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1975/77
Water Supply and Sewerage
Vol. II

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FORM NO. 635
(6–77)

CLOSE – OUT SHEET

This file is closed as of DEC. 31, 1977.

For further correspondence, please see 1925/80 files.

RECORDS MANAGEMENT SECTION

water supply & sew.

Filed. Dec. 31, 77

2

WATER SUPPLY FEASIBILITY REPORT

Suggested Outline

I. BORROWER AND PROJECT AGENCY

1.01 Give a brief history of the agency which will carry out the project and be responsible for operating the water supply system. Include information on organization, administration, relationship to government departments, and organization charts. Describe existing legislation, regulations, charters, or by-laws that outline the agency's responsibilities and its powers to carry out the proposed project, to borrow funds, to charge fees and taxes, and to enforce their collection. Describe any proposed changes.

1.02 Provide a schedule giving by categories of work, the number of people employed by the water agency at the end of each of the last three years.

II. PRESENT WATER SUPPLY SITUATION

2.01 Furnish a general schematic map showing all present water systems including the areas served by each, supply sources, and (by-symbols) the location of pumping stations, storage tanks, reservoirs, and transmission and principal distribution mains. Give information on the average % of time each system is under pressure and the maximum, average, and minimum pressures in each system when under pressure.

2.02 Describe raw water sources for each water system, give withdrawal data, static and pumping levels, and any trend of change.
stream flow data

2.03 Give results of recent analyses of the untreated water including temperatures, turbidity, color, type and concentration of bacteria, pH. carbon dioxide, and the concentration of chlorides, hardness, total solids, iron and manganese, ammonia nitrogen, nitrites, nitrates, and other salts. Describe the arrangements for the testing of water quality, and the analytical standards used. Describe any problems with the quality of the water and any changes that have occurred. Give the dates of all analyses.

2.04 Describe water pumping stations. List major pumps giving type and characteristics, including rated and present capacity (if known), how they are driven, the dates of installation and indicate the general condition of pumps and other equipment. Give the total capacity of each station. Describe any recent difficulties. Give present overall efficiency of pumping units and drivers, and describe method of determination. (Give details of bulk water purchases (if any).

2.05 Briefly describe the water transmission and distribution facilities. Provide a simple plan showing line locations, length, diameter, capacities, materials of construction, and dates of installation. Indicate physical condition of lines, leakage, and any recent difficulties. Show reservoirs and indicate capacity.

2.06 Describe any regular program for sampling and analysis of water from the distribution system.

2.07 Describe the scope and cost of expansion (or replacement projects) for the major parts of the water systems during the last five years and those now in progress. Give dates. Describe whether work was done by the water agency, by contract, or other means.

2.08 Describe pertinent information bearing upon the rights of the water systems to use their sources of raw water. Give details of any disputes about water rights during the last five years or any pending problems.

Analysis of Consumption

2.09 For each of the last three years give total water produced for each water system and the total of all systems. Provide actual data if available; otherwise provide the best possible estimates. Describe how are the above production data determined (master meters, pump rating, hours of operation, or otherwise), and what is the probable margin of error in %? Explain all estimates. Describe any efforts to check or verify data or estimates.

2.10 Describe data estimates and analyses of peak monthly, daily, or hourly flows.

2.11 For each of the last three years, give the distribution of water as follows for each individual system:

Class of Water User	No. of Service Connections			Annual Distribution (Volume)		
	Metered	Not Metered	Total	Metered	Not Metered	Total
Domestic						
Commercial						
Industrial						
Public Fountains or taps						
Public or Government						
Free (give details)						
Wholesale to other systems						
Other (give details)						
Unaccounted-for water						

N.B. If actual data are not available, estimates should be provided and fully explained. Explain your definition of these classes. Other classifications may be used if they provide a detailed breakdown of water uses equal to that given in this suggested table. Is the metered distribution shown in the table calculated on the assumption that all customers have used at least the quantity allowed for the minimum charge?

2.12 Give a table showing, for each of the last three years, the average (actual or estimated) water consumption per person per day for (a) the total population, (b) the population served.

