PRELIMINARY EVALUATION OF THE SURFACE-WATER SUPPLIES IN THE COW PEN SLOUGH AREA

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INTRODUCTION

On July 31, 1979, the Southwest Florida Water Management District authorized the firm of Hydroscience Research Group, Inc. to conduct a preliminary evaluation of the surface-water supplies in the Cow Pen Slough Area, Sarasota County, Florida. The results of the preliminary evaluation are contained in this report which is submitted in fulfillment of the agreement between the Southwest Florida Water Management District and Hydroscience Research Group, Inc.

PURPOSE AND SCOPE

The purpose of this preliminary evaluation was to evaluate the water quality, water quantity, and the potential yield of water from Cow Pen Slough, Phillippi Creek, and the Myakka River, under a given set of variable limiting factors. The scope of work included the collection and evaluation of all existing and available data on water quality and water quantity of the selected streams, and the evaluation of appropriate methods of diverting and capturing large amounts of water for future use.

The recent and present rate of urban and agricultural growth in Sarasota County within and adjacent to the Basins of Cow Pen Slough, Phillippi Creek, and the Myakka River has dictated the need for new water supplies as well as flood control measures to meet the future needs of the county. Information and data provided in this report gives a preliminary evaluation of the surface-water potential and methods of possible development of selected streams to determine the availability of possible future water supplies and, in turn, solve the flooding problems.

The purpose and scope of this preliminary evaluation is enhanced by the long-term data available on both water quality and water quantity parameters of the three streams. The possibilities of producing a new water supply needed for future development and, by doing so, alleviating potential flooding problems, makes the area of study a unique setting in surface-water hydrology.

DESCRIPTION OF AREA

The area of study, Figure 1, includes the northern and west-central part of Sarasota County that falls within the Basins of Cow Pen Slough, Phillippi Creek, and the Myakka River (from the State Park, south). The area covered by the three basins form a watershed approximatly 30 miles long and up to 11 miles wide that contains approximatly 242 square miles. The area is made up of nearly level plains separated by low, flat ridges, usually no more than 20 feet high and paralleling natural drainage patterns. Elevations within the area of study vary from 85 feet above mean sea level to the northeast, to sea level along the coast.

WATER QUALITY

Available Data

As a first step in evaluating a potential new water source, the past variability of water quality must be studied in detail, using all available data. The water quality data for the study area were obtained from two sources:

1.) The United States Geological Survey (U.S.G.S.)
2.) The Environmental Protection Agency (E.P.A.)

The water quality data from the E.P.A. were not used because the data were received only as statistics and no concurrent stream discharge measurements were available. This means the data would be of limited value because, without concurrent stream discharge measurements, too many assumptions would have to be made to determine how water quality changes with stream discharge.

The U.S.G.S. water quality data for each of the three streams (Cow Pen Slough, Phillippi Creek, and the Myakka River), and the daily discharges on the streams at the U.S.G.S. gages near the planned points of development were analyzed with the Statistical Package for Social Sciences (SPSS) computer program to arrive at a correlation of water quality

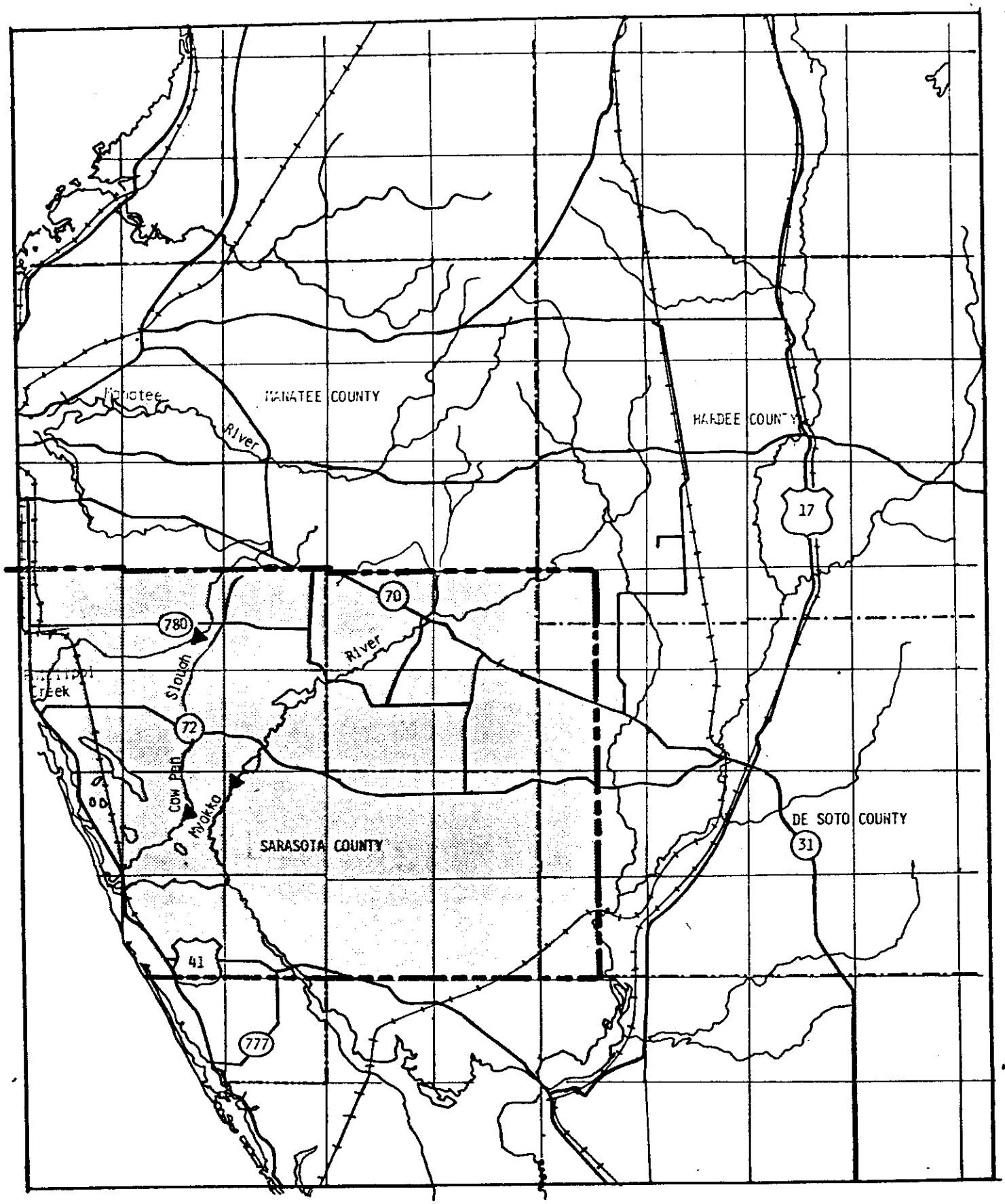


FIGURE 1 MAP OF STUDY AREA
SHOWING U.S.G.S. GAGING STATIONS (▲)

with stream discharge. This correlation was done in logarithmic form because the natural variability of stream flow is very close to log normal distribution. For reference, the results of this correlation are shown in Appendix A, Tables 1A, 1B, and 1C.

The physical and chemical characteristics of Cow Pen Slough, Phillippi Creek, and the Myakka River are shown in Tables 2A, 2B, and 2C. These three tables show concentration of chemical constituents in miligrams per liter under various flow conditions as identified by the flow duration points (D-10, D-25, D-50...etc.).

One of these points would be identified as that flow for the site which is equaled or exceeded the percentage of time shown (D-10 = exceeded 10% of the time). The headings for each column also show the flow for the specific stream in cubic feet per second at these flow durations. The percent flow duration is also shown for the column headed "Q Average" (average flow). Potable water standards are shown in Column 9, and the percentage of time that these standards are exceeded are listed in Column 10.

The water quality data on the three streams needs a great deal more work initiated to give a better quality water base. Cow Pen Slough has a great deal of agricultural influence which could mean that run-off into the Slough may be highly effected by fertilizers and pesticides. There are indications that Phillippi Creek may have areas where sewage is being discharged into the creek. Even though the Myakka River has a great number of samples taken over the past few years, the broad spectrum of water quality is not covered adequatly.

Cow Pen Slough and Phillippi Creek

The statistical evaluation of the existing water quality data for Cow Pen Slough and Phillippi Creek shows that both streams have very few parameters that are significantly higher than drinking water standards. The parameters that could be of concern, such as color, are normally easy to treat, The U.S.G.S. Water Quality Data indicates that water quality on the two streams is good. However, there are problems that

TABLE NO.: 2A PHYSICAL AND CHEMICAL CHARACTER OF WATER AT STATION NO.: 02299700

COW PEN SLOUGH NEAR BEE RIDGE, FLORIDA

Parameter	Quality Parameter at Duration: D-10**	D-25	D-50	D-70	D-75	D-90	D-95	Q Avg D-19	Quality Water Standards	Percentage of Time Exceeding Drinking Water Standards
Discharge, CFS	110	27	3.7	.70	.60	.10	.05	46.4		
pH	6.86	7.03	7.28	7.50	7.52	7.75	7.85	6.97	6.5-8.5	0
	Concentration in Miligrams Per Liter									
Chloride	14.0	18.8	28.6	40.6	42	61.3	50.9	16.8	250	0
Color	124	81.7	45.2	27.6	26.4	15.5	12.6	95.9	15	90
Na	7.9	11	17.7	26.2	27.2	41.2	49.1	9.69	NONE Yet	0
SO_4	28.4	41.9	72.6	15	120	197	239	36.1	250	4
F	1.86	2.51	3.83	5.45	5.63	8.22	9.53	2.24	1.4-2.4	87
TDS-Res	111	156	252	377	391	604	714	137	500	14
TDS-Sum	102	145	236	356	370	576	683	126		
EPA: Fec Coli								70.5	~~4~~/100	70
NO_3-N								.183	10	0

* Quantity of flow duration, D-10, is that flow equaled or exceeded 10% of the time

TABLE NO.: 2B PHYSICAL AND CHEMICAL CHARACTER OF WATER AT STATION NO.: 02299750

PHILLIPPI CREEK NEAR SARASOTA, FLORIDA

Parameter	Quality Parameter at Duration: D-10*	D-25	D-50	D-70	D-75	D-90	D-95	Q Avg D-24	Quality Water Standards	Percentage Of Time Exceeding Drinking Water Standards
Discharge, CFS	.78	28	8.5	4.1	3.5	1.9	1.2	29.5		
pH	7.31	7.40	752	7.59	7.60	7.66	7.70	7.40	6.5-8.5	0
	Concentration in Miligrams Per Liter									
Chloride	22.1	27.4	35.1	40.8	42.1	47.8	52.6	27.1	250	0
Color	67.1	51.6	38	31.5	30.3	25.9	23	52.3	15	0.3
Na	14.7	18.5	24.2	28.5	29.5	33.9	37.5	18.3	NONE	56
SO_4	145	191	263	320	334	393	445	189	250	0
F	.613	.717	.862	.964	.988	1.09	1.16	.712	1.4-2.4	80
TDS-Res	431	527	666	768	792	893	978	522	500	
TDS-Sum	343	425	545	634	655	744	818	420		
EPA: NO_3-N									10	0
Fec Coli									4/100	100
Chloride										

* Quantity of flow duration, D-10, is that flow equaled or exceeded 10% of the time

TABLE NO.: 2C PHYSICAL AND CHEMICAL CHARACTER OF WATER AT STATION NO.: 02299000

MYAKKA RIVER NEAR SARASOTA, FLORIDA

Parameter	Quality Parameter at Duration: D-10*	D-25	D-50	D-70	D-75	D-90	D-95	Q Avg D-26	Quality Water Standards	Percentage Of Time Exceeding Drinking Water Standards
Discharge, CFS	730	280	62	11	5.7	.01	--	254		
pH	6.60	6.62	6.66	6.69	6.71	6.15	--	6.62	6.5-8.5	0
	Concentration in Miligrams Per Liter									
Color	162	150	133	116	110	66.7	--	149	15	100
NO_5-N	.227	.226	.224	.222	.222	.215	--	.226	10	0
Chloride	11.3	12.1	13.4	15.1	15.8	24.5	--	12.2	250	0
SO_4	7.07	8.20	10.4	13.6	15.0	40.1	--	8.32	250	0
F	.289	.293	.299	.306	.309	.338	--	.293	1.4-2.4	0
TDS-Res	80.5	84.5	91.3	99.6	103	142	--	85	500	0
TDS-Sum	45.6	49.2	55.4	63.4	66.7	110	--	49.6		
As								.256	.05	100
Ca-Total								10.0	.05	100
Cd-Total								1.0	.01	100
Fe-Total								4.5	.30	100
Pb-Total	640	548	428	323	290	103	--	539	.002	100
Mn-Total								6.80	.05	100

TABLE NO.: 2C (Continued) MYAKKA RIVER NEAR SARASOTA, FLORIDA

Parameter	D-10 **	D-25	D-50	D-70	D-75	D-90	D-95	Q Avg D-26	Quality Water Standards	Percentage of Time Exceeding Drkg. Water Standards
Zn-Total								11.6	-5-	
Ag-Total								1.0	.05	
Na	5.02	5.60	6.66	8.12	8.75	18.1	--	5.67		
Ca-Dis								12.2	1.0	
pB-Dis								4.61	.002	100
Zn-Dis								9.61	5	69
Cd-Dis								22.7	.01	100
Cr-Hex								2.0	.05	
Cr-Dis								2.0	.05	
As-Dis								2.0	.05	
Se-Dis								25	.01	
EPA: Fec Coli								350/100	4/100	65*

MAX = 3800 MIN = 10 $\bar{0}$ = 904

* Based on Assumption of Random Sampling and Normal Probability

** Quantity of flow duration, D-10, is that flow equaled or exceeded 10% of the time

must be investigated prior to any new development. The data available and used for water quality ranges from very minimal on Cow Pen Slough to good coverage on Phillippi Creek as follows:

> Cow Pen Slough, during the period 1962 to 1966, only 18 observations were recorded.
>
> Phillippi Creek, during the period 1963 to 1968, 180 observations were recorded.

The evaluation of water quality shows that a number of parameters need to be added in any future water quality studies. The needed data should cover coliform bacteria and nutrients (because of agricultural influence), toxins and viruses (because of existing landfill in the area of Cow Pen Slough), and the possiblilty of sewage being discharged into Phillippi Creek. Trace inorganics should be added to give background that is needed on all potential surface-water sources.

Myakka River

The evaluation of water quality in the Myakka River shows that the trace inorganics, Nitrates, pH, and Fluorides need more data to make correlations significant. These parameters probably are only significant when average values are used. All of the trace inorganics for the Myakka River exceed the Drinking Water Standards and the treatment to bring these elements back within the Standards could be very difficult.

The sampling of the Myakka River includes the period from October 1962 to September 1968, with 224 observations.

WATER QUANTITY

Available Data

The information available for the study area and this report is from the following stations operated by the U.S.G.S.:

Station Number	Name	Area Sq. Mile	Period of Record
02299700	Cow Pen Slough near Bee Ridge, Florida	a. 38	1963-66

Station Number	Name	Area Sq.Mile	Period Of Record
02299800	Phillippi Creek near Sarasota, Florida	a. 24	1963-68
02298830	Myakka River near Sarasota, Florida	a. 235	1936-78
02298850	Myakka River below lower Myakka Lake near Sarasota, Florida	a. 240	1946-51

a. = approximate

The daily discharges for the above-listed stations through the 1978 water year were obtained on a magnetic tape from the U.S.G.S. All of the daily figures are published in reports from the U.S.G.S.

The monthly and yearly average flows, as published by the U.S.G.S. for gaging station No. 02299700, Cow Pen Slough, near Bee Ridge, Fla., are shown in Appendix B, Table 3A. This table shows flows from 1963 to 1966; however, estimates for four months in 1963 and three months in 1966 were added in order to show annual figures for the four year period. This extended data, using a transfer relationship, is explained in a later section of this report, entitled "The Transfer and Extension of Surface-Water Records From One Stream To Another." Tables 3B and 3C lists the daily volumes and the Flow Duration Summary for the two complete water years, as published.

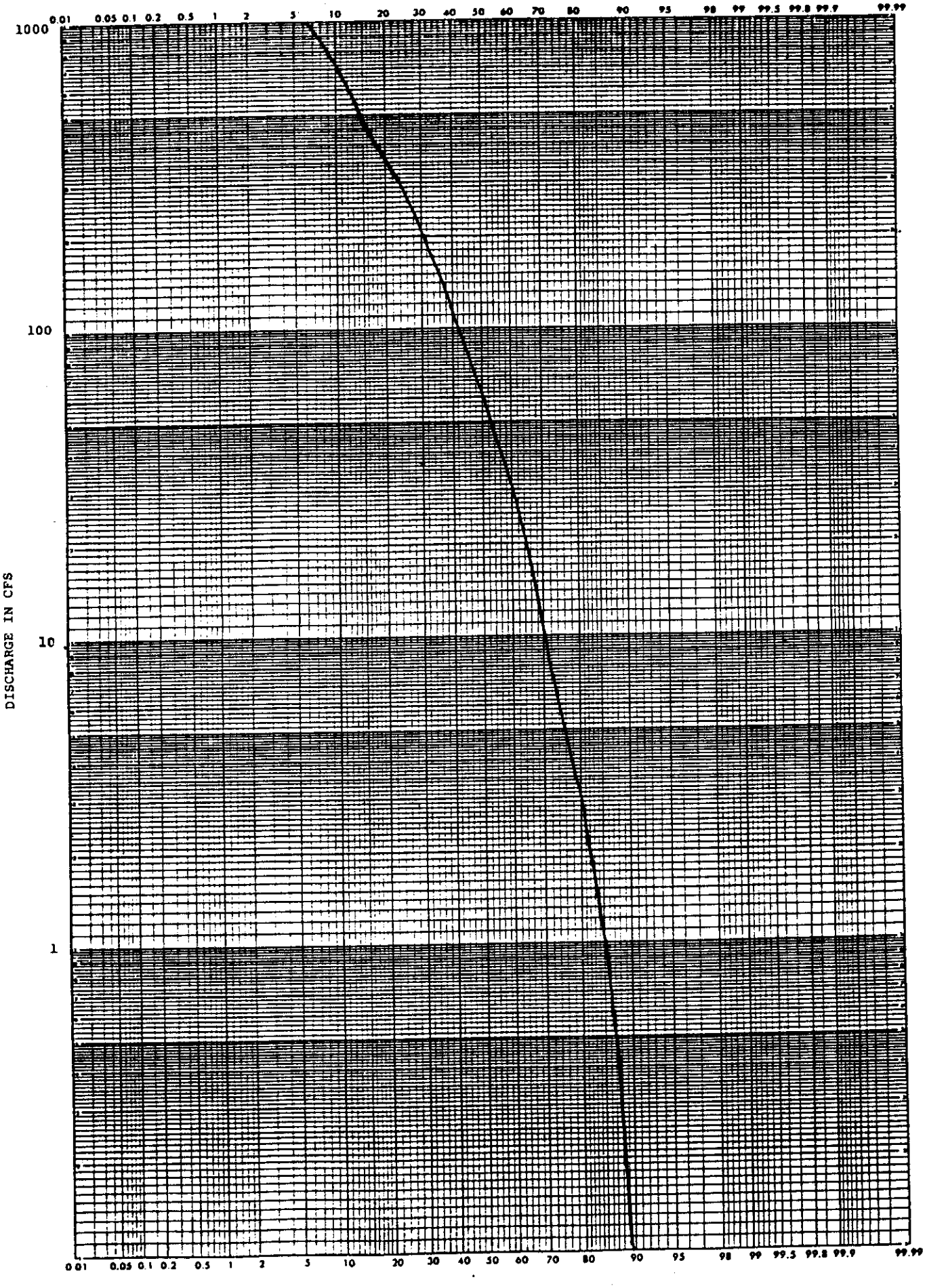
The monthly and yearly average flows as published by the U.S.G.S. for gaging station No. 02299750, Phillippi Creek near Sarasota, Fla., are shown in Appendix B, Table 4A. In order to have one extra complete year on this table, and show annual figures for six years, 1963-68, estimates of the monthly flow for the first four months of record in the 1963 water year was added, using a transfer relationship. Table 4B lists the Flow Duration Data and Table 4C list the Flow Duration Summary for the five complete water years available for the Phillippi Creek site. Figures of monthly flow for station No. 02298830, Myakka River near Sarasota, Fla., are shown in Appendix B, Table 5A.

This station has a 42-year record that provides important long-term input to this report. Table 5B lists statistics of the monthly and yearly flows; Table 5C, the Flow Duration Data; Table 5D, Flow Duration Summary; Table 5E, Low-Flow Summary; and Table 5F, High-Flow Summary. Figure 2 shows the Flow Duration Curve for the period of record for the Myakka River station. Various points taken from the Flow Duration Curve were previously explained on page 4 of the text on Water Quality. This curve shows the percentage of time specific flows are equaled or exceeded. For example, on Figure 2, a flow of 11 CFS is shown as being equaled or exceeded 70 % of the time.

The Use of Available Data

Determination of surface-water availability requires long-term records of daily discharge or a long-term period of simulated daily discharges. When there is adequate precipitation, there is also adequate run-off in streams; but the streamflow is not always available when it is needed. The extreme variability of streamflow data in time can be best seen by an inspection of Tables 5A and 5B, and Figure 3. The seasonal variability for each month from maximum to minimum are shown by coded lines on Figure 3. Many years of record are required before a reasonable long-term average can be obtained and the extreme ranges from wet to dry conditions adequatly appraised. For example, the range between the maximum and minimum values of the yearly discharge range from 128 percent of the long-term average for the minimum year, 1956. This roughly averages $\pm$ 100 percent. In using the long-term Myakka records, one can determine the error that would occur if only 5 years of records were available, such as the record for Cow Pen Slough and Phillippi Creek. The Myakka records were investigated in terms of 5-year running averages. The highest 5-year running average of 383 cubic feet per second, ending in 1961, would be + 51 percent of the long-term average and the lowest 5-year running average of 184 cubic feet per second for the period ending in 1944 would be - 28 percent of the long-term average, thus averaging $\pm$44 percent. If other longer periods were investigated, such as 10-year or 20-year running averages, one would find that at least 20 to

FIGURE NO 2 MYAKKA RIVER NR SARASOTA, FLA. FLOW DURATION CURVE



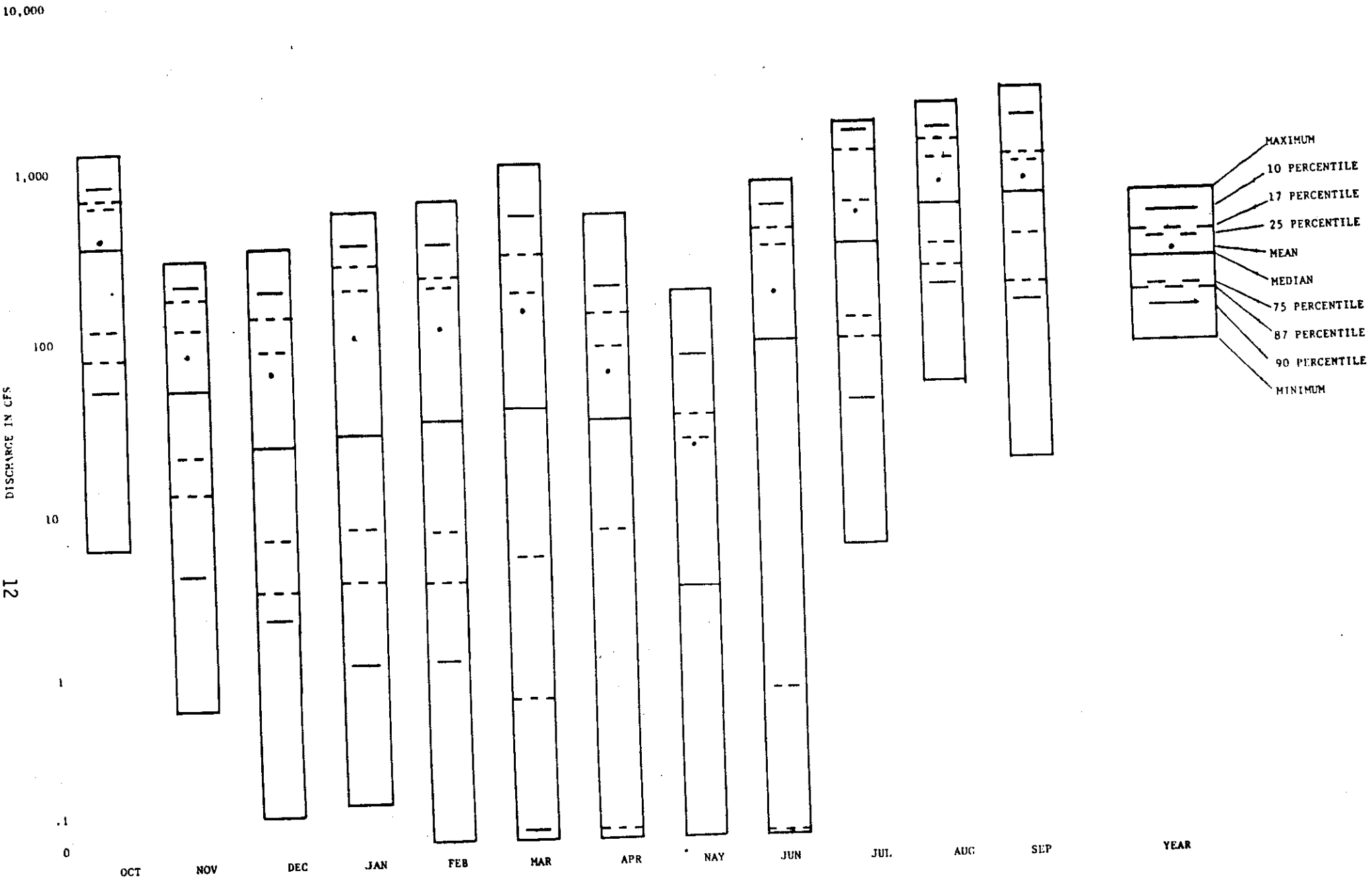


FIGURE 3 VARIABILITY OF MONTHLY AND YEARLY STREAM FLOW FOR STATION 02298830 MYAKKA RIVER NEAR SARASOTA, FL.

