	--	(i)	--	--	--	4.2	8	(i)
Total-	1,322.5	--	1,100	5,640	--	9,520	217.3	--	56

(i) Sediment discharge less than 1.0 ton.

2/Estimated.

KANSAS RIVER BASIN--Continued

WOLF CREEK NEAR SYLVAN GROVE, KANS.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	4.1	18	(i)	5.4	59		4.4	184	2
2-----	4.0			6.0	19		4.4	246	3
3-----	4.1			5.0	13		4.3	--	2/3
4-----	4.0			4.7	12		4.3	292	3
5-----	3.8			4.6	--	(i)	4.6	--	2/4
6-----	3.6			5.0	33		9.7	--	2/11
7-----	3.5			6.0	10		69	2,300	3/563
8-----	3.4	--	(i)	7.4	--		225	5,030	3/4,860
9-----	3.5			12	--	2/2	2,230	4,140	3/23,800
10-----	3.6			13	10		568	1,920	3/2,860
11-----	3.8			9.2	4		39	900	3/107
12-----	3.8			7.4	--		21	494	28
13-----	3.8			6.8	23	(i)	402	4,690	3/4,780
14-----	5.5	--	2/5	6.8	34		155	1,850	3/815
15-----	4.9	370	5	6.8	32		76	1,390	285
16-----	4.0			6.8	29		40	900	97
17-----	3.8			7.1	25		19	350	18
18-----	3.8			9.2	--	2/30	14	--	2/10
19-----	3.8			34	3,730	3/373	35	1,580	3/240
20-----	3.8			9.9	2,080	3/65	19	495	25
21-----	4.1			197	5,860	3/3,220	16	--	2/11
22-----	4.0			72	4,460	2/1,150	15	167	7
23-----	4.0			6.6	1,040	3/28	12	230	7
24-----	3.9	26	(i)	5.9	270	4	11	191	6
25-----	4.0			5.1	193	3	9.9	166	4
26-----	4.0			4.8	--		9.6	148	4
27-----	4.0			4.7	160		8.6	114	3
28-----	4.0			4.6	142	2	8.2	126	3
29-----	4.0			4.4	--		8.4	200	5
30-----	4.3			4.4	145		9.0	187	5
31-----	--	--	--	4.5	183		--	--	--
Total-	118.9	--	16	489.3	--	4,890	4,051.4	--	38,570
	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	6.3	137		2.0	--		1.5	--	
2-----	5.4			1.8	99		1.4	--	
3-----	4.8			1.7	--		1.4	36	
4-----	4.6		2/2	1.6	--		1.4	--	
5-----	4.3	162		1.6	56		1.3	71	
6-----	4.0	155		1.5	--		1.4	--	
7-----	4.0	122	1	1.4	--		1.4	125	
8-----	4.1	187	2	1.4	99		1.4	--	
9-----	180	4,550	3/2,860	1.3	117		1.7	--	
10-----	18	2,020	98	1.4	113		1.4	--	
11-----	5.3	770	11	1.4	--		1.2	--	
12-----	4.6	273	3	1.3	--		1.2	51	
13-----	4.3	183	2	1.3	--		1.1	78	
14-----	3.8	157	2	1.3	104	(i)	1.0	42	
15-----	3.5	160	2	1.3	107		.9	--	
16-----	3.4	141	1	1.4	117		.9	--	(i)
17-----	3.3	121	1	1.4	--		.8	--	
18-----	3.1	117		1.4	158		.8	--	
19-----	3.1	135	1	1.3	154		.8	55	
20-----	2.9	116		1.2	136		.7	55	
21-----	2.7	108		1.2	--		.7	--	
22-----	2.7	110		1.2	--		.7	--	
23-----	2.7	--		1.2	162		.7	--	
24-----	2.6	102		1.2	120		.6	--	
25-----	2.5	87		1.2	95		.6	--	
26-----	2.3	--	(i)	1.3	98		.5	--	
27-----	2.4	77		8.0	2,440	3/71	.5	50	
28-----	2.2	136		3.7	475	5	.5	--	
29-----	2.2	81		3.3	--		.5	53	
30-----	1.8	--		1.7	27	(i)	.5	--	
31-----	2.0	74		1.6	34		--	--	--
Total-	298.9	--	3,000	54.6	--	88	29.5	--	5

Total discharge for year (second-foot-days) ----- 12,283.7
 Total load for year (tons) ----- 57,250

(i) Sediment discharge less than 1.0 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued

WOLF CREEK NEAR SYLVAN GROVE, KANS.--Continued

Particle-size analyses of suspended sediment, January to August 1949
 (Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
 W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350		0.500	1.000
Jan. 23, 1949	2:55 p. m.	574	1,030	451	74	84	91	95	--	--	--	--	--	--	--	BWC
Feb. 19	7:00 p. m.	530	2,475	297	52	72	90	96	98	99	100	--	--	--	--	BN
May 19	3:45 p. m.	19	3,300	2,420	40	53	60	72	80	88	98	99	100	100	100	BW
May 20	8:45 a. m.	8.4	1,600	1,130	60	65	70	75	78	80	82	94	98	98	98	BW
May 20	8:20 a. m.	258	5,680	4,700	36	50	64	77	90	94	96	98	100	100	100	BW
May 21	5:10 p. m.	178	3,750	2,980	30	43	56	71	87	94	95	98	100	100	100	BW
May 21	7:45 p. m.	226	6,780	4,530	24	41	54	71	92	97	99	100	--	--	--	BW
May 22	8:45 a. m.	68	5,570	3,820	38	52	73	85	94	96	98	99	100	100	100	BW
June 7	11:10 p. m.	131	4,330	5,890	34	48	63	77	87	95	98	99	--	--	--	BW
June 8	7:45 p. m.	274	8,980	6,110	22	32	46	58	70	91	94	98	100	100	100	BW
June 9	2:20 p. m.	2,680	3,300	4,530	52	66	80	83	88	90	91	96	98	98	98	BW
June 10	7:00 a. m.	738	1,660	930	46	61	78	88	94	98	98	99	100	100	100	BW
June 10	8:20 p. m.	166	2,120	360	38	55	66	76	80	84	85	94	98	98	98	BW
June 13	8:05 a. m.	390	4,120	2,980	30	40	58	73	85	92	94	98	--	--	--	BW
June 13	11:30 a. m.	510	3,820	2,780	32	44	60	71	82	88	92	--	--	--	--	BW
June 13	2:15 p. m.	541	4,590	3,830	35	48	66	76	84	88	90	96	99	99	99	BW
June 29	8:06 p. m.	11	344	532	23	46	--	--	82	87	93	96	--	--	--	BW
July 9	7:05 a. m.	184	11,200	3,000	23	36	56	68	88	96	98	99	100	100	100	BW
July 9	7:05 a. m.	184	11,200	2,730	2	14	46	64	85	94	97	98	99	99	99	BN
July 9	5:55 p. m.	234	2,760	2,030	42	64	78	90	96	98	99	100	100	100	100	BW
July 11	8:15 p. m.	F. 6	712	450	43	68	83	94	98	98	99	100	100	100	100	BW
Aug. 27	2:15 p. m.	12	4,300	3,560	32	48	72	89	95	97	98	99	99	100	100	BW

KANSAS RIVER BASIN--Continued
SOUTH FORK SOLOWON RIVER AT ALTON, KANS.

LOCATION.--At gaging station at bridge 1.1 miles south of Missouri Pacific Railroad in Alton, Osborne County.

DRAINAGE AREA.--1,720 square miles.

RECORDS AVAILABLE.--Water temperatures: June to September 1949.

Sediment records: June 1946 to September 1949.

EXTREMES, 1948-49.--Sediment concentrations: Maximum daily, not determined; minimum daily, less than 1 ton on many days.

Sediment loads: Maximum daily, 79,400 tons June 14; minimum daily, less than 1 ton on many days.

EXTREMES, 1946-49.--Sediment loads: Maximum daily, 168,000 tons Oct. 8, 1946; minimum daily, less than 1 ton on many days each year.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Discharge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		Per- cent so- di- um car- bon- ate	
																Parts per mil- lion	Tons per ac- re- foot	Tons per day	Total	Non- carbon- ate		
Oct. 2, 1948 -----	2.2	7.8	630	22	0.04	86	15	42	254	124	21	0.3	0.3	0.7	0.03	444	0.60		276	68	25	
Mar. 19, 1949 -----	115	8.0	669	29	.02	90	11	44	235	108	35	.4	.11	2.8	.11	445	.61		270	77	25	
May 2 -----	77	7.5	669	25	.02	83	14	35	227	115	23			5	1.0	--	464	.63		265	79	22
May 31 -----	65	7.4	614	28	.02	76	14	31	211	105	21			.5	1.4	--	442	.60		247	74	21
June 14 -----	5,960	7.3	330	22	.02	49	4.7	11	160	26	4.4			.3	1.9	--	234	.32		142	11	15
June 27 -----	932	7.5	438	20	.06	59	8.3	26	198	53	12			.3	1.4	--	308	.42		181	19	23
July 9 -----	68	7.7	760	32	.01	92	16	43	243	123	41			.4	3.1	--	564	.77		296	97	24
Sept. 20 -----	12	8.1	627	18	.04	76	9.4	53	208	131	24			.4	2.5	--	458	.62		228	57	34

KANSAS RIVER BASIN--Continued

SOUTH FORK SOLOMON RIVER AT ALTON, KANS.--Continued

Temperature (°F) of water, water year October 1948 to September 1949
 /Once-daily temperature measurement between 7 a. m. and 6 p. m./

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					--				--	79	79	70
2					--				80	78	69	74
3					--				--	--	69	76
4					--				--	--	--	74
5					--				--	85	69	66
6					--				--	--	84	--
7					--				68	--	--	66
8					37				68	79	74	66
9					35				72	82	72	65
10					34				74	78	83	66
11					35				78	74	82	75
12					35				--	--	82	--
13					--				70	75	--	--
14					--				--	--	80	59
15					--				74	--	--	56
16					--				74	--	--	60
17					--				--	80	79	67
18					32				71	82	83	70
19					32				--	85	69	68
20					--				--	86	77	74
21					--				82	77	--	--
22					--				--	--	72	--
23					--				--	--	77	64
24					--				--	86	81	67
25					--				75	--	82	--
26					--				--	74	72	68
27					--				67	84	77	66
28					--				--	82	--	--
29					--				--	77	73	--
30					--				--	79	--	--
31					--				--	82	71	--
Aver- age					--				--	--	--	--

