Summary of Alluvial-Channel Data From Rio Grande Conveyance Channel, New Mexico, 1965–69

GEOLOGICAL SURVEY PROFESSIONAL PAPER 562-J

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By J. K. CULBERTSON, C. H. SCOTT, *and* J. P. BENNETT

SEDIMENT TRANSPORT IN ALLUVIAL CHANNELS

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Summary of basic hydraulic and sediment data obtained from a field stream

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By J. K. CULBERTSON, C. H. SCOTT, and J. P. BENNETT

ABSTRACT

The Rio Grande conveyance channel near Bernardo, N. Mex., was the site for a field study of mechanics of flow and sediment transport. During the period of study, the channel bed consisted of sands with median diameters ranging from 0.15 to 0.35 millimeters, and the bed form varied from dunes to flat. A few data were obtained at two other locations in the channel system.

The report summarizes the basic hydraulic and sediment data obtained during the study. Brief descriptions of equipment and procedures of sampling are followed by descriptions of two sets of data. The first set, consisting of a series of measurements taken at individual cross sections, is intended to be descriptive of conditions at successive points along the reach. The second set consists of a series of measurements characterizing the entire length of the Bernardo reach of the channel system.

The data described, which include water discharge, cross-sectional area, channel width, slope, point velocity, point-integrated sediment concentration, depth-integrated sediment concentration, and bed material, are summarized in eight tables.

Data were obtained for water discharges ranging from 560 to 1,860 cubic feet per second and slopes ranging from 0.00041 to 0.0011. Also observed were cross-sectional area variations from 143 to 425 square feet and suspended-sediment concentration, of materials in all sizes, ranging from 1,240 to 7,700 milligrams per liter.

INTRODUCTION

As part of the research program of the Water Resources Division of the U.S. Geological Survey, a field study of the mechanics of water and sediment movement in alluvial channels was started in July 1964. The study site was the Rio Grande conveyance channel near Bernardo, N. Mex. This site was selected because (1) the channel had a sand bed, (2) bed forms ranging from dunes to flat bed and standing wave had been observed in the channel, (3) a concrete weir across the channel acted as a control for accurate water-discharge measurement and as a sampling point for the total-sediment concentration, and (4) water discharge could be controlled by means of a gated headwork. A few sets of data obtained at two other channel sites, near San Marcial, N. Mex., and near Nogal Canyon, N. Mex., are included in this report.

The primary objective of this study was to collect field data that describe the interrelations among hydraulic and sediment-transport variables over the range of bed forms in sand channels. The secondary objective was to obtain data on the resistance to flow resulting from different bed forms in sand-bed channels. This report is a compilation of the hydraulic and sediment data from the Rio Grande conveyance channel reaches at Bernardo, San Marcial, and Nogal Canyon during the period 1965 to 1969. The data are divided into two sets: those describing the conditions at individual cross-sections and those characterizing the entire length of a particular reach.

A brief general description of the channel reaches in which the measurements were made is followed by a description of data-collection methods and equipment and by a discussion of the two sets of data. Appendix 1 is a general description of the conditions prevailing in the study reach when each set of data was collected, and appendix 2 consists of the tables of data collected.

Some data presented in this report have been mentioned in earlier interpretative reports. These reports include discussions by Scott and Culbertson (1967) and Scott, Norman, and Fields (1969) on flow-measurement techniques which use fluorescent tracers. Scott (1968) and Scott and Culbertson (1971) reported on resistance to flow in flat-bed alluvial channels, and Culbertson and Scott (1970) discussed sand-bar development and movement in alluvial channels. Other data from this report were used by Fischer (1967) in a discussion of transverse mixing in alluvial channels.

The project, was started under the general supervision of Luna B. Leopold, chief hydrologist, Water

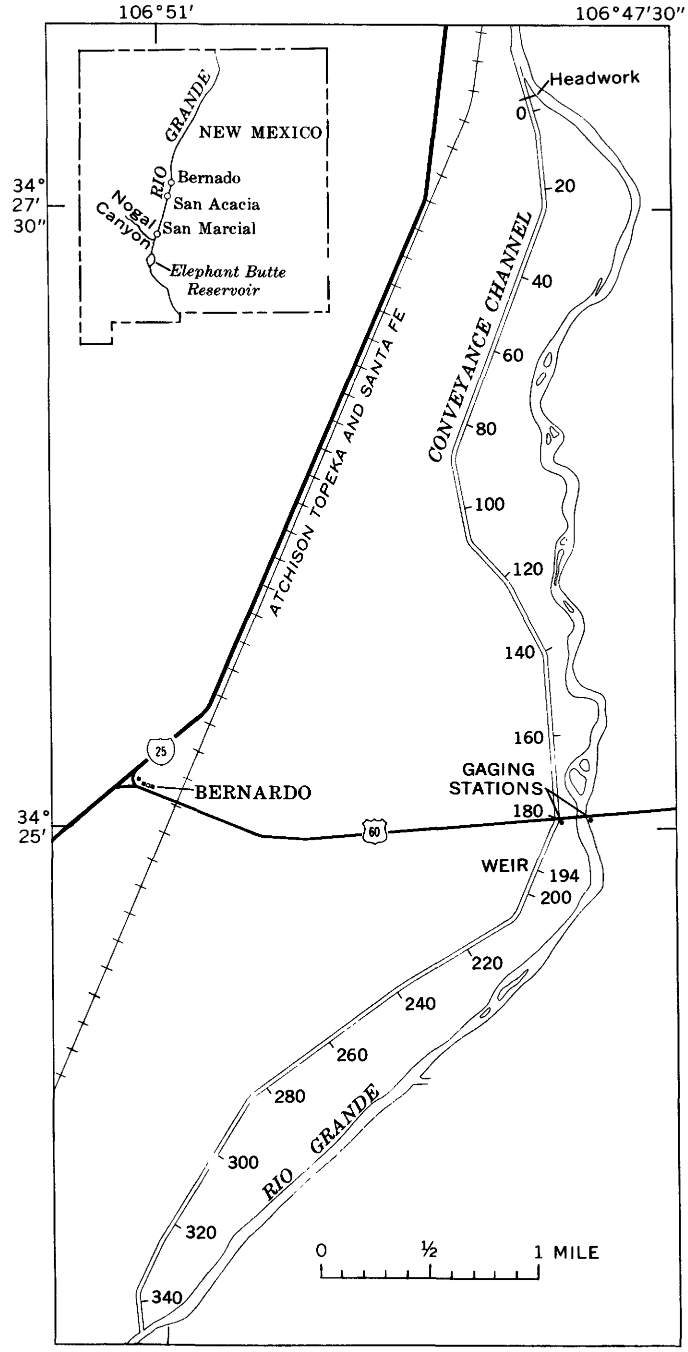


FIGURE 1.—Location of channel near Bernardo, N. Mex. Numbers along channel designate every 20th sampling section. Sampling sections are between stations at 100-foot increments on each side of the channel.

Resources Division, and continued under Ernest L. Hendricks, chief hydrologist, Water Resources Division. Technical guidance was given by P. C. Benedict, R. W. Carter, Tom Maddock, Jr., D. B. Simons, and others from the Geological Survey.

The principal investigators were J. K. Culbertson and C. H. Scott, who were assisted by C. F. Nordin, Jr., E. V. Richardson, W. F. Curtis, V. W. Norman, J. D. Dewey, and others.

DESCRIPTION OF STUDY REACHES

CHANNEL NEAR BERNARDO

The part of the channel near Bernardo, N. Mex. is approximately 6.8 miles long from the gated headwork to the point at which it returns to the Rio Grande floodway channel (fig. 1). The channel was originally a riverside drain. In 1948, the river broke through the drain at the location of the present headwork. The Bureau of Reclamation installed the headwork and straightened the channel, creating the first segment of the present channel. The capacity of the headwork is nominally 2,000 cfs (cubic feet per second); however, the discharge in the channel usually is limited to less than 1,600 cfs.

The channel banks are composed of a sandy clay and are fairly well stabilized by salt cedar and range grass. Where bank erosion has occurred, the banks have been stabilized with rock and gravel. A few hundred feet of Kelner jetties also have been placed along some short reaches for bank stabilization. The channel bed consists of sands with median diameters ranging from 0.15 to 0.35 mm (millimeters). Figure 2 shows the channel during typical low-flow and high-flow situations.

In 1964, prior to this study, a concrete control structure was constructed 19,800 feet downstream of the headwork. This structure, referred to as a weir in this report, acts as a control for the gaging station installed at the site. Because baffles placed on the upstream apron of the weir force all sediment into suspension, suspended-sediment samples obtained at a sill on the downstream apron of the weir represent total sediment in transport. The sill is designed so that the nozzle of a U.S. DH–48 suspended-sediment sampler (discussed later in this report) can be lowered through the entire depth of flow at the weir section. At the bottom of the sampler's descent, its nozzle rests directly on the sill of the weir, which means that the sample represents all of the suspended material and, therefore, all the sediment moving through the section. Gonzalez, Scott, and Culbertson (1969) described the construction of the weir and evaluated its effectiveness as a control structure. Figure 3*A* shows the sampling sill and the orifice of a bubbler gage installed at the weir. Figure 3*B* shows the entire weir, baffles, sampling sill, and footbridge; and figure 3*C* shows a U.S. DH–48 sampler being lowered to the sampling sill along specially prepared guides which are positioned from the footbridge.

A

B

FIGURE 2. — Typical views of channel near Bernardo. *A*, Typical low-discharge situation. *B*, Typical high-discharge situation.

CHANNEL NEAR SAN MARCIAL

The San Marcial reach of the channel is between the San Acacia diversion dam and Elephant Butte Reservoir. Data given in this report were collected at a location near San Marcial which is about 41.7 miles downstream of the headwork at San Acacia and about 59.8 miles downstream of the headwork at Bernardo.

The channel near San Marcial is a dug channel with a capacity of about 2,000 cfs. The channel bed in this reach consists of sand having a median diameter of about 0.18 mm. The channel banks are sand and gravel.

CHANNEL NEAR NOGAL CANYON

The Nogal Canyon reach is about 18.8 miles downstream of the San Marcial reach. This reach has a

A

B

C

FIGURE 3. — Control weir, channel near Bernardo. *A*, Sampling sill and bubbler-gage orifice. *B*, Weir, baffles, sampling sill, and footbridge. *C*, U.S. DH-48 sampler in use from footbridge.

sand bed consisting of material having a median diameter of about 0.18 mm. The channel banks in this reach are unstabilized sand and clay. At the time the data of this study were collected, the banks were deteriorating under high-flow conditions.

DATA-COLLECTION METHODS AND EQUIPMENT

WATER DISCHARGE

Water discharge was obtained either from the record of stage and the stage-discharge relation for the gaging station at the weir at station 194 or from water-discharge measurements. Gonzalez, Scott, and Culbertson (1969) discussed the stage-discharge relation for the gaging station at the weir. The water-discharge measurements were made at the cableway of U.S. Geological Survey gage 08–3319.9, at station 180, 100 feet upstream of the U.S. 60 highway bridge. The measurements were made by current meter using standard U.S. Geological Survey methods as described by Buchanan and Somers (1969).

The discharges reported in the tables of basic data are the means for the periods unless the discharge varied considerably, and then the discharge at the time of observation is reported.

WATER TEMPERATURE

Water temperatures were determined several times during each observation period. Temperatures are reported to the nearest degree Celsius in the tables of basic data. The range in temperature usually was not more than 2° or 3° Celsius during any period of observation.

BED CONFIGURATION

Profiles of the streambed were obtained with an ultrasonic sounder (Richardson and others, 1961). The sounder was mounted in a boat, with the transducer in a well near the center of the boat (fig. 4). The bed-form classification used herein conforms to that presented by the Task Force on Bed Forms in Alluvial Channels (1966). Longitudinal profiles of the bed form were obtained for those data-collection periods when the bed form was transition or dunes. The profiles generally were obtained at the approximate quarter points of the channel width. Because the speed of the boat varied somewhat through the length of the reach, marks at 50-foot intervals of boat movement, as indicated by stationing on the bank, were placed on the chart of the sounder profile. Variations in length of chart per unit distance traveled by the boat usually were not large, and an average scale value was computed and applied to each separate longitudinal profile.

The average length of dunes was computed by dividing a distance by the number of dunes occurring in that distance, and the average height of dunes was computed as the sum of heights, measured from crest to downstream trough, divided by the number of heights measured on the profile. This method of determining average length and height of dune is subjective because different persons may not agree as to what should be called a dune on the profile, particularly when smaller dunes appear to be superimposed on larger dunes. The classification of the bed form as dunes, transition, or flat is based on the observer's best judgment and is also, therefore, somewhat subjective.

FIGURE 4. — Boat with sounder equipment.

CROSS-SECTIONAL AREAS

Cross-sectional areas were determined either from cross-section profiles obtained with the ultrasonic sounder or from depths obtained with a sounding rod.

To determine profiles with the ultrasonic sounder, the transducer was placed a known distance below the water surface in the well in the boat. A cable was stretched tightly across the section, and the boat was hooked to the cable by means of a crossarm. The boat was pulled across the channel at about one-half foot per second by means of a second cable and a constant-speed-drive motor. Reference marks at 2-foot intervals of distance traversed in the cross section were marked automatically on the sounder chart of the profile. The depths at verticals near the banks were determined with a wading rod. Cross-sectional profiles usually were determined with the ultrasonic sounder when there were dunes because of the softness of the bed and the relatively large changes in bed elevation in the cross section. The cross-sectional area was determined by planimetering the cross-section profile, taking into account the distance of the transducer face below the water surface.

Cross sections usually were obtained with a sounding rod when the bed was hard and had relatively constant elevation; it was possible to determine depth to the nearest 0.1 foot with the sounding rod. It was assumed that the depth at a given vertical applied to half the distance between adjacent verticals, and the cross-sectional area was computed as the sum of subareas.

WATER-SURFACE SLOPE

Water-surface slopes were determined from water-surface elevation taken near the banks either with a level and rod or from staff-gage readings.

Water-surface elevations generally were obtained twice a day at 100-foot intervals over reaches 1,000 to 1,200 feet in length. The water-surface elevations were plotted, and a mean slope was determined graphically.

Because the readings were taken near the banks, local conditions could have affected water-surface elevation. For example, a dune near the bank could affect the water-surface elevation. However, water-surface slopes determined by this method generally were consistent for any given day.

VERTICAL VELOCITY PROFILES

Vertical velocity profiles were obtained with standard Price current meters equipped with magnetic heads which produced two impulses per revolution of the current-meter bucket wheel. Five current meters were mounted on a sounding rod, and the impulses from the meters were recorded by digital counters (fig. 5) which were started and stopped together by single switch. Point velocity was computed from counts produced by the current meter for a 1-minute period. The average of the five individual meter ratings was used for converting meter counts per unit time to stream velocity. For a given meter count per unit time, the maximum difference between the average rating and any of the individual ratings was about 1 percent. The results of extensive tests of meters indicate that an average rating for meters can be used (Smoot and Carter, 1968). Ratings taken from meters all mounted on one rod were checked in a towing tank and did not depart from the individual ratings when meter spacing was as close as 0.5 foot (R. W. Carter, written commun.).

Because the velocity at as many as five points in the vertical could be obtained at one time, it was possible to obtain 10–12 vertical velocity profiles at a cross section in 20–30 minutes. Usually the bottom four meters were set at fixed depths, and only the position of the top meter was changed when a large change in depth of flow occurred from one vertical to another. The depth of flow at the vertical was measured on the rod on which the meters were mounted, and the meters were assumed to be the same distance above the bed as they were above the base plate of the rod. At some verticals the rod would settle because of the weight of the rod and meters and the softness of the bed. When this happened, the indicated depth of the rod was noted, and the actual depth was measured with another sounding rod. The indicated distances above the bed at which the velocities were obtained were adjusted accordingly.

Velocity profiles for the flat bed form, when plotted as $\log_{10} y$ versus velocity, where y is the elevation above the streambed, generally were consistent except at verticals near the banks. Near the banks, the slopes (the difference in velocity at y and $10y$ distances above the bed) and intercepts (the velocity 1.0 ft above the bed) of the profiles varied because of the roughness of the banks.

Velocity profiles for dune bed forms generally were less consistent than profiles for flat bed forms.

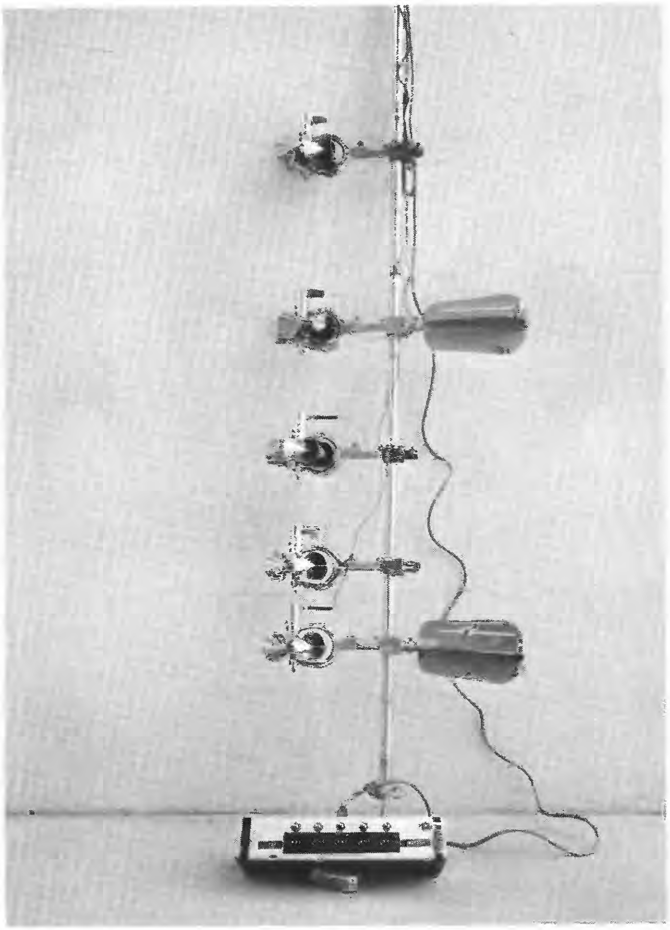


FIGURE 5.—Meter stack and digital-counter box used for obtaining vertical profiles of point velocities.

The slopes and intercepts of the velocity profiles varied across the channel. The value of the slope and of the intercept of the profile depended on the location of the vertical with respect to a dune. Figure 6 shows typical velocity profiles obtained downstream of points near the middle of the channel on February 4 and May 12, 1965. Near the crests of the dunes, the velocities were high and nearly equal at all points in the verticals. This is a result of acceleration of the flow caused by the decrease in depth toward the crest of the dune. In the trough between dunes, the velocity 1 foot from the bed was relatively low and increased considerably from near the bed to near the surface in the vertical. This is a result of deceleration of the flow as the depth increases rapidly from the crest to the trough. Immediately downstream of the crest of the dune, flow near the bed may have been in an upstream direction. No attempt was made to determine the direction of flow in the troughs between dunes, and some velocities obtained near the bed in troughs may actually have been negative, even though they were recorded as positive. Velocity profiles were especially difficult to obtain in the troughs because sand stopped the lower meters before sufficient counting time had elapsed.

SUSPENDED-SEDIMENT SAMPLES

POINT-INTEGRATED SAMPLES

Point-integrated samples of suspended sediment were obtained at five points in each of three to five verticals in a cross section. The samples at each point were analyzed for concentration and for size distribution of sediment coarser than 0.062 mm. The analysis was performed using a visual-accumulation tube according to the methods described by Guy (1969) and by the U.S. Inter-Agency Committee on

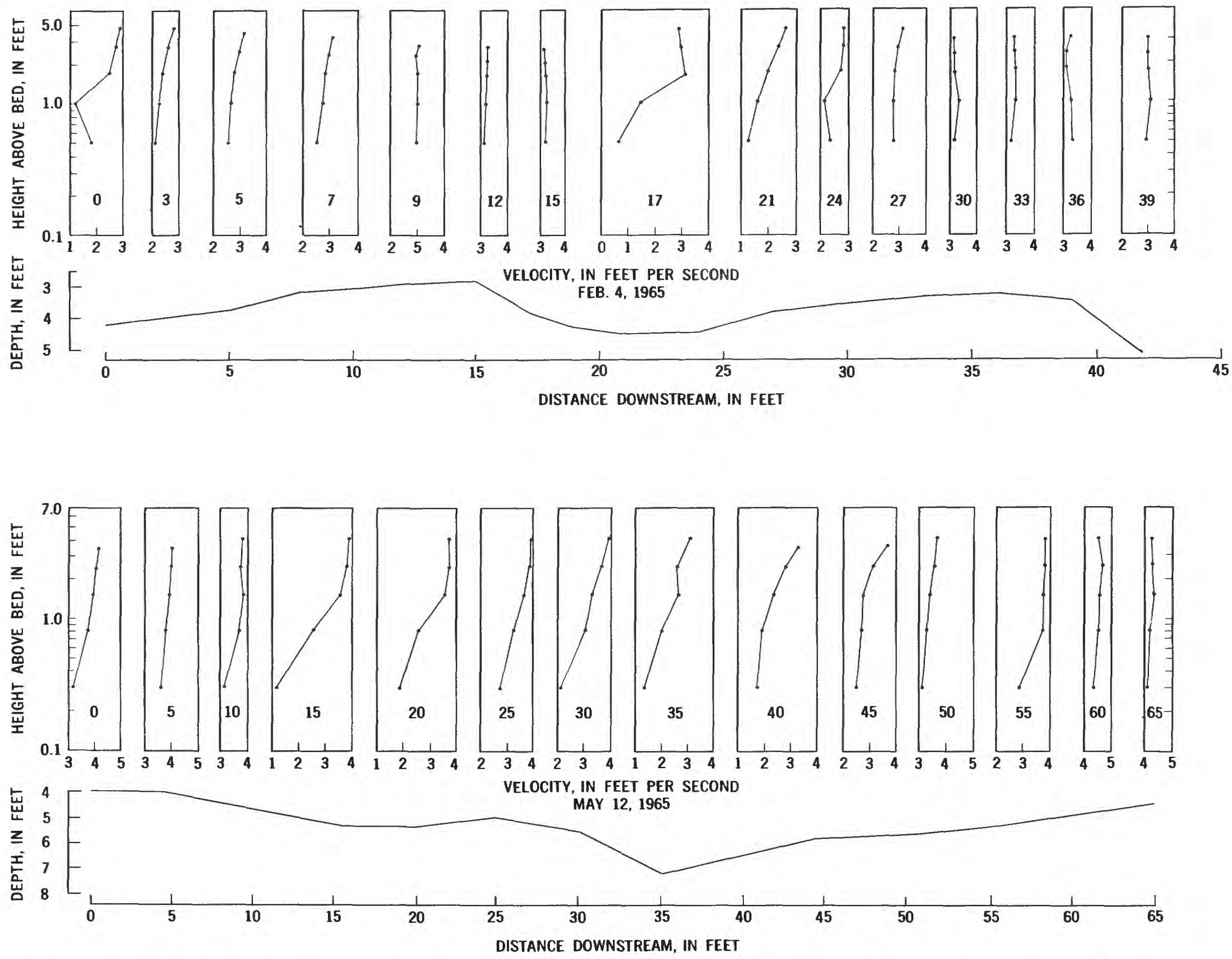


FIGURE 6. — Typical velocity profiles over dunes, channel near Bernardo, February 4 and May 12, 1965. Values in rectangles are distances downstream, in feet.

Water Resources (1957). None of the point samples were analyzed for size distribution of sediment finer than 0.062 mm. The samples were taken with a U.S. DH–48 sampler modified for point sampling (fig. 7). The modified sampler was equipped with a pressure-equalization chamber that was connected to the sample chamber and vented to the outside. Watertight covers sealed the water-inlet nozzle and the air-outlet port. The covers could be opened and closed together by means of a pull cable.

The length of sampling time varied inversely with stream velocity, from 5 to 6 seconds for high-velocity flows to 12 to 15 seconds for low-velocity flows. Because the local flow conditions could change with time at a given vertical, particularly where the bed form was dunes, it was desirable to obtain samples at all points in the vertical as quickly as possible. Therefore, only one to three samples were obtained at a given depth in each vertical, and because of the short sampling time involved, some variability in the concentration sampled at a given depth probably was introduced because short-term fluctuations of concentration were not adequately averaged.

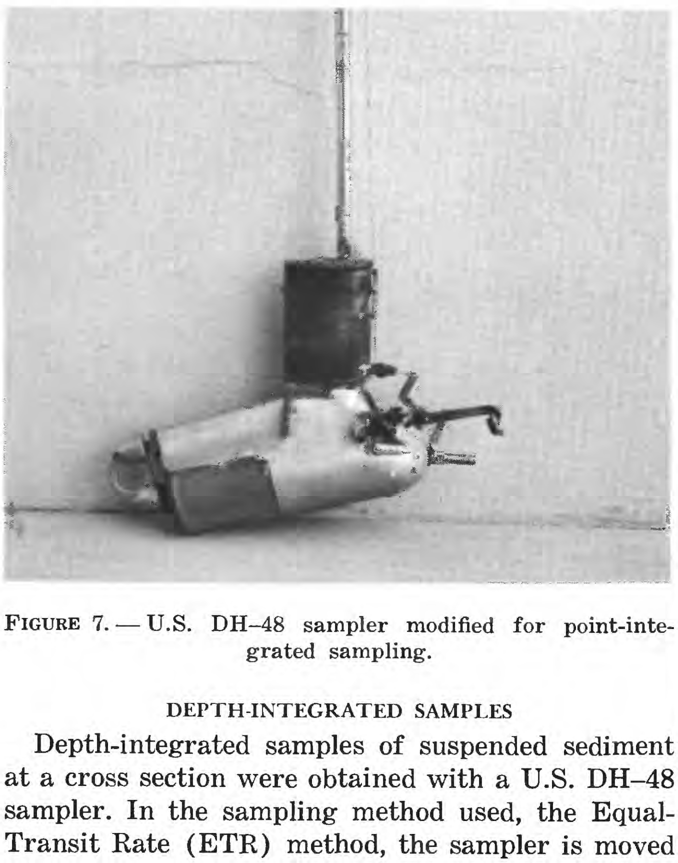


FIGURE 7. — U.S. DH–48 sampler modified for point-integrated sampling.

DEPTH-INTEGRATED SAMPLES

Depth-integrated samples of suspended sediment at a cross section were obtained with a U.S. DH–48 sampler. In the sampling method used, the Equal-Transit Rate (ETR) method, the sampler is moved at the same transit rate for each one of a set of equally spaced verticals in the cross section. The sediment concentration of the composite of all samples collected from the cross section is the average concentration of the suspended material moving in the sampled zone (Guy and Norman, 1970; Task Committee on Preparation of Sedimentation Manual, 1969). Samples were collected at verticals 5 feet apart, and the composited samples for each cross section were analyzed for concentration and for size distribution of sediment coarser than 0.062 mm. The size distribution of sediment coarser than 0.062 mm was determined by the visual-accumulation-tube method (U.S. Inter-Agency Committee on Water Resources, 1957; Guy, 1969). In addition, the size distribution of sediment finer than 0.062 mm was determined for a few samples by the pipette method (U.S. Inter-Agency Committee on Water Resources, 1941; Guy, 1969).

Depth-integrated samples of suspended sediment were obtained by the ETR method with a U.S. DH–48 sampler at verticals spaced at 5-foot intervals across the weir (section 194). A sampling lip with a guide slot allowed the nozzle of the DH–48 sampler, which was mounted on a guide frame, to traverse the full depth of flow. In this way, samples represented essentially the total material passing the weir. Each set of samples was composited and analyzed for concentration and for size distribution of sediment coarser than 0.062 mm. Size distribution of sediment finer than 0.062 mm was determined for a few samples.

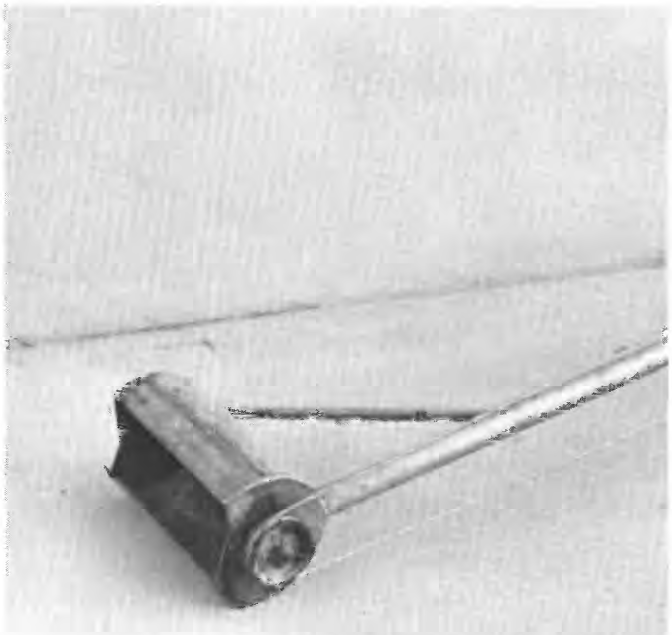
In this report, samples obtained by the ETR method at the sampling section on the weir (section 194) will be referred to as total-sediment samples, and samples obtained by the ETR method at any other sampling section will be referred to as measured suspended-sediment samples.

BED MATERIAL

Samples of bed material were obtained usually at 10-foot intervals across cross sections in the study reach. Analyses of samples from the individual points in cross sections for two flow conditions indicated no great variation in size distribution of bed material from point to point in the cross sections, and therefore, all other bed-material samples were composited into a single sample for a cross section. The samples were analyzed for size distribution by the visual-accumulation-tube method in the laboratory. The values of d_{16}, d_{50}, and d_{84} were scaled from the original curve on the visual-accumulation-tube chart. The value of the gradation coefficient, σ, was computed from the equation

$$\sigma = \tfrac{1}{2}\left(\frac{d_{50}}{d_{16}} + \frac{d_{84}}{d_{50}}\right). \qquad (1)$$

For flow depths greater than 3 feet, most samples of bed material were obtained with a hand-held clamshell-type sampler (fig. 8*A*). The sampler was equipped with a seal to prevent loss of fine material from the bucket as the sampler was raised to the surface. The bucket sampled to a depth of about 0.1 foot. For flow depths less than 3 feet, samples were obtained either with the clamshell sampler or with the U.S. BMH–53 piston-type (fig. 8*B*) sampler (Inter-Agency Committee on Water Resources,



A

B

FIGURE 8.—Bed-material sampling equipment. *A*, Hand-held clamshell-type sampler. *B*, U.S. BMH–53 piston-type sampler. Rule is 6 inches long.

1959). The core barrel of the piston sampler is 8 inches long, but only the top 0.1 foot of the core was retained for analysis.

SECTION DATA

The data collected for the description of flow conditions at individual cross sections in the Bernardo, San Marcial, and Nogal Canyon reaches of the Rio Grande conveyance channel are summarized in tables 1 through 5 of appendix 2. Given in appendix 1 are detailed descriptions of the flow and channel characteristics prevailing in the reaches prior to and during the data-collection periods. The authors strongly recommend that, before using appendix 2, one study the pertinent sections of appendix 1 to become aware of the prevailing conditions when measurements were made.

Table 1 summarizes available section data, in chronological order, for the Bernardo, San Marcial, and Nogal Canyon sites. The term "section," as used in this report, refers to the cross section's location. The number in column 2 assigned to a section for the Bernardo observations is the distance, in hundreds of feet, downstream of the first cross section downstream of the headwork. The first cross section, section 0, is 400 feet downstream of the headwork. Section 20 is 2,000 feet downstream of the first cross section and is therefore 2,400 feet downstream of the headwork. The number in column 2 assigned to a section for the San Marcial and Nogal Canyon observations is the distance, in hundreds of feet, upstream of Elephant Butte Dam. For example, section 2261+00 in the San Marcial reach is 226,100 feet upstream of Elephant Butte Dam.

In table 1, water discharge, cross-sectional area, water-surface width and slope, and bed form were determined as discussed earlier in this report; any special conditions are discussed in appendix 1. In column 2 of this table, the notation "Reach" indicates that the data listed were averaged from the particular cross sections listed in the remarks column.

Figure 9 shows daily-mean water discharge and daily-mean sediment concentrations for 10-day periods prior to the day on which data were collected for each of the observation periods. This information should be considered in interpreting data shown in the tables of basic data.

Table 2 gives measured velocities at five points in the vertical in some of the cross sections listed in table 1. The velocities were measured using a rack of five Price current meters over a counting period of 60 seconds. Typical velocity profiles over a dune bed are plotted in figure 6.

Table 3 gives the size analyses and related data for the point-integrated sediment samples. The samples were collected with a modified U.S. DH–48 sampler and were analyzed by means of the visual-accumulation-tube method. At sampled verticals in the cross section, size analyses are given for each point in each vertical. The analyses data are given both as the percent finer than a given reference size and as the concentration, in milligrams per liter, in a given size class. Related parameters reported are water discharge, water temperature, and total depth of flow at the point in the cross section where the samples were collected.

Table 4 gives the size analyses and related data for the depth-integrated sediment samples. The sediment samples were collected with a U.S. DH–48 sampler and the ETR collection procedures; they were analyzed by means of the visual-accumulation-tube method for the material coarser than 0.0625 mm and the pipet method for material finer than 0.0625 mm. The weir at section 194 is designed so that all sediment moving in a vertical can be sampled by means of a U.S. DH–48 sampler. Therefore, the sediment sampled at the weir represents the total-sediment load at that section. The analyses for a composite of the samples collected in the cross section at a particular time are listed both in terms of percent finer than a given reference size and as concentration, in milligrams per liter, in a given size range. Related parameters listed are water discharge, water temperature, median particle diameter, and gradation coefficient. The water discharge listed is that at the time the sediment samples were collected.

Table 5 summarizes size analyses of bed material. The material, obtained from the upper 0.1 foot of

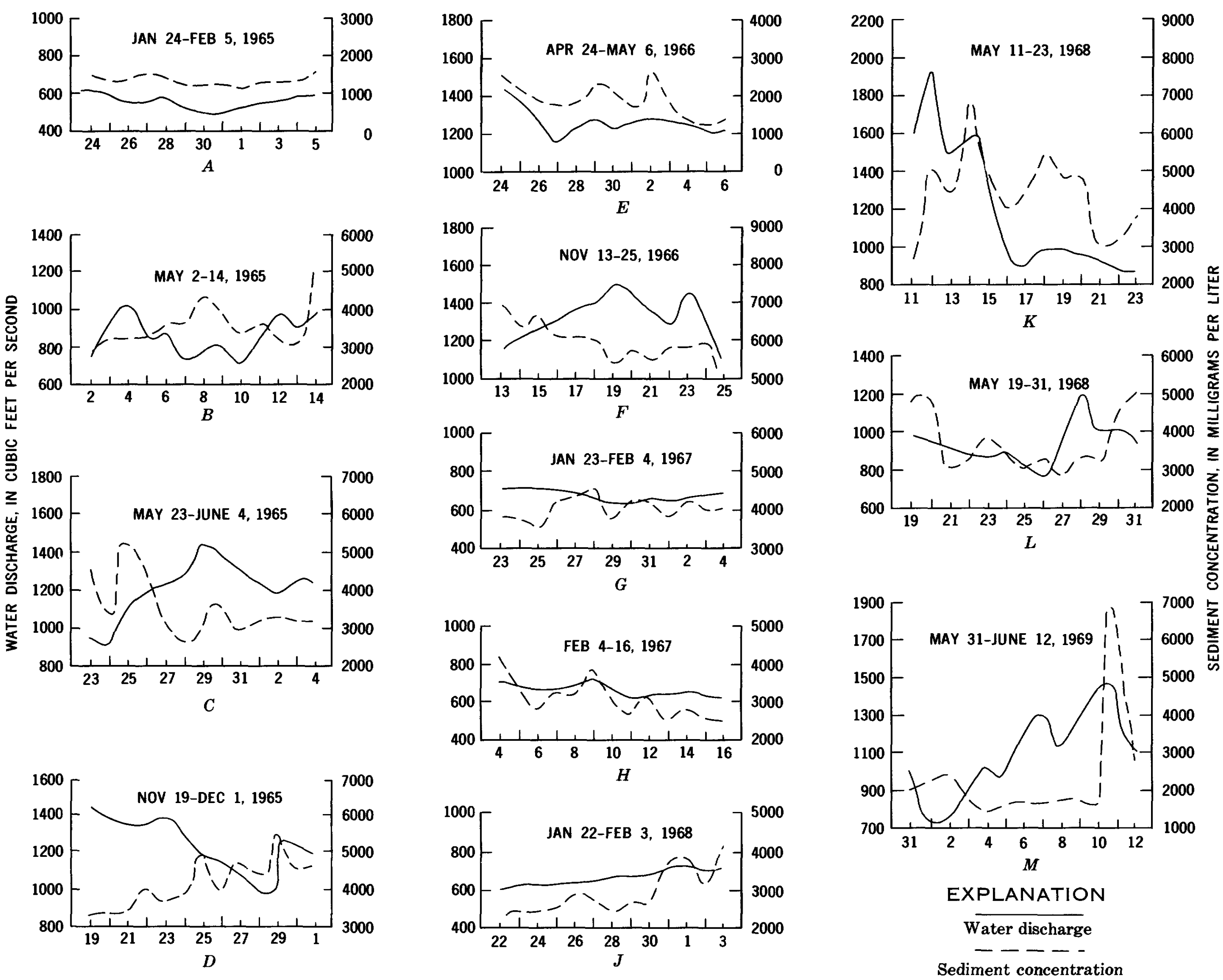


FIGURE 9.—Hydrographs of water discharge and sediment concentration at the weir (section 194), channel near Bernardo.

the bed, was collected with either a clamshell-type sampler or a U.S. BMH–53. The samples analyzed were actually composites of samples from several points (usually at 10-ft intervals) in the cross section. Listed in addition to percent finer than a given reference size are median diameter, gradation coefficient, water discharge and temperature, and bed form.