30 years of record would be needed to assure ± 5 percent accuracy from such a period. Therefore, it is necessary to have long-term records of daily discharges in order to appraise the availability of water in a stream within a reasonable percent.

In addition to the variability of streamflow in time, there is the further variability of streamflow from place to place that must be appraised. All streamflow is derived from rainfall. However, the distribution of run-off in time changes from place to place in response to variations in topography, soil, geology, vegetative cover, and land use. For example, one soil type may be more absorptive than another, run-off is affected by the geologic formations in the basin and by the slopes of both the land and the channels. Also, development in the form of improved drainage may have a considerable effect of the timing of run-off. As a result, it is necessary for the success of any planned development to have some records of flow appraising these local conditions.

Part of the precipitation from a storm event may flow overland to streams as direct surface run-off. Some of the precipitation may seep through the surficial soils and be stored temporarily under ground-water conditions to be released later downstream in the channels as base flow. The amount of base flow in any stream is related to the depth to which the channel is cut into the shallow aquifers; each stream being unique. The two short term records for which diversion figures are wanted in this study, Cow Pen Slough and Phillippi Creek, have considerably different run-off conditions. For example, Cow Pen Slough, during its short period of record, showed many days and several months of no-flows, indicating lower base flows similar to conditions that exist in the Myakka River records. The records of flow for Phillippi Creek show little, if any, periods of no-flow, indicating higher base flows. All of these factors must be considered when appraising the flow of streams for diversion.

The Extension of Surface-Water Records In Time By Transfer From One Stream To Another

Cow Pen Slough Transfer

When evaluating two or more streams in a study area, and at least one stream has long-term data, it is possible to transfer long-term data to sites where it is needed. In this case, logarithms of daily discharges for Cow Pen Slough near Bee Ridge, were plotted against logarithms of concurrent daily discharges for Myakka River near Sarasota in order to obtain a relation for the transfer of long-term records of flow from the Myakka River. The relationship as shown in Figure 4 has a wide scatter; however, upon watching the sequential plotting of days on a fluorescent screen at a graphic terminal, it was possible to observe general relationships as separated from individual excursions of the data points. These individual digressions away from the relationship occured when one basin received rainfall at a time when the other basin did not. By separating these side excursions from the general relationship, a curve was drawn passing through the generalized data and the 100- and 2-year flood levels, as shown on Figure 4. The relationship was fine-tuned to provide nearly identical flow duration points for the transferred 2-year period as was obtained for the measured 2-year period for Cow Pen Slough when the gage was in operation. The relationship was further checked to see that the long-term average flow resulting from the transferred data fell in the range appropriate for this coastal stream.

Table 6A, in Appendix B, shows the relation used to transfer discharge by days from the Myakka River to Cow Pen Slough. The generated daily figures were used to develop monthly and yearly average flows as shown in Table 6B, with statistics as shown in Table 6C and Figure 5.

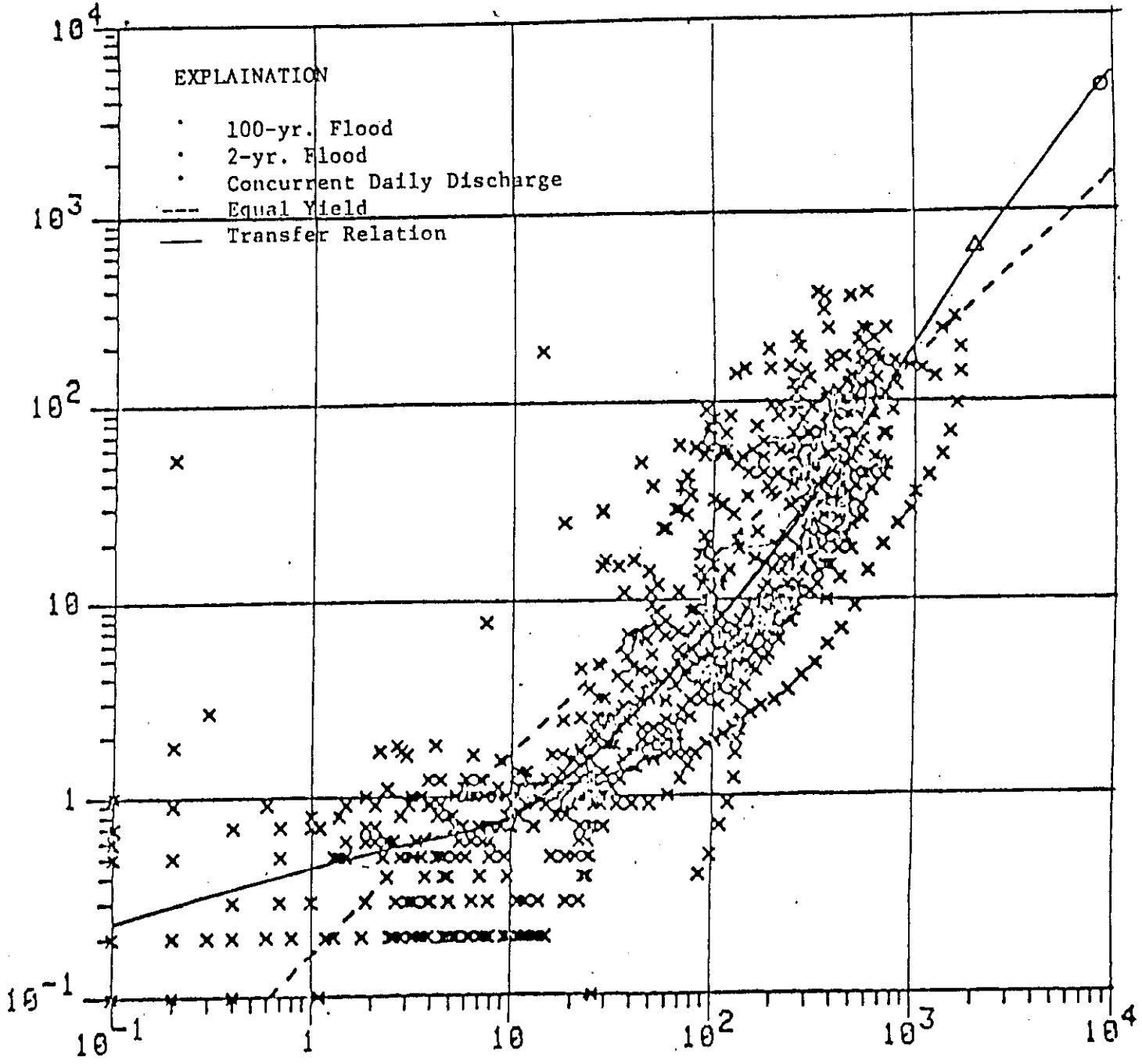


FIGURE 4. TRANSFER RELATION IN CFS FOR COW PEN SLOUGH BASED ON MYAKKA RIVER

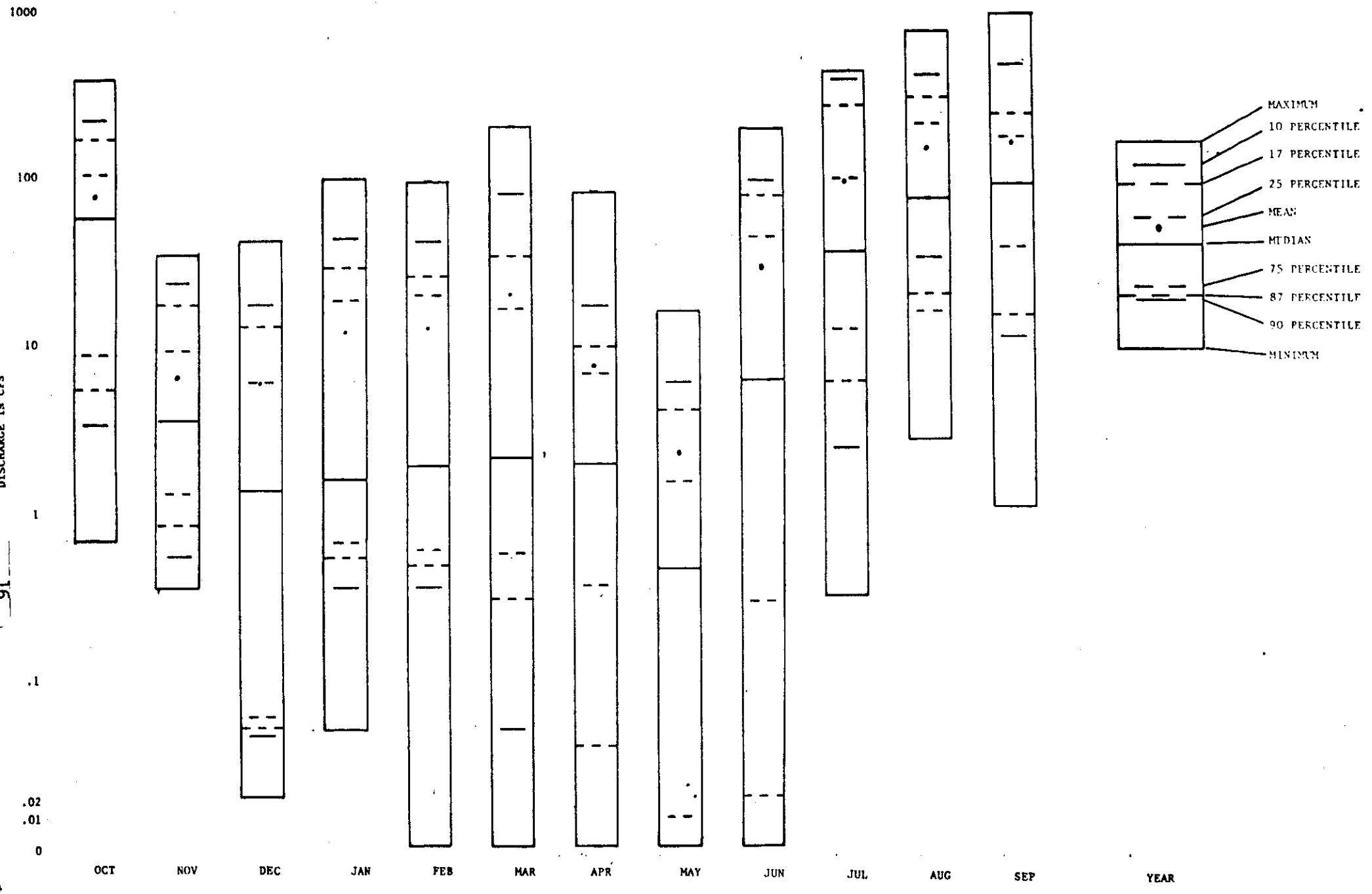


FIGURE 5 VARIABILITY OF MONTHLY AND YEARLY STREAM FLOW FOR STATION 02299700
COW PEN SLOUGH (EXTENDED) NEAR BEE RIDGE, FLA.

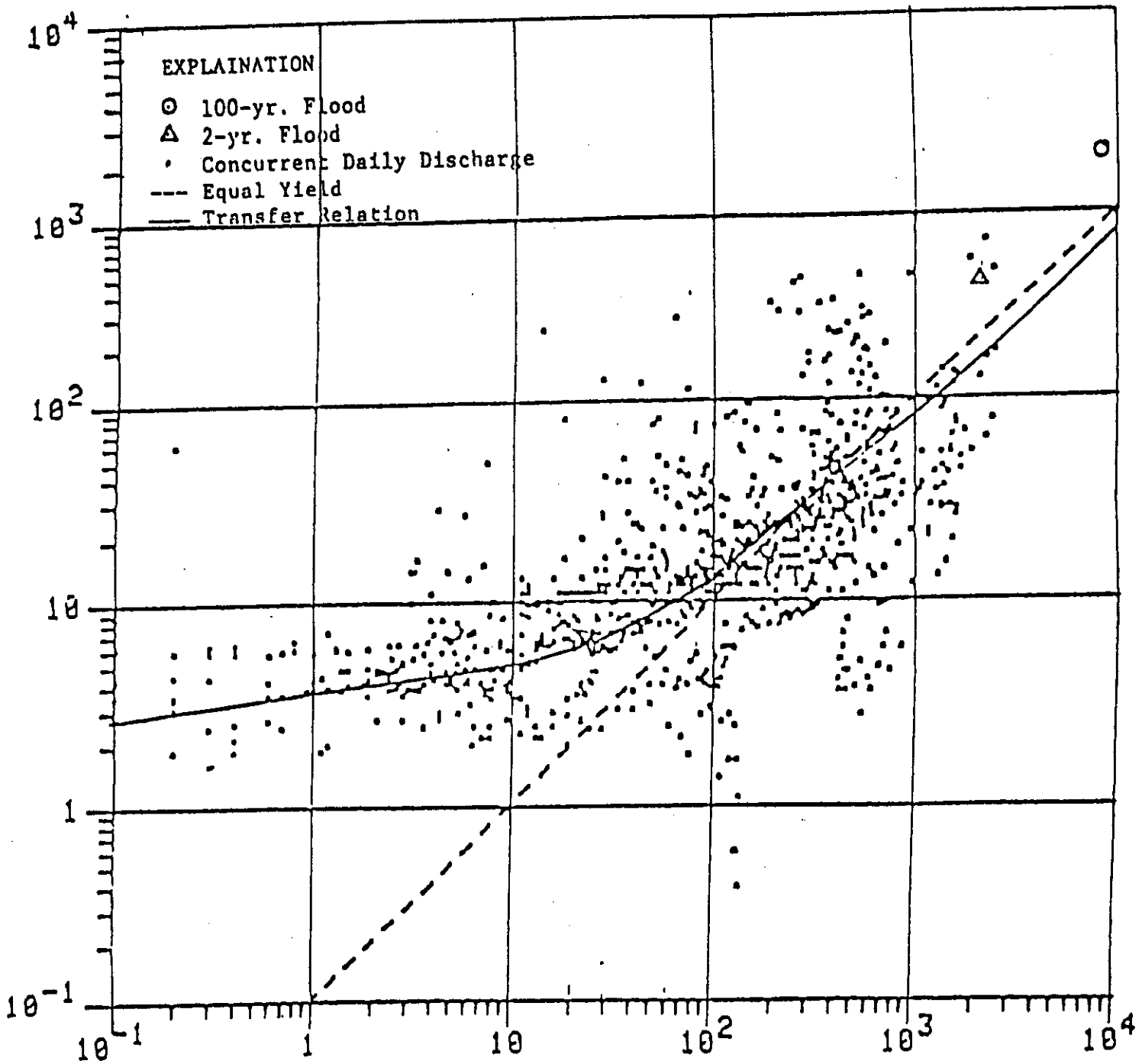
Phillippi Creek Transfer

The transfer and extension of records is not always a positive method for securing good data. An example of a transfer not working is shown in Figure 6, where an attempt was made to transfer records from the Myakka River to Phillippi Creek. This transfer could not be used because the relationship will not provide flows on Phillippi Creek on all the days that are appropriate. The Myakka River has too many no-flow days to make a proper transfer relationship. When this type of situation arises, another stream in the general vicinity with long-term records of perrenial flows is used. In the case of this study, long-term records of flows in the Manatee River near Bradenton, were used to develop the transfer relation, shown in Figure 7. The variability of monthly and yearly streamflows for transferred data on Phillippi Creek are shown in Figure 8 and in Tables 7A, 7B, and 7C in Appendix B. The transfer was successful because the Manatee River provided for flow when the Myakka River shows none.

Quantity of Water Statistics

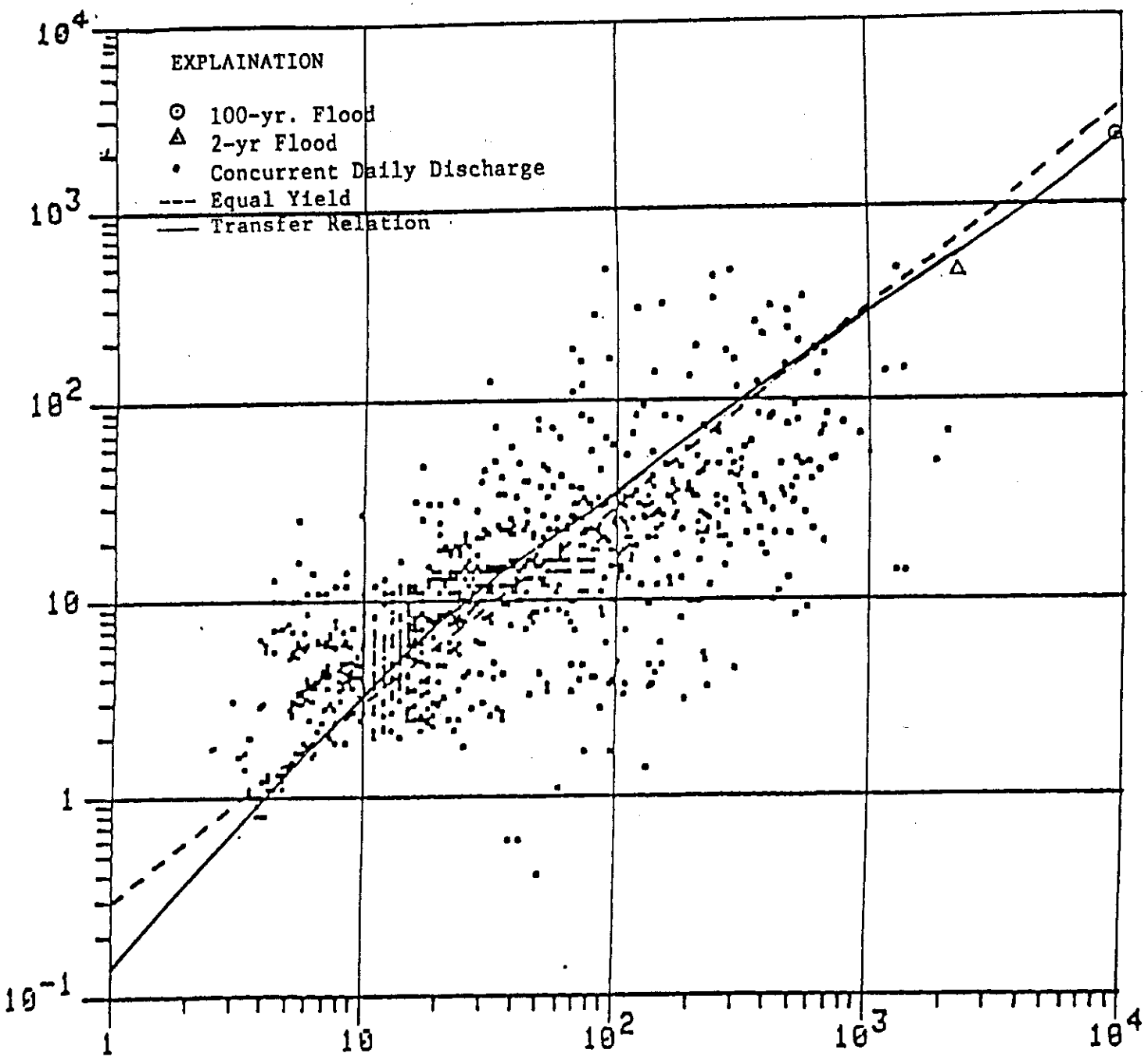
The evaluation of Cow Pen Slough and Phillippi Creek, as potential water supply sources, required the development of flow statistics based upon the actual, extended, or transferred data. Flow conditions for Cow Pen Slough, using extended records based on the Myakka River flow for periods that were not available in the Cow Pen Slough data, are shown in Appendix B, as Tables 8A, 8B, 8C, and 8D, which are entitled: Flow Duration Data, Flow Duration Summary, Low-Flow Summary, and High-Flow Summary. The extended Flow Duration Curve is shown in Figure 9.

Flow conditions for Phillippi Creek, using extended records based on the Manatee River, for the periods not available on Phillippi Creek, are shown in Appendix B, as Tables 9A, 9B, 9C, and 9D, which are entitled: Flow Duration Data, Flow Duration Summary, Low-Flow Summary, and High-Flow Summary. The extended Flow Duration Curve is Figure 10.



MYAKKA RIVER NR SARASOTA, FLA. (235 SQ. MI.)

PHILLIPPI CREEK NEAR SARASOTA, FLORIDA (24 SQ.MI.)



MANATEE RIVER NR BRADENTON, FLA. (80 SQ. MI.)

PHILLIPPI CREEK NEAR SARASOTA, FLORIDA (24 SQ.MI.)

