PD-AAM-493

SAIGON
WATER DISTRIBUTION PROJECT

CONTRACT NO. AID/vn-36

MONTHLY REPORT

NUMBER 13

JUNE 30, 1971

FOR

UNITED STATES
AGENCY FOR INTERNATIONAL DEVELOPMENT
AND
SAIGON METROPOLITAN WATER OFFICE
MINISTRY OF PUBLIC WORKS
REPUBLIC OF VIETNAM

M&E METCALF & EDDY, INC. | ENGINEERS

MONTHLY REPORT
NUMBER 13
JUNE 30 1971

SAIGON WATER DISTRIBUTION PROJECT

SAIGON VIETNAM

AID - VN - 86

SUBMITTED BY:

METCALF & EDDY
ENGINEERS
45 NGUYEN KHAC NHU
SAIGON VIETNAM

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July 13, 1971

United States Agency for
International Development
Mission to Vietnam

Saigon Metropolitan Water Office
Ministry of Public Works
Republic of Vietnam

SUBJECT: Monthly Report for June, 1971
Contract AID/VN-86.

Gentlemen:

In June the hydraulic measurement program was completed. The Pitometer Associate's work was concluded during the reporting period also. SMWO, however, is developing a field crew for what is hoped to be a continuous leakage survey.

During the month Mr. R. D. Howard reported from Boston and, with the help of two able, new Vietnamese staff members, began the data collection and analysis necessary for forecasting future revenues and expenses. The cooperation of the Accounting Office at the SMWO has been outstanding and gratifying.

The field work, with the conclusion of the testing and measurement programs, is now concentrating on inventory and inspection of system components. It is anticipated that by the end of July they will have completed most of the inventory and will be checking and retesting to confirm or modify data and results of the computerized distribution system out put.

Respectfully Submitted,

WILLIAM A. CHENEY
ACTING PROJECT MANAGER

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SECTION I

PROJECT DESCRIPTION

The objectives of the Saigon Water Distribution Project are as follows:

1. Examine the existing system to determine its physical condition and the extent it can meet current and foreseeable future demands.

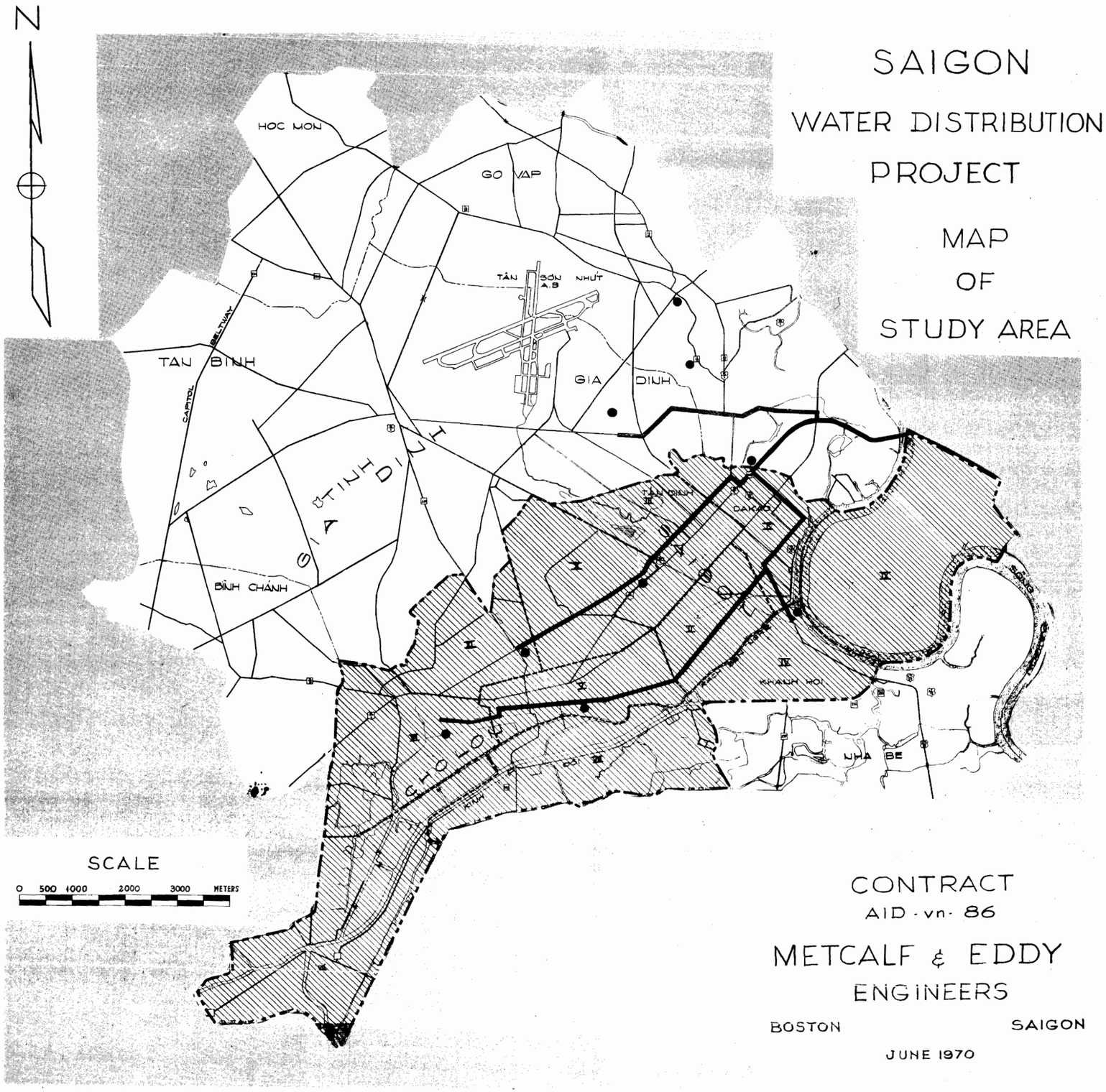
2. Determine improvements or modifications to the existing system that should be made to upgrade the system to meet surrent or immediately foreseeable distribution demands.

3. Prepare a program for expansion of the Saigon metropolitan area water distribution system within the study area (Figure 1.) The program for expansion shall be keyed to implementation by increments that can be related to project time periods, GVN financial capacity, and engineering and constructions considerations.

The major deficiencies in the existing network would be identified and a program of remedial action would be undertaken through a survey and inventory of the existing system, supplemented by a program of hydraulic measurement. The distribution network would then be analysed and recommendations made for an immediate program to achieve the greatest possible improvement with a relatively limited program of reinforcements and inter-connections.

The system would also be studied for determination of an improved system of primary and secondary mains to provide adequate distribution throughout the present water service area. A phased construction program would be recommended that would be related to increments of time and which would recognize the ulimate demands within the existing water service area.

FIGURE 1



SAIGON
WATER DISTRIBUTION PROJECT
MAP OF STUDY AREA

CONTRACT
AID - vn - 86

METCALF & EDDY
ENGINEERS

BOSTON SAIGON

JUNE 1970

SECTION II

PROJECT HISTORY

The Thu Duc water treatment plant began operations in June 1966. Pressure mains were completed in 1967 which were able to transport water to all of the metropolitan system in Gia Dinh and Saigon-Cholon.

By September of 1967 water production reached the capacity of the existing transmission system. Since that time expansion of the system has been undertaken only as pipe stock, connections and other supplies and materials became available. It readily became apparent that a hydraulic survey and investigation of the system were needed together with a plan for the replacement, reinforcement, and further expansion of the system.