KANSAS RIVER BASIN--Continued

SOUTH FORK SOLOMON RIVER AT ALTON, KANS.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis- charge (second- feet)	Suspended sediment		Mean dis- charge (second- feet)	Suspended sediment		Mean dis- charge (second- feet)	Suspended sediment	
		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day		Mean concen- tration (ppm)	Tons per day
1-----	3.0	77	(i)	3.4	57	(i)	8.5	36	1
2-----	2.6			3.4			9.9		
3-----	2.2			3.4			11		
4-----	2.2			5.7			15		
5-----	2.2			6.4			17		
6-----	2.6	76	(i)	5.0	16	(i)	14	9	(i)
7-----	3.4			5.0			9.2		
8-----	3.0			4.2			11		
9-----	2.6			4.2			5.7		
10-----	2.6			3.8			5.7		
11-----	2.6	76	(i)	3.4	16	(i)	11	9	(i)
12-----	2.6			3.4			4.6		
13-----	2.6			3.4			11		
14-----	3.0			3.8			15		
15-----	3.0			3.4			27		
16-----	3.0	74	(i)	3.4	35	(i)	7.8	29	(i)
17-----	3.0			3.4			9.2		
18-----	3.4			3.8			11		
19-----	3.4			3.4			5.0		
20-----	3.4			3.8			7.1		
21-----	3.4	74	(i)	4.6	18	(i)	8.5	29	(i)
22-----	3.4			4.6			9.2		
23-----	3.4			4.6			17		
24-----	3.8			4.6			12		
25-----	3.8			4.2			7.8		
26-----	3.4	74	(i)	3.8	35	(i)	8.5	29	(i)
27-----	3.4			5.0			8.5		
28-----	3.4			5.0			7.8		
29-----	4.2			4.6			4.6		
30-----	3.8			4.2			4.6		
31-----	4.2			--			2.6		
Total-----	96.6	--	19	124.9	--	11	306.8	--	20
January									
1-----	2.2	59	(i)	1.0	18	(i)	187	600	303
2-----	1.4	48	(i)				169	590	269
3-----	1.5	25	(i)				187	1,780	899
4-----							187	1,460	737
5-----							177	1,260	602
6-----					166	840	376		
7-----					146	572	225		
8-----	134	--	2/170						
9-----	120	361	117						
10-----	110	266	79						
11-----	2.0	10	(i)	202	--	2/240	101	238	65
12-----				805	--	2/2,800	99	201	54
13-----				316	353	3/436	91	170	42
14-----				47	138	18	87	143	34
15-----				45	82	10	74	93	18
16-----	1.5	29	(i)	50	80	11	67	71	13
17-----				60	70	11	67	129	23
18-----				455	591	3/1,180	76	--	2/32
19-----				1,310	637	3/2,730	98	310	82
20-----				1,470	387	3/2,060	100	335	90
21-----	1.5	29	(i)	300	94	76	86	--	2/60
22-----				356	525	3/784	79	155	33
23-----				2,480	1,690	3/11,800	72	--	2/26
24-----				2,290	2,020	3/10,800	70	156	29
25-----				608	1,350	3/2,390	62	121	20
26-----	1.0	21	(i)	316	--	2/700	68	110	20
27-----				240	710	460	72	142	28
28-----				209	695	392	80	128	28
29-----				--	--	--	76	108	22
30-----				--	--	--	75	100	20
31-----				--	--	--	97	222	58
Total-----	47.6	--	3.5	11,578.5	--	36,900	3,280	--	4,570

(i) Sediment discharge less than 1 ton.

2/Estimated.

3/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued

SOUTH FORK SOLOMON RIVER AT ALTON, KANS.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	121	522	170	70	78	15	52	71	10
2-----	110	508	151	70	35	7	71	568	3/266
3-----	105	401	114	77	33	7	163	--	2/1,400
4-----	104	329	92	70	30	6	127	2,450	840
5-----	94	257	65	70	30	6	114	1,280	394
6-----	86	182	42	79	--	2/7	148	1,740	3/857
7-----	75	130	26	100	130	35	728	6,510	3/14,200
8-----	70	144	27	114	155	48	830	6,220	3/14,800
9-----	62	230	38	128	216	75	733	5,380	3/11,200
10-----	61	129	21	187	--	2/1,300	733	4,290	3/8,950
11-----	61	90	15	152	1,620	665	394	2,630	2,800
12-----	61	72	12	109	428	126	390	--	2/2,900
13-----	61	63	10	91	237	58	1,560	5,800	3/33,300
14-----	60	62	10	80	181	39	4,610	6,240	3/79,400
15-----	57	47	7	76	136	28	1,220	5,320	17,500
16-----	55	39	6	77	126	26	631	3,620	6,170
17-----	52	35	5	315	--	2/11,000	373	2,860	2,880
18-----	50	31	4	272	8,240	3/8,330	596	--	2/6,700
19-----	47	28	4	155	2,720	1,140	414	1,330	1,490
20-----	50	27	4	120	--	2/360	280	690	522
21-----	56	31	5	141	1,160	442	240	540	350
22-----	70	--	2/17	148	--	2/650	256	870	601
23-----	68	--	2/10	206	--	2/3,000	209	840	474
24-----	61	49	8	127	2,180	748	262	--	2/1,100
25-----	58	50	8	97	715	187	209	600	338
26-----	57	50	8	86	382	89	180	--	2/220
27-----	58	50	8	73	304	60	174	--	2/300
28-----	60	--	2/6	65	252	44	587	6,480	3/11,800
29-----	63	28	5	61	189	31	248	--	2/1,600
30-----	66	25	4	60	166	27	202	--	2/850
31-----	--	--	--	57	110	17	--	--	--
Total-	2,059	--	902	3,533	--	26,570	16,734	--	224,200
	July			August			September		
1-----	142	780	299	59	249	40	16	90	4
2-----	107	460	133	60	--	2/75	14	61	2
3-----	92	--	2/65	60	435	70	13	54	2
4-----	80	--	2/42	45	260	32	12	56	2
5-----	75	166	34	38	186	19	11	71	2
6-----	68	152	28	34	146	13	11	--	2/3
7-----	63	150	26	31	120	10	12	105	3
8-----	59	140	22	29	148	12	13	99	4
9-----	59	112	18	26	170	12	14	84	3
10-----	138	--	2/1,400	25	131	9	14	69	3
11-----	119	--	2/440	24	85	6	14	53	2
12-----	103	--	2/260	22	95	6	14	--	2/2
13-----	79	564	120	20	100	5	14	--	2/4
14-----	74	--	2/100	18	85	4	13	113	4
15-----	68	--	2/80	18	--	2/4	13	100	4
16-----	76	--	2/90	54	--	2/380	13	86	3
17-----	87	388	70	88	--	2/800	12	70	2
18-----	56	273	41	59	1,150	183	11	54	2
19-----	50	173	23	62	--	2/320	9.9	43	1
20-----	47	150	19	128	--	2/2,900	9.9	85	2
21-----	43	136	16	67	--	2/700	8.5	--	2/2
22-----	40	152	16	59	1,100	175	7.8	90	2
23-----	38	--	2/15	51	573	79	6.4	90	2
24-----	36	113	11	43	323	37	7.1	87	2
25-----	34	90	8	34	195	18	5.7	85	1
26-----	36	117	3/20	29	157	12	5.7	84	1
27-----	244	2,910	3/5,070	26	167	12	5.7	83	1
28-----	552	7,540	3/12,000	23	170	10	7.1	98	2
29-----	202	4,200	3/2,330	21	160	9	6.4	68	1
30-----	116	1,600	501	18	153	7	5.7	89	1
31-----	82	542	120	18	123	6	--	--	--
Total-	3,045	--	23,420	1,289	--	5,960	319.9	--	69
Total discharge for year (second-foot-days)									42,414.3
Total load for year (tons)									322,600

2/Estimated.

3/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued
SOUTH FORK SOLOMON RIVER AT ALTON, KANS.--Continued

Particle-size analyses of suspended sediment, February to August 1949
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment										Methods of analysis	
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters									
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250		0.350
Feb. 20, 1949	12:30 a.m.	2,910	844	1,170	26	40	51	59	66	76	82	84		BN
June 6	11:15 a.m.	125	1,220	824	52	71	82	87	92	94	95	97	--	BW
June 7	1:15 p.m.	488	5,070	2,560	36	48	61	64	74	80	82	90	94	BW
June 7	9:35 p.m.	1,440	9,290	6,790	26	36	42	52	62	78	89	95	99	BW
June 7	11:30 p.m.	1,400	9,530	3,590	8	20	38	59	65	78	86	92	100	BN
June 7	11:30 p.m.	1,400	9,530	4,410	32	37	57	69	85	96	99	100		BW
June 8	3:40 p.m.	805	3,020	3,130	32	42	52	57	62	70	72	74	--	BW
June 9	6:30 p.m.	541	4,190	3,010	37	48	59	69	78	80	81	84	--	BW
June 13	9:45 p.m.	3,140	8,950	5,770	48	63	80	88	92	92	93	96	--	BW
June 14	1:45 a.m.	5,370	7,760	5,880	50	67	83	89	92	93	94	96	--	BW
June 14	5:40 a.m.	6,480	7,070	4,040	48	58	72	75	80	84	85	92	--	BW
June 14	6:55 a.m.	6,480	6,600	4,740	44	54	71	84	91	94	96	98	99	BW
June 23	11:30 a.m.	209	971	1,920	40	54	77	84	92	96	98	99	100	BW
June 24	8:30 p.m.	354	2,080	1,660	29	44	60	66	80	92	96	98	100	BW
July 1	7:00 a.m.	158	850	640	27	50	79	88	95	98	99	100	--	BW
July 28	12:05 a.m.	932	10,200	4,060	30	43	60	71	82	92	97	99	100	BW
July 28	12:05 a.m.	932	10,200	3,910	2	8	40	72	81	92	96	100	--	BN
July 28	7:55 p.m.	344	5,920	5,050	38	56	70	82	90	96	98	100	--	BW
July 29	3:50 p.m.	176	3,910	3,140	38	56	72	84	92	96	98	99	100	BW
Aug. 1	6:55 p.m.	55	189	493	42	55	77	87	92	--	--	--	--	BW
Aug. 20	5:30 p.m.	111	7,950	3,410	48	70	86	96	99	100	--	--	--	BW
Aug. 22	8:50 a.m.	62	1,230	1,000	55	78	90	96	98	100	--	--	--	BW

LOCATION.--At bridge on State Highway 14 in Beloit, Mitchell County, 300 feet downstream from dam at city water plant, 450 feet downstream from gaging station which is 1½ miles upstream from Lebanon Creek.

DRAINAGE AREA.--5,430 square miles.

RECORDS AVAILABLE.--Water temperatures: February to September 1949.

EXTRIMES, 1948-49.--Water temperatures (February to September 1949): Maximum, 80°F on several days in July.

Records: May 1948 to September 1949.

Sediment concentrations: Maximum daily, 13.00 ppm Aug. 19; minimum daily, 1.1 on Jan. 5, Apr. 27.

Sediment loads: Maximum daily, 107,000 tons May 22; minimum daily, 15,100 ppm Aug. 6, 1948; minimum daily, 8 ppm Apr. 27, 1949.

EXTREMES May 1948 to September 1949.--Sediment concentrations: Maximum daily, 15,100 ppm Aug. 6, 1948; minimum daily, 8 ppm Apr. 27, 1949.