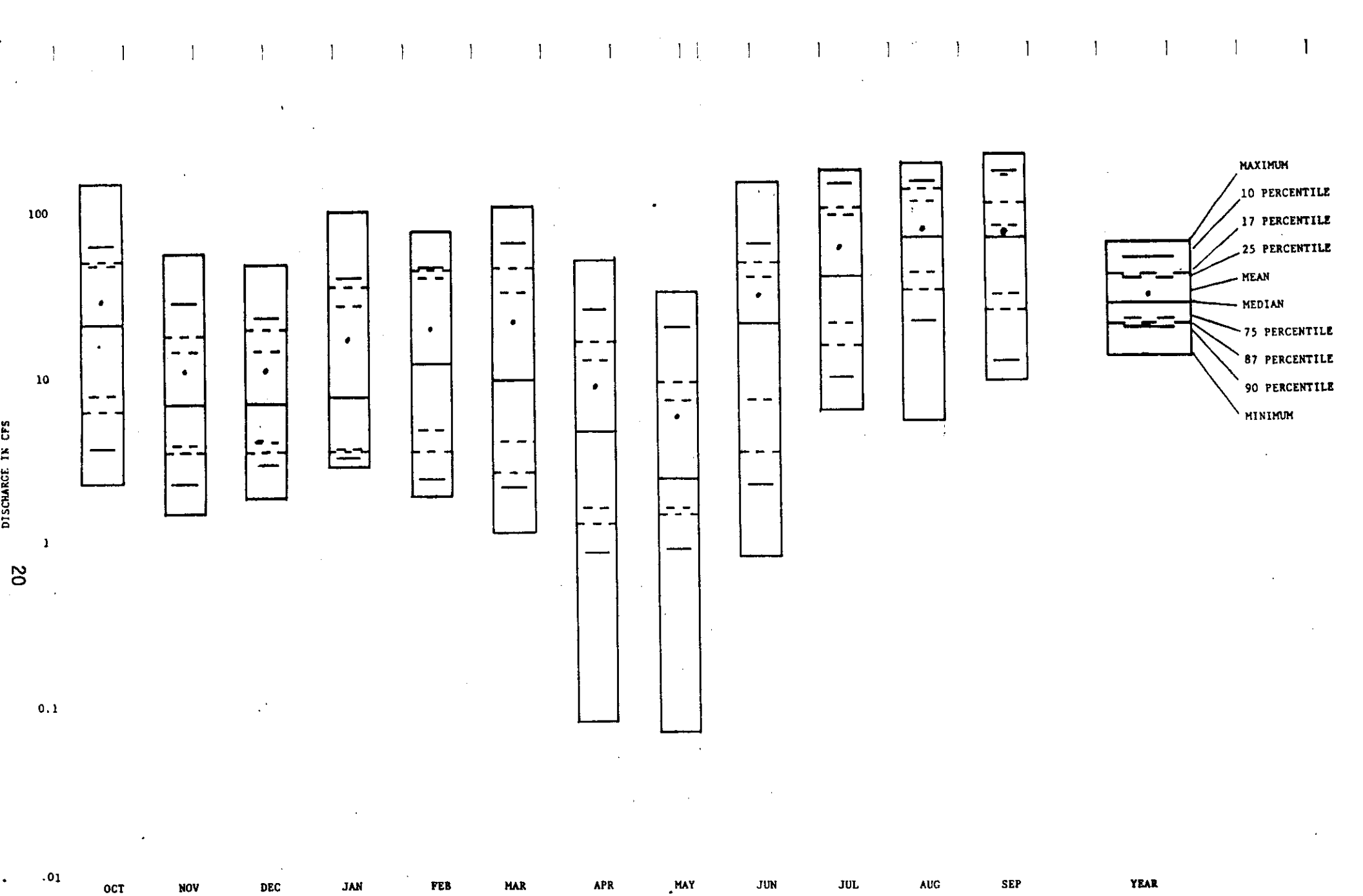


FIGURE 8 VARIABILITY OF MONTHLY AND YEARLY STREAM FLOW FOR STATION 02299750 PHILLIPPI CREEK (EXTENDED) NEAR SARASOTA, FL.

FIGURE NO 9 02-2997.00 COW PEN SLOUGH (EXTENDED) NR BEE RIDGE, FL.

FLOW DURATION CURVE

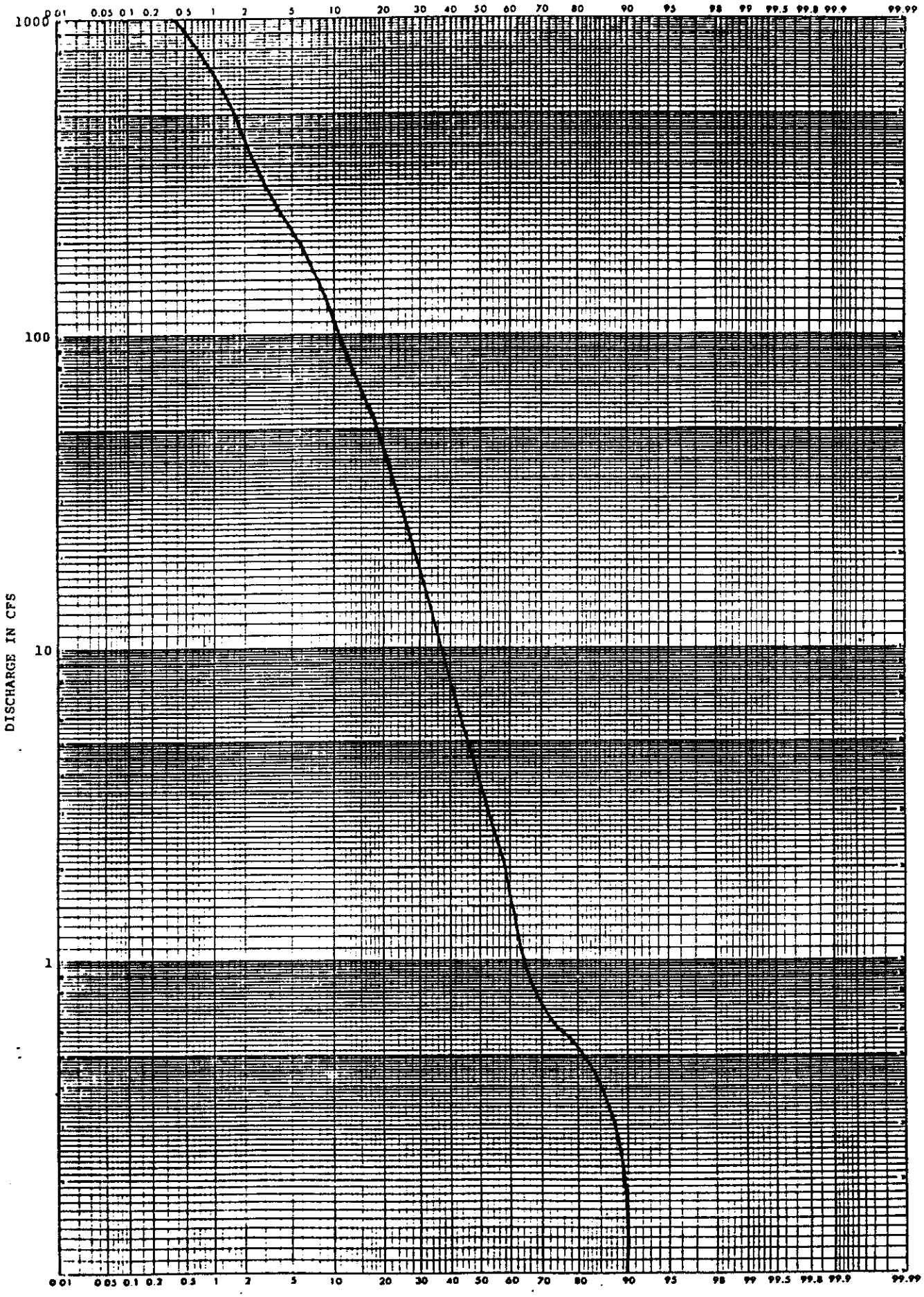
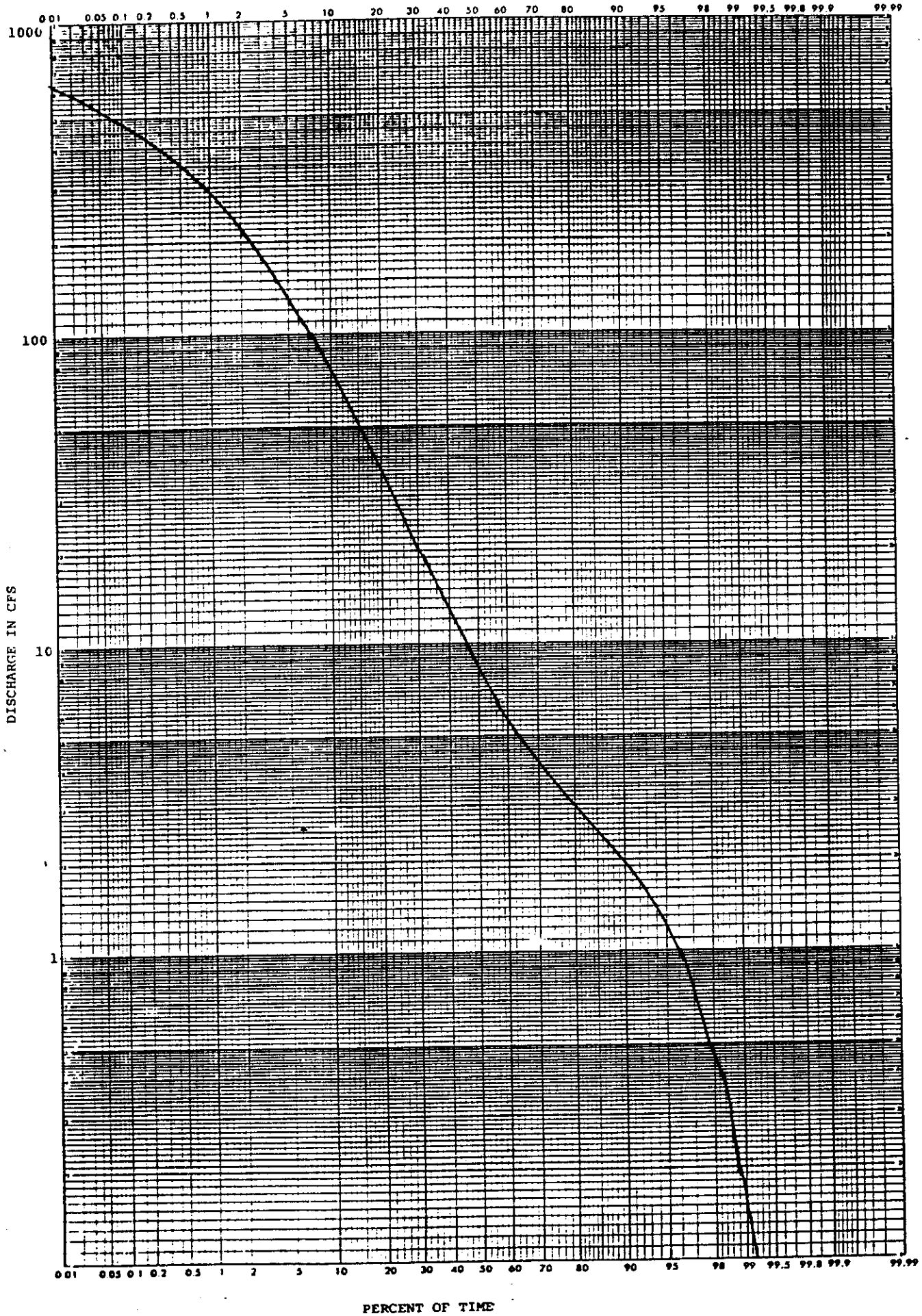


FIGURE NO 10 02-2997.50 PHILLIPPI CREEK (EXTENDED) NR SARASOTA, FL.

FLOW DURATION CURVE



Determination of Diversion and Storage

This surface-water study addresses two primary considerations. The first consideration is the development of a major water supply through diversion and storage of surface-water to relieve pumping stress placed on the Floridan Aquifer, which may be threatened by salt water encroachment upon further development of ground-water. The second consideration is the development of control structures for the relief of flood conditions on Cow Pen Slough and Phillippi Creek. In order to study the potential for diversion and storage of surface-water, a theoretical model was designed that would produce reliable results. Certain criteria were established, as shown in Figure 11 and set forth:

1.) The plans for development of the three streams would include high capacity pumping stations on each stream.

2.) Water from Cow Pen Slough and Phillippi Creek would be pumped through a diversion canal into a proposed reservoir to be built between Cow Pen Slough and the Myakka River.

3.) In time of flooding, excess water from Phillippi Creek and Cow Pen Slough could be diverted into the reservoir or, if needed, into the main channel of the Myakka River.

4.) The pumping station on the Myakka River would be such that it would discharge only into the off-channel reservoir. When the off-channel reservoir was full, there would be no further pumping from the Myakka.

Historical records were used to show how much water would have been available for use in the water supply, had the various alternatives been in existance for the past 40 years. The analysis of the system was divided into two parts; first, the three streams were considered

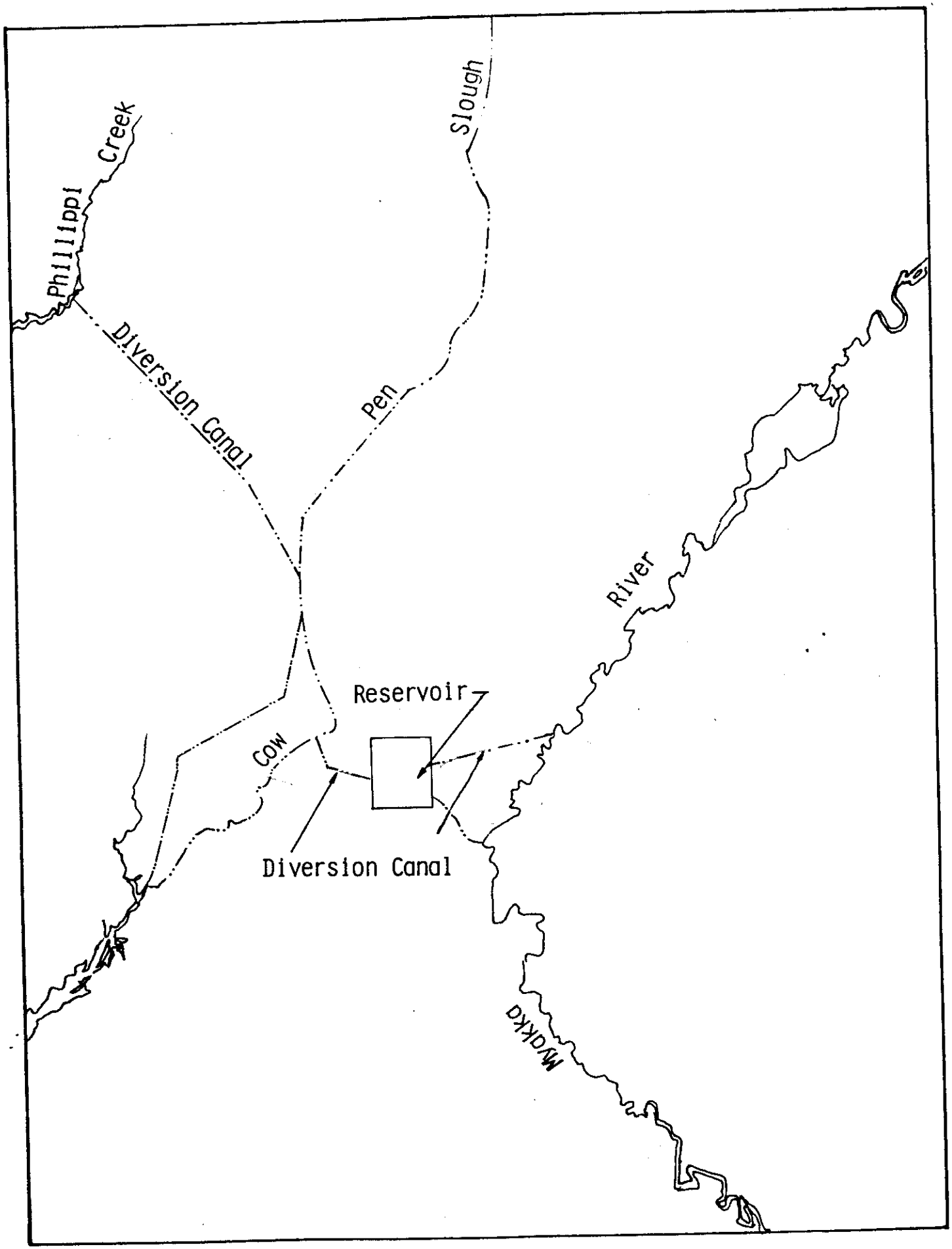


FIGURE 11 SCHEMATIC OF STREAMS AND PROPOSED RESERVOIR SITE

separatly without the off-channel reservoir, then the streams were considered together with the off-channel reservoir in the final development plan. Since the Myakka River is a major stream in the area, and any excess development could cause a stress on environmental conditions in the tidal waters, a regulatory minimum release of five cubic feet per second (CFS) was assumed. Because the development of environmental impact must be regulated, these studies were carried out with three allowable diversion rates of 10%, 30%, and 50% of the flow of the stream being diverted on any day of operation. The pumping rates of 1, 2, 5, 10, 20, 50, 100, 200, and 500 CFS have been considered.

Using the above conditions and limitations, the water available for pumping out of the Myakka River was evaluated on a daily basis throughout the full period of record and summarized as long-term average yields in Table 10 and Figure 12.

The availability of water from Cow Pen Slough and Phillippi Creek was studied on a daily basis without using a regulatory minimum release, such as was used on Myakka River, but with the same 10%, 30%, and 50% allowable diversion rates and the same pump capacities to be installed on Cow Pen Slough and Phillippi Creek, as were considered for the Myakka River. The water available from Cow Pen Slough and Phillippi Creek is shown on Tables 11 and 12, and on Figures 13 and 14. (Figures 12, 13, and 14 show graphically the water available for diversion and pump capacities. The graphs should be used in the following sequence: 1. Pump Capacity; 2. Plotted Line; and 3. Water Available). The final plan of development includes the construction of a reservoir between Cow Pen Slough and the Myakka River. While there is a multitude of possibilities for development considering the many pumpage rates, allowable diversion rates, and demand rates of the stored water, as well as varying sizes of the reservoir, the evaluation of various development options was limited to a manageable number of options.

TABLE NO. 10 WATER AVAILABLE FROM MYAKKA RIVER WITH VARIED PUMPING AND RELEASE

Figures Represent Long-Term Average Annual Diversion or Use in CFS

Usable Storage: None

Pump Capacity In CFS	Allowable Diversion % of Flow		
	10	30	50
1	0.74	0.75	0.75
2	1.41	1.49	1.49
5	3.14	3.56	3.64
10	5.51	6.64	6.97
20	9.09	12.0	12.9
50	15.6	24.0	27.5
100	20.7	37.6	45.5
200	23.8	53.4	69.5
500	25.2	69.7	103.0

NOTE: In addition to the limitations in allowable diversion in persent of flow; it was further specified, that no diversion would occur if the flow after diversion would be less than 5 CFS.

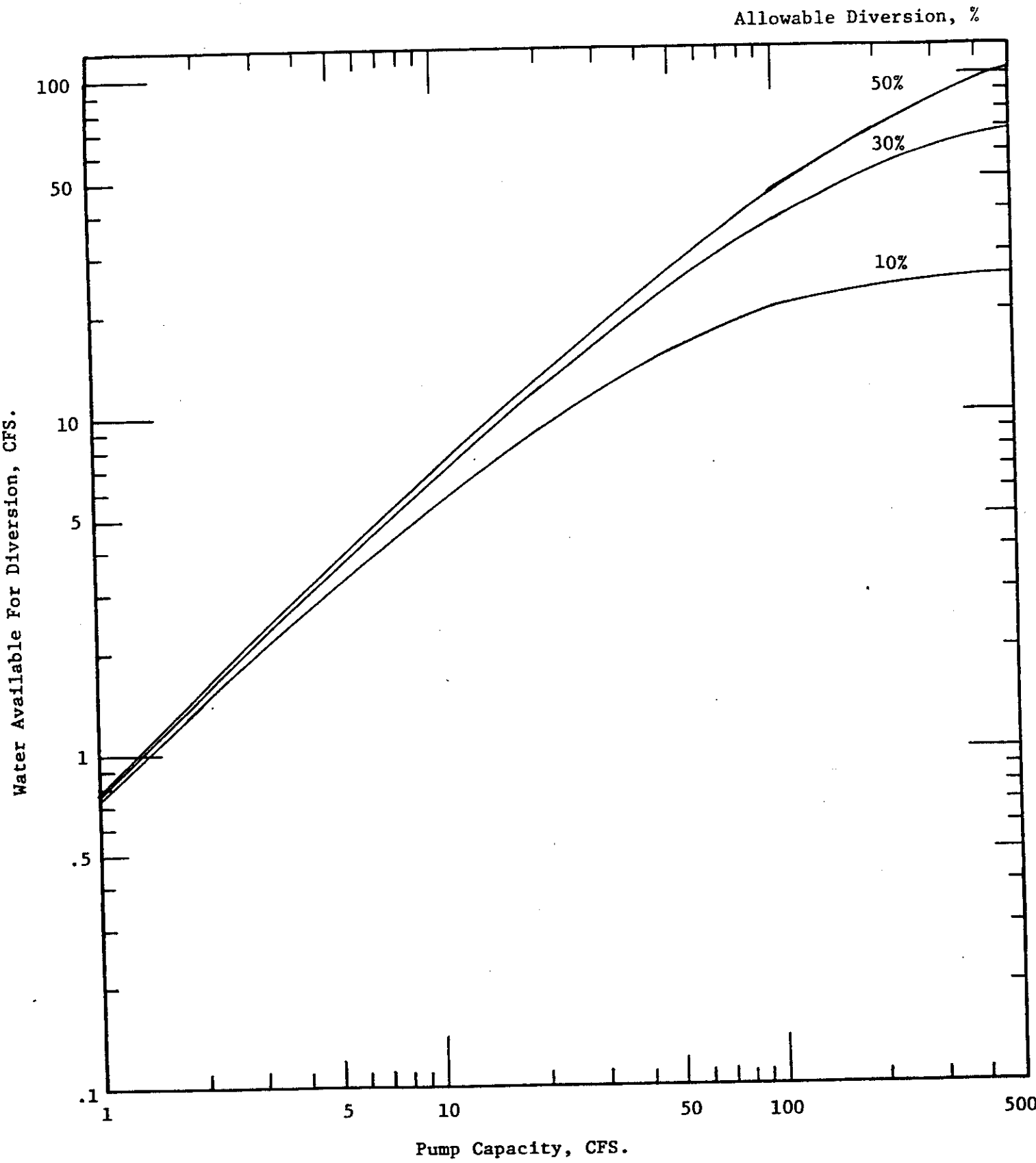


FIGURE NO 12 02-2988.30 MYAKKA RIVER NR SARASOTA, FL.

TABLE NO. 11. WATER AVAILABLE FROM COW PEN SLOUGH WITH VARIED PUMPING AND RELEASE.

Figures Represent Long-term Average Diversion or Use in CFS.

PUMP CAPACITY IN CFS	ALLOWABLE DIVERSION % OF FLOW		
	10	30	50
1	0.50	0.63	0.70
2	0.81	1.10	1.22
5	1.49	2.15	2.48
10	2.19	3.44	4.06
20	2.98	5.29	6.45
50	3.83	8.31	10.9
100	4.29	10.5	14.9
200	4.52	12.2	18.2
500	4.64	13.4	21.5

TABLE NO. 12. WATER AVAILABLE FROM PHILLIPPI CREEK WITH VARIED PUMPING AND RELEASE.

Figures Represent Long-term Average Diversion or Use in CFS.

PUMP CAPACITY IN CFS	ALLOWABLE DIVERSION % OF FLOW		
	10	30	50
1	0.68	0.90	0.95
2	1.05	1.54	1.75
5	1.69	2.83	3.40
10	2.22	4.17	5.25
20	2.65	5.73	7.61
50	2.90	7.68	11.1
100	2.94	8.52	13.3
200	2.95	8.77	14.4
500	2.95	8.83	14.7

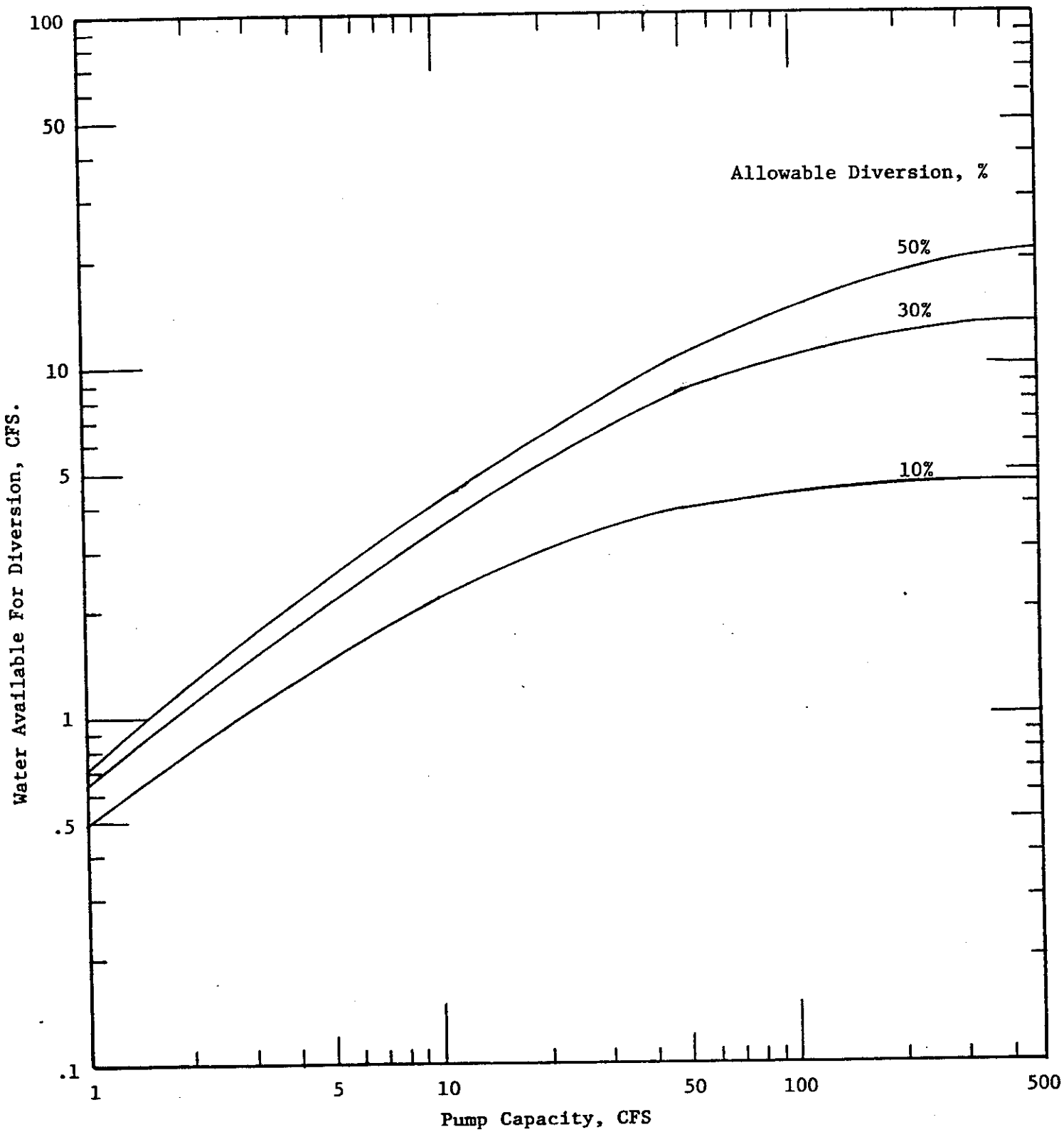


FIGURE NO 13. 02-2997.00 COWPEN SLOUGH NR BEE RIDGE, FL.
WATER AVAILABLE WITH VARIED PUMPING AND RELEASE.