REACH DATA

Hydraulic data collected at each section in the Bernardo reach are shown in table 6. Generally, data were collected at sections 2,000 feet apart; however, 4,000-foot intervals were used for some observations.

The data from table 6 were used to compile the average values shown in table 7. The weir divided the channel into two reaches. Channel widths upstream of the weir were greater and more variable than the relatively uniform channel widths downstream of the weir (fig. 10). Some of the observations were completed in 1 day; others, over 2 days.

Table 7 was developed from table 6. Water discharge is the mean discharge at the weir for the period of observation. Reach length is the length, in feet, between the two end sections. Mean water-surface width is the average width of all sections within the reach length. Mean depth of flow is the average of the areas of each section within the reach length divided by the average width. Mean velocity is the mean discharge during the period divided by the average area within the reach length. Water-surface slope is the mean slope of a graph of observed water-surface elevations versus distance. Water temperature is the average during the period of observation. Median diameter of bed material is the average of the d_{50} at each section within the reach length. Fall velocity and gradation are for the d_{50} shown.

The dominant bed form listed in table 7 is based on the qualitative field observations. If the majority of the sections were classified as dune, the reach length was classified as dune. For some observations, bed form varied from section to section, and no specific bed form was considered to be dominant; therefore, the reach was classified as transition. No practical method for the classification of discrete bed forms in an alluvial channel has been determined; therefore, the classification of bed form remains qualitative, based entirely on the authors' observations and judgments. In cases where the longitudinal variation of bed form was considered to be excessive, not all sections listed in table 6 were used in determining the reach data of table 7.

In table 7, the values of suspended-sediment concentration for all observations prior to September 30, 1965, are daily mean concentrations. They were determined from suspended-sediment samples collected usually at section 180. Beginning October 1, 1965, the suspended-sediment concentrations shown are total-sediment concentrations determined from samples collected at the weir, section 194.

In table 7, Manning's n was computed for each reach observation from the relation

$$n=\frac{1.49\ D^{2/3}\ S^{1/2}}{V}, \tag{2}$$

where D is mean depth of flow, in feet, S is average water-surface slope, and V is mean velocity, in feet per second. The range in values of Manning's n for the reach data was approximately twofold. The n values for flat bed forms generally were from 0.015 to 0.017 for dune bed forms, from 0.023 to 0.033; and for transition bed forms, from 0.019 to 0.024. The flow conductance coefficient, $C/\sqrt{g}$, was computed from the relation

$$C/\sqrt{g}=\frac{V}{(gDS)^{1/2}}, \tag{3}$$

where D is mean depth of flow, in feet, S is average water-surface slope, V is mean velocity, in feet per

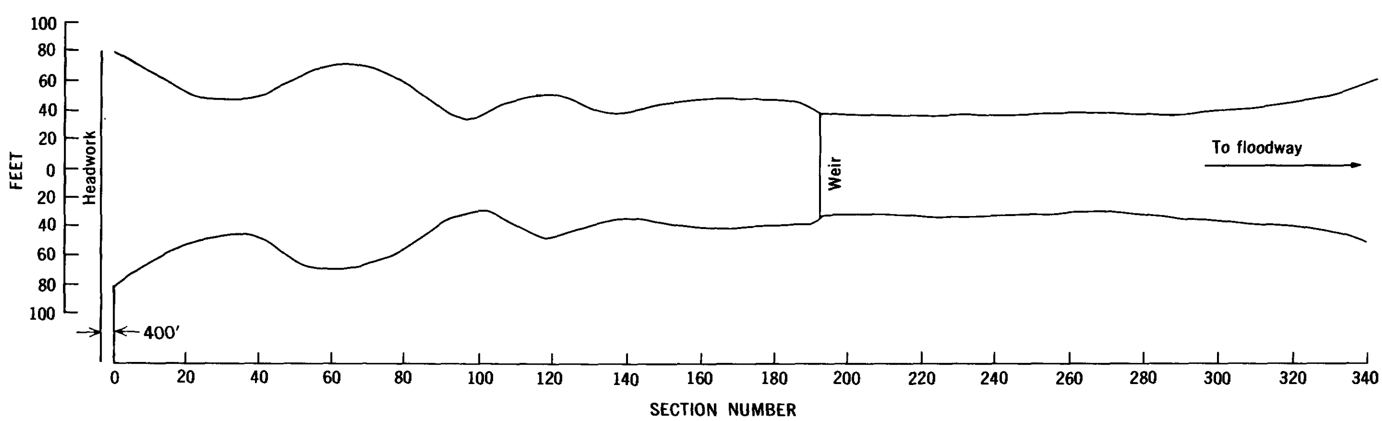


FIGURE 10. — Plan view of channel near Bernardo.

second, and g is the gravitational constant, 32.2 feet per second.

The range in values of $C/\sqrt{g}$ for these data was from about 21 for the flat bed form to 11 for the dune bed form. For flat bed forms, values of $C/\sqrt{g}$ generally ranged between 18 and 21; for dune bed forms, values ranged between 10 and 13. Transition reach values of $C/\sqrt{g}$ generally were between 13 and 18.

Measured suspended-sediment samples for May 27–28, 1965, were collected at all sections in the reach. These observations (table 6) illustrate the unsteady sediment transport from section to section through the length of the conveyance channel. Table 8 gives the particle-size distributions and size-class concentrations of these samples. The format of table 8 is essentially the same as that of table 4.

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APPENDIXES

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APPENDIX I. DESCRIPTIONS OF OBSERVATION CONDITIONS

FEBRUARY 3–4, 1965

Water discharge in the channel was relatively constant for 10 days prior to January 24. From January 24 to January 30, the discharge decreased from about 600 to 500 cfs. The discharge then began to increase slowly (fig. 9*A*). Four water-discharge measurements obtained on February 3 averaged 560 cfs, and on February 4 five measurements averaged 575 cfs. The daily-mean sediment concentration varied between 1,000 and 2,000 mg/l (milligrams per liter) during the period January 24 to February 1 (fig. 9*A*). Water temperature varied from 6°C at 0800 hours to 11°C at 1600 hours on both days.

Bed forms in the channel were observed periodically by means of a sonic sounder beginning on January 14. On January 14 the bed form throughout the channel was flat. By January 20, however, an 850-foot reach of dunes had developed, beginning at a point 850 feet upstream of section 220. Downstream of section 220 the bed remained flat. By January 29, the dune reach had lengthened to 1,650 feet, beginning 700 feet farther downstream than on January 20. On January 31, the dune reach was 1,850 feet long; the beginning point had moved downstream another 300 feet, and the downstream point of the dune reach was at section 240. On February 3, the downstream end of the dune reach was at section 246.5, and on February 4 it had reached section 247. The dune bed form was three dimensional throughout the dune reach. Crest-to-crest length of the dunes was 20 to 25 feet, and dune heights were from 1.5 to 2.5 feet.

Profiles of the channel cross section were obtained with the ultrasonic sounder on February 3 at sections 236, 238, and 240 in the dune-bed reach and at sections 250 and 255 in the flat-bed reach. The profile at section 252 in the flat-bed reach was obtained with a sounding rod. The average cross-sectional areas and widths for the three sections in the dune-bed reach and for the three sections in the flat-bed reach are shown in table 1.

Water-surface elevations were determined once for the reach from section 223 to 257 and once for the reach from section 234 to 246 on February 4. Elevations of water surface were determined along the left bank at 100-foot intervals; where bed form changed from dunes to flat, 25-foot intervals were used. Figure 11 shows the water-surface elevations through the 3,200-foot reach from section 223 to 255, including the dune-bed reach and the flat-bed reach, for one of the observations on February 3.

Vertical velocity profiles in the cross section were obtained on February 3 at section 252 (flat bed form), and at section 240 (dune bed form) on February 4. Profiles were obtained at 5-foot intervals.

Total-sediment samples were collected at the weir (section 194) on February 3 and 4; measured suspended-sediment samples were collected at sections 236 and 255 on February 3 and at section 255 on February 4.

Samples of bed-material were collected on February 4 in the dune-bed reach at section 238 and in the flat-bed reach at section 255. The analyses shown in the tables of basic data are for composite samples at each cross section. Individual samples were taken at nine points in the cross section at section 238 (5-ft intervals) and at six points in the cross section at section 255 (5-ft intervals). The median diameter of bed material for the samples at section 238 (dune bed form) varied from 0.22 to 0.27 mm, and the average value was 0.24 mm. The median diameter at section 255 (flat bed form) varied from 0.17 to 0.22 mm, and the average value was 0.19 mm.

MAY 12–13, 1965

Water discharge fluctuated between about 700 and 1,000 cfs during the 10-day period prior to these observations. Daily-mean sediment concentrations varied between 2,800 and 4,300 mg/l. Both water discharge and sediment concentration remained relatively constant during May 12–13 (fig. 9*B*). Water temperature varied from 14°C to 17°C on May 12 and from 15°C to 16°C on May 13.

Bed form was three-dimensional dunes prior to and during these observations. Figure 12 shows the longitudinal profile for the reach between sections 245 and 255, at the approximate centerline of the channel. Sketches of three cross sections, 245, 250,

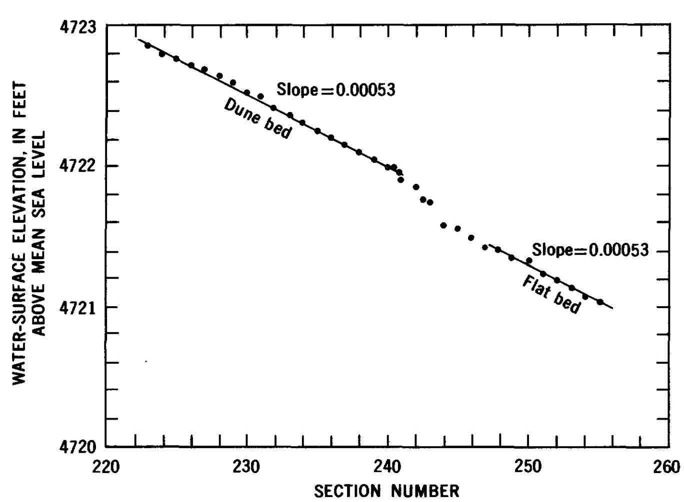

FIGURE 11. — Water-surface elevations, channel near Bernardo, February 3, 1965.

and 255, also are shown to illustrate the three-dimensional bed form. The average height and length of dunes, as determined from the longitudinal profile along the centerline of the channel from section 240 to 260, were 2.6 feet and 47 feet, respectively.

Cross-sectional profiles were obtained with the ultrasonic sounder at 14 sections on May 12 and 13. The profiles were obtained at 100-foot intervals from section 243 to 255. A profile also was obtained at section 260. The cross-sectional areas (A) ranged from 238 to 350 square feet and averaged 300 sq ft on May 12, and they ranged from 264 to 368 sq ft and averaged 300 sq ft on May 13.

Water-surface elevations were determined four times each day over the 1,200-foot reach from section 243 to 255. Elevations of the water surface were determined at 100-foot intervals along both banks. The individual determinations of slope of the water surface ranged from 0.00060 to 0.00069 on May 12 and from 0.00063 to 0.00067 on May 13. The average slope for each day, as shown in table 1, was 0.00065.

Vertical velocity profiles were obtained at 5-foot intervals at sections 249 and 250 on May 12 and at section 250 on May 13.

The average concentrations of total sands, or material coarser than 0.062 mm, determined from samples collected at the weir were 920 mg/l on May 12 and 910 mg/l on May 13. Concentrations of fine material (finer than 0.062 mm) averaged 2,430 mg/l on May 12 and 2,150 mg/l on May 13. Samples obtained at the weir and at section 240 were collected at 1- to 2-hour intervals each day. Samples of bed material were collected at 15 cross sections on May 12 and at three cross sections on May 13.

JUNE 2–3, 1965

Daily-mean water discharge averaged about 900 cfs from the time the observations were made on May 12 and 13 until May 24. The large dune bed configurations present on May 12 and 13 remained during this period. Beginning May 24, the discharge in the channel was increased by about 100 cfs per day by opening the headgates. This was done to observe changes in bed form resulting from the increase in discharge. Large transverse bars were formed as a result. Culbertson and Scott (1970) described the development and movement of these transverse bars during the period May 24–29. The discharge was reduced from the high of about 1,450 cfs on May 29 to about 1,200 cfs on June 2 (fig. 9C), at which time the observations in this report were made. Daily-mean sediment concentrations decreased from an average of about 5,300 mg/l on May 25 to an average of about 3,200 mg/l for the period May 27 to June 4 (fig. 9C). The values given for water discharge in table 4 were determined from the stage-discharge relation for the stages at the weir for the times shown.

On June 2, data were obtained at section 250 in a dune reach. Figure 13 shows the longitudinal profile of the reach between sections 244 and 256. Cross-sectional profiles of sections 245, 250, and 255 also are shown with mean depths and mean velocities indicated. Observations were made June 3 at section 322 over one of the large transverse bars that had formed during the period May 24–30. Figure 14 shows the longitudinal profile of the reach between sections 316 and 327. The bed was virtually flat for about 650 feet and varied little in depth across the channel.

Cross-sectional profiles were obtained with the ultrasonic sounder at 15 sections on June 2. The upstream profile was at section 240, and the next was at section 243. The remainder of the profiles were obtained at 100-foot intervals to section 255 and at section 260. The average width and average area

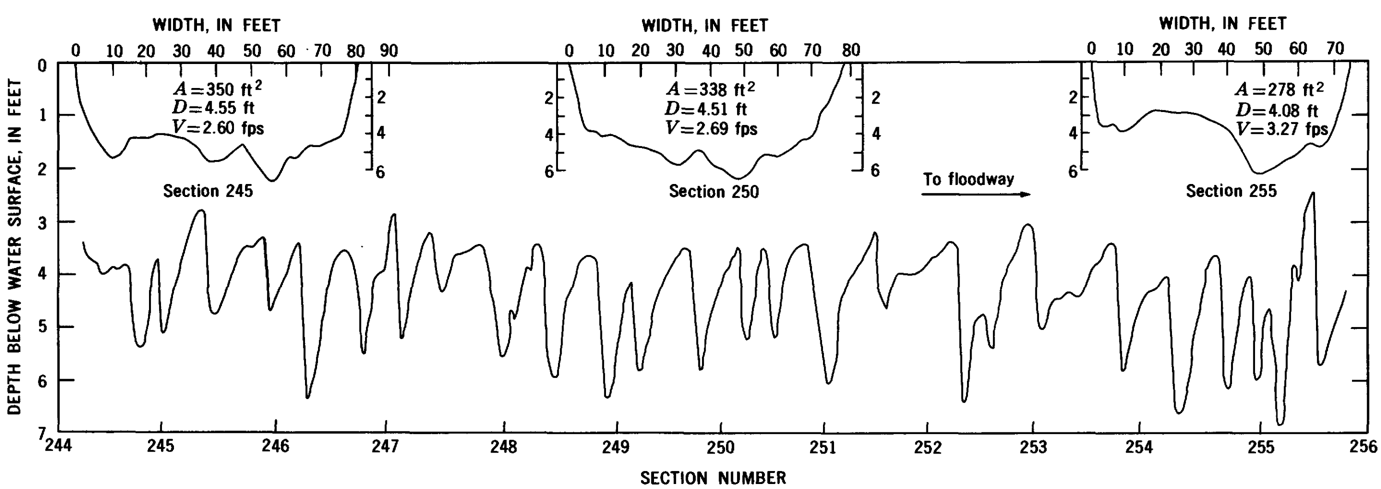

FIGURE 12. — Longitudinal profile, channel near Bernardo, May 12, 1965.

for the 15 cross sections are given in table 1. The widths ranged from 66 to 77 feet, and areas ranged from 209 to 365 sq ft for the 15 cross sections.

Slopes were determined from water-surface elevations obtained at 100-foot intervals twice on June 2 from section 243 to 255 and twice on June 3 from section 320 to 325. Average slope through the dune reach (1,200 ft) was 0.00073, and average slope through the flat-bed reach (500 ft) was 0.00052.

Vertical-velocity-profile data collected at sections 250 and 322 at 5-foot intervals are given in table 2.

The average sand concentrations at the weir were 1,400 and 1,440 mg/l, respectively, for June 2 and 3. Fine-material concentration increased from an average of 1,430 mg/l on June 2 to an average of 2,010 mg/l on June 3.

Samples of bed material were collected twice at section 250 on June 2. The first set of samples was obtained at 1100 hours, apparently on or near the crest of the large dune form seen on the sounder chart (fig. 13); the d_{50} of the composite sample was 0.20 mm. The second set of samples was obtained 4 hours later, at 1500 hours. The crest of the dune had moved downstream 30 to 50 feet, so that the d_{50} of 0.24 mm was representative of the material closer to the trough upstream of the dune. The composite of samples collected at section 322 on the back of the large transverse bar had a d_{50} of 0.18 mm.

NOVEMBER 29–30, 1965

Water discharge decreased from about 1,400 cfs on November 19 to 1,000 cfs on November 28 (fig. 9*D*). The headgates were cleaned and opened farther on the morning of the 29th, and the discharge increased to about 1,250 cfs. It then remained fairly

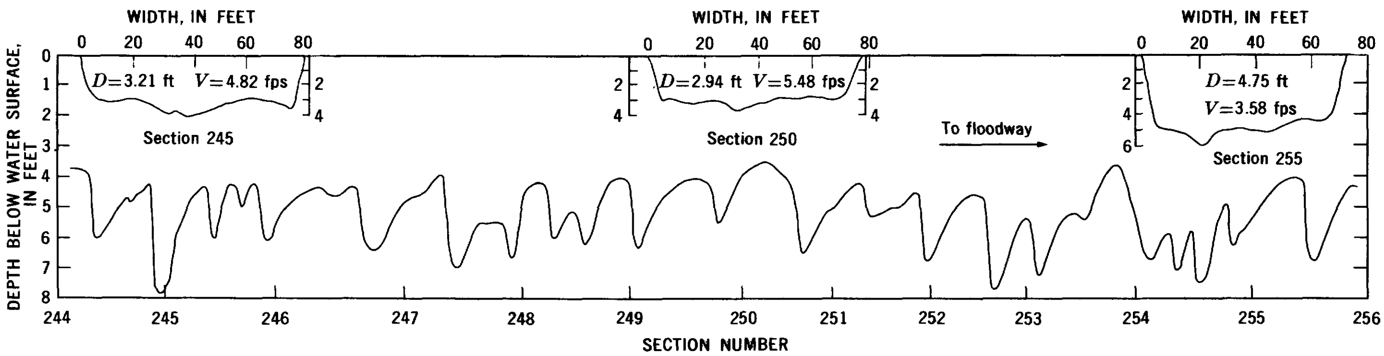

FIGURE 13. — Longitudinal profile, channel near Bernardo, June 2, 1965.

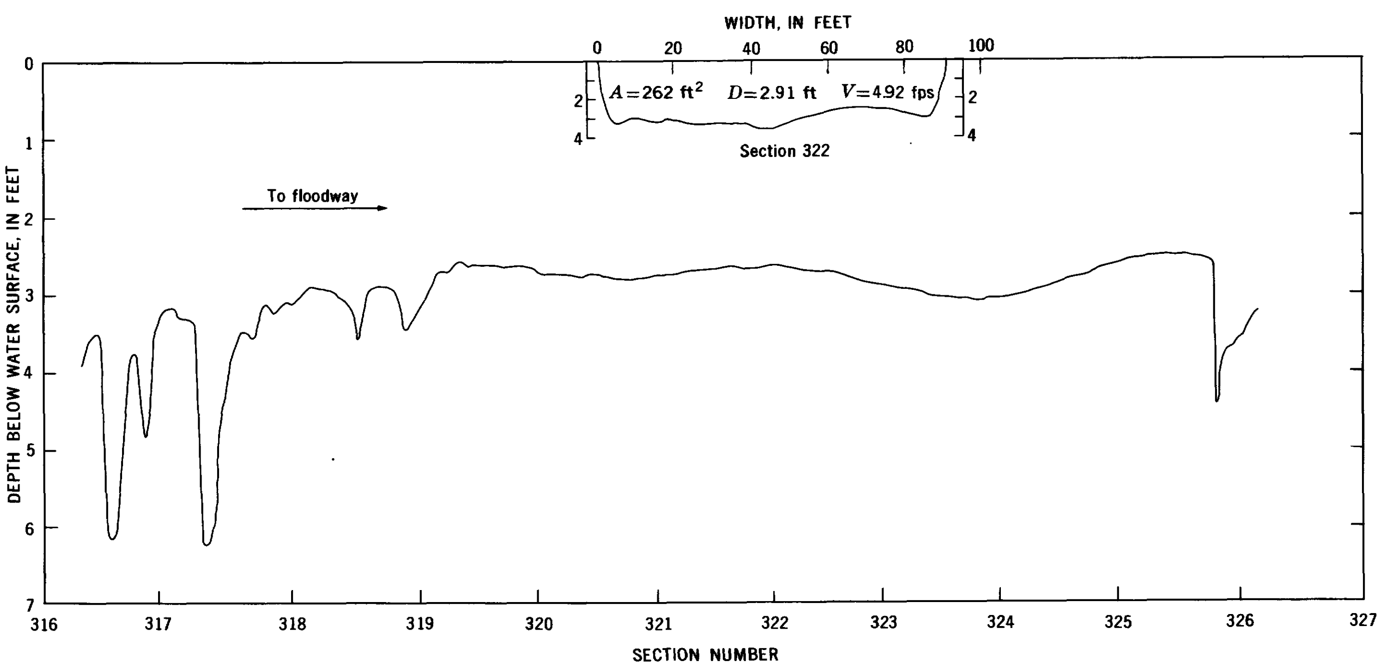

FIGURE 14. — Longitudinal profile, channel near Bernardo, June 3, 1965.

steady during the period of these observations. Daily-mean sediment concentration increased during the period November 19 to November 29 from about 3,500 mg/l to about 5,500 mg/l (fig. 9*D*).

Water temperature varied from about 3°C to 6°C during the day for each observation.

Bed form prior to and during these observations was flat. The median diameter of bed material, 0.18 mm, was consistent throughout the period. Figure 15 shows a typical cross section for the observation reach.

Cross-sectional profiles were obtained with the ultrasonic sounder at 15 sections on November 29. The first profile was at section 240, and the second, at section 243; from section 243 to 255, the profiles were obtained at 100-foot intervals, and the last profile was at section 260. Water-surface widths ranged from 64 to 74 feet, and the areas, from 234 to 269 sq ft. The average width and area for the reach are shown in table 1.

Water-surface elevations were obtained at 100-foot intervals from section 243 to 255 twice each day. The average slope from two determinations was 0.00066 on November 29 and 0.00059 on November 30.

Vertical-velocity-profile data were obtained on November 30 at section 252 at 5-foot intervals and are given in table 2.

Point-integrated sediment samples were obtained by means of the modified DH–48 sampler with a ¼-inch nozzle at section 255 on both days. Particle-size analyses and concentrations in each size class are given in table 3. Total-sand concentrations of samples collected at the weir averaged 2,700 mg/l on November 29 and 2,870 mg/l on November 30. Fine-sediment concentrations averaged 1,790 mg/l on November 29 and 1,530 mg/l on November 30.

Bed-material samples were obtained at 5-foot intervals at section 245 on November 29 and 30. The sample from each vertical was analyzed separately in the laboratory; the median particle size ranged from 0.16 to 0.21 mm on November 29 and from 0.17 to 0.19 mm on November 30. The averages of the 10 analyses across the section for each day are given in table 5.

MAY 4, 1966

Water discharge was relatively steady from April 28 through May 4, the day of observations. Daily-mean sediment concentrations varied from 2,500 to about 1,200 mg/l during this period (fig. 9*E*). Water temperature varied from 16°C to 21°C during the day of observations, May 4.

The 1,000-foot reach chosen for this set of observations, section 245 to 255, was classified as transition upstream of section 250 because the bed form was irregular dunes between sections 240 and 250; it was classified as flat downstream of section 250. Figure 16 shows the bed profile between sections 240 and 260.

Cross-sectional profiles were obtained by means of a sounding rod at seven sections on May 4. Profiles were obtained once at sections 245 and 255 and twice at sections 246, 248, 250, 252, and 254. The average areas and widths of sections in the transition-bed reach (section 245 to 250) and the flat-bed reach (section 252 to 255) are given in table 1. Sketches of cross-sectional profiles obtained from 1300 to 1440 hours are shown in figure 17.

Water-surface slope was determined from observations obtained at 100-foot intervals between sections 243 and 255, twice on May 4 and once on May 5, and was consistent at 0.0011. This was the greatest slope observed for any of the observations presented in this report. However, inspection of the bed pro-

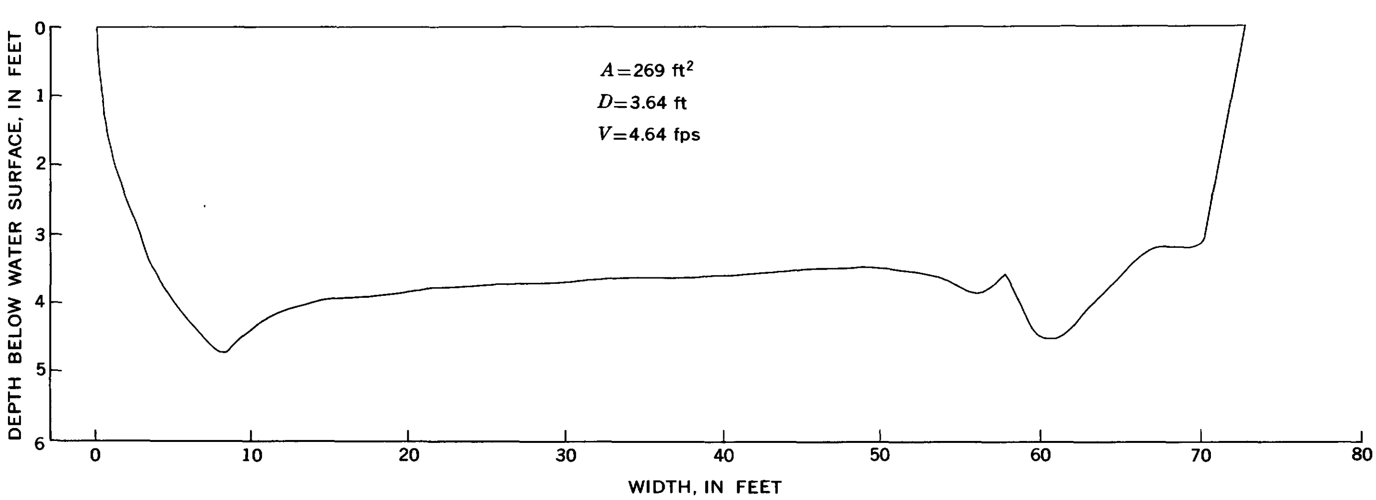

FIGURE 15.—Typical cross section for flat bed form, channel near Bernardo (section 245), November 30, 1965.

file obtained with the ultrasonic sounder (fig. 16) indicates that the mean depth was decreasing from about section 242 to 252. The water-surface elevations were obtained in the reach where bed form was changing from rough to smooth. The water-surface slope would tend to be greater through this reach than in reaches upstream or downstream. That a relatively steep slope can exist in a reach where bed roughness is changing from rough to smooth is well illustrated in figure 11. The flow would be accelerating through the reach shown in figure 16 and, therefore, would be considered as unsteady.

Vertical velocity profiles and point-integrated sediment samples were collected at section 245 in the transition-bed reach and at section 255 in the flat-bed reach.

Depth-integrated samples were collected at 30-minute intervals throughout the day at the weir (section 194). Total-sand concentration averaged 2,300 mg/l, varying between 1,820 and 2,870 mg/l. Fine-material concentration averaged 905 mg/l during the period of observations. Measured suspended-sediment samples also were collected at section 240 in the transition-bed reach and at section 260 in the flat-bed reach. Average measured sand concentrations were 840 mg/l at section 240 and 1,010 mg/l at section 260. Fine-material concentrations were 902 mg/l at both sections.

Bed-material samples were collected at verticals at 10-foot intervals at each of five sections, and the samples from each section were composited for analysis in the laboratory. Median diameters of these samples are indicated in figure 16 for the sections sampled to illustrate the decrease in size of material as the bed form changes from transition to flat.

NOVEMBER 23, 1966

Water discharge varied widely prior to and during these observations. Daily-mean sediment concentrations remained relatively steady, however, through the period November 13–25 (fig. 9*F*). Water discharges, measured at five sections spaced at 500-foot intervals from section 240 to 260, are given in the tables of data. Water temperature was 8°C during the period of observations.

Bed form was flat for the period prior to and during these observations. Longitudinal profiles showed the bed was flat near the center of the channel, but that long, low-amplitude waves were present near both banks.

Cross-sectional profiles were obtained by means of a sounding rod at five sections on November 23. Depth soundings were made at 5-foot intervals at each section. The profiles were obtained at the same sections and at the same times as the point velocities.

Water-surface slope was determined from water-surface observations made at 100-foot intervals through the 1,200 foot reach, section 243 to 255. Slopes during these observations were 0.00062.

Vertical-velocity-profile data, measured suspended-sediment samples, and bed material samples were collected at five sections. Figure 18 shows sketches of the five cross sections, lines of equal velocity, and hydraulic data and serves to illustrate the typical flow conditions for the flat bed form in the channel near Bernardo.

The average measured suspended-sand concentration during the observations was 1,880 mg/l, and the average fine-sediment concentration was 2,520 mg/l. The concentration of fine material increased during the observation period from 2,070 mg/l to 2,980 mg/l, whereas the concentration of sand remained constant. Median diameter of bed material was virtually the same at all sections.

FEBRUARY 2, 1967

Water discharge and daily-mean sediment concentration were relatively steady for the period January 23 to February 4 (fig. 9*G*). Water temperature varied from 6°C to 8°C during the day of the observations.

Bed form was flat prior to and during the period of observations.

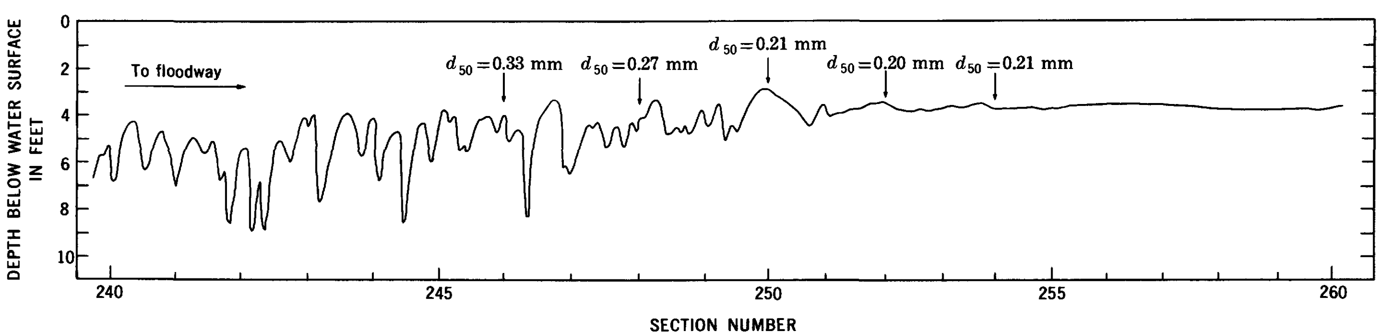

FIGURE 16.—Longitudinal profile, channel near Bernardo, May 4, 1966.

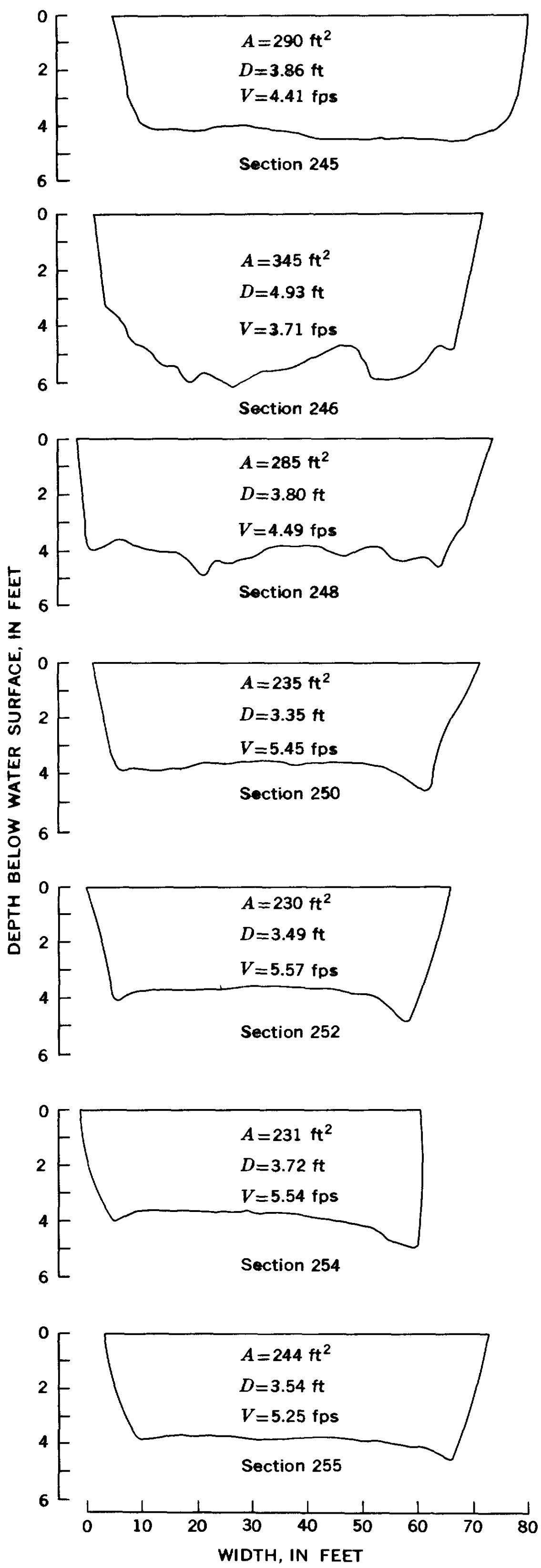

FIGURE 17. — Cross sections, channel near Bernardo, May 4, 1966.

Cross-sectional profiles were determined by means of a sounding rod at five sections spaced at 500-foot intervals from section 240 to 260. Soundings were obtained at 5-foot intervals except near the banks, where a smaller interval was used. The profiles were typical of those for flat bed form. Depths, which were uniform across most of the channel, were greater near the banks.

Water-surface elevations were obtained at 100-foot intervals through the 1,200-foot reach from section 243 to 255 once on February 2. The water-surface slope determined from water-surface elevations was 0.00052.

Vertical velocity profiles, suspended-sediment samples, and bed-material samples were collected at five sections in the 2,000-foot reach from section 240 to 260. Samples at each cross section were composited in the laboratory. Bed-material samples were obtained at 10-foot intervals, and the samples for each section were composited in the field. No total-sediment samples were collected at the weir during these observations. The average measured suspended-sand concentration for the five cross sections was 1,100 mg/l, and the average fine-material concentration was 833 mg/l. Median diameter of the bed-material samples was virtually identical at all five sections, $d_{50}=0.19$ mm.

FEBRUARY 14–15, 1967

These observations were obtained in conjunction with a special study on lateral dispersion. A 6,000-foot reach from section 220 to 280 was used, which was much longer than the reaches used for any of the other observations.

Water discharge prior to and during these observations was relatively steady. Daily-mean sediment concentration decreased from about 4,000 mg/l on February 4 to about 2,800 mg/l on February 14 (fig. 9*H*). Water temperature varied between 6°C and 9°C during the 2 days.