Sediment loads: Maximum daily, 107,000 tons May 22, 1949; minimum daily, 15,100 tons Aug. 6, 1948.

REMARKS.--Records of discharge for water year October 1948 to September 1949 given in Water-Supply Paper 1146.

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Dis-charge (second-foot)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Carbo-nate (CO ₃)	Bicar-bonate (HCO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Nitrate (NO ₃)	Bor-on (B)	Dissolved solids			Hardness as CaCO ₃		Per-cent so-dium
																	Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbon-ate	
Oct. 2, 1948	28	7.6	1,260	22	0.02	108	21	163		0	370	146	180	0.3	1.3	0.19	842	1.15		356	53	50
Mar. 19, 1949	151	8.2	656	26	.02	82	9.5	49		5	235	88	38	.2	3.9	.12	421	.57		244	46	30
May 10	3,760	7.8	284	13	.02	44	6.8	3.1		0	145	23	3.0	.4	1.5	.14	182	.25		136	19	7
May 22	4,080	7.1	335	28	.13	43	6.0	20		0	192	12	2.4	.4	.7	--	230	.31		132	0	25
June 10	10,400	7.2	282	16	.02	43	4.4	9.0		0	145	21	1.4	.3	1.1	--	198	.27		126	7	13
July 9	1,680	7.1	411	20	.02	54	4.2	23		0	161	50	10	.3	3.1	--	292	.40		152	20	25
July 23	1,219	8.3	859	32	.02	90	12	75		8	278	112	68	.3	4.7	--	578	.79		297	56	35
Sept. 19	102	8.0	874	20	.02	85	12	96		0	279	114	84	.3	3.7	--	582	.79		262	33	44

KANSAS RIVER BASIN--Continued

SOLOMON RIVER AT BELOIT, KANS.--Continued

Temperature (°F) of water, February to September 1949
 /Once-daily temperature measurement between 7 a. m. and 9 a. m. 7

Day	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.
1					--	33	--	58	74	77	75	--
2					--	33	--	62	--	80	74	--
3					--	--	--	65	70	80	72	--
4					--	36	--	70	69	80	73	--
5					--	36	--	72	68	80	74	--
6					--	38	--	--	69	79	73	--
7					--	36	--	--	66	80	75	67
8					--	39	--	61	67	80	76	--
9					34	38	--	--	66	75	75	--
10					36	36	--	--	71	75	75	--
11					35	36	--	52	73	74	77	--
12					33	36	52	56	71	74	79	--
13					--	35	56	56	71	76	79	--
14					--	36	52	--	69	75	77	--
15					--	33	50	--	68	73	78	--
16					--	33	52	--	70	73	77	--
17					--	32	56	--	72	75	77	65
18					--	33	56	--	72	76	75	63
19					--	36	55	--	72	78	74	62
20					--	44	54	--	73	80	72	65
21					32	48	55	--	73	78	69	65
22					34	44	57	--	77	75	70	60
23					38	47	59	--	79	76	69	62
24					34	50	62	--	76	77	71	60
25					--	48	--	61	75	80	72	60
26					33	49	68	65	75	80	--	62
27					33	47	--	68	77	78	--	61
28					33	50	--	--	71	77	70	60
29					--	49	65	71	77	78	71	57
30					--	46	65	--	76	73	--	57
31					--	42	--	--	--	72	--	--
Average					--	40	--	--	72	77	74	--

KANSAS RIVER BASIN--Continued

SOLOMON RIVER AT BELOIT, KANS.--Continued

Suspended sediment, water year October 1948 to September 1949

Day	October			November			December		
	Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	28	133	10	40	610	66	30	89	7
2-----	28	130	10	38	390	40	32	63	5
3-----	28	360	27	38	235	24	32	--	1/8
4-----	26	400	28	40	380	41	32	82	7
5-----	26	320	22	52	495	69	38	70	7
6-----	28	375	28	50	375	51	40	148	16
7-----	28	540	41	52	295	41	42	80	9
8-----	26	560	39	42	350	40	42	40	5
9-----	32	365	32	34	170	16	42	35	4
10-----	26	1,230	86	30	180	14	32	78	7
11-----	22	1,420	84	26	80	6	40	171	18
12-----	22	1,490	88	26	40	3	44	23	3
13-----	24	1,570	102	34	150	14	50	48	6
14-----	24	1,580	102	30	200	16	44	182	22
15-----	28	1,220	92	26	200	14	47	47	6
16-----	34	1,320	121	24	190	12	40	54	6
17-----	34	1,420	130	22	125	7	28	35	3
18-----	38	505	52	26	205	14	38	41	4
19-----	40	550	59	28	405	31	38	70	7
20-----	40	558	60	22	850	50	40	240	26
21-----	40	545	59	22	795	47	52	38	5
22-----	38	380	39	24	490	32	52	27	4
23-----	40	135	14	24	225	14	50	25	3
24-----	38	480	49	26	270	15	52	33	5
25-----	38	505	52	28	265	20	34	--	1/3
26-----	38	460	47	30	70	6	28	28	2
27-----	38	95	10	30	310	25	38	23	2
28-----	44	80	9	32	785	68	47	29	4
29-----	54	82	12	32	640	55	34	58	5
30-----	67	165	30	32	220	19	28	--	1/4
31-----	60	650	105	--	--	--	42	--	1/4
Total-	1,077	--	1,640	960	--	870	1,228	--	217
Day	January			February			March		
	Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment		Mean dis-charge (second-feet)	Suspended sediment	
		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day		Mean concen-tration (ppm)	Tons per day
1-----	34	--	1/3	52	--	1/18	960	750	1,940
2-----	30	22	2	42	--	1/14	700	760	1,440
3-----	34	21	2	36	--	1/11	623	885	1,490
4-----	26	--	1/1	30	--	1/9	552	765	1,140
5-----	26	--	1/1	28	--	1/8	870	1,380	3,240
6-----	26	1/4	1/4	26	--	1/8	890	1,690	4,060
7-----	26			36	--	1/10	680	1,480	2,720
8-----	28			151	105	43	552	1,090	1,620
9-----	26			374	135	136	459	1,030	1,280
10-----	21			1,160	285	893	374	975	984
11-----	24			1,560	392	1,650	334	720	649
12-----	26			3,010	--	1/9,000	300	525	425
13-----	24			4,780	--	1/7,100	278	355	266
14-----	22			3,840	--	1/2,600	256	260	180
15-----	24			1,180	--	1/650	224	210	127
16-----	22	1/200	1/200	404	--	1/180	187	165	83
17-----	19			470	--	1/300	174	133	63
18-----	21			2,160	--	1/5,000	138	117	44
19-----	22			4,320	--	1/10,000	169	102	46
20-----	19			5,010	390	5,280	198	107	57
21-----	19			3,650	241	2,380	246	145	96
22-----	21			1,550	278	1,160	268	195	141
23-----	827	--	1/1,800	1,050	333	944	235	180	114
24-----	1,560	--	1/2,800	3,740	1,230	2/13,000	214	152	88
25-----	1,250	--	1/1,000	6,460	1,240	2/22,200	198	137	73
26-----	356	--	1/200	9,030	1,340	2/33,000	192	121	63
27-----	187	--	1/90	5,510	1,350	2/19,200	187	107	54
28-----	110	--	1/50	1,740	1,210	5,680	187	98	49
29-----	102	--	1/44	--	--	--	192	94	49
30-----	106	--	1/44	--	--	--	198	82	44
31-----	88	--	1/34	--	--	--	203	72	39
Total-	5,126	--	6,100	61,399	--	141,200	11,238	--	22,660

1/Estimated.

2/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued

SOLOMON RIVER AT BELOIT, KANS.--Continued

Suspended sediment, water year October 1948 to September 1949--Continued

Day	April			May			June		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	198	55	29	164	60	26	235	202	128
2-----	214	51	29	284	199	2/286	224	182	110
3-----	273	63	46	660	5,960	2/10,300	198	142	76
4-----	268	112	61	356	3,840	2/4,320	187	144	73
5-----	240	122	79	178	400	192	528	1,990	2,840
6-----	235	102	65	146	--	1/120	1,180	3,900	12,400
7-----	208	86	48	406	--	1/12,000	2,210	6,190	2/38,300
8-----	192	63	33	1,470	12,200	48,400	3,960	8,000	2/83,600
9-----	169	55	25	1,070	11,100	32,100	5,490	3,740	2/54,700
10-----	169	50	23	3,330	9,480	2/83,800	8,800	3,140	2/74,200
11-----	164	38	17	1,860	8,150	40,900	9,990	2,300	62,000
12-----	164	49	22	587	5,500	8,720	6,280	3,490	2/53,500
13-----	164	60	26	386	2,300	2,400	2,500	6,600	44,600
14-----	156	55	23	312	650	548	4,200	7,570	2/83,800
15-----	156	100	42	251	520	352	6,740	3,740	2/66,700
16-----	160	39	17	224	250	151	10,800	3,080	89,800
17-----	182	23	11	219	160	95	8,780	2,060	2/49,200
18-----	169	23	10	344	620	576	2,870	4,520	2/34,800
19-----	146	22	9	605	1,900	3,100	2,920	6,090	2/50,500
20-----	130	20	7	1,190	10,100	2/35,900	4,730	5,500	2/69,000
21-----	118	20	6	2,670	12,200	87,900	4,240	4,440	2/46,900
22-----	122	20	6	3,800	10,700	2/107,000	1,980	5,910	31,600
23-----	122	18	6	3,500	8,610	2/81,600	1,920	5,480	28,400
24-----	134	25	9	2,280	8,950	55,100	1,150	4,650	14,400
25-----	164	15	7	1,180	8,300	26,400	1,410	--	1/21,000
26-----	138	10	4	650	4,410	7,740	1,860	6,740	33,800
27-----	122	8	3	452	2,520	3,080	1,240	7,120	23,800
28-----	187	15	8	350	940	888	1,980	6,990	2/37,300
29-----	156	11	5	295	520	414	1,740	5,820	27,300
30-----	134	30	11	262	--	1/200	1,740	8,000	2/36,100
31-----	--	--	--	235	210	133	--	--	--
Total--	5,154	--	707	29,716	--	654,700	102,082	--	1,171,000

Day	July			August			September		
	Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment		Mean discharge (second-foot)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1-----	1,030	6,150	2/18,800	445	3,050	3,660	118	--	1/48
2-----	860	2,420	5,620	290	1,350	1,060	110	--	1/40
3-----	710	1,400	2,680	246	355	236	106	123	35
4-----	544	900	1,320	208	222	125	160	--	1/100
5-----	452	630	769	192	214	111	246	--	1/340
6-----	410	500	554	164	170	75	445	2,800	2/3,560
7-----	386	440	458	146	149	59	404	2,440	2,660
8-----	417	918	2/1,240	134	154	56	251	750	508
9-----	2,100	6,080	2/35,200	130	148	52	169	326	149
10-----	1,560	6,140	25,900	134	185	67	146	172	68
11-----	1,110	6,580	19,700	126	161	55	156	136	57
12-----	596	4,050	6,520	114	145	45	156	136	57
13-----	466	1,860	2,340	110	137	41	240	--	1/800
14-----	445	1,180	1,420	142	161	62	268	1,070	774
15-----	380	762	782	106	186	53	156	203	86
16-----	334	580	523	374	228	230	126	152	52
17-----	322	520	452	268	1,440	1,040	118	118	38
18-----	300	428	347	322	2,230	1,940	114	108	33
19-----	295	384	306	1,190	13,100	2/45,800	106	102	29
20-----	268	290	210	1,260	10,200	2/34,800	98	97	26
21-----	251	278	188	960	8,600	22,300	98	94	25
22-----	235	255	162	552	5,580	8,320	246	245	163
23-----	219	248	147	380	2,400	2,460	146	384	151
24-----	203	217	119	290	925	724	88	132	31
25-----	187	214	108	229	480	297	81	110	24
26-----	187	213	108	182	--	1/180	81	68	15
27-----	178	213	102	178	--	1/120	81	87	19
28-----	174	147	69	380	864	2/968	81	105	23
29-----	473	--	1/6,000	192	415	215	81	95	21
30-----	1,180	7,910	25,200	146	--	1/80	74	83	16
31-----	820	7,150	15,800	130	--	1/55	--	--	--
Total--	17,092	--	173,100	9,720	--	125,300	4,750	--	9,950

Total discharge for year (second-foot-days) ----- 249,542
 Total load for year (tons) ----- 2,307,000

1/Estimated.