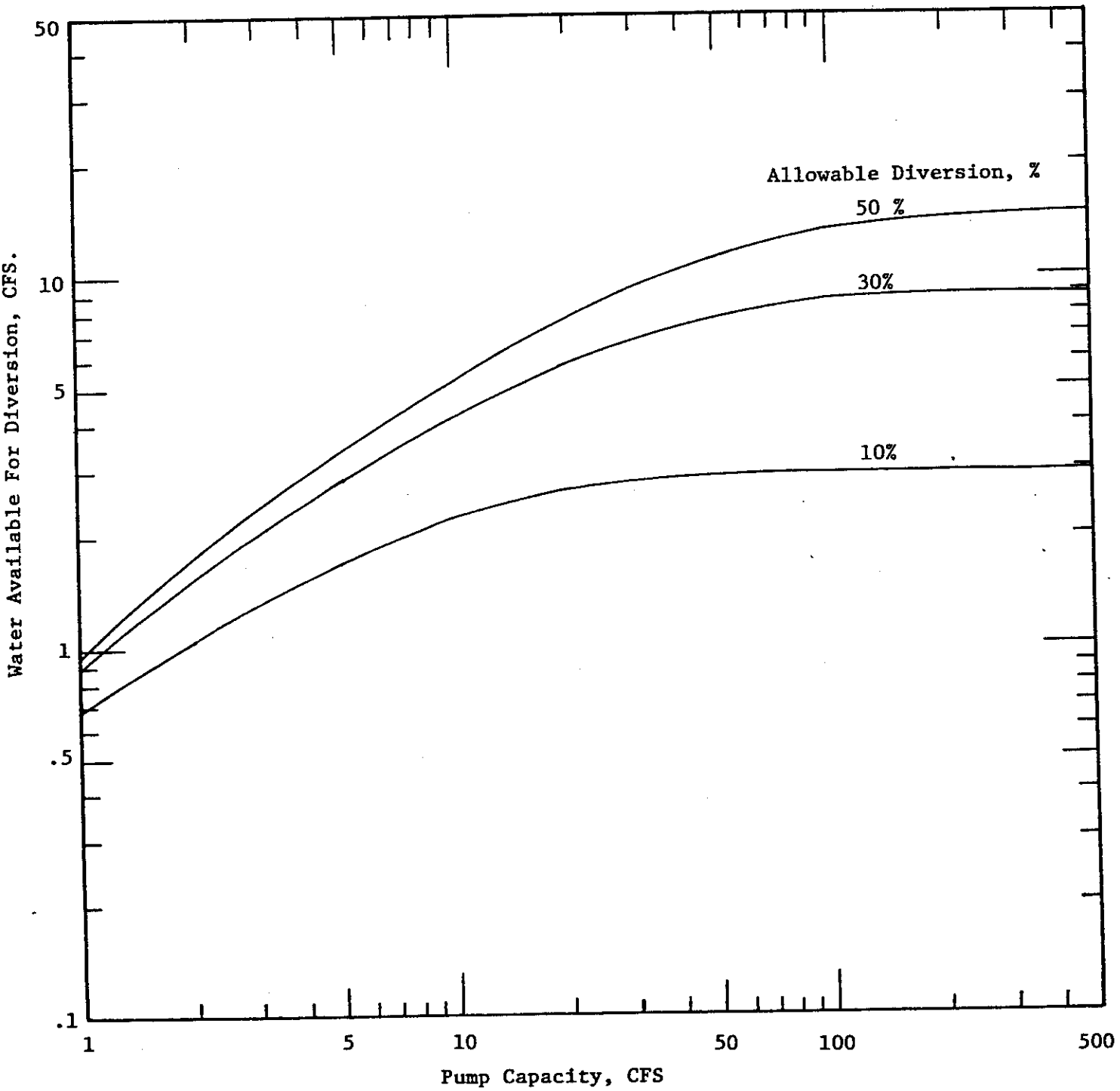


FIGURE NO 14. 02-299750 PHILLIPPI CREEK NR SARASOTA, FL.
WATER AVAILABLE WITH VARIED PUMPING AND RELEASE

Development Options

It was first assumed that the pumping stations on all three streams would be the same size, for example, if there were 50 CFS pumps on Phillippi Creek, there would also be 50 CFS pumps on the Myakka River and Cow Pen Slough. Also, it was assumed that the allowable diversion rates of 10%, 30%, and 50% were the same on all three streams. Of course, with the Myakka River being the larger of the three streams, a 10% diversion rate on the Myakka River would be a great deal more than 10% from either of the other two streams. Also, for this preliminary analyses, it was assumed that the off-channel storage reservoir would be constructed with usable storage in the range of 500, 1,000, 2,000, 5,000, 10,000, or 15,000 CFS-Days storage capacity. (CFS-Days is the volumn of water that would flow in one day at 1 cubic foot per second and is equal to 86,400 cubic feet or 1.98 acre feet). Assuming a reservoir with vertical walls 25 feet deep, these ranges of usable storage would require an areal extent of from 40 to 1,200 acres. The only water use considered from the reservoir was water supplied at the rate of 10, 20, and 50 CFS. It was also assumed, for simplification at this preliminary stage, that evapotranspiration is equal to annual rainfall and that these factors do not have to be considered at this time. Table 13, in Appendix C (Surface-Water Diversion), shows that the diversion pump capacity in CFS has little relation to the project yield, except for the largest water demand rates considered. Under all of the above mentioned constraints, the production yield was computed on a day to day basis throughout the full period of gage records. The long-term yield of the development is shown for the varying conditions in Tables 13A, 13B, 13C, 13D, 13E, and 13F in Appendix C, and Figures 15 and 16, which graphically portray the tabular results. Note that Figures 15 and 16 only consider the smallest pump capacity of 50 CFS and the largest pump capacity of 500 CFS.

THE FOLLOWING IS AN EXPLANATION OF FIGURES 15 and 16 :

Figures 15 and 16 may be used to determine how the three streams will respond together under various conditions. For example, assume that we will be allowed to divert a maximum of 30 percent of the flow in the stream at any given time. We further assume that the pumps being used for diversion of the stream will be of a maximum capacity of 50 cubic feet per second (CFS). Then, given a desired demand rate of 20 CFS (12.9 mgd), how large a reservoir is needed to hold enough water to supply the need all of the time? For the solution to this question, we use Figure 15, which is for the 50 CFS diversion pumps, and we use the short dashed lines of the 20 CFS demand rate group, then we find the point where this line meets the 20 CFS line of the graph paper and becomes horizontal. That is, about 4500 CFS Days (8,910 acre-feet) is the required storage volumn to have enough water during the longest dry periods.

Another approach would be: given the same conditions, we might also ask how many CFS average are available with 1,000 CFS Days (1,980 acre-feet) storage and what percent of the time would there not be enough water. Using Figure 15 as before, we look along the bottom of the graph for 1,000 CFS Days and we follow the line until it intersects the same line we were using before. Where the lines intersect is read on the left side of the graph that 16.2 CFS are available on the average, or that is, 81 percent of the water needs. Since we assume that the desired demand rate will be used all of the time that water is available then we also assume that 19 percent of the time, no water is available at all. We could further expand our question to determine how we would be able to get 20 CFS demand rate all of the time, minimizing in turn each of the assumptions. For example, we might want to minimize impact on the stream; therefore, we would use the 10 percent line, or we might want to minimize the size of the reservoir, therefore, we would use a reasonable small reservoir, say 500 to 1000 CFS Days.

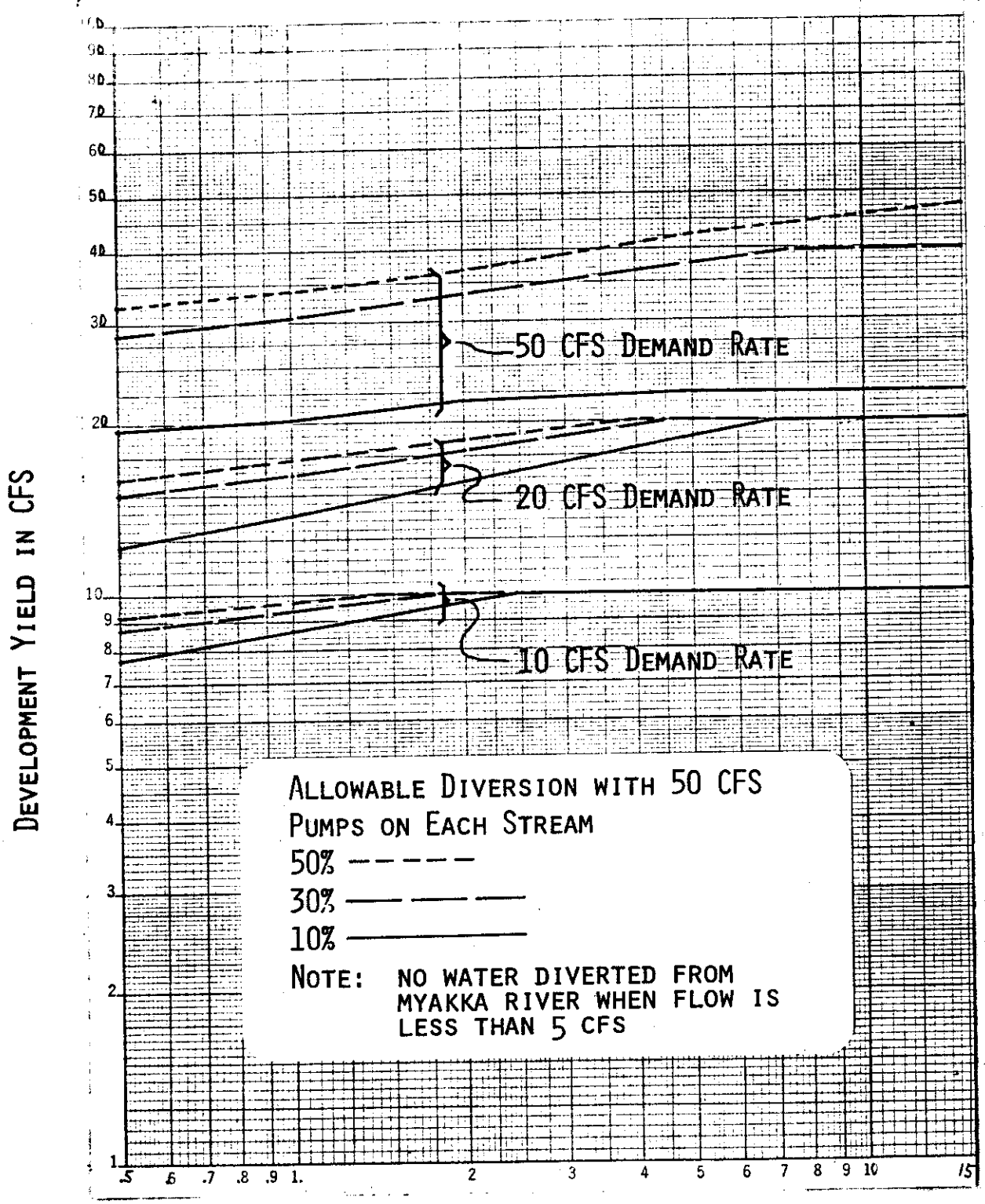


FIGURE NO. 15. WATER AVAILABLE FOR PUMPING FROM AN OFF-CHANNEL RESERVOIR UNDER VARIED CONDITIONS OF STORAGE, ALLOWABLE DIVERSION, AND USE; AND WITH A DIVERSION PUMP CAPACITY OF 50 CFS.

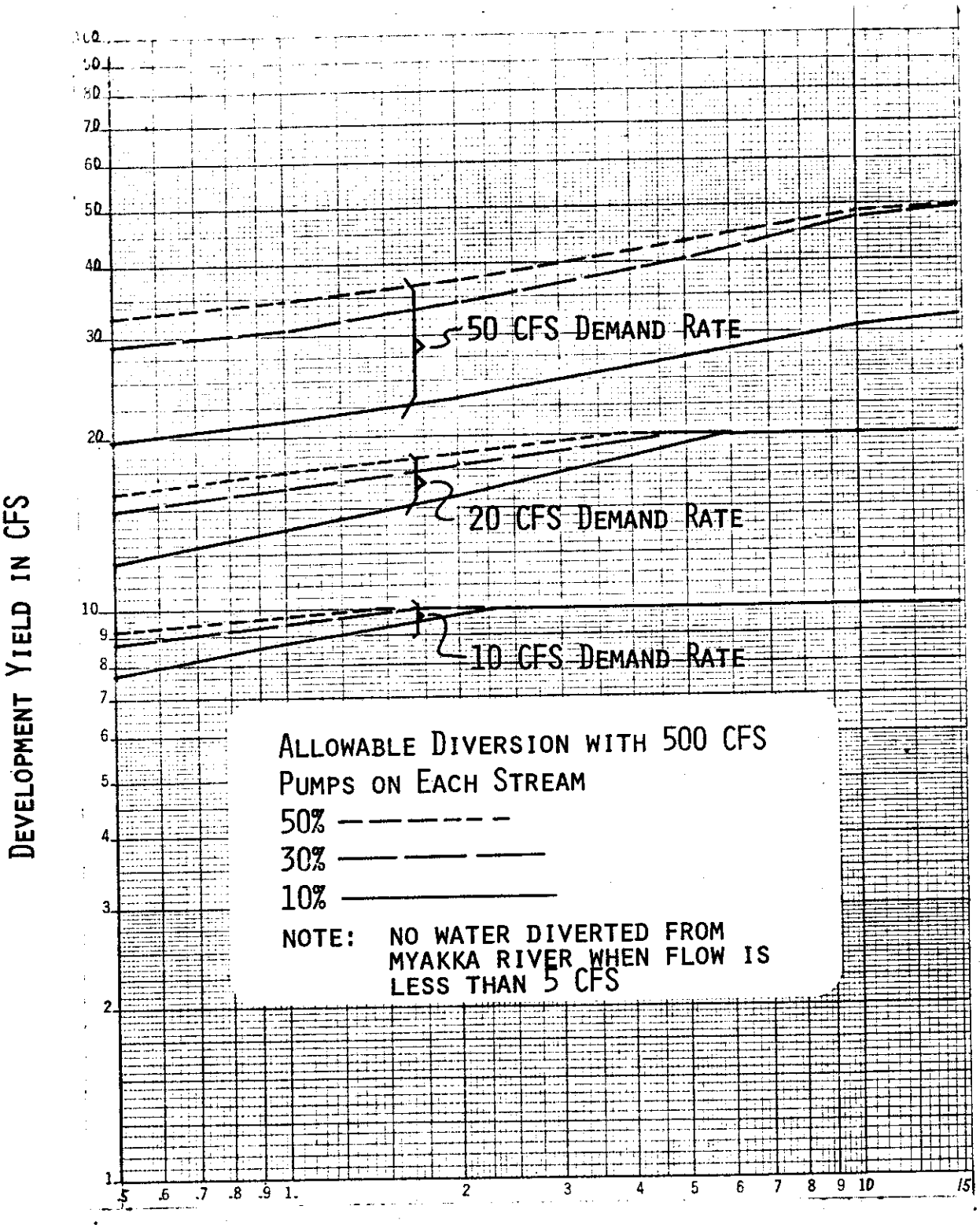


FIGURE NO. 16. WATER AVAILABLE FOR PUMPING FROM AN OFF-CHANNEL RESERVOIR UNDER VARIED CONDITIONS OF STORAGE, ALLOWABLE DIVERSION, AND USE; AND WITH A DIVERSION PUMP CAPACITY OF 500 CFS.

The values shown in the tables and curves are long-term average yields for the various development plans studied. For each of these values, there is a separate computer run that also shows the average yield by individual months over the period of record, as well as the long-term average. One copy of these computer output sheets is furnished as an Appendix to the report for use by the Southwest Florida Water Management District.

Study of these preliminary figures of development yield will allow the District to choose some reasonable amount of pumpage on each stream (which does not necessarily have to be of the larger capacities studied) in order to provide a maximum amount of flood control. However, pumping capacity for the Myakka River as well as the size of the off-channel reservoir will need to be projected to the maximum needs of the Manasota Basin Area. The water pumped from Cow Pen Slough and Phillippi Creek will be put into the off-channel storage and supplimented by the Myakka River when the reservoir needs water to meet requirements. Also, during the wet season, the pumping from Cow Pen Slough and Phillippi Creek will be increased to help solve flood control problems. During this period, the Myakka River will act as a transport stream for movement of large quantities of flood waters.

Limitations of the Data and Methods of Computation

Lack of long-term records of daily discharge on Cow Pen Slough and Phillippi Creek were of little concern, inasmuch as the available data was correlated with a reasonable period of concurrent records at long-term gaging stations. However, if the scatter of data around the plots shown in Figures 4, 6, and 7 are disturbing, one other method of computation exists that might provide more precise transferred information. This other approach would be that of rainfall / run-off modeling. To get a better result, it might be necessary to reestablish the gaging stations on Phillippi Creek and Cow Pen Slough, and install recording rain-gages in

each basin in order to obtain hourly rainfall records, as well as gaged daily discharges for use in a rainfall / run-off model similar to the Stanford Watershed or Georgia Tech rainfall / run-off models. It is not believed, however, that much improvement would be obtained in the long-term figures of water availability in these streams.

If diversion is not to be made at exactly the points where the daily discharge records have been collected, it is possible to transfer these figures, adjusted for the size of the basin at any point of development, to other diversion points. Lacking the exact locations of where pumping stations might be placed, the water availability data was developed for the gaging station sites.

The computations of yields for any of the three streams pumped separatly or for the whole development channelled into a single off-channel reservoir made certain assumptions that may be persued to greater detail in a later phase of the study. All variations of pump capacities on each stream, all reservoir sizes, and all possible sizes of the pumps required for delivering the water to be used at the various water plants could not possibly be considered, but it is believed enough choices of each variant was considered that the feasibility of future development can be ascertained and further studies considered.

CONCLUSIONS AND RECOMMENDATIONS

Water Quality

From the existing U.S.G.S. water quality data, the waters of Cow Pen Slough and Phillippi Creek, together or independently, appear to be of suitable quality for use as a water supply. The existing data on parameters that could be problems such as color, pH, etc., are treatable.

A more detailed sampling program, along with concurrent discharges, is highly recommended before any new development in initiated. The sampling

program should include trace elements, nutrient loading, coliform bacteria, toxins, and viruses, because of the potential influence of sewage discharges and sanitary landfills in the area of both streams. The Myakka River does have water quality problems. An example is that all of the trace inorganics exceed Drinking Water Standards, and the treatment to bring these elements within the Standards could be very difficult.

A detailed sampling program to further study trace inorganics, Nitrates, and Fluorides, is needed to complete a water quality evaluation of the Myakka. It is also recommended that trace elements along with concurrent discharges be sampled to determine if the problems are as great as indicated by this preliminary study, and if so, can the problems be solved?

Water Quantity

Cow Pen Slough and Phillippi Creek:

The evaluation of Cow Pen Slough and Phillippi Creek as potential water supply sources required the development of statistics based on actual, extended, or transferred data. These data show the two streams to certainly be qualified as potential sources for surface-water supply development, especially during the wet season (June through December).

Myakka River:

The larger of the three streams can be used as a supplementary source of water for off-stream storage during the periods when Cow Pen Slough and Phillippi Creek cannot support the reservoir. The mixing and dilution of the three streams will help solve minor water quality problems. The Myakka River could possibly act as the receiver stream for flood control measures in the total proposed system, as shown in Figure 11. The existing water quantity data indicates the Myakka, as a single source, could support an off-stream reservoir.

Diversion and Storage

The variables included in this preliminary study (as shown in Figure 11 and Tables 13A - 13F), are assumed to give a base for computations. The assumptions were made from basic surface-water hydrology background and meetings with the District Staff. The preliminary data, using the assumptions, is of course, extreme in some cases to look for possible faults in the development approach. The system, as outlined in this report, is feasible by using both Cow Pen Slough and Phillippi Creek and supplimenting the supply with the Myakka River, to supply the storage reservoir. A portion of the potential flooding problems associated with the two smaller streams can be solved by the diversion and storage system because the Myakka River can handle the overflow at peak flood periods.

It is recommended that if future studies are carried out, the needs for water use in the area of development should be the base for design criteria; for example, the exact size of a reservoir needed to supply the needs of the area will dictate pump sizes, diversion canal sizes, and the control structure needed to handle peak flood events.

This preliminary report deals with a potential water supply system, using Cow Pen Slough, Phillippi Creek, and the Myakka River, because of flood problems on the two smaller streams. In the future, evaluations should be made and considered on the following:

1) A Cow Pen Slough - Myakka River Reservoir
2) A Myakka River Reservoir
3) A combination of Cow Pen Slough and Phillippi Creek

The possibilities of combinations that are feasible are great because these preliminary studies indicate that a considerable amount of water is available and may be developed from surface streams in the Manasota Basin. Also, any water developed will require certain treatment, as is expected for any surface-water use. Therefore, the best combination for future study would be a management decision and depend on needs, economics, (treatment of waters and construction costs) and long-term feasibility.

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INDEX TO APPENDIX A

Water Quality

Tables No. 1A
1B
1C

The above tables show the statistical analyses of variation of Physical and Chemical Character of Water With Discharge or Time for Samples Taken at the U.S.G.S. Stations on the three streams of study.