Following discussions among personnel of the SMWO, USAID and AID/W, a scope of work was developed as a basis for discussion with interested consultants. The chronological order of events following the initial advertisement in the Commerce Business Daily for statements of interest by consultants in the summer of 1969 was as follows:

October 6, 1969	- Metcalf & Eddy, Inc. selected for negotiation.
April 15, 1970	- Effective date of contract.
May 15, 1970	- Personnel approved.
May 30, 1970	- Engineer's advance party arrived in Saigon to begin work.
October 20, 1970	- Meeting with Chief of City Public Works Office, the City Police, USAID and SMWO at the SMWO Office to discuss work during curfew hours.
December 2, 1970	- Presentation of test procedures and work review with SMWO.
January 15, 1971	- Tenth anniversary celebration of the Saigon Metropolitan Water Office.

March 31, 1971 - Special Presentation of Procedures & Project Objectives to the Minister of Public Works and his staff.

SECTION III

PROGRESS, ENGINEERING

The major work load shifted to Boston in June. This is evidenced by a look at Fig. 1 and the work accomplished under F & G, the hydraulic analysis and the system planning respectively.

As further evidence is the description under D below of the work accomplsihed in computer programming for water use by phuong, projected water use by phuong and projected node water flows. Tables 1-3 show samples of the computer print-outs or results of these analyses. Again, the examples are intended as samples of some of the analyses possible using the sophisticated computer capabilities of the Metcalf & Eddy team in Boston.

Under section F is a description of another computerized effort which indicates that the distribution system has been simulated accurately. Those discrepancies which preliminary analysis appear to require verification are being checked out in the field, or with appropriate personnel from the Saigon Metropolitan Water Office.

To assist in the work in Boston are Mssrs. Diep and Toan of the SMWO who arrived in Boston during the reporting period and whose presence there for about a month's time will be an invaluable aid in discussions regarding the validity of the computer results. Though it is appreciated that their role is primarily as observers they will be active participants in that part of the work being done with which they have been intimately associated in Saigon for the SMWO.

In Saigon, the principal effort during the reporting period was in field verification of system piping hydrants and public fountains. Most notable perhaps was a survey of residential or public water sources in selected areas on the periphery of the distribution system, which produced data which will be helpful in anticipating residential needs. A compilation of data and a discussion of these findings will appear in the report for July and should be quite provocative as some data on controversial aspects of the system should be helpful in determining future plans.

June to supplement those taken earlier. Unfortunately, the age of pipe which was in question was not matched by the tests. The low readings led to questions of the validity of the recorded pipe ages and it developed that the year of installation proved to be earlier than our records showed. Though it might be called negative information it is verification and proves the validity of the tests if not the written record.

Pressure Survey Pressure recordings were taken in about 50 additional locations to complete information on the system. Additional recordings will be asked for as the system analysis progresses but the programmed recordings are now complete.

D. Planning Study

Land Use. It should be noted that DGRUP (Directorate General for Reconstruction and Urban Planning) under a new contract, has begun current land use mapping of Gia Dinh Provence. The work has started in Go Vap District to be followed by Tan Binh. The completion of these two areas first to the north of Saigon will be helpful in checking the immediate and short range programs for improvements and extensions.

Water Use. The computer program on water use by phuong written in May to handle data on 1970 water use has been amended to provide a more easily understood printout tabulation. For example, the water use data has been changed to give liters per person per day rather than liters per second per 1,000 persons. A sample of the revised format of the 1970 water use by phuong is shown in Table 1. Examination of the May results raised questions as to the accuracy of some of the input data. Many of these questions have now been resolved and the revised results obtained in time for the first computer runs of the entire primary distribution system.

A modification to the 1970 take-off calculation program, in conjunction with an analysis of water use records and projection on 1980 water use by phuong enabled a rapid calculation of the take-offs for the 1980 distribution system analysis.

A sample of the 1980 water use by phuong calculations is shown in Table 2, and an associated 1980 node take-off calculation sheet is shown in Table 3.

Utilizing the basic flow distribution data calculated for 1970 and 1980, a further program has been used to generate take-offs for the various flow situations to be analyzed in each year. An investigation of discrepancies discovered in data relating to unaccounted

for water indicates that initial findings underestimated the magnitude of the losses. The revised unaccounted for water factor has been use in the most recent take-off calculations.

E. Financial Program.

The principal objective of the financial study is the development of a simplified balance sheet and income statement for 1968, 1969 and 1970. An analysis would then be made of each account to form a basis for projections. Pro-forma statements (income, cash flow and balance sheet) would then be developed for a future period.

To assist us in reaching these objectives we intended to engage the services of SGV-Thuan, an accounting firm with offices on Nguyen Thong. However, the subcontract for such services was not approved by USAID.

Work was initiated with our own staff and the preparation of the simplified historical statements is well under way but considerably behind schedule. The biggest single obstacle is that a very large part of the accounting records are in Vietnamese.

The cooperation and assistance of Mr. Nguyen Dang Minh, Chief Accountant of SMWO, and his staff has been outstanding and is greatly appreciated and hereby acknowledged.

F. Hydraulic Analysis

Model Verification. The first computer runs of the primary distribution system have been made. The computer results have been compared with field test data. A preliminary assessment suggests that both the distribution of flow as measured by the trunk main survey and the hydraulic grade elevations obtained during flow tests are simulated by the computer. Where significant differences were found between field results and computer results an investigation of the causes has been initated in order that the computer model will simulate the operation of the existing distribution system as closely as possible.

During the month additional and revised data have been received on the pipes in the system and the resulting additions and changes made to the computer input data.

G. System Planning

Immediate Program. Collection of data for an evaluation of the relative cost and effectiveness of French flush type hydrants

vs. U. S. post type hydrants is complete. This subject will be discussed in detail with those in Saigon.

Long-Range Study. Based on present water use trends and population projections developed by James E. Bogle, future water use was projected for 1980 and through year 2000 for both the high population growth rate and the low restricted population grwoth rate. On this basis, studies were initiated to determine:

1. Cost of staged supply works.

2. Cost of staged construction of major transmission mains.

3. Cost of corresponding staged distribution system development.

Based on these studies, costs will be estimated for the various stages of development for each of the above growth rates, which will provide a basis for estimateing unit costs for area developments and indicate when major increments of the supply and transmission system will be needed.

H. Report

A first draft has been prepared of the chapter dealing with historical water use records and their use in conjunction with other applicable factors, to predict future water use.

The organization chart for the SMWO is shown as Fig. 6. This chart, which shows the full range of the activity of Saigon Thuy Cuc, is included to give those not in Saigon a better idea of the structure and comprehensiveness of the organization. This chart, with amendments or corrections and with the approval of the Director's Office, will appear in the final project report.

* *
*

A final comment under "Progress, Engineering" is to point out the potential value of the visit to Boston by Mssrs. Diep and Toan. They are following the results of the initial computer analysis having had briefings on the general operation and instructions in computer technology. In addition, their involvement will make a much more meaningful report for those who have stayed at home on both sides of the world. For the report to be effective, it must be used and up dated with the years. It is our hope that the closer ties

such visits inevitably produce will result in gains and advanteges for all concerned. Last, but not least, it is nice to have a chance to return the hospitality that has been extended to the Americans on the staff in Saigon as well as those who have visited Vietnam in the course of the work.