Bed form had alternated between transition and flat prior to this set of observations. During the observation period, the bed remained flat over the center part of the channel. Long, low-amplitude sand waves were near both banks. The bed form was classified as flat for these observations.

Cross-sectional profiles were obtained with a sounding rod at nine cross sections on February 14 and at 10 cross sections on February 15. Depth soundings were taken at 5-foot intervals at each section. The cross-sectional profiles were typical of those for flat bed forms except that the depths near the banks at some sections were relatively large (fig. 19).

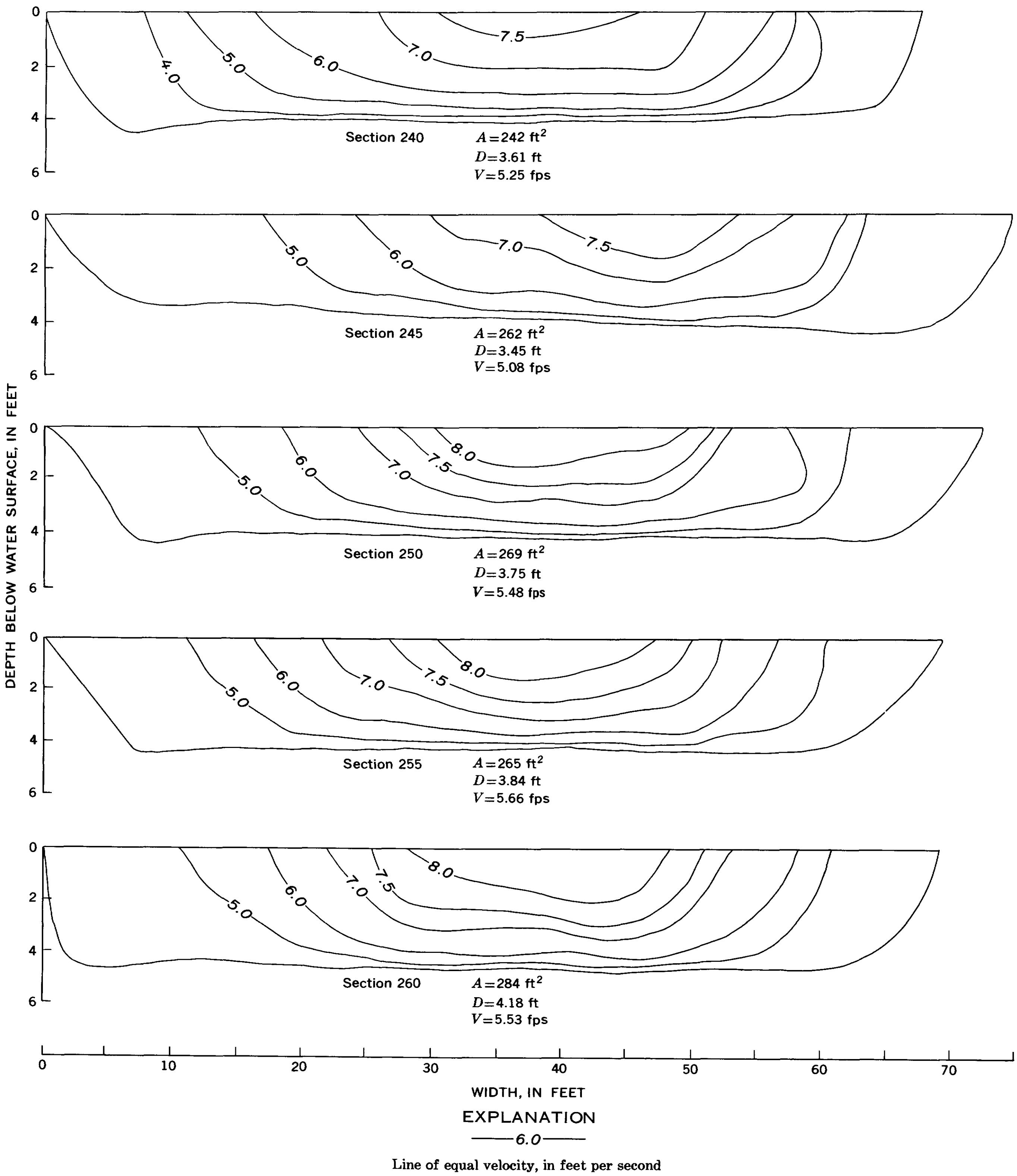

FIGURE 18. — Cross sections, showing lines of equal velocity and hydraulic data, channel near Bernardo, November 23, 1966.

Water-surface elevations were obtained at 1,000-foot intervals from section 220 to 240 and from section 260 to 280, and at 500-foot intervals from section 240 to 260, on both days. The maximum deviation of any individual elevation from the mean line used to determine slope was 0.08 foot. Vertical-

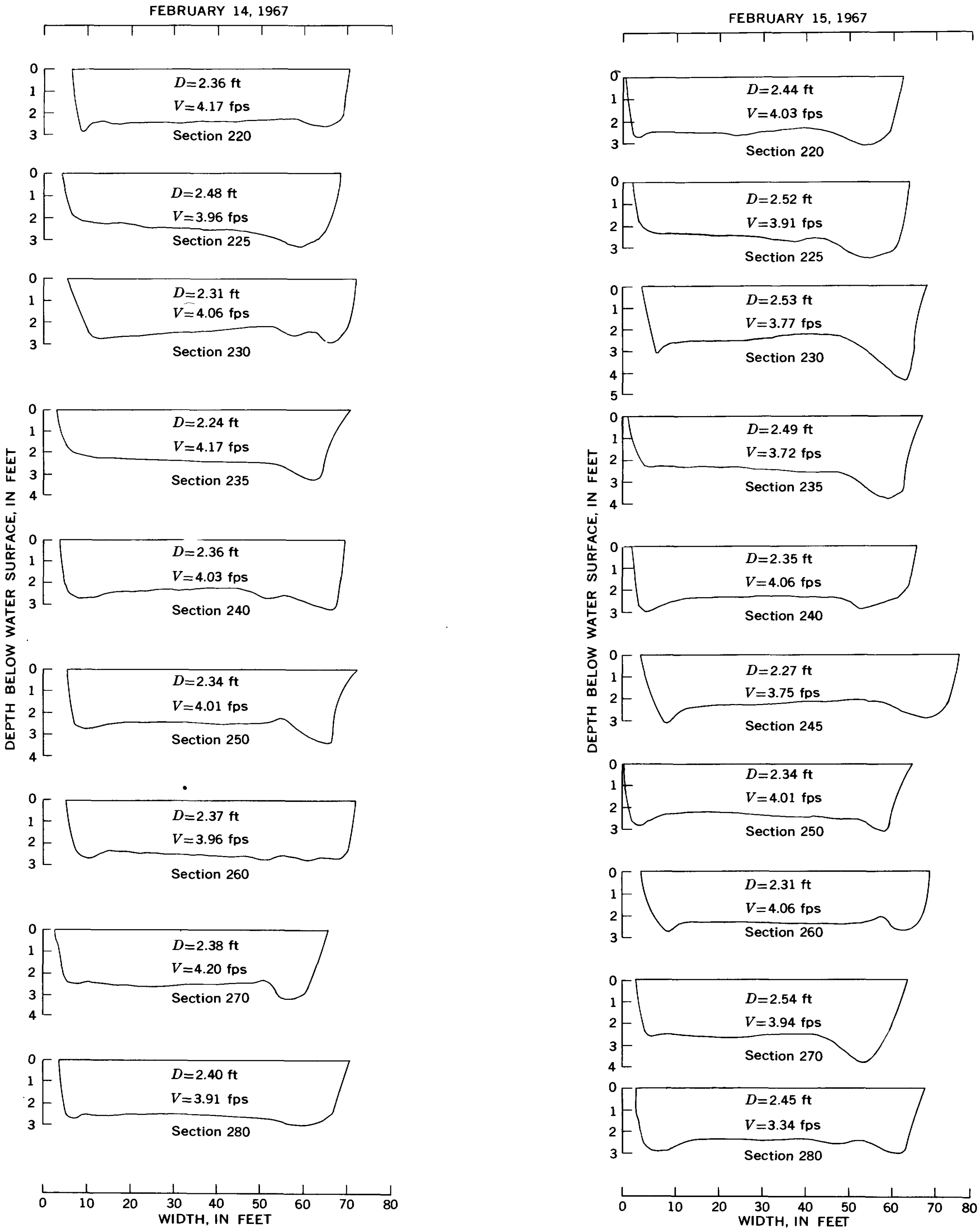

FIGURE 19. — Cross sections, channel near Bernardo, February 14–15, 1967.

velocity-profile data were collected at nine sections on February 14 and at 10 sections on February 15. The vertical velocity profiles were obtained at verticals spaced at 5-foot intervals.

No total-sediment samples were collected at the weir during these observations. Suspended-sediment samples were obtained at two sections on February 14 and at four sections on February 15. Suspended-sand concentration averaged 880 mg/l on both days. Fine-material concentrations were 760 mg/l on February 14 and 840 mg/l on February 15.

Bed-material samples were collected at seven sections on February 14 and at four sections on February 15. The samples at each section were taken at 10-foot intervals and composited in the field.

FEBRUARY 1, 1968

Water discharge increased rather uniformly during the period January 22 to February 1, from about 620 cfs to an average of 750 cfs during the observations on February 1. Daily-mean sediment concentration increased from 2,400 to 3,800 mg/l during this period (fig. 9*J*). Water temperature varied from 5°C to 8°C during the period of observations.

Five sections upstream from the weir were used for these observations. The bed form was flat at all sections. Sections 99, 100, and 101 were in a relatively narrow reach, and sections 159 and 160 were in a wide reach.

Cross-sectional profiles were obtained with a wading rod at the five cross sections. Depths were sounded at 5-foot intervals except near the banks, where a smaller interval was used.

Water-surface elevations were obtained at 50-foot intervals from section 97 to 103 and from section 157 to 163. The water-surface slopes in these 600-foot reaches were 0.00041 and 0.00045, respectively. These were the least slopes for any of the observations listed in this report.

Vertical-velocity-profile data, measured suspended-sediment samples, and bed-material samples were collected at all sections. The suspended-sand concentration averaged about 1,000 mg/l for all sections. Fine-material concentration averaged 1,250 mg/l for all sections. No total-sediment samples were collected at the weir during these observations. Samples of bed material were obtained at 10-foot intervals in each cross section. The samples at each cross section were composited in the field. Median diameter of composite bed-material samples averaged about 0.20 mm at all sections.

MAY 21, 1968

Water discharge fluctuated rather widely prior to these observations. The discharge dropped from a high of 1,910 cfs on May 12 to about 900 cfs on May 17, where it remained relatively steady through the period of observations on May 21. Daily-mean sediment concentration also fluctuated during the period prior to the observations (fig. 9*K*). The water discharge shown in the tables of basic data is the average of seven measurements made between 1235 and 1520 hours on May 21. Water temperature ranged between 18°C and 21°C during the period of observations on May 21.

Bed form was dunes prior to and during the period of observation. Profiles were obtained with the ultrasonic sounder from section 220 to 235. The average height and length of dunes, as determined from measurements of 45 dunes on the profile at the center line of the channel, were 2.7 and 30 feet, respectively.

Cross-sectional profiles were obtained with a sounding rod at five cross sections spaced at 200-foot intervals from section 225 to 233. Depths were sounded at 2.5-foot intervals in each cross section. The cross-sectional profiles are shown in figure 20.

Water-surface elevations were obtained at 500-foot intervals from section 240 to 260. The water-surface slope through the 2,000-foot reach was 0.00063. Relatively few water-surface elevations were obtained for this set of observations. However, all the elevations were within 0.1 foot of the mean line; therefore, the water-surface slope is probably within an acceptable limit of error.

Vertical velocity profiles were obtained at 5-foot intervals at each of the cross sections. Velocities at five points are shown in table 2 for most of the verticals; however, the meter nearest the bed failed to function properly at a few verticals located just downstream of the crest of a dune, and at those verticals only four-point velocities are shown.

Suspended-sediment samples were obtained at each of the five cross sections, and total-sediment samples were collected at the weir (section 194).

Bed-material samples were obtained at 10-foot intervals at each of the five cross sections in the study reach. The samples at each cross section were composited in the field. The median diameter of the composite samples for the individual cross sections varied from 0.22 to 0.32 mm and averaged 0.27 mm for the reach.

MAY 29, 1968

Water discharge prior to the day of observations, May 29, ranged between 760 and 1,190 cfs; however, discharge was steady during the observations made on May 29. Daily-mean sediment concentration varied from 2,800 mg/l to a high of about 4,900 mg/l. Concentrations during the period of observation were relatively steady (fig. 9*L*). The water dis-

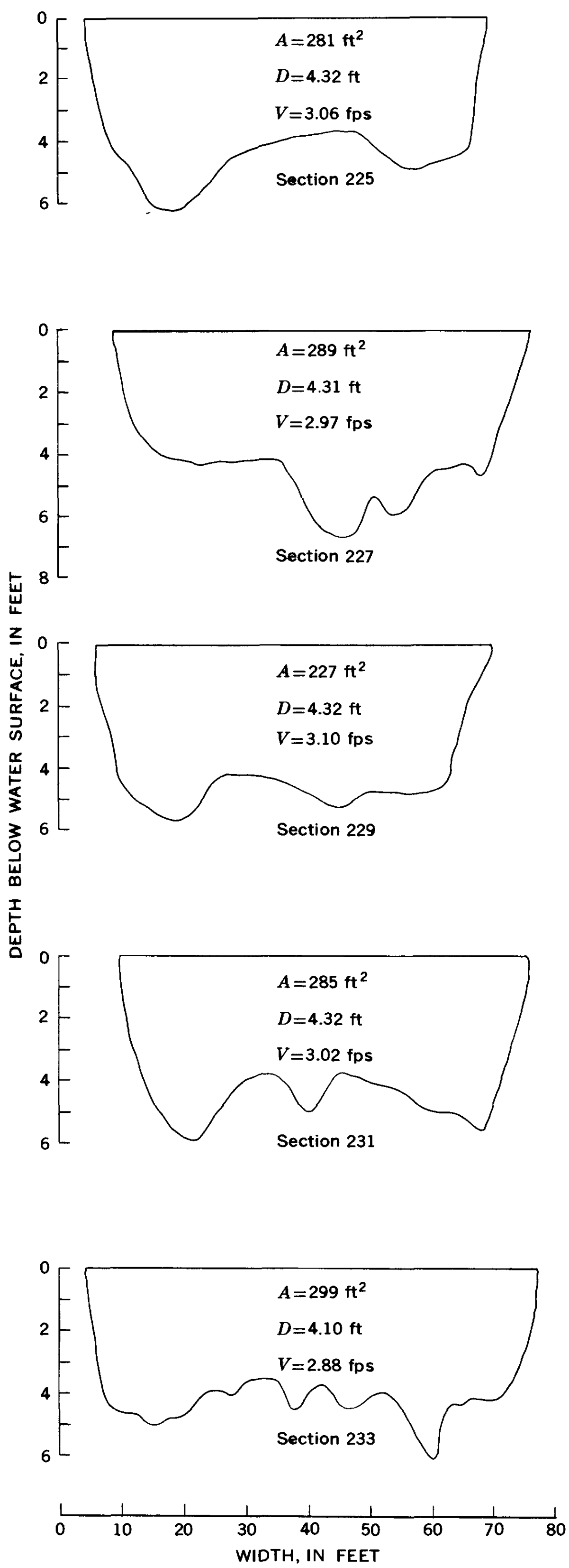

FIGURE 20. — Cross sections, channel near Bernardo, May 21, 1968.

charge shown in the tables of data is the average of five measurements made during the observation period. The measurements for this set of observations were taken at the same cross sections that were used for the measurements obtained on May 21, 1968. Water temperature was 21°C to 22°C during the day on May 29.

Bed form was dunes prior to and during the period of observations. Longitudinal profiles were obtained with the ultrasonic sounder from section 220 to 235. The average height and length of the dunes, as determined from measurements of about 30 dunes on the sounder profile, were 4.2 and 44 feet, respectively.

Cross-sectional profiles were obtained with a sounding rod at five cross sections spaced at 200-foot intervals. Depths were sounded at 2.5-foot intervals. The cross-sectional profiles are shown in figure 21.

Water-surface elevations were obtained at 30-foot intervals from section 225 to 235. The mean water-surface slope through the 1,000-foot reach was 0.00056.

Vertical-velocity-profile data, measured suspended-sediment samples, and bed-material samples were collected at all five sections. No total-sediment samples were collected at the weir during these observations.

The median diameter of the composite samples of bed material varied from 0.23 to 0.26 mm for the individual cross sections, and the average for the reach was 0.24 mm.

JUNE 11, 1969

Water discharge generally increased for several days prior to these observations (fig. 9*M*). On June 10, the discharge peaked at 1,720 cfs, and on June 11, another peak at 1,600 cfs occurred at 0800 hours. The discharge was decreasing as the measurements on this date were obtained. A single discharge measurement was made on June 11, and the discharges reported in the tables of basic data are based on the stage-discharge relationship and the stages at the weir at the times shown.

Temperatures ranged from 18°C to 19°C during the period of observations.

Bed form was dunes prior to and during these observations.

Cross-sectional profiles were obtained with a sounding rod. Depths were sounded at 2.5-foot intervals at each section. Profiles of each cross section are shown in figure 22.

Water-surface elevations were obtained at 100-foot intervals from section 243 to 257. The water-surface slope for the 1,400-foot reach was 0.00069.

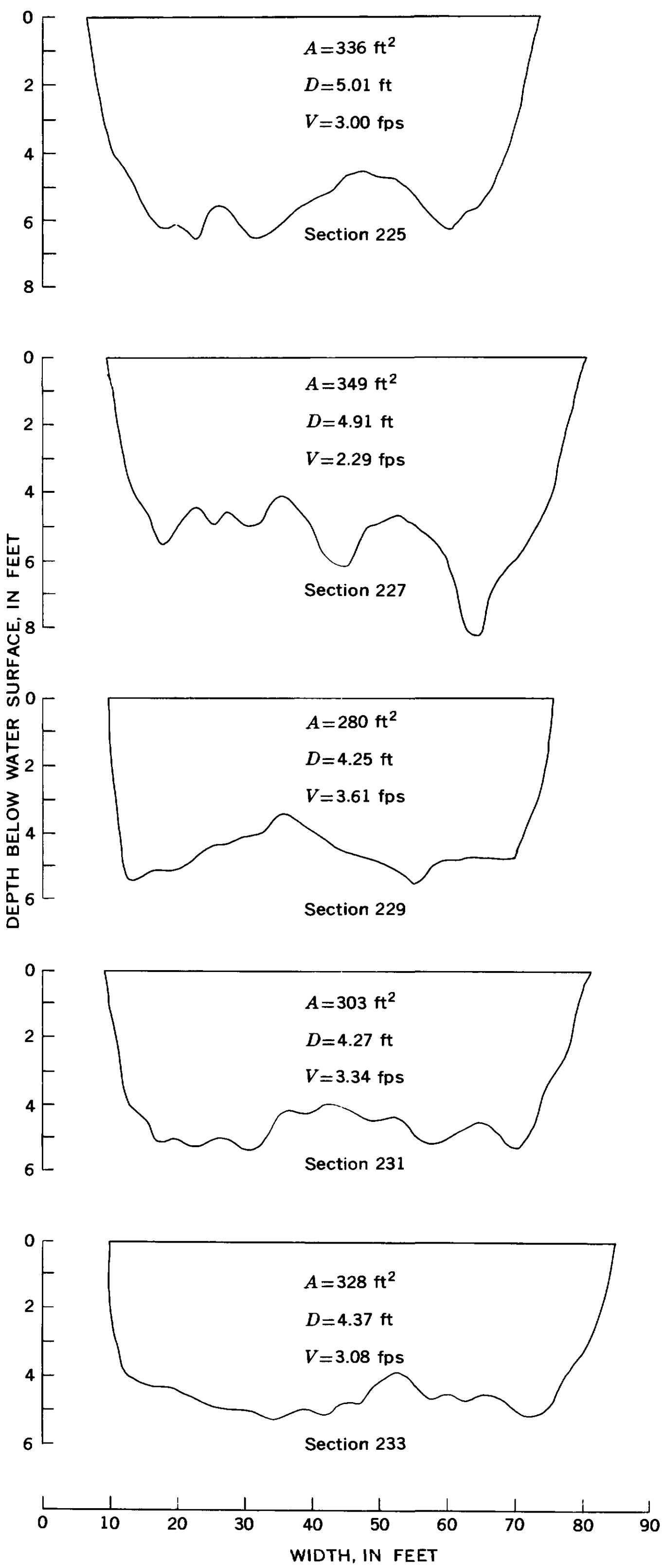

FIGURE 21. — Cross sections, channel near Bernardo, May 29, 1968.

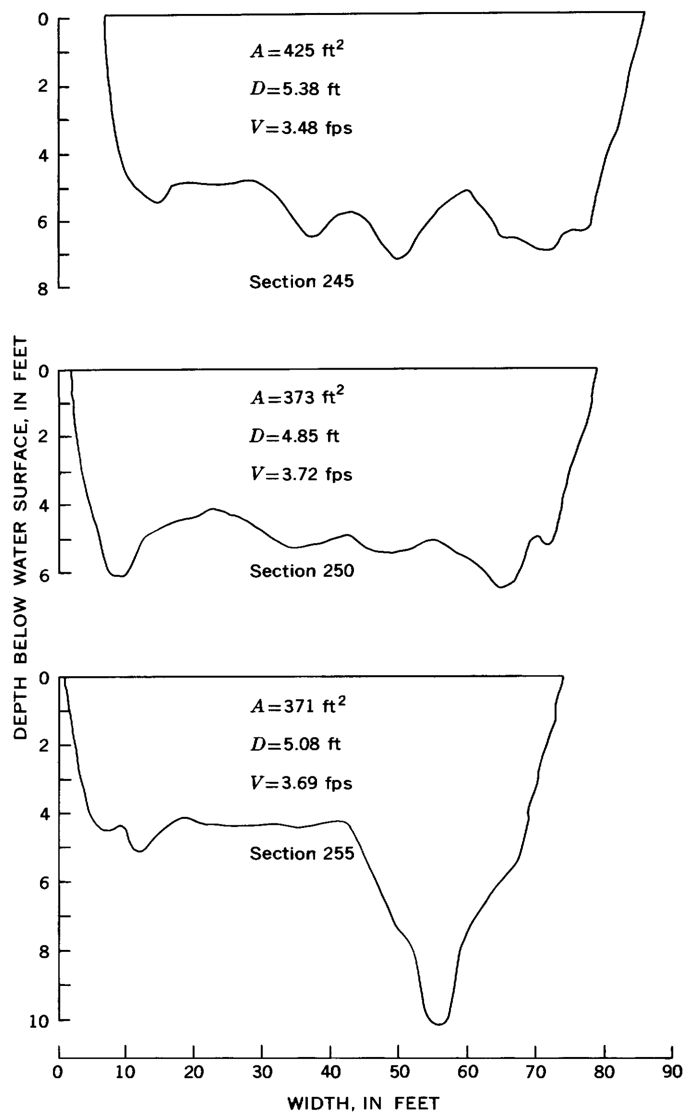

FIGURE 22. — Cross sections, channel near Bernardo, June 11, 1969.

Vertical velocity profiles were obtained at 5-foot intervals at three cross sections spaced at 500-foot intervals. At some verticals, the bottom meter failed to operate because the vertical was located immediately downstream of a dune crest.

Suspended-sediment samples were obtained at three cross sections, and total-sediment samples at the weir were obtained twice during the observation period.

Bed-material samples were obtained at three cross sections at verticals spaced 10 feet apart. The samples at each cross section were composited in the field for analysis in the laboratory.

DECEMBER 21–22, 1965

The water discharge at the San Marcial gaging station remained relatively constant near 1,900 cfs from December 11 to 15. The discharge increased to 1,950 cfs on December 18 and then decreased to 1,860 cfs on December 21, when the data in the San Marcial reach were obtained. The discharge was about 1,750 cfs on December 22, when the data in the Nogal Canyon reach were obtained. The discharges for the San Marcial and Nogal Canyon reaches reported in the tables of basic data are the daily-mean discharges at San Marcial.

The bed form was flat in both reaches during the observations. Standing waves were present near the center of the channel in both reaches but were most pronounced in the Nogal Canyon reach. The standing waves tended to build up with some regularity and to dissipate before reaching the anti-dune stage in both reaches.

Cross-sectional areas were computed on the basis of depth soundings obtained in conjunction with point velocities. The depths were uniform across the channel at all sections.

Water-surface elevations were obtained at approximately 500-foot intervals one time only in each of the reaches. At San Marcial, the elevations were obtained in the 2,900-foot reach from section 2261+00 to 2232+00; at Nogal Canyon, in the 2,800-foot reach from section 1323+00 to 1295+00.

Point velocities in the vertical were obtained at verticals spaced at 10-foot intervals except at section 1300+00 in the Nogal Canyon reach, where a 20-foot spacing of verticals was used. The presence of large standing waves at section 1300+00 created somewhat difficult and hazardous working conditions.

Point-integrated samples were obtained with a modified DH–48 sampler at five points in three verticals at each section. In the San Marcial reach, the verticals were spaced at 10-foot intervals. No point-integrated samples were obtained at section 1300+00 because of the standing waves.

Suspended-sediment samples were obtained by the equal-transit-rate method at verticals spaced at 10-foot intervals with a DH–48 sampler at sections in both reaches. Because of standing waves at section 1300+00 in the Nogal Canyon reach, the suspended-sediment samples were obtained at section 1306+00.

Bed-material samples were obtained at verticals spaced at 10-foot intervals. The samples at each cross section were composited in the field for analysis in the laboratory.

In addition to the data obtained in the reaches at San Marcial and Nogal Canyon, bed-material samples were obtained at approximately 5,000-foot intervals from section 4400+00, just below San Acacia diversion dam, to section 1200+00, just above Elephant Butte Reservoir, a distance of more than 60 miles. The size distributions of these samples are not given in the tables of basic data; however, the median diameters ranged from 0.17 to 0.20 mm at 33 of the 64 sections. At two sections, the median diameter was 0.16 mm, and at the remainder of the sections, the median diameters were fairly evenly distributed in the range of 0.21 to 0.29 mm. There was no indication that the bed material became finer in the downstream direction.

APPENDIX 2. BASIC DATA

TABLE 1.—*Summary of available data*

Date	Sampling Section	Water Discharge Q (ft³ per second)	Cross Section Area A (ft²)	Water Surface Width B (ft)	Water Surface Slope S (x10⁴)	Bed Form	Data Available				Remarks
							Point velocities	Point Sediment Analyses	Suspended[1/] Sediment Analyses	Bed Material Analyses	
						Rio Grande conveyance channel near Bernardo, N. Mex.					
1965											
Feb. 3[2/]	194	560	--	--	--	--			X		
	Reach	560	212	69	5.3	Dune.					3 cross sections in dune-bed reach.
	236	560	212	70	5.3	Do.			X		
	252	560	143	64	5.3	Flat.	X				
	255	560	159	67	5.3	Do.			X		
	Reach	560	149	66	5.3	Do.					3 cross sections in flat-bed reach.
Feb. 4[2/]	194	575	--	--	--	--			X		
	238	575	--	70	5.3	Dune.				X	
	240	575	--	68	5.3	Do.	X				
	255	575	--	67	5.3	Flat.			X	X	
May 12[2/]	194	910	--	--	--	--			X		
	Reach	910	300	71	6.5	Dune.				X	14 cross sections, bed material at 15 cross sections.
	240	910	--	--	6.5	Do.			X	X	
	249	910	298	70	6.5	Do.	X			X	
	250	910	338	75	6.5	Do.	X			X	
May 13[2/]	194	890	--	--	--	--			X		14 cross sections.
	Reach	890	300	71	6.5	Dune.					
	240	890	--	--	6.5	Do.			X	X	
	250	890	368	75	6.5	Do.	X			X	
	260	890	270	66	6.5	Do.				X	
June 2[2/]	194	1,190	--	--	--	--			X		
	Reach	1,190	267	71	7.3	Transition.					15 cross sections.
	250	1,190	217	74	7.3	Do.	X		X	X	
June 3[2/]	194	1,290	--	--	--	--			X		
	322	1,290	262	90	5.2	Flat.	X		X	X	
Nov. 29[2/]	194	1,250	--	--	--	--			X		
	Reach	1,250	251	68	6.6	Flat.					15 cross sections.
	245	1,250	266	74	6.6	Do.			X	X	
	255	1,250	254	67	6.6	Do.		X			
Nov. 30[2/]	194	1,250	--	--	--	--			X		
	245	1,250	269	74	5.9	Flat.			X	X	
	252	1,250	242	65	5.9	Do.	X	X			
1966											
May 4[2/]	194	--	--	--	--	--			X		
	Reach	1,280	289	73	11.1	Transition.					4 cross sections.
	240	1,280	--	--	11.1	Do.			X		
	245	1,280	290	75	11.1	Do.	X	X		X	
	250	1,280	235	70	11.1	Do.				X	
	Reach	1,280	233	66	11.1	Flat.					3 cross sections.
	255	1,280	244	69	11.1	Do.	X	X			
	260	1,280	--	--	11.1	Do.			X		
Nov. 23	240	1,270	242	67	6.2	Flat.	X		X	X	
	245	1,330	262	74	6.2	Do.	X			X	
	250	1,480	270	72	6.2	Do.	X		X	X	
	255	1,500	265	69	6.2	Do.	X		X	X	
	260	1,570	284	68	6.2	Do.	X		X	X	
1967											
Feb. 2[2/]	240	650	157	66	5.2	Flat.	X		X	X	
	245	650	172	72	5.2	Do.	X		X	X●	
	250	650	152	67	5.2	Do.	X		X	X	
	255	650	155	66	5.2	Do.	X		X	X	
	260	650	160	66	5.2	Do.	X		X	X	
Feb. 14[2/]	220	630	151	64	5.4	Flat.	X			X	
	225	630	159	64	5.4	Do.	X				
	230	630	155	67	5.4	Do.	X			X	
	235	630	151	68	5.4	Do.	X				
	240	630	156	66	5.4	Do.	X			X	
	250	630	157	67	5.4	Do.	X			X	
	260	630	159	67	5.4	Do.	X		X	X	
	270	630	150	63	5.4	Do.	X			X	
	280	630	161	67	5.4	Do.	X		X	X	
Feb. 15[2/]	220	630	156	64	5.6	Flat.	X		X	X	
	225	630	161	64	5.6	Do.	X				
	230	630	167	66	5.6	Do.	X			X	
	235	630	169	68	5.6	Do.	X				
	240	630	155	66	5.6	Do.	X		X		

TABLE 1.—*Summary of available data*—Continued

Date	Sampling Section	Water Discharge Q (ft³ per second)	Cross Section Area A (ft²)	Water Surface Width B (ft)	Water Surface Slope S (x10⁴)	Bed Form	Data Available: Point velocities	Point Sediment Analyses	Suspended[1/] Sediment Analyses	Bed Material Analyses	Remarks
1967--Continued											
Feb. 15 [2/]	245	630	168	74	5.6	Do.	X				
--Con.	250	630	157	67	5.6	Do.	X				
	260	630	155	67	5.6	Do.	X		X	X	
	270	630	160	63	5.6	Do.	X				
	280	630	164	67	5.6	Do.	X		X	X	
1968											
Feb. 1	99	750	175	62	4.1	Flat.	X		X	X	
	100	750	163	57	4.1	Do.	X		X	X	
	101	750	174	66	4.1	Do.	X		X	X	
	159	750	197	87	4.5	Do.	X		X	X	
	160	750	186	85	4.5	Do.	X		X	X	
May 21 [2/]	194	860	--	--	--	--			X		
	225	860	281	65	6.3	Dune.	X		X	X	
	227	860	289	67	6.3	Do.	X		X	X	
	229	860	277	64	6.3	Do.	X		X	X	
	231	860	285	66	6.3	Do.	X		X	X	
	233	860	299	73	6.3	Do.	X		X	X	
May 29	225	1,010	336	67	5.6	Dune.	X		X	X	
	227	1,010	349	71	5.6	Do.	X		X	X	
	229	1,010	280	66	5.6	Do.	X		X	X	
	231	1,010	303	71	5.6	Do.	X		X	X	
	233	1,010	328	75	5.6	Do.	X			X	
1969											
June 11	245	1,480	425	79	6.9	Dune.	X		X	X	
	250	1,390	373	77	6.9	Do.	X		X	X	
	255	1,370	371	73	6.9	Do.	X		X	X	
Rio Grande conveyance channel near San Marcial, N. Mex.											
1965											
Dec. 21	2249+93	1,860	305	70	5.9	Flat.	X	X	X	X	
	2243+62	1,860	308	67	5.9	Do.	X	X	X	X	
Rio Grande conveyance channel near Nogal Canyon, N. Mex.											
Dec. 22	1318+00	1,750	352	80	5.5	Flat.	X	X	X	X	
	1300+00	1,750	337	110	5.5	Do.	X		X	X	

1/ The suspended sediment measured at the weir (station 194) represents total sediment moving through that cross-section.

2/ Water discharge measured at the cableway, station 184.

TABLE 2.—*Measured velocity at indicated heights above riverbed*

[Velocity, V, in feet per second. Height above riverbed, y, in feet]

Rio Grande conveyance channel naar Bernardo, N. Mex.