Where:

a, b - the regression coefficients where the concentration = $10^a Q^b$

r - correlation coefficient

Sig - the significance of the correlation coefficient

σ % - Standard error of the estimate in percent

n - number of observations of each parameter

Q - rate of flow in a stream

TABLE NO.: 1 A STATISTICAL ANALYSIS OF VARIATION OF PHYSICAL AND CHEMICAL CHARACTER OF WATER WITH DISCHARGE OR TIME FOR SAMPLES TAKEN AT STATION NO.: 02299700 COW PEN SLOUGH NR BEE RIDGE, FLORIDA

Where Concentrations = $10^{a}Q^{b}$

	a	b	r	Sig	σ %	n
pH	.8721	-.01741	-.74561	.00422	4	11
Chloride	1.57608	-.21104	-.86508	.00014	31.7	12
Color	1.48672	.29720	.92678	.00006	31.4	10
Na	1.38218	-.23744	-.87941	.00040	33.6	10
SO_4	2.01873	-.27682	-.74281	.00692	68.5	10
F	.7032	-.21192	-.76416	.00503	47.5	10
TDS-Res	2.53905	-.24168	-.96246	.00006	19	8
TDS-Sum	2.51329	-.24676	-.79112	.01705	54.4	7

TABLE NO.: 1 B STATISTICAL ANALYSIS OF VARIATION OF PHYSICAL AND CHEMICAL CHARACTER OF WATER WITH DISCHARGE OR TIME FOR SAMPLES TAKEN AT STATION NO.: 02299750 PHILLIPPI CREEK NR SARASOTA, FLORIDA

Where Concentration = $10^{a}Q^{b}$

	a	b	r	Sig		σ %	n
pH	.88777	-.01263	-.36991	.00001		4.2	130
Cl	1.73776	.-20779	-.79036	.00001		21.6	130
Color	1.34165	.25625	.53536	.00001		54	124
Na	1.59240	-.22528	-.76475	.00001		25.5	127
SO_4	2.66937	-.26792	-.68651	.00001		29.7	131
F	.07837	-.15389	-.64449	.00001		24.5	129
TDS-Res	3.00574	-.1962	-.63615	.00001		31.7	110
TDS-Sum	2.92934	-.20795	-.68897	.00001		31.1	84

TABLE NO.: 1 C STATISTICAL ANALYSIS OF VARIATION OF PHYSICAL AND CHEMICAL CHARACTER OF WATER WITH DISCHARGE OR TIME FOR SAMPLES TAKEN AT STATION NO.: 02299000 MYAKKA RIVER NR SARASOTA, FLORIDA

	a	b	r	Sig		0 %	n
pH	.82915	-.00333	-.12725	.05275	**	5.25	163
Color	1.98201	.07910	.44704	.00001		32.7	155
NO_3-N	-.65809	.00477	.02110	.47693	**	54.8	10
Chloride	1.251	-.06889	-.28231	.00011		48.3	166
SO_4	1.29336	-.15513	-.49063	.00001		57.8	162
F	-.49944	-.01406	-.08063	.15161	**	35.0	165
TDS-Res	2.05108	-.05066	-.35465	.00001		26.6	153
TDS-Sum	1.88359	-.07837	-.48952	.00001		27.9	160
As	-.86653	.11414	.38530	.22532	**	77.9	6
Cr-Total	.86093	-.04999	-.08870	.45565	**	196.	4 *
Cd-Total	5.51459	-.44777	-.06316	.42682	**	413.	11
Fe-Total							2 *
Pb-Total	2.33933	.16308	.49737	.04996	**	67	12
Mn-Total	.71912	.04721	.14212	.34765	**	86	10
Zn-Total	1.23099	-.06868	-.23854	.23997	**	67.3	11
Ag-Total							1 *
Na	1.02853	.11443	-.56212	.00001		34	162
Cu-Dis	.0272	.44055	.64654	.27622	**		3 *
Pb-Dis	.32592	.14031	.27344	.23825	**	134	9
Zn-Dis	.46607	.21491	.46088	.07683	**	99.6	11
Cd-Dis	1.30089	.02297	.19248	.23755	**	30.1	16
Cr-Hex							2 *
Cr-Dis							1 *
Ag-Dis							2 *
Se-Dis							2 *

** Correlation coefficient, r, fails the two-tailed t-test for significance @ the 5% level.

* Insufficient number of samples to correlate.

Semi log form of analyses for these parameters. All others in log-log form.

INDEX TO APPENDIX B

Water Quantity

Tables No. 3A
3B
3C

The above tables show the flows of the U.S.G.S. Station on Cow Pen Slough, 3A giving monthly and yearly averages, 3B the Flow Duration Data, and 3C the Flow Duration Summary for the two water years.

Tables No. 4A
4B
4C

The above tables show the flows of the U.S.G.S. Station on Phillippi Creek, 4A giving monthly and yearly averages, 4B the Flow Duration Data, and 4C the Flow Duration Summary for the six water years.

Tables 5A 5D
5B 5E
5C 5F

The above tables show the flows of the U.S.G.S. Station on the Myakka River, 5A giving the monthly and yearly averages, 5B the monthly and yearly statistics of flow, 5C the Flow Duration Data for 42 years, 5D the Flow Duration Summary, 5E the Low-Flow Summary for the 42 years, and 5F the High-Flow Summary for the 42 year period.

Tables No. 6A
6B
6C

The above tables show the extended and transfer data requred to assess potential diversion. The transfer is from the Myakka River. Table 6A is the hydrologic transfer relation showing the independent variable (X), the dependent variable (Y), and the equations to perform the transfer.

Table 6B shows the extended Cow Pen Slough data transferred from the Myakka River in average discharge in CFS. Table 6C shows the monthly statistics in the transfer relation.

Tables No. 7A
7B
7C

The above tables show the extended and transfer data required to assess potential diversion. The transfer is from the Manatee River. Table 7A is the hydrologic transfer relation showing the independent variable (X), the dependent variable (Y), and the equations to perform the transfer. Table 7B shows the transfer data in average discharge in CFS. Table 7C shows the monthly statistics in the transfer relation.

Tables No. 8A 8C
8B 8D

The above tables show the Cow Pen Slough extended data based on Myakka River transfer. Table 8A is Flow Duration Data, 8B is a Flow Duration Summary, 8C is the Low-Flow Summary using the transfer data and 8D is the High-Flow Summary using the transfer data.

Tables No. 9A 9C
9B 9D

The above tables show the extended data based on the Manatee River transfer. Table 9A is the Flow Duration Data, 9B is the Flow Duration Summary, 9C is the Low-Flow Summary, and 9D is the High-Flow Summary using the transfer data.

TABLE NO 3A COWPEN SLOUGH NR BEE RIDGE, FLORIDA 02-2997.00

AVERAGE DISCHARGE IN CFS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEARLY
1963	50.7*	2.91*	.97*	1.11*	47.6	19.9	1.04	.31	31.6	51.6	83.1	69.7	30.0**
1964	7.46	14.3	11.9	45.8	77.7	24.0	12.3	1.19	.25	8.92	22.4	101.	26.9
1965	4.08	.88	.39	.43	1.23	3.10	.54	.04	37.6	317.	545.	56.8	81.9
1966	28.7	2.34	1.87	12.4	21.3	4.07	3.85	2.03	56.6	42.2*	59.7*	18.6*	21.1**
4-yr AVE	22.7**	5.11**	3.78**	14.9**	37.0	12.8	4.45	.89	31.4	126.**	217.**	75.8**	40.0**

*ESTIMATE BASED ON CORRELATION WITH MYAKKA RIVER. ** PARTLY ESTIMATED.

TABLE NO 3B

STATION NUMBER 02299700

DURATION TABLE OF DAILY VALUES FOR YEAR ENDING SEPTEMBER 30

DISCHARGE, IN CUBIC FEET PER SECOND

MEAN

COWPEN SLOUGH ACTUAL STATION RECORD

CLASS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
YEAR	NUMBER OF DAYS IN CLASS																																		
1964	9		6		13	12	4	8	18	20	20	14	17	19	27	21	18	18	14	22	19	19	12	13	7	8	5	1	2						
1965	32		3		30	24	22	29	38	24	12	12	6	3	7	3	6	3	9	9	6	13	11	12	5	5	4	12	12	4	3	1	2	1	2

COWPEN SLOUGH ACTUAL STATION RECORD

TABLE NO 3C

FLOW DURATION SUMMARY

2 YEAR PERIOD, FROM 1964 TO 1965

CLASS	VALUE	TOTAL	ACCUM	PERCT	CLASS	VALUE	TOTAL	ACCUM	PERCT	CLASS	VALUE	TOTAL	ACCUM	PERCT
0	.00	41	731	100.0	12	2.8	23	381	52.1	24	110.	12	74	10.1
1	.10	0	690	94.4	13	3.8	22	358	49.0	25	140.	13	62	8.4
2	.19	9	690	94.4	14	5.1	34	336	46.0	26	190.	9	49	6.7
3	.20	0	681	93.2	15	7.0	24	302	41.3	27	260.	13	40	5.4
4	.20	43	681	93.2	16	9.4	24	278	38.0	28	360.	14	27	3.6
5	.30	36	638	87.3	17	13.0	21	254	34.7	29	480.	4	13	1.7
6	.50	26	602	82.4	18	17.0	23	233	31.9	30	650.	3	9	1.2
7	.60	37	576	78.8	19	23.0	31	210	28.7	31	890.	1	6	.8
8	.80	56	539	73.7	20	32.0	25	179	24.5	32	1200.	2	5	.6
9	1.10	44	483	66.1	21	43.0	32	154	21.1	33	1600.	1	3	.4
10	1.50	32	439	60.1	22	58.0	23	122	16.7	34	2200.	2	2	.2
11	2.10	26	407	55.7	23	79.0	25	99	13.5					

TABLE NO 4A PHILLIPPI CREEK NR SARASOTA, FLORIDA 02-2997.50

AVERAGE DISCHARGE IN CFS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEARLY
1963	26.8*	13.4*	5.28*	8.17*	56.4	16.0	4.90	3.63	7.22	16.0	25.1	52.4	19.4**
1964	9.72	19.8	21.3	40.3	61.5	25.6	12.9	9.38	6.46	25.9	70.4	131.	36.0
1965	10.7	4.48	5.60	4.83	7.69	5.79	3.05	1.68	18.1	91.0	86.9	68.7	25.9
1966	25.0	8.71	6.98	21.9	18.9	9.97	10.1	4.32	10.6	45.2	26.3	15.4	17.0
1967	19.2	6.64	5.12	5.06	5.81	2.97	.73	.89	7.44	12.0	113.	25.6	17.2
1968	29.3	8.11	6.92	3.61	4.72	3.62	2.51	2.82	114.	138.	71.5	123.	42.4
6-yr AVE	20.1**	10.2**	9.18**	14.1**	25.8	10.7	5.70	3.79	27.3	54.7	65.5	69.3	26.3**

* ESTIMATED BASED ON CORRELATION WITH MANATEE RIVER. ** PARTLY ESTIMATED.

TABLE NO 4B DURATION TABLE OF DAILY VALUES FOR YEAR ENDING SEPTEMBER 30

ISCHARGE, IN CUBIC FEET PER SECOND

EAN FLOW DURATION DATA

PHILLIPPI CREEK ACTUAL STATION DATA

LASS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
EAR	NUMBER OF DAYS IN CLASS																																		
964												1	3	30	25	21	42	62	27	28	22	28	18	14	8	12	2	7	6	1	3	3	3		
965		1		2	4	10	10	13	17	37	34	47	25	27	15	6	23	13	10	9	10	9	7	9	4	3	7	3	4	2	1		2	1
966											5	18	14	28	58	60	20	45	24	26	13	21	11	10	5	4	2		1						
967		7	7	6	13	18	6	12	10	16	11	7	31	47	26	31	24	18	16	11	4	11	9	5	3	4	2	3		4		3			
968					1	4	4	18	7	30	48	31	20	34	10	6	15	8	11	21	10	19	13	8	3	8	6	6	11	6	2	2	3	1	

PHILLIPPI CREEK ACTUAL STATION DATA

TABLE NO 4C

FLOW DURATION SUMMARY

5 YEAR PERIOD, FROM 1964 TO 1968

CLASS	VALUE	TOTAL	ACCUM	PERCT	CLASS	VALUE	TOTAL	ACCUM	PERCT	CLASS	VALUE	TOTAL	ACCUM	PERCT
0	.00	0	1827	100.0	12	3.9	126	1450	79.4	24	62.	33	168	9.1
1	.30	7	1827	100.0	13	4.9	150	1324	72.5	25	78.	27	135	7.3
2	.40	8	1820	99.6	14	6.2	170	1174	64.3	26	98.	17	108	5.9
3	.50	6	1812	99.2	15	7.8	137	1004	55.0	27	120.	23	91	4.9
4	.60	15	1806	98.9	16	9.8	98	867	47.5	28	160.	16	68	3.7
5	.80	23	1791	98.0	17	12.0	163	769	42.1	29	200.	20	52	2.8
6	1.00	20	1768	96.8	18	16.0	88	606	33.2	30	250.	11	32	1.7
7	1.20	26	1748	95.7	19	20.0	86	518	28.4	31	310.	9	21	1.1
8	1.60	41	1722	94.3	20	25.0	69	432	23.6	32	390.	5	12	.6
9	2.00	40	1681	92.0	21	31.0	80	363	19.9	33	490.	5	7	.3
10	2.50	83	1641	89.8	22	39.0	66	283	15.5	34	620.	2	2	.1
11	3.10	108	1558	85.3	23	49.0	49	217	11.9					

TABLE No. 5A

02-2988.30 MYAKKA R NR SARASOTA, FL.

AVERAGE DISCHARGE IN CFS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEAR
1936	--	--	--	--	--	--	--	--	--	--	--	477.	--
1937	639.	116.	34.5	15.1	37.6	36.9	501.	175.	95.7	275.	512.	668.	260.
1938	424.	114.	158.	45.8	20.3	.84	.00	.00	121.	1617.	458.	15.7	252.
1939	771.	57.6	9.10	3.69	1.05	.00	.09	.00	746.	1136.	1534.	1095.	450.
1940	204.	41.4	5.86	64.2	148.	88.0	59.4	1.11	17.9	92.4	468.	626.	151.
1941	451.	6.03	12.0	206.	141.	32.9	49.8	31.8	.10	434.	157.	330.	155.
1942	103.	111.	137.	391.	187.	410.	57.3	4.02	562.	358.	45.8	183.	212.
1943	43.0	1.09	.10	.15	.00	29.8	1.33	.06	315.	1563.	937.	716.	303.
1944	689.	21.2	3.11	3.10	1.47	.36	.01	.00	.00	67.9	221.	145.	97.2
1945	75.6	20.3	2.97	11.0	3.38	.07	.00	.00	207.	1618.	1288.	680.	329.
1946	240.	20.2	6.86	17.5	4.23	24.5	.67	.00	.03	143.	682.	526.	140.
1947	151.	12.4	1.79	.21	7.05	180.	134.	25.3	538.	1625.	1354.	2467.	543.
1948	293.	138.	128.	269.	196.	12.7	4.54	6.61	.91	310.	1081.	1001.	287.
1949	1325.	66.4	24.8	7.68	1.89	.00	.00	.00	130.	309.	2032.	709.	389.
1950	709.	115.	27.9	1.89	.43	.00	.00	.00	.00	197.	179.	915.	179.
1951	80.8	29.3	25.6	17.9	23.1	3.48	83.5	21.9	.29	385.	332.	162.	98.0
1952	831.	41.4	15.3	7.64	19.0	42.7	49.9	.11	.01	7.78	231.	127.	116.
1953	1143.	298.	93.2	189.	250.	57.7	30.7	10.1	134.	345.	778.	1347.	390.
1954	1144.	214.	343.	234.	49.5	34.9	30.0	60.2	141.	366.	360.	522.	294.
1955	417.	60.9	83.5	40.8	129.	53.5	37.9	.00	.00	5.21	315.	780.	160.
1956	123.	13.0	3.00	4.52	14.5	.68	.00	3.77	2.40	7.30	121.	590.	73.1
1957	484.	31.9	3.97	.15	6.69	212.	123.	172.	218.	321.	1000.	989.	299.
1958	867.	48.6	37.5	447.	367.	1013.	470.	120.	10.7	324.	201.	52.7	332.
1959	58.2	257.	206.	262.	104.	822.	164.	78.7	458.	830.	1744.	1935.	579.
1960	676.	217.	66.6	43.3	197.	306.	103.	27.1	39.3	679.	1944.	2247.	546.
1961	642.	107.	32.8	57.2	225.	43.7	36.0	2.09	.00	86.5	238.	413.	157.
1962	37.8	1.24	.51	.82	.77	.01	76.8	4.24	177.	169.	944.	2222.	302.
1963	333.	49.7	17.2	20.8	205.	252.	3.90	.02	79.2	191.	350.	583.	173.
1964	292.	125.	66.8	271.	425.	181.	154.	13.4	2.65	26.6	250.	402.	183.
1965	54.6	3.24	5.77	12.4	25.0	79.4	2.79	.09	305.	1027.	1370.	391.	276.
1966	409.	47.5	21.5	85.2	306.	110.	58.6	2.28	321.	369.	467.	209.	200.
1967	404.	69.2	16.5	7.22	22.1	14.7	.70	.00	398.	319.	996.	525.	232.
1968	413.	23.1	18.7	12.1	5.74	11.6	.82	1.01	608.	1258.	341.	758.	288.
1969	123.	181.	40.2	123.	50.5	543.	84.6	4.89	343.	225.	795.	983.	292.
1970	564.	193.	160.	367.	161.	600.	272.	30.4	522.	165.	358.	428.	319.
1971	150.	11.4	1.88	3.63	21.4	5.21	.51	.00	.00	61.1	634.	892.	149.
1972	518.	220.	275.	37.1	218.	28.5	43.0	48.1	235.	96.8	170.	702.	215.
1973	80.4	48.6	136.	550.	603.	158.	283.	19.3	3.69	99.7	324.	584.	231.
1974	291.	14.7	7.21	8.17	16.5	15.6	3.84	1.53	171.	1221.	729.	166.	223.
1975	7.09	.66	8.53	24.8	9.04	9.30	.15	.00	.00	478.	518.	488.	125.
1976	453.	181.	13.4	28.4	22.1	21.9	4.74	6.03	28.4	184.	763.	311.	169.
1977	115.	88.2	80.6	75.4	64.5	37.4	9.22	4.08	5.96	181.	914.	982.	202.
1978	256.	52.6	334.	326.	416.	379.	22.7	2.58	31.5	803.	857.	133.	277.

TABLE NO. 5B

02-2988.30 MYAKKA R NR SARASOTA, FL.

STATISTICS

MONTHLY STATISTICS IN CFS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEARLY
N	42	42	42	42	42	42	42	42	42	42	42	43	42
AVG	407.	82.6	63.5	102.	112.	139.	68.5	20.9	166.	467.	690.	706.	254.
STD	330.	78.8	88.7	144.	143.	231.	113.	42.2	205.	492.	512.	580.	120.
SKEW	.96	1.05	1.87	1.51	1.55	2.28	2.59	2.68	1.18	1.33	1.00	1.59	1.01
KURT	.36	.11	2.77	1.25	2.03	4.77	6.63	6.45	.35	.47	.24	2.20	.76

MONTHLY STATISTICS OF LOG(CFS)

LOGS	42	42	42	42	42	42	42	42	42	42	42	43	42
AVG	2.42	1.62	1.32	1.38	.83	-.64	-2.96	-6.20	-2.67	2.38	2.71	2.69	2.36
STD	.48	.64	.77	.93	4.60	7.71	10.3	12.3	10.5	.60	.36	.42	.20
SKEW	-.96	-1.10	-.61	-.62	-5.94	-3.22	-2.00	-1.21	-1.99	-.97	-.48	-1.14	-.15
KURT	.85	.80	.37	-.12	34.5	8.64	2.08	-.51	2.05	.91	.01	2.17	-.24

MONTHLY QUANTILES IN CFS

MAX	1325.	298.	343.	550.	603.	1013.	501.	175.	746.	1625.	2032.	2467.	579.
0% ILE	856.	216.	192.	355.	349.	503.	191.	73.1	533.	1471.	1885.	1700.	432.
7% ILE	706.	181.	137.	268.	224.	297.	132.	31.6	389.	1118.	1253.	997.	331.
5% ILE	640.	118.	85.9	193.	196.	180.	83.8	22.7	307.	547.	957.	902.	302.
0% ILE	368.	51.1	23.1	26.6	31.3	35.9	30.3	3.13	87.4	314.	512.	584.	231.
0% ILE	147.	22.9	8.40	8.12	14.0	12.6	1.28	.06	2.62	163.	331.	404.	173.
5% ILE	121.	20.3	6.61	7.53	6.96	4.78	.69	.00	.76	116.	299.	330.	159.
3% ILE	80.5	12.5	3.25	3.64	3.52	.70	.03	.00	.01	87.5	223.	172.	149.
0% ILE	52.2	4.08	2.21	1.14	1.18	.03	.00	.00	.00	36.9	173.	138.	119.

STATION NUMBER 02298830

DURATION TABLE OF DAILY VALUES FOR YEAR ENDING SEPTEMBER 30

DISCHARGE, IN CUBIC FEET PER SECOND
MEAN

02-2988.30 MYAKKA R NR SARASOTA, FL.

CLASS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
YEAR	NUMBER OF DAYS IN CLASS																																		
1937																5	13	13	16	38	34	35	32	23	45	29	50	20	12						
1938	71							2	7	4	1	3	3	3	2	1	14	12	12	5	14	47	41	17	22	13	10	15	20	17	2	7				
1939	111								2		2	1	4	16	8	18	19	14	9	6	15	3	6	9	8	9	6	11	28	22	21	13	4			
1940	6							3	2	1	2	2	3	32	13	6	9	15	11	11	15	24	49	65	23	12	16	35	9	2						
1941	35							3	1	4	17	12	12	7	4	6	3	6	5	12	16	23	23	48	45	24	23	23	11	2						
1942														1	21	4	4	2	3	10	24	87	34	25	19	32	35	44	15	5					
1943	80							40	19	15	10	6	16	13	11	4	3	4	6	3	10	8	11	9	1	1	2	24	29	31	3	3	3			
1944	90							24		1		3	21	14	40	20	9	7	2	9	11	12	5	5	51	25	3	3	3	4	4					
1945	102							7	4	2	2	2	4	27	8	15	10	21	15	7	19		10	13		1	3	23	27	20	14	9				
1946	65							5	3	5	3	12	12	8	10	15	15	10	34	23	17	10	18	14	8	7	20	33	18							
1947	14							12	15	5	20	7	12	7	15	5	8	5	11	7	17	11	13	27	28	11	9	6	28	30	30	4	3	5		
1948											14	5	13	17	33	13	9	3	10	8	5	4	17	51	47	17	32	15	28	19	3	1	2			
1949	121								1		1	1	1	3	8	13	8	7	17	10	18	12	6	6	12	26	26	9	12	10	20	14	3			
1950	133							5		5	5	10	13	12	3	1	8	7	2	5	4	4	18	24	27	39	13	6	5	4	7	5				
1951	27							2	2	3	4	5	5	10	14	13	15	13	28	34	32	26	23	35	35	16	6	6	6	5						
1952	55							3	1	1	1	3	6	4	2	12	33	20	22	29	43	22	18	27	14	31	7	2	2	2	2	4				
1953	26							2		1		1	2	4	3	7	5	5	6	5	11	23	32	20	41	36	41	32	31	14	12	5				
1954																1	3	5	8	13	17	60	38	26	47	43	47	20	13	14	9	1				
1955	84							2	1	1	1	6	4	4	7	6	3	4	6	10	21	19	42	36	21	21	30	18	7	11						
1956	72							6	1	4	2	6	15	27	25	22	21	25	31	22	10	7	11	6	8	9	12	15	9							
1957	37							1				3	5	5	7	8	19	4	8	8	5	7	23	35	46	29	34	37	19	18	7					
1958											1	1	2	4	3	1	3	7	8	9	25	41	31	20	33	41	56	29	28	11	11					
1959																	2	6	11	9	9	30	25	27	51	37	24	23	44	27	30	8	2			
1960															5	7	11	11	6	8	28	23	46	13	36	42	33	35	20	16	8	6	4	7	1	
1961	46										1	1	1	1	3	5	8	3	3	9	48	52	38	25	41	23	19	23	12	3						
1962	42							25	25	14	11	7	15	30	9	12	17	5	4	6	9	5	8	27	20	15	4	7	15	15	10	3	1	4		
1963	36							6	3	1		1	2	3	2	2	4	5	30	21	33	24	32	31	25	47	24	18	5	7	3					
1964	10							2	1	3	3	4	4	2	4	6	5	5	18	22	29	31	24	29	37	40	43	35	8	1						
1965	44							3	4	1	4	4	4	9	15	15	25	18	25	27	11	9	17	15	8	7	30	22	13	22	10	3				
1966	17							2	2		1		1	1	1	10	6	10	17	29	23	26	19	19	46	44	38	39	14						
1967	62			1		1	1	3	2	1	4	3	3	6	8	6	6	27	19	23	28	8	9	10	17	25	31	17	24	14	6				
1968	21	2	2	1		1	1	2	2	1	7	9	4	4	6	16	27	26	31	33	13	7	5	5	5	17	21	42	28	19	8				
1969														12	8	4	11	4	7	28	25	19	28	40	46	29	20	26	37	21					
1970								1	1		1	3	3	8	2	6	1	3	3	3	6	14	13	26	56	84	58	30	30	13					
1971	81	1				1	1	2	1	2	2	14	24	16	19	23	21	8	13	12	17	6	6	15	18	13	4	18	9	18						
1972																3	18	9	11	18	37	32	46	35	36	34	38	26	15	8					
1973														2	11	18	11	17	18	11	9	15	23	34	48	60	39	27	11	10	1				
1974											1	3	3	6	7	11	23	37	21	35	54	27	11	8	7	6	10	24	18	14	20	6	6	7		
1975	91	2	2			1	3	1	6	3	3	7	5	9	11	23	13	20	19	41	8	8	8	1	1	1	8	21	29	18	2				
1976				1			1		2	2	1	2	2	2	8	12	9	13	30	40	46	30	13	9	9	29	33	37	19	8	5	3				
1977																7	41	32	13	9	9	9	34	100	35	8	4	3	19	26	9	7				
1978												1	1	3	6	4	11	13	11	8	9	7	12	17	15	12	27	40	42	45	47	28	6				

TABLE NO. 5C

02-22988.30 MYAKKA R NR SARASOTA, FL.

