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VENEZUELAN INTERNATIONAL METEOROLOGICAL
AND HYDROLOGICAL EXPERIMENT
(VIMHEX)

HYDROLOGY REPORT

VOLUME II

STREAMFLOW, GROUNDWATER AND GROUND RESPONSE DATA

by

D. B. Simons, E. V. Richardson, M. A. Stevens,
J. H. Duke, and V. C. Duke

Civil Engineering Department
Colorado State University
Fort Collins, Colorado

ENGINEERING RESEARCH

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August 1971

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The VIMHEX hydrological data and analyses are being presented in a series of VIMHEX hydrology reports. This second volume contains the streamflow, groundwater and ground response data collected by VIMHEX during the summer of 1969.

Volume I, Precipitation Data and Analysis, was published in May, 1971. Volume I lists all the precipitation data collected during the summer of 1969 in the study area of northeast Venezuela. Most of the precipitation data is in the form of hourly rainfall.

Volume III will be a presentation of the geometric and hydraulic properties of the rivers in the study area.

Further analyses of the hydrological data will be published in other volumes of the VIMHEX hydrology reports.

August 1971

FOREWORD

The project leaders for VIMHEX are Dr. H. Riehl, Atmospheric Science Department, Colorado State University and D. B. Simons, Civil Engineering Department, Colorado State University. VIMHEX is sponsored by the Department of Defense through its THEMIS program. In addition to the financial support provided by the Department of Defense, professional members of the various branches of the Armed Services are contributing significantly to the solution of logistics, management and scientific problems. Mr. James Hughes, Office of Naval Research, who is the Contracting Officer for VIMHEX, has been especially helpful.

ABSTRACT

VIMHEX is an intensive program of tropical meteorological and hydrological observations taken in northeast Venezuela during the summer of 1969 to support a study of tropical atmospheric physics and the resulting effects of rainfall.

The objectives of the program are to express the meso-scale weather structure in terms of the synoptic-scale envelope and to formulate the ground response to the rainfall produced by tropical weather disturbances over relatively flat tropical topography.

The Volume II Hydrology Report is a compilation of the data obtained on streamflow, groundwater, and ground response in the VIMHEX study area during the summer of 1969. The report includes 2-hourly stream flow and mean daily discharge records at 25 river discharge gaging stations; measured suspended sediment at 4 river locations; river bed material size analyses at 30 locations; river bank material descriptions; groundwater table levels in 38 wells; chemical quality analysis and specific conductance for various discharges at selected river stations; soil moisture content at 4 locations; infiltration test results and soil descriptions for various areas in the drainage basins; and soil temperature data at 1 station.

ACKNOWLEDGMENTS

The Venezuelan International Meteorological and Hydrological Experiment (VIMHEX) was conducted by Colorado State University with participation by the National Center for Atmospheric Research, the U. S. National Guard Bureau, the Venezuelan Air Force Meteorological Service, the Venezuelan Minister of Public Works, the Venezuelan National Institute of Sanitation, the Central University of Venezuela the Eastern University at Jusepín, the Bonn Institute, the Imperial College, Mobile Oil Company of Venezuela and IBIDEM Company of Venezuela.

In this report, special acknowledgment is made to the Ministerio de Obras Publicas (M.O.P.), Division de Hidrologia, under the direction of Dr. Hector Silva. This Venezuelan Government organization assigned eleven field technicians to work directly with the VIMHEX Hydrology Section during the full extent of the study period. These well qualified technicians were Abel Santos, Blas Santaella, Baudelio Romero, Eduardo Canache, Cesar Cardot, Eduardo Contreras, Orlando Gomez, Gilberto Rodriquez, José Sabino, Oswaldo Tirado and Antonio Velasquez. These men constructed and maintained the hydrological data collecting stations and made most of the data measurements recorded in this volume. To these eleven people, muchas gracias for a job well done.

Dr. J. Narváez and Dr. L. Villalba, through the M.O.P. Divisional Office at Barcelona, provided field equipment and laboratory facilities to VIMHEX. Their help is gratefully acknowledged.

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CHAPTER I
INTRODUCTION

The Venezuelan International Meteorological and Hydrological Experiment (VIMHEX) was an intensive program of tropical meteorological and hydrological observations taken in northeast Venezuela during the summer of 1969 to support a study of tropical atmospheric physics and the resulting effects of rainfall. The general study area is outlined on Figure I-1.

The objectives of the program are: (1) to express the meso-scale (10-50 mile) weather structure in terms of the synoptic-scale (1,000 mile) envelope; (2) to formulate prediction methods from this weather model for runoff from streams, ground trafficability and groundwater variations; (3) to contribute to the understanding of the role of meso-scale weather to large-scale weather, and (4) to observe the extent and severity of equatorial zone thunderstorms relative to that encountered in other areas.

This report is a collection and presentation of the data relating to streamflow, river sediments, surface water quality, groundwater, infiltration in soils, soil temperature and soil moisture. The data were collected by the VIMHEX Hydrology Section in the study area during the summer of 1969.

The streamflow data are presented in Chapter II. For each of the 16 primary and 9 secondary discharge gaging stations there is a station description, a discharge measurement summary, the 1969 discharge rating curve in tabular form, a listing of the 2-hourly and special point discharges, and a table giving the mean daily discharges during the study period. At the primary stations, standard U.S. Geological

Survey stream-gaging procedures were employed; at secondary stations less refined discharge measuring techniques were used.

Data on river-transported sediments in the study area were collected. The river sediment information is given in Chapter III. The data include measured suspended sediment discharges, size analyses of river bed-material sediments and descriptions of river banks and bank materials.

Weekly or bi-weekly measurements of the free water surface level in 38 wells were made throughout the summer of 1969. The fluctuations are indications of changes in groundwater storage. These measured fluctuations are tabulated in Chapter IV. At one well, a continuous water level record was obtained. The record has been reduced to 2-hourly and special point water levels. The continuous record exhibited a daily cyclic variation in the free water surface level in the well.

Chemical quality analyses and specific electrical conductance tests were made on samples of river water collected at various primary discharge measuring stations. The results of these analyses and tests are given in Chapter V.

In Chapter VI, the soils in the study area are described. Infiltration test results at 9 locations, representative of the different soil types, are given. Soil moisture readings at 4 locations and soil temperature profiles obtained in the top 24 inches of soil at Anaco are presented.

The purpose of this data report and the VIMHEX data reports on precipitation (Volume I) and on hydraulic and geometry properties of the rivers (Volume III) is to provide a documentation of the hydrologic

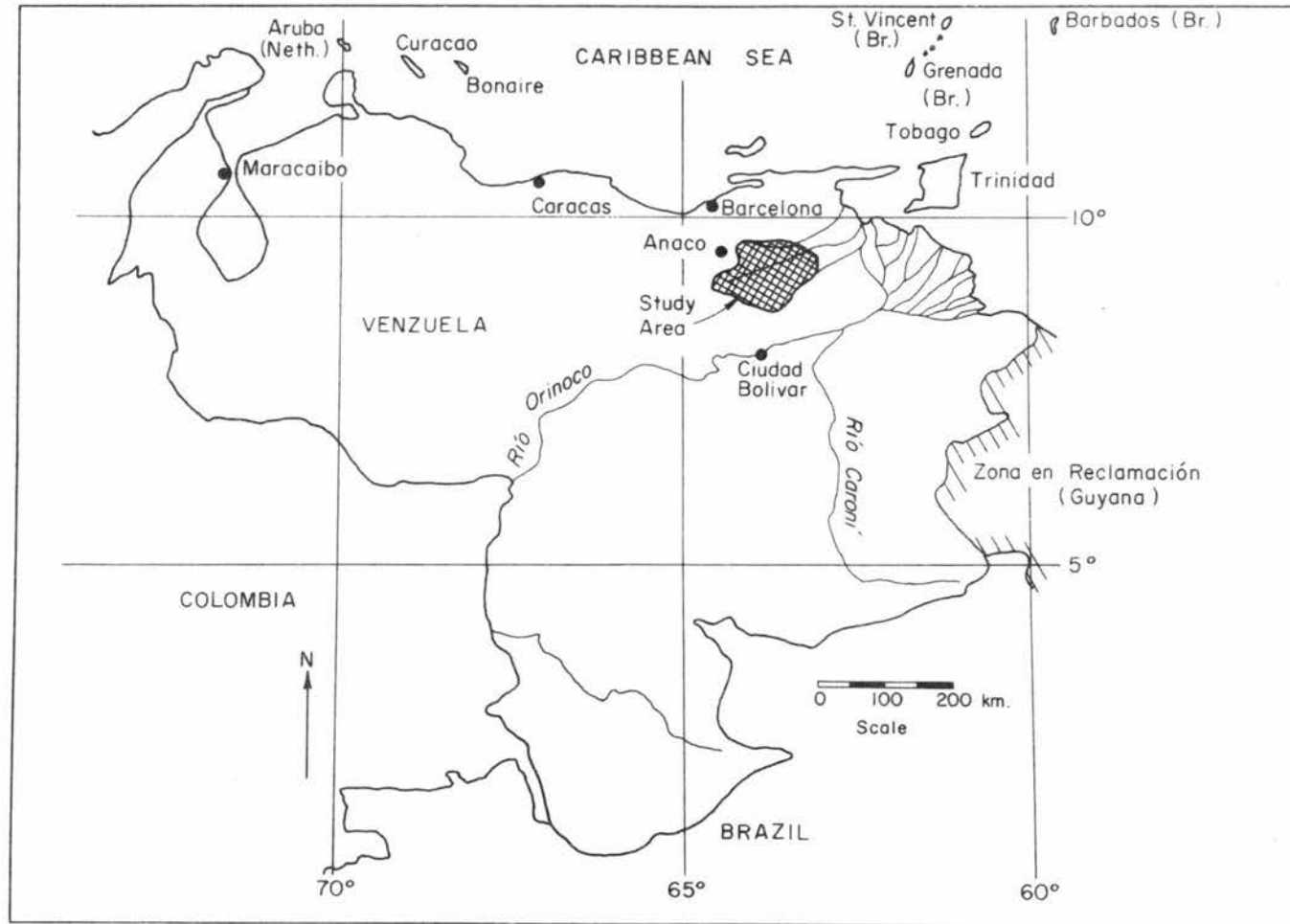


FIGURE I-1 LOCATION OF STUDY AREA

measurements. This documentation will facilitate the preparation of reports dealing with the analyses of the data.

CHAPTER II
STREAMFLOW DATA

INTRODUCTION

Water discharge measurements were made at 16 primary and 9 crest-stage partial record stations during the summer of 1969. The locations of the gaging stations are shown on Figure II-1.

Standard U.S. Geological Survey stream gaging methods were employed to measure the discharge at the primary gaging stations. At the secondary partial record gaging stations, discharges were measured by less accurate means.

In this chapter, the discharge hydrograph data for the 25 river gaging sites are presented. Mean daily discharges for the 16 primary stations are also given.

PRIMARY STATIONS

At the primary gaging stations Stevens Type A35 water level recorders were installed to continuously record the stage in the river. For all but one station, the stage recorders were attached to bridges. Bridge sites were chosen because they are easily accessible on the road network.

Large discharges were, by necessity, measured from the bridges, but for low flows the stream gagers were instructed to choose the cross-section at which the most accurate discharge measurement could be made. Generally, this meant that low flows were measured by wading at a narrow section either upstream or downstream of the bridge. The Río Tigre at Las Piedritas was gaged from a boat at the same cross-section for all flows.

A stage-discharge rating curve was established at each of the primary gaging stations. All continuous stage records were converted to 2-hourly digital form. Abrupt changes in stage that occurred between the 2-hour intervals (special points) were included in the digital stage records. All stage records were punched on computer cards.

A computer program was written to convert the digital stage records into 2-hourly and special-point discharges by using the stage-discharge rating curve. The discharges were tabulated and printed by the computer in the form given in this report. The computer program also included a punched-card output for all discharges.

The 2-hourly and special-point discharges were used to compute the mean daily discharges at each of the primary gaging stations. The trapezoidal rule was employed to obtain the mean daily discharge. Another computer program was written to facilitate the computing of the mean daily discharges.

The discharge measurement summaries, stage-discharge rating curves, 2-hourly discharges, and mean daily discharges for each of the 16 primary gaging stations are given in the following tables.

A few comments are necessary to define the aims of the stream gaging program. The primary function of the stream gaging program was to obtain an accurate measurement of the runoff at each of the gaging stations. Those discharges are presented in this chapter. The relations between the hydraulic and geometric properties of the rivers at gaging stations are also being compiled and analyzed but will be presented in VIMHEX Hydrology Report, Volume III.

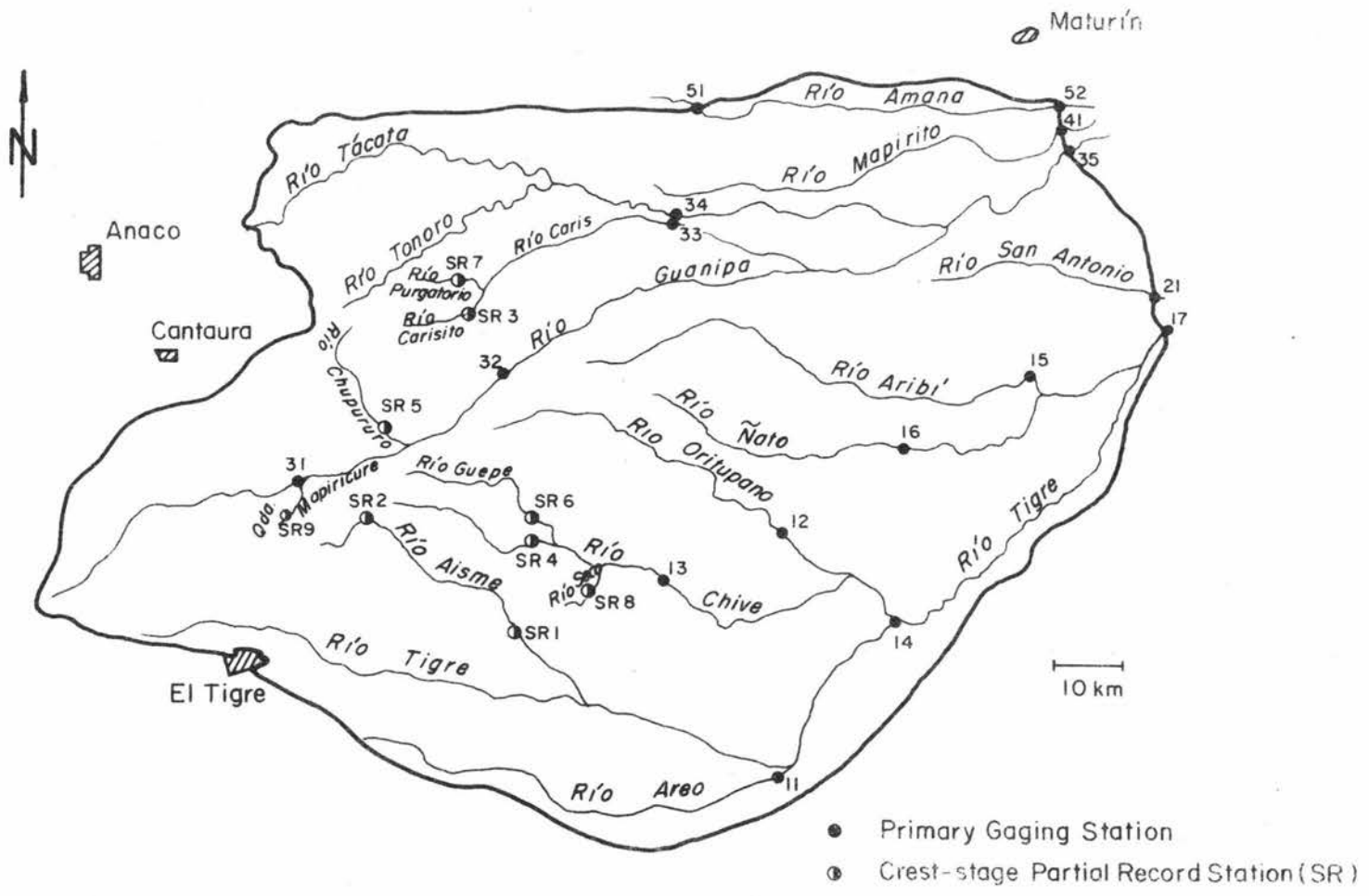


FIGURE II-1 LOCATIONS OF STREAM GAGING STATIONS

In addition to the remarks given in the stream gage descriptions, the supplemental comments given below will be useful in assessing the discharge records.

The Río Areo is principally a groundwater-fed stream. The records showed that there were only small variations in stream discharges even during the tropical storm season. The stage-discharge relationship at the Río Areo gaging station was affected by backwater from the Río Tigre downstream. The method used to compute Areo discharges has been described by Duke [1] and is not given in this report.

Four gaging stations, the Río Oritupano at Los Caracas, the Río Guanipa at the crossing of Maturín-Temblador road and the Ríos Caris and Tonoro at the crossing of the Santa Bárbara-Aguasay road exhibited pronounced shifting control. Shifting control has been discussed and illustrated in the stream-gaging procedure manual describing the methods and practices of the U.S. Geological Survey [2].

The Río Oritupano at Los Caracas and the Ríos Caris and Tonoro are wide sand-bed channels and exhibited shifts in the rating curve depending on the magnitude and duration of each storm hydrograph. Also the Río Oritupano control was affected by the migration of the channel at the bend immediately downstream of the gaging station.

The Río Guanipa at the crossing of the Maturín-Temblador road was greatly influenced by its two tributaries, the Río Caris and Río Tonoro. The Río Guanipa shift in the rating curve has not been identified as adequately as for the other three stations.

The details of the methods employed to shift the rating curves at these four river gaging stations are somewhat involved and are not given in this report.

RIVER GAGE DATA

NAME: Sta. No. 11 Río Arco at Las Bombitas.

LOCATION: Longitude $63^{\circ} 31.5'$ W, latitude $08^{\circ} 44.9'$ N. Approximately 35 km SSW of Oritupano, 1.2 km NW of Las Bombitas.

DRAINAGE AREA: 193 sq mi (from topographic map).

GAGE: Stevens Type A35 water level recorder attached to right bridge abutment on downstream side of bridge.

RECORDS AVAILABLE: April 10, 1969 through September 30, 1969.

REMARKS: Record is good. This gaging station was affected by backwater conditions. A Stevens Type F water level recorder was installed on June 30, 1969, 1554 ft river distance upstream from the A35 gage. The method used for computation of discharge is described in Computation of Discharge at Gaging Stations Affected by Backwater (Duke, James, 1967, Thesis - M.S.C.E., The University of Texas, Austin, Texas).

CODING: M signifies missing data; E signifies estimated data.



Looking downstream at Río Arco gaging site. The A35 recorder is in the metal house on top of the corrugated metal pipe attached near the right abutment of the bridge. Most of the discharge measurements were made at a section about 100 feet downstream of the bridge.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 11 RIO AREO AT LAS BOMBITAS

Meas. No.	Date	Made by	Width ft	Area sq ft	Mean Velocity fps	Inside Gage Height ft	Dis-charge cfs	Shift Adj. ft	Per-cent Diff.	Method	Num-ber Meas. Sec-tions	Gage Height Change ft	Time hr	Water Temp. °F
1	May 7	Romero	40.0	107.	1.33	0.55	142.	0	+2.2	Wading	21	0	1.0	83
2	30	Santaeilla	34.0	96.8	1.53	0.62	148.	0	+3.5	Wading	18	0	1.0	82
3	June 9	Romero	34.2	107.	1.38	0.70	148.	0	+1.4	Wading	24	-.01	1.2	81
4	19	Santos	38.0	122.	1.23	0.84	150.	0	0.0	Wading	22	0	1.5	87
5	July 7	Romero	32.5	99.4	1.40	0.53	139.	0	+0.7	Wading	27	0	1.5	-
6	14	Stevens	53.0	142.	1.39	1.44	198.	0	+8.2	Bridge	25	0	1.1	80
7	18	Tirado	64.0	205.	1.06	1.67	218.	0	+3.2	Bridge	27	-.01	1.2	80
8	23	Santos	44.5	134.	1.25	1.24	167.	0	-0.6	Wading	24	-.01	1.2	80
9	30	Santaeilla	43.0	109.	1.36	0.94	148.	0	-5.1	Wading	23	0	0.8	79
10	Aug. 6	Santaeilla	61.0	163.	1.24	1.68	202.	0	+1.0	Wading	25	-.02	2.0	78
11	14	Santaeilla	51.0	166.	1.17	1.21	195.	0	+14.7	Bridge	23	0	0.9	76
12	21	Tirado	54.0	184.	1.07	1.40	196.	0	+7.1	Bridge	23	0	1.2	76
13	28	Romero	46.0	142.	1.21	1.31	172.	0	-0.6	Wading	22	0	0.8	76
14	Sept. 4	Santaeilla	44.0	132.	1.23	1.08	163.	0	+1.9	Wading	23	0	1.9	78
15	11	Tirado	44.0	120.	1.27	0.94	152.	0	0.0	Wading	23	-.01	0.8	-
16	18	Tirado	43.0	115.	1.29	0.84	148.	0	-0.7	Wading	23	0	0.8	-
17	25	Tirado	43.0	115.	1.30	0.80	149.	0	+3.5	Wading	24	-.01	0.7	-

RIVER GAGE DATA
 STA. NO. 11 RIO ARCO AT LAS BOMBITAS
 APRIL 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
10	M	M	M	M	M	M	130.	128.	126.	126.	126.	127.
11	128.	129.	130.	131.	131.	131.	130.	129.	127.	126.	127.	128.
12	129.	130.	131.	131.	131.	131.	131.	130.	128.	128.	129.	130.
13	131.	131.	132.	133.	134.	133.	132.	131.	131.	130.	130.	131.
14	131.	132.	134.	134.	134.	134.	133.	131.	131.	130.	130.	131.
15	131.	132.	133.	134.	134.	134.	133.	131.	130.	130.	130.	131.
16	131.	131.	132.	133.	133.	133.	131.	131.	130.	129.	129.	129.
17	130.	131.	132.	133.	134.	133.	132.	130.	129.	129.	129.	130.
18	131.	131.	132.	133.	134.	133.	132.	131.	129.	129.	129.	130.
19	131.	131.	132.	133.	134.	133.	131.	131.	129.	129.	129.	130.
20	131.	131.	132.	133.	134.	133.	131.	130.	129.	129.	129.	130.
21	130.	131.	132.	133.	133.	132.	131.	130.	128.	128.	128.	129.
22	130.	131.	131.	132.	133.	132.	131.	130.	129.	128.	128.	130.
23	130.	131.	131.	131.	132.	132.	131.	130.	129.	129.	129.	130.
24	131.	131.	132.	133.	134.	134.	132.	131.	130.	130.	130.	130.
25	130.	131.	131.	132.	133.	134.	134.	132.	131.	131.	131.	131.
26	131.	132.	133.	134.	134.	134.	134.	133.	131.	131.	131.	131.
27	131.	132.	133.	134.	134.	134.	133.	131.	130.	130.	130.	130.
28	131.	131.	131.	133.	134.	133.	131.	130.	128.	127.	127.	128.
29	128.	129.	130.	131.	132.	132.	131.	129.	127.	127.	127.	127.
30	128.	129.	130.	131.	132.	132.	131.	130.	128.	127.	127.	128.

*SPECIAL POINTS

NONE

RIVER GAGE DATA
 STA. NO. 11 RIO ARO AT LAS BOMBITAS
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	128.	130.	131.	132.	132.	132.	131.	130.	128.	129.	127.	128.
2	128.	129.	130.	131.	132.	132.	132.	131.	E 130.	E 129.	E 128.	E 128.
3	128.	E 129.	E 130.	E 131.	E 132.	E 134.	E 133.	E 132.	E 131.	E 131.	E 130.	E 130.
4	130.	E 131.	E 132.	E 133.	E 134.	E 135.	E 134.	E 134.	E 133.	E 132.	E 131.	E 131.
5	131.	E 132.	E 133.	E 134.	E 135.	E 136.	E 136.	E 135.	E 134.	E 134.	E 133.	E 132.
6	132.	E 133.	E 133.	E 134.	E 134.	E 135.	E 136.	E 136.	E 136.	E 137.	E 137.	E 138.
7	138.	138.	138.	139.	140.	140.	139.	138.	138.	138.	139.	140.
8	140.	140.	141.	142.	142.	142.	142.	141.	140.	140.	140.	140.
9	140.	140.	140.	141.	141.	141.	140.	139.	139.	138.	138.	138.
10	139.	140.	140.	140.	140.	140.	140.	139.	138.	138.	138.	138.
11	139.	139.	140.	140.	140.	140.	139.	138.	138.	138.	138.	138.
12	138.	138.	138.	141.	142.	142.	142.	141.	140.	140.	140.	140.
13	140.	140.	140.	140.	140.	140.	140.	138.	138.	137.	137.	137.
14	137.	137.	138.	138.	138.	138.	137.	136.	135.	135.	135.	135.
15	135.	136.	136.	137.	137.	137.	136.	135.	134.	134.	134.	134.
16	134.	135.	135.	136.	136.	136.	134.	133.	132.	132.	132.	133.
17	133.	134.	134.	134.	135.	134.	134.	132.	131.	131.	131.	131.
18	132.	132.	133.	134.	134.	133.	132.	131.	130.	130.	130.	131.
19	131.	131.	133.	134.	134.	133.	132.	131.	130.	130.	130.	130.
20	131.	131.	132.	133.	134.	133.	132.	131.	130.	130.	131.	131.
21	133.	134.	136.	137.	138.	138.	139.	140.	140.	140.	140.	141.
22	141.	142.	142.	142.	142.	142.	140.	140.	138.	138.	138.	138.
23	138.	138.	139.	139.	140.	140.	139.	138.	138.	138.	138.	138.
24	140.	143.	145.	146.	146.	146.	147.	146.	146.	146.	146.	146.
25	146.	146.	146.	146.	147.	146.	146.	146.	145.	145.	145.	145.
26	145.	145.	146.	146.	146.	145.	144.	144.	143.	143.	143.	143.
27	143.	143.	143.	143.	143.	142.	142.	140.	140.	140.	140.	140.
28	140.	140.	140.	140.	140.	140.	138.	138.	137.	137.	137.	137.
29	138.	138.	138.	139.	139.	139.	138.	138.	138.	140.	140.	140.
30	141.	142.	142.	143.	143.	143.	142.	142.	141.	141.	141.	141.
31	141.	142.	142.	142.	142.	142.	142.	141.	140.	140.	140.	140.

*SPECIAL POINTS

NONE

RIVER GAGE DATA
 STA. NO. 11 RIO ARRED AT LAS BOMBITAS
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	141.	142.	142.	142.	142.	142.	142.	141.	140.	140.	141.	142.
2	142.	143.	143.	144.	144.	144.	144.	144.	145.	146.	147.	147.
3	147.	148.	148.	148.	148.	148.	148.	147.	147.	147.	147.	147.
4	146.	146.	146.	146.	146.	146.	145.	144.	144.	144.	144.	143.
5	143.	143.	143.	143.	143.	143.	142.	142.	142.	142.	142.	142.
6	142.	142.	142.	142.	142.	142.	142.	140.	140.	140.	140.	140.
7	140.	140.	141.	142.	142.	142.	141.	142.	143.	143.	144.	144.
8	145.	145.	146.	146.	146.	147.	147.	147.	147.	147.	147.	147.
9	147.	147.	147.	147.	147.	146.	145.	145.	144.	144.	144.	144.
10	144.	144.	144.	144.	144.	143.	142.	142.	141.	140.	140.	140.
11	140.	140.	141.	142.	142.	140.	140.	139.	138.	138.	138.	138.
12	138.	139.	140.	140.	140.	139.	138.	138.	138.	139.	140.	140.
13	141.	142.	142.	143.	143.	142.	142.	141.	140.	140.	140.	140.
14	140.	140.	140.	140.	141.	140.	140.	139.	138.	138.	138.	138.
15	138.	139.	140.	140.	140.	140.	139.	138.	138.	138.	139.	140.
16	140.	140.	140.	140.	140.	140.	140.	138.	138.	138.	138.	139.
17	140.	140.	140.	140.	140.	140.	140.	140.	140.	144.	146.	148.
18	148.	148.	149.	149.	150.	150.	150.	150.	150.	150.	150.	150.
19	150.	150.	150.	150.	150.	150.	150.	150.	149.	149.	149.	149.
20	149.	149.	149.	149.	149.	148.	148.	148.	147.	147.	147.	147.
21	147.	147.	147.	146.	146.	146.	146.	146.	147.	147.	147.	147.
22	147.	147.	148.	148.	148.	148.	147.	147.	147.	147.	147.	147.
23	147.	147.	148.	148.	148.	148.	147.	147.	146.	146.	146.	146.
24	146.	146.	146.	146.	146.	146.	146.	145.	144.	144.	144.	144.
25	144.	144.	145.	145.	145.	144.	144.	143.	143.	142.	142.	142.
26	142.	143.	143.	143.	143.	143.	142.	142.	141.	140.	140.	141.
27	141.	141.	142.	142.	142.	141.	140.	140.	139.	139.	139.	139.
28	139.	140.	140.	140.	140.	140.	140.	138.	138.	138.	138.	138.
29*	138.	138.	138.	139.	139.	139.	138.	138.	137.	140.	142.	143.
30	144.	144.	144.	144.	144.	144.	143.	144.	146.	147.	148.	148.

*SPECIAL POINTS

29 1830/137.

RIVER GAGE DATA
 STA. NO. 11 RIO AREO AT LAS BOMBITAS
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	148.	149.	150.	150.	151.	151.	152.	152.	152.	152.	152.	152.
2	152.	152.	152.	152.	151.	150.	150.	148.	148.	147.	148.	148.
3	146.	146.	146.	146.	146.	146.	145.	146.	145.	145.	145.	144.
4	145.	145.	145.	145.	144.	144.	142.	142.	143.	142.	143.	143.
5	143.	145.	144.	144.	144.	143.	143.	142.	142.	141.	140.	140.
6	139.	139.	139.	138.	138.	138.	138.	138.	138.	138.	137.	137.
7	136.	136.	135.	136.	135.	136.	137.	135.	134.	133.	133.	133.
8*	133.	132.	132.	133.	137.	140.	139.	142.	143.	142.	143.	143.
9	146.	146.	146.	147.	148.	148.	148.	148.	150.	152.	154.	154.
10	156.	157.	157.	158.	159.	159.	161.	162.	159.	161.	161.	162.
11	163.	164.	165.	166.	166.	169.	171.	171.	171.	172.	172.	173.
12*	175.	176.	177.	178.	178.	179.	178.	180.	172.	172.	174.	175.
13	175.	177.	178.	178.	178.	179.	180.	181.	183.	182.	185.	184.
14*	186.	187.	189.	186.	186.	187.	188.	190.	192.	193.	192.	194.
15	196.	200.	203.	207.	214.	221.	228.	222.	225.	230.	226.	231.
16	230.	230.	230.	229.	229.	229.	230.	230.	230.	230.	230.	230.
17	227.	227.	226.	226.	225.	223.	219.	221.	221.	219.	219.	218.
18	218.	214.	212.	209.	208.	215.	212.	209.	206.	200.	199.	197.
19	192.	189.	189.	187.	188.	186.	187.	187.	190.	195.	201.	204.
20	210.	217.	222.	227.	228.	234.	237.	238.	241.	242.	244.	243.
21	245.	243.	240.	239.	240.	234.	234.	234.	231.	227.	227.	224.
22	223.	220.	218.	213.	211.	207.	205.	202.	196.	194.	189.	184.
23	182.	178.	176.	174.	170.	167.	166.	168.	169.	169.	169.	169.
24	171.	171.	171.	169.	167.	165.	162.	159.	159.	159.	159.	157.
25	158.	157.	158.	157.	156.	157.	156.	155.	155.	153.	153.	152.
26	152.	154.	154.	155.	153.	154.	155.	155.	158.	158.	159.	160.
27	161.	161.	160.	159.	159.	158.	158.	157.	158.	158.	158.	157.
28	158.	158.	158.	159.	157.	157.	157.	156.	157.	156.	156.	155.
29	156.	156.	156.	157.	156.	154.	154.	154.	154.	154.	156.	156.
30	158.	159.	158.	158.	157.	156.	156.	156.	156.	156.	156.	157.
31*	156.	155.	154.	154.	152.	152.	151.	153.	152.	164.	164.	166.

*SPECIAL POINTS

8	1250/143.
12	1110/176.
14	0705/189.
31	1850/165.

RIVER GAGE DATA
 STA. NO. 11 RIO ARED AT LAS BOMBITAS
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	165.	166.	169.	169.	169.	169.	170.	170.	169.	170.	170.	169.
2*	169.	169.	168.	169.	167.	167.	166.	168.	170.	170.	168.	168.
3*	168.	168.	168.	168.	168.	167.	167.	185.	188.	194.	197.	201.
4	201.	203.	204.	206.	210.	211.	214.	216.	216.	217.	217.	219.
5	221.	226.	222.	223.	219.	219.	218.	217.	215.	211.	209.	212.
6	213.	209.	208.	207.	207.	205.	200.	201.	197.	194.	193.	191.
7	187.	185.	185.	180.	179.	178.	176.	173.	172.	170.	168.	166.
8*	164.	164.	162.	162.	163.	161.	161.	168.	163.	162.	162.	161.
9	161.	161.	162.	163.	160.	161.	161.	162.	161.	160.	161.	162.
10	162.	160.	161.	162.	161.	159.	157.	159.	157.	157.	157.	157.
11	156.	156.	156.	156.	155.	155.	154.	155.	153.	152.	151.	151.
12	150.	152.	152.	153.	152.	153.	154.	156.	156.	157.	158.	159.
13	159.	161.	162.	162.	163.	162.	162.	164.	164.	165.	164.	166.
14*	168.	169.	169.	168.	170.	170.	169.	171.	173.	174.	174.	175.
15	176.	178.	178.	178.	179.	179.	181.	179.	179.	178.	179.	177.
16	177.	176.	175.	173.	173.	174.	172.	171.	170.	169.	168.	168.
17*	167.	166.	166.	166.	166.	165.	166.	164.	164.	162.	162.	158.
18*	167.	167.	168.	168.	167.	168.	167.	167.	168.	182.	195.	200.
19	215.	217.	217.	216.	213.	211.	208.	204.	205.	199.	195.	195.
20	192.	191.	191.	190.	189.	190.	190.	186.	185.	185.	185.	185.
21	183.	182.	182.	182.	182.	183.	181.	183.	183.	183.	184.	183.
22	183.	185.	188.	189.	190.	191.	190.	192.	192.	191.	191.	191.
23	191.	190.	188.	187.	185.	183.	181.	181.	179.	176.	173.	172.
24	170.	168.	167.	165.	167.	166.	166.	166.	167.	167.	166.	167.
25*	167.	168.	169.	168.	168.	169.	169.	169.	172.	171.	173.	173.
26	173.	174.	173.	174.	174.	174.	174.	174.	174.	174.	176.	175.
27	175.	175.	175.	175.	174.	173.	174.	173.	173.	174.	174.	174.
28	174.	174.	174.	172.	173.	172.	172.	171.	171.	169.	167.	168.
29	168.	169.	168.	168.	168.	167.	166.	166.	165.	165.	165.	164.
30	163.	163.	164.	162.	162.	163.	163.	162.	162.	161.	162.	162.
31	162.	162.	162.	162.	162.	162.	160.	160.	160.	159.	159.	160.

*SPECIAL POINTS

2	1630/173.		
3	1550/167.		
8	1530/167.	1635/162.	1700/163.
14	1700/166.		
17	2320/163.		
18	1930/171.		
25	1700/173.	1730/169.	

RIVER GAGE DATA
 STA. NO. 11 RIO ARO AT LAS BOMBITAS
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	158.	158.	158.	158.	158.	159.	160.	159.	162.	164.	164.	167.
2	168.	169.	168.	169.	170.	170.	170.	169.	169.	168.	168.	167.
3	167.	165.	163.	163.	162.	164.	164.	162.	160.	162.	160.	161.
4	159.	159.	159.	159.	160.	160.	160.	160.	160.	161.	160.	158.
5	160.	161.	162.	160.	160.	159.	160.	158.	159.	159.	160.	160.
6	160.	160.	160.	158.	158.	159.	159.	158.	159.	159.	159.	159.
7	159.	158.	158.	158.	158.	159.	159.	158.	159.	158.	159.	159.
8	159.	159.	159.	158.	158.	158.	157.	157.	157.	157.	158.	158.
9	158.	158.	158.	159.	156.	153.	154.	154.	153.	153.	153.	153.
10	153.	153.	153.	153.	154.	154.	154.	154.	153.	153.	153.	152.
11	152.	155.	155.	154.	153.	154.	153.	153.	152.	152.	151.	151.
12	150.	151.	151.	150.	150.	151.	151.	151.	152.	150.	150.	149.
13	151.	150.	150.	149.	149.	151.	149.	148.	148.	148.	148.	148.
14	149.	148.	148.	150.	150.	150.	149.	149.	150.	148.	148.	148.
15	148.	148.	147.	147.	147.	148.	148.	146.	147.	146.	146.	146.
16	146.	146.	145.	144.	147.	146.	146.	146.	146.	147.	148.	150.
17	151.	151.	152.	152.	152.	151.	152.	152.	152.	152.	150.	150.
18	150.	150.	149.	148.	147.	148.	148.	148.	147.	147.	147.	147.
19	147.	147.	147.	147.	146.	147.	146.	145.	145.	146.	144.	146.
20	145.	145.	144.	145.	145.	145.	144.	144.	144.	146.	145.	146.
21	146.	146.	146.	148.	148.	146.	146.	145.	144.	145.	143.	145.
22	143.	142.	142.	142.	141.	142.	143.	142.	142.	143.	143.	142.
23	144.	145.	145.	145.	144.	145.	146.	145.	146.	146.	146.	146.
24	145.	145.	145.	145.	145.	145.	147.	143.	144.	143.	142.	143.
25	144.	144.	144.	144.	144.	142.	144.	143.	142.	142.	142.	142.
26	139.	139.	139.	140.	140.	139.	138.	137.	139.	138.	139.	139.
27	139.	139.	139.	139.	138.	138.	137.	136.	136.	136.	136.	136.
28	136.	136.	137.	139.	139.	137.	136.	136.	136.	136.	138.	137.
29*	138.	138.	140.	139.	140.	139.	145.	143.	145.	145.	145.	145.
30*	143.	143.	143.	144.	144.	144.	143.	142.	140.	145.	146.	146.

*SPECIAL POINTS

1 1700/159.
 29 1300/139.
 30 1840/141.

RIVER GAGE DATA
 STA. NO. 11 RIO ARO AT LAS BOMBITAS
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		130.	141.	151.	169.	160.
2		130. E	144.	150.	169.	169.
3		131. E	148.	146.	176.	163.
4		132. E	145.	144.	210.	160.
5		134. E	143.	143.	218.	160.
6		135.	141.	138.	203.	159.
7		139.	142.	135.	178.	159.
8		141.	146.	138.	163.	158.
9		140.	146.	148.	161.	155.
10	M	139.	143.	159.	159.	153.
11	129.	139.	140.	168.	154.	153.
12	130.	140.	139.	176.	154.	151.
13	132.	139.	141.	180.	163.	149.
14	132.	137.	139.	189.	170.	149.
15	132.	135.	139.	215.	178.	147.
16	131.	134.	139.	230.	173.	146.
17	131.	133.	141.	223.	165.	151.
18	131.	132.	149.	209.	172.	148.
19	131.	132.	150.	191.	208.	146.
20	131.	132.	148.	230.	189.	145.
21	130.	138.	147.	236.	183.	146.
22	130.	140.	147.	207.	189.	142.
23	130.	139.	147.	172.	183.	145.
24	131.	145.	145.	165.	167.	144.
25	132.	146.	144.	156.	169.	143.
26	132.	145.	142.	155.	174.	139.
27	132.	142.	140.	159.	174.	138.
28	130.	139.	139.	157.	172.	137.
29	129.	139.	139.	155.	167.	141.
30	129.	142.	145.	157.	163.	144.
31		141.		156.	161.	

RIVER GAGE DATA

NAME: Sta. No. 12 Río Oritupano at Los Caracas.

LOCATION: Longitude 63° 30.6' W, latitude 09° 04.2' N. Approximately 7.3 km WNW of Oritupano, at Los Caracas.

DRAINAGE AREA: 268 sq mi (from topographic map).

GAGE: Stevens Type A35 water level recorder attached to left downstream side of bridge.

RECORDS AVAILABLE: April 16, 1969 through September 30, 1969.

REMARKS: Record is good. Shifting control method was applied from July 12 through September 30.

CODING: M signifies missing data; E signifies estimated data.



Aerial view of the Río Oritupano at Los Caracas. The gaging site is at the bridge which is located downstream of the large meander loop in the lower left-hand corner of the photograph. There is a large point bar just downstream from the bridge.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 12 RIO ORITUPANO AT LOS CARACAS

Meas. No.	Date	Made by	Width ft	Area sq ft	Mean Velocity fps	Inside Gage Height ft	Dis-charge cfs	Shift Adj. ft	Per-cent Diff.	Method	Num-ber Meas. Sec-tions	Gage Height Change ft	Time hr	Water Temp. °F
1	May 7	Santos	48.3	35.6	1.28	0.59	45.5	0	-4.9	Wading	23	0	0.6	88
2	18	Santos	48.0	36.4	1.20	0.56	43.5	0	-2.0	Wading	23	0	0.5	88
3	27	Santae11a	44.0	36.2	1.19	0.54	43.1	0	+2.4	Wading	22	0	0.5	84
4	June 10	Romero	48.0	52.5	1.36	0.79	71.4	0	+2.1	Wading	25	0	0.9	83
5	19	Santae11a	70.0	101.	1.47	1.49	148.	0	-5.5	Wading	20	+0.3	0.7	88
6	25	Santos	72.0	106.	1.46	1.50	155.	0	-2.0	Wading	24	0	0.9	83
7	27	Santae11a	68.0	86.0	1.43	1.28	123.	0	-2.6	Wading	19	-.01	0.6	85
8	July 11	Santae11a	74.0	171.	2.13	2.46	364.	0	+0.8	Wading	22	-.03	0.8	76
9	11	Santae11a	52.0	165.	2.91	2.98	480.	0	-4.7	Bridge	27	Var.	1.3	75
10	11	Santae11a	52.0	205.	3.05	3.32	626.	0	+4.6	Bridge	19	+1.5	1.1	74
11	12	Santos	50.0	243	3.28	4.26	798.	0	-4.0	Bridge	26	+1.7	1.3	78
12	12	Santos	50.0	251.	3.76	4.51	945.	0	+2.8	Bridge	26	+1.0	1.3	79
13	12	Santos	50.0	284.	3.91	4.81	1110.	0	+5.1	Bridge	26	+5.1	1.3	-
14	12	Santos	50.0	341.	3.64	5.19	1240.	0	-3.4	Bridge	26	+1.0	1.1	75
15	14	Velasquez	64.0	185.	1.81	2.73	334.	-.37	-0.4	Bridge	22	0	1.3	80
16	21	Romero	70.0	115.	1.11	1.63	128.	-.29	-5.0	Bridge	26	-.01	0.7	84
17	29	Santae11a	65.0	107.	0.93	1.28	99.3	-.25	-3.1	Wading	23	-.01	0.7	82
18	Aug. 2	Tirado	71.0	73.5	1.05	1.04	77.2	-.19	+0.9	Wading	25	0	0.6	80
19	4	Tirado	80.0	152.	1.73	2.14	263.	-.04	-3.2	Wading	22	-.06	0.7	78
20	9	Santos	50.0	147.	1.82	2.23	268.	-.02	-9.9	Bridge	23	-.09	1.2	83
21	10	Santos	70.0	154.	1.91	2.18	294.	-.03	+3.7	Wading	24	+0.3	1.0	83
22	16	Tirado	50.0	143.	1.63	2.34	233.	-.37	-4.1	Bridge	26	-.01	1.2	79
23	21	Romero	67.0	155.	1.22	1.98	189.	-.33	+3.7	Wading	20	-.01	0.7	85
24	Sept. 5	Sabino	62.0	90.0	0.99	1.21	89.3	-.23	-1.6	Wading	22	0	0.5	85
25	10	Romero	54.0	254.	2.93	3.87	743.	0	+2.0	Bridge	28	+0.2	1.1	80
26	27	Tirado	64.0	77.2	0.87	1.06	67.0	-.27	-4.1	Wading	23	0	0.7	-

RATING TABLE
FOR
STA. NO. 12 RIO ORITUPANO AT LOS CARACAS

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00		1.00	93.0	2.00	249.	3.00	509.	4.00	759.	5.00	1165.
.10		.10	104.	.10	272.	.10	537.	.10	785.	.10	1227.
.20		.20	116.	.20	295.	.20	565.	.20	813.	.20	1293.
.30		.30	129.	.30	320.	.30	593.	.30	843.	.30	1363.
.40		.40	143.	.40	345.	.40	621.	.40	877.	.40	1437.
.50	37.5	.50	158.	.50	372.	.50	647.	.50	915.	.50	1515.
.60	49.0	.60	174.	.60	401.	.60	671.	.60	957.	.60	
.70	60.0	.70	191.	.70	428.	.70	693.	.70	1003.	.70	
.80	71.0	.80	209.	.80	455.	.80	713.	.80	1053.	.80	
.90	82.0	.90	228.	.90	482.	.90	735.	.90	1107.	.90	

RIVER GAGE DATA
 STA. NO. 12 RIO ORITUPANO AT LOS CARACAS
 APRIL 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
16	M	M	M	M	M	49.0	49.0	49.0	49.0	49.0	49.0	49.0
17	49.0	49.0	49.0	49.0	49.0	49.0	49.0	49.0	47.9	47.9	47.9	47.9
18	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	47.9	46.8	46.8	46.8
19	46.8	46.8	46.8	46.8	46.8	46.8	47.9	47.9	46.8	46.8	46.8	46.8
20	46.8	46.8	46.8	46.8	46.8	46.8	46.8	49.0	45.6	45.6	45.6	45.6
21	45.6	45.6	45.6	45.6	45.6	45.6	46.8	46.8	45.6	45.6	45.6	45.6
22	46.8	46.8	46.8	46.8	46.8	46.8	46.8	47.9	46.8	46.8	46.8	46.8
23	46.8	46.8	46.8	46.8	46.8	46.8	47.9	47.9	46.8	46.8	46.8	46.8
24	46.8	46.8	46.8	46.8	46.8	47.9	47.9	47.9	46.8	46.8	46.8	46.8
25	46.8	46.8	46.8	46.8	46.8	46.8	46.8	46.8	45.6	45.6	45.6	45.6
26	46.8	46.8	46.8	46.8	46.8	46.8	46.8	46.8	45.6	44.5	45.6	45.6
27	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	44.5	44.5	44.5	44.5
28	44.5	44.5	44.5	44.5	45.6	45.6	45.6	44.5	44.5	44.5	44.5	44.5
29	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	44.5	43.3	43.3	44.5
30	44.5	44.5	44.5	44.5	44.5	44.5	47.9	44.5	44.5	43.3	43.3	44.5

*SPECIAL POINTS

NONE

RIVER GAGE DATA
 STA. NO. 12 RIO ORITUPANO AT LOS CARACAS
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	44.5	44.5	44.5	44.5	44.5	45.6	45.6	45.6	44.5	43.3	44.5	44.5
2	44.5	44.5	44.5	44.5	44.5	45.6	45.6	45.6	44.5	43.3	43.3	43.3
3	43.3	43.3	43.3	44.5	44.5	45.6	44.5	43.3	43.3	43.3	43.3	43.3
4	43.3	43.3	44.5	44.5	45.6	45.6	45.6	45.6	44.5	44.5	44.5	44.5
5	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
7	45.6	45.6	46.8	46.8	46.8	47.9	47.9	47.9	46.8	47.9	49.0	49.0
8	49.0	49.0	49.0	49.0	49.0	50.1	50.1	50.1	49.0	51.2	51.2	51.2
9	51.2	51.2	50.1	50.1	51.2	53.4	55.6	56.7	55.6	54.5	54.5	53.4
10	53.4	52.3	52.3	51.2	51.2	51.2	50.1	49.0	49.0	49.0	49.0	49.0
11	49.0	49.0	49.0	49.0	49.0	47.9	47.9	47.9	46.8	46.8	46.8	47.9
12	47.9	47.9	47.9	46.8	46.8	46.8	45.6	44.5	44.5	44.5	44.5	45.6
13	47.9	50.1	50.1	50.1	49.0	49.0	49.0	47.9	47.9	47.9	47.9	47.9
14	47.9	47.9	46.8	45.6	45.6	45.6	45.6	44.5	44.5	45.6	45.6	46.8
15	47.9	47.9	47.9	45.6	45.6	45.6	45.6	44.5	44.5	45.6	45.6	45.6
16	45.6	45.6	46.8	44.5	44.5	44.5	44.5	43.3	43.3	44.5	45.6	45.6
17	45.6	45.6	45.6	45.6	45.6	45.6	44.5	43.3	42.2	43.3	43.3	44.5
18	44.5	45.6	45.6	44.5	44.5	44.5	44.5	43.3	43.3	43.3	43.3	43.3
19	43.3	43.3	43.3	43.3	43.3	43.3	44.5	44.5	43.3	43.3	43.3	43.3
20	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3
21	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	43.3	42.2	42.2	42.2
22	42.2	42.2	43.3	43.3	43.3	43.3	43.3	43.3	42.2	41.0	41.0	41.0
23	41.0	41.0	41.0	42.2	43.3	44.5	43.3	43.3	43.3	43.3	43.3	43.3
24	44.5	45.6	45.6	45.6	46.8	47.9	49.0	49.0	49.0	49.0	49.0	49.0
25	49.0	47.9	46.8	46.8	46.8	46.8	46.8	45.6	45.6	45.6	45.6	45.6
26	44.5	43.3	43.3	43.3	43.3	43.3	43.3	43.3	42.2	42.2	42.2	42.2
27	42.2	42.2	42.2	42.2	42.2	41.0	41.0	41.0	39.9	39.9	39.9	39.9
28	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9	39.9
29*	39.9	39.9	39.9	39.9	39.9	39.9	41.0	43.3	79.8	220.	191.	139.
30	111.	121.	143.	155.	143.	129.	116.	106.	101.	95.2	90.8	87.5
31	84.2	83.1	88.6	101.	104.	114.	115.	114.	114.	112.	109.	104.

*SPECIAL POINTS

29 1730/82.0 1900/77.6

RIVER GAGE DATA
 STA. NO. 12 RIO ORITUPANO AT LOS CARACAS
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	99.5	94.1	89.7	85.3	82.0	80.9	78.7	78.7	75.4	73.2	71.0	68.8
2	66.6	64.4	63.3	63.3	63.3	62.2	61.1	60.0	60.0	58.9	57.8	57.8
3	56.7	55.6	54.5	54.5	54.5	54.5	53.4	52.3	51.2	51.2	51.2	50.1
4	50.1	49.0	49.0	49.0	49.0	47.9	47.9	46.8	46.8	45.6	44.5	44.5
5*	44.5	43.3	43.3	43.3	42.2	43.3	43.3	51.2	82.0	281.	228.	186.
6	161.	137.	117.	104.	102.	96.3	93.0	87.5	83.1	79.8	77.6	75.4
7	72.1	68.8	65.5	65.5	67.7	68.8	66.6	66.6	67.7	68.8	68.8	72.1
8*	116.	172.	189.	191.	184.	172.	161.	150.	142.	132.	125.	117.
9	112.	106.	102.	97.3	93.0	90.8	87.5	85.3	83.1	82.0	80.9	79.8
10	78.7	77.6	75.4	74.3	73.2	69.9	68.8	68.8	67.7	67.7	65.5	64.4
11	64.4	63.3	62.2	61.1	61.1	61.1	60.0	58.9	58.9	57.8	57.8	56.7
12*	56.7	55.6	55.6	54.5	54.5	54.5	54.5	54.5	60.0	87.5	94.1	79.8
13	68.8	71.0	91.9	109.	114.	110.	98.4	86.4	79.8	73.2	68.8	65.5
14	63.3	61.1	58.9	57.8	57.8	56.7	56.7	57.8	56.7	55.6	54.5	53.4
15*	53.4	52.3	52.3	51.2	51.2	52.3	53.4	56.7	56.7	57.8	76.5	80.9
16	75.4	75.4	74.3	71.0	66.6	64.4	62.2	60.0	60.0	57.8	57.8	56.7
17	54.5	52.3	52.3	51.2	50.1	50.1	50.1	49.0	49.0	49.0	49.0	47.9
18	49.0	47.9	47.9	47.9	49.0	51.2	53.4	53.4	52.3	52.3	52.3	52.3
19*	71.0	128.	143.	144.	144.	153.	160.	158.	150.	142.	134.	129.
20	126.	125.	126.	126.	129.	129.	126.	122.	119.	114.	109.	105.
21*	101.	96.3	93.0	89.7	87.5	86.4	85.3	83.1	85.3	144.	117.	128.
22*	117.	106.	110.	122.	130.	130.	122.	122.	111.	104.	99.5	97.3
23	96.3	95.2	97.3	102.	107.	111.	112.	115.	121.	125.	129.	129.
24	126.	129.	142.	156.	163.	158.	144.	132.	122.	116.	115.	115.
25	116.	122.	134.	147.	156.	158.	156.	152.	147.	142.	134.	129.
26	122.	120.	122.	136.	147.	149.	149.	152.	155.	156.	155.	152.
27	149.	146.	143.	140.	136.	133.	128.	125.	121.	117.	114.	110.
28	107.	105.	103.	102.	99.5	97.3	97.3	96.3	95.2	93.0	91.9	88.6
29	86.4	84.2	80.9	79.8	77.6	75.4	74.3	73.2	72.1	71.0	69.9	68.8
30*	67.7	66.6	65.5	64.4	64.4	64.4	64.4	64.4	67.7	67.7	67.7	67.7

*SPECIAL POINTS

5	1930/283.											
8	0700/191.											
12	1755/55.6	1835/65.5	1910/130.	2045/75.4	2120/95.2							
15	1625/60.0	1930/54.5										
19	0100/53.4											
21	1845/85.3	2130/116.										
22	0250/105.	1530/116.										
30	1630/67.7											

RIVER GAGE DATA
 STA. NO. 12 RIO ORITUPANO AT LOS CARACAS
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	66.6	66.6	66.6	67.7	87.5	142.	147.	130.	111.	101.	94.1	90.8
2	87.5	85.3	84.2	84.2	85.3	87.5	90.8	97.3	109.	115.	121.	119.
3	114.	109.	106.	103.	99.5	97.3	95.2	93.0	94.1	91.9	90.8	87.5
4	85.3	83.1	82.0	80.9	79.8	78.7	77.6	76.5	75.4	75.4	74.3	73.2
5*	72.1	71.0	69.9	69.9	76.5	134.	169.	160.	142.	120.	107.	101.
6	96.3	93.0	90.8	88.6	85.3	83.1	80.9	79.8	77.6	76.5	74.3	73.2
7	71.0	68.8	67.7	66.6	65.5	65.5	64.4	63.3	64.4	64.4	74.3	78.7
8	74.3	67.7	64.4	63.3	62.2	62.2	62.2	63.3	65.5	69.9	74.3	78.7
9	82.0	83.1	83.1	84.2	85.3	86.4	88.6	88.6	87.5	87.5	87.5	87.5
10*	88.6	91.9	94.1	94.1	91.9	89.7	87.5	84.2	155.	166.	200.	167.
11*	144.	156.	305.	384.	372.	356.	320.	495.	596.	565.	634.	782.
12*	859.	840.	782.	788.	759.	810.	895.	961.	1260.	1390.	1390.	1300.
13	1120.	984.	863.	790.	742.	676.	607.	551.	515.	479.	458.	439.
14	420.	406.	392.	375.	366.	356.	337.	332.	332.	332.	327.	335.
15*	337.	340.	337.	335.	327.	320.	315.	312.	310.	342.	340.	372.
16*	576.	673.	777.	796.	769.	724.	680.	687.	772.	759.	769.	931.
17*	1310.	1480.	1480.	1290.	966.	870.	807.	793.	796.	796.	785.	767.
18	737.	709.	687.	669.	652.	634.	632.	626.	618.	607.	599.	579.
19	554.	531.	498.	460.	420.	384.	350.	312.	277.	249.	228.	216.
20	203.	195.	186.	177.	174.	169.	164.	160.	156.	152.	149.	147.
21	144.	140.	139.	136.	136.	133.	132.	129.	128.	126.	126.	124.
22	122.	121.	120.	119.	117.	117.	115.	114.	112.	112.	111.	110.
23*	110.	109.	109.	111.	114.	114.	110.	106.	106.	105.	104.	103.
24	103.	102.	101.	101.	101.	99.5	99.5	98.4	98.4	98.4	98.4	98.4
25	98.4	98.4	98.4	99.5	101.	101.	101.	101.	99.5	98.4	98.4	97.3
26	97.3	96.3	96.3	96.3	96.3	95.2	94.1	93.0	91.9	91.9	90.8	90.8
27*	93.0	96.3	112.	136.	136.	126.	116.	110.	107.	110.	117.	134.
28	161.	181.	177.	163.	147.	134.	125.	119.	115.	110.	107.	105.
29	103.	102.	101.	101.	98.4	96.3	95.2	94.1	91.9	90.8	90.8	90.8
30	88.6	87.5	87.5	86.4	86.4	86.4	85.3	84.2	84.2	84.2	84.2	83.1
31	83.1	82.0	82.0	82.0	82.0	82.0	82.0	80.9	80.9	79.8	79.8	79.8

*SPECIAL POINTS

1	0900/69.9	1300/149.										
5	1430/171.											
10	1615/84.2	1900/128.	2115/203.									
11	0240/144.	1615/523.	1655/485.	2015/565.								
12	0645/774.	0750/790.	2110/1430.									
15	2045/348.											
16	0730/796.	1515/654.	1900/759.									
17	0500/1500.											
23	1450/115.											
27	0830/139.											

RIVER GAGE DATA
 STA. NO. 12 RIO ORITUPANO AT LOS CARACAS
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	79.8	79.8	79.8	79.8	78.7	78.7	78.7	78.7	78.7	78.7	78.7	78.7
2	77.6	77.6	76.5	76.5	76.5	76.5	77.6	77.6	77.6	79.8	87.5	119.
3	149.	171.	184.	198.	209.	226.	232.	251.	345.	392.	366.	361.
4	358.	364.	372.	366.	345.	310.	274.	240.	220.	213.	216.	218.
5	222.	226.	228.	222.	220.	216.	211.	209.	202.	198.	191.	186.
6	176.	166.	160.	155.	153.	150.	144.	140.	130.	124.	121.	119.
7	116.	114.	110.	107.	106.	104.	103.	98.4	97.3	94.1	93.0	89.7
8	88.6	87.5	86.4	87.5	101.	134.	191.	222.	240.	258.	267.	277.
9	293.	582.	689.	639.	543.	452.	361.	297.	263.	238.	228.	226.
10	226.	230.	240.	251.	267.	281.	290.	305.	310.	310.	295.	274.
11	249.	218.	200.	179.	164.	155.	150.	149.	146.	137.	130.	126.
12*	128.	161.	238.	767.	840.	919.	1030.	1000.	853.	747.	693.	684.
13*	701.	726.	757.	788.	793.	802.	834.	940.	899.	895.	940.	1050.
14	1310.	1360.	1300.	1120.	975.	895.	849.	822.	790.	762.	730.	699.
15	676.	634.	599.	559.	526.	485.	455.	433.	409.	386.	361.	345.
16*	332.	315.	300.	283.	267.	251.	242.	300.	843.	1040.	1040.	907.
17*	774.	673.	579.	537.	531.	548.	568.	610.	699.	802.	737.	699.
18	680.	662.	652.	634.	607.	573.	531.	479.	431.	384.	345.	317.
19	300.	293.	290.	283.	279.	267.	256.	249.	234.	222.	216.	230.
20	258.	327.	358.	348.	320.	295.	279.	265.	258.	254.	242.	234.
21	222.	216.	209.	203.	198.	191.	186.	179.	174.	171.	164.	160.
22	155.	150.	147.	144.	147.	158.	163.	158.	152.	146.	140.	136.
23*	134.	132.	129.	126.	126.	124.	122.	121.	137.	177.	216.	203.
24*	174.	161.	444.	626.	730.	793.	831.	822.	774.	728.	647.	551.
25*	495.	452.	433.	431.	431.	423.	412.	406.	450.	415.	386.	372.
26	358.	350.	340.	322.	307.	281.	251.	232.	215.	203.	193.	184.
27	177.	174.	169.	166.	163.	160.	155.	150.	147.	146.	143.	142.
28	139.	136.	136.	134.	133.	132.	130.	126.	125.	124.	122.	121.
29*	120.	125.	139.	155.	153.	144.	134.	128.	124.	121.	122.	124.
30	125.	125.	124.	122.	117.	116.	114.	111.	109.	107.	107.	106.
31	106.	105.	104.	103.	102.	102.	101.	101.	99.5	99.5	98.4	98.4

*SPECIAL POINTS

12	1450/1060.	2230/684.										
13	1330/799.	1625/944.	1900/888.									
16	1515/240.	2115/1060.										
17	0930/526.	1920/810.										
23	1730/122.	1900/136.	2045/176.	2230/220.								
24	0345/160.	1500/837.										
25	1630/401.											
29	0900/156.											

RIVER GAGE DATA
 STA. NO. 12 RIO DRITUPANO AT LOS CARACAS
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	97.3	96.3	96.3	96.3	96.3	96.3	95.2	94.1	94.1	93.0	93.0	93.0
2*	93.0	91.9	91.9	91.9	115.	155.	155.	144.	126.	117.	112.	114.
3	119.	122.	124.	124.	124.	124.	122.	120.	117.	112.	111.	109.
4	107.	106.	105.	104.	102.	101.	98.4	97.3	96.3	95.2	94.1	93.0
5*	93.0	91.9	91.9	90.8	90.8	90.8	96.3	93.0	93.0	93.0	91.9	90.8
6	89.7	88.6	87.5	87.5	87.5	87.5	86.4	86.4	86.4	86.4	85.3	85.3
7	84.2	84.2	84.2	84.2	84.2	84.2	84.2	83.1	83.1	83.1	83.1	82.0
8*	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	82.0	84.2	84.2	72.4
9*	961.	993.	849.	757.	719.	707.	705.	695.	678.	652.	637.	642.
10	659.	676.	689.	709.	722.	730.	737.	737.	737.	733.	719.	703.
11*	659.	626.	587.	537.	477.	404.	404.	307.	300.	317.	358.	401.
12*	431.	431.	417.	401.	386.	378.	372.	369.	369.	366.	369.	372.
13	378.	384.	384.	381.	381.	378.	375.	364.	340.	310.	274.	240.
14	213.	191.	177.	167.	161.	155.	150.	144.	140.	137.	133.	132.
15	129.	128.	126.	122.	120.	119.	116.	115.	114.	112.	111.	110.
16	109.	107.	107.	106.	106.	105.	103.	102.	101.	101.	101.	99.5
17	99.5	98.4	97.3	97.3	97.3	97.3	96.3	96.3	95.2	94.1	94.1	93.0
18	93.0	91.9	91.9	91.9	91.9	90.8	89.7	89.7	89.7	88.6	88.6	87.5
19	86.4	85.3	85.3	85.3	85.3	85.3	85.3	84.2	83.1	83.1	83.1	83.1
20	83.1	83.1	82.0	82.0	82.0	82.0	82.0	80.9	80.9	80.9	80.9	80.9
21	79.8	78.7	78.7	78.7	78.7	78.7	78.7	78.7	78.7	77.6	77.6	77.6
22*	77.6	77.6	76.5	76.5	76.5	76.5	80.9	78.7	77.6	77.6	77.6	77.6
23*	76.5	76.5	86.4	153.	163.	146.	116.	103.	97.3	93.0	89.7	87.5
24	84.2	84.2	83.1	83.1	80.9	79.8	78.7	78.7	77.6	76.5	76.5	85.3
25	95.2	97.3	93.0	88.6	84.2	82.0	79.8	78.7	78.7	77.6	76.5	75.4
26	74.3	74.3	73.2	73.2	73.2	73.2	72.1	71.0	71.0	71.0	71.0	71.0
27	69.9	69.9	69.9	69.9	69.9	69.9	69.9	69.9	69.9	68.8	68.8	67.7
28	67.7	67.7	67.7	67.7	67.7	67.7	68.8	68.8	67.7	67.7	67.7	67.7
29*	67.7	67.7	67.7	67.7	67.7	67.7	66.6	71.0	69.9	69.9	71.0	74.3
30	75.4	74.3	72.1	71.0	69.9	69.9	67.7	67.7	66.6	66.6	66.6	66.6

*SPECIAL POINTS

2	1245/158.
5	1310/89.7
8	2320/85.3
9	0330/1000.
11	1630/300.
12	0230/433.
22	1250/76.5
23	0500/76.5
29	1500/72.1

1100/163.

RIVER GAGE DATA
 STA. NO. 12 RIO ORITUPANO AT LOS CARACAS
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		44.6	83.1	96.5	79.1	95.3
2		44.4	62.1	96.1	80.0	116.
3		43.8	53.6	99.8	246.	119.
4		44.6	47.8	79.2	298.	101.
5		45.6	90.5	107.	212.	92.2
6		45.6	107.	84.7	148.	87.3
7		47.2	68.5	67.7	104.	83.8
8		49.7	152.	67.1	162.	91.4
9		53.0	93.5	85.4	403.	727.
10		50.8	71.7	113.	271.	710.
11		48.1	60.6	399.	174.	461.
12		46.2	63.6	976.	650.	388.
13		48.6	87.6	725.	828.	354.
14		46.0	58.2	364.	978.	164.
15		46.0	56.8	331.	505.	119.
16	M	44.9	66.0	717.	486.	104.
17	48.7	44.6	50.8	1010.	662.	96.7
18	47.7	44.2	50.6	654.	542.	90.7
19	47.1	43.5	134.	389.	265.	84.8
20	46.7	43.3	123.	173.	286.	81.8
21	45.8	43.1	97.7	134.	193.	78.7
22	46.8	42.5	114.	117.	151.	77.5
23	47.0	42.6	110.	109.	141.	107.
24	47.1	47.3	135.	100.	593.	80.9
25	46.4	46.7	141.	99.4	436.	84.0
26	46.3	43.2	142.	94.5	278.	72.6
27	45.3	41.2	132.	114.	160.	69.7
28	44.8	39.9	99.1	138.	131.	67.9
29	44.3	72.8	77.1	96.9	132.	68.9
30	44.5	121.	66.2	86.0	116.	69.7
31		103.		81.5	102.	

RIVER GAGE DATA

NAME: Sta. No. 13 Río Chive at La Colmena.

LOCATION: Longitude 63° 40.5' W, latitude 09° 00.5' N. Approximately 25.8 km WSW of Oritupano, at La Colmena.

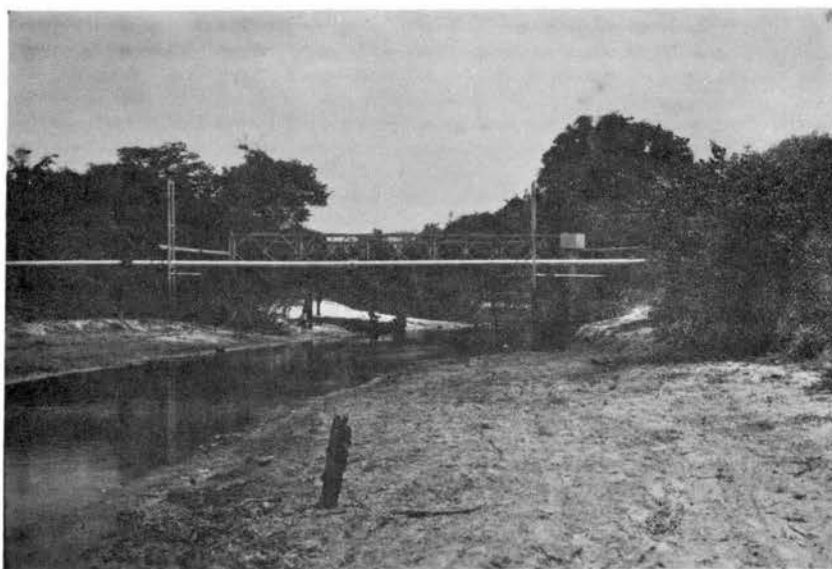
DRAINAGE AREA: 206 sq mi (from topographic map).

GAGE: Stevens Type A35 water level recorder attached to left bridge abutment on downstream side of bridge.

RECORDS AVAILABLE: May 7, 1969 through September 30, 1969.

REMARKS: Record is fair to good, except between 300 cfs and 500 cfs where flow through the culvert begins.

CODING: M signifies missing data; E signifies estimated data.



Looking upstream at the Río Chive gaging station. The A35 recorder is in the white metal box on the downstream left abutment of the bridge (right side of the photograph). There is a large point sand bar immediately upstream of the bridge. The sand bar appears white in the photograph.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 13 RIO CHIVE AT LA COLMENA

Meas. No.	Date	Made by	* Width ft	* Area sq ft	* Mean Velocity fps	Inside Gage Height ft	* Dis-charge cfs	Shift Adj. ft	Per- cent Diff.	Method	Num- ber Meas. Sec- tions	Gage Height Change ft	Time hr	Water Temp. °F
1	May 7	Santos	22.0	11.0	1.02	0.61	11.2	0	-1.5	Wading	21	0	0.4	84
2	18	Santos	21.0	10.6	1.00	0.58	10.6	0	+0.2	Wading	21	0	0.5	82
3	29	Santaella	20.0	9.69	1.10	0.60	10.7	0	-3.6	Wading	20	0	0.3	83
4	June 10	Romero	23.0	16.9	1.13	0.86	19.1	0	+4.1	Wading	24	0	0.7	82
5	17	Santaella	22.0	14.8	1.10	0.78	16.4	0	+2.2	Wading	23	-.01	0.4	82
6	25	Santos	31.0	21.8	1.00	1.01	21.8	0	-4.4	Wading	25	0	0.7	81
7	29	Santaella	24.0	18.5	1.05	0.90	19.5	0	0.0	Wading	25	0	0.5	82
8	July 7	Tirado	34.0	28.8	1.01	1.23	29.0	0	-1.4	Wading	22	0	0.5	81
9	8	Santos	58.0	49.9	0.74	1.50	37.0	0	-1.3	Wading	21	+.02	0.7	82
10	10	Romero	40.0	44.7	0.78	1.41	35.0	0	+0.6	Wading	21	-.02	0.1	81
11	11	Santaella	58.0	79.3	0.70	1.98	55.4	0	+1.3	Wading	28	+.05	0.9	76
12	12	Santos	63.0	129.	0.74	2.82	95.4	0	-1.9	Wading	22	+.04	0.9	78
13	13	Duke	53.0	225.	1.11	4.28	251.	0	0.0	Bridge	19	+.05	1.1	77
14	13	Stevens	53.0	242.	1.20	4.44	291.	0	+5.7	Bridge	22	+.06	1.4	77
15	14	Santos	49.0	230.	1.30	4.90	298.	0	-16.4	Bridge	24	+.03	1.4	76
16	15	Tirado	51.0	207.	1.47	5.10	328.	0	-16.5	Bridge	26	-.01	1.7	-
17	17	Tirado	50.0	170.	1.41	4.29	239.	0	-5.5	Bridge	25	-.01	1.2	79
18	21	Romero	78.0	157.	1.18	3.82	185.	0	-2.9	Bridge	26	-.03	0.9	78
19	29	Santaella	65.0	91.8	1.15	2.98	106.	0	-1.7	Wading	23	-.01	0.5	76
20	Aug. 4	Velasquez	65.0	56.0	0.97	1.98	54.3	0	-0.7	Wading	26	+.01	0.6	84
21	8	Santos	63.5	101.	1.02	2.84	103.	0	+4.0	Wading	22	-.02	0.6	80
22	10	Santos	74.0	145.	1.03	3.44	150.	0	+1.4	Wading	26	+.07	1.0	81
23	11	Santaella	52.0	203.	1.50	4.50	305.	0	+7.1	Bridge	26	+.04	1.7	78
24	13	Santaella	52.0	505.	3.47	8.56	1840.	0	+8.2	Bridge	24	+.48	1.5	75
25	13	Santaella	52.0	643.	3.61	8.96	2410.	0	-3.8	Bridge	24	+.07	1.3	75
26	14	Romero	52.0	747.	1.93	8.54	1520.	0	-8.4	Bridge	26	-.05	1.3	80
27	15	Romero	52.0	703.	1.20	7.64	912.	0	-4.8	Bridge	26	-.04	0.9	80
28	16	Romero	52.0	666.	1.13	6.94	813.	0	+3.4	Bridge	26	-.03	1.1	78
29	18	Romero	52.0	573.	0.80	5.50	499.	0	+6.0	Bridge	26	-.04	1.2	-
30	Sept. 5	Velasquez	67.0	134.	0.49	2.56	65.4	0	-20.0	Wading	25	-.01	0.8	81
31	13	Velasquez	70.0	174.	0.66	3.17	116.	0	-5.8	Wading	24	0	0.7	-

* Width, area, and mean velocity do not include flow through culverts.
Discharge is total discharge, including flow through culverts.

RATING TABLE
FOR
STA. NO. 13 RIO CHIVE AT LA COLMENA

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00		2.00	55.5	4.00	213.	6.00	575.	8.00	1101.
.10		.10	59.7	.10	226.	.10	597.	.10	1161.
.20		.20	64.1	.20	240.	.20	619.	.20	1241.
.30		.30	68.7	.30	254.	.30	641.	.30	1341.
.40		.40	73.5	.40	269.	.40	663.	.40	1461.
.50	8.5	.50	78.5	.50	285.	.50	685.	.50	1601.
.60	11.1	.60	83.9	.60	302.	.60	708.	.60	1761.
.70	13.8	.70	89.7	.70	320.	.70	731.	.70	1941.
.80	16.6	.80	95.9	.80	338.	.80	754.	.80	2141.
.90	19.5	.90	102.5	.90	356.	.90	777.	.90	2361.
1.00	22.5	3.00	109.5	5.00	374.	7.00	800.	9.00	2601.
.10	25.5	.10	117.	.10	393.	.10	824.	.10	2861.
.20	28.5	.20	125.	.20	412.	.20	848.	.20	
.30	31.5	.30	134.	.30	431.	.30	872.	.30	
.40	34.5	.40	144.	.40	451.	.40	896.	.40	
.50	37.5	.50	154.	.50	471.	.50	921.	.50	
.60	40.7	.60	165.	.60	491.	.60	946.	.60	
.70	44.1	.70	176.	.70	512.	.70	976.	.70	
.80	47.7	.80	188.	.80	533.	.80	1011.	.80	
.90	51.5	.90	200.	.90	554.	.90	1051.	.90	

RIVER GAGE DATA
 STA. NO. 13 RIO CHIVE AT LA COLMENA
 APRIL 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
10	M	M	M	M	M	11.9	11.9	11.6	11.6	11.6	11.6	11.6
11	11.9	11.9	11.9	12.2	12.2	11.9	11.9	11.6	11.6	11.6	11.6	11.6
12	11.6	11.9	11.9	12.2	12.2	12.2	11.9	11.9	11.6	11.6	11.6	11.6
13	11.9	11.9	12.2	12.2	12.2	12.2	11.9	11.9	11.9	11.9	11.9	11.9
14	11.9	11.9	12.2	12.2	12.2	12.2	12.2	12.2	12.2	12.2	11.9	11.9
15	12.2	12.2	12.2	12.4	12.4	12.2	12.2	11.9	11.9	11.9	11.9	11.9
16	11.9	12.2	12.2	12.2	12.4	12.4	12.2	12.2	12.2 E	11.9 E	11.9 E	11.9 E
17	11.9	12.2	12.2	12.2	12.4	12.4	12.4	12.2	12.2 E	11.9 E	11.9 E	11.9 E
18	11.9	11.9	12.2	12.2	12.2	12.4	12.2	12.2	11.9	11.9 E	11.9	11.9
19	11.9	11.9	11.9	12.2	12.2	12.2	12.2	11.9	11.9 E	11.9 E	11.9	11.9
20	11.9	11.9	11.9	12.2	12.2	12.2	12.2	11.9	11.6	11.6	11.6	11.6
21	11.6	11.9	11.9	11.9	12.2	12.2	11.9	11.6	11.6	11.4	11.4	11.4
22	11.6	11.6	11.6	11.9	11.9	11.9	11.9	11.6	11.4	11.4	11.4	11.4
23	11.4	11.4	11.6	11.6	11.9	11.9	11.9	11.6	11.6	11.4	11.4	11.4
24	11.4	11.4	11.6	11.6	11.6	11.9	11.6	11.6	11.4	11.4	11.4	11.4
25	11.4	11.4	11.4	11.6	11.6	11.6	11.6	11.6	11.4	11.1	11.1	11.1
26	11.1	11.4	11.4	11.6	11.6	11.6	11.4	11.4	11.1	11.1	10.8	10.8
27	11.1	11.1	11.4	11.4	11.6	11.6	11.4	11.1	10.8	10.8	10.8	10.8
28	11.1	11.1	11.1	11.4	11.4	11.4	11.4	11.1	10.8	10.8	10.6	10.8
29	10.8	10.8	10.8	11.1	11.1	11.4	11.4	11.1	10.8	10.8	10.6	10.6
30	10.8	10.8	10.8	11.1	11.1	11.4	11.4	11.1	10.8	10.8	10.6	10.8

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 13 RIO CHIVE AT LA COLMENA
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	10.8	10.8	10.8	11.1	11.1	11.4	11.4	11.1	10.8	10.8	10.6	10.6
2	10.6	10.6	10.8	10.8	11.1	11.1	11.4	11.1	11.1	10.8	10.8	10.6
3	10.6	10.6	10.8	10.8	10.8	11.1	11.1	11.1	10.8	10.8	10.6	10.6
4	10.6	10.6	10.6	10.8	10.8	10.8	11.1	11.1	10.8	10.8	10.6	10.6
5	10.6	10.6	10.6	10.8	10.8	10.8	11.1	11.1	11.1 E	10.8 E	10.8 E	10.6 E
6	10.6	10.8	10.8	10.8	10.8	11.1	11.1	11.1 E	11.1 E	11.1 E	11.1 E	11.1 E
7	11.1 E	11.1 E	11.1 E	11.1 E	11.1 F	11.1 E	11.4	11.1	11.1	11.1	11.1	11.1
8	11.1	11.4	11.4	11.4	11.4	11.4	11.1	11.1	11.1	11.1	11.1	11.4
9	11.6	11.9	12.2	12.2	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.4
10	12.4	12.4	12.4	12.4	12.4	12.4	12.4	12.2	12.2	11.9	11.9	11.9
11	12.2	12.2	12.2	12.4	12.4	12.2	11.9	11.9	11.6	11.6	11.6	11.6
12	11.9	11.9	12.2	12.2	12.2	12.2	11.9	11.6	11.6	11.6	11.6	11.6
13	11.6	11.6	11.9	11.9	11.9	11.9	11.6	11.4	11.1	11.1	11.4	11.4
14	11.4	11.6	11.6	11.6	11.4	11.1	11.1	10.8	10.6	10.8	11.1	11.1
15	11.1	11.4	11.4	11.6	11.4	11.1	11.1	10.8	10.6	10.6	10.8	11.1
16	11.1	11.1	11.4	11.4	11.1	10.8	10.6	10.3	10.3	10.6	10.6	10.8
17	10.8	11.1	11.1	11.1	11.1	10.8	10.6	10.3	10.3	10.3	10.3	10.6
18	10.6	10.6	10.8	10.8	10.6	10.6	10.3	10.0	10.0	10.0	10.0	10.0
19	10.3	10.3	10.3	10.6	10.6	10.6	10.6	10.3	10.0	10.0	10.0	10.0
20	10.3	10.3	10.6	10.6	10.8	10.8	10.6	10.3	10.0	10.0	10.0	10.3
21	10.3	10.3	10.6	10.6	10.8	10.6	10.6	10.3	10.3	10.3	10.3	10.3
22	10.6	10.6	10.8	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1	11.1
23	11.1	11.1	11.1	11.1	11.4	11.4	11.4	11.1	11.1	11.1	11.1	11.1
24	11.4	11.6	11.6	11.6	11.9	11.9	11.6	11.6	11.4	11.4	11.4	11.4
25	11.6	11.6	11.6	11.6	11.9	11.6	11.4	11.4	11.1	11.1	11.1	11.1
26	11.1	11.4	11.4	11.4	11.4	11.4	11.1	11.1	11.1	11.1	11.1	11.1
27	11.1	11.1	11.1	11.1	11.4	11.1	11.1	10.8	10.6	10.6	10.6	10.6
28	10.6	10.8	10.8	11.1	11.1	11.1	11.1	10.8	10.6	10.6	10.6	10.6
29	10.6	10.8	10.8	11.1	11.1	11.1	11.1	11.1	11.6	12.2	12.4	12.4
30	12.4	12.4	12.4	12.7	12.7	12.7	12.4	12.4	12.4	12.4	12.4	12.4
31	12.4	12.4	12.4	12.4	12.4	12.4	12.2	11.9	11.6	11.6	11.6	11.6

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 13 RIO CHIVE AT LA COLMENA
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	11.6	11.9	11.9	12.2	12.2	12.2	11.9	11.9	11.9	12.2	12.2	12.4
2	12.4	12.4	12.4	12.7	12.7	12.7	12.4	12.4	13.8	13.3	14.6	15.7
3	16.0	16.0	16.0	15.7	16.0	16.3	16.6	17.2	17.2	17.2	17.5	17.5
4	17.5	17.5	17.2	17.2	16.9	16.6	16.0	15.7	15.5	15.2	15.2	15.2
5	15.2	15.2	15.2	15.2	15.2	14.9	14.6	14.6	14.4	14.4	14.4	14.4
6	14.4	14.4	14.6	14.6	14.6	14.6	14.6	14.6	15.2	15.2	15.5	16.3
7	16.9	17.7	18.0	18.6	19.2	18.9	18.9	21.0	21.0	21.3	21.6	21.6
8	21.6	21.6	21.6	21.6	21.9	21.9	21.9	21.6	21.6	21.6	21.6	21.6
9	21.6	21.3	21.0	20.7	20.4	19.8	19.5	19.2	18.9	18.9	19.2	19.2
10	19.5	19.5	19.2	18.9	18.6	18.3	18.6	18.6	18.6	18.6	18.6	18.6
11	18.6	18.6	18.6	18.3	18.3	18.0	17.7	17.7	17.7	17.7	17.7	17.7
12	17.7	17.7	17.7	17.5	17.5	17.2	17.2	16.9	16.9	17.5	17.5	17.5
13	17.5	17.5	17.5	17.5	17.5	17.5	17.2	17.2	17.2	17.2	16.9	16.9
14	16.6	16.6	16.6	16.3	16.3	16.0	15.7	15.5	15.5	15.5	15.7	15.7
15	15.7	15.7	15.7	15.7	15.5	15.2	15.2	14.9	14.9	14.9	15.2	15.5
16	15.7	16.3	16.9	17.5	17.7	17.7	17.7	17.5	17.2	17.2	16.9	16.9
17	16.9	16.6	16.3	16.3	16.0	16.0	15.7	15.5	15.5	15.7	15.7	15.7
18	15.7	15.7	15.7	15.7	16.0	16.0	16.0	16.0	16.3	16.3	16.3	16.3
19	16.3	16.3	16.3	16.6	16.6	16.3	16.3	16.0	16.0	16.0	16.0	16.0
20	16.0	16.0	16.0	16.0	16.0	15.7	15.7	15.5	15.2	15.2	15.5	15.5
21	15.5	15.5	15.7	15.7	15.7	15.7	16.0	16.0	16.6	17.5	17.7	18.0
22	18.6	18.9	18.9	18.9	19.2	19.5	19.8	20.1	20.4	20.4	20.4	20.4
23	20.1	20.1	19.8	19.5	19.5	19.2	19.2	18.9	18.9	18.9	18.9	18.9
24	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	18.9	19.2
25	19.5	20.1	20.7	21.6	22.5	22.8	23.1	23.1	23.1	22.8	22.8	22.5
26	22.5	22.2	22.2	22.2	22.2	21.9	21.9	21.9	21.6	21.6	21.6	21.6
27	21.6	21.6	21.3	21.3	21.3	21.0	21.0	20.4	20.4	20.4	20.4	20.4
28	20.4	20.4	20.1	20.1	20.1	19.8	20.4	20.4	20.4	20.4	20.4	20.4
29*	20.4	20.4	20.4	20.1	20.1	19.8	19.5	18.9	19.2	20.1	20.1	20.7
30*	21.0	21.3	21.0	21.0	21.3	21.3	21.3	23.4	26.7	30.6	35.4	36.6

*SPECIAL POINTS
 29 1830/19.2
 30 1545/21.3 2310/36.6

RIVER GAGE DATA
 STA. NO. 13 RIO CHIVE AT LA COLMENA
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	35.7	35.7	36.0	36.3	36.9	37.5	37.5	37.5	37.8	37.8	37.2	36.9
2	36.3	35.7	34.8	33.9	33.0	32.1	31.2	30.3	29.7	29.7	29.4	29.7
3	29.4	29.7	30.3	30.9	32.1	32.4	33.3	33.9	34.8	35.4	36.3	36.9
4	37.5	37.8	38.1	38.4	38.8	38.8	38.8	38.8	39.1	39.4	39.4	39.4
5	39.4	39.4	39.1	39.1	39.1	39.1	38.8	38.8	38.4	38.1	37.5	36.9
6	36.3	35.4	35.1	34.2	33.6	33.0	32.7	32.1	31.5	31.2	31.2	30.9
7	30.6	30.3	30.0	29.7	29.4	29.4	29.4	29.4	29.7	30.3	30.6	31.2
8	32.1	32.7	33.6	34.5	36.0	37.5	38.8	39.4	40.0	40.0	39.7	39.1
9	38.4	37.8	37.2	36.9	36.6	36.0	36.0	36.0	36.0	36.0	35.7	35.7
10	35.7	35.7	35.7	35.7	35.7	35.4	34.5	34.8	35.7	37.5	39.7	41.7
11	43.8	45.9	49.2	52.3	55.5	58.0	59.3	62.3	65.9	69.2	70.1	70.1
12	78.0	82.2	85.6	89.1	95.3	100.	113.	124.	139.	150.	163.	175.
13	190.	203.	216.	227.	239.	250.	261.	271.	283.	295.	309.	316.
14	324.	331.	336.	345.	352.	360.	365.	370.	378.	380.	391.	393.
15	397.	399.	399.	399.	397.	395.	393.	393.	395.	391.	385.	374.
16	370.	363.	360.	351.	345.	340.	334.	327.	320.	315.	304.	295.
17	285.	278.	271.	264.	257.	251.	246.	243.	240.	237.	233.	232.
18	226.	218.	212.	205.	199.	194.	188.	183.	178.	176.	175.	175.
19	177.	180.	183.	189.	195.	200.	206.	214.	219.	225.	230.	236.
20	239.	244.	247.	251.	254.	257.	257.	255.	254.	251.	247.	241.
21	236.	230.	222.	214.	206.	199.	192.	184.	176.	170.	164.	158.
22	152.	148.	145.	142.	140.	139.	140.	140.	141.	143.	144.	146.
23	149.	152.	155.	158.	161.	162.	162.	162.	161.	158.	157.	155.
24	153.	151.	149.	146.	144.	141.	138.	134.	129.	125.	120.	116.
25	112.	108.	105.	101.	97.2	94.0	91.5	90.9	89.7	89.1	88.5	89.1
26	90.9	92.1	93.4	93.4	92.7	90.3	87.9	86.2	83.3	80.6	78.5	77.0
27	76.0	75.5	76.0	77.0	78.0	79.5	80.6	82.2	83.9	85.6	87.9	90.9
28	94.6	99.1	103.	108.	113.	118.	120.	123.	123.	123.	123.	122.
29	120.	117.	115.	112.	109.	105.	102.	99.8	96.5	94.0	91.5	89.1
30	86.7	84.5	82.2	80.1	78.5	76.0	74.5	73.0	72.0	70.6	68.7	67.3
31	65.9	64.1	63.2	61.9	61.0	59.7	58.8	58.0	57.2	55.9	55.1	54.3

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 13 RIO CHIVE AT LA COLMENA
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	53.1	52.7	51.9	51.1	50.7	50.0	49.2	48.8	48.1	47.3	46.6	46.2
2	45.5	44.8	44.5	44.1	43.8	43.4	43.1	42.7	42.4	42.4	42.0	41.7
3	41.4	41.0	41.0	40.7	40.4	40.0	39.7	39.4	39.4	41.4	42.7	43.4
4	44.1	45.5	46.6	48.1	50.0	51.9	53.9	54.7	55.5	55.9	56.3	56.3
5	56.3	56.7	57.2	58.0	59.3	61.4	63.7	66.4	70.1	73.0	76.5	81.1
6	86.2	92.1	97.8	102.	107.	109.	113.	116.	118.	119.	120.	120.
7	121.	121.	121.	121.	121.	121.	120.	120.	119.	117.	115.	113.
8*	111.	109.	106.	103.	101.	98.5	95.9	93.4	94.6	91.5	88.5	86.2
9	84.5	82.8	82.2	82.2	83.3	83.9	83.9	83.9	83.3	82.8	83.3	85.0
10	90.3	99.8	112.	123.	138.	150.	165.	178.	194.	206.	221.	232.
11	241.	251.	260.	269.	275.	282.	287.	293.	299.	307.	307.	306.
12	311.	316.	318.	320.	324.	325.	329.	333.	331.	329.	324.	318.
13	311.	313.	320.	342.	399.	630.	1230.	2250.	2600.	2750.	2750.	2600.
14	2550.	2360.	2180.	2000.	1870.	1760.	1650.	1530.	1440.	1350.	1270.	1200.
15	1140.	1100.	1050.	1020.	996.	970.	943.	928.	908.	889.	870.	850.
16	834.	819.	810.	807.	793.	777.	761.	747.	733.	717.	701.	681.
17*	656.	634.	612.	588.	569.	548.	525.	508.	510.	516.	483.	467.
18	457.	459.	469.	477.	475.	463.	443.	414.	387.	358.	336.	313.
19	292.	274.	260.	246.	234.	225.	213.	205.	200.	195.	190.	187.
20	180.	174.	168.	162.	155.	149.	145.	141.	139.	138.	137.	139.
21	140.	144.	148.	154.	164.	172.	183.	196.	200.	219.	230.	241.
22	243.	254.	260.	263.	264.	263.	261.	258.	255.	251.	247.	241.
23	236.	232.	229.	229.	223.	221.	217.	216.	216.	216.	217.	218.
24*	218.	217.	214.	210.	205.	200.	195.	190.	219.	541.	604.	715.
25	628.	539.	451.	393.	361.	334.	318.	299.	288.	283.	288.	307.
26	340.	391.	489.	650.	850.	966.	1030.	1050.	1050.	1040.	1020.	993.
27	973.	949.	931.	913.	891.	872.	850.	829.	807.	784.	765.	742.
28	719.	699.	676.	652.	632.	610.	586.	575.	552.	531.	510.	487.
29	465.	445.	425.	408.	391.	374.	358.	343.	329.	315.	302.	287.
30	275.	263.	251.	241.	232.	222.	212.	204.	196.	187.	180.	173.
31	166.	158.	153.	148.	144.	139.	134.	130.	127.	123.	121.	119.