February 3, 1965, Section 252, Right bank station 4, Left bank station 68

Sta. 10 D=2.7 ft. y	V	Sta. 15 D=2.5 ft. y	V	Sta. 20 D=2.4 ft. y	V	Sta. 25 D=2.6 ft. y	V	Sta. 30 D=2.5 ft. y	V	Sta. 35 D=2.4 ft. y	V	Sta. 40 D=2.3 ft. y	V	Sta. 45 D=2.4 ft. y	V	Sta. 50 D=2.4 ft. y	V	Sta. 57 D=3.1 ft. y	V
2.2	3.10	2.2	4.24	2.2	4.91	2.2	4.99	2.2	5.15	2.2	4.94	2.2	4.78	2.2	4.78	2.2	4.37	2.2	2.99
1.7	3.20	1.7	4.14	1.7	4.76	1.7	4.81	1.7	4.96	1.7	4.81	1.7	4.72	1.7	4.77	1.7	4.30	1.7	2.77
1.2	3.01	1.2	3.94	1.2	4.62	1.2	4.60	1.2	4.80	1.2	4.59	1.2	4.57	1.2	4.62	1.2	4.12	1.2	2.42
.7	2.77	.7	3.82	.7	4.40	.7	4.37	.7	4.54	.7	4.34	.7	4.37	.7	4.44	.7	3.92	.7	2.16
.2	1.84	.2	3.18	.2	3.39	.2	3.36	.2	3.36	.2	3.32	.2	3.45	.2	3.50	.2	3.19	.2	1.58

February 4, 1965, Section 240, Right bank station 4, Left bank station 72

Sta. 10 D=3.2 ft. y	V	Sta. 15 D=3.6 ft. y	V	Sta. 20 D=3.2 ft. y	V	Sta. 25 D=3.3 ft. y	V	Sta. 30 D=3.1 ft. y	V	Sta. 35 D=3.6 ft. y	V	Sta. 40 D=3.2 ft. y	V	Sta. 45 D=2.7 ft. y	V	Sta. 50 D=2.7 ft. y	V	Sta. 55 D=3.9 ft. y	V	Sta. 60 D=4.5 ft. y	V	Sta. 65 D=3.0 ft. y	V
2.9	2.58	3.2	3.25	2.9	3.25	2.9	3.45	2.8	2.65	3.2	2.67	2.9	3.19	2.4	3.30	2.4	2.85	3.4	3.07	4.0	2.80	2.6	2.60
2.3	2.64	2.5	3.16	2.3	3.31	2.3	3.33	2.3	2.64	2.5	2.64	2.3	3.17	2.0	3.42	2.0	2.79	2.5	2.86	2.9	2.73	2.0	2.33
1.7	2.70	1.7	3.07	1.7	3.18	1.7	3.29	1.7	2.56	1.7	2.65	1.7	3.20	1.5	3.49	1.5	2.64	1.7	2.82	1.7	2.71	1.5	2.18
1.0	2.68	1.0	2.91	1.0	2.86	1.0	3.19	1.0	2.46	1.0	2.64	1.0	3.22	1.0	3.62	1.0	2.64	1.0	2.84	1.0	2.62	1.0	2.02
.5	2.40	.5	2.36	.5	2.76	.5	3.10	.5	2.30	.5	2.43	.5	1.70	.5	3.45	.5	2.54	.5	2.56	.5	1.41	.5	2.08

TABLE 2.—*Measured velocity at indicated heights above riverbed*—Continued

May 12, 1965, Section 249, Right bank station 8, Left bank station 82

Sta. 14 D=4.1 ft.		Sta. 17 D=3.9 ft.		Sta. 20 D=3.8 ft.		Sta. 25 D=3.7 ft.		Sta. 30 D=3.9 ft.		Sta. 35 D=4.4 ft.		Sta. 40 D=3.0 ft.		Sta. 45 D=4.0 ft.		Sta. 50 D=4.5 ft.		Sta. 55 D=3.6 ft.		Sta. 60 D=3.9 ft.		Sta. 65 D=4.5 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.3	2.65	3.3	3.37	3.3	3.73	3.3	3.80	3.3	3.80	3.3	3.62	3.3	3.91	3.3	4.20	3.3	3.84	3.3	3.62	3.6	3.55	3.6	3.62
2.4	2.92	2.4	3.46	2.4	3.70	2.4	3.79	2.4	3.84	2.4	3.59	2.4	3.97	2.4	4.22	2.4	3.77	2.4	3.68	2.4	3.52	2.4	3.52
1.5	2.94	1.5	3.19	1.5	3.66	1.5	3.28	1.5	3.53	1.5	3.35	1.5	3.46	1.5	4.42	1.5	3.59	1.5	3.62	1.5	3.25	1.5	2.98
.8	2.74	.8	3.17	.8	3.41	.8	3.50	.8	3.52	.8	3.39	.8	3.75	.8	4.13	.8	3.17	.8	3.43	.8	3.23	.8	2.58
.3	2.21	.3	2.94	.3	3.30	.3	3.28	.3	2.94	.3	3.12	.3	3.53	.3	3.62	.3	2.12	.3	3.10	.3	2.87	.3	2.53

Sta. 70 D=3.7 ft.		Sta. 73 D=3.7 ft.		Sta. 76 D=3.8 ft.	
y	V	y	V	y	V
3.4	3.08	3.4	2.69	3.4	-
2.4	3.39	2.4	3.08	2.4	1.89
1.5	3.44	1.5	2.98	1.5	1.62
.8	2.94	.8	2.69	.8	1.16
.3	1.90	.3	2.30	.3	.90

May 12, 1965, Section 250, Right bank station 6, Left bank station 77

Sta. 17 D=3.8 ft.		Sta. 24 D=5.6 ft.		Sta. 30 D=6.5 ft.		Sta. 36 D=6.5 ft.		Sta. 42 D=6.1 ft.		Sta. 47 D=5.4 ft.		Sta. 49 D=6.2 ft.		Sta. 54 D=6.2 ft.		Sta. 60 D=5.4 ft.		Sta. 66 D=5.3 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
4.0	-	4.0	3.79	4.0	3.50	4.0	3.30	4.0	3.52	4.0	3.55	4.0	3.30	4.0	3.44	4.0	3.48	3.6	3.59
2.4	3.84	2.4	3.62	2.4	2.19	2.4	1.98	2.4	3.28	2.4	2.54	2.4	1.87	2.4	3.41	2.4	3.57	2.4	3.62
1.5	3.77	1.5	3.34	1.5	1.21	1.5	1.23	1.5	2.10	1.5	1.64	1.5	1.48	1.5	3.28	1.5	3.61	1.5	3.19
.8	3.59	.8	2.56	.8	.98	.8	.88	.8	1.25	.8	1.90	.8	2.34	.8	3.10	.8	3.46	.8	2.74
.3	3.35	.3	2.28	.3	.79	.3	.77	.3	1.05	.3	1.46	.3	2.10	.3	2.39	.3	2.72	.3	1.99

May 13, 1965, Section 250, Right bank station 7, Left bank station 80

Sta. 15 D=5.7 ft.		Sta. 20 D=6.5 ft.		Sta. 25 D=5.8 ft.		Sta. 30 D=4.3 ft.		Sta. 35 D=4.5 ft.		Sta. 40 D=4.8 ft.		Sta. 45 D=4.7 ft.		Sta. 50 D=4.5 ft.		Sta. 55 D=4.0 ft.		Sta. 60 D=4.3 ft.		Sta. 65 D=5.2 ft.		Sta. 70 D=2.9 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
4.0	3.50	4.0	3.89	4.0	4.31	4.0	4.07	4.0	3.62	4.0	3.52	4.0	3.16	4.0	3.61	3.7	3.79	3.7	3.91	4.0	3.16	4.0	-
2.4	3.59	2.4	3.79	2.4	4.38	2.4	3.97	2.4	3.30	2.4	3.30	2.4	2.96	2.4	3.61	2.4	3.77	2.4	3.68	2.4	3.05	2.4	2.16
1.5	3.55	1.5	3.68	1.5	4.15	1.5	3.62	1.5	3.07	1.5	3.17	1.5	2.85	1.5	3.52	1.5	3.59	1.5	3.43	1.5	2.92	1.5	2.16
.8	3.32	.8	1.01	.8	3.86	.8	3.41	.8	2.90	.8	2.96	.8	2.83	.8	3.34	.8	3.39	.8	3.26	.8	2.45	.8	1.25
.3	3.00	.3	-	.3	2.39	.3	3.07	.3	2.80	.3	2.71	.3	2.78	.3	3.28	.3	3.30	.3	3.16	.3	1.83	.3	1.23

June 2, 1965, Section 250, Right bank station 14, Left bank station 88

Sta. 20 D=4.2 ft.		Sta. 25 D=4.3 ft.		Sta. 30 D=6.6 ft.		Sta. 35 D=6.5 ft.		Sta. 40 D=6.8 ft.		Sta. 45 D=6.0 ft.		Sta. 50 D=5.0 ft.		Sta. 55 D=4.4 ft.		Sta. 60 D=4.0 ft.		Sta. 65 D=4.2 ft.		Sta. 70 D=4.0 ft.		Sta. 75 D=4.3 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.7	3.43	3.7	3.77	3.7	3.70	3.7	4.47	3.7	4.58	3.7	4.67	3.7	4.67	3.7	4.90	3.7	4.99	3.7	4.92	3.7	3.97	3.7	3.84
2.5	3.48	2.5	3.73	2.5	3.41	2.5	4.24	2.5	3.77	2.5	4.15	2.5	4.69	2.5	4.92	2.5	-	2.5	-	2.5	-	2.5	-
1.5	3.39	1.5	3.68	1.5	1.65	1.5	2.85	1.5	2.47	1.5	2.74	1.5	4.69	1.5	5.01	1.5	5.13	1.5	4.99	1.5	4.42	1.5	3.17
.7	2.74	.7	3.28	.7	.73	.7	1.50	.7	1.43	.7	1.32	.7	3.46	.7	4.52	.7	4.47	.7	4.27	.7	3.79	.7	2.14
.3	2.37	.3	3.03	.3	-	.3	1.25	.3	-	.3	-	.3	2.08	.3	3.26	.3	3.39	.3	3.39	.3	3.43	.3	1.68

June 3, 1965, Section 322, Right bank station 20, Left bank station 110

Sta. 25 D=3.3 ft.		Sta. 30 D=3.0 ft.		Sta. 35 D=3.2 ft.		Sta. 40 D=3.2 ft.		Sta. 45 D=3.3 ft.		Sta. 50 D=3.2 ft.		Sta. 55 D=3.3 ft.		Sta. 60 D=3.4 ft.		Sta. 65 D=3.6 ft.		Sta. 70 D=3.2 ft.		Sta. 75 D=3.0 ft.		Sta. 80 D=2.7 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
2.5	2.60	2.5	4.47	2.5	5.80	2.5	6.39	2.5	5.83	2.5	5.92	2.5	5.82	2.2	5.83	2.2	5.45	2.2	5.88	2.2	5.74	2.2	6.28
1.7	2.07	1.7	-	1.7	5.67	1.7	6.00	1.7	5.63	1.7	5.72	1.7	5.68	1.7	5.61	1.7	5.24	1.7	5.68	1.7	5.58	1.7	6.01
1.2	2.19	1.2	4.29	1.2	5.38	1.2	5.63	1.2	5.20	1.2	5.38	1.2	-	1.2	5.25	1.2	4.81	1.2	5.34	1.2	5.24	1.2	5.80
.6	2.51	.6	3.62	.6	4.60	.6	4.79	.6	4.47	.6	4.56	.6	4.56	.6	4.42	.6	2.74	.6	4.31	.6	4.54	.6	4.94
.2	2.45	.2	3.34	.2	4.09	.2	4.11	.2	3.79	.2	3.80	.2	3.59	.2	3.37	.2	-	.2	-	.2	3.77	.2	4.09

Sta. 85 D=2.6 ft.		Sta. 90 D=2.6 ft.		Sta. 95 D=2.6 ft.		Sta. 100 D=2.8 ft.		Sta. 105 D=3.2 ft.	
y	V	y	V	y	V	y	V	y	V
2.2	5.34	2.2	5.74	2.2	5.49	2.5	4.88	2.5	3.01
1.7	5.42	1.7	5.58	1.7	5.47	1.9	4.94	1.9	3.32
1.2	5.31	1.2	5.27	1.2	5.16	1.2	4.38	1.2	3.26
.6	4.65	.6	4.45	.6	4.43	.6	3.73	.6	2.74
.2	3.95	.2	3.91	.2	3.77	.2	3.23	.2	2.12

November 30, 1965, Station 252, Right bank station 4, Left bank station 69

Sta. 20 D=4.2 ft.		Sta. 25 D=4.4 ft.		Sta. 30 D=4.4 ft.		Sta. 35 D=4.5 ft.		Sta. 40 D=4.4 ft.		Sta. 45 D=4.3 ft.		Sta. 50 D=3.9 ft.		Sta. 55 D=4.0 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.5	5.85	3.5	6.80	3.5	7.25	3.5	7.50	3.5	7.00	3.5	6.46	3.5	5.52	3.5	4.65
2.7	5.72	2.7	6.50	2.7	7.07	2.7	7.20	2.7	6.78	2.7	6.28	2.7	5.33	2.7	4.42
1.9	4.85	1.9	6.03	1.9	6.55	1.9	6.64	1.9	6.26	1.9	5.87	1.9	4.97	1.9	3.88
1.0	4.83	1.0	5.24	1.0	5.61	1.0	5.60	1.0	5.31	1.0	4.88	1.0	4.56	1.0	3.61
.5	4.54	.5	4.78	.5	5.24	.5	5.07	.5	4.60	.5	4.33	.5	4.33	.5	3.43

TABLE 2.—*Measured velocity at indicated heights above riverbed*—Continued

May 4, 1966, Section 245, Right bank station 3, Left bank station 78

Sta. 12 D=4.1 ft.		Sta. 15 D=4.1 ft.		Sta. 20 D=4.1 ft.		Sta. 25 D=3.9 ft.		Sta. 30 D=4.0 ft.		Sta. 35 D=4.1 ft.		Sta. 40 D=4.4 ft.		Sta. 45 D=4.4 ft.		Sta. 50 D=4.4 ft.		Sta. 55 D=4.4 ft.		Sta. 60 D=4.4 ft.		Sta. 65 D=4.5 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.5	4.72	3.5	4.94	3.0	4.54	3.7	4.43	3.2	4.78	3.1	4.13	3.8	5.11	3.7	4.13	3.7	3.35	3.5	4.58	3.9	4.52	3.9	4.42
2.7	4.79	2.7	4.96	2.2	4.54	2.9	4.45	2.4	4.83	2.3	3.98	2.5	5.16	2.4	4.07	2.4	3.41	2.2	4.43	2.6	4.34	2.6	4.34
1.8	4.52	1.8	4.79	1.3	4.29	2.0	4.45	1.5	4.70	1.4	3.89	1.6	5.11	1.5	4.24	1.5	3.44	1.3	4.15	1.7	4.18	1.7	4.09
1.1	4.27	1.1	4.56	.6	3.95	1.3	4.38	.8	4.52	.7	3.61	.9	4.87	.8	4.24	.8	3.25	.6	3.88	1.0	4.02	1.0	3.75
.6	4.04	.6	4.38	.1	-	.8	4.34	.3	3.86	.2	3.48	.4	4.72	.3	4.11	.3	3.12	.1	3.44	.5	3.98	.5	3.64

Sta. 70 D=4.2 ft.	
y	V
3.7	3.82
2.7	3.80
1.8	3.35
1.1	3.07
.6	2.85

May 4, 1966, Section 255, Right bank station 3, Left bank station 72

Sta. 15 D=3.7 ft.		Sta. 20 D=3.7 ft.		Sta. 25 D=3.7 ft.		Sta. 30 D=3.8 ft.		Sta. 35 D=3.8 ft.		Sta. 40 D=3.8 ft.		Sta. 45 D=3.8 ft.		Sta. 50 D=3.8 ft.		Sta. 55 D=3.9 ft.		Sta. 60 D=4.0 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.2	4.51	3.0	6.59	3.0	7.07	3.1	7.05	3.1	7.32	3.1	7.29	3.0	7.07	3.1	6.68	3.1	6.01	3.0	5.61
2.3	5.22	2.1	6.41	2.1	6.62	2.2	6.73	2.2	7.05	2.2	7.00	2.1	6.75	2.2	6.48	2.2	5.74	2.1	5.33
1.5	5.13	1.3	5.92	1.3	6.17	1.4	6.24	1.4	6.59	1.4	6.62	1.3	6.26	1.4	6.12	1.4	5.42	1.3	4.85
.7	4.29	.5	4.97	.5	5.27	.6	5.25	.6	5.56	.6	5.43	.5	5.36	.6	5.36	.6	4.61	.5	3.98
.3	3.91	.1	4.47	.1	4.74	.2	4.67	.2	4.87	.2	4.99	.1	4.76	.2	4.83	.2	3.75	.1	2.58

November 23, 1966, Section 240, Right bank station 0, Left bank station 67

Sta. 5 D=3.7 ft.		Sta. 10 D=3.7 ft.		Sta. 15 D=3.8 ft.		Sta. 20 D=3.8 ft.		Sta. 25 D=3.8 ft.		Sta. 30 D=3.8 ft.		Sta. 35 D=3.9 ft.		Sta. 40 D=3.9 ft.		Sta. 45 D=3.9 ft.		Sta. 50 D=4.0 ft.		Sta. 55 D=4.1 ft.		Sta. 60 D=4.5 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.2	3.52	3.2	4.65	3.2	6.15	3.2	7.34	3.2	7.50	3.2	7.59	3.2	7.47	3.2	7.07	3.2	6.55	3.2	5.94	3.2	4.96	3.2	3.73
2.0	3.86	2.0	4.92	2.0	6.17	2.0	7.18	2.0	7.13	2.0	7.20	2.0	7.05	2.0	6.71	2.0	6.19	2.0	5.58	2.0	4.74	2.0	3.39
1.4	3.68	1.4	4.63	1.4	5.87	1.4	6.82	1.4	6.78	1.4	6.77	1.4	6.66	1.4	6.28	1.4	5.79	1.4	5.27	1.4	4.49	1.4	3.12
.8	3.26	.8	4.16	.8	5.24	.8	6.15	.8	6.01	.8	5.99	.8	5.96	.8	5.40	.8	5.25	.8	4.76	.8	4.13	.8	2.35
.3	2.60	.3	3.79	.3	4.38	.3	5.22	.3	4.99	.3	5.18	.3	5.16	.3	4.81	.3	4.56	.3	4.15	.3	3.77	.3	1.23

November 23, 1966, Section 245, Right bank station 4, Left bank station 78

Sta. 15 D=4.2 ft.		Sta. 20 D=4.1 ft.		Sta. 25 D=4.1 ft.		Sta. 30 D=4.0 ft.		Sta. 35 D=4.0 ft.		Sta. 40 D=3.8 ft.		Sta. 45 D=3.8 ft.		Sta. 50 D=3.8 ft.		Sta. 55 D=3.7 ft.		Sta. 60 D=3.4 ft.		Sta. 65 D=3.4 ft.		Sta. 70 D=3.5 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.0	4.60	3.0	6.39	3.0	7.05	3.0	-	3.0	7.45	3.0	7.09	3.0	6.96	3.0	6.24	3.0	5.83	3.2	4.36	3.2	3.71	3.2	2.81
2.0	4.69	2.0	6.41	2.0	6.44	2.0	7.16	2.0	6.93	2.0	6.55	2.0	6.57	2.0	6.05	2.0	5.79	2.0	4.94	2.0	4.33	2.0	3.12
1.4	4.36	1.4	5.94	1.4	6.01	1.4	6.66	1.4	6.48	1.4	6.08	1.4	6.21	1.4	5.72	1.4	5.51	1.4	4.74	1.4	4.15	1.4	2.89
.8	3.98	.8	5.36	.8	5.36	.8	5.79	.8	5.54	.8	5.25	.8	5.36	.8	5.05	.8	4.87	.8	4.33	.8	3.68	.8	2.51
.3	3.50	.3	4.72	.3	4.45	.3	3.70	.3	-	.3	-	.3	2.43	.3	4.07	.3	4.07	.3	3.80	.3	3.26	.3	2.25

November 23, 1966, Section 250, Right bank station 1, Left bank station 73

Sta. 6 D=3.5 ft.		Sta. 10 D=4.2 ft.		Sta. 15 D=4.1 ft.		Sta. 20 D=4.1 ft.		Sta. 25 D=4.1 ft.		Sta. 30 D=4.2 ft.		Sta. 35 D=4.2 ft.		Sta. 40 D=4.1 ft.		Sta. 45 D=4.1 ft.		Sta. 50 D=4.1 ft.		Sta. 55 D=4.1 ft.		Sta. 60 D=4.1 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.2	2.60	3.2	4.24	3.2	5.90	3.2	6.84	3.2	7.82	3.2	7.96	3.2	8.07	3.2	7.93	3.2	7.36	3.2	6.80	3.2	5.76	3.2	4.99
2.0	3.12	2.0	4.29	2.0	6.03	2.0	6.51	2.0	7.16	2.0	7.34	2.0	7.16	2.0	7.20	2.0	6.66	2.0	6.26	2.0	5.72	2.0	4.49
1.4	2.98	1.4	3.91	1.4	5.72	1.4	6.15	1.4	6.66	1.4	6.98	1.4	6.69	1.4	6.69	1.4	6.48	1.4	5.74	1.4	5.42	1.4	4.15
.8	2.63	.8	3.28	.8	5.22	.8	5.61	.8	5.79	.8	6.15	.8	5.69	.8	5.65	.8	5.69	.8	4.87	.8	4.85	.8	3.62
.3	2.19	.3	2.74	.3	2.83	.3	4.96	.3	3.59	.3	4.65	.3	-	.3	3.59	.3	4.76	.3	2.43	.3	4.27	.3	3.21

November 23, 1966, Section 255, Right bank station 4, Left bank station 73

Sta. 10 D=3.5 ft.		Sta. 15 D=4.3 ft.		Sta. 20 D=4.3 ft.		Sta. 25 D=4.3 ft.		Sta. 30 D=4.3 ft.		Sta. 35 D=4.3 ft.		Sta. 40 D=4.3 ft.		Sta. 45 D=4.3 ft.		Sta. 50 D=4.3 ft.		Sta. 55 D=4.3 ft.		Sta. 60 D=4.3 ft.		Sta. 65 D=4.5 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.2	2.12	3.2	5.49	3.2	6.57	3.2	7.56	3.2	7.93	3.2	8.14	3.2	8.04	3.2	7.25	3.2	7.05	3.2	6.06	3.2	5.18	3.2	4.27
2.0	2.96	2.0	5.47	2.0	6.21	2.0	7.20	2.0	7.32	2.0	7.49	2.0	7.32	2.0	6.55	2.0	6.59	2.0	5.65	2.0	4.74	2.0	3.82
1.4	2.28	1.4	5.16	1.4	5.87	1.4	6.80	1.4	6.84	1.4	6.98	1.4	6.87	1.4	6.15	1.4	6.17	1.4	5.36	1.4	4.45	1.4	3.59
.8	2.51	.8	4.54	.8	5.15	.8	6.12	.8	5.72	.8	6.05	.8	6.06	.8	5.18	.8	5.47	.8	4.92	.8	4.06	.8	3.05
.3	2.19	.3	4.31	.3	4.61	.3	6.08	.3	4.42	.3	4.74	.3	5.07	.3	4.32	.3	4.02	.3	4.58	.3	3.77	.3	2.65

November 23, 1966, Section 260, Right bank station 0, Left bank station 68

Sta. 5 D=3.9 ft.		Sta. 10 D=4.5 ft.		Sta. 15 D=4.4 ft.		Sta. 20 D=4.5 ft.		Sta. 25 D=4.6 ft.		Sta. 30 D=4.5 ft.		Sta. 35 D=4.5 ft.		Sta. 40 D=4.4 ft.		Sta. 45 D=4.4 ft.		Sta. 50 D=4.3 ft.		Sta. 55 D=4.2 ft.		Sta. 60 D=4.5 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.2	3.32	3.2	5.51	3.2	6.41	3.2	7.75	3.2	8.25	3.2	8.11	3.2	7.75	3.2	7.63	3.2	6.89	3.2	5.96	3.2	5.16	3.2	4.07
2.0	3.28	2.0	4.99	2.0	6.23	2.0	7.27	2.0	7.75	2.0	7.20	2.0	7.05	2.0	6.98	2.0	6.50	2.0	5.58	2.0	4.81	2.0	3.64
1.4	-	1.4	-	1.4	-	1.4	-	1.4	-	1.4	-	1.4	-	1.4	-	1.4	-	1.4	-	1.4	-	1.4	3.17
.8	1.83	.8	3.93	.8	5.34	.8	6.30	.8	6.48	.8	5.87	.8	5.65	.8	5.65	.8	5.47	.8	4.81	.8	4.15	.8	2.54
.3	-	.3	3.86	.3	4.81	.3	5.43	.3	5.61	.3	4.45	.3	-	.3	3.48	.3	5.72	.3	4.60	.3	3.89	.3	2.34

TABLE 2. — *Measured velocity at indicated heights above riverbed* — Continued

February 2, 1967, Section 240, Right bank station 1, Left bank station 67

Sta. 5 D=2.8 ft.		Sta. 10 D=2.6 ft.		Sta. 15 D=2.4 ft.		Sta. 20 D=2.4 ft.		Sta. 25 D=2.3 ft.		Sta. 30 D=2.3 ft.		Sta. 35 D=2.3 ft.		Sta. 40 D=2.4 ft.		Sta. 45 D=2.4 ft.		Sta. 50 D=2.4 ft.		Sta. 55 D=3.3 ft.		Sta. 60 D=3.1 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
2.6	2.63	1.9	4.43	1.9	5.34	2.0	5.69	1.9	5.94	1.9	5.78	2.0	5.69	2.0	5.34	2.0	4.56	2.0	3.97	2.6	3.17	2.6	2.99
2.0	3.34	1.3	4.18	1.3	5.09	1.4	5.51	1.3	5.70	1.3	5.52	1.4	5.49	1.4	5.13	1.4	4.49	1.4	3.91	2.0	2.99	2.0	2.90
1.4	3.34	.7	3.70	.7	4.61	.8	4.90	.7	5.11	.7	4.97	.8	4.90	.8	4.56	.8	4.04	.8	3.52	1.4	2.80	1.4	2.80
.8	2.87	.2	3.19	.2	3.97	.3	4.20	.2	4.36	.2	4.29	.3	4.24	.3	3.95	.3	3.55	.3	3.10	.8	2.23	.8	2.35
.3	2.35	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.3	1.52	.3	1.81

February 2, 1967, Section 245, Right bank station 0, Left bank station 72

Sta. 5 D=3.3 ft.		Sta. 10 D=2.6 ft.		Sta. 15 D=2.6 ft.		Sta. 20 D=2.5 ft.		Sta. 25 D=2.4 ft.		Sta. 30 D=2.3 ft.		Sta. 35 D=2.3 ft.		Sta. 40 D=2.2 ft.		Sta. 45 D=2.2 ft.		Sta. 50 D=2.2 ft.		Sta. 55 D=2.0 ft.		Sta.60 D=3.2 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
2.5	2.72	2.5	3.80	1.9	4.81	1.9	5.38	1.8	5.67	1.9	5.76	1.9	5.63	1.9	5.29	2.0	4.94	2.0	3.91	2.0	3.16	2.6	2.74
1.9	2.60	1.9	4.04	1.4	4.70	1.4	5.18	1.3	5.51	1.4	5.56	1.4	5.51	1.4	5.15	1.4	4.90	1.4	3.98	1.4	3.62	2.0	2.62
1.4	2.28	1.4	3.97	.8	4.33	.8	4.72	.7	4.99	.8	5.07	.8	4.99	.8	4.69	.8	4.45	.8	3.64	.8	3.48	1.4	2.43
.8	1.48	.8	3.66	.3	3.80	.3	4.04	.2	4.25	.3	4.38	.3	4.33	.3	4.07	.3	3.86	.3	3.25	.3	3.16	.8	1.72
.3	1.05	.3	3.26	–	–	–		–	–	–	–	–	–	–	–	–	–	–	–	–	–	.3	1.07

February 2, 1967, Section 250, Right bank station 0, Left bank station 67

Sta. 5 D=2.6 ft.		Sta. 10 D=2.4 ft.		Sta. 15 D=2.3 ft.		Sta. 20 D=2.3 ft.		Sta. 25 D=2.3 ft.		Sta. 30 D=2.4 ft.		Sta. 35 D=2.4 ft.		Sta. 40 D=2.4 ft.		Sta. 45 D=2.4 ft.		Sta. 50 D=2.5 ft.		Sta. 55 D=2.8 ft.		Sta. 60 D=3.4 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.8	3.64	1.9	4.52	1.8	5.25	1.8	5.65	1.8	5.65	1.8	5.72	1.8	5.56	1.8	5.38	1.8	4.79	2.4	3.98	2.4	3.88	2.5	3.01
1.3	3.55	1.4	4.42	1.3	5.13	1.3	5.47	1.3	5.51	1.3	5.58	1.3	5.42	1.3	5.24	1.3	4.70	1.8	3.97	1.8	3.84	1.9	2.94
.7	3.16	.8	4.06	.7	4.67	.7	4.96	.7	4.99	.7	5.03	.7	4.94	.7	4.78	.7	4.27	1.3	3.79	1.3	3.93	1.4	3.03
.2	2.62	.3	3.61	.2	4.07	.2	4.24	.2	4.27	.2	4.27	.2	4.22	.2	4.07	.2	3.66	.7	3.44	.7	3.80	.8	2.89
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.2	3.25	.1	3.10	.3	2.01

February 2, 1967, Section 255, Right bank station 0, Left bank station 66

Sta. 5 D=2.6 ft.		Sta. 10 D=2.4 ft.		Sta. 15 D=2.4 ft.		Sta. 20 D=2.4 ft.		Sta. 25 D=2.4 ft.		Sta. 30 D=2.4 ft.		Sta. 35 D=2.4 ft.		Sta. 40 D=2.4 ft.		Sta. 45 D=2.5 ft.		Sta. 50 D=2.6 ft.		Sta. 55 D=2.8 ft.		Sta. 60 D=2.8 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.9	3.01	1.8	4.04	1.8	–	1.8	5.49	1.8	5.76	1.8	5.83	1.8	5.70	1.8	5.40	1.9	4.85	2.5	4.52	2.7	3.50	2.4	3.35
1.4	2.99	1.3	3.93	1.3	4.79	1.3	5.36	1.3	5.61	1.3	5.67	1.3	5.52	1.3	5.22	1.4	4.72	1.9	4.42	2.1	3.68	1.8	3.12
.8	2.62	.7	3.59	.7	4.34	.7	4.92	.7	5.09	.7	5.15	.7	4.96	.7	4.70	.8	4.25	1.4	4.34	1.6	3.62	1.3	2.94
.3	1.68	.2	3.16	.2	3.79	.2	4.27	.2	4.33	.2	4.36	.2	4.18	.2	4.06	.3	3.66	.8	3.98	1.0	3.32	.7	2.51
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.3	3.50	.5	2.81	.2	2.12

February 2, 1967, Section 260, Right bank station 4, Left bank station 70

Sta. 10 D=2.8 ft.		Sta. 15 D=2.5 ft.		Sta. 20 D=2.5 ft.		Sta. 25 D=2.5 ft.		Sta. 30 D=2.5 ft.		Sta. 35 D=2.5 ft.		Sta. 40 D=2.5 ft.		Sta. 45 D=2.4 ft.		Sta. 50 D=2.4 ft.		Sta. 55 D=2.3 ft.		Sta. 60 D=2.3 ft.		Sta. 65 D=2.9 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
2.4	3.35	1.9	4.24	1.9	5.16	1.8	5.49	1.8	5.81	1.9	5.78	1.9	5.63	1.9	5.34	1.9	4.79	1.9	3.88	1.9	3.57	2.5	2.96
1.8	3.26	1.4	4.20	1.4	5.01	1.3	5.40	1.3	5.61	1.4	5.63	1.4	5.49	1.4	5.25	1.4	4.61	1.4	3.93	1.4	3.71	1.9	2.87
1.3	3.12	.8	3.88	.8	4.61	.7	4.79	.7	5.03	.8	5.13	.8	4.96	.8	4.76	.8	4.27	.8	3.70	.8	3.52	1.4	2.71
.7	2.53	.3	3.34	.3	3.97	.2	4.04	.2	4.18	.3	4.31	.3	4.18	.3	4.07	.3	3.71	.3	3.26	.3	3.05	.8	2.25
.2	1.92	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.3	1.90

February 14, 1967, Section 220, Right bank station 4, Left bank station 68

Sta. 10 D=2.4 ft.		Sta. 15 D=2.5 ft.		Sta. 20 D=2.5 ft.		Sta. 25 D=2.5 ft.		Sta. 30 D=2.5 ft.		Sta. 35 D=2.5 ft.		Sta. 40 D=2.4 ft.		Sta. 45 D=2.4 ft.		Sta. 50 D=2.4 ft.		Sta. 55 D=2.3 ft.		Sta. 60 D=2.6 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.3	3.23	1.3	4.90	1.3	5.07	1.3	5.24	1.3	5.27	1.3	5.27	1.3	5.09	1.3	4.43	1.3	3.68	1.3	3.77	1.2	3.30
.8	2.72	.8	4.60	.8	4.56	.8	4.78	.8	4.78	.8	4.83	.8	4.70	.8	4.11	.8	3.50	.8	3.57	.7	3.08
.3	1.55	.3	3.88	.3	3.79	.3	3.95	.3	4.00	.3	4.04	.3	3.89	.3	3.50	.3	3.14	.3	3.17	.2	2.45

February 14, 1967, Section 225, Right bank station 2, Left bank station 66

Sta. 10 D=2.3 ft.		Sta. 15 D=2.3 ft.		Sta. 20 D=2.4 ft.		Sta. 25 D=2.5 ft.		Sta. 30 D=2.5 ft.		Sta. 35 D=2.6 ft.		Sta. 40 D=2.6 ft.		Sta. 45 D=2.7 ft.		Sta. 50 D=3.0 ft.		Sta. 55 D=3.4 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.3	3.43	1.3	4.61	1.3	5.38	1.3	5.52	1.3	5.45	1.3	5.24	1.3	4.79	1.3	4.29	1.3	3.37	1.9	2.41
.8	3.10	.8	4.27	.8	4.94	.8	5.09	.8	5.03	.8	4.81	.8	4.40	.8	4.00	.8	2.80	1.3	3.07
.3	2.69	.3	3.62	.3	4.11	.3	4.27	.3	4.20	.3	4.07	.3	3.77	.3	3.53	.3	1.85	.8	2.60
–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	–	.3	2.49

February 14, 1967, Section 230, Right bank station 3, Left bank station 70

Sta. 10 D=2.7 ft.		Sta. 15 D=2.6 ft.		Sta. 20 D=2.6 ft.		Sta. 25 D=2.5 ft.		Sta. 30 D=2.4 ft.		Sta. 35 D=2.4 ft.		Sta. 40 D=2.3 ft.		Sta. 45 D=2.2 ft.		Sta. 50 D=2.1 ft.		Sta. 55 D=2.6 ft.		Sta. 60 D=2.5 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.9	3.62	1.9	4.88	1.9	5.56	1.9	5.67	1.8	5.56	1.9	5.49	1.8	5.31	1.9	4.63	1.7	3.66	1.9	3.12	1.9	2.61
1.3	3.57	1.3	4.60	1.3	5.22	1.3	5.34	1.2	5.27	1.3	5.16	1.2	4.99	1.3	4.54	1.1	3.86	1.3	2.94	1.3	2.35
.8	3.23	.8	4.20	.8	4.83	.8	4.90	.7	4.78	.8	4.81	.7	4.60	.8	4.29	.6	3.68	.8	2.71	.8	2.14
.3	2.71	.3	3.62	.3	4.07	.3	4.15	.2	4.09	.3	4.15	.2	3.88	.3	3.71	.1	3.23	.3	2.19	.3	1.81

TABLE 2.—*Measured velocity at indicated heights above riverbed*—Continued

February 14, 1967, Section 235, Right bank station 1, Left bank station 69

Sta. 5		Sta. 10		Sta. 15		Sta. 20		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55		Sta. 60	
D=2.0 ft.		D=2.2 ft.		D=2.2 ft.		D=2.3 ft.		D=2.3 ft.		D=2.3 ft.		D=2.4 ft.		D=2.4 ft.		D=2.5 ft.		D=2.5 ft.		D=2.8 ft.		D=3.4 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.9	-	1.9	4.00	1.9	4.67	1.9	5.22	1.9	5.38	1.9	5.43	1.9	5.51	1.9	5.29	1.9	4.74	1.9	4.09	2.4	2.28	2.4	2.60
1.3	2.74	1.3	4.00	1.3	4.49	1.3	4.97	1.3	5.15	1.3	5.15	1.3	5.15	1.3	5.01	1.3	4.58	1.3	4.04	1.8	3.61	1.8	2.72
.8	2.76	.8	3.77	.8	4.24	.8	4.63	.8	4.78	.8	4.74	.8	4.79	.8	4.65	.8	4.27	.8	3.80	1.2	3.41	1.2	2.54
.3	2.17	.3	3.25	.3	3.59	.3	3.93	.3	4.06	.3	3.95	.3	4.04	.3	4.07	.3	3.73	.3	3.34	.7	3.14	.7	2.37
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.2	2.35	.2	2.01

February 14, 1969, Section 240, Right bank station 2, Left bank station 68

Sta. 10		Sta. 15		Sta. 20		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55		Sta. 60	
D=2.6 ft.		D=2.4 ft.		D=2.3 ft.		D=2.3 ft.		D=2.3 ft.		D=2.2 ft.		D=2.2 ft.		D=2.2 ft.		D=2.6 ft.		D=2.6 ft.		D=2.9 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.9	4.40	1.9	5.24	1.9	5.47	1.9	5.60	1.9	5.61	1.9	5.51	1.8	5.11	1.9	4.81	2.3	3.68	2.3	3.08	2.5	2.71
1.3	4.18	1.3	4.97	1.3	5.20	1.3	5.34	1.3	5.33	1.3	5.29	1.2	4.87	1.3	4.61	1.7	3.89	1.7	3.12	1.9	2.92
.8	3.82	.8	4.63	.8	4.81	.8	4.92	.8	4.94	.8	4.92	.7	4.18	.8	4.29	1.1	3.61	1.1	2.92	1.3	2.78
.3	3.26	.3	4.00	.3	4.18	.3	4.20	.3	4.24	.3	4.18	.2	3.84	.3	3.66	.6	3.30	.6	2.74	.8	2.34
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.1	2.39	.1	1.44	.3	-

February 14, 1969, Section 250, Right bank station 4, Left bank station 71

Sta. 10		Sta. 15		Sta. 20		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55		Sta. 60		Sta. 65	
D=2.7 ft.		D=2.4 ft.		D=2.4 ft.		D=2.4 ft.		D=2.4 ft.		D=2.4 ft.		D=2.5 ft.		D=2.4 ft.		D=2.3 ft.		D=2.1 ft.		D=3.0 ft.		D=3.2 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
2.5	3.52	1.9	4.85	1.9	5.40	1.9	5.65	1.9	5.72	1.9	5.65	1.9	5.51	1.9	5.25	1.9	4.78	1.9	3.70	2.4	3.48	2.5	2.72
1.9	3.88	1.3	4.70	1.3	5.08	1.3	5.43	1.3	5.47	1.3	5.36	1.3	5.22	1.3	4.99	1.3	4.63	1.3	3.95	1.8	3.55	1.9	2.85
1.3	3.62	.8	4.38	.8	4.74	.8	5.11	.8	5.11	.8	4.92	.8	4.88	.8	4.63	.8	4.34	.8	3.66	1.2	3.48	1.3	2.63
.8	3.34	.3	3.88	.3	4.06	.3	4.34	.3	4.34	.3	4.24	.3	4.20	.3	3.98	.3	3.84	.3	3.37	.7	3.05	.8	2.28
.3	2.76	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.2	2.21	.3	1.64