FLOW DURATION DATA

STATION NUMBER 02298830

DURATION TABLE OF DAILY VALUES FOR YEAR ENDING SEPTEMBER 30

DISCHARGE, IN CUBIC FEET PER SECOND
MEAN
02-2988.30 MYAKKA R NR SARASOTA, FL.

42 YEAR PERIOD, FROM 1937 TO 1978

CLASS	VALUE	TOTAL	ACCUM	PERCT	CLASS	VALUE	TOTAL	ACCUM	PERCT	CLASS	VALUE	TOTAL	ACCUM	PERCT
0	.00	1579	15340	100.0	12	.9	236	13087	85.3	24	130.	1137	5832	38.0
1	.01	5	13761	89.7	13	1.4	353	12851	83.8	25	200.	1116	4695	30.6
2	.02	5	13756	89.7	14	2.2	408	12498	81.5	26	310.	1010	3579	23.3
3	.03	2	13751	89.6	15	3.3	435	12090	78.8	27	460.	972	2569	16.7
4	.04	1	13749	89.6	16	4.9	493	11655	76.0	28	700.	753	1597	10.4
5	.05	7	13748	89.6	17	7.4	472	11162	72.8	29	1100.	475	844	5.5
6	.08	4	13741	89.6	18	11.0	634	10690	69.7	30	1600.	237	369	2.4
7	.10	171	13737	89.6	19	17.0	623	10056	65.6	31	2400.	93	132	.8
8	.20	107	13566	88.4	20	26.0	787	9433	61.5	32	3700.	22	39	.2
9	.30	83	13459	87.7	21	39.0	863	8646	56.4	33	5500.	16	17	.1
10	.40	135	13376	87.2	22	59.0	972	7783	50.7	34	8400.	1	1	.0
11	.60	154	13241	86.3	23	89.0	979	6811	44.4					

VALUE EXCEEDED >P> PERCENT OF THE TIME

V95 =	.00
V90 =	.01
V75 =	5.70
V70 =	11.00
V50 =	62.00
V25 =	280.00
V10 =	730.00
MODE=	200.00

TABLE NO. 5D

02-2988.30 MYAKKA R NR SARASOTA, FL.

FLOW DURATION SUMMARY

TABLE NO 5E

02-2988.30 MYAKKA R NR SARASOTA, FL.

LOW-FLOW SUMMARY

LOWEST MEAN DISCHARGE, IN CFS, FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS IN YEAR ENDING JUN

YEAR	1	3	7	14	30	60	90	120	150	183	274
1938	.00	.00	.00	.00	.00	.00	.00	3.10	11.10	19.22	93.06
1939	.00	.00	.00	.00	.00	.00	.00	.00	.93	1.66	95.63
1940	.00	.00	.01	.14	.84	2.90	25.01	39.98	61.39	80.67	78.86
1941	.00	.00	.00	.00	.03	5.97	27.55	38.85	49.69	73.30	100.46
1942	2.10	2.17	2.26	2.48	3.25	22.21	93.43	147.79	159.03	189.85	188.36
1943	.00	.00	.00	.00	.00	.05	.08	.26	2.66	5.31	12.02
1944	.00	.00	.00	.00	.00	.00	.00	.00	.35	.84	82.84
1945	.00	.00	.00	.00	.00	.00	.00	.04	1.08	2.48	16.07
1946	.00	.00	.00	.00	.00	.00	.19	6.23	6.00	8.01	36.48
1947	.00	.00	.00	.00	.07	.19	.83	5.26	20.79	49.89	86.61
1948	.40	.40	.40	.51	.91	3.52	4.07	5.67	42.70	81.89	123.85
1949	.00	.00	.00	.00	.00	.00	.00	.00	.56	2.40	192.77
1950	.00	.00	.00	.00	.00	.00	.00	.00	.08	.47	198.75
1951	.00	.00	.00	.00	.29	10.10	11.44	16.79	15.75	25.06	38.06
1952	.00	.00	.00	.00	.00	.04	13.65	19.38	22.34	19.73	113.92
1953	.00	.00	.00	.00	.04	19.52	16.94	40.67	81.49	91.88	238.42
1954	4.80	5.20	7.04	10.81	22.41	30.19	34.84	42.29	60.45	93.59	261.33
1955	.00	.00	.00	.00	.00	.00	12.60	20.37	42.73	43.25	96.84
1956	.00	.00	.00	.00	.00	.00	.78	1.64	3.98	4.07	19.86
1957	.00	.00	.00	.00	.16	.73	2.44	9.78	51.03	64.05	141.63
1958	.50	.80	1.17	2.44	10.74	41.81	106.54	214.53	277.66	392.56	380.70
1959	6.30	7.23	9.83	11.63	23.93	49.87	93.19	129.60	148.55	155.15	819.49
1960	2.40	2.50	2.97	4.58	5.61	27.45	53.29	109.83	128.43	115.32	198.87
1961	.00	.00	.00	.00	.00	.96	12.13	19.80	58.66	58.15	131.82
1962	.00	.00	.00	.00	.00	.36	.53	.48	.63	3.69	87.85
1963	.00	.00	.00	.00	.02	.77	20.20	35.28	94.81	80.47	118.31
1964	.00	.00	.00	.00	.53	7.47	51.44	84.30	151.70	172.33	178.07
1965	.00	.00	.00	.00	.00	.11	6.42	9.70	18.49	20.55	87.49
1966	.00	.00	.00	.00	.92	20.10	30.07	71.82	107.49	93.04	138.48
1967	.00	.00	.00	.00	.00	.80	.75	7.16	7.75	8.28	68.84
1968	.00	.00	.00	.00	.02	.51	4.28	4.60	6.12	8.34	108.83
1969	1.40	1.70	2.01	2.05	3.84	12.75	67.82	95.71	98.15	138.00	163.15
1970	.16	.30	.59	1.06	3.21	138.39	223.01	221.38	240.63	261.72	383.17
1971	.00	.00	.00	.00	.00	.00	.14	1.18	5.16	4.86	28.83
1972	.00	.00	.00	.99	11.09	26.27	37.94	50.37	72.36	76.03	180.92
1973	2.00	2.17	2.39	2.73	3.67	10.74	72.83	92.00	190.56	203.37	196.82
1974	.28	.30	.40	.62	1.19	1.93	3.45	7.18	8.83	8.83	57.02
1975	.00	.00	.00	.00	.00	.00	.04	.00	2.40	6.30	6.09
1976	.00	.00	.17	.51	1.82	4.44	6.28	10.60	13.96	14.81	86.61
1977	2.50	2.70	2.94	3.61	4.05	5.01	6.26	13.67	23.65	38.86	54.09
1978	.29	.35	.47	.64	1.32	2.89	15.42	105.30	167.35	195.80	203.86

TABLE NO 5F

HIGH-FLOW SUMMARY

HIGHEST MEAN DISCHARGE, IN CFS, FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS IN YEAR ENDING DEC

YEAR	1	3	7	15	30	60	90	120	150	183	274
1937	1340.00	1300.00	1138.57	964.67	746.33	604.42	537.06	476.65	410.87	371.31	325.46
1938	3870.00	3606.67	2898.57	2168.00	1681.00	1104.55	757.23	746.11	620.17	514.44	344.28
1939	4040.00	3876.67	3272.86	2247.00	1956.83	1396.30	1386.64	1186.93	967.85	796.22	531.99
1940	1350.00	1350.00	1189.29	953.33	789.10	633.45	524.50	416.77	338.64	277.91	218.98
1941	1020.00	971.67	842.57	712.07	500.37	327.22	327.54	261.03	231.11	213.88	156.46
1942	1190.00	1150.00	940.71	770.07	711.60	469.22	333.99	293.38	304.62	278.64	208.09
1943	3850.00	3850.00	3271.43	2229.33	1713.33	1355.10	1170.23	1071.50	868.63	713.02	479.61
1944	268.00	268.00	265.43	255.20	225.77	187.33	152.42	130.77	108.53	89.49	59.77
1945	3360.00	3200.00	2650.00	2168.67	1651.57	1491.72	1262.81	1025.98	831.44	682.49	456.84
1946	1010.00	1010.00	966.86	821.73	673.70	618.75	491.28	384.11	309.43	253.95	172.25
1947	6620.00	6276.67	5712.86	4002.67	2503.93	1913.77	1823.31	1571.33	1290.66	1079.63	753.86
1948	4800.00	4620.00	3908.57	2921.33	1948.17	1395.83	1205.84	958.28	776.18	639.18	454.32
1949	3160.00	3106.67	2691.43	2487.33	2223.00	1489.75	1185.02	988.31	811.22	677.34	452.63
1950	3000.00	2893.33	2452.86	1610.87	930.30	565.77	440.44	350.27	283.31	236.49	157.95
1951	3390.00	3226.67	2552.86	1539.20	879.90	518.53	554.54	442.97	360.99	298.09	210.75
1952	3630.00	3520.00	3034.29	1982.07	1230.27	740.75	539.10	464.87	388.03	319.50	219.40
1953	2500.00	2410.00	2085.71	1918.67	1763.73	1296.92	1132.10	925.57	798.05	705.24	485.36
1954	1520.00	1486.67	1243.00	889.60	633.20	475.37	496.34	426.57	367.85	312.64	228.14
1955	1360.00	1336.67	1257.14	1075.27	779.73	557.27	410.31	312.25	250.69	205.60	160.04
1956	1140.00	1100.00	955.71	741.80	658.80	559.97	410.71	311.70	250.94	206.35	138.51
1957	2340.00	2273.33	2041.43	1582.67	1336.27	1110.18	1003.57	820.72	692.57	597.36	442.13
1958	2200.00	2056.67	1712.86	1297.87	1028.60	764.27	688.70	580.47	488.73	413.19	334.22
1959	4160.00	3856.67	3217.14	2322.67	1991.33	1857.38	1521.37	1310.86	1171.78	985.72	773.25
1960	8400.00	7983.33	6078.57	3811.33	2322.53	2202.42	1764.18	1403.30	1149.33	948.69	693.11
1961	698.00	688.67	639.00	544.27	462.87	326.90	253.13	196.84	157.72	130.44	122.75
1962	7730.00	7143.33	5454.29	3364.33	2222.80	1709.45	1184.00	962.97	782.14	648.16	442.62
1963	1700.00	1673.33	1551.43	1174.27	717.47	533.60	422.99	363.02	312.80	271.81	219.42
1964	807.00	796.33	720.29	566.93	460.10	365.57	314.63	258.09	209.29	172.16	190.28
1965	2500.00	2463.33	2325.71	1984.67	1709.00	1242.90	986.04	858.67	724.29	597.99	408.82
1966	1050.00	1023.33	899.29	683.07	492.10	454.10	428.00	408.12	367.83	309.33	252.96
1967	1910.00	1886.67	1760.00	1459.33	1142.63	847.75	704.07	660.25	545.03	448.93	302.08
1968	2190.00	2133.33	1944.29	1538.20	1282.13	977.92	811.44	756.97	628.87	546.96	369.00
1969	1410.00	1383.33	1278.57	1161.80	1048.53	981.60	794.94	692.05	607.65	522.98	416.86
1970	1580.00	1536.67	1333.57	895.40	712.13	468.17	423.73	368.57	339.39	333.28	324.79
1971	1580.00	1543.33	1494.29	1267.47	930.93	777.37	710.10	592.39	515.97	434.27	290.09
1972	1530.00	1510.00	1444.29	1154.40	771.23	458.05	359.09	313.57	263.21	227.79	178.58
1973	1620.00	1586.67	1488.57	1215.47	859.23	582.48	444.41	374.40	303.49	249.43	296.41
1974	2860.00	2810.00	2645.71	2221.33	1381.83	1057.42	778.21	588.87	471.66	387.16	262.65
1975	1170.00	1123.33	1000.43	906.47	756.50	581.53	564.96	514.80	424.77	349.90	233.71
1976	1890.00	1796.67	1582.86	1184.87	811.60	546.98	430.14	352.01	298.50	259.32	177.31
1977	1810.00	1756.67	1585.71	1179.40	1008.70	910.32	726.51	566.36	502.84	431.70	290.39

TABLE NO 6A

(EXTENDED) COW PEN SLOUGH NR BEE RIDGE, FL.

TRANSFERRED FROM MYAKKA R.

TRANSFER RELATION

COWPEN SLOUGH NR BEE RIDGE TRANSFERRED FORM MYAKKA RIVER

X	Y
.00	.00
.10	.25
1.00	.40
10.00	.70
21.90	1.10
34.30	2.00
66.10	4.00
100.00	6.50
219.00	18.00
468.00	60.00
646.00	92.00
1000.00	180.00
1570.00	340.00
2130.00	614.00
8750.00	4550.00

EQUATIONS USED TO PERFORM THE TRANSFER

Y = .4000 * X ** .20412

Y = .4000 * X ** .20412

Y = .4000 * X ** .24304

Y = .1856 * X ** .57658

Y = .2855-01 * X ** 1.1831

Y = .3141-01 * X ** 1.1565

Y = .2934-01 * X ** 1.1727

Y = .1638-01 * X ** 1.2994

Y = .3505-02 * X ** 1.5854

Y = .1726-01 * X ** 1.3261

Y = .4439-02 * X ** 1.5360

Y = .1060-01 * X ** 1.4099

Y = .2184-03 * X ** 1.9376

Y = .1175-01 * X ** 1.4175

TABLE NO 6B

(EXTENDED) COW PEN SLOUGH NR BEE RIDGE, FL.

TRANSFERRED FROM MYAKKA R.

AVERAGE DISCHARGE IN CFS

COWPEN SLOUGH NR BEE RIDGE TRANSFERRED FORM MYAKKA RIVER

AVERAGE DISCHARGE IN CFS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEARLY
1936	--	—	--	—	--	—	--	—	--	—	--	62.8	--
1937	96.7	8.21	1.89	.90	2.26	2.09	78.6	14.2	6.59	26.9	68.0	106.	34.5
1938	55.9	8.52	13.2	2.62	1.16	.30	.00	.00	15.2	412.	72.8	1.04	49.5
1939	219.	3.58	.70	.54	.33	.00	.00	.00	191.	276.	420.	229.	113.
1940	22.1	2.52	.59	4.32	11.7	5.71	3.80	.34	1.28	6.11	61.3	93.7	17.7
1941	68.3	.60	1.03	18.4	10.3	1.94	3.06	2.23	.06	62.0	12.5	36.3	18.2
1942	8.08	8.41	15.7	48.3	27.6	53.0	3.44	.55	89.3	44.4	2.63	16.2	26.4
1943	2.87	.39	.20	.26	.00	1.76	.41	.08	95.4	389.	166.	113.	64.8
1944	145.	1.29	.52	.52	.43	.30	.02	.00	.00	4.61	18.7	10.4	15.4
1945	4.84	1.19	.51	.74	.51	.12	.00	.00	40.7	406.	309.	106.	73.5
1946	25.3	1.29	.63	.97	.52	1.40	.26	.00	.04	15.8	107.	71.4	18.9
1947	12.8	.83	.42	.28	.47	16.4	9.74	1.64	104.	399.	303.	876.	144.
1948	36.6	10.3	9.05	33.3	18.6	.89	.56	.63	.39	44.1	202.	252.	50.7
1949	375.	4.16	1.36	.66	.36	.00	.00	.00	18.2	33.3	581.	145.	98.0
1950	164.	7.96	1.71	.45	.30	.00	.00	.00	.00	19.0	14.0	226.	36.1
1951	5.18	1.79	1.48	1.04	1.29	.47	5.92	1.44	.16	67.2	38.4	12.5	11.6
1952	213.	2.40	.92	.66	1.11	2.48	3.28	.07	.02	.63	21.3	9.24	21.6
1953	306.	32.7	6.55	17.9	24.9	3.69	2.02	.65	14.7	40.5	128.	304.	73.7
1954	268.	29.0	39.5	22.0	2.93	1.99	1.75	3.61	10.4	47.6	53.2	75.8	46.9
1955	58.5	3.76	5.59	2.65	9.62	3.80	2.39	.01	.00	.31	32.9	132.	20.9
1956	9.58	.81	.52	.54	.91	.14	.00	.28	.42	.63	10.9	83.4	8.92
1957	69.4	1.91	.51	.05	.56	20.3	8.62	15.3	21.0	36.8	212.	181.	47.6
1958	187.	2.90	2.17	64.5	42.2	198.	62.4	8.62	.79	35.7	18.8	3.09	52.6
1959	3.19	30.2	17.9	26.7	7.14	160.	16.3	6.36	75.9	138.	454.	534.	123.
1960	110.	23.1	4.05	2.48	17.9	33.5	7.35	1.78	3.26	161.	700.	740.	151.
1961	103.	7.71	1.79	3.46	24.5	2.50	2.11	.30	.00	5.73	22.7	51.0	18.7
1962	2.43	.40	.30	.31	.35	.02	5.35	.53	21.0	13.8	207.	759.	83.7
1963	50.7	2.91	.97	1.11	22.3	29.9	.39	.04	5.24	16.3	39.8	183.	22.7
1964	40.3	10.3	4.37	28.2	54.2	16.0	16.1	.85	.32	1.57	28.6	48.6	20.6
1965	3.39	.51	.60	.81	1.40	5.19	.36	.05	40.7	206.	319.	46.6	52.8
1966	53.9	2.85	1.29	7.91	33.2	8.58	3.69	.34	47.2	42.2	59.7	18.6	23.3
1967	55.3	4.31	.93	.63	1.26	.93	.24	.00	71.4	33.0	199.	76.7	37.2
1968	61.1	1.36	1.07	.79	.61	.78	.37	.12	94.1	268.	37.9	128.	49.7
1969	8.84	15.1	2.39	9.13	3.02	85.8	6.79	.58	48.2	22.0	137.	178.	43.3
1970	86.4	16.1	13.3	44.6	12.5	91.0	36.4	4.35	86.4	13.2	46.3	50.8	42.0
1971	12.3	.78	.45	.53	1.24	.58	.26	.00	.00	4.16	107.	161.	24.1
1972	75.2	20.5	30.1	2.08	21.1	1.76	2.78	3.10	29.5	6.85	17.8	124.	27.7
1973	5.39	3.30	10.3	94.5	90.0	12.8	17.2	1.20	.54	8.87	34.7	85.9	29.9
1974	35.6	.90	.64	.67	.95	.91	.54	.43	40.5	315.	119.	13.6	44.7
1975	.66	.34	.58	1.43	.69	.52	.12	.00	.00	77.9	68.9	97.4	17.5
1976	58.8	18.4	.83	1.65	1.15	1.17	.55	.56	1.93	14.5	139.	32.8	22.8
1977	8.18	5.70	5.06	4.68	3.89	2.09	.70	.56	.62	15.3	167.	165.	31.6
1978	27.6	3.15	40.0	37.8	56.0	45.6	1.41	.48	2.48	72.8	149.	11.2	37.4

TABLE NO 6C

(EXTENDED) COW PEN SLOUGH NR BEE RIDGE, FL.

TRANSFERRED FROM MYAKKA R.

STATISTICS

MONTHLY STATISTICS IN CFS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEARLY
N	42	42	42	42	42	42	42	42	42	42	42	43	42
AVG	75.1	7.20	5.75	11.7	12.2	19.4	7.27	1.70	28.1	90.5	141.	152.	46.4
STD	89.6	8.79	9.82	20.4	19.1	42.2	15.9	3.45	41.5	128.	159.	203.	35.0
SKEW	1.69	1.61	2.44	2.33	2.26	2.97	3.35	2.89	1.91	1.58	1.83	2.38	1.56
KURT	2.31	1.58	5.28	5.47	5.39	8.54	10.9	7.81	3.93	1.03	3.07	4.93	1.78

MONTHLY STATISTICS OF LOG(CFS)

N-LOGS	42	42	42	42	42	42	42	42	42	42	42	43	42
AVG	1.51	.54	.29	.41	-.15	-1.53	-3.75	-6.84	-3.34	1.45	1.87	1.85	1.57
STD	.66	.56	.61	.79	4.43	7.44	9.99	11.9	10.2	.78	.53	.61	.29
SKEW	-.48	.00	.63	.35	-5.97	-3.25	-2.02	-1.22	-2.00	-.52	-.32	-.71	.26
KURT	-.56	-.98	-.71	-.85	34.8	8.76	2.12	-.50	2.07	-.03	-.26	.78	-.49

MONTHLY QUANTILES IN CFS

MAX	375.	32.7	40.0	94.5	90.0	198.	78.6	15.3	191.	412.	700.	876.	191.
10%ILE	217.	22.3	17.2	42.6	39.5	76.0	16.9	5.76	92.7	367.	390.	442.	108.
17%ILE	161.	15.9	12.7	27.9	24.8	32.9	9.55	2.95	75.1	258.	288.	228.	73.7
25%ILE	98.3	8.96	5.83	18.0	19.2	16.1	6.14	1.49	42.3	92.9	200.	165.	52.6
50%ILE	52.3	3.22	1.33	1.54	1.83	2.04	1.89	.45	5.91	34.5	70.8	85.9	36.6
70%ILE	12.0	1.35	.64	.67	.88	.88	.37	.05	.41	14.4	37.6	49.0	22.8
75%ILE	8.67	1.27	.60	.65	.59	.56	.26	.01	.28	11.9	31.8	36.3	21.4
83%ILE	5.21	.82	.52	.53	.47	.30	.04	.00	.02	5.79	19.2	14.5	18.7
90%ILE	3.25	.54	.47	.35	.35	.05	.00	.00	.00	2.35	15.1	10.7	17.6
MIN	.66	.34	.20	.05	.00	.00	.00	.00	.00	.31	2.63	1.04	8.92

TABLE NO 7A

02-2997.50

PHILLIPPI CREEK (EXTENDED) NR SARASOTA, FL.

TRANSFERRED FROM MANATEE R.

TRANSFER RELATION

PHILLIPPI CREEK NR SARASOTA TRANSFERRED FROM MANATEE R.

X	Y	EQUATIONS USED TO PERFORM THE TRANSFER
.00	.00	
1.00	.15	Y = .1470 * X ** 1.4565
3.73	1.00	Y = .1470 * X ** 1.4565
10.00	3.16	Y = .2153 * X ** 1.1667
25.90	10.00	Y = .1946 * X ** 1.2105
49.90	18.70	Y = .4477 * X ** .95450
100.00	34.80	Y = .5684 * X ** .89347
381.00	120.00	Y = .4906 * X ** .92542
700.00	200.00	Y = .8161 * X ** .83979
1400.00	340.00	Y = 1.327 * X ** .76553
2500.00	540.00	Y = 1.050 * X ** .79788

TABLE NO 7B

02-2997.50 PHILLIPPI CREEK (EXTENDED) NR SARASOTA, FL.

TRANSFERRED FROM MANATEE R.

AVERAGE DISCHARGE IN CFS

PHILLIPPI CREEK NR SARASOTA TRANSFERRED FROM MANATEE R.