*SPECIAL POINTS

8	1730/92.1
17	1720/497. 1850/550.
24	1725/187.

RIVER GAGE DATA
 STA. NO. 13 RIO CHIVE AT LA COLMENA
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	115.	114.	111.	109.	108.	107.	106.	105.	104.	104.	105.	106.
2	108.	110.	112.	113.	114.	112.	111.	109.	107.	105.	103.	101.
3	99.1	97.8	95.9	95.3	94.0	93.4	92.7	92.7	92.7	92.7	93.4	93.4
4	93.4	93.4	93.4	92.7	92.7	91.5	90.9	90.3	90.3	89.7	89.1	87.9
5	87.3	86.2	84.5	83.9	82.2	81.1	80.1	79.0	78.5	77.5	77.5	76.5
6	76.0	75.0	74.0	73.0	72.0	71.6	70.6	69.2	68.7	67.3	66.8	65.9
7	65.0	64.1	63.7	63.2	62.2	62.3	62.3	61.9	61.9	61.0	60.6	60.1
8	59.7	59.7	59.3	58.8	58.8	58.4	58.4	58.0	58.0	57.0	57.2	56.7
9	56.3	55.9	55.9	55.5	55.5	54.7	54.3	53.9	53.5	53.1	52.7	52.3
10	51.9	51.9	51.9	51.5	51.5	51.5	51.1	51.1	51.5	51.5	52.3	53.9
11	55.5	58.4	61.9	67.8	74.0	81.1	89.1	98.5	108.	117.	124.	131.
12	138.	143.	146.	150.	153.	154.	154.	152.	150.	146.	142.	137.
13	133.	128.	126.	123.	123.	123.	123.	125.	127.	129.	133.	136.
14	139.	142.	144.	148.	150.	153.	156.	158.	159.	161.	161.	159.
15	154.	158.	156.	154.	153.	151.	150.	148.	146.	144.	142.	139.
16	136.	133.	129.	126.	123.	120.	117.	113.	109.	107.	104.	102.
17	90.5	95.9	92.7	90.3	87.9	86.2	83.9	81.7	80.1	78.5	76.5	75.0
18	73.5	72.0	70.6	68.7	67.8	66.4	65.0	64.1	62.8	62.3	61.0	60.1
19	54.3	58.0	57.2	55.9	55.5	54.7	54.3	53.9	53.5	53.1	52.3	51.9
20	51.5	51.1	50.3	50.0	49.6	49.2	48.8	48.4	48.1	47.7	47.7	47.3
21	47.0	46.6	46.2	45.9	45.9	45.5	45.2	44.8	44.5	44.5	44.5	44.1
22	44.1	43.8	43.4	43.1	42.7	42.7	43.1	43.1	43.1	42.7	42.7	42.7
23	42.7	42.4	42.4	42.0	41.7	41.7	41.4	41.0	41.0	41.0	40.7	40.7
24	40.7	40.7	40.7	40.7	41.0	42.0	43.8	46.2	48.4	52.3	57.2	62.8
25	69.6	75.0	80.1	84.5	87.9	90.9	93.4	94.0	94.6	94.0	94.0	93.4
26	93.4	95.3	97.2	100.	105.	110.	116.	121.	127.	133.	138.	143.
27	148.	150.	154.	155.	156.	155.	153.	150.	146.	141.	135.	128.
28	123.	117.	112.	107.	103.	99.1	95.3	91.5	88.5	86.2	83.3	80.6
29	74.0	75.5	73.5	71.1	69.2	66.8	65.0	63.2	61.9	60.6	59.7	58.0
30*	56.3	55.1	53.9	53.5	53.1	52.3	51.9	51.5	56.7	55.9	55.9	56.7

*SPECIAL POINTS
 30 1540/51.5

RIVER GAGE DATA
 STA. NO. 13 RIO CHIVE AT LA COLMENA
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		10.9	12.0	36.9	50.0	108.
2		10.9	13.0	32.5	43.6	109.
3		10.8	16.5	32.6	40.8	94.8
4		10.8	16.4	38.6	51.0	91.5
5		10.8 E	14.8	38.7	63.9	81.7
6		10.9 E	14.8	33.4	107.	71.3
7		11.1	19.3	30.0	119.	62.7
8		11.2	21.7	36.6	99.3	58.5
9		12.2	20.1	36.7	83.6	54.7
10	M	12.3	18.8	36.2	153.	51.7
11	11.8	12.0	18.1	57.2	278.	85.6
12	11.8	11.9	17.4	112.	323.	147.
13	12.0	11.6	17.3	249.	1280.	128.
14	12.1	11.2	16.0	357.	1830.	151.
15	12.1	11.1	15.3	394.	990.	151.
16	12.1 E	10.8	17.0	339.	773.	120.
17	12.1 E	10.7	16.0	256.	562.	86.8
18	12.1	10.4	16.0	197.	428.	66.9
19	12.0	10.3	16.2	202.	233.	55.3
20	11.9	10.4	15.7	249.	154.	49.3
21	11.8	10.4	16.2	200.	178.	45.5
22	11.6	11.0	19.5	144.	255.	43.2
23	11.6	11.2	19.4	157.	224.	41.6
24	11.5	11.6	18.9	139.	289.	45.5
25	11.4	11.4	21.9	97.6	386.	86.1
26	11.3	11.2	22.0	87.7	793.	113.
27	11.2	11.0	21.0	80.6	870.	148.
28	11.1	10.8	20.3	113.	614.	101.
29	10.9	11.3	20.0	106.	379.	67.9
30	10.9	12.5	24.3	77.2	225.	54.5
31		12.1		60.2	141.	

RIVER GAGE DATA

NAME: Sta. No. 14 Río Tigre at Las Piedritas.

LOCATION: Longitude 63° 21.7' W, latitude 08° 57.2' N. Approximately 14.7 km SE of Oritupano, 1.2 km SSE of Las Piedritas.

DRAINAGE AREA: 1655 sq mi (from topographic map).

GAGE: Stevens Type A35 water level recorder free-standing on left bank with intake pipe extending to river.

RECORDS AVAILABLE: April 11, 1969 through September 30, 1969.

REMARKS: Record is fair to good.

CODING: M signifies missing data; E signifies estimated data.



Aerial view of the confluence of the Río Oritupano, the light colored sediment-laden stream on the right of the photograph, and the Río Tigre, the dark colored clear-water stream coming from the upper right-hand corner of the photograph. The gaging site is immediately below the confluence at the point where the trails meet the river.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 14 RIO TIGRE AT LAS PIEDRITAS

Meas. No.	Date	Made by	Width ft	Area sq ft	Mean Velocity fps	Inside Gage Height ft	Dis-charge cfs	Shift Adj. ft	Per- cent Diff.	Method	Num- ber Meas. Sec- tions	Gage Height Change ft	Time hr	Water Temp. °F
1	May 27	Romero	100.	379.	1.91	1.53	722.	0	-1.8	Boat	19	0	1.0	89
2	28	Romero	100.	336.	1.87	1.52	628.	0	-14.3	Boat	20	0	1.0	90
3	June 4	Romero	116.	427.	1.89	1.73	806.	0	+0.1	Boat	25	0	1.6	88
4	5	Romero	116.	438.	1.88	1.71	822.	0	+2.9	Boat	26	0	1.3	84
5	12	Santae11a	114.	427.	1.88	1.74	803.	0	-0.8	Boat	22	-.01	1.2	81
6	25	Romero	118.	467.	2.03	2.11	947.	0	+2.6	Boat	25	0	1.2	84
7	July 14	Santos	133.	714.	2.48	4.42	1770.	0	-3.4	Boat	23	-.04	1.2	-
8	15	Santos	130.	678.	2.54	3.84	1720.	0	+9.6	Boat	23	-.02	1.6	82
9	29	Romero	128.	663.	2.50	3.90	1660.	0	+4.3	Boat	26	-.04	2.2	81
10	Aug. 5	Santos	119.	622.	2.28	3.46	1420.	0	+1.4	Boat	22	0	1.2	80
11	13	Tirado	132.	749.	2.40	4.25	1800.	0	+2.7	Boat	23	+.02	1.1	78
12	14	Romero	134.	842.	2.28	4.60	1920.	0	+0.7	Boat	23	+.03	1.0	-
13	15	Romero	138.	864.	2.44	4.98	2110.	0	+0.9	Boat	24	0	0.9	79
14	16	Romero	139.	952.	2.48	5.53	2360.	0	-0.2	Boat	24	+.06	1.1	80
15	17	Romero	153.	1330.	3.26	8.64	4330.	0	-5.0	Boat	21	+.16	1.2	-
16	18	Romero	163.	1480.	3.63	9.12	5370.	0	+4.8	Boat	22	-.03	0.9	-
17	19	Santae11a	152.	1330.	3.22	8.13	4280.	0	+4.5	Boat	23	-.06	1.0	79
18	21	Romero	143.	1210.	2.59	6.85	3130.	0	+0.1	Boat	25	-.04	1.3	82
19	26	Romero	137.	950.	2.34	5.30	2220.	0	-1.3	Boat	21	-.02	1.7	84
20	Sept. 2	Santae11a	128.	779.	2.27	4.15	1770.	0	+3.8	Boat	27	-.02	1.1	77
21	11	Romero	126.	732.	2.17	4.07	1590.	0	-4.8	Boat	24	0	1.2	-
22	17	Romero	122.	548.	1.82	2.67	999.	0	-8.8	Boat	25	0	1.0	-
23	23	Romero	122.	538.	1.84	2.42	988.	0	-2.7	Boat	26	0	1.1	-
24	29	Romero	123.	532.	1.92	2.37	1020.	0	+1.9	Boat	26	0	1.2	-

RATING TABLE
FOR
STA. NO. 14 RIO TIGRE AT LAS PIEDRITAS

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
1.00		3.00	1210.	5.00	2100.	7.00	3225.	9.00	4960.
.10		.10	1250.	.10	2150.	.10	3295.	.10	5095.
.20		.20	1290.	.20	2200.	.20	3365.	.20	5240.
.30		.30	1330.	.30	2250.	.30	3435.	.30	5395.
.40	685.	.40	1370.	.40	2300.	.40	3510.	.40	
.50	725.	.50	1415.	.50	2350.	.50	3585.	.50	
.60	760.	.60	1460.	.60	2400.	.60	3660.	.60	
.70	795.	.70	1505.	.70	2450.	.70	3740.	.70	
.80	830.	.80	1550.	.80	2500.	.80	3820.	.80	
.90	860.	.90	1595.	.90	2555.	.90	3900.	.90	
2.00	890.	4.00	1640.	6.00	2610.	8.00	3985.	10.00	
.10	920.	.10	1685.	.10	2670.	.10	4070.	.10	
.20	950.	.20	1730.	.20	2730.	.20	4155.	.20	
.30	980.	.30	1775.	.30	2790.	.30	4245.	.30	
.40	1010.	.40	1820.	.40	2850.	.40	4335.	.40	
.50	1040.	.50	1865.	.50	2910.	.50	4425.	.50	
.60	1070.	.60	1910.	.60	2970.	.60	4520.	.60	
.70	1105.	.70	1955.	.70	3030.	.70	4615.	.70	
.80	1140.	.80	2000.	.80	3095.	.80	4720.	.80	
.90	1175.	.90	2050.	.90	3160.	.90	4835.	.90	

RIVER GAGE DATA
 STA. NO. 14 RIO TIGRE AT LAS PIEDRITAS
 APRIL 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
11	M	M	M	M	M	710.	710.	710.	706.	702.	702.	702.
12	706.	706.	706.	706.	710.	710.	710.	710.	706.	706.	706.	706.
13	706.	706.	710.	710.	710.	710.	710.	710.	710.	710.	710.	710.
14	710.	710.	710.	714.	714.	714.	714.	714.	710.	710.	710.	710.
15	710.	710.	710.	710.	714.	718.	718.	714.	710.	710.	710.	710.
16	710.	710.	710.	710.	710.	710.	710.	710.	710.	710.	710.	710.
17	710.	710.	710.	710.	710.	710.	710.	710.	706.	706.	706.	706.
18	706.	706.	706.	706.	710.	710.	710.	706.	706.	706.	702.	702.
19	702.	702.	702.	706.	706.	706.	706.	702.	698.	698.	698.	698.
20	698.	698.	702.	702.	702.	702.	702.	698.	694.	689.	689.	689.
21	689.	689.	694.	694.	694.	694.	694.	689.	689.	689.	689.	689.
22	689.	689.	689.	694.	694.	694.	694.	689.	689.	689.	689.	689.
23	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.
24	689.	689.	689.	689.	689.	694.	694.	694.	689.	689.	689.	689.
25	689.	689.	689.	689.	689.	694.	694.	694.	694.	694.	689.	689.
26	689.	689.	689.	689.	689.	694.	694.	694.	694.	694.	694.	694.
27	694.	694.	694.	694.	694.	694.	694.	694.	694.	694.	689.	689.
28	689.	689.	689.	689.	689.	694.	694.	694.	689.	689.	689.	689.
29	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.
30	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 14 RIO TIGRE AT LAS PIEDRITAS
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	689.	689.	689.	694.	694.	694.	694.	694.	694.	689.	689.	689.
2	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.
3	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.
4	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.
5	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.
6	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.	689.
7	689.	689.	689.	689.	694.	694.	694.	694.	694.	694.	694.	694.
8	694.	694.	694.	694.	694.	694.	698.	698.	698.	698.	698.	698.
9	698.	702.	702.	702.	706.	710.	710.	710.	710.	710.	710.	710.
10	710.	710.	710.	710.	710.	710.	710.	710.	710.	710.	710.	710.
11	710.	710.	710.	710.	714.	714.	714.	714.	714.	714.	714.	714.
12	714.	714.	714.	714.	714.	718.	718.	718.	718.	718.	718.	718.
13	718.	718.	718.	718.	718.	718.	718.	718.	718.	718.	718.	718.
14	718.	718.	718.	718.	718.	721.	721.	721.	721.	721.	721.	721.
15	721.	721.	721.	721.	725.	725.	725.	721.	721.	721.	721.	721.
16	721.	721.	721.	721.	725.	725.	725.	725.	721.	721.	721.	721.
17	721.	721.	721.	721.	721.	721.	721.	721.	721.	721.	721.	721.
18	721.	721.	721.	721.	721.	721.	721.	721.	718.	718.	718.	718.
19	718.	718.	718.	718.	718.	718.	718.	718.	718.	718.	718.	718.
20	718.	718.	718.	718.	718.	718.	721.	721.	721.	721.	721.	721.
21	721.	721.	721.	721.	721.	721.	721.	721.	721.	721.	721.	721.
22	721.	721.	721.	721.	721.	721.	721.	721.	721.	721.	721.	721.
23	721.	721.	721.	721.	721.	721.	721.	721.	721.	721.	721.	721.
24	721.	721.	721.	721.	725.	725.	725.	725.	725.	725.	725.	725.
25	725.	725.	729.	729.	729.	729.	729.	732.	732.	732.	732.	732.
26	732.	732.	732.	736.	736.	736.	736.	736.	736.	736.	736.	736.
27	736.	736.	736.	736.	736.	736.	736.	732.	732.	732.	732.	732.
28	732.	732.	732.	732.	732.	732.	732.	732.	732.	732.	732.	732.
29	732.	732.	732.	732.	732.	732.	732.	732.	750.	750.	753.	753.
30	757.	760.	760.	763.	770.	774.	777.	781.	784.	791.	799.	806.
31	813.	816.	820.	823.	823.	823.	823.	823.	820.	816.	813.	813.

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 14 RIO TIGRE AT LAS PIEDRITAS
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	809.	806.	806.	806.	806.	806.	806.	806.	806.	806.	806.	806.
2	802.	802.	802.	802.	799.	799.	795.	795.	795.	791.	791.	791.
3	791.	791.	795.	795.	795.	799.	799.	799.	799.	802.	802.	802.
4	802.	802.	802.	806.	806.	806.	806.	806.	806.	806.	802.	802.
5	802.	802.	802.	799.	799.	795.	813.	809.	809.	806.	806.	806.
6	806.	806.	806.	802.	802.	806.	809.	813.	827.	827.	833.	836.
7	839.	842.	842.	842.	842.	842.	839.	839.	839.	839.	839.	839.
8	839.	839.	839.	836.	836.	836.	836.	836.	833.	833.	833.	833.
9	836.	839.	845.	851.	854.	857.	860.	857.	854.	854.	854.	854.
10	851.	851.	848.	848.	845.	845.	845.	842.	839.	839.	836.	836.
11	836.	833.	833.	830.	830.	830.	830.	827.	827.	823.	823.	820.
12	820.	820.	816.	816.	816.	809.	809.	806.	802.	802.	799.	799.
13	802.	806.	813.	816.	823.	830.	833.	836.	839.	842.	842.	842.
14	842.	842.	842.	845.	845.	845.	842.	842.	839.	836.	836.	833.
15	833.	830.	830.	827.	827.	823.	823.	820.	820.	813.	809.	809.
16	806.	806.	802.	802.	799.	799.	799.	795.	795.	791.	791.	791.
17	791.	791.	791.	791.	791.	791.	791.	791.	791.	788.	788.	788.
18	788.	788.	788.	788.	788.	788.	791.	791.	791.	791.	791.	791.
19*	791.	795.	795.	816.	816.	816.	816.	816.	820.	820.	820.	823.
20	823.	827.	827.	830.	836.	839.	842.	848.	851.	854.	854.	857.
21	857.	860.	860.	860.	860.	863.	863.	863.	869.	869.	872.	872.
22	878.	884.	887.	896.	902.	908.	914.	920.	929.	932.	932.	935.
23	938.	938.	938.	938.	941.	941.	938.	935.	935.	932.	929.	929.
24	926.	923.	920.	920.	917.	917.	917.	917.	917.	917.	917.	917.
25	917.	917.	917.	920.	923.	923.	923.	920.	920.	917.	917.	914.
26	914.	914.	917.	917.	920.	920.	920.	923.	923.	926.	926.	926.
27	926.	926.	926.	926.	926.	926.	926.	926.	926.	926.	923.	923.
28	923.	920.	917.	917.	914.	914.	911.	908.	905.	902.	899.	896.
29	893.	890.	887.	887.	884.	884.	881.	881.	878.	878.	875.	872.
30*	872.	869.	869.	866.	863.	863.	860.	923.	929.	932.	932.	932.

*SPECIAL POINTS

19	0715/795.	0725/816.
30	1440/860.	1550/923.

RIVER GAGE DATA
 STA. NO. 14 RIO TIGRE AT LAS PIEDRITAS
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	929.	923.	917.	911.	908.	905.	902.	902.	899.	896.	893.	887.
2	887.	887.	884.	887.	887.	896.	899.	902.	902.	899.	896.	893.
3*	890.	887.	887.	887.	887.	887.	887.	887.	935.	947.	956.	959.
4	962.	962.	962.	962.	959.	956.	950.	944.	938.	935.	932.	932.
5	932.	932.	932.	935.	935.	935.	938.	938.	938.	941.	941.	938.
6	935.	935.	935.	935.	935.	935.	935.	935.	938.	941.	932.	926.
7	920.	917.	914.	908.	905.	902.	899.	896.	893.	890.	887.	884.
8	881.	881.	878.	878.	875.	875.	875.	875.	875.	872.	872.	872.
9*	872.	872.	872.	872.	869.	869.	884.	881.	881.	884.	887.	887.
10*	890.	893.	893.	896.	896.	896.	899.	899.	929.	932.	941.	947.
11*	950.	956.	959.	962.	965.	1030.	1040.	1050.	1060.	1060.	1060.	1070.
12*	1070.	1080.	1150.	1180.	1200.	1270.	1290.	1370.	1430.	1460.	1470.	1480.
13*	1500.	1530.	1550.	1570.	1590.	1610.	1670.	1690.	1720.	1750.	1770.	1790.
14*	1820.	1840.	1850.	1860.	1860.	1850.	1840.	1820.	1800.	1760.	1730.	1700.
15*	1670.	1640.	1630.	1610.	1600.	1580.	1560.	1570.	1570.	1570.	1570.	1560.
16*	1560.	1560.	1550.	1550.	1540.	1550.	1550.	1560.	1600.	1620.	1640.	1670.
17*	1680.	1700.	1720.	1730.	1740.	1810.	1820.	1820.	1830.	1840.	1860.	1880.
18	1900.	1920.	1950.	1980.	2000.	2020.	2030.	2040.	2040.	2050.	2050.	2050.
19*	2050.	2050.	2050.	2050.	2050.	2050.	2050.	2040.	2040.	2040.	2030.	2030.
20*	2020.	2010.	2010.	2000.	2000.	1980.	1970.	1940.	1920.	1900.	1890.	1870.
21*	1860.	1840.	1830.	1820.	1810.	1800.	1790.	1790.	1780.	1770.	1760.	1750.
22	1740.	1740.	1740.	1730.	1730.	1730.	1730.	1730.	1720.	1720.	1720.	1720.
23	1730.	1730.	1730.	1730.	1730.	1740.	1740.	1750.	1750.	1750.	1750.	1760.
24	1760.	1770.	1770.	1770.	1780.	1780.	1790.	1800.	1810.	1810.	1810.	1810.
25	1810.	1810.	1810.	1810.	1800.	1790.	1770.	1770.	1760.	1760.	1750.	1740.
26	1740.	1730.	1720.	1720.	1700.	1700.	1690.	1680.	1680.	1680.	1670.	1670.
27	1670.	1660.	1660.	1660.	1660.	1660.	1660.	1660.	1660.	1660.	1660.	1660.
28	1660.	1660.	1660.	1660.	1660.	1660.	1670.	1670.	1670.	1670.	1670.	1670.
29	1670.	1670.	1660.	1650.	1630.	1610.	1590.	1580.	1560.	1550.	1540.	1530.
30	1520.	1510.	1500.	1490.	1470.	1470.	1460.	1440.	1430.	1420.	1410.	1400.
31	1400.	1390.	1380.	1370.	1370.	1360.	1360.	1360.	1350.	1350.	1340.	1330.

*SPECIAL POINTS

3	1615/887.	1630/929.										
9	1225/914.											
10	1610/899.	1630/947.		1700/926.								
11	1055/968.	1115/1030.		1310/1030.	1320/1040.	1500/1050.						
12	1100/1210.	1105/1270.		1545/1290.								
13	1330/1630.											
14	1950/1770.											
15	1450/1560.	1500/1590.										
16	1620/1570.	1645/1590.										
17	1150/1750.											
19	1255/2050.	1300/2060.										
20	1515/1960.	1520/1950.										
21	2145/1770.	2150/1760.										

RIVER GAGE DATA
 STA. NO. 14 RIO TIGRE AT LAS PIEDRITAS
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	1330.	1330.	1320.	1320.	1310.	1300.	1300.	1290.	1280.	1280.	1270.	1270.
2	1260.	1260.	1250.	1250.	1250.	1240.	1230.	1230.	1230.	1220.	1210.	1210.
3*	1200.	1200.	1200.	1190.	1190.	1190.	1270.	1190.	1250.	1250.	1260.	1270.
4	1280.	1290.	1300.	1310.	1320.	1330.	1340.	1340.	1350.	1360.	1360.	1370.
5	1370.	1380.	1380.	1390.	1400.	1400.	1400.	1380.	1370.	1370.	1360.	1360.
6	1350.	1350.	1340.	1340.	1330.	1330.	1320.	1320.	1310.	1300.	1300.	1290.
7	1280.	1280.	1270.	1270.	1270.	1260.	1260.	1260.	1250.	1250.	1250.	1250.
8	1250.	1250.	1250.	1250.	1260.	1260.	1260.	1260.	1260.	1270.	1270.	1270.
9	1280.	1280.	1290.	1300.	1340.	1360.	1380.	1400.	1410.	1450.	1480.	1500.
10	1530.	1550.	1560.	1560.	1560.	1550.	1520.	1500.	1490.	1480.	1470.	1460.
11	1450.	1450.	1450.	1450.	1450.	1450.	1450.	1440.	1430.	1420.	1410.	1400.
12	1380.	1370.	1370.	1360.	1360.	1350.	1350.	1350.	1350.	1360.	1390.	1440.
13	1500.	1550.	1590.	1630.	1660.	1700.	1730.	1760.	1770.	1790.	1810.	1820.
14	1830.	1840.	1860.	1870.	1880.	1920.	1940.	1950.	1960.	1980.	2000.	2010.
15	2030.	2050.	2060.	2070.	2080.	2090.	2090.	2090.	2090.	2070.	2060.	2040.
16	2030.	2040.	2070.	2190.	2270.	2340.	2380.	2450.	2510.	2550.	2620.	2700.
17	2840.	3080.	3400.	3770.	4110.	4410.	4630.	4850.	5030.	5140.	5230.	5260.
18	5240.	5230.	5200.	5120.	5050.	4970.	4880.	4790.	4720.	4670.	4590.	4510.
19	4430.	4350.	4290.	4230.	4150.	4080.	4000.	3930.	3890.	3840.	3790.	3740.
20	3690.	3650.	3610.	3580.	3540.	3510.	3470.	3440.	3410.	3370.	3340.	3320.
21	3290.	3260.	3220.	3190.	3170.	3130.	3100.	3060.	3020.	2980.	2950.	2900.
22	2860.	2810.	2770.	2720.	2680.	2630.	2590.	2570.	2530.	2490.	2460.	2430.
23*	2410.	2390.	2370.	2350.	2330.	2310.	2290.	2260.	2300.	2340.	2340.	2370.
24	2410.	2450.	2470.	2490.	2510.	2510.	2500.	2480.	2440.	2410.	2380.	2360.
25	2350.	2350.	2350.	2350.	2350.	2350.	2350.	2350.	2350.	2350.	2340.	2320.
26	2320.	2300.	2290.	2280.	2270.	2250.	2230.	2220.	2210.	2190.	2190.	2180.
27	2180.	2180.	2180.	2170.	2180.	2180.	2210.	2230.	2250.	2250.	2250.	2250.
28	2250.	2250.	2240.	2230.	2220.	2200.	2180.	2160.	2120.	2110.	2100.	2100.
29	2110.	2120.	2130.	2140.	2150.	2180.	2200.	2220.	2230.	2250.	2250.	2260.
30	2270.	2280.	2280.	2280.	2290.	2290.	2280.	2260.	2240.	2220.	2200.	2180.
31	2170.	2150.	2140.	2120.	2100.	2080.	2060.	2040.	2020.	2000.	1980.	1960.

*SPECIAL POINTS
 3 1350/1180. 1450/1190. 1715/1190. 1755/1330. 1820/1230.
 23 1715/2260. 1900/2340.

RIVER GAGE DATA
 STA. NO. 14 RIO TIGRE AT LAS PIEDRITAS
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400	
1	1950.	1930.	1910.	1900.	1890.	1870.	1860.	1840.	1820.	1810.	1800.	1790.	
2	1770.	1760.	1750.	1730.	1730.	1710.	1700.	1680.	1670.	1660.	1650.	1640.	
3	1630.	1630.	1630.	1630.	1620.	1620.	1610.	1600.	1610.	1600.	1600.	1600.	
4	1590.	1590.	1580.	1560.	1550.	1540.	1530.	1520.	1510.	1500.	1480.	1470.	
5*	1470.	1460.	1450.	1440.	1430.	1420.	1420.	1410.	1400.	1400.	1460.	1490.	
6	1510.	1530.	1550.	1550.	1550.	1550.	1540.	1520.	1510.	1500.	1500.	1510.	
7	1510.	1510.	1500.	1500.	1500.	1490.	1480.	1470.	1460.	1450.	1440.	1420.	
8	1410.	1390.	1390.	1370.	1370.	1360.	1350.	1340.	1340.	1330.	1330.	1330.	
9*	1320.	1320.	1310.	1310.	1300.	1300.	1310.	1310.	1460.	1510.	1550.	1580.	
10	1600.	1620.	1630.	1640.	1640.	1640.	1640.	1640.	1640.	1640.	1650.	1650.	
11	1650.	1660.	1660.	1660.	1670.	1670.	1670.	1670.	1660.	1650.	1640.	1630.	
12	1620.	1600.	1570.	1540.	1500.	1470.	1450.	1430.	1420.	1410.	1410.	1400.	
13	1400.	1390.	1380.	1380.	1370.	1360.	1360.	1350.	1350.	1340.	1340.	1330.	
14	1330.	1330.	1330.	1320.	1320.	1310.	1300.	1280.	1260.	1240.	1220.	1200.	
15	1190.	1180.	1170.	1160.	1160.	1150.	1150.	1150.	1140.	1130.	1130.	1130.	
16	1120.	1120.	1120.	1120.	1120.	1110.	1110.	1110.	1110.	1110.	1100.	1100.	
17	1100.	1100.	1100.	1090.	1090.	1090.	1090.	1090.	1090.	1090.	1090.	1080.	
18	1080.	1080.	1080.	1080.	1080.	1080.	1080.	1080.	1080.	1070.	1070.	1070.	
19	1070.	1070.	1070.	1070.	1070.	1070.	1070.	1060.	1060.	1060.	1060.	1050.	
20	1050.	1050.	1050.	1050.	1050.	1050.	1050.	1050.	1040.	1040.	1040.	1030.	
21	1030.	1030.	1030.	1030.	1030.	1030.	1030.	1030.	1020.	1020.	1020.	1020.	
22	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	
23	1020.	1020.	1020.	1020.	1020.	1020.	1010.	1010.	1010.	1010.	1010.	1010.	
24	1010.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	
25	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	
26	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1020.	1010.	E 1010.	E 1010.	E
27	1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E
28	1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E
29	1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	E 1000.	1000.	1000.	1000.	1000.	1000.	E
30	1000.	1000.	1000.	1000.	1000.	1000.	1000.	1000.	1000.	1000.	1000.	1000.	E

*SPECIAL POINTS
 5 2100/1400.
 9 1700/1430.

RIVER GAGE DATA
 STA. NO. 14 RIO TIGRE AT LAS PIEDRITAS
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		692.	807.	908.	1300.	1870.
2		689.	798.	893.	1240.	1710.
3		689.	797.	906.	1210.	1620.
4		689.	804.	951.	1320.	1540.
5		689.	804.	936.	1380.	1440.
6		689.	813.	935.	1330.	1520.
7		692.	840.	903.	1260.	1480.
8		696.	836.	876.	1260.	1360.
9		706.	851.	879.	1360.	1370.
10		710.	845.	908.	1520.	1630.
11	M	713.	829.	1010.	1440.	1660.
12	707.	716.	811.	1270.	1370.	1500.
13	709.	718.	825.	1630.	1670.	1370.
14	712.	720.	841.	1810.	1910.	1290.
15	712.	722.	823.	1600.	2070.	1160.
16	710.	722.	799.	1580.	2320.	1110.
17	709.	721.	790.	1770.	4200.	1090.
18	707.	720.	789.	1990.	4940.	1080.
19	702.	718.	810.	2050.	4100.	1070.
20	697.	719.	839.	1970.	3510.	1050.
21	691.	721.	863.	1810.	3120.	1030.
22	691.	721.	907.	1730.	2650.	1020.
23	689.	721.	936.	1740.	2340.	1020.
24	690.	724.	919.	1790.	2450.	1020.
25	691.	729.	919.	1780.	2350.	1020.
26	692.	735.	920.	1700.	2250.	1020.
27	693.	735.	926.	1660.	2210.	1000.
28	690.	732.	912.	1660.	2190.	1000.
29	689.	738.	884.	1610.	2180.	1000.
30	689.	775.	889.	1470.	2260.	1000.
31		818.		1370.	2080.	

E
E
E

II-43

RIVER GAGE DATA

NAME: Sta. No. 15 Río Aribí at Paso de Aribí.

LOCATION: Longitude $63^{\circ} 10.2'$ W, latitude $09^{\circ} 16.7'$ N. Approximately 52.1 km S of Maturín, at El Paso de Aribí.

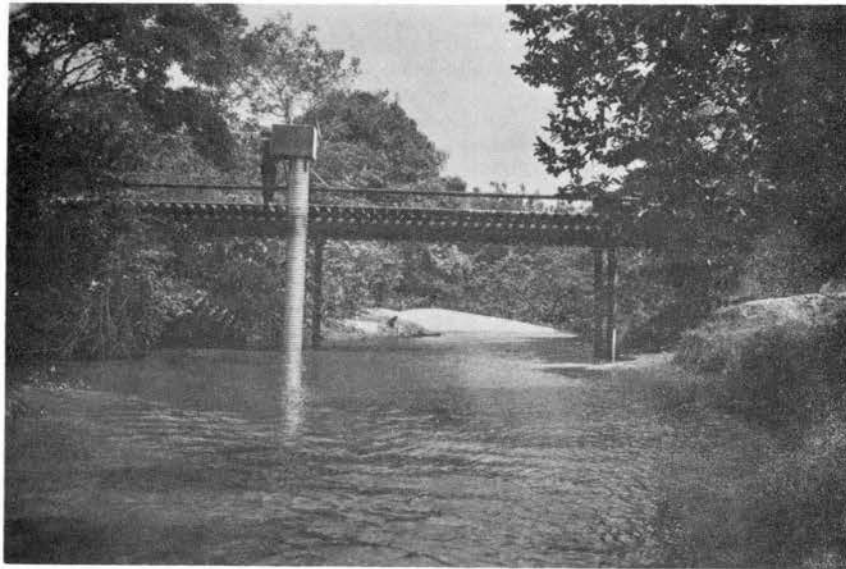
DRAINAGE AREA: 396 sq mi (from topographic map).

GAGE: Friez water level recorder attached to right downstream side of bridge.

RECORDS AVAILABLE: May 6, 1969 through September 30, 1969.

REMARKS: Record is fair to good.

CODING: M signifies missing data; E signifies estimated data.



Looking upstream at the gaging site on the Río Aribí. The Friez recorder is housed in the metal box on top of the 18-inch corrugated metal pipe. There is a large point bar (center of photograph) immediately upstream of the bridge.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 15 RIO ARIBI AT PASO DE ARIBI

Meas. No.	Date	Made by	Width ft	Area sq ft	Mean Velocity fps	Outside Gage Height ft	Dis-charge cfs	Shift Adj. ft	Per-cent Diff.	Method	Num-ber Meas. Sec-tions	Gage Height Change ft	Time hr	Water Temp. °F
1	May 6	Romero	25.0	10.7	1.39	0.56	14.9	0	-0.7	Wading	23	0	0.7	82
2	13	Santaeilla	45.0	55.4	1.93	1.32	107.	0	+14.2	Wading	24	+05	0.5	80
3	18	Santaeilla	32.0	32.1	1.02	0.71	32.7	0	+4.8	Wading	19	0	0.5	82
4	27	Santos	33.0	30.0	0.68	0.61	20.3	0	+1.0	Wading	25	0	1.0	83
5	June 11	Santaeilla	47.0	113.	1.91	2.73	216.	0	-0.8	Wading	25	+01	1.0	82
6	12	Duke	39.0	87.8	2.21	2.36	194.	0	+7.8	Bridge	20	-.09	1.5	-
7	16	Santos	35.0	38.2	1.18	0.88	45.3	0	-10.8	Wading	21	0	1.0	83
8	21	Romero	44.0	40.5	1.68	1.01	67.9	0	-4.5	Wading	23	0	1.0	82
9	23	Romero	44.0	49.4	1.78	1.20	87.8	0	+5.8	Wading	23	-.01	0.4	81
10	29	Santaeilla	48.0	171.	1.87	3.98	319.	0	-10.1	Wading	22	-.03	1.3	85
11	July 9	Santos	44.0	47.5	1.85	1.18	88.2	0	+8.6	Wading	24	0	0.5	78
12	14	Santaeilla	43.0	184.	2.35	4.44	433.	0	+3.8	-	22	+10	1.0	75
13	14	Santaeilla	55.0	266.	2.46	6.05	654.	0	+2.8	Bridge	25	+30	1.1	76
14	15	Santaeilla	60.0	308.	2.23	6.71	686.	0	-4.7	Bridge	26	-.01	1.2	74
15	18	Romero	240.	810.	2.14	11.31	1730.	0	-1.5	Bridge	42	-.15	2.9	80
16	19	Romero	138.	574.	2.32	10.08	1330.	0	-0.6	Bridge	42	-.12	1.9	79
17	21	Tirado	62.0	330.	2.40	7.03	792.	0	+3.8	Bridge	24	-.12	1.6	82
18	22	Tirado	43.0	160.	2.19	3.84	350.	0	+3.2	Bridge	23	-.18	1.1	81
19	25	Santaeilla	48.0	90.8	1.74	2.19	158.	0	-4.6	Wading	25	-.02	0.8	78
20	26	Santaeilla	56.0	291.	2.38	6.32	693.	0	+3.6	Bridge	26	+12	1.4	76
21	30	Santos	46.5	77.4	1.82	1.93	141.	0	-3.0	Wading	24	+02	0.7	81
22	Aug. 5	Romero	76.0	454.	2.38	9.09	1090.	0	-1.9	Bridge	29	-.18	1.3	-
23	13	Santos	47.5	90.5	1.75	2.14	158.	0	-2.2	Wading	24	-.01	1.0	81
24	18	Tirado	43.5	151.	2.27	3.58	343.	0	+10.4	Bridge	23	-.07	1.3	86
25	Sept. 2	Romero	45.0	98.3	1.67	2.32	164.	0	-7.1	Wading	23	0	1.2	80
26	8	Contreras	45.0	45.6	1.80	1.26	81.8	0	-7.5	Wading	24	0	0.4	-
27	26	Tirado	44.0	38.8	1.60	1.00	62.2	0	-2.8	Wading	23	0	0.3	-

RATING TABLE
FOR
STA. NO. 15 RIO ARIBI AT PASO DE ARIBI

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00		2.00	151.	4.00	357.	6.00	630.	8.00	911.	10.00	1315.	12.00	2065.
.10		.10	158.	.10	369.	.10	642.	.10	928.	.10	1343.	.10	2113.
.20		.20	166.	.20	382.	.20	654.	.20	945.	.20	1372.	.20	2162.
.30		.30	175.	.30	396.	.30	666.	.30	962.	.30	1402.	.30	2212.
.40		.40	184.	.40	411.	.40	679.	.40	979.	.40	1433.	.40	2263.
.50	9.0	.50	194.	.50	426.	.50	692.	.50	997.	.50	1465.	.50	2315.
.60	19.0	.60	204.	.60	441.	.60	705.	.60	1015.	.60	1498.	.60	
.70	30.0	.70	214.	.70	456.	.70	718.	.70	1033.	.70	1532.	.70	
.80	42.0	.80	225.	.80	471.	.80	731.	.80	1051.	.80	1567.	.80	
.90	53.0	.90	236.	.90	485.	.90	745.	.90	1070.	.90	1603.	.90	
1.00	64.0	3.00	247.	5.00	499.	7.00	759.	9.00	1089.	11.00	1640.	13.00	
.10	74.0	.10	258.	.10	513.	.10	773.	.10	1108.	.10	1678.	.10	
.20	83.0	.20	269.	.20	527.	.20	787.	.20	1127.	.20	1717.	.20	
.30	92.0	.30	280.	.30	541.	.30	802.	.30	1147.	.30	1757.	.30	
.40	101.	.40	291.	.40	554.	.40	817.	.40	1168.	.40	1798.	.40	
.50	110.	.50	302.	.50	567.	.50	832.	.50	1190.	.50	1840.	.50	
.60	119.	.60	313.	.60	580.	.60	847.	.60	1213.	.60	1883.	.60	
.70	127.	.70	324.	.70	593.	.70	863.	.70	1237.	.70	1927.	.70	
.80	135.	.80	335.	.80	606.	.80	879.	.80	1262.	.80	1972.	.80	
.90	143.	.90	346.	.90	618.	.90	895.	.90	1288.	.90	2018.	.90	

RIVER GAGE DATA
 STA. NO. 15 RIO ARIBI AT PASO DE ARIBI
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
6	M	M	M	M	M	14.9	14.9	14.9	14.9	13.9	13.9	13.9
7	14.9	14.9	14.9	15.9	15.9	15.9	15.9	14.9	14.9	14.9	14.9	14.9
8	14.9	14.9	15.9	15.9	16.9	16.9	16.9	16.9	16.9	15.9	16.9	16.9
9*	16.9	16.9	16.9	18.0	18.0	19.0	36.0	47.6	48.7	47.6	43.1	40.8
10	39.6	40.8	43.1	44.2	44.2	44.2	44.2	42.0	39.6	38.4	36.0	34.8
11	33.6	32.4	31.2	30.0	27.7	26.6	25.5	24.4	23.3	23.3	22.2	22.2
12	22.2	22.2	21.1	21.1	21.1	21.1	20.1	19.0	19.0	18.0	18.0	16.9
13*	16.9	30.0	64.0	83.9	99.2	113.	120.	126.	132.	140.	146.	149.
14	152.	152.	152.	149.	144.	136.	129.	120.	111.	101.	92.0	84.8
15	78.6	74.0	70.1	67.1	64.0	61.8	59.7	57.5	56.3	55.2	53.0	53.0
16	51.9	50.8	50.8	49.7	48.7	47.6	46.5	45.4	44.2	43.1	43.1	42.0
17	40.8	39.6	39.6	39.6	38.4	38.4	38.4	37.2	36.0	36.0	34.8	33.6
18	33.6	32.4	32.4	32.4	31.2	31.2	30.0	28.9	28.9	28.9	28.9	28.9
19	28.9	28.9	28.9	27.7	27.7	27.7	27.7	26.6	26.6	26.6	25.5	25.5
20	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	25.5	24.4	24.4	24.4
21	24.4	24.4	25.5	25.5	25.5	25.5	24.4	25.5	25.5	25.5	25.5	26.6
22	27.7	28.9	27.7	26.6	25.5	25.5	24.4	23.3	23.3	23.3	23.3	23.3
23	23.3	23.3	23.3	23.3	23.3	22.2	22.2	22.2	22.2	22.2	22.2	22.2
24	22.2	22.2	22.2	22.2	22.2	22.2	22.2	21.1	21.1	21.1	21.1	21.1
25	21.1	21.1	21.1	21.1	22.2	22.2	21.1	21.1	20.1	21.1	21.1	21.1
26	21.1	21.1	21.1	21.1	21.1	21.1	21.1	21.1	20.1	20.1	20.1	20.1
27	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1
28	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	19.0	19.0	19.0
29	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
30	19.0	19.0	20.1	20.1	21.1	21.1	21.1	20.1	20.1	20.1	21.1	21.1
31	21.1	21.1	21.1	21.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1	20.1

*SPECIAL POINTS

9 1700/49.7
 13 0300/16.9

RIVER GAGE DATA
 STA. NO. 15 RIO ARIBI AT PASO DE ARIBI
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	20.1	21.1	22.2	23.3	23.3	23.3	23.3	22.2	22.2	22.2	23.3	23.3
2	24.4	25.5	25.5	26.6	26.6	26.6	27.7	25.5	25.5	25.5	25.5	24.4
3	24.4	24.4	33.6	72.1	88.4	100.	110.	117.	123.	126.	129.	131.
4	133.	133.	133.	131.	127.	123.	120.	123.	113.	105.	98.3	91.1
5	85.7	80.3	75.8	72.1	69.1	67.1	64.0	64.0	62.9	60.8	59.7	58.6
6	58.6	57.5	56.3	56.3	56.3	56.3	55.2	56.3	56.3	56.3	56.3	56.3
7	56.3	56.3	57.5	58.6	60.8	64.0	69.1	88.4	80.3	77.7	74.9	74.0
8	74.0	74.0	74.0	74.9	76.8	74.9	74.0	72.1	71.1	71.1	69.1	68.1
9	68.1	67.1	67.1	68.1	69.1	71.1	73.0	74.9	76.8	80.3	83.9	87.5
10	91.1	96.5	100.	109.	136.	160.	175.	182.	192.	197.	204.	209.
11	212.	214.	215.	216.	219.	221.	222.	224.	225.	225.	225.	225.
12	224.	221.	215.	209.	203.	193.	183.	173.	163.	157.	148.	138.
13	130.	124.	117.	110.	105.	100.	97.4	94.7	92.0	89.3	85.7	83.0
14	81.2	78.6	76.8	74.9	72.1	71.1	69.1	67.1	66.1	65.0	65.0	64.0
15	62.9	62.9	61.8	60.8	59.7	58.6	57.5	56.3	55.2	55.2	54.1	53.0
16	53.0	53.0	51.9	51.9	51.9	51.9	50.8	49.7	49.7	48.7	48.7	48.7
17	48.7	49.7	50.8	51.9	51.9	51.9	51.9	51.9	51.9	50.8	50.8	49.7
18	49.7	48.7	48.7	47.6	47.6	47.6	47.6	47.6	47.6	46.5	47.6	48.7
19	48.7	48.7	48.7	47.6	47.6	47.6	47.6	47.6	47.6	47.6	47.6	47.6
20	49.7	51.9	54.1	56.3	57.5	56.3	54.1	54.1	53.0	53.0	53.0	53.0
21	53.0	53.0	53.0	57.5	62.9	65.0	68.1	70.1	70.1	70.1	70.1	69.1
22	69.1	68.1	67.1	65.0	65.0	65.0	65.0	65.0	66.1	67.1	67.1	68.1
23	70.1	72.1	73.0	74.9	77.7	81.2	85.7	92.9	97.4	103.	107.	113.
24	117.	119.	122.	125.	127.	129.	129.	129.	129.	129.	129.	129.
25	130.	133.	135.	140.	145.	149.	153.	158.	165.	171.	179.	186.
26	194.	199.	206.	214.	223.	228.	234.	241.	247.	254.	262.	269.
27	274.	280.	285.	291.	296.	302.	306.	310.	313.	316.	318.	323.
28	326.	328.	333.	335.	339.	342.	344.	348.	349.	351.	353.	356.
29	358.	359.	360.	362.	362.	360.	358.	351.	345.	334.	321.	306.
30	290.	269.	247.	224.	213.	194.	179.	163.	154.	145.	137.	129.

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 15 RIO ARIBI AT PASO DE ARIBI
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	121.	116.	112.	108.	104.	99.2	96.5	92.9	90.2	88.4	85.7	83.9
2	80.3	79.5	78.6	76.8	76.8	75.8	74.9	74.0	73.0	73.0	74.0	74.0
3	73.0	73.0	71.1	71.1	70.1	70.1	69.1	68.1	68.1	68.1	69.1	70.1
4	73.0	75.8	78.6	82.1	83.9	85.7	85.7	85.7	84.8	83.9	82.1	79.5
5	74.6	77.7	77.7	78.6	78.6	79.5	79.5	79.5	79.5	79.5	81.2	83.9
6	87.5	92.0	96.5	101.	106.	110.	115.	118.	121.	125.	127.	129.
7	132.	134.	136.	137.	139.	139.	139.	137.	134.	131.	128.	125.
8	121.	117.	113.	108.	104.	99.2	98.3	94.7	93.8	93.8	91.1	87.5
9	83.9	81.2	78.6	77.7	74.9	75.8	82.1	78.6	76.8	75.8	75.8	74.9
10*	77.7	85.7	95.6	104.	110.	115.	117.	118.	121.	152.	154.	167.
11	173.	176.	179.	186.	189.	189.	184.	179.	172.	165.	160.	157.
12	154.	154.	154.	157.	160.	163.	164.	164.	163.	161.	159.	158.
13	161.	168.	178.	186.	208.	225.	240.	258.	277.	299.	325.	344.
14	359.	375.	395.	412.	433.	459.	576.	656.	695.	714.	724.	730.
15	731.	728.	723.	719.	715.	713.	715.	730.	762.	787.	809.	833.
16	860.	905.	997.	1150.	M	M	M	M	M	M	M	M
17	M	M	M	M	M	M	M	1350.	1490.	1650.	1790.	1890.
18	1950.	1960.	1950.	1930.	1890.	1850.	1790.	1740.	1690.	1640.	1600.	1570.
19	1510.	1470.	1420.	1380.	1340.	1310.	1270.	1240.	1200.	1170.	1140.	1110.
20	1090.	1060.	1040.	1020.	986.	962.	940.	918.	903.	889.	874.	860.
21	845.	835.	824.	812.	797.	783.	762.	742.	721.	698.	667.	623.
22*	551.	486.	412.	362.	331.	301.	276.	261.	260.	269.	281.	293.
23	303.	311.	315.	317.	316.	312.	309.	303.	296.	290.	283.	278.
24	272.	266.	259.	251.	244.	236.	228.	221.	213.	206.	198.	191.
25*	186.	180.	176.	171.	165.	161.	157.	157.	210.	217.	331.	355.
26*	454.	540.	586.	622.	648.	671.	691.	701.	700.	682.	643.	593.
27	524.	435.	357.	315.	287.	259.	238.	225.	213.	208.	207.	206.
28	205.	202.	196.	187.	178.	170.	163.	157.	154.	153.	151.	151.
29	151.	151.	151.	149.	148.	145.	142.	140.	137.	135.	133.	133.
30	134.	137.	141.	145.	148.	150.	151.	152.	151.	149.	149.	147.
31	145.	141.	138.	136.	133.	129.	128.	125.	122.	121.	119.	117.

*SPECIAL POINTS

10	1725/117.	2100/152.
22	1730/259.	
25	1600/155.	1900/207.
26	1700/701.	

RIVER GAGE DATA
 STA. NO. 15 RIO ARIBI AT PASO DE ARIBI
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	115.	113.	112.	111.	110.	107.	106.	105.	104.	104.	103.	103.
2*	103.	102.	101.	99.2	98.3	97.4	97.4	95.6	95.6	129.	137.	186.
3*	280.	335.	390.	453.	505.	550.	589.	616.	1160.	1300.	1410.	1530.
4*	1580.	1610.	1740.	1910.	1950.	1950.	1910.	1830.	1710.	1620.	1540.	1460.
5	1400.	1330.	1250.	1210.	1160.	1110.	1070.	1040.	1010.	988.	969.	959.
6	955.	955.	960.	965.	979.	990.	999.	1010.	1010.	1010.	1030.	1060.
7	1080.	1090.	1110.	1120.	1120.	1120.	1110.	1110.	1100.	1090.	1080.	1070.
8	1060.	1050.	1040.	1030.	1010.	1000.	983.	962.	943.	918.	889.	841.
9	774.	672.	622.	588.	567.	551.	544.	471.	400.	349.	315.	287.
10	267.	254.	246.	239.	234.	230.	226.	225.	227.	219.	217.	215.
11	210.	207.	203.	200.	198.	191.	187.	183.	180.	177.	174.	172.
12	171.	172.	174.	179.	181.	182.	181.	181.	180.	179.	177.	175.
13	170.	169.	166.	164.	162.	161.	161.	161.	161.	160.	160.	159.
14	158.	157.	158.	160.	162.	163.	163.	160.	158.	155.	154.	152.
15	151.	150.	151.	158.	167.	178.	191.	206.	223.	238.	254.	267.
16	281.	295.	310.	322.	329.	339.	347.	354.	357.	367.	496.	655.
17	877.	959.	976.	960.	911.	855.	790.	714.	632.	542.	462.	375.
18*	324.	291.	281.	289.	306.	320.	321.	314.	301.	290.	276.	261.
19*	248.	239.	241.	261.	292.	338.	365.	396.	415.	427.	427.	421.
20	411.	399.	390.	379.	375.	370.	368.	369.	372.	377.	383.	390.
21	397.	405.	411.	418.	427.	435.	442.	448.	448.	445.	438.	423.
22	400.	373.	332.	302.	274.	254.	236.	223.	215.	206.	197.	188.
23	179.	173.	170.	167.	163.	160.	157.	155.	180.	175.	168.	163.
24	160.	155.	154.	154.	151.	152.	152.	152.	151.	151.	151.	153.
25*	157.	166.	177.	183.	186.	187.	186.	184.	204.	365.	600.	693.
26*	734.	737.	727.	710.	701.	701.	701.	692.	678.	660.	644.	634.
27	629.	626.	624.	623.	622.	620.	617.	614.	608.	601.	586.	571.
28	545.	485.	441.	357.	332.	307.	290.	273.	258.	245.	234.	225.
29	217.	211.	206.	202.	197.	196.	196.	198.	200.	203.	206.	209.
30	211.	212.	212.	212.	207.	204.	196.	192.	187.	184.	184.	185.
31	190.	194.	196.	196.	194.	188.	180.	171.	163.	157.	153.	149.

*SPECIAL PRINTS

2	2120/132.
3	1945/1260.
4	1100/1960.
18	1330/322.
19	0500/234.
25	1655/184.
26	0330/738.

RIVER GAGE DATA
 STA. NO. 15 RIO ARIBI AT PASO DE ARIBI
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	147.	143.	143.	143.	143.	154.	161.	172.	177.	177.	176. E	175. E
2	174. E	173. E	174. E	175. E	176. E	177.	176.	174.	172.	169.	163.	158.
3	154.	150.	146.	142.	138.	133.	130.	127.	125.	123.	121.	119.
4	115. E	113. E	110. E	107. E	106. E	105. E	105. E	105. E	104. E	103. E	102. E	102. E
5	102. E	102. E	102. E	101. E	101. E	100. E	100. E	100. E	100. E	100. E	110. E	115. E
6	119. E	121. E	123. E	125. E	125. E	126. E	126. E	125. E	121. E	116. E	111. E	107. E
7	104. E	100. E	98.3 E	95.6 E	93.8 E	92.0 E	91.1 E	90.2 E	89.3 E	88.4 E	87.5 E	87.5 E
8	86.6 E	86.6 E	86.6 E	87.5 E	87.5 E	87.5 E	88.4	91.1	95.6	106.	123.	131.
9	141.	165.	191.	214.	234.	258.	291.	332.	M	M	M	M
10	M	M	M	M	M	M	M	M	M	M	M	M
11	M	M	M	M	M	M	M	M	M	M	M	M
12	M	M	M	M	M	M	M	M	M	M	M	M
13	M	M	M	M	M	M	649.	646.	641.	634.	628.	623.
14	619.	616.	612.	608.	605.	600.	593.	585.	573.	559.	538.	509.
15	461.	411.	362.	327.	298.	272.	249.	230.	212.	200.	191.	182.
16	177.	171.	166.	167.	157.	154.	151.	148.	145.	141.	139.	136.
17	133. E	132. E	130. E	129. E	126. E	125. E	123. E	121. E	119. E	117. E	116. E	115. E
18	113. E	111. E	109. E	107. E	106. E	105. E	104.	103.	102.	101.	100.	99.2
19	98.3	97.4	96.5	95.6	95.6	94.7	92.9	92.0	91.1	90.2	90.2	89.3
20	89.3	88.4	87.5	87.5	86.6	86.6	85.7	84.8	83.9	83.9	83.9	83.0
21	83.0	83.0	82.1	82.1	81.2	81.2	79.5	79.5	79.5	78.6	78.6	78.6
22*	77.7	77.7	77.7	76.8	75.8	75.8	74.9	74.9	74.9	74.9	74.9	74.9
23	76.8	74.9 E	74.0 E	73.0 E	72.1	72.1	71.1	70.1	70.1	69.1	69.1	69.1
24	69.1	69.1	69.1	70.1	69.1	69.1	69.1 E	68.1 E	68.1 E	68.1 E	68.1 E	68.1 E
25	68.1 E	68.1 E	67.1 E	67.1 E	67.1 E	67.1 E	66.1 E	66.1	65.0	65.0	65.0	65.0
26	65.0	65.0	65.0	65.0	64.0	64.0	64.0	61.8	61.8	61.8	61.8	61.8
27	61.8	61.8	61.8	60.8	60.8	60.8	60.8	60.8 E	60.8 E	60.8 E	60.8 E	60.8 E
28	59.7 E	59.7 E	59.7 E	59.7 E	58.6 E	58.6 E	58.6 E	58.6 E	57.5 E	57.5 E	57.5 E	56.3 E
29	56.3 E	56.3 E	56.3 E	55.2 E	55.2 E	55.2 E	55.2 E	55.2 E	54.1 E	54.1 E	54.1 E	54.1 E
30	53.0 E	53.0 E	53.0 E	53.0 E	53.0 E	53.0 E	53.0 E	53.0 E	53.0 E	53.0 E	53.0 E	53.0 E

*SPECIAL POINTS

- 1 1050/144.
- 22 1700/105.

RIVER GAGE DATA
 STA. NO. 15 RIO ARIBI AT PASO DE ARIBI
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		22.3	102.	108.	158.
2		25.7	76.4	108.	173.
3		85.5	70.2	701.	136.
4		121.	81.3	1730.	107. E
5		70.0	79.4	1150.	104. F
6	M	56.6	109.	990. E	121. E
7	15.2	67.4	134.	1100. E	94.1 E
8	16.2	73.1	103.	987. E	94.6
9	29.9	73.1	78.7	537.	M
10	41.3	149.	114.	237.	M
11	27.4	219.	176.	192.	M
12	20.2	189.	159.	178.	M
13	95.9	105.	231.	164.	M
14	129.	71.8	527.	159.	590.
15	64.1	58.7	743.	190.	298.
16	47.4	51.0	M	354.	156.
17	38.1	50.9	M	759.	125. E
18	30.9	48.0	1810.	306.	106.
19	27.5	47.9	1320.	333.	94.1
20	25.3	53.6	974.	383.	86.2
21	25.2	62.8	770.	426.	80.8
22	25.3	66.6	356.	266.	83.5
23	22.7	85.4	303.	179.	72.5
24	21.8	125.	236.	155.	68.8 E
25	21.2	151.	199.	251.	66.5
26	20.8	227.	617.	692.	63.5
27	20.1	299.	308.	615.	61.1 E
28	19.9	340.	175.	348.	58.7 E
29	19.0	350.	144.	204.	55.2 E
30	20.2	203.	146.	200.	53.0 E
31	20.5		131.	179.	

RIVER GAGE DATA

NAME: Sta. No. 16 Río Ñato at Las Gaviotas.

LOCATION: Longitude 63° 21.0' W, latitude 09° 10.6' N. Approximately 17.2 km NNE of Oritupano, 3 km NNE of Las Gaviotas.

DRAINAGE AREA: 106 sq mi (from topographic map).

GAGE: Stevens Type A35 water level recorder attached to left downstream side of bridge.

RECORDS AVAILABLE: April 16, 1969 through September 30, 1969.

REMARKS: Record is fair to good.

CODING: M signifies missing data; E signifies estimated data.



Looking downstream at the gaging station on the Río Ñato. The A35 recorder is attached to the downstream side of the bridge (center of photograph).

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 16 RIO NATO AT LAS GAVIOTAS

Meas. No.	Date	Made by	Width ft	Area sq ft	Mean Velocity fps	Inside Gage Height ft	Dis-charge cfs	Shift Adj. ft	Per- cent Diff.	Method	Number Meas. Sections	Gage Height Change ft	Time hr	Water Temp. °F
1	May 6	Santos	20.7	6.66	0.72	0.55	4.79	0	-7.9	Wading	21	0	1.1	81
2	18	Santaeilla	19.0	8.00	0.40	0.40	3.19	0	+0.3	Wading	19	0	0.4	83
3	27	Santaeilla	18.5	9.40	0.48	0.50	4.50	0	0.0	Wading	18	0	0.4	81
4	June 17	Santaeilla	21.0	8.10	0.75	0.61	6.05	0	0.0	Wading	22	-.01	0.2	79
5	24	Duke	26.0	66.4	1.17	3.02	77.7	0	-5.2	Bridge	18	-.05	1.0	79
6	25	Santos	38.0	79.6	0.94	2.89	75.2	0	-1.9	Wading	20	-.02	0.8	78
7	29	Santaeilla	30.0	20.2	0.83	1.14	16.7	0	+2.4	Wading	25	-.01	0.7	79
8	July 1	Santos	39.0	94.5	0.97	3.28	91.4	0	-3.8	Wading	21	-.18	0.9	78
9	7	Tirado	26.0	13.6	0.82	0.87	11.2	0	+7.8	Wading	24	-.01	0.6	81
10	13	Santos	61.0	534.	2.21	12.71	1180.	0	+2.2	Bridge	25	-.15	1.4	68
11	13	Santos	56.0	489.	2.25	12.44	1100.	0	+2.7	Bridge	24	-.20	1.4	79
12	14	Velasquez	48.0	314.	2.15	10.04	675.	0	-1.0	Bridge	23	-.25	1.7	78
13	17	Santaeilla	31.0	140.	1.76	5.28	247.	0	-2.3	Bridge	26	-.10	1.2	78
14	21	Romero	34.5	39.3	0.88	1.76	34.6	0	+3.4	Wading	24	-.01	0.7	80
15	29	Santaeilla	30.0	18.2	0.87	1.16	15.8	0	-5.8	Wading	19	-.01	0.5	79
16	Aug. 2	Tirado	30.0	20.8	0.88	1.19	18.3	0	+4.8	Wading	22	0	0.5	77
17	4	Tirado	41.0	277.	2.03	8.64	562.	0	-0.4	Bridge	22	-.22	1.2	74
18	6	Santos	38.5	83.0	1.03	3.09	85.7	0	+0.2	Wading	21	-.04	1.0	80
19	19	Santaeilla	39.0	78.2	1.03	2.96	80.7	0	+1.6	Wading	22	-.08	0.7	75
20	26	Romero	59.0	443.	2.13	11.86	944.	0	+1.2	Bridge	27	-.15	1.2	78
21	Sept. 17	Romero	28.0	23.8	0.75	1.30	17.9	0	-11.4	Wading	29	-.01	0.7	-
22	23	Sabino	30.0	24.2	0.82	1.42	19.9	0	-14.4	Wading	22	-.03	0.7	-
23	27	Tirado	28.0	13.5	0.96	1.02	13.0	0	-4.1	Wading	29	0	0.6	-

RATING TABLE
FOR
STA. NO. 16 RIO NATO AT LAS GAVIOTAS

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00		2.00	41.1	4.00	141.	6.00	324.	8.00	510.	10.00	678.	12.00	959.
.10		.10	45.0	.10	149.	.10	334.	.10	519.	.10	688.	.10	980.
.20		.20	49.0	.20	157.	.20	344.	.20	528.	.20	698.	.20	1003.
.30	2.00	.30	53.0	.30	165.	.30	354.	.30	537.	.30	708.	.30	1028.
.40	3.20	.40	57.0	.40	173.	.40	364.	.40	545.	.40	719.	.40	1055.
.50	4.50	.50	61.0	.50	182.	.50	374.	.50	553.	.50	730.	.50	1084.
.60	5.90	.60	65.0	.60	191.	.60	384.	.60	561.	.60	742.	.60	1115.
.70	7.40	.70	69.0	.70	200.	.70	393.	.70	569.	.70	754.	.70	1148.
.80	9.10	.80	73.0	.80	209.	.80	402.	.80	577.	.80	767.	.80	1183.
.90	11.0	.90	77.0	.90	218.	.90	411.	.90	585.	.90	780.	.90	1220.
1.00	13.1	3.00	81.0	5.00	227.	7.00	420.	9.00	593.	11.00	794.	13.00	1259.
.10	15.4	.10	86.0	.10	236.	.10	429.	.10	601.	.10	808.	.10	1300.
.20	17.7	.20	91.0	.20	245.	.20	438.	.20	609.	.20	823.	.20	1343.
.30	20.2	.30	96.0	.30	254.	.30	447.	.30	617.	.30	838.	.30	1388.
.40	22.7	.40	101.	.40	264.	.40	456.	.40	625.	.40	854.	.40	1435.
.50	25.4	.50	107.	.50	274.	.50	465.	.50	633.	.50	870.	.50	1484.
.60	28.5	.60	113.	.60	284.	.60	474.	.60	642.	.60	887.	.60	1535.
.70	31.6	.70	119.	.70	294.	.70	483.	.70	651.	.70	904.	.70	1588.
.80	34.7	.80	126.	.80	304.	.80	492.	.80	660.	.80	922.	.80	
.90	37.8	.90	133.	.90	314.	.90	501.	.90	669.	.90	940.	.90	

RIVER GAGE DATA
 STA. NO. 16 RIO NITO AT LAS GAVIOTAS
 APRIL 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
16	M	M	M	M	M	5.90	5.76	5.61	5.61	5.61	5.61	5.61
17	5.76	5.76	5.76	5.90	5.90	5.90	5.76	5.76	5.61	5.61	5.76	5.76
18	5.76	5.90	5.90	5.90	5.90	5.90	5.76	5.76	5.61	5.61	5.61	5.61
19	5.76	5.76	5.90	5.90	5.90	5.76	5.76	5.61	5.61	5.61	5.61	5.61
20	5.61	5.61	5.76	5.90	5.90	5.90	5.76	5.76	5.61	5.61	5.61	5.61
21	5.76	5.76	5.76	5.90	5.90	5.76	5.76	5.61	5.61	5.61	5.61	5.61
22	5.61	5.61	5.61	5.61	5.61	5.61	5.47	5.47	5.33	5.33	5.33	5.33
23	5.33	5.33	5.47	5.47	5.47	5.47	5.33	5.33	5.19	5.19	5.19	5.19
24	5.19	5.33	5.33	5.33	5.33	5.19	5.19	5.05	5.05	5.05	5.05	5.05
25	5.19	5.19	5.19	5.19	5.19	5.19	5.19	5.05	5.05	5.05	5.05	5.05
26	5.05	5.05	5.19	5.19	5.19	5.19	5.19	5.05	4.91	4.91	4.91	5.05
27	5.05	5.19	5.19	5.19	5.19	5.19	5.05	5.05	4.91	4.91	4.91	4.91
28	5.05	5.05	5.19	5.05	5.05	4.91	4.91	4.91	4.91	4.91	4.91	4.91
29	4.91	4.91	4.91	4.91	5.05	5.05	4.91	4.91	4.77	4.77	4.77	4.77
30	4.77	4.77	4.91	4.91	5.05	4.91	4.77	4.77	4.64	4.64	4.64	4.64

*SPECIAL POINTS

NONE

RIVER GAGE DATA
 STA. NO. 16 RIO NATION AT LAS GAVIOTAS
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	4.64	4.64	4.50	4.64	4.64	4.50	4.50	4.37	4.37	4.23	4.10	4.10
2	4.10	4.10	4.10	4.10	4.10	4.10	3.97	3.84	3.84	3.84	3.84	3.84
3	3.84	3.84	4.37	5.05	5.47	5.61	5.61	5.61	5.61	5.47	5.47	5.47
4	5.47	5.61	5.61	5.61	5.61	5.47	5.47	5.33	5.33	5.19	5.19	5.19
5	5.19	5.33	5.33	5.33	5.33	5.19	5.19	5.19	5.05	5.05	5.05	4.91
6	4.91	5.05	5.05	5.05	5.19	5.19	5.05	5.05	4.91	4.91	4.91	4.91
7	4.91	5.05	5.05	5.19	5.19	5.19	5.05	4.91	4.91	4.91	4.71	4.91
8	4.91	4.91	4.91	4.91	4.91	4.91	4.77	4.77	4.77	4.91	4.91	4.71
9	5.05	5.05	5.05	5.05	4.91	4.77	4.77	4.64	4.50	4.50	4.50	4.50
10	4.50	4.50	4.37	4.37	4.37	4.23	4.10	4.10	3.97	3.97	3.77	3.84
11	3.84	3.84	3.84	3.84	3.84	3.84	3.71	3.71	3.71	3.71	3.58	3.58
12	3.45	3.45	3.58	3.58	3.71	3.58	3.45	3.45	3.45	3.33	3.33	3.33
13	3.45	5.05	6.04	6.19	6.19	6.19	5.90	5.76	5.61	5.47	5.33	5.19
14	5.05	4.91	4.77	4.77	4.64	4.50	4.37	4.23	4.10	4.10	3.97	3.97
15	3.97	3.97	3.84	3.84	3.84	3.84	3.71	3.58	3.45	3.45	3.45	3.45
16	3.45	3.45	3.45	3.45	3.45	3.45	3.33	3.20	3.20	3.20	3.20	3.20
17	3.20	3.20	3.33	3.33	3.33	3.33	3.20	3.20	3.08	3.08	3.08	3.08
18	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
19	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20	3.20
21	3.20	3.20	3.20	3.33	3.45	3.45	3.45	3.45	3.45	3.45	3.45	3.45
22	3.45	3.45	3.58	3.58	3.58	3.58	6.04	7.56	7.72	7.56	7.40	7.40
23	7.24	7.09	6.93	6.93	6.78	6.63	6.63	6.48	6.33	6.19	6.04	5.90
24	5.90	5.90	5.90	5.76	5.76	5.61	5.47	5.33	5.19	5.19	5.19	5.19
25	5.19	5.19	5.19	5.05	5.05	4.91	4.91	4.77	4.64	4.64	4.64	4.64
26	4.64	4.64	4.64	4.64	4.64	4.64	4.64	4.50	4.50	4.50	4.50	4.50
27	4.50	4.50	4.50	4.50	4.50	4.50	4.50	4.37	4.23	4.23	4.37	4.37
28	4.37	4.37	4.50	4.50	4.50	4.50	4.50	4.37	4.23	4.23	4.37	4.37
29*	4.37	4.37	4.50	4.50	4.50	4.50	4.50	5.47	6.48	6.04	5.90	6.73
30*	8.22	10.0	9.10	7.72	7.09	6.63	6.63	6.63	6.63	6.63	6.48	6.33
31	6.33	6.19	6.19	6.19	6.04	5.90	5.90	5.76	5.61	5.61	5.61	5.47

*SPECIAL POINTS

29	1545/4.37	1700/6.48
30	0345/10.0	

RIVER GAGE DATA
 STA. NO. 16 RIO NAITO AT LAS GAVIOTAS
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	5.47	5.47	5.47	5.47	5.33	5.33	5.19	5.19	5.05	5.05	5.05	5.05
2	5.05	5.05	5.05	5.05	5.05	5.05	4.91	4.77	4.77	4.77	4.77	4.77
3	4.77	4.77	4.91	5.05	5.05	5.05	4.91	4.77	4.77	4.77	4.77	4.77
4	4.91	4.91	5.05	5.05	5.05	5.05	5.05	4.91	4.91	4.91	4.91	4.91
5	4.91	4.91	5.05	5.05	5.05	5.05	4.91	4.91	4.91	4.77	4.77	4.77
6	4.77	4.77	4.77	4.77	4.77	4.77	4.77	4.77	4.77	4.77	4.77	4.77
7*	4.91	4.91	4.91	4.91	4.91	4.91	4.91	5.61	5.61	5.61	5.61	6.48
8*	6.48	6.19	5.90	5.76	5.76	5.90	6.33	6.33	6.33	6.19	6.19	6.19
9	6.19	6.04	6.04	6.04	6.04	5.90	5.90	5.90	5.76	5.61	5.61	5.61
10	5.61	5.61	5.61	5.76	5.76	5.76	5.76	5.76	5.76	5.76	5.90	5.90
11	6.04	6.19	6.19	6.33	6.33	6.33	6.33	5.19	6.19	6.19	6.19	6.19
12	6.19	6.19	6.19	6.19	6.19	6.04	6.04	5.90	5.90	5.90	5.76	5.76
13	5.76	5.76	5.76	5.90	5.90	5.90	5.76	5.76	5.61	5.61	5.61	5.47
14	5.47	5.47	5.33	5.33	5.19	5.19	5.19	5.05	4.91	4.91	4.91	4.91
15	4.91	4.91	4.91	4.91	4.91	4.91	4.77	4.64	4.64	4.64	4.64	4.64
16	4.64	4.77	4.77	4.91	5.19	6.48	7.40	8.06	8.06	7.69	7.72	7.56
17	7.24	6.93	6.63	6.48	6.33	6.19	5.90	5.90	5.90	5.90	5.90	5.90
18	5.90	6.04	6.19	6.33	6.33	6.48	6.48	6.48	6.48	6.63	6.63	6.77
19	6.93	7.09	7.09	7.24	7.24	7.40	7.40	7.40	7.40	7.56	7.39	8.40
20	9.10	10.0	10.6	11.2	11.8	12.0	12.2	12.0	12.0	11.8	11.6	11.6
21*	11.2	11.2	11.0	10.8	10.6	10.2	10.0	9.84	9.84	10.7	17.9	47.0
22*	83.4	106.	125.	179.	204.	205.	182.	146.	117.	101.	96.5	96.0
23*	93.5	89.0	82.9	76.6	70.6	65.0	59.4	55.8	51.0	47.8	51.8	54.6
24*	66.6	90.0	108.	109.	102.	92.0	84.5	80.2	79.7	82.0	86.5	90.0
25	93.0	93.5	91.5	87.0	80.2	74.2	67.4	61.4	56.2	51.0	48.6	42.6
26*	39.4	36.9	34.4	32.2	30.0	27.9	26.3	24.6	24.0	23.5	23.5	24.2
27	29.7	29.1	27.2	26.6	26.6	26.0	25.1	24.6	24.3	24.5	25.4	26.3
28	26.6	26.6	26.3	25.7	25.1	24.6	23.7	23.0	22.2	21.7	20.9	20.2
29	19.7	18.9	18.4	17.7	17.2	16.8	16.3	15.9	15.2	14.9	14.7	14.2
30*	14.0	13.8	13.8	13.6	13.1	12.9	12.7	12.4	12.1	12.1	12.1	12.1

*SPECIAL POINTS

7	1415/5.47											
8	0045/6.63											
21	1915/9.84	2045/17.5										
22	1115/207.											
23	1545/54.6											
24	0715/111.	1730/79.3										
26	2115/23.0											
30	1615/12.4	1640/17.9	2330/67.4									

RIVER GAGE DATA
 STA. NO. 16 RIO NATA AT LAS GAVIOTAS
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	65.0	78.9	106.	115.	107.	90.5	75.4	64.6	56.6	51.4	49.4	49.8
2	50.6	51.0	50.2	48.2	45.8	42.6	39.1	36.5	33.5	30.7	28.5	26.3
3*	24.6	23.5	26.6	34.1	37.2	36.9	35.3	34.7	35.6	38.4	41.1	48.2
4	50.2	47.8	45.0	42.2	39.1	36.9	34.4	31.9	29.7	27.9	25.7	24.0
5	22.7	21.7	20.7	19.7	18.7	17.9	17.2	16.5	16.1	15.0	15.2	14.9
6	14.7	14.2	13.8	13.6	13.3	13.1	12.7	12.4	12.2	12.0	11.8	11.6
7	11.6	11.4	11.4	11.2	11.2	11.0	10.8	10.4	10.4	10.2	10.0	10.0
8	9.84	9.84	9.65	9.65	9.46	9.46	9.46	9.65	9.84	9.84	9.65	19.4
9*	26.3	27.6	30.0	34.1	35.6	35.3	35.9	33.8	35.9	34.7	29.7	26.3
10*	25.1	24.0	22.7	22.2	22.2	22.4	21.9	20.9	26.0	23.7	77.0	100.0
11*	116.	111.	107.	109.	109.	100.	86.0	81.5	97.0	173.	324.	436.
12*	481.	478.	478.	486.	499.	519.	546.	581.	637.	694.	720.	764.
13*	859.	961.	1140.	1220.	1190.	1130.	1050.	1060.	1070.	1090.	1080.	1010.
14*	936.	872.	818.	775.	736.	704.	673.	643.	515.	555.	820.	1110.
15*	1410.	1490.	1560.	1530.	1440.	1340.	1230.	1120.	1020.	940.	872.	811.
16	749.	698.	644.	593.	535.	468.	411.	369.	342.	314.	301.	294.
17	291.	289.	286.	278.	265.	248.	232.	230.	213.	186.	159.	139.
18	122.	111.	102.	95.0	89.0	83.9	78.9	75.8	72.6	69.8	67.0	65.0
19	63.0	61.0	59.8	58.6	57.8	56.6	55.8	54.6	53.8	52.6	51.8	50.6
20	49.4	48.2	47.4	46.2	45.4	44.2	43.0	41.8	40.7	39.7	39.1	38.1
21*	37.5	36.9	36.2	35.6	34.7	34.1	33.5	32.8	35.6	35.0	38.4	107.
22*	215.	206.	163.	133.	121.	109.	95.5	83.4	74.6	67.8	75.0	73.0
23	63.4	56.6	51.4	47.4	44.6	42.2	40.4	38.8	37.5	36.5	35.3	34.1
24	33.1	32.2	31.6	30.7	30.4	29.7	29.4	28.6	28.2	27.0	25.9	25.6
25	26.0	25.4	25.1	M	M	M	M	M	M	M	M	M
26	M	M	M	M	M	M	M	31.5	30.7	29.7	28.0	27.9
27	26.9	26.0	25.1	24.3	23.7	23.2	22.7	22.2	21.7	21.4	20.7	20.7
28	20.4	20.2	19.9	19.7	19.4	19.2	18.9	18.7	18.4	18.2	17.9	17.7
29	17.7	17.5	17.5	17.2	17.2	17.0	16.8	16.5	16.3	16.3	16.3	16.1
30	16.3	16.5	17.0	17.7	18.4	19.2	19.7	19.9	20.4	20.4	20.7	20.7
31	20.4	20.4	20.2	20.2	19.9	19.7	19.7	19.4	19.4	19.2	18.9	18.7

*SPECIAL POINTS

1	0115/64.6	0730/115.										
3	1050/37.5	1430/35.6										
9	1300/36.9	1650/32.8										
10	1715/20.4	1815/26.3										
11	0900/110.	1435/85.5										
12	0240/484.	0500/477.										
13	1440/1030.	1500/1070.										
14	1830/610.											
15	0620/1560.											
21	1100/32.2	1135/35.6										
22	0340/220.	2030/67.4										

RIVER GAGE DATA
 STA. NO. 16 RIO NATO AT LAS GAVIOTAS
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	18.4	18.4	18.2	17.9	17.7	17.5	17.5	17.2	17.2	25.4	27.7	24.0
2*	20.9	19.4	18.4	17.9	17.5	17.5	17.5	17.5	17.7	17.7	30.0	25.4
3	341.	278.	193.	170.	167.	148.	118.	100.0	112.	240.	506.	655.
4*	767.	754.	691.	628.	593.	562.	539.	524.	513.	488.	458.	415.
5	369.	329.	291.	258.	233.	208.	182.	163.	147.	131.	120.	112.
6*	105.	100.0	96.0	92.5	89.0	85.5	81.5	77.2	75.0	71.8	69.8	77.0
7	89.0	98.4	93.5	88.0	86.0	82.0	76.2	70.2	69.4	58.6	57.0	53.4
8	51.0	48.6	46.6	45.0	43.4	41.8	40.7	39.4	38.1	37.5	36.2	35.9
9*	37.2	36.5	35.6	38.1	84.5	109.	108.	98.7	86.5	79.3	73.4	67.4
10	62.2	57.8	53.4	49.4	45.8	42.6	40.1	39.1	37.5	35.9	34.7	33.3
11*	33.1	32.8	32.8	32.8	32.5	32.2	37.5	51.4	51.0	39.7	33.8	31.9
12*	69.0	97.0	97.9	88.5	77.4	68.6	61.8	55.8	50.2	46.2	42.2	39.4
13	36.9	35.0	33.1	31.6	31.0	31.0	31.9	32.8	34.7	35.3	35.9	36.5
14	37.2	37.5	38.1	38.8	39.4	41.1	44.2	48.2	52.6	56.6	59.4	60.6
15	60.2	59.4	58.2	57.0	55.8	55.0	53.4	52.2	51.0	49.4	48.2	46.6
16	45.0	43.8	44.2	43.0	42.6	43.0	41.8	42.6	43.0	51.0	60.2	64.2
17*	62.6	65.0	109.	163.	182.	181.	171.	157.	149.	127.	117.	107.
18*	98.9	92.0	87.0	81.5	77.8	74.2	70.6	67.4	74.2	73.8	111.	76.5
19*	91.0	83.9	86.0	96.5	97.0	90.5	82.0	75.8	114.	135.	141.	141.
20	133.	120.	108.	96.0	85.5	77.8	72.2	67.4	63.8	59.8	56.6	54.2
21	51.4	49.4	47.4	45.8	44.2	42.2	40.7	39.4	36.1	36.9	35.9	35.0
22	33.8	32.8	32.2	31.3	31.0	30.7	30.4	30.0	29.7	29.4	29.7	30.0
23*	29.7	29.1	29.4	30.0	30.7	30.7	30.4	29.7	29.7	33.5	39.1	73.8
24*	122.	132.	102.	85.5	78.2	76.6	75.8	72.2	66.6	60.2	54.6	51.0
25*	50.6	51.8	53.4	53.8	52.6	50.6	48.6	46.2	114.	512.	827.	1230.
26*	1440.	1430.	1260.	1120.	1050.	998.	955.	915.	867.	820.	764.	794.
27	631.	547.	433.	311.	238.	178.	151.	130.	115.	102.	97.0	89.5
28	85.0	78.9	75.4	72.2	69.4	66.6	63.8	61.0	59.0	56.6	54.2	52.6
29	50.2	49.4	49.0	48.6	47.0	45.4	43.8	42.6	41.5	41.8	45.0	53.8
30*	65.8	167.	169.	139.	129.	118.	104.	91.5	81.5	73.8	67.4	63.0
31	59.4	56.6	54.2	52.6	50.6	48.6	46.2	44.2	42.6	40.7	39.4	38.1

*SPECIAL POINTS

1	1950/17.0	2100/31.3
2	2130/17.7	
4	0250/771.	
6	2220/69.4	
9	0615/35.3	1300/111.
11	1700/54.2	2330/31.6
12	0550/98.9	
17	0030/64.6	1050/183.
18	1715/66.2	1930/73.0
19	0450/82.4	0915/97.9
23	1900/29.1	1930/34.7
24	0300/131.	
25	1620/46.2	
26	0250/1450.	
30	0500/179.	