2/Sediment discharge computed by subdividing day.

KANSAS RIVER BASIN--Continued

SOLOMON RIVER AT BELOIT, KANS.--Continued

Particle-size analyses of suspended sediment, February to September 1949

(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;

W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment											Methods of analysis		
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters											
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000	
	9:00 p. m.	4,900	1,460	782	23	32	45	61	74	82	92	99		100		BN
	3:45 p. m.	6,930	1,480	980	29	38	55	71	86	94	98	99		100		BN
	Feb. 25	9,330	1,290	1,010	34	44	62	80	92	96	100	--		--		BN
	8:20 a. m.	730	991	766	37	50	66	83	95	97	98	99		100		BN
	May 2	11:55 p. m.	11,500	3,630	48	65	94	84	99	100	--	--		--		BWC
	May 9	840	11,500	3,630	48	65	94	84	99	100	--	--		--		BWC
	May 9	1,100	11,800	3,840	49	61	77	88	98	100	--	--		--		BWC
	4:30 p. m.															
	May 9	1,100	11,800	3,970	4	10	30	92	98	100	--	--		--		BN
	12:50 p. m.	1,920	11,600	3,360	45	56	72	86	97	100	--	--		--		BWC
	May 10	1,920	11,600	3,540	10	19	46	78	96	100	--	--		--		BN
	May 10	3,760	8,570	5,230	42	56	74	85	96	100	--	--		--		BW
	May 10	3,760	8,570	5,030	10	16	54	86	94	100	--	--		--		BN
	2:45 p. m.															
	May 21	2,770	11,900	6,070	56	70	82	92	98	100	--	--		--		BWC
	10:30 p. m.	2,770	11,900	5,500	4	6	34	--	98	100	--	--		--		BWC
	May 21	3,730	11,700	4,980	40	54	68	80	92	--	--	--		--		BW
	8:45 a. m.	4,040	9,550	5,940	56	70	80	88	96	100	--	--		--		BWC
	May 22	4,040	9,550	5,880	4	6	54	87	96	--	--	--		--		BN
	3:10 p. m.															
	June 8	4,320	6,260	1,920	42	55	72	85	96	99	100	--		--		BW
	4:05 p. m.	4,320	6,260	1,730	45	62	78	87	96	100	--	--		--		BWC
	June 8	5,250	3,850	1,160	56	80	86	91	96	100	--	--		--		BWC
	9:00 a. m.	5,690	3,340	1,140	78	90	96	--	--	--	--	--		--		BWC
	June 9	5,900	3,280	1,130	78	86	92	95	98	100	--	--		--		BWC
	1:00 p. m.	10,800	2,890	1,800	62	82	95	98	100	--	--	--		--		BW
	June 9															
	8:40 p. m.															
	June 10															
	11:50 p. m.	11,200	2,760	1,740	62	80	92	98	100	--	--	--		--		BW
	4:40 a. m.	10,600	2,490	1,600	64	82	94	97	99	100	--	--		--		BW
	June 11	10,600	2,460	1,540	84	91	93	97	99	100	--	--		--		BW
	6:40 a. m.	4,470	8,840	5,000	31	48	64	78	92	100	--	--		--		BW
	June 14	1,200	3,400	3,400	45	56	63	64	66	--	--	--		--		BW
	1:15 p. m.	11,200	3,860	3,400	45	56	63	64	66	--	--	--		--		BW
	June 16	4,950	4,480	2,360	44	63	76	84	92	96	98	99		100		BW
	5:50 p. m.	1,740	6,860	3,250	31	43	62	75	87	93	96			99		BW
	June 20															
	3:40 p. m.															

KANSAS RIVER BASIN--Continued

SOLOMON RIVER AT BELOIT, KANS.--Continued

Particle-size analyses of suspended sediment, February to September 1949--Continued
(Methods of analysis: B, bottom withdrawal tube; D, decantation; P, pipette; S, sieve; N, in native water;
W, in distilled water; C, chemically dispersed; M, mechanically dispersed)

Date of collection	Time	Discharge (second- feet)	Suspended sediment														Methods of analysis
			Concentration of sample (ppm)	Concentration of suspension analyzed (ppm)	Percent finer than indicated size, in millimeters												
					0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.350	0.500	1.000		
July 1, 1949	7:30 a. m.	1,170	7,070	4,490	35	52	72	84	96	98	100	--	--	--	--	BW	
July 2	8:05 p. m.	830	1,770	1,110	38	56	74	85	99	100	--	--	--	--	--	BW	
July 7	8:25 a. m.	392	466	383	40	48	65	77	80	84	92	96	100	100	--	BW	
July 9	7:00 a. m.	2,670	9,660	4,070	18	24	36	48	62	74	88	94	98	98	--	BN	
July 9	7:00 a. m.	2,670	9,660	4,030	8	15	30	44	58	74	89	96	98	98	--	BN	
July 9	11:40 a. m.	2,560	6,800	5,680	21	30	43	54	69	82	94	98	100	100	--	BW	
July 9	9:10 p. m.	1,680	3,320	1,370	32	42	59	71	84	92	96	98	--	--	--	BW	
July 12	7:45 a. m.	632	4,600	3,840	34	41	76	89	96	98	100	--	--	--	--	BW	
July 19	3:00 p. m.	414	324	324	48	59	82	88	91	92	96	98	59	59	--	BW	
July 23	8:10 a. m.	219	256	548	34	42	60	67	69	72	--	--	--	--	--	BW	
July 30	8:15 a. m.	1,230	7,780	3,230	32	48	66	78	89	96	99	100	--	--	--	BW	
Aug. 2	8:45 a. m.	295	1,600	3,900	42	62	73	78	80	82	--	--	--	--	--	BW	
Aug. 3	7:10 a. m.	231	1,366	1,313	61	80	87	90	96	98	100	--	--	--	--	BW	
Aug. 17	7:10 a. m.	293	1,340	1,160	43	64	84	90	96	98	100	--	--	--	--	BW	
Aug. 18	7:30 a. m.	200	1,910	1,710	49	70	87	93	98	99	100	--	--	--	--	BW	
Aug. 19	8:25 a. m.	1,350	16,200	3,370	26	44	60	73	84	94	98	100	--	--	--	BW	
Aug. 19	1:40 p. m.	1,440	19,000	3,870	24	42	58	74	89	96	99	100	--	--	--	BN	
Aug. 19	1:40 p. m.	1,440	19,000	3,660	4	8	23	80	89	96	98	99	100	100	--	BN	
Aug. 20	9:05 p. m.	1,280	9,650	2,650	36	56	73	85	94	98	99	100	--	--	--	BW	
Aug. 20	6:15 p. m.	1,230	10,000	4,360	40	58	74	85	92	98	100	--	--	--	--	BW	
Aug. 21	7:30 a. m.	1,090	8,970	3,980	36	52	70	82	92	98	100	--	--	--	--	BW	
Aug. 21	7:30 p. m.	790	7,840	3,400	41	54	78	90	96	99	100	--	--	--	--	BW	
Aug. 23	7:20 a. m.	404	2,720	2,120	49	66	84	94	--	98	99	100	--	--	--	BW	
Aug. 24	5:00 p. m.	278	6,656	544	54	70	83	91	96	98	100	--	--	--	--	BW	
Aug. 28	8:35 a. m.	488	1,450	1,170	47	68	84	95	98	98	100	--	--	--	--	BW	
Sept. 6	7:50 a. m.	398	2,960	2,460	46	72	90	99	--	--	--	--	--	--	--	BW	
Sept. 7	8:00 a. m.	438	2,740	2,450	42	66	86	98	98	100	--	--	--	--	--	BW	
Sept. 7	5:15 p. m.	368	2,230	1,520	49	68	88	96	98	100	--	--	--	--	--	BW	
Sept. 8	8:00 a. m.	268	860	727	54	74	90	97	100	--	--	--	--	--	--	BW	
Sept. 14	7:45 a. m.	290	1,300	1,090	48	70	90	99	100	--	--	--	--	--	--	BW	

KANSAS RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN KANSAS RIVER BASIN

Chemical analyses, in parts per million, water year October 1948 to September 1949