2.13 Give estimate of consumption of water drawn from private sources in each of the areas which will be served by the public system upon completion of the proposed project.

2.14 Explain water use practices by all people who make use of water from sources other than the piped water system such as from ponds, rivers, wells, etc.

III. EXPECTED DEMAND

3.01 Discuss the growth of population in the city and the pattern of growth within the city, and indicate the assumptions made regarding future population growth, density, etc. in the preparation of the project. Attach supporting data from census records and studies.

3.02 Describe any zoning regulations, regional planning, and forecasts for development for the areas to be served by the proposed project.

3.03 Provide estimates of expected total water consumption during the year for each year for which population estimates are given. These should be based upon analyses of present consumption and water use practices as well as trends in population, domestic, commercial, industrial, and other significant types of consumption, unaccounted-for water, use of public watering points, installation of modern plumbing, use of water service and all other factors which could affect water consumption. The estimates of the yearly design consumption should be broken down into the consumptions by various user categories.

IV. THE PROJECT

Water Resources Development

4.01 Describe the long term plans for the staged development of water resources to meet the long term demand. Describe how the proposed project fits in this development.

Description of Project

4.02 Give a general description of the proposed project. Include a map showing principal roads and geographic features, existing built-up areas, the areas now served by water systems, the areas to which service will be extended under the proposed construction project, and approximate areas which are expected to be served by successive future extensions.

On the same map or a separate map, show the location of principal components of the proposed project, such as, main supply lines, pumping stations, reservoirs, and the like.

4.03 Provide the general capacity criteria used for design of the major elements of the proposed project - distribution, transmission, storage, pumping, treatment, supply elements, etc. What provisions for fire flows, if any, are made in the design of the major elements of the proposed project? Explain generally how the capacity of the major elements would be expanded in the future to accommodate future extensions and increases in water demand.

4.04 Describe the results of studies on the yield and the chemical and bacteriological quality of the various sources of supply which have been considered. Explain the reasons for selecting the proposed sources.

4.05 Describe the methodology used to select the most economic size for the major project components.

4.06 Describe the program for extension replacement and improvement of secondary mains, meters, etc. and all other works not included in the project but necessary for fulfillment of the objectives of the proposed project.

4.07 Describe the present status and schedule of project planning, detail design, further studies, procurement and construction. Explain how the work is proposed to be done - by force account, contract, etc.

4.08 Provide a construction schedule for the major items of work on the proposed project.

V. COST ESTIMATES

5.01 Cost estimates for the project should be given in sufficient detail, subdivided into logical project elements, and supported by assumptions and bases for figures in adequate detail to permit detailed analysis., The estimates and any revisions thereon should be dated and should show local currency and foreign exchange costs, land costs, consultants' fees for design and supervision, and allowances for price increases and contingencies.

5.02 Cost estimates should be prepared on the basis that there will be international competition for all contracts, and the sources of unit prices given in the supporting data should be identified, such as, "recent construction costs", "orders placed", "bids received", "informal information from potential suppliers and contractors", etc.

5.03 Provide an estimated schedule of expenditures, by year, for the estimated project costs given by foreign exchange and local currency expenditures. The schedule should be subdivided to show requirements for the major parts of the project and should be coordinated with the preliminary construction schedule. Show expenditures already made as of a given date and estimated expenditures for subsequent periods. Dates of expenditures should be the dates cash payments are due. A specimen table is attached as Annex 1.

5.04 Provide a similar cost estimate and schedule for other secondary works not included in the main project but necessary for fulfillment of the objectives of the proposed project.

5.05 Describe any major water supply works which you expect may be undertaken during the first five years after this project is completed (and which are not included in works estimated above). Include cost estimates and approximate dates.

VI. FINANCES

Rates and Billings

6.01 Give complete details of present water service charges or taxes including minimum charges, consumption allowed for minimum charge (if metered), charges for different service sizes or classes, penalty or rebate provisions for delayed or prompt payments, basis of charges for public taps, etc. Are there any special charges or discounts for government, military, charitable and other special users? Who owns and maintains meters on service connections?