RIVER GAGE DATA
 STA. NO. 16 RIO NATO AT LAS GAVIOTAS
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	37.2	35.9	35.3	34.4	33.8	33.1	32.5	32.2	31.9	31.6	31.3	31.3
2	31.0	30.4	30.0	29.7	29.7	29.4	29.1	28.8	28.2	27.9	27.6	26.9
3	26.6	26.3	26.0	25.7	25.4	24.8	24.6	24.3	24.0	23.7	23.5	23.2
4	23.0	23.0	22.7	22.7	22.4	22.2	21.9	21.9	21.7	21.7	21.4	21.2
5*	21.2	20.9	20.9	20.7	20.7	20.4	20.9	21.2	22.2	25.7	23.0	21.7
6	20.9	20.7	20.4	20.4	20.4	20.2	19.9	19.7	19.4	19.4	19.4	19.2
7	19.2	19.2	19.2	18.9	18.9	18.7	18.7	18.4	18.4	18.4	18.2	18.2
8*	18.2	18.2	18.2	17.9	17.9	17.9	28.5	71.4	197.	337.	386.	392.
9	387.	375.	354.	329.	315.	304.	287.	261.	231.	195.	166.	139.
10*	117.	102.	91.0	81.5	75.0	69.4	65.0	61.8	58.2	55.4	59.0	78.5
11*	85.5	85.5	88.0	88.5	84.5	77.8	71.8	67.0	63.4	59.8	59.0	71.4
12*	92.0	97.5	91.5	81.0	75.4	77.0	80.2	79.7	76.2	71.0	66.2	61.8
13	58.2	55.4	53.0	52.2	52.2	52.6	53.0	53.4	53.0	52.2	51.0	49.4
14	47.4	45.8	44.2	42.2	40.7	39.4	38.1	36.9	35.9	35.0	34.1	33.5
15	32.5	31.9	31.0	30.4	29.4	28.8	28.5	27.6	27.2	26.3	25.7	25.4
16	25.1	24.8	24.3	23.7	23.5	23.2	23.0	22.4	22.2	22.2	21.9	21.7
17	21.4	21.2	20.9	20.9	20.7	20.4	20.2	19.9	19.7	19.7	19.4	19.4
18	19.2	19.2	18.9	18.9	18.7	18.7	18.4	18.4	18.2	18.2	17.9	17.9
19	17.9	17.7	17.7	17.7	17.5	17.5	17.2	17.0	17.0	17.0	17.0	17.0
20	17.0	16.8	16.8	16.5	16.5	16.5	16.3	16.1	16.1	16.1	16.1	16.1
21	16.1	16.1	16.1	16.1	16.1	15.9	15.9	15.6	15.6	15.4	15.4	15.4
22*	15.4	15.4	15.4	15.4	15.4	15.4	15.2	15.2	14.9	17.7	98.4	122.
23	86.0	57.4	42.6	35.0	29.7	26.0	23.0	21.4	19.9	19.2	18.4	17.9
24	17.2	17.0	16.8	16.5	16.3	15.9	15.9	15.6	15.6	15.4	15.2	15.2
25	15.2	14.9	14.9	14.9	14.7	14.7	14.5	14.5	14.2	14.2	14.2	14.0
26	14.0	14.0	14.2	14.2	14.0	14.0	13.8	13.6	13.6	13.6	13.6	13.6
27	13.6	13.6	13.6	13.6	13.6	13.3	13.3	13.1	13.1	13.6	14.0	14.5
28	13.8	13.6	13.3	13.3	13.3	13.3	13.1	13.1	12.9	13.1	13.1	13.1
29*	13.1	13.1	13.1	13.1	13.1	13.1	12.9	13.8	13.6	13.3	13.1	12.9
30	12.9	13.1	13.1	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.3	13.6

*SPECIAL POINTS

5	1930/26.0	
8	2325/393.	
10	2120/55.0	
11	0715/89.0	2100/58.6
12	1500/81.0	
22	1945/14.9	2340/124.
29	1545/12.9	

RIVER GAGE DATA
 STA. NO. 16 RIO NATO AT LAS GAVIOTAS
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		4.46	5.28	76.6	19.5	33.7
2		3.99	4.93	41.2	29.1	29.2
3		5.05	4.86	33.9	226.	25.0
4		5.43	4.96	36.9	582.	22.2
5		5.19	4.93	18.5	226.	21.7
6		5.02	4.77	13.1	86.8	20.2
7		5.01	5.22	10.9	77.5	18.7
8		4.87	6.13	10.1	42.9	111.
9		4.79	5.91	31.4	70.1	289.
10		4.22	5.73	30.9	46.0	79.7
11		3.77	6.21	139.	37.0	74.7
12		3.48	6.04	555.	65.9	79.1
13		5.45	5.75	1060.	34.0	53.7
14		4.50	5.18	778.	45.1	40.2
15		3.72	4.80	1230.	54.4	29.1
16	M	3.35	6.33	501.	46.4	23.3
17	5.76	3.21	6.34	241.	130.	20.4
18	5.77	3.19	6.36	89.9	84.3	18.6
19	5.73	3.20	7.35	57.0	102.	17.4
20	5.72	3.20	11.2	44.2	86.5	16.4
21	5.72	3.37	13.1	38.5	43.1	15.8
22	5.50	5.24	134.	117.	31.2	27.0
23	5.34	6.66	68.2	45.8	32.7	37.5
24	5.18	5.57	87.7	30.0	81.1	16.2
25	5.13	4.92	72.4	M	208.	14.6
26	5.07	4.59	30.1	M	1030.	13.9
27	5.06	4.43	26.2	23.5	280.	13.5
28	4.98	4.40	24.1	19.2	68.1	13.3
29	4.89	5.05	16.9	16.9	46.5	13.2
30	4.79	7.33	20.1	18.7	105.	13.2
31		5.94		19.8	49.0	

RIVER GAGE DATA

NAME: Sta. No. 17 Río Tigre at the Crossing of the Maturín-Temblador Road.

LOCATION: Longitude 62° 59.5' W, latitude 09° 21.0' N. Approximately 48.3 km SSE of Maturín, 4.2 km SSE of El Blanquero.

DRAINAGE AREA: 2668 sq mi (from topographic map).

GAGE: Stevens Type F water level recorder attached to right downstream side of bridge.

RECORDS AVAILABLE: June 3, 1969 through September 30, 1969.

REMARKS: Record is good.

CODING: M signifies missing data; E signifies estimated data.



Aerial view of the Río Tigre at the crossing of the Maturín-Temblador road. The Type F recorder is attached to the downstream side of the bridge. Note the improvement to the channel alignment upstream of the bridge. A cutoff has been excavated so that the river crosses the road at right angles.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 17 RIO TIGRE AT THE CROSSING OF THE MATURIN-TEMBLADOR ROAD

Meas. No.	Date	Made by	Width ft	Area sq ft	Mean Velocity fps	Outside Gage Height ft	Dis-charge cfs	Shift Adj. ft	Per-cent Diff.	Method	Number Meas. Sections	Gage Height Change ft	Time hr	Water Temp. °F
1	May 28	Santos	138.	490.	1.76	No Gage	862.	0	-	-	26	-	-	85
2	June 3	Romero	137.	545.	1.64	0.26	892.	0	+2.2	Bridge	31	0	1.7	88
3	11	Santaella	135.	610.	1.90	0.57	1160.	0	+0.7	Bridge	27	+0.1	0.5	85
4	17	Santos	138.	722.	1.38	0.37	995.	0	+1.4	Bridge	27	0	2.7	84
5	20	Romero	139.	642.	1.43	0.29	915.	0	+1.1	Bridge	25	+0.1	1.1	85
6	23	Romero	140.	654.	1.65	0.54	1080.	0	-3.8	Bridge	26	0	1.1	82
7	30	Santaella	138.	700.	2.14	1.03	1500.	0	-4.9	Bridge	23	0	1.3	84
8	July 10	Santos	139.	620.	1.95	0.71	1210.	0	-4.0	Bridge	23	0	1.1	81
9	14	Santaella	140.	910.	2.54	2.36	2310.	0	+0.6	Bridge	26	+0.4	1.4	78
10	19	Romero	178.	1690.	2.81	5.69	4750.	0	-4.3	Bridge	27	-0.2	2.0	82
11	25	Santaella	153.	1240.	2.27	3.01	2820.	0	+3.4	Bridge	29	-0.2	1.6	80
12	29	Santos	140.	1240.	2.10	2.79	2610.	0	+1.1	Bridge	24	-0.2	1.2	84
13	Aug. 6	Romero	179.	1630.	2.85	5.26	4640.	0	-1.0	-	26	+0.3	1.0	-
14	8	Santaella	176.	1420.	2.75	4.54	3910.	0	-3.0	Bridge	23	+0.3	1.5	78
15	12	Santos	140.	1070.	2.22	2.37	2380.	0	+3.1	Bridge	24	0	1.2	85
16	19	Tirado	174.	1470.	3.07	4.90	4520.	0	+3.1	Bridge	23	+0.5	1.4	84
17	20	Santos	178.	1580.	2.99	5.49	4720.	0	-2.5	Bridge	27	+0.2	1.3	78
18	21	Santos	184.	1760.	3.07	6.28	5410.	0	+2.3	Bridge	26	0	1.2	-
19	22	Santos	181.	1650.	3.07	5.86	5060.	0	+0.2	Bridge	26	-0.5	1.2	-
20	23	Santos	181.	1690.	2.88	5.61	4860.	0	-1.1	Bridge	25	+0.2	1.0	-
21	Sept. 2	Romero	172.	1480.	2.03	3.57	3010.	0	-4.7	Bridge	27	-0.2	1.3	83
22	9	Contreras	153.	1000.	2.19	2.25	2190.	0	-2.1	Bridge	26	0	1.5	-
23	26	Tirado	133.	614.	2.51	0.94	1540.	0	+3.4	Bridge	24	0	0.9	-

RATING TABLE
FOR
STA. NO. 17 RIO TIGRE AT THE CROSSING OF THE MATURIN-TEMBLADOR ROAD

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00		1.00	1550.	2.00	2110.	3.00	2720.	4.00	3540.	5.00	4475.	6.00	5130.
.10		.10	1635.	.10	2160.	.10	2790.	.10	3630.	.10	4560.	.10	5185.
.20	810.	.20	1710.	.20	2210.	.20	2865.	.20	3720.	.20	4640.	.20	5240.
.30	915.	.30	1775.	.30	2265.	.30	2940.	.30	3810.	.30	4715.	.30	5295.
.40	1010.	.40	1830.	.40	2325.	.40	3020.	.40	3900.	.40	4785.	.40	
.50	1095.	.50	1875.	.50	2390.	.50	3100.	.50	3995.	.50	4850.	.50	
.60	1170.	.60	1915.	.60	2455.	.60	3185.	.60	4090.	.60	4910.	.60	
.70	1255.	.70	1960.	.70	2520.	.70	3270.	.70	4190.	.70	4965.	.70	
.80	1350.	.80	2010.	.80	2585.	.80	3360.	.80	4290.	.80	5020.	.80	
.90	1455.	.90	2060.	.90	2650.	.90	3450.	.90	4385.	.90	5075.	.90	

RIVER GAGE DATA
 STA. NO. 17 RIO TIGRE AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
3	M	M	M	M	M	M	M	M	M	M	M	M
4	874.	864.	854.	874.	895.	915.	945.	874.	874.	874.	874.	874.
5	983.	992.	1000.	1010.	1010.	1020.	1050.	1050.	1050.	1040.	1030.	1020.
6	1010.	1000.	1000.	1000.	992.	983.	1000.	983.	983.	983.	992.	1000.
7	983.	983.	973.	964.	964.	964.	964.	1010.	1050.	1050.	1030.	1020.
8	1010.	1000.	1000.	1000.	1000.	1010.	1010.	1020.	1030.	1040.	1050.	1060.
9	1070.	1080.	1080.	1090.	1090.	1090.	1090.	1090.	1090.	1090.	1080.	1080.
10	1080.	1070.	1070.	1070.	1070.	1060.	1060.	1060.	1060.	1060.	1060.	1050.
11	1080.	1090.	1100.	E 1120.	E 1130.	E 1150.	E 1170.	1190.	1200.	1220.	1220.	1230.
12	1230.	1230.	1230.	1230.	1230.	1230.	1230.	1230.	1230.	1220.	1220.	1220.
13	1220.	1220.	1210.	1210.	1190.	1190.	1160.	1160.	1150.	1130.	1130.	1120.
14	1100.	1090.	1080.	1070.	1060.	1050.	1040.	1030.	1020.	1010.	1000.	1000.
15	1000.	1000.	1010.	1020.	1030.	1030.	1040.	1040.	1040.	1050.	1050.	1050.
16	1050.	1050.	1050.	1050.	1050.	1040.	1040.	1030.	1020.	1010.	1000.	1000.
17	992.	983.	983.	983.	973.	973.	964.	954.	954.	945.	945.	935.
18	925.	915.	905.	915.	915.	925.	925.	915.	915.	915.	915.	915.
19	915.	915.	905.	905.	905.	915.	915.	915.	915.	915.	915.	915.
20	905.	915.	915.	915.	915.	915.	915.	905.	905.	915.	915.	915.
21	925.	925.	935.	945.	954.	964.	964.	964.	964.	964.	973.	983.
22	992.	1000.	1010.	1020.	1030.	1050.	1050.	1070.	1080.	1090.	1090.	1090.
23	1100.	1110.	1120.	1120.	1130.	1130.	1130.	1130.	1130.	1130.	1130.	1140.
24	1170.	1180.	1230.	1220.	1240.	1250.	1260.	1280.	1300.	1330.	1360.	1380.
25	1390.	1400.	1410.	1420.	1440.	1430.	1460.	1460.	1440.	1440.	1430.	1430.
26	1430.	1420.	1400.	1390.	1390.	1400.	1420.	1420.	1430.	1440.	1460.	1470.
27	1480.	1510.	1530.	1540.	1560.	1560.	1560.	1560.	1560.	1550.	1550.	1550.
28	1550.	1550.	1550.	1550.	1550.	1560.	1570.	1570.	1570.	1570.	1570.	1570.
29	1580.	1590.	1590.	1590.	1590.	1590.	1590.	1600.	1590.	1590.	1590.	1590.
30	1590.	1600.	1600.	1590.	E 1590.	E 1580.	1580.	1570.	1560.	1550.	1540.	1510.

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 17 RIO TIGRE AT THE CROSSING OF THE MATORIN-TEMBLADOR ROAD
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	1500.	1490.	1470.	1460.	1440.	1430.	E 1420.	1390.	1380.	1340.	1320.	1300.
2	1290.	1280.	1270.	1270.	1260.	1260.	1260.	1250.	1250.	1250.	1250.	1260.
3	1260.	1260.	1270.	1280.	1290.	1290.	1290.	1290.	1290.	1280.	1270.	1260.
4	1250.	1250.	1250.	1250.	1240.	1240.	1230.	1230.	1230.	1220.	1220.	1230.
5	1220.	1230.	1240.	1250.	1280.	1300.	1330.	1360.	1380.	1380.	1390.	1390.
6	1390.	1390.	1390.	1390.	1380.	1380.	1380.	1360.	1350.	1340.	1320.	1330.
7	1320.	1310.	1310.	1310.	1310.	1310.	1310.	1310.	1310.	1300.	1300.	1300.
8	1300.	1300.	1310.	1320.	1320.	1330.	1440.	1460.	1460.	1440.	1420.	1400.
9*	1380.	1360.	1340.	1330.	1320.	1380.	1360.	1320.	1300.	1290.	1290.	1290.
10	1280.	1280.	1270.	1260.	1250.	1240.	1240.	1240.	1290.	1290.	1290.	1290.
11	1290.	1290.	1290.	1300.	1310.	1320.	1360.	1390.	1440.	1500.	1560.	1620.
12	1700.	1750.	1790.	1840.	1870.	1890.	1920.	1940.	1960.	1980.	2000.	2020.
13	2030.	2050.	2080.	2100.	2110.	2120.	2140.	2160.	2170.	2230.	2230.	2230.
14	2230.	2240.	2240.	2250.	2260.	2290.	2310.	2310.	2330.	2350.	2370.	2390.
15	2420.	2450.	2470.	2490.	2540.	2550.	2580.	2610.	2640.	2690.	2730.	2770.
16	2830.	2880.	2920.	3040.	3110.	3210.	3330.	3430.	3540.	3650.	3700.	3760.
17	3850.	3970.	4050.	4140.	4260.	4380.	4490.	4620.	4700.	4780.	4890.	4940.
18	4980.	5010.	5040.	5050.	5060.	5060.	5060.	5050.	5040.	5040.	5030.	5010.
19	5000.	4990.	4990.	4980.	4960.	4950.	4940.	4930.	4920.	4910.	4900.	4890.
20	4870.	4850.	4820.	4780.	4760.	4710.	4670.	4620.	4550.	4490.	4440.	4380.
21	4320.	4250.	4190.	4120.	4050.	3990.	3930.	3860.	3810.	3760.	3680.	3630.
22	3580.	3510.	3450.	3390.	3370.	3340.	3310.	3280.	3250.	3220.	3180.	3150.
23	3100.	3080.	3040.	3010.	3000.	3000.	3000.	3000.	3000.	3000.	3010.	3010.
24	3000.	3000.	2990.	2990.	2980.	2970.	2960.	2930.	2920.	2910.	2890.	2870.
25	2840.	2820.	2800.	2780.	2770.	2750.	2720.	2700.	2680.	2660.	2660.	2660.
26	2680.	2720.	2770.	2830.	2920.	2970.	3050.	3110.	3180.	3220.	3250.	3280.
27	3300.	3310.	3320.	3330.	3330.	3330.	3330.	3320.	3310.	3310.	3270.	3240.
28	3200.	3140.	3090.	3040.	2970.	2920.	2890.	2840.	2810.	2770.	2740.	2730.
29	2710.	2690.	2670.	2650.	2630.	2610.	2600.	2580.	2570.	2550.	2530.	2530.
30	2510.	2510.	2490.	2470.	2470.	2450.	2440.	2430.	2420.	2400.	2400.	2390.
31	2380.	2380.	2380.	2380.	2380.	2370.	2360.	2360.	2350.	2340.	2340.	2330.

*SPECIAL POINTS

9 1050/1320.

RIVER GAGE DATA
 STA. NO. 17 RIO TIGRE AT THE CROSSING OF THE MATURIN-TEMBLADOR ROAD
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	2320.	2320.	2310.	2310.	2310.	2290.	2280.	2260.	2260.	2250.	2240.	2240.
2*	2230.	2220.	2200.	2190.	2180.	2170.	2160.	2150.	2140.	2160.	2140.	2140.
3	2140.	2150.	2150.	2160.	2160.	2160.	2160.	2160.	2170.	2180.	2210.	2230.
4	2270.	2340.	2410.	2480.	2550.	2600.	2670.	2750.	2830.	2890.	2980.	3040.
5	3130.	3250.	3320.	3430.	3540.	3620.	3680.	3770.	3850.	4080.	4220.	4290.
6	4410.	4530.	4590.	4680.	4730.	4760.	4780.	4780.	4780.	4760.	4760.	4740.
7	4690.	4630.	4580.	4530.	4450.	E 4320.	E 4200.	E 4230.	E 4160.	E 4110.	E 4070.	E 4050.
8	4020.	E 4000.	E 3990.	E 4000.	E 4010.	E 4030.	4040.	4080.	4070.	4070.	4060.	4030.
9	4000.	3980.	3920.	3850.	3760.	3710.	3630.	3540.	3470.	3380.	3270.	3220.
10	3140.	3070.	3020.	2960.	2900.	2830.	2780.	2720.	2660.	2600.	2560.	2510.
11	2450.	2420.	2380.	2350.	2350.	2340.	2330.	2320.	2320.	2320.	2320.	2320.
12	2310.	2310.	2320.	2310.	2310.	2310.	2310.	2310.	2310.	2320.	2320.	2330.
13	2320.	2320.	2320.	2310.	2310.	2300.	2290.	2280.	2270.	2260.	2260.	2260.
14	2250.	2250.	2250.	2250.	2250.	2250.	2250.	2260.	2260.	2270.	2280.	2280.
15	2270.	2270.	2260.	2260.	2250.	2250.	2240.	2240.	2230.	2230.	2220.	2220.
16	2230.	2230.	2240.	2240.	2250.	2260.	2270.	2290.	2400.	2440.	2490.	2490.
17	2490.	2490.	2490.	2500.	2510.	2540.	2570.	2610.	2650.	2720.	2810.	2890.
18	2990.	3090.	3180.	3290.	3370.	3440.	3510.	3580.	3670.	3720.	3790.	3830.
19	3940.	3990.	4060.	4130.	4200.	4260.	4360.	4420.	4470.	4530.	4570.	4600.
20	4660.	4700.	4740.	4770.	4810.	4840.	4860.	4940.	4980.	5030.	5070.	5120.
21	5160.	5190.	5210.	5250.	5260.	5280.	5280.	5280.	5280.	5270.	5260.	5250.
22	5200.	5160.	5120.	5090.	5040.	5040.	5020.	4970.	4940.	4920.	4890.	4880.
23	4880.	4880.	4890.	4900.	4930.	4930.	4950.	4960.	4990.	5010.	5030.	5040.
24	5060.	5070.	5090.	5100.	5110.	5120.	5120.	5130.	5120.	5120.	5110.	5100.
25	5080.	5070.	5070.	5080.	5100.	5110.	5130.	5180.	5190.	5200.	5210.	5230.
26	5240.	5260.	5270.	5270.	5270.	5260.	5230.	5220.	5200.	5180.	5170.	5160.
27	5160.	5160.	5150.	5150.	5160.	5160.	5170.	5180.	5180.	5180.	5180.	5170.
28	5170.	5170.	5160.	5150.	5150.	5130.	5120.	E 5110.	E 5100.	E 5090.	E 5070.	E 5070.
29	5050.	E 5040.	E 5030.	E 5010.	E 5000.	E 4980.	E 4960.	E 4950.	E 4930.	E 4900.	E 4880.	E 4850.
30	4810.	E 4770.	E 4730.	E 4690.	E 4620.	E 4570.	E 4480.	E 4380.	E 4290.	E 4180.	E 4100.	E 4010.
31	3930.	E 3870.	E 3800.	E 3750.	E 3690.	E 3650.	E 3600.	E 3560.	E 3520.	E 3490.	E 3470.	E 3450.

*SPECIAL POINTS
 2 1855/2170.

RIVER GAGE DATA
 STA. NO. 17 RIO TIGRE AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	3430.	E 3420.	E 3410.	E 3400.	E 3400.	E 3380.	E 3370.	E 3350.	E 3330.	E 3310.	E 3300.	E 3280.
2	3260.	E 3230.	E 3210.	E 3170.	E 3150.	3150.	3130.	3130.	3120.	3120.	3110.	3100.
3	3100.	3100.	3080.	3080.	3070.	3050.	3040.	3040.	3030.	3030.	3020.	3000.
4	3000.	2990.	2970.	2960.	2940.	2920.	2910.	2910.	2890.	2890.	2880.	2860.
5	2860.	2830.	2820.	2800.	2790.	2780.	2750.	2730.	2720.	2710.	2690.	2680.
6	2650.	2640.	2640.	2620.	2600.	2580.	2570.	2550.	2540.	2530.	2520.	2510.
7	2490.	2470.	2460.	2450.	2440.	2420.	2410.	2400.	2390.	2380.	2370.	2360.
8	2340.	2330.	2320.	2310.	2300.	2290.	2290.	2290.	2290.	2280.	2250.	2250.
9	2240.	2240.	2230.	2230.	2240.	2250.	2260.	2310.	2320.	2340.	2360.	2370.
10	2380.	2380.	2380.	2390.	2390.	2400.	2410.	2430.	2450.	2470.	2510.	2550.
11	2580.	2620.	2640.	2670.	2730.	2750.	E 2780.	E 2800.	E 2830.	E 2860.	E 2900.	E 2920.
12	2960.	E 2990.	E 3020.	E 3040.	3080.	3080.	3100.	3110.	E 3120.	E 3120.	E 3130.	E 3130.
13	3130.	E 3130.	E 3130.	E 3120.	E 3120.	E 3110.	E 3100.	E 3090.	F 3080.	E 3070.	E 3050.	E 3040.
14	3020.	E 3000.	E 2970.	E 2950.	2910.	2890.	2860.	2830.	2810.	2790.	2770.	2750.
15	2740.	2730.	2710.	E 2700.	F 2680.	E 2650.	E 2630.	E 2600.	E 2570.	E 2530.	E 2500.	E 2460.
16	2440.	E 2410.	E 2380.	E 2360.	2310.	2280.	2250.	2230.	2210.	2190.	2170.	2150.
17	2120.	2110.	2100.	2090.	2060.	2030.	2020.	2000.	E 1990.	E 1980.	E 1960.	E 1960.
18	1940.	E 1930.	E 1920.	E 1910.	1900.	1890.	1880.	1870.	1860.	1860.	1850.	1840.
19	1830.	1820.	1820.	1810.	1810.	1800.	1790.	1790.	1780.	1770.	1760.	1760.
20	1740.	1740.	1730.	1720.	1720.	1720.	1720.	1700.	1690.	1690.	1680.	1670.
21	1660.	1650.	1640.	1640.	1630.	1630.	1620.	1610.	1600.	1600.	1590.	1590.
22	1570.	1560.	1560.	1550.	1550.	1540.	1520.	1510.	1510.	1500.	1500.	1500.
23	1490.	1490.	1480.	1480.	1490.	1490.	1490.	1490.	1490.	1490.	1490.	1480.
24	1480.	1470.	1470.	1470.	1480.	1480.	1470.	1470.	1470.	1470.	1470.	1470.
25	1490.	1500.	1510.	1530.	1530.	1520.	1510.	1500.	1500.	1490.	1490.	1480.
26	1490.	1490.	1490.	1490.	1490.	1490.	1490.	1480.	1470.	1460.	1460.	1460.
27	1440.	1440.	1430.	1430.	1430.	1410.	1400.	1390.	1380.	1380.	1370.	1360.
28	1360.	1360.	1360.	1350.	1350.	1350.	1350.	1340.	1330.	1330.	1330.	1320.
29	1330.	1330.	1330.	1330.	1330.	1320.	1320.	1320.	1320.	1320.	1320.	1320.
30	1320.	1320.	1320.	1330.	1320.	1320.	1320.	1320.	1310.	1310.	1310.	1310.

*SPECIAL POINTS
 NONE

STA. NO. 17

RIVER GAGE DATA
 RIO TIGRE AT THE CROSSING OF THE MATORIN-TEMBLADOR ROAD
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	JUNE	JULY	AUGUST	SEPTEMBER	
1		1420.	2290.	3370.	E
2		1270.	2180.	3170.	
3	M	1280.	2170.	3060.	
4	917.	1240.	2620.	2930.	
5	1020.	1310.	3630.	2770.	
6	995.	1370.	4670.	2590.	
7	995.	1310.	4360.	2430.	E
8	1020.	1370.	4040.	2300.	
9	1080.	1330.	3680.	2280.	
10	1070.	1270.	2840.	2420.	
11	1150.	1380.	2360.	2740.	E
12	1230.	1870.	2310.	3060.	E
13	1180.	2130.	2290.	3100.	F
14	1050.	2290.	2260.	2890.	
15	1030.	2560.	2250.	2640.	E
16	1030.	3240.	2310.	2300.	
17	968.	4370.	2590.	2040.	E
18	918.	5030.	3410.	1890.	
19	913.	4950.	4260.	1800.	
20	913.	4680.	4850.	1710.	
21	952.	4000.	5240.	1630.	
22	1040.	3360.	5040.	1530.	
23	1120.	3030.	4940.	1490.	
24	1260.	2960.	5100.	1470.	
25	1430.	2750.	5130.	1500.	
26	1420.	2970.	5230.	1480.	
27	1540.	3310.	5170.	1410.	
28	1560.	2950.	5130.	1350.	E
29	1590.	2620.	4970.	1320.	E
30	1580.	2450.	4510.	1320.	F
31		2370.	3680.		F

RIVER GAGE DATA

NAME: Sta. No. 21 Río San Antonio at the Crossing of the Maturín-Temblador Road.

LOCATION: Longitude $63^{\circ} 00.6' W$, latitude $09^{\circ} 23.0' N$. Approximately 43.9 km SSE of Maturín, at El Blanquero.

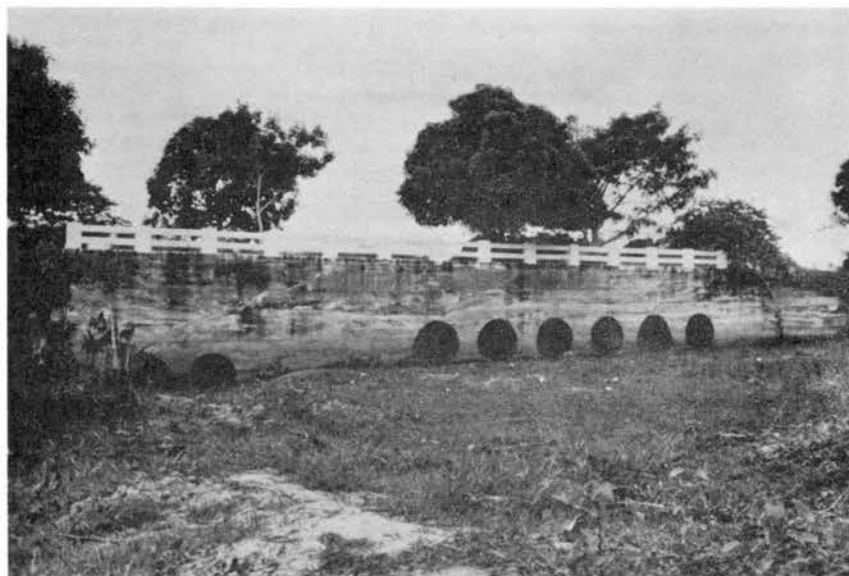
DRAINAGE AREA: 118 sq mi (from topographic map).

GAGE: Stevens Type A35 water level recorder at right upstream end of 6 culverts under road embankment.

RECORDS AVAILABLE: April 23, 1969 through September 30, 1969.

REMARKS: Due to a dam upstream, there was no flow at this station.

CODING: M signifies missing data; E signifies estimated data.



View, looking upstream, of the culverts on the Río San Antonio under the Maturín-Temblador road. No water passed this section during the study period. The entire channel is now vegetated.

RIVER GAGE DATA

NAME: Sta. No. 31 Río Guanipa at El Aceite.

LOCATION: Longitude 64° 11.0' W, latitude 09° 07.9' N. Approximately 28.6 km SE of Cantaura at El Aceite.

DRAINAGE AREA: 344 sq mi (from topographic map).

GAGE: Stevens Type A35 water level recorder attached to left bridge abutment on downstream side of bridge.

RECORDS AVAILABLE: April 15, 1969 through September 30, 1969.

REMARKS: Record is fair to good.

CODING: M signifies missing data; E signifies estimated data.



Aerial view of the Río Guanipa at El Aceite. The gaging station is at the bridge shown at the extreme left side of the photograph. The river flow direction is from the tip of the aircraft wing towards the bridge. A large tributary stream joins the Río Guanipa downstream of the bridge.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 31 RIO GUANIPA AT EL ACEITE

Meas. No.	Date	Made by	Width ft	Area sq ft	Mean Velocity fps	Inside Gage Height ft	Dis-charge cfs	Shift Adj. ft	Per-cent Diff.	Method	Num-ber Meas. Sec-tions	Gage Height Change ft	Time hr	Water Temp. °F
1	May 5	Santaella	78.0	101.	1.41	0.56	142.	0	-5.0	Wading	23	0	1.1	83
2	16	Santos	78.0	98.7	1.70	0.62	168.	0	+6.1	Wading	26	0	1.2	85
3	26	Santaella	78.0	94.0	1.71	0.60	161.	0	+4.0	Wading	21	0	0.5	86
4	June 17	Santaella	78.0	136.	1.29	0.70	176.	0	+2.9	Wading	22	+0.02	0.7	82
5	18	Santaella	78.0	194.	1.84	1.51	357.	0	+1.3	Wading	21	0	1.0	78
6	July 7	Tirado	79.0	109.	1.60	0.76	174.	0	-3.8	Wading	20	-0.01	0.7	82
7	12	Santaella	80.0	218.	1.94	1.65	422.	0	+7.4	Wading	23	-0.04	0.9	77
8	17	Tirado	85.0	184.	1.86	1.33	343.	0	+13.7	Wading	23	-0.01	1.0	85
9	31	Romero	77.0	176.	1.70	1.38	300.	0	-5.0	-	26	-0.04	1.5	82
10	Aug. 4	Romero	80.0	313.	4.47	3.38	1400.	0	-4.6	Bridge	26	-0.03	1.2	78
11	7	Santos	76.5	170.	1.87	1.33	318.	0	+5.4	Wading	25	-0.04	1.2	83
12	10	Santos	79.0	189.	2.56	2.09	484.	0	-9.4	Wading	22	-0.06	0.9	80
13	11	Santos	77.0	162.	1.91	1.37	309.	0	-1.3	Wading	22	0	1.1	84
14	12	Santaella	80.0	352.	5.14	3.72	1810.	0	+1.0	Bridge	22	-0.01	1.0	73
15	12	Santaella	80.0	373.	4.85	3.71	1810.	0	+1.8	Bridge	22	-0.06	0.9	-
16	19	Romero	72.0	205.	2.73	2.06	559.	0	+6.5	Bridge	25	+0.04	0.8	80
17	24	Santaella	78.0	161.	1.92	1.34	309.	0	+1.2	Wading	22	-0.01	0.7	78
18	30	Tirado	75.0	279.	3.13	2.59	872.	0	+6.5	Bridge	26	-0.08	1.5	79
19	Sept. 3	Romero	78.0	182.	1.83	1.54	333.	0	-7.7	Wading	24	-0.03	1.5	85
20	13	Velasquez	75.0	139.	1.78	1.13	248.	0	-2.0	Wading	22	0	0.5	-
21	16	Tirado	80.0	118.	1.86	0.95	220.	0	+1.9	Wading	23	+0.02	0.6	-
22	19	Cardot	80.0	152.	1.73	1.23	263.	0	-4.8	Wading	25	-0.02	0.7	-
23	28	Romero	80.0	129.	1.70	0.96	219.	0	+0.9	Wading	22	0	0.7	-

RATING TABLE
FOR
STA. NO. 31 RIO GUANIPA AT EL ACEITE

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00		1.00	225.	2.00	504.	3.00	1142.	4.00	2072.
.10		.10	246.	.10	538.	.10	1226.	.10	2176.
.20		.20	269.	.20	580.	.20	1312.	.20	2282.
.30		.30	294.	.30	630.	.30	1400.	.30	2390.
.40		.40	321.	.40	688.	.40	1490.	.40	2500.
.50	140.	.50	349.	.50	754.	.50	1582.	.50	2612.
.60	155.	.60	378.	.60	826.	.60	1676.	.60	
.70	171.	.70	408.	.70	902.	.70	1772.	.70	
.80	188.	.80	439.	.80	980.	.80	1870.	.80	
.90	206.	.90	471.	.90	1060.	.90	1970.	.90	

RIVER GAGE DATA
 STA. NO. 31 RIO GUANIPA AT EL ACEITE
 APRIL 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
15	M	M	M	M	M	155.	155.	155.	155.	155.	155.	153.
16	153.	153.	155.	155.	155.	155.	155.	155.	153.	153.	153.	153.
17	153.	155.	155.	157.	157.	157.	157.	155.	155.	155.	155.	155.
18	155.	155.	155.	155.	155.	155.	155.	153.	152.	152.	152.	152.
19	152.	152.	152.	152.	152.	152.	152.	152.	152.	152.	152.	152.
20	152.	152.	152.	152.	152.	152.	152.	150.	150.	150.	150.	149.
21	149.	149.	149.	149.	150.	150.	150.	150.	150.	150.	150.	149.
22	149.	149.	150.	150.	150.	150.	150.	150.	150.	149.	149.	149.
23	149.	149.	149.	149.	150.	149.	149.	149.	149.	147.	147.	147.
24	147.	147.	149.	149.	149.	149.	149.	149.	147.	147.	147.	147.
25	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.	146.
26	146.	146.	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.
27	147.	147.	147.	149.	149.	149.	149.	147.	147.	147.	147.	147.
28	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.	146.	146.
29	146.	146.	146.	147.	147.	147.	147.	147.	147.	147.	147.	147.
30	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 31 RIO GUANIPA AT EL ACEITE
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.
2	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.
3	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.	147.
4	147.	147.	147.	147.	147.	147.	147.	147.	E 147.	E 147.	E 147.	E 147.
5	147.	E 147.	E 147.	E 147.	E 147.	E 147.	E 147.	E 147.	E 147.	E 149.	E 149.	E 149.
6	149.	149.	149.	149.	149.	149.	149.	149.	149.	149.	149.	149.
7	150.	217.	408.	M	M	M	M	M	M	M	M	M
8	M	M	M	M	M	M	M	M	M	M	M	M
9	M	M	M	M	720.	682.	647.	594.	558.	514.	494.	474.
10	458.	439.	423.	408.	393.	384.	384.	390.	399.	414.	430.	445.
11	455.	455.	455.	442.	417.	396.	375.	346.	324.	305.	294.	284.
12	276.	269.	264.	260.	255.	253.	248.	246.	239.	235.	231.	229.
13	225.	221.	219.	215.	213.	212.	210.	206.	202.	199.	197.	193.
14	192.	190.	188.	186.	185.	181.	179.	179.	178.	176.	174.	174.
15	173.	171.	171.	171.	171.	169.	168.	166.	164.	164.	163.	163.
16	161.	161.	160.	160.	158.	158.	158.	158.	157.	157.	157.	155.
17	155.	155.	155.	157.	155.	155.	155.	155.	155.	155.	153.	152.
18	150.	150.	150.	152.	153.	153.	153.	153.	153.	152.	150.	150.
19	150.	150.	150.	152.	152.	153.	152.	152.	152.	152.	150.	150.
20	150.	150.	150.	152.	153.	153.	153.	153.	153.	152.	152.	152.
21	152.	152.	152.	152.	153.	155.	157.	158.	158.	158.	157.	155.
22	155.	155.	155.	157.	158.	157.	157.	155.	155.	155.	153.	153.
23	153.	153.	155.	155.	155.	157.	157.	155.	155.	155.	155.	155.
24	155.	157.	157.	157.	157.	157.	157.	157.	157.	155.	155.	155.
25	155.	155.	155.	157.	157.	157.	157.	157.	157.	155.	155.	155.
26	155.	155.	155.	155.	157.	155.	155.	155.	155.	155.	155.	155.
27	155.	E 155.	E 155.	E 155.	E 155.	E 157.	E 157.	E 155.	E 155.	E 155.	E 155.	E 155.
28	155.	E 157.	E 157.	E 157.	E 157.	E 157.	E 157.	E 157.	E 157.	E 157.	E 157.	E 155.
29	155.	E 155.	E 155.	E 155.	E 155.	E 157.	E 158.	E 158.	E 157.	E 157.	E 157.	E 155.
30	155.	E 155.	E 155.	E 155.	E 155.	E 157.	E 157.	E 157.	E 157.	E 155.	E 155.	E 155.
31	155.	E 155.	E 155.	E 155.	E 155.	E 155.	E 155.	E 155.	E 155.	E 155.	E 155.	E 155.

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 31 RIO GUANIPA AT EL ACEITE
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	155.	E 155.	E 155.	E 155.	155.	155.	155.	155.	155.	155.	155.	155.
2	155.	E 157.	E 158.	E 160.	161.	160.	158.	157.	158.	158.	158.	158.
3	160.	161.	163.	163.	169.	174.	179.	178.	176.	173.	171.	169.
4	164.	163.	163.	163.	163.	161.	161.	161.	161.	160.	158.	158.
5	157.	157.	157.	157.	158.	160.	160.	160.	160.	160.	160.	161.
6	161.	161.	161.	161.	163.	164.	164.	166.	166.	166.	166.	166.
7	173.	181.	181.	178.	176.	174.	171.	169.	169.	169.	168.	174.
8	174.	173.	173.	176.	179.	185.	190.	193.	193.	190.	185.	185.
9	176.	174.	173.	171.	171.	169.	168.	166.	166.	164.	163.	161.
10	161.	161.	160.	160.	160.	160.	160.	158.	158.	158.	157.	157.
11	155.	155.	155.	155.	155.	155.	157.	157.	157.	155.	155.	155.
12	155.	155.	155.	155.	155.	155.	155.	155.	155.	155.	153.	153.
13	153.	153.	155.	155.	155.	155.	153.	153.	153.	153.	152.	152.
14	152.	152.	153.	153.	153.	153.	153.	153.	153.	155.	155.	155.
15	155.	155.	155.	155.	155.	155.	155.	153.	153.	153.	153.	152.
16	152.	152.	153.	153.	153.	155.	153.	153.	153.	153.	152.	152.
17*	152.	152.	153.	153.	160.	160.	164.	171.	174.	176.	190.	279.
18	349.	363.	363.	355.	352.	343.	338.	324.	294.	269.	250.	233.
19	221.	212.	204.	200.	195.	188.	185.	179.	176.	174.	171.	169.
20	169.	169.	169.	169.	169.	169.	168.	166.	164.	164.	163.	163.
21	161.	161.	161.	161.	163.	163.	161.	168.	164.	164.	164.	173.
22	186.	199.	225.	244.	239.	229.	219.	210.	202.	200.	199.	199.
23	200.	204.	206.	210.	210.	208.	208.	206.	202.	200.	195.	197.
24	202.	200.	195.	192.	188.	186.	183.	181.	181.	179.	178.	176.
25	176.	176.	176.	176.	176.	176.	174.	174.	171.	171.	169.	169.
26	171.	171.	171.	171.	173.	173.	171.	173.	169.	169.	169.	169.
27	168.	168.	168.	168.	168.	168.	168.	166.	166.	164.	163.	163.
28	163.	163.	163.	163.	163.	163.	163.	161.	161.	161.	161.	160.
29	161.	161.	161.	161.	161.	161.	161.	161.	161.	161.	161.	161.
30	161.	163.	161.	163.	163.	161.	161.	161.	164.	163.	161.	161.

*SPECIAL POINTS
 17 2100/179.

RIVER GAGE DATA
 STA. NO. 31 RIO GUANIPA AT EL ACEITE
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	161.	161.	161.	161.	161.	161.	160.	160.	160.	161.	161.	163.
2	163.	164.	164.	164.	164.	164.	164.	163.	163.	161.	161.	161.
3	163.	168.	171.	174.	176.	176.	176.	176.	176.	174.	173.	173.
4	171.	169.	169.	169.	168.	168.	166.	166.	164.	164.	164.	164.
5	164.	164.	164.	166.	166.	166.	164.	164.	164.	163.	163.	161.
6	163.	163.	163.	164.	164.	164.	164.	164.	164.	164.	164.	166.
7	169.	178.	186.	186.	181.	178.	176.	173.	169.	174.	179.	178.
8	174.	174.	174.	174.	174.	173.	171.	169.	168.	168.	166.	164.
9	164.	164.	164.	166.	166.	166.	169.	169.	169.	168.	168.	166.
10*	166.	166.	164.	164.	166.	166.	166.	166.	181.	208.	227.	229.
11*	225.	231.	237.	231.	231.	246.	284.	387.	494.	474.	452.	433.
12	426.	417.	405.	390.	396.	381.	363.	352.	349.	349.	352.	355.
13*	360.	360.	360.	358.	352.	346.	332.	315.	302.	289.	291.	299.
14*	294.	279.	286.	291.	299.	302.	346.	332.	307.	289.	274.	262.
15*	260.	257.	260.	264.	291.	363.	408.	414.	396.	366.	329.	310.
16*	286.	267.	253.	242.	233.	231.	231.	233.	253.	474.	571.	554.
17*	517.	481.	439.	390.	358.	329.	313.	302.	291.	284.	289.	369.
18*	375.	360.	332.	307.	289.	271.	257.	248.	239.	242.	585.	594.
19*	562.	571.	609.	594.	546.	487.	445.	405.	375.	346.	327.	310.
20	302.	291.	281.	274.	264.	257.	253.	248.	246.	239.	237.	233.
21*	231.	227.	225.	223.	221.	217.	215.	213.	212.	213.	215.	208.
22*	204.	202.	200.	199.	202.	199.	199.	197.	197.	204.	217.	255.
23	294.	305.	291.	274.	260.	246.	235.	225.	215.	212.	208.	204.
24	202.	200.	199.	197.	197.	195.	193.	192.	190.	190.	188.	190.
25	192.	192.	190.	188.	188.	188.	188.	193.	188.	186.	185.	183.
26	183.	183.	183.	183.	183.	183.	181.	181.	179.	179.	183.	186.
27	195.	204.	213.	213.	208.	200.	199.	195.	193.	192.	192.	192.
28	193.	199.	200.	204.	204.	204.	202.	200.	199.	195.	193.	190.
29	190.	192.	217.	305.	390.	448.	504.	558.	619.	688.	789.	848.
30	871.	871.	856.	833.	819.	754.	664.	619.	558.	524.	494.	468.
31	445.	417.	390.	372.	349.	335.	315.	305.	291.	281.	267.	260.

*SPECIAL POINTS

10	1730/166.	2310/231.
11	1820/497.	
13	2100/286.	
14	1350/349.	
15	1515/417.	
16	2100/550.	
17	2135/279.	2300/420.
18	0030/366.	2235/664.
19	0245/558.	0625/614.
21	2035/219.	
22	1615/206.	

RIVER GAGE DATA
 STA. NO. 31 RIO GUANIPA AT EL ACEITE
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	246.	242.	239.	237.	229.	225.	221.	219.	217.	215.	213.	210.
2*	210.	206.	204.	202.	197.	221.	217.	213.	210.	210.	208.	208.
3	210.	208.	208.	206.	206.	E 206.	E 204.	E 204.	E 202.	E 202.	E 202.	E 200.
4	200.	E 199.	E 542.	E 1140.	E 1580.	E 1540.	E 1490.	1450.	1400.	1300.	1270.	1180.
5	1130.	1080.	1060.	1080.	1140.	1200.	1230.	1220.	1200.	1150.	1090.	988.
6	887.	789.	701.	641.	E 585.	E 538.	E 501.	E 465.	F 426.	E 396.	E 372.	E 349.
7	338.	E 327.	E 315.	E 307.	E 305.	291.	284.	279.	274.	267.	260.	253.
8*	250.	246.	242.	239.	239.	237.	237.	372.	360.	478.	733.	714.
9	910.	1010.	1100.	1130.	1150.	1150.	1170.	1140.	1060.	956.	887.	782.
10	720.	658.	599.	554.	527.	494.	468.	439.	420.	390.	369.	E 352.
11*	343.	E 335.	E 327.	E 318.	E 313.	310.	305.	585.	658.	740.	782.	1230.
12*	2560.	2470.	2070.	1830.	1820.	1780.	1820.	1740.	1710.	1650.	1580.	1550.
13*	1580.	1580.	1540.	1440.	1350.	1270.	1240.	1250.	1100.	1020.	949.	902.
14	848.	775.	701.	652.	619.	580.	554.	531.	520.	504.	487.	468.
15	452.	436.	433.	426.	417.	405.	384.	378.	366.	360.	355.	346.
16	340.	327.	E 321.	E 315.	E 310.	E 305.	E 299.	E 294.	E 291.	E 286.	E 284.	E 279.
17	276.	E 276.	E 271.	E 269.	E 267.	E 264.	E 262.	E 260.	F 260.	E 260.	E 260.	E 260.
18	260.	E 257.	E 257.	E 257.	E 260.	E 260.	E 262.	E 271.	E 289.	E 302.	313.	321.
19*	332.	384.	455.	501.	527.	580.	594.	604.	585.	558.	524.	487.
20*	452.	426.	393.	378.	375.	349.	329.	318.	310.	297.	279.	269.
21	264.	262.	262.	262.	264.	269.	274.	279.	279.	289.	284.	281.
22	284.	286.	289.	284.	274.	264.	257.	253.	244.	239.	239.	242.
23	239.	237.	229.	E 225.	E 223.	E 219.	E 217.	E 215.	E 217.	E 219.	E 221.	E 225.
24	233.	E 244.	E 269.	310.	335.	340.	335.	329.	324.	313.	305.	299.
25	299.	313.	335.	369.	396.	417.	433.	448.	468.	504.	524.	531.
26	531.	527.	527.	527.	534.	542.	550.	554.	558.	546.	524.	491.
27	465.	430.	405.	384.	366.	349.	329.	324.	310.	297.	284.	276.
28*	267.	264.	264.	260.	255.	250.	244.	257.	279.	520.	761.	826.
29	833.	917.	1000.	1080.	1170.	1230.	1340.	1420.	1460.	1490.	1460.	1360.
30*	1290.	1160.	1010.	949.	864.	782.	727.	664.	619.	562.	542.	527.
31	504.	487.	481.	478.	468.	458.	439.	420.	399.	384.	369.	352.

*SPECIAL POINTS

2	1145/197.			
8	1620/414.	1730/332.	1900/507.	2030/474.
11	1515/305.	1700/688.	2240/1230.	2330/1060.
12	0130/2560.			
13	1330/1270.			
19	1515/614.			
20	0840/402.			
28	1535/244.	1725/313.	2345/826.	
30	2135/531.	2230/546.		

RIVER GAGE DATA
 STA. NO. 31 RIO GUANIPA AT EL ACEITE
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	340.	327.	315.	313.	310.	307.	307.	307.	652.	614.	619.	554.
2	504. E	458. E	423. E	417. E	423. E	433. E	433. E	445. E	452. E	455. E	452. E	445. E
3	442.	430.	411.	399.	384.	372.	360.	355.	352.	355.	352.	349.
4*	381.	390.	378.	360.	349.	346.	340.	335.	329.	324.	318.	315.
5	313.	310.	307.	302.	299.	297.	294.	289.	286.	286.	284.	281.
6	279.	276.	276.	274.	274.	274.	271.	269. E	267. E	264. E	262. E	260. E
7	257. E	255. E	253. E	250. E	248. E	246. E	244. E	242. E	239. E	237. E	235. E	233. E
8	231. E	229. E	227. E	225. E	223. E	221. E	219. E	217. E	217. E	215. E	215. E	215. E
9	465.	507.	524.	546.	554.	562.	550.	534.	510.	465.	430.	393.
10*	360.	335.	315.	305.	289.	279.	269.	257.	315.	302.	305.	327.
11	340.	343.	329.	310.	291.	279.	264.	255.	250.	246.	246.	244.
12	244.	242.	242.	242.	239.	239.	248.	248.	246.	244.	239.	242.
13	246.	248.	253.	253.	253.	250.	248.	244.	242.	237.	231.	229.
14	227.	227.	225.	225.	225.	221.	219.	217.	215. E	212. E	210. E	208. E
15	206. F	204. E	202. E	200. E	200. E	199. E	197. E	195. E	195. E	193. E	193. E	192. E
16	192. E	195. E	197. E	200. E	202. E	206. E	213. E	225. E	244. E	269. E	302. E	321. E
17	329.	324.	313.	294.	279.	267.	253.	244.	237.	229.	225.	223.
18	221.	223.	233.	255.	294.	321.	349.	366.	369.	366.	355.	340.
19	321.	310.	299.	291.	281.	274.	269.	262.	253.	250.	244.	239.
20	235.	231.	231.	229.	227.	225.	223.	221.	219.	217.	215.	213.
21	213.	213.	213.	215.	215.	215.	215.	213.	212.	210.	210.	208.
22*	206.	208.	208.	208.	210.	210.	210.	215.	321.	358.	294.	255.
23	239.	233.	229.	229.	229.	233.	235.	235.	233.	233.	233.	237.
24*	281.	420.	484.	465.	433.	411.	411.	433.	455.	594.	571.	550.
25	542.	531.	510.	491.	471.	458.	452.	445.	436.	430.	420.	408.
26	402.	390.	378.	360.	343.	329.	318.	307.	297.	289.	279.	269.
27	262.	255.	253.	250.	246.	244.	239.	235.	231.	229.	225.	223.
28	221.	221.	221.	221.	219.	217.	217.	215.	213.	212.	212.	210.
29*	210.	221.	271.	313.	313.	299.	284.	269.	255.	244.	239.	239.
30	239.	239.	242.	242.	242.	239.	237.	235.	231.	227.	225.	223.

*SPECIAL POINTS

1	1740/658.	2115/625.	
4	0035/349.	0300/393.	
10	1645/257.	1835/390.	2050/286.
22	1855/390.		
24	0525/491.	1300/408.	2030/594.
29	0300/212.	0900/315.	

RIVER GAGE DATA
 STA. NO. 31 RIO GUANIPA AT EL ACEITE
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	
1		147.	155.	161.	228.	409.	
2		147.	158.	163.	208.	452.	
3		147.	170.	173.	205.	E 384.	
4		147.	E 162.	167.	1070.	348.	
5		147.	159.	164.	1140.	297.	
6		149.	164.	164.	585.	E 272.	E
7		M	173.	177.	297.	246.	E
8		M	182.	171.	344.	235.	
9		M	170.	167.	1040.	499.	
10		415.	159.	178.	521.	F 311.	
11		385.	156.	319.	488.	286.	
12		253.	155.	382.	1880.	243.	
13		211.	154.	332.	1300.	245.	
14		183.	153.	298.	623.	220.	E
15	M	168.	154.	325.	402.	199.	E
16	154.	159.	153.	311.	307.	E 225.	
17	155.	155.	168.	375.	266.	E 271.	
18	154.	152.	318.	336.	273.	303.	
19	152.	151.	193.	480.	504.	279.	
20	151.	152.	167.	264.	360.	225.	
21	150.	155.	163.	220.	272.	213.	
22	150.	156.	211.	205.	265.	242.	
23	149.	155.	204.	248.	224.	E 236.	
24	148.	156.	188.	195.	300.	447.	
25	147.	156.	174.	189.	410.	473.	
26	147.	155.	171.	182.	536.	336.	
27	148.	156.	E 167.	199.	362.	243.	
28	147.	157.	E 162.	199.	350.	217.	
29	147.	156.	E 161.	452.	1210.	262.	
30	147.	156.	E 162.	708.	847.	236.	
31		155.	E	345.	445.		

RIVER GAGE DATA

NAME: Sta. No. 32 Río Guanipa at Los Palos Blancos.

LOCATION: Longitude 63° 53.9' W, latitude 09° 16.8' N. Approximately 24.2 km SW of Aguasay, 1.5 km S of Los Palos Blancos.

DRAINAGE AREA: 693 sq mi (from topographic map).

GAGE: Stevens Type A35 water level recorder attached to right downstream side of bridge.

RECORDS AVAILABLE: April 9, 1969 through September 30, 1969.

REMARKS: Record is fair to good. Shifting control method was applied from August 14 through September 30. There are 9 culverts in the two embankments on the long approaches to the bridge.

CODING: M signifies missing data; E signifies estimated data.



Aerial view of the Río Guanipa at Los Palos Blancos. The gaging site is at the bridge which is 1 inch down and to the left of the wing tip. Three channels converge at the bridge (right side of the road) and after passing through the bridge the water spreads out again. Portions of the channels downstream of the bridge (left side of the road) can be seen through the dense vegetation.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 32 RIO GUANIPA AT LOS PALOS BLANCOS

Meas. No.	Date	Made by	** Width ft	** Area sq ft	** Mean Velocity fps	Inside Gage Height ft	** Dis-charge cfs	Shift Adj. ft	Per-cent Diff.	Method	Num-ber Meas. Sec-tions	Gage Height Change ft	Time hr	Water Temp. °F
1*	May 7	Santaella	32.0	96.0	1.38	0.50	132.	0	-4.5	Wading	18	0	0.8	80
2*	June 2	Cardot	34.0	132.	1.21	0.60	160.	0	+6.5	Wading	22	-.01	1.2	83
3*	11	Romero	32.0	125.	1.37	0.81	171.	0	-3.1	Wading	22	-.01	1.3	-
4*	19	Santaella	146.	294.	0.73	1.12	216.	0	-0.6	Bridge	25	+.04	1.6	80
5*	July 10	Romero	32.0	140	1.29	0.86	180.	0	-1.5	-	21	0	0.8	81
6*	13	Santaella	146.	424.	0.92	2.10	435.	0	+5.3	Bridge	28	+.01	1.9	-
7*	14	Duke	148.	418.	0.99	2.40	500.	0	-3.5	Bridge	24	+.01	1.8	80
8*	17	Tirado	147.	372.	1.27	2.59	586.	0	-3.6	Bridge	22	0	1.2	79
9*	22	Romero	147.	421.	1.39	2.82	766.	0	+3.5	-	31	-.01	1.2	80
10	Aug. 4	Romero	147.	277.	1.21	2.08	381.	0	-6.5	Bridge	40	0	1.0	80
11	9	Santos	146.	513.	1.08	2.68	699.	0	+6.4	Bridge	32	-.01	1.4	-
12	13	Santaella	146.	597.	1.46	3.18	872.	0	-6.6	Bridge	32	0	1.0	75
13	15	Romero	147.	925.	1.78	3.74	2090.	+.22	+5.7	Bridge	36	-.01	0.8	80
14	24	Santaella	145.	713.	0.86	2.58	717.	+.13	+6.4	Bridge	37	+.01	3.0	77
15	Sept. 3	Romero	147.	486.	0.97	2.52	580.	+.09	-6.3	Bridge	37	0	0.8	82
16	10	Romero	147.	417.	1.12	2.39	540.	+.08	-1.7	Bridge	31	+.02	0.9	-
17	16	Tirado	147.	516.	0.68	1.96	371.	+.01	-1.5	Bridge	33	-.01	1.2	-
18	28	Romero	144.	471.	0.93	2.16	480.	+.06	+6.6	Bridge	38	-.01	0.9	-

* Discharge through culverts is estimated.
** Width, area, and velocity do not include flow through culverts.
Discharge is total discharge, including flow through culverts.

RATING TABLE
FOR
STA. NO. 32 RIO GUANIPA AT LOS PALOS BLANCOS

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00		1.00	201.	2.00	385.	3.00	843.	4.00	2088.
.10		.10	215.	.10	413.	.10	893.	.10	2403.
.20		.20	229.	.20	443.	.20	943.	.20	2773.
.30	114.	.30	244.	.30	478.	.30	1003.	.30	
.40	126.	.40	259.	.40	518.	.40	1073.	.40	
.50	138.	.50	275.	.50	563.	.50	1163.	.50	
.60	150.	.60	293.	.60	613.	.60	1278.	.60	
.70	162.	.70	313.	.70	668.	.70	1423.	.70	
.80	175.	.80	335.	.80	728.	.80	1603.	.80	
.90	188.	.90	359.	.90	788.	.90	1823.	.90	

STA. NO. 32 RIVER GAGE DATA
 RIO GUANIPA AT LOS PALOS BLANCOS
 APRIL 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400		
9	M	M	M	M	150.	150.	151.	151.	151.	151.	151.	151.		
10	151.	151.	150.	150.	150.	150.	151.	151.	152.	152.	152.	152.		
11	152.	151.	151.	151.	151.	151.	151.	152.	152.	152.	152.	152.		
12	152.	152.	152.	152.	152.	152.	152.	152.	152.	152.	152.	152.		
13	152.	151.	151.	151.	151.	151.	151.	151.	149.	144.	142.	142.		
14	143.	144.	144.	145.	146.	146.	148.	149.	150.	151.	152.	154.		
15	154.	155.	155.	155.	154.	152.	151.	151.	150.	150.	150.	150.		
16	150.	150.	150.	150.	150.	150.	150.	150.	150.	150.	149.	149.		
17	150.	150.	150.	150.	150.	150.	150.	149.	149.	149.	149.	149.		
18	149.	149.	150.	151.	151.	151.	151.	151.	151.	151.	152.	154.		
19	154.	154.	154.	154.	154.	152.	150.	150.	151.	152.	152.	151.		
20	150.	150.	150.	148.	148.	148.	148.	148.	148.	145.	145.	144.		
21	145.	144.	144.	145.	146.	146.	146.	144.	144.	144.	143.	142.		
22	142.	143.	143.	142.	E	142.	E	142.	E	140.	E	140.	E	
23	140.	E	139.	E	139.	E	138.	E	138.	E	138.	E	137.	E
24	137.	E	137.	E	137.	E	136.	F	136.	E	136.	E	134.	E
25	134.	E	133.	E	133.	E	133.	F	133.	E	132.	E	132.	E
26	131.	E	131.	E	131.	E	130.	E	130.	E	130.	E	128.	E
27	128.	E	128.	E	127.	E	127.	E	127.	E	126.	E	126.	E
28	125.	E	125.	E	125.	E	125.	E	124.	E	124.	E	122.	E
29	122.	E	122.	F	122.	E	121.	E	121.	E	121.	E	121.	E
30	122.		122.		124.		124.		122.		122.		121.	

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 32 RIO GUANIPA AT LOS PALOS BLANCOS
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	121.	121.	121.	122.	122.	121.	121.	120.	120.	120.	120.	120.
2	120.	120.	121.	121.	120.	120.	120.	119.	119.	119.	119.	119.
3	119.	120.	120.	120.	120.	120.	119.	119.	119.	119.	118.	118.
4	118.	119.	119.	120.	120.	119.	119.	119.	119.	119.	119.	120.
5	120.	120.	121.	121.	121.	121.	121.	120.	120.	121.	121.	121.
6	122.	124.	125.	126.	126.	126.	126.	126.	126.	128.	130.	132.
7	134.	136.	137.	138.	138.	138.	138.	138.	139.	140.	142.	150.
8	161.	172.	181.	189.	196.	201.	205.	211.	218.	223.	230.	236.
9	242.	248.	254.	259.	264.	267.	270.	273.	277.	282.	286.	289.
10	293.	297.	301.	305.	307.	309.	313.	317.	322.	326.	333.	340.
11	344.	352.	359.	367.	374.	382.	385.	390.	393.	396.	399.	399.
12	399.	402.	402.	402.	404.	404.	404.	404.	407.	407.	407.	407.
13	407.	407.	404.	404.	402.	399.	393.	388.	382.	377.	369.	364.
14	359.	352.	344.	337.	330.	324.	317.	309.	303.	299.	291.	286.
15	280.	275.	270.	265.	264.	254.	250.	244.	241.	236.	233.	230.
16	226.	225.	222.	219.	216.	214.	211.	208.	205.	202.	201.	198.
17	197.	196.	194.	194.	192.	191.	189.	188.	185.	184.	183.	181.
18	181.	181.	181.	180.	179.	178.	176.	175.	174.	172.	171.	170.
19	170.	170.	168.	168.	168.	167.	166.	165.	165.	163.	163.	162.
20	162.	162.	162.	162.	161.	160.	160.	158.	158.	158.	157.	157.
21	156.	156.	156.	156.	156.	156.	156.	156.	156.	156.	156.	156.
22	155.	155.	155.	155.	155.	155.	154.	154.	154.	154.	155.	155.
23	155.	156.	156.	156.	156.	156.	155.	155.	154.	154.	154.	154.
24	154.	154.	154.	154.	154.	154.	154.	154.	154.	154.	154.	154.
25	154.	155.	155.	155.	155.	155.	154.	154.	152.	152.	152.	152.
26	152.	152.	152.	152.	152.	151.	150.	150.	149.	149.	148.	148.
27	148.	148.	149.	149.	148.	148.	146.	145.	145.	144.	144.	144.
28	144.	144.	144.	144.	144.	144.	143.	142.	142.	140.	140.	140.
29*	140.	140.	142.	142.	142.	140.	140.	139.	165.	170.	178.	181.
30	179.	172.	168.	165.	162.	160.	158.	158.	158.	158.	160.	162.
31	162.	163.	163.	162.	162.	162.	161.	160.	158.	157.	157.	157.

*SPECIAL POINTS
 29 1720/139.

RIVER GAGE DATA
 STA. NO. 32 RIO GUANIPA AT LOS PALOS BLANCOS
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	157.	157.	157.	156.	156.	155.	154.	152.	152.	151.	150.	150.
2	150.	150.	150.	150.	150.	150.	150.	150.	150.	150.	150.	150.
3	151.	151.	150.	150.	150.	151.	152.	154.	154.	154.	154.	154.
4	154.	155.	156.	156.	157.	158.	160.	162.	165.	166.	167.	168.
5	168.	170.	170.	170.	168.	168.	167.	165.	167.	167.	166.	165.
6	165.	163.	163.	162.	162.	162.	161.	163.	167.	171.	175.	178.
7	181.	181.	183.	183.	181.	179.	178.	178.	178.	178.	178.	178.
8	178.	179.	180.	181.	184.	185.	188.	189.	189.	189.	189.	188.
9	188.	188.	188.	189.	189.	191.	191.	191.	192.	192.	193.	194.
10	194.	194.	194.	194.	194.	193.	192.	189.	188.	187.	185.	184.
11	181.	180.	179.	178.	176.	175.	172.	170.	168.	168.	167.	165.
12	163.	162.	161.	160.	158.	157.	157.	155.	154.	154.	152.	151.
13	151.	151.	151.	150.	149.	149.	149.	148.	146.	145.	145.	145.
14	144.	144.	144.	144.	144.	144.	144.	143.	143.	143.	143.	143.
15	142.	142.	142.	142.	142.	142.	140.	140.	140.	139.	139.	139.
16	140.	142.	143.	144.	144.	144.	144.	143.	143.	143.	142.	142.
17	142.	142.	142.	143.	143.	145.	146.	145.	145.	145.	145.	144.
18	144.	145.	145.	146.	149.	151.	154.	156.	165.	170.	175.	181.
19	189.	197.	204.	212.	219.	222.	228.	233.	239.	245.	248.	253.
20	257.	261.	264.	265.	267.	267.	267.	267.	264.	261.	259.	256.
21	253.	248.	244.	239.	235.	230.	225.	222.	221.	219.	221.	219.
22	219.	218.	215.	212.	211.	209.	208.	209.	211.	212.	215.	219.
23	222.	225.	228.	232.	235.	239.	242.	244.	251.	256.	261.	265.
24	265.	265.	264.	264.	262.	262.	262.	262.	264.	262.	261.	261.
25	261.	261.	259.	257.	256.	254.	253.	250.	250.	251.	253.	253.
26	253.	251.	250.	248.	247.	242.	241.	239.	238.	236.	233.	230.
27	228.	225.	223.	221.	218.	216.	214.	211.	208.	207.	204.	201.
28	200.	198.	197.	196.	194.	193.	192.	191.	189.	188.	187.	185.
29	185.	184.	183.	181.	181.	180.	179.	179.	178.	178.	176.	175.
30	175.	174.	174.	172.	172.	171.	170.	168.	172.	180.	187.	193.

*SPECIAL PRINTS
 NONE

RIVER GAGE DATA
 STA. NO. 32 RIO GUANIPA AT LOS PALOS BLANCOS
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	193.	201.	204.	205.	207.	208.	209.	211.	212.	212.	212.	212.
2	212.	212.	212.	211.	211.	209.	207.	205.	204.	201.	201.	200.
3	194.	194.	197.	196.	194.	194.	193.	192.	192.	192.	191.	189.
4	187.	187.	185.	185.	185.	185.	185.	185.	185.	185.	185.	185.
5	187.	188.	188.	189.	189.	189.	188.	188.	187.	187.	185.	184.
6*	185.	181.	181.	180.	179.	178.	176.	175.	172.	180.	179.	178.
7	180.	184.	187.	188.	189.	188.	188.	188.	187.	185.	184.	183.
8	181.	183.	184.	187.	188.	191.	192.	194.	194.	196.	197.	198.
9	198.	198.	198.	198.	198.	197.	196.	194.	194.	192.	191.	189.
10	188.	187.	185.	183.	183.	183.	183.	185.	187.	191.	194.	198.
11	201.	204.	205.	207.	211.	218.	228.	235.	244.	251.	259.	268.
12	278.	289.	301.	313.	322.	333.	344.	354.	364.	372.	377.	382.
13	390.	396.	402.	407.	413.	416.	419.	422.	431.	450.	467.	493.
14	505.	514.	514.	514.	514.	514.	518.	522.	527.	531.	535.	535.
15	535.	531.	527.	527.	518.	514.	510.	510.	505.	505.	522.	535.
16	558.	577.	592.	592.	592.	592.	592.	592.	587.	587.	587.	592.
17	597.	603.	608.	608.	608.	608.	608.	613.	613.	613.	613.	613.
18	613.	613.	613.	613.	608.	608.	608.	608.	608.	608.	603.	603.
19	597.	597.	603.	603.	603.	608.	608.	613.	613.	618.	618.	624.
20	629.	629.	634.	634.	640.	640.	645.	645.	651.	657.	668.	674.
21	686.	698.	704.	716.	728.	740.	746.	752.	758.	758.	758.	758.
22	756.	758.	758.	752.	746.	740.	734.	728.	722.	716.	704.	692.
23	674.	657.	645.	629.	613.	597.	577.	558.	540.	527.	518.	510.
24	501.	493.	486.	478.	471.	463.	456.	453.	446.	443.	440.	437.
25	431.	428.	425.	422.	416.	410.	404.	399.	393.	385.	380.	374.
26	367.	364.	357.	352.	349.	344.	340.	337.	333.	330.	328.	326.
27	326.	326.	328.	330.	333.	330.	330.	328.	330.	333.	333.	330.
28	324.	328.	328.	328.	330.	333.	333.	335.	337.	337.	337.	335.
29	335.	330.	328.	326.	322.	319.	315.	311.	307.	305.	301.	299.
30	297.	295.	293.	293.	293.	293.	295.	297.	299.	301.	307.	311.
31	322.	330.	342.	357.	374.	390.	410.	419.	434.	446.	460.	471.

*SPECIAL POINTS

6 1845/180.

RIVER GAGE DATA
 STA. NO. 32 RIO GUANIPA AT LOS PALOS BLANCOS
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	478.	482.	489.	493.	497.	501.	505.	527.	514.	510.	510.	505.
2	501.	497.	497.	493.	486.	482.	478.	474.	471.	471.	471.	467.
3	460.	456.	453.	446.	443.	437.	434.	431.	428.	425.	422.	416.
4	416.	413.	410.	407.	407.	407.	404.	404.	407.	410.	416.	422.
5	431.	440.	453.	467.	482.	493.	501.	510.	522.	535.	544.	554.
6	563.	568.	577.	582.	587.	592.	597.	603.	634.	634.	640.	645.
7	651.	668.	680.	698.	710.	716.	734.	746.	752.	758.	758.	764.
8	770.	770.	770.	770.	770.	770.	764.	764.	752.	746.	734.	734.
9	722.	710.	692.	680.	662.	651.	640.	634.	651.	640.	634.	629.
10	629.	629.	629.	629.	634.	634.	640.	645.	651.	662.	668.	680.
11	698.	716.	734.	746.	770.	776.	782.	788.	799.	827.	883.	938.
12	922.	912.	898.	888.	883.	878.	878.	883.	888.	893.	893.	903.
13	917.	927.	938.	938.	933.	927.	922.	927.	938.	972.	1020.	1120.
14	1280.	1470.	1780.	2060.	2340.	2440.	2440.	2370.	2370.	2370.	2300.	2240.
15	2210.	2180.	2180.	2150.	2120.	2060.	1980.	1950.	1850.	1780.	1690.	1620.
16	1550.	1470.	1420.	1350.	1320.	1270.	1220.	1180.	1150.	1120.	1090.	1070.
17	1040.	1020.	1000.	984.	966.	943.	922.	908.	898.	893.	883.	868.
18	858.	843.	827.	805.	788.	764.	740.	716.	704.	680.	662.	640.
19	608.	597.	582.	568.	554.	544.	535.	531.	522.	518.	514.	514.
20	514.	514.	518.	522.	522.	531.	535.	544.	549.	558.	563.	573.
21	582.	587.	592.	597.	597.	597.	608.	608.	608.	608.	603.	603.
22	597.	587.	582.	573.	563.	554.	549.	540.	535.	527.	518.	514.
23	505.	501.	497.	497.	501.	501.	505.	510.	531.	535.	540.	549.
24	582.	603.	629.	645.	662.	674.	674.	692.	704.	710.	728.	740.
25	746.	764.	776.	794.	799.	827.	863.	858.	868.	898.	912.	922.
26	922.	922.	912.	903.	883.	878.	863.	848.	832.	822.	799.	788.
27	770.	746.	740.	728.	716.	704.	692.	686.	680.	674.	674.	662.
28	662.	657.	657.	645.	640.	640.	640.	640.	629.	618.	608.	603.
29	597.	587.	573.	568.	554.	549.	535.	531.	522.	518.	518.	518.
30	518.	522.	531.	540.	549.	558.	563.	573.	582.	587.	597.	603.
31	608.	613.	618.	640.	645.	657.	680.	680.	686.	686.	704.	710.

*SPECIAL POINTS

1 1530/505. 1550/527.

RIVER GAGE DATA
 STA. NO. 32 RIO GUANIPA AT LOS PALOS BLANCOS
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	728.	734.	746.	758.	770.	776.	805.	827.	832.	838.	838.	838.
2	827.	822.	816.	805.	794.	776.	770.	758.	740.	734.	710.	692.
3	680.	662.	645.	640.	618.	618.	613.	608.	608.	603.	603.	597.
4	592.	592.	592.	587.	587.	582.	582.	573.	568.	563.	558.	554.
5	554.	549.	549.	544.	540.	535.	535.	531.	527.	527.	522.	518.
6	514.	510.	505.	501.	497.	486.	482.	474.	467.	463.	456.	453.
7	443.	440.	437.	434.	428.	425.	422.	422.	416.	407.	404.	404.
8	404.	407.	407.	404.	402.	399.	410.	422.	450.	463.	474.	474.
9	467.	463.	460.	453.	450.	450.	450.	453.	456.	460.	467.	478.
10	486.	501.	510.	522.	527.	535.	549.	554.	573.	608.	640.	645.
11	680.	710.	728.	728.	728.	728.	728.	734.	746.	764.	770.	776.
12	776.	776.	776.	776.	770.	764.	758.	746.	740.	734.	728.	728.
13	716.	710.	704.	686.	680.	662.	640.	618.	603.	582.	563.	549.
14	540.	531.	522.	514.	505.	497.	486.	482.	474.	463.	460.	453.
15	450.	443.	440.	437.	434.	425.	422.	419.	416.	407.	404.	402.
16	399.	390.	390.	388.	380.	377.	374.	372.	369.	364.	359.	359.
17	357.	357.	354.	352.	349.	347.	344.	344.	344.	342.	340.	340.
18	342.	344.	344.	347.	349.	354.	357.	359.	362.	364.	369.	369.
19	372.	372.	372.	372.	372.	372.	372.	369.	369.	369.	369.	372.
20	374.	380.	385.	388.	390.	399.	399.	402.	402.	402.	402.	402.
21	402.	399.	399.	393.	390.	388.	385.	377.	374.	369.	364.	359.
22	349.	347.	344.	337.	335.	333.	330.	328.	326.	324.	322.	322.
23	319.	317.	315.	313.	313.	311.	311.	311.	313.	313.	315.	315.
24	319.	322.	324.	328.	337.	344.	352.	362.	374.	380.	393.	402.
25	407.	410.	410.	410.	416.	422.	428.	434.	437.	440.	450.	456.
26	460.	463.	474.	482.	486.	489.	501.	505.	510.	514.	514.	514.
27	514.	514.	514.	514.	510.	510.	505.	501.	497.	489.	486.	482.
28	482.	474.	463.	456.	450.	443.	437.	425.	422.	416.	407.	404.
29	399.	390.	388.	380.	377.	372.	364.	362.	359.	354.	349.	349.
30	347.	342.	342.	340.	340.	337.	337.	340.	340.	340.	340.	342.