Date of collection	Dis-charge (second- feet)	pH	Specific conduct- ance (micro- mhos at 25° C)	Silica (SiO ₂)	Iron (Fe)	Cal- cium (Ca)	Mag- ne- sium (Mg)	So- dium (Na)	Po- tas- sium (K)	Car- bo- nate (CO ₃)	Bicar- bonate (HCO ₃)	Sul- fate (SO ₄)	Chlo- ride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids		Hardness as CaCO ₃		Per- cent Non- carbon- ate	
																	Parts per mil- lion	Tons per acre- foot	Total	Non- carbon- ate		
REPUBLICAN RIVER AT CAMBRIDGE, NEBR.																						
Oct. 1, 1948-----	64	7.9	437	50	0.03	52	12	27	0	271	5.6	4.0	0.5	4.9	0.02	314	0.43	179	0	25		
Feb. 28, 1949-----	1,100	7.6	409	32	.05	44	11	30	0	196	4.5	6.5	.7	3.2	.03	274	.37	155	0	30		
Mar. 31-----	837	7.9	451	38	.04	57	13	22	0	240	32	6.0	.6	4.1	.06	308	.42	196	0	20		
Apr. 26-----	474	7.5	495	48	.13	53	14	42	0	270	42	7.0	.9	4.9	--	344	.47	190	0	33		
May 9-----	1,660	7.1	442	37	.02	53	12	24	0	222	40	4.0	.7	4.1	.15	304	.41	182	0	22		
May 27-----	660	7.6	523	45	.03	53	14	42	0	261	50	6.0	.8	4.7	--	366	.50	190	0	32		
June 24-----	472	7.9	495	38	.04	56	10	42	0	250	47	7.8	.7	4.9	--	350	.48	181	0	33		
Sept. 14-----	233	8.3	533	38	.02	55	14	41	16	228	50	9.5	.8	2.9	--	348	.47	195	0	31		
REPUBLICAN RIVER NEAR BLOOMINGTON, NEBR.																						
Nov. 1, 1948-----	286	7.8	502	47	0.05	44	15	54	0	272	48	8.0	0.7	4.0	0.06	368	0.50	172	0	41		
Mar. 1, 1949-----	2,040	7.4	354	25	.06	44	8.0	18	0	177	26	4.5	.5	3.2	.06	236	.32	143	0	22		
Mar. 31-----	1,170	7.6	496	35	.06	58	12	34	0	241	52	9.0	.7	3.8	.02	334	.45	194	0	28		
May 10-----	5,070	7.4	319	24	.02	39	6.6	17	0	170	16	1.0	.5	2.0	--	206	.28	125	0	22		
May 31-----	1,010	7.6	491	40	.02	51	12	40	0	245	46	7.0	.7	4.1	--	328	.45	177	0	33		
June 30-----	744	7.9	483	38	.04	57	7.8	43	0	246	46	9.2	.6	3.5	--	334	.45	174	0	35		
Sept. 22-----	243	8.3	484	40	.05	51	12	40	9	228	44	9.0	.7	3.8	--	326	.44	177	0	33		
NORTH FORK REPUBLICAN RIVER AT COLORADO-NEBRASKA STATE LINE																						
Mar. 1, 1949-----	72	7.8	411	49	0.05	49	12	25	0	228	26	5.0	1.1	2.9	0.00	286	0.39	172	0	24		
Apr. 4-----	108	7.7	476	48	.05	54	15	30	0	258	38	4.0	1.2	3.1	.00	312	.44	196	0	25		
Apr. 26-----	70	7.8	423	54	.02	50	13	25	0	233	30	4.0	1.2	3.2	--	300	.41	179	0	23		
May 21-----	201	7.3	360	32	.30	33	9.5	34	0	198	26	2.0	.7	1.1	--	242	.33	122	0	38		
June 28-----	94	8.3	391	49	.04	46	12	26	10	200	28	4.0	1.0	4.2	--	284	.39	165	0	39		
Sept. 27-----	36	8.0	498	52	.02	55	18	26	0	252	47	4.5	1.2	4.0	--	341	.46	211	4	21		

KANSAS RIVER BASIN--Continued
MISCELLANEOUS ANALYSES OF STREAMS IN KANSAS RIVER BASIN--Continued
Chemical analyses, in parts per million, water October 1948 to September 1949--Continued

Date of collection	Dis-charge (second-feet)	pH	Specific conductance (micro-mhos at 25° C.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Mag-nesium (Mg)	So-dium (Na)	Po-tas-sium (K)	Car-bonate (CO ₃)	Sul-fate (SO ₄)	Chlo-ride (Cl)	Fluo-ride (F)	Ni-trate (NO ₃)	Dissolved solids			Hardness as CaCO ₃			
															Parts per million	Tons per acre-foot	Tons per day	Total	Non-carbonate		
FRENCHMAN CREEK NEAR ENDERS, NEBR.																					
Feb. 28, 1949	122	7.8	370	48	0.05	44	11		22	0	211	20	3.0	0.8	4.5	0.00	253	0.34	155	0	24
Mar. 28	115	7.7	385	49	0.05	46	12	17		0	218	11	4.0	8	4.1	0.00	269	.37	164	0	18
Apr. 25	88	7.9	399	50	0.08	48	13		16	0	220	16	3.5	8	4.5	--	274	.37	174	0	16
May 31	83	7.7	398	52	.02	50	13	15		0	220	19	3.5	8	4.9	--	273	.37	179	0	16
June 28	87	8.0	402	41	.04	44	11	25		0	214	21	4.0	7	5.0	--	270	.37	156	0	26
Sept. 26	68	8.0	377	51	.02	43	14	20		0	218	20	2.6	8	5.0	--	274	.37	165	0	21
FRENCHMAN CREEK AT CULBERTSON, NEBR.																					
Feb. 28, 1949	335	7.6	374	39	0.02	45	12		15	0	212	10	3.5	0.8	4.4	0.06	256	0.35	162	0	17
Mar. 28	256	7.5	465	44	.02	52	17	13		0	250	8.8	6.5	8	4.8	.09	312	.42	200	0	13
Apr. 25	204	7.9	470	52	.08	55	15	26		0	256	30	5.5	9	5.6	--	320	.44	199	0	22
May 31	190	7.9	474	53	.05	52	14	30		0	254	29	5.5	9	4.8	--	330	.45	188	0	26
June 28	168	7.9	454	46	.02	49	12	28		0	226	32	5.5	8	6.1	--	300	.41	172	0	26
Sept. 26	63	8.4	485	55	.08	52	15	39		12	242	39	6.0	9	7.0	--	356	.48	192	0	30
SMOKY HILL RIVER AT ELLSWORTH, KANS.																					
Oct. 2, 1948	44	8.0	2,180	27	0.03	144	26	287		0	212	228	480	0.5	0.7	0.18	1,300	1.77	466	292	57
Apr. 1, 1949	102	7.3	1,690	15	.02	140	23	180		0	204	240	285	.5	2.4	--	996	1.35	444	277	47
May 3	108	8.2	1,770	17	.02	151	25	193		0	186	234	355	.5	2.7	--	1,070	1.46	460	227	16
May 24	1,020	7.8	419	11	.02	56	8.5	18		0	119	75	25	.5	2.0	.11	280	.38	175	77	18
June 9, 12:20 p.m.	10,600	7.9	359	17	.02	53	3	19		0	128	44	26	2	1.1	--	222	.30	147	42	22
June 9, 6:00 p.m.	10,900	7.9	405	16	.02	59	5.0	21		0	150	53	23	.2	1.9	--	254	.35	168	45	21
July 30	128	8.3	1,820	26	.05	144	15	230		4	190	276	332	.6	1.2	--	1,130	1.54	421	259	54
Sept. 20	141	7.7	1,200	23	.04	114	15	132		0	184	253	153	.7	1.5	--	828	1.13	346	195	45
NORTH FORK SOLOMON RIVER AT KIRWIN, KANS.																					
Oct. 2, 1948	0.4	7.7	578	28	0.01	83	13	19	12		0	308	57	0.6	0.7	0.12	372	0.51	261	8	13
Mar. 19, 1949	66	7.6	499	34	.05	74	9.0	23		0	251	51	6.0	.3	3.4	.09	328	.45	222	16	18
May 2	32	7.6	548	30	.01	75	15	24		0	274	59	9.4	.4	1.2	--	374	.51	249	24	18
May 21	1,060	7.0	302	31	.04	41	4.2	28		0	185	25	1.4	.3	1.3	--	234	.32	120	0	34
June 7	1,380	7.2	373	26	.02	46	6.3	24		0	193	30	2.4	.3	.5	--	244	.33	141	0	28
July 26	109	7.6	566	21	.05	54	6.5	17		0	172	45	5.0	.7	2.4	--	239	.33	162	21	18
Sept. 20	12	8.1	583	32	.02	92	17	16		0	276	90	10	.4	.5	--	413	.56	300	74	11

KANSAS RIVER BASIN--Continued

MISCELLANEOUS ANALYSES OF STREAMS IN KANSAS RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1948 to September 1949

Date	Instantaneous water discharge (second-feet)	Suspended sediment	
		Mean concentration (ppm)	Instantaneous discharge (tons per day)

WHITE ROCK CREEK AT LOVEWELL, KANS.

July 18, 1949 -----	4	165	1.8
July 23 -----	7	238	4.5
Sept. 1 -----	3.8	240	2.5
Sept. 12 -----	395	11,400	12,200
Sept. 26 -----	.6	174	.3

SMOKY HILL RIVER AT ELLSWORTH, KANS.

Apr. 1, 1949 -----	106	50	14.3
May 3 -----	113	129	39

NORTH FORK SOLOMON RIVER AT KIRWIN, KANS.

Aug. 20, 1948 -----	8	202	4.4
Mar. 19, 1949 -----	66	576	103
May 2 -----	32	122	10
May 21 -----	1,060	15,400	44,100
May 23 -----	232	5,500	3,440
May 31 -----	41	804	89
June 7 -----	1,380	22,000	82,000
July 26 -----	109	5,460	1,610
Sept. 20 -----	12	23	.7

INDEX

	A	Page
Abram Run near Bridgeport, Pa.		91
Abrams Creek at Winchester, Va.		147
Ahoskie Creek at Ahoskie, N. C.		175
Akron, Ohio, Little Cuyahoga River at ..		266
Akron, Ohio, Springfield Lake Outlet at ..		267
Alamance Creek near Graham, N. C.		192
Alderson, W. Va., Greenbrier River at ..		247
Alkali Creek at Ralston, Wyo.		407
Allegheny River at Kittanning, Pa.		218-219
at Sharpsburg, Pa.		220
at Warren, Pa.		215-217
tributaries of ..		225-232
Altapass, N. C., North Toe River at ..		252-254
Alton, Kans., South Fork Solomon River at ..		642-646
Aluminum ..		8
Alzado, Mont., Little Missouri River at ..		408-410
Ambridge, Pa., Ohio River at ..		221-224
Antietam Creek near Waynesboro, Pa.		148-149
Antwerp, Ohio, Maumee River at ..		256-258
Arikaree River at Haigler, Nebr.		577-578
Arvada, Wyo., Powder River at ..		398-402
Auburn, Pa., Schuylkill River at ..		46-51
B		
Bad River near Fort Pierre, S. Dak.		477
Bad River basin ..		477
Badwater Creek at Bonneville, Wyo.		378-381
Beaver City, Nebr., Sappa Creek near ..		594-600
Beaver Creek at Downingtown, Pa.		89
at Hecla, Pa.		89
at Loretto, Nebr.		561-565
near Beaver City, Nebr.		570-571, 576
near Newcastle, Wyo.		474, 475
Beaverhead River at Barratts, Mont.		293
Beaver River at New Brighton, Pa.		241-243
Beaver River basin ..		241-243
Belle Fourche River below Moorcroft, Wyo.		474, 475, 476
near Elm Springs, S. Dak.		476
Beloit, Kans., Solomon River at ..		647-652
Bennetts Creek near Gatesville, N. C.		175
Berne, Pa., Schuylkill River at ..		52-58
Berryville, Va., Opequon Creek near ..		146
Big Elk Creek near Lewisville, Pa.		96
Bighorn, Mont., Bighorn River at ..		322-326
Bighorn River at Bighorn, Mont.		322-326
at Kane, Wyo.		317-321
at Manderson, Wyo.		313-316
at Thermopolis, Wyo.		303-308
near Manderson, Wyo.		309-312
Big Sandy River basin ..		250
Bitter Creek near Garland, Wyo.		407
Bixby, S. Dak., Moreau River at ..		455-460
Black Creek near Four Oaks, N. C.		189
Bonneville, Wyo., Badwater Creek at ..		378-381
Bonneville, Wyo., Dry Cottonwood Creek near ..		386-389
Boron ..		11
Botzum, Ohio, Cuyahoga River at ..		262
Brandywine Creek at Chadds Ford, Pa.		79
at Wilmington, Del.		80-82
Briar Creek at Briar, Pa.		135
Bridgeport, Md., Monocacy River at ..		168-169
Broad River near Gaffney, S. C.		207
Brodhead Creek near Stroudsburg, Pa.		84
Buck Run Creek near Doe Run, Pa.		94
Buffalo Bill Reservoir, Wyo., Shoshone River below ..		390-391
Buffalo Creek near Blacksburg, S. C.		207