* *
*

FIGURE 2

PROJECT SCHEDULE & TIME DISTRIBUTION AID/VN - 86

	% TOT. EFFORT	% COMP.	% JOB COMP.
SCHEDULED COMPLETION			
ACTUAL COMPLETION			
A			
MAPPING	21.0	83	17.5
1. SYSTEM MAPS (1:15,000)	1.5	100	1.5
2. SYSTEM WORKING MAPS	8.5	100	8.5
3. PLANNING MAPS	1.5	100	1.5
4. FINAL SYSTEM MAPS	4.0	30	1.2
5. FINAL PLANNING MAPS	1.0	100	1.0
6. SMWO SYS. MAP CORRECTIONS	4.5	85	3.8
B			
SYSTEM INVENTORY	11.0	83	9.1
1. VALVES	3.0	70	2.1
2. HYDRANTS	3.0	75	2.2
3. PIPING	4.0	95	3.8
4. CORROSION EFFECTS	1.0	100	1.0
C			
HYDRAULIC MEAS.	20.0	100	20.0
1. PIPE CONDITION TESTS	5.0	100	5.0
2. FLOW TESTS	5.0	100	5.0
3. PRESSURE SURVEY	1.0	100	1.0
4. GEOPHONE SURVEY	5.0	100	5.0
5. TRUNK MAIN SURVEY	2.0	100	2.0
6. DISTRICT MEASUREMENT	2.0	100	2.0
D			
PLANNING STUDY	7.0	96	6.7
1. DEMOGRAPHY	2.5	100	2.5
2. LAND USE	1.5	100	1.5
3. WATER USE	3.0	90	2.7
E			
FINANCIAL PROGRAM	3.0	10	0.3
F			
HYDRAULIC ANALYSIS	15.0	63	9.5
1. MODEL VERIFICATION	6.0	90	5.4
2. IMMEDIATE PROGRAM	5.0	50	2.5
3. LONG RANGE PROGRAM	4.0	40	1.6
G			
SYSTEM PLANNING	15.0	55	8.3
1. IMMEDIATE PROGRAM	4.0	40	1.6
2. DEVELOPMENT MODULE	4.0	90	3.6
3. COST ESTIMATES	2.0	30	0.6
4. LONG RANGE PROGRAM	5.0	50	2.5
H			
REPORT	8.0	5	0.6
1. TEXT	4.0	15	0.6
2. GRAPHICS	2.0	0	
3. CLIENT REVIEW			
4. REVISIONS & FINAL REPRODUCTION	2.0		
	100		72.9

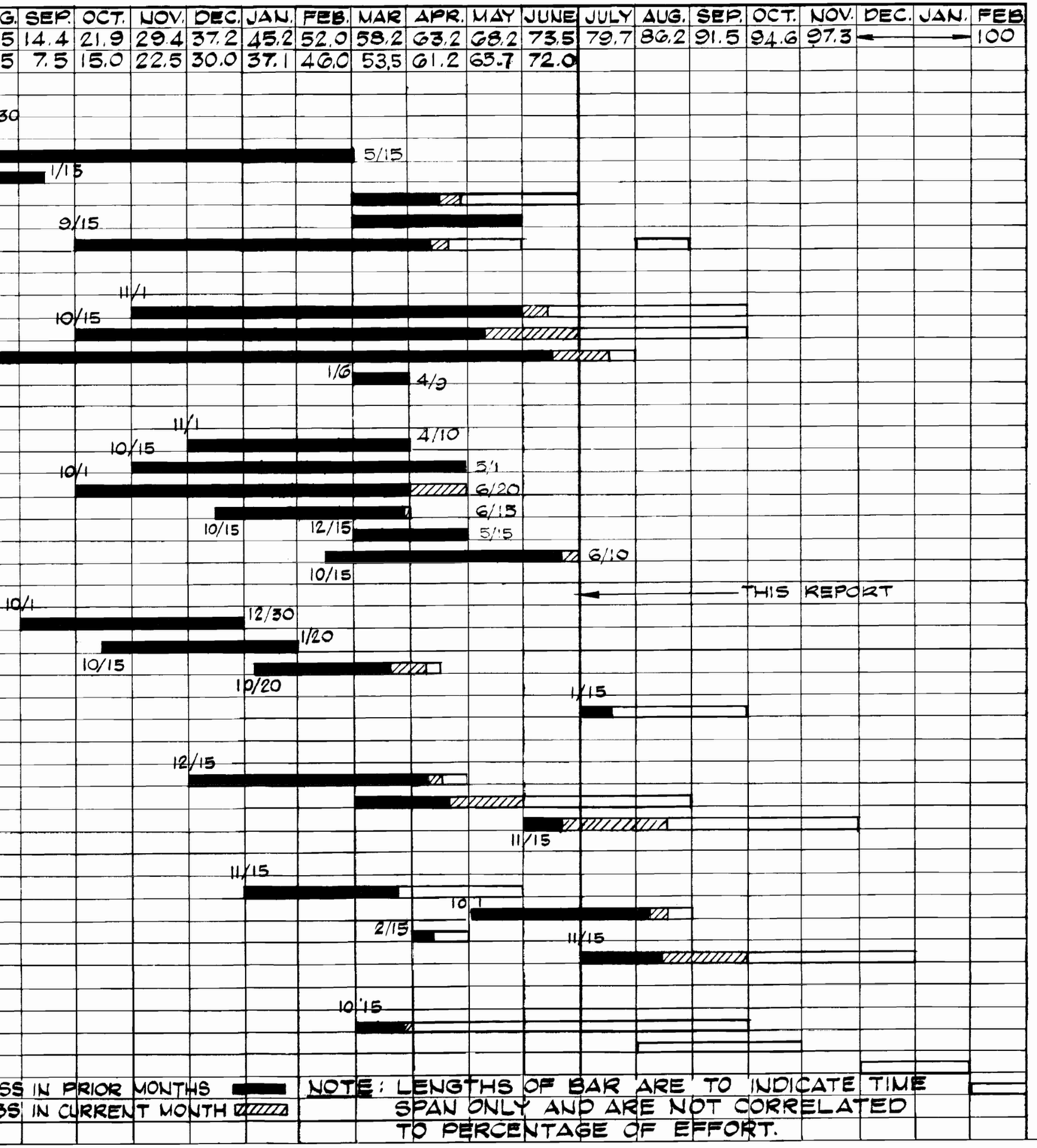
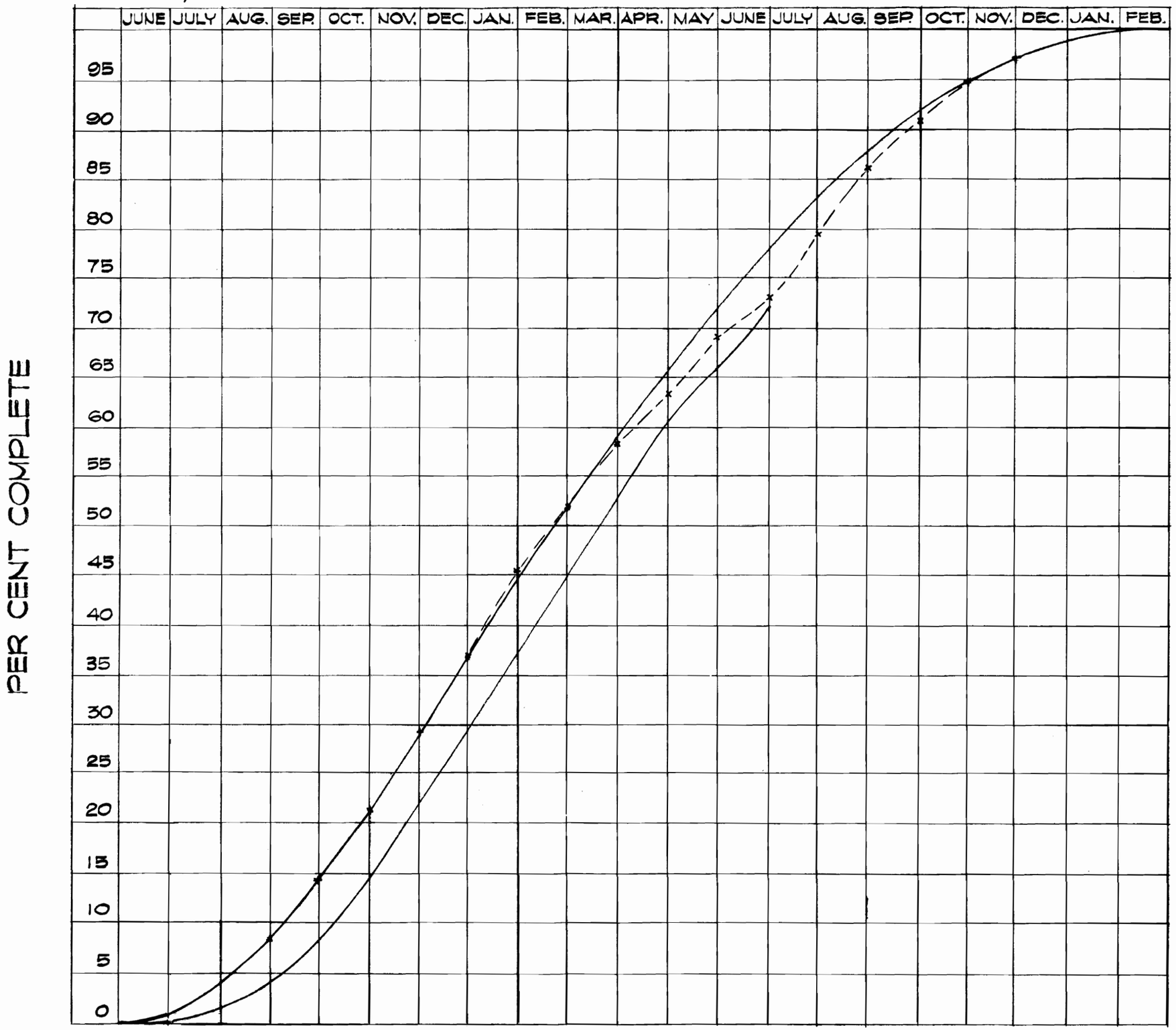