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 32 RIO GUANIPA AT LOS PALOS BLANCOS
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		121.	154.	207.	498.	785.
2		120.	150.	208.	484.	776.
3		119.	152.	194.	440.	629.
4		119.	160.	186.	410.	580.
5		121.	168.	187.	489.	538.
6		126.	166.	179.	598.	487.
7		138.	180.	186.	714.	426.
8		198.	185.	190.	761.	423.
9	M	265.	190.	196.	666.	459.
10	151.	311.	191.	187.	642.	547.
11	152.	376.	174.	225.	777.	729.
12	152.	404.	158.	331.	892.	758.
13	149.	393.	149.	421.	947.	650.
14	147.	324.	144.	517.	2070.	499.
15	152.	256.	141.	520.	2010.	427.
16	150.	214.	143.	584.	1290.	379.
17	150.	190.	144.	608.	953.	348.
18	151.	177.	155.	609.	762.	354.
19	152.	167.	221.	608.	555.	371.
20	148.	160.	263.	643.	534.	392.
21	145.	156.	233.	730.	598.	385.
22	142.	E 155.	213.	737.	557.	335.
23	138.	E 155.	240.	595.	513.	314.
24	136.	E 154.	263.	467.	662.	349.
25	133.	E 154.	255.	408.	828.	424.
26	130.	F 151.	243.	346.	870.	490.
27	127.	E 147.	216.	330.	712.	504.
28	124.	E 143.	193.	332.	640.	443.
29	121.	149.	180.	318.	551.	373.
30	122.	164.	175.	297.	557.	341.
31		160.		389.	656.	

RIVER GAGE DATA

NAME: Sta. No. 33 Río Caris at the Crossing of the Santa Bárbara-Aguasay Road.

LOCATION: Longitude 63° 39.6' W, latitude 09° 29.5' N. Approximately 14.6 km SW of Santa Bárbara, 10.2 km NE of Aguasay.

DRAINAGE AREA: 112 sq mi (from topographic map).

GAGE: Stevens Type A35 water level recorder attached to right bridge abutment on downstream side of bridge.

RECORDS AVAILABLE: April 14, 1969 through September 30, 1969.

REMARKS: Record is fair to good. Shifting control method was applied from May 9 through September 30.

CODING: M signifies missing data; E signifies estimated data.



View of the Río Caris gaging site looking upstream. The A35 recorder is attached to the bridge abutment and is visible in the photograph. The river is destroying the riprapped abutment where the recorder is located.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 33 RIO CARIS AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD

Meas. No.	Date	Made by	Width ft	Area sq ft	Mean Velocity fps	Inside Gage Height ft	Dis-charge cfs	Shift Adj. ft	Per-cent Diff.	Method	Number Meas. Sections	Gage Height Change ft	Time hr	Water Temp. °F
1	May 6	Santaella	105.	34.4	1.36	0.53	46.9	0	-3.3	Wading	27	0	0.5	87
2	14	Romero	34.0	25.8	1.70	0.49	43.9	+05	-17.2	Wading	29	0	1.0	86
3	17	Santos	52.0	25.8	1.59	0.51	40.9	0	+3.5	Wading	23	0	0.8	87
4	28	Santaella	80.0	25.6	1.46	0.51	37.3	0	-5.6	Wading	21	0	0.4	84
5	June 6	Canache	50.5	36.6	1.89	0.71	69.2	+11	-51.6	Wading	26	+01	0.8	84
6	24	Canache	88.0	57.8	1.30	1.00	175.	0	-2.8	Wading	23	-.04	0.7	80
7	29	Santos	52.0	31.4	1.57	0.53	49.2	0	+1.4	Wading	25	0	0.8	88
8	July 11	Duke	69.0	61.7	2.95	1.00	182.	0	+1.1	Wading	23	Var.	1.1	-
9	15	Romero	115.	97.0	3.08	1.22	299.	0	+6.0	Wading	25	-.06	0.8	81
10	17	Santos	69.0	51.0	2.29	0.52	117.	+14	+15.8	Wading	22	0	0.8	92
11	19	Tirado	97.0	69.6	2.96	0.90	206.	+17	-1.0	Wading	22	-.04	0.7	89
12	23	Romero	70.0	41.6	2.26	0.62	94.0	+04	-6.9	Wading	35	0	1.0	80
13	24	Santaella	66.0	52.6	2.17	0.57	114.	+11	+5.6	Wading	24	-.02	0.5	87
14	27	Santos	169.	292.	4.59	2.27	1340.	0	-0.2	-	23	+09	2.1	-
15	28	Santaella	62.0	49.7	2.82	0.38	140.	+41	-1.4	Wading	23	-.03	0.5	83
16	30	Romero	37.0	33.2	1.86	0.37	61.6	+19	-0.6	Wading	24	-.02	0.6	88
17	Aug. 3	Romero	59.0	48.0	2.83	0.54	136.	+19	+9.7	-	27	-.03	0.7	-
18	5	Santaella	57.0	47.7	2.24	0.35	107.	+37	-11.6	Wading	20	0	0.4	78
19	7	Romero	51.0	42.2	2.42	0.45	102.	+21	+1.0	-	26	0	0.5	-
20	12	Romero	62.0	64.7	3.26	0.72	211.	+33	+5.5	-	24	-.05	0.7	87
21	20	Romero	63.0	56.4	2.62	0.64	148.	+23	-1.7	Wading	23	-.01	0.4	91
22	27	Santaella	56.0	40.0	1.82	0.54	72.8	+04	+2.5	Wading	21	-.02	0.4	81
23	31	Tirado	59.0	33.6	1.89	0.38	63.6	+19	-4.4	Wading	25	0	0.6	91
24	Sept. 4	Velasquez	44.0	31.6	2.19	0.49	69.2	+08	+4.1	Wading	23	0	0.4	84
25	5	Santaella	62.0	35.9	1.66	0.48	59.5	+07	+3.5	Wading	23	0	0.4	79
26	7	Santaella	66.0	44.2	2.08	0.62	92.0	0	+5.7	Wading	24	+16	0.6	79
27	12	Tirado	72.0	39.8	1.95	0.60	77.5	0	-3.1	Wading	26	0	0.6	-
28	14	Tirado	71.0	33.0	1.72	0.54	56.6	0	+6.8	Wading	23	0	0.6	-
29	16	Santaella	70.0	35.7	1.58	0.55	56.5	0	-1.7	Wading	26	0	0.4	86
30	18	Contreras	63.0	33.2	1.29	0.52	42.8	0	-2.7	Wading	23	+01	0.8	87
31	20	Santaella	64.0	33.4	1.41	0.54	47.2	0	-10.9	Wading	23	0	0.4	85

RATING TABLE
FOR
STA. NO. 33 RIO CARIS AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00		1.00	180.	2.00	1000.	3.00	2550.
.10		.10	220.	.10	1125.	.10	2750.
.20		.20	270.	.20	1250.	.20	2950.
.30	5.0	.30	330.	.30	1375.	.30	3150.
.40	16.0	.40	400.	.40	1525.	.40	3350.
.50	35.0	.50	480.	.50	1675.	.50	
.60	80.0	.60	570.	.60	1825.	.60	
.70	115.	.70	670.	.70	2000.	.70	
.80	140.	.80	775.	.80	2175.	.80	
.90	155.	.90	885.	.90	2350.	.90	

RIVER GAGE DATA
 STA. NO. 33 RIO CARIS AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD
 APRIL 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
14	M	M	M	M	M	80.0	80.0	80.0	75.4	75.4	75.4	80.0
15	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	129.	126.	115.
16	109.	106.	98.7	91.5	91.5	87.8	83.9	80.0	80.0	75.4	75.4	75.4
17	75.4	80.0	80.0	80.0	80.0	80.0	70.6	65.9	61.2	61.2	61.2	61.2
18	61.2	61.2	65.9	65.9	75.4	70.6	70.6	70.6	65.9	61.2	61.2	61.2
19	61.2	61.2	65.9	70.6	70.6	65.9	65.9	65.9	61.2	61.2	61.2	61.2
20	61.2	65.9	65.9	70.6	70.6	80.0	75.4	80.0	80.0	75.4	75.4	70.6
21	70.6	65.9	65.9	65.9	70.6	70.6	70.6	65.9	61.2	56.5	56.5	56.5
22	56.5	56.5	56.5	61.2	61.2	56.5	56.5	56.5	56.5	56.5	56.5	56.5
23	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5
24	56.5	56.5	61.2	61.2	65.9	61.2	51.9	51.9	51.9	47.4	47.4	47.4
25	47.4	47.4	51.9	56.5	56.5	56.5	56.5	51.9	43.1	43.1	43.1	43.1
26	43.1	43.1	47.4	51.9	56.5	56.5	56.5	56.5	47.4	43.1	38.9	38.9
27	38.9	43.1	47.4	47.4	47.4	47.4	51.9	56.5	47.4	43.1	43.1	43.1
28	43.1	47.4	51.9	51.9	51.9	47.4	47.4	43.1	38.9	35.0	35.0	35.0
29	38.9	43.1	47.4	47.4	47.4	47.4	47.4	43.1	38.9	38.9	35.0	35.0
30	35.0	38.9	43.1	47.4	51.9	51.9	47.4	43.1	38.9	38.9	38.9	35.0

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 33 RIO CARIS AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	35.0	38.9	38.9	43.1	51.9	47.4	47.4	43.1	35.0	35.0	35.0	35.0
2	35.0	35.0	35.0	35.0	43.1	38.9	35.0	35.0	29.7	29.7	29.7	29.7
3	29.7	32.2	35.0	38.9	43.1	43.1	38.9	38.9	35.0	35.0	35.0	35.0
4	35.0	35.0	38.9	43.1	43.1	47.4	51.9	47.4	47.4	43.1	43.1	43.1
5	43.1	43.1	43.1	47.4	47.4	47.4	51.9	47.4	47.4	43.1	43.1	43.1
6	43.1	43.1	43.1	47.4	47.4	47.4	47.4	43.1	43.1	43.1	43.1	43.1
7	47.4	47.4	47.4	51.9	51.9	51.9	47.4	43.1	43.1	43.1	43.1	43.1
8*	47.4	51.9	51.9	56.5	56.5	56.5	56.5	51.9	47.4	47.4	87.8	155.
9*	140.	149.	942.	722.	524.	343.	305.	281.	259.	259.	249.	225.
10	211.	203.	191.	177.	171.	168.	161.	157.	153.	147.	146.	146.
11	145.	143.	142.	142.	140.	136.	134.	126.	115.	112.	109.	106.
12	109.	106.	106.	106.	109.	106.	102.	98.7	95.2	87.8	83.9	80.0
13	80.0	80.0	80.0	83.9	87.8	80.0	80.0	75.4	70.6	61.2	61.2	61.2
14	56.5	51.9	56.5	56.5	56.5	51.9	51.9	47.4	43.1	43.1	43.1	38.9
15	38.9	38.9	38.9	38.9	43.1	43.1	43.1	38.9	38.9	35.0	29.7	29.7
16	29.7	29.7	29.7	35.0	35.0	35.0	35.0	35.0	35.0	32.2	32.2	29.7
17	29.7	32.2	32.2	35.0	38.9	38.9	35.0	32.2	29.7	29.7	29.7	27.4
18	27.4	27.4	27.4	29.7	32.2	38.9	35.0	32.2	27.4	25.3	25.3	25.3
19	25.3	27.4	29.7	29.7	35.0	35.0	32.2	29.7	27.4	27.4	27.4	27.4
20	27.4	27.4	29.7	35.0	35.0	35.0	35.0	87.8	80.0	61.2	38.9	35.0
21	35.0	35.0	38.9	38.9	38.9	43.1	47.4	56.5	56.5	51.9	61.2	65.9
22	80.0	109.	106.	98.7	87.8	75.4	70.6	65.9	61.2	56.5	51.9	47.4
23	47.4	47.4	43.1	47.4	51.9	51.9	51.9	51.9	47.4	43.1	43.1	43.1
24	43.1	43.1	43.1	51.9	51.9	56.5	51.9	47.4	47.4	56.5	56.5	51.9
25	51.9	51.9	56.5	56.5	56.5	56.5	56.5	51.9	47.4	43.1	43.1 E	43.1 E
26	43.1 F	43.1 E	43.1 E	47.4 E	47.4 E	47.4	43.1	43.1	38.9	38.9	38.9	38.9
27	38.9	38.9	43.1	43.1	43.1	43.1	38.9	35.0	32.2	29.7	29.7	29.7
28	29.7	29.7	32.2	35.0	38.9	38.9	38.9	38.9	38.9	35.0	35.0	35.0
29*	35.0	35.0	38.9	43.1	47.4	51.9	51.9	80.0	121.	147.	134.	775.
30*	497.	885.	599.	439.	311.	276.	265.	254.	254.	249.	225.	207.
31	194.	191.	177.	171.	168.	161.	153.	149.	146.	143.	142.	136.

*SPECIAL POINTS

8	2230/207.											
9	0500/1020.											
29	1540/51.9	1845/220.	2320/131.	2335/896.								
30	0250/1110.											

RIVER GAGE DATA
 STA. NO. 33 RIO CARIS AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	134.	131.	131.	126.	126.	126.	121.	129.	126.	115.	109.	109.
2	106.	102.	98.7	102.	98.7	98.7	98.7	95.7	87.8	83.9	80.0	75.4
3	70.6	70.6	70.6	70.6	65.9	65.9	65.9	61.2	56.5	61.2	51.9	47.4
4	38.9	38.9	38.9	35.0	35.0	35.0	35.0	29.7	29.7	29.7	27.4	25.3
5*	47.4	83.9	109.	118.	118.	115.	194.	350.	225.	159.	542.	324.
6	225.	180.	153.	147.	143.	142.	143.	145.	140.	136.	131.	126.
7*	124.	126.	140.	149.	159.	191.	225.	393.	515.	2770.	2450.	1390.
8	829.	489.	371.	270.	229.	211.	198.	171.	159.	152.	147.	143.
9	140.	134.	131.	126.	121.	115.	112.	112.	102.	91.5	87.8	83.9
10	75.4	65.9	56.5	51.9	56.5	56.5	56.5	61.2	47.4	47.4	47.4	38.9
11	43.1	43.1	43.1	43.1	38.9	38.9	35.0	29.7	25.3	20.0	21.6	20.0
12	20.0	21.6	23.4	23.4	25.3	25.3	25.3	21.6	21.6	18.6	17.2	16.0
13	16.0	14.8	16.0	16.0	17.2	16.0	16.0	14.8	12.7	11.6	9.59	10.6
14	9.59	9.59	10.6	10.6	11.6	11.6	11.6	12.7	10.6	9.59	9.59	8.53
15	9.59	10.6	10.6	11.6	12.7	13.7	11.6	11.6	10.6	9.59	9.59	9.59
16	9.59	10.6	10.6	12.7	13.7	14.8	13.7	13.7	12.7	11.6	11.6	10.6
17	11.6	11.6	12.7	14.8	14.8	16.0	16.0	14.8	13.7	13.7	13.7	13.7
18*	13.7	14.8	16.0	18.6	27.4	29.7	56.5	51.9	56.5	47.4	43.1	35.0
19*	35.0	35.0	43.1	38.9	140.	115.	95.2	83.9	70.6	47.4	35.0	43.1
20	75.4	65.9	65.9	56.5	47.4	51.9	47.4	43.1	38.9	35.0	32.2	29.7
21	29.7	27.4	29.7	29.7	29.7	32.2	29.7	27.4	29.7	32.2	32.2	680.
22*	1090.	988.	775.	680.	580.	542.	599.	489.	423.	463.	343.	254.
23*	211.	180.	161.	153.	145.	136.	142.	140.	147.	168.	138.	124.
24*	102.	91.5	337.	259.	203.	168.	155.	146.	136.	126.	115.	109.
25	102.	102.	95.2	87.8	91.5	91.5	87.8	80.0	87.8	83.9	80.0	87.8
26*	83.9	75.4	65.9	118.	126.	115.	102.	95.2	91.5	91.5	91.5	83.9
27	80.0	80.0	80.0	83.9	80.0	80.0	75.4	70.6	70.6	70.6	65.9	65.9
28	65.9	70.6	70.6	65.9	70.6	70.6	61.2	56.5	56.5	51.9	51.9	56.5
29*	56.5	56.5	61.2	61.2	56.5	61.2	51.9	61.2	61.2	112.	364.	159.
30	149.	155.	187.	177.	174.	161.	155.	152.	150.	146.	143.	140.

*SPECIAL POINTS

5	1340/106.	1445/317.	1450/239.	1525/400.	2130/147.
7	1515/220.	2045/3170.			
18	1240/29.7	1255/80.0	1305/70.6	1320/83.9	
19	1530/146.				
22	0215/1220.	1245/480.	1340/609.	1830/415.	1910/497.
23	1030/147.				
24	0440/431.				
26	0700/70.6	0920/134.			
29	2140/385.				

RIVER GAGE DATA
 STA. NO. 33 RIO CARIS AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	138.	142.	136.	131.	131.	129.	126.	121.	115.	112.	109.	112.
2*	150.	138.	124.	121.	129.	134.	140.	131.	134.	124.	112.	109.
3*	109.	140.	149.	140.	131.	124.	124.	112.	109.	152.	239.	153.
4*	150.	155.	140.	112.	109.	124.	136.	126.	150.	207.	168.	159.
5	153.	138.	121.	115.	115.	112.	109.	109.	106.	98.7	95.2	95.2
6	95.2	91.5	95.2	95.2	91.5	91.5	87.8	83.9	83.9	80.0	80.0	83.9
7	80.0	75.4	75.4	75.4	83.9	83.9	80.0	75.4	70.6	70.6	65.9	65.9
8	70.6	75.4	75.4	83.9	87.8	83.9	83.9	87.8	106.	98.7	87.8	75.4
9	75.4	75.4	75.4	75.4	75.4	65.9	70.6	70.6	70.6	70.6	65.9	65.9
10	65.9	70.6	70.6	70.6	75.4	70.6	75.4	80.0	80.0	87.8	109.	660.
11*	515.	393.	533.	371.	207.	177.	177.	249.	305.	400.	364.	524.
12*	350.	259.	187.	161.	155.	152.	203.	166.	2230.	3210.	2310.	1490.
13*	1020.	639.	400.	293.	239.	194.	159.	155.	155.	140.	244.	215.
14*	159.	149.	142.	136.	146.	142.	138.	131.	180.	152.	155.	220.
15*	2330.	1450.	385.	472.	293.	220.	164.	152.	140.	129.	109.	129.
16*	147.	121.	95.2	70.6	43.1	27.4	47.4	138.	102.	83.9	220.	183.
17*	171.	211.	164.	143.	129.	109.	102.	91.5	83.9	80.0	70.6	61.2
18*	56.5	47.4	174.	276.	234.	171.	364.	330.	423.	265.	194.	161.
19*	147.	136.	124.	124.	174.	225.	183.	155.	142.	131.	124.	118.
20*	112.	105.	98.7	91.5	91.5	87.8	70.6	65.9	98.7	115.	75.4	35.0
21*	32.2	27.4	25.3	32.2	27.4	29.7	27.4	29.7	32.2	32.2	32.2	32.2
22*	21.6	23.4	20.0	25.3	32.2	43.1	106.	65.9	65.9	98.7	180.	136.
23*	171.	166.	145.	126.	112.	102.	83.9	87.8	91.5	98.7	1250.	829.
24	463.	225.	149.	131.	118.	106.	115.	124.	136.	129.	121.	102.
25*	91.9	75.4	56.5	47.4	38.9	35.0	35.0	32.2	27.4	25.3	20.0	16.0
26*	13.7	11.6	9.59	12.7	13.7	16.0	20.0	20.0	480.	146.	129.	91.5
27*	70.6	98.7	80.0	87.8	1670.	1700.	1400.	1010.	851.	609.	942.	589.
28	287.	203.	171.	157.	149.	138.	134.	126.	129.	118.	121.	124.
29	118.	118.	109.	106.	109.	109.	109.	102.	102.	87.8	87.8	80.0
30	83.9	83.9	75.4	70.6	70.6	61.2	61.2	51.9	47.4	43.1	38.9	38.9
31	38.9	38.9	32.2	38.9	32.2	35.0	32.2	29.7	29.7	25.3	25.3	21.6

*SPECIAL POINTS

2	0030/112.	0145/152.	1720/138.									
3	0315/109.	1130/152.	1340/112.	1420/220.	1500/177.							
4	1700/126.	1915/265.										
11	0125/480.	0220/542.	0530/551.	1230/191.	1430/187.	1945/299.	2315/570.					
12	1105/109.	1415/207.	1715/153.	1945/3250.								
13	1450/152.	1715/159.	2140/249.	2245/203.								
14	0830/129.	0915/155.	1100/150.	1740/183.	2030/168.							
15	0040/2950.	2345/134.										
16	0050/124.	1445/43.1	1630/155.	2115/47.4	2225/244.							
17	0130/153.	0240/220.										
18	0100/51.9	0550/35.0	0625/439.	1335/150.	1430/259.	1510/506.	1700/254.					
19	0955/115.	1040/287.										
20	1730/61.2	1830/136.										
21	2315/43.1											
22	1045/43.1	1420/118.	2110/102.									
23	0030/127.	0135/171.	2045/1250.									
25	1300/27.4											
26	1320/21.6	1615/20.0	1810/524.									
27	0900/41.5	0930/2050.	1115/1250.	1300/1220.	2045/542.							

RIVER GAGE DATA
 STA. NO. 33 RIO CARIS AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	21.6	21.6	23.4	23.4	27.4	32.2	51.9	70.6	61.2	51.9	51.9	80.0
2*	75.4	47.4	35.0	32.2	32.2	29.7	27.4	95.2	32.2	51.9	32.2	32.2
3*	35.0	164.	131.	109.	129.	109.	98.7	91.5	129.	2370.	1640.	1000.
4	629.	415.	281.	239.	211.	174.	166.	168.	147.	146.	138.	136.
5	134.	129.	129.	131.	124.	115.	124.	121.	118.	118.	118.	115.
6*	109.	91.5	98.7	91.5	102.	95.2	98.7	98.7	91.5	91.5	102.	118.
7	106.	91.5	87.8	80.0	65.9	106.	102.	83.9	75.4	75.4	70.6	56.5
8*	51.9	80.0	140.	106.	87.8	118.	106.	115.	75.4	91.5	91.5	134.
9*	98.7	47.4	38.9	43.1	61.2	56.5	51.9	47.4	43.1	38.9	43.1	80.0
10	43.1	35.0	35.0	35.0	38.9	61.2	38.9	32.2	25.3	23.4	20.0	20.0
11*	17.2	16.0	13.7	13.7	13.7	14.8	16.0	14.8	20.0	17.2	16.0	2370.
12*	1980.	1240.	786.	599.	415.	270.	198.	183.	164.	155.	149.	146.
13	138.	143.	138.	131.	136.	136.	136.	136.	129.	126.	115.	112.
14	109.	102.	102.	98.7	87.8	106.	109.	106.	91.5	80.0	80.0	80.0
15*	75.4	146.	124.	106.	87.8	91.5	87.8	87.8	80.0	75.4	87.8	80.0
16*	70.6	65.9	61.2	65.9	83.9	118.	1840.	1290.	660.	385.	299.	211.
17*	180.	183.	174.	164.	152.	147.	142.	146.	138.	134.	126.	124.
18*	124.	115.	98.7	98.7	95.2	109.	106.	107.	146.	98.7	691.	463.
19*	423.	317.	276.	225.	187.	168.	171.	159.	168.	152.	142.	357.
20*	265.	227.	198.	244.	249.	183.	155.	147.	142.	129.	115.	146.
21	115.	98.7	83.9	70.6	61.2	70.6	75.4	65.9	61.2	56.5	51.9	38.9
22	32.2	29.7	27.4	32.2	27.4	32.2	61.2	83.9	38.9	25.3	32.2	27.4
23*	27.4	25.3	25.3	25.3	38.9	38.9	38.9	51.9	38.9	35.0	35.0	136.
24	400.	M	M	M	M	M	M	M	M	M	M	M
25	M	M	M	M	M	M	M	M	M	M	M	M
26	M	M	M	M	M	M	M	112.	102.	102.	98.7	91.5
27	87.8	91.5	87.8	80.0	80.0	80.0	61.2	51.9	51.9	47.4	43.1	43.1
28*	35.0	38.9	38.9	38.9	35.0	38.9	43.1	138.	75.4	65.9	1480.	670.
29*	265.	171.	155.	153.	164.	152.	157.	M	M	M	M	M
30	M	M	M	M	M	M	M	M	M	M	M	M
31	M	M	M	M	M	M	65.9	56.5	56.5	65.9	56.5	51.9

*SPECIAL POINTS

2	0035/102.	1515/29.7			
3	0340/56.5	0420/194.	1840/157.	1900/136.	1955/2610.
6	2300/124.				
8	0530/147.				
9	0020/147.				
11	1730/23.4	2330/43.1			
12	0100/2450.				
15	0230/70.6	0300/152.			
16	1430/1930.				
17	1730/147.				
18	2115/98.7	2345/378.			
19	0030/629.	1700/180.	2235/143.	2325/393.	
20	0730/152.	0830/393.	2245/157.		
23	2245/38.9	2325/149.			
28	1430/43.1	1505/299.	2055/83.9	2130/1510.	
29	0530/150.				

RIVER GAGE DATA
 STA. NO. 33 RIO CARIS AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	47.4	43.1	43.1	47.4	47.4	51.9	70.6	136.	281.	408.	299.	187.
2*	265.	265.	244.	211.	183.	171.	164.	153.	149.	147.	143.	138.
3	131.	124.	121.	115.	112.	112.	109.	102.	98.7	95.2	83.9	75.4
4	70.6	70.6	65.9	65.9	65.9	65.9	65.9	61.2	56.5	56.5	56.5	51.9
5	56.5	56.5	56.5	56.5	61.2	56.5	51.9	43.1	43.1	35.0	29.7	29.7
6*	32.2	29.7	32.2	32.2	35.0	38.9	32.2	32.2	75.4	47.4	38.9	43.1
7*	56.5	51.9	43.1	38.9	38.9	106.	118.	161.	146.	140.	220.	166.
8*	145.	129.	112.	109.	98.7	140.	152.	455.	343.	234.	215.	220.
9	211.	180.	174.	159.	157.	155.	155.	150.	145.	142.	136.	134.
10	129.	124.	118.	118.	118.	109.	109.	106.	106.	102.	98.7	98.7
11	91.5	87.8	83.9	80.0	80.0	80.0	75.4	70.6	70.6	65.9	65.9	75.4
12	75.4	75.4	70.6	65.9	65.9	65.9	65.9	80.0	80.0	80.0	75.4	70.6
13	70.6	65.9	65.9	65.9	61.2	61.2	61.2	51.9	51.9	51.9	51.9	51.9
14	51.9	47.4	47.4	47.4	47.4	51.9	51.9	47.4	47.4	47.4	47.4	47.4
15	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4	47.4
16	47.4	47.4	51.9	51.9	51.9	51.9	56.5	51.9	51.9	51.9	47.4	47.4
17	51.9	51.9	51.9	51.9	56.5	56.5	56.5	51.9	51.9	51.9	51.9	47.4
18	43.1	33.9	38.9	38.9	43.1	35.0	32.2	29.7	29.7	29.7	29.7	29.7
19	32.2	32.2	32.2	35.0	35.0	35.0	38.9	38.9	38.9	38.9	38.9	43.1
20	43.1	43.1	47.4	47.4	51.9	51.9	51.9	51.9	47.4	47.4	47.4	51.9
21	51.9	51.9	51.9	51.9	47.4	47.4	38.9	35.0	35.0	35.0	35.0	43.1
22	47.4	43.1	51.9	47.4	43.1	32.2	29.7	32.2	32.2	32.2	32.2	32.2
23	32.2	32.2	32.2	32.2	32.2	32.2	32.2	35.0	38.9	38.9	38.9	35.0
24*	35.0	35.0	35.0	35.0	35.0	1200.	1060.	701.	489.	324.	259.	229.
25*	265.	198.	177.	159.	157.	153.	147.	143.	136.	134.	129.	124.
26	121.	118.	115.	112.	102.	106.	95.2	71.5	83.9	80.0	65.9	61.2
27	61.2	65.9	61.2	56.5	51.9	51.9	47.4	43.1	38.9	38.9	35.0	35.0
28	32.2	29.7	29.7	27.4	32.2	29.7	27.4	23.4	21.6	20.0	21.6	20.0
29*	20.0	18.6	56.5	29.7	25.3	23.4	20.0	16.0	17.2	17.2	16.0	16.0
30*	25.3	29.7	21.6	21.6	21.6	20.0	18.6	38.9	65.9	177.	136.	61.2

*SPECIAL POINTS

1	1500/70.6	1645/174.	1750/136.	1815/840.	2110/207.	
2	0100/281.					
6	1835/80.0					
7	1145/115.	1450/118.	1555/164.	1710/142.	2155/118.	2215/270.
8	1505/629.					
24	1100/51.9	1145/1220.	1300/1240.			
25	0050/317.					
29	0515/56.5					
30	1500/20.0	1640/106.	1750/61.2	1850/143.	2100/136.	

RIVER GAGE DATA
 STA. NO. 33 RIO CARIS AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		40.6	125.	126.	40.8	144.
2		34.5	95.3	129.	44.5	193.
3		36.4	64.5	142.	421.	109.
4		42.9	34.3	151.	300.	64.1
5		45.6	174.	117.	124.	49.1
6		44.5	168.	88.8	99.6	39.1
7		46.7	684.	75.8	86.2	99.8
8		63.5	377.	84.3	98.0	211.
9		386.	116.	72.3	56.9	162.
10		174.	57.2	102.	35.0	113.
11		131.	34.6	343.	41.8	78.2
12		100.	21.8	819.	579.	72.4
13		76.1	14.5	408.	133.	60.3
14	M	50.7	10.6	155.	97.5	48.7
15	89.4	38.6	10.9	627.	94.9	47.4
16	90.0	32.8	12.1	99.6	434.	50.8
17	72.0	32.7	13.8	126.	158.	52.7
18	65.9	29.6	34.4	216.	154.	35.8
19	64.3	29.4	67.7	153.	241.	36.4
20	72.2	43.6	49.3	91.2	198.	48.2
21	65.5	46.3	57.1	32.3	75.7	43.9
22	57.3	76.4	598.	63.5	38.5	38.1
23	56.5	47.8	163.	273.	38.8	34.2
24	55.4	49.7	174.	208.	M	349.
25	49.9	51.8 E	90.9	45.8	M	168.
26	48.5	42.9	94.4	78.1	M	98.8
27	46.2	37.5	76.3	691.	69.2	50.2
28	44.3	35.3	62.8	189.	194.	26.9
29	42.5	91.3	95.0	105.	M	23.8
30	42.5	419.	167.	62.6	M	53.4
31		165.		32.4	M	

II-103

RIVER GAGE DATA

NAME: Sta. No. 34 Río Tonoro at the Crossing of the Santa Bárbara-Aguasay Road.

LOCATION: Longitude $63^{\circ} 39.2'$ W, latitude $09^{\circ} 30.1'$ N. Approximately 13.6 km SW of Santa Bárbara, 11.2 km NE of Aguasay.

DRAINAGE AREA: 409 sq mi (from topographic map).

GAGE: Stevens Type A35 water level recorder attached to left downstream side of bridge.

RECORDS AVAILABLE: April 18, 1969 through September 30, 1969.

REMARKS: Record is good. Shifting control method was applied from June 8 through September 30.

CODING: M signifies missing data; E signifies estimated data.



Aerial view of the Río Tonoro at the crossing of the Santa Bárbara-Aguasay road. The A35 recorder is attached to the downstream (right hand side of photograph) side of the bridge. Note the braided appearance of the river at low flow.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 34 RIO TONORO AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD

Meas. No.	Date	Made by	Width ft	Area sq ft	Mean Velocity fps	Inside Gage Height ft	Dis-charge cfs	Shift Adj. ft	Per-cent Diff.	Method	Num-ber Meas. Sec-tions	Gage Height Change ft	Time hr	Water Temp. °F
1	May 6	Rodriguez	126.	36.1	1.39	0.27	50.1	0	-4.6	Wading	27	0	0.7	88
2	June 19	Romero	138.	90.0	1.94	0.60	175.	+10	-2.8	Wading	29	0	0.9	-
3	23	Romero	142.	105.	1.83	0.62	192.	+10	+0.5	Wading	26	0	0.8	82
4	24	Canache	145.	86.3	1.74	0.52	150.	+12	-2.0	Wading	23	0	0.8	87
5	July 4	Canache	146.	55.5	1.67	0.38	92.6	+09	+0.1	Wading	33	0	0.7	84
6	11	Duke	182.	236.	2.88	1.28	680.	0	-0.7	-	26	Var.	1.1	-
7	15	Romero	267.	368.	5.54	1.36	2040.	+65	+0.5	Bridge	37	-.27	2.1	84
8	17	Santos	129.	127.	2.95	0.66	375.	+33	+0.8	Wading	24	-.07	0.8	90
9	19	Tirado	80.0	106.	2.46	0.54	261.	+33	-7.0	Wading	22	+05	0.8	91
10	23	Romero	97.0	80.4	1.85	0.52	149.	+10	+3.5	Wading	27	-.03	1.1	82
11	24	Santaella	129.	101.	1.85	0.66	187.	+05	+0.8	Wading	23	-.05	0.5	86
12	27	Santos	529.	1630.	8.53	4.44	13900.	0	-2.4	Bridge	41	-1.10	1.8	80
13	27	Santos	495.	1090.	6.92	3.07	7540.	+61	-2.1	Bridge	44	-.85	1.8	80
14	28	Santos	140.	159.	3.52	0.50	560.	+68	-0.5	Wading	23	-.05	1.0	89
15	30	Romero	80.0	83.8	2.05	0.15	172.	+53	+0.6	Wading	22	0	0.7	-
16	Aug. 3	Romero	101.	101.	2.02	0.28	204.	+45	+3.8	Wading	23	-.01	0.8	-
17	5	Santaella	69.0	103.	2.66	0.06	274.	+80	0.0	Wading	20	-.03	0.5	77
18	7	Romero	122.	99.4	2.14	0.22	213.	+55	-2.5	Wading	27	-.09	1.2	85
19	12	Romero	512.	1070.	6.54	3.06	7000.	+50	-1.1	Bridge	35	-.37	3.1	80
20	12	Romero	512.	809.	5.86	2.35	4740.	+59	-0.1	Bridge	37	-.50	1.5	77
21	20	Romero	96.0	109.	1.86	0.38	203.	+36	+0.5	-	26	-.05	1.0	89
22	27	Santaella	181.	118.	1.57	0.80	185.	-.09	-0.3	Wading	24	0	0.7	83
23	29	Romero	280.	301.	4.75	1.12	1430.	+62	-0.7	Bridge & Wading	33	-.04	1.6	-
24	31	Tirado	86.0	102.	2.05	0.54	209.	+22	-1.9	Wading	23	+01	0.8	89
25	Sept. 4	Velasquez	60.5	75.7	1.94	0.55	147.	+10	-6.7	Wading	22	0	0.5	89
26	5	Santaella	62.0	69.0	2.17	0.48	150.	+13	+7.5	Wading	23	0	0.4	80
27	7	Santaella	69.0	66.0	1.89	0.52	125.	+05	+0.4	Wading	25	+01	0.5	81
28	12	Tirado	107.	95.7	2.60	0.76	249.	+06	+0.4	Wading	24	0	0.7	-
29	14	Tirado	107.	79.4	1.54	0.56	122.	0	+0.8	Wading	26	0	0.8	-
30	16	Santaella	68.0	56.3	2.10	0.55	118.	0	+0.4	Wading	25	0	0.5	88
31	20	Santaella	85.0	54.9	1.68	0.50	92.0	0	-8.0	Wading	22	-.01	0.5	81
32	24	Tirado	515.	1120.	6.62	3.68	7410.	0	-3.8	Bridge	31	+1.35	1.8	-
33	24	Tirado	520.	1510.	7.42	4.07	11200.	0	+4.4	Bridge	30	-.45	1.5	-

RATING TABLE
FOR
STA. NO. 34 RIO TONORO AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00		1.00	380.	2.00	2005.	3.00	4950.	4.00	10060.	5.00	19810.
.10	10.0	.10	475.	.10	2250.	.10	5300.	.10	11010.	.10	
.20	35.0	.20	585.	.20	2510.	.20	5660.	.20	11960.	.20	
.30	60.0	.30	710.	.30	2780.	.30	6030.	.30	12910.	.30	
.40	75.0	.40	850.	.40	3060.	.40	6410.	.40	13860.	.40	
.50	100.	.50	1005.	.50	3350.	.50	6810.	.50	14810.	.50	
.60	135.	.60	1175.	.60	3650.	.60	7260.	.60	15810.	.60	
.70	180.	.70	1360.	.70	3960.	.70	7810.	.70	16810.	.70	
.80	235.	.80	1560.	.80	4280.	.80	8460.	.80	17810.	.80	
.90	300.	.90	1775.	.90	4610.	.90	9210.	.90	18810.	.90	

RIVER GAGE DATA
 STA. NO. 34 RIO TONORO AT THE CROSSING OF THE SANTA BARBARA AGUASAY ROAD
 APRIL 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
18	M	M	M	M	M	48.1	48.1	45.6	45.6	45.6	45.6	45.6
19	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
20	45.6	45.6	48.1	48.1	48.1	50.6	50.6	48.1	45.6	45.6	48.1	48.1
21	48.1	48.1	48.1	48.1	50.6	50.6	50.6	50.6	48.1	48.1	48.1	48.1
22	48.1	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6	45.6
23	45.6	45.6	45.6 E	45.6 E	45.6 E	45.6 E	45.6 E	45.6 E	45.6 E	45.6 E	45.6 E	45.6 E
24	45.6 E	45.6 E	45.6 E	45.6 F	45.6 E	45.6 F	45.6 E	45.6 E	45.6 E	45.6 E	45.6 E	45.6 E
25	48.1 E	48.1 E	48.1 E	48.1 E	48.1 E	48.1 F	48.1 E	48.1 F	48.1 F	48.1 F	48.1 E	48.1 E
26	48.1 E	48.1 E	48.1 E	48.1 E	48.1 F	48.1 E	48.1 E	48.1 E	48.1 E	48.1 E	48.1 E	48.1 E
27	50.6 E	50.6 E	50.6 E	50.6 E	50.6 F	50.6 F	50.6 F	50.6 E	50.6 E	50.6 E	50.6 E	50.6 E
28	50.6 E	50.6 E	50.6 E	50.6 E	50.6 F	50.6	50.6	48.1	48.1	45.6	45.6	45.6
29	45.6	45.6	45.6	45.6	45.6	43.0	43.0	43.0	40.3	37.7	37.7	40.3
30	40.3	43.0	43.0	43.0	45.6	48.1	45.6	43.0	40.3	40.3	40.3	40.3

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 34 RIO TONORO AT THE CROSSING OF THE SANTA BARBARA AGUASAY ROAD
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	40.3	40.3	43.0	45.6	45.6	45.6	45.6	43.0	40.3	40.3	40.3	40.3
2	40.3	43.0	40.3	40.3	40.3	43.0	40.3	40.3	40.3	40.3	40.3	40.3
3	40.3	40.3	43.0	45.6	48.1	48.1	48.1	48.1	48.1	48.1	48.1	48.1
4	48.1	48.1	48.1	50.6	53.1	53.1	53.1	50.6	50.6	50.6	50.6	50.6
5	50.6	53.1	53.1	53.1	55.5	55.5	55.5	53.1	53.1	53.1	53.1	53.1
6	53.1	53.1	53.1	53.1	53.1	53.1	53.1	50.6	50.6	50.6	48.1	48.1
7	50.6	50.6	50.6	53.1	55.5	55.5	55.5	55.5	53.1	53.1	53.1	53.1
8*	53.1	53.1	53.1	53.1	55.5	55.5	55.5	53.1	53.1	71.8	106.	86.2
9	75.0	70.4	67.5	66.1	64.6	63.2	61.6	63.2	67.5	68.9	75.0	91.4
10*	97.0	94.2	88.8	86.2	79.2	77.0	75.0	71.8	70.4	68.9	67.5	64.6
11	64.6	63.2	63.2	63.2	63.2	63.2	61.6	60.0	60.0	57.8	57.8	57.8
12	57.8	57.8	57.8	60.0	60.0	60.0	57.8	57.8	55.5	55.5	55.5	55.5
13	55.5	55.5	57.8	57.8	57.8	57.8	55.5	55.5	53.1	53.1	53.1	53.1
14	53.1	53.1	55.5	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8	57.8
15	57.8	57.8	57.8	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0
16	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	57.8	55.5	55.5
17	55.5	55.5	55.5	55.5	55.5	55.5	45.6	43.0	M	M	M	M
18	M	M	M	M	M	M	M	M	M	M	M	M
19	M	M	M	M	M	M	M	M	M	M	M	M
20	M	M	M	M	M	50.6	48.1	53.1	53.1	50.6	48.1	45.6
21	43.0	40.3	43.0	45.6	45.6	53.1	53.1	48.1	50.6	50.6	53.1	53.1
22	55.5	55.5	57.8	60.0	64.6	64.6	64.6	61.6	57.8	55.5	55.5	55.5
23	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	53.1	53.1	53.1	53.1
24	53.1	53.1	55.5	55.5	55.5	55.5	50.6	50.6	50.6	50.6	50.6	50.6
25	53.1	53.1	55.5	57.8	57.8	57.8	57.8	57.8	57.8	60.0	60.0	60.0
26	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	57.8	57.8	57.8
27	55.5	55.5	55.5	55.5	55.5	55.5	53.1	50.6	50.6	48.1	48.1	48.1
28	48.1	48.1	48.1	48.1	48.1	48.1	48.1	45.6	45.6	45.6	45.6	45.6
29*	45.6	45.6	45.6	45.6	45.6	48.1	53.1	53.1	73.4	83.8	67.5	66.1
30	60.1	77.0	86.2	97.0	143.	116.	106.	100.	100.	91.4	86.2	79.2
31	77.0	75.0	73.4	73.4	73.4	71.8	70.4	70.4	70.4	70.4	70.4	70.4

*SPECIAL POINTS

8	1730/53.1	
10	0045/97.0	
29	1640/64.9	1900/100.

RIVER GAGE DATA
 STA. NO. 34 RIO TONORO AT THE CROSSING OF THE SANTA BARBARA AGUASAY ROAD
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	68.9	67.5	67.5	67.5	66.1	66.1	64.6	66.1	64.6	61.6	61.6	61.6
2	61.6	61.6	61.6	61.6	61.6	61.6	60.0	57.8	55.5	53.1	53.1	55.5
3	55.5	55.5	55.5	55.5	55.5	57.8	60.0	60.0	60.0	60.0	61.6	63.2
4	63.2	64.6	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67.5	67.5
5*	66.1	66.1	66.1	66.1	66.1	64.6	64.6	75.0	68.9	66.1	64.6	63.2
6	61.6	60.0	60.0	60.0	60.0	60.0	60.0	64.6	66.1	67.5	64.6	66.1
7*	73.4	81.5	81.5	81.5	79.2	79.2	75.0	79.2	83.8	81.5	88.8	100.
8*	380.	322.	165.	165.	201.	272.	272.	247.	229.	241.	223.	206.
9	206.	195.	190.	185.	170.	165.	143.	135.	127.	120.	113.	106.
10	106.	103.	103.	100.	91.5	91.5	86.2	83.8	79.2	79.2	77.0	75.0
11	75.0	71.8	71.8	70.4	68.9	67.5	66.1	63.2	63.2	61.6	61.6	60.0
12	61.6	60.0	60.0	57.8	57.8	55.5	55.5	53.1	50.6	48.1	48.1	48.1
13	48.1	48.1	48.1	50.6	50.6	50.6	48.1	48.1	45.6	45.6	45.6	45.6
14	45.6	45.6	43.0	40.3	40.3	37.7	35.0	35.0	35.0	37.7	37.7	35.0
15	32.3	32.3	29.7	29.7	29.7	35.0	32.3	29.7	27.0	27.0	29.7	35.0
16	40.3	45.6	48.1	48.1	50.6	48.1	48.1	45.6	45.6	43.0	43.0	43.0
17	43.0	43.0	43.0	45.6	45.6	48.1	50.6	48.1	45.6	45.6	45.6	45.6
18*	45.6	48.1	53.1	57.8	61.6	81.5	113.	103.	94.2	407.	175.	165.
19*	156.	217.	223.	185.	180.	180.	180.	170.	161.	165.	152.	147.
20	143.	139.	143.	152.	165.	170.	156.	139.	131.	123.	116.	113.
21	106.	106.	103.	100.	100.	100.	97.0	97.0	94.2	91.5	91.5	88.8
22*	91.5	97.0	94.2	94.2	94.2	91.5	88.8	88.8	86.2	86.2	496.	416.
23*	229.	185.	185.	195.	195.	206.	201.	212.	223.	229.	247.	241.
24*	195.	190.	175.	156.	152.	152.	621.	621.	330.	253.	223.	217.
25	217.	223.	217.	217.	206.	201.	201.	190.	180.	180.	175.	175.
26*	190.	212.	260.	190.	330.	293.	241.	212.	195.	175.	175.	241.
27*	241.	212.	195.	170.	161.	152.	135.	120.	113.	113.	109.	103.
28	100.	97.0	91.5	91.5	88.8	88.8	86.2	83.8	83.8	83.8	83.8	83.8
29	79.2	77.0	77.0	75.0	75.0	71.8	70.4	68.9	75.0	81.5	86.2	81.5
30*	621.	354.	266.	206.	201.	185.	165.	147.	135.	131.	120.	113.

*SPECIAL POINTS

5	1520/63.2											
7	1520/75.0	1530/88.8										
8	0145/106.	0215/1190.	1315/293.									
18	1220/81.5	1235/116.	1310/103.	1930/475.								
19	0500/260.											
22	2215/528.											
23	2235/253.											
24	1320/152.	1510/778.										
26	0745/185.											
27	0130/254.											
30	0115/94.2	0210/646.										

RIVER GAGE DATA
 STA. NO. 34 RIO TONORO AT THE CROSSING OF THE SANTA BARBARA AGUASAY ROAD
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	109.	106.	103.	100.	100.	100.	97.0	94.2	94.2	91.4	88.8	86.2 E
2	83.8	81.5	79.2	79.2	77.0	97.0	100.	113.	116.	116.	116.	123. E
3	113.	97.0	88.8	83.8	81.5	79.2	79.2	73.4	73.4	77.0	79.2	81.5 E
4*	81.5	79.2	79.2	83.8	91.4	88.8	86.2	81.5	91.4	113.	106.	100.
5	97.0	88.8	91.5	88.8	81.5	79.2	75.0	73.4	75.0	79.2	81.5	91.4
6	103.	100.	97.0	91.4	86.2	83.8	79.2	73.4	70.4	68.9	67.5	67.5
7	67.5	67.5	68.9	70.4	70.4	70.4	68.9	67.5	68.9	70.4	68.9	67.5
8	66.1	66.1	66.1	67.5	67.5	67.5	67.5	M	M	M	M	M
9	M	M	M	M	M	M	M	M	M	M	M	M
10	M	M	M	M	M	M	M	M	M	M	M	M
11*	M	M	M	M	M	M	M	506.	322.	354.	346.	354.
12*	710.	562.	835.	562.	465.	371.	445.	435.	445.	398.	354.	338. E
13*	2300.	1070.	973.	806.	821.	646.	621.	597.	585.	609.	573.	585.
14*	633.	821.	835.	806.	684.	573.	506.	2330.	3470.	4380.	3590.	2380.
15*	2080.	1690.	1400.	2170.	2890.	2380.	1770.	1070.	621.	496.	528.	380.
16*	407.	528.	455.	455.	426.	416.	363.	389.	371.	389.	389.	322.
17*	1120.	973.	445.	723.	1160.	646.	398.	307.	315.	279.	272.	253.
18*	241.	195.	1890.	1340.	957.	710.	764.	989.	750.	621.	597.	465.
19*	585.	445.	445.	435.	416.	363.	286.	241.	550.	646.	475.	445.
20	346.	363.	346.	354.	363.	380.	300.	266.	260.	260.	253.	223.
21	223.	229.	229.	235.	235.	217.	201.	190.	190.	175.	165.	156.
22	156.	161.	165.	156.	147.	152.	152.	M	M	M	M	M
23*	M	M	M	M	M	152.	135.	131.	116.	116.	131.	131.
24*	116.	116.	116.	131.	241.	235.	190.	175.	293.	338.	241.	195.
25	189.	190.	175.	152.	139.	135.	116.	103.	94.2	88.8	88.8	86.2
26*	86.2	86.2	86.2	86.2	83.8	88.8	91.4	88.8	260.	152.	175.	416.
27*	1190.	1280.	1250.	435.	338.	363.	18900.	13600.	6610.	3960.	3470.	3500.
28	2050.	1500.	1050.	895.	658.	646.	621.	517.	445.	389.	363.	346.
29	300.	286.	272.	279.	260.	247.	241.	217.	201.	190.	217.	195.
30	180.	180.	195.	190.	180.	180.	161.	152.	156.	152.	139.	127.
31	135.	131.	131.	139.	135.	135.	123.	123.	123.	120.	109.	109.

*SPECIAL POINTS

4	2030/170.											
11	1425/710.											
12	0240/778.	0415/528.	0500/1020.	1445/465.								
13	0020/322.	0110/3260.	0845/1040.									
14	0230/441.	1720/3900.	1915/4710.	2040/4780.								
15	0635/1340.	0945/3320.	1100/2330.									
16	0340/550.	1500/330.	1655/426.	2100/426.								
17	0100/315.	0255/1190.										
18	0430/3470.	1245/585.	1645/1210.									
19	0115/607.	1900/737.										
23	2300/135.											
24	0725/116.	1100/241.	1900/380.									
26	1610/88.8	1700/212.	1745/266.									
27	0045/506.	0130/465.	0320/597.	0430/1480.	1215/354.	2045/3650.	2115/4150.	2225/3230.	2320/3870.			

RIVER GAGE DATA
 STA. NO. 34 RIO TONORO AT THE CROSSING OF THE SANTA BARBARA AGUASAY ROAD
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	107.	109.	109.	109.	109.	113.	123.	131.	127.	131.	161.	190.
2*	426.	506.	445.	247.	229.	235.	229.	241.	235.	229.	241.	229.
3*	235.	241.	241.	229.	223.	201.	170.	156.	165.	416.	272.	3680.
4*	2950.	1070.	910.	821.	778.	658.	633.	550.	346.	330.	315.	322.
5*	346.	338.	315.	307.	307.	293.	260.	229.	266.	260.	338.	338.
6	253.	235.	223.	235.	229.	201.	195.	195.	185.	190.	180.	185.
7*	175.	212.	354.	407.	300.	260.	229.	212.	206.	195.	185.	190.
8*	185.	206.	217.	212.	223.	260.	229.	190.	315.	880.	1000.	562.
9*	445.	435.	926.	723.	550.	475.	389.	307.	307.	272.	260.	371.
10*	435.	330.	272.	272.	217.	175.	135.	116.	106.	100.	106.	100.
11	86.2	88.8	91.4	91.4	81.5	81.5	73.4	68.9	67.5	67.5	63.2	68.9
12*	103.	116.	91.4	97.0	7410.	6260.	5990.	4980.	3500.	2780.	2130.	1730.
13*	1230.	957.	737.	737.	880.	573.	354.	485.	562.	416.	371.	380.
14	389.	389.	380.	371.	338.	315.	322.	445.	485.	407.	322.	279.
15	253.	247.	229.	217.	195.	175.	175.	161.	170.	165.	229.	212.
16*	190.	180.	180.	175.	266.	435.	496.	1040.	957.	1120.	895.	517.
17	426.	445.	407.	407.	389.	307.	315.	307.	272.	247.	229.	223.
18*	217.	201.	180.	170.	170.	161.	152.	143.	170.	398.	300.	286.
19*	260.	1000.	517.	506.	821.	435.	445.	371.	389.	338.	322.	272.
20*	286.	229.	241.	235.	260.	223.	170.	165.	539.	435.	1500.	1340.
21	646.	737.	573.	485.	506.	445.	363.	272.	300.	272.	300.	300.
22*	315.	371.	398.	293.	272.	266.	989.	517.	307.	293.	322.	363.
23*	723.	597.	562.	539.	445.	398.	346.	300.	279.	286.	346.	1440.
24*	2510.	1230.	1420.	1110.	1120.	1000.	778.	750.	684.	633.	585.	585.
25*	671.	573.	597.	697.	609.	539.	865.	621.	528.	528.	562.	1270.
26*	684.	1190.	646.	633.	455.	416.	389.	354.	315.	293.	260.	241.
27	229.	217.	201.	190.	180.	185.	180.	170.	175.	165.	156.	152.
28*	161.	170.	175.	185.	206.	206.	206.	229.	201.	1910.	1110.	1520.
29*	6980.	5920.	2730.	2430.	1870.	1420.	1540.	957.	941.	821.	737.	697.
30	723.	684.	485.	465.	455.	416.	426.	455.	445.	407.	380.	371.
31	426.	338.	300.	279.	266.	235.	206.	217.	190.	206.	212.	206.

*SPECIAL POINTS

2	0300/562.											
3	2315/266.											
4	0500/6220.											
5	2140/363.											
7	0655/426.	0730/354.										
8	1145/247.	1950/247.	2050/1270.									
9	0500/435.	0620/1000.										
10	0150/455.											
12	0330/173.	0925/7990.										
13	0930/310.											
16	0845/1360.	1615/1160.	1845/865.	2045/895.	2115/1040.							
18	1930/416.											
19	0300/253.	0730/363.	0900/1020.									
20	1500/161.	2100/407.	2240/2030.									
22	0500/445.											
23	2330/1480.											
24	0025/1380.	0150/2590.	0900/895.									
25	0500/550.											
26	0720/647.											
28	1500/435.	1830/185.	1945/2200.	2315/850.								
29	0215/1630.	1430/1640.										

RIVER GAGE DATA
 STA. NO. 34 RIO TONORO AT THE CROSSING OF THE SANTA BARBARA AGUASAY ROAD
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	190.	201.	201.	195.	201.	190.	201.	260.	286.	272.	279.	585.
2*	1500.	778.	398.	293.	266.	465.	416.	241.	223.	286.	322.	307.
3	266.	241.	229.	253.	212.	201.	190.	170.	165.	170.	170.	152.
4	156.	165.	170.	170.	161.	152.	161.	156.	147.	139.	139.	143.
5	147.	147.	139.	139.	139.	139.	135.	165.	152.	131.	116.	116.
6	123.	123.	143.	161.	156.	161.	152.	147.	161.	156.	135.	123.
7	120.	116.	113.	120.	120.	147.	266.	260.	229.	206.	175.	161.
8*	165.	161.	147.	143.	135.	147.	455.	821.	562.	380.	346.	322.
9	322.	330.	300.	279.	260.	247.	235.	229.	212.	217.	201.	190.
10	185.	180.	185.	180.	175.	170.	152.	147.	135.	135.	123.	120.
11*	116.	120.	123.	123.	120.	123.	127.	135.	180.	266.	926.	737.
12*	633.	475.	517.	496.	389.	286.	253.	260.	241.	206.	180.	156.
13	152.	139.	139.	135.	131.	131.	131.	127.	131.	123.	123.	123.
14	123.	120.	123.	120.	120.	120.	123.	120.	120.	116.	120.	116.
15	106.	106.	106.	106.	103.	106.	100.	100.	100.	91.5	94.2	97.0
16	103.	106.	106.	113.	116.	116.	113.	116.	116.	113.	116.	116.
17	120.	152.	161.	152.	143.	139.	139.	135.	131.	135.	131.	131.
18	131.	131.	131.	135.	139.	143.	143.	135.	131.	131.	131.	131.
19	131.	152.	156.	152.	147.	143.	135.	127.	120.	116.	109.	106.
20	103.	103.	100.	103.	103.	100.	100.	97.0	91.4	88.8	88.8	88.8
21	86.2	86.2	88.8	91.4	91.4	91.4	91.4	88.8	86.2	83.8	81.5	81.5
22	81.5	81.5	81.5	83.8	83.8	83.8	83.8	83.8	83.8	83.8	83.8	83.8
23*	83.8	83.8	83.8	83.8	86.2	86.2	86.2	170.	103.	91.4	88.8	86.2
24*	778.	1140.	4850.	2840.	3960.	12200.	11500.	7120.	5260.	3930.	2380.	2150.
25*	2000.	1540.	1640.	1870.	1730.	1560.	2350.	2640.	1690.	1280.	1070.	910.
26	865.	737.	658.	658.	597.	539.	496.	465.	416.	389.	389.	371.
27	363.	338.	338.	330.	322.	300.	300.	293.	279.	272.	266.	266.
28	260.	260.	253.	260.	260.	253.	247.	247.	241.	235.	235.	229.
29*	229.	223.	223.	229.	235.	241.	371.	315.	260.	229.	223.	206.
30*	206.	195.	195.	206.	195.	190.	185.	212.	223.	217.	206.	185.

*SPECIAL POINTS

1	1315/223.	1430/195.										
2	0030/1520.	0110/1140.	0900/315.	1030/260.	1300/496.	1740/180.						
8	1105/131.	1530/910.										
11	2145/773.	2330/658.										
12	0100/865.											
23	1505/86.2	1545/180.										
24	0150/86.2	0220/1250.	0320/926.	0530/6140.	0830/2380.	1245/15300.						
25	0100/1540.	0500/1870.	0720/2170.	1315/1360.	1440/3000.							
29	0735/217.	1420/389.										
30	1445/253.	1520/190.										

RIVER GAGE DATA
 STA. NO. 34 RIO TONORO AT THE CROSSING OF THE SANTA BARBARA AGUASAY ROAD
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		42.5	65.7	98.9	123.	240.
2		40.7	59.0	97.0	292.	484.
3		45.8	58.3	85.4	287.	209.
4		50.5	66.7	89.7	1020.	156.
5		53.4	66.3	84.1	300.	140.
6		51.8	62.5	82.9	215.	145.
7		53.1	80.6	68.9	244.	168.
8		61.0	264.	M	347.	316.
9		70.1	159.	M	475.	258.
10		79.4	91.2	M	205.	161.
11		61.7	67.5	M	79.1	233.
12		57.7	55.2	510.	2980.	371.
13		55.6	48.0	902.	716.	134.
14		56.6	39.4	1780.	374.	120.
15		59.4	30.9	1590.	207.	102.
16		58.9	45.2	421.	571.	112.
17		M	45.7	567.	359.	138.
18	M	M	119.	911.	213.	134.
19	45.6	M	179.	457.	467.	134.
20	47.6	M	142.	320.	427.	98.1
21	48.9	48.0	99.0	208.	505.	87.7
22	45.9	58.9	140.	M	392.	83.1
23	45.6 E	54.8	225.	M	488.	93.1
24	45.6 E	52.8	269.	199.	1060.	4940.
25	48.0 E	57.0	201.	136.	642.	1750.
26	48.1 E	59.5	223.	130.	506.	577.
27	50.5 E	53.0	156.	4320.	188.	311.
28	49.1	47.2	89.6	937.	454.	250.
29	43.0	56.5	76.6	249.	2300.	251.
30	42.6	95.2	208.	170.	491.	204.
31		72.9		127.	264.	

RIVER GAGE DATA

NAME: Sta. No. 35 Río Guanipa at the Crossing of the Maturín-Temblador Road.

LOCATION: Longitude $63^{\circ} 07.4'$ W, latitude $09^{\circ} 35.0'$ N. Approximately 18.8 km SSE of Maturín.

DRAINAGE AREA: 1622 sq mi (from topographic map).

GAGE: Stevens Type A35 metric water level recorder in standard M.O.P. shelter, on left bank downstream of bridge; installed and maintained by M.O.P.

RECORDS AVAILABLE: June 5, 1969 through September 30, 1969.

REMARKS: Record is fair to good.

CODING: M signifies missing data; E signifies estimated data.



Aerial view of the Río Guanipa at the crossing of the Maturín-Temblador road. The A35 recorder is on the left bank of the river downstream of the bridge and upstream of the elevated pipeline crossing. The direction of river flow is from right to left on the photograph.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 35 RIO GUANIPA AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD

Meas. No.	Date	Made by	Width ft	Area sq ft	Mean Velocity fps	Outside Gage Height ft	Dis-charge cfs	Shift Adj. ft	Per- cent Diff.	Method	Number Meas. Sec- tions	Gage Height Change ft	Time hr	Water Temp. °F
1	May 14	Santaeilla	165.	161.	1.73	4.33	278.	0	+5.3	Wading	29	+0.03	0.7	82
2	27	Santos	171.	156.	1.58	4.30	246.	0	-3.6	Wading	28	0	0.7	80
3	June 11	Santaeilla	174.	249.	1.68	4.92	419.	0	-10.9	Wading	24	0	0.5	84
4	21	Romero	179.	229.	1.78	4.64	407.	0	+11.5	Wading	27	0	0.7	83
5	24	Romero	173.	262.	2.05	5.02	538.	0	+4.9	Wading	26	0	0.7	81
6	30	Santaeilla	174.	227.	1.76	4.82	399.	0	-7.4	Wading	27	0	0.7	85
7	July 15	Santaeilla	172.	708.	3.43	7.58	2430.	0	+0.8	Bridge	27	-0.46	1.4	78
8	19	Romero	174.	461.	2.45	6.30	1130.	0	-6.5	Bridge	23	-0.03	1.1	83
9	21	Tirado	175.	406.	2.23	6.05	906.	0	-12.2	Bridge	24	0	1.0	87
10	27	Santaeilla	172.	404.	2.20	5.84	890.	0	-1.6	Bridge	27	+0.03	1.1	78
11	29	Santos	169.	535.	2.47	6.40	1320.	0	+2.5	-	23	-0.03	1.4	85
12	31	Santos	169.	451.	2.20	6.04	994.	0	-3.0	Bridge	23	-0.03	1.3	84
13	Aug. 6	Romero	168.	454.	2.42	6.04	1100.	0	+7.2	-	22	0	0.7	-
14	13	Santos	178.	823.	3.23	7.94	2660.	0	-0.7	Bridge	25	-0.15	1.2	80
15	14	Santos	170.	561.	2.60	6.56	1460.	0	+2.2	Bridge	24	-0.03	0.8	80
16	Sept. 12	Tirado	174.	410.	2.27	5.91	930.	0	-1.5	Wading	23	0	1.0	-
17	16	Romero	182.	341.	1.98	5.41	674.	0	-1.9	Wading	23	0	0.7	-

RATING TABLE
FOR
STA. NO. 35 RIO GUANIPA AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
4.00		5.00	504.	6.00	999.	7.00	1874.	8.00	2725.	9.00	3471.
.10		.10	547.	.10	1064.	.10	1979.	.10	2799.	.10	3541.
.20		.20	591.	.20	1134.	.20	2079.	.20	2875.	.20	3610.
.30	255.	.30	636.	.30	1209.	.30	2174.	.30	2953.	.30	3678.
.40	285.	.40	682.	.40	1289.	.40	2264.	.40	3030.	.40	3745.
.50	318.	.50	729.	.50	1374.	.50	2349.	.50	3106.	.50	
.60	351.	.60	777.	.60	1464.	.60	2429.	.60	3181.	.60	
.70	387.	.70	828.	.70	1559.	.70	2506.	.70	3255.	.70	
.80	423.	.80	882.	.80	1659.	.80	2580.	.80	3328.	.80	
.90	462.	.90	939.	.90	1764.	.90	2653.	.90	3400.	.90	

RIVER GAGE DATA
 STA. NO. 35 RIO GUANIPA AT THE CROSSING OF THE MATORIN-TEMBLADOR ROAD
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
	P.	M.	M.	M.	M.	M.	M.	M.	M.			
5									308.	315.	315.	305.
6*	298.	298.	305.	311.	318.	325.	334.	321.	315.	318.	334.	338.
7	331.	325.	318.	315.	311.	311.	311.	318.	325.	334.	355.	372.
8*	376.	380.	383.	383.	387.	394.	405.	412.	408.	405.	427.	618.
9*	654.	613.	543.	487.	458.	446.	450.	458.	470.	483.	483.	483.
10	474.	479.	491.	504.	525.	543.	564.	573.	582.	582.	582.	578.
11	569.	556.	538.	525.	508.	495.	474.	470.	458.	454.	446.	438.
12	434.	427.	419.	416.	408.	401.	394.	394.	391.	383.	380.	376.
13	372.	369.	369.	365.	358.	351.	348.	344.	341.	338.	338.	334.
14	331.	331.	328.	325.	321.	318.	315.	311.	308.	308.	308.	308.
15	308.	308.	308.	305.	301.	298.	298.	295.	291.	291.	291.	291.
16	291.	291.	291.	288.	285.	285.	285.	285.	282.	282.	282.	282.
17	285.	282.	282.	282.	282.	279.	279.	276.	276.	276.	276.	279.
18	276.	276.	276.	279.	276.	279.	288.	285.	285.	288.	282.	282.
19	282.	285.	285.	282.	282.	282.	285.	285.	288.	298.	338.	419.
20*	462.	442.	416.	401.	401.	412.	416.	412.	398.	387.	383.	383.
21	376.	372.	376.	376.	372.	362.	365.	372.	376.	376.	376.	376.
22	372.	369.	369.	365.	365.	362.	358.	358.	355.	351.	348.	348.
23	348.	344.	344.	344.	344.	344.	341.	341.	355.	355.	351.	351.
24*	394.	504.	543.	538.	517.	513.	517.	538.	564.	591.	604.	618.
25*	627.	627.	627.	618.	613.	604.	600.	641.	720.	738.	701.	654.
26	618.	600.	595.	600.	604.	609.	613.	622.	618.	613.	613.	609.
27	604.	600.	604.	613.	627.	641.	654.	654.	645.	627.	604.	587.
28	573.	569.	582.	591.	591.	587.	573.	564.	551.	543.	530.	521.
29	517.	508.	500.	495.	491.	483.	479.	474.	483.	474.	466.	462.
30	458.	454.	446.	442.	434.	434.	434.	431.	431.	431.	427.	423.

*SPECIAL POINTS

6	1245/325.	1315/341.
8	1900/465.	
9	0130/654.	
20	0930/398.	
24	0640/547.	1130/508.
25	1320/600.	1900/738.

RIVER GAGE DATA
 STA. NO. 35 RIO GUANIPA AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	431.	495.	613.	631.	600.	573.	547.	538.	530.	517.	504.	487.
2	474.	458.	454.	446.	446.	442.	438.	434.	434.	446.	458.	450.
3	431.	419.	419.	416.	412.	408.	408.	405.	408.	416.	419.	416.
4	412.	412.	412.	412.	412.	408.	408.	405.	398.	394.	391.	391.
5	387.	383.	383.	383.	383.	383.	380.	376.	376.	376.	383.	387.
6	391.	394.	401.	408.	408.	408.	412.	408.	405.	408.	412.	416.
7	416.	416.	419.	423.	434.	431.	434.	431.	419.	416.	412.	408.
8	393.	398.	391.	387.	383.	372.	372.	369.	369.	365.	365.	365.
9	362.	362.	362.	362.	362.	M	362.	362.	358.	358.	358.	358.
10	358.	362.	362.	362.	362.	362.	358.	355.	355.	355.	355.	355.
11	355.	355.	358.	365.	372.	380.	380.	391.	405.	387.	372.	394.
12*	517.	604.	663.	687.	743.	839.	839.	715.	622.	573.	687.	957.
13*	981.	904.	797.	720.	654.	627.	622.	807.	1450.	1480.	1350.	1190.
14	1080.	1040.	999.	951.	910.	893.	893.	888.	871.	844.	833.	933.
15*	1050.	1700.	3010.	3200.	2590.	2130.	1930.	1770.	1660.	1650.	2160.	2320.
16	2220.	1950.	1670.	1750.	1310.	1200.	1150.	1120.	1080.	1040.	987.	904.
17	927.	927.	933.	939.	945.	939.	939.	945.	945.	975.	1150.	1270.
18*	1260.	1290.	1380.	1370.	1290.	1160.	1080.	1030.	1130.	1980.	2160.	2100.
19	1930.	1720.	1660.	1700.	1680.	1500.	1340.	1220.	1180.	1150.	1130.	1110.
20	1100.	1070.	1060.	1040.	1040.	1040.	1030.	1060.	1150.	1180.	1160.	1110.
21	1050.	1020.	1010.	1010.	1020.	1020.	1020.	1010.	999.	981.	963.	951.
22	963.	951.	957.	957.	957.	951.	945.	939.	939.	933.	922.	916.
23	899.	893.	893.	893.	888.	876.	876.	871.	882.	939.	981.	981.
24	945.	922.	904.	876.	876.	855.	855.	849.	849.	844.	833.	833.
25	834.	833.	833.	839.	844.	849.	876.	893.	904.	922.	939.	939.
26	927.	904.	899.	888.	888.	888.	888.	888.	882.	888.	876.	876.
27*	871.	871.	876.	876.	893.	933.	981.	981.	968.	1490.	3520.	3700.
28*	3620.	3330.	3050.	2900.	2860.	2810.	2660.	2460.	2320.	2080.	1930.	1750.
29	1630.	1510.	1450.	1400.	1370.	1310.	1270.	1220.	1190.	1160.	1160.	1140.
30	1160.	1160.	1160.	1160.	1160.	1160.	1160.	1140.	1130.	1110.	1090.	1090.
31	1080.	1060.	1060.	1040.	1040.	1010.	993.	968.	945.	922.	922.	910.

*SPECIAL POINTS

1	0730/631.											
12	1220/844.											
13	0120/987.	1925/1500.										
15	0345/1100.	0630/3080.	1930/1620.	2325/2330.								
18	0725/1390.	1700/1020.										
27	2315/3720.											
28	0915/2850.	1100/2890.										

RIVER GAGE DATA
 STA. NO. 35 RIO GUANIPA AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	876.	849.	812.	802.	787.	782.	762.	743.	715.	705.	691.	687.
2*	687.	865.	1140.	1090.	975.	855.	777.	705.	668.	650.	641.	673.
3*	762.	865.	904.	904.	888.	849.	823.	792.	777.	758.	753.	748.
4	748.	753.	758.	758.	762.	748.	1950.	2310.	2160.	1930.	1670.	1480.
5	1340.	1260.	1210.	1190.	1160.	1130.	1080.	1040.	1010.	987.	981.	981.
6	963.	968.	981.	999.	1030.	1030.	1030.	1020.	1010.	999.	999.	1020.
7	1040.	1060.	1080.	1080.	1090.	1090.	1080.	1110.	1090.	1060.	1060.	1090.
8	1090.	1090.	1100.	1140.	1160.	1150.	1110.	1100.	1100.	1090.	1080.	1060.
9*	1070.	1090.	1110.	1110.	1110.	1110.	1310.	1600.	1570.	1410.	1290.	1220.
10*	1290.	1360.	1340.	1250.	1190.	1160.	1100.	1060.	1050.	1020.	1010.	999.
11	1010.	1020.	1010.	993.	968.	963.	945.	927.	916.	899.	888.	871.
12*	860.	855.	849.	844.	839.	839.	844.	844.	849.	2940.	3610.	3620.
13	3410.	2980.	2850.	2680.	2490.	2350.	2190.	2050.	1900.	1720.	1670.	1720.
14	1730.	1680.	1550.	1440.	1400.	1390.	1340.	1320.	1290.	1250.	1240.	1230.
15	1250.	1250.	1260.	1260.	1260.	1290.	1340.	1360.	1350.	1310.	1260.	1220.
16	1190.	1160.	1160.	1160.	1160.	1160.	1160.	1160.	1160.	1160.	1160.	1160.
17	1140.	1130.	1130.	1140.	1360.	1680.	1750.	1680.	1530.	1430.	1320.	1250.
18	1220.	1230.	1230.	1230.	1230.	1230.	1220.	1220.	1210.	1190.	1190.	1190.
19*	1220.	1270.	1350.	1490.	1620.	1610.	1530.	1470.	1450.	1490.	1550.	1690.
20	1830.	1930.	1970.	1930.	1860.	1790.	1760.	1740.	1710.	1700.	1710.	1700.
21*	1700.	1720.	1720.	1750.	1800.	2020.	2490.	2530.	2460.	2380.	2320.	2300.
22	2310.	2330.	2370.	2380.	2390.	2400.	2430.	2410.	2390.	2380.	2400.	2400.
23	2410.	2430.	2440.	2500.	2510.	2460.	2410.	2330.	E 2260.	E 2260.	E 2310.	E 2360.
24	2390.	E 2390.	C 2350.	E 2290.	E 2260.	E 2190.	E 2020.	E 1720.	F 1670.	E 1750.	E 1870.	E 2000.
25	2100.	E 2180.	E 2270.	E 2360.	E 2390.	E 2410.	E 2350.	E 2260.	F 2190.	F 2000.	F 1930.	E 1900.
26*	1880.	F 1870.	E 1870.	E 1860.	E 1820.	E 1790.	E 1730.	E 1650.	E 1660.	E 1760.	E 1930.	E 1920.
27	1790.	1680.	1610.	1520.	1480.	1430.	1380.	1370.	1360.	1330.	1290.	1260.
28*	1230.	1220.	1210.	1210.	1200.	1190.	1190.	1190.	1140.	1120.	1110.	1100.
29*	1090.	1080.	1070.	1060.	1750.	3240.	3150.	2830.	2540.	2360.	2330.	2270.
30*	2220.	2100.	1970.	1850.	1720.	1650.	1560.	1650.	1490.	1390.	1340.	1290.
31	1260.	1260.	1240.	1240.	1260.	1250.	1240.	1230.	1230.	1220.	1210.	1210.

*SPECIAL POINTS

2	0630/1150.
3	0730/910.
9	1620/1610.
10	0415/1370.
12	1900/844. 2300/3630.
19	1100/1630.
21	1500/2540.
26	1700/1650. 2215/1930.
28	1300/1160.
29	1030/3250. 1110/3170. 1245/3260.
30	1530/1670.

RIVER GAGE DATA
 STA. NO. 35 RIO GUANIPA AT THE CROSSING OF THE MATORIN-TEMBLADOR ROAD
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	1220.	1250.	1260.	1260.	1230.	1230.	1210.	1220.	1210.	1190.	1190.	1210.
2	1230.	1260.	1260.	1240.	1230.	1230.	1230.	1260.	1750.	2000.	1900.	1700.
3*	1550.	1450.	1400.	1440.	1470.	1500.	1450.	1370.	1350.	1310.	1310.	1290.
4	1270.	1260.	1250.	1250.	1240.	1230.	1220.	1220.	1210.	1190.	1160.	1130.
5	1110.	1110.	1100.	1090.	1080.	1060.	1060.	1030.	1010.	999.	987.	981.
6	963.	963.	951.	939.	939.	933.	927.	927.	922.	922.	916.	904.
7	899.	910.	922.	945.	963.	981.	981.	987.	999.	1010.	1030.	1040.
8	1040.	1020.	1020.	1010.	1010.	1010.	1050.	1110.	1160.	1190.	1190.	1250.
9*	1290.	1300.	1290.	1340.	1560.	1660.	1550.	1420.	1310.	1230.	1170.	1160.
10	1160.	1180.	1160.	1160.	1130.	1130.	1110.	1090.	1080.	1090.	1080.	1070.
11	1060.	1060.	1060.	1060.	1050.	1060.	1060.	1060.	1040.	1020.	1020.	1010.
12*	999.	993.	987.	981.	968.	963.	975.	957.	1150.	1390.	1370.	1260.
13	1160.	1120.	1090.	1080.	1070.	1040.	1020.	993.	981.	963.	957.	939.
14	910.	904.	888.	865.	849.	849.	839.	828.	812.	797.	782.	772.
15	767.	753.	748.	748.	743.	738.	734.	720.	720.	710.	705.	705.
16	691.	687.	687.	687.	691.	691.	691.	701.	705.	705.	701.	701.
17	705.	710.	715.	720.	724.	729.	734.	734.	729.	729.	734.	734.
18	734.	734.	734.	738.	748.	753.	758.	767.	767.	767.	762.	762.
19	758.	753.	758.	753.	753.	758.	758.	758.	758.	753.	748.	734.
20	734.	734.	724.	710.	705.	701.	701.	687.	677.	663.	659.	650.
21*	645.	600.	595.	591.	587.	582.	560.	556.	551.	543.	538.	530.
22	525.	525.	521.	517.	517.	513.	513.	513.	513.	513.	513.	513.
23*	513.	513.	474.	470.	470.	470.	466.	466.	466.	466.	466.	462.
24*	462.	462.	462.	458.	458.	458.	458.	458.	1520.	3600.	3680.	3790.
25	3620.	3250.	2910.	2700.	2490.	2320.	2170.	2030.	1850.	1630.	1500.	1410.
26*	1360.	1310.	1310.	1540.	1590.	1450.	1290.	1160.	1040.	993.	963.	939.
27	922.	904.	893.	871.	849.	833.	812.	787.	762.	748.	729.	710.
28	687.	682.	673.	663.	659.	641.	631.	627.	618.	613.	604.	595.
29	582.	582.	573.	569.	569.	560.	556.	551.	547.	551.	551.	547.
30	538.	534.	534.	534.	525.	525.	517.	525.	543.	564.	569.	556.

*SPECIAL POINTS
 3 0620/1400.
 9 0715/1290.
 12 2100/1430.
 21 0340/641.
 23 0430/513.
 24 1730/454.
 26 0500/1210. 0920/1600.

RIVER GAGE DATA
 STA. NO. 35 RIO GUANIPA AT THE CROSSING OF THE MATORIN-TEMBLADOR ROAD
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	JUNE	JULY	AUGUST	SEPTEMBER
1		537.	777.	1220.
2		451.	812.	1420.
3		417.	814.	1430.
4		406.	1310.	1230.
5	M	382.	1140.	1060.
6	317.	405.	1000.	937.
7	326.	422.	1070.	967.
8	404.	380.	1110.	1080.
9	502.	M	1240.	1360.
10	536.	359.	1170.	1120.
11	500.	375.	957.	1050.
12	405.	665.	1330.	1070.
13	354.	950.	2410.	1050.
14	319.	945.	1420.	849.
15	299.	2020.	1290.	736.
16	286.	1420.	1170.	695.
17	280.	974.	1370.	723.
18	280.	1390.	1220.	751.
19	295.	1490.	1460.	755.
20	407.	1090.	1800.	700.
21	373.	1010.	2080.	580.
22	361.	946.	2380.	517.
23	347.	904.	2390.	E 478.
24	526.	876.	2090.	E 1180.
25	646.	871.	2190.	E 2420.
26	613.	894.	1810.	1270.
27	623.	1300.	1490.	829.
28	568.	2730.	1180.	647.
29	489.	1350.	2060.	564.
30	439.	1140.	1730.	538.
31		1000.	1240.	

RIVER GAGE DATA

NAME: Sta. No. 41 Río Mapirito at the Crossing of the Maturín-Temblador Road.

LOCATION: Longitude 63° 08.2' W, latitude 09° 36.8' N. Approximately 15.3 km SSE of Maturín, at Balneario Mapirito.

DRAINAGE AREA: 193 sq mi (from topographic map).

GAGE: Friez water level recorder attached to left bridge abutment on downstream side of bridge.

RECORDS AVAILABLE: April 10, 1969 through September 30, 1969.

REMARKS: Record is fair.

CODING: M signifies missing data; E signifies estimated data.