	Page
Buffalo Creek near Elm Creek, Nebr. . .	567
Buffalo River near Dilworth, Minn.	270
Bullock Creek near Sharon, S. C.	207
Burketown, Va., North River near	150
Bushkill Creek at Easton, Pa.	85
at Shoemakers, Pa.	84
at Tatamy, Pa.	85
Byron, Wyo., Shoshone River at	392-393

C

Cacapon River at Great Cacapon, W. Va.	143
Calamus River near Burwell, Nebr.	569, 574
Calcium	9
Calico Creek near Oregon, Pa.	140
Cambridge, Nebr., Medicine Creek at ..	590-593
Cannonball River at Breien, N. Dak.	445
near New Leipzig, N. Dak.	437-440
Cannonball River basin	437-445
Cape Fear River at Fayetteville, N. C. .	190
at Lillington, N. C.	192
Cape Fear River basin	190-192
Carbonate and bicarbonate	10
Casper, Wyo., North Platte River below	513-517
Cassa, Wyo., North Platte River near ..	523-527
Catasauqua, Pa., Lehigh River at	33-35
Catawba River near Marion, N. C.	206
Catawissa Creek at Catawissa, Pa.	134, 135
Cedar Creek at Society Hill, S. C.	196
near Pretty Rock, N. Dak.	441-444
near Winchester, Va.	170
Cedar Rapids, Iowa, Cedar River at	281-289
Cedar River at Cedar Rapids, Iowa	281-289
Chadds Ford, Pa., Brandywine Creek at	79
Charleroi, Pa., Monongahela River at ..	234-236
Chemical quality	3
Cherry Creek at Delaware Water Gap, Pa.	85
Chester Creek at Chester, Pa.	94
at Lenni Mills, Pa.	93
near Cheney, Pa.	93
near Westtown, Pa.	93
Cheyenne River near Hot Springs, S. Dak.	469-473
near Wasta, S. Dak.	474
Cheyenne River basin	469-476
Chloride	10
Chowan River at Chowan-Bertie County	
line near Edenton, N. C.	175
Chowan River basin	175
Clarion River near Piney, Pa.	225-227
Cliffside, N. C., Second Broad River at	199-201
Cobbs Creek at West Overbrook, Pa. ...	92
near Darby, Pa.	93
Codorus Creek near York, Pa.	127-129
Cody, Nebr., Niobrara River near	494-498
Coleman Drain near Shoshoni, Wyo.	363-365
Collection and examination of samples ..	3-5
Color	12
Colo.-Kans. State line, South Fork	
Republican River near	586-589
Columbia, S. C., Congaree River at ...	197
Combahee-Broad River basins	210
Composition of surface waters	7-15
Conestoga Creek at Brownstown, Pa.	138
at Hinkletown, Pa.	138
at Hunsucker, Pa.	138
at Lancaster, Pa.	130-132, 139
at Martinsdale, Pa.	138
at Oregon, Pa.	138
at Safe Harbor, Pa.	140
at Union Grove, Pa.	138
at Weaverland, Pa.	138

	Page
Elkhorn River at Waterloo, Nebr.	567, 570, 575, 576
Elkins, W. Va., Tygart River at	233
Elkton, Va., South Fork Shenandoah River at	151-153
Ellis, Kans., Smoky Hill River near	614-618
Enfield, N. C., Fishing Creek near	181-183
Eno River near Braggtown, N. C.	188
Expression of results	5-7
F	
Fairview, Md., Conococheague Creek at	144-145
Faith, S. Dak., Moreau River near	461-467
Falls, Pa., Susquehanna River at	97-99
Fargo, N. Dak., Red River of the North at	268, 269
Fayetteville, N. C., Cape Fear River at	190
Fifteenmile Creek at Worland, Wyo.	407
First Broad River near Lawndale, N. C.	202-204
Fishing Creek near Enfield, N. C.	181-183
Fivemile Creek near Pavillion, Wyo.	331-332
near Shoshoni, Wyo.	333-337
Fivemile 76 Drain near Riverton, Wyo.	357-358
Flat River at Bahama, N. C.	188
Fluoride	10
Fort Peck Reservoir, Mont.	293
Frankford Creek at Bridge Street, Philadelphia, Pa.	88
Frankstown Branch Juniata River at Huntingdon, Pa.	118-120
French Broad River at Marshall, N. C.	255
French Creek at Carters Corners, Pa. .	231
at Franklin, Pa.	231
at Knauertown, Pa.	89
at Meadville, Pa.	231
at Phoenixville, Pa.	90
near Franklin, Pa.	231
Frenchman Creek at Culbertson, Nebr.	654
near Enders, Nebr.	654
Front Royal, Va., South Fork Shenandoah River near	157
G	
Glenville, W. Va., Little Kanawha River at	245
Golden Valley, N. Dak., Knife River near	420-423
Goldsboro, N. C., Neuse River near 185-187,	188
Goose Creek near Leesburg, Va.	170
Goose River at Hillsboro, N. Dak.	270
near Portland, N. Dak.	270
Gordon, Nebr., Niobrara River near	490-493
Grand River at Shadehill, S. Dak.	446-451
near Wakpala, S. Dak.	452
Grand River basin	446-454
Graters Ford, Pa., Perkiomen Creek at	76-78
Great Cacapon, W. Va., Cacapon River at	143
Greenbrier River at Alderson, W. Va. .	247
Green River near Mill Spring, N. C.	198
Greenville, N. C., Tar River at	180
Grottoes, Va., Middle River near	158
Guernsey Reservoir, Wyo., North Platte River below	528-530
Gulph Creek near West Conshohocken, Pa.	91
H	
Haigler, Nebr., Arikaree River at	577-578
Hardness	13
Harrisburg, Pa., Susquehanna River at	106-108
Harrison, Va., South River at	160-162
Harvey Creek at West Nanticoke, Pa. .	133
Haw River at Haw River, N. C.	192
near Benaja, N. C.	192
near Pittsboro, N. C.	192
Heart River below Heart Butte Dam near Glen Ullin, N. Dak.	434, 435-436
near Mandan, N. Dak.	434
near Richardson, N. Dak.	430-433
near South Heart, N. Dak.	425-429
Heart River basin	425-436
Hinton, W. Va., New River at	246

	Page		Page
Hiram Rapids, Ohio, Cuyahoga River at	259-261	Lehigh River at Tannery, Pa.	85
Hope Mills, N. C., Rockfish Creek near	191	at Walnutport, Pa.	30-32
Hot Springs, S. Dak., Cheyenne River		Lewisburg, Pa., West Branch	
near	469-473	Susquehanna River at.	115-117
Hudson Bay and Upper Mississippi		Literature cited.	19-20
River basins.	268-289	Littitz Creek at Oregon, Pa.	141
Hunlock Creek at Hunlock, Pa.	133	Little Chickies Creek at Mt. Joy, Pa. .	137
Huntingdon, Pa., Frankstown Branch		Little Coharie Creek at Roseboro, N. C.	192
Juniata River at.	118-120	Little Conestoga Creek near Safe Harbor, Pa.	141
Huntingdon, Pa., Raystown Branch		Little Conneautee Creek near Cambridge	
Juniata River near.	124-126	Springs, Pa.	231
Hydrogen-ion concentration.	12	Little Cuyahoga River at Massillon Road,	
		Akron, Ohio.	266
I		Little Elk Creek near Lewisville, Pa. .	96
Independence, Ohio, Cuyahoga River at	263-265	Little Juniata Creek at Duncannon, Pa.	137
Indian Creek near Vernfield, Pa.	91	Little Kanawha River at Glenville, W. Va.	245
Indian Run Creek near Dreherstown, Pa.	89	Little Kanawha River basin.	245
Inghams Spring Creek at New Hope, Pa.	87	Little Missouri River at Alzada, Mont.	408-410
Introduction.	1-3	at Marmarth, N. Dak.	417, 418-419
Iowa City, Iowa, Iowa River at.	272-280	at Medora, N. Dak.	411-416
Iowa River at Iowa City, Iowa.	272-280	near Watford City, N. Dak.	417
Iowa River basin.	272-289	Little Missouri River basin.	408-419
Iron.	9	Little Neshaminy Creek at Hartsville, Pa.	87
Ithan Creek near Ithan, Pa.	92	Little Pee Dee River near Dillon, S. C.	196
Ivy River near Marshall, N. C.	255	Little River near Goldsboro, N. C.	189
		near Mount Carmel, S. C.	211
J		near Star, N. C.	195
James River at Buchanan, Va.	174	Little Schuylkill River at Dreherstown, Pa.	70-75
at Columbia, S. Dak.	512	at Port Clinton, Pa.	88
at Huron, S. Dak.	512	at Tamaqua, Pa.	88
at Jamestown, N. Dak.	512	Little Sugar Creek at Cochran, Pa. .	232
at Richmond, Va.	171-173	Lock Haven, Pa., West Branch	
James River basin (N. Dak., S. Dak.) .	512	Susquehanna River at.	112-114
James River basin (Virginia).	171-174	Locust Creek near Tamaqua, Pa.	89
Jonathon Creek at Cove Creek, N. C. .	255	Long Pine Creek near Riverview, Nebr.	503-506
Julesburg, Colo., South Platte River at.	531-534	Loretto, Nebr., Beaver Creek at.	561-565
Juniata River at Newport, Pa.	121-123	Lost Wells Butte Drain near Riverton,	
		Wyo.	361-362
K		Lumber River at Boardman, N. C.	195
Kadoka, S. Dak., White River near.	483-487	Luray, Va., South Fork Shenandoah	
Kanawha River basin.	246-249	River near.	154-156
Kane, Wyo., Bighorn River at.	317-321		
Kansas River basin.	577-655	M	
Kaycee, Wyo., Middle Fork Powder		Macoby Creek at Greenlane, Pa.	90
River above.	403-404	Magnesium.	9
Fellet Drain near Pavilion, Wyo.	351-353	Mahanoy Creek at Dornsife, Pa.	136
Keowee River near Newry, S. C.	211	Mahoning Creek at Danville, Pa.	135
Kermit, W. Va., Tug Fork at.	250	Manatawny Creek at Pottstown, Pa. .	89
Keyapaha River at Wewela, S. Dak.	508, 509, 510	Manderson, Wyo., Bighorn River at. .	313-316
near Hidden Timber, S. Dak.	507, 509, 510	Manderson, Wyo., Bighorn River near	309-312
Kings Creek at Kings Creek, S. C.	207	Manganese.	8-9
Kiskiminetas River at Leechburg, Pa. .	228-230	Maple River at Mapleton, N. Dak.	269
Kitanning, Pa., Allegheny River at.	218-219	Marcus Hook Creek at Trainer, Pa.	94
Knapp Creek at Marlinton, W. Va.	248	Marias River near Shelby, Mont.	294
Knife River at Hazen, N. Dak.	424	Marias River basin.	294
near Golden Valley, N. Dak.	420-423	Marlinton, W. Va., Knapp Creek at. .	248
Knife River basin.	420-424	Marshalls Creek at Marshalls Creek, Pa.	84
		Marsh Creek near Lyndell, Pa.	95
L		Marsh River at Shelly, Minn.	270
Lackawanna River at Carbondale, Pa. .	133	near Shelly, Minn.	270
at Forrest City, Pa.	133	Maumee River at Antwerp, Ohio.	256-258
at Old Forge, Pa.	109-111, 133	Mayo River near Price, N. C.	179
Lackawaxen River at Hawley, Pa.	83	McConaughy Lake near Keystone, Nebr.	566
at Kimbles, Pa.	83	Medicine Creek at Cambridge, Nebr. .	590-593
at Rowland, Pa.	84	Medora, N. Dak., Little Missouri	
Lake Maloney near North Platte, Nebr. .	566, 567	River at.	411-416
Lake Marion-Moultrie Diversion Canal		Middle Creek near Selingsgrove, Pa. .	135
near Pineville, S. C.	208	near Smithfield, N. C.	189
Lancaster, Pa., Conestoga Creek at	130-132, 139	Middle Fork Powder River above	
Landingville, Pa., Schuylkill River at .	39-45	Kaycee, Wyo.	403-404
Lateral P-34, 9 Wasteway near Shoshoni, Wyo.	374	near Kaycee, Wyo.	406
Lateral P-36, 8 Wasteway near Shoshoni, Wyo.	375	Middle Fork Reddies River at Wilbar, N. C.	195
Lawndale, N. C., First Broad River near	202-204	Middle Fork Sugar Creek near	
Le Boeuf Creek near Waterford, Pa. .	231	Bradleytown, Pa.	232
Leechburg, Pa., Kiskiminetas River at	228-230	Middle Loup River at Arcadia, Nebr.	568, 572
Lehigh River at Catasauqua, Pa.	33-35	at Dunning, Nebr.	539-543
at Easton, Pa.	85	at Loup City, Nebr.	568-572
at Glendon, Pa.	85	at Milburn, Nebr.	568-572
		at St. Paul, Nebr.	544-549
		at Walworth, Nebr.	568
		near Seneca, Nebr.	568, 522