FIGURE 3

FORECAST/ PROGRESS CHART AID/ VN-86



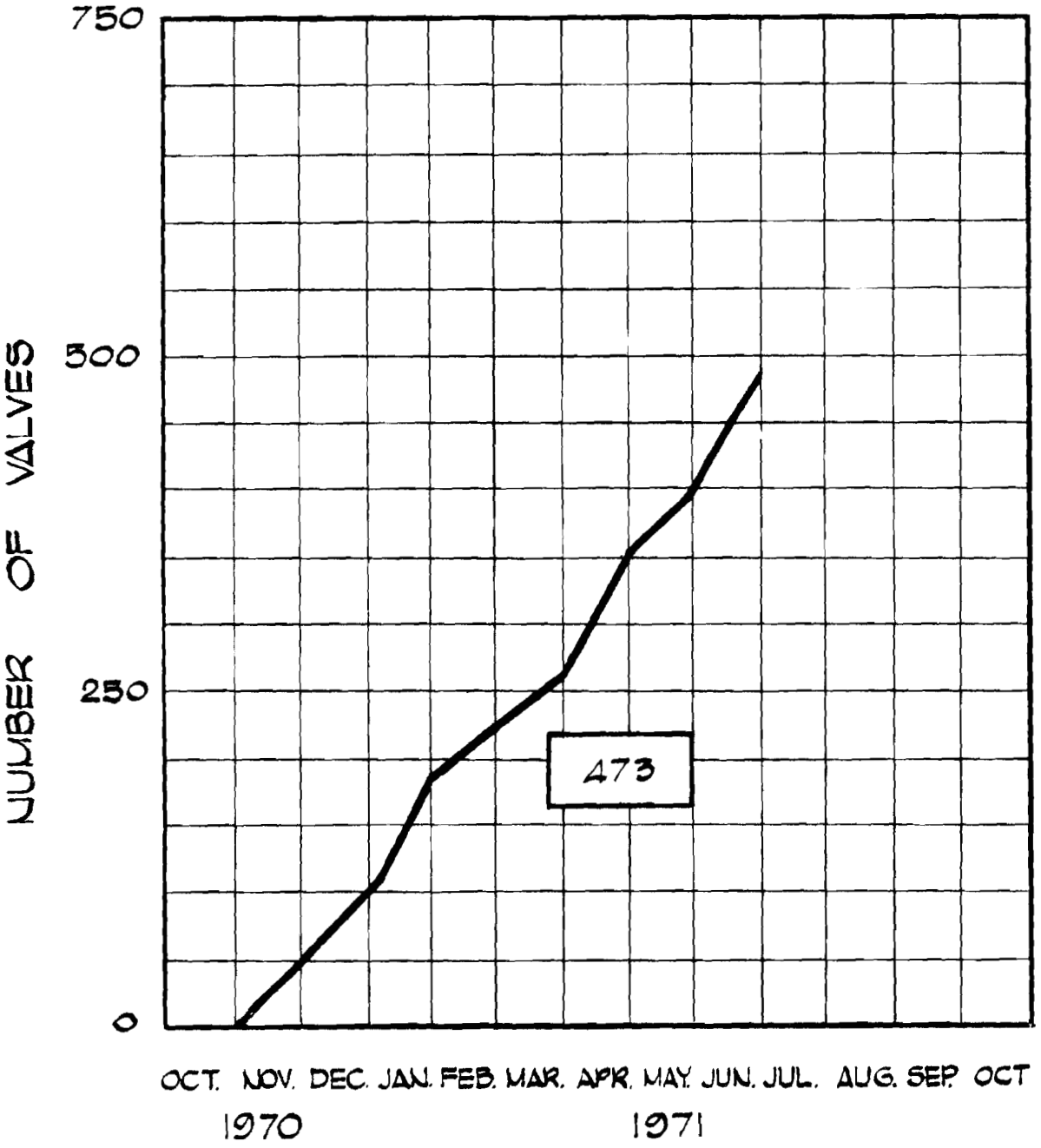


FIG. 4 NUMBER OF VALVES INSPECTED IN SAIGON CHOLON AND GIADINH PROVINCE

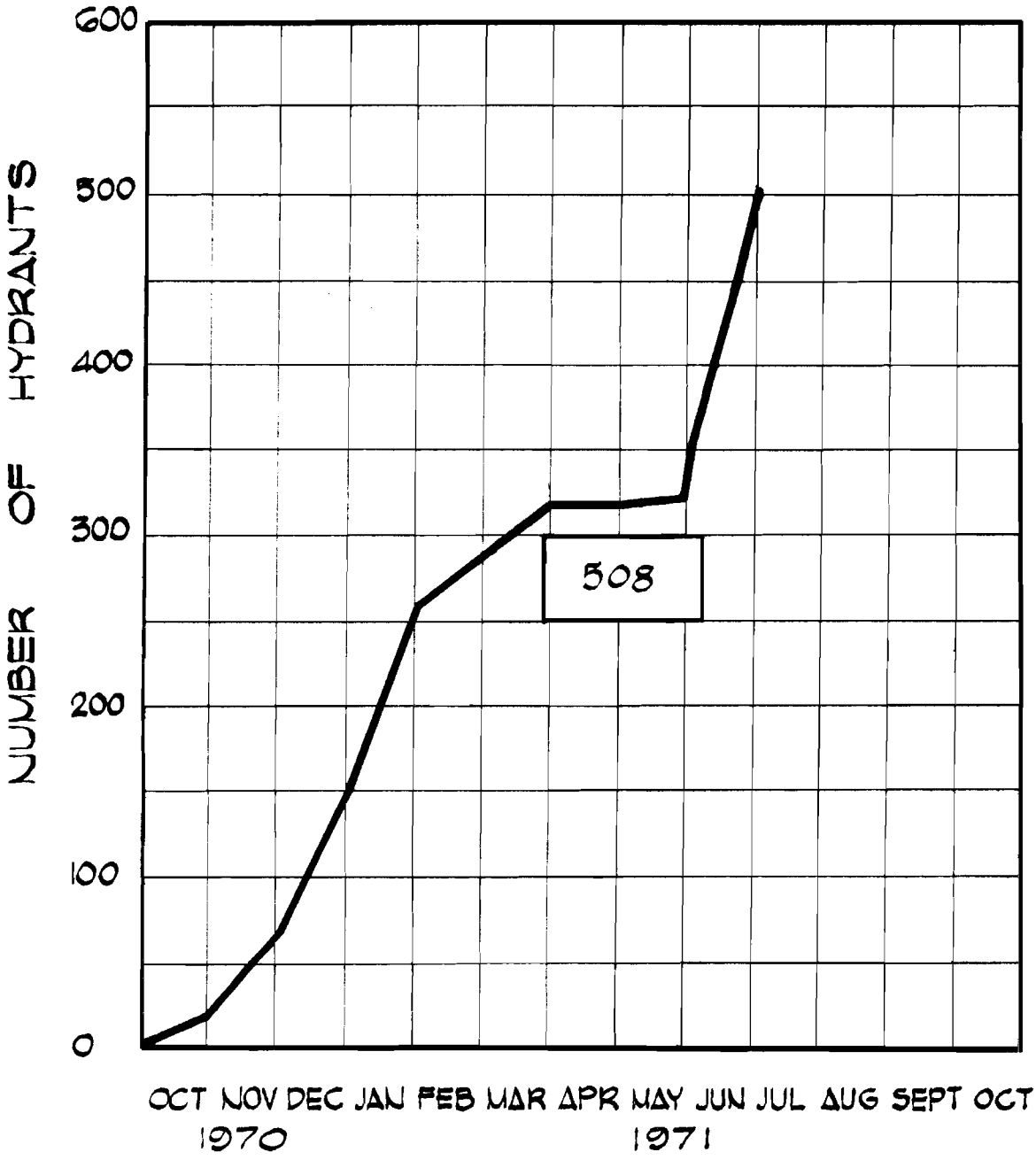


FIG. 5 NUMBER OF HYDRANTS INSPECTED

FIGURE 6

SAIGON METROPOLITAN WATER OFFICE
ORGANIZATION CHART

BOARD OF DIRECTORS APPROVES : GENERAL POLICY, ADMINISTRATIVE, FINANCIAL AND PERSONNEL REGULATION; ANNUAL BUDGET, PERSONNEL SALARIES & FAMILY ALLOWANCE SCALES; EXTENSION PROGRAM, IMPORTANT CONTRACTS, BALANCE SHEET, LOANS.

CHAIRMAN : MINISTER OF PUBLIC WORKS

MEMBERS : MINISTER OF FINANCE OR REPRESENTATIVE
MINISTER OF INTERIOR OR REPRESENTATIVE
MINISTER OF HEALTH OR REPRESENTATIVE
DIRECTOR GENERAL OF PLANNING OR REPRESENTATIVE
DIRECTOR GENERAL OF BUDGET OR REPRESENTATIVE
MAYOR OF SAIGON OR REPRESENTATIVE
TWO COUNCILORS FROM THE SAIGON CITY COUNCIL
DIRECTOR OF RURAL WATER SUPPLY.

MINISTER OF PUBLIC WORKS (SUPERVISION & CONTROL)

NATIONAL UTILITIES COMMITTEE (RATE CONTROLS & POLICY)

DIRECTOR SAIGON METROPOLITAN WATER OFFICE

ASST DIRECTOR FOR MANAGEMENT

ASST DIRECTOR FOR ENGINEERING

SECRETARY'S OFFICE & PUBLIC RELATIONS

GENERAL AUDITOR TECHNICAL INSPECTOR

- MANAGEMENT DIVISION
  - MANAGEMENT SECT. ADMINISTRATION LEGAL BRANCH REAL ESTATE
  - PERSONNEL SECTION
  - SALARIES SECTION
- COMMERCIAL DIVISION
  - BUSINESS COORDINATION SECTION (3)
  - OPERATION SECTION (1)
  - CUSTOMERS SECTION (2)
- ACCOUNTING DIVISION
  - BUDGET SECTION
  - COST ACCOUNTING SECTION
  - GENERAL ACCOUNTING SECTION
  - CENTRAL CASHIER
- I.B.M. SECTION
- SUPPLY DIVISION
  - MATERIAL'S ACCOUNTING SECTION
  - WAREHOUSE SECTION
  - PURCHASING SECTION
- PLANNING & ENGINEERING DIVISION
  - PLANNING & RESEARCH SECTION
  - ENGINEERING SECTION