View from the bridge looking at the downstream reach of the Río Mapirito. The discharge was gaged in this reach. Note the vegetation in the channel and on the banks.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 41 RIO MAPIRITO AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD

Meas. No.	Date	Made by	Width ft	Area sq ft	Mean Velocity fps	Outside Gage Height ft	Dis-charge cfs	Shift Adj. ft	Per- cent Diff.	Method	Num- ber Meas. Sec- tions	Gage Height Change ft	Time hr	Water Temp. °F
1	May 13	Rodriguez	24.0	26.5	0.72	0.60	19.1	0	+9.8	Wading	22	0	0.4	83
2	26	Santos	21.0	24.2	0.72	0.60	17.3	0	-0.6	Wading	19	0	0.5	84
3	June 10	Santaella	28.0	36.5	0.50	0.66	18.1	0	-8.6	Wading	19	0	0.5	83
4	21	Romero	25.0	49.4	0.51	0.75	25.3	0	+9.3	Wading	21	0	0.9	82
5	24	Romero	25.0	50.3	0.55	0.80	27.8	0	+11.6	Wading	26	0	0.3	81
6	July 1	Santaella	28.0	41.8	0.61	0.88	25.5	0	-6.6	Wading	29	0	0.7	81
7	9	Santos	32.0	45.6	0.54	0.85	24.7	0	-6.4	Wading	23	0	1.0	80
8	14	Santaella	29.0	44.0	0.60	0.94	26.5	0	-8.3	Wading	24	0	1.3	73
9	20	Romero	25.0	52.2	0.68	0.95	36.0	0	+23.5	Wading	22	0	1.9	81
10	30	Santos	32.0	47.6	0.65	0.98	31.0	0	+3.7	Wading	25	0	0.6	83
11	Aug. 6	Romero	25.0	50.3	0.62	0.95	31.3	0	+7.4	Wading	21	0	1.1	-
12	8	Santaella	35.0	83.1	0.75	1.64	62.4	0	-3.8	Wading	20	+0.1	0.7	77
13	13	Santos	33.0	64.5	0.76	1.38	49.3	0	+4.4	Wading	26	+0.1	1.0	83
14	18	Tirado	34.0	67.2	0.63	1.25	42.2	0	+5.8	Wading	26	0	1.6	83
15	26	Santaella	36.0	70.0	0.56	1.30	39.3	0	-7.3	Wading	21	0	0.7	77
16	Sept. 2	Romero	30.0	69.3	0.72	1.42	50.2	0	+1.0	Wading	26	-0.1	1.1	84
17	10	Contreras	32.0	63.0	0.61	1.21	38.3	0	+1.0	Wading	23	0	0.8	-
18	16	Romero	33.0	65.0	0.58	1.20	37.6	0	+0.5	Wading	28	0	1.1	-
19	26	Tirado	32.0	46.6	0.60	0.98	27.7	0	-7.4	Wading	26	-0.1	0.7	-

RATING TABLE
FOR
STA. NO. 41 RIO MAPIRITO AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00		1.00	30.4
.10		.10	33.4
.20		.20	37.4
.30		.30	42.4
.40		.40	48.4
.50	13.4	.50	54.9
.60	17.4	.60	61.9
.70	21.4	.70	69.4
.80	24.9	.80	
.90	27.9	.90	

RIVER GAGE DATA
 STA. NO. 41 RIO MAPIRITO AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD
 APRIL 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
10	M	M	M	M	M	M	13.8	13.8	13.8	13.8	13.8	13.8
11	13.8	13.8	13.8	13.8	14.2	14.2	14.2	14.2	14.2	13.8	13.8	13.8
12	13.8	13.8	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2	14.2
13	14.2	14.2	14.2	14.6	14.6	15.0	15.4	15.4	15.4	15.4	15.4	15.4
14	15.4	15.4	15.4	15.4	15.4	15.4	15.4	15.8	15.8	15.8	15.8	15.8
15	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.4	15.4	15.4
16	15.4	15.4	15.4	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8	15.8
17	15.8	15.8	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2
18	16.2	16.2	16.6	16.6	16.6	17.0	16.6	16.6	16.6	16.6	16.6	16.6
19	17.0	17.0	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
20	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
21	17.4	17.4	17.4	17.8	17.8	17.4	17.4	17.4	17.4	17.4	17.4	17.4
22	17.4	17.4	17.8	17.8	17.8	17.8	17.4	17.4	17.4	17.4	17.4	17.4
23	17.4	17.4	17.8	18.2	18.2	17.8	17.8	17.8	17.8	17.4	17.4	17.4
24	17.4	17.4	17.8	18.2	18.2	18.2	18.2	18.2	17.8	17.4	17.4	17.4
25	17.4	17.4	17.4	17.8	17.8	17.8	17.8	17.4	17.4	17.4	17.4	17.4
26	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
27	17.4	17.4	17.4	17.4	17.4	17.4	17.8	17.4	17.4	17.0	17.0	17.0
28	17.0	17.0	17.0	17.0	17.4	17.4	17.0	17.0	16.6	16.6	16.6	16.6
29	16.6	16.6	16.6	16.6	17.0	17.0	17.0	17.0	16.6	16.2	16.2	16.2
30	16.2	16.6	16.6	16.6	17.0	17.0	16.6	16.6	16.2	16.2	16.2	16.2

*SPECIAL PRINTS

NONE

RIVER GAGE DATA
 STA. NO. 41 RIO MAPIRITO AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	16.2	16.2	16.2	16.6	16.6	16.6	17.0	16.2	16.2	16.2	16.2	16.2
2	16.2	16.2	16.2	16.2	16.6	16.6	16.2	15.8	15.8	15.8	15.8	15.8
3	15.8	15.8	16.2	16.6	16.6	16.6	16.2	16.2	15.8	15.8	15.8	15.8
4	15.8	15.8	16.2	16.6	16.6	16.6	16.2	16.2	15.8	15.8	15.8	15.8
5	15.8	15.8	15.8	16.2	16.2	16.2	15.8	15.8	15.8	15.8	15.8	15.8
6	15.8	15.8	15.8	16.2	16.6	16.6	16.6	16.2	16.2	16.2	16.2	16.2
7	16.2	16.2	16.6	16.6	16.6	16.6	16.6	16.2	16.2	16.2	16.2	16.2
8	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2
9	16.6	16.6	16.6	16.6	17.0	17.0	17.0	16.6	16.6	16.6	16.6	16.6
10	16.6	16.6	16.6	16.6	16.6	17.0	17.0	17.0	16.6	16.6	16.6	16.6
11	16.6	16.6	16.6	17.0	17.4	17.4	17.4	17.0	16.6	16.6	16.6	16.6
12	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6
13	16.6	16.6	17.0	17.4	17.4	17.4	17.0	16.6	16.6	16.6	16.6	17.0
14	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.0	17.0	17.0	17.0
15	17.0	17.0	17.4	17.4	17.4	17.4	17.0	17.0	16.6	16.6	16.6	16.6
16	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.2	16.2	16.2
17	16.2	16.2	16.2	16.6	16.6	16.6	16.6	16.2	16.2	16.2	16.2	16.2
18	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2
19	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2
20	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2	16.2
21	16.2	16.2	16.2	16.2	16.6	16.6	16.6	17.0	17.0	17.0	17.0	17.0
22	17.0	17.0	17.0	17.0	17.0	17.0	17.0	16.6	16.6	16.6	16.6	16.6
23	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6	16.6
24	17.0	17.0	17.0	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
25	17.4	17.4	17.4	17.4	17.4	17.8	17.8	17.8	17.8	17.8	17.4	17.4
26	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
27	17.4	17.4	17.4	17.8	17.8	17.8	17.8	17.4	17.4	17.0	17.0	17.0
28	17.0	17.0	17.0	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
29	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.4
30	17.4	17.4	17.4	17.4	17.4	17.4	17.4	17.0	17.0	17.0	17.0	17.0
31	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0

*SPECIAL POINTS

NONF

RIVER GAGE DATA
 STA. NO. 41 RIO MAPIRITU AT THE CROSSING OF THE MATORIN-TEMOLADOR ROAD
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	17.0	17.0	17.0	17.0	17.4	17.4	17.4	17.4	17.0	17.0	17.0	17.0
2	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
3	17.4	17.4	17.4	17.8	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
4	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.2
5	18.2	18.2	18.2	18.2	18.2	18.2	18.2	18.6	18.6	18.6	18.6	18.6
6	18.6	18.6	18.6	18.6	19.0	19.0	19.0	19.4	19.4	19.4	19.8	19.8
7	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8
8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8
9	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8
10	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8	19.8
11	19.8	19.8	20.2	20.2	20.6	20.2	20.2	20.2	19.8	19.8	19.8	20.2
12	20.2	20.2	20.2	20.2	20.6	20.6	20.6	20.6	20.6	20.6	20.6	20.6
13	21.0	21.0	21.0	21.4	21.4	21.4	21.4	21.4	21.0	21.0	21.0	21.0
14	21.0	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4	21.4
15	21.4	21.4	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8	21.8
16	21.8	21.8	22.1	22.1	22.5	22.5	22.1	22.1	21.8	21.8	21.8	21.8
17	21.8	22.1	22.1	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
18	22.5	22.5	22.5	22.9	22.9	22.9	22.9	22.9	22.5	22.5	22.9	22.9
19	22.9	22.9	22.9	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2
20	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	23.2	22.9	22.9	22.9
21	22.9	22.9	23.2	23.2	23.2	23.2	23.2	23.2	23.6	23.6	23.6	23.6
22	23.6	23.6	23.6	23.6	23.9	23.9	24.2	23.9	23.9	23.9	23.9	23.9
23	23.9	23.9	23.9	24.2	24.2	24.2	24.2	24.2	24.6	24.6	24.6	24.6
24	24.6	24.6	24.9	24.9	24.9	24.9	25.5	24.9	24.9	24.6	24.6	24.6
25	24.6	24.6	24.9	24.9	24.9	24.9	24.9	24.9	25.9	26.2	26.5	26.5
26	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5
27	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.2	26.2	26.2	26.2
28	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	25.9	25.9	25.9
29	25.9	25.9	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.5	26.5	26.5
30	26.5	26.5	26.5	26.8	26.8	26.8	27.1	27.1	27.1	26.8	26.8	26.8

*SPECIAL POINTS

ACNE

RIVER GAGE DATA
 STA. NO. 41 RIO MAPIRITO AT THE CROSSING OF THE MATORIN-TEMLADOR RUAD
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	26.8	27.1	27.1	27.1	27.3	27.3	27.3	27.1	27.1	26.8	26.8	26.8
2	26.8	26.8	26.8	26.8	27.1	27.1	27.3	27.6	27.6	27.3	27.3	27.3
3	27.3	27.3	27.3	27.3	27.3	27.3	27.3	27.1	26.8	26.8	26.8	26.8
4	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.8	26.5	26.5	26.5	26.5
5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5
6	26.5	26.5	26.5	26.5	26.5	26.5	26.8	27.3	27.3	27.3	27.1	27.1
7	27.1	27.1	27.1	26.8	26.8	26.5	26.8	26.5	25.9	25.9	25.9	25.9
8	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.9	25.5	25.5	25.5
9	25.5	25.5	25.5	25.5	25.5	25.9	26.2	26.2	26.5	26.2	26.2	26.2
10	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2	26.2
11	26.2	26.2	26.2	26.2	26.2	26.2	26.2	27.3	27.6	27.6	27.6	27.3
12	27.3	27.3	27.1	27.1	27.9	27.9	27.9	27.6	27.3	27.3	27.1	27.1
13	27.1	27.1	27.1	27.1	27.1	27.1	26.8	27.1	27.1	27.1	27.1	27.1
14	27.1	27.1	26.8	26.8	26.8	27.3	28.7	28.7	28.7	28.9	28.7	28.7
15	28.7	28.4	28.4	28.2	28.2	28.2	28.2	30.4	30.7	30.4	30.1	29.9
16	29.9	29.6	29.4	29.1	29.1	28.9	29.6	29.6	29.6	29.4	29.4	29.4
17	29.4	29.1	29.1	29.1	29.1	29.1	29.1	28.9	28.9	28.9	28.7	28.7
18	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
19	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
20	28.9	28.9	28.9	29.1	29.1	29.1	29.1	29.1	29.1	28.9	28.9	28.9
21	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1
22	29.1	29.1	29.1	29.6	29.6	29.6	30.7	30.7	30.7	30.7	30.7	30.7
23	30.7	30.7	30.7	30.7	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9
24	30.9	30.9	30.9	30.9	31.2	31.2	31.2	31.2	30.9	30.9	30.9	30.9
25	30.9	31.2	31.5	31.8	31.8	31.8	31.8	31.8	31.8	31.5	31.5	31.5
26	31.2	30.9	30.9	30.9	31.2	31.2	31.2	31.2	30.9	30.9	30.9	30.9
27	30.7	30.7	30.7	30.7	30.7	30.4	30.7	30.7	30.4	30.1	30.1	30.1
28	30.4	30.4	30.4	30.4	30.4	30.4	30.4	30.1	30.1	30.1	29.9	29.6
29	29.9	29.9	29.9	29.6	29.6	29.6	29.6	30.1	30.1	30.1	30.1	30.1
30	30.1	30.1	29.9	29.9	29.9	29.6	29.6	29.6	29.4	29.4	29.4	29.4
31	29.4	29.4	29.4	29.1	29.1	29.1	29.1	29.1	29.1	28.9	28.9	28.9

*SPECIAL POINTS

NONE

RIVER GAGE DATA
 STA. NO. 41 RIO MAPIRITO AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9
2	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.9	28.7	28.7	28.7
3	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7	28.7
4	28.7	28.7	28.9	28.9	29.1	29.1	29.1	29.1	29.1	28.9	28.9	28.9
5	28.9	28.9	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	29.1	28.9
6	28.9	28.9	28.9	28.9	29.1	29.1	29.1	29.1	29.1	28.9	28.9	28.9
7	28.9	28.9	28.9	29.1	29.1	29.1	29.4	38.3	39.3	40.8	41.3	41.3
8	42.4	45.3	47.8	50.9	54.2	58.3	61.9	64.1	64.8	65.6	64.8	64.1
9	63.4	61.9	60.5	58.3	56.9	55.6	54.2	52.9	51.6	50.3	49.0	48.4
10	47.1	46.5	45.9	45.3	44.1	43.5	43.0	42.4	41.3	40.8	40.3	39.8
11	39.8	39.3	39.3	39.3	39.3	39.3	38.8	39.8	39.8	39.8	39.8	39.8
12	39.8	39.8	40.3	40.3	40.8	41.3	41.3	41.3	41.3	41.9	41.9	41.9
13	43.0	43.0	43.5	44.1	44.7	45.3	47.1	47.8	47.8	47.8	47.8	47.8
14	47.8	47.8	48.4	49.0	49.7	49.7	49.7	49.7	49.0	48.4	48.4	48.4
15	47.8	47.1	47.1	47.1	47.1	46.5	46.5	45.9	45.3	45.3	44.7	44.7
16	44.7	44.1	44.1	43.5	44.1	44.1	43.5	43.5	43.0	42.4	42.4	42.4
17	42.4	41.9	41.3	41.3	41.3	41.9	41.9	40.8	40.8	40.3	40.3	40.3
18	40.3	39.8	39.8	39.8	39.8	39.8	39.8	39.8	39.3	39.3	38.8	39.3
19	38.8	38.8	38.8	38.3	38.8	38.8	38.8	38.8	38.3	38.3	37.9	37.9
20	37.9	37.9	37.9	37.9	37.9	37.9	37.4	37.4	37.4	37.4	37.0	37.0
21	37.0	37.0	37.0	37.0	37.0	37.0	36.5	36.5	36.5	36.1	36.1	35.7
22	35.7	35.7	35.3	35.3	35.7	35.3	35.7	36.1	35.7	35.7	35.3	35.3
23	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	35.3	34.9	34.9	34.5
24	34.5	34.5	34.5	34.5	34.9	34.5	35.3	35.7	35.3	35.3	35.3	35.3
25*	35.3	34.9	34.9	34.9	34.9	34.9	34.9	40.8	42.4	41.9	40.8	40.3
26	40.3	39.8	39.8	40.3	41.3	41.9	43.0	44.1	45.3	47.1	48.4	49.0
27	50.9	51.6	52.9	53.6	54.2	54.2	54.2	54.2	53.6	52.9	52.2	51.6
28	50.9	50.3	49.7	49.7	49.0	48.4	48.4	49.0	48.4	47.8	47.1	46.5
29	45.9	45.3	45.3	45.3	45.3	44.7	44.7	44.1	43.5	43.5	43.0	43.0
30	43.0	43.0	43.0	43.0	43.5	43.5	43.5	44.1	44.7	44.1	44.1	44.1
31	44.1	44.1	44.7	45.3	45.9	46.5	46.5	47.1	47.1	47.1	47.1	47.1

*SPECIAL POINTS

25 1530/34.9 1630/43.5

RIVER GAGE DATA
 STA. NO. 41 RIO MAPIRITO AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	47.1	47.1	47.1	47.1	47.1	47.8	49.0	49.7	49.7	49.7	49.7	49.7
2	49.7	49.7	49.7	50.3	50.3	49.7	49.0	48.4	48.4	47.8	47.1	47.1
3	47.1	46.5	46.5	46.5	46.5	46.5	45.9	45.3	44.7	44.7	44.7	44.1
4	44.1	44.1	43.5	43.5	43.5	43.0	42.4	42.4	42.4	42.4	42.4	41.9
5	41.9	41.3	41.3	41.3	41.3	41.3	41.3	40.8	40.8	40.3	39.8	39.8
6	39.8	39.8	39.8	39.8	39.8	39.3	39.3	39.8	39.3	38.8	38.8	38.8
7	38.8	38.8	38.3	38.3	38.3	38.8	38.8	38.8	38.3	38.3	37.9	37.9
8	37.9	37.9	37.9	37.9	37.9	39.3	39.3	39.3	39.3	39.3	38.8	38.8
9	38.8	38.8	38.3	38.8	38.8	38.3	38.3	38.3	38.3	37.9	37.9	37.9
10	37.9	37.9	37.9	37.9	37.4	37.4	37.4	37.4	37.4	37.4	37.4	37.4
11*	37.4	37.4	37.4	37.4	37.4	37.4	43.0	45.3	44.1	44.1	43.5	43.0
12	42.4	41.9	41.3	41.3	41.3	40.8	40.8	40.8	40.3	40.3	40.3	39.8
13	39.8	39.8	39.8	39.8	39.8	39.8	39.8	39.3	38.8	38.3	38.3	38.3
14	38.3	38.3	38.3	38.3	37.9	37.9	37.9	38.3	37.4	37.4	37.4	37.4
15	37.4	37.4	37.4	37.4	37.4	37.4	37.4	37.0	37.0	37.0	37.0	37.0
16	37.4	37.4	37.4	37.4	37.4	37.4	37.4	37.4	37.4	37.0	37.0	37.0
17	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.5	36.1	36.1
18	35.7	35.7	35.7	35.7	35.7	35.3	35.3	35.3	35.3	34.9	34.9	34.9
19	34.9	34.9	34.9	34.9	34.5	34.5	34.5	34.5	34.1	34.1	33.8	33.8
20	33.8	33.8	33.8	33.4	33.4	33.4	33.4	33.4	33.4	33.4	33.1	33.1
21	33.1	33.1	33.1	32.7	32.7	32.7	32.7	32.7	32.4	32.4	32.1	32.1
22	32.1	32.1	32.1	32.1	31.8	31.8	31.8	31.8	31.8	31.8	31.5	31.5
23	31.5	31.5	31.5	31.5	31.5	31.5	31.5	31.2	31.2	30.9	30.9	30.9
24	31.2	31.2	31.2	31.2	31.2	31.2	30.9	30.7	30.7	30.4	30.4	30.4
25	30.4	30.4	30.4	30.4	30.4	30.4	30.4	30.1	30.1	29.9	29.9	29.9
26	29.9	29.9	29.9	29.9	29.9	29.9	29.6	29.6	29.6	29.6	29.6	29.6
27	29.4	29.4	29.4	29.4	29.4	29.4	29.4	29.1	29.1	29.1	29.1	29.1
28	29.1	29.1	29.1	28.9	28.9	28.9	28.9	28.9	28.7	28.7	28.7	28.7
29	28.7	28.7	28.4	28.4	28.4	28.4	28.4	28.4	28.2	28.2	28.2	27.9
30	27.9	27.9	27.9	27.9	27.9	28.2	28.2	27.9	27.9	27.6	27.6	27.6

*SPECIAL POINTS

11 1335/37.4 1500/45.3

RIVER GAGE DATA
 STA. NO. 41 RIO MAPIRITO AT THE CROSSING OF THE MATORIN-TEMBLADOR ROAD
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		16.4	17.1	27.0	28.9	48.3
2		16.1	17.0	27.1	28.8	49.0
3		16.1	17.9	27.1	28.7	45.9
4		16.1	18.2	26.7	28.9	43.1
5		15.9	18.3	26.5	29.0	41.0
6		16.2	19.0	26.8	29.0	39.5
7		16.4	19.8	26.6	33.2	38.5
8		16.2	19.8	25.8	56.1	38.6
9		16.7	19.8	26.0	55.9	38.4
10	M	16.7	19.8	26.2	43.7	37.6
11	14.0	16.9	20.0	26.7	39.5	40.2
12	14.1	16.6	20.4	27.4	40.9	41.1
13	14.9	16.9	21.1	27.1	45.6	39.4
14	15.5	17.2	21.3	27.8	48.8	37.9
15	15.7	17.0	21.7	29.1	46.4	37.2
16	15.7	16.5	22.0	29.4	43.6	37.3
17	16.1	16.3	22.3	29.0	41.3	36.5
18	16.5	16.2	22.7	28.9	39.7	35.4
19	17.3	16.2	23.1	28.9	38.6	34.5
20	17.4	16.2	23.1	29.0	37.6	33.5
21	17.5	16.6	23.3	29.1	36.7	32.7
22	17.5	16.8	23.8	30.0	35.6	31.9
23	17.7	16.6	24.2	30.8	35.2	31.3
24	17.8	17.3	24.8	31.0	34.9	30.9
25	17.5	17.6	25.2	31.5	37.3	30.2
26	17.4	17.4	26.5	31.0	43.0	29.8
27	17.3	17.4	26.4	30.5	52.9	29.3
28	16.9	17.3	26.1	30.2	49.0	28.9
29	16.6	17.4	26.2	29.9	44.6	28.4
30	16.5	17.2	26.8	29.7	43.6	27.9
31		17.0		29.1	45.9	

RIVER GAGE DATA

NAME: Sta. No. 51 Río Amana near El Tejero.

LOCATION: Longitude $63^{\circ} 38.5'$ W, latitude $09^{\circ} 39.3'$ N. Approximately 6.3 km NW of Santa Bárbara, 3.1 km ENE of El Tejero.

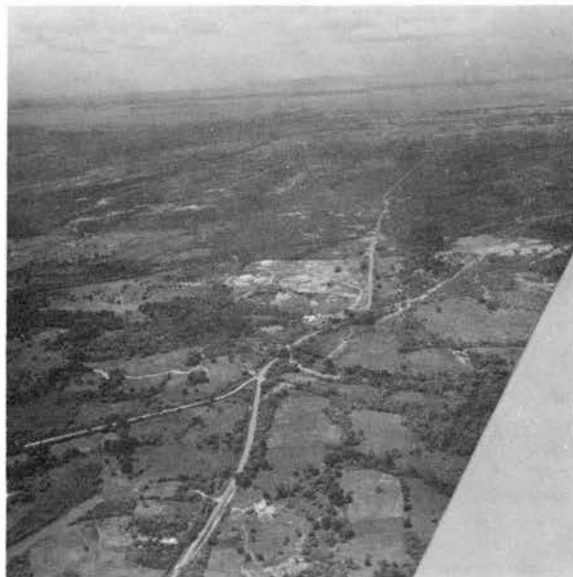
DRAINAGE AREA: 738 sq mi (from topographic map).

GAGE: Stevens Type A35 water level recorder attached to left downstream side of bridge.

RECORDS AVAILABLE: April 18, 1969 through September 30, 1969.

REMARKS: Record is fair to good. Shifting control method was applied from April 18 through September 30.

CODING: M signifies missing data; E signifies estimated data.



Aerial view of the Río Amana near El Tejero. The A35 recorder is at the bridge (center of photograph). Only reach of river visible in the photograph is that reach downstream of the bridge. To the left of the bridge, an oxbow lake is visible.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 51 RIO AMANA NEAR EL TEJERO

Meas. No.	Date	Made by	Width ft	Area sq ft	Mean Velocity fps	Inside Gage Height ft	Dis-charge cfs	Shift Adj. ft	Per-cent Diff.	Method	Number Meas. Sections	Gage Height Change ft	Time hr	Water Temp. °F
1	May 6	Santaella	45.0	48.2	1.58	0.59	76.3	+0.05	+9.0	Wading	24	0	0.7	80
2	17	Santos	47.0	47.9	1.24	0.53	59.2	+0.06	-8.9	Wading	23	0	0.7	86
3	28	Santaella	46.0	65.3	1.55	0.97	101.	0	-1.6	Wading	23	0	0.6	83
4	June 10	Santaella	47.0	78.5	1.55	1.12	122.	0	+2.8	Wading	24	0	0.7	81
5	15	Santos	46.0	67.4	1.09	0.78	73.3	-.21	+16.3	Wading	23	-.01	0.8	84
6	17	Santos	48.0	79.8	1.10	1.03	87.6	-.12	-9.7	Wading	23	-.03	0.7	84
7	19	Romero	52.0	110.	1.50	1.61	165.	-.05	-2.6	Wading	27	0	1.1	80
8	20	Romero	59.0	135.	1.84	2.23	248.	-.06	-0.5	Wading	28	0	1.3	83
9	24	Tirado	52.0	118.	1.55	1.72	183.	-.05	+0.4	Wading	26	-.01	1.0	81
10	29	Santos	51.0	99.3	1.44	1.38	143.	-.07	+2.1	Wading	26	-.01	0.7	81
11	July 15	Romero	63.0	143.	1.82	2.37	260.	-.07	-3.1	Wading	29	-.02	0.9	80
12	17	Santos	170.	369.	1.24	3.40	457.	-.11	+3.6	Bridge	36	-.04	1.0	77
13	19	Tirado	202.	541.	1.35	4.46	732.	-.05	+6.0	Bridge	32	+0.01	1.5	83
14	28	Santaella	194.	549.	1.19	4.42	654.	-.06	-3.5	Bridge	32	+0.02	1.1	81
15	28	Santaella	204.	641.	1.16	4.67	741.	0	-3.2	Bridge	32	+0.02	1.1	77
16	30	Romero	131.	252.	1.58	2.94	397.	+0.20	-3.5	Bridge	23	-.03	0.8	80
17	Aug. 3	Romero	180.	396.	1.31	3.44	520.	+0.18	+2.3	-	36	-.03	1.0	-
18	5	Santaella	124.	241.	1.56	2.72	375.	+0.19	+1.8	Bridge	24	-.01	0.7	78
19	20	Romero	167.	423.	1.41	4.06	597.	+0.09	-4.4	-	31	+0.05	1.2	82
20	31	Tirado	204.	699.	1.43	5.18	1000.	0	+4.2	Bridge	31	+0.03	1.8	80
21	Sept. 1	Romero	179.	432.	1.29	4.16	558.	+0.04	-12.3	Bridge	32	-.05	0.9	85
22	4	Velasquez	107.	225.	1.65	2.65	371.	+0.18	+4.6	Bridge	26	-.02	1.0	83
23	14	Tirado	119.	180.	1.39	2.18	250.	+0.10	-5.5	Bridge	27	-.01	1.0	-
24	20	Santaella	105.	132.	1.58	1.88	209.	+0.03	-1.8	Wading	23	0	0.5	85

RATING TABLE
FOR
STA. NO. 51 RIO AMANA AT EL TEJERO

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00		1.00	106.	2.00	225.	3.00	385.	4.00	590.	5.00	882.
.10		.10	117.	.10	239.	.10	404.	.10	613.	.10	925.
.20		.20	128.	.20	253.	.20	423.	.20	637.	.20	972.
.30		.30	139.	.30	268.	.30	443.	.30	662.	.30	1023.
.40		.40	150.	.40	283.	.40	463.	.40	688.	.40	1078.
.50	56.0	.50	162.	.50	299.	.50	483.	.50	715.	.50	1137.
.60	66.0	.60	174.	.60	315.	.60	504.	.60	744.	.60	
.70	76.0	.70	186.	.70	332.	.70	525.	.70	775.	.70	
.80	86.0	.80	199.	.80	349.	.80	546.	.80	808.	.80	
.90	96.0	.90	212.	.90	367.	.90	568.	.90	843.	.90	

II-135

RIVER GAGE DATA
 STA. NO. 51 RIO AMANA NEAR EL TEJERO
 APRIL 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
18	M	M	M	M	M	84.0	83.0	83.0	82.0	82.0	82.0	82.0
19	82.0	82.0	83.0	84.0	86.0	87.0	95.0	99.0	99.9	99.9	99.0	98.0
20	97.0	96.0	95.0	94.0	94.0	94.0	94.0	94.0	93.0	92.0	91.0	90.0
21	90.0	90.0	89.0	88.0	88.0	88.0	87.0	86.0	86.0	86.0	85.0	85.0
22	85.0	85.0	84.0	84.0	84.0	84.0	84.0	83.0	83.0	83.0	83.0	83.0
23	83.0	83.0	82.0	82.0	82.0	81.0	80.0	79.0	79.0	79.0	79.0	78.0
24	78.0	78.0	78.0	77.0	77.0	77.0	76.0	75.0	75.0	75.0	74.0	74.0
25	74.0	74.0	74.0	73.0	73.0	73.0	72.0	72.0	71.0	71.0	71.0	71.0
26	71.0	71.0	71.0	71.0	71.0	71.0	71.0	70.0	69.0	69.0	69.0	69.0
27	69.0	69.0	70.0	74.0	77.0	81.0	85.0	88.0	87.0	86.0	85.0	84.0
28	83.0	82.0	82.0	81.0	80.0	79.0	79.0	78.0	77.0	77.0	77.0	77.0
29	77.0	77.0	76.0	75.0	75.0	75.0	75.0	74.0	73.0	73.0	73.0	73.0
30	73.0	73.0	73.0	73.0	72.0	72.0	72.0	72.0	72.0	71.0	71.0	71.0

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. 51 RIO AMANA NEAR EL TEJERO
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	71.0	71.0	71.0	71.0	70.0	70.0	69.0	69.0	69.0	69.0	69.0	69.0
2	69.0	69.0	69.0	69.0	69.0	68.0	68.0	67.0	67.0	67.0	67.0	67.0
3	67.0	67.0	67.0	67.0	67.0	67.0	66.0	66.0	66.0	66.0	66.0	66.0
4	66.0	67.0	67.0	67.0	67.0	66.0	66.0	65.0	64.0	64.0	64.0	64.0
5	65.0	65.0	66.0	67.0	67.0	68.0	69.0	69.0	69.0	69.0	69.0	69.0
6	69.0	70.0	70.0	70.0	70.0	70.0	69.0	69.0	69.0	69.0	69.0	69.0
7	69.0	69.0	69.0	69.0	69.0	69.0	69.0	69.0	68.0	68.0	69.0	69.0
8	69.0	69.0	69.0	69.0	69.0	69.0	68.0	68.0	67.0	67.0	68.0	69.0
9	70.0	71.0	71.0	71.0	71.0	71.0	72.0	72.0	72.0	74.0	75.0	75.0
10	75.0	74.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	74.0
11	74.0	75.0	75.0	76.0	77.0	80.0	82.0	83.0	83.0	83.0	83.0	83.0
12	83.0	83.0	83.0	83.0	83.0	83.0	83.0	82.0	82.0	82.0	82.0	82.0
13	82.0	81.0	81.0	80.0	80.0	79.0	79.0	79.0	78.0	78.0	78.0	77.0
14	77.0	77.0	77.0	76.0	76.0	75.0	75.0	74.0	73.0	72.0	72.0	72.0
15	73.0	73.0	72.0	72.0	72.0	71.0	71.0	71.0	70.0	69.0	69.0	69.0
16	69.0	68.0	67.0	67.0	67.0	66.0	66.0	66.0	66.0	66.0	65.0	65.0
17	65.0	64.0	64.0	64.0	64.0	64.0	65.0	64.0	64.0	64.0	64.0	64.0
18	64.0	64.0	64.0	64.0	65.0	65.0	64.0	63.0	63.0	63.0	63.0	64.0
19	64.0	64.0	64.0	63.0	63.0	63.0	63.0	63.0	62.0	63.0	64.0	64.0
20	64.0	65.0	65.0	65.0	66.0	66.0	65.0	64.0	64.0	64.0	64.0	64.0
21	64.0	64.0	64.0	64.0	64.0	64.0	65.0	67.0	67.0	67.0	67.0	67.0
22	68.0	69.0	71.0	72.0	74.0	75.0	77.0	84.0	93.0	115.	186.	268.
23*	301.	296.	268.	268.	204.	185.	176.	172.	168.	164.	162.	158.
24	154.	149.	144.	140.	138.	135.	132.	130.	127.	125.	122.	121.
25	120.	119.	117.	115.	113.	110.	108.	107.	105.	104.	103.	103.
26	102.	106.	118.	125.	126.	122.	120.	118.	118.	119.	119.	118.
27	117.	115.	113.	110.	108.	107.	106.	107.	107.	107.	107.	106.
28	105.	105.	105.	105.	104.	103.	102.	99.9	99.9	99.0	99.0	99.0
29	98.0	98.0	97.0	97.0	95.0	94.0	93.0	92.0	92.0	92.0	92.0	93.0
30	94.0	96.0	99.0	101.	102.	101.	99.9	99.0	98.0	97.0	97.0	97.0
31	97.0	97.0	98.0	99.0	99.9	99.9	99.9	99.9	99.9	99.9	99.9	99.9

*SPECIAL POINTS
 23 0240/302.

RIVER GAGE DATA
 STA. NO. 51 RIO AMANA NEAR EL TEJERO
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	99.9	99.9	99.9	99.9	99.9	99.9	98.0	97.0	95.0	95.0	95.0	95.0
2	95.0	95.0	96.0	97.0	98.0	99.0	98.0	97.0	95.0	95.0	95.0	97.0
3	98.0	97.0	97.0	96.0	96.0	95.0	95.0	95.0	95.0	95.0	95.0	95.0
4	95.0	95.0	94.0	94.0	94.0	94.0	94.0	94.0	95.0	95.0	94.0	95.0
5	95.0	96.0	97.0	97.0	97.0	98.0	97.0	97.0	97.0	97.0	97.0	97.0
6	97.0	96.0	96.0	96.0	95.0	95.0	98.0	99.9	99.0	99.0	98.0	97.0
7	97.0	97.0	97.0	96.0	96.0	95.0	96.0	95.0	95.0	96.0	97.0	97.0
8	97.0	97.0	98.0	99.0	99.9	99.9	101.	101.	102.	103.	104.	106.
9	109.	114.	118.	119.	119.	116.	116.	115.	116.	117.	119.	120.
10	120.	120.	120.	120.	119.	119.	117.	115.	113.	113.	109.	109.
11	108.	108. E	107. E	106. E	105. E	105. E	103. E	103. E	102. E	101. E	99.9 E	99.9 E
12	98.0 E	98.0 E	97.0 E	96.0 E	95.0 E	95.0 E	93.0 E	93.0 E	92.0 E	91.0 E	90.0 E	90.0 E
13	86.0 E	88.0 E	87.0 E	86.0 E	85.0 E	84.0 E	83.0 E	83.0 E	81.0 E	81.0 E	80.0 E	79.0 E
14	78.0 E	78.0 E	76.0 E	75.0 E	74.0 E	73.0 E	72.0 E	71.0 E	67.0 E	67.0 E	67.0 E	66.0 E
15	66.0 E	66.0 E	65.0 E	65.0 E	64.0 E	65.0 E	63.0 E	63.0 E	63.0 E	63.0 E	63.0 E	63.0 E
16	63.0 E	63.0 E	63.0 E	63.0 E	63.0 E	63.0 E	63.0	63.0	63.0	65.0	65.0	65.0
17*	65.0	65.0	66.0 E	67.0 E	69.0 E	70.0	148.	97.0	93.0	93.0	103.	118.
18*	119.	111.	103.	98.0	95.0	97.0	106.	108.	105.	108.	129.	148.
19	162.	168.	169.	169.	169.	170.	176.	182.	182.	199.	226.	262.
20*	281.	281.	269.	256.	249.	247.	252.	254.	253.	253.	250.	247.
21	242.	236.	232.	226.	220.	216.	211.	205.	202.	199.	196.	191.
22	187.	185.	180.	178.	175.	174.	172.	168.	166.	163.	162.	160.
23*	158.	163.	178.	200.	209.	209.	207.	204.	203.	199.	195.	190.
24	189.	187.	187.	187.	187.	186.	182.	179.	176.	179.	189.	200.
25*	207.	205.	199.	192.	187.	184.	181.	180.	181.	181.	180.	180.
26	178.	176.	174.	170.	169.	168.	167.	167.	166.	162.	162.	163.
27*	166.	170.	176.	181.	182.	179.	174.	169.	166.	163.	161.	160.
28	158.	158.	158.	157.	157.	154.	152.	150.	149.	148.	146.	144.
29	143.	142.	140.	140.	138.	137.	136.	136.	138.	137.	137.	137.
30	137.	136.	133.	130.	128.	127.	126.	125.	125.	125.	125.	127.

*SPECIAL POINTS

17	1335/70.0	1355/148.
18	0100/122.	
20	0300/285.	
23	0300/158.	
25	0245/208.	
27	0900/184.	

RIVER GAGE DATA
 STA. NO. 51 RIO AMANA NEAR EL TEJERO
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	136.	142.	147.	148.	148.	148.	148.	148.	146.	144.	144.	144.
2	148.	149.	149.	148.	147.	148.	149.	149.	149.	148.	147.	147.
3	146.	144.	144.	143.	143.	142.	140.	139.	137.	137.	137.	137.
4	137.	137.	137.	136.	135.	133.	130.	128.	127.	127.	126.	125.
5	124.	124.	122.	120.	119.	118.	116.	114.	113.	111.	111.	111.
6	110.	110.	109.	109.	108.	105.	104.	102.	102.	99.9	99.9	99.9
7	99.9	99.9	99.9	99.0	99.0	98.0	98.0	97.0	95.0	97.0	97.0	97.0
8	94.0	94.0	94.0	93.0	93.0	92.0	90.0	90.0	89.0	88.0	88.0	88.0
9	87.0	88.0	88.0	88.0	88.0	87.0	85.0	85.0	85.0	85.0	85.0	84.0
10*	84.0	84.0	84.0	84.0	84.0	84.0	98.0	109.	105.	102.	102.	103.
11	99.0	97.0	97.0	95.0	95.0	95.0	98.0	98.0	98.0	99.0	99.0	99.9
12	102.	103.	104.	105.	105.	106.	109.	111.	114.	116.	116.	116.
13	117.	117.	120.	132.	148.	157.	162.	162.	161.	158.	158.	163.
14	167.	173.	180.	203.	236.	266.	280.	285.	278.	269.	259.	247.
15	239.	243.	256.	269.	277.	277.	272.	266.	265.	291.	329.	372.
16	412.	431.	445.	439.	419.	400.	391.	396.	404.	417.	427.	435.
17	445.	453.	461.	461.	449.	435.	417.	398.	381.	371.	369.	371.
18*	369.	363.	358.	353.	346.	347.	346.	369.	378.	410.	467.	517.
19*	557.	545.	625.	657.	691.	691.	667.	644.	618.	597.	586.	575.
20	561.	544.	525.	496.	467.	439.	410.	389.	374.	360.	349.	340.
21	330.	323.	317.	310.	305.	297.	293.	286.	285.	283.	281.	277.
22	275.	269.	265.	259.	256.	253.	252.	249.	247.	242.	240.	238.
23	235.	232.	232.	231.	229.	228.	224.	224.	226.	235.	240.	238.
24	235.	229.	224.	222.	224.	224.	224.	218.	216.	213.	211.	209.
25	209.	208.	211.	213.	213.	212.	211.	207.	204.	202.	200.	198.
26	198.	198.	198.	198.	198.	192.	192.	191.	190.	187.	186.	186.
27	185.	184.	182.	185.	184.	185.	190.	213.	310.	459.	572.	672.
28*	750.	750.	701.	672.	677.	704.	744.	769.	778.	765.	732.	691.
29	657.	625.	592.	553.	514.	489.	479.	467.	471.	475.	479.	485.
30	491.	489.	479.	465.	447.	431.	415.	398.	389.	376.	367.	362.
31	354.	353.	351.	347.	340.	334.	330.	320.	312.	307.	301.	296.

*SPECIAL POINTS
 10 1315/83.0 1530/110.
 18 1125/340. 1430/346.
 19 0050/540. 0105/535. 1100/693.
 28 0300/759.

RIVER GAGE DATA
 STA. NO. 51 RIO AMANA NEAR EL TEJERO
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	291.	283.	291.	288.	285.	288.	302.	307.	299.	320.	378.	408.
2*	406.	393.	385.	431.	498.	550.	608.	637.	670.	691.	696.	683.
3	670.	639.	620.	583.	546.	506.	498.	496.	491.	487.	485.	483.
4	481.	475.	469.	457.	449.	439.	431.	429.	429.	427.	419.	406.
5	393.	385.	380.	376.	374.	374.	369.	362.	360.	353.	340.	335.
6	325.	318.	312.	309.	302.	299.	296.	291.	288.	291.	313.	351.
7	378.	381.	374.	362.	347.	335.	327.	325.	330.	339.	347.	353.
8*	360.	363.	362.	360.	356.	353.	371.	362.	351.	340.	332.	322.
9	330.	340.	346.	346.	344.	340.	334.	323.	313.	334.	381.	431.
10*	467.	485.	489.	479.	471.	461.	465.	479.	496.	512.	525.	535.
11	546.	555.	557.	555.	544.	527.	500.	481.	461.	445.	433.	423.
12	413.	408.	402.	404.	404.	400.	389.	385.	391.	396.	412.	427.
13	437.	447.	463.	481.	531.	570.	606.	625.	630.	630.	630.	625.
14	625.	620.	618.	611.	599.	586.	564.	542.	514.	489.	471.	451.
15	443.	431.	419.	410.	400.	389.	381.	371.	362.	353.	347.	344.
16*	344.	347.	349.	351.	346.	353.	662.	635.	572.	572.	525.	473.
17	439.	423.	413.	412.	410.	402.	393.	383.	374.	369.	365.	365.
18	367.	369.	371.	374.	369.	363.	354.	347.	349.	363.	378.	402.
19*	423.	423.	413.	412.	423.	435.	479.	540.	586.	611.	615.	608.
20	586.	570.	561.	570.	579.	592.	608.	622.	630.	635.	637.	637.
21	637.	637.	637.	630.	608.	586.	564.	548.	544.	542.	546.	557.
22	564.	572.	583.	590.	597.	608.	608.	604.	586.	553.	523.	500.
23	479.	463.	449.	439.	429.	421.	415.	419.	410.	400.	391.	391.
24	380.	378.	376.	369.	365.	362.	354.	351.	346.	344.	344.	351.
25	367.	391.	410.	417.	412.	400.	389.	387.	396.	410.	431.	453.
26	479.	525.	583.	627.	654.	688.	712.	723.	732.	738.	741.	747.
27	756.	756.	747.	735.	726.	718.	709.	707.	738.	718.	726.	735.
28*	750.	769.	788.	795.	801.	801.	791.	1000.	907.	808.	762.	738.
29*	723.	718.	707.	691.	670.	639.	632.	637.	667.	712.	762.	805.
30*	832.	832.	818.	801.	785.	775.	772.	778.	791.	801.	818.	839.
31	870.	882.	903.	925.	953.	972.	987.	997.	992.	972.	925.	882.

*SPECIAL POINTS

2	0045/419.	
8	1245/380.	
10	0515/496.	
16	1130/347.	1445/672.
19	0300/427.	0700/412.
28	1435/788.	
29	1430/632.	
30	0315/836.	

RIVER GAGE DATA
 STA. NO. 51 RIO AMANA NEAR EL TEJERO
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	822.	765.	715.	672.	644.	632.	618.	604.	590.	581.	570.	559.
2	548.	540.	529.	521.	512.	502.	496.	487.	483.	477.	469.	463.
3	453.	449.	441.	435.	427.	421.	412.	406.	404.	398.	394.	391.
4	385.	378.	376.	369.	365.	362.	356.	349.	347.	344.	339.	335.
5	330.	327.	322.	320.	318.	317.	312.	309.	304.	304.	310.	313.
6	318.	317.	310.	307.	304.	307.	310.	323.	353.	387.	402.	400.
7	391.	376.	363.	349.	344.	335.	327.	325.	330.	332.	334.	330.
8*	325.	322.	318.	313.	310.	312.	312.	335.	346.	354.	354.	349.
9	335.	320.	310.	304.	301.	297.	297.	293.	289.	289.	297.	312.
10	327.	332.	330.	323.	318.	322.	335.	354.	378.	393.	404.	408.
11*	404.	398.	389.	380.	363.	354.	347.	435.	367.	347.	339.	335.
12	332.	330.	334.	335.	334.	327.	325.	320.	317.	317.	313.	312.
13	310.	309.	309.	309.	307.	302.	299.	296.	289.	285.	281.	280.
14	278.	275.	274.	272.	272.	268.	266.	262.	259.	259.	256.	252.
15	250.	250.	246.	245.	243.	243.	240.	238.	235.	232.	232.	231.
16	231.	229.	228.	228.	225.	224.	224.	222.	224.	229.	242.	253.
17	265.	272.	280.	301.	334.	354.	369.	376.	378.	381.	385.	387.
18	383.	378.	374.	365.	349.	334.	318.	304.	291.	283.	278.	274.
19	271.	265.	260.	257.	253.	250.	245.	243.	240.	236.	232.	229.
20	225.	224.	221.	220.	217.	216.	213.	211.	209.	207.	205.	205.
21	202.	202.	200.	199.	199.	196.	195.	192.	191.	190.	189.	187.
22	187.	187.	186.	185.	184.	184.	182.	181.	180.	180.	180.	180.
23	180.	182.	191.	207.	216.	221.	224.	231.	235.	236.	235.	229.
24	225.	228.	232.	246.	262.	283.	317.	346.	374.	393.	398.	402.
25	404.	404.	410.	421.	441.	459.	475.	491.	510.	529.	544.	559.
26	572.	586.	595.	597.	586.	555.	512.	467.	429.	406.	391.	383.
27	369.	360.	351.	340.	332.	320.	313.	307.	301.	296.	289.	283.
28	280.	275.	272.	271.	265.	260.	257.	252.	246.	245.	243.	242.
29	240.	236.	232.	231.	229.	225.	222.	221.	220.	217.	216.	217.
30	217.	224.	231.	231.	231.	225.	228.	231.	236.	246.	257.	266.

*SPECIAL POINTS

8 2120/356.
 11 1350/443.

RIVER GAGE DATA
 STA. NO. 51 RIO AMANA NEAR EL TEJERO
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		69.9	98.1	144.	307.	663.
2		68.1	96.3	148.	543.	507.
3		66.5	95.8	141.	551.	423.
4		65.7	94.4	132.	446.	361.
5		67.5	96.7	118.	370.	317.
6		69.4	97.2	105.	307.	333.
7		68.8	96.2	98.2	348.	348.
8		68.4	100.	91.5	355.	330.
9		71.8	116.	86.4	343.	305.
10		73.4	117.	92.6	483.	347.
11		79.1	104. E	97.6	507.	378.
12		82.6	94.4 E	108.	403.	326.
13		79.5	84.2 E	144.	547.	299.
14		74.9	72.6 E	233.	565.	267.
15		71.1	64.3 E	275.	393.	241.
16		66.7	63.4	414.	456.	229.
17		64.2	83.2	420.	402.	334.
18	M	63.8	109.	379.	366.	332.
19	90.6	63.3	181.	622.	488.	250.
20	94.0	64.7	257.	448.	601.	216.
21	87.6	65.2	217.	302.	590.	196.
22	83.8	96.0	174.	256.	576.	183.
23	80.8	211.	192.	231.	431.	214.
24	76.4	136.	185.	222.	362.	302.
25	72.5	111.	189.	208.	401.	464.
26	70.3	117.	169.	193.	649.	513.
27	79.0	110.	171.	273.	731.	326.
28	79.7	102.	153.	723.	806.	261.
29	74.8	94.7	139.	534.	695.	227.
30	72.2	98.2	129.	431.	800.	233.
31		99.1		332.	936.	

RIVER GAGE DATA

NAME: Sta. No. 52 Río Amana at the Crossing of the Maturín-Temblador Road.

LOCATION: Longitude $63^{\circ} 08.2'$ W, latitude $09^{\circ} 39.0'$ N. Approximately 11.5 km SSE of Maturín, at Amana Abajo.

DRAINAGE AREA: 935 sq mi (from topographic map).

GAGE: Stevens Type A35 water level recorder attached to left downstream side of bridge.

RECORDS AVAILABLE: April 23, 1969 through September 30, 1969.

REMARKS: Record is good.

CODING: M signifies missing data; E signifies estimated data.



Aerial view of the Río Amana at the crossing of the Maturín-Temblador road. In the photograph, the bridge is near the large, high building which is on the left side of the road extending into the background. The direction of the river flow is from left to right on the photograph.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD

Meas. No.	Date	Made by	Width ft	Area sq ft	Mean Velocity fps	Inside Gage Height ft	Dis-charge cfs	Shift Adj. ft	Per-cent Diff.	Method	Number Meas. Sections	Gage Height Change ft	Time hr	Water Temp. °F
1	May 13	Santaella	45.0	61.5	1.59	2.85	98.0	0	+4.2	Wading	24	0	0.5	85
2	27	Santos	46.0	110.	1.08	3.35	119.	0	-6.3	Wading	22	+0.2	1.5	86
3	June 21	Romero	47.5	98.6	1.60	3.64	158.	0	+4.4	Wading	25	+0.3	1.0	83
4	24	Romero	51.0	124.	1.68	4.13	208.	0	+2.1	Wading	25	0	1.1	81
5	July 1	Santaella	49.0	109.	1.62	3.94	177.	0	-2.2	Wading	26	0	1.2	82
6	10	Santos	48.0	96.9	1.49	3.48	144.	0	+4.6	Wading	23	0	0.8	81
7	20	Romero	60.0	213.	1.81	5.38	385.	0	+5.0	Wading	23	0	1.4	82
8	27	Santaella	51.0	148.	1.58	4.40	234.	0	-1.3	Wading	24	0	1.2	79
9	29	Santos	51.0	148.	1.64	4.53	242.	0	-4.7	Wading	25	+0.3	1.2	85
10	31	Santos	61.0	228.	1.74	5.68	397.	0	-4.1	Bridge	27	-0.3	1.1	83
11	Aug. 6	Romero	63.0	275.	1.95	6.17	535.	0	+4.2	-	26	0	1.0	-
12	9	Santaella	57.0	212.	1.76	5.38	374.	0	+2.2	Bridge	26	+0.3	1.2	76
13	13	Santos	57.0	250.	1.76	5.94	439.	0	-5.0	Bridge	27	+0.2	1.2	81
14	Sept. 2	Romero	87.0	360.	1.75	7.22	630.	0	-2.7	Bridge	28	0	0.9	81

RATING TABLE
FOR
STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
2.00		3.00	103.	4.00	188.	5.00	315.	6.00	474.	7.00	624.
.10		.10	109.	.10	200.	.10	328.	.10	496	.10	634.
.20		.20	116.	.20	212.	.20	341.	.20	520.	.20	645.
.30		.30	123.	.30	224.	.30	355.	.30	542.	.30	657.
.40		.40	131.	.40	237.	.40	369.	.40	561.	.40	670.
.50		.50	139.	.50	250.	.50	384.	.50	577.	.50	684.
.60		.60	148.	.60	263.	.60	400.	.60	590.	.60	699.
.70	85.0	.70	157.	.70	276.	.70	417.	.70	600.	.70	715.
.80	91.0	.80	167.	.80	289.	.80	435.	.80	607.	.80	
.90	97.0	.90	177.	.90	302.	.90	454.	.90	615.	.90	

RIVER GAGE DATA
 STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD
 APRIL 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
23	M	M	M	M	M	108.	107.	107.	106.	106.	106.	106.
24	105.	105.	105.	105.	104.	104.	104.	104.	104.	104.	104.	104.
25	104.	104.	104.	104.	103.	103.	102.	102.	102.	101.	101.	101.
26	100.	100.	100.	100.	100.	100.	100.	99.4	98.2	98.2	97.0	97.0
27	96.4	96.4	96.4	96.4	96.4	96.4	96.4	95.8	95.2	94.6	94.0	94.0
28	94.0	94.0	94.0	94.0	94.0	94.0	94.0	94.0	92.8	92.8	92.2	92.2
29	92.2	92.2	92.2	92.8	93.4	93.4	94.0	94.6	95.8	96.4	97.6	98.8
30	100.	100.	100.	101.	101.	101.	100.	98.2	M	M	M	M

*SPECIAL POINTS

NONE

RIVER GAGE DATA
 STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	M	M	M	M	M	M	M	M	M	M	M	M
2	M	M	M	M	M	M	M	M	M	M	M	M
3	M	M	M	M	M	M	M	M	M	M	M	M
4	M	M	M	M	M	M	M	M	M	M	M	M
5	M	M	M	M	M	M	M	M	M	M	M	M
6	M	M	M	M	M	M	M	M	M	M	M	M
7	M	M	M	M	M	M	M	M	M	M	M	M
8	M	M	M	M	M	M	M	91.0	M	M	M	M
9	M	M	M	M	M	M	90.4	M	M	M	M	M
10	M	M	M	M	M	M	M	M	M	M	M	M
11	M	M	M	M	M	M	M	M	M	M	M	M
12	M	M	M	M	M	M	M	M	M	M	M	M
13	M	M	M	M	M	M	94.0	M	M	M	M	M
14	M	M	M	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2	98.2
15	98.2	97.6	97.6	97.6	98.2	97.6	97.6	97.0	96.4	96.4	95.8	95.8
16	95.2	95.2	94.6	94.6	94.6	94.6	94.0	94.0	93.4	92.8	92.2	92.2
17	91.6	91.6	91.6	91.6	91.6	91.6	91.0	91.6	91.6	91.0	90.4	90.4
18	90.4	90.4	90.4	90.4	90.4	90.4	89.8	89.2	89.2	88.6	88.6	88.6
19	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6
20	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.0
21	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6	88.6
22	88.6	88.6	88.6	89.2	89.8	89.8	89.8	90.4	90.4	90.4	90.4	91.6
23	92.2	92.2	92.2	92.2	92.2	92.2	92.8	92.8	93.4	93.4	94.0	94.0
24	94.0	94.0	94.0	94.6	95.2	95.8	95.8	96.4	96.4	97.0	98.2	101.
25	104.	110.	117.	124.	131.	139.	144.	148.	150.	150.	150.	149.
26	149.	148.	148.	147.	146.	144.	143.	141.	138.	137.	135.	134.
27	133.	132.	130.	129.	129.	128.	129.	128.	127.	125.	125.	123.
28	123.	122.	122.	122.	122.	122.	125.	125.	126.	126.	126.	127.
29	127.	127.	126.	126.	126.	125.	124.	123.	122.	122.	122.	122.
30	121.	120.	120.	120.	120.	119.	119.	119.	119.	117.	117.	117.
31	117.	116.	115.	115.	115.	115.	115.	112.	112.	112.	111.	110.

*SPECIAL POINTS

NONE

RIVER GAGE DATA
 STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	110.	110.	110.	110.	110.	112.	112.	112.	112.	112.	113.	113.
2	113.	113.	114.	114.	115.	115.	115.	115.	115.	115.	115.	115.
3	115.	115.	116.	116.	116.	117.	117.	118.	118.	118.	118.	118.
4	117.	117.	116.	115.	115.	115.	115.	115.	115.	115.	115.	115.
5	115.	115.	115.	115.	115.	115.	115.	115.	115.	115.	115.	115.
6	115.	115.	115.	116.	117.	117.	119.	119.	122.	122.	122.	123.
7	124.	124.	124.	124.	128.	129.	130.	132.	132.	132.	132.	132.
8	132.	132.	132.	132.	132.	132.	132.	132.	132.	131.	132.	133.
9	134.	133.	132.	132.	131.	130.	129.	129.	128.	127.	126.	126.
10	126.	126.	125.	125.	126.	126.	125.	125.	125.	125.	125.	125.
11	125.	126.	127.	128.	129.	130.	131.	131.	132.	132.	132.	132.
12	132.	132.	132.	133.	133.	133.	133.	133.	132.	132.	131.	130.
13	130.	129.	129.	129.	129.	128.	128.	127.	127.	126.	125.	125.
14	125.	124.	124.	124.	124.	124.	123.	122.	121.	120.	119.	119.
15	118.	118.	117.	117.	117.	116.	115.	115.	114.	113.	113.	112.
16	112.	112.	111.	111.	111.	111.	110.	110.	110.	110.	109.	109.
17	108.	108.	108.	108.	108.	108.	108.	108.	108.	108.	108.	108.
18	109.	109.	109.	110.	110.	110.	110.	109.	109.	108.	108.	108.
19	109.	110.	110.	112.	114.	115.	117.	120.	123.	125.	128.	129.
20	129.	130.	131.	133.	134.	136.	136.	136.	136.	136.	137.	137.
21	139.	143.	145.	150.	154.	158.	162.	164.	167.	171.	173.	177.
22	181.	186.	190.	195.	200.	205.	208.	212.	214.	216.	218.	219.
23	220.	222.	223.	224.	224.	224.	223.	220.	219.	216.	214.	212.
24	210.	207.	205.	204.	201.	200.	198.	195.	194.	193.	192.	189.
25	188.	188.	188.	188.	188.	190.	194.	198.	214.	219.	220.	222.
26*	222.	222.	222.	222.	222.	220.	227.	224.	224.	224.	223.	223.
27	222.	220.	220.	220.	222.	223.	223.	222.	220.	218.	216.	214.
28	213.	212.	212.	211.	212.	211.	210.	208.	207.	205.	204.	201.
29	200.	200.	200.	200.	201.	204.	204.	204.	205.	204.	204.	201.
30	200.	196.	195.	193.	192.	190.	189.	188.	186.	185.	183.	182.

*SPECIAL POINTS

26 1250/220. 1315/228.

RIVER GAGE DATA
 STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	181.	180.	180.	180.	180.	180.	179.	178.	178.	177.	177.	177.
2	175.	174.	173.	172.	171.	171.	169.	168.	166.	165.	164.	164.
3	164.	163.	164.	164.	166.	167.	168.	169.	170.	170.	171.	171.
4	171.	172.	174.	176.	179.	180.	181.	182.	182.	182.	182.	181.
5	181.	181.	180.	179.	178.	177.	175.	174.	172.	171.	170.	169.
6	168.	167.	167.	166.	165.	164.	164.	163.	163.	163.	161.	160.
7	158.	158.	156.	156.	155.	154.	154.	153.	152.	152.	151.	149.
8	149.	149.	148.	148.	148.	148.	147.	146.	145.	144.	143.	143.
9	143.	142.	141.	140.	140.	143.	142.	141.	140.	140.	140.	139.
10	139.	138.	137.	137.	137.	137.	137.	137.	137.	136.	134.	134.
11*	134.	134.	133.	133.	133.	134.	137.	140.	140.	139.	137.	137.
12	137.	137.	137.	137.	141.	141.	143.	145.	147.	149.	152.	152.
13	155.	158.	161.	162.	164.	164.	165.	167.	166.	166.	167.	167.
14	167.	167.	167.	166.	166.	165.	169.	168.	168.	167.	167.	166.
15	166.	165.	164.	164.	165.	167.	168.	173.	174.	177.	179.	181.
16	182.	185.	186.	188.	192.	201.	211.	216.	223.	229.	234.	238.
17	245.	246.	249.	253.	255.	258.	260.	262.	267.	267.	269.	271.
18	275.	279.	282.	288.	293.	299.	307.	308.	312.	318.	321.	324.
19	327.	329.	331.	334.	338.	344.	348.	354.	356.	361.	362.	363.
20	366.	366.	368.	368.	370.	370.	369.	369.	366.	366.	363.	362.
21	362.	362.	363.	365.	366.	370.	372.	376.	381.	386.	390.	392.
22	397.	400.	405.	408.	414.	419.	424.	429.	431.	437.	442.	444.
23	448.	450.	454.	456.	456.	454.	448.	439.	424.	407.	390.	376.
24	363.	352.	344.	338.	338.	329.	323.	318.	314.	308.	303.	301.
25	297.	295.	292.	289.	284.	281.	277.	275.	272.	269.	268.	267.
26	267.	267.	266.	263.	262.	260.	258.	254.	253.	251.	249.	246.
27	245.	242.	241.	238.	237.	237.	237.	236.	236.	234.	233.	232.
28	229.	228.	225.	224.	224.	224.	224.	223.	223.	220.	220.	220.
29	220.	224.	227.	232.	237.	241.	243.	247.	251.	258.	266.	273.
30	284.	292.	301.	311.	319.	327.	334.	342.	348.	355.	361.	368.
31	373.	379.	386.	390.	402.	410.	422.	429.	439.	444.	450.	458.

*SPECIAL POINTS

11 1430/143.

RIVER GAGE DATA
 STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	464.	470.	476.	483.	489.	496.	496.	496.	496.	491.	487.	480.
2	472.	462.	448.	435.	415.	400.	387.	376.	365.	356.	349.	344.
3	338.	334.	331.	327.	325.	323.	321.	321.	321.	323.	324.	327.
4	329.	334.	340.	345.	352.	358.	362.	366.	372.	378.	384.	387.
5	392.	400.	405.	410.	419.	431.	439.	446.	452.	458.	468.	474.
6	483.	489.	496.	506.	513.	515.	520.	522.	527.	527.	527.	527.
7*	522.	513.	506.	496.	480.	466.	456.	462.	470.	476.	476.	470.
8	460.	446.	429.	407.	390.	381.	375.	368.	363.	359.	355.	352.
9	352.	355.	356.	359.	362.	366.	368.	368.	369.	369.	370.	370.
10	373.	376.	378.	381.	386.	390.	395.	398.	403.	407.	412.	417.
11	421.	424.	426.	429.	431.	433.	433.	429.	429.	426.	422.	421.
12	417.	414.	412.	408.	410.	412.	414.	415.	417.	421.	424.	426.
13	429.	431.	435.	437.	441.	442.	460.	462.	462.	468.	472.	476.
14	480.	483.	489.	489.	489.	489.	489.	483.	480.	474.	466.	458.
15	448.	442.	437.	431.	429.	426.	426.	426.	428.	429.	433.	437.
16	441.	444.	448.	454.	460.	466.	470.	476.	483.	489.	496.	498.
17	506.	510.	515.	520.	522.	527.	527.	527.	520.	510.	496.	480.
18*	462.	442.	426.	414.	405.	398.	395.	395.	398.	402.	407.	410.
19	415.	422.	429.	435.	442.	448.	456.	462.	466.	470.	472.	474.
20	472.	468.	462.	456.	448.	442.	439.	437.	437.	441.	444.	448.
21	456.	462.	466.	472.	476.	483.	485.	487.	489.	489.	489.	489.
22	489.	491.	491.	491.	496.	498.	506.	506.	510.	515.	520.	525.
23	527.	531.	534.	536.	540.	546.	550.	552.	554.	557.	561.	561.
24	564.	568.	569.	571.	576.	577.	578.	578.	578.	578.	578.	578.
25*	580.	581.	581.	583.	585.	585.	586.	599.	606.	609.	612.	614.
26	613.	612.	612.	611.	611.	611.	610.	609.	609.	606.	602.	593.
27	580.	561.	534.	508.	487.	474.	464.	456.	448.	444.	439.	437.
28	435.	433.	431.	431.	433.	437.	441.	444.	448.	454.	458.	464.
29	468.	474.	480.	489.	496.	503.	513.	520.	527.	531.	540.	544.
30*	552.	559.	564.	571.	577.	581.	585.	592.	593.	596.	598.	600.
31	602.	604.	606.	607.	609.	611.	612.	614.	616.	617.	618.	618.

*SPECIAL POINTS

7	1500/452.	
18	1530/395.	
25	1530/589.	1630/605.
30	1430/590.	

RIVER GAGE DATA
 STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	620.	621.	623.	624.	627.	629.	632.	634.	636.	636.	638.	639.
2	644.	646.	655.	655.	657.	651.	651.	652.	652.	652.	652.	652.
3	652.	652.	652.	652.	655.	655.	656.	660.	660.	660.	660.	663.
4	666.	671.	675.	680.	683.	685.	685.	690.	691.	693.	696.	699.
5	701.	702.	705.	705.	705.	705.	702.	696.	690.	677.	656.	639.
6*	620.	605.	589.	566.	542.	513.	485.	483.	468.	458.	446.	437.
7	426.	417.	408.	402.	397.	390.	386.	382.	378.	373.	372.	370.
8	366.	363.	362.	361.	358.	370.	376.	379.	384.	389.	397.	412.
9	422.	429.	437.	442.	448.	452.	454.	448.	444.	435.	424.	414.
10	407.	402.	395.	390.	386.	390.	381.	381.	381.	381.	382.	382.
11*	382.	382.	381.	379.	375.	372.	386.	379.	376.	370.	366.	362.
12	362.	362.	361.	359.	361.	361.	362.	366.	372.	381.	390.	402.
13	414.	429.	439.	448.	454.	460.	462.	460.	456.	454.	450.	450.
14	450.	450.	450.	450.	454.	450.	448.	441.	431.	424.	414.	407.
15	397.	390.	382.	376.	372.	366.	361.	356.	352.	347.	342.	338.
16	334.	331.	329.	327.	323.	321.	318.	315.	312.	311.	308.	305.
17	303.	301.	298.	297.	295.	294.	292.	289.	286.	284.	284.	281.
18	280.	277.	275.	275.	273.	272.	271.	271.	271.	271.	272.	275.
19	276.	280.	284.	289.	295.	299.	305.	310.	315.	320.	323.	327.
20	329.	332.	333.	334.	334.	334.	331.	327.	321.	316.	310.	303.
21	298.	293.	289.	285.	281.	279.	275.	271.	267.	266.	263.	260.
22	258.	255.	254.	250.	250.	249.	246.	245.	242.	241.	240.	237.
23	237.	234.	233.	232.	230.	228.	225.	224.	223.	220.	220.	219.
24	218.	217.	217.	217.	219.	220.	219.	217.	216.	213.	212.	212.
25	212.	213.	216.	218.	220.	224.	228.	232.	233.	236.	237.	237.
26	238.	238.	240.	241.	245.	249.	254.	262.	267.	273.	279.	285.
27	293.	297.	301.	306.	312.	315.	319.	323.	329.	331.	334.	340.
28*	344.	348.	352.	356.	362.	366.	370.	381.	381.	382.	384.	386.
29	386.	384.	379.	372.	362.	352.	340.	329.	320.	311.	302.	297.
30	292.	288.	282.	279.	275.	272.	268.	266.	262.	258.	255.	253.

*SPECIAL POINTS

6	1300/496.
11	1330/370.
28	1500/381.

RIVER GAGE DATA
 STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATORIN-TEMBLADOR ROAD
 MEAN DAILY DISCHARGE IN CFS
 1969

DAY	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER
1		M	111.	179.	484.	629.
2		M	114.	170.	407.	651.
3		M	117.	167.	327.	656.
4		M	116.	178.	356.	683.
5		M	115.	176.	429.	693.
6		M	118.	165.	510.	527.
7		M	128.	155.	485.	395.
8		M	132.	147.	396.	375.
9		M	130.	141.	363.	437.
10		M	125.	137.	391.	390.
11		M	129.	136.	427.	376.
12		M	132.	143.	416.	368.
13		M	128.	163.	449.	446.
14		M	123.	167.	481.	441.
15		97.2	116.	170.	434.	368.
16		94.1	111.	205.	466.	321.
17		91.4	108.	257.	514.	293.
18		89.8	109.	298.	416.	274.
19		88.6	117.	344.	446.	300.
20		88.6	134.	367.	451.	326.
21		88.6	157.	373.	477.	279.
22		89.7	202.	419.	502.	248.
23	M	92.6	220.	436.	544.	228.
24	104.	95.7	200.	331.	574.	217.
25	103.	133.	199.	282.	592.	224.
26	99.3	143.	223.	259.	609.	254.
27	95.8	129.	220.	238.	493.	314.
28	93.6	124.	209.	224.	441.	366.
29	94.2	125.	202.	241.	504.	348.
30	M	119.	191.	324.	578.	273.
31		114.		411.	610.	

SECONDARY STATIONS

At the nine crest stage partial record stations, water levels were measured to the nearest one-tenth of a foot with Model SR recorders. Stage discharge rating curves at all stations were established by one or more of four methods described in the next paragraphs. The same computer program that was developed for the primary station data was employed to compute 2-hourly and special-point discharges. The published discharges for the secondary stations are given to three digits because the computer program is designed to print three significant digits only. The accuracy of the secondary station discharge records is at best two digits and in some cases only one digit may be significant.

Rating curves were developed by the float-timing method of measuring discharge at four stations. They were the Ríos Aisme near Urupia, Chive near Campamento La Leona, Chupururo near Campo Mata and Guepe near El Limón. At each station, the cross-section of the river at the gage was obtained by survey and referenced to the stage gage vertical control and to horizontal control marks painted on the bridge. Surface floats were timed over a measured distance either upstream or downstream of the gage at different positions in the cross-section. Each surface velocity was reduced by 10 percent to obtain an estimate of the vertically averaged velocity and then multiplied by the area associated with each velocity for the stage existing at the time of the measurement. The sum of the average velocity-area products gave an estimate of the total discharge. The method does not account for any changes in the cross-section which may have occurred with the passage of the floods.

Rating curves were established for the Río Aisme near El Aisme and Río Seco near Campamento La Leona by the float-timing method described

above and in combination with the slope-area method of estimating discharge. The slope-area method is adequately described in many publications [2] [3] [4].

Even though many efforts were made to obtain measurements of peak flood discharges on the Ríos Carisito near Carisito and Purgatorio near El Purgatorio, only a few measurements of low flows were obtained. The high water marks remaining after the passage of a flood could not be adequately distinguished. To obtain a rating curve, cross-sectional surveys of the river reaches in the vicinity of the stage gages were taken to provide an estimate of the cross-sectional area. The water surface slope was assumed equal to the river slope obtained from the topographical maps. Manning's n was estimated for the reaches of both rivers and the stage discharge relationship was computed from Manning's equation and the stage-area relationships established from the surveys.

Both the Río Carisito and Río Purgatorio are wide, shallow sand-bed channels. The method employed to establish the stage-discharge relation is not considered very good for these types of streams. Therefore, the published discharges are to be considered only very approximate. Flows below four cfs in the Río Carisito and two cfs in the Río Purgatorio are not published because the stages corresponding to these flows could not be obtained most of the time.

The station on the Quebrada Mapiricure o San Miguel near El Aceite was located at the inlet of two large culverts that carried the stream through the road. Runoff from the small drainage area was so rapid that it was not possible to reach the site before runoff events had subsided.

The stage-discharge rating curve was established by applying well-known hydraulic relationships for culverts.

RIVER GAGE DATA

NAME: Sta. No. SRI Río Aisme near Urupia.

LOCATION: Longitude $63^{\circ} 52.7'$ W, latitude $08^{\circ} 56.2'$ N. Approximately 41.3 km ENE of El Tigre, 2.2 km ESE of Urupia.

DRAINAGE AREA: 187 sq mi (from topographic map).

GAGE: Model SR recorder attached to left bridge abutment on downstream side of bridge.

RECORDS AVAILABLE: May 21, 1969 through September 30, 1969.

REMARKS: Record is fair to poor.

CODING: M signifies missing data; E signifies estimated data.



View looking downstream to the bridge over the Río Aisme. The SR recorder is visible on the left side of the photograph.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. SRI RIO AISME NEAR URUPIA

Meas. No.	Date	Made by	Stage ft	Discharge cfs	Method
1	July 11	Richardson	5.6	218.	Float-timing
2	13	Richardson	8.2	295.	Float-timing
3	14	Duke	5.4	178.	Float-timing
4	Aug. 9	Stevens	6.2	177.	Float-timing
5	13	Stevens	11.6	947.	Float-timing
6	14	Stevens	8.3	410.	Float-timing
7	21	Canache	6.0	116.	Float-timing
8	23	Stevens	5.1	151.	Float-timing
9	25	Santos	9.4	574.	Float-timing
10	31	Romero	4.0	105.	Float-timing

RATING TABLE
FOR
STA. NO. SRI RIO AISME NEAR URUPIA

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00	33.0	3.00	90.0	6.00	200.	9.00	480.	12.00	1075.	15.00	2300.	18.00	4900.
.10	35.0	.10	93.0	.10	207.	.10	495.	.10	1105.	.10	2370.	.10	5040.
.20	37.0	.20	96.0	.20	214.	.20	510.	.20	1135.	.20	2440.	.20	5180.
.30	39.0	.30	99.0	.30	221.	.30	525.	.30	1166.	.30	2510.	.30	5320.
.40	40.0	.40	102.	.40	228.	.40	540.	.40	1197.	.40	2580.	.40	5460.
.50	41.0	.50	105.	.50	235.	.50	555.	.50	1229.	.50	2650.	.50	5600.
.60	42.0	.60	108.	.60	242.	.60	572.	.60	1261.	.60	2720.	.60	
.70	44.0	.70	111.	.70	249.	.70	589.	.70	1294.	.70	2790.	.70	
.80	46.0	.80	114.	.80	256.	.80	606.	.80	1328.	.80	2860.	.80	
.90	48.0	.90	117.	.90	263.	.90	623.	.90	1363.	.90	2930.	.90	
1.00	50.0	4.00	120.	7.00	270.	10.00	640.	13.00	1399.	16.00	3000.	19.00	
.10	52.0	.10	123.	.10	279.	.10	659.	.10	1436.	.10	3080.	.10	
.20	54.0	.20	126.	.20	288.	.20	678.	.20	1473.	.20	3160.	.20	
.30	56.0	.30	129.	.30	297.	.30	697.	.30	1510.	.30	3240.	.30	
.40	58.0	.40	132.	.40	306.	.40	716.	.40	1548.	.40	3320.	.40	
.50	60.0	.50	135.	.50	315.	.50	735.	.50	1586.	.50	3400.	.50	
.60	62.0	.60	138.	.60	324.	.60	754.	.60	1624.	.60	3480.	.60	
.70	64.0	.70	141.	.70	333.	.70	773.	.70	1663.	.70	3560.	.70	
.80	66.0	.80	145.	.80	342.	.80	792.	.80	1702.	.80	3640.	.80	
.90	68.0	.90	149.	.90	351.	.90	811.	.90	1741.	.90	3720.	.90	
2.00	70.0	5.00	153.	8.00	360.	11.00	830.	14.00	1780.	17.00	3800.	20.00	
.10	72.0	.10	157.	.10	371.	.10	850.	.10	1820.	.10	3890.	.10	
.20	74.0	.20	161.	.20	382.	.20	871.	.20	1862.	.20	3980.	.20	
.30	76.0	.30	165.	.30	393.	.30	893.	.30	1906.	.30	4080.	.30	
.40	78.0	.40	170.	.40	404.	.40	916.	.40	1952.	.40	4180.	.40	
.50	80.0	.50	175.	.50	415.	.50	940.	.50	2000.	.50	4290.	.50	
.60	82.0	.60	180.	.60	428.	.60	965.	.60	2050.	.60	4400.	.60	
.70	84.0	.70	185.	.70	441.	.70	991.	.70	2105.	.70	4520.	.70	
.80	86.0	.80	190.	.80	454.	.80	1018.	.80	2165.	.80	4640.	.80	
.90	88.0	.90	195.	.90	467.	.90	1046.	.90	2230.	.90	4770.	.90	

RIVER GAGE DATA
 STA. NO. SRI RIO AISME NEAR URUPIA
 MAY 1964
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
21	M	M	M	M	M	M	70.0	70.0	70.0	70.0	70.0	70.0
22	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
23	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
24	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
25	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
26	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
27	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
28	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
29	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	74.0	74.0	74.0	74.0
30	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	70.0
31	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0

*SPECIAL POINTS

NONE

RIVER GAGE DATA
 STA. NO. SRI RIO AISME NEAR URUPIA
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0	74.0
2	74.0	74.0	74.0	74.0	74.0	74.0	70.0	70.0	70.0	70.0	70.0	70.0
3	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
4	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
5	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
6	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
7	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
8	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
9	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
10	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
11	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
12	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
13	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
14	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0
15	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	70.0	74.0	82.0	86.0
16	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0	90.0
17	82.0	80.0	80.0	80.0	80.0	96.0	96.0	M	M	M	M	M
18	M	M	M	M	M	M	M	M	M	M	M	M
19	M	M	M	214.	200.	200.	190.	200.	214.	214.	200.	190.
20	180.	170.	161.	153.	138.	132.	132.	120.	120.	120.	120.	120.
21	120.	120.	120.	120.	120.	120.	114.	114.	114.	114.	114.	114.
22	114.	114.	114.	108.	108.	108.	105.	105.	105.	105.	105.	105.
23	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.
24	105.	105.	105.	105.	105.	105.	105.	120.	105.	105.	105.	105.
25	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.
26	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.
27	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.
28	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.
29	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.
30	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.

*SPECIAL POINTS

NONE

RIVER GAGE DATA
 STA. NO. SR1 RIO AISMF NEAR URUPIA
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.
2	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.	105.
3	105.	105.	105.	105.	105.	105.	102.	102.	102.	102.	102.	102.
4	102.	102.	102.	102.	102.	102.	102.	102.	102.	102.	102.	102.
5	102.	102.	102.	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0
6	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0
7	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0
8	96.0	96.0	96.0	96.0	96.0	96.0	90.0	90.0	90.0	90.0	90.0	90.0
9	90.0	90.0	90.0	96.0	96.0	96.0	96.0	96.0	96.0	90.0	90.0	90.0
10	90.0	90.0	90.0	90.0	90.0	90.0	90.0	96.0	104.	132.	135.	135.
11*	135.	145.	149.	149.	149.	149.	180.	175.	153.	145.	145.	145.
12*	145.	145.	145.	145.	145.	145.	256.	297.	333.	333.	351.	360.
13	371.	382.	382.	382.	382.	360.	342.	324.	315.	288.	270.	256.
14	242.	228.	200.	190.	180.	175.	170.	170.	170.	165.	161.	161.
15*	161.	161.	161.	161.	161.	161.	161.	161.	161.	161.	180.	190.
16	200.	200.	200.	200.	200.	200.	214.	214.	214.	214.	214.	214.
17	214.	207.	200.	195.	185.	180.	M	M	M	M	M	M
18	M	M	M	M	M	138.0	138.0	138.0	315.0	235.0	235.0	235.0
19	235.	235.	M	M	M	M	M	M	M	153.	161.	161.
20	161.	170.	170.	170.	180.	190.	200.	214.	214.	200.	200.	190.
21	180.	170.	161.	153.	145.	145.	138.	138.	132.	129.	129.	129.
22	129.	129.	129.	129.	129.	129.	129.	129.	129.	129.	129.	129.
23	129.	129.	129.	129.	129.	129.	129.	129.	129.	129.	129.	129.
24	129.	129.	129.	129.	129.	129.	129.	126.	126.	126.	126.	126.
25	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.
26	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.
27	120.	120.	120.	120.	120.	114.	114.	114.	108.	108.	108.	108.
28	108.	108.	108.	108.	108.	108.	108.	108.	108.	108.	108.	108.
29	108.	108.	108.	108.	108.	102.	102.	102.	102.	102.	102.	102.
30	102.	102.	102.	102.	102.	102.	102.	102.	102.	102.	102.	102.
31	102.	102.	102.	102.	102.	102.	102.	102.	102.	102.	102.	102.

*SPECIAL POINTS

11	1300/200.
12	1300/221.
15	2100/175.

RIVER GAGE DATA
 STA. NO. SRI R10 AISME NEAR URUPIA
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	102.	102.	102.	102.	102.	102.	102.	102.	102.	102.	102.	102.
2	102.	102.	102.	102.	102.	102.	96.0	96.0	96.0	96.0	96.0	96.0
3	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	96.0	120.	132.	126.
4	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.
5	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.
6	120.	120.	120.	120.	126.	132.	145.	157.	170.	185.	195.	207.
7	214.	214.	214.	214.	207.	207.	200.	180.	161.	161.	161.	161.
8*	153.	153.	152.	138.	135.	132.	132.	129.	161.	180.	185.	190.
9	200.	200.	214.	214.	214.	214.	214.	214.	214.	214.	214.	214.
10	214.	214.	200.	190.	185.	185.	180.	175.	170.	170.	170.	170.
11*	170.	170.	170.	180.	214.	270.	297.	324.	333.	333.	333.	342.
12	393.	393.	M	M	M	M	M	M	M	M	M	M
13	M	M	M	M	M	M	M	965.	871.	792.	716.	640.
14	572.	555.	510.	480.	428.	415.	393.	393.	382.	360.	360.	333.
15	324.	315.	315.	306.	288.	288.	270.	263.	263.	263.	242.	235.
16	235.	235.	221.	221.	200.	200.	200.	190.	185.	185.	185.	185.
17	180.	175.	175.	170.	165.	165.	161.	153.	153.	153.	153.	153.
18	161.	161.	161.	165.	170.	175.	175.	170.	165.	153.	153.	153.
19*	153.	153.	153.	153.	175.	315.	428.	480.	510.	480.	454.	415.
20	393.	342.	324.	306.	288.	270.	270.	249.	242.	235.	228.	221.
21	221.	200.	200.	200.	200.	200.	200.	214.	214.	221.	221.	221.
22	221.	221.	221.	221.	221.	214.	200.	185.	180.	175.	170.	170.
23	165.	161.	153.	153.	153.	153.	153.	161.	170.	175.	170.	190.
24	214.	228.	235.	242.	235.	235.	235.	235.	235.	221.	214.	207.
25*	200.	200.	200.	200.	297.	495.	572.	495.	495.	454.	415.	392.
26	360.	324.	306.	297.	279.	270.	249.	249.	228.	207.	200.	190.
27	180.	165.	161.	153.	149.	141.	132.	132.	132.	132.	132.	132.
28*	132.	132.	132.	132.	132.	132.	132.	120.	120.	120.	120.	120.
29	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.
30	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.
31	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.

*SPECIAL POINTS

8	1700/135.											
11	0900/185.	1100/234.										
19	0900/165.	1100/235.	1300/393.									
25	0900/214.	1100/415.	1300/540.	1500/572.								
28	1300/132.											

Maximum stage of 18.1 ft occurred between 0800 hrs August 12 and 1400 hrs August 13. Estimated peak discharge for a stage of 18.1 ft is 5000 cfs.

RIVER GAGE DATA
 STA. NO. SR1 RIO AISME NEAR URUPIA
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.
2	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.
3	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.	120.
4	120.	120.	120.	120.	120.	120.	114.	114.	114.	114.	114.	114.
5	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.
6	114.	114.	114.	114.	114.	111.	111.	111.	111.	111.	111.	111.
7	111.	111.	111.	111.	111.	111.	111.	111.	111.	111.	111.	111.
8	111.	111.	111.	111.	111.	111.	111.	111.	111.	111.	111.	111.
9	111.	111.	111.	111.	111.	111.	114.	114.	114.	114.	114.	114.
10	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.
11	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.
12	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.
13	114.	114.	M	M	M	114.	114.	114.	117.	120.	120.	126.
14	132.	132.	138.	138.	138.	145.	145.	145.	141.	138.	135.	135.
15	132.	132.	132.	126.	126.	126.	126.	126.	126.	120.	120.	114.
16	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.
17	114.	114.	114.	114.	114.	114.	114.	108.	108.	108.	108.	108.
18	108.	108.	108.	108.	108.	108.	111.	111.	111.	111.	111.	111.
19	111.	111.	111.	111.	111.	111.	111.	111.	111.	111.	111.	111.
20	111.	111.	111.	114.	114.	114.	114.	120.	120.	120.	120.	120.
21	120.	120.	120.	120.	120.	114.	114.	114.	114.	114.	114.	114.
22*	114.	114.	114.	114.	114.	114.	114.	114.	114.	120.	120.	132.
23	132.	132.	132.	145.	145.	145.	135.	135.	135.	135.	132.	132.
24	132.	132.	132.	132.	132.	132.	132.	132.	132.	132.	132.	132.
25	132.	132.	132.	132.	132.	132.	132.	132.	132.	132.	132.	132.
26	132.	132.	132.	129.	129.	126.	126.	126.	126.	126.	120.	120.
27	120.	117.	117.	117.	117.	117.	117.	117.	117.	117.	117.	117.
28	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.
29	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.
30	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.	114.

*SPECIAL POINTS

22 2300/126.

RIVER GAGE DATA

NAME: Sta. No. SR2 Río Aisme near El Aisme.

LOCATION: Longitude $64^{\circ} 04.8'$ W, latitude $09^{\circ} 05.0'$ N. Approximately 40.4 km SE of Cantaura, near El Aisme.

DRAINAGE AREA: 23.8 sq mi (from topographic map).

GAGE: Model SR recorder attached to right bridge abutment on upstream side of bridge.

RECORDS AVAILABLE: May 21, 1969 through September 30, 1969.

REMARKS: Record is fair to good. Discharge less than 1 cfs was not tabulated.

CODING: M signifies missing data; E signifies estimated data; blank signifies less than 1 cfs.