February 14, 1967, Section 260, Right bank station 4, Left bank station 71

Sta. 10		Sta. 15		Sta. 20		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55		Sta. 60		Sta. 65	
D=2.7 ft.		D=2.3 ft.		D=2.4 ft.		D=2.4 ft.		D=2.4 ft.		D=2.5 ft.		D=2.5 ft.		D=2.5 ft.		D=2.7 ft.		D=2.4 ft.		D=2.6 ft.		D=2.5 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.9	3.28	1.9	4.52	1.9	4.96	1.9	5.49	1.8	5.67	1.9	5.60	1.9	5.51	1.8	5.25	1.9	4.40	1.9	3.57	1.8	3.61	1.9	2.60
1.3	2.99	1.3	4.31	1.3	4.69	1.3	5.24	1.2	5.40	1.3	5.29	1.3	5.22	1.2	4.97	1.3	4.27	1.3	3.26	1.2	3.50	1.3	2.62
.8	2.65	.8	3.97	.8	4.38	.8	4.81	.7	4.94	.8	4.88	.8	4.81	.7	4.54	.8	3.97	.8	3.08	.7	3.34	.8	2.45
.3	2.16	.3	3.46	.3	3.80	.3	4.04	.2	4.18	.3	4.09	.3	4.02	.2	3.86	.3	3.43	.3	2.90	.2	-	.3	2.05

February 14, 1967, Section 270, Right bank station 2, Left bank station 65

Sta. 10		Sta. 15		Sta. 20		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55	
D=2.3 ft.		D=2.5 ft.		D=2.6 ft.		D=2.6 ft.		D=2.5 ft.		D=2.5 ft.		D=2.4 ft.		D=2.4 ft.		D=2.2 ft.		D=3.1 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.9	4.24	1.9	5.25	1.9	5.54	1.9	5.70	1.9	5.70	1.9	5.61	1.9	5.45	1.9	4.92	1.8	4.52	2.4	3.53
1.3	4.27	1.3	5.16	1.3	5.22	1.3	5.33	1.3	5.38	1.3	5.25	1.3	5.13	1.3	4.69	1.2	4.24	1.8	3.37
.8	4.06	.8	4.83	.8	4.85	.8	4.92	.8	4.96	.8	4.85	.8	4.76	.8	4.29	.7	3.98	1.2	3.10
.3	3.41	.3	4.15	.3	4.07	.3	4.09	.3	4.22	.3	4.07	.3	4.09	.3	3.75	.2	3.53	.7	2.63
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.2	1.48

February 14, 1967, Section 280, Right bank station 3, Left bank station 70

Sta. 5		Sta. 10		Sta. 15		Sta. 20		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55		Sta. 60	
D=2.6 ft.		D=2.5 ft.		D=2.5 ft.		D=2.5 ft.		D=2.4 ft.		D=2.4 ft.		D=2.4 ft.		D=2.5 ft.		D=2.5 ft.		D=2.5 ft.		D=2.7 ft.		D=2.9 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.8	2.23	1.9	3.44	1.9	4.60	1.9	5.25	1.8	5.61	1.8	5.74	1.8	5.67	1.9	5.45	1.8	5.15	1.9	4.42	1.9	3.53	1.9	2.92
1.2	1.99	1.3	3.61	1.3	4.63	1.3	4.97	1.2	5.33	1.2	5.40	1.2	5.38	1.3	5.24	1.2	4.90	1.3	4.36	1.3	3.84	1.3	2.98
.7	1.48	.8	3.32	.8	4.34	.8	4.60	.7	4.88	.7	5.03	.7	4.92	.8	4.88	.7	4.58	.8	4.25	.8	3.66	.8	2.78
.2	1.11	.3	2.80	.3	3.80	.3	3.97	.2	4.09	.2	4.36	.2	4.25	.3	4.13	.2	4.02	.3	4.04	.3	3.44	.3	2.47

February 15, 1967, Section 220, Right bank station 0, Left bank station 64

Sta. 5		Sta. 10		Sta. 15		Sta. 20		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55	
D=2.6 ft.		D=2.5 ft.		D=2.5 ft.		D=2.6 ft.		D=2.6 ft.		D=2.5 ft.		D=2.4 ft.		D=2.3 ft.		D=2.4 ft.		D=2.7 ft.		D=3.1 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.9	3.48	1.9	4.56	1.9	5.29	1.9	5.76	1.9	5.76	1.9	5.72	1.9	5.58	1.9	4.88	1.9	4.13	2.5	3.08	2.5	3.05
1.3	3.30	1.3	4.27	1.3	5.07	1.3	5.51	1.3	5.51	1.3	5.36	1.3	5.29	1.3	4.60	1.3	4.02	1.9	3.37	1.9	2.90
.8	2.80	.8	4.06	.8	4.74	.8	5.07	.8	5.03	.8	4.85	.8	4.88	.8	4.34	.8	3.84	1.3	3.52	1.3	2.58
.3	2.32	.3	3.66	.3	4.27	.3	4.42	.3	4.42	.3	4.27	.3	4.49	.3	3.98	.3	3.44	.8	3.55	.8	2.39
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.3	3.19	.3	2.08

February 15, 1967, Section 225, Right bank station 2, Left bank station 66

Sta. 5		Sta. 10		Sta. 15		Sta. 20		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55		Sta. 60	
D=2.2 ft.		D=2.4 ft.		D=2.4 ft.		D=2.4 ft.		D=2.5 ft.		D=2.5 ft.		D=2.6 ft.		D=2.7 ft.		D=2.5 ft.		D=2.9 ft.		D=3.5 ft.		D=3.3 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.9	1.30	1.9	3.59	1.9	4.74	1.9	4.99	1.9	5.47	1.9	5.51	1.9	5.47	1.9	5.18	1.9	4.60	2.5	4.06	2.4	3.40	2.5	2.46
1.3	1.41	1.3	3.55	1.3	4.45	1.3	4.81	1.3	5.22	1.3	5.15	1.3	5.11	1.3	4.88	1.3	4.31	1.9	3.80	1.8	3.01	1.9	2.46
.8	1.37	.8	3.34	.8	4.20	.8	4.60	.8	4.85	.8	4.78	.8	4.67	.8	4.49	.8	4.06	1.3	3.52	1.2	2.76	1.3	2.28
.3	1.26	.3	2.87	.3	3.62	.3	4.02	.3	4.13	.3	4.02	.3	3.95	.3	3.91	.3	3.70	.8	3.37	.7	2.54	.8	2.23
-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	.3	3.16	.2	2.54	.3	2.07

TABLE 2.—*Measured velocity at indicated heights above riverbed*—Continued

February 15, 1967, Section 230, Right bank station 4, Left bank station 70

Sta. 10 D=2.7 ft.	Sta. 15 D=2.6 ft.	Sta. 20 D=2.6 ft.	Sta. 25 D=2.5 ft.	Sta. 30 D=2.5 ft.	Sta. 35 D=2.3 ft.	Sta. 40 D=2.3 ft.	Sta. 45 D=2.2 ft.	Sta. 50 D=2.2 ft.	Sta. 55 D=2.8 ft.	Sta. 60 D=3.5 ft.	Sta. 65 D=4.3 ft.
y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V
2.5 3.01	2.5 4.96	2.5 6.26	2.5 6.62	2.5 6.69	1.8 5.43	1.9 5.05	1.9 4.63	1.9 4.13	2.5 3.30	2.5 3.52	2.5 2.72
1.9 3.41	1.9 4.78	1.9 5.15	1.9 5.40	1.9 5.54	1.2 5.18	1.3 4.87	1.3 4.52	1.3 4.06	1.9 3.48	1.9 3.31	1.9 2.69
1.3 3.44	1.3 4.67	1.3 4.88	1.3 5.18	1.3 5.29	.7 4.85	.8 4.56	.8 4.24	.8 3.80	1.3 3.37	1.3 3.12	1.3 2.54
.8 3.12	.8 4.31	.8 4.49	.8 4.81	.8 4.92	.2 4.20	.3 3.97	.3 3.73	.3 3.30	.8 3.19	.8 2.72	.8 2.28
.3 2.65	.3 3.77	.3 3.91	.3 4.24	.3 4.24	- -	- -	- -	- -	.3 2.76	.3 -	.3 1.16

February 15, 1967, Section 235, Right bank station 1, Left bank station 69

Sta. 10 D=2.3 ft.	Sta. 15 D=2.3 ft.	Sta. 20 D=2.3 ft.	Sta. 25 D=2.4 ft.	Sta. 30 D=2.4 ft.	Sta. 35 D=2.5 ft.	Sta. 40 D=2.5 ft.	Sta. 45 D=2.6 ft.	Sta. 50 D=2.6 ft.	Sta. 55 D=3.1 ft.	Sta. 60 D=3.7 ft.	Sta. 65 D=3.4 ft.
y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V
1.9 3.95	1.9 4.74	1.9 4.99	1.9 5.33	1.9 5.36	1.9 5.25	1.9 4.99	1.9 4.34	1.9 3.88	2.5 3.59	2.5 2.87	2.5 2.28
1.3 3.80	1.3 4.63	1.3 4.78	1.3 5.11	1.3 5.11	1.3 4.99	1.3 4.85	1.3 4.06	1.3 3.62	1.9 3.46	1.9 2.58	1.9 1.99
.8 3.55	.8 4.27	.8 4.49	.8 4.74	.8 4.74	.8 4.63	.8 4.49	.8 3.77	.8 3.37	1.3 3.34	1.3 2.28	1.3 1.59
.3 3.12	.3 3.77	.3 3.91	.3 4.13	.3 4.16	.3 4.09	.3 4.06	.3 3.34	.3 3.05	.8 3.17	.8 2.03	.8 1.37
- -	- -	- -	- -	- -	- -	- -	- -	- -	.3 2.85	.3 -	.3 -

February 15, 1967, Section 240, Right bank station 2, Left bank station 68

Sta. 5 D=3.0 ft.	Sta. 10 D=2.7 ft.	Sta. 15 D=2.4 ft.	Sta. 20 D=2.4 ft.	Sta. 25 D=2.3 ft.	Sta. 30 D=2.3 ft.	Sta. 35 D=2.3 ft.	Sta. 40 D=2.3 ft.	Sta. 45 D=2.4 ft.	Sta. 50 D=2.4 ft.	Sta. 55 D=2.8 ft.	Sta. 60 D=2.6 ft.
y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V
2.0 3.26	1.9 4.24	1.9 4.85	1.9 5.29	1.9 5.47	1.9 5.58	1.9 5.40	1.9 5.25	1.9 4.56	1.9 3.98	1.8 3.34	1.9 2.98
1.4 3.16	1.3 3.80	1.3 4.74	1.3 5.03	1.3 5.18	1.3 5.07	1.3 5.11	1.3 5.03	1.3 4.38	1.3 3.80	1.2 3.26	1.3 2.85
.9 2.90	.8 3.52	.8 4.45	.8 4.70	.8 4.85	.8 4.92	.8 4.70	.8 4.63	.8 4.06	.8 3.52	.7 3.19	.8 2.65
.4 2.32	.3 3.08	.3 3.88	.3 4.20	.3 4.13	.3 4.31	.3 4.02	.3 4.02	.3 3.62	.3 3.08	.2 2.94	.3 2.41

February 15, 1967, Section 245, Right bank station 4, Left bank station 78

Sta. 10 D=3.1 ft.	Sta. 15 D=2.5 ft.	Sta. 20 D=2.4 ft.	Sta. 25 D=2.3 ft.	Sta. 30 D=2.3 ft.	Sta. 35 D=2.2 ft.	Sta. 40 D=2.2 ft.	Sta. 45 D=2.2 ft.	Sta. 50 D=2.1 ft.	Sta. 55 D=2.1 ft.	Sta. 60 D=2.3 ft.	Sta. 65 D=2.6 ft.
y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V
2.5 3.37	1.9 3.95	1.9 4.63	1.8 5.22	1.9 5.22	1.9 5.33	1.9 5.33	1.9 5.18	1.9 4.78	1.9 4.38	1.9 3.73	1.9 3.30
1.9 3.19	1.3 3.73	1.3 4.42	1.2 4.96	1.3 5.07	1.3 5.15	1.3 5.07	1.3 4.99	1.3 4.78	1.3 4.38	1.3 3.55	1.3 3.26
1.3 2.72	.8 3.55	.8 4.16	.7 4.63	.8 4.70	.8 4.74	.8 4.63	.8 4.67	.8 4.52	.8 4.16	.8 3.34	.8 2.76
.8 1.81	.3 3.19	.3 3.73	.2 4.13	.3 3.98	.3 4.06	.3 4.06	.3 4.06	.3 3.95	.3 3.73	.3 2.94	.3 2.54
.3 1.09	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -

February 15, 1967, Section 250, Right bank station 0, Left bank station 67

Sta. 5 D=2.8 ft.	Sta. 10 D=2.4 ft.	Sta. 15 D=2.3 ft.	Sta. 20 D=2.3 ft.	Sta. 25 D=2.4 ft.	Sta. 30 D=2.4 ft.	Sta. 35 D=2.4 ft.	Sta. 40 D=2.4 ft.	Sta. 45 D=2.5 ft.	Sta. 50 D=2.6 ft.	Sta. 55 D=2.6 ft.	Sta. 60 D=3.1 ft.
y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V
2.4 3.59	1.9 4.34	1.9 5.03	1.9 5.18	1.9 5.40	1.9 -	1.9 5.43	1.9 5.36	1.9 4.49	1.9 3.84	1.9 3.88	2.4 2.72
1.8 3.41	1.3 4.13	1.3 4.78	1.3 4.96	1.3 5.18	1.3 5.22	1.3 5.22	1.3 5.03	1.3 4.27	1.3 3.88	1.3 3.88	1.8 2.76
1.2 3.16	.8 3.88	.8 4.45	.8 4.63	.8 4.81	.8 4.81	.8 4.88	.8 4.74	.8 3.91	.8 3.66	.8 3.70	1.2 2.72
.7 2.83	.3 3.37	.3 3.88	.3 4.02	.3 4.16	.3 4.16	.3 4.24	.3 4.06	.3 3.44	.3 3.26	.3 3.41	.7 2.32
.2 2.43	- -	- -	- -	- -	- -	- -	- -	- -	- -	- -	.2 2.07

February 15, 1967, Section 260, Right bank station 4, Left bank station 71

Sta. 10 D=2.8 ft.	Sta. 15 D=2.4 ft.	Sta. 20 D=2.4 ft.	Sta. 25 D=2.4 ft.	Sta. 30 D=2.4 ft.	Sta. 35 D=2.4 ft.	Sta. 40 D=2.4 ft.	Sta. 45 D=2.4 ft.	Sta. 50 D=2.4 ft.	Sta. 55 D=2.5 ft.	Sta. 60 D=2.0 ft.	Sta. 65 D=2.6 ft.
y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V
1.8 3.23	1.9 4.34	1.9 4.92	1.9 5.58	1.9 5.69	1.9 5.69	1.9 5.58	1.9 5.47	1.9 4.78	1.9 4.16	1.9 -	1.9 2.90
1.2 2.94	1.3 4.09	1.3 4.67	1.3 5.15	1.3 5.36	1.3 5.29	1.3 5.15	1.3 5.07	1.3 4.49	1.3 4.02	1.3 3.37	1.3 2.72
.7 2.54	.8 3.84	.8 4.42	.8 4.81	.8 4.88	.8 4.92	.8 4.74	.8 4.74	.8 4.24	.8 3.80	.8 3.08	.8 2.51
.2 2.14	.3 3.44	.3 3.91	.3 4.27	.3 4.20	.3 4.20	.3 4.13	.3 4.20	.3 3.84	.3 3.37	.3 2.83	.3 1.92

February 15, 1967, Section 270, Right bank station 3, Left bank station 66

Sta. 5 D=2.5 ft.	Sta. 10 D=2.5 ft.	Sta. 15 D=2.5 ft.	Sta. 20 D=2.6 ft.	Sta. 25 D=2.6 ft.	Sta. 30 D=2.6 ft.	Sta. 35 D=2.5 ft.	Sta. 40 D=2.5 ft.	Sta. 45 D=2.5 ft.	Sta. 50 D=3.0 ft.	Sta. 55 D=3.9 ft.	Sta. 60 D=2.7 ft.
y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V
1.9 1.85	1.9 4.60	1.9 4.67	1.9 5.22	1.9 5.54	1.9 5.72	1.9 5.61	1.9 5.47	1.9 4.78	1.9 3.70	1.9 2.90	1.9 2.39
1.3 1.85	1.3 4.45	1.3 4.52	1.3 4.99	1.3 5.22	1.3 5.43	1.3 5.33	1.3 5.22	1.3 4.56	1.3 3.34	1.3 2.65	1.3 1.96
.8 1.66	.8 4.20	.8 4.31	.8 4.63	.8 4.88	.8 5.07	.8 4.96	.8 4.85	.8 4.31	.8 2.43	.8 2.39	.8 1.70
.3 1.55	.3 3.70	.3 3.88	.3 4.09	.3 4.34	.3 4.34	.3 4.42	.3 4.38	.3 3.84	.3 1.62	.3 1.78	.3 1.16

February 15, 1967, Section 280, Right bank station 3, Left bank station 70

Sta. 10 D=3.0 ft.	Sta. 15 D=2.5 ft.	Sta. 20 D=2.4 ft.	Sta. 25 D=2.4 ft.	Sta. 30 D=2.4 ft.	Sta. 35 D=2.4 ft.	Sta. 40 D=2.4 ft.	Sta. 45 D=2.4 ft.	Sta. 50 D=2.6 ft.	Sta. 55 D=2.5 ft.	Sta. 60 D=2.8 ft.
y V	y V	y V	y V	y V	y V	y V	y V	y V	y V	y V
2.5 3.66	1.9 4.38	1.9 5.22	1.9 5.61	1.9 5.61	1.9 5.58	1.9 5.61	1.8 5.25	1.9 4.70	1.9 3.91	2.5 3.37
1.9 3.44	1.3 4.09	1.3 4.88	1.3 5.29	1.3 5.33	1.3 5.25	1.3 5.33	1.2 4.96	1.3 4.56	1.3 3.73	1.9 3.16
1.3 3.26	.8 3.73	.8 4.49	.8 4.85	.8 4.88	.8 4.92	.8 4.81	.7 4.63	.8 4.24	.8 3.44	1.3 2.94
.8 3.12	.3 3.34	.3 4.02	.3 4.27	.3 4.31	.3 4.20	.3 4.34	.2 4.13	.3 3.84	.3 3.19	.8 2.62
.3 2.35	- -	- -	- -	- -	- -	- -	- -	- -	- -	.3 2.35

TABLE 2.—*Measured velocity at indicated heights above riverbed*—Continued

February 1, 1968, Section 99, Right bank station 0, Left bank station 62

Sta. 6		Sta. 10		Sta. 15		Sta. 20		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55	
D=3.3 ft.		D=3.0 ft.		D=2.9 ft.		D=2.9 ft.		D=2.9 ft.		D=2.9 ft.		D=3.0 ft.		D=3.0 ft.		D=3.1 ft.		D=3.3 ft.		D=3.5 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
2.5	2.80	2.5	4.49	2.5	5.18	2.5	5.61	2.5	6.03	2.5	6.17	2.5	6.28	2.5	5.96	2.5	5.49	2.5	4.58	2.5	3.32
1.7	3.14	1.7	4.00	1.7	4.83	1.7	5.29	1.7	5.61	1.7	5.76	1.7	5.87	1.7	5.45	1.7	4.99	1.7	4.00	1.7	3.16
1.2	2.96	1.2	3.57	1.2	4.52	1.2	4.90	1.2	5.16	1.2	5.27	1.2	5.40	1.2	5.05	1.2	4.60	1.2	3.68	1.2	2.78
.8	2.72	.8	3.34	.8	4.27	.8	4.72	.8	4.72	.8	4.85	.8	5.05	.8	4.67	.8	4.42	.8	3.44	.8	2.56
.4	2.26	.4	3.10	.4	4.00	.4	4.33	.4	4.40	.4	4.42	.4	4.67	.4	4.27	.4	4.16	.4	3.23	.4	2.16

February 1, 1968, Section 100, Right bank station 0, Left bank station 57

Sta. 10		Sta. 15		Sta. 20		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50	
D=2.7 ft.		D=2.5 ft.		D=2.6 ft.		D=2.7 ft.		D=2.9 ft.		D=3.1 ft.		D=3.4 ft.		D=3.7 ft.		D=4.3 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
2.3	4.15	2.5	4.83	2.5	5.51	2.5	6.03	2.5	6.14	2.5	6.25	2.5	6.03	2.5	5.22	2.5	3.62
1.5	4.02	1.7	4.76	1.7	5.34	1.7	5.63	1.7	5.65	1.7	5.74	1.7	5.42	1.7	4.67	1.7	3.30
1.0	3.68	1.2	4.45	1.2	4.96	1.2	5.18	1.2	5.16	1.2	5.22	1.2	4.97	1.2	4.40	1.2	2.99
.6	3.43	.8	4.24	.8	4.67	.8	4.88	.8	4.88	.8	4.88	.8	4.67	.8	4.27	.8	2.89
.2	2.92	.4	3.95	.4	4.29	.4	4.47	.4	4.58	.4	4.49	.4	4.33	.4	3.77	.4	2.58

February 1, 1968, Section 101, Right bank station 1, Left bank station 67

Sta. 15		Sta. 20		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55		Sta. 60	
D=2.3 ft.		D=2.4 ft.		D=2.4 ft.		D=2.6 ft.		D=2.8 ft.		D=3.1 ft.		D=3.3 ft.		D=3.4 ft.		D=3.5 ft.		D=3.8 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.7	4.00	1.7	4.76	1.6	4.97	1.6	5.29	2.5	5.87	2.5	6.01	2.5	5.29	2.5	5.51	2.5	4.87	2.5	3.21
1.2	3.82	1.2	4.40	1.1	4.63	1.1	4.85	1.7	5.52	1.7	5.58	1.7	4.88	1.7	5.11	1.7	4.70	1.7	3.61
.8	3.66	.8	4.18	.7	4.36	.7	4.56	1.2	5.11	1.2	5.05	1.2	4.47	1.2	4.69	1.2	4.43	1.2	3.62
.4	3.45	.4	3.95	.3	4.07	.3	4.25	.8	4.74	.8	4.74	.8	4.29	.8	4.45	.8	4.22	.8	3.50
-	-	-	-	-	-	-	-	.4	4.38	.4	4.38	.4	4.00	.4	4.20	.4	4.00	.4	3.19

February 1, 1968, Section 159, Right bank station 1, Left bank station 88

Sta. 10		Sta. 15		Sta. 20		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55		Sta. 60		Sta. 65	
D=3.1 ft.		D=2.6 ft.		D=2.6 ft.		D=2.6 ft.		D=2.5 ft.		D=2.3 ft.		D=2.3 ft.		D=2.2 ft.		D=2.1 ft.		D=1.9 ft.		D=1.9 ft.		D=1.8 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
2.5	3.35	1.7	4.11	1.7	4.88	1.7	5.20	1.7	5.56	1.7	5.69	1.7	5.69	1.7	5.63	1.7	5.51	1.7	5.13	1.7	4.56	1.7	4.16
1.7	3.10	1.2	3.75	1.2	4.45	1.2	4.74	1.2	4.92	1.2	5.20	1.2	5.07	1.2	5.13	1.2	5.09	1.2	4.81	1.2	4.49	1.2	4.07
1.2	2.76	.8	3.53	.8	4.11	.8	4.43	.8	4.74	.8	4.85	.8	4.85	.8	4.81	.8	4.76	.8	4.52	.8	4.29	.8	3.91
.8	2.49	.4	3.34	.4	3.79	.4	4.13	.4	4.34	.4	4.43	.4	4.42	.4	4.43	.4	4.36	.4	4.36	.4	4.06	.4	3.70
.4	2.12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Sta. 70		Sta. 75	
D=1.7 ft.		D=1.6 ft.	
y	V	y	V
1.2	3.77	1.2	3.35
.8	3.66	.8	3.26
.4	3.43	.4	3.08

February 1, 1968, Section 160, Right bank station 0, Left bank station 85

Sta. 14		Sta. 19		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55		Sta. 60		Sta. 65		Sta. 70	
D=2.7 ft.		D=2.6 ft.		D=2.4 ft.		D=2.3 ft.		D=2.2 ft.		D=2.1 ft.		D=2.0 ft.		D=1.9 ft.		D=1.9 ft.		D=1.9 ft.		D=1.9 ft.		D=1.9 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
1.7	4.40	1.7	4.90	2.2	5.36	1.7	5.51	1.7	5.56	1.7	5.54	1.7	5.49	1.7	5.16	1.7	4.96	1.7	4.58	1.7	4.33	1.7	3.68
1.2	4.02	1.2	4.49	1.7	5.22	1.2	5.05	1.2	5.15	1.2	5.18	1.2	5.15	1.2	4.83	1.2	4.78	1.2	4.45	1.2	4.15	1.2	3.53
.8	3.77	.8	4.24	1.2	4.79	.8	4.74	.8	4.85	.8	-	.8	4.85	.8	4.54	.8	4.54	.8	4.25	.8	3.91	.8	3.35
.4	3.61	.4	3.93	.8	4.51	.4	4.36	.4	4.43	.4	4.49	.4	4.47	.4	4.24	.4	4.20	.4	3.97	.4	3.64	.4	3.14
-	-	-	-	.4	4.15	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

May 21, 1968, Section 225, Right bank station 2, Left bank station 63

Sta. 5		Sta. 10		Sta. 15		Sta. 20		Sta. 25		Sta. 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55	
D=4.7 ft.		D=6.2 ft.		D=6.0 ft.		D=4.8 ft.		D=4.2 ft.		D=4.0 ft.		D=3.8 ft.		D=3.7 ft.		D=4.2 ft.		D=4.9 ft.		D=4.6 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.8	2.99	3.9	3.50	4.0	3.16	4.0	3.48	3.5	3.64	3.6	3.59	3.4	3.44	3.3	3.23	3.3	3.79	3.2	3.89	3.5	3.61
2.3	3.37	2.9	3.32	3.0	3.17	3.0	3.25	2.5	3.48	2.6	3.53	2.4	3.48	2.3	3.16	2.3	3.66	2.2	3.80	2.5	3.61
1.4	3.37	1.5	3.03	1.6	2.43	1.6	2.67	1.1	3.17	1.2	3.26	1.5	3.37	1.4	3.25	1.4	3.59	1.3	3.75	1.6	3.52
0.6	2.67	0.7	.75	.8	.98	.8	1.11	.3	2.99	.6	3.17	.9	3.19	.8	3.30	.8	3.57	.7	3.71	1.0	3.44
0.1	1.76	.2	.96	.3	.68	.3	-	-	-	.1	-	.4	2.65	.3	3.12	.3	3.52	.2	2.30	.5	3.32

May 21, 1968, Section 227, Right bank station 3, Left bank station 70

Sta. 10		Sta. 15		Sta. 20		Sta. 25		Sta, 30		Sta. 35		Sta. 40		Sta. 45		Sta. 50		Sta. 55		Sta. 60		Sta. 65	
D=4.0 ft.		D=4.8 ft.		D=4.5 ft.		D=4.6 ft.		D=5.3 ft.		D=6.0 ft.		D=6.6 ft.		D=5.3 ft.		D=5.3 ft.		D=4.5 ft.		D=4.2 ft.		D=3.3 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.4	2.53	3.5	3.32	3.5	3.34	3.5	3.12	3.5	2.90	4.1	3.91	4.1	3.79	4.2	3.82	4.1	3.14	4.3	3.12	4.0	3.01	-	-
2.4	3.01	2.5	2.96	2.5	2.96	2.5	2.98	2.5	2.69	3.1	3.79	3.1	3.43	3.2	3.80	3.1	3.05	3.3	3.28	3.3	3.43	3.0	2.25
1.5	2.02	1.6	2.80	1.6	2.69	1.6	2.74	1.6	2.53	2.3	3.59	2.3	3.75	2.4	3.80	2.3	3.03	2.5	3.28	2.5	3.44	2.2	2.60
.9	2.94	1.0	2.72	1.0	2.60	1.0	2.60	1.0	2.41	1.3	3.17	1.3	1.16	1.4	3.64	1.3	3.01	1.5	3.12	1.5	2.45	1.2	1.07
.4	2.80	.5	2.56	.5	2.39	.5	2.51	0.5	2.23	.3	-	.3	.75	.4	1.39	.3	-	.8	2.21	.8	2.99	.5	.55

TABLE 2.—*Measured velocity at indicated heights above riverbed*—Continued

May 21, 1968, Section 229, Right bank station 0, Left bank station 64

Sta. 5 D=5.5 ft.		Sta. 10 D=5.5 ft.		Sta. 15 D=5.5 ft.		Sta. 20 D=4.3 ft.		Sta. 25 D=4.2 ft.		Sta. 30 D=4.4 ft.		Sta. 35 D=4.9 ft.		Sta. 40 D=5.3 ft.		Sta. 45 D=4.7 ft.		Sta. 50 D=4.8 ft.		Sta. 55 D=4.7 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
4.0	3.03	4.0	3.50	3.9	3.41	4.0	3.16	3.9	3.21	3.7	2.85	3.9	2.63	4.0	2.56	3.8	3.44	3.9	3.17	3.9	2.96
3.3	3.43	3.3	3.43	3.2	3.41	3.3	3.21	3.2	3.30	3.0	2.96	3.2	2.54	3.3	2.72	3.1	3.34	3.2	3.19	3.2	2.99
2.5	3.28	2.5	3.28	2.4	3.46	2.5	3.17	2.4	3.30	2.2	3.07	2.4	2.58	2.5	2.85	2.3	3.08	2.4	3.01	2.4	2.89
1.5	2.85	1.5	2.85	1.4	3.50	1.5	2.99	1.4	3.10	1.2	2.81	1.4	2.49	1.5	2.87	1.3	2.53	1.4	2.53	1.4	2.45
.8	2.89	.8	2.89	.7	3.43	.8	2.94	.7	2.90	.5	2.65	.7	2.32	.8	2.60	.8	2.34	.7	2.34	.7	2.07

May 21, 1968, Section 231, Right bank station 4, Left bank station 70

Sta. 10 D=4.7 ft.		Sta. 15 D=5.9 ft.		Sta. 20 D=5.0 ft.		Sta. 25 D=4.0 ft.		Sta. 30 D=3.9 ft.		Sta. 35 D=5.0 ft.		Sta. 40 D=3.7 ft.		Sta. 45 D=4.0 ft.		Sta. 50 D=4.3 ft.		Sta. 55 D=5.0 ft.		Sta. 60 D=5.1 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
4.0	2.90	4.0	3.05	3.9	3.12	3.8	3.37	3.8	3.17	3.5	3.43	3.5	2.69	3.8	2.63	3.5	3.26	4.0	3.16	3.8	3.66
3,3	3,05	3.3	2.98	3.2	3.12	3.1	3.61	3.2	3.59	2.9	3.32	2.9	2.98	3.2	2.94	2.9	3.23	3.2	2.99	3.0	3.59
2.5	3.07	2.5	2.94	2.4	3.03	2.3	3.59	2.1	3.62	1.8	3.12	1.8	3.03	2.1	3.05	1.8	3.08	2.1	2.90	1.9	3.30
1.5	2.74	1.5	2.65	1.4	2.90	1.3	3.30	1.5	3.59	1.2	2.90	1.2	2.92	1.5	2.99	1.2	2.98	1.5	2.85	1.3	3.07
.8	2.16	.8	2.37	.7	2.16	.6	3.14	.8	3.48	.5	1.19	.5	2.67	.8	2.81	.5	2.41	.8	2.65	.6	2.62

May 21, 1968, Saction 233, Right bank station 1, Left bank station 72

Sta. 5 D=4.6 ft.		Sta. 10 D=5.0 ft.		Sta. 15 D=4.7 ft.		Sta. 20 D=3.9 ft.		Sta. 25 D=3.6 ft.		Sta. 30 D=3.5 ft.		Sta. 35 D=3.8 ft.		Sta. 40 D=4.3 ft.		Sta. 45 D=4.1 ft.		Sta. 50 D=4.4 ft.		Sta. 55 D=6.0 ft.		Sta. 60 D=4.3 ft.		Sta. 65 D=4.2 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.9	2.87	3.8	3.68	4.0	3.52	-	-	3.2	3.03	3.3	2.76	3.4	3.28	3.4	3.01	3.3	2.90	3.4	2.90	4.2	3.35	3.6	3.35	3.9	2.37
3.1	3.14	3.0	3.57	3.2	3.41	3.2	3.10	2.4	2.87	2.5	2.98	2.6	3.25	2.6	2.74	2.5	2.85	2.6	2.90	3.3	3.21	2.7	3.28	3.3	2.45
2.0	3.23	1.9	3.37	2.1	3.23	2.1	3.17	1.6	2.89	1.7	2.85	1.8	3.10	1.8	1.98	1.7	2.71	1.8	2.98	1.8	3.10	1.2	3.16	1.8	2.34
1.4	3.17	1.3	2.89	1.5	3.10	1.5	3.19	,9	3.03	1.0	2.72	1.1	2.90	1.1	1.53	1.0	2.51	1.1	3.08	1.1	2.53	.5	2.89	1.1	2.19
.7	2.92	.6	2.01	.8	2.67	.8	3.12	.3	2.94	.4	2.60	.5	2.69	.5	1.34	.4	2.07	.5	2.85	.5	1.05	-	-	.5	.58

May 29, 1968, Section 225, Right bank station 4, Laft bank station 63

Sta. 5 D=5.7 ft.		Sta. 10 D=6.0 ft.		Sta. 15 D=5.6 ft.		Sta. 20 D=6.4 ft.		Sta. 25 D=6.0 ft.		Sta. 30 D=5.3 ft.		Sta. 35 D=4.5 ft.		Sta. 40 D=4.7 ft.		Sta. 45 D=5.4 ft.		Sta. 50 D=6.3 ft.	
y	V	yy	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
4.2	2.65	4.3	3.68	4.2	3.86	4.1	3.55	4.3	4.13	4.1	4.00	4.0	3.61	4.0	3.30	4.3	2.78	4.3	3.08
2.9	3.46	3.0	3.32	2.9	3.62	2.8	3.07	3.0	3.59	2.8	3.64	3.0	3.55	3.0	3.34	3.0	2.87	3.0	2.99
1.9	2.71	2.0	2.25	1.9	3.43	1.8	2.85	2.0	2.83	1.8	3.03	2.0	3.50	2.0	3.41	2.0	2.90	2.0	2.71
1.2	1.81	1.3	1.26	1.2	3.10	1.1	2.54	1.3	2.51	1.1	2.76	1.3	3.26	1.3	3.30	1.3	2.87	1.3	2.37
.6	1.64	.7	1.21	.6	2.87	.5	1.99	.7	-	.5	-	.7	-	.7	-	.7	-	.7	-

May 29, 1968, Section 227, Right bank station 1, Left bank station 70

Sta. 10 D=4.9 ft.		Sta. 15 D=5.0 ft.		Sta. 20 D=5.0 ft.		Sta. 25 D=4.0 ft.		Sta. 30 D=5.1 ft.		Sta. 35 D=6.2 ft,		Sta. 40 D=4.9 ft.		Sta. 45 D=5.0 ft.		Sta. 50 D=6.3 ft.		Sta. 55 D=8.0 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
4.3	3.35	3.9	3.50	3.9	3.59	3.5	4.06	3.9	3.77	4.0	3.48	4.0	4.02	3.9	4.02	3.7	3.75	3.8	3.70
3.0	3.41	3.0	3.55	3.0	-	2.7	4.04	2.6	3.68	2.7	3.26	2.7	3.89	2.6	3.70	2.4	3.50	2.5	3.12
2.0	3.28	2.0	3.44	2.0	3.55	2.0	4.02	1.9	3.64	2.0	3.16	2.0	3.80	1.9	3.61	1.7	2.85	1.8	3.37
1.3	2.81	1.3	2.76	1.3	3.10	1.3	3.89	1.2	3.41	1.3	2.51	1.3	3.57	1.2	3.39	1.0	1.41	1.1	3.29
.7	2.17	.7	1.53	.7	-	.7	-	.7	-	.7	-	.7	-	.6	-	.4	-	.5	-