- CONSTRUCTION DIVISION
  - NEW CONSTRUCTION SECTION (6)
  - MAINTENANCE SECTION (7)
  - SHOPS
- PRODUCTION DIVISION
  - DONG NAI WATER SYSTEM OPERATIONS SECTION
  - WELL'S OPERATION & MAINTENANCE SECTION
  - DONG NAI WATER SYSTEM MAINTENANCE SECTION

- SAIGON DISTRICT
  - COMMERCIAL SECTION (4)
  - CONSTRUCTION SECTION (5)
  - DISTRICT CASHIER
- CHOLON DISTRICT
  - COMMERCIAL SECTION (4)
  - CONSTRUCTION SECTION (5)
  - DISTRICT CASHIER
- GIA-DINH DISTRICT
  - COMMERCIAL SECTION (4)
  - CONSTRUCTION SECTION (5)
  - DISTRICT CASHIER

(1) CONTROL & FILING OF ALL CONNECTION CONTRACTS SIGNED BETWEEN CUSTOMERS & DISTRICT. CUSTOMERS ACCOUNTING. DISTRIBUTION OF BILLS TO DISTRICTS.
CONTROL OVER DISTRICTS ON COLLECTION OF WATER BILLS (PRIVATE)
COLLECTION OF WATER BILLS, (GOVERNMENT AGENCIES, COMPANIES AND PRIVATE BILLS IN ARREARS)

(2) CONTROL OF READINGS BEFORE SENDING THEM TO I.B.M. SECTION FOR BILLING. CLAIMS INVESTIGATIONS (2 ND LEVEL).
CONTROL ON EXECUTION OF CONTRACTS BETWEEN CUSTOMERS AND S.M.W.O.

(3) RESEARCH ON POLICY, STATISTICS & RATE STUDIES.

(4) MAKES ESTIMATE ON CONNECTION INSTALLATION CHARGES; PROPOSE AND SIGN CONTRACTS WITH CUSTOMERS FOR SUPPLYING WATER; READING, AND COLLECTION OF BILLS.
CLAIMS INVESTIGATIONS (1 ST LEVEL)

(5) PREPARE DRAWINGS FOR CONNECTION & INSTALLATION. INSTALL CONNECTIONS AND MAIN PIPES NECESSARY FOR CONNECTION. INSPECTION OR CONTROL OF WORKS DONE BY CONTRACTORS.
MAINTENANCE OF PIPES (LEAKS) AND CONNECTIONS, PUBLIC FOUNTAINS, FIRE-HYDRANTS (1 ST LEVEL)

(6) CONSTRUCTION OF MAINS, RESERVOIRS, ELEVATED TANKS, BUILDINGS, WELLS AND CONNECTIONS (SPECIAL CASES) (2 ND LEVEL)

(7) ROUTINE MAINTENANCE OF THE DISTRIBUTION SYSTEM & BUILDINGS RESERVOIRS, ELEVATED TANKS, VEHICLES AND WATER METERS.