View looking downstream from the bridge. Note the few large rocks on the channel bed. At a few locations, there are outcroppings of conglomerates on the bed of this stream. This reach of river has been surveyed in detail.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. SR2 RIO AISME NEAR EL AISME

Meas. No.	Date	Made by	Stage	Discharge	Method
			ft	cfs	
1	Aug. 9	Stevens	3.1	240.	Float-timing
2	18	Stevens	2.8	133.	Float-timing
3	Aug. -	Stevens	10.8	9200.	Slope-Area

PROVISIONAL RATING TABLE
FOR
STA. NO. SR2 RIO AISME NEAR EL AISME

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
2.00	<1.00	4.00	628.	6.00	2090.	8.00	4500.	10.00	7750.
.10	7.00	.10	684.	.10	2190.	.10	4650.	.10	7930.
.20	15.0	.20	741.	.20	2300.	.20	4800.	.20	8110.
.30	27.0	.30	799.	.30	2410.	.30	4950.	.30	8290.
.40	43.0	.40	860.	.40	2520.	.40	5100.	.40	8470.
.50	61.0	.50	924.	.50	2630.	.50	5250.	.50	8650.
.60	81.0	.60	991.	.60	2740.	.60	5410.	.60	8830.
.70	103.	.70	1061.	.70	2850.	.70	5570.	.70	9010.
.80	127.	.80	1133.	.80	2960.	.80	5730.	.80	9200.
.90	154.	.90	1206.	.90	3070.	.90	5890.	.90	9390.
3.00	184.	5.00	1280.	7.00	3180.	9.00	6050.	11.00	9580.
.10	217.	.10	1355.	.10	3300.	.10	6210.	.10	
.20	253.	.20	1430.	.20	3420.	.20	6380.	.20	
.30	292.	.30	1506.	.30	3540.	.30	6550.	.30	
.40	334.	.40	1583.	.40	3670.	.40	6720.	.40	
.50	378.	.50	1661.	.50	3800.	.50	6890.	.50	
.60	424.	.60	1740.	.60	3930.	.60	7060.	.60	
.70	472.	.70	1820.	.70	4070.	.70	7230.	.70	
.80	522.	.80	1905.	.80	4210.	.80	7400.	.80	
.90	574.	.90	1995.	.90	4350.	.90	7570.	.90	

RIVER GAGE DATA
 STA. NO. SR2 RIO AISME NEAR EL AISME
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
21	M	M	M	M	M	M	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
23	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
26	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
27	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
28	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
29	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
31	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. SR2 RIO AISME NEAR EL AISME
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
11	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
19	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
21	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
23	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
26	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
27	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
28	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
29	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. SR2 RIO AISME NEAR EL AISME
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	43.0	61.0	43.0
11	7.00	1.00	1.00	1.00	1.00	1.00	1.00	334.	81.0	61.0	43.0	15.0
12	7.00	7.00	7.00	43.0	15.0	1.00	1.00	1.00	1.00	43.0	43.0	27.0
13	15.0	7.00	7.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14*	1.00	43.0	43.0	15.0	15.0	378.	184.	127.	61.0	43.0	43.0	43.0
15*	43.0	43.0	43.0	27.0	27.0	27.0	7.00	7.00	1.00	184.	184.	81.0
16*	43.0	15.0	1.00	1.00	1.00	1.00	1.00	61.0	334.	217.	81.0	43.0
17*	15.0	1.00E	1.00E	1.00E	1.00E	1.00E	1.00E	1.00E	1.00E	1.00E	1.00E	924.
18*	334.	184.	127.	81.0	81.0	81.0	61.0	61.0	253.	184.	6380.	2090.
19	860.	424.	334.	253.	184.	184.	127.	253.	127.	81.0 E	43.0 E	15.0 E
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
21	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
23	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
26	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
27	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
28	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
29	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
31	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

*SPECIAL POINTS

14	1100/334.
15	2030/334.
16	1900/378.
17	2230/628. 2330/1210.
18	2100/1280.

RIVER GAGE DATA
 STA. NO. SR2 RIO AISME NEAR EL AISME
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400	
1	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
2	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
3*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	628. E	
4*	424.	253.	184.	127.	81.0	43.0 E	15.0 E	1.00E	1.00	1.00	1.00	1.00	
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
7	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
8*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	799.	1350.	628.	378.	
9*	292.	253.	184.	154.	154.	103.	81.0	184.	154.	81.0	43.0 E	15.0 E	
10	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
11*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1280.	628.	378.	1280.	5250.
12	9200.	M	M	M	M	M	M	M	M	184.	184.	154.	
13	127.	127.	103.	81.0	61.0	27.0	7.00	1.00	1.00	1.00	1.00	1.00	
14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	61.0	27.0	
18*	15.0	1.00	1.00	1.00	253.	184.	127.	103.	103.	628.	741.	378.	
19	217.	184.	103.	81.0	61.0	61.0	61.0	61.0	43.0	43.0	27.0	27.0	
20	15.0	15.0	15.0	7.00	7.00	7.00	7.00	1.00	1.00	1.00	1.00	1.00	
21	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
22	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
23	1.00	1.00	1.00	1.00	1.00	1.00	27.0	43.0	103.	103.	81.0	61.0	
24	61.0	43.0	15.0	7.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
26	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
27	1.00	1.00	1.00	1.00	1.00	1.00	1.00	43.0	43.0	27.0	7.00	1.00	
28*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	184.	61.0	43.0	27.0	15.0	
29	7.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	
31	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	

*SPECIAL POINTS

3	1120/1.00E											
4	0020/860.											
8	1700/1.00	1900/2410.										
9	1700/253.											
11	1500/1.00	2100/334.	2320/6210.									
18	0900/1.00	1030/378.	1800/103.	2020/1430.								
28	1500/61.0											

RIVER GAGE DATA
 STA. NO. SR2 RIO AISME NEAR EL AISME
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	81.0	43.0	27.0	15.0	7.00
2	7.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
3	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
4	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
5	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
6	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
7	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
8	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
9	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
10*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	799.	799.	334.	103.
11	61.0	43.0	27.0	27.0	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
12	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
13	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
14	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
15	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
16	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
17	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
18	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
19	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
20	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
21	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
22*	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	184.	61.0	43.0	15.0
23	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
24	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	15.0	1.00	1.00	1.00
25	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
26	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
27	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
28	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
29	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
30	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00

*SPECIAL POINTS
 1 1500/1.00
 10 1700/154.
 22 1700/334.

RIVER GAGE DATA

NAME: Sta. No. SR3 Río Carisito near Carisito.

LOCATION: Longitude $63^{\circ} 56.8'$ W, latitude $09^{\circ} 21.8'$ N. Approximately 25.2 km WSW of Aguasay, near Carisito.

DRAINAGE AREA: 15.8 sq mi (from topographic map).

GAGE: Model SR recorder attached to left bridge abutment on downstream side of bridge.

RECORDS AVAILABLE: May 19, 1969 through September 30, 1969.

REMARKS: Record is good. Shifting control method was applied from May 19 through September 30. Discharge less than or equal to 4 cfs was not tabulated.

CODING: M signifies missing data; E signifies estimated data; blank signifies discharge less than or equal to 4 cfs.



View looking upstream from the bridge at the Río Carisito gaging site. Flow is at an acute angle to the bridge crossing.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. SR3 RIO CARISITO NEAR CARISITO

Meas. No.	Date	Made by	Stage ft	Discharge cfs	Method
1	Aug. 9	Stevens	1.00	4.00	Float-timing

PROVISIONAL RATING TABLE
FOR
STA. NO. SR3 RIO CARISITO NEAR CARISITO

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00		2.00	65.0	4.00	1440.
.10		.10	95.0	.10	1530.
.20		.20	155.	.20	1630.
.30		.30	220.	.30	1730.
.40		.40	280.	.40	1830.
.50		.50	335.	.50	1930.
.60		.60	385.	.60	2030.
.70		.70	430.	.70	2130.
.80	0.00	.80	480.	.80	2230.
.90	2.00	.90	540.	.90	2320.
1.00	4.00	3.00	610.	5.00	2410.
.10	6.00	.10	680.	.10	2500.
.20	8.00	.20	760.	.20	2590.
.30	10.5	.30	840.	.30	2680.
.40	13.5	.40	920.	.40	2770.
.50	17.0	.50	1000.	.50	2860.
.60	22.0	.60	1080.	.60	
.70	29.0	.70	1170.	.70	
.80	38.0	.80	1260.	.80	
.90	50.0	.90	1350.	.90	

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RIVER GAGE DATA
STA. NO. SR3 RIO CARISITO NEAR CARISITO
MAY 1969
DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
19	M	M	M	M	M	M						
20												
21												
22												
23												
24												
25												
26												
27												
28												
29									220.	280.	17.0	9.19
30	7.22	6.00										
31												

*SPECIAL POINTS
NONE

RIVER GAGE DATA
 STA. NO. SR3 RIO CARISITO NEAR CARISITO
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21						13.5 E	155.	65.0	408.	65.0	65.0	33.2
22	25.3	25.3	29.0	25.3	25.3	25.3	17.0	17.0	22.0	22.0 E	22.0 E	22.0 E
23	22.0 E	22.0 E	22.0 E	17.0 E	17.0 E	17.0 E	17.0 E	17.0 E	123.	123.	38.0	22.0
24	22.0	22.0	M	M	M	M	M	M	M	M	M	M
25	M	M	M	M	M	M	M	M	50.0	29.0	29.0	22.0
26	22.0	22.0	22.0	17.0	17.0	17.0	17.0	13.5 E	10.5 E	8.00E	6.00E	
27												
28												
29												
30									13.5	17.0	17.0	17.0

*SPECIAL POINTS
 NONE

11-176

RIVER GAGE DATA
 STA. NO. SR3 RIO CARISITO NEAR CARISITO
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	17.0	17.0	17.0	17.0	33.2	22.0	22.0	22.0	29.0	22.0	22.0	22.0
2	22.0	22.0	22.0	22.0	17.0	17.0	50.0	33.2	22.0	22.0	22.0	22.0
3	22.0	22.0	22.0	22.0	22.0	17.0	17.0	17.0	33.2	33.2	22.0	M
4	M	M	M	M	M							
5												
6												
7												
8												
9												
10*										22.0		
11												
12*						9.19	454.	10.5				
13												
14												
15												
16												
17												
18											6.00	
19												
20												
21												
22												
23												
24												
25												
26												
27												
28												
29												
30												
31												

*SPECIAL POINTS
 10 1900/22.0 1930/33.2
 12 1500/29.0

II-177

STA. NO. SR3 RIVER GAGE DATA
 RIO CARISITO NEAR CARISITO
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14*							9.19					
15												
16			7.22									
17												
18												
19												
20												
21												
22												
23*								50.0	10.5			
24*												
25												
26												
27												
28												
29												
30												
31												

*SPECIAL POINTS
 14 1345/11.9
 23 1300/2.87 1500/29.0 1630/65.0
 24 1635/13.5

II-179

STA. NO. SR3 RIVER GAGE DATA
RIO CARISITO NEAR CARISITO
SEPTEMBER 1969
DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1												
2												
3												
4												
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24*		56.4	574.	22.0	7.22							
25												
26												
27												
28												
29												
30												

*SPECIAL POINTS
24 0500/960. 0530/1300.

RIVER GAGE DATA

NAME: Sta. No. SR4 Río Chive near Campamento La Leona.

LOCATION: Longitude $63^{\circ} 51.2'$ W, latitude $09^{\circ} 03.2'$ N. Approximately 44.8 km W of Oritupano, 6.1 km NNW of Campamento La Leona.

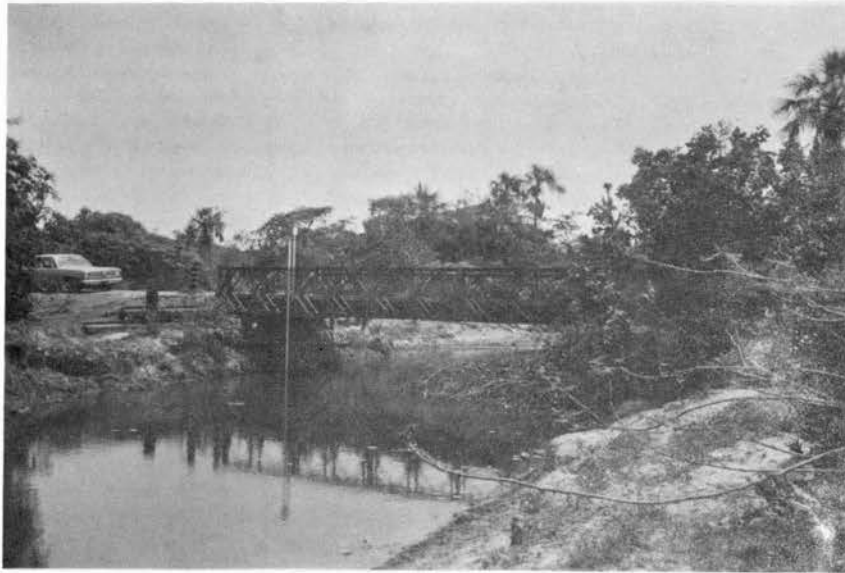
DRAINAGE AREA: 63.6 sq mi (from topographic map).

GAGE: Model SR recorder attached to right downstream side of bridge.

RECORDS AVAILABLE: May 24, 1969 through September 30, 1969.

REMARKS: Record is fair to poor.

CODING: M signifies missing data; E signifies estimated data.



View looking upstream to the SR recorder and bridge on the Río Chive near Campamento La Leona.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. SR4 RIO CHIVE NEAR CAMPAMENTO LA LEONA

Meas. No.	Date	Made by	Stage ft	Discharge Under Bridge cfs	Discharge * Through Culverts cfs	Discharge ** Over Road cfs	Method
1	July 11	Richardson	4.0	72.	0	0	Float-timing
2	12	Richardson	3.4	49.	0	0	Float-timing
3	Aug. 12	Stevens	8.6	397.	-	97.	Float-timing
4	13	Stevens	8.4	412.	-	-	Float-timing
5	13	Stevens	7.8	-	65.	0	Float-timing
6	14	Stevens	7.0	173.	-	0	Float-timing
7	22	Canache	3.4	50.	0	0	Float-timing
8	25	Santos	7.8	199.	-	0	Float-timing
9	26	Stevens	6.6	191.	-	0	Float-timing

* Flow through the culverts begins at a stage of 5.5 ft (est.)
** Flow over the road begins at a stage of 8.15 ft

RATING TABLE
FOR
STA. NO. SR4 RIO CHIVE NEAR CAMPAMENTO LA LEONA

Gage Height feet	Dis- charge cfs	Gage Height feet	Dis- charge cfs	Gage Height feet	Dis- charge cfs	Gage Height feet	Dis- charge cfs	Gage Height feet	Dis- charge cfs
0.00		2.00	20.0	4.00	65.0	6.00	155.	8.00	360.
.10		.10	22.0	.10	67.0	.10	163.	.10	385.
.20		.20	24.0	.20	69.0	.20	171.	.20	415.
.30		.30	26.0	.30	71.0	.30	179.	.30	450.
.40		.40	28.0	.40	73.0	.40	187.	.40	490.
.50	0.00	.50	30.0	.50	75.0	.50	195.	.50	535.
.60	1.00	.60	32.0	.60	78.0	.60	203.	.60	585.
.70	2.00	.70	34.0	.70	81.0	.70	211.	.70	640.
.80	3.00	.80	36.0	.80	84.0	.80	219.	.80	700.
.90	4.00	.90	38.0	.90	87.0	.90	227.	.90	765.
1.00	5.00	3.00	40.0	5.00	90.0	7.00	235.	9.00	835.
.10	6.00	.10	42.0	.10	94.0	.10	243.	.10	
.20	7.00	.20	44.0	.20	98.0	.20	251.	.20	
.30	8.00	.30	47.0	.30	102.	.30	260.	.30	
.40	9.00	.40	50.0	.40	106.	.40	270.	.40	
.50	10.0	.50	53.0	.50	110.	.50	280.	.50	
.60	12.0	.60	56.0	.60	119.	.60	292.	.60	
.70	14.0	.70	59.0	.70	128.	.70	306.	.70	
.80	16.0	.80	61.0	.80	137.	.80	322.	.80	
.90	18.0	.90	63.0	.90	146.	.90	340.	.90	

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STA. NO. SR4 RIVER GAGE DATA
 RIO CHIVE NEAR CAMPAMENTO LA LEONA
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
24	M	M	M	M	M	20.0	20.0	20.0	20.0	20.0	20.0	20.0
25	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
26	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
27	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
28	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
29	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	24.0	24.0	24.0
30	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
31	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. SR4 RIO CHIVE NEAR CAMPAMENTO LA LEONA
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
2	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
3	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
4	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
5	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
6	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
7	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
8	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	20.0	20.0
9	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
10	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
11	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
12	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
13	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
14	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
15	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
16	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	M	M	M
17	M	M	M	M	M	20.0	20.0	20.0	20.0	20.0	20.0	20.0
18	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
19	20.0	20.0	20.0	24.0	24.0	24.0	40.0	40.0	40.0	36.0	32.0	32.0
20	32.0	32.0	30.0	30.0	30.0	30.0	30.0	30.0	28.0	28.0	28.0	28.0
21	28.0	24.0	24.0	24.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
22	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
23	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
24	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
25	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
26	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
27	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
28	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	16.0	16.0	16.0	20.0
29	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
30	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0

*SPECIAL POINTS
 NINE

RIVER GAGE DATA
 STA. NO. SR4 RIO CHIVE NEAR CAMPAMENTO LA LEONA
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
2	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
3	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
4	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
6	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
7	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
8	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
9	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
10*	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	36.0	69.0	73.0
11*	73.0	73.0	73.0	73.0	73.0	65.0	61.0	59.0	53.0	53.0	50.0	50.0
12	50.0	50.0	50.0	50.0	50.0	50.0	50.0	53.0	61.0	69.0	81.0	87.0
13	90.0	90.0	81.0	73.0	65.0	61.0	56.0	53.0	50.0	47.0	47.0	44.0
14	42.0	42.0	40.0	40.0	42.0	42.0	42.0	42.0	44.0	47.0	47.0	47.0
15	47.0	47.0	44.0	42.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0	40.0
16	40.0	40.0	40.0	40.0	40.0	38.0	36.0	36.0	36.0	36.0	36.0	36.0
17	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
18	36.0	36.0	36.0	36.0	36.0	36.0	36.0	M	M	M	M	M
19	M	M	M	M	M	44.0	50.0	50.0	M	M	M	M
20	M	M	M	M	M	73.0	73.0	73.0	73.0	73.0	73.0	73.0
21	73.0	73.0	73.0	73.0	73.0	73.0	73.0	73.0	69.0	69.0	65.0	65.0
22	65.0	61.0	56.0	53.0	53.0	50.0	44.0	44.0	40.0	40.0	40.0	40.0
23	40.0	40.0	36.0	36.0	36.0	36.0	32.0	32.0	32.0	32.0	32.0	32.0
24	32.0	32.0	32.0	32.0	32.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
25*	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	32.0	40.0	56.0
26	56.0	53.0	44.0	40.0	38.0	36.0	36.0	32.0	32.0	32.0	36.0	40.0
27	40.0	44.0	42.0	38.0	36.0	36.0	34.0	34.0	34.0	34.0	34.0	34.0
28	34.0	34.0	34.0	34.0	34.0	34.0	32.0	30.0	30.0	30.0	30.0	30.0
29	30.0	28.0	28.0	28.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0
30	26.0	26.0	26.0	26.0	26.0	24.0	24.0	24.0	24.0	24.0	20.0	20.0
31	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0

*SPLCIAL POINTS
 10 1900/28.0 2100/44.0
 11 1100/67.0
 25 2100/36.0 2300/44.0

RIVER GAGE DATA
 STA. NO. SR4 RIO CHIVE NEAR CAMPAMENTO LA LEONA
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
2	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
3*	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	32.0	56.0
4*	67.0	71.0	73.0	73.0	67.0	63.0	56.0	56.0	61.0	65.0	65.0	69.0
5	71.0	71.0	69.0	69.0	65.0	65.0	63.0	63.0	63.0	63.0	63.0	63.0
6	56.0	56.0	56.0	56.0	56.0	53.0	53.0	44.0	44.0	44.0	44.0	44.0
7	40.0	40.0	40.0	40.0	40.0	36.0	40.0	38.0	34.0	34.0	34.0	34.0
8*	34.0	34.0	34.0	32.0	32.0	32.0	30.0	30.0	47.0	69.0	90.0	90.0
9	90.0	90.0	84.0	75.0	71.0	69.0	65.0	63.0	63.0	61.0	63.0	65.0
10	69.0	69.0	69.0	74.1	73.0	73.0	74.6	74.6	74.6	74.1	73.0	73.0
11*	73.0	74.1	76.1	78.0	84.0	78.0	78.0	78.0	78.0	90.0	119.	187.
12*	235.	251.	M	M	M	M	M	640.	640.	585.	640.	535.
13*	535.	535.	535.	535.	535.	535.	360.	322.	322.	322.	306.	306.
14	292.	240.	280.	260.	251.	235.	235.	235.	211.	203.	203.	195.
15	195.	179.	155.	137.	128.	110.	102.	90.0	90.0	81.0	75.0	75.0
16	73.0	71.0	65.0	65.0	61.0	61.0	59.0	61.0	59.0	56.0	56.0	56.0
17	56.0	53.0	53.0	50.0	50.0	44.0	44.0	44.0	44.0	44.0	44.0	44.0
18	44.0	44.0	44.0	44.0	44.0	44.0	53.0	53.0	53.0	50.0	47.0	44.0
19*	44.0	44.0	44.0	50.0	61.0	87.0	110.	137.	171.	179.	171.	137.
20*	110.	98.0	87.0	65.0	65.0	61.0	98.0	110.	110.	110.	110.	110.
21*	110.	110.	90.0	81.0	75.0	75.0	75.0	73.0	73.0	69.0	69.0	69.0
22	61.0	59.0	56.0	56.0	53.0	53.0	50.0	50.0	47.0	44.0	44.0	44.0
23	44.0	44.0	40.0	40.0	40.0	38.0	40.0	44.0	47.0	47.0	47.0	47.0
24*	40.0	47.0	47.0	50.0	50.0	50.0	63.0	67.0	71.0	75.0	146.	235.
25	243.	251.	251.	M	M	M	292.	340.	292.	292.	292.	292.
26	280.	270.	270.	260.	243.	219.	203.	M	M	M	M	M
27	M	M	M	M	M	M	65.0	65.0	65.0	65.0	65.0	65.0
28	65.0	65.0	65.0	65.0	63.0	61.0	61.0	61.0	61.0	56.0	56.0	56.0
29	56.0	53.0	53.0	50.0	50.0	50.0	53.0	53.0	53.0	53.0	53.0	53.0
30	53.0	53.0	53.0	53.0	53.0	53.0	50.0	50.0	50.0	50.0	50.0	50.0
31	50.0	50.0	50.0	50.0	50.0	40.0	38.0	38.0	38.0	38.0	38.0	38.0

*SPECIAL PRINTS

3	2100/26.0	2300/42.0		
4	0100/63.0			
8	1700/34.0	1900/65.0	2100/84.0	
11	2100/90.0	2300/155.		
12	0100/175.			
13	1300/535.			
19	1100/75.0	1300/102.		
20	0700/78.0	1300/102.		
21	0500/110.			
24	1400/53.0	2100/90.0	2300/195.	

RIVER GAGE DATA
 STA. NO. SR4 RIO CHIVE NEAR CAMPAMENTO LA LEONA
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	36.0	38.0	38.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
2	36.0	36.0	36.0	36.0	36.0	M	M	M	M	M	M	M
3	M	M	M	M	M	32.0	32.0	32.0	32.0	32.0	32.0	32.0
4	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
5	32.0	32.0	32.0	32.0	32.0	32.0	28.0	28.0	28.0	28.0	28.0	28.0
6	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
7	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
8	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0	28.0
9	28.0	28.0	28.0	28.0	28.0	28.0	30.0	30.0	30.0	30.0	30.0	30.0
10	30.0	30.0	30.0	30.0	30.0	30.0	26.0	26.0	26.0	26.0	26.0	26.0
11	26.0	26.0	26.0	26.0	26.0	26.0	26.0	M	M	M	M	M
12	M	M	M	M	M	M	44.0	47.0	47.0	47.0	47.0	47.0
13	50.0	56.0	56.0	59.0	59.0	56.0	56.0	56.0	53.0	53.0	53.0	50.0
14	50.0	50.0	50.0	44.0	44.0	40.0	40.0	36.0	36.0	34.0	34.0	34.0
15	34.0	34.0	34.0	34.0	34.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
16	30.0	30.0	30.0	30.0	30.0	30.0	28.0	28.0	28.0	28.0	28.0	28.0
17	28.0	28.0	28.0	28.0	28.0	28.0	28.0	29.0	28.0	28.0	28.0	28.0
18	26.0	26.0	26.0	26.0	26.0	26.0	26.0	24.0	24.0	24.0	24.0	24.0
19	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
20	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
21	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
22*	24.0	24.0	24.0	24.0	24.0	24.0	26.0	42.0	61.0	69.0	65.0	56.0
23	53.0	53.0	47.0	47.0	44.0	44.0	44.0	40.0	40.0	36.0	36.0	36.0
24	34.0	34.0	34.0	34.0	34.0	34.0	34.0	36.0	36.0	36.0	36.0	36.0
25	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	32.0	32.0	32.0	32.0
26	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0	32.0
27	32.0	32.0	32.0	32.0	32.0	32.0	32.0	30.0	30.0	30.0	30.0	30.0
28	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
29	30.0	30.0	30.0	30.0	30.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
30*	36.0	36.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0	26.0

*SPECIAL POINTS
 22 1500/40.0 1700/47.0
 30 0500/46.0

RIVER GAGE DATA

NAME: Sta. No. SR5 Río Chupururo near Campo Mata.

LOCATION: Longitude $64^{\circ} 03.5'$ W, latitude $09^{\circ} 12.6'$ N. Approximately 34.5 km ESE of Cantaura, 1 km SW of Campo Mata.

DRAINAGE AREA: 60.0 sq mi (from topographic map).

GAGE: Model SR recorder attached to right downstream side of bridge.

RECORDS AVAILABLE: May 19, 1969 through September 30, 1969.

REMARKS: Record is fair to good.

CODING: M signifies missing data; E signifies estimated data.



View looking downstream to the bridge over the Río Chupururo near Campo Mata. The float well for the SR recorder is visible between the cross-bracing on the right set of piers.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. SR5 RIO CHUPURURO NEAR CAMPO MATA

Meas. No.	Date	Made by	Stage ft	Discharge cfs	Method
1	July 19	Stevens	8.5	452.	Float-timing
2	Aug. 9	Stevens	3.5	54.	Float-timing
3	12	Stevens	9.0	504.	Float-timing
4	13	Contreras	4.8	107.	Float-timing
5	14	Contreras	5.2	137.	Float-timing

RATING TABLE
FOR
STA. NO. SR5 RIO CHUPURURO NEAR CAMPO MATA

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
2.00	0.00	4.00	70.0	6.00	200.	8.00	395.	10.00	615.
.10	3.00	.10	75.0	.10	209.	.10	406.	.10	
.20	6.00	.20	80.0	.20	218.	.20	417.	.20	
.30	9.00	.30	85.0	.30	227.	.30	428.	.30	
.40	12.0	.40	90.0	.40	236.	.40	439.	.40	
.50	15.0	.50	95.0	.50	245.	.50	450.	.50	
.60	18.0	.60	101.	.60	255.	.60	461.	.60	
.70	21.0	.70	107.	.70	265.	.70	472.	.70	
.80	24.0	.80	113.	.80	275.	.80	483.	.80	
.90	27.0	.90	119.	.90	285.	.90	494.	.90	
3.00	30.0	5.00	125.	7.00	295.	9.00	505.	11.00	
.10	34.0	.10	132.	.10	305.	.10	516.	.10	
.20	38.0	.20	139.	.20	315.	.20	527.	.20	
.30	42.0	.30	146.	.30	325.	.30	538.	.30	
.40	46.0	.40	153.	.40	335.	.40	549.	.40	
.50	50.0	.50	160.	.50	345.	.50	560.	.50	
.60	54.0	.60	168.	.60	355.	.60	571.	.60	
.70	58.0	.70	176.	.70	365.	.70	582.	.70	
.80	62.0	.80	184.	.80	375.	.80	593.	.80	
.90	66.0	.90	192.	.90	385.	.90	604.	.90	

RIVER GAGE DATA
 STA. NO. 525 RIO CHUPURURO NEAR CAMPO MATA
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
19	"	"	"	"	"	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
30	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*SPECIAL PRINTS

NONE

RIVER GAGE DATA
 STA. NO. 525 RIO CHUPURURO NEAR CAMPO MATA
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	6.00	12.0	12.0	12.0
7	6.00	15.0	15.0	15.0	18.0	18.0	18.0	18.0	24.0	30.0	30.0	30.0
8	24.0	24.0	24.0	24.0	18.0	18.0	18.0	18.0	24.0	38.0	30.0	30.0
9	30.0	24.0	24.0	24.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
10	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
11	18.0	18.0	18.0	18.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
12	15.0	15.0	15.0	15.0	15.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
13	12.0	12.0	12.0	12.0	12.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
14	15.0	18.0	18.0	15.0	15.0	12.0	12.0	12.0	15.0	18.0	18.0	18.0
15	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
16	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
17	18.0	18.0	18.0	24.0	30.0	30.0	24.0	24.0	24.0	24.0	24.0	24.0
18	24.0	18.0	18.0	18.0	18.0	18.0	24.0	30.0	30.0	24.0	24.0	18.0
19	18.0	12.0	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.00	6.00	6.00	6.00	6.00
25	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.0	12.0	12.0	6.00
26	0.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.0	18.0	18.0	18.0

*SPECIAL PRINTS

NONE

RIVER GAGE DATA
 STA. NO. SR5 RIO CHUPURURO NEAR CAMPO MATA
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	15.0	15.0	9.00	9.00	12.0	12.0	12.0	12.0	6.00	6.00	6.00	6.00
2	6.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.0	6.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	12.0	12.0	12.0
8	12.0	12.0	6.00	6.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	9.00	9.00	9.00
11	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	9.00	9.00	9.00	9.00
12	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00	9.00
13	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00	6.00
14*	18.0	18.0	18.0	18.0	18.0	18.0	18.0	15.0	15.0	34.0	34.0	42.0
15	34.0	24.0	18.0	18.0	18.0	18.0	15.0	15.0	24.0	38.0	38.0	38.0
16	38.0	38.0	38.0	38.0	M	M	M	M	M	27.0	24.0	21.0
17*	18.0	18.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	62.0	192.
18*	70.0	95.0	95.0	95.0	62.0	54.0	46.0	30.0	30.0	30.0	450.	560.
19	450.	406.	450.	450.	395.	M	M	M	125.	101.	80.0	66.0
20	50.0	42.0	30.0	30.0	30.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
21	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
22	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
23	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
24	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	15.0	15.0	15.0	15.0
25	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
26	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
27	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
28	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
29	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
30	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
31	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0

*SPECIAL POINTS

14	1900/18.0			
17	2100/15.0	2320/209.		
18	0900/80.0	2100/70.0	2300/582.	

RIVER GAGE DATA
 STA. NO. SR5 RIO CHUPURURO NFAR CAMPO MATA
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
2	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
3*	15.0	15.0	15.0	15.0	15.0	15.0	15.0	42.0	42.0	42.0	42.0	42.0
4	42.0	42.0	42.0	38.0	30.0	27.0	24.0	21.0	21.0	21.0	21.0	21.0
5	21.0	21.0	21.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
6*	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	30.0	24.0	50.0
7*	75.0	80.0	46.0	30.0	30.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
8*	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	42.0	146.	146.
9*	146.	139.	95.0	58.0	50.0	38.0	38.0	30.0	30.0	30.0	24.0	30.0
10	30.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
11*	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	146.
12*	146.	146.	146.	450.	450.	439.	439.	439.	505.	461.	395.	355.
13*	295.	200.	146.	113.	90.0	80.0	80.0	125.	132.	184.	227.	227.
14*	227.	218.	160.	125.	95.0	45.0	90.0	125.	153.	139.	139.	101.
15	95.0	90.0	90.0	85.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
16	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
17	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0	80.0
18*	80.0	80.0	80.0	80.0	80.0	80.0	80.0	200.	101.	90.0	95.0	95.0
19	95.0	95.0	95.0	90.0	M	M	M	M	M	M	M	M
20	M	M	M	M	M	M	M	M	M	M	M	M
21	M	M	M	M	M	M	M	M	M	M	M	M
22	M	M	M	M	M	M	M	M	M	M	M	M
23*	M	M	M	M	M	M	M	95.0	95.0	176.	160.	160.
24*	160.	139.	101.	90.0	80.0	M	M	v	v	v	v	M
25*	M	M	M	M	34.0	38.0	38.0	80.0	38.0	38.0	38.0	38.0
26	38.0	38.0	38.0	38.0	M	M	M	M	M	M	M	M
27	M	M	M	M	24.0	21.0	21.0	21.0	21.0	21.0	18.0	18.0
28*	18.0	18.0	18.0	18.0	18.0	18.0	18.0	24.0	21.0	21.0	21.0	21.0
29	30.0	46.0	42.0	38.0	38.0	34.0	30.0	27.0	24.0	24.0	24.0	24.0
30	24.0	24.0	24.0	21.0	21.0	21.0	21.0	27.0	38.0	24.0	24.0	21.0
31	21.0	21.0	21.0	21.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0

*SPECIAL POINTS

3	1500/38.0											
6	1730/38.0											
7	0500/62.0											
8	1400/21.0											
9	0500/125.	2100/119.										
		0700/80.0										
11	2300/44.0											
12	0700/450.	1700/450.	2100/450.									
13	0300/245.	0500/168.	1500/113.	1900/160.								
14	0500/184.											
18	1500/80.0											
23	1460/215.											
24	0500/119.											
25	1500/38.0	1700/42.0										
28	1460/62.0											

RIVER GAGE DATA
 STA. NO. SR5 RIO CHUPURURO NEAR CAMPO MATA
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	18.0	18.0	18.0	18.0	18.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
2	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
3	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
4	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
5	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
6	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
7	15.0	15.0	15.0	15.0	15.0	15.0	27.0	24.0	18.0	18.0	18.0	15.0
8*	15.0	15.0	15.0	15.0	15.0	15.0	15.0	30.0	30.0	30.0	30.0	30.0
9	30.0	30.0	24.0	21.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0	18.0
10	18.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	16.8	24.0	21.0	21.0
11	21.0	18.0	15.0	15.0	15.0	15.0	15.0	M	30.0	24.0	24.0	21.0
12	21.0	21.0	18.0	18.0	18.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
13	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
14	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
15	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
16	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
17	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
18	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
19	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
20	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
21	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
22	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
23	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
24	15.0	15.0	21.0	30.0	38.0	30.0	27.0	24.0	21.0	18.0	18.0	18.0
25	18.0	18.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
26	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
27	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	12.0
28	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
29	15.0	15.0	15.0	15.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
30	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0

*SPECIAL POINTS

8 1500/27.0

RIVER GAGE DATA

NAME: Sta. No. SR6 Río Guepe near El Limón

LOCATION: Longitude $63^{\circ} 51.2'$ W, latitude $09^{\circ} 05.2'$ N. Approximately 45.3 km WNW of Oritupano, 1.2 km SW of El Limón.

DRAINAGE AREA: 47.4 sq mi (from topographic map).

GAGE: Model SR recorder attached to right downstream side of bridge.

RECORDS AVAILABLE: May 24, 1969 through September 30, 1969.

REMARKS: Record is fair to poor.

CODING: M signifies missing data; E signifies estimated data.



View looking downstream at the Río Guepe at bankful discharge. The bridge and SR recorder are about 300 feet upstream of this reach.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. SR6 RIO GUEPE NEAR EL LIMON

Meas. No.	Date	Made by	Stage ft	Discharge cfs	Method
1	July 10	Duke	1.0	13.5	Float-timing
2	11	Richardson	3.0	68.	Float-timing
3	12	Richardson	4.6	126.	Float-timing
4	Aug. 9	Stevens	4.3	145.	Float-timing
5	12	Stevens	9.3	525.	Float-timing
6	13	Stevens	8.0	386.	Float-timing
7	14	Stevens	8.0	311.	Float-timing
8	24	Stevens	9.8	679.	Float-timing
9	25	Santos	7.6	282.	Float-timing

RATING TABLE
FOR
STA. NO. SR6 RIO GUEPE NEAR EL LIMON

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00	0.00	2.00	36.0	4.00	110.	6.00	210.	8.00	350.	10.00	690.
.10	1.00	.10	39.0	.10	114.	.10	216.	.10	360.	.10	712.
.20	2.00	.20	42.0	.20	118.	.20	222.	.20	370.	.20	736.
.30	3.00	.30	45.0	.30	122.	.30	228.	.30	382.	.30	762.
.40	4.00	.40	48.0	.40	126.	.40	234.	.40	394.	.40	790.
.50	5.00	.50	51.0	.50	130.	.50	240.	.50	408.	.50	820.
.60	6.00	.60	54.0	.60	135.	.60	246.	.60	422.	.60	852.
.70	7.00	.70	58.0	.70	140.	.70	252.	.70	438.	.70	886.
.80	8.00	.80	62.0	.80	145.	.80	258.	.80	454.	.80	922.
.90	10.0	.90	66.0	.90	150.	.90	264.	.90	472.	.90	960.
1.00	12.0	3.00	70.0	5.00	155.	7.00	270.	9.00	490.	11.00	1000.
.10	14.0	.10	74.0	.10	160.	.10	277.	.10	510.	.10	
.20	16.0	.20	78.0	.20	165.	.20	284.	.20	530.	.20	
.30	18.0	.30	82.0	.30	170.	.30	291.	.30	550.	.30	
.40	20.0	.40	86.0	.40	175.	.40	299.	.40	570.	.40	
.50	22.0	.50	90.0	.50	180.	.50	307.	.50	590.	.50	
.60	24.0	.60	94.0	.60	186.	.60	315.	.60	610.	.60	
.70	27.0	.70	98.0	.70	192.	.70	323.	.70	630.	.70	
.80	30.0	.80	102.	.80	198.	.80	332.	.80	650.	.80	
.90	33.0	.90	106.	.90	204.	.90	341.	.90	670.	.90	

RIVER GAGE DATA
STA. NO. SR6 RIO GUEPE NEAR EL LIMON
MAY 1969
DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
24	M	M	M	M	M	36.0	36.0	36.0	36.0	36.0	36.0	36.0
25	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
26	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
27	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
28	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
29	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	42.0	42.0	42.0	42.0
30	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
31	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0

*SPECIAL POINTS
NONE

RIVER GAGE DATA
 STA. NO. SR6 RIO GUEPE NEAR EL LIMON
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
2	42.0	42.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
3	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
4	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
5	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
6	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
7	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
8	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
9	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
10	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
11	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
12	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
13	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
14	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
15	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
16	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
17	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
18	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
19	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	42.0	48.0	48.0	48.0
20	48.0	48.0	48.0	48.0	48.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0
21	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0	48.0
22	48.0	48.0	48.0	48.0	48.0	48.0	42.0	42.0	42.0	42.0	42.0	42.0
23	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
24	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
25	42.0	42.0	42.0	42.0	42.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0
26	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0	39.0
27	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
28	36.0	36.0	36.0	36.0	36.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
29	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
30	42.0	42.0	42.0	42.0	42.0	42.0	36.0	42.0	48.0	48.0	48.0	51.0

*SPECIAL POINTS
 NONE

RIVER GAGE DATA
 STA. NO. SR6 RIO GUEPE NEAR EL LIMON
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	48.0	48.0	51.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0
2	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0
3	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	51.0	51.0	51.0	51.0
4	51.0	51.0	51.0	51.0	51.0	51.0	48.0	48.0	48.0	M	M	M
5	M	M	M	M	M	M	M	M	M	M	M	M
6	M	M	M	M	M	36.0	36.0	30.0	24.0	24.0	24.0	24.0
7	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
8	20.0	20.0	20.0	20.0	20.0	30.0	48.0	51.0	51.0	51.0	51.0	51.0
9	51.0	51.0	48.0	42.0	36.0	30.0	24.0	24.0	22.0	20.0	16.0	12.0
10*	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	36.0	48.0	70.0	74.0
11*	78.0	74.0	70.0	70.0	70.0	70.0	74.0	82.0	145. E	145. E	145. E	145. E
12	145. E	145. E	145. E	145. E	145. E	135.	145.	145.	150.	150.	150.	150.
13	150.	140.	130.	122.	118.	114.	110.	106.	102.	98.0	98.0	94.0
14	90.0	82.0	78.0	74.0	70.0	58.0	54.0	51.0	51.0	45.0	45.0	45.0
15	45.0	45.0	45.0	45.0	42.0	42.0	39.0	36.0	36.0	36.0	36.0	36.0
16*	36.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0	39.0	39.0	62.0	58.0
17	54.0	54.0	70.0	78.0	90.0	110.	118.	135.	145.	150.	145.	135.
18*	130.	118.	110.	98.0	90.0	70.0	62.0	54.0	54.0	54.0	54.0	54.0
19	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0
20	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0
21	54.0	54.0	54.0	54.0	54.0	54.0	54.0	48.0	48.0	42.0	36.0	36.0
22	36.0	30.0	30.0	24.0	24.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
23	20.0	20.0	20.0	20.0	20.0	20.0	16.0	16.0	16.0	16.0	16.0	16.0
24	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	16.0	14.0
25*	14.0	14.0	14.0	12.0	12.0	12.0	12.0	16.0	24.0	70.0	70.0	70.0
26	70.0	66.0	54.0	42.0	33.0	22.0	20.0	20.0	16.0	16.0	16.0	14.0
27	12.0	12.0	12.0	12.0	12.0	12.0	12.0	8.00	8.00	8.00	8.00	8.00
28	8.00	8.00	8.00	8.00	8.00	8.00	8.00	12.0	12.0	12.0	12.0	12.0
29	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
30	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
31	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00

*SPECIAL POINTS
 10 1700/36.0 2100/54.0
 11 1700/145.E
 16 2100/51.0
 18 1100/78.0
 25 1900/58.0

RIVER GAGE DATA
 STA. NO. SR6 RIO GUEPE NEAR EL LIMON
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	8.00	12.0
2*	12.0	12.0	16.0	36.0	51.0	51.0	51.0	48.0	42.0	42.0	42.0	39.0
3	39.0	39.0	39.0	39.0	39.0	42.0	42.0	42.0	42.0	42.0	42.0	45.0
4	54.0	66.0	70.0	70.0	66.0	62.0	54.0	51.0	48.0	45.0	42.0	42.0
5	48.0	48.0	51.0	51.0	51.0	51.0	51.0	51.0	51.0	45.0	42.0	42.0
6	36.0	36.0	36.0	27.0	24.0	22.0	22.0	22.0	20.0	18.0	18.0	18.0
7	18.0	14.0	14.0	14.0	14.0	14.0	12.0	12.0	12.0	12.0	12.0	12.0
8	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	M	M
9	M	M	M	M	M	M	118.	126.	130.	130.	129.	118.
10*	110.	90.0	86.0	68.4	68.4	51.0	51.0	42.0	42.0	42.0	42.0	24.0
11	27.0	24.0	22.0	22.0	22.0	22.0	24.0	24.0	24.0	24.0	M	M
12	M	M	M	M	M	M	M	M	M	M	922.	922.
13	922.	736.	690.	690.	690.	690.	M	M	M	M	M	M
14	M	M	M	M	M	M	350.	350.	315.	284.	258.	234.
15*	222.	222.	198.	186.	145.	135.	135.	135.	135.	135.	135.	135.
16	135.	135.	135.	135.	135.	135.	135.	135.	135.	135.	135.	135.
17	135.	135.	135.	135.	135.	135.	135.	135.	135.	135.	135.	135.
18	135.	135.	135.	135.	135.	135.	135.	135.	135.	135.	135.	135.
19	135.	135.	135.	135.	M	M	M	M	M	M	M	M
20	M	M	M	M	M	M	M	M	M	M	M	M
21	M	M	M	M	M	66.0	62.0	58.0	54.0	58.0	70.0	70.0
22	M	M	M	M	M	M	M	M	M	M	M	M
23	M	M	M	M	M	M	M	M	M	M	M	M
24	M	M	M	M	M	630.	570.	530.	510.	472.	472.	510.
25	490.	454.	408.	370.	332.	315.	299.	M	M	M	M	M
26*	M	M	M	M	M	M	155.	130.	122.	114.	106.	98.0
27	94.0	90.0	86.0	82.0	82.0	74.0	66.0	66.0	62.0	66.0	78.0	86.0
28	102.	106.	90.0	74.0	66.0	62.0	62.0	54.0	51.0	48.0	48.0	48.0
29	48.0	48.0	48.0	45.0	45.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
30	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0	42.0
31	42.0	42.0	42.0	42.0	42.0	42.0	42.0	36.0	36.0	36.0	36.0	36.0

*SPECIAL POINTS
 2 0700/24.0 0900/48.0
 10 0300/94.0 0700/70.0 1100/51.0 2100/30.0
 15 0900/159.
 26 1500/140.

11-202

RIVER GAGE DATA
 STA. NO. SR6 RIO GUEPE NEAR EL LIMON
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	36.0	36.0	M	M	M	39.0	39.0	39.0	39.0	39.0	39.0	39.0
2	39.0	39.0	39.0	39.0	39.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
3	36.0	36.0	36.0	36.0	36.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
4	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
5	30.0	30.0	30.0	30.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
6	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
7	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
8*	27.0	27.0	27.0	27.0	27.0	27.0	24.0	24.0	24.0	36.0	58.0	90.0
9*	110.	110.	130.	140.	155.	175.	192.	210.	210.	210.	192.	180.
10*	165.	140.	126.	118.	110.	102.	94.0	94.0	90.0	90.0	90.0	86.0
11	86.0	86.0	86.0	90.0	94.0	102.	110.	118.	126.	130.	135.	145.
12	145.	145.	145.	145.	145.	145.	130.	130.	126.	122.	118.	118.
13	110.	110.	102.	102.	102.	98.0	98.0	98.0	98.0	98.0	98.0	98.0
14	94.0	94.0	90.0	86.0	82.0	74.0	70.0	66.0	62.0	54.0	51.0	51.0
15	51.0	48.0	42.0	42.0	42.0	42.0	42.0	42.0	36.0	30.0	30.0	30.0
16	30.0	30.0	30.0	36.0	36.0	36.0	30.0	30.0	30.0	30.0	30.0	30.0
17	30.0	30.0	30.0	30.0	30.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
18	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
19	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0
20	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	27.0	24.0
21	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0	24.0
22*	24.0	24.0	24.0	24.0	24.0	24.0	42.0	36.0	33.0	94.0	78.0	54.0
23	70.0	78.0	86.0	86.0	86.0	86.0	M	M	M	M	M	M
24	M	M	M	M	M	140.	130.	M	M	M	M	M
25	M	M	M	M	M	90.0	86.0	82.0	74.0	70.0	62.0	54.0
26	51.0	51.0	51.0	48.0	48.0	36.0	36.0	36.0	36.0	36.0	36.0	36.0
27	36.0	36.0	36.0	33.0	33.0	33.0	30.0	30.0	30.0	30.0	30.0	30.0
28	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0
29*	30.0	30.0	30.0	30.0	54.0	78.0	74.0	70.0	66.0	58.0	48.0	45.0
30	36.0	33.0	33.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

*SPECIAL POINTS

8	2100/54.0	2300/78.0										
9	0500/126.											
10	0300/145.											
22	1300/24.0	1900/70.0	2030/102.	2300/62.0								
29	0900/42.0	1100/70.0										

RIVER GAGE DATA

NAME: Sta. No. SR7 Río Purgatorio near El Purgatorio.

LOCATION: Longitude $63^{\circ} 57.6'$ W, latitude $09^{\circ} 24.7'$ N. Approximately 25.4 km W of Aguasay, 2.2 km NNE of El Purgatorio.

DRAINAGE AREA: 6.5 sq mi (from topographic map).

GAGE: Model SR recorder free-standing on right bank downstream of bridge.

RECORDS AVAILABLE: May 19, 1969 through September 30, 1969.

REMARKS: Record is fair. Discharge less than 2 cfs was not tabulated.

CODING: M signifies missing data; E signifies estimated data; blank signifies discharge less than 2 cfs.



Aerial view of the Río Purgatorio near El Purgatorio. The gaging site is at the extreme left side of the photograph.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. SR7 RIO PURGATORIO NEAR EL PURGATORIO

Meas. No.	Date	Made by	Stage ft	Discharge cfs	Method
1	Sept. 1	Duke	1.50	50.	Float-timing
2	1	Stevens	1.45	40.	Float-timing

PROVISIONAL RATING TABLE
FOR
STA. NO. SR7 RIO PURGATORIO NEAR EL PURGATORIO

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
1.00		2.00	202.	3.00	890.	4.00	2330.
.10	2.60	.10	250.	.10	980.	.10	2490.
.20	6.20	.20	305.	.20	1080.	.20	2650.
.30	12.0	.30	365.	.30	1200.	.30	
.40	22.0	.40	430.	.40	1340.	.40	
.50	37.0	.50	500.	.50	1500.	.50	
.60	58.0	.60	580.	.60	1680.	.60	
.70	86.0	.70	660.	.70	1850.	.70	
.80	120.	.80	740.	.80	2010.	.80	
.90	159.	.90	810.	.90	2170.	.90	

STA. NO. SR7 RIVER GAGE DATA
 RIO PURGATORIO NEAR EL PURGATORIO
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
19	M	M	M	M	M	M	M					
20												
21							8.70	8.70	M	M	M	M
22	M	M	M	M	M							
23												
24												
25												
26												
27												
28												
29*									334.	37.0	12.0	8.70
30	8.70	6.20	6.20	6.20	6.20	6.20	2.60					
31												

*SPECIAL POINTS
 29 1830/500.

STA. NO. SR7 RIVER GAGE DATA
 RIO PURGATORIO NEAR EL PURGATORIO
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1												
2												
3												
4												
5												
6												
7								6.20				
8												
9												
10												
11												
12												
13												
14												
15												
16												
17												
18								12.0	8.70			
19												
20								M	M	M	M	M
21	M	M	M	M	M							
22												
23										12.0	6.20	2.60
24	2.60	2.60	2.60									
25												
26												
27												
28												
29												
30												

*SPECIAL POINTS
 NONE

11-208

STA. NO. SR7 RIVER GAGE DATA
 RIO PURGATORIO NEAR EL PURGATORIO
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1												
2							6.20					
3												
4												
5												
6												
7												
8												
9												
10*								225.	8.70	28.8	4.13	4.13
11						2.60	305.	12.0	8.70	4.13	4.13	4.13
12*	2.60						701.	86.0	71.2	58.0	58.0	46.7
13	28.8	4.13	6.20	6.20	6.20	6.20	46.7	46.7	46.7	37.0	12.0	6.20E
14	2.60E			37.0	37.0	6.20E						
15							46.7	58.0	46.7	22.0 E	6.20E	
16										775.	159.	86.0
17										M	M	102.
18*	58.0	71.2	58.0	58.0	37.0	M	M	M	M			
19	46.7	M	M	M	M							
20												
21												
22												
23												
24												
25												
26												
27*			500.	71.2	37.0	12.0	6.20					
28												
29												
30												
31												

*SPECIAL POINTS
 10 1500/202. 1530/334. 1900/6.20
 12 1300/1850.
 18 2320/159.
 27 0500/500. 0520/810.

11-210

STA. NO. SR7 RIVER GAGE DATA
 RIO PURGATORIO NEAR EL PURGATORIO
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1												
2												
3												
4	M	M	M	M	M	M	M	M	M	M	M	M
5												
6												
7												
8												
9												
10												
11												
12												
13												
14												
15												
16				8.70	8.70	2.60						
17												
18												
19						M	M	M	M	M	M	M
20	M	M	M	M	M	M	M	M	M	M	M	M
21	M	M	M	M	M	M						
22												
23												
24												
25*							16.4	6.20				
26												
27												
28												
29												
30												
31												

*SPECIAL POINTS
 25 1300/139.

RIVER GAGE DATA
 STA. NO. SR7 RIO PURGATORIO NEAR EL PURGATORIO
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*						4.13	16.4	37.0	8.70	4.13	2.60	
2												
3												
4												
5												
6												
7												
8												
9												
10												
11*								159.	22.0	12.0	6.20	2.60
12												
13												
14												
15												
16												
17												
18												
19												
20												
21												
22												
23												
24*		120.	102.	22.0	22.0	12.0	8.70	6.20	2.60	2.60		
25												
26												
27												
28						M	M	M	M	M	M	M
29	M	M	M	M	M			M				
30								6.20				

*SPECIAL POINTS
 1 1440/58.0
 11 1500/4.13
 24 0445/277.

RIVER GAGE DATA

NAME: Sta. No. SR8 Río Seco near Campamento La Leona.

LOCATION: Longitude $63^{\circ} 46.6'$ W, latitude $08^{\circ} 59.4'$ N. Approximately 36.9 km WSW of Oritupano, 7.2 km ESE of Campamento La Leona.

DRAINAGE AREA: 9.1 sq mi (from topographic map).

GAGE: Model SR recorder attached to right bridge abutment on downstream side of bridge.

RECORDS AVAILABLE: May 20, 1969 through September 30, 1969.

REMARKS: Record is good.

CODING: M signifies missing data; E signifies estimated data.



View of the Río Seco near Campamento La Leona. The SR recorder is attached to the abutment on the right side of the river. As the name would suggest, the Río Seco is nearly always dry.

SUMMARY OF DISCHARGE MEASUREMENTS
FOR
STA. NO. SR8 RIO SECO NEAR CAMPAMENTO LA LEONA

Meas. No.	Date	Made by	Stage ft	Discharge cfs	Method
1	July 12	Richardson	0.7	108.	Float-timing
2	Aug. 23	Holland	0.9	140.	Float-timing
3	23	Holland	0.9	140.	Float-timing
4	23	Stevens	0.2	15.	Float-timing

RATING TABLE
FOR
STA. NO. SR8 RIO SECO NEAR CAMPAMENTO LA LEONA

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00	0.00	1.00	160.
.10	5.00	.10	178.
.20	15.0	.20	196.
.30	30.0	.30	
.40	48.0	.40	
.50	66.0	.50	
.60	85.0	.60	
.70	104.	.70	
.80	123.	.80	
.90	142.	.90	

RIVER GAGE DATA
 RIO SECO NEAR CAMPAMENTO LA LEONA
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
20	M	M	M	M	M	M	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*SPECIAL POINTS

NONE

RIVER GAGE DATA
 STA. NO. SR8 RIO SECO NEAR CAMPAMENTO LA LFONA
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	48.0	15.0	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	M	M	M	M	M
19	M	M	M	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.0	66.0	15.0
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*SPECIAL POINTS

NONE

11-216

RIVER GAGE DATA
 STA. NO. SRR RIO SECO NEAR CAMPAMENTO LA LEONA
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	123.	66.0	48.0	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12*	0.00	0.00	0.00	30.0	48.0	85.0	104.	66.0	30.0	5.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.0	30.0	15.0
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*SPECIAL PRINTS

10 1700/85.0
 12 1500/123.
 18 2250/65.0

RIVER GAGE DATA
 STA. NO. SRR RIO SECO NEAR CAMPAMENTO LA LEONA
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	104.	104.	66.0
4	66.0	30.0	15.0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	5.00	142.	142.	66.0	66.0
9	66.0	30.0	15.0	5.00	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	M	M	M	M	M	M	M	0.00	0.00	0.00	0.00	0.00
12*	196.	104.	85.0	48.0	48.0	15.0	15.0	5.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16*	0.00	0.00	0.00	85.0	48.0	15.0	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18*	48.0	15.0	15.0	15.0	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23*	0.00	0.00	0.00	142.	30.0	15.0	5.00	196.	142.	123.	M	M
24*	M	M	M	0.00	0.00	0.00	0.00	0.00	0.00	30.0	30.0	66.0
25	30.0	15.0	5.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*SPECIAL POINTS

3	1900/0.00	
8	1900/160.	
12	0100/0.00	
16	0700/0.00	
18	0020/0.00	0030/48.0
23	0700/160.	1520/15.0
24	1930/48.0	2300/85.0

RIVER GAGE DATA
 STA. NO. SR8 RIO SECO NEAR CAMPAMENTO LA LEONA
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	15.6	5.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*SPECIAL POINTS

1	144670.00
11	1900730.0

RIVER GAGE DATA

NAME: Sta. No. SR9 Quebrada Mapiricure o San Miguel near El Aceite.

LOCATION: Longitude $64^{\circ} 11.2'$ W, latitude $09^{\circ} 05.1'$ N. Approximately 32 km SE of Cantaura, 5.1 km S of El Aceite.

DRAINAGE AREA: 0.6 sq mi (from topographic map).

GAGE: Model SR recorder at right upstream end of 2 culverts under road embankment.

RECORDS AVAILABLE: May 24, 1969 through September 30, 1969.

REMARKS: Record is fair to poor. Shifting control method was applied from May 24 through September 30. No measurements were made.

CODING: M signifies missing data; E signifies estimated data.



View of the Quebrada Mapiricure looking upstream from the culverts. This reach of stream has been surveyed in detail.

*RATING TABLE
FOR
STA. NO. SR9 QUEBRADA MAPIRICURE O SAN MIGUEL NEAR EL ACEITE

Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs	Gage Height feet	Dis-charge cfs
0.00	0.00	1.00	12.0	2.00	56.0	3.00	141.	4.00	238.
.10	0.50	.10	15.0	.10	63.0	.10	150.	.10	
.20	1.00	.20	18.0	.20	70.0	.20	159.	.20	
.30	2.00	.30	22.0	.30	78.0	.30	168.	.30	
.40	3.00	.40	26.0	.40	87.0	.40	178.	.40	
.50	4.00	.50	30.0	.50	96.0	.50	188.	.50	
.60	5.00	.60	34.0	.60	105.	.60	198.	.60	
.70	6.00	.70	39.0	.70	114.	.70	208.	.70	
.80	8.00	.80	44.0	.80	123.	.80	218.	.80	
.90	10.0	.90	50.0	.90	132.	.90	228.	.90	

* The stage-discharge curve is computed from culvert hydraulics. No measurements were made.

STA. NO. SR9 RIVER GAGE DATA
 QUERRADA MAPIRICURE O SAN MIGUEL NEAR FL ACEITE
 MAY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*SPECIAL POINTS

NOTE

RIVER GAGE DATA
 STA. NO. SR9 QUEBRADA MAPIRICURE O SAN MIGUEL NEAR EL ACEITE
 JUNE 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*SPECIAL POINTS

30 1900/1.00

11-224

RIVER GAGE DATA
 STA. NO. SR9 QUERRADA MAPIRICURE O SAN MIGUEL NEAR EL ACEITE
 JULY 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	1.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	M	M	M	M	M	M	M
11*	M	M	M	M	M	M	M	.28	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16*	0.00	0.00	0.00	0.00	0.00	0.00	.28	6.00	M	M	M	M
17	M	M	M	M	M	M	M	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22*	0.00	0.00	0.00	0.00	0.00	0.00	1.00	.50	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*SPECIAL POINTS

1	1430/ .50			
11	1500/1.00			
16	1300/ .28	1500/6.94	1540/8.00	
22	1100/4.00			

RIVER GAGE DATA
 STA. NO. SR9 QUEBRADA MAPIRICURE U SAN MIGUEL NFAR EL ACEITE
 AUGUST 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.4	2.50	.50	.28
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.00	2.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
11*	0.00	0.00	0.00	0.00	0.00	0.00	1.47	0.00	0.00	0.00	8.00	2.00
12*	13.4	2.00	.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13*	0.00	0.00	0.00	0.00	0.00	.28	.28	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
23*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.50	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	.72	.28	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
31	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*SPECIAL POINTS

3	1720/0.00	1740/59.4										
8	1420/0.00	1440/13.4	1500/12.0		1640/2.50	1725/4.00						
11	1320/0.00	1340/3.00	1420/0.00		2050/0.00	2125/56.0						
12	0030/28.0	0040/16.4	0100/31.9									
13	1300/ .72											
23	1620/0.00	1625/ .72										
28	1440/0.00	1530/2.50										

RIVER GAGE DATA
 STA. NO. 589 QUEBRADA MAPIRICURE O SAN MIGUEL NEAR EL ACEITE
 SEPTEMBER 1969
 DISCHARGE IN CFS

DAY	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
5	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
10*	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	3.50	.72	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
16	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
17	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
18	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22*	0.00	0.00	0.00	0.00	0.00	0.00	2.50	.28	0.00	0.00	0.00	0.00
23	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
26	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
27	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
28	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
29	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

*SPECIAL PRINTS

10 1640/0.30 1730/5.00
 22 1300/0.00

CHAPTER III
RIVER SEDIMENTS

INTRODUCTION

During the summer of 1969 measurements were made of the suspended sediment discharges on the three main rivers leaving the study drainage area. Also, a few suspended sediment discharges were measured on the rivers within the drainage area.

Bed-material samples were collected at 15 primary and 6 secondary discharge gaging stations and at 9 other selected river cross-sections. All bed-material samples were sieved to obtain the size gradation of the bed-material larger than 0.062 mm.

The river bank materials were visually inspected and qualitatively described for sections of the rivers at the 16 primary and the 9 secondary discharge gaging stations and at a few other locations.

The suspended sediment discharge data, bed-material size analyses and the descriptions of the bank materials are given in this chapter.

SUSPENDED SEDIMENT DISCHARGE

Measurements of the suspended sediment discharge were made throughout the summer of 1969 at four discharge gaging stations; the Río Aribí at Paso de Aribí, and the Ríos Tigre, Guanipa and Amana at the crossing of the Maturín-Temblador road.

The U.S. D-49 depth-integrating suspended-sediment sampler was used and the field methods for the measurement of fluvial sediment recommended by the U.S. Geological Survey [5] were employed.

At the three stations on the Maturín-Temblador road, the cross-section was initially sampled three times at five vertical sections. Thus a total of 15 samples were collected for one suspended sediment discharge measurement. When it was found that the lateral concentration of sediments did not vary to any extent, the number of vertical sections was reduced to three. Three samples were taken at each vertical, yielding nine samples per measurement. The concentration of each sample was determined individually. If any one sample had a concentration greatly different from the other two taken at the same vertical, that sample was not used in computing the measured suspended sediment discharge.

Three samples taken at each of three vertical sections on the Río Aribí at Paso de Aribí were sufficient. The Río Aribí is much narrower than the other three rivers.

The suspended sediment discharge was measured once at three other locations; the Río Amana near El Tejero and the Río Guanipa at El Aceite and at Los Palos Blancos. Measurements were discontinued chiefly because the water depths were very small.

The data and measured suspended sediment discharges for the four sediment discharge stations are presented in the following tables. The measured suspended sediment discharge was computed with the equation

$$Q_s = 0.0027 CQ$$

where Q_s is the measured suspended sediment transport rate in tons/day, C is the average concentration in ppm by weight and Q is the water discharge in cfs.

In some cases, enough suspended sediment was collected in the nine samples that a visual accumulation tube size analysis could be done. The results of those analyses are also given.

MEASURED SUSPENDED SEDIMENT DISCHARGE
 STA. NO. 15 RIO ARIBI AT PASO DE ARIBI
 1969

Date	Stage ft	Dis-charge cfs	Water Temperature °F	No. of Samples	No. of Vertical Sections	Average Depth in the Verticals ft	Average Concentration of Suspended Sediments ppm	Measured Suspended Sediment Discharge tons/day	Per-cent Sand %	Size Analysis of Sands
July 9	1.165	79.8	78	9	3	1.3	74	15.9	17.5	partial
July 14	4.54	432.	77	9	3	4.6	406	474.	35	partial
July 18	11.10	1680.	80	9	3	10.1	206	934.	20	partial
July 22	3.585	311.	81	9	3	4.1	112	94.0	34	partial
July 25	2.17	164.	78	9	3	2.2	92	40.7	-	none
Aug. 9	6.94	751.	76	9	3	7.1	88	178.	-	see Page III-7
Aug. 18	3.48	300.	86	9	3	3.9	138	112.	-	see Page III-7
Sept. 8	1.26	88.4	-	9	3	1.1	57	13.6	-	see Page III-7
Sept. 26	1.00	64.0	-	9	3	-	22	3.80	-	see Page III-7

MEASURED SUSPENDED SEDIMENT DISCHARGE
 STA. NO. 17 RIO TIGRE AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD
 1969

Date	Stage ft	Dis-charge cfs	Water Temperature °F	No. of Samples	No. of Vertical Sections	Average Depth in the Verticals ft	Average Concentration of Suspended Sediments ppm	Measured Suspended Sediment Discharge tons/day	Per-cent Sand %	Size Analysis of Sands
June 3	0.26	873.	88	15	5	4.3	90	212.	-	none
July 10	0.695	1250.	81	9	3	5.7	165	557.	-	none
July 14	2.36	2300.	82	9	3	8.1	252	1560.	42	partial
July 19	5.68	4950.	82	9	3	11.9	333	4450.	-	none
July 25	2.99	2710.	80	9	3	8.8	136	995.	30	partial
Aug. 8	4.55	4040.	79	9	3	10.6	184	2010.	-	see Page III-7
Aug. 12	2.37	2310.	85	9	3	8.4	392	2440.	-	see Page III-7
Aug. 19	4.96	4440.	84	9	3	9.9	298	3570.	-	see Page III-7
Aug. 20	5.53	4870.	68	9	3	11.6	365	4800.	-	see Page III-7
Aug. 21	6.28	5280.	-	9	3	12.8	228	3250.	-	see Page III-7
Aug. 23	5.63	4930.	-	9	3	12.4	248	3300.	-	see Page III-7
Sept. 9	2.25	2240.	-	9	3	7.4	184	1110.	-	see Page III-7
Sept. 26	0.94	1490.	-	9	3	4.5	176	710.	-	see Page III-7

MEASURED SUSPENDED SEDIMENT DISCHARGE
 STA. NO. 31 RIO GUANIPA AT EL ACEITE
 1969

Date	Stage	Dis-charge	Water Temperature	No. of Samples	No. of Vertical Sections	Average Depth in the Verticals	Average Concentration of Suspended Sediments	Measured Suspended Sediment Discharge	Percent Sand	Size Analysis of Sands
	ft	cfs	°F			ft	ppm	tons/day	%	
May 29	0.61	157.	82	15	3	1.3	134	56.8	-	none

MEASURED SUSPENDED SEDIMENT DISCHARGE
 STA. NO. 32 RIO GUANIPA AT LOS PALOS BLANCOS
 1969

Date	Stage	Dis-charge	Water Temperature	No. of Samples	No. of Vertical Sections	Average Depth in the Verticals	Average Concentration of Suspended Sediments	Measured Suspended Sediment Discharge	Percent Sand	Size Analysis of Sands
	ft	cfs	°F			ft	ppm	tons/day	%	
June 2	0.605	151.	83	12	4	1.5	78	31.8	-	none

MEASURED SUSPENDED SEDIMENT DISCHARGE
 STA. NO. 35 RIO GUANIPA AT THE CROSSING OF THE MATORIN-TEMBLADOR ROAD
 1969

Date	Stage	Dis-charge	Water Temperature	No. of Samples	No. of Vertical Sections	Average Depth in the Verticals	Average Concentration of Suspended Sediments	Measured Suspended Sediment Discharge	Percent Sand	Size Analysis of Sands
	ft	cfs	°F			ft	ppm	tons/day	%	
June 3	4.54	331.	84	15	5	1.2	215	192.	-	none
July 15	7.23	2110.	79	9	3	4.1	5600	31900.	38	partial
July 19	6.32	1220.	82	9	3	2.5	2150	7080.	36	partial
July 21	6.04	1020.	87	9	3	2.3	589	1620.	37	partial
July 27	5.89	933.	79	9	3	2.4	351	884.	43.5	partial
Aug. 8	6.17	1110.	78	9	3	3.1	1545	4630.	-	see Page III-7
Aug. 13	7.78	2570.	80	9	3	4.6	5992	41580.	-	see Page III-7
Aug. 14	6.52	1390.	80	9	3	3.1	1897	7120.	-	see Page III-7

MEASURED SUSPENDED SEDIMENT DISCHARGE
 STA. NO. 51 RIO AMANA NEAR EL TEJERO
 1969

Date	Stage ft	Dis-charge cfs	Water Temperature °F	No. of Samples	No. of Vertical Sections	Average Depth in the Verticals ft	Average Concentration of Suspended Sediments ppm	Measured Suspended Sediment Discharge tons/day	Percent Sand %	Size Analysis of Sands
May 30	0.94	100.	82	14	5	1.3	75	20.2	-	none

MEASURED SUSPENDED SEDIMENT DISCHARGE
 STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD
 1969

Date	Stage ft	Dis-charge cfs	Water Temperature °F	No. of Samples	No. of Vertical Sections	Average Depth in the Verticals ft	Average Concentration of Suspended Sediments ppm	Measured Suspended Sediment Discharge tons/day	Percent Sand %	Size Analysis of Sands
June 3	3.23	118.	84	15	5	2.1	38	12.1	-	none
July 10	3.48	137.	81	9	3	2.7	32	11.8	-	none
July 20	5.40	369.	82	9	3	4.3	110	110.	-	none
July 27	4.40	237.	80	9	3	3.2	60	38.4	23	partial
Aug. 9	5.38	366.	78	9	3	4.4	84	83.0	-	none
Aug. 13	5.95	464.	81	6	3	5.4	108	135.	-	see Page III-7

SIZE ANALYSIS OF SUSPENDED SEDIMENT
 STA. NO. 15 RIO ARIBI AT PASO DE ARIBI
 1969

PERCENT FINER THAN:								
Date	1.0 mm	0.5 mm	0.35 mm	0.25 mm	0.175 mm	0.125 mm	0.088 mm	0.062 mm
Aug. 9					100.	98.6	93.7	90.9
Aug. 18				100.	97.8	91.5	82.2	77.8
Sept. 8	100.	98.4	95.2	88.8	65.5	31.5	15.6	11.9
Sept. 26	100.	89.6	82.6	82.6	82.6	65.2	51.4	51.4

STA. NO. 17 RIO TIGRE AT THE CROSSING OF THE MATURIN-TEMBLADOR ROAD

PERCENT FINER THAN:								
Date	1.0 mm	0.5 mm	0.35 mm	0.25 mm	0.175 mm	0.125 mm	0.088 mm	0.062 mm
Aug. 8			100.	97.2	90.2	74.7	63.5	57.9
Aug. 12				100.	82.0	73.1	68.6	46.1
Aug. 19		100.	98.3	91.5	69.5	59.4	49.8	44.2
Aug. 20		100.	98.7	96.8	77.2	70.4	66.2	65.4
Aug. 21	100.	95.2	92.8	72.2	57.8	50.1	42.9	39.7
Aug. 23	100.	81.1	70.4	44.9	38.4	33.4	29.0	27.6
Sept. 9				100.	99.3	95.3	88.2	85.3
Sept. 26				100.	67.0	55.7	50.0	50.0

STA. NO. 35 RIO GUANIPA AT THE CROSSING OF THE MATURIN-TEMBLADOR ROAD

PERCENT FINER THAN:								
Date	1.0 mm	0.5 mm	0.35 mm	0.25 mm	0.175 mm	0.125 mm	0.088 mm	0.062 mm
Aug. 8	100.	99.9	99.7	98.8	94.4	93.8	93.8	93.5
Aug. 13	100.	97.8	94.9	87.0	76.1	71.7	68.8	66.7
Aug. 14		100.	99.5	98.2	90.6	85.7	81.3	78.9

STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATURIN-TEMBLADOR ROAD

PERCENT FINER THAN:								
Date	1.0 mm	0.5 mm	0.35 mm	0.25 mm	0.175 mm	0.125 mm	0.088 mm	0.062 mm
Aug. 13			100.	97.5	92.5	91.2	88.8	87.5

BED MATERIAL

River bed-material samples were collected at the 30 locations in the drainage area shown on Figure III-1.

Where the river cross-section could be waded the US BHM-53 piston-type bed-material sampler was used; at deeper sections samples were obtained from the bridges with a US BMH-54 100-pound bed-material sampler.

At each location, 10 bed-material samples were collected equidistant across the bed of the stream from the toe of one bank to the toe of the other bank. Each sample contained about one pint of bed material. The samples were numbered consecutively from one side to the other. The 10 samples so collected were examined visually and samples which appeared to have essentially the same size composition were mixed together before the size analyses was done.

The size analyses given in the following tables were determined by sieving. Materials finer than 0.062 mm were not analyzed.

The Río Areo at Hato Areito is located about two km upstream of the gaging station number 11.

For the Río Tigre at Las Piedritas, the bed-material samples were taken in the Río Tigre immediately upstream of its confluence with the Río Oritupano.

The location of the section of the Río Oritupano near Pelayo is upstream of the confluence of the Río Guibimba with the Río Oritupano.

The village called Tonoro is on the Río Tonoro immediately upstream of its confluence with the Río Tácata.

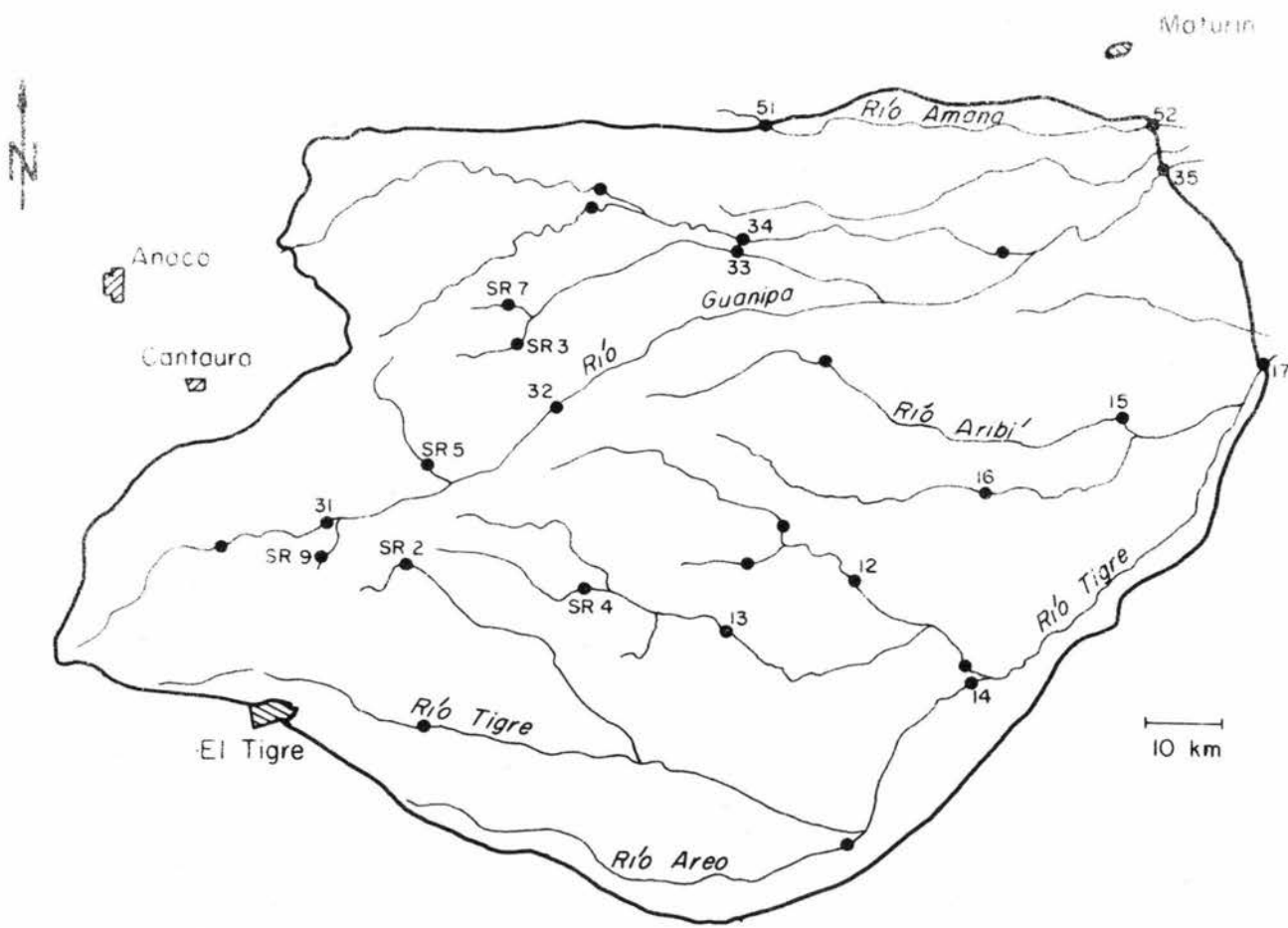


FIGURE III-1 SITES WHERE BED-MATERIAL SAMPLES WERE COLLECTED

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. 12 RIO ORITUPANO AT LOS CARACAS
 SAMPLE COLLECTED: AUGUST 30, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1				100.	99.3	98.1	90.7	81.4	69.1	44.1	12.2	1.6	0.2	0.1	Samples 1, 2, 3 combined. Samples 4, 5 combined. Samples 6, 7, 8, 9, 10 combined.
2						100.	99.9	99.6	97.7	88.4	49.5	11.5	2.3	1.3	
3				100.	99.7	99.5	97.1	92.9	83.7	60.7	26.1	4.4	0.4	0.2	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. 13 RIO CHIVE AT LA COLMENA
 SAMPLE COLLECTED: AUGUST 30, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1						100.	99.9	99.4	97.7	87.0	15.9	1.8	0.4	0.3	Samples 1, 2, 3 combined. Samples 4, 5, 6 combined. Samples 7, 8, 9, 10 combined.
2						100.	99.7	98.8	95.9	83.9	18.1	2.0	0.2	0.2	
3								100.	99.9	99.9	87.1	19.2	3.5	2.0	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. 14 RIO TIGRE AT LAS PIEDRITAS
 SAMPLE COLLECTED: SEPTEMBER 11, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1										100.	96.1	14.7	1.0	0.5	Left bank
2										100.	85.3	5.2	0.2	0.1	
3								100.	99.9	99.0	68.4	3.2	0.1	0.0	
4								100.	99.9	99.7	44.8	1.6	0.1	0.0	
5								100.	99.9	95.8	22.1	0.7	0.1	0.0	
6		100.	97.1	97.1	96.3	94.3	89.9	86.8	79.2	48.9	5.0	0.3	0.1	0.1	Right bank
7						100.	99.9	99.7	98.5	81.8	8.0	0.3	0.0	0.0	
8		100.	97.5	95.5	88.7	86.0	69.4	57.3	41.2	19.0	3.4	0.3	0.0	0.0	
9		100.	92.3	90.3	81.1	76.0	65.2	57.6	42.4	23.2	4.9	0.6	0.0	0.0	
10				100.	99.2	99.2	98.5	97.1	89.9	51.6	12.7	4.7	0.3	0.1	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. 15 RIO ARIBI AT PASO DE ARIBI
 SAMPLE COLLECTED: AUGUST 27, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1						100.	99.7	98.6	96.2	92.4	83.3	40.2	13.4	8.9	Samples 1, 10 combined. Samples 2, 3, 4, 5, 6, 7 combined. Samples 8, 9 combined.
2	100.	95.3	74.0	62.7	49.3	44.5	28.3	18.6	12.8	9.7	3.4	0.4	0.1	0.0	
3			100.	98.5	96.6	94.5	91.0	89.4	86.1	68.4	8.3	0.5	0.1	0.1	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. 16 RIO NATO AT LAS GAVIOTAS
 SAMPLE COLLECTED: AUGUST 30, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1				100.	98.1	96.3	83.9	74.0	67.6	61.0	22.6	3.8	0.8	0.7	Samples 1, 2, 3 combined. Samples 4, 5 combined. Sample 6. Samples 7, 9 combined. Sample 8. Sample 10.
2				100.	99.0	97.9	87.5	81.8	78.1	70.8	21.7	4.3	1.1	0.9	
3						100.	99.2	98.3	95.1	75.6	14.3	1.2	0.3	0.2	
4					100.	99.8	98.7	95.6	87.7	67.6	17.2	2.1	0.4	0.3	
5					100.	99.9	97.7	94.4	91.3	80.0	29.4	5.5	1.0	0.8	
6				100.	99.0	96.7	80.1	63.9	48.6	35.7	13.1	0.8	0.1	0.1	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. 17 RIO TIGRE AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD
 SAMPLE COLLECTED: AUGUST 27, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1						100.	99.8	99.0	98.0	93.5	84.3	48.6	16.0	10.3	Samples 1, 10 combined. Samples 2, 3, 4, 8, 9 combined. Samples 5, 6, 7 combined. Sample 11. Sample 12.
2						100.	99.9	99.5	97.6	91.2	21.3	4.4	0.7	0.4	
3						100.	99.7	97.8	88.1	66.6	14.5	1.0	0.1	0.0	
4						100.	99.9	99.3	97.4	91.5	20.4	1.7	0.1	0.0	
5						100.	99.9	98.3	90.6	68.2	15.4	4.4	1.9	1.5	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. 31 RIO GUANIPA AT EL ACEITE
 SAMPLE COLLECTED: AUGUST 30, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1						100.	99.7	99.5	98.8	95.3	45.0	4.7	0.2	0.1	Samples 1, 2, 9, 10 combined. Samples 3, 4, 5, 6 combined. Samples 7, 8 combined.
2						100.	99.0	96.7	90.6	79.5	28.3	2.8	0.1	0.1	
3				100.	99.7	99.7	99.5	99.1	98.6	95.9	32.8	3.2	0.1	0.0	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. 32 RIO GUANIPA AT LOS PALOS BLANCOS
 SAMPLE COLLECTED: AUGUST 30, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1						100.	99.9	99.5	99.0	98.9	93.5	5.9	0.2	0.1	Sample 2. Samples 3, 4, 5, 6 combined. Samples 7, 8 combined. Samples 9, 10 combined.
2						100.	99.9	99.2	97.0	91.9	35.3	0.5	0.0	0.0	
3						100.	99.9	99.6	96.8	86.8	28.6	0.4	0.0	0.0	
4				100.	98.7	98.7	97.7	97.0	96.5	95.9	90.0	39.4	30.0	29.5	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. 33 RIO CARIS AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD
 SAMPLE COLLECTED: AUGUST 27, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1				100.	99.2	99.0	94.8	86.1	76.0	54.6	15.4	6.0	1.7	1.1	Samples 1, 9, 10 combined. Sample 2. Sample 3. Sample 4. Sample 5.
2		100.	98.3	96.6	88.7	83.5	61.8	41.7	29.2	19.8	3.9	1.4	0.5	0.4	
3		100.	97.7	96.3	87.2	83.5	59.5	35.6	20.8	11.0	2.0	0.6	0.2	0.2	
4		100.	98.7	93.1	85.8	81.0	60.0	38.6	23.2	11.3	3.1	0.6	0.2	0.1	
5		100.	94.2	89.3	80.0	74.8	58.1	46.2	37.5	27.4	7.4	0.5	0.0	0.0	
6		100.	100.	99.0	99.0	98.8	94.7	88.7	82.9	30.4	11.3	2.0	0.1	0.1	Samples 6, 7, 8 combined.