AVERAGE DISCHARGE IN CFS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEARLY
1939	--	—	--	—	--	—	1.39	2.33	144.	110.	144.	75.7	--
1940	17.7	4.89	4.15	14.6	24.5	15.3	6.44	1.82	17.2	27.5	60.3	59.1	21.1
1941	7.33	1.97	10.6	27.2	19.2	11.0	25.8	1.82	19.1	101.	26.1	36.0	24.0
1942	4.43	18.8	12.7	22.1	44.7	38.7	5.62	1.52	57.0	12.5	5.32	29.0	20.8
1943	3.38	1.48	2.57	2.91	2.18	13.0	1.94	2.28	103.	144.	112.	60.1	37.7
1944	51.1	4.18	3.63	4.07	2.41	9.99	2.28	8.82	16.4	38.7	53.6	34.3	19.3
1945	19.1	4.48	3.24	7.58	2.49	1.13	.67	.37	46.5	171.	143.	77.5	40.1
1946	20.9	3.56	4.97	6.28	4.80	8.20	1.27	2.98	2.87	83.9	133.	101.	31.4
1947	22.2	3.85	2.96	3.40	14.1	62.7	15.0	4.16	62.8	94.6	95.7	203.	48.7
1948	23.8	17.5	14.4	39.6	12.4	7.93	8.07	1.47	.80	61.7	142.	132.	38.7
1949	63.0	5.88	10.2	3.70	2.49	1.57	1.28	.54	12.8	24.2	185.	74.5	32.4
1950	51.2	16.8	4.77	2.95	1.93	2.74	1.70	1.66	6.62	40.9	29.5	68.3	19.2
1951	29.1	4.60	14.2	7.03	11.6	3.08	26.0	1.65	1.12	56.1	45.6	72.1	23.1
1952	49.8	12.3	6.06	3.51	12.8	11.9	2.81	2.43	8.59	15.1	59.1	74.9	21.6
1953	147.	25.4	12.6	33.2	46.2	4.55	15.2	1.51	30.9	35.1	110.	179.	53.4
1954	45.2	56.8	47.8	33.3	8.45	6.65	7.88	6.25	21.1	34.7	16.9	71.6	29.8
1955	17.2	15.4	10.8	11.7	11.9	4.24	4.20	2.13	3.64	13.8	73.6	72.6	20.1
1956	7.85	3.56	3.63	3.23	5.26	1.65	1.50	7.52	2.13	9.41	42.1	65.8	12.8
1957	48.2	3.59	2.77	4.52	12.5	41.8	30.0	26.4	39.4	84.2	93.1	60.8	37.5
1958	69.0	7.76	21.3	98.2	38.9	106.	49.3	10.6	9.67	40.1	10.5	9.38	39.5
1959	3.77	6.97	20.7	26.7	11.9	96.8	21.6	28.5	98.5	93.6	167.	166.	62.1
1960	56.1	12.6	13.9	7.85	43.1	50.9	10.3	3.52	20.1	153.	116.	207.	57.9
1961	49.5	7.32	7.20	15.5	40.8	12.3	5.25	2.50	4.70	20.0	82.9	24.4	22.7
1962	2.32	1.69	1.85	2.95	2.14	7.43	12.8	2.27	41.6	34.7	130.	163.	33.6
1963	26.8	13.4	5.28	8.67	75.5	30.5	2.63	7.72	37.3	83.8	58.3	103.	37.4
1964	14.2	28.5	22.8	48.2	60.2	32.3	11.3	7.48	1.90	6.20	48.6	36.0	26.4
1965	12.5	4.82	6.20	5.14	10.8	34.5	3.06	1.32	36.9	165.	73.7	30.7	32.4
1966	21.4	4.88	7.45	38.5	52.0	9.58	10.6	2.72	35.9	25.2	32.5	9.19	20.6
1967	24.9	3.79	3.72	3.76	9.36	4.15	.84	.07	32.2	95.5	109.	13.7	25.3
1968	8.57	3.09	4.73	3.66	4.82	4.54	1.93	2.15	59.4	122.	34.0	28.3	23.2
1969	11.7	29.2	5.96	20.3	14.0	63.7	6.39	3.39	14.5	15.3	70.4	70.4	27.2
1970	46.9	15.4	29.2	28.7	14.7	64.5	8.99	32.0	25.6	8.36	20.5	21.7	26.6
1971	6.99	4.11	3.41	3.74	11.8	3.50	1.54	2.09	11.7	21.3	63.3	75.6	17.4
1972	78.7	30.3	19.1	6.12	41.1	8.53	14.0	20.0	39.0	6.86	89.6	30.2	31.9
1973	5.07	8.00	16.0	43.3	23.7	14.3	20.9	2.77	2.64	25.3	33.6	66.1	21.9
1974	7.97	4.36	8.74	5.12	4.14	2.13	.64	.90	33.1	89.2	40.4	11.9	17.6
1975	2.58	2.27	4.79	3.59	4.43	2.29	.08	.89	38.9	79.1	52.0	78.5	22.5
1976	32.6	12.6	4.76	5.00	4.23	2.42	.94	1.56	44.4	51.4	81.3	40.1	23.5
1977	7.48	7.86	9.42	13.7	10.5	6.67	1.61	3.40	6.77	18.5	41.5	98.2	18.8
1978	18.4	12.0	45.8	38.2	44.4	24.9	2.89	13.7	14.4	32.4	38.7	19.4	24.1

TABLE NO 7C

02-2997.50 PHILLIPPI CREEK (EXTENDED) NR SARASOTA FL.

TRANSFERRED FROM MANATEE R.

STATISTICS

MONTHLY STATISTICS IN CFS

	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	YEARLY
N	39	39	39	39	39	39	40	40	40	40	40	40	39
AVG	29.1	10.9	11.2	16.9	19.6	21.3	8.67	5.67	30.2	58.7	75.1	71.0	29.5
STD	28.5	11.0	10.7	19.2	19.0	26.4	10.3	7.79	30.6	47.0	45.1	52.2	11.4
SKEW	2.03	2.25	2.02	2.23	1.20	1.75	2.00	2.24	1.84	.87	.57	1.14	1.20
KURT	5.60	6.05	4.05	6.29	.45	2.38	4.42	4.06	3.82	-.27	-.48	.69	.97

MONTHLY STATISTICS OF LOG(CFS)

N-LOGS	39	39	39	39	39	39	40	40	40	40	40	40	39
AVG	1.27	.87	.90	1.00	1.08	1.02	.63	.46	1.22	1.61	1.78	1.72	1.44
STD	.44	.38	.35	.44	.46	.53	.57	.51	.54	.40	.33	.36	.15
SKEW	-.24	.26	.38	.43	-.08	.16	-.45	-.22	-.66	-.28	-1.03	-.49	.41
KURT	-.77	-.65	-.65	-1.15	-1.04	-.96	.26	1.18	-.31	-.93	1.20	-.38	-.26

MONTHLY QUANTILES IN CFS

MAX	147.	56.8	47.8	98.2	75.5	106.	49.3	32.0	144.	171.	185.	207.	62.1
10%ILE	63.0	28.5	22.8	39.6	46.4	63.7	25.4	19.3	62.5	142.	143.	166.	48.7
17%ILE	51.1	17.9	19.6	34.9	43.6	44.8	16.1	9.12	48.2	102.	130.	108.	39.0
25%ILE	48.2	15.4	14.4	27.2	38.9	32.3	12.4	7.17	39.3	92.5	110.	78.2	37.4
50%ILE	20.9	6.97	7.20	7.58	11.9	9.58	4.72	2.38	20.6	39.4	66.8	67.2	26.4
70%ILE	8.57	4.18	4.76	4.07	5.26	4.54	1.77	1.71	10.3	24.5	43.1	34.8	21.9
75%ILE	7.85	3.85	4.15	3.74	4.80	4.15	1.56	1.58	7.22	20.3	40.7	30.3	21.1
83%ILE	6.35	3.56	3.56	3.56	3.59	2.63	1.28	1.44	3.51	14.9	32.0	23.9	19.8
90%ILE	3.77	2.27	2.96	3.23	2.41	2.13	.85	.89	2.18	9.72	21.1	12.1	18.8
MIN	2.32	1.48	1.85	2.91	1.93	1.13	.08	.07	.80	6.20	5.32	9.19	12.8

STATION NUMBER 02[illegible]30

DURATION TABLE OF DAILY VALUES FOR YEAR ENDING SEPTEMBER 30

DISCHARGE, IN CUBIC FEET PER SECOND
MEAN

COMPEN SLOUGH NR BEE RIDGE TRANSFERRED FORM MYAKKA RIVER

TABLE NO. 8A

02-2997.00 COW PEN SLOUGH (EXTENDED) NR BEE RIDGE, FL.

BASED ON MYAKKA R.

FLOW DURATION DATA

CLASS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
YEAR	NUMBER OF DAYS IN CLASS																																		
1937						15	21	15	26	14	28	26	17	19	14	13	24	22	12	17	35	14	10	7	14	2									
1938	71		9	11	6	18	22	4	8	19	33	29	16	13	9	13	6	7	6	2	6	8	7	12	15	6		1	3	5					
1939	111		2	7	44	29	13	5	10	5	2	2	5	8	4	4	5	4	2	4	5	4	12	17	10	13	12	8	4	9	5				
1940	6		5	5	56	19	19	9	8	8	20	31	36	43	20	6	5	8	5	10	21	11	12	1		2									
1941	35		4	36	27	6	11	11	8	15	13	14	17	34	24	21	13	17	17	6	10	8	10	5	2	1									
1942					27	5	5	9	9	41	60	25	19	15	10	9	18	14	17	18	28	15	8	6	7										
1943	80		59	32	44	6	7	5	4	5	6	9	4	7		1		1	1	1	4	17	14	12	26	11	2	1	1	1	4				
1944	90		24	8	92	14	5	7	5	8	10	2	5	3	32	19	10	15	3		2	1	2	1	2	2		4							
1945	102		11	7	53	20	26	7	9	10		10		13				1	1	2	9	12	11	11	21	6	8	6	3	6					
1946	65		8	24	43	20	43	19	12	11	2	8	12	12	4	2	5	4	7	12	18	11	10	13											
1947	14		27	36	37	11	12	6	10	12	6	7	11	21	16	11	8	5	4	5		6	6	15	26	14	12	13	4	1	1	3	5		
1948				21	75	10	13	6	3	4	2	4	27	37	27	20	11	6	16	12	11	8	13	10	18	6	1	2	1		1	1			
1949	121		1	2	26	12	23	7	4	22	3	4	4	4	3	9	19	7	16	9	5	3	10	4	4	6	8	9	10	7	2	1			
1950	133		5	20	29	13	5	4	3	2	3	10	15	15	14	15	20	19	10	3	3	2	3	3	2	2	1	2	6	3					
1951	27		4	12	44	24	37	29	15	29	12	16	14	26	15	21	12	5	2	4	4	2	3	1	5	2									
1952	55		4	6	30	43	32	26	22	23	16	11	14	15	13	6	15	16	6	1	1	1	1	1	1	1		2	1	3					
1953	26		2	2	17	7	8	7	2	17	13	24	12	13	19	22	20	19	21	17	23	8	16	18	11	4	2	8	2	3	2				
1954					1	5	12	17	7	17	48	25	19	19	14	30	27	19	19	28	13	8	4	8	9	6	3	3	4							
1955	84		3	8	21	3	12	10	13	12	13	25	33	17	14	9	12	8	18	14	10	8	3	3	9	3									
1956	72		7	13	89	39	87	15	6	4	4	7	6	4	3	5	4	5	8	4	8	7	9												
1957	37		1	3	27	20	13	4	2	6	4	13	22	21	29	18	19	11	11	20	23	13	8	10	18	6	1	4	1						
1958				2	10	9	11	9	11	30	23	24	12	15	12	21	13	25	37	20	19	11	15	11	10	4	4	7							
1959						6	19	4	4	15	19	15	18	17	26	26	23	14	9	14	13	10	25	17	14	17	11	14	11	1	3				
1960					13	19	9	11	17	12	18	30	20	9	11	22	22	23	15	17	14	20	8	6	16	9	3	3	5	2	2	2	5	3	
1961	46			2	13	7	4	12	26	33	38	23	27	11	14	26	18	7	6	11	16	7	7	5	6										
1962	42		50	33	66	20	6	7	5	3	4	3	18	14	8	12	3	12	3	1	4	2	3	7	18	4	4	5	1	1	2		2	2	
1963	36		9	2	10	8	32	21	24	16	15	25	18	19	9	15	17	30	16	10	9	9	3	2	1	6	3								
1964	10		3	10	16	9	25	17	18	20	21	14	20	16	20	20	15	23	24	18	29	8	7	2	1										
1965	44		7	9	50	32	33	26	4	7	6	11	12	8	7		6	3	9	19	12	11	9	2	9	16	5	4	4					
1966	17		4	2	13	12	27	22	11	23	15	12	11	15	8	35	15	30	22	14	26	15	10	6											
1967	62		7	9	24	28	30	17	15	14	6	5	7	7	4	11	8	19	17	13	8	9	8	13	16	2	5	1							
1968	21	4	5	20	33	41	52	21	11	3	5	4	2	4	1	4	8	9	7	11	24	20	7	19	16	8	2	4							
1969					27	15	11	31	12	17	10	16	28	23	24	21	16	14	5	15	9	15	16	17	23	5									
1970			1	6	16	3	5	2	3	9	8	7	8	22	23	33	46	39	21	36	18	13	15	15	10	4									
1971	81	1	4	21	82	23	20	11	9	9	3	4	4	13	10	8	8	5	2	2	7	9	6	5	6	12									
1972					5	24	15	18	22	20	24	29	27	25	16	18	17	18	21	17	11	13	10	6	4	6									
1973					35	18	28	9	6	5	11	15	15	24	31	19	31	30	16	21	17	10	7	4	7	5	1								
1974				17	79	42	71	22	4	7	5	5	4	4	4	6	8	15	8	11	9	5	6	13	5	2	2	2	7	2					
1975	91	4	11	20	57	30	50	7	4	5	5	1		1	1			8	10	9	19	11	12	6	3										
1976		1	4	7	32	32	53	44	20	11	10	6	7	5	2	24	26	9	15	20	15	5	8	1	3	3	3								
1977					51	40	13	8	6	8	28	65	50	20	3	5	3		1	3	9	6	26	4	4	5	7								
1978				12	39	13	12	10	8	12	12	7	15	17	16	22	23	19	19	27	17	24	15	17	5	4									

STATION NUMBER 02298830

DURATION TABLE OF DAILY VALUES FOR YEAR ENDING SEPTEMBER 30

DISCHARGE, IN CUBIC FEET PER SECOND
MEAN
COWPEN SLOUGH NR BEE RIDGE -TRANSFERRED FORM MYAKKA RIVER

42 YEAR PERIOD, FROM 1937 TO 1978

CLASS	VALUE	TOTAL	ACCUM	PERCT	CLASS	VALUE	TOTAL	ACCUM	PERCT	CLASS	VALUE	TOTAL	ACCUM	PERCT
0	.00	1579	15340	100.0	12	4.8	631	7160	46.7	24	190.	377	943	6.1
1	.10	10	13761	89.7	13	6.5	648	6529	42.6	25	270.	205	566	3.6
2	.20	281	13751	89.6	14	8.9	534	5881	38.3	26	360.	100	361	2.3
3	.30	425	13470	87.8	15	12.0	602	5347	34.9	27	490.	103	261	1.7
4	.40	1461	13045	85.0	16	16.0	579	4745	30.9	28	670.	68	158	1.0
5	.60	765	11584	75.5	17	22.0	565	4166	27.2	29	910.	44	90	.5
6	.70	912	10819	70.5	18	31.0	485	3601	23.5	30	1200.	22	46	.2
7	1.00	551	9907	64.6	19	42.0	498	3116	20.3	31	1700.	7	24	.1
8	1.40	426	9356	61.0	20	57.0	544	2618	17.1	32	2300.	12	17	.1
9	1.90	563	8930	58.2	21	77.0	400	2074	13.5	33	3100.	5	5	.0
10	2.60	584	8367	54.5	22	100.0	395	1674	10.9	34	4300.	0	0	.0
11	3.50	623	7783	50.7	23	140.0	336	1279	8.3					

VALUE EXCEEDED >P> PERCENT OF THE TIME

V95 =	.05
V90 =	.10
V75 =	.60
V70 =	.70
V50 =	3.70
V25 =	27.00
V10 =	110.00
MODE=	1.00

TABLE NO 8B

02-2997.00 COW PEN SLOUGH (EXTENDED) NR BEE RIDGE, FL.

BASED ON MYAKKA R.

FLOW DURATION SUMMARY

TABLE NO 8C

02-2997.00 COW PEN SLOUGH (EXTENDED) NR BEE RIDGE, FL.

BASED ON MYAKKA R.

LOW-FLOW SUMMARY

COWPEN SLOUGH NR BEE RIDGE TRANSFERRED FORM MYAKKA RIVER

LOWEST MEAN DISCHARGE, IN CFS, FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS IN YEAR ENDING JUN

YEAR	1	3	7	14	30	60	90	120	150	183	274
1938	.00	.00	.00	.00	.00	.00	.07	.25	.69	1.16	9.79
1939	.00	.00	.00	.00	.00	.00	.00	.03	.12	.21	25.43
1940	.00	.00	.04	.17	.31	.44	1.74	2.66	4.45	4.25	6.34
1941	.00	.00	.00	.00	.04	.61	1.80	1.80	3.41	5.79	12.85
1942	.48	.48	.48	.50	.53	1.46	8.16	13.89	14.91	20.17	21.99
1943	.00	.00	.00	.00	.00	.11	.15	.19	.33	.44	.93
1944	.00	.00	.00	.00	.00	.00	.01	.08	.15	.21	16.86
1945	.00	.00	.00	.00	.00	.00	.00	.04	.15	.25	1.11
1946	.00	.00	.00	.00	.00	.00	.09	.42	.45	.54	3.53
1947	.00	.00	.00	.00	.14	.23	.30	.50	1.46	4.16	8.26
1948	.33	.33	.33	.34	.39	.50	.53	.59	4.09	9.08	13.97
1949	.00	.00	.00	.00	.00	.00	.00	.00	.10	.21	52.20
1950	.00	.00	.00	.00	.00	.00	.00	.00	.06	.13	21.28
1951	.00	.00	.00	.00	.16	.71	.76	1.02	.97	1.64	2.10
1952	.00	.00	.00	.00	.00	.04	.88	1.17	1.39	1.26	25.34
1953	.00	.00	.00	.00	.04	1.21	1.09	2.76	7.04	8.20	44.55
1954	.59	.60	.64	.75	1.34	1.72	1.99	2.47	3.88	7.30	45.31
1955	.00	.00	.00	.00	.00	.00	.79	1.36	3.06	3.05	10.82
1956	.00	.00	.00	.00	.00	.00	.11	.20	.34	.38	1.63
1957	.00	.00	.00	.00	.05	.17	.32	.69	4.72	5.42	15.62
1958	.35	.38	.41	.48	.79	2.45	9.00	26.69	36.25	61.35	64.40
1959	.63	.65	.72	.77	1.39	3.00	7.70	12.21	13.97	14.68	30.06
1960	.49	.50	.52	.57	.60	1.91	3.81	8.53	12.26	10.65	23.07
1961	.00	.00	.00	.00	.00	.14	.77	1.19	5.57	5.18	17.15
1962	.00	.00	.00	.00	.01	.17	.22	.24	.27	.42	2.42
1963	.00	.00	.00	.00	.04	.16	1.34	2.05	10.64	8.89	14.19
1964	.00	.00	.00	.08	.24	.56	5.05	7.92	17.03	18.89	19.71
1965	.00	.00	.00	.00	.00	.09	.62	.73	1.22	1.37	4.68
1966	.00	.00	.00	.00	.19	1.28	1.92	5.63	10.22	8.73	15.08
1967	.00	.00	.00	.00	.00	.01	.15	.48	.53	.56	7.78
1968	.00	.00	.00	.00	.06	.23	.41	.46	.53	.62	14.78
1969	.43	.45	.47	.47	.51	.92	4.61	7.21	7.25	17.95	19.38
1970	.28	.31	.35	.40	.49	13.17	21.48	21.83	24.13	33.23	44.32
1971	.00	.00	.00	.00	.00	.00	.08	.20	.40	.42	1.93
1972	.00	.00	.00	.09	.79	1.75	2.42	3.34	5.94	6.05	20.79
1973	.47	.48	.49	.51	.54	.83	5.54	7.49	23.24	27.54	25.58
1974	.31	.31	.33	.36	.41	.46	.51	.64	.68	.68	7.51
1975	.00	.00	.00	.00	.00	.00	.04	.16	.26	.46	.49
1976	.00	.00	.06	.32	.43	.53	.59	.75	.89	.95	9.78
1977	.50	.51	.52	.54	.56	.59	.62	.96	1.54	2.10	3.56
1978	.31	.32	.34	.36	.42	.49	1.17	12.05	20.75	23.74	24.08

TABLE NO. 8D

02-2997.00 COW PEN SLOUGH (EXTENDED) NR BEE RIDGE, FL.

BASED ON MYAKKA R.