May 29, 1968, Section 229, Right bank station 1, Left bank station 65

Sta. 10 D=5.1 ft.		Sta. 15 D=4.4 ft.		Sta. 20 D=4.1 ft.		Sta. 25 D=3.4 ft.		Sta. 30 D=4.0 ft.		Sta. 35 D=4.6 ft.		Sta. 40 D-4.9 ft.		Sta. 45 D=5.5 ft.		Sta. 50 D=4.7 ft.		Sta. 55 D=4.7 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
4.0	4.02	4.0	4.34	3.9	4.56	3.2	3.52	3.2	3.59	3.6	3.93	3.7	3.84	3.7	3.71	3.7	3.82	3.7	3.21
2.8	4.15	2.8	3.95	2.7	4.52	2.8	3.66	2.8	3.61	2.4	3.95	2.5	3.80	2.5	3.66	2.5	3.64	2.5	3.48
2.0	4.20	2.0	4.36	1.9	4.52	2.0	3.79	2.0	3.70	1.6	3.89	1.7	3.79	1.7	3.70	1.7	3.43	1.7	3.62
1.2	3.93	1.2	4.27	1.1	4.49	1.2	3.82	1.2	3.75	.7	3.82	.8	3.62	.8	3.48	.8	3.17	.8	3.53

May 29, 1968, Section 231, Right bank station 1, Left bank station 71

Sta. 10 D=5.0 ft.		Sta. 15 D=5.1 ft.		Sta. 20 D=5.3 ft.		Sta. 25 D=4.3 ft.		Sta. 30 D=4.3 ft.		Sta. 35 D=4.1 ft.		Sta. 40 D=4.5 ft.		Sta. 45 D=4.9 ft.		Sta. 50 D=5.0 ft.		Sta. 55 D=4.5 ft.		Sta. 60 D=5.3 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
4.0	3.37	4.0	3.75	4.0	3.75	4.0	3.48	4.0	3.55	3.7	3.86	3.5	3.55	4.0	4.04	3.8	4.09	3.8	4.13	4.0	3.46
3.4	3.61	3.4	3.73	3.4	3.73	3.4	3.34	3.4	3.34	3.4	3.50	3.2	3.32	3.4	3.68	3.2	3.93	3.2	4.00	3.4	3.61
2.0	3.57	2.0	3.66	2.0	3.66	2.0	3.01	2.0	3.05	2.0	3.10	1.8	2.92	2.0	3.35	1.8	3.79	1.8	3.91	2.0	3.50
.8	3.25	.8	3.23	.8	3.37	.8	2.78	.8	2.94	.8	2.56	.6	2.67	.8	3.14	.6	3.46	.6	3.62	.8	2.41

May 29, 1968, Section 233, Right bank station 0, Left bank station 75

Sta. 10 D=4.4 ft.		Sta. 15 D=4.9 ft.		Sta. 20 D=5.0 ft.		Sta. 25 D=5.3 ft.		Sta. 30 D=5.0 ft.		Sta. 35 D=4.8 ft.		Sta. 40 D=4.2 ft.		Sta. 45 D=4.1 ft.		Sta. 50 D=4.5 ft.		Sta. 55 D=4.5 ft.		Sta. 60 D=5.0 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
4.0	3.26	3.9	3.48	3.8	3.75	4.0	4.11	4.0	3.95	3.8	3.61	3.6	3.41	3.6	2.90	3.4	3.26	3.7	3.86	3.7	3.53
3.4	3.26	3.3	3.26	3.2	3.61	3.4	4.07	3.4	3.70	3.2	3.26	3.3	3.41	3.3	2.83	3.1	3.34	3.4	3.86	3.4	3.35
2.0	3.07	1.9	2.87	1.8	3.37	2.0	4.07	2.0	3.53	1.8	2.92	1.9	3.39	1.9	2.81	1.7	2.89	2.0	3.14	2.0	2.80
.8	2.37	.7	2.56	.8	3.12	.8	3.70	.8	3.23	.6	2.58	.7	2.98	.7	2.67	.5	1.96	.8	2.74	.8	2.17

TABLE 2. — *Measured velocity at indicated heights above riverbed* — Continued

June 11, 1969, Section 245, Right bank station 7, Left bank station 86

Sta. 15 D=4.8 ft.		Sta. 20 D=4.8 ft.		Sta. 25 D=4.8 ft.		Sta. 30 D=4.9 ft.		Sta. 35 D=5.8 ft.		Sta. 40 D=5.9 ft.		Sta. 45 D=6.2 ft.		Sta. 50 D=7.2 ft.		Sta. 55 D=6.2 ft.		Sta. 60 D=5.1 ft.		Sta. 65 D=6.6 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
4.3	3.01	4.1	3.93	4.3	3.84	4.2	3.57	4.3	3.91	4.2	4.07	4.2	3.95	4.2	3.41	4.2	2.94	4.3	3.55	4.3	3.08
3.2	3.82	3.0	4.25	3.2	3.97	3.1	3.61	3.2	3.73	3.1	3.79	3.1	3.79	3.1	3.30	3.1	2.67	3.2	3.71	3.2	3.39
2.2	3.82	2.0	4.15	2.2	3.82	2.1	3.46	2.2	3.59	2.1	3.12	2.1	2.65	2.1	3.05	2.1	2.39	2.2	3.64	2.2	3.53
1.3	3.73	1.1	4.00	1.4	3.66	1.2	3.21	1.3	3.34	1.2	2.14	1.2	1.90	1.2	2.67	1.2	2.21	1.3	3.52	1.3	2.63
.5	3.64	.3	3.77	.5	3.52	.4	2.96	.5	2.98	.4	1.61	.4	1.72	.4	-	.4	-	.5	-	.5	-

Sta. 70 D=5.8 ft.		Sta. 75 D=5.8 ft.	
y	V	y	V
4.2	3.64	4.2	3.70
3.1	3.84	3.1	3.80
2.1	3.86	2.1	3.73
1.2	3.68	1.2	3.03

June 11, 1969, Section 250, Right bank station 2, Left bank station 79

Sta. 15 D=4.8 ft.		Sta. 20 D=4.3 ft.		Sta. 25 D=4.3 ft.		Sta. 30 D=4.3 ft.		Sta. 35 D=4.1 ft.		Sta. 40 D=4.2 ft.		Sta. 45 D=4.4 ft.		Sta. 50 D=4.9 ft.		Sta. 55 D=4.8 ft.		Sta. 60 D=5.2 ft.		Sta. 65 D=6.1 ft.		Sta. 70 D=5.1 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
3.9	3.46	4.0	3.57	4.0	3.62	4.0	4.13	4.0	4.16	4.0	3.71	4.0	4.06	4.0	4.38	4.0	4.36	4.0	4.45	4.0	4.07	4.0	2.65
3.1	3.57	3.2	3.73	3.2	3.79	3.2	4.16	3.2	4.13	3.2	3.43	3.2	4.06	3.2	4.40	3.2	4.07	3.2	4.24	3.2	3.97	3.2	2.92
2.1	3.75	2.2	3.64	2.2	3.80	2.2	4.07	2.2	3.93	2.2	3.07	2.2	3.80	2.2	4.31	2.2	3.57	2.2	3.71	2.2	3.77	2.2	2.98
1.2	3.77	1.3	3.61	1.3	3.70	1.3	3.88	1.3	3.66	1.3	2.85	1.3	3.61	1.3	4.15	1.3	3.30	1.3	3.43	1.3	3.21	1.3	2.85
.4	-	.5	3.57	.5	3.59	.5	3.68	.5	3.50	.5	2.80	.5	3.28	.5	3.98	.5	3.37	.5	3.14	.5	2.65	.5	2.49

Juna 11, 1969, Saction 255, Right bank station 1, Left bank station 74

Sta. 15 D=5.1 ft.		Sta. 20 D=4.3 ft.		Sta. 25 D=4.6 ft.		Sta. 30 D=4.7 ft.		Sta. 35 D=4.7 ft.		Sta. 40 D=4.6 ft.		Sta. 45 D=5.2 ft.		Sta. 50 D=7.7 ft.		Sta. 55 D=8.9 ft.		Sta. 60 D=7.4 ft.		Sta. 65 D=5.8 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V	y	V
4.0	4.22	3.9	4.42	4.0	4.61	4.0	4.43	4.0	4.38	4.0	4.31	4.0	4.49	4.0	3.80	4.0	3.30	4.0	3.79	4.0	2.96
3.2	4.27	3.1	4.56	3.2	4.72	3.2	4.54	3.2	4.43	3.2	4.51	3.2	4.61	3.2	3.95	3.2	3.26	3.2	3.70	3.2	2.96
2.2	4.13	2.1	4.51	2.2	4.63	2.2	4.45	2.2	4.33	2.2	4.54	2.2	4.51	2.2	3.16	2.2	2.72	2.2	3.55	2.2	2.69
1.3	4.07	1.2	4.38	1.3	4.56	1.3	4.18	1.3	4.09	1.3	4.09	1.3	4.36	1.3	1.12	1.3	1.16	1.3	2.90	1.3	2.14
.5	3.95	.4	4.36	.5	4.33	.5	3.64	.5	3.80	.5	4.22	.5	3.46	.5	-	.5	-	.5	.89	.5	1.64

Rio Granda convayance channal naar San Marcial, N. Mex.

December 21, 1965, Section 2249+93, Right bank station 0, Left bank station 70

Sta. 15 D=4.7 ft.		Sta. 25 D=4.7 ft.		Sta. 35 D=4.7 ft.		Sta. 45 D=4.7 ft.		Sta. 50 D=4.7 ft.		Sta. 53 D=4.7 ft.		Sta. 55 D=4.8 ft.	
y	V	y	V	y	V	y	V	y	V	y	V	y	V
4.0	5.85	4.0	7.14	4.0	7.63	4.0	7.36	4.0	7.54	4.0	7.14	4.0	5.76
3.0	6.06	3.0	7.25	3.0	7.93	3.0	7.89	3.0	7.59	3.0	7.29	3.0	6.91
2.0	5.58	2.0	6.68	2.0	7.25	2.0	7.25	2.0	7.14	2.0	6.78	2.0	6.41
1.2	5.16	1.2	6.08	1.2	6.71	1.2	6.66	1.2	6.59	1.2	6.15	1.2	5.85
.5	4.61	.5	5.18	.5	5.78	.5	5.74	.5	5.54	.5	5.27	.5	5.03

December 21, 1965, Section 2243+62, Right bank station 0, Left bank station 67

Sta. 15 D=4.5 ft.		Sta. 25 D=4.7 ft.		Sta. 35 D=4.9 ft.		Sta. 45 D=5.2 ft.		Sta. 50 D=5.4 ft.		Sta. 55 D=5.6 ft.	
y	V	y	V	y	V	y	V	y	V	y	V
4.0	5.24	4.0	7.34	4.0	7.89	4.0	7.52	4.0	7.14	4.0	6.08
3.0	5.76	3.0	7.58	3.0	8.07	3.0	7.78	3.0	7.29	3.0	6.57
2.0	5.70	2.0	7.00	2.0	7.36	2.0	7.31	2.0	6.77	2.0	5.76
1.2	5.38	1.2	6.37	1.2	6.69	1.2	6.64	1.2	6.28	1.2	4.88
.5	4.76	.5	5.47	.5	5.83	.5	5.76	.5	5.47	.5	4.06

Rio Grande convayance channal near Nogal Canyon, N. Mex.

December 22, 1965, Section 1318+00, Right bank station 0, Left bank station 80

Sta. 20 D=4.3 ft.		Sta. 30 D=5.0 ft.		Sta. 40 D=4.9 ft.		Sta. 50 D=4.9 ft.		Sta. 60 D=4.6 ft.		Sta. 70 D=4.2 ft.	
y	V	y	V	y	V	y	V	y	V	y	V
3.0	4.09	3.0	7.13	3.0	7.75	3.0	7.87	3.0	7.16	3.0	4.65
2.0	3.73	2.0	6.60	2.0	7.07	2.0	7.23	2.0	6.51	2.0	4.65
1.2	3.46	1.2	6.23	1.2	6.53	1.2	6.73	1.2	5.94	1.2	4.15
.5	3.05	.5	5.45	.5	5.51	.5	5.69	.5	5.01	.5	3.64

December 22, 1965, Section 1300+00, Right bank station 0, Left bank station 110

Sta. 30 D=3.5 ft.		Sta. 50 D=3.4 ft.		Sta. 70 D=2.9 ft.		Sta. 90 D=2.7 ft.	
y	V	y	V	y	V	y	V
2.5	6.55	2.5	7.34	2.5	7.16	2.5	5.03
1.5	5.97	1.5	6.62	1.5	6.59	1.5	5.13
.9	5.58	.9	6.10	.9	6.01	.9	4.56
.3	4.42	.3	4.76	.3	4.85	.3	3.59

TABLE 3.—*Summary of size analyses and related data for point-integrated sediment samples*

Date	Station (ft)	Water Discharge Q (ft^3 per second)	Water Temperature T (°C)	Total Depth of Flow D (ft)	Height above Bed y (ft)	$\frac{D-y}{y}$	Percent finer than indicated size, in mm: 0.062	0.125	0.250	0.500	1.00	Concentration, in mg/l, of Size class, in mm: Sample	Finer than 0.062	0.062 to 0.125	0.125 to 0.250	0.250 to 0.500	0.500 to 1.00	Coarser than 0.062
Rio Grande conveyance channel near Bernardo, N. Mex.																		
Sampling section 255, Right bank station 4, Left bank station 71																		
1965 Nov. 29	20	1,250	6	4.2	3.7	0.14	66	93	100	--	--	2,690	1,780	726	188	0	0	910
				4.2	1.5	1.80	41	75	99	100	--	4,530	1,860	1,540	1,090	45	0	2,670
				4.2	1.0	3.20	44	75	99	100	--	4,490	1,980	1,390	1,080	45	0	2,510
				4.2	.5	7.40	38	68	97	100	--	5,120	1,950	1,540	1,480	154	0	3,170
				4.2	.3	13.0	17	34	89	100	--	12,100	2,060	2,060	6,660	1,330	0	10,000
	30	1,250	6	4.2	3.7	.14	67	92	100	--	--	2,680	1,800	670	214	0	0	880
				4.2	1.5	1.80	50	81	100	--	--	3,710	1,860	1,150	705	0	0	1,850
				4.2	1.0	3.20	--	--	--	--	--	--	--	--	--	-		--
				4.2	.5	7.40	27	50	94	100	--	7,340	1,980	1,690	3,230	440	0	5,360
				4.2	.3	13.0	22	40	86	100	--	9,000	1,980	1,620	4,140	1,260	0	7,020
	40	1,250	6	4.2	2.7	.56	55	88	100	--	--	3,400	1,870	1,120	408	0	0	1,530
				4.2	1.5	1.80	45	78	100	--	--	4,400	1,980	1,450	968	0	0	2,420
				4.2	1.0	3.20	34	66	99	100	--	5,860	1,990	1,880	1,930	59	0	3,870
				4.2	.5	7.40	28	54	96	100	--	7,440	2,080	1,930	3,120	298	0	5,360
				4.2	.3	13.0	15	33	90	100	--	15,200	2,280	2,740	8,660	1,520	0	12,900
	50	1,250	6	3.8	2.7	.41	55	85	100	--	--	3,380	1,860	1,010	507	0	0	1,520
				3.8	1.5	1.53	53	82	100	--	--	3,500	1,860	1,020	630	0	0	1,640
				3.8	1.0	2.80	49	79	100	--	--	3,770	1,850	1,130	792	0	0	1,920
				3.8	.5	6.60	38	65	96	100	--	5,190	1,970	1,400	1,610	208	0	3,220
				3.8	.3	11.7	15	26	71	99	100	13,300	2,000	1,460	5,990	3,720	133	11,300
Sampling section 252, Right bank station 4, Left bank station 69																		
Nov. 30	20	1,250	4	4.0	3.0	.33	54	84	100	--	--	2,980	1,610	894	477	0	0	1,370
				4.0	1.5	1.67	46	77	99	100	--	3,500	1,610	1,090	770	35	0	1,890
				4.0	1.0	3.00	38	68	98	100	--	4,390	1,670	1,320	1,320	88	0	2,720
				4.0	.5	7.00	36	63	96	100	--	4,560	1,640	1,230	1,500	182	0	2,920
				4.0	.3	12.3	13	26	77	100	--	14,100	1,830	1,830	7,190	3,240	0	12,300
	30	1,250	4	4.0	3.0	.33	57	87	100	--	--	2,760	1,570	828	359	0	0	1,190
				4.0	1.5	1.67	43	76	100	--	--	3,900	1,680	1,290	936	20	0	2,220
				4.0	1.0	3.00	37	67	98	100	--	4,500	1,670	1,340	1,400	90	0	2,830
				4.0	.5	7.00	23	45	90	100	--	7,280	1,670	1,600	3,280	728	0	5,610
				4.0	.3	12.3	18	42	93	100	--	9,390	1,690	2,250	4,790	657	0	7,700
Sampling section 245, Right bank station 3, Left bank station 78																		
1966 May 4	15	1,280	17	4.2	3.7	.14	55	85	99	100	--	1,650	908	495	231	16	0	742
				4.2	2.5	.68	46	76	97	100	--	2,080	957	624	437	62	0	1,120
				4.2	1.2	2.50	38	69	95	100	--	2,490	946	772	647	125	0	1,540
				4.2	.8	4.25	41	69	94	100	--	2,300	943	644	575	138	0	1,360
				4.2	.5	7.40	36	66	95	100	--	2,620	943	786	760	131	0	1,680
				4.2	.3	13.0	35	64	94	100	--	2,740	960	795	822	164	0	1,780
	25	1,280	17	4.3	3.8	.13	52	80	99	100	--	1,790	931	501	340	18	0	859
				4.3	2.5	.72	42	70	96	100	--	2,200	924	616	572	88	0	1,280
				4.3	1.2	2.58	36	63	89	100	--	2,610	940	705	679	287	0	1,670
				4.3	.8	4.38	33	58	88	100	--	2,870	947	718	861	344	0	1,920
				4.3	.5	7.60	33	58	85	100	--	2,830	934	708	764	424	0	1,900
				4.3	.3	13.3	35	61	89	100	--	2,640	924	686	739	290	0	1,720
	35	1,280	17	5.1	4.6	.11	54	83	99	100	--	1,690	913	490	270	17	0	777
				5.1	2.5	1.04	41	68	93	100	--	2,310	947	624	578	162	0	1,360
				5.1	1.2	3.25	39	66	93	100	--	2,380	928	643	643	167	0	1,450
				5.1	.8	5.38	36	64	94	100	--	2,710	976	759	813	163	0	1,730
				5.1	.5	9.20	26	50	88	100	--	3,990	1,040	958	1,520	479	0	2,950
				5.1	.3	16.0	23	47	85	100	--	4,320	994	1,040	1,640	648	0	3,330
	45	1,280	17	5.8	5.3	.09	49	77	96	100	--	1,870	916	524	355	75	0	954
				5.8	2.5	1.32	35	58	82	100	--	2,650	928	610	636	477	0	1,720
				5.8	1.2	3.83	32	55	83	100	--	2,810	899	646	787	478	0	1,910
				5.8	.8	6.25	31	51	79	100	--	2,980	924	596	834	626	0	2,060
	55	1,280	17	4.5	4.0	.12	54	79	96	100	--	1,700	918	425	289	68	0	782
				4.5	2.5	.80	40	64	86	100	--	2,360	944	566	519	330	0	1,420
				4.5	1.2	2.75	35	57	82	100	--	2,660	931	585	665	479	0	1,730
				4.5	.8	4.62	36	61	85	100	--	2,530	911	633	607	380	0	1,620
				4.5	.5	8.00	32	54	79	100	--	2,920	934	642	730	613	0	1,990
				4.5	.3	14.0	32	54	81	100	--	2,960	947	651	799	562	0	2,010
	65	1,280	17	5.3	4.8	.10	68	91	100	--	--	1,270	864	292	114	0	0	406
				5.3	2.5	1.12	44	69	88	100	--	2,120	933	530	403	254	0	1,190
				5.3	1.2	3.42	34	55	80	100	--	2,650	901	557	663	530	0	1,750
				5.3	.8	5.62	26	42	69	100	--	3,530	918	565	953	1,090	0	2,610
				5.3	.5	9.60	28	46	74	100	--	3,320	930	598	930	863	0	2,390
				5.3	.3	16.7	29	45	70	99	100	3,100	899	496	775	899	31	2,200

TABLE 3.—*Summary of size analyses and related data for point-integrated sediment samples*—Continued

Date	Station (ft)	Water Discharge Q (ft^3 per second)	Water Temperature T (°C)	Total Depth of Flow D (ft)	Height above Bed y (ft)	$\frac{D-y}{y}$	Percent finer than indicated size, in mm					Concentration, in mg/l, of size class, in mm						
							0.062	0.125	0.250	0.500	1.00	Sample	Finer than 0.062	0.062 to 0.125	0.125 to 0.250	0.250 to 0.500	0.500 to 1.00	Coarser than 0.062
Rio Grande conveyance channel near Bernardo, N. Mex.--Continued																		
Sampling section 255, Right bank station 3, Left bank station 72																		
May 4	20	1,280	20	3.8	3.3	.15	70	93	100	--	--	1,220	854	281	85	0	0	366
				3.8	2.5	.52	54	84	100	--	--	1,700	918	510	272	0	0	782
				3.8	1.2	2.17	38	72	100	--	--	2,620	996	891	734	0	0	1,620
				3.8	.8	3.75	31	63	100	--	--	3,290	1,020	1,050	1,220	0	0	2,270
				3.8	.5	6.60	26	56	96	100	--	3,900	1,010	1,170	1,560	156	0	2,890
				3.8	.3	11.7	12	29	90	100	--	9,520	1,140	1,620	5,810	952	0	8,380
	30	1,280	20	3.7	3.2	.16	72	94	100	--	--	1,170	842	257	70	0	0	328
				3.7	2.5	.48	57	88	100	--	--	1,610	918	499	193	0	0	692
				3.7	1.2	2.08	41	75	100	--	--	2,000	820	680	500	0	0	1,180
				3.7	.8	3.62	32	63	100	--	--	3,110	995	964	1,150	0	0	2,120
				3.7	.5	6.40	26	57	98	100	--	3,780	983	1,170	1,550	76	0	2,800
				3.7	.3	11.3	14	34	91	100	--	7,970	1,120	1,590	4,540	717	0	6,850
	40	1,280	20	3.8	3.3	.15	77	96	100	--	--	1,110	855	211	44	0	0	255
				3.8	2.5	.52	58	89	100	--	--	1,580	916	490	174	0	0	664
				3.8	1.2	2.17	38	71	100	--	--	2,530	961	835	734	0	0	1,570
				3.8	.8	3.75	30	60	98	100	--	3,360	1,010	1,010	1,280	67	0	2,350
				3.8	.5	6.60	22	49	96	100	--	4,530	997	1,220	2,130	181	0	3,530
				3.8	.3	11.7	11	29	88	100	--	9,800	1,080	1,760	5,780	1,180	0	8,720
	50	1,280	20	3.8	3.3	.15	64	89	100	--	--	1,330	851	333	146	0	0	479
				3.8	2.5	.52	53	85	100	--	--	1,690	896	541	254	0	0	794
				3.8	1.2	2.17	39	71	99	100	--	2,440	952	781	683	24	0	1,490
				3.8	.8	3.75	37	67	98	100	--	2,590	958	777	803	52	0	1,630
				3.8	.5	6.60	31	59	97	100	--	3,080	955	862	1,170	92	0	2,130
				3.8	.3	11.7	19	42	91	100	--	4,880	927	1,120	2,390	439	0	3,950
	60	1,280	20	4.0	3.5	.14	64	89	100	--	--	1,370	877	343	151	0	0	490
				4.0	2.5	.60	56	83	99	100	--	1,570	879	424	251	16	0	691
				4.0	1.2	2.33	48	72	94	100	--	1,940	931	466	427	116	0	1,010
				4.0	.8	4.00	42	67	92	100	--	2,130	895	533	533	170	0	1,230
				4.0	.5	7.00	37	64	88	100	--	2,450	907	662	588	294	0	1,540
				4.0	.3	12.3	15	27	64	100	--	5,910	886	709	2,190	2,130	0	5,020
Rio Grande conveyance channel near San Marcial, N.Mex.																		
Sampling section 2249 + 93, Right bank station 0, Left bank station 70																		
1965 Dec. 21	25	1,860	3	4.7	4.0	.18	59	88	100	--	--	2,350	1,390	681	282	--	--	960
				4.7	3.0	.57	46	79	100	--	--	3,120	1,440	1,030	655	--	--	1,680
				4.7	2.0	1.35	41	73	100	--	--	3,530	1,450	1,130	953	--	--	2,080
				4.7	1.2	2.92	27	55	98	100	--	5,530	1,490	1,550	2,380	111	--	4,040
				4.7	0.5	8.40	22	47	97	100	--	7,340	1,610	1,840	3,670	220	--	5,730
	35	1,860	3	4.7	4.0	.18	59	85	100	--	--	2,290	1,350	595	344	--	--	940
				4.7	3.0	.57	47	77	100	--	--	3,010	1,410	903	692	--	--	1,600
				4.7	2.0	1.35	36	69	100	--	--	3,980	1,430	1,310	1,240	--	--	2,550
				4.7	1.2	2.92	26	53	98	100	--	5,890	1,530	1,590	2,650	118	--	4,360
				4.7	0.5	8.40	16	36	93	100	--	9,950	1,590	1,990	5,670	696	--	8,360
	50	1,860	3	4.7	4.0	.18	65	92	100	--	--	2,140	1,390	577	171	--	--	750
				4.7	3.0	.57	50	83	100	--	--	2,940	1,470	970	500	--	--	1,470
				4.7	2.0	1.35	38	73	100	--	--	3,840	1,460	1,340	1,040	--	--	2,380
				4.7	1.2	2.92	27	60	100	--	--	5,740	1,550	1,890	2,290	--	--	4,190
				4.7	0.5	8.40	19	44	96	100	--	8,360	1,590	2,090	4,350	335	--	6,770
Sampling section 2243 + 62, Right bank station 0, Left bank station 67																		
Dec. 21	25	1,860	3	4.7	4.0	.18	59	88	100	--	--	2,650	1,560	769	318	--	--	1,090
				4.7	3.0	.57	46	79	100	--	--	3,550	1,630	1,170	745	--	--	1,920
				4.7	2.0	1.35	37	68	100	--	--	4,450	1,650	1,380	1,420	--	--	2,800
				4.7	1.2	2.92	28	56	98	100	--	5,990	1,680	1,680	2,520	120	--	4,310
				4.7	0.5	8.40	21	46	95	100	--	8,370	1,760	2,090	4,100	418	--	6,610
	35	1,860	3	4.9	4.0	.23	53	86	100	--	--	3,060	1,620	1,010	428	--	--	1,440
				4.9	3.0	.63	44	78	100	--	--	3,850	1,690	1,310	847	--	--	2,160
				4.9	2.0	1.45	37	72	100	--	--	4,770	1,760	1,670	1,340	--	--	3,010
				4.9	1.2	3.08	29	62	100	--	--	6,200	1,800	2,040	2,360	--	--	4,400
				4.9	0.5	8.80	21	52	99	100	--	8,620	1,810	2,670	4,050	86	--	6,810
	50	1,860	3	5.4	4.0	.35	54	84	100	--	--	2,830	1,530	850	453	--	--	1,300
				5.4	3.0	.80	42	73	100	--	--	3,780	1,590	1,170	1,020	--	--	2,190
				5.4	2.0	1.70	34	66	99	100	--	4,760	1,620	1,520	1,570	48	--	3,140
				5.4	1.2	3.50	27	58	98	100	--	6,380	1,720	1,980	2,550	128	--	4,660
				5.4	0.5	9.80	23	49	93	100	--	7,660	1,760	1,990	3,370	536	--	5,900
Rio Grande conveyance channel near Nogal Canyon, N. Mex.																		
Sampling section 1318 + 00, Right bank station 0, Left bank station 80																		
1965 Dec. 22	20	1,750	3	4.3	4.0	.075	46	79	99	100	--	3,490	1,600	1,150	698	35	--	1,890
				4.3	3.0	.43	42	75	97	100	--	3,720	1,560	1,230	818	112	--	2,160
				4.3	2.0	1.15	39	71	97	100	--	4,130	1,610	1,320	1,070	124	--	2,520
				4.3	1.2	2.58	37	69	96	100	--	4,470	1,650	1,430	1,210	179	--	2,820
				4.3	0.5	7.60	32	59	91	100	--	4,990	1,600	1,350	1,600	442	--	3,390

TABLE 3. — *Summary of size analyses and related data for point-integrated sediment samples* — Continued

Date	Station (ft)	Water Discharge Q (ft^3 per second)	Water Temperature T (°C)	Total Depth of Flow D (ft)	Height above Bed y (ft)	$\frac{D-y}{y}$	Percent finer than indicated size, in mm					Concentration, in mg/l,						
													of Size class, in mm					
							0.062	0.125	0.250	0.500	1.00	Sample	Finer than 0.062	0.062 to 0.125	0.125 to 0.250	0.250 to 0.500	0.500 to 1.00	Coarser than 0.062
Rio Grande conveyance channel near Nogal Canyon, N. Mex.--Continued																		
Sampling section 1318 + 00, Right bank station 0, Left bank station 80--Continued																		
	40	1,750	3	4.7	4.0	.18	53	87	100	--	--	2,820	1,490	960	367	--	--	1,330
				4.7	3.0	.57	40	73	100	--	--	3,960	1,580	1,310	1,070	--	--	2,380
				4.7	2.0	1.35	35	69	100	--	--	3,960	1,390	1,350	1,230	--	--	2,570
				4.7	1.2	2.92	26	60	99	100	--	6,270	1,630	2,130	2,450	63	--	4,640
				4.7	0.5	8.40	20	51	98	100	--	8,710	1,740	2,700	4,100	174	--	6,970
	60	1,750	3	4.6	4.0	.15	73	95	100	--	--	1,930	1,410	425	96	--	--	520
				4.6	3.0	.53	54	85	100	--	--	2,850	1,540	884	427	--	--	1,310
				4.6	2.0	1.30	40	75	100	--	--	4,020	1,610	1,410	1.000	--	--	2,410
				4.6	1.2	2.83	32	65	100	--	--	5,020	1,610	1,660	1,760	--	--	3,410
				4.6	0.5	8.20	26	53	99	100	--	6,200	1,610	1,680	2,850	62	--	4,590

TABLE 4. — *Summary of size analyses and related data for depth-integrated sediment samples*

Date	Time	Sampling Section	Water Discharge Q (ft^3 per second)	Water Temperature T (°C)	Percent finer than indicated size, in mm								Concentration, in mg/l,							Median Diameter d_{50} (mm)	Gradation σ
														of Size class, in mm							
					0.002	0.004	0.016	0.062	0.125	0.250	0.500	1.00	Sample	Finer than 0.062	0.062 to 0.125	0.125 to 0.250	0.250 to 0.500	0.500 to 1.00	Coarser than 0.062		
Rio Grande conveyance channel near Bernardo, N. Mex.																					
1965																					
Feb. 3	0945	Weir	560	6	16	19	28	32	40	88	100	--	2,230	710	178	1,070	268	0	1,520	0.18	1.41
	1320	do	550	9	21	26	34	40	52	85	99	100	1,790	720	215	591	251	18	1,020	.19	1.58
	1505	do	540	11	15	17	25	29	38	80	100	--	2,520	730	227	1,060	504	0	1,790	.19	1.52
	1700	do	550	10	18	21	30	35	45	86	99	100	2,160	760	216	886	281	22	1,400	..18	1.47
Feb. 3	1205	236	550	8	19	24	34	40	50	86	100	--	1,880	750	188	677	263	0	1,130	.19	1.51
	1430	236	540	10	29	36	51	62	76	99	100	--	1,190	738	167	274	12	0	452	.14	1.42
	1630	236	550	10	27	30	49	60	75	98	100	--	1,320	792	198	304	26	0	528	.14	1.46
Feb. 3	1030	255	560	7	27	33	47	56	70	99	100	--	1,340	750	188	389	13	0	590	.14	1.35
	1400	255	540	9	27	33	50	60	76	100	--	--	1,260	756	202	302	0	0	504	.13	1.36
	1600	255	550	10	28	35	53	61	77	100	--	--	1,240	756	198	285	0	0	484	.14	1.38
Feb. 4	0830	Weir	575	6	15	17	27	31	40	85	100	--	2,490	770	224	1,120	373	0	1,720	.18	1.45
	1000	do	575	7	13	15	24	28	40	91	100	--	2,690	750	323	1,370	242	0	1,940	.17	1.38
	1220	do	575	8	17	20	30	34	45	89	99	100	2,280	780	251	1,000	228	23	1,500	.18	1.43
	1415	do	575	9	14	18	26	30	40	90	100	--	2,600	780	260	1,300	260	0	1,820	.17	1.39
Feb. 4	0900	255	575	5	24	31	43	51	67	99	100	--	1,520	775	243	486	15	0	745	.14	1.36
	1100	255	575	7	28	35	50	59	64	100	--	--	1,320	779	198	343	0	0	541	.14	1.36
	1340	255	575	9	29	36	51	60	75	100	--	--	1,360	816	204	340	0	0	544	.14	1.36
May 12	0750	Weir	980	14	--	--	--	72	87	98	100	--	3.530	2,540	529	388	71	0	990	0.11	1.60
	0900	do	930	14	--	--	--	73	88	97	100	--	3,300	2,410	495	297	99	0	890	.11	1.65
	1000	do	910	15	20	23	38	70	86	97	100	--	3,420	2,390	547	376	103	0	1,030	.12	1.71
	1100	do	910	15	--	--	--	71	86	97	100	--	3,380	2,400	507	372	101	0	980	.12	1.67
	1200	do	910	16	--	--	--	74	88	97	100	--	3,270	2,420	458	294	98	0	850	.11	1.63
	1335	Weir	910	17	--	--	--	75	89	98	100	--	3,110	2,330	435	280	62	0	780	.11	1.65
	1430	do	920	17	--	--	--	74	89	98	100	--	3,220	2,380	483	290	64	0	840	.11	1.61
	1530	do	1,110	17	--	--	--	71	88	98	100	--	3,680	2,610	626	368	74	0	1,070	.11	1.62
	1630	do	1,090	17	--	--	--	74	89	98	100	--	3,360	2,490	504	302	67	0	870	.10	1.63
	1730	do	1,010	17	--	--	--	72	86	96	100	--	3,210	2,310	449	321	128	0	900	.12	1.72
May 12	0920	240	930	14	22	26	41	74	90	99	100	--	3,120	2,340	468	281	31	0	780	.11	1.60
	1030	240	910	14	--	--	--	77	91	99	100	--	3,130	2,410	438	250	31	0	720	.11	1.61
	1230	240	910	16	--	--	--	76	91	100	--	--	3,150	2,390	472	284	0	0	760	.10	1.58
	1420	240	910	17	--	--	--	78	92	99	100	--	2,990	2,330	419	209	30	0	660	..10	1.64
	1615	240	1,100	17	--	--	--	75	89	98	100	--	3,650	2,740	511	328	73	0	910	.11	1.67
	1730	240	1,010	17	--	--	--	76	91	99	100	--	3,300	2,510	495	264	33	0	790	.10	1.58
May 13	0800	Weir	900	15	--	--	--	72	89	98	100	--	3,000	2,160	510	270	60	0	840	.10	1.58
	0900	do	890	15	--	--	--	70	87	97	100	--	3,020	2,110	513	302	91	0	910	.11	1.63
	1000	do	890	16	--	--	--	70	87	97	100	--	3,060	2,140	520	306	92	0	920	.11	1.60
	1110	do	890	16	19	21	34	69	86	98	100	--	3,120	2,150	530	374	62	0	970	.11	1.59
	1200	Weir	890	16	--	--	--	72	88	98	100	--	3,090	2,220	494	309	62	0	870	.11	1.62
	1345	do	900	16	--	--	--	69	86	97	100	--	3,100	2,140	527	341	93	0	960	.12	1.65
	1440	do	910	16	--	--	--	71	86	97	100	--	3,020	2,140	453	332	91	0	880	.12	1.63
May 13	0840	240	900	15	20	23	36	75	91	99	100	--	2,940	2,200	470	235	29	0	740	.10	1.57
	1120	240	890	16	--	--	--	73	89	99	100	---	3,020	2,200	483	302	30	0	820	.11	1.60
	1300	240	900	16	--	--	--	61	76	88	99	100	3,550	2,170	532	426	390	36	1,380	.16	2.08

TABLE 4. — *Summary of size analyses and related data for depth-integrated sediment samples* — Continued