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. 34 RIO TONORO AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD
 SAMPLE COLLECTED: AUGUST 27, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1		100.	96.7	96.7	94.7	93.6	85.9	76.6	66.0	43.1	7.7	2.9	1.4	1.1	Samples 1, 6 combined. Sample 2. Samples 3, 4, 5 combined. Sample 7. Samples 8, 9, 10 combined.
2				100.	97.1	95.5	78.1	61.5	48.9	30.5	6.6	2.0	0.6	0.4	
3		100.	95.9	94.2	91.2	88.6	75.4	64.9	56.6	42.1	12.1	3.6	1.3	0.9	
4		100.	97.9	96.3	92.9	90.5	78.8	67.4	57.4	39.8	8.2	0.6	0.1	0.1	
5				100.	99.9	99.7	98.0	95.9	93.2	83.4	21.3	1.8	0.3	0.2	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. 35 RIO GUANIPA AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD
 SAMPLE COLLECTED: AUGUST 27, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1				100.	96.8	95.4	91.4	85.8	78.9	60.5	9.6	0.6	0.0	0.0	Samples 1, 2, 3 combined. Samples 4, 5, 6, 8 combined. Sample 7. Samples 9, 10 combined.
2						100.	99.8	99.7	99.4	96.7	35.9	1.8	0.1	0.0	
3		100.	94.7	89.2	82.3	69.2	65.6	55.6	45.8	30.1	7.8	0.5	0.0	0.0	
4			100.	99.6	99.0	99.0	96.6	94.5	92.3	86.2	23.7	1.4	0.1	0.0	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. 51 RIO AMANA NEAR EL TEJERO
 SAMPLE COLLECTED: SEPTEMBER 3, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1			100.	96.7	94.6	93.3	88.8	83.4	80.7	76.5	71.5	59.1	27.3	21.9	Left bank Right bank
2						100.	99.3	98.5	96.5	69.4	20.3	1.8	0.2	0.1	
3						100.	96.2	90.6	80.8	40.4	7.1	0.8	0.1	0.0	
4						100.	99.1	96.9	89.0	45.9	5.8	0.4	0.0	0.0	
5				100.	99.7	99.1	91.1	78.0	61.2	29.9	3.2	0.2	0.1	0.0	
6					100.	99.8	98.5	93.3	78.2	43.0	8.5	0.5	0.1	0.0	
7						100.	98.6	94.7	87.0	54.4	7.6	0.3	0.0	0.0	
8						100.	99.6	98.4	94.7	65.7	8.8	0.3	0.0	0.0	
9							100.	99.8	99.3	89.9	19.1	1.2	0.1	0.0	
10								100.	99.8	97.4	44.5	5.0	0.4	0.2	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD
 SAMPLE COLLECTED: AUGUST 27, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1							100.	99.9	99.4	96.2	76.3	29.8	6.0	3.3	Samples 1, 9, 10 combined. Samples 5, 7 combined. Samples 2, 3, 4, 8 combined. Sample 6.
2						100.	99.8	98.2	88.7	20.9	1.2	0.4	0.1	0.1	
3							100.	99.9	99.7	84.4	18.4	4.1	0.8	0.5	
4						100.	97.6	82.4	46.0	5.4	0.3	0.1	0.0	0.0	

ANALYSIS OF BED MATERIAL SAMPLES
 RIO AREO AT HATO "AREITO"
 SAMPLE COLLECTED: SEPTEMBER 25, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1		100.	99.2	98.5	97.6	96.5	95.0	92.9	90.3	80.7	37.8	5.5	0.7	0.4	Left bank, some organic material
2		100.	96.1	94.8	93.6	91.2	74.2	50.8	33.2	21.2	8.6	1.4	0.1	0.0	
3						100.	98.5	81.0	35.3	19.7	12.6	1.9	0.0	0.0	Some organic material
4						100.	99.8	98.1	64.9	18.5	5.5	1.0	0.0	0.0	
5							100.	99.3	91.1	59.2	12.0	0.4	0.0	0.0	
6								100.	97.4	80.3	17.4	0.5	0.0	0.0	Right bank
7								100.	99.8	97.7	60.3	3.4	0.3	0.1	
8								100.	99.7	96.6	58.5	3.8	0.2	0.0	
9								100.	99.3	95.5	49.1	3.7	0.1	0.0	
10								100.	99.9	99.4	87.5	11.0	0.5	0.2	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. SR2 RIO AISME NEAR EL AISME
 SAMPLE COLLECTED: SEPTEMBER 8, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1		100.	97.8	94.9	92.2	89.4	72.5	54.9	39.0	30.8	21.5	11.5	4.8	3.8	Right bank
2			100.	98.7	97.1	96.6	93.2	83.6	58.5	37.3	16.0	2.6	0.7	0.5	
3				100.	99.0	98.8	96.3	93.0	88.4	77.0	39.3	6.2	1.4	1.0	
4				100.	95.7	93.0	83.9	73.1	53.8	29.0	10.9	2.3	0.4	0.3	
5				100.	95.6	93.7	88.5	81.1	61.0	29.0	12.1	2.8	0.6	0.4	
6					100.	98.6	95.2	89.8	74.5	43.5	14.9	5.0	0.4	0.2	Left bank
7	100.	94.4	91.7	90.5	90.1	88.3	82.1	71.5	55.5	33.1	11.0	2.8	0.8	0.6	
8					100.	99.2	98.7	98.1	93.9	87.1	49.9	15.1	4.1	3.0	
9					100.	99.2	97.2	93.3	80.9	57.6	29.9	14.9	5.3	4.5	
10					100.	99.9	99.8	99.8	99.6	96.8	90.8	49.1	13.0	9.5	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. SR3 RIO CARISITO NEAR CARISITO
 SAMPLE COLLECTED: SEPTEMBER 3, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1		100.	95.0	93.9	88.3	86.0	73.7	62.9	55.3	47.0	14.9	1.2	0.2	0.2	Left bank
2		100.	98.4	94.5	88.8	85.1	63.5	45.3	35.4	28.4	7.6	0.8	0.3	0.2	
3		100.	95.3	89.6	80.5	75.4	47.1	30.6	23.9	19.3	5.9	0.9	0.2	0.1	
4		100.	97.2	92.2	84.2	78.5	52.4	36.2	29.0	24.1	8.5	1.7	0.6	0.4	
5		100.	98.6	95.3	88.1	81.8	54.8	31.6	21.2	16.7	6.7	0.5	0.1	0.1	
6		100.	97.4	94.1	88.1	83.4	62.9	43.9	34.1	27.3	9.3	1.7	0.4	0.3	Right bank
7		100.	97.8	94.8	88.1	85.5	70.6	52.9	38.6	28.7	12.0	3.7	1.4	1.0	
8		100.	99.2	98.1	95.7	92.6	81.1	69.1	61.0	51.6	14.3	1.0	0.2	0.1	
9		100.	99.0	97.9	93.1	90.4	73.0	54.6	40.7	27.4	6.2	0.6	0.2	0.1	
10				100.	96.5	92.4	73.8	53.3	37.8	24.7	7.8	3.3	1.3	0.9	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. SR4 RIO CHIVE NEAR CAMPAMENTO LA LEONA
 SAMPLE COLLECTED: SEPTEMBER 8, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1									100.	99.8	95.3	46.8	25.7	23.6	Right bank
2									100.	99.2	91.8	33.5	13.3	12.1	
3								100.	99.6	97.0	82.3	36.1	20.0	18.3	
4						100.	86.7	75.8	68.4	59.2	29.0	8.7	3.6	2.9	
5						100.	96.1	90.6	84.4	73.0	33.7	4.5	0.9	0.5	
6						100.	95.8	86.3	80.5	75.4	68.9	38.4	17.6	14.3	
7					100.	99.4	93.8	86.6	85.2	82.9	68.5	23.2	9.8	8.0	
8					100.	98.8	96.5	86.4	86.4	64.0	33.1	3.9	1.2	0.9	
9						100.	98.8	99.8	99.2	97.8	76.7	11.4	1.3	0.9	
10									100.	99.8	93.0	12.8	1.5	0.9	Left bank

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. SR5 RIO CHUPURURO NEAR CAMPO MATA
 SAMPLE COLLECTED: SEPTEMBER 8, 1969

Sample Number	PERCENT FINER THAN:														Comments	
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm		
1									100.	97.9	93.8	90.3	82.9	58.6	51.5	Left bank
2									100.	99.1	93.6	86.3	77.3	44.7	37.4	
3				100.	99.6	99.3	98.7	98.4	91.3	84.7	66.4	39.1	34.5	30.1		
4			100.	97.7	96.4	92.8	82.3	73.8	63.9	51.9	26.0	13.7	6.6	5.3		
5		100.	89.7	82.7	75.8	74.0	64.2	55.5	48.6	39.7	27.0	17.7	4.5	3.0		
6		100.	91.9	88.2	85.0	82.9	74.4	64.1	56.7	49.4	37.3	6.2	1.2	0.9		
7				100.	98.5	97.7	87.2	65.7	45.4	30.5	18.2	4.7	1.6	1.2		
8				100.	98.1	97.3	86.6	67.5	52.1	39.4	21.8	8.4	3.1	2.4		
9				100.	96.6	94.7	73.4	48.1	34.0	27.0	22.3	15.7	7.2	5.3		
10									100.	99.5	93.6	85.6	44.0	38.8	Right bank	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. SR7 RIO PURGATORIO NEAR EL PURGATORIO
 SAMPLE COLLECTED: SEPTEMBER 9, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1						90.7	75.7	59.0	46.2	32.8	11.0	2.3	0.5	0.3	Left bank
2						83.3	62.8	48.0	39.1	28.4	4.7	0.6	0.1	0.1	
3						90.2	67.7	49.6	36.8	25.6	8.5	1.8	0.4	0.3	
4						86.7	71.2	59.7	51.9	43.3	14.4	1.4	0.2	0.1	
5						88.3	74.4	63.0	54.4	44.0	12.3	0.9	0.1	0.1	
6						96.8	86.4	75.0	66.4	57.1	18.6	2.0	0.3	0.1	Right bank
7						90.4	79.3	71.1	65.7	58.8	27.3	3.6	0.7	0.3	
8						82.0	66.2	53.7	46.9	41.2	18.3	2.3	0.3	0.2	
9						94.3	84.3	76.2	70.7	64.1	30.8	4.6	0.8	0.4	
10						96.0	88.0	80.4	75.4	70.3	47.4	11.8	2.9	2.0	

ANALYSIS OF BED MATERIAL SAMPLES
 STA. NO. SR9 QUEBRADA MAPIRICURE O SAN MIGUEL NEAR EL ACEITE
 SAMPLE COLLECTED: SEPTEMBER 8, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1			100.	97.5	96.7	95.1	92.1	89.1	77.9	60.5	41.4	10.0	2.0	1.4	Right bank
2							100.	99.9	94.2	72.5	35.2	2.8	0.2	0.2	
3						100.	99.9	99.6	88.5	62.4	26.8	1.5	0.0	0.0	
4						100.	99.9	97.9	86.2	64.3	33.6	3.5	0.4	0.3	
5						100.	99.6	98.0	88.3	65.9	32.6	3.5	0.3	0.2	
6					100.	99.9	99.6	97.7	85.9	66.1	32.4	2.8	0.3	0.2	Left bank
7				100.	99.7	99.7	99.5	98.1	90.8	72.6	40.4	3.9	0.3	0.2	
8				100.	99.4	99.4	98.7	96.9	88.8	69.0	32.6	2.7	0.2	0.1	
9						100.	98.3	94.9	78.6	60.2	32.9	3.3	0.4	0.2	
10						100.	99.9	98.9	90.2	69.5	31.7	2.8	0.3	0.2	

ANALYSIS OF BED MATERIAL SAMPLES
 RIO ARIBI AT DIA PERDIDO
 SAMPLE COLLECTED: SEPTEMBER 6, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1		100.	97.7	92.0	74.1	61.7	54.4	28.7	22.7	17.2	10.2	6.6	5.6	5.5	Sample 1, Samples 2, 3 combined, Sample 4, Samples 5, 6, 7 combined, Samples 8, 9 combined, Sample 10.
2		100.	96.1	95.2	92.0	90.2	81.7	77.0	74.6	72.8	61.3	36.0	22.7	21.1	
3	100.	94.5	93.8	92.8	88.5	86.1	77.0	71.5	68.1	65.2	43.1	16.2	9.6	8.9	
4		100.	89.3	86.6	80.0	76.3	61.1	50.5	43.7	38.7	20.4	5.5	3.0	2.7	
5		100.	86.9	84.3	81.8	80.1	72.5	65.6	60.6	57.2	29.3	4.0	0.5	0.4	
6	100.	94.3	67.8	61.3	53.4	50.1	37.8	30.5	26.0	22.6	12.4	1.8	0.3	0.2	

ANALYSIS OF BED MATERIAL SAMPLES
 RIO GUANIPA AT SANTA ROSA
 SAMPLE COLLECTED: SEPTEMBER 6, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1						100.	99.6	99.1	97.4	92.0	55.3	6.9	1.1	0.8	Samples 1, 2 combined, Samples 3, 5, 6, 10 combined, Samples 4, 7, 9 combined, Sample 8.
2						100.	99.9	99.5	98.8	95.6	58.6	6.9	1.2	0.2	
3				100.	99.5	99.2	98.9	97.9	94.8	85.0	32.1	3.1	0.2	0.1	
4		100.	98.1	97.2	96.6	95.7	91.8	82.7	70.4	58.2	27.4	2.1	0.1	0.1	

ANALYSIS OF BED MATERIAL SAMPLES
 RIO GUIBIMBA NEAR BOCA DE GUIBIMBA
 SAMPLE COLLECTED: SEPTEMBER 9, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1									100.	99.4	96.0	68.5	33.5	25.6	Left bank, some organic material
2								100.	99.9	99.0	94.8	25.4	2.7	1.7	
3								100.	99.9	99.7	96.4	11.7	1.2	0.7	
4								100.	99.9	99.6	95.7	15.5	1.7	1.0	
5								100.	99.9	99.7	89.0	8.0	0.9	0.5	
6								100.	99.9	99.5	86.7	7.4	1.1	0.6	
7								100.	99.7	98.3	75.3	6.6	0.6	0.2	
8								100.	99.4	96.3	43.8	1.5	0.1	0.0	
9						100.	99.8	99.2	97.5	88.6	47.4	3.9	0.3	0.1	
10							100.	99.9	99.8	98.9	61.0	5.1	1.7	1.3	

ANALYSIS OF BED MATERIAL SAMPLES
 RIO ORITUPANO NEAR Pelayo
 SAMPLE COLLECTED: SEPTEMBER 6, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1															Sample 1. Samples 2, 3, 4, 5, 6, 7 combined. Samples 8, 9, 10 combined.
2		100.	81.7	69.8	56.4	100.	99.3	99.0	97.9	96.4	80.9	42.6	23.5	20.5	
3		100.	91.1	85.9	75.3	70.9	51.0	38.2	32.2	26.7	11.7	6.3	4.9	4.8	

ANALYSIS OF BED MATERIAL SAMPLES
 RIO ORITUPANO AT LAS PIEDRITAS
 SAMPLE COLLECTED: SEPTEMBER 11, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1			100.	98.7	93.1	89.8	81.4	71.0	56.6	34.2	6.9	0.9	0.3	0.1	Left bank
2					100.	91.1	74.1	59.8	46.3	28.0	7.2	1.6	0.5	0.3	
3								100.	99.5	94.8	11.8	0.9	0.3	0.2	
4						100.	97.9	95.0	86.2	60.6	5.9	0.5	0.2	0.2	
5						100.	99.5	97.7	89.9	65.0	5.2	0.5	0.1	0.0	
6						100.	99.2	92.7	77.7	47.8	3.8	0.3	0.1	0.0	
7				100.	99.7	99.5	98.8	92.9	77.8	48.0	4.3	0.1	0.0	0.0	
8				100.	99.7	99.4	98.7	94.5	82.0	45.3	3.1	0.2	0.1	0.1	
9			100.	97.2	91.4	88.8	82.7	76.7	66.6	40.3	3.4	0.1	0.0	0.0	
10		100.	91.9	84.8	73.2	69.0	55.4	43.5	33.1	20.9	4.8	0.4	0.1	0.1	

ANALYSIS OF BED MATERIAL SAMPLES
 RIO TACATA (1 KM UPSTREAM FROM JUNCTION WITH RIO TONORO)
 SAMPLE COLLECTED: SEPTEMBER 3, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1						100.	99.8	99.5	98.7	95.2	66.1	43.1	25.4	20.8	Right bank
2				100.	98.5	97.5	90.0	80.0	69.6	53.6	19.2	1.4	0.1	0.1	
3				100.	94.8	92.3	80.4	68.1	56.8	40.5	12.3	1.1	0.1	0.1	
4				100.	94.7	93.2	84.7	76.3	69.0	49.2	7.5	0.5	0.0	0.0	
5						100.	96.5	93.8	91.0	77.3	13.6	0.6	0.0	0.0	
6		100.	98.3	97.7	93.5	92.7	86.2	80.9	75.1	57.6	13.3	1.0	0.1	0.0	
7		100.	98.2	96.5	89.0	84.9	71.2	61.6	55.5	45.5	12.2	0.9	0.2	0.1	
8			100.	97.6	92.9	91.7	78.4	68.0	57.9	34.9	6.0	0.8	0.2	0.1	
9		100.	95.0	93.1	90.6	88.5	79.4	72.8	66.8	52.1	11.3	1.2	0.3	0.2	
10			100.	99.2	97.1	96.2	92.5	87.9	83.8	68.9	9.6	0.8	0.2	0.2	

ANALYSIS OF BED MATERIAL SAMPLES
 RIO TIGRE AT CRISTOBERO
 SAMPLE COLLECTED: SEPTEMBER 23, 1969

Sample Number	PERCENT FINER THAN:														Comments	
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm		
1								100.	97.7	73.2	26.5	5.8	0.6	0.2	Left bank	
2						100.	99.9	99.2	87.9	45.2	13.8	2.0	0.2	0.0		
3							100.	99.3	87.4	43.6	8.8	0.8	0.1	0.0		
4					100.	97.7	92.5	80.5	58.1	25.7	8.5	1.6	0.1	0.1		
5							100.	99.8	97.0	68.5	17.9	0.9	0.0	0.0		
6								100.	99.8	95.6	65.2	13.3	0.9	0.1		0.0
7					100.	99.4	81.6	71.9	43.6	23.2	15.0	2.6	0.3	0.1		
8						100.	96.4	86.4	50.9	19.2	12.0	2.1	0.2	0.1		
9							100.	99.8	98.9	96.7	89.1	36.5	4.2	2.1		
10							100.	99.8	99.5	98.6	89.8	24.3	2.1	0.9		Right bank

ANALYSIS OF BED MATERIAL SAMPLES
 RIO TIGRE AT EL TIGRITO
 SAMPLE COLLECTED: SEPTEMBER 6, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1		100.	95.2	93.0	89.6	87.4	79.4	69.2	56.0	42.0	17.9	2.2	0.2	0.2	Samples 1, 8 combined. Sample 2. Samples 3, 4, 5, 6, 9 combined. Sample 7. Sample 10; all is finer than 50 mm.
2			100.	99.1	91.8	88.5	79.9	73.9	68.5	61.4	52.6	20.2	3.3	2.0	
3	100.	96.2	85.3	80.3	68.2	62.3	46.5	37.0	25.0	14.2	4.8	0.6	0.1	0.1	
4	100.	92.5	89.3	82.4	75.4	72.4	65.8	62.6	58.7	51.6	25.3	3.5	0.4	0.2	
5	83.1	83.1	80.2	76.3	72.4	71.1	67.8	64.1	55.1	44.0	28.6	5.8	0.7	0.5	

ANALYSIS OF BED MATERIAL SAMPLES
 RIO TONORO AT EL ZAMURO
 SAMPLE COLLECTED: SEPTEMBER 3, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1								100.	99.8	98.1	62.2	47.7	30.2	23.7	Left bank, some organic material
2				100.	99.7	99.1	87.6	78.9	72.7	60.0	11.6	1.6	0.5	0.3	
3							100.	99.8	99.0	91.5	28.2	4.5	1.5	0.9	
4							100.	99.9	99.4	95.5	38.3	7.5	2.9	2.2	
5					100.	99.6	97.1	95.3	94.0	83.8	7.6	0.6	0.0	0.0	
6						100.	99.2	97.2	93.5	82.7	24.4	3.7	0.6	0.3	
7					100.	99.1	97.6	94.9	90.9	81.4	26.5	1.0	0.3	0.2	
8					100.	98.9	95.0	90.3	86.2	74.7	14.2	6.2	0.2	0.1	
9							100.	99.9	99.6	96.2	42.8	9.2	4.1	2.7	
10						100.	99.9	99.6	99.4	97.6	56.4	6.2	1.5	1.1	

ANALYSIS OF BED MATERIAL SAMPLES
 RIO TONORO UPSTREAM OF TONORO
 SAMPLE COLLECTED: SEPTEMBER 3, 1969

Sample Number	PERCENT FINER THAN:														Comments
	32.0 mm	26.7 mm	16.0 mm	12.5 mm	9.423 mm	8.0 mm	4.0 mm	2.0 mm	1.0 mm	0.5 mm	0.25 mm	0.125 mm	0.063 mm	0.053 mm	
1					100.	99.8	99.2	96.9	92.9	82.6	31.0	5.0	1.5	1.0	Left bank
2						100.	99.8	99.1	97.5	88.9	14.1	1.0	0.5	0.3	
3				100.	97.2	96.3	90.4	85.8	81.2	69.1	18.4	5.3	2.3	1.6	
4					100.	99.8	98.1	95.9	92.7	79.3	14.7	1.3	0.2	0.2	
5					100.	98.9	98.0	96.7	94.9	90.0	35.0	4.2	0.5	0.3	
6						100.	99.3	97.5	94.0	83.2	28.7	3.5	0.2	0.1	
7						100.	99.0	97.1	94.8	87.6	37.3	5.3	0.4	0.2	
8					100.	98.8	96.4	94.4	92.3	88.0	40.4	4.2	0.3	0.1	
9						100.	99.8	99.5	99.2	98.0	76.3	17.3	1.5	0.8	
10									100.	99.8	58.3	16.4	5.3	3.9	

BANK MATERIALS

At the locations shown on Figure III-2 river bank materials were examined. The bank materials were sampled to a depth of 3 feet with a hand-sampling tool. The materials were inspected visually. The field-note descriptions of the bank materials are given in this section.

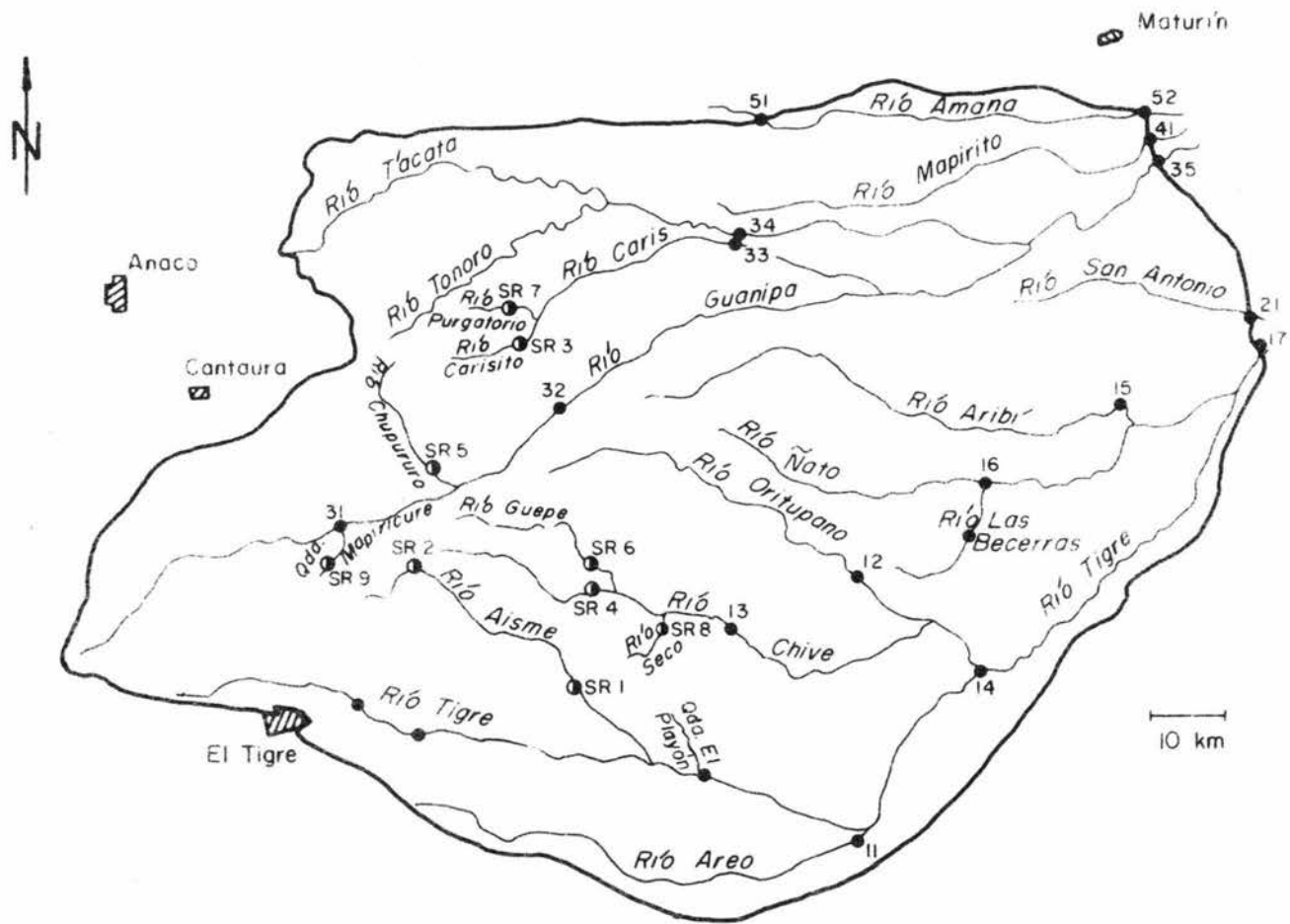


FIGURE III-2 SITES WHERE BANK MATERIALS WERE EXAMINED

BANK MATERIAL DESCRIPTION

Sta. No. 11 Río Areo at Las Bombitas

The river meanders through a densely vegetated flood plain. Where the river impinges on the edge of the flood plain, the banks are composed of coarse sand and fine gravel. Immediately upstream of the gaging station a rock outcropping on the high bank controlled the lateral migration of a meander loop. Large rocks were found on the sand bed of the channel adjacent to the rock outcrop.

The bank on the flood plain side of the channel is only the height of the average flow stage during the summer. The bank is saturated or covered with water. The top three to six inches is organic muck. Below this cover, the bank material is fine sand with very small pockets of clay. Some organic materials were found in the sand.

Sta. No. 12 Río Oritupano at Los Caracas

Vegetation is sparse along the banks and on the flood plain. There are only a few trees. The banks are almost entirely sand with a median diameter of about 0.3 mm. There is little or no silt and clay in most of the cores cut from the bank and adjacent areas.

The channel carries a fairly large amount of wash load. There are thin lenses of clay in the point bars. The clay is usually deposited in the lee of dunes during the falling stage. Gravel can be seen on the point bars. There is minor berming particularly on stretches of low banks where there is sufficient vegetation to retard the velocity.

BANK MATERIAL DESCRIPTION

Sta. No. 13 Río Chive at La Colmena

The banks are composed mostly of fine sand with little or no silt or clay. Sparse clumps of vegetation grow on the flood plain where some clay has been deposited. The clay holds the water to support vegetation. Where there are no brush or trees, the flood plain material is sand.

There should be a good correlation between the type and extent of bank and flood plain vegetation and the amount of silt and clay in the banks and flood plain. The correlation may also extend to channel slope and to the percentage of wash load that the channel carries.

Sta. No. 14 Río Tigre at Las Piedritas

The Las Piedritas gage is immediately downstream of the confluence of the Rios Tigre and Oritupano. Upstream of the confluence, the Tigre water is clear and the flood plain is covered with jungle vegetation. Along the Oritupano, there is less vegetation and the Oritupano water is muddy. At the gage, the two water flows have not yet mixed and there is a distinct interface between the muddy and clear water.

The median diameter of the bank and flood plain material at the gaging site is about 0.2 mm. Small amounts of silt and clay were found in the core samples.

BANK MATERIAL DESCRIPTION

Sta. No. 15 Río Aribí at Paso de Aribí

Core samples of bank materials are a mixture of sand, silt and clay. There is sufficient clay so the samples can be molded when damp or wet. The median diameter of the sand fraction is approximately 0.2 mm. The bank material supports a good growth of vegetation. In areas not covered by trees, there is a growth of high grass.

On the inside of the bends, the usual point bars exist. The cores from these bars were mostly sand or contain lenses of silt and clay and lenses of different sizes of sand. These point bars are often armored with 1/4-inch to 1-inch gravel.

The banks are a light red in color. As these banks erode they are the source of some of the wash load. The natural material has a thin armor of fine white gravel on top. The natural material is tougher than the more recently water deposited bank and point bar material. The natural material contains more clay.

Sta. No. 16 Río Nato at Las Gaviotas

The banks consist of sand with a small percentage of silt and clay. The sand fraction has a median diameter of approximately 0.25 mm. Adjacent to the relatively narrow deep channel, the bank material is unconsolidated but holds enough moisture for tree growth. Back 20 to 50 feet from the channel, the tree and grass vegetation is sparse and the material is more consolidated and dry.

BANK MATERIAL DESCRIPTION

In this area, the ground is very dry even though rains have occurred recently. The water drains off quickly where there is a slope to the land. In other places, the water ponds and, apparently, evaporates.

Sta. No. 17 Río Tigre at the Crossing of the Maturín-Temblador Road

Upstream of the bridge, the channel has been re-aligned by excavating through native materials. The native materials are quite cohesive when damp but crack and crumble into $\frac{1}{2}$ -inch to 2-inch granules when dry. In the alluvial deposits that form part of the new channel banks, there are lenses of nearly pure sand, lenses of silt and lenses of cohesive clay. These materials are usually found on the exposed parts of bars. The sand in the banks and bars is more coarse than in the Río Guanipa at the crossing of the Maturín-Temblador road. Some of the sand in the lenses have a 0.3 to 0.4 mm median diameter. The clay lenses are quite thin and very tough and cohesive.

In general, the banks on the Río Tigre are more heterogeneous than on the Río Guanipa at the crossing of the Maturín-Temblador road.

Sta. No. 21 Río San Antonio at the Crossing of the Maturín-Temblador Road

Throughout the entire summer, no water came down this channel; the channel was dry. The banks consist mostly of clay material which does not crumble when dry. There are lenses of sand, silt, and clay in the alluvial deposits, such as the point bars, and in the old channels. The banks support vegetation but to a lesser extent than the Río Guanipa

BANK MATERIAL DESCRIPTION

on the Maturín-Temblador road. At this time (Aug. 4, 1969) the area is very dry and vegetation may be less apparent than in a wetter season.

Sta. No. 31 Río Guanipa at El Aceite

The banks are composed mostly of fine sand but in some places there are caps of sand and gravel which are very porous. There are enough silts in the fine sand so that some moisture is retained and a growth of grass and a few trees can be supported. The median diameter of the bank material is approximately 0.2 mm.

The channel is symmetrically formed and well defined in spite of the fact that the banks are mostly fine sand. The flow velocities are very low.

Sta. No. 32 Río Guanipa at Los Palos Blancos

On the north side of the river at the lateral extent of the flood plain (1 km north of the channel), the core samples of the material are all clay. There is a moderate tree cover on this area.

At 1/10 of a kilometer into the flood plain, there is a very dense growth of trees and bush. There are many small areas of open, still water. In most places it is not possible to penetrate the clay soil with the sampler any farther than 6 inches. Even next to the open water, some samples were dry 6 inches below the surface. At one location, the soil could be penetrated. The sample core was wet clay for the entire 3 feet.

Four tenths of a kilometer north of the gaging station, the flood plain is covered with water. Vegetation is moderately dense. The sampler

BANK MATERIAL DESCRIPTION

penetrated the material easily . The soil is clay with very small amounts of fine sand. Along the east side of the road from this area to the gaging site, there is a 20-foot wide channel flowing to the north. The channel is more than 4 feet deep at the center. Along the banks of this channel the material is loose uniform coarse sand.

Upstream of the gaging site, the banks are covered with 6 inches of clay and silt. Below this layer, there is more sand. At 3 feet, it is all medium sand. Below the gaging site, there is medium sand with lenses of clay. At a depth of 2 to 3 feet, the sand is so loose and wet that hardly any material can be retained in the sampler. Along the channel at the gaging site, the area is covered with a heavy growth of bushes and trees.

One-tenth of a kilometer south of the gaging site on the downstream side of the road, there is about 1½ feet of moving water on the flood plain. Also, there is a network of very deep (over 4 feet) and narrow (5 feet wide) channels on this portion of the flood plain. Materials are all clay. Vegetation is not as thick here as at the channel.

The edge of the treed area and the flood plain is 0.4 kilometers south of the gaging site. Water has flooded out to the edge of the trees. The flood plain is composed of clay in this area. To the south, there is a meadow. Here the clay is so dry that the sampler will not penetrate more than 6 inches.

Note: This bank material survey was conducted on October 12, 1969. The gage height at the gaging station was 2.82 feet.

BANK MATERIAL DESCRIPTION

Sta. No. 33 Río Caris at the Crossing of the Santa Bárbara-Aquasay Road

The native material is cemented sand and gravel. Where the banks have flat slopes, a layer of sand covers the native materials. The south bank at the bridge is caving into the river. This bank is composed of fine sand with a small amount of clay. The clay indicates that the river is carrying some wash load.

On the exposed point bars, gravel armoring has occurred on the edge of the low-water channel.

Sta. No. 34 Río Tonoro at the Crossing of the Santa Bárbara-Aquasay Road

On the north bank there are silt and sand layers in the water-deposited bank material. Much of the bank consists of native materials which are cemented sands and gravels. In some places, there are layers of weak shales in the cemented sands and gravels.

On the south side, the banks have flat slopes and consist of 6 to 12 inches of fine unstable sand on top of the native cemented sandy gravel. On this side, the sand supports a growth of grass.

Sta. No. 35 Río Guanipa at the Crossing of the Maturín-Temblador Road

The banks consist mainly of fine sand. There are some silts and clays in the river deposited bank material. The bank material can be slightly molded when the material is damp or moist. The sand in the banks has a median diameter of about 0.10 to 0.15 mm. This bank material sustains heavy weed and tree growth.

BANK MATERIAL DESCRIPTION

There are a few areas on the banks where original or native materials still exist. This native material consists of cemented sand, silt, and clay mixed homogeneously with some fine gravel. The native material is fairly resistant to erosion and should not move until the stream velocity is greater than 4 or 5 fps.

The gravel dispersed in the natural bank material ranges in size up to $\frac{1}{2}$ -inch and 1-inch in diameter.

Sta. No. 41 Río Mapirito at the Crossing of the Maturín-Temblador Road

The banks and bed, insofar as the sampler would reach, are tough, erosion-resistant clay which is very dense.

The water is very clear and there is considerable plant growth in the water. The extent and density of the growth seems to increase with time. The increase in growth may cause the stage to change with time.

With clay banks and bed, the question is, "how does the clear water seep or otherwise get into the channel?" On August 5, we flew over the river basin and discovered some small reservoirs. These reservoirs trap the sediment and control a large part of the runoff from this small basin.

Sta. No. 51 Río Amana near El Tejero

Banks are composed of silt and clay with lenses of sand and are heavily vegetated. The banks are quite stable.

BANK MATERIAL DESCRIPTION

At one place, a large tree is falling toward the river as the bank is slowly being scoured. After falling, the tree may divert the current and cause local channel changes.

Sta. No. 52 Río Amana at the Crossing of the Maturín-Temblador Road

In the vicinity of the bridge, the bank material is rather resistant to erosion. The materials contain a considerable percentage of clay. On the outside of the bends, the banks are vertical and consist mainly of erosion-resistant clay. On the inside of the bends, there are point bars formed from layers of sand, silt, and clay. The median diameter of the sand is from 0.2 to 0.3 mm.

There is appreciable vegetation growing on the exposed point bars. The vegetation is not as dense as along the Río Guanipa at the Maturín-Temblador road but is similar to it.

Río Las Becerras near Oritupano

There is no stage gage on this stream.

The ephemeral stream channel is very active in this reach and the banks are subject to heavy erosion. The banks are vertical and 10 to 15 feet high. The bank material is red in color and consists of fine sand which is well cemented with a small percentage of silt and clay. The material is hard when dry but can be crushed into individual grains with ones fingers.

The stream is fed by a vast number of gully channels which are relatively very deep and narrow. One such tributary is 3 inches wide and

BANK MATERIAL DESCRIPTION

15 inches deep. These tributaries deposit small alluvial cones on the bed of the main channel. The materials in the cones will be washed away when the main channel floods.

Río Tigre at the Confluence with Quebrada El Playón

At this location, the high bank is about 3 feet above the water level (October 14, 1969). The high bank is sparsely vegetated and consists of fine loose sand with some clay and silt. The water table is about 2 feet below the ground.

The other bank is very low (at water level) and has a heavy growth of jungle vegetation. The low bank has more silt and clay on the surface but beneath, the material is the same as on the high bank.

It appears that ground water is fed into the river along the low bank.

Quebrada El Playón is a wide sand bed ephemeral stream that supplies relatively large amounts of sediment to the Río Tigre when the Quebrada floods.

Río Tigre at Cristobero

On Figure III-2, Cristobero is the second site, where bank material samples were taken downstream, from the Rio Tigre headwaters.

In the vicinity of the bridge, no bank material samples can be obtained. Although one can walk on the banks, there is no soil near the surface; only water and vegetation. Farther back from the channel, the core samples are fine sand. The sand is very loose and entirely saturated.

BANK MATERIAL DESCRIPTION

Over to the flood plain side of the channel near the overflow channel bridge, the materials are a heterogeneous mixture consisting of organic material, clay, silt, sand, gravel and, in some spots, only water and vegetation.

Río Tigre at El Tigrito

The El Tigrito site is that location closest to El Tigre (Figure III-2). The bank materials at this location are the same as for the Río Tigre at Cristobero.

Sta. No. SR1 Río Aisme near Urupia

At this station there is a heavy growth of jungle vegetation on the flood plain and on the banks. Velocities in the channel are very low. Most of the bank materials are deposited by the river and are fine sands between 0.2 and 0.3 mm in diameter. There is some dark organic matter in the bank material.

The low velocities have caused the coarser sediment yield of the drainage basin to drop out of the flow upstream of this site.

The native material in this region is reddish sand with some silts and clays and a few small rocks. The native material is moderately cemented.

BANK MATERIAL DESCRIPTION

Sta. No. SR2 Río Aisme near El Aisme

Most of the bankline is nearly vertical and is slowly caving when attacked by the flow. The bank materials are cemented sands and silts with some pea-sized gravel. The banks are a reddish color.

When the banks cave into the channel, the water leaves a residue of loose sand and small rocks.

Sta. No. SR3 Río Carisito near Carisito

Banks have formed in the native material and are nearly vertical and consist of cemented fine sands with some silt and clay. The clay is very sticky when wet. Banks in native material are stable. Banks composed of water-deposited sands and gravels are not stable. Since the banks are not homogeneous, the bankline is very irregular.

Sta. No. SR4 Río Chive near Campamento La Leona

The channel velocities are very low in this reach. The bank materials are fine sands with a small amount of silt, clay, and organic material. The banks are well vegetated. The water-deposited bank materials are highly erodible, but because of the vegetation and low velocities, the banks remain relatively stable.

Sta. No. SR5 Río Chupururo near Campo Mata

This stream has a well formed and defined channel. Bank materials are sands with some silt, clay, gravel and organic material. The banks

BANK MATERIAL DESCRIPTION

are quite resistant to erosion. The reach is vegetated with large trees and willow-type brush.

This river carries a large wash load during floods. It has been observed that, after a large flood which inundated the flood plain, a very thin greasy layer of silt and clay was left on the flood plain and on the banks. On the point bars and alternate bars, this layer of silt and clay completely covered up a 3 to 6 inch layer of leaves. The source of the organic material in the banks is apparently the layer of water transported leaves which is covered by the thin layer of silt and clay.

Sta. No. SR6 Río Guepe near El Limón

Along a portion of one bank, the upper 15 inches is gravel and clay. Below this layer, there is only clay.

The water-deposited bank materials are sands with 5 to 10 percent clay. The stream must carry considerable wash load at times. Channel velocities are very low at low stage.

Sta. No. SR7 Río Purgatorio near El Purgatorio

The river and river valley is very wide and composed of mostly loose sand and gravel. The river banks are formed in alluvium and have very little resistance to erosion. Hence, the river channel is very wide and shallow. Where banks are well defined, they are vertical and are caving in places. Some of the gravel in the banks is up to 1 inch in diameter.

BANK MATERIAL DESCRIPTION

Sta. No. SR8 Río Seco near Campamento La Leona

The Río Seco is a very wide shallow sand-bed channel with very low banks. The banks are only 1 to 2 feet high and consist mostly of loose sand very similar to the bed sand. There are traces of silts and clays in the bank.

Sta. No. SR9 Quebrada Mapiricure o San Miguel near El Aceite

The banks along this very small tributary stream are nearly vertical and are slowly eroding. Some bank caving is evident. The banks are composed of native cemented sand and pea-size gravel. The material is red in color and very hard but porous. The bed of the channel is entirely sand.

The area which is drained by this stream is vegetated with brownish looking grass only.

CHAPTER IV
GROUNDWATER LEVELS

INTRODUCTION

Fluctuations in the free water surface level of the 38 wells shown on Figure IV-1 were observed during the summer of 1969. Such fluctuations are an indication of changes in groundwater storage.

All of the observed wells were wells that have been in existence for some time. A number of wells have been abandoned and the remainder are not used to the extent that the water table would be drawn down a measurable amount. Some wells supply water for domestic use in very small villages but none of the wells are pumped by mechanical means.

The elevation of water surface level in each well was measured either weekly or biweekly. The data are presented in the following tables.

In one well, Observation Well No. 1c Campo Experimental de Guanipa, the water surface fluctuations were monitored with a Type F continuous recording float operated recorder. The 2-hourly and special point water levels for this well are given in the last table of this chapter.

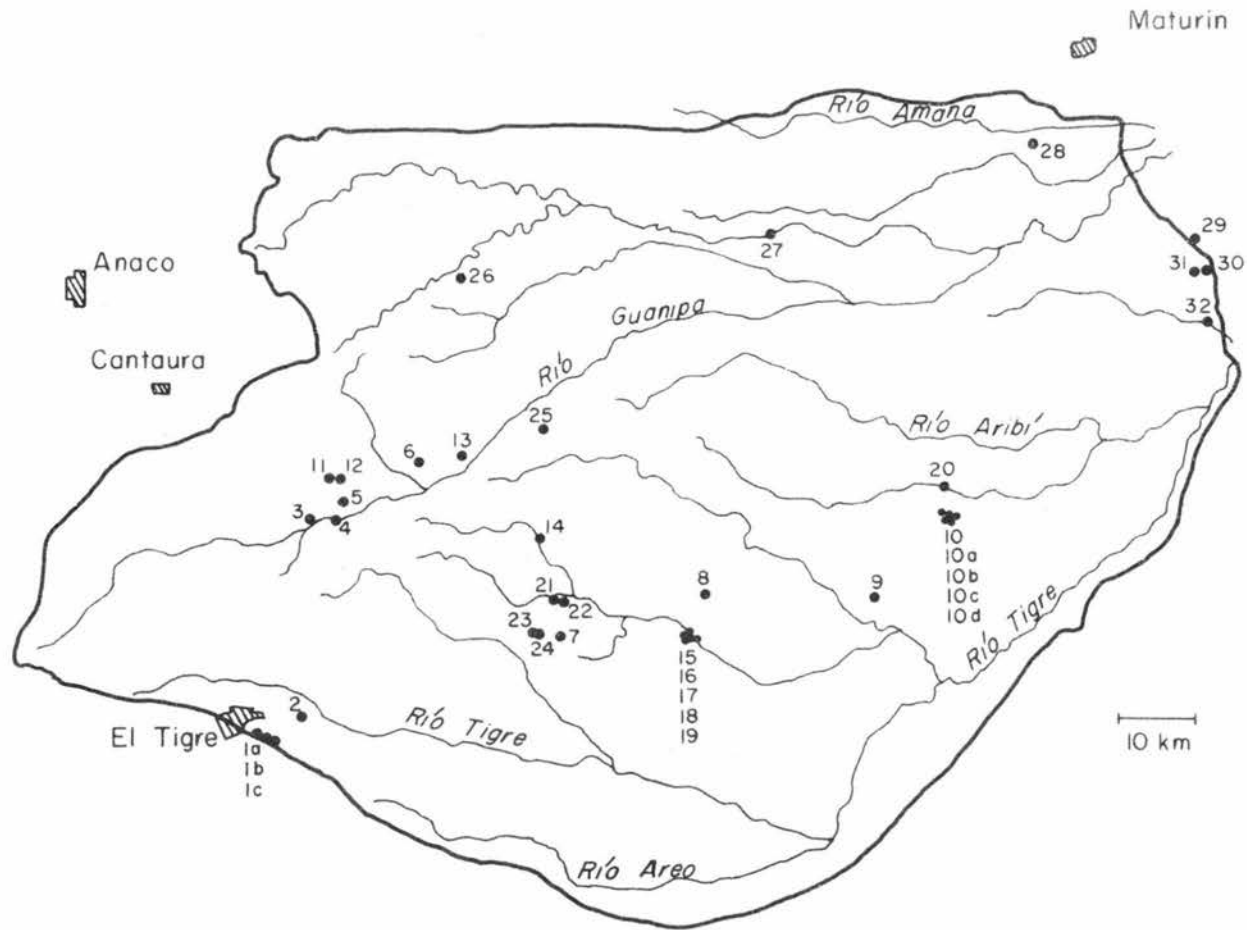


FIGURE IV-1 LOCATIONS OF OBSERVATION WELLS

GROUNDWATER DATA

NAME: Observation Well No. 1a Campo Experimental de Guanipa

LOCATION: Longitude $64^{\circ} 13.1'$ W, latitude $08^{\circ} 52.1'$ N.
Approximately 5 km SE of El Tigre at M.A.C. Campo
Experimental de Guanipa.

RECORDS AVAILABLE: Weekly water level measurement, June 3-July 30, 1969.
Biweekly, July 30-September 25, 1969.

DATUM: Top of well casing 1.2 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 3	85.13	
11	85.31	-.18
18	85.46	-.15
25	85.54	-.08
July 2	85.59	-.05
9	85.60	-.01
16	85.73	-.13
23	85.82	-.09
30	85.92	-.10
Aug. 14	86.11	-.19
27	86.33	-.22
Sept. 11	86.38	-.05
25	85.90	+.48

GROUNDWATER DATA

NAME: Observation Well No. 1b Campo Experimental de Guanipa.

LOCATION: Longitude $64^{\circ} 13.1'$ W, latitude $08^{\circ} 52.1'$ N.
 Approximately 5 km SE of El Tigre at M.A.C. Campo
 Experimental de Guanipa.

RECORDS AVAILABLE: Weekly water level measurement, June 3-July 30, 1969.
 Biweekly, July 30-September 25, 1969.

DATUM: Top of well casing 1.8 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 3	116.30	
11	116.29	+.01
18	116.52	-.23
25	116.52	.00
July 2	116.61	-.09
9	116.70	-.09
16	116.85	-.15
23	116.96	-.11
30	117.06	-.10
Aug. 14	117.48	-.42
27	117.44	+.04
Sept. 11	117.39	+.05
25	117.14	+.25

GROUNDWATER DATA

NAME: Observation Well No. 1c Campo Experimental de Guanipa.

LOCATION: Longitude 64° 12.2' W, latitude 08° 52.0' N.
 Approximately 5 km SE of El Tigre at M.A.C. Campo
 Experimental de Guanipa.

RECORDS AVAILABLE: Weekly water level measurement, June 3-July 30, 1969.
 Biweekly, July 30-September 25, 1969.

DATUM: Top of well casing 3.3 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 3	101.16	
11	101.23	-.07
18	101.16	+.07
25	101.20	-.04
July 2	101.56	-.36
9	101.64	-.08
16	101.72	-.08
23	101.81	-.09
30	101.93	-.12
Aug. 14	102.27	-.34
Sept. 11	102.40	-.13
25	102.14	+.26

GROUNDWATER DATA

NAME: Observation Well No. 2 El Tigrito.

LOCATION: Longitude 64° 10.0' W, latitude 08° 53.2' N.
Approximately 1.9 km S of San José de Guanipa (El Tigrito).

RECORDS AVAILABLE: Weekly water level measurement, June 3-June 11, 1969.

DATUM: Top of well casing 1.1 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 3	100.60	
11	100.46	+.14

GROUNDWATER DATA

NAME: Observation Well No. 3 El Estero.

LOCATION: Longitude 64° 09.1' W, latitude 09° 08.1' N.
Approximately 14 km NNW of Guico.

RECORDS AVAILABLE: Weekly water level measurement, June 3-July 28, 1969.
Biweekly, July 28-September 23, 1969.

DATUM: Top of well casing 0.6 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 3	34.90	
11	34.21	+ .69
18	34.94	- .73
25	34.91	+ .03
July 2	34.90	+ .01
9	34.94	- .04
15	34.67	+ .27
22	34.48	+ .19
28	34.55	- .07
Aug. 11	34.34	+ .21
25	34.32	+ .02
Sept. 8	34.38	- .06
23	34.50	- .12

GROUNDWATER DATA

NAME: Observation Well No. 4 Hato La Puerta.

LOCATION: Longitude $64^{\circ} 07.1'$ W, latitude $09^{\circ} 08.1'$ N.
Approximately, 4.3 km NE of El Aceite, at Hato La Puerta.

RECORDS AVAILABLE: Weekly water level measurement, June 3-July 28, 1969.
Biweekly, July 28-September 23, 1969.

DATUM: Top of well casing 0.0 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 3	7.96	
11	7.95	+0.01
18	7.98	-0.03
25	7.78	+0.20
July 2	7.80	-0.02
9	7.62	+0.18
16	7.42	+0.20
22	7.13	+0.29
28	7.15	-0.02
Aug. 11	6.81	+0.34
25	6.57	+0.24
Sept. 10	6.42	+0.15
23	6.44	-0.02

GROUNDWATER DATA

NAME: Observation Well No. 5 Hato Mapirito.

LOCATION: Longitude 64° 07.0' W, latitude 09° 10.0' N.
Approximately 9 km NNW of El Aisme, at Hato Mapirito.

RECORDS AVAILABLE: Weekly water level measurement, June 3-July 28, 1969.
Biweekly, July 28-September 23, 1969.

DATUM: Top of well casing 0.4 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 3	54.51	
11	54.47	+.04
18	54.60	-.13
25	54.54	+.06
July 2	54.46	+.08
9	54.50	-.04
16	54.30	+.20
22	54.14	+.16
28	54.17	-.03
Aug. 11	54.00	+.17
25	53.84	+.16
Sept. 10	53.77	+.07
23	54.01	-.24

GROUNDWATER DATA

NAME: Observation Well No. 6 Campo Mata.

LOCATION: Longitude $64^{\circ} 01.4'$ W, latitude $09^{\circ} 13.3'$ N.
Approximately 1 km E of Campo Mata.

RECORDS AVAILABLE: Weekly water level measurement, June 3-July 28, 1969.
Biweekly, July 28-September 23, 1969.

DATUM: Top of well casing 1.1 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 3	54.22	
11	54.30	-.08
16	53.50	+.80
25	51.90	+1.60
July 2	51.77	+.13
9	51.05	+.72
16	50.44	+.61
23	49.72	+.72
28	49.36	+.36
Aug. 11	48.75	+.61
25	49.20	-.45
Sept. 10	49.49	-.29
23	48.53	+.96

GROUNDWATER DATA

NAME: Observation Well No. 7 Campamento La Leona.

LOCATION: Longitude 63° 50.0' W, latitude 09° 00.0' N.
Approximately 20.5 km by road E of La Colmena,
at Campamento La Leona.

RECORDS AVAILABLE: Weekly water level measurement, June 5-July 29, 1969.
Biweekly, July 29-September 25, 1969.

DATUM: Top of well casing 2.2 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 5	193.08	
12	193.12	-.04
17	193.22	-.10
24	193.30	-.08
July 1	193.43	-.13
8	193.41	+.02
18	193.36	+.05
22	193.51	-.15
29	193.47	+.04
Aug. 12	193.72	-.25
26	193.77	-.05
Sept. 10	193.85	-.08
25	193.80	+.05

GROUNDWATER DATA

NAME: Observation Well No. 8 Campamento Pelayo.

LOCATION: Longitude $63^{\circ} 39.4'$ W, latitude $09^{\circ} 03.3'$ N.
Approximately 8 km by road NNE of La Colmena,
at Campamento Pelayo.

RECORDS AVAILABLE: Weekly water level measurement, June 4-July 29, 1969.
Biweekly, July 29-September 24, 1969.

DATUM: Top of well casing 1.7 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 4	164.08	
10	164.10	-.02
17	164.19	-.09
24	164.15	+.04
July 1	164.25	-.10
8	164.37	-.12
18	164.30	+.07
22	164.13	+.17
29	164.28	-.15
Aug. 12	164.50	-.22
Sept. 24	164.54	-.04

GROUNDWATER DATA

NAME: Observation Well No. 9 Campo Oritupano.

LOCATION: Longitude 63° 26.7' W, latitude 09° 03.4' N.
In the Texas Oil Company camp of Oritupano.

RECORDS AVAILABLE: Weekly water level measurement, June 4-July 29, 1969.
Biweekly, July 29-September 24, 1969.

DATUM: Top of well casing 0.9 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 4	150.40	
12	151.01	-.61
17	150.00	+1.01
24	149.79	+.21
July 1	149.61	+.18
8	150.00	-.39
18	149.27	+.73
22	149.20	+.07
29	149.23	-.03
Aug. 12	149.25	-.02
26	149.08	+.17
Sept. 9	148.96	+.12
24	150.10	-1.14

GROUNDWATER DATA

NAME: Observation Well No. 10 Las Gaviotas.

LOCATION: Longitude 63° 20.9' W, latitude 09° 09.6' N.
Near the village of Las Gaviotas, NE of Oritupano.

RECORDS AVAILABLE: Weekly water level measurement, June 5-July 15, 1969.
Biweekly, July 15-September 24, 1969.

DATUM: Top of well casing 3.5 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 5	22.76	
10	21.97	+ .79
17	22.07	- .10
24	22.04	+ .03
July 1	22.17	- .13
8	22.11	+ .06
15	21.90	+ .21
31	21.88	+ .02
Aug. 12	21.81	+ .07
29	21.69	+ .12
Sept. 9	21.66	+ .03
24	21.78	- .12

GROUNDWATER DATA

NAME: Observation Well No. 10a Las Gaviotas.

LOCATION: Longitude 63° 20.9' W, latitude 09° 09.6' N.
Near the village of Las Gaviotas, NE of Oritupano.

RECORDS AVAILABLE: Weekly water level measurement, June 5-July 29, 1969.
Biweekly, July 29-September 24, 1969.

DATUM: Top of well casing 2.4 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 5	20.79	
10	20.97	-.18
17	20.71	+.26
24	21.02	-.31
July 1	20.93	+.09
8	20.84	+.09
15	20.05	+.79
21	19.92	+.13
29	19.75	+.17
Aug. 12	19.49	+.26
29	18.68	+.81
Sept. 9	18.69	-.01
24	19.16	-.47

GROUNDWATER DATA

NAME: Observation Well No. 10b Las Gaviotas.

LOCATION: Longitude 63° 20.9' W, latitude 09° 09.6' N.
Near the village of Las Gaviotas, NE of Oritupano.

RECORDS AVAILABLE: Weekly water level measurement, June 5-July 29, 1969.
Biweekly, July 29-September 24, 1969.

DATUM: Top of well casing 1.1 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 5	18.23	
10	17.54	+ .69
17	18.87	-1.33
24	18.31	+ .56
July 1	18.89	- .58
8	18.52	+ .37
15	16.54	+1.98
21	17.19	- .65
29	16.83	+ .36
Aug. 12	15.12	+1.71
29	17.46	-2.34
Sept. 9	17.70	- .24
24	17.41	+ .29

GROUNDWATER DATA

NAME: Observation Well No. 10c Las Gaviotas.

LOCATION: Longitude 63° 20.9' W, latitude 09° 09.6' N.
Near the village of Las Gaviotas, NE of Oritupano.

RECORDS AVAILABLE: Weekly water level measurement, June 5-July 29, 1969.
Biweekly, July 29-September 24, 1969.

DATUM: Top of well casing 1.9 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 5	24.96	
10	24.90	+0.06
17	24.83	+0.07
24	24.93	-0.10
July 1	25.00	-0.07
8	24.88	+0.12
15	24.65	+0.23
21	24.44	+0.21
29	24.35	+0.09
Aug. 12	24.24	+0.11
29	24.09	+0.15
Sept. 9	24.10	-0.01
24	24.24	-0.14

GROUNDWATER DATA

NAME: Observation Well No. 10d Las Gaviotas.

LOCATION: Longitude 63^o 20.9' W, latitude 09^o 09.6' N.
At the village of Las Gaviotas, NE of Oritupano.

RECORDS AVAILABLE: Weekly water level measurement, June 5-July 29, 1969.
Biweekly, July 29-September 24, 1969.

DATUM: Top of well casing 0.7 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 5	10.27	
10	10.36	-.09
17	10.39	-.03
24	9.76	+.63
July 1	9.95	-.19
8	10.20	-.25
15	5.29	+4.91
21	7.45	-2.16
29	7.46	-.01
Aug. 12	7.02	+.44
29	4.15	+2.87
Sept. 9	6.57	-2.42
24	8.33	-1.76

GROUNDWATER DATA

NAME: Observation Well No. 11 Texas (Mata).

LOCATION: Longitude 64° 08.0' W, latitude 09° 11.9' N.
Approximately 10 km WSW of Campo Mata.

RECORDS AVAILABLE: Weekly water level measurement, June 3-July 28, 1969.
Biweekly, July 28-September 23, 1969.

DATUM: Top of well casing 1.5 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 3	122.20	
11		
16	121.96	+.24
25	122.11	-.15
July 2	122.38	-.27
9	122.51	-.13
16	122.73	-.22
22	122.78	-.05
28	122.84	-.06
Aug. 11	122.83	+.01
25	122.80	+.03
Sept. 10	122.78	+.02
23	122.86	-.08

GROUNDWATER DATA

NAME: Observation Well No. 12 Texas (Mata).

LOCATION: Longitude $64^{\circ} 07.5'$ W, latitude $09^{\circ} 11.8'$ N.
Approximately 10 km WSW of Campo Mata.

RECORDS AVAILABLE: Weekly water level measurement, June 4-July 28, 1969.
Biweekly, July 28-September 23, 1969.

DATUM: Top of well casing 1.6 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 4	151.92	
11	151.87	+ .05
16	151.15	+ .72
25	152.01	- .86
July 2	152.02	- .01
9	152.30	- .28
16	152.32	- .02
22	152.41	- .09
28	152.42	- .01
Aug. 11	152.52	- .10
25	152.82	- .30
Sept. 10	152.80	+ .02
23	152.91	- .11

GROUNDWATER DATA

NAME: Observation Well No. 13 Guanipa.

LOCATION: Longitude 63° 58.0' W, latitude 09° 13.7' N.
In the town of Guanipa.

RECORDS AVAILABLE: Weekly water level measurement, June 4-July 28, 1969.
Biweekly, July 28-September 23, 1969.

DATUM: Top of well casing 2.5 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 4	11.68	
12	11.50	+.18
16	11.65	-.15
25	10.93	+.72
July 2	10.80	+.13
11	10.69	+.11
16	9.48	+1.21
22	9.00	+.48
28	9.25	-.25
Aug. 11	8.37	+.88
25	8.25	+.12
Sept. 10	8.91	-.66
23	9.42	-.51

GROUNDWATER DATA

NAME: Observation Well No. 14 Zumo.

LOCATION: Longitude 63° 52.0' W, latitude 09° 07.0' N.
 Approximately 17 km by road SE of Guanipa, at Hato Zumo.

RECORDS AVAILABLE: Weekly water level measurement, June 4-July 30, 1969.
 Biweekly, July 30-September 24, 1969.

DATUM: Top of well casing 1.9 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 4	12.03	
12	12.52	-.49
16	12.93	-.41
24	12.89	+.04
July 1	12.96	-.07
8	13.30	-.34
16	11.40	+1.90
23	11.16	+.24
30	11.63	-.47
Aug. 14	10.32	+1.31
27	10.12	+.20
Sept. 10	10.65	-.53
24	11.06	-.41

GROUNDWATER DATA

NAME: Observation Well No. 15 La Colmena (Chive).

LOCATION: Longitude 63° 40.5' W, latitude 09° 00.2' N.
Approximately 500 meters S of the Río Chive at La Colmena.

RECORDS AVAILABLE: Weekly water level measurement, June 5-July 29, 1969.
Biweekly, July 29-September 24, 1969.

DATUM: Top of well casing 1.7 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 5	10.54	
12	13.30	-2.76
17	12.21	+1.09
24	12.57	-.36
July 1	12.33	+.24
7	12.93	-.60
18	11.95	+.98
22	11.75	+.20
29	12.04	-.29
Aug. 12	11.93	+.11
26	9.32	+2.61
Sept. 11	9.42	-.10
24	9.63	-.21

GROUNDWATER DATA

NAME: Observation Well No. 16 La Colmena (Chive).

LOCATION: Longitude 63° 40.5' W, latitude 09° 00.2' N.
Approximately 500 meters S of the Río Chive at La Colmena.

RECORDS AVAILABLE: Weekly water level measurement, June 5-July 29, 1969.
Biweekly, July 29-September 24, 1969.

DATUM: Top of well casing 0.5 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 5	10.13	
12	10.30	-.17
17	10.37	-.07
24	10.43	-.06
July 1	10.00	+.43
7	10.40	-.40
18	9.91	+.49
22	10.30	-.39
29	10.38	-.08
Aug. 12	10.14	+.24
26	8.05	+2.09
Sept. 11	8.42	-.37
24	8.75	-.33

GROUNDWATER DATA

NAME: Observation Well No. 17 La Colmena (Chive).

LOCATION: Longitude 63° 40.5' W, latitude 09° 00.2' N.
 Approximately 500 meters S of the Río Chive at La Colmena.

RECORDS AVAILABLE: Weekly water level measurement, June 5-July 29, 1969.
 Biweekly, July 29-September 24, 1969.

DATUM: Top of well casing 1.1 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 5	12.61	
12	13.08	-.47
17	12.89	+.19
24	12.72	+.17
July 1	12.73	-.01
7	12.55	+.18
18	12.26	+.29
22	11.54	+.72
29	11.17	+.37
Aug. 12	11.34	-.17
26	8.55	+2.79
Sept. 11	8.92	-.37
24	9.36	-.44

GROUNDWATER DATA

NAME: Observation Well No. 18 La Colmena (Chive).

LOCATION: Longitude 63° 40.5' W, latitude 09° 00.2' N.
Approximately 500 meters S of the Río Chive at La Colmena.

RECORDS AVAILABLE: Weekly water level measurement, June 5-July 29, 1969.
Biweekly, July 29-September 24, 1969.

DATUM: Top of well casing 1.9 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 5	13.53	
12	13.42	+ .11
17	13.98	- .56
24	13.77	+ .21
July 1	13.35	+ .42
7	13.23	+ .12
18	10.69	+2.54
22	10.24	+ .45
29	9.70	+ .54
Aug. 12	9.64	+ .06
26	6.83	+2.81
Sept. 11	7.84	-1.01
24	7.88	- .04

GROUNDWATER DATA

NAME: Observation Well No. 19 La Colmena (Chive).

LOCATION: Longitude 63° 40.5' W, latitude 09° 00.2' N.
Approximately 500 meters S of the Río Chive at La Colmena.

RECORDS AVAILABLE: Weekly water level measurement, June 5-July 29, 1969.
Biweekly, July 29-September 24, 1969.

DATUM: Top of well casing 2.4 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 5	12.85	
12	12.69	+.16
17	12.80	-.11
24	12.93	-.13
July 1	13.41	-.48
7	13.06	+.35
18	12.70	+.36
22	12.46	+.24
29	12.13	+.33
Aug. 12	12.24	-.11
26	9.67	+2.57
Sept. 11	9.25	+.42
24	9.74	-.49

GROUNDWATER DATA

NAME: Observation Well No. 20 Hato Las Gaviotas.

LOCATION: Longitude 63° 21.3' W, latitude 09° 11.8' N.
Approximately 1.5 km by road from the Río Nato at
Hato Las Gaviotas.

RECORDS AVAILABLE: Weekly water level measurement, June 5-July 29, 1969.
Biweekly, July 29-September 24, 1969.

DATUM: Top of well casing 3.8 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 5	31.82	
10	31.61	+ .21
17	31.86	- .25
24	31.82	+ .04
July 1	31.96	- .14
8	32.07	- .11
17	31.29	+ .78
25	30.94	+ .35
29	30.86	+ .08
Aug. 12	30.79	+ .07
29	29.91	+ .88
Sept. 9	29.44	+ .47
24	29.16	+ .28

GROUNDWATER DATA

NAME: Observation Well No. 21 Hato Las Araguatas.

LOCATION: Longitude 63° 50.6' W, latitude 09° 03.0' N.
 Approximately 5.5 km N of Campamento La Leona, at
 Hato Las Araguatas.

RECORDS AVAILABLE: Weekly water level measurement, June 16-July 30, 1969.
 Biweekly, July 30-September 25, 1969.

DATUM: Top of well casing 1.8 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 16	22.49	
24	22.61	-.12
July 1	22.54	+.07
7	22.50	+.04
16	21.94	+.56
23	21.53	+.41
30	21.39	+.14
Aug. 14	20.17	+1.22
27	18.79	+1.38
Sept. 10	18.10	+.69
25	16.88	+1.22

GROUNDWATER DATA

NAME: Observation Well No. 22 Hato Las Araguatas.

LOCATION: Longitude 63° 50.6' W, latitude 09° 03.0' N.
Approximately 5.5 km N of Campamento La Leona, at
Hato Las Araguatas.

RECORDS AVAILABLE: Weekly water level measurement, June 16-July 30, 1969.
Biweekly, July 30-September 25, 1969.

DATUM: Top of well casing 0.0 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 16	8.98	
24	9.16	-.18
July 1	9.10	+.06
7	8.92	+.18
16	8.65	+.27
23	8.22	+.43
30	8.15	+.07
Aug. 14	6.39	+1.76
27	6.36	+.03
Sept. 10	6.89	-.53
25	7.14	-.25

GROUNDWATER DATA

NAME: Observation Well No. 23 Hato Santana.

LOCATION: Longitude 63° 52.0' W, latitude 09° 00.9' N.
Approximately 3.5 km NE of Campamento La Leona, at
Hato Santana.

RECORDS AVAILABLE: Weekly water level measurement, June 16-July 30, 1969.
Biweekly, July 30-September 25, 1969.

DATUM: Top of well casing 2.8 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 16	22.99	
24	23.33	-.34
July 1	23.47	-.14
7	23.43	+.04
16	23.19	+.24
23	23.21	-.02
30	23.07	+.14
Aug. 14	23.06	+.01
27	21.99	+1.07
Sept. 10	21.82	+.17
25	21.54	+.28

GROUNDWATER DATA

NAME: Observation Well No. 24 Hato Santana.

LOCATION: Longitude $63^{\circ} 52.0'$ W, latitude $09^{\circ} 00.9'$ N.
 Approximately 3.5 km NE of Campamento La Leona, at
 Hato Santana.

RECORDS AVAILABLE: Weekly water level measurement, June 16-July 30, 1969.
 Biweekly, July 30-September 25, 1969.

DATUM: Top of well casing 2.6 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 16	25.40	
24	26.42	-1.02
July 1	26.49	-.07
7	26.33	+ .16
16	26.16	+ .17
23	26.30	-.14
30	26.19	+ .11
Aug. 14	26.31	-.12
27	25.53	+ .78
Sept. 10	25.15	+ .38
25	24.95	+ .20

GROUNDWATER DATA

NAME: Observation Well No. 25 Periquito.

LOCATION: Longitude 63^o 52.0' W, latitude 09^o 15.8' N.
In the town of Periquito.

RECORDS AVAILABLE: Weekly water level measurement, June 20-July 28, 1969.

DATUM: Top of well casing 0.8 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 20	125.17	
25	125.07	+.10
July 2	125.06	+.01
11	125.20	-.14
16	124.96	+.24
23	125.00	-.04
28	125.00	0.00

GROUNDWATER DATA

NAME: Observation Well No. 26 Hato Mesa Pelona.

LOCATION: Longitude 63° 58.1' W, latitude 09° 27.1' N.
 Approximately 6.1 km by road WNW of the Río Purgatorio
 at El Purgatorio, at Hato Mesa Pelona.

RECORDS AVAILABLE: Weekly water level measurement, June 26-July 31, 1969.
 Biweekly, July 31-September 23, 1969.

DATUM: Top of well casing 1.2 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 26	102.40	
July 3	102.46	-.06
10	102.57	-.11
17	102.66	-.09
25	102.79	-.13
31	102.83	-.04
Aug. 13	103.20	-.37
28	103.22	-.02
Sept. 8	103.32	-.10
23	103.36	-.04

GROUNDWATER DATA

NAME: Observation Well No. 27 Hato Campo Alegre.

LOCATION: Longitude 63° 34.1' W, latitude 09° 30.1' N.
 Approximately 11.3 km by road NE of the Río Tonoro at
 Puente Rómulo Gallegos, at Hato Campo Alegre.

RECORDS AVAILABLE: Weekly water level measurement, June 26–July 31, 1969.
 Biweekly, July 31–September 24, 1969.

DATUM: Top of well casing 1.8 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 26	34.10	
July 3	34.40	-.30
10	36.71	-2.31
17	34.44	+2.27
25	34.38	+.06
31	35.40	-1.02
Aug. 13	36.93	-1.53
28	34.89	+2.04
Sept. 8	34.84	+.05
24	34.90	-.06

GROUNDWATER DATA

NAME: Observation Well No. 28 Boquerón de Amana.

LOCATION: Longitude 63° 14.8' W, latitude 09° 37.6' N.
Approximately 10.9 km NNW of Balneario Mapirito, at
Hato Boquerón de Amana.

RECORDS AVAILABLE: Weekly water level measurement, June 27-July 31, 1969.
Biweekly, July 31-September 22, 1969.

DATUM: Top of well casing 0.0 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 27	30.66	
July 3	30.50	+ .16
10	31.88	-1.38
17	30.62	+1.26
25	33.31	-2.69
31	32.07	+1.24
Aug. 13	32.25	- .18
28	33.61	-1.36
Sept. 8	32.44	+1.17
22	31.55	+ .89

GROUNDWATER DATA

NAME: Observation Well No. 29 Hato El Oso.

LOCATION: Longitude 63° 02.8' W, latitude 09° 30.2' N.
 Approximately 13.2 km by road SW of the Río Guanipa at
 the crossing of the Maturín-Temblador road, at Hato El Oso.

RECORDS AVAILABLE: Weekly water level measurement, June 27-July 31, 1969.
 Biweekly, July 31-September 22, 1969.

DATUM: Top of well casing 2.9 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 27	10.92	
July 3	10.72	+ .20
10	11.06	- .34
17	10.89	+ .17
25	11.33	- .44
31	10.66	+ .67
Aug. 13	10.60	+ .06
28	10.92	- .32
Sept. 8	10.54	+ .38
22	10.44	+ .10

GROUNDWATER DATA

NAME: Observation Well No. 30 Via Maturín-El Blanquero.

LOCATION: Longitude 63° 02.2' W, latitude 09° 28.0' N.
 Approximately 8.9 km by road NNW of Hato San Antonio.

RECORDS AVAILABLE: Weekly water level measurement, June 27-July 31, 1969.
 Biweekly, July 31-September 22, 1969.

Datum: Top of well casing 2.4 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 27	14.36	
July 3	11.95	+2.41
10	12.10	-.15
17	11.53	+.57
25	12.10	-.57
31	11.24	+.86
Aug. 13	11.10	+.14
28	10.70	+.40
Sept. 8	11.93	-1.23
22	10.83	+1.10

GROUNDWATER DATA

NAME: Observation Well No. 31 Hato Las Casitas.

LOCATION: Longitude $63^{\circ} 02.5'$ W, latitude $09^{\circ} 27.8'$ N.
 Approximately 2.1 km W of the Maturín-Temblador road
 at Hato Las Casitas.

RECORDS AVAILABLE: Weekly water level measurement, June 27-July 31, 1969.
 Biweekly, July 31-September 22, 1969.

DATUM: Top of well casing 3.0 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 27	12.20	
July 3	14.19	-1.99
10	14.32	-.13
17	13.12	+1.20
25	14.33	-1.21
31	13.72	+.61
Aug. 13	13.60	+.12
28	13.68	-.08
Sept. 8	13.90	-.22
22	12.65	+1.25

GROUNDWATER DATA

NAME: Observation Well No. 32 Hato San Antonio.

LOCATION: Longitude $63^{\circ} 01.1'$ W, latitude $09^{\circ} 24.0'$ N.
At Hato San Antonio, W of the Maturín-Temblador road.

RECORDS AVAILABLE: Weekly water level measurement, June 27-July 31, 1969.
Biweekly, July 31-September 22, 1969.

DATUM: Top of well casing 1.5 feet above ground level.

Date	Distance From Datum To Water Level ft	Change in Water Level From Previous Reading ft
June 27	14.59	
July 3	14.53	+0.06
10	14.66	-0.13
17	14.45	+0.21
25	14.33	+0.12
31	14.61	-0.28
Aug. 13	14.56	+0.05
28	14.41	+0.15
Sept. 8	14.21	+0.20
22	14.28	-0.07

NAME: Observation Well No. 1c Campo Experimental de Guanipa.

LOCATION: Longitude 64° 12.2' W, latitude 08° 52.0' N. Approximately 5 km SE of El Tigre at M. A. C. Campo Experimental de Guanipa.

GAGE: Type F continuous water stage recorder, set on top of well casing; June 18-Oct. 2, 1969.

RECORDS AVAILABLE: Weekly water level measurement, June 3-July 30, 1969, biweekly water level measurement, July 30-Sept. 25, 1969, continuous water level record June 18-Oct. 2, 1969.

DATUM: Top of well casing 3.3 feet above ground level. All distances are below ground level.

GROUNDWATER DATA
OBSERVATION WELL NO. 1c CAMPO EXPERIMENTAL DE GUANIPA
June 1969
DISTANCE FROM DATUM POINT TO WATER LEVEL IN FEET

Day	Hour											
	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
18	M	M	M	M	101.160	101.139	101.127	101.127	101.149	101.169	101.179	101.159
19	101.147	101.154	101.167	101.177	101.169	101.145	101.119	101.134	101.161	101.183	101.182	101.170
20	101.156	101.163	101.175	101.184	101.166	101.152	101.137	101.140	101.164	101.182	101.183	101.167
21*	101.156	101.167	101.180	101.185	101.180	101.153	101.149	101.156	101.181	101.204	101.185	101.172
22	101.169	101.181	101.186	101.192	101.169	101.152	101.142	101.147	101.172	101.190	101.190	101.172
23	101.162	101.177	101.197	101.197	101.182	101.167	101.151	101.161	101.205	101.195	101.200	101.192
24	101.187	101.189	101.200	101.203	101.190	101.171	101.161	101.161	101.190	101.206	101.206	101.189
25	101.187	101.189	101.198	101.203	101.200	101.237	101.216	101.213	101.241	101.256	101.258	101.259
26	101.238	101.239	101.253	101.262	101.262	101.291	101.267	101.261	101.286	101.306	101.311	101.308
27	101.291	101.291	101.301	101.314	101.309	101.337	101.314	101.308	101.334	101.359	101.362	101.356
28	101.336	101.344	101.347	101.364	101.363	101.380	101.361	101.357	101.363	101.417	101.417	101.407
29	101.381	101.386	101.395	101.418	101.417	101.425	101.412	101.405	101.440	101.470	101.465	101.455
30*	101.444	101.445	101.465	101.478	101.458	101.483	101.461	101.463	101.513	101.513	101.513	101.513

* Special points

21 1900/101.214

30 1550/101.452 1900/101.495

GROUNDWATER DATA
 OBSERVATION WELL NO. 1c CAMPO EXPERIMENTAL DE GUANIPA
 July 1969
 DISTANCE FROM DATUM POINT TO WATER LEVEL IN FEET

Day	Hour											
	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1*	101.493	101.492	101.513	101.517	101.511	101.524	101.510	101.500	101.534	101.560	101.560	101.552
2	101.533	101.540	101.550	101.560	101.560	101.552	101.534	101.534	101.552	101.558	101.570	101.568
3	101.561	101.564	101.575	101.576	101.574	101.553	101.548	101.538	101.578	101.593	101.597	101.588
4	101.569	101.578	101.595	101.596	101.588	101.575	101.560	101.558	101.578	101.597	101.607	101.586
5	101.590	101.587	101.608	101.610	101.595	101.587	101.576	101.572	101.590	101.616	101.617	101.607
6	101.597	101.605	101.618	101.624	101.615	101.593	101.581	101.584	101.621	101.634	101.640	101.621
7*	101.612	101.631	101.632	101.640	101.634	101.627	101.596	101.603	101.642	101.656	101.656	101.644
8	101.631	101.632	101.656	101.659	101.656	101.630	101.606	101.620	101.645	101.670	101.660	101.644
9*	101.639	101.645	101.671	101.670	101.660	101.640	101.632	101.629	101.635	101.678	101.685	101.668
10	101.645	101.655	101.677	101.677	101.675	101.648	101.625	101.642	101.682	101.684	101.672	101.680
11	101.652	101.657	101.673	101.691	101.687	101.662	101.639	101.649	101.659	101.659	101.709	101.689
12	101.664	101.671	101.680	101.694	101.694	101.676	101.661	101.658	101.676	101.691	101.701	101.686
13	101.683	101.668	101.691	101.699	101.696	101.676	101.660	101.647	101.683	101.703	101.716	101.693
14	101.676	101.683	101.703	101.712	101.703	101.692	101.660	101.648	101.689	101.720	101.716	101.695
15	101.681	101.688	101.710	101.720	101.710	101.690	101.670	101.650	101.705	101.730	101.717	101.717
16	101.698	101.699	101.719	101.723	101.720	101.706	101.686	101.696	101.711	101.722	101.725	101.722
17	101.706	101.706	101.726	101.741	101.736	101.712	101.693	101.693	101.722	101.743	101.758	101.732
18*	101.725	101.728	101.738	101.743	101.743	101.737	101.705	101.711	101.741	101.761	101.786	101.741
19*	101.728	101.745	101.756	101.759	101.757	101.739	101.723	101.736	101.738	101.753	101.769	101.767
20	101.751	101.758	101.766	101.774	101.773	101.756	101.737	101.736	101.766	101.796	101.792	101.776
21	101.756	101.776	101.786	101.796	101.787	101.770	101.758	101.757	101.781	101.808	101.800	101.784
22	101.779	101.788	101.798	101.807	101.798	101.783	101.771	101.763	101.796	101.820	101.820	101.793
23	101.783	101.806	101.818	101.818	101.810	101.799	101.771	101.776	101.822	101.828	101.843	101.813
24*	101.804	101.810	101.825	101.838	101.839	101.806	101.787	101.792	101.818	101.848	101.854	101.839
25*	101.822	101.822	101.849	101.861	101.850	101.829	101.803	101.808	101.844	101.867	101.869	101.841
26*	101.839	101.849	101.860	101.877	101.858	101.838	101.819	101.822	101.860	101.872	101.883	101.868
27	101.858	101.859	101.878	101.892	101.879	101.844	101.840	101.843	101.886	101.896	101.889	101.877
28	101.866	101.868	101.885	101.908	101.890	101.870	101.861	101.847	101.882	101.907	101.913	101.893
29*	101.874	101.886	101.905	101.920	101.916	101.886	101.867	101.867	101.918	101.918	101.929	101.899
30	101.898	101.907	101.920	101.930	101.921	101.901	101.875	101.881	101.901	101.932	101.943	101.934
31	101.919	101.916	101.937	101.948	101.944	101.930	101.905	101.912	101.933	101.962	101.980	101.960

*Special points

1	2100/101.565		
7	2100/101.666		
9	2100/101.693		
18	1750/101.756		
19	1950/101.763		
24	0900/101.845	1450/101.782	2050/101.858
25	1450/101.798		
26	0100/101.827		
29	1850/101.925		

GROUNDWATER DATA
 OBSERVATION WELL NO. 1c CAMPO EXPERIMENTAL DE GUANIPA
 August 1969
 DISTANCE FROM DATUM POINT TO WATER LEVEL IN FEET

Day	Hour											
	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	101.952	101.953	101.959	101.970	101.968	101.952	101.933	101.944	101.971	101.978	101.994	101.978
2*	101.961	101.975	101.991	102.002	101.983	101.967	101.953	101.961	101.997	102.023	102.010	101.995
3	101.977	101.996	102.013	102.022	102.010	101.986	101.957	101.993	102.054	102.025	102.021	102.016
4	102.005	102.020	102.035	102.046	102.027	102.008	101.996	102.010	102.031	102.052	102.053	102.034
5*	102.025	102.034	102.047	102.063	102.049	102.030	102.011	102.032	102.053	102.074	102.082	102.056
6*	102.047	102.068	102.082	102.080	102.071	102.052	102.033	102.044	102.085	102.111	102.087	102.068
7	102.077	102.090	102.101	102.117	102.103	102.084	102.065	102.073	102.107	102.123	102.144	102.120
8*	102.101	102.112	102.128	102.141	102.135	102.116	102.109	102.118	102.119	102.140	102.166	102.137
9	102.123	102.135	102.146	102.161	102.162	102.138	102.119	102.114	102.141	102.172	102.193	102.169
10*	102.150	102.156	102.182	102.183	102.174	102.160	102.134	102.136	102.158	102.192	102.205	102.181
11*	102.166	102.164	102.189	102.210	102.201	102.176	102.160	102.154	102.185	102.206	102.227	102.208
12*	102.179	102.188	102.191	102.212	102.213	102.206	102.175	102.176	102.210	102.238	102.234	102.227
13	102.212	102.207	102.233	102.248	102.240	102.216	102.197	102.218	102.239	102.250	102.263	102.242
14	102.231	102.241	102.252	102.257	102.262	102.232	102.219	102.218	102.237	102.262	102.269	102.252
15*	102.242	102.242	102.262	102.270	102.264	102.232	102.212	102.222	102.242	102.272	102.279	102.262
16	102.247	102.251	102.271	102.284	102.276	102.241	102.237	102.243	102.261	102.288	102.281	102.261
17*	102.256	102.271	102.283	102.285	102.283	102.261	102.241	102.241	102.281	102.296	102.301	102.261
18*	102.277	102.285	102.286	102.285	102.290	102.260	102.240	102.260	102.280	102.290	102.300	102.280
19	102.267	102.280	102.297	102.310	102.297	102.267	102.248	102.260	102.287	102.307	102.317	102.290
20	102.279	102.289	102.309	102.315	102.299	102.279	102.259	102.266	102.299	102.329	102.321	102.306
21*	102.296	102.306	102.314	102.322	102.319	102.299	102.271	102.284	102.301	102.322	102.339	102.309
22	102.308	102.308	102.318	102.339	102.328	102.298	102.283	102.288	102.328	102.335	102.345	102.328
23*	102.308	102.298	102.328	102.352	102.328	102.305	102.277	102.307	102.327	102.344	102.352	102.330
24*	102.317	102.321	102.340	102.350	102.337	102.314	102.286	102.299	102.344	102.354	102.354	102.317
25*	102.324	102.346	102.333	102.366	102.343	102.316	102.293	102.316	102.333	102.346	102.359	102.333
26	102.326	102.341	102.353	102.366	102.356	102.326	102.295	102.307	102.332	102.358	102.367	102.345
27	102.335	102.348	102.362	102.362	102.355	102.345	102.313	102.322	102.336	102.365	102.384	102.342
28*	102.334	102.344	102.351	102.356	102.361	102.344	102.311	102.351	102.354	102.343	102.370	102.361
29	102.343	102.345	102.347	102.372	102.356	102.345	102.330	102.322	102.357	102.376	102.383	102.358
30	102.348	102.363	102.359	102.377	102.380	102.353	102.319	102.325	102.354	102.369	102.382	102.372
31*	102.359	102.359	102.372	102.382	102.374	102.359	102.332	102.331	102.352	102.382	102.394	102.369

*Special points

2	1500/101.945								17	0100/102.251		
5	0700/102.070		1900/102.048						18	0900/102.300		
6	2050/102.032		2300/102.058						21	0100/102.290		
8	1650/102.140								23	2100/102.324		
10	1900/102.204								24	1900/102.324		
11	1450/102.147		2100/102.252						25	0300/102.316	0500/102.322	
12	1500/102.166								28	0100/102.323	1700/102.364	2300/102.374
15	0300/102.237								31	2100/102.402		

GROUNDWATER DATA
 OBSERVATION WELL NO. 1c CAMPO EXPERIMENTAL DE GUANIPA
 September 1969 (Oct. 1 and 2)
 DISTANCE FROM DATUM POINT TO WATER LEVEL IN FEET

Day	Hour											
	0200	0400	0600	0800	1000	1200	1400	1600	1800	2000	2200	2400
1	102.360	102.363	102.382	102.401	102.381	102.361	102.331	102.341	102.358	102.381	102.404	102.371
2	102.358	102.361	102.368	102.391	102.381	102.371	102.337	102.342	102.357	102.390	102.392	102.380
3	102.367	102.374	102.381	102.407	102.392	102.365	102.340	102.330	102.357	102.390	102.400	102.375
4	102.356	102.369	102.386	102.402	102.390	102.366	102.336	102.351	102.376	102.401	102.406	102.386
5*	102.375	102.387	102.400	102.409	102.387	102.360	102.340	102.352	102.379	102.401	102.415	102.390
6	102.365	102.375	102.395	102.409	102.400	102.370	102.335	102.362	102.386	102.419	102.404	102.388
7	102.376	102.392	102.402	102.414	102.394	102.364	102.344	102.356	102.389	102.404	102.414	102.394
8	102.373	102.388	102.400	102.410	102.400	102.373	102.390	102.358	102.383	102.403	102.408	102.386
9	102.386	102.393	102.403	102.413	102.403	102.373	102.347	102.352	102.382	102.407	102.417	102.392
10	102.374	102.385	102.404	102.425	102.402	102.372	102.342	102.372	102.396	102.405	102.403	102.392
11*	102.381	102.386	102.404	102.420	102.400	102.374	102.341	102.343	102.378	102.377	102.407	102.391
12	102.356	102.365	102.377	102.397	102.386	102.358	102.340	102.339	102.357	102.371	102.381	102.360
13	102.353	102.353	102.373	102.382	102.382	102.347	102.327	102.323	102.346	102.377	102.373	102.362
14	102.344	102.344	102.354	102.373	102.362	102.330	102.311	102.310	102.340	102.368	102.359	102.338
15	102.327	102.337	102.347	102.363	102.336	102.310	102.285	102.294	102.324	102.343	102.343	102.322
16*	102.322	102.331	102.341	102.345	102.320	102.299	102.287	102.288	102.308	102.319	102.336	102.316
17*	102.298	102.306	102.320	102.331	102.316	102.293	102.273	102.284	102.297	102.321	102.321	102.295
18	102.290	102.294	102.309	102.316	102.308	102.296	102.279	102.270	102.280	102.292	102.309	102.298
19	102.286	102.267	102.287	102.306	102.306	102.274	102.254	102.250	102.253	102.277	102.297	102.286
20*	102.276	102.260	102.280	102.294	102.289	102.262	102.237	102.226	102.251	102.275	102.293	102.254
21	102.244	102.248	102.263	102.281	102.272	102.250	102.205	102.204	102.246	102.258	102.270	102.252
22*	102.234	102.231	102.246	102.260	102.255	102.228	102.203	102.199	102.212	102.236	102.249	102.230
23	102.208	102.209	102.229	102.238	102.238	102.216	102.176	102.160	102.190	102.224	102.224	102.213
24*	102.188	102.187	102.192	102.211	102.211	102.179	102.149	102.132	102.157	102.185	102.205	102.185
25	102.153	102.148	102.168	102.194	102.194	102.140	102.121	102.122	102.148	102.170	102.182	102.157
26	102.136	102.146	102.155	102.163	102.154	102.124	102.103	102.101	102.120	102.144	102.151	102.131
27	102.105	102.110	102.129	102.139	102.128	102.093	102.067	102.077	102.086	102.121	102.125	102.090
28*	102.074	102.084	102.108	102.111	102.102	102.062	102.041	102.061	102.085	102.100	102.094	102.059
29	102.057	102.065	102.072	102.092	102.071	102.031	102.018	102.035	102.074	102.069	102.060	102.043
30	102.032	102.042	102.061	102.071	102.040	102.010	101.989	102.019	102.058	102.050	102.047	102.017
October												
1	101.996	102.029	102.035	102.037	102.019	101.984	101.973	101.968	102.012	102.040	102.011	101.990
2	101.974	101.988	102.007	101.996	101.975	101.944						

*Special points

5	1450/102.333	
11	1750/102.397	
16	0300/102.301	0450/102.347
17	2050/102.327	
20	2250/102.302	
22	1550/102.179	
24	0900/102.223	
28	1500/102.100	

CHAPTER V
WATER QUALITY

INTRODUCTION

Chemical quality analyses and specific electrical conductance tests were done on samples of river water collected at various primary discharge measuring stations (Figure II-2) during the summer of 1969. The data obtained from these tests are given in this chapter.