PERSONNEL :

ENGINEERS	:	26
SUB ENGINEERS	:	25
ADMINISTRATION	:	60
ACCOUNTING	:	32
READERS	:	32
COLLECTORS	:	43
OTHERS	:	573
LABOR	:	195
TOTAL	:	986

1F

TABLE 1 U.S. A.I.D. SAIGON WATER REPORT
1970 WATER USE BY PHUONG

PRELIMINARY

30 JUN 1971

DIST	PHUONG	POP (1000)	P C POP SERV	LAND AREA	** TOTAL ** SERV (HA)	LPCD	******** RESIDENTIAL & COMMERCIAL ******** SERV (HA)	METERS (NO)	METER (LPS)	(LPS /HA)	LPCD	SERV	(CMD/ METER)	*** GOVERNMENT & MILITARY *** SERV (HA)	METERS (NO)	METER (LPS)	(LPS /HA)	(CMD/ METER)
1	1	25.1	95.0	105.0	102.3	557.99	53.9	989	66.0	1.22	227.2	239.1	5.77	48.4	269	96.1	1.99	30.87
1	2	9.2	95.0	97.0	92.9	500.56	13.7	437	8.1	0.59	76.1	80.1	1.60	79.2	150	45.2	0.57	26.04
1	3	32.1	90.0	88.0	83.0	187.07	42.1	1430	40.1	0.95	107.9	119.9	2.42	40.9	165	29.4	0.72	15.39
1	4	48.1	90.0	58.0	52.1	85.86	42.6	2268	45.0	1.06	80.8	89.8	1.71	9.5	35	2.8	0.29	6.91
2	1	14.3	90.0	35.0	34.5	286.99	26.9	753	27.0	1.00	163.1	181.3	3.10	7.6	105	20.5	2.68	16.87
2	2	33.6	85.0	43.0	42.7	101.06	29.8	915	30.9	1.04	79.5	93.5	2.92	12.9	38	8.4	0.65	19.10
2	3	22.4	80.0	23.0	22.9	77.53	18.5	958	18.2	0.98	70.2	87.7	1.64	4.4	14	1.9	0.43	11.73
2	4	54.8	80.0	63.0	56.0	152.30	46.7	2597	58.6	1.25	92.4	115.5	1.95	9.3	190	38.0	4.08	17.28
2	5	21.6	90.0	78.0	73.3	274.00	27.5	1522	32.9	1.19	131.6	146.2	1.87	45.8	61	35.6	0.78	50.42
2	6	13.3	85.0	15.0	14.5	145.52	11.6	725	16.4	1.41	106.5	125.3	1.95	2.9	5	6.0	2.07	103.68
2	7	25.7	85.0	35.0	35.0	121.36	21.6	1166	23.7	1.10	79.7	93.7	1.76	13.3	30	12.4	0.93	35.71
3	1	26.6	85.0	191.0	190.2	395.30	116.5	2785	57.5	0.49	186.8	219.7	1.78	73.7	479	64.2	0.87	11.58
3	2	55.1	90.0	54.0	52.0	69.15	44.6	1594	36.8	0.83	57.7	64.1	1.99	7.4	58	7.3	0.99	10.87
3	3	29.0	85.0	17.0	17.1	43.80	16.3	1404	14.4	0.88	42.9	50.5	0.89	0.9	5	0.3	0.35	5.18
3	4	34.9	90.0	31.0	30.8	67.59	27.6	1582	23.8	0.86	58.9	73.7	1.30	3.1	12	3.5	1.12	25.20
3	5	33.0	85.0	20.0	19.5	56.29	18.5	2471	21.5	1.16	56.3	66.2	0.75	1.0	3	0.0	0.0	0.0
3	6	46.7	85.0	34.0	32.5	69.01	30.3	1847	35.5	1.17	65.7	77.3	1.66	2.2	21	1.8	0.82	7.41
3	7	36.5	60.0	62.0	61.8	28.41	50.3	734	9.5	0.19	22.5	37.5	1.12	11.5	5	2.5	0.22	43.20
3	8	60.4	90.0	63.0	62.4	56.22	49.8	1686	38.9	0.78	55.6	61.8	1.99	12.6	3	0.4	0.03	11.52
4	1	32.4	70.0	28.0	27.7	34.13	26.8	731	12.8	0.48	34.1	48.8	1.51	0.9	1	0.0	0.0	0.0
4	2	44.4	55.0	114.0	101.9	35.42	46.0	711	11.1	0.24	21.6	39.3	1.35	55.9	7	7.1	0.13	87.63
4	3	39.6	50.0	37.0	37.0	25.31	31.5	919	11.0	0.35	24.0	48.0	1.03	5.5	5	0.6	0.11	10.37
4	4	41.9	85.0	85.0	81.6	48.87	55.2	382	20.2	0.37	41.7	49.0	4.57	26.4	20	3.5	0.13	15.12
4	5	43.3	85.0	71.0	70.5	77.62	24.8	1778	22.3	0.90	44.5	52.3	1.08	45.7	89	16.6	0.36	16.12
5	1	25.9	95.0	36.0	35.0	225.84	28.2	1243	52.5	1.86	175.1	184.4	3.65	6.7	86	15.2	2.25	15.27
5	2	36.3	90.0	44.0	43.8	134.24	39.3	1199	48.8	1.24	116.2	129.1	3.52	4.5	69	7.6	1.69	9.52
5	3	19.5	95.0	51.0	50.7	152.42	8.4	416	15.8	1.87	70.0	73.7	3.28	42.2	45	18.6	0.44	35.71
5	4	38.4	95.0	38.0	37.0	93.15	23.5	1214	37.1	1.58	83.5	87.9	2.64	13.6	16	4.3	0.32	23.22
5	5	42.3	90.0	81.0	80.3	117.24	52.3	1376	44.2	0.85	90.3	100.3	2.78	28.0	61	13.2	0.47	18.70
5	6	80.9	95.0	48.0	47.8	105.62	40.4	3347	57.6	1.43	61.5	64.8	1.49	7.4	95	41.3	5.58	37.56
5	7	35.4	70.0	124.0	123.4	146.68	66.5	1584	44.6	0.67	108.9	155.5	2.43	56.9	58	15.5	0.27	23.09
6	1	76.1	85.0	161.0	127.0	47.57	95.2	1859	35.5	0.37	40.3	47.4	1.65	31.8	39	6.4	0.20	14.18
6	2	67.2	90.0	225.0	106.5	52.59	86.4	1700	39.6	0.46	50.9	56.6	2.01	20.1	6	1.3	0.06	18.72
6	3	9.5	75.0	13.0	12.3	117.32	11.7	453	10.3	0.88	93.7	124.9	1.96	0.6	62	2.6	4.21	3.62
6	4	65.4	70.0	117.0	103.1	33.42	69.4	1424	25.0	0.36	33.0	47.2	1.52	33.6	4	0.3	0.01	6.48
7	1	3.7	1.0	319.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0
7	2	14.7	40.0	72.0	68.2	22.92	56.1	225	3.2	0.06	18.8	47.0	1.23	12.1	9	0.7	0.06	6.72
7	3	14.7	65.0	44.0	43.3	29.39	28.8	268	4.8	0.17	28.2	43.4	1.55	14.4	4	0.2	0.01	4.32
7	4	7.5	1.0	146.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0
7	5	2.1	1.0	208.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0
7	6	8.5	55.0	112.0	45.0	13.21	36.4	131	0.4	0.01	4.1	7.4	0.26	8.6	0	0.9	0.11	0.0
8	1	20.5	10.0	117.0	26.1	3.79	9.6	550	0.9	0.09	3.8	37.9	0.14	16.5	0	0.0	0.0	0.0
8	2	41.3	10.0	291.0	54.1	12.55	38.5	880	2.3	0.06	4.8	48.1	0.23	15.7	11	3.7	0.24	29.06
8	3	53.3	55.0	80.0	73.6	24.96	55.0	1055	14.6	0.27	23.7	43.0	1.20	18.6	6	0.8	0.04	11.52
8	4	41.1	40.0	135.0	43.3	22.70	30.7	652	9.7	0.32	20.4	51.0	1.29	12.6	5	1.1	0.09	19.01
8	5	54.4	85.0	70.0	68.4	54.32	52.3	1524	31.2	0.60	49.6	58.3	1.77	16.1	14	3.0	0.19	18.51
9	1	8.5	5.0	500.0	0.0	10.16	0.0	2	1.0	0.0	10.2	203.3	43.20	0.0	0	0.0	0.0	0.0
9	2	14.3	1.0	500.0	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0	0	0.0	0.0	0.0
10	1	53.9	85.0	256.0	51.8	116.86	46.6	2719	30.6	0.66	49.1	57.7	0.97	5.2	30	42.3	8.12	121.82