Date	Time	Sampling Section	Water Discharge Q (ft^3 per second)	Water Temperature T (°C)	Percent finer than indicated size, in mm: 0.002	0.004	0.016	0.062	0.125	0.250	0.500	1.00	Concentration, in mg/l: Sample	of Size class, in mm: Finer than 0.062	0.062 to 0.125	0.125 to 0.250	0.250 to 0.500	0.500 to 1.00	Coarser than 0.062	Median Diameter d_{50} (mm)	Gradation σ
								Rio Grande conveyance channel near Bernardo, N. Mex.--Continued													
June 2	0850	Weir	1,190	17	--	--	--	52	75	94	99	100	2,810	1,460	646	534	140	28	1,350	.13	1.67
	1045	do	1,190	17	--	--	--	53	76	94	99	100	2,810	1,490	646	506	140	28	1,320	.13	1.62
	1145	do	1,190	18	--	--	--	51	73	93	99	100	2,870	1,460	631	574	172	29	1,410	.13	1.68
	1350	do	1,180	19	--	--	--	47	67	92	99	100	3,030	1,420	606	758	212	30	1,610	.15	1.64
	1500	do	1,180	19	17	19	32	56	80	96	100	--	2,430	1,360	583	389	97	00	1,070	.12	1.59
	1600	do	1,160	19	--	--	--	46	67	91	99	100	3,010	1,380	632	722	241	30	1,630	.15	1.67
June 2	1025	250	1,190	17	--	--	--	56	79	96	100	--	2,890	1,620	665	491	116	0	1,270	.12	1.57
	1130	250	1,190	18	22	24	39	69	89	98	100	--	2,040	1,410	408	184	41	0	630	.10	1.57
	1545	250	1,180	19	18	21	33	59	83	98	100	--	2,380	1,400	571	357	48	0	980	.11	1.53
June 3	0850	Weir	1,280	16	--	--	--	59	79	95	100	--	3,090	1,820	618	494	155	0	1,270	.12	1.63
	1100	do	1,300	17	14	18	27	62	81	96	100	--	3,330	2,060	633	500	133	0	1,270	.12	1.59
	1205	do	1,300	17	--	--	--	52	68	90	99	100	4,080	2,120	653	898	367	41	1,960	.17	1.75
	1330	do	1,280	17	--	--	--	62	80	94	100	--	3,290	2,040	592	461	197	0	1,250	.12	1.70
June 3	--	322	1,290	17	--	--	--	66	87	99	100	--	2,900	1,910	609	348	29	00	990	.11	1.46
Nov. 29	1000	Weir	1,250	3	--	--	--	--	--	--	--	--	3,430	1,590	--	--	--	-	1,840	--	--
	1030	do	1,250	3	--	--	--	--	--	--	--	--	3,510	1,550	--	--	--	-	1,960	--	--
	1100	do	1,250	4	8	11	17	41	68	93	100	--	4,220	1,730	1,140	1,060	290	0	2,490	.13	1.61
	1200	do	1,250	4	--	--	--	--	--	--	--	--	4,750	1,990	--	--	--	-	2,760	--	--
	1230	do	1,250	4	--	--	--	--	--	--	--	--	4,710	1,950	--	--	--	-	2,760	--	--
	1300	Weir	1,250	5	--	--	--	--	--	--	--	--	4,210	1,910	--	--	--	-	2,290	--	--
	1330	do	1,250	6	--	--	--	--	--	--	--	--	4,690	1,870	--	--	--	-	2,820	--	--
	1400	do	1,250	6	1	4	15	37	63	92	100	--	4,730	1,750	1,230	1,370	380	0	2,980	.14	1.61
	1430	do	1,250	6	--	--	--	--	--	--	--	--	4,790	1,800	--	--	--	-	2,990	--	--
	1500	do	1,250	6	--	--	--	--	--	--	--	--	5,390	1,810	--	--	--	-	3,580	--	--
	1530	Weir	1,250	6	--	--	--	--	--	--	--	--	4,590	1,770	--	--	--	-	2,820	--	--
	1600	do	1,250	6	--	--	--	--	--	--	--	--	4,820	1,770	--	--	--	-	3,050	--	--
Nov. 29	1030	245	1,250	3	--	--	--	--	--	--	--	--	3,520	1,780	--	--	--	--	1,740	--	--
	1120	245	1,250	4	9	11	18	43	72	97	100	--	4,060	1,750	1,180	1,010	122	0	2,310	.12	1.50
	1205	245	1,250	4	--	--	--	--	--	--	--	--	5,070	2,110	--	--	--	--	2,960	--	--
	1310	245	1,250	5	--	--	--	--	--	--	--	--	3,950	1,940	--	--	--	--	2,010	--	--
	1425	245	1,250	6	11	13	25	49	77	98	100	--	3,550	1,740	994	746	71	0	1,810	.12	1.52
	1450	245	1,250	6	--	--	--	--	--	--	--	--	3,520	1,830	--	--	--	--	1,690	--	--
	1550	245	1,250	7	--	--	--	--	--	--	--	--	3,900	1,890	--	--	--	--	2,010	--	--
Nov. 30	0800	Weir	1,250	3	--	--	--	--	--	--	--	--	4,550	1,550	--	--	--	--	3,000	--	--
	0900	do	1,250	3	--	--	--	--	--	--	--	--	4,120	1,450	--	--	--	--	2,670	--	--
	1000	do	1,250	3	7	9	15	33	53	87	100	--	4,560	1,460	958	1,550	593	0	3,100	.16	1.63
	1100	do	1,250	3	--	--	--	--	--	--	--	--	4,100	1,540	--	--	--	--	2,560	--	--
	1200	Weir	1,250	4	--	--	--	--	--	--	--	--	4,380	1,570	--	--	--	--	2,810	--	--
	1230	do	1,250	4	--	--	--	--	--	--	--	--	4,480	1,580	--	--	--	--	2,900	--	--
	1300	do	1,250	4	7	8	15	34	57	86	100	--	4,590	1,560	1,060	1,330	640	0	3,030	.15	1.72
Nov. 30	0835	245	1,250	2	--	--	--	--	--	--	--	--	3,520	1,580	--	--	--	--	1,940	--	--
	0935	245	1,250	3	--	--	--	--	--	--	--	--	3,260	1,540	--	--	--	--	1,720	--	--
	1030	245	1,250	3	11	13	22	48	74	99	100	--	3,070	1,470	798	768	31	0	1,600	.13	1.42
	1130	245	1,250	3	--	--	--	--	--	--	--	--	3,320	1,550	--	--	--	--	1,770	--	--
	1225	245	1,250	4	--	--	--	--	--	--	--	--	3,590	1,580	--	--	--	--	2,010	--	--
	1330	245	1,250	4	10	12	20	46	76	99	100	--	3,380	1,550	1,010	777	34	0	1,830	.12	1.48
	1420	245	1,250	5	--	--	--	--	--	--	--	--	3,390	1,550	--	--	--	--	1,840	--	--
1966 May 4	0800	Weir	1,280	16	--	--	--	26	50	90	97	100	3,320	860	797	1,330	332	0	2,460	0.16	1.58
	0830	do	1,280	16	--	--	--	29	53	89	99	100	3,080	890	739	1,110	308	31	2,190	.15	1.63
	0900	do	1,280	16	--	--	--	32	60	92	100	--	2,780	890	778	890	222	0	1,890	.14	1.55
	0930	do	1,280	16	--	--	--	33	60	91	100	--	2,710	890	732	840	244	0	1,820	.14	1.63
	1000	do	1,280	16	6	8	12	26	47	86	100	--	3,490	910	733	1,360	489	0	2,580	.17	1.62
	1030	Weir	1,280	17	--	--	--	24	46	85	100	--	3,780	910	832	1,470	567	0	2,870	.14	1.63
	1100	do	1,280	17	--	--	--	27	51	90	100	--	3,440	930	826	1,340	344	0	2,510	.16	1.59
	1130	do	1,280	18	--	--	--	26	48	86	99	--	3,350	870	737	1,270	436	34	2,480	.16	1.64
	1200	do	1,280	18	--	--	--	28	50	83	99	100	3,320	930	730	1,100	531	33	2,390	.17	1.70
	1230	do	1,280	18	--	--	--	28	50	87	100	--	3,390	950	746	1,250	407	34	2,440	.16	1.64
	1300	Weir	1,280	19	--	--	--	28	51	90	100	--	3,340	940	768	1,300	334	0	2,400	.16	1.58
	1330	do	1,280	19	--	--	--	27	47	85	100	--	3,360	900	672	1,280	504	0	2,460	.17	1.65
	1400	do	1,280	20	7	8	13	29	52	92	100	--	3,280	950	754	1,310	262	0	2,330	.15	1.54
	1430	do	1,280	20	--	--	--	34	56	88	100	--	2,770	940	609	886	332	0	1,830	.16	1.67
	1500	do	1,280	21	--	--	--	29	49	88	100	--	2,870	830	574	1,120	344	0	2,040	.17	1.57
	1530	do	1,280	21	--	--	--	29	49	83	99	100	3,060	890	612	1,040	490	31	2,170	.17	1.70
May 4	0920	240	1,280	16	--	--	--	52	81	98	100	--	1,720	894	499	293	34	0	826	0.11	1.47
	1020	240	1,280	17	12	15	23	50	79	96	100	--	1,750	875	508	297	70	0	875	.12	1.51
	1115	240	1,280	17	--	--	--	52	79	95	100	--	1,730	900	467	277	86	0	830	.12	1.58
	1450	240	1,280	20	--	--	--	53	78	95	100	--	1,760	933	440	299	88	0	827	.12	1.55

TABLE 4. — *Summary of size analyses and related data for depth-integrated sediment samples* — Continued

Date	Time	Sampling Section	Water Discharge Q (ft³ per second)	Water Temperature T (°C)	Percent finer than indicated size, in mm: 0.002	0.004	0.016	0.062	0.125	0.250	0.500	1.00	Concentration, in mg/l: Sample	of Size class, in mm: Finer than 0.062	0.062 to 0.125	0.125 to 0.250	0.250 to 0.500	0.500 to 1.00	Coarser than 0.062	Median Diameter d_{50} (mm)	Gradation σ
Rio Grande conveyance channel near Bernardo, N. Mex.--Continued																					
May 4	1005	260	1,280	16	--	--	--	45	77	99	100	--	2,070	930	662	455	21	0	1,140	.11	1.33
	1050	260	1,280	17	11	14	20	44	74	98	100	--	2,100	920	630	504	42	0	1,180	.12	1.47
	1140	260	1,280	18	--	--	--	44	70	96	100	--	2,010	880	523	523	80	0	1,130	.13	1.55
	1215	260	1,280	18	--	--	--	48	75	97	100	--	1,910	917	516	420	57	0	993	.12	1.48
	1325	260	1,280	19	--	--	--	48	75	97	100	--	1,860	893	502	409	56	0	967	.12	1.53
	1410	260	1,280	20	--	--	--	58	86	100	--	--	1,520	882	426	213	0	0	638	.10	1.41
Nov. 23	1055	240	1,270	8	--	--	--	53	77	99	100	--	3,900	2,070	936	858	39	0	1,830	.12	1.45
	1250	250	1,480	8	--	--	--	55	77	99	100	--	4,320	2,380	950	950	43	0	1,940	.13	1.47
	1340	255	1,500	8	--	--	--	58	79	99	100	--	4,560	2,640	958	912	46	0	1,920	.13	1.48
	1425	260	1,570	8	--	--	--	62	81	99	100	--	4,800	2,980	912	864	48	0	1,820	.12	1.48
1967 Feb. 2	1120	240	650	6	--	--	--	40	70	99	100	--	1,930	770	579	560	19	0	1,160	.13	1.38
	1200	245	650	7	--	--	--	41	71	98	100	--	2,000	820	600	540	40	0	1,180	.12	1.39
	1315	250	650	7	--	--	--	45	73	88	100	--	1,880	850	526	489	19	0	1,030	.12	1.37
	1330	255	650	7	--	--	--	43	72	100	--	--	1,950	840	566	546	0	00	1,110	.12	1.39
	1420	260	650	8	--	--	--	47	75	100	--	--	1,880	884	526	470	0	0	996	.12	1.38
Feb. 14	1115	260	630	6	--	--	--	--	--	--	--	--	1,560	750	--	--	--	--	810	--	--
	1050	280	630	6	--	--	--	--	--	---	--	--	1,730	780	--	--	--	--	950	--	--
Feb. 15	1540	220	630	9	--	--	--	--	--	---	--	--	1,540	780	--	--	--	--	760	--	--
	1320	240	630	8	--	--	--	--	--	--	--	--	1,530	760	--	--	--	--	770	--	--
	1150	260	630	6	--	--	--	--	--	---	--	--	1,700	810	--	--	--	--	890	--	--
	1045	280	630	6	--	--	--	--	--	--	--	--	2,070	990	--	--	--	--	1,080	--	--
1968 Feb. 1	1030	99	750	5	--	--	--	52	71	99	100	--	2,300	1,200	437	644	23	0	1,100	0.13	1.44
	1125	100	750	6	--	--	--	54	74	100	--	--	2,430	1,310	486	632	0	0	1,120	.13	1.45
	1210	101	750	6	--	--	--	55	73	99	100	--	2,140	1,180	385	556	21	0	960	.14	1.44
	1425	159	750	7	--	--	--	58	78	100	--	--	2,140	1,240	428	471	0	0	900	.13	1.42
	1530	160	750	8	--	--	--	55	73	99	--	--	2,230	1,230	401	580	22	0	1,000	.14	1.45
May 21	1025	Weir	860	18	20	23	33	74	88	97	100	--	2,840	2,100	398	256	85	--	740	.12	1.69
	1230	do	860	20	--	--	--	74	87	98	100	--	2,770	2,050	360	305	55	--	720	.12	1.69
	1240	do	860	20	--	--	--	76	90	99	100	--	2,580	1,960	361	232	26	--	620	.11	1.65
	1530	do	860	20	--	--	--	77	89	98	100	--	2,640	2,030	317	238	53	--	610	.12	1.69
	1610	do	860	20	--	--	--	76	88	97	100	--	2,830	2,150	340	255	85	--	680	.12	1.77
May 21	1130	225	860	--	--	--	--	74	88	99	100	--	2,770	2,050	388	305	28	--	720	.12	1.61
	1255	227	860	20	--	--	--	77	90	99	100	--	2,610	2,010	339	235	26	--	600	.11	1.60
	1335	229	860	20	--	--	--	62	73	88	99	100	3,180	1,970	350	477	350	32	1,210	.17	1.94
	1410	231	860	20	--	--	--	66	77	88	100	--	2,970	1,960	327	327	356	--	1,010	.16	2.11
	1500	233	860	21	--	--	--	79	92	100	--	--	2,530	2,000	329	202	--	--	530	.10	1.56
May 29	1125	225	1,010	--	--	---	--	74	90	99	100	--	3,050	2,260	488	275	31	--	790	.10	1.61
	1300	227	1,010	21	--	--	--	70	89	99	100	--	3,220	2,250	612	322	32	--	970	.10	1.61
	1400	229	1,010	21	--	--	--	74	92	99	100	--	3,020	2,230	544	211	30	--	790	.09	1.59
	1440	231	1,010	22	--	--	--	73	90	98	100	--	3,050	2,230	519	244	61	--	820	.10	1.61
1969 June 11	1010	Weir	1,560	18	--	--	--	75	90	98	100	--	5,530	4,150	830	442	111	--	1,380	.11	1.46
	1300	do	1,390	19	--	--	--	80	92	98	100	--	7,210	5,770	865	432	144	--	1,440	.10	1.52
	1145	245	1,410	18	--	--	--	81	94	99	100	--	5,910	4,790	768	295	59	--	1,120	.10	1.46
	1400	250	1,370	19	--	--	--	77	88	94	100	--	7,700	5,930	847	462	462	--	1,770	.13	2.00
	1430	255	1,330	19	--	---	--	83	94	99	100	--	7,690	6,380	842	385	77	--	1,310	.11	1.50
Rio Grande conveyance channel near San Marcial, N. Mex.																					
1965 Dec. 21	1035	2249+93	1,800	3	8	10	16	33	64	98	100	--	4,530	1,490	1,410	1,540	90	0	3,040	0.13	1.42
	1200	2243+62	1,800	3	7	9	14	34	65	97	100	--	4,870	1,650	1,510	1,560	150	0	3,220	.13	1.47
Rio Grande conveyance channel near Nogal Canyon, N. Mex.																					
Dec. 22	0930	1318+00	1,750	3	8	9	16	35	67	97	100	--	4,360	1,530	1,390	1,310	130	0	2,830	.13	1.50
	1040	1306+00	1,750	3	8	9	16	37	71	99	100	--	4,130	1,530	1,400	1,160	40	0	2,600	.12	1.43

TABLE 5. — *Summary of size analyses of bed material*

Sampling Section	Water Discharge Q (ft³ per second)	Water Temperature T (°C)	Bed Material — Percent finer than indicated size, in mm: 0.062	0.125	0.250	0.500	1.00	2.00	Median Diameter d_{50} (mm)	Gradation σ	Bed Form
Rio Grande conveyance channel near Bernardo, N. Mex.											
February 4, 1965											
238	575	7	0	3	60	96	100	--	0.24	1.38	Dune.
255	575	9	0	4	76	99	100	--	.19	1.28	Flat.

TABLE 5. — *Summary of size analyses of bed material* — Continued

Sampling Section	Water Discharge Q (ft³ per second)	Water Temperature T (°C)	Bed Material: Percent finer than indicated size, in mm: 0.062	0.125	0.250	0.500	1.00	2.00	Median Diameter d_{50} (mm)	Gradation σ	Bed Form
Rio Grande conveyance channel near Bernardo, N. Mex.--Continued											
May 12, 1965											
240	910	15	0	4	61	95	100	--	.23	1.38	Dune.
243	910	15	0	3	57	95	100	--	.22	1.37	Do.
244	910	15	0	6	75	97	100	--	.20	1.35	Do.
245	910	15	0	5	50	91	100	--	.25	1.52	Do.
246	910	15	0	5	67	96	100	--	.22	1.38	Do.
247	910	15	0	4	58	92	99	100	.24	1.47	Do.
248	910	15	0	8	69	97	100	--	.22	1.40	Do.
249	910	15	0	4	43	87	98	100	.27	1.62	Do.
250	910	15	0	3	42	82	99	100	.28	1.75	Do.
251	910	15	0	4	58	96	100	--	.23	1.36	Do.
252	910	15	0	7	56	94	100	--	.24	1.48	Do.
253	910	15	0	5	79	99	100	--	.20	1.29	Do.
254	910	16	0	5	58	96	100	--	.23	1.43	Do.
255	910	16	0	5	68	98	100	--	.22	1.32	Do.
260	910	16	0	3	48	93	100	--	.25	1.41	Do.
May 13, 1965											
240	890	15	0	5	68	97	100	--	.22	1.34	Do.
250	890	15	0	10	71	98	100	--	.21	1.42	Do.
260	890	15	0	9	61	97	100	--	.23	1.42	Do.
June 2, 1965											
250	1,190	17	0	4	75	98	100	--	0.20	1.30	Transition
250	1,180	17	0	7	58	99	100	--	.24	1.42	Do.
June 3, 1965											
322	1,290	17	0	11	85	99	100	--	.18	1.34	Flat.
November 29, 1965											
245	1,250	4	0	12	82	99	100	--	.18	1.40	Do.
November 30, 1965											
245	1,250	3	0	12	84	99	100	--	.18	1.42	Do.
May 4, 1966											
246	1,280	17	0	1	26	79	99	100	.33	1.52	Transition
248	1,280	17	1	5	43	89	100	--	.27	1.54	Do.
250	1,280	18	1	8	66	98	100	--	.21	1.46	Do.
252	1,280	18	1	7	70	91	99	100	.20	1.55	Do.
254	1,280	19	1	9	69	93	100	--	.21	1.48	Do.
November 23, 1966											
240	1,270	8	0	6	85	100	--	--	.18	1.30	Flat
245	1,330	8	0	4	65	96	100	--	.22	1.36	Do.
250	1,480	8	0	5	71	95	100	--	.21	1.35	Do.
255	1,500	8	0	5	69	99	100	--	.21	1.36	Do.
260	1,570	8	0	5	77	100	--	--	.20	1.30	Do.
February 2, 1967											
240	650	6	0	6	84	99	100	--	0.19	1.30	Flat
245	650	7	0	7	77	99	100	--	.19	1.36	Do.
250	650	7	0	6	82	100	--	--	.19	1.29	Do.
255	650	7	0	7	79	100	--	--	.19	1.34	Do.
260	650	8	0	12	92	100	--	--	.17	1.32	Do.
February 14, 1967											
220	630	6	0	8	79	99	100	--	.19	1.38	Do.
230	630	6	0	11	86	100	--	--	.18	1.35	Do.
240	630	6	0	15	89	100	--	--	.17	1.36	Do.
250	630	6	0	16	91	100	--	--	.17	1.34	Do.
260	630	6	0	11	81	100	--	--	.18	1.38	Do.
270	630	6	0	8	89	100	--	--	.18	1.29	Do.
280	630	6	0	7	90	100	--	--	.18	1.26	Do.
February 15, 1967											
220	630	9	0	4	64	99	100	--	.22	1.35	Do.
230	630	8	0	4	70	98	100	--	.20	1.37	Do.
260	630	6	0	8	85	100	--	--	.19	1.31	Do.
280	630	6	0	7	80	100	--	--	.19	1.33	Do.
February 1, 1968											
99	750	5	0	3	63	99	100	--	.23	1.32	Flat.
100	750	6	0	5	60	100	--	--	.18	1.37	Do.
101	750	6	0	13	82	99	100	--	.18	1.40	Do.
159	750	7	0	5	73	100	--	--	.20	1.76	Do.
160	750	8	0	5	79	100	--	--	.20	1.32	Do.

TABLE 5. — *Summary of size analyses of bed material* — Continued

Sampling Section	Water Discharge Q (ft^3 per second)	Temperature T (°C)	Bed Material: Percent finer than indicated size, in mm: 0.062	0.125	0.250	0.500	1.00	2.00	Median Diameter d_{50} (mm)	Gradation σ	Bed Form
Rio Grande conveyance channel near Bernardo, N. Mex.--Continued											
May 21, 1968											
225	860	--	0	3	47	87	98	100	.26	1.55	Dune
227	860	20	0	6	61	96	100	--	.22	1.50	Do.
229	860	20	0	3	44	94	100	--	.26	1.45	Do.
231	860	20	0	2	27	85	99	100	.32	1.51	Do.
233	860	21	0	2	38	93	100	--	.28	1.51	Do.
May 29, 1968											
225	1,010	--	0	4	58	94	100	--	.23	1.46	Do.
227	1,010	21	0	5	60	96	100	--	.23	1.44	Do.
229	1,010	21	0	3	44	88	99	100	.26	1.57	Do.
231	1,010	22	0	5	47	89	100	--	.26	1.57	Do.
233	1,010	22	0	4	56	92	99	100	.24	1.52	Do.
June 11, 1969											
245	1,480	18	0	5	45	87	99	100	.27	1.52	Do.
250	1,390	19	0	3	32	83	99	100	.30	1.58	Do.
255	1,370	19	0	3	45	95	100	--	.26	1.36	Do.
Rio Grande conveyance channel near San Marcial, N. Mex.											
December 21, 1965											
2,249+93	1,860	3	0	21	90	100	--	--	0.16	1.44	Standing Wave.
2,243+62	1,860	3	0	14	80	100	--	--	.18	1.43	Do.
Rio Grande conveyance channel near Nogal Canyon, N. Mex.											
December 22, 1965											
1,318+00	1,750	3	0	14	79	100	--	--	.18	1.45	Standing Wave.
1,300+00	1,750	3	0	19	91	100	--	--	.17	1.38	Do.

TABLE 6. — *Cross-sectional data for channel near Bernardo*

Sampling Section	Water Discharge Q (ft^3 per second)	Water Surface Elevation Hω (ft)	Water Temperature T (°C)	Width B (ft)	Area A (ft^2)	Mean Velocity V (ft per second)	Mean Depth D (ft)	Suspended[1/] Sediment Concentration C (mg/l)	Bed Material: Median Diameter d_{50} (mm)	Bed Material: Gradation σ	Bed Form
January 9, 1965											
0	580	38.0	--	160	252	2.30	1.57	--	--	--	Dune-Ripple.
40	580	35.0	--	85	208	2.79	2.44	--	--	--	Dune.
80	580	32.0	--	108	220	2.64	2.05	--	--	--	Do.
120	580	29.5	--	95	200	2.90	2.10	--	--	--	Do.
160	580	26.9	--	79	146	3.97	1.84	--	--	--	Flat.
193	580	25.0	11	73	140	4.14	1.91	1,600	--	--	Do.
194 Weir Structure											
200	580	24.3	--	63	138	4.20	2.20	--	--	--	Do.
240	580	22.5	--	68	206	2.82	3.00	--	--	--	Dune.
280	580	20.3	--	64	154	3.76	2.41	--	--	--	Dune-Ripple.
320	580	18.6	--	82	163	3.56	1.98	--	--	--	Dune-Flat.
340	580	17.8	--	110	209	2.77	1.89	--	--	--	Dune.
January 15, 1965											
0	630	37.2	--	156	167	3.77	1.07	--	--	--	Dune-Flat.
40	630	34.5	--	85	168	3.75	1.98	--	--	--	Do.
80	630	31.8	--	107	155	4.06	1.45	--	--	--	Flat.
120	620	29.4	--	93	190	3.26	2.04	--	--	--	Dune-Flat.
160	620	27.3	--	81	233	2.66	2.88	--	--	--	Dune.
193	620	25.2	8	75	189	3.28	2.52	2,300	--	--	Flat.
194 Weir Structure											
200	620	24.0	--	63	167	3.71	2.65	--	--	--	Do.
240	620	22.0	--	68	162	3.83	2.38	--	--	--	Do.
280	610	20.0	--	64	174	3.50	2.72	--	--	--	Do.
320	610	18.4	--	82	179	3.40	2.18	--	--	--	Do.
340	610	17.5	--	107	186	3.28	1.74	--	--	--	Do.

TABLE 6.—*Cross-sectional data for channel near Bernardo*—Continued

Sampling Section	Water Discharge Q (ft³ per second)	Water Surface Elevation Hω (ft)	Water Temperature T (°C)	Width B (ft)	Area A (ft²)	Mean Velocity V (ft per second)	Mean Depth D (ft)	Suspended[1/] Sediment Concentration C (mg/l)	Bed Material: Median Diameter d_{50} (mm)	Bed Material: Gradation σ	Bed Form
					February 18-19, 1965						
0	545	37.2	6	103	186	2.93	1.81	--	0.20	1.22	Dune-Flat.
20	545	36.0	6	102	238	2.29	2.33	--	.26	1.55	Dune.
40	545	34.7	6	85	178	3.06	2.10	--	.25	1.28	Do.
60	545	33.1	6	137	166	3.28	1.21	--	.24	1.38	Flat.
80	545	31.9	6	108	157	3.47	1.45	--	.18	1.31	Do.
100	545	30.5	6	56	135	4.03	2.44	--	.22	1.35	Do.
120	545	29.6	6	94	242	2.25	2.56	--	.24	1.30	Dune.
140	545	28.2	6	63	140	3.89	2.22	--	.20	1.26	Flat.
160	545	27.1	6	80	151	3.61	1.89	--	.19	1.30	Do.
193	545	25.0	7	75	164	3.32	2.19	1,300	.19	1.33	Do.
194 Weir Structure											
200	535	23.8	7	63	158	3.38	2.51	--	.17	1.27	Dune-Flat.
220	535	22.9	7	60	151	3.54	2.52	--	.18	1.29	Flat.
240	535	21.9	7	68	136	3.94	1.98	--	.18	1.26	Do.
260	535	20.8	7	64	143	3.74	2.22	--	.17	1.29	Do.
280	535	19.9	7	64	160	3.34	2.52	--	.17	1.26	Do.
300	535	19.1	7	72	167	3.20	2.32	--	.18	1.29	Dune-Flat.
320	535	18.1	8	82	161	3.32	1.96	--	.18	1.28	Do.
340	535	17.2	8	108	162	3.30	1.50	--	.19	1.25	Do.
					March 4-5, 1965						
0	590	37.4	3	113	253	2.33	2.24	--	--	--	Ripples.
20	590	36.3	3	103	281	2.10	2.73	--	--	--	Dune-Ripple.
40	590	34.8	3	86	258	2.29	3.00	--	--	--	Dune.
60	590	33.2	4	138	246	2.40	1.79	--	--	--	Dune-Ripple.
80	590	31.9	4	108	204	2.89	1.88	--	--	--	Do.
100	590	30.5	4	55	155	3.80	2.82	--	--	--	Flat.
120	590	29.4	4	94	164	3.60	1.75	--	--	--	Do.
140	590	28.4	5	63	154	3.83	2.44	--	--	--	Do.
160	590	27.4	6	82	240	2.46	2.92	--	--	--	Dune.
193	590	25.1	6	75	167	3.54	2.22	2,300	--	--	Flat.
194 Weir Structure											
200	590	23.9	4	63	155	3.80	2.48	--	--	--	Do.
220	590	23.0	4	61	165	3.57	2.71	--	--	--	Do.
240	590	22.0	4	68	172	3.43	2.54	--	--	--	Do.
260	590	21.0	4	63	168	3.51	2.67	--	--	--	Do.
280	590	20.1	5	63	177	3.33	2.81	--	--	--	Do.
300	590	19.2	6	72	169	3.49	2.35	--	--	--	Do.
320	590	18.2	6	80	175	3.37	2.19	--	--	--	Do.
340	590	17.2	7	107	190	3.10	1.77	--	--	--	Do.
					March 18-19, 1965						
0	475	37.5	9	151	248	1.91	1.64	--	0.20	1.46	Dune.
20	480	36.1	9	103	210	2.28	2.04	--	.24	1.46	Do.
40	480	34.7	9	85	223	2.15	2.62	--	.32	1.64	Do.
60	485	33.1	9	138	226	2.14	1.64	--	.22	1.31	Do.
80	485	31.8	9	108	230	2.11	2.13	--	.17	1.50	Do.
100	490	30.8	10	56	198	2.47	3.53	--	.24	1.33	Do.
120	490	29.6	10	94	213	2.30	2.25	--	.25	1.36	Do.
140	495	28.5	11	63	198	2.50	3.14	--	.26	1.38	Do.
160	495	27.3	11	82	203	2.44	2.48	--	.22	1.40	Do.
193	500	24.9	11	75	180	2.78	2.40	1,200	.22	1.31	Do.
194 - Weir Structure											
200	350	23.9	7	65	162	2.16	2.49	--	.22	1.33	Do.
220	350	22.8	7	60	149	2.35	2.48	--	.22	1.31	Do.
240	350	21.6	7	67	108	3.24	1.61	--	.16	1.24	Flat.
260	350	20.7	7	65	139	2.52	2.13	--	.19	1.30	Dune.
280	350	19.9	8	64	164	2.14	2.56	--	.23	1.32	Do.
300	350	19.0	8	71	160	2.19	2.25	--	.24	1.34	Do.
320	350	18.1	9	82	163	2.15	1.99	--	.19	1.37	Dune-Ripple.
340	350	17.0	10	107	172	2.04	1.61	--	.21	1.31	Dune-Ripple.
					April 1, 1965						
0	180	36.9	12	157	112	1.61	0.71	--	--	--	Dune.
20	180	35.2	12	100	114	1.58	1.14	--	--	--	Do.
40	180	33.7	12	81	108	1.67	1.33	--	--	--	Dune-Flat.
60	180	32.3	13	134	123	1.46	.92	--	--	--	Flat-Dune.
80	180	30.8	13	103	122	1.48	1.18	--	--	--	Do.
100	180	29.3	13	50	102	1.77	2.02	--	--	--	Flat.
120	180	28.5	13	90	106	1.70	1.18	--	--	--	Do.
140	180	27.3	13	58	106	1.70	1.83	--	--	--	Dune.
160	180	26.2	14	75	104	1.73	1.39	--	--	--	Flat.
193	180	24.3	14	73	116	1.55	1.59	790	--	--	Do.
194 - Weir Structure											
200	180	23.2	14	61	98	1.84	1.60	--	--	--	Dune
220	180	22.1	15	58	96	1.88	1.65	--	--	--	Do.
240	180	21.2	16	66	105	1.71	1.59	--	--	--	Do.
260	180	20.3	16	63	96	1.88	1.52	--	--	--	Do.
280	180	19.3	17	62	107	1.68	1.72	--	--	--	Flat-Dune
300	180	18.5	18	70	117	1.54	1.67	--	--	--	Flat.
320	180	17.6	18	80	114	1.58	1.42	--	--	--	Do.
340	180	16.7	18	105	114	1.58	1.08	--	--	--	Do.

TABLE 6. — *Cross-sectional data for channel near Bernardo* — Continued

Sampling Section	Water Discharge Q (ft³ per second)	Water Surface Elevation Hω (ft)	Water Temperature T (°C)	Width B (ft)	Area A (ft²)	Mean Velocity V (ft per second)	Mean Depth D (ft)	Suspended[1/] Sediment Concentration C (mg/l)	Bed Material: Median Diameter d_{50} (mm)	Bed Material: Gradation σ	Bed Form
					April 15-16, 1965						
0	1,000	38.4	12	162	462	2.16	2.85	--	0.23	1.54	Flat-Dune.
20	1,000	37.3	12	106	428	2.34	4.05	--	.24	1.39	Dune.
40	1,000	36.0	12	89	385	2.60	4.33	--	.23	1.35	Do.
60	1,000	34.3	13	139	424	2.36	3.04	--	.23	1.34	Do.
80	990	33.0	13	111	311	3.18	2.80	--	.18	1.26	Flat-Dune.
100	985	31.8	13	60	233	4.23	3.89	--	.19	1.27	Flat.
120	985	31.0	13	99	358	2.75	3.62	--	.27	1.42	Dune.
140	980	29.7	14	66	286	3.43	4.34	--	.23	1.30	Flat-Dune.
160	960	28.1	14	83	269	3.57	3.24	--	.20	1.27	Dune.
193	960	25.6	14	77	203	4.74	2.64	2,000	.18	1.26	Flat.
194 - Weir Structure											
200	710	24.5	12	65	153	4.64	2.30	1,400	.19	1.35	Do.
220	715	23.3	12	61	157	4.55	2.58	--	.18	1.31	Do.
240	715	22.2	12	68	181	3.95	2.64	--	.18	1.35	Do.
260	715	21.3	13	65	182	3.93	2.80	--	.19	1.34	Do.
280	715	20.3	13	64	188	3.80	2.94	--	.18	1.30	Do.
300	715	19.3	13	72	202	3.54	2.81	--	.22	1.35	Flat-Dune.
320	715	18.3	14	83	190	3.76	2.29	--	.17	1.29	Flat.
340	715	17.3	14	110	209	3.42	1.90	--	.18	1.29	Do.
					April 29-30, 1965						
0	900	37.6	14	160	305	2.95	1.91	--	--	--	Dune.
20	900	36.6	14	105	243	3.70	2.31	--	--	--	Do.
40	900	35.5	14	87	357	2.52	4.10	--	--	--	Do.
60	900	34.1	14	139	336	2.68	2.42	--	--	--	Do.
80	900	32.6	15	109	277	3.25	2.54	--	--	--	Do.
100	900	31.5	15	59	310	2.90	5.25	--	--	--	Do.
120	900	30.7	16	98	316	2.84	3.23	--	--	--	Do.
140	900	29.1	16	64	191	4.71	2.99	--	--	--	Flat.
160	900	28.1	16	84	309	2.91	3.68	--	--	--	Dune.
193	900	25.8	16	77	255	3.53	3.31	3,900	--	--	Do.
194 - Weir Structure.											
200	740	25.0	14	66	239	3.10	3.62	3,200	--	--	Do.
220	740	23.9	14	64	275	2.69	4.30	--	--	--	Do.
240	740	22.7	14	68	280	2.64	4.12	--	--	--	Do.
260	740	21.4	14	63	184	4.02	2.92	--	--	--	Flat.
280	740	20.5	14	64	212	3.49	3.31	--	--	--	Do.
300	740	19.5	14	72	196	3.78	2.72	--	--	--	Do.
320	740	18.7	14	83	212	3.49	2.55	--	--	--	Do.
340	740	17.7	14	109	217	3.41	1.99	--	--	--	Do.
					May 17-18, 1965						
0	835	37.9	--	160	365	2.28	2.28	--	0.18	1.40	Dune.
20	835	36.7	--	111	293	2.85	2.64	--	.23	1.48	Dune-Flat.
40	835	35.5	--	88	316	2.64	3.59	--	.27	1.48	Dune.
60	835	34.1	--	140	346	2.41	2.47	--	.24	1.53	Flat-Dune.
80	835	32.9	21	110	265	3.15	2.41	--	.26	1.77	Dune.
100	835	31.7	--	60	304	2.74	5.07	--	.23	1.36	Do.
120	835	30.8	--	100	320	2.61	3.20	3,500	.25	1.42	Do.
140	795	29.4	--	66	296	2.68	4.48	3,600	.24	1.56	Do.
160	795	28.3	--	84	325	2.44	3.87	--	.24	1.39	Do.
193	795	26.0	--	79	292	2.72	3.70	--	.29	1.70	Dune-Flat.
194 - Weir Structure											
200	795	25.6	--	68	308	2.58	4.53	--	.23	1.46	Dune.
220	795	24.6	--	66	279	2.85	4.23	--	.23	1.37	Flat.
240	795	23.5	--	72	275	2.89	3.82	--	.22	1.34	Flat-Dune.
260	795	22.5	22	65	275	2.89	4.24	--	.28	1.66	Dune.
280	795	21.4	--	67	289	2.75	4.32	--	.25	1.39	Dune-Flat.
300	795	20.3	--	74	304	2.61	4.11	--	.38	1.52	Dune.
320	795	19.1	--	84	391	2.03	4.65	--	.24	1.42	Do.
340	795	17.9	--	111	290	2.74	2.61	--	.20	1.40	Do.
					May 27-28, 1965						
0	1,170	37.6	18	162	399	2.94	2.46	4,500	0.23	1.36	Dune.
20	1,170	37.0	18	106	354	3.31	3.34	2,620	.25	1.38	Do.
40	1,170	35.6	19	89	299	3.92	3.36	2,640	.24	1.39	Transition.
60	1,170	34.3	19	140	374	3.13	2.67	3,430	.21	1.37	Dune.
80	1,170	33.3	19	112	368	3.18	3.28	2,530	.14	1.35	Do.
100	1,170	32.2	19	62	406	2.88	6.55	2,410	.29	1.62	Do.
120	1,170	31.1	21	99	351	3.34	3.55	3,150	.26	1.44	Do.
140	1,170	30.0	21	68	327	3.58	4.81	2,470	.24	1.50	Dune-Flat.
160	1,170	28.7	21	85	377	3.10	4.43	2,650	.23	1.42	Flat-Dune.
193	1,170	26.5	21	81	355	3.30	4.38	3,810	.25	1.38	Dune-Flat.
194 - Weir Structure											
200	1,090	25.9	18	70	295	3.70	4.22	3,150	.23	1.64	Transition.
220	1,090	24.8	18	67	343	3.18	5.12	2,910	.19	1.69	Dune.
240	1,090	23.6	18	71	276	3.95	3.89	3,110	.23	1.30	Transition.
260	1,090	22.4	18	64	301	3.62	4.71	3,260	.20	1.45	Dune.
280	1,090	21.2	18	66	313	3.48	4.74	3,230	.24	1.49	Do.
300	1,090	20.0	18	73	273	3.99	3.74	3,330	.18	1.39	Transition
320	1,090	18.6	18	82	245	4.45	2.99	3,080	.18	1.29	Flat.
340	1,090	17.6	18	110	281	3.88	2.56	2,890	.19	1.31	Do.