The methods employed for the collection of water samples and for measuring specific conductance were essentially those recommended by the U.S. Geological Survey [6].

Generally, the study area was free of water pollutants. During the summer of 1969 an oil slick was observed on one of the tributaries to the Río Chive. Also, immediately upstream of the crossing of the Maturín-Temblador road, the Rio Amana received the raw wastes of a meat-slaughtering plant. No other cases of polluting were observed.

CHEMICAL QUALITY ANALYSES

Once a month water samples were collected for chemical analyses at nine primary discharge measuring stations. The samples were shipped to M.O.P., División de Hidrología, Caracas for analysis. The results obtained from M.O.P. are presented in the following tables. The units for total alkalinity, total hardness, ..., and SiO_2 are parts per million by weight (ppm).

The first set of samples collected at the stations were broken in transit and another set of samples were lost between Anaco and Caracas so only two chemical analysis results are available for each station.

CHEMICAL QUALITY ANALYSIS
1969

Date of Collection	Dis-charge cfs	Water Temperature °C	Appearance	Color		Turbidity	Specific Conductance (micro-mhos at 25°C)	pH	Total Alkalinity (CaCO ₃)	Total Hardness, as CaCO ₃	Non-carbonate Hardness, as CaCO ₃	CO ₃	HCO ₃	Cl	SO ₄	NO ₃	F	Ca	Mg	NaK	Fe	Fe Dis-solved	Mn	SiO ₂	Dis-solved Solids at 103°C
				Ap-pear-ent	Real																				
STA. NO. 11 RIO AREO AT LAS BOMBITAS																									
July 24	161.	28	Turbid, yellowish, particles in suspension	30.	20.	7.	25.	6.4	6.	12.	6.	0.	6.	8.	3.	trace	0.1	2.4	1.4	4.	0.2	-	trace	25.6	48.
Aug. 21	182.	24	Yellow, particles in suspension	120.	110.	5.	29.	6.0	4.	6.	2.	0.	4.	8.	trace	0.0	0.1	0.8	1.	4.	0.5	0.2	0.0	15.	30.
STA. NO. 12 RIO ORITUPANO AT LOS CARACAS																									
July 25	101.	28	Turbid, yellowish	150.	180.	48.	31.	6.6	8.	8.	0.	0.	8.	12.	3.	trace	0.2	1.6	1.	9.	2.5	0.8	0.0	16.6	50.
Aug. 21	180.	29	Turbid, yellowish, particles in suspension	800.	260.	300.	37.	6.5	6.	2.	0.	0.	6.	9.	trace	0.0	0.1	trace	trace	8.	1.2	0.6	0.0	11.	35.
STA. NO. 15 RIO ARIBI AT PASO DE ARIBI																									
July 18	1660.	27	Turbid, yellowish	800.	300.	240.	23.	6.2	8.	8.	0.	0.	8.	8.	3.	0.4	0.1	1.6	1.	7.	8.4	2.2	0.0	7.	30.
Aug. 22	243.	-	Turbid, yellowish, particles in suspension	400.	250.	130.	28.	6.2	6.	6.	0.	0.	6.	7.	trace	0.0	0.2	0.8	1.	4.	2.7	1.4	0.0	15.	30.
STA. NO. 17 RIO TIGRE AT THE CROSSING OF THE MATURIN-TEMBLADOR ROAD																									
July 19	4930.	28	Turbid, yellowish, particles in suspension	600.	225.	120.	49.	6.2	6.	8.	2.	0.	6.	14.	3.	0.8	0.2	1.6	1.	9.	7.0	2.2	0.0	12.4	50.
Aug. 23	4930.	-	Turbid, yellowish, particles in suspension	600.	350.	150.	42.	6.0	6.	8.	0.	0.	6.	9.	trace	0.0	0.1	0.8	1.4	5.	2.5	1.2	0.0	20.	40.
STA. NO. 31 RIO GUANIPA AT EL ACEITE																									
July 25	190.	-	Turbid, yellowish	90.	30.	45.	48.	7.2	16.	8.	0.	0.	16.	8.	2.	0.4	0.2	1.6	1.	10.	-	2.1	0.0	34.8	70.
Aug. 22	269.	28	Turbid, yellowish, particles in suspension	150.	60.	70.	38.	7.0	10.	4.	0.	0.	10.	7.	trace	0.4	0.1	trace	trace	9.	1.3	0.3	0.0	19.	45.

CHEMICAL QUALITY ANALYSIS
1969

Date of Collection	Dis-charge cfs	Water Temperature °C	Appearance	Color		Turbidity	Specific Conductance (microhmhos at 25°C)	pH	Total Alkalinity (CaCO ₃)	Total Hardness, as CaCO ₃	Non-carbonate Hardness, as CaCO ₃	CO ₃	HCO ₃	Cl	SO ₄	NO ₃	F	Ca	Mg	NaK	Fe	Fe Dissolved	Mn	SiO ₂	Dissolved Solids at 103°C
				Ap-pear-ent	Real																				
STA. NO. 32 RIO GUANIPA AT LOS PALOS BLANCOS																									
July 25	413.	27	Turbid, yellowish, particles in suspension	400.	150.	180.	81.	7.0	24.	16.	0.	0.	24.	16.	3.	0.8	0.1	3.2	2.	15.	5.6	1.4	0.0	28.6	99.
Aug. 22	558.	27	Turbid, yellowish, particles in suspension	400.	100.	120.	62.	6.9	16.	10.	0.	0.	16.	9.	trace	trace	0.1	0.8	2.	8.	2.5	0.4	0.0	20.	60.
STA. NO. 34 RIO TONORO AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD																									
July 20	294.	29	Turbid, yellowish, particles in suspension	600.	225.	120.	49.	6.2	6.	8.	2.	0.	6.	14.	3.	0.8	0.2	1.6	1.	9.	7.0	2.2	0.0	12.4	50.
STA. NO. 35 RIO GUANIPA AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD																									
July 20	1190.	28	Turbid, yellowish, with many particles in suspension	3500.	150.	1800.	38.	6.4	8.	8.	0.	0.	8.	12.	2.	trace	0.1	2.4	0.4	9.	115.	2.0	0.0	14.6	50.
Aug. 23	2460.	-	Turbid, yellowish, particles in suspension	2400.	200.	300.	55.	6.7	12.	8.	0.	0.	12.	10.	1.	0.0	0.1	0.8	1.4	9.	4.5	1.2	0.0	20.	50.
STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATORIN-TEMLADOR ROAD																									
July 20	370.	28	Turbid, yellowish	250.	90.	60.	137.	7.4	40.	56.	16.	0.	40.	16.	13.	0.8	0.2	16.	4.	9.	3.5	1.1	0.0	13.6	110.
Aug. 23	548.	-	Turbid, yellowish, particles in suspension	600.	120.	180.	126.	7.3	36.	40.	4.	0.	36.	14.	5.	0.0	0.2	10.	4.	9.	1.5	0.9	0.0	9.	98.

SPECIFIC CONDUCTANCE

Specific conductance measurements were made on samples of river water collected at 13 of the primary discharge measuring stations. Generally specific conductance tests were made on the chemical quality samples before they were sent to Caracas and on the suspended sediment samples before they were forwarded to Barcelona for analyses.

Specific conductance data are given in the following tables along with the river flow rates at the time the samples were collected.

SPECIFIC CONDUCTANCE
STA. NO. 11 RIO AREO AT LAS BOMBITAS

Date	Time	Stage ft	Dis-charge cfs	Water Temperature at Time of Collection	Specific Conductance Micro-mhog at 25°C	Location of Collection	Appearance of Sample	Remarks
July 14	1400	1.44	188.	80°F	40.2	-	Very slight brown color, very slight sediment	Chemical quality sample
July 14	1400	1.44	188.	80°F	39.4	-	Very slight brown color, no turbidity, very slight sediment	Chemical quality sample
Aug. 21	1310	1.40	182.	76°F	26.6	-	-	Chemical quality sample--rain

SPECIFIC CONDUCTANCE
STA. NO. 12 RIO ORITUPANO AT LOS CARACAS

Date	Time	Stage ft	Dis-charge cfs	Water Temperature at Time of Collection	Specific Conductance Micro-mhog at 25°C	Location of Collection	Appearance of Sample	Remarks
July 10	1125	0.94	86.4	-	70.9	-	Brown, turbid, sediment	Chemical quality sample
July 13	1415	3.55	659.	80°F	41.0	-	Slight brown, very turbid, sediment	Chemical quality sample
Aug. 21	1544	1.98	180.	85°F	36.4	Right edge	-	Chemical quality sample no. 3--rain

SPECIFIC CONDUCTANCE
STA. NO. 14 RIO TIGRE AT LAS PIEDRITAS

Date	Time	Stage ft	Dis-charge cfs	Water Temperature at Time of Collection	Specific Conductance Micro-mhog at 25°C	Location of Collection	Appearance of Sample	Remarks
July 25	1315	4.32	1780.	85°F	180.	2 ft from left edge	-	Chemical quality sample no. 1
July 25	1320	4.32	1780.	85°F	175.	2 ft from left edge	-	Chemical quality sample no. 2
July 25	1324	4.32	1780.	85°F	173.	2 ft from left edge	-	Chemical quality sample no. 3

SPECIFIC CONDUCTANCE
STA. NO. 15 RIO ARIBI AT PASO DE ARIBI

Date	Time	Stage ft	Dis- charge cfs	Water Temper- ature at Time of Collec- tion	Specific Conduct- ance Micro- mhos at 25°C	Location of Collection	Appearance of Sample	Remarks	
July	7	1430	1.84	138.	-	39.0	-	Brown, turbid, slight sediment	Chemical quality sample
July	13	-	3.09	257.	77°F	33.0	-	Brown, very turbid, slight sediment	Chemical quality sample
July	18	1800	11.05	1660.	80°F	21.5	-	Turbid, sedi- ment in bottom	Chemical quality sample no. 3--rain
Aug.	9	0748	6.93	749.	76°F	28.7	-	-	Sediment sample no. 1
Aug.	9	0751	6.93	749.	76°F	26.1	-	-	Sediment sample no. 2
Aug.	9	0753	6.93	749.	76°F	25.9	-	-	Sediment sample no. 3
Aug.	18	1740	3.48	300.	86°F	25.2	-	-	Sediment sample no. 5
Aug.	22	1315	2.94	240.	-	25.1	Left edge	-	Chemical quality sample--rain
Sept.	8	1417	1.26	88.4	-	35.0	-	-	Sediment sample no. 1
Sept.	8	1420	1.26	88.4	-	35.1	-	-	Sediment sample no. 2
Sept.	8	1421	1.26	88.4	-	34.2	-	-	Sediment sample no. 3
Sept.	26	1523	1.00	64.0	-	59.2	-	-	Sediment sample no. 1
Sept.	26	1525	1.00	64.0	-	63.0	-	-	Sediment sample no. 2
Sept.	26	1526	1.00	64.0	-	66.1	-	-	Sediment sample no. 3

SPECIFIC CONDUCTANCE
STA. NO. 17 RIO TIGRE AT THE CROSSING OF THE MATURIN-TEMLADOR ROAD

Date	Time	Stage ft	Dis- charge cfs	Water Temper- ature at Time of Collec- tion	Specific Conduct- ance Micro- mhog at 25°C	Location of Collection	Appearance of Sample	Remarks
July 7	1340	0.76	1310.	-	54.2	-	Slight brown, turbid, sedi- ment	Chemical quality sample
July 7	1340	0.76	1310.	-	56.0	-	Turbid, slight sediment	Chemical quality sample
July 14	1310- 1334	2.36	2300.	78°F	50.4	-	Brown, turbid, sediment	Sediment sample
July 19	1553	5.68	4950.	82°F	49.6	77 ft from right edge	Turbid, sediment in bottom	Chemical quality sample no. 3--rain
Aug. 8	1230	4.55	4040.	79°F	44.6	-	-	Sediment sample no. 4
Aug. 8	1234	4.55	4040.	79°F	44.2	-	-	Sediment sample no. 5
Aug. 8	1236	4.55	4040	79°F	44.0	-	-	Sediment sample no. 6
Aug. 12	1758	2.37	2310.	85°F	64.1	Right edge	-	Sediment sample no. 4
Aug. 12	1805	2.37	2310.	85°F	59.1	Left edge	-	Sediment sample no. 6
Aug. 19	1649	4.97	4450.	84°F	54.6	-	-	Sediment sample no. 9
Aug. 20	1358	5.51	4860.	68°F	50.4	Right edge	-	Sediment sample no. 1
Aug. 20	1413	5.54	4870.	68°F	47.4	Center	-	Sediment sample no. 5
Aug. 20	1426	5.54	4870.	68°F	47.5	Left edge	-	Sediment sample no. 9
Aug. 21	1755	6.28	5280.	-	50.4	Right edge	-	Sediment sample no. 1
Aug. 21	1800	6.28	5280.	-	52.9	Left edge	-	Sediment sample no. 3
Aug. 23	1120	5.63	4930.	-	61.2	Left edge	-	Sediment sample no. 6-- rain
Sept. 9	1215	2.25	2240.	-	61.3	-	-	Sediment sample no. 1
Sept. 9	1221	2.25	2240.	-	62.7	-	-	Sediment sample no. 2
Sept. 9	1224	2.25	2240.	-	63.0	-	-	Sediment sample no. 3
Sept. 26	1334	0.94	1490.	-	89.8	-	-	Sediment sample no. 1
Sept. 26	1337	0.94	1490.	-	80.5	-	-	Sediment sample no. 2
Sept. 26	1340	0.94	1490.	-	72.6	-	-	Sediment sample no. 3

SPECIFIC CONDUCTANCE
STA. NO. 31 RIO GUANIPA AT EL ACEITE

Date	Time	Stage ft	Dis-charge cfs	Water Temperature at Time of Collection	Specific Conductance Micro-mhos at 25°C	Location of Collection	Appearance of Sample	Remarks
July 9	1035	0.66	165.	-	44.9	-	Clear, very slight turbidity, very slight sediment	Chemical quality sample
July 25	1440	0.82	192.	-	48.6	Left edge	-	Chemical quality sample--rain
Aug. 22	1310	1.20	269.	83°F	36.0	Left edge	-	Chemical quality sample--rain

SPECIFIC CONDUCTANCE
STA. NO. 32 RIO GUANIPA AT LOS PALOS BLANCOS

Date	Time	Stage ft	Dis-charge cfs	Water Temperature at Time of Collection	Specific Conductance Micro-mhos at 25°C	Location of Collection	Appearance of Sample	Remarks
July 9	1345	0.96	196.	-	81.1	-	Turbid, slight brown, sediment	Chemical quality sample
July 13	-	2.11	416.	77°F	85.6	-	Brown, turbid, slight sediment	Chemical quality sample

SPECIFIC CONDUCTANCE
STA. NO. 33 RIO CARIS AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD

Date	Time	Stage ft	Dis-charge cfs	Water Temperature at Time of Collection	Specific Conductance Micro-mhos at 25°C	Location of Collection	Appearance of Sample	Remarks
July 8	1545	0.62	87.0	-	30.2	-	Clear, very slight sediment	Chemical quality sample

SPECIFIC CONDUCTANCE
 STA. NO. 34 RIO TONORO AT THE CROSSING OF THE SANTA BARBARA-AGUASAY ROAD

Date	Time	Stage ft	Dis-charge cfs	Water Temperature at Time of Collection	Specific Conductance Micro-mhos at 25°C	Location of Collection	Appearance of Sample	Remarks
July 8	1555	0.33	64.5	-	39.0	-	Slight turbidity, slight sediment	Chemical quality sample
July 20	1444	0.54	294.	85°F	30.6	2 ft from left edge	Very turbid, sediment on bottom	Chemical quality sample--dry
Aug. 29	1535	1.03	1270.	89°F	25.2	Left edge	-	Chemical quality sample--dry
Aug. 29	1535	1.03	1270.	89°F	23.7	Left edge	-	Chemical quality sample--dry

SPECIFIC CONDUCTANCE
 STA. NO. 35 RIO GUANIPA AT THE CROSSING OF THE MATURIN-TEMBLADOR ROAD

Date	Time	Stage ft	Dis-charge cfs	Water Temperature at Time of Collection	Specific Conductance Micro-mhos at 25°C	Location of Collection	Appearance of Sample	Remarks
July 1	1305	5.09	543.	84°F	82.4	-	-	Chemical quality sample
July 7	1235	4.82	431.	-	66.2	-	Slight brown, turbid, sediment	
July 15	1205-1242	7.81	2590.	79°F	33.6	-	Brown, very turbid, much sediment	Sediment sample
July 20	1905	6.27	1190.	82°F	38.4	86 ft from left edge	Very turbid, sediment in bottom	Chemical quality sample no. 3
Aug. 8	1434	6.17	1110.	78°F	47.1	Left edge	-	Sediment sample no. 4
Aug. 8	1438	6.17	1110.	78°F	49.0	Center	-	Sediment sample no. 5
Aug. 8	1441	6.17	1110.	78°F	46.8	Right edge	-	Sediment sample no. 6
Aug. 13	0850	7.84	2610.	80°F	25.6	Left edge	-	Sediment sample no. 1
Aug. 14	0955	6.53	1400.	80°F	36.4	Left edge	-	Sediment sample no. 1
Aug. 23	1205	7.68	2490.	-	53.1	Left edge	-	Sediment sample--rain
Sept. 16	0935	5.41	687.	-	68.5	-	-	Sediment sample no. 1
Sept. 16	0936	5.41	687.	-	88.1	-	-	Sediment sample no. 2
Sept. 16	0937	5.41	687.	-	69.9	-	-	Sediment sample no. 3

SPECIFIC CONDUCTANCE
 STA. NO. 41 RIO MAPIRITO AT THE CROSSING OF THE MATURIN-TEMBLADOR ROAD

Date	Time	Stage ft	Dis-charge cfs	Water Temperature at Time of Collection	Specific Conductance Micro-mhos at 25°C	Location of Collection	Appearance of Sample	Remarks
July 7	1215	0.88	27.3	-	32.4	-	Clear, very slight sediment	Chemical quality sample
July 15	-	0.91	28.2	71°F	35.6	-	Clear, very slight sediment	Chemical quality sample

SPECIFIC CONDUCTANCE
 STA. NO. 51 RIO AMANA AT EL TEJERO

Date	Time	Stage ft	Dis-charge cfs	Water Temperature at Time of Collection	Specific Conductance Micro-mhos at 25°C	Location of Collection	Appearance of Sample	Remarks
July 8	1430	0.98	90.0	-	165.	-	Clear, very slight sediment	Chemical quality sample

SPECIFIC CONDUCTANCE
 STA. NO. 52 RIO AMANA AT THE CROSSING OF THE MATURIN-TEMBLADOR ROAD

Date	Time	Stage ft	Dis-charge cfs	Water Temperature at Time of Collection	Specific Conductance Micro-mhos at 25°C	Location of Collection	Appearance of Sample	Remarks
July 7	1145	3.67	154.	-	180.	-	Sample clear, slight sediment in bottom	Chemical quality sample
July 13	-	3.81	168.	79°F	236.	-	No color or turbidity, very slight sediment	Chemical quality sample
July 20	1258	5.41	370.	82°F	144.	30 ft from right edge	Turbid, slight sediment in bottom	Chemical quality sample no. 3--dry
Aug. 9	1240	5.38	366.	78°F	141.	Right edge	-	Sediment sample no. 4
Aug. 9	1243	5.38	366.	78°F	145.	Center	-	Sediment sample no. 5
Aug. 9	1245	5.38	366.	78°F	145.	Left edge	-	Sediment sample no. 6
Aug. 13	1850	5.95	464.	81°F	139.	Right edge	-	Sediment sample no. 1
Aug. 23	1230	6.33	548.	-	121.	Right edge	-	Chemical quality sample--rain

CHAPTER VI
SOIL MOISTURE AND TEMPERATURE AND
INFILTRATION DATA

INTRODUCTION

The infiltration, moisture, and temperature properties of the soils in the study area have been examined in a limited manner. A flight was made over the study area to define the major soil regions. In the selection of infiltration and soil moisture sites, an attempt was made to include each of the major soil types. Soil temperature observations were made only at Anaco where the Meteorological Section maintained radiation measuring equipment.

In this chapter, the study area soils are described, and the infiltration, soil moisture and soil temperature data are presented.

DESCRIPTION OF SOILS

A detailed classification of soils is available for only a very small section of the study area. Dr. Carlostado Sanchez, soil chemist, and Dr. Hermogenes Flores, plant pathologist, from the Universidad de Oriente at Jusepín helped the project to obtain a general soil classification that was deduced from their knowledge of the relationships between soils, erosion patterns, and vegetation in Eastern Venezuela.

Dr. Sanchez, Dr. Flores and Dr. Holland of CSU flew over the study area along the flight paths shown on Figure VI-1. Their report contained the following information which was supplemented by Dr. Holland's observations made in his travels about the study area.

The vegetation in the study area is primarily controlled by the water table and becomes extensive only along the stream channels. Most of the soils in the study area are derived from the same parent material which has a pH value of about 4 to 5. The reason for the scarcity of vegetation over the study area is the acidic soil. Along the stream channels, the water table and the accumulation of river transported sediments modify the soil conditions so that vegetation can be supported.

In a small part of the study area to the southeast of Cantaura and to the northwest of the study area, there is a more calcerous type of soil with a pH value of about 7 to 8. In this region, plant growth is more dense and the soil is much tighter and more cohesive.

The calcerous soil appears to overlap the material that dominates nearly all of the study area. The elevation of the ground decreases in an easterly direction and at some distance east of the study area the delta formations from the Orinoco River become dominant and the streams are affected by tides. Within the study area, however, the variation is from the "sabana", or mesas, in the west to the alluvial in the east.

The mesas in the northwest part of the study area have a red soil at the surface. The material is rocky to a depth of at least three feet. The vegetation in this area is very sparse. The same tough grass that grows over most of the study area covers about 30% of the ground surface in the northwest part and a few small trees are scattered widely.

Going to the east, the soil becomes less rocky. The topography around the Ríos Tonoro and Caris is still dominated by mesa formations, but even the mesa tops show some alluvial characteristics. The soils are more commonly an unconsolidated red, sandy material. The vegetation is essentially the same as that on the higher mesa and the soil appears to be

derived from the same base material. However, the soil is fairly permeable in this area and can be fairly easily compacted. Dr. Sanchez indicated that these soils are used for road construction because of their good compaction properties.

Near the center of the west-to-east flight path, the red material gives way to an underlying yellow formation. This is usually covered with a gray, sandy soil which may be the weathered version of the yellow material. The transition to the sandy, alluvial topography becomes more dominant. The vegetation remains the same with sparse vegetation except adjacent to the streams.

The gray soil in the San Tomé area appears to form a crust at some locations. During the flight, a power shovel was observed working in the yellow soil overlain by the gray. The yellow soil in this area is similar to that mentioned in the previous paragraph. The gray soil on the surface appeared about one foot thick.

The gray, sandy, alluvial formation is the main soil over the north-east portion of the study area. There are no mesas, but the vegetation is the same type as on the mesas and has a similar distribution. The gray soil persists in the vicinity of the Río Aribí gaging station. The soil at the surface has quite a lot of fine black material in it. There are scattered areas in which the black material has collected at the surface. To the southwest of the Río Aribí a number of areas of ponded water were observed during the flight although it had not rained that day.

To the southwest of the Río Oritupano, many round mounds of reddish soil were observed during the flight. From ground level inspection it appears that the mounds are the remnants of former mesas. The ground is hard red or yellow soil that resists the soil sampler. These mounds have

little vegetation and show effects of erosion. The soil in the low areas between the mounds is the red, unconsolidated sand. The tough grass is again the main vegetation and covers less than half the ground surface although it appears more extensive from the air.

The reddish, sandy soil gives way to the gray sandy soil further to the southwest. The sandy soil is found on the plateaus as well as in the valleys except for a few scattered outcrops. The sand is about six inches deep at a number of locations checked along the road. At several locations in this area, a considerable amount of runoff has been observed along the road during and after rain storms. The runoff appears along the road even when it is not apparent over the rest of the area.

Along the Río Areo the soil is sandy and gray in color. There is a small amount of black material in the soil. Below the gray sand there is reddish sand.

Further descriptions of the surface soils in the study area are given in the following sections on infiltration and soil moisture.

INFILTRATION

The infiltration tests were made with a single-ring infiltrometer, 24 inches in diameter. The ring was driven into the ground with a sledge using a 4-inch by 4-inch post as the drive cap. A carpenter's level was used to help drive the ring in uniformly. The rate of infiltration was measured as a rate of drop of the water level in a plastic cylinder having an area 0.1 times that of the ring. The water was supplied to the ring through a plastic tube from the cylinder at a rate controlled by a screw clamp on the plastic tube. The flow rate was adjusted to

maintain the water level in the ring at the level of a wire point gage. A steel tape was mounted on the side of the cylinder and timings were made by stop watch. Water was supplied to the plastic cylinder by bucket and the elapsed time between the successive fillings was observed to provide long period average rates. The cylinder was refilled to the same level for the short period timings. Water was carried to the site in two 55 gallon drums mounted on a pickup truck. The first few tests had some variation in procedure and the initial rate determinations had large errors at times because of the trial-and-error method of adjusting the supply rate to the infiltration rate. However, the final rates should be valid for all the tests. It must be recognized, of course, that the single-ring infiltrometer gives higher rates than will occur during rainfall. The data are indicative of the relative rates, and the comparisons between soils are appropriate.

Infiltration tests were made throughout the study area at the sites shown on Figure VI-1. The sites are described below and the infiltration test data are given in the following tables.

Site No. 1: Representative of the small area having dense plant growth and cohesive soil. This more calcareous type of soil has a pH value of about 7 to 8. The brief infiltration test indicated that the soil was very impervious even though it was dry.

Site No. 2: Representative of the gray, sandy, alluvial soil over the northeast portion of the study area. The surface soil contains a lot of fine black material in the sand. The infiltration rate was rather low at the test site and a ten minute general rain over the area during the test resulted in some ponding of water on the surface, especially in locations where the black materials had accumulated on the surface.

Sites No. 3 and 4: Representative of the area in the vicinity of El Tigre and also of the north-central portion of the study area. At Site No. 3, the infiltration test was made on the gray sandy soil at the surface and a fairly high rate was obtained. At Site No. 4, the upper one foot of gray sandy soil was removed to show the yellow soil beneath. The infiltration test was made on the yellow soil and the rate was found to be much lower.

Site No. 5: Representative of the mesas along the Ríos Tonoro and Caris. The surface soils were unconsolidated red sandy material. A red silt was found beneath this covering layer of sand.

Site No. 6: Representative of the area between the Río Nato and Río Chive. In this area there are mounds of reddish soil, the remnants of former mesas. The ground is hard red or yellow soil that resists penetration by the soil sampler. The mounds were not vegetated. In the low areas between the mounds the soil is red unconsolidated sand.

Site No. 7: Representative of the plateau areas along the Río Aisme. The gray and black soil materials extended down about nine inches before yellow soil was encountered.

Site No. 8: Representative of the headwaters of the Río Areo and that area to the south of the Río Areo. The soil is gray-colored sand with a small amount of black minerals. The infiltration rate was very high and there was evidence of the lateral spreading of the water as it entered the ground.

Site No. 9: Representative of the most northwest part of the study area. The surface soil was red and the material was rocky and not very permeable. A complete infiltration test was not made because it was impossible to drive the ring into the rocky soil. The brief

test was made by sealing the edge of the ring with mud and allowing the water to stand in the ring for about 15 minutes. There was no measurable drop in water level during this time.

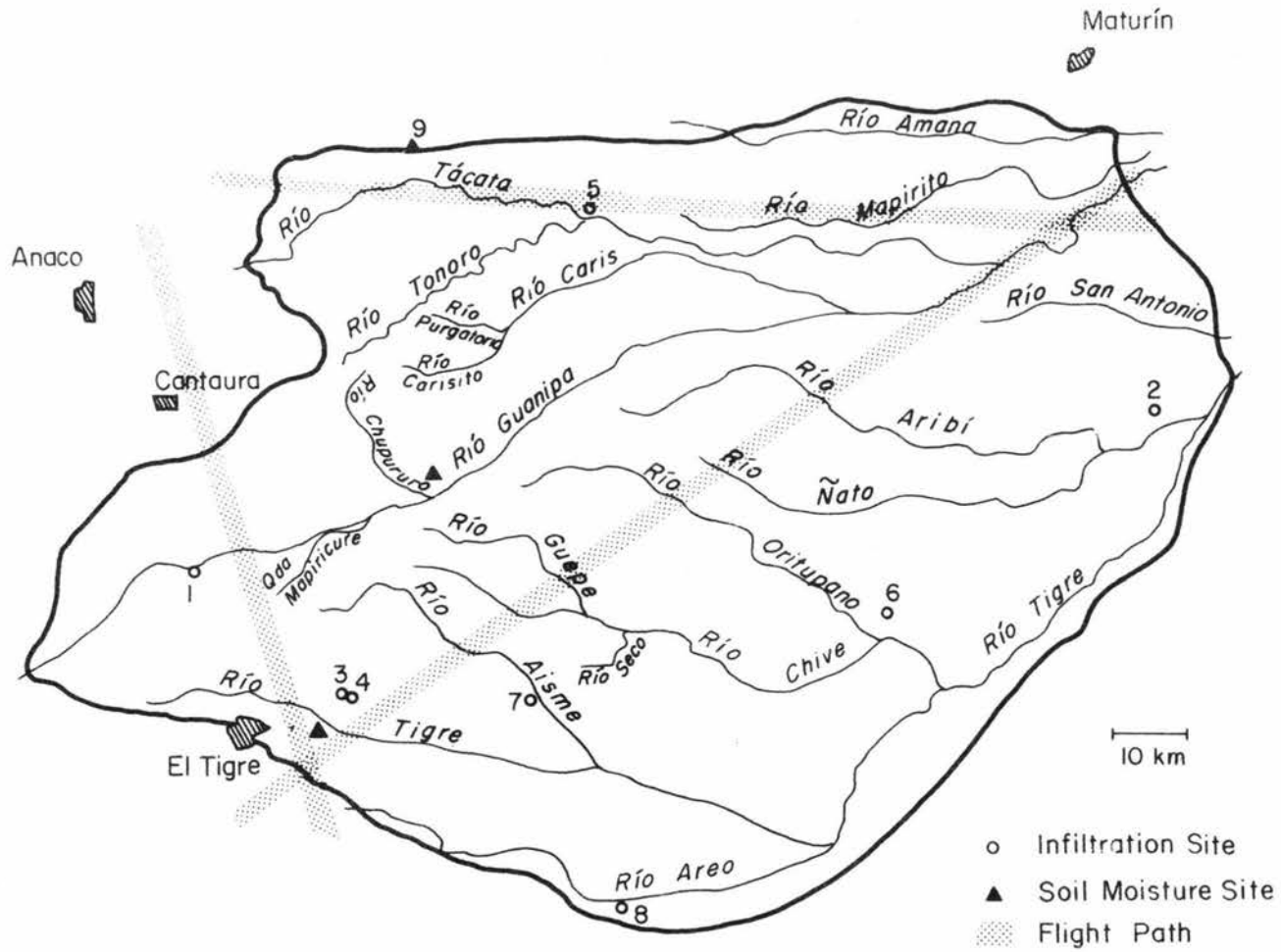


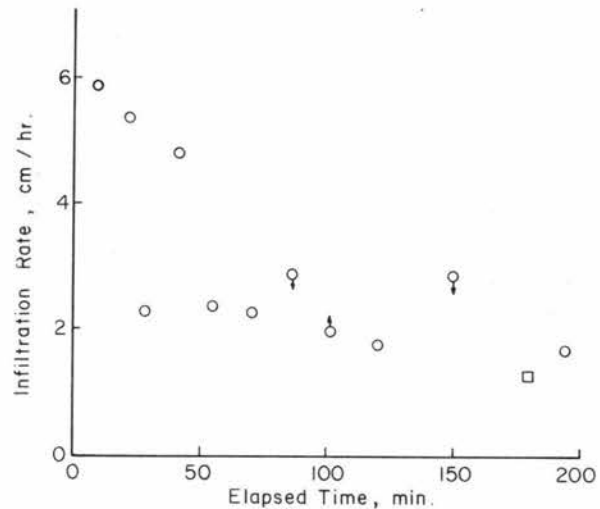
FIGURE VI-1 LOCATIONS OF INFILTRATION TEST SITES

INFILTRATION TEST

LOCATION: Site no. 1, SE of Cantaura; longitude $64^{\circ} 16.2' W$, latitude $9^{\circ} 09.2' N$.

DATE: August 12, 1969

Clock	Time Elapsed min	Drop in Water Level ft	Time of Drop sec	Infil- tration Rate cm/hr	Comments
1035	0	-	-	-	Fill ring
1044	9	0.05	94	5.9	
1057	22	0.05	102	5.4	
1104	29	0.03	143	2.3	
1116	41	0.05	115	4.8	Rising level?
1131	55	0.03	140	2.4	
1146	71	0.03	143	2.3	Rise
1201	86	0.03	112	2.9	Begin long-term
1217	102	0.02	166	2.0	Falling level
1235	120	0.03	187	1.8	Steady
1305	150	0.03	115	2.9	Rise
1335	180	0.02	177	1.3	
1349	194	0.98	108 min	1.7	End long-term



SITE DESCRIPTION: Reddish-brown sand, small grains. Slight moisture at least to 3 ft. Soil samples taken at 0.4 ft and 1.3 ft.

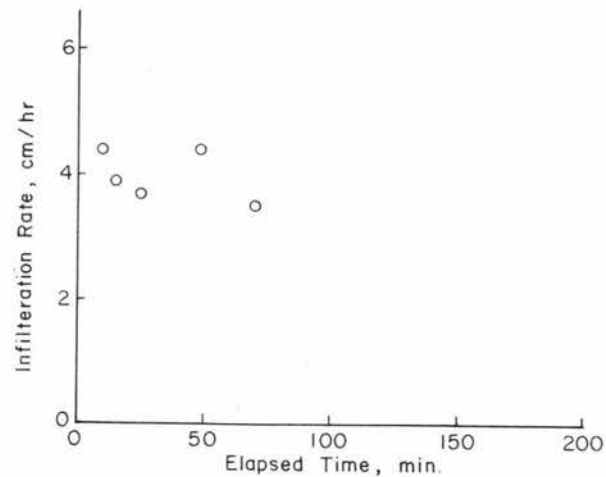
- Short-term
- Rising level, infiltration rate possibly lower
- Falling level, infiltration rate possibly higher
- Long-term

INFILTRATION TEST

LOCATION: Site no. 2, SE of Paso de Agua Negra; longitude 63° 07.7' W, latitude 9° 17.2' N.

DATE: August 13, 1969

Time Clock	Time Elapsed min	Drop in Water Level ft	Time of Drop sec	Infil- tration Rate cm/hr	Comments
1220	0	-	-	-	Fill ring
1230	10	0.05	124	4.4	
1235	15	0.05	140	3.9	
1245	25	0.05	149	3.7	
1303	48	0.05	125	4.4	
1330	70	0.05	156	3.5	



SITE DESCRIPTION: Sandy soil with black material in it.
 Black accumulations at surface.
 Rain--heavy, 1201-1210; light to 1240.
 Soil shows penetration about 1/4 in
 from rain.

- Short-term
- Rising level, infiltration rate possibly lower
- Falling level, infiltration rate possibly higher
- Long-term

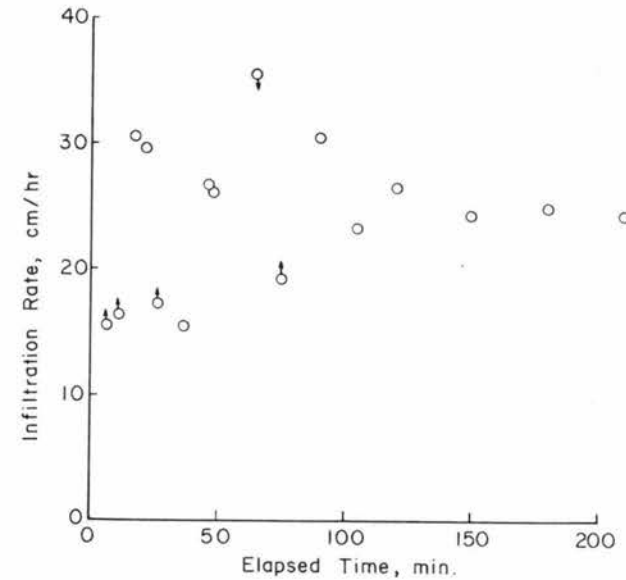
INFILTRATION TEST

LOCATION: Site no. 3, NE of San Tomé; longitude 64° 04.7' W, latitude 8° 59.6' N.

DATE: August 18, 1969

Time Clock	Time Elapsed min	Drop in Water Level ft	Time of Drop sec	Infil- tration Rate cm/hr	Comments
1005	0	-	-	-	Fill ring
1012	7	0.05	35	15.7	Falling level
1017	12	0.10	68	16.2	Falling level
1022	17	0.10	36	30.6	
1026	21	0.10	37	29.7	
1032	27	0.10	64	17.2	Falling level
1042	37	0.15	71	15.5	
1051	46	0.10	41	26.8	
1052	47	0.10	42	26.2	Check reading
1110	65	0.10	31	35.4	Rising level
1120	75	0.10	57	19.3	Falling level
1135	90	0.10	36	30.5	
1150	105	0.10	47	23.4	
1205	120	0.10	41	26.8	
1235	150	0.10	45	24.4	
1305	180	0.10	44	25.0	
1335	210	0.10	45	24.4	

SITE DESCRIPTION: Gray, sandy soil over red to yellow.
Three soil samples at 0.5 ft, 1.5 ft,
and 2.5 ft.



- Short-term
- ◌ Rising level, infiltration rate possibly lower
- ◌ Falling level, infiltration rate possibly higher
- Long-term

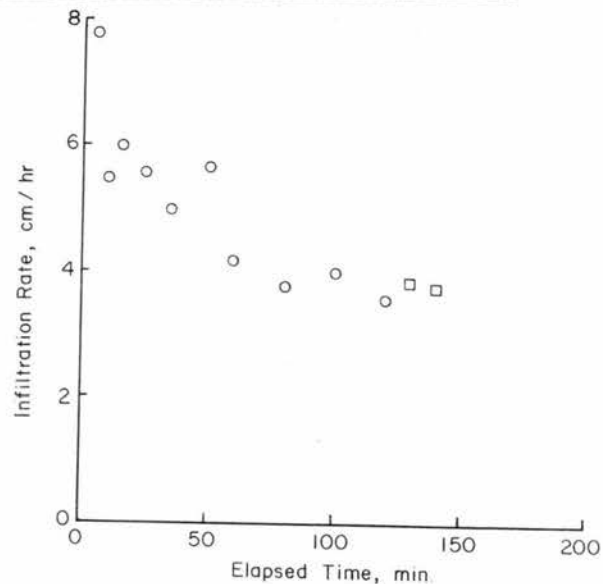
INFILTRATION TEST

LOCATION: Site no. 4, NW of San Tomé; longitude 64° 04.8' W, latitude 8° 58.4' N.

DATE: August 19, 1969

Time Clock	Time Elapsed min	Drop in Water Level ft	Time of Drop sec	Infil- tration Rate cm/hr	Comments
1050	0	-	-	-	Fill ring
1055	5	0.05	70	7.8	
1100	10	0.05	100	5.5	
1105	15	0.05	91	6.0	
1115	25	0.05	99	5.6	
1125	35	0.05	111	5.0	
1140	50	0.05	97	5.7	
1150	60	0.05	131	4.2	
1210	80	0.05	146	3.8	
1230	100	0.05	137	4.0	
1240	110	-	-	-	Begin long- term
1250	120	0.05	151	3.6	
1300	130	0.42	1200	3.9	Long- term
1310	140	0.62	1800	3.8	Long- term

SITE DESCRIPTION: Dug down about 1 ft to reach yellow soil under sand.



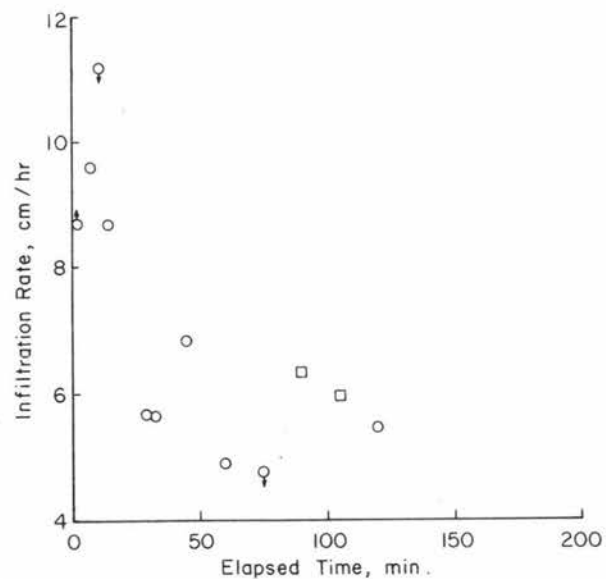
- Short-term
- ◐ Rising level, infiltration rate possibly lower
- ◑ Falling level, infiltration rate possibly higher
- Long-term

INFILTRATION TEST

LOCATION: Site no. 5, WSW of Mata Grande; longitude 63° 48.1' W, latitude 9° 33.6' N.

DATA: August 20, 1969

Time Clock	Time Elapsed min	Drop in Water Level ft	Time of Drop sec	Infil- tration Rate cm/hr	Comments
1132	0	-	-	-	Fill ring
1134	2	0.05	63	8.7	Falling level
1138	6	0.05	57	9.6	
1141	9	-	-	-	Begin long-term
1142	10	0.05	49	11.2	Rising level
1146	14	0.05	63	8.7	
1202	30	0.05	97	5.7	
1204	32	0.03	56	5.7	Check reading
1205:15	33:15	1.00	1455	-	End long-term
1207	35	-	-	-	Begin long-term
1217	45	0.05	80	6.9	
1227	55	0.70	1200	-	End long-term
1232	60	0.05	113	4.9	
1233	61	-	-	-	Begin long-term
1247	75	0.05	114	4.8	Falling level
1247:30	75:30	0.37	870	-	End long-term
1249	77	-	-	-	Begin long-term
1300	88	0.30	660	-	End long-term
1302	90	0.05	86	6.4	Begin long-term
1315	103	0.44	780	-	End long-term
1317	105	0.05	92	6.0	Begin long-term
1332	120	0.46	900	-	End long-term
1332	120	0.05	100	5.5	
1333	121	-	-	-	Begin long-term
1418	166	1.18	2700	-	End long-term



SITE DESCRIPTION: Red soil with black mixed in to 9 in,
then tight red silt.
Grass cover with occasional trees.

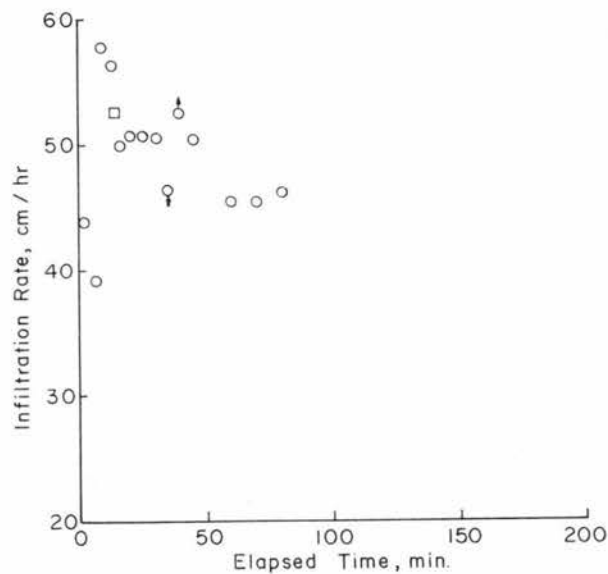
- Short-term
- ◌ Rising level, infiltration rate possibly lower
- ⊖ Falling level, infiltration rate possibly higher
- Long-term

INFILTRATION TEST

LOCATION: Site no. 6, SSW of Oritupano; longitude 63° 27.7' W, latitude 9° 02.8' N.

DATE: August 23, 1969

Clock	Time Elapsed min	Drop in Water Level ft	Time of Drop sec	Infil- tration Rate cm/hr	Comments
1010	0	-	-	-	Fill ring
1013	3	0.10	25.	44.	
1016	6	0.10	28.	39.3	Falling level
1019	9	0.10	19.	58.	
1022	12	-	-	-	Begin long-term
1023	13	0.20	39.	56.4	
1024:05	14	0.60	125.	52.8	End long-term
1026	16	0.10	22.	50.0	
1030	20	0.10	22.	50.9	
1035	25	0.10	21.6	50.9	
1040	30	0.10	21.7	50.7	
1045	35	0.10	23.7	46.4	Falling level
1049	39	0.10	20.8	52.8	Slight rise
1055	45	0.10	21.8	50.4	
1110	60	0.10	24.1	45.6	
1120	70	0.10	24.1	45.6	
1130	80	0.10	23.8	46.2	



SITE DESCRIPTION: Red sandy soil in valley between mesas.
Tough grass with scattered trees.

- Short-term
- ◌ Rising level, infiltration rate possibly lower
- ◌ Falling level, infiltration rate possibly higher
- Long-term

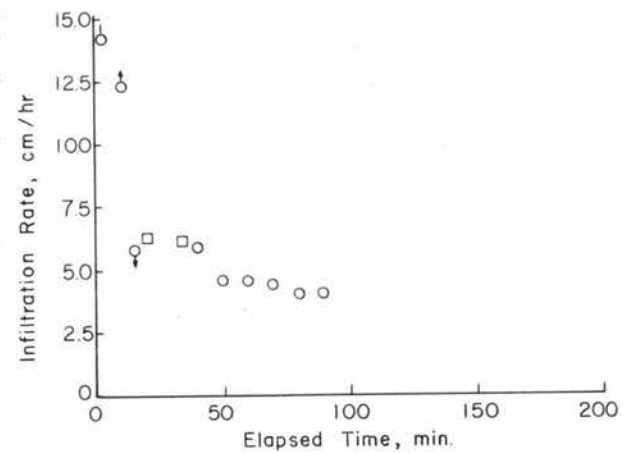
INFILTRATION TEST

LOCATION: Site no. 7, E of Urupia; longitude 63° 51.9' W, latitude 8° 56.3' N.

DATE: August 23, 1969

Time Clock	Time Elapsed min	Drop in Water Level ft	Time of Drop sec	Infil- tration Rate cm/hr	Comments
1330	0	-	-	-	
1333	3	0.05	37.4	14.7	Slight rise
1333	-	-	-	-	Begin long-term
1340	10	0.05	44.6	12.3	Slight rise
1340	-	0.46	420.	12.0	End long-term
1345	15	0.05	94.8	5.8	Slight drop
1350	20	0.05	86.9	6.3	Begin long-term
1402	-	0.40	720.	6.0	End long-term
1404	34	0.05	88.1	6.2	Begin long-term
1410	40	0.05	93.1	5.9	
1419	-	0.44	900.	5.3	End long-term
1420	50	0.05	120.	4.6	
1421:45	-	-	-	-	Begin long-term
1430	60	0.05	120.	4.6	
1440	70	0.05	123.	4.5	
1449	-	0.66	1665.	4.4	Read long-term
1450	80	0.05	133.	4.1	
1459	-	0.88	2265.	4.2	End long-term
1500	90	0.05	135.	4.1	

SITE DESCRIPTION: Soil is sand with some black to 9 in, then yellow. Tough grass with some trees.



- o Short-term
- o with vertical line Rising level, infiltration rate possibly lower
- o with vertical line Falling level, infiltration rate possibly higher
- Long-term

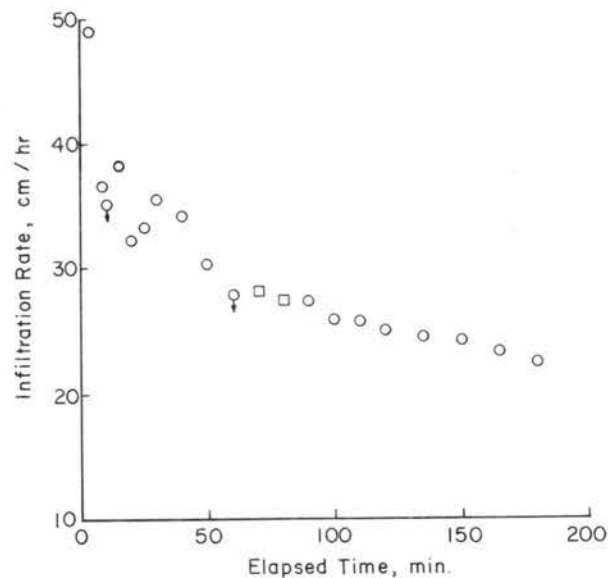
VI-15

INFILTRATION TEST

LOCATION: Site no. 8, ENE of La Viuda; longitude 63° 46.7' W, latitude 8° 41.5' N.

DATE: August 26, 1969

Time Clock	Elapsed min	Drop in Water Level ft	Time of Drop sec	Infil- tration Rate cm/hr	Comments
1015	-	-	-	-	Fill ring
1019	4	0.10	22.2	49.6	
1023	8	0.10	29.9	36.8	
1025	10	0.10	31.3	35.2	Very slight fall
1030	15	0.10	28.8	38.2	
1035	20	0.10	34.2	32.2	
1040	25	0.10	33.0	33.4	
1045	30	0.10	31.0	35.6	
1055	40	0.10	32.1	34.2	
1105	50	0.10	36.3	30.4	
1115	60	0.10	39.4	28.0	Falling level
1115:05	-	-	-	-	Begin long-term
1120:19	-	0.80	314.	28.0	End long-term
1125	70	0.10	39.2	28.1	Begin long-term
1129:53	-	0.80	293.	30.0	End long-term
1135	80	0.10	39.6	27.8	Begin long-term
1140:42	-	0.80	342.	25.7	End long-term
1145	90	0.10	39.9	27.6	
1148	-	-	-	-	Begin long-term
1153:09	-	0.70	309.	24.9	End long-term
1155	100	0.10	42.4	26.0	
1205	110	0.10	42.3	26.0	
1215	120	0.10	43.8	25.1	
1217	-	-	-	-	Begin long-term
1222:25	-	0.70	325.	23.7	End long-term
1230	135	0.10	44.6	24.7	
1245	150	0.10	45.1	24.4	
1300	165	0.10	46.5	23.7	
1315	180	0.10	48.3	22.8	



SITE DESCRIPTION: Sand as far down as sampler reaches.
Occasional black material mixed in tip
2 in.
Grass cover, spotty, with a few trees.

- Short-term
- ↑ Rising level, infiltration rate possibly lower
- ↓ Falling level, infiltration rate possibly higher
- Long-term

SOIL MOISTURE

The soil moisture observations were made by using a porous cup tensiometer (irrometer) with a vacuum gage. The tube-type tensiometer was inserted into a hole made by a soil sampler of the same diameter. This gage reads zero when the soil is saturated and 100 when it is completely dry. To provide quantitative data on soil moisture content, the tube must be calibrated after installation by taking a series of soil moisture samples at various moisture contents to establish a calibration curve. The tubes were not installed until after the wet season was well established, so there was little change in the soil moisture levels during the study. In addition, a period of time is required for the tubes to make good contact with the soil before the instrument readings are indicative of soil moisture levels. The soil scientists at the Universidad de Oriente at Jusepín cooperated in running soil moisture samples, but the data from the soil moisture tubes will still be largely qualitative.

One set of soil moisture tubes was installed at the VIMHEX headquarters in Anaco and was observed by project personnel. Three other installations (see Figure VI-1) were made in the study area using the following criteria: (1) local observer available for at least daily readings; and (2) along a route allowing a project staff member to take readings and soil samples at each site and deliver the soil samples to Jusepín the same day. The south site was in the sandy reddish soil at the agricultural experiment station near El Tigre. This soil is similar to that over much of the area and the experiment station personnel served as observers. The tubes were installed next to a recording rain gage.

The second set of tubes was installed near Campo Mata southwest of Cantaura. This is in a transition area where the calcerous top soil overlies the reddish soil. The third set was installed at La Leona near the highway leading from Anaco to Jusepín along the north boundary of the study area. This is in the rocky soil on the mesa top.

The irrometer readings observed at the four soil moisture sites are presented in the following tables.

Initially in the program, soil samples were collected periodically at the levels of the irrometer cups and sent to Jusepín to determine the soil moisture content. However, the percent of voids filled with water is the desired result. With the sampling method used, the volume of the sample would not be measured with any accuracy. Thus it was very difficult to correlate the irrometer readings with the amount of moisture in the voids.

The sieve-size analyses of the soil materials at the different levels at the four soil moisture sites are given in the table following the irrometer readings.

SOIL MOISTURE DATA

NAME: Anaco.

LOCATION: Anaco; longitude 64° 28' W, latitude 09° 27' N.

REMARKS: Units are 0.01 atmospheres tension.

Date	Hour	Depth Below Surface				
		6"	12"	18"	24"	36"
July 8	1630	12.0	-	19.0	30.0	24.0
9	0730	0.0	-	22.0	34.0	24.0
	1115	1.0	-	18.0	28.0	20.0
	1630	5.0	-	20.0	31.0	36.0
10	0815	0.0	-	24.0	34.0	25.0
	1100	0.0	18.0	22.0	32.0	22.0
	-	0.0	18.0	24.0	34.0	26.0
11	-	0.0	2.5	20.0	35.0	25.0
12	0740	0.0	1.0	4.0	8.0	23.0
13	1055	0.0	3.5	5.0	7.5	16.0
	1630	7.5	7.5	7.5	13.0	18.0
14	0718	0.0	2.5	0.0	5.0	13.0
	1826	2.5	3.0	2.5	7.5	14.0
15	0910	0.0	5.0	5.0	8.0	12.0
	1640	7.0	6.0	6.5	10.0	17.0
16	1040	0.5	7.0	7.0	10.0	14.0
17	0725	0.0	5.0	2.5	7.5	12.0
	1620	7.5	7.0	7.5	12.0	18.0
18	0817	0.0	5.0	2.5	7.5	12.0
	1610	7.1	5.5	4.5	11.0	18.8
19	0830	0.5	3.0	1.0	8.0	12.0
	1700	6.0	6.0	7.0	10.0	15.5
20	0810	0.5	3.0	2.5	7.0	12.0
21	0815	0.5	5.0	3.0	7.5	12.5
	1730	7.0	6.3	7.5	10.5	15.5
22	0820	0.5	4.5	4.0	7.5	12.0
	1600	8.5	7.0	8.0	12.5	17.0
23	0820	0.0	5.0	6.0	8.0	12.0
	1540	11.0	8.0	9.0	13.5	17.0
24	0830	0.5	5.0	4.0	7.5	12.0
	1630	7.5	7.5	9.0	12.0	15.0
25	0830	0.5	5.0	3.7	8.0	12.0
	1710	9.0	8.7	8.5	12.5	16.5
26	0910	0.5	6.2	5.0	8.0	12.0
	1745	11.0	6.0	7.0	12.0	18.0
28	0835	0.5	6.3	4.5	9.0	12.5
29	0745	0.5	7.0	3.3	9.0	17.0
30	1645	17.5	13.0	13.5	18.5	17.5
31	1615	13.3	11.5	11.5	16.0	15.5
Aug. 2	0830	0.5	6.0	11.0	17.5	14.0
4	0855	3.5	7.2	22.0	25.5	13.0
6	1615	14.0	34.0	27.0	28.0	21.0
27	1005	2.5	10.0	6.0	7.5	12.5
28	0850	2.5	7.5	3.0	6.0	10.0
29	0915	0.5	5.0	3.0	5.5	7.5
	1600	2.5	12.5	7.5	10.0	15.0
Aug. 30	0715	0.0	2.5	0.0	5.0	7.5
31	1605	5.0	12.5	10.0	12.5	17.5
	0830	0.0	5.0	2.5	5.0	10.0
Sept. 1	0700	0.0	2.5	2.5	5.0	10.0
	1700	0.0	7.5	5.5	10.0	16.0
2	0700	0.0	2.0	2.0	5.0	12.0
	0655	0.0	2.0	0.0	5.0	12.0
3	1645	5.5	25.0	11.0	11.0	17.0
	0700	0.0	2.5	2.0	5.0	12.0
4	1700	10.0	36.0	12.0	12.0	17.0
	0700	0.0	2.5	2.0	5.0	12.0
5	0700	0.0	2.5	2.5	6.0	12.0
	0845	5.0	12.0	2.5	7.5	11.0
7	0925	2.5	16.0	5.0	7.5	10.0
	1635	7.5	23.0	7.5	7.5	14.0
8	0925	2.5	12.0	5.0	7.5	11.0
	0700	1.0	5.0	2.5	7.5	12.0
9	1740	11.0	44.0	15.0	13.0	18.0
	0655	3.0	12.0	5.0	9.0	14.0
11	0845	13.0	24.0	7.5	10.0	12.0
	1820	0.0	48.0	16.0	14.0	18.0
12	0645	0.0	17.0	1.0	7.5	14.0
	1815	2.5	26.0	10.0	10.0	18.0
13	0700	0.0	5.0	0.0	3.0	14.0
14	0650	0.0	5.0	0.0	5.0	12.0
15	0645	0.0	7.5	2.5	5.0	14.0
16	0700	5.0	7.5	2.5	7.5	14.0
	0705	5.0	7.5	2.5	7.5	13.0
18	0650	0.0	2.5	2.5	10.0	14.0
	1655	2.5	16.0	7.5	14.0	15.0
19	0700	0.0	2.5	0.0	7.5	14.0
	0700	0.0	2.5	0.0	7.5	14.0
21	0900	2.5	7.5	2.5	10.0	12.0
	1630	10.0	26.0	14.0	16.0	18.0
22	1630	12.0	24.0	12.0	18.0	18.0
	0645	12.0	10.0	2.5	12.0	16.0
27	0920	34.0	18.0	7.5	22.0	16.0
	0655	44.0	52.0	18.0	34.0	22.0
29	1700	44.0	54.0	20.0	35.0	22.0
	0700	44.0	56.0	18.0	34.0	20.0
Oct. 1	1700	44.0	58.0	22.0	38.0	20.0
	0655	44.0	58.0	20.0	36.0	20.0
2	1705	44.0	58.0	20.0	38.0	19.0

SOIL MOISTURE DATA

NAME: La Leona.

LOCATION: La Leona; longitude 64° 03' W, latitude 09° 38' N.

REMARKS: Units are 0.01 atmospheres tension.

Date	Hour	Depth Below Surface		Date	Hour	Depth Below Surface	
		6"	18"			6"	18"
Aug. 14	1530	5.0	8.0	Sept. 8	0800	33.0	30.0
	0800	6.0	10.0		1800	32.0	29.0
	1800	13.0	9.0	9	0800	30.0	31.0
					1800	31.0	36.0
16	0800	5.0	10.0	10	0800	35.0	39.0
	1800	5.5	9.0				
17	0800	5.0	9.5	11	0800	40.0	44.0
	1800	8.0	10.0		1800	35.0	34.0
18	0800	6.0	9.0	12	0800	31.0	33.0
	1800	5.0	6.0		1800	28.0	32.0
19	0800	6.0	8.0	13	0800	21.0	31.0
	1800	5.0	9.0		1800	20.0	30.0
20	0800	5.5	9.5	14	0800	19.0	29.0
	1800	5.0	8.0		1800	18.0	31.0
21	0800	6.0	9.0	15	0800	17.0	28.0
	1800	7.0	8.0		1800	18.0	29.0
22	0815	5.0	9.0	16	0800	20.0	31.0
	1800	6.0	7.0		1800	19.0	30.0
23	0815	7.0	9.0	17	0800	22.0	31.0
	2000	6.5	10.0		1800	18.0	31.0
24	0800	9.0	8.0	18	0800	20.0	35.0
	1800	9.5	6.0		1800	19.0	39.0
25	0800	10.0	7.0	19	0800	27.0	41.0
	1800	9.0	8.0		1800	25.0	39.0
26	0800	5.0	10.0	20	0800	23.0	37.0
	1800	7.0	9.0		1800	21.0	31.0
27	0800	5.0	9.0	21	0800	18.0	28.0
	1800	7.0	9.0		1800	17.0	25.0
28	0800	5.0	10.0	22	0800	16.0	23.0
	1800	9.0	8.0		1800	22.0	28.0
29	0800	8.0	7.0	23	0800	35.0	30.0
	1800	5.0	9.0		1800	25.0	20.0
30	0800	8.0	7.0	24	0800	5.0	7.0
	1800	7.0	8.0		1800	2.0	9.0
31	0800	5.0	6.0	25	0800	5.0	5.0
	1800	9.0	6.0		1800	6.0	6.0
Sept. 1	0800	7.0	11.0	26	0800	5.0	8.0
	1800	6.0	9.0		1800	7.0	5.0
2	0800	7.0	8.0	27	0800	9.0	9.0
	1800	7.0	9.0		1800	10.0	11.0
3	0800	5.0	8.0	28	0800	7.0	9.0
	1800	4.0	5.0		1800	8.0	8.0
4	0800	11.0	14.0	29	0800	6.0	10.0
	1800	16.0	12.0		1800	5.0	7.0
5	0800	19.0	18.0	30	0800	8.0	6.0
	1800	19.0	18.0		1800	9.0	7.0
6	0800	15.0	16.0	Oct. 1	0800	-	10.0
	1800	21.0	19.0				
7	0800	26.0	21.0				
	1800	29.0	27.0				

SOIL MOISTURE DATA

NAME: Campo Mata.

LOCATION: Restaurante El Alto, Campo Mata; longitude 64° 04' W, latitude 09° 12' N.

REMARKS: Units are 0.01 atmospheres tension.

Date	Hour	Depth Below Surface			Date	Hour	Depth Below Surface		
		12"	18"	36"			12"	18"	36"
Aug. 14	1600	6.0	6.0	11.0	Sept. 8	1000	13.0	13.0	14.0
15	0900	7.0	6.0	12.0		1600	13.0	10.0	14.0
	1600	8.0	8.0	14.0	9	1000	9.0	12.0	14.0
16	1100	8.0	6.0	12.0		1700	11.0	11.0	16.0
	1700	9.0	8.0	13.0	10	0800	11.0	12.0	16.0
17	0800	9.0	7.0	13.0		1600	13.0	13.0	16.0
	1700	9.0	8.0	13.0	11	0900	10.0	10.0	14.0
18	0900	10.0	7.0	14.0		1700	8.0	8.0	14.0
	1600	10.0	9.0	14.0	12	0900	6.0	8.0	14.0
19	0900	10.0	8.0	14.0		1700	6.0	8.0	14.0
	1700	10.0	9.0	14.0	13	1000	10.0	10.0	14.0
20	1000	10.0	9.0	14.0		1600	8.0	8.0	14.0
	1600	10.0	10.0	14.0	14	0900	10.0	10.0	14.0
21	1000	10.0	10.0	14.0		1700	10.0	10.0	14.0
	1700	10.0	10.0	12.0	15	1000	10.0	8.0	14.0
22	0900	10.0	10.0	14.0		1700	10.0	10.0	22.0
	1700	10.0	10.0	14.0	16	0900	11.0	8.0	16.0
23	0900	10.0	10.0	14.0		1600	11.0	10.0	18.0
	1700	10.0	10.0	14.0	17	0900	11.0	9.0	15.0
24	0900	10.0	10.0	14.0		1600	11.0	9.0	14.0
	1600	8.0	8.0	12.0	18	0900	11.0	10.0	16.0
25	0900	8.0	8.0	12.0		1600	10.0	10.0	16.0
	1700	10.0	9.0	12.0	19	0900	12.0	10.0	16.0
26	1000	8.0	8.0	12.0		1600	12.0	12.0	18.0
	1600	8.0	10.0	12.0	20	0900	12.0	10.0	14.0
27	0900	8.0	10.0	12.0		1600	10.0	10.0	14.0
	1700	10.0	8.0	12.0	21	0900	12.0	11.0	15.0
28	0900	10.0	8.0	12.0		1700	12.0	12.0	14.0
	1600	10.0	8.0	12.0	22	0900	14.0	10.0	16.0
29	0900	10.0	8.0	12.0		1600	13.0	10.0	20.0
	1600	10.0	8.0	12.0	23	0900	13.0	12.0	15.0
30	0900	10.0	8.0	12.0		1600	10.0	10.0	12.0
	1600	10.0	9.0	14.0	24	0900	14.0	12.0	16.0
31	0900	10.0	9.0	14.0		1600	14.0	10.0	14.0
	-	10.0	9.0	14.0	25	0900	13.0	12.0	16.0
Sept. 1	1000	11.0	10.0	12.0		1600	13.0	12.0	16.0
	1600	11.0	10.0	12.0	26	1000	12.0	12.0	14.0
2	0900	9.0	8.0	14.0		1700	14.0	10.0	14.0
3	0900	13.0	10.0	11.0	27	0900	10.0	10.0	12.0
	1600	13.0	10.0	11.0		1600	11.0	10.0	12.0
4	1000	12.0	10.0	14.0	28	0800	10.0	10.0	12.0
	1700	12.0	11.0	16.0		1700	12.0	12.0	14.0
5	0800	12.0	9.0	16.0	29	0900	0.0	12.0	0.0
	1600	12.0	9.0	16.0		1700	0.0	13.0	0.0
6	0800	13.0	13.0	16.0					
	1700	12.0	8.0	14.0					
7	0900	12.0	13.0	16.0					
	1700	12.0	10.0	14.0					

SOIL MOISTURE DATA

NAME: El Tigre.

LOCATION: M. A. C. Campo Experimental de Guanipa; longitude 64° 13' W, latitude 08° 52' N.

REMARKS: Units are 0.01 atmospheres tension.

Date	Hour	Depth Below Surface			Date	Hour	Depth Below Surface		
		12"	24"	36"			12"	24"	36"
Aug. 22	1600	7.5	0.0	14.0	Sept. 19	0800	7.0	7.5	10.5
23	0800	3.5	-	12.0	20	1600	11.0	7.5	17.0
	1600	7.0	3.0	16.0		0800	7.0	7.5	18.0
25	0800	4.0	3.5	14.5	22	1600	11.0	7.0	16.0
	1600	7.0	3.0	15.0		0800	8.0	7.0	19.0
26	0800	4.0	3.0	14.0	23	1600	10.0	7.5	17.5
	1600	6.0	4.0	15.0		24	0800	7.5	7.5
27	0800	4.0	4.0	13.0	1600		12.5	7.5	16.0
	1600	5.0	3.0	15.0		25	0800	9.0	7.5
28	0800	5.0	3.0	14.0	1600		8.0	8.5	19.0
						29	0800	4.0	2.0
1600	6.0	3.0	15.0	1600	7.5		7.5	17.5	
Sept. 1	0800	4.0	2.0	13.0	30	0800	7.5	7.5	18.0
						1600	10.0	7.5	15.0
2	0800	3.0	2.0	14.0	Oct. 1	0800	7.5	7.5	19.0
						1600	8.0	5.0	14.0
3	0800	3.0	2.0	14.0	2	0800	5.0	7.5	19.0
						1600	7.5	2.5	15.0
4	0800	5.0	2.5	12.5	3	0800	7.5	7.5	17.5
						1600	8.5	3.0	15.0
5	0800	7.5	2.5	15.0	6	0800	10.0	8.0	18.0
						1600	8.0	3.0	15.0
8	0800	7.5	3.0	14.0	7	0800	12.5	8.0	19.0
						1600	12.5	8.0	17.5
9	0800	6.5	6.0	14.0	8	0800	10.0	7.5	18.0
						1600	10.0	7.5	15.0
10	0800	2.5	2.5	13.0	9	0800	8.0	7.5	18.0
						1600	10.0	8.0	15.0
12	0800	7.5	4.5	15.5	10	0800	10.0	7.5	17.0
						1600	10.0	6.0	17.5
15	0800	7.5	7.5	17.5	13	0800	10.0	7.5	17.5
						1600	7.5	7.5	17.5
16	1600	10.0	7.5	17.0	14	0800	10.0	7.5	15.0
						1600	11.5	7.5	17.5
17	0800	6.5	7.5	16.5	15	0800	10.0	7.5	16.0
						1600	10.0	7.5	17.5
18	0800	7.5	7.5	17.0					
					1600	10.0	7.5	17.5	

SIZE ANALYSIS OF SOIL PROFILE
AT SOIL MOISTURE SITES
Samples Collected: September 2, 1969

ANACO SOIL MOISTURE SITE

Sample Number	Distance Below Surface	PERCENT FINER THAN:									
		32.0mm	16.0mm	8.0mm	4.0mm	2.0mm	1.0mm	0.5mm	0.25mm	0.125mm	0.0625mm
1	6"			100.	99.9	99.3	94.6	85.5	37.0	14.1	7.1
2	12"			100.	99.8	99.2	94.0	85.0	35.7	12.2	5.7
3	18"				100.	99.2	94.1	85.9	37.8	12.9	5.9
4	24"				100.	99.6	94.2	85.9	35.2	12.1	5.6
5	36"				100.	99.6	94.5	86.5	40.1	13.8	6.4

LA LEONA SOIL MOISTURE SITE

Sample Number	Distance Below Surface	PERCENT FINER THAN:									
		32.0mm	16.0mm	8.0mm	4.0mm	2.0mm	1.0mm	0.5mm	0.25mm	0.125mm	0.0625mm
1	1"	100.	67.3	45.9	36.0	31.3	28.5	27.0	21.9	13.4	7.2
2	6"	100.	51.0	28.2	23.5	22.3	21.0	20.2	15.9	9.0	4.2
3	18"		100.	99.2	98.4	94.2	82.2	64.4	42.5	20.7	8.2

CAMPO MATA SOIL MOISTURE SITE

Sample Number	Distance Below Surface	PERCENT FINER THAN:									
		32.0mm	16.0mm	8.0mm	4.0mm	2.0mm	1.0mm	0.5mm	0.25mm	0.125mm	0.0625mm
1	0"-2.5"			100.	99.9	98.9	93.0	82.2	62.5	28.3	13.1
2	16"-20"	100.	92.0	92.0	91.8	91.2	87.0	77.5	60.3	32.4	15.4
3	32"-40"				100.	98.6	93.3	84.6	66.4	35.2	18.4

EL TIGRE SOIL MOISTURE SITE

Sample Number	Distance Below Surface	PERCENT FINER THAN:									
		32.0mm	16.0mm	8.0mm	4.0mm	2.0mm	1.0mm	0.5mm	0.25mm	0.125mm	0.0625mm
1	0"-2.5"				100.	98.7	88.6	70.0	37.1	15.9	6.4
2	12"-15"			100.	99.9	95.8	78.2	64.0	44.5	19.1	8.1
3	22"-25"			100.	99.9	97.6	84.2	66.9	49.7	31.4	21.3

SOIL TEMPERATURE

Measurements were made of the soil temperature profile at the Anaco rain gage site. Ten copper-constantan thermocouples were installed at 24, 12, 6, 4, 3, 2 and 1 inches below the ground surface, at the ground surface and at 1 and 2 inches above the surface. The grass vegetation at the ground surface was not disturbed by the installation. The reference temperature was obtained with a calibrated mercury thermometer, and a non-recording null potentiometer was used to measure the induced voltage across the thermocouples.

The thermocouples above the ground were shielded from direct solar radiation during daytime observations when there was no cloud cover. Otherwise, the shield was removed.

The soil temperature data are presented in the following table.

SOIL TEMPERATURE DATA

LOCATION: Anaco Rain Gage Sta. No. WG 1
1969

Date	Time of Observation (hour)	Temperature °F at										
		Ambient Air	+2"	+1"	Surface 0	-1"	-2"	-3"	-4"	-6"	-12"	-24"
Sept. 20	1055-1115	86.2	100.2	100.0	98.1	87.2	85.4	84.6	83.9	82.3	82.8	84.0
	1430-1500	91.2	97.1	97.2	98.9	92.4	93.7	92.7	90.6	88.8	84.8	83.7
	1510-1525	92.2	97.8	96.6	96.6	91.2	91.4	91.2	90.1	87.8	84.4	83.4
	1725-1745	82.2	83.4	82.0	84.6	87.1	87.4	87.8	88.0	87.6	85.6	84.0
21	0630-0655	75.8	75.6	74.8	76.2	79.6	80.0	80.2	80.7	80.5	83.2	84.2
	1120-1145	91.8	94.0	96.5	96.5	86.6	86.5	85.7	84.7	84.0	83.0	83.7
24	0945-1000	86.8	87.6	86.9	86.0	82.3	82.3	81.6	81.9	81.8	82.9	84.4
	1300-1315	92.4	94.4	94.7	94.5	86.7	86.2	84.8	84.8	83.9	83.6	84.6
	2145-2215	80.0	74.6	74.8	76.6	80.4	81.8	81.7	82.5	82.8	84.1	84.0
27	0730-0750	80.2	79.7	79.0	79.8	80.2	81.0	81.0	81.5	81.4	84.2	84.8
	0950-1005	88.4	87.8	87.0	85.6	81.4	82.1	81.6	82.0	81.7	83.7	84.6
29	0955-1010	86.4	87.2	87.0	84.8	83.0	83.0	82.6	82.8	82.7	83.9	84.8
	1805-1900	79.2	78.0	78.0	80.2		84.0	84.4	84.5	84.4	85.0	84.9
	1910-1945	79.0	77.3	77.2	79.8	82.4	83.1	83.6	84.0	84.0	84.9	84.6
	2000-2040	78.6	77.1	78.3	79.7	82.4	83.4	83.2	83.8	83.7	84.8	84.6
	2130-2210	77.4	77.1	75.9	78.6	81.8	82.4	82.7	83.5	83.4	84.8	84.7
	2225-2300	77.6	75.1	75.4	78.0	81.4	82.8	82.4	83.4	83.6	85.0	84.7
30	2330-2350	76.4	74.4	73.6	77.1	80.4	82.2	81.9	82.8	82.8	84.5	84.8
	0005-0050	76.8	74.1	74.0	76.8	80.5	82.0	82.1	82.6	82.8	84.2	84.2
30	0105-0135	77.0	73.3	72.7	76.0	79.3	81.1	80.9	82.3	82.2	84.4	84.3
	0200-0230	76.8	72.0		75.2	79.0		80.9	81.8	82.0	84.4	
	0300-0352	76.0	72.3	72.2	75.2	79.0		80.5	81.6	81.0	84.0	84.4
	0400-0440	75.6	73.6	73.7	76.0	79.2	80.2	80.6	82.2	81.6	83.7	84.3
	0505-0550	75.0	73.8	74.2	76.4	79.1	80.3		81.3	81.7	83.8	85.0
	0600-0645	76.5	73.7	73.2	75.6	78.9	80.3	80.7	80.7	82.6	83.7	84.6
	0700-0730	79.6	76.4	76.0	78.1	78.8	80.0	79.6	80.8	81.0	83.0	84.1
	0800-0830	82.5	79.6	78.8	80.7	79.7	80.4	81.9	80.6	80.8	82.6	83.6
	0900-0925	85.0	83.4	82.2	81.4	79.9	80.0		80.5	81.0	82.2	83.2
	1000-1025	83.3	84.8	85.0	84.2	80.2	80.4		80.8	80.1	81.6	82.2
	1100-1120	90.0	89.2	88.4	87.4	81.0	80.7		80.8	80.8	81.6	81.6
	1200-1215	92.5	95.0	93.8	92.4	82.0	81.4		80.8	80.8	81.0	82.4
1300-1325	93.2	96.9	95.8	95.7	84.3	83.4		83.5	82.9	82.8	84.0	
1400-1420	92.4	90.7	90.8		88.0	86.4		85.5	84.6	84.1	85.0	
30	1500-1520	94.8	95.5	94.4	94.4	87.3	86.0		85.1	84.8	83.2	84.1
	1600-1626	87.6	90.6	88.6	90.2	86.2	85.5	85.3	84.8	84.8	82.8	83.8
	1700-1720	81.2	77.4	76.2	80.0	84.5	85.3	85.2	84.6	84.0	84.2	84.6
	1800-1825	79.2	76.8	76.9	80.4	83.7	83.8		84.2	84.3	84.5	84.4
	1900-1925	80.4	74.4	74.6	78.7	81.8	82.4	81.6	83.9		84.5	
	2000-2015	79.4		75.5	79.6	82.1	83.6	83.1	83.8	83.5	84.9	84.2
	2100-2115	79.2	75.8	75.8	78.9	81.8	82.9	82.6	83.4	83.2	84.9	84.6
	2200-2217	78.5	75.2	75.5	78.0	79.9	82.3	82.5	83.8	83.8	85.2	84.5
2300-2315	78.6	75.4	75.8	78.0	80.8	82.0	81.8	82.6	82.5	84.4	83.4	
Oct. 1	0000-0011	77.8	75.6	76.2	77.6	80.7	81.9	82.0	82.8	83.7	85.2	
8	0800-0815	80.6	80.3	79.6	79.2	78.2	78.1	77.8	78.1	77.9	79.6	81.8
	1400-1420	93.0	101.7	102.6	102.6	87.6	84.8	82.4	81.6	80.2	79.3	80.8
	1800-1810	81.0	78.0	78.4	80.4	82.0	82.4	82.1	82.1	82.0	81.0	81.0
9	0700-0720	76.5	74.1	75.1	75.8	76.9	77.8	77.7	78.6	78.8	80.8	
	1405-1425	89.0	92.6	93.2	91.7	85.0	85.2	84.0	83.8	83.0	81.3	81.4
	1815-1830	80.6	80.0	79.8	82.4	84.0	84.0	82.6	83.9	83.9	83.3	82.0
10	0700-0720	78.8	77.7	78.2	79.1	79.5	79.8	79.8	80.8	81.0	82.8	83.3
	1733-1745	83.0	81.5	81.7	84.4	85.0	85.2	85.2	85.5	84.4	83.8	

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