	Page		Page
Middle River near Grottoes, Va.	158	North Platte River above Bedtick Creek near Douglas, Wyo.	518-522
Miles City, Mont., Tongue River at....	394-397	below Casper, Wyo.	513-517
Mill Creek at Bristol, Pa.	87	below Guernsey Reservoir, Wyo. .	528-530
at Lancaster, Pa.	141	near Cassa, Wyo.	523-527
near Gladwyne, Pa.	92	North River near Burkettown, Va.	150
Mill Spring, N. C., Green River near ..	198	near Stokesville, Va.	170
Mineral constituents in solution.....	8-11	North Toe River at Altapass, N. C.	252-254
Minnehadaza Creek at Valentine, Nebr.	507	North Tyger River near Moore, S. C. .	205
Missouri River at Highway Bridge at Toston, Mont.	290-292	Northwest Branch Perkiomen Creek near Greenlane, Pa.	90
main stem	290-293	Norton, Kans., Prairie Dog Creek at..	606-613
near Wolf Point, Mont.	293		
Missouri River basin	290-655	O	
Monocacy River at Bridgeport, Md.	168-169	Ocean Drain at Ocean Lake Outlet near Pavillion, Wyo.	343-345
Monongahela River at Charleroi, Pa. .	234-236	near Pavillion, Wyo.	346-349
Monongahela River basin	233-240	Octoraro Creek at Lees Bridge near Glenroy, Pa.	141
Moore, S. C., North Tyger River near	205	Oglala, S. Dak., White River near ...	478-482
Moreau River at Bixby, S. Dak.	455-460	Ohio River at Ambridge, Pa.	221-224
at Promise, S. Dak.	468	main stem	215-224
near Dupree, S. Dak.	468	Ohio River basin	215-255
near Eagle Butte, S. Dak.	468	Old Forge, Pa., Lackawanna River at 109-111,	133
near Faith, S. Dak.	461-467	Olentangy River near Delaware, Ohio .	251
Moreau River basin	455-468	Opequon Creek near Berryville, Va. .	146
Mt. Jackson, Va., North Fork Shenandoah River at.	164	Oxygen consumed	11-12
Muddy Creek at Hinkletown, Pa.	140		
near Cambridge Springs, Pa.	231	P	
near Homeville, Pa.	141	Pacolet River near Clifton, S. C.	207
near Pavillion, Wyo.	382-384	Pamlico River at Washington, N. C. ..	184
near Shoshoni, Wyo.	385-387	Pamlico River basin	180-184
Muskingum River basin	244	Panther Creek at Tamaqua, Pa.	89
		Paradise Creek near Paradise, Kans. .	631-636
N		Paradise, Kans., Paradise Creek near	631-636
Naaman Creek near Marcus Hook, Pa.	94	Parsons, W. Va., Shavers Fork at	237
Narrowsburg, N. Y., Delaware River at 21-23,	83	Passage Creek at Buckton, Va.	170
Nescopeck Creek at Nescopeck, Pa. .	134	Pavillion Drain near Pavillion, Wyo. .	339-342
Neshaminy Creek at Croydon, Pa.	87	Pavillion, Wyo., Dewey Drain near....	354-356
at Hulmeville, Pa.	87	Pavillion, Wyo., Dudley Wasteway near	350
near Edison, Pa.	87	Pavillion, Wyo., Fivemile Creek near .	331-332
near Langhorne, Pa.	87	Pavillion, Wyo., Kellett Drain near,...	351-353
Neuse River at Kinston, N. C.	188	Pavillion, Wyo., Muddy Creek near....	382-384
near Clayton, N. C.	188	Pavillion, Wyo., Ocean Drain at Ocean Lake Outlet near.	343-345
near Fort Barnwell, N. C.	188	Pavillion, Wyo., Ocean Drain near ...	346-349
near Goldsboro, N. C.	185-187, 188	Pavillion, Wyo., Pavillion Drain near	339-342
near Northside, N. C.	188	Pavillion, Wyo., Power Line Wasteway near.	338
Neuse River basin	185-189	Pee Dee River at Pee Dee, S. C.	194
New Brighton, Pa., Beaver River at ..	241-243	Pee Dee River basin	194-196
Newcomerstown, Ohio, Tuscarawas River at	244	Peedee, S. C., Pee Dee River at.	194
New Leipzig, N. Dak., Cannonball River near	437-440	Penns Creek near Selingsgrove, Pa.	135
Newport, Pa., Juniata River at	121-123	Pennypack Creek at Philadelphia, Pa.	88
New River at Hinton, W. Va.	246	Percent sodium	14
Niobrara River near Cody, Nebr.	494-498	Perkiomen Creek at Collegeville, Pa.	90
near Gordon, Nebr.	490-493	at Graters Ford, Pa.	76-78
near Sparks, Nebr.	499-502	Petersburg, W. Va., South Branch Potomac River near	142
Niobrara River basin	490-511	Philadelphia, Pa., Schuylkill River at Belmont Filters	67-69
Nitrate	11	Philadelphia, Pa., Schuylkill River at Manayunk	64-66
North Atlantic Slope Basins	21-170	Pickering Creek near Perkiomen Junction, Pa.	90
Northeast Branch Perkiomen Creek near Bergey, Pa.	90	Pidcock Creek near New Hope, Pa.	87
near Schwenkville, Pa.	91	Pigeon Creek at Parker Ford, Pa.	89
North Fork Catawba River at Pitts, N. C.	206	Pigeon River at Canton, N. C.	255
North Fork Grand River near White Butte, S. Dak.	452, 453, 454	near Hepco, N. C.	255
North Fork New River at Creston, N. C.	249	Pine Creek near Barnesville, Pa.	88
North Fork Republican River at Colo. - Nebr. State line	653	Piney, Pa., Clarion River near	225-227
North Fork Shenandoah River at Cootes Store, Va.	163	Platte River near Cozad, Nebr.	566
at Mt. Jackson, Va.	164	near Odessa, Nebr.	566
near Strasburg, Va.	165-167	Platte River basin	513-576
North Fork Solomon River at Kirwin, Kans.	654, 655	Plum Creek near Meadville, Nebr.	507
North Loup River at Brewster, Nebr. .	569, 573	near Smithfield, Nebr.	568, 572
at Burwell, Nebr.	569, 574	Plymouth Creek at Conshohocken, Pa.	91
at Ord, Nebr.	569, 574	Pocono Creek at Stroudsburg, Pa.	84
at Scotia, Nebr.	569, 574	Poison Creek near Shoshoni, Wyo.	376-377
at Taylor, Nebr.	569, 574	Ponca Creek at Anoka, Nebr.	489
near St. Paul, Nebr.	555-560		
North Pacolet River at Fingerville, S. C.	207		

	Page
Ponca Creek basin	489
Popo Agie River near Riverton, Wyo.	327-330
Poquessing Creek at Philadelphia, Pa.	88
Port Carbon, Pa., Schuylkill River at ..	36-38
Potacasi Creek at Potacasi, N. C.	175
Potomac River basin	142-170
Pottstown, Pa., Schuylkill River at	59-63
Powder River at Arvada, Wyo.	398-402
near Locate, Mont.	405
Power Line Wasteway near Pavilion, Wyo.	338
Prairie Dog Creek at Norton, Kans.	606-613
Pretty Rock, N. Dak., Cedar Creek near ..	441-444
Properties and characteristics of water ..	11-14
Publications	15-16