TABLE 2 U.S. A.I.D. SAIGON WATER REPORT
1980 WATER USE BY PHUONG

PRELIMINARY

17 JUN 1971

DIST	PHUONG	POP (1000)	P C POP SERV	LAND AREA	** TOTAL ** SERV (HA)	LPCD	******** RESIDENTIAL & COMMERCIAL ******** SERV (HA)	(LPS)	(LPS /HA)	SERV LPCD	*** GOVERNMENT & MILITARY *** SERV (HA)	(LPS)	(LPS /HA)
1	1	38.2	95.0	105.0	102.3	484.71	53.9	105.0	1.9	250.0	48.4	109.3	2.26
1	2	15.2	100.0	97.0	92.9	354.08	13.7	17.6	1.3	100.0	79.2	44.7	0.56
1	3	43.5	95.0	88.0	83.0	204.67	42.1	71.7	1.7	150.0	40.9	31.3	0.77
1	4	50.4	95.0	58.0	58.1	122.86	48.2	69.3	1.4	125.0	9.8	2.4	0.24
2	1	20.6	95.0	35.0	34.5	287.57	26.9	51.0	1.9	225.0	7.6	17.6	2.31
2	2	34.0	95.0	43.0	42.7	166.39	29.8	56.1	1.9	150.0	12.9	9.4	0.73
2	3	22.6	95.0	23.0	22.9	127.54	18.5	31.1	1.7	125.0	4.4	2.3	0.52
2	4	55.0	95.0	63.0	56.0	261.95	46.7	120.9	2.6	200.0	9.3	45.8	4.91
2	5	27.3	95.0	78.0	73.3	293.79	27.5	52.5	1.9	175.0	45.8	40.3	0.88
2	6	13.5	95.0	15.0	14.5	196.26	11.6	22.3	1.9	150.0	2.9	8.4	2.89
2	7	25.9	95.0	35.0	35.0	148.11	21.6	35.6	1.6	125.0	13.3	8.8	0.66
3	1	51.5	95.0	191.0	200.3*	320.45	125.6	127.4	1.0	225.0	74.7	63.6	0.85
3	2	46.4	95.0	54.0	54.4	111.39	46.9	51.0	1.1	100.0	7.5	8.8	1.17
3	3	28.5	90.0	17.0	17.1	69.02	16.3	22.3	1.4	75.0	0.9	0.5	0.58
3	4	34.8	90.0	31.0	30.8	100.43	27.6	36.2	1.3	100.0	3.1	4.2	1.34
3	5	33.0	95.0	20.0	19.5	97.62	18.5	36.3	2.0	100.0	1.0	1.0	1.03
3	6	46.5	95.0	34.0	32.5	98.90	30.3	51.1	1.7	100.0	2.2	2.1	0.95
3	7	39.0	80.0	62.0	61.8	67.75	50.3	27.1	0.5	75.0	11.5	3.5	0.30
3	8	49.6	95.0	63.0	62.4	143.55	49.8	81.8	1.6	150.0	12.6	0.6	0.05
4	1	37.8	80.0	28.0	27.7	61.14	26.8	26.2	1.0	75.0	0.9	0.5	0.56
4	2	61.5	80.0	114.0	101.9	73.49	46.0	42.7	0.9	75.0	55.9	9.6	0.17
4	3	42.0	80.0	37.0	37.0	62.06	31.5	29.2	0.9	75.0	5.5	1.0	0.18
4	4	63.4	90.0	85.0	81.6	74.18	55.2	49.5	0.9	75.0	26.4	4.9	0.19
4	5	43.7	95.0	71.0	70.5	154.73	24.8	60.1	2.4	125.0	45.7	18.2	0.40
5	1	27.0	95.0	36.0	35.0	240.24	28.2	59.4	2.1	200.0	6.7	15.7	2.33
5	2	36.3	95.0	44.0	43.8	187.91	39.3	69.8	1.8	175.0	4.5	9.1	2.02
5	3	22.0	95.0	51.0	50.7	182.58	8.4	24.2	2.9	100.0	42.2	22.3	0.53
5	4	38.9	95.0	38.0	37.0	129.41	23.5	53.5	2.3	125.0	13.6	4.8	0.35
5	5	45.6	95.0	81.0	80.3	172.44	52.3	75.2	1.4	150.0	28.0	15.8	0.56
5	6	83.2	95.0	48.0	47.8	124.70	40.4	91.5	2.3	100.0	7.4	28.6	3.87
5	7	37.0	90.0	124.0	123.4	168.71	66.5	67.4	1.0	175.0	56.9	4.8	0.08
6	1	87.2	90.0	161.0	141.2	98.92	108.2	90.8	0.8	100.0	33.0	9.0	0.27
6	2	114.6	90.0	225.0	180.1	68.86	158.6	89.5	0.6	75.0	21.5	1.8	0.08
6	3	10.5	90.0	13.0	12.3	164.62	11.7	16.4	1.4	150.0	0.6	3.6	5.84
6	4	92.0	80.0	117.0	157.1*	60.94	123.5	63.9	0.5	75.0	33.6	1.0	0.03
7	1	62.1	20.0	319.0	0.0	15.70	0.0	10.8	0.0	75.0	0.0	0.5	0.0
7	2	31.2	80.0	72.0	91.5*	62.49	79.3	21.7	0.3	75.0	12.1	0.9	0.07
7	3	27.0	85.0	44.0	43.3	66.63	28.8	19.9	0.7	75.0	14.4	0.9	0.06
7	4	34.5	50.0	146.0	0.0	39.25	0.0	15.0	0.0	75.0	0.0	0.7	0.0
7	5	24.3	30.0	208.0	0.0	24.28	0.0	6.3	0.0	75.0	0.0	0.5	0.0
7	6	27.4	60.0	112.0	124.8*	48.78	111.2	14.3	0.1	75.0	13.6	1.2	0.09
8	1	35.7	50.0	117.0	71.1	40.89	61.8	15.5	0.3	75.0	9.3	1.4	0.15
8	2	93.7	60.0	291.0	105.5	49.24	90.1	48.8	0.5	75.0	15.4	4.6	0.30
8	3	65.0	85.0	80.0	73.6	65.21	55.0	48.0	0.9	75.0	18.6	1.1	0.06
8	4	80.9	80.0	135.0	99.4	81.39	83.1	74.9	0.9	100.0	16.4	1.3	0.08
8	5	55.8	90.0	70.0	68.4	119.00	52.3	72.7	1.4	125.0	16.1	4.2	0.26
9	1	192.4	50.0	500.0	145.2	37.77	136.5	83.5	0.6	75.0	8.7	0.6	0.07
9	2	40.1	50.0	500.0	58.1	38.79	52.3	17.4	0.3	75.0	5.8	0.6	0.10
10	1	72.3	90.0	256.0	51.8	139.59	46.6	75.3	1.6	100.0	5.2	41.5	7.96

*To be revised to conform to Land Area.