6.02 Describe any changes in the rate schedules within the last ten years.

6.03 Describe any other charges to water customers, such as charges to property owners for construction of new mains in streets adjoining such property, charges for fire hydrants installated on public or private property, meter and service connection charges. Are any of these treated as "capital receipts" in the accounts?

6.04 Who is responsible for recommending and approving water tax or rate changes? What is the procedure for making changes? How long does it take to have changes approved and put into effect?

Financial Results

6.05 Furnish balance sheets (or proforma balance sheets) as at the close of each of the last three fiscal years in the form shown in Annex 2.

6.06 Furnish income statements[1/] (or proforma income statements) for each of the last three fiscal years, in the form shown in Annex 2.

6.07 For itemized operating costs, show on a separate table the amounts budgeted for those years and for the current year compared with the amounts actually spent. Describe the system of budget authorization.

6.08 If possible furnish cash flow statements for the periods covered by the income statements, in the form shown in Annex 3. The purpose of this statement is to show for each year what funds were needed and how they were provided; it should be derived from and consistent with the statement in 6.05 and 6.06.

6.09 Itemize loans outstanding at date of latest balance sheet, showing for each the date of issue, original amount, amount now outstanding, currency in which payable, interest rate, maturity or amortization provisions, holder (government, banks, ...), and any covenants requiring or limiting payment of dividends, maintenance of working capital, issuance of debt investment in fixed assets, etc.) Show short-term debt separately.

6.10 Equity - (the value of total assets less the total liabilities). Under equity, please show separately, if available, customers' contribution, the amount contributed on a permanent basis by any authority to the water agency (such as government grants for public water supply systems), as well as any amounts of surplus arising from any revaluation or sale of fixed assets or from any other source.

1/Sometimes called "Revenue Account" or "Profit & Loss Account".

6.11 Describe purposes of and principles of allocations to all reserves.

6.12 Describe method of valuation of fixed assets. Describe any revaluations which have been made during the last five years.

6.13 Describe depreciation policy as applied to major categories of assets.

6.14 Describe how unallocated stores (inventories) are priced and charged to works. (See Note a/ on Annex 1).

Receivables

6.15 Give an analysis of all accounts receivable (bills sent out but not collected) at the end of the last three fiscal years, showing those less than six months old, those between six and twelve months old, and those over twelve months old. List any significantly large outstanding accounts and provide some explanation for such accounts.

If applicable, give amount written off as bad debts during each of the last three fiscal years.

6.16 Describe any substantial asset or liability included in the balance sheets under"Other".

6.17 Describe any substantial non-operating income or expenses in the income statements furnished.

6.18 Describe any occurrence since the date of the latest financial statements that has materially altered the financial position from that shown (e.g. tariff changes).

6.19 Summarize tax legislation applicable to the water systems, including the method of calculation for taxes, if any paid by the systems (such as production or turnover taxes, income taxes, property taxes), and the current rate of each.

6.20 Give details of insurance carried on fixed assets, inventories (stores), etc., showing amounts in force and types of risks covered.

6.21 Describe any subsidies (direct or indirect) or other payments made to the water agency which are not included under previous questions in this section.

6.22 Describe any funds derived from water revenues or water taxes which have been transferred to other accounts and used for other purposes during the last three years and which have not been fully covered under previous questions.

VII. FINANCIAL PLANNING

Financing Plan during the Construction Period

7.01 Give the proposed financing plan in the following form (for the entire construction period):

Requirements for Funds

Project Construction	000
Interest during Construction	000
Other Interest and Debt Repayments	000
Other Construction (itemize)	000
Renewals and Replacements 1/	000
Taxes, if applicable	000
Increase in Net Working Capital 2/	000
Other (specify)	000
Total Requirements	000

Sources of Funds

Cash Generated from Operations 3/	000
Government Grants (specify)	000
Customers' Contributions (specify)	000
Decrease in Net Working Capital 2/ (if applicable)	000
Other (specify) 4/	000
Sub-total before Borrowings	000
Borrowings - IBRD or IDA	000
Other	000
Total Sources	000

NB: Allowance should be made for anticipated inflation in all future projections.

1/ If not charged to operations (that is, not shown as expenses in the income forecasts), or not shown under construction costs.