R

Railroad Reservoir near Dickinson, N. Dak.	434
Raymond Kill at Raymond Kill, Pa.	84
Raystown Branch Juniata River near Huntingdon, Pa.	124-126
Red Lake River at Crookston, Minn.	270
Red River of the North at Fargo, N. Dak.	268, 269
at Grand Forks, N. Dak.	269
Red River of the North basin	268-271
Reedy River near Ware Shoals, S. C.	208
Republican River at Cambridge, Nebr.	653
at Trenton, Nebr.	579-585
near Bloomington, Nebr.	653
Richardton, N. Dak., Heart River near.	430-433
Richmond, Va., James River at	171-173
Ridley Creek at Chester, Pa.	93
near Gradyville, Pa.	93
near Willistown, Pa.	93
Riverdale, Nebr., Wood River near	535-538
Riverton, Wyo., Five-mile 76 Drain near ..	357-358
Riverton, Wyo., Lost Wells Butte Drain near	361-362
Riverton, Wyo., Popo Agie River near ..	327-330
Riverton, Wyo., Sand Gulch Drain and Wasteway near	359-360
Riverton, Wyo., Wind River at	297-302
Riverview, Nebr., Long Pine Creek near ..	503-506
Roanoke Rapids, N. C., Roanoke River at ..	176-178
Roanoke River at Roanoke Rapids, N. C.	176-178
near Scotland Neck, N. C.	179
Roanoke River basin	176-179
Rockfish Creek near Hope Mills, N. C.	191
Rocky River near Concord, N. C.	195
Roquist Creek near Windsor, N. C.	179
Rose Creek near Wallace, Kans.	619
Russell, Kans., Saline River near	620-626

S

Sage Creek near Lovell, Wyo.	407
St. Johns River near De Land, Fla.	212-214
St. Johns River basin	212-214
St. Lawrence River basin	256-267
St. Michael, Nebr., South Loup River at ..	550-554
St. Paul, Nebr., Middle Loup River at ..	544-549
St. Paul, Nebr., North Loup River near ..	555-560
Saline River near Russell, Kans.	620-626
near Wilson, Kans.	627-630
Salkhatchie River near Barnwell, S. C.	210
Saluda River near Greenville, S. C.	207
near Ware Shoals, S. C.	208
Sand Gulch Drain and Wasteway near Riverton, Wyo.	359-360
Sand Gulch near Shoshoni, Wyo.	366-369
Sandy Run at Fort Washington, Pa.	92
Santee River basin	197-208
Sapony Creek near Nashville, N. C.	184
Sappa Creek near Beaver City, Nebr.	594-600
near Stamford, Nebr.	601-605
Savannah River at Burtons Ferry Bridge near Millhaven, Ga.	211
near Augusta, Ga.	211
near Calhoun Falls, S. C.	211
Savannah River basin	211
Schuylkill River at Auburn, Pa.	46-51
at Belmont Filters, Philadelphia, Pa.	67-69

Schuylkill River at Berne, Pa.	52-58
at Landingville, Pa.	39-45
at Manayunk, Philadelphia, Pa.	64-66
at Port Carbon, Pa.	36-38
at Pottstown, Pa.	59-63
Scioto River basin	251
Scotts Creek at Dillsboro, N. C.	255
Second Broad River at Cliffside, N. C.	199-201
Sediment	14-15
Seneca River near Anderson, S. C.	211
Shadehill, S. Dak., Grand River at	446-451
Shamokin Creek at Weigh Scale, Pa.	135
Sharpsburg, Pa., Allegheny River at ..	220
Shavers Fork at Parsons, W. Va.	237
Shell Creek near Columbus, Nebr.	569, 574, 575
Shermans Creek at Duncannon, Pa.	137
Sheneyne River at Sheneyne, N. Dak.	269
at Valley City, N. Dak.	269
at West Fargo, N. Dak.	269
near Harvey, N. Dak.	269
Shickshinny Creek at Shickshinny, Pa.	134
Shohola Creek at Shohola, Pa.	84
Shoshone River at Byron, Wyo.	392-393
below Buffalo Bill Reservoir, Wyo.	390-391
Shoshoni, Wyo., Coleman Drain near.	363-365
Shoshoni, Wyo., Eagle Drain near	370-373
Shoshoni, Wyo., Five-mile Creek near.	333-337
Shoshoni, Wyo., Lateral P-34.9 Wasteway near	374
Shoshoni, Wyo., Lateral P-36.8 Wasteway near	375
Shoshoni, Wyo., Muddy Creek near ..	385-387
Shoshoni, Wyo., Poison Creek near ..	376-377
Shoshoni, Wyo., Sand Gulch near	366-369
Silica	8
Skippack Creek at Mainland, Pa.	91
near Collegeville, Pa.	91
Smith River at Spray, N. C.	179
Smoky Hill River at Ellsworth, Kans.	654, 655
near Ellis, Kans.	614-618
Snake River near Burge, Nebr.	507, 509, 510
Sodium and potassium	9-10
Solomon River at Beloit, Kans.	647-652
Souris River near Verendrye, N. Dak.	270
South Atlantic Slope and Eastern Gulf of Mexico Basins	171-214
South Branch French Creek near Coventryville, Pa.	90
near Union City, Pa.	231
South Branch Potomac River near Petersburg, W. Va.	142
South Fork Edisto River near Denmark, S. C.	209
near Montmorenci, S. C.	209
South Fork Grand River near Cash, S. Dak.	452, 453, 454
South Fork New River near Jefferson, N. C.	249
South Fork Republican River near Colo.-Kans. State line	586-589
South Fork Shenandoah River at Elkton, Va.	151-153
at Front Royal, Va.	157
near Luray, Va.	154-156
South Fork Solomon River at Alton, Kans.	642-646
South Heart, N. Dak., Heart River near	425-429
South Loup River at St. Michael, Nebr. near Cumro, Nebr.	550-554
569, 573	
South Platte River at Julesburg, Colo. near Kersey, Colo.	531-534
566	
South River at Harrison, Va.	160-162
at Waynesboro, Va.	159
South Tyger River near Reidville, S. C.	207
near Woodruff, S. C.	207
Sparks, Nebr., Niobrara River near ..	499-502
Specific conductance	12
Springfield Lake Outlet at Akron, Ohio.	267
Stamford, Nebr., Sappa Creek near ..	601-605
Stevens Creek near Modoc, S. C.	211
Still Creek at Ginters, Pa.	88

	Page		Page
Stony Creek at Columbia Furnace, Va.	170	Valley Creek near Sugars Bridge, Pa.	95
Stony Creek at Norristown, Pa.	91	Verdigre River at Verdigre, Nebr.	509, 511
Strasburg, Va., North Fork Shenandoah		near Verdigre, Nebr.	508
River near	165-167		
Stream flow	19	W	
Streams tributary to Lake Erie	256-267	Waccamaw River at Freeland, N. C.	193
Sugar Creek at Sugar Creek, Pa.	232	Waccamaw River basin	193
Sulfate	10	Wallace, Kans., Rose Creek near	619
Suspended sediment	4-5	Walnutport, Pa., Lehigh River at	30-32
Susquehanna River at Danville, Pa.	100-105	Wapwallopen Creek at Wapwallopen, Pa.	134
at Falls, Pa.	97-99	Warren, Pa., Allegheny River at	215-217
at Harrisburg, Pa.	106-108	Waynesboro, Pa., Antietam Creek near	148-149
at Shickshinny, Pa.	133	Waynesboro, Va., South River at	159
Susquehanna River basin	97-141	West Branch Brandywine Creek at	
Sutersville, Pa., Youghiogheny River at	238-240	Cedar Knoll, Pa.	94
Swatara Creek at Harper Tavern, Pa. ..	137	at Coatesville, Pa.	94
near Middletown, Pa.	137	at Mortonville, Pa.	94
Swift Creek near McCullers, N. C.	188	near Wawaset, Pa.	94
near Smithfield, N. C.	189	West Branch Chester Creek near Lemmi	
near Vanceboro, N. C.	189	Mills, Pa.	94
Sylvan Grove, Kans., Wolf Creek near .	637-641	West Branch Little Schuylkill River	
		at Gintners, Pa.	88
T		West Branch Octoraro Creek near	
Tar River at Greenville, N. C.	180	Spruce Grove, Pa.	141
near Nashville, N. C.	184	West Branch Red Clay near Kennett	
near Tar River, N. C.	184	Square, Pa.	95
Temperature	5	West Branch Susquehanna River at	
Tennessee River basin	252-255	Lewisburg, Pa.	115-117
Thermopolis, Wyo., Bighorn River at ..	303-308	at Lock Haven, Pa.	112-114
Tinicum Creek at Tinicum, Pa.	86	West Branch White Clay Creek near	
near Ottsville, Pa.	86	Landenberg, Pa.	95
Toby Creek at Luzerne, Pa.	133	West Mahantango Creek near McKees	
Tohickon Creek at Point Pleasant, Pa. .	86	Half Falls, Pa.	136
at Tohickon, Pa.	86	West Swamp Creek at Layfield, Pa. ..	90
near Pipersville, Pa.	86	near Delphi, Pa.	90
near Quakertown, Pa.	86	White River near Kadoka, S. Dak.	483-487
Tongue River at Miles City, Mont.	394-397	near Oacoma, S. Dak.	488
Toston, Mont., Missouri River at	290-292	near Oglala, S. Dak.	478-482
Total acidity	13	White River basin	478-488
Tranfers Creek above Washington, N. C.	184	White Rock Creek at Lovewell, Kans. .	655
at Latham, N. C.	184	Wiconisco Creek near Elizabethville, Pa.	136
near Washington, N. C.	184	Wild Rice River at Hendrum, Minn. . .	270
Trenton, Nebr., Republican River at ...	579-585	Wilmington, Del., Brandywine Creek at	80-82
Trenton, N. J., Delaware River at ...	27-29, 83	Wilson, Kans., Saline River near	627-630
Trent River near Pollocksville, N. C. .	189	Winchester, Va., Abrams Creek at ...	147
near Trenton, N. C.	189	Wind River at Dubois, Wyo.	295-296
Trout Creek near Port Kennedy, Pa.	91	at Riverton, Wyo.	297-302
Tuckasegee River at Dillsboro, N. C. ..	255	Wissahickon Creek at Philadelphia, Pa.	92
Tug Fork at Kermit, W. Va.	250	at Whitmarsh, Pa.	92
Tuscarawas River at Newcomerstown,		near Port Washington, Pa.	92
Ohio	244	Wolf Creek near Sylvan Grove, Kans. .	637-641
Twelve Mile Creek near Pickens, S. C. .	211	Woodcock Creek near Saegerstown, Pa.	232
Tygart River at Elkins, W. Va.	233	Wood River near Riverdale, Nebr.	535-538
U		Y	
Unami Creek near Sumneytown, Pa. ...	90	Yadkin River at Yadkin College, N. C. .	195
		Yellowstone River at Miles City, Mont.	405
V		near Sidney, Mont.	405
Valley Creek at Valley Forge, Pa.	91	Yellowstone River basin	295-407
		York, Pa., Codorus Creek near	127-129
		Youghiogheny River at Sutersville, Pa.	238-240