PRELIMINARY

TABLE 3 U.S. A.I.D. SAIGON WATER REPORT
1980 TAKE OFFS BY NODE

PRELIMINARY

17 JUN 1971

NODE	DIST	PHUONG	TOTAL AREA (HA)	P C RES	P C COM	RES. & COMM. AREA (HA)	RES. & COMM. (LPS /HA)	RES. & COMM. (LPS)	GOV. & MILITARY AREA (HA)	GOV. & MILITARY (LPS /HA)	GOV. & MILITARY (LPS)	MAJOR USER (LPS)	BILLED TOTAL (LPS)	LOSS FACT	TOTAL (LPS)
514	2	5	18.29	0.0		0.0	1.91	0.0	18.3	0.88	16.11	0.0	16.11	1.41	22.71
	3	6	11.61	90.0		10.5	1.69	17.63	1.2	0.95	1.11	0.0	18.74	1.41	26.42
	5	7	24.53	65.0		15.9	1.01	16.18	8.6	0.08	0.72	0.0	16.90	1.41	23.83
	10	3	15.82	20.0		3.2	2.19	6.92	12.7	0.71	9.04	0.0	15.96	1.41	22.51
****													67.71		95.47
600	2	2	20.61	90.0		18.6	1.88	34.89	2.1	0.73	1.51	0.0	36.40	1.41	51.32
	2	3	9.44	90.0		8.5	1.68	14.26	0.9	0.52	0.49	1.8	16.55	1.41	23.34
	2	4	10.16	95.0		9.7	2.59	24.99	0.5	4.91	2.50	2.5	29.99	1.41	42.29
	2	7	21.48	85.0		18.3	1.65	30.04	3.2	0.66	2.12	0.0	32.17	1.41	45.36
****													115.11		162.30
603	2	3	4.65	90.0		4.2	1.68	7.02	0.5	0.52	0.24	0.0	7.26	1.41	10.24
	2	6	14.52	80.0		11.6	1.92	22.27	2.9	2.89	8.40	16.5	47.27	1.41	66.64
	2	7	13.50	25.0		3.4	1.65	5.55	10.1	0.66	6.68	0.0	12.23	1.41	17.24
	5	7	3.77	80.0		3.0	1.01	3.06	0.8	0.08	0.06	7.3	10.43	1.41	14.70
	5	7	6.82	90.0		6.1	1.01	6.23	0.7	0.08	0.06	0.0	6.29	1.41	8.87
****													83.47		117.69
703	5	3	4.21	5.0		0.2	2.86	0.60	4.0	0.53	2.11	0.0	2.72	1.41	3.83
	5	3	8.71	5.0		0.4	2.86	1.25	8.3	0.53	4.37	0.0	5.62	1.41	7.92
	5	5	8.42	50.0		4.2	1.44	6.06	4.2	0.56	2.38	0.0	8.43	1.41	11.89
	5	5	15.53	85.0		13.2	1.44	18.99	2.3	0.56	1.32	0.0	20.31	1.41	28.63
	5	5	7.69	85.0		6.5	1.44	9.41	1.2	0.56	0.65	0.0	10.06	1.41	14.18
	5	5	11.47	5.0		0.6	1.44	0.82	10.9	0.56	6.15	0.0	6.98	1.41	9.83
	5	6	9.58	80.0		7.7	2.27	17.37	1.9	3.87	7.41	0.0	24.78	1.41	34.94
	5	7	3.77	35.0		1.3	1.01	1.34	2.5	0.08	0.21	0.0	1.55	1.41	2.18
	10	3	26.27	90.0		23.6	2.19	51.69	2.6	0.71	1.88	0.0	53.57	1.41	75.53
	10	4	15.39	85.0		13.1	1.88	24.65	2.3	1.53	3.52	0.0	28.17	1.41	39.72
****													162.17		228.66
711	10	2	4.21	0.0		0.0	1.60	0.0	4.2	0.64	2.69	9.6	12.29	1.41	17.32
	10	3	26.13	95.0		24.8	2.19	54.26	1.3	0.71	0.93	0.0	55.20	1.41	77.83
	10	4	24.53	95.0		23.3	1.88	43.92	1.2	1.53	1.87	0.0	45.79	1.41	64.56
****													113.27		159.72
800	5	7	3.63	85.0		3.1	1.01	3.13	0.5	0.08	0.05	0.0	3.18	1.41	4.48
	5	7	8.71	15.0		1.3	1.01	1.33	7.4	0.08	0.62	0.0	1.95	1.41	2.75
	5	7	4.50	65.0		2.9	1.01	2.97	1.6	0.08	0.13	0.0	3.10	1.41	4.37
****													8.23		11.60
801	5	7	24.39	75.0		18.3	1.01	18.56	6.1	0.08	0.51	4.2	23.27	1.41	32.81
	5	7	5.23	90.0		4.7	1.01	4.77	0.5	0.08	0.04	0.0	4.82	1.41	6.79
	5	7	17.42	50.0		8.7	1.01	8.84	8.7	0.08	0.73	0.0	9.57	1.41	13.50
****													37.66		53.10

PRELIMINARY

SECTION IV

PROGRESS, CONSTRUCTION

This project does not involve construction and no report is made under this section.

SECTION V

PROGRESS, PROCUREMENT

This project does not involve procurement and no report is made under this section.

SECTION VI

SUMMARY DATA

Contract Number	AID-vn-86
Date of Contract	April 12, 1970
Contract Type	Cost plus fixed fee
Contract estimate	
Dollars	588,209
Piasters	20,000,000
Additonal expenditures since previous report	
Dollars	40,000
Piasters	1,223,823
Expenditures to date	
Dollars (6/27/71)	447,000
Piasters (6/20/71)	9,621,020
Contract completion date	March 1, 1972
Scheduled percentage complete	73.5
Anticipated completion date	March 1, 1972
Actual percentage complete	72.0
Time lag	About 1 week

SECTION VII

PERSONNEL.

On June 30, there were 24 Vietnamese on the Metcalf & Eddy payrolls. This is eleven less than at the preceding months end. The decrease is because of the successful completion of the field testing and measurement programs. The physical inventory and verification of components, component sizes and locations can be accomplished with the reduced forces.

The U. S. staff, which numbered four at the beginning of the month, was augmented by Mr. R. D. Howard who arrived from Boston on June 10th. James D. Fort completed his work on June 23rd, leaving a balance of four at the end of the month.

William A. Cheney	Acting Project Manager Data Collector
Donald M. Dewart	Hydraulic Engineer
James D. Fort	Pitometer Engineer (left June 23)
Richard D. Howard	Boston Project Manager (arrived June 10)
G. W. Mann, Jr.	Field Engineer

The Office Manager and bookkeeper, Mr. Ernesto Gabriel, was in Saigon for the whole reporting period.

The present total staff will stabalize and remain much the same for the balance of the work in Saigon.

SECTION VIII

ENVIRONMENTAL WORK CONDITIONS

No report is required under this section for this reporting period.