TABLE 6. — *Cross-sectional data for channel near Bernardo* — Continued

Sampling Section	Water Discharge Q (ft^3 per second)	Water Surface Elevation H_ω (ft)	Water Temperature T (°C)	Width B (ft)	Area A (ft^2)	Mean Velocity V (ft per second)	Mean Depth D (ft)	Suspended[1/] Sediment Concentration C (mg/l)	Bed Material		Bed Form
									Median Diameter d_{50} (mm)	Gradation σ	
June 10-11, 1965											
0	720	38.0	17	159	313	2.30	1.97	--	--	--	Dune.
20	720	36.7	17	105	306	2.35	2.91	--	--	--	Do.
40	720	35.4	17	89	288	2.50	3.24	--	--	--	Do.
60	720	33.9	17	138	303	2.38	2.20	--	--	--	Do
80	720	32.6	17	110	268	2.68	2.44	--	--	--	Dune-Flat.
100	720	31.1	17	57	183	3.93	3.21	--	--	--	Flat.
120	720	30.4	17	98	264	2.72	2.70	--	--	--	Dune-Flat.
140	720	29.1	17	64	231	3.12	3.61	--	--	--	Dune.
160	720	27.9	17	83	274	2.62	3.30	--	--	--	Do.
193	720	25.7	18	77	273	2.64	3.55	2,200	--	--	Do.
194 - Weir Structure											
200	685	25.0	16	66	248	2.76	3.76	2,500	0.24	1.37	Flat-Dune.
220	685	24.0	16	64	303	2.26	4.74	--	.24	1.37	Dune.
240	685	22.7	17	69	254	2.70	3.69	--	.24	1.40	Dune-Flat.
260	685	21.4	17	64	179	3.82	2.80	--	.18	1.28	Flat.
280	685	20.4	17	65	265	2.58	4.08	--	.26	1.38	Dune.
300	685	19.4	18	72	258	2.66	3.59	--	.23	1.33	Do.
320	685	18.0	18	81	277	2.47	3.43	--	.26	1.40	Do.
340	685	17.1	19	108	313	2.18	2.90	--	.24	1.41	Do.
June 24-25, 1965											
0	1,140	38.7	--	163	419	2.72	2.57	--	0.24	1.36	Dune.
20	1,160	37.3	--	106	411	2.82	3.88	--	.24	1.45	Do.
40	1,160	35.9	--	89	346	3.35	3.89	--	.23	1.43	Do.
60	1,170	34.5	--	140	393	2.98	2.81	--	.20	1.36	Do.
80	1,180	33.3	--	112	385	3.06	3.44	--	.20	1.40	Do.
100	1,320	32.2	--	62	346	3.82	5.58	--	.21	1.45	Do.
120	1,330	31.3	20	100	407	3.27	4.07	--	.24	1.36	Dune-Flat.
140	1,330	29.9	--	69	287	4.63	4.16	--	.18	1.30	Flat.
160	1,310	28.8	--	85	333	3.93	3.92	--	.24	1.44	Dune.
193	1,240	26.6	--	81	361	3.43	4.45	2,800	.30	1.77	Flat.
194 - Weir Structure											
200	1,000	25.8	--	68	325	3.08	4.78	2,800	.25	1.43	Dune.
220	1,000	24.7	--	67	272	3.68	4.06	--	.22	1.39	Flat-Dune.
240	1,000	23.5	--	70	307	3.26	4.39	--	.24	1.48	Dune.
260	1,000	22.4	21	66	320	3.12	4.85	--	.26	1.50	Do.
280	1,000	21.2	--	66	304	3.29	4.61	--	.23	1.54	Flat-Dune.
300	1,000	20.0	--	72	317	3.15	4.40	--	.26	1.46	Dune-Flat.
320	1,000	18.8	--	83	318	3.14	3.83	--	.22	1.35	Flat.
340	1,000	17.5	--	110	336	2.98	3.06	--	.24	1.48	Dune.
July 22, 1965											
0	1,060	38.0	26	164	380	2.79	2.32	--	0.21	1.34	Dune.
20	1,060	37.6	26	106	354	2.99	3.34	--	.21	1.34	Do.
40	1,060	35.9	26	89	234	4.53	2.63	--	.18	1.28	Flat.
60	1,060	34.4	26	140	252	4.21	1.80	--	.17	1.36	Do.
80	1,060	33.3	27	112	406	2.61	3.63	--	.18	1.45	Dune.
100	1,060	32.0	27	60	290	3.66	4.83	--	.22	1.47	Flat-Dune.
120	1,060	31.0	27	99	316	3.35	3.19	--	.23	1.42	Do.
140	1,060	29.9	27	68	294	3.61	4.32	--	.25	1.49	Dune.
160	1,060	28.6	27	85	322	3.29	3.79	--	.28	1.48	Do.
193	1,060	26.3	27	81	347	3.05	4.28	960	.26	1.52	Do.
194 - Weir Structure											
200	1,060	25.9	27	68	306	3.46	4.50	--	.24	1.36	Do.
220	1,060	24.7	27	68	315	3.37	4.63	--	.24	1.32	Do.
240	1,060	23.5	27	70	228	4.65	3.26	--	.22	1.29	Flat.
260	1,060	22,3	27	65	322	3.29	4.95	--	.20	1.39	Dune.
280	1,060	20.9	27	67	286	3.71	4.27	--	.26	1.34	Do.
300	1,060	19.7	27	73	314	3.38	4.30	--	.28	1.57	Do.
320	1,060	18.2	27	82	334	3.17	4.07	--	.26	1.50	Do.
340	1,060	16.5	27	108	288	3.68	2.67	--	.22	1.34	Transition.
August 25, 1965											
0	127	38.1	26	124	82.9	1.53	0.67	--	0.20	1.39	Flat.
20	127	35.8	26	103	84.3	1.51	.82	--	.20	1.39	Do.
40	127	34.2	26	84	84.1	1.51	1.00	--	.18	1.60	Do.
60	127	32.9	26	137	88.5	1.44	.64	--	.21	1.35	Do.
80	127	31.2	28	107	78.9	1.61	.74	--	.20	1.27	Do.
100	127	29.6	28	53	77.5	1.64	1.46	--	.20	1.34	Do.
120	127	28.5	28	91	48.7	2.61	.54	--	.18	1.32	Do.
140	127	26.7	29	59	88.7	1.43	1.50	--	.24	1.64	Do.
160	127	25.8	29	76	81.8	1.55	1.08	--	.18	1.30	Do.
193	127	24.1	29	74	133.0	0.95	1.80	2,400	--	--	Do.
194 - Weir Structure											
200	127	22.0	29	58	78.9	1.61	1.37	--	.27	1.37	Do.
220	127	20.9	29	56	75.8	1.68	1.34	--	.25	1.42	Do.
240	127	19.6	29	55	76.0	1.67	1.38	--	.24	1.60	Do.
260	127	18.6	29	62	71.7	1.77	1.15	--	.25	1.36	Do.
280	127	17.6	29	60	82.8	1.53	1.39	--	.20	1.58	Do.
300	127	16.8	29	68	84.5	1.50	1.23	--	.22	1.42	Do.
320	127	15.8	29	78	80.2	1.58	1.03	--	.23	1.42	Do.
340	127	14.5	29	103	79.8	1.59	.77	--	.24	1.42	Do.

TABLE 6. — *Cross-sectional data for channel near Bernardo* — Continued

Sampling Section	Water Discharge Q (ft^3 per second)	Water Surface Elevation Hω (ft)	Water Temperature T (°C)	Width B (ft)	Area A (ft^2)	Mean Velocity V (ft per second)	Mean Depth D (ft)	Suspended[1/] Sediment Concentration C (mg/l)	Bed Material		Bed Form
									Median Diameter d_{50} (mm)	Gradation σ	
					September 23, 1965						
0	160	38.2	18	86	108.5	1.47	1.27	--	0.18	1.41	Dune.
20	160	36.5	18	105	95.2	1.68	.91	--	.18	1.34	Dune-Ripple.
40	160	34.8	18	88	96.4	1.66	1.10	--	.19	1.32	Ripple.
60	160	33.1	18	138	108.5	1.47	.79	--	.20	1.35	Do.
80	160	31.5	18	107	99.1	1.61	.93	--	.22	1.34	Ripple-Dune.
100	160	30.0	19	54	90.8	1.76	1.67	--	.19	1.31	Do.
120	160	28.8	19	92	98.0	1.63	1.07	--	.18	1.32	Ripple
140	160	27.3	19	61	95.4	1.68	1.56	--	.20	1.41	Dune
160	160	26.1	19	78	101.5	1.58	1.30	--	.16	1.44	Do.
193	160	24.2	20	75	116.8	1.37	1.56	1,200	.13	1.59	--
194 - Weir Structure											
200	160	22.2	20	59	87.5	1.83	1.48	--	.25	1.32	Dune
220	160	21.0	20	57	88.9	1.80	1.56	--	.24	1.43	Do.
240	160	19.8	20	66	87.2	1.83	1.32	--	.25	1.48	Do.
260	160	18.8	21	64	89.8	1.78	1.40	--	.27	1.43	Do.
280	160	17.8	20	60	96.2	1.66	1.59	--	.21	1.55	Ripple.
300	160	17.0	20	69	100.6	1.59	1.46	--	.22	1.43	Do.
320	160	16.1	20	79	102.2	1.56	1.29	--	.22	1.38	Do.
340	160	14.9	20	106	127.2	1.26	1.20	--	.26	1.62	Ripple-Flat.
					October 28-29, 1965						
20	520	36.9	14	105	144	3.62	1.37	--	0.17	1.33	Flat
40	520	35.4	15	89	151	3.45	1.69	--	.16	1.35	Do.
60	520	33.7	16	140	154	3.38	1.10	--	.16	1.38	Do.
80	520	32.3	16	109	150	3.47	1.38	--	.16	1.30	Do.
100	520	30.7	16	55	128	4.07	2.32	--	.18	1.33	Do.
120	520	29.6	16	94	155	3.36	1.65	--	.18	1.40	Do.
140	520	28.3	16	63	135	3.85	2.15	--	.15	1.35	Do.
160	520	27.1	16	81	150	3.46	1.85	--	.16	1.30	Do.
193	520	24.9	16	77	150	3.48	1.94	--	.16	1.42	Do.
								1,200			
194 - Weir Structure											
								1,100			
200	520	23.9	16	62	134	3.89	2.15	--	.17	1.41	Do.
220	520	22.8	16	62	134	3.88	2.16	--	.17	1.30	Do.
240	500	21.4	11	67	169	2.96	2.52	--	.19	1.40	Dune.
260	500	20.5	11	66	199	2.51	3.02	--	.24	1.44	Do.
280	500	19.4	11	64	188	2.66	2.94	--	.22	1.45	Do.
300	500	18.3	11	70	193	2.59	2.76	--	.24	1.44	Do.
320	500	17.1	11	81	201	2.49	2.48	--	.22	1.38	Do.
340	520	16.1	16	107	234	2.22	2.19	--	.23	1.48	Do.
					November 9-10, 1965						
20	1,490	37.9	12	107	388	3.84	3.63	--	0.28	1.49	Dune-Flat.
40	1,490	36.3	12	90	292	5.10	3.24	--	.21	1.42	Flat.
60	1,490	35.1	12	140	309	4.82	2.21	--	.18	1.33	Do.
80	1,490	33.8	12	114	305	4.89	2.68	--	.19	1.37	Do.
100	1,490	32.2	13	61	264	5.64	4.33	--	.23	1.44	Do.
120	1,490	31.1	13	100	292	5.10	2.92	--	.18	1.46	Do.
140	1,490	29.8	13	68	266	5.60	3.91	--	.20	1.47	Do.
160	1,490	28.6	13	85	291	5.12	3.42	--	.20	1.40	Do.
193	1,490	26.1	13	80	280	5.32	3.50	--	.19	1.34	Do.
								3,300			
194 - Weir Structure											
								3,200			
200	1,490	25.3	13	68	260	5.73	3.82	--	.20	1.53	Do.
220	1,490	24.2	13	65	260	5.73	4.00	--	.19	1.32	Do.
240	1,490	23.0	13	69	269	5.54	3.90	--	.23	1.36	Do.
260	1,490	21.8	10	67	280	5.32	4.18	--	.20	1.29	Do.
280	1,490	20.5	10	66	277	5.38	4.20	--	.22	1.45	Do.
300	1,490	19.3	10	72	270	5.52	3.75	--	.19	1.35	Do.
320	1,490	18.1	10	83	270	5.52	3.25	--	.19	1.37	Do.
340	1,490	17.0	10	109	298	5.00	2.73	--	.18	1.37	Do.
					November 30, 1965						
194 - Weir Structure											
								4,500			
200	1,250	24.6	--	67	244	5.12	3.64	--	--	--	Flat.
220	1,250	23.5	--	64	253	4.94	3.95	--	--	--	Do.
240	1,250	22.5	--	68	251	4.98	3.69	--	--	--	Do.
260	1,250	21.4	--	65	251	4.97	3.87	--	--	--	Do.
280	1,250	20.3	--	66	251	4.97	3.81	--	--	--	Do.
300	1,250	19.2	--	72	245	5.10	3.40	--	--	--	Do.
320	1,250	18.1	--	82	243	5.14	2.97	--	--	--	Do.
340	1,250	17.0	--	109	270	4.62	2.48	--	--	--	Do.

TABLE 6. — *Cross-sectional data for channel near Bernardo* — Continued

Sampling Section	Water Discharge Q (ft³ per second)	Water Surface Elevation Hω (ft)	Water Temperature T (°C)	Width B (ft)	Area A (ft²)	Mean Velocity V (ft per second)	Mean Depth D (ft)	Suspended[1/] Sediment Concentration C (mg/1)	Bed Material: Median Diameter d_{50} (mm)	Bed Material: Gradation σ	Bed Form
					January 4-5, 1966						
0	1,130	38.2	2	160	256	4.42	1.60	--	0.18	1.36	Flat.
20	1,130	36.7	2	105	247	4.58	2.35	--	.18	1.46	Do.
40	1,130	35.2	2	88	233	4.85	2.65	--	.19	1.47	Do.
60	1,130	33.9	2	140	257	4.40	1.84	--	.19	1.40	Do.
80	1,130	32.8	3	110	250	4.52	2.27	--	.19	1.40	Standing Waves.
100	1,130	31.3	3	58	221	5.11	3.81	--	.21	1.51	Do.
120	1,130	30.2	3	98	249	4.55	2.54	--	.17	1.44	Flat.
140	1,130	29.1	3	66	229	4.94	3.47	--	.20	1.50	Do.
160	1,130	28.0	3	84	249	4.55	2.96	--	.19	1.44	Do.
193	1,130	25.8	3	80	243	4.65	3.04	--	.18	1.38	Do.
								4,200			
194 - Weir Structure											
								3,800			
200	1,000	23.9	1	68	221	4.52	3.25	--	.24	1.60	Do.
220	1,000	22.9	1	62	225	4.44	3.63	--	.22	1.51	Do.
240	1,000	21.8	1	67	221	4.52	3.30	--	.20	1.53	Do.
260	1,000	20.7	1	64	220	4.55	3.44	--	.20	1.48	Do.
280	1,000	19.6	1	63	230	4.35	3.65	--	.19	1.42	Do.
300	1,000	18.6	1	71	222	4.50	3.13	--	.17	1.42	Do.
320	1,000	17.6	1	81	228	4.39	2.81	--	.18	1.41	Do.
340	1,000	16.5	1	107	256	3.91	2.39	--	.18	1.52	Do.
					February 16, 1966						
20	820	36.4	2	105	206	3.98	1.96	--	0.17	1.36	Flat.
40	820	35.1	2	88	199	4.12	2.26	--	.18	1.40	Do.
60	820	33.7	2	140	209	3.92	1.49	--	.16	1.32	Do.
80	820	32.5	2	111	208	3.94	1.87	--	.17	1.33	Do.
100	820	31.1	2	58	182	4.50	3.16	--	.19	1.35	Do.
120	820	30.1	2	97	198	4.14	2.04	--	.16	1.36	Do.
140	820	28.8	3	66	183	4.48	2.77	--	.17	1.33	Do.
160	820	27.6	4	83	195	4.20	2.35	--	.18	1.36	Do.
193	820	25.4	4	78	195	4.20	2.50	--	.19	1.47	Do.
								2,100			
194 - Weir Structure											
200	820	23.9	4	63	182	4.50	2.89	--	.17	1.38	Do.
220	820	22.7	4	62	178	4.60	2.87	--	.20	1.41	Do.
240	820	21.7	4	67	193	4.25	2.88	--	.20	1.52	Do.
260	820	20.6	4	66	190	4.31	2.88	--	.17	1.38	Do.
280	820	19.6	4	64	198	4.14	3.09	--	.18	1.44	Do.
300	820	18.6	4	72	191	4.30	2.65	--	.18	1.40	Do.
320	820	17.6	5	82	197	4.16	2.40	--	.16	1.33	Do.
340	820	16.7	5	109	220	3.72	2.02	--	.16	1.39	Do.
					March 8, 1966						
20	600	35.4	8	107	175	3.42	1.64	--	0.18	1.40	Flat.
40	600	35.0	8	89	173	3.47	1.94	--	.18	1.38	Do.
60	600	33.4	8	140	196	3.07	1.40	--	.18	1.35	Do.
80	600	32.2	9	109	165	3.64	1.51	--	.17	1.36	Do.
100	600	30.7	9	56	147	4.09	2.62	--	.22	1.53	Do.
120	600	29.6	9	94	173	3.46	1.84	--	.17	1.34	Do.
140	600	28.4	9	64	149	4.03	2.33	--	.19	1.40	Do.
160	600	27.3	9	82	168	3.56	2.05	--	.18	1.44	Do.
193	600	25.1	10	78	174	3.45	2.23	--	.18	1.45	Do.
								1,800			
194 - Weir Structure											
200	600	23.5	11	63	148	4.07	2.34	--	.18	1.40	Do.
220	600	22.5	11	61	159	3.77	2.61	--	.21	1.47	Do.
240	600	21.5	11	66	164	3.66	2.48	--	.22	1.52	Do.
260	600	20.4	11	65	157	3.81	2.42	--	.18	1.44	Do.
280	600	19.5	12	64	175	3.43	2.73	--	.19	1.51	Do.
300	600	18.5	12	72	170	3.54	2.36	--	.19	1.42	Do.
320	600	17.6	12	82	176	3.40	2.15	--	.16	1.28	Do.
340	600	16.5	12	109	193	3.12	1.77	--	.16	1.34	Do.
					March 31, 1966						
0	1,180	38.4	14	163	373	3.16	2.29	--	0.19	1.39	Dune-Flat.
60	1,210	35.2	14	140	349	3.47	2.49	--	.26	1.44	Dune.
80	1,260	33.6	16	114	346	3.64	3.04	--	.21	1.31	Dune-Flat.
120	1,280	31.0	16	103	299	4.28	2.90	--	.18	1.52	Flat-Dune.
160	1,310	28.5	16	86	294	4.45	3.42	--	.23	1.57	Flat.
193	1,330	26.1	16	81	290	4.58	3.58	--	.23	1.48	Do.
								3,700			
194 - Weir Structure											
200	1,350	25.1	17	68	268	5.04	3.94	--	.21	1.44	Do.
220	1,350	24.0	17	65	251	5.38	3.86	--	.20	1.41	Do.
240	1,350	22.8	17	68	273	4.95	4.01	--	.18	1.41	Do.
260	1,350	21.7	17	67	279	4.84	4.16	--	.21	1.51	Do.
280	1,350	20.4	17	66	267	5.05	4.04	--	.19	1.57	Do.
300	1,350	19.2	17	73	262	5.15	3.59	--	.19	1.47	Do.
320	1,350	17.9	17	83	262	5.15	3.16	--	.18	1.34	Do.
340	1,350	16.7	18	109	280	4.82	2.57	--	.17	1.38	Do.

TABLE 6. — *Cross-sectional data for channel near Bernardo* — Continued

Sampling Section	Water Discharge Q (ft^3 per second)	Water Surface Elevation Hω (ft)	Water Temperature T (°C)	Width B (ft)	Area A (ft^2)	Mean Velocity V (ft per second)	Mean Depth D (ft)	Suspended[1/] Sediment Concentration C (mg/l)	Bed Material: Median Diameter d_{50} (mm)	Bed Material: Gradation σ	Bed Form
					May 12, 1966						
0	1,050	38.2	16	161	392	2.68	2.43	--	0.19	1.32	Dune.
20	1,050	36.8	17	107	244	4.30	2.28	--	.18	1.28	Flat.
40	1,050	35.7	17	89	371	2.83	4.17	--	.25	1.47	Dune.
60	1,050	34.1	17	140	259	4.05	1.85	--	.16	1.33	Flat.
80	1,050	33.0	18	113	269	3.90	2.38	--	.18	1.37	Do.
100	1,050	31.6	18	59	211	4.98	3.58	--	.19	1.40	Do.
120	1,050	30.8	18	104	356	2.95	3.42	--	.22	1.43	Dune.
140	1,050	29.6	18	69	308	3.41	4.46	--	.24	1.47	Do.
160	1,050	28.4	18	85	347	3.03	4.08	--	.26	1.44	Do.
193	1,050	25.8	18	80	230	4.57	2.88	--	.22	1.31	Flat-Dune.
								1,500			
194 - Weir Structure.											
200	1,050	25.0	18	67	232	4.53	3.46	--	.19	1.38	Flat.
240	1,050	22.5	18	69	224	4.69	3.25	--	.17	1.36	Do.
260	1,050	21.8	18	66	325	3.23	4.92	--	.32	1.92	Dune.
280	1,050	20.6	18	69	330	3.18	4.78	--	.27	1.62	Do.
300	1,050	19.3	18	73	338	3.11	4.63	--	.25	1.49	Do.
320	1,050	18.1	18	83	335	3.13	4.04	--	.28	1.79	Do.
340	1,050	16.8	19	110	377	2.79	3.43	--	.24	1.87	Do.
					June 14, 1966						
20	250	35.4	24	102	134	1.87	1.31	--	0.21	1.50	Dune.
40	250	34.0	24	85	144	1.74	1.69	--	.20	1.52	Do.
60	250	33.1	24	138	141	1.77	1.02	--	.24	1.34	Do.
80	250	31.6	24	108	144	1.74	1.33	--	.24	1.38	Do.
100	250	29.9	24	53	139	1.80	2.62	--	.16	1.32	Flat.
120	250	28.7	25	95	132	1.89	1.39	--	.18	1.57	Dune.
140	250	27.2	27	62	130	1.92	2.10	--	.24	1.54	Do.
160	250	26.0	27	78	129	1.94	1.65	--	.26	1.54	Do.
193	250	24.5	27	77	157	1.59	2.04	--	.23	1.34	Do.
								1,100			
194 - Weir Structure											
200	250	23.1	27	64	129	1.94	2.02	--	.24	1.45	Do.
220	250	21.6	27	62	82	3.05	1.32	--	.17	1.28	Flat.
240	250	20.1	27	66	85	2.94	1.29	--	.17	1.27	Do.
260	250	19.0	26	65	127	1.97	1.95	--	.23	1.50	Dune.
280	250	17.8	26	63	134	1.87	2.13	--	.22	1.60	Do.
300	250	16.9	26	70	147	1.70	2.10	--	.23	1.54	Ripple.
320	250	16.4	26	79	170	1.47	2.15	--	.28	1.63	Do.
340	250	15.4	26	107	142	1.76	1.33	--	.21	1.27	Do.
					May 23, 1968						
0	815	38.1	17	156	358	2.28	2.29	--	0.23	1.90	Dune
20	815	36.9	17	106	326	2.50	3.08	--	.27	1.38	Do.
40	815	35.8	18	89	336	2.42	3.78	--	.25	1.37	Do.
80	815	33.0	18	111	312	2.61	2.81	--	.24	1.33	Do.
100	815	31.7	18	59	180	4.53	3.05	--	.18	1.23	Flat.
120	815	30.6	18	93	330	2.46	3.55	--	.26	1.63	Dune.
140	815	29.6	18	67	279	2.92	4.17	--	.25	1.46	Do.
160	815	28.4	18	86	298	2.73	3.47	--	.23	1.36	Do.
193	815	26.0	18	80	281	2.90	3.51	--	.25	1.47	Do.
								3,800			
194 - Weir Structure											
200	885	--	19	70	314	2.82	4.48	--	.24	1.36	Do.
220	885	24.6	19	69	301	2.94	4.36	--	.24	1.40	Do.
240	885	23.1	20	68	301	2.94	4.43	--	.25	1.53	Do.
260	885	21.9	20	69	250	3.54	3.63	--	.22	1.36	Do.
280	885	20.8	20	69	302	2.93	4.37	--	.27	1.65	Do.
300	885	19.6	20	72	321	2.76	4.46	--	.24	1.41	Do.
340	885	17.1	20	109	326	2.71	2.99	--	.25	1.45	Do.

[1/] Prior to October 1, 1965, the concentration listed is the measured suspended concentration at the section. Following October 1, 1965, the concentration listed is the total concentration measured at the weir, section 194.

TABLE 7.—*Summary of average values for streamflow and sediment data for channel near Bernardo*

Date	Water Discharge Q (ft³ per second)	Reach Length (ft)	Water Surface Width B (ft)	Mean Depth of flow	Mean Velocity V (fps)	Water Surface Slope S ($x10^{-4}$)	Water Temperature T (°C)	Bed Material Median Diameter d_{50} (mm)	Bed Material Fall Velocity ω (fps)	Bed Material Gradation σ	Dominant Bed Form	Suspended[1/] Sediment Concentration C (mg/l)	Manning n	$C/\sqrt{g}$
Aug. 25, 1965	127	19,700	91	0.93	1.50	7.4	27	0.20	0.089	1.40	Flat.	2,500	0.026	10.1
Aug. 25	127	14,000	68	1.16	1.61	5.4	29	.24	.115	1.45	Do.	2,500	.024	11.3
Sept. 23	160	14,000	70	1.39	1.64	5.2	20	.24	.103	1.46	Dune.	1,180	.026	10.8
April 1	180	19,700	92	1.21	1.62	6.6	13	--	--	--	Transition	790	.027	10.1
April 1	180	14,000	71	1.49	1.70	4.7	17	--	--	--	Dune.	790	.025	11.3
June 14, 1966	250	17,300	89	1.56	1.80	6.4	26	.22	.098	1.45	Do.	1,100	.028	10.0
Mar. 19, 1965	350	14,000	73	2.08	2.30	4.9	8	.21	.069	1.32	Do.	1,200	.023	12.7
Mar. 18	485	19,700	96	2.22	2.28	6.6	10	.23	.082	1.42	Do.	1,200	.028	10.5
Oct. 29	500	8,000	70	2.71	2.63	5.4	10	.22	.077	1.42	Do.	1,100	.026	12.1
Oct. 28	520	16,000	92	1.62	3.56	7.0	15	.16	.053	1.35	Flat.	1,200	.015	18.6
Feb. 18	540	19,700	90	1.96	3.08	6.3	6	.22	.072	1.33	Transition	1,300	.019	15.4
Feb. 19	540	14,000	73	2.12	3.48	4.8	7	.18	.053	1.27	Flat.	1,300	.015	19.2
Jan. 9	580	12,000	112	1.96	2.64	6.9	--	--	--	--	Dune.	1,600	.023	12.6
Mar. 4	590	19,700	92	2.30	2.78	6.3	4	--	--	--	Transition.	2,300	.023	12.9
Mar. 5	590	14,000	72	2.38	3.45	4.8	5	--	--	--	Flat.	2,300	.017	18.0
Mar. 8, 1966	600	13,300	89	1.89	3.57	6.5	9	.18	.056	1.41	Do.	1,800	.016	18.0
Mar. 8	600	14,000	73	2.30	3.57	5.0	11	.19	.064	1.42	Do.	1,800	.016	18.6
Jan. 15, 1965	615	14,000	77	2.26	3.53	4.6	8	--	--	--	Do.	2,300	.016	19.2
Jan. 15	625	19,700	99	1.86	3.40	6.4	8	--	--	--	Do.	2,300	.017	17.4
June 11	685	14,000	74	3.54	2.61	5.6	17	.24	.098	1.37	Dune.	2,500	.031	10.3
April 16	715	14,000	74	2.47	3.91	5.1	13	.19	.066	1.32	Flat.	1,400	.016	19.4
June 10	720	19,700	98	2.76	2.67	6.4	17	--	--	--	Dune.	2,200	.028	11.2
April 30	740	8,000	78	2.62	3.63	4.6	14	--	--	--	Flat.	3,200	.017	18.4
May 17	795	14,000	76	3.96	2.64	5.5	19	.25	.107	1.44	Dune.	3,600	.033	10.0
May 23, 1968	815	19,700	94	3.19	2.72	6.1	18	.24	.100	1.46	Do.	3,800	.029	10.9
Feb. 16, 1966	820	17,300	92	2.14	4.16	6.4	2	.17	.044	1.37	Flat.	2,100	.015	19.8
Feb. 16	820	14,000	73	2.66	4.23	5.1	4	.18	.051	1.41	Do.	2,100	.015	20.2
May 17, 1965	835	12,400	110	2.87	2.64	6.1	17	.24	.098	1.49	Dune.	3,600	.028	11.1
May 23, 1968	885	10,000	69	4.32	2.97	6.2	19	.24	.100	1.45	Do.	3,800	.033	10.0
April 29	900	19,700	98	2.96	3.10	6.0	15	--	--	--	Do.	3,900	.024	13.0
Apr. 15, 1965	980	19,700	99	3.39	2.92	6.6	13	0.22	0.082	1.34	Dune.	2,000	0.029	10.9
June 25	1,000	14,000	75	4.16	3.21	5.9	22	.24	.108	1.45	Do.	2,800	.029	11.4
Jan. 5	1,000	14,000	73	3.14	4.37	5.2	3	.20	.058	1.49	Flat.	3,800	.017	19.2
May 12	1,050	19,700	101	2.96	3.51	6.3	18	.21	.082	1.38	Transition.	1,500	.022	14.3
May 12	1,050	14,000	75	4.12	3.40	6.2	18	.24	.098	1.63	Dune.	1,500	.028	11.9
July 22	1,060	15,300	100	3.20	3.31	6.4	27	.22	.100	1.42	Transition.	1,900	.025	12.9
July 22	1,060	14,000	75	3.99	3.54	6.7	27	.24	.115	1.40	Dune.	1,900	.027	12.1
May 27	1,090	14,000	75	3.88	3.74	5.9	18	.21	.082	1.44	Do.	3,100	.024	13.8
Jan. 4, 1966	1,130	19,700	99	2.45	4.65	6.4	4	.19	.055	1.44	Flat.	4,200	.015	20.7
May 28, 1965	1,170	15,300 17,300	94	3.80	3.28	6.1	19	.23	.095	1.43	Dune.	2,900	.027	12.0
Nov. 30	1,250	14,000	74	3.39	4.98	5.5	3	--	--	--	Flat.	4,500	.016	20.3
Mar. 31, 1966	1,350	14,000	75	3.57	5.04	6.0	17	.19	.071	1.44	Do.	3,700	.017	19.2
Nov. 9, 1965	1,490	15,300	94	3.18	4.98	6.8	13	.21	.077	1.41	Do.	3,300	.017	18.9
Nov. 10, 1965	1,490	14,000	75	3.64	5.46	6.0	10	.20	.067	1.38	Do.	3,200	.016	20.6

[1/] Prior to October 1, 1965, the concentration listed is the measured suspended concentration at the section. Following October 1, 1965, the concentration listed is the total concentration measured at the weir, section 194.

TABLE 8.—*Summary of measured suspended-sediment analyses, May 27–28, for channel near Bernardo*

Sampling Section	Water Discharge Q (ft³ per second)	Mean Velocity V (fps)	Water Temperature T (°C)	Percent finer than indicated size in mm 0.062	0.125	0.250	0.500	1.00	Concentration, in mg/l, Sample	of Size class, in mm Finer than 0.062	0.062 to 0.125	0.125 to 0.250	0.250 to 0.500	0.500 to 1.00	Coarser than 0.062	Median Diameter d_{50} (mm)	Gradation σ
0	1,170	2.94	18	37	47	77	96	100	4,500	1,670	450	1,350	855	180	2,830	0.22	1.65
20	1,170	3.31	18	63	79	92	99	100	2,620	1,650	419	341	183	26	970	.14	1.95
40	1,170	3.92	19	65	84	98	100	--	2,640	1.720	502	370	53	0	920	.12	1.55
60	1,170	3.13	19	48	64	91	100	--	3,430	1,650	549	926	309	0	1,780	.16	1.65
80	1,170	3.18	19	67	91	100	--	--	2,530	1,700	607	228	0	0	830	.10	1.36
100	1,170	2.88	19	69	91	99	100	--	2,410	1,660	530	193	24	0	750	.10	1.42
120	1,170	3.34	21	53	70	86	99	100	3,150	1,670	536	504	410	32	1,480	.18	1.94
140	1,170	3.58	21	68	89	99	100	--	2,470	1,680	519	247	25	0	790	.11	1.52
160	1,170	3.10	21	63	85	97	100	--	2,650	1,670	583	318	80	0	980	.11	1.58
193	1,170	3.30	21	49	68	90	99	100	3,810	1,870	724	838	343	38	1,940	.15	1.72
200	1,090	3.70	18	65	88	98	100	--	3,150	2,050	725	315	63	0	1,100	.10	1.53
220	1,090	3.18	18	72	93	100	--	--	2,910	2,100	611	204	0	0	810	.10	1.44
240	1,090	3.95	18	67	87	98	100	--	3,110	2,080	622	342	62	0	1,030	.11	1.56
260	1,090	3.62	18	65	86	98	100	--	3,260	2,120	685	391	65	0	1,140	.11	1.59
280	1,090	3.48	18	66	85	97	100	--	3,230	2,130	614	388	97	0	1,100	.11	1.61
300	1,090	3.99	18	65	88	99	100	--	3,330	2,160	766	366	33	0	1,170	.10	1.45
320	1,090	4.45	18	69	90	100	--	--	3,080	2,130	647	308	0	0	950	.10	1.46
340	1,090	3.88	18	72	93	100	--	--	2,890	2,080	607	202	0	0	810	.09	1.42

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