HIGH-FLOW SUMMARY

COWPEN SLOUGH NR BEE RIDGE TRANSFERRED FORM MYAKKA RIVER

HIGHEST MEAN DISCHARGE, IN CFS, FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS IN YEAR ENDING SEP

YEAR	1	3	7	15	30	60	90	120	150	183	274
1937	272.00	260.67	217.00	170.67	120.60	89.57	67.94	52.67	45.04	49.87	33.88
1938	1088.00	1028.00	951.29	631.87	431.83	256.76	172.33	129.41	103.53	84.86	58.55
1939	1521.00	1436.33	1140.86	682.67	541.13	371.84	354.24	284.63	227.70	186.64	124.75
1940	275.00	245.00	161.57	117.60	93.73	78.46	54.37	41.15	32.99	27.67	20.81
1941	275.00	237.33	182.00	130.07	70.46	40.94	37.73	28.34	23.08	19.46	16.37
1942	230.00	219.33	165.71	126.00	112.17	67.78	47.57	38.51	43.12	38.75	33.02
1943	1421.00	1421.00	1140.57	677.40	456.47	319.50	256.80	195.52	156.42	128.29	85.91
1944	655.00	630.33	481.43	284.47	149.75	75.59	50.57	38.06	30.54	25.08	16.75
1945	1172.00	1094.00	841.00	616.73	416.80	370.13	291.10	221.41	177.12	145.18	97.12
1946	183.00	183.00	171.43	135.53	105.13	92.15	66.07	49.57	39.65	32.55	22.06
1947	3064.00	2842.33	2496.14	1586.40	876.13	590.55	528.49	426.19	341.19	281.35	189.85
1948	1943.00	1396.00	860.29	434.27	251.53	227.17	168.60	126.54	101.35	83.18	61.82
1949	1902.00	1648.33	1170.71	765.93	651.50	372.22	257.73	199.51	159.61	130.83	87.49
1950	998.00	948.00	747.43	430.93	227.03	122.08	86.56	64.92	51.94	42.57	28.52
1951	272.00	265.33	238.00	166.53	101.00	56.30	40.55	30.45	24.57	21.19	14.46
1952	1186.00	1106.67	796.71	425.93	219.90	111.20	74.46	56.01	45.02	37.38	25.30
1953	1307.00	1252.00	1023.57	589.53	325.40	216.05	157.96	123.11	98.56	81.17	59.20
1954	771.00	732.00	554.57	461.87	276.43	149.74	115.19	92.14	74.43	61.36	42.78
1955	304.00	271.33	249.00	200.73	131.57	82.72	55.31	41.48	33.19	27.59	20.17
1956	134.00	131.67	122.14	103.47	83.40	47.32	31.77	23.92	19.20	15.74	10.68
1957	702.00	673.67	562.57	358.00	217.17	198.85	144.69	114.59	94.79	79.21	55.27
1958	664.00	639.67	530.29	356.47	201.97	134.35	116.11	93.21	76.36	83.93	63.63
1959	1586.00	1427.33	1115.43	703.27	548.80	499.75	379.99	304.86	245.46	203.88	158.22
1960	4294.00	4001.33	2797.14	1556.47	841.67	774.73	542.40	408.25	326.82	269.22	185.73
1961	255.00	234.67	189.71	173.40	106.42	57.18	38.72	29.88	28.52	23.84	16.18
1962	3817.00	3818.33	2395.14	1289.47	759.00	486.38	328.52	252.05	201.74	166.25	111.11
1963	397.00	385.00	140.86	181.47	103.13	71.75	53.21	41.58	33.28	27.34	24.05
1964	227.00	193.00	137.57	79.33	58.10	42.86	35.76	28.91	27.19	25.51	21.32
1965	771.00	758.67	695.86	538.87	417.30	273.17	201.18	157.58	126.07	103.40	69.88
1966	175.00	170.00	148.86	105.40	67.70	59.18	54.28	42.78	34.28	28.72	24.45
1967	497.00	485.33	428.00	323.67	229.77	140.47	121.70	96.92	77.54	63.59	42.78
1968	639.00	611.33	517.29	368.20	275.40	189.22	150.41	134.54	107.66	88.31	59.23
1969	292.00	284.33	255.00	211.33	178.47	160.07	113.29	97.81	78.37	65.36	54.71
1970	344.00	330.67	272.29	164.20	113.27	67.08	64.30	55.12	49.88	47.88	43.69
1971	344.00	332.33	317.43	254.27	168.67	135.75	92.07	69.05	55.24	45.32	30.52
1972	328.00	322.00	302.43	223.80	134.53	71.11	55.72	44.66	36.39	30.30	22.89
1973	361.00	347.67	317.14	240.73	153.37	92.68	66.39	53.83	44.66	37.15	37.73
1974	932.00	909.33	835.71	646.53	361.57	240.70	167.02	125.55	100.53	82.50	55.38
1975	225.00	212.33	179.71	155.27	121.37	84.97	69.71	52.28	41.82	34.30	23.20
1976	487.00	442.00	359.00	241.73	147.90	87.93	63.62	48.31	38.76	31.87	21.72
1977	448.00	423.00	358.29	239.20	195.40	166.40	117.55	88.32	70.77	58.13	40.00
1978	328.00	314.00	264.43	209.87	164.87	113.87	79.43	60.43	48.43	47.88	45.49

STATION NUMBER 02300000

DURATION TABLE OF DAILY VALUES FOR YEAR ENDING SEPTEMBER 30

DISCHARGE, IN CUBIC FEET PER SECOND

MEAN

PHILLIPPI CREEK NR SARASOTA TRANSFERRED FROM MANATEE RIVER

CLASS	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34
YEAR	NUMBER OF DAYS IN CLASS																																		
1940														2	12	8	20	44	41	29	38	61	31	25	16	16	9	8	4	2					
1941														10	16	48	37	17	21	18	22	43	34	25	25	17	15	10	7						
1942														5	9	16	27	30	80	39	31	25	25	25	18	13	8	7	2	3	2				
1943												1	8	7	3	23	69	62	33	22	11	8	9	8	10	18	15	10	23	11	5	6	1	2	
1944															4	28	48	77	59	18	15	19	19	27	15	19	8	5		3	2				
1945									6	12	24	11	22	14	19	20	27	62	22	6	3	5	5	9	14	20	16	19	10	7	8	3	1		
1946														6	39	20	25	64	58	27	16	9	6	13	14	17	13	14	9	12	3				
1947																12	38	67	39	13	12	21	20	19	20	25	18	26	20	10	2	1	1	1	
1948													4	9	19	22	20	16	27	25	23	17	37	20	30	22	20	10	20	15	4	4	2		
1949											7	17	12	17	21	27	33	29	28	27	14	30	20	20	14	8	8	9	10	5	7	2			
1950															41	58	44	30	37	22	14	21	19	25	20	16	9	3	1	2	3				
1951														5	14	21	22	20	31	51	30	35	26	28	25	17	11	9	12	3	2	3			
1952														2	3	13	17	16	43	54	65	27	31	16	15	30	14	6	8	1	1	3	1		
1953													6	3		17	13	10	16	14	11	27	56	34	30	31	25	18	16	14	15	6	3		
1954																		5	21	51	37	38	49	35	55	24	20	8	12	4	4	1	1		
1955															9	22	25	26	22	53	37	32	37	22	18	20	19	9	10	3	1				
1956															18	40	25	82	56	31	21	15	25	9	15	8	5	9	3	2	1	1			
1957																		65	33	20	9	19	50	38	28	18	26	15	27	10	4	3			
1958																	6	10	20	52	31	27	41	41	32	24	26	12	28	5	4	6			
1959																	6	20	29	26	19	26	53	36	28	21	18	18	23	12	13	9	5	3	
1960																	6	27	10	31	17	36	60	27	34	19	21	20	30	11	8	3		3	3
1961																9	19	22	23	56	47	43	54	19	25	13	9	6	9	3	8				
1962																3	89	88	35	8	9	5	15	13	16	16	16	18	15	10	5	2		1		1
1963																1	26	17	13	53	37	32	34	30	31	17	18	18	17	12	3	5	1			
1964																9	22	21	13	43	23	38	44	36	33	32	19	14	10	9					
1965															8	21	13	20	50	58	25	22	27	15	27	18	19	10	12	9	5	4	2		
1966																	3	23	22	90	41	26	41	29	27	17	26	10	8	2					
1967				3		8	7	9	14	2	4	2	2	1	5	5	17	95	48	21	14	23	7	7	19	18	10	11	6	4	1	2			
1968											3	2	4	5	7	5	47	104	47	22	13	24	16	12	6	13	11	9	9	6	1				
1969																	15	32	70	42	25	41	38	29	29	14	9	13	2	3	3				
1970															1	9	25	14	31	29	47	71	43	34	18	14	10	10	4	3	2				
1971												11	8	3	5	18	32	106	43	22	18	25	18	18	10	13	3	3	4	3	2			
1972																	14	32	72	58	39	31	23	17	18	18	12	11	11	6	3	1			
1973							1	2	3	1		3	5		1		42	27	36	36	27	46	38	35	22	19	12	5	2	1	1				
1974		2	1	4	6	2	2	4	12	7	2	5	7	2	3	13	24	61	77	24	19	21	12	7	12	13	7	9	2	4	1				
1975	5	8	6	5	3	4	7	2	9	5	2	2	1	1	4	18	72	56	30	12	7	14	9	13	17	17	14	12	4	5	1				
1976				1	1	5	8	4	6	5	1	1	3	2	7	8	20	50	60	33	18	26	25	24	20	9	7	10	6	4	1	1			
1977									8	2		5	3	3	6	9	25	23	55	57	38	68	18	15	4	5	4	6	4	7					
1978																5	13	25	41	32	27	52	43	49	31	19	9	9	5	4	1				

TABLE NO 9A

02-2997.50 PHILLIPPI CREEK (EXTENDED) NR SARASOTA, FL.

BASED ON MANATEE R.

FLOW DURATION DATA

TABLE NO 9B

02-2997.50 PHILLIPPI CREEK (EXTENDED) NR SARASOTA, FL.

BASED ON MANATEE R.

FLOW DURATION SUMMARY

STATION NUMBER 02300000

DURATION TABLE OF DAILY VALUES FOR YEAR ENDING SEPTEMBER 30

DISCHARGE, IN CUBIC FEET PER SECOND
MEAN

PHILLIPPI CREEK NR SARASOTA TRANSFERRED FROM MANATEE RIVER

39 YEAR PERIOD, FROM 1940 TO 1978

CLASS	VALUE	TOTAL	ACCUM	PERCT	CLASS	VALUE	TOTAL	ACCUM	PERCT	CLASS	VALUE	TOTAL	ACCUM	PERCT
0	.00	5	14245	100.0	12	.5	93	13922	97.7	24	36.	727	2878	20.2
1	.01	10	14240	100.0	13	.7	145	13829	97.1	25	51.	650	2151	15.1
2	.02	7	14230	99.9	14	1.0	401	13684	96.1	26	73.	432	1501	10.5
3	.03	13	14223	99.8	15	1.5	708	13283	93.2	27	100.	492	1069	7.5
4	.04	10	14210	99.8	16	2.1	1195	12575	88.3	28	150.	258	577	4.0
5	.05	19	14200	99.7	17	3.0	1542	11380	79.9	29	210.	177	319.	2.2
6	.06	25	14181	99.6	18	4.2	1733	9838	69.1	30	300.	100	142	.9
7	.08	21	14156	99.4	19	6.1	1080	8105	56.9	31	430.	26	42	.2
8	.10	58	14135	99.2	20	8.7	930	7025	49.3	32	620.	11	16	.1
9	.20	34	14077	98.8	21	12.0	1365	6095	42.8	33	890.	4	5	.0
10	.30	44	14043	98.6	22	18.0	925	4730	33.2	34	1300.	1	1	.0
11	.40	77	13999	98.3	23	25.0	927	3805	26.7					

VALUE EXCEEDED >P> PERCENT OF THE TIME

V95 =	1.20
V90 =	1.90
V75 =	3.90
V70 =	4.10
V50 =	8.50
V25 =	28.00
V10 =	78.00
MODE=	6.10

TABLE NO 9C

02-2997.50 PHILLIPPI CREEK (EXTENDED) NR SARASOTA, FL.

BASED ON MANATEE R.

LOW-FLOW SUMMARY

PHILLIPPI CREEK NR SARASOTA TRANSFERRED FROM MANATEE RIVER

LOWEST MEAN DISCHARGE, IN CFS, FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS IN YEAR ENDING JUN

YEAR	1	3	7	14	30	60	90	120	150	183	274
1940	.95	.98	1.03	1.15	1.66	3.54	6.82	8.59	11.14	10.94	11.86
1941	.87	.90	.93	.97	1.19	1.94	5.69	10.65	12.59	12.62	13.45
1942	.80	.85	.91	1.15	1.50	3.20	9.70	14.66	13.19	17.35	19.35
1943	.35	.38	.45	.50	.98	1.78	2.18	2.19	2.38	3.95	5.57
1944	1.40	1.40	1.44	1.51	1.94	2.94	3.23	3.39	4.23	4.39	11.56
1945	.19	.19	.22	.24	.28	.37	.48	.71	1.16	2.24	4.71
1946	.87	.90	1.00	1.08	1.20	1.89	1.97	3.23	3.82	4.28	6.26
1947	1.50	1.50	1.54	1.74	2.63	3.02	3.21	3.85	8.86	16.20	21.24
1948	.49	.49	.55	.63	.73	1.10	3.43	4.60	6.08	11.73	14.24
1949	.32	.33	.35	.39	.47	.69	.99	1.27	1.58	2.41	12.75
1950	1.10	1.10	1.10	1.10	1.14	1.53	1.92	1.98	2.12	2.48	12.25
1951	.66	.68	.70	.76	.91	1.35	6.47	7.92	8.56	8.31	11.44
1952	.69	.78	.92	1.03	1.34	2.48	4.49	6.25	6.45	6.40	12.60
1953	.40	.44	.46	.73	1.06	8.24	6.66	9.65	16.34	18.05	37.05
1954	2.30	2.40	2.81	3.81	4.38	6.14	6.79	7.26	9.16	14.16	26.63
1955	.87	.88	.90	.97	1.18	1.81	3.26	3.52	5.11	6.26	9.14
1956	.73	.75	.77	.91	1.20	1.47	2.72	2.86	3.01	3.10	4.10
1957	1.90	2.00	2.27	2.42	2.58	2.72	3.46	3.98	10.52	15.02	21.87
1958	1.90	1.97	2.19	2.63	3.34	7.54	18.32	36.69	40.76	47.27	45.97
1959	1.70	1.70	1.86	2.27	3.76	5.37	6.52	7.50	8.40	12.07	22.63
1960	1.50	1.53	1.70	2.19	2.47	5.55	7.84	18.85	22.29	20.56	23.31
1961	1.30	1.30	1.34	1.55	1.80	2.58	3.73	5.99	12.57	12.94	16.41
1962	1.40	1.43	1.50	1.52	1.61	1.70	1.92	2.16	2.10	2.32	4.94
1963	1.40	1.47	1.51	1.57	1.85	2.54	7.81	9.94	21.15	20.02	21.44
1964	1.10	1.10	1.21	1.41	1.90	4.71	6.45	12.90	22.20	26.65	25.08
1965	.73	.82	.95	1.02	1.11	1.81	3.79	5.58	7.21	9.83	10.84
1966	2.00	2.03	2.09	2.34	2.72	4.76	6.32	12.35	15.43	19.55	18.87
1967	.03	.04	.04	.06	.07	.32	1.22	2.83	3.41	3.47	6.45
1968	.32	.32	.63	.71	1.16	1.89	2.76	3.30	3.37	3.58	5.04
1969	2.40	2.47	2.57	2.81	3.19	3.90	7.98	16.91	15.54	17.19	18.38
1970	1.30	1.43	1.61	1.89	2.31	9.75	22.10	22.03	21.80	25.12	29.86
1971	.43	.43	.43	.46	.77	1.69	2.05	3.17	4.25	4.14	5.40
1972	2.40	2.53	2.69	3.04	4.95	10.76	12.14	13.00	15.22	15.77	25.73
1973	.07	.10	.59	2.03	2.30	2.68	6.43	9.14	13.08	17.09	15.33
1974	.01	.02	.03	.04	.11	.76	1.08	1.81	2.35	3.27	5.13
1975	.00	.00	.00	.02	.08	.19	.95	1.81	2.16	2.60	3.54
1976	.03	.05	.06	.07	.14	.92	1.61	2.26	2.80	3.16	10.59
1977	.11	.12	.32	.65	1.22	2.48	3.58	4.49	5.72	7.10	7.49
1978	1.50	1.73	1.91	2.21	2.69	6.87	8.69	14.40	20.28	23.49	24.31

TABLE NO. 9 D

02-2997.50 PHILLIPPI CREEK (EXTENDED) NR SARASOTA, FL.

BASED ON MANATEE R.

HIGH-FLOW SUMMARY

PHILLIPPI CREEK NR SARASOTA TRANSFERRED FROM MANATEE RIVER

HIGHEST MEAN DISCHARGE, IN CFS, FOR THE FOLLOWING NUMBER OF CONSECUTIVE DAYS IN YEAR ENDING SEP

YEAR	1	3	7	15	30	60	90	120	150	183	274
1940	216.00	189.67	150.14	103.53	62.10	60.60	49.81	41.73	33.72	28.74	25.16
1941	209.00	191.00	183.71	132.40	106.40	69.93	58.34	46.57	37.59	35.09	30.42
1942	373.00	312.33	170.57	117.87	74.63	41.39	36.36	33.05	30.69	28.48	23.73
1943	888.00	673.00	392.29	239.67	200.57	168.32	136.09	106.98	86.04	70.86	49.37
1944	421.00	340.67	182.00	97.80	70.47	54.34	43.16	36.62	31.00	25.94	19.89
1945	651.00	485.67	348.57	248.13	182.53	160.77	145.54	112.08	89.74	73.67	50.45
1946	336.00	265.33	237.43	192.80	150.47	134.98	107.63	82.03	66.24	54.53	38.59
1947	940.00	714.00	480.43	296.93	211.17	150.87	132.00	115.40	93.21	78.91	61.63
1948	561.00	491.67	326.00	210.93	150.33	137.65	114.12	85.95	69.02	57.94	45.38
1949	613.00	470.00	241.86	221.73	187.27	129.73	96.38	75.83	60.76	50.03	34.29
1950	371.00	323.67	224.14	127.07	81.73	58.95	46.93	36.88	29.85	24.76	17.40
1951	371.00	300.00	185.57	119.25	75.52	61.24	59.02	44.56	35.94	33.77	24.92
1952	535.00	307.67	181.00	94.60	74.90	66.17	50.24	39.84	32.51	27.13	21.13
1953	603.00	499.33	310.00	220.13	178.77	145.62	109.07	89.85	72.11	61.68	50.24
1954	456.00	388.00	208.14	139.87	87.97	63.85	50.38	46.55	38.96	33.14	26.04
1955	210.00	198.33	148.57	102.00	89.57	75.38	54.15	41.59	33.72	28.34	21.98
1956	304.00	258.67	159.71	108.53	85.10	54.62	39.54	30.28	25.27	21.39	15.41
1957	403.00	345.67	271.43	179.20	154.03	98.88	80.59	70.78	61.43	55.84	43.81
1958	421.00	365.67	244.57	137.33	113.90	90.60	84.53	76.55	63.97	57.75	46.19
1959	797.00	598.67	362.00	271.07	209.40	170.53	148.66	135.44	112.49	100.15	80.10
1960	1264.00	941.33	611.29	348.40	224.03	200.33	160.64	126.35	101.72	85.17	68.06
1961	298.00	253.00	187.43	158.13	101.70	57.62	43.90	33.84	27.56	24.18	23.17
1962	1361.00	796.67	444.14	242.87	184.23	147.83	109.93	93.46	75.33	63.87	44.06
1963	461.00	361.33	304.00	175.57	103.36	81.99	83.40	71.52	59.04	48.86	44.79
1964	190.00	168.67	119.57	85.40	65.77	55.92	47.26	42.11	39.42	34.13	29.11
1965	594.00	451.33	325.00	274.47	200.80	126.08	96.80	78.59	63.12	53.16	40.53
1966	162.00	140.00	124.29	96.67	65.80	46.38	34.64	27.91	26.50	26.07	23.69
1967	450.00	386.33	234.29	164.53	130.43	106.08	82.86	64.23	51.40	42.27	30.10
1968	306.00	260.00	234.00	178.93	141.70	92.85	74.15	62.19	50.23	41.49	29.14
1969	354.00	255.33	167.71	109.80	73.17	71.18	52.48	43.31	35.31	31.44	31.02
1970	364.00	274.33	178.57	99.47	68.80	41.61	40.38	36.07	32.66	33.72	29.80
1971	370.00	298.33	209.00	129.73	82.80	73.60	55.49	43.64	35.36	29.24	21.57
1972	433.00	290.67	268.29	193.07	117.53	61.79	54.22	44.91	37.89	33.69	28.54
1973	335.00	195.33	143.86	99.53	69.50	51.13	42.30	32.29	26.41	25.69	26.00
1974	335.00	240.67	207.14	147.07	108.63	80.48	57.83	44.74	35.98	29.60	21.35
1975	306.00	256.33	168.00	132.20	110.90	83.82	72.29	62.91	50.73	41.62	28.93
1976	519.00	316.00	228.57	133.07	93.67	79.45	69.06	55.29	44.65	36.76	25.84
1977	292.00	235.33	165.57	108.00	98.17	70.26	53.31	41.62	34.08	28.20	22.24
1978	375.00	272.67	169.57	140.07	94.80	61.17	46.61	39.86	34.12	33.43	33.92

INDEX TO APPENDIX C

Surface-Water Diversion

Tables No.	13A	13D
	13B	13E
	13C	13F

The above tables show water available for use from off-channel reservoir with varied figures for storage, allowable diversion, diversion pump capacity, and use.

The reservoir storage capacity is listed in CFS-Days. CFS-Day is the volumn of water that would flow in one day at 1 cubic foot per second, and is equal to 86,400 cubic feet or 1,98 acre feet.

TABLE NO. 13 WATER AVAILABLE FOR USE FROM OFF-CHANNEL RESERVOIR WITH VARIED FIGURES FOR STORAGE, ALLOWABLE DIVERSION, DIVERSION PUMP CAPACITY, AND USE:

13A Reservoir Storage Capacity, 500 CFS-Days

DEMAND RATE	10 CFS			20 CFS			50 CFS		
Diversion Pump Capacity in CFS *	Allowable Diversion * 10%	30%	50%	Allowable Diversion * 10%	30%	50%	Allowable Diversion * 10%	30%	50%
50	7.75	8.76	9.19	12.1	15.0	16.0	19.5	28.7	32.2
100	7.75	8.76	9.19	12.1	15.0	16.0	19.8	28.9	32.4
200	7.75	8.76	9.19	12.1	15.0	16.0	19.8	28.9	32.4
500	7.75	8.76	9.19	12.1	15.0	16.0	19.8	28.9	32.4

13B Reservoir Storage Capacity, 1,000 CFS-Days

DEMAND RATE	10 CFS			20 CFS			50 CFS		
Diversion Pump Capacity in CFS *	Allowable Diversion * 10%	30%	50%	Allowable Diversion * 10%	30%	50%	Allowable Diversion * 10%	30%	50%
50	8.67	9.40	9.71	13.7	16.2	17.2	20.3	30.5	34.0
100	8.67	9.40	9.71	13.7	16.2	17.2	21.2	30.8	34.3
200	8.67	9.40	9.71	13.7	16.2	17.2	21.2	30.8	34.3
500	8.67	9.40	9.71	13.7	16.2	17.2	21.2	30.8	34.3

* For this preliminary analysis the allowable diversion in percent of flow is considered the same for all three streams (Cow Pen Slough, Phillippi Creek and Myakka River). Also for this preliminary analysis the pump capacity to be installed at all three streams will be the same.

TABLE NO. 13 (Continued). WATER AVAILABLE FOR USE FROM OFF-CHANNEL RESERVOIR WITH VARIED FIGURES FOR STORAGE, ALLOWABLE DIVERSION, DIVERSION PUMP CAPACITY, AND USE:

13C Reservoir Storage Capacity, 2,000 CFS-Days

DEMAND RATE	10 CFS			20 CFS			50 CFS		
Diversion Pump Capacity in CFS *	Allowable Diversion * 10%	30%	50%	Allowable Diversion * 10%	30%	50%	Allowable Diversion * 10%	30%	50%
50	9.75	10.0	10.0	15.7	17.9	18.6	21.7	33.2	36.9
100	9.75	10.0	10.0	15.8	17.9	18.6	22.9	34.0	37.3
200	9.75	10.0	10.0	15.8	17.9	18.6	23.3	34.1	37.4
500	9.75	10.0	10.0	15.8	17.9	18.6	23.3	34.1	37.4

13D Reservoir Storage Capacity, 5,000 CFS-Days

DEMAND RATE	10 CFS			20 CFS			50 CFS		
Diversion Pump Capacity in CFS *	Allowable Diversion * 10%	30%	50%	Allowable Diversion * 10%	30%	50%	Allowable Diversion * 10%	30%	50%
50	10.0	10.0	10.0	18.7	20.0	20.0	22.4	37.5	42.1
100	10.0	10.0	10.0	19.1	20.0	20.0	26.2	40.4	43.3
200	10.0	10.0	10.0	19.3	20.0	20.0	27.0	40.7	43.3
500	10.0	10.0	10.0	19.3	20.0	20.0	27.1	40.7	43.3

* For this preliminary analysis the allowable diversion in percent of flow is considered the same for all three streams (Cow Pen Slough, Phillippi Creek, and Myakka River). Also for this preliminary analysis the pump capacity to be installed at all three streams will be the same.

TABLE NO. 13 (Continued). WATER AVAILABLE FOR USE FROM OFF-CHANNEL RESERVOIR WITH VARIED FIGURES FOR STORAGE, ALLOWABLE DIVERSION, DIVERSION PUMP CAPACITY, AND USE:

13E Reservoir Storage Capacity, 10,000 CFS-Days

DEMAND RATE	10 CFS			20 CFS			50 CFS		
Diversion Pump Capacity in CFS *	Allowable Diversion * 10%	30%	50%	Allowable Diversion * 10%	30%	50%	Allowable Diversion * 10%	30%	50%
50	10.0	10.0	10.0	19.9	20.0	20.0	22.4	39.4	45.9
100	10.0	10.0	10.0	20.0	20.0	20.0	27.9	46.0	48.6
200	10.0	10.0	10.0	20.0	20.0	20.0	30.3	47.1	48.7
500	10.0	10.0	10.0	20.0	20.0	20.0	30.8	47.4	48.7

13F Reservoir Storage Capacity, 15,000 CFS-Days

DEMAND RATE	10 CFS			20 CFS			50 CFS		
Diversion Pump Capacity in CFS *	Allowable Diversion * 10%	30%	50%	Allowable Diversion * 10%	30%	50%	Allowable Diversion * 10%	30%	50%
50	10.0	10.0	10.0	19.9	20.0	20.0	22.4	39.7	47.3
100	10.0	10.0	10.0	20.0	20.0	20.0	27.9	48.5	49.8
200	10.0	10.0	10.0	20.0	20.0	20.0	31.2	49.3	49.8
500	10.0	10.0	10.0	20.0	20.0	20.0	32.0	49.5	49.8

* For this preliminary analysis the allowable diversion in percent of flow is considered the same for all three streams (Cow Pen Slough, Phillippi Creek, and Myakka River). Also for this preliminary analysis the pump capacity to be installed at all three streams will be the same.