2/ "Net Working Capital" means the excess of current assets (including cash) over current liabilities. Provision should be made for working cash, stocks and inventories, normal increases in accounts receivable, and other current assets necessary to operate the system.

3/ Net income before taxes and interest and before charging depreciation.

4/ Proceeds of sales of fixed assets or other assets, etc.

Rate Schedule

7.02 Include any proposed new tariff in detail. Explain when it will be put into effect and any future changes which are anticipated.

Financial Forecasts

7.03 Provide a detailed breakdown of estimated water sold consistent with 3.03 and revenues anticipated under the forecast tariffs by years until three years after the proposed project completion date. Revenues for service connections, meter charges, etc., should be included under "Other Revenues". Income from land leased to others, etc., should be included under "Non-operating Income".

7.04 Give detailed estimates of the annual costs of operating and administering the system beginning now and continuing through the first five years after the estimated construction completion date. Include sample computations for each expense category. Maintenance should include the cost of materials, equipment and maintenance labor. Salaries should include the costs of employees' benefits such as retirement, hospitalization, etc. Administration should include the costs of insurance, legal services, office equipment and supplies, etc. Items under "other" should be itemized and explained. A miscellaneous or contingency item is appropriate under "other". Include the cost of any additional management or operating assitance.

7.05 From the estimates provided above, as well as from additional estimates which may be necessary, compute an "Income Forecast" in the form shown in Annex 3 for each year from the present until three years after the estimated project completion date. Give full details concerning any items not previously described including:

i. Other Revenue
ii. Interest
iii. Depreciation
iv. Other Expenses
v. Non-Operating Income
vi. Taxes

7.06 If possible, from the financing plan and income forecasts, give cash flow estimates for each year from the present until three years after the estimated project completion date, following the form shown in Annex 4. Give full details of assumptions with respect to:

i. Government grant and advances.
ii. Increase in long-term debt, including Government loans.
iii. Amortization of long-term debt.
iv. Increase or decrease in short-term debt.

7.07 Indicate any financing arrangements already completed. On the basis of the last balance sheet of the water agency and the foregoing forecasts, compute year-end balance sheets for the first full fiscal year following completion of construction and for the following three years. Give full details of assumptions with respect to overall working capital requirements, including:

i. Level of cash required to maintain operations.
ii. Amount of receivables to be outstanding.
iii. Inventory requirements.
iv. Amount of accounts payable.

APPRAISAL OF

A SECOND DAMASCUS WATER SUPPLY PROJECT

SYRIA

COST ESTIMATES

WORKS	TOTAL COSTS[1] 000 LS			EXPENDITURES 1975 000 LS			EXPENDITURES 1976 000 LS			EXPENDITURES 1977 000 LS			EXPENDITURES 1978 000 LS			EXPENDITURES 1979 000 LS			EXPENDITURES 1980 000 LS		
	LOCAL	FOREIGN	TOTAL	LOCAL	FOREIGN	TOTAL	LOCAL	FOREIGN	TOTAL	LOCAL	FOREIGN	TOTAL	LOCAL	FOREIGN	TOTAL	LOCAL	FOREIGN	TOTAL	LOCAL	FOREIGN	TOTAL
Contract No. 1																					
Tunnel and Wali Reservoir[2]	79,000	183,100	262,100	-	53,000	53,000	25,000	40,300	65,300	25,000	40,300	65,300	25,000	40,300	65,300	4,000	9,200	13,200	-	-	-
Contract No. 2																					
Reservoirs II West	8,700	18,600	27,300	-	-	-	1,300	2,800	4,100	3,500	7,400	10,900	3,500	7,400	10,900	400	1,000	1,400	-	-	-
Pumping Station Wali	1,350	4,680	6,030	-	-	-	210	690	900	360	1,260	1,620	360	1,260	1,620	420	1,470	1,890	-	-	-
Barada Overflow	1,300	1,600	2,900	-	-	-	-	-	-	200	300	500	500	600	1,100	600	700	1,300	-	-	-
Contract No. 3																					
Distribution Pumping Stations	3,150	10,920	14,070	-	-	-	490	1,610	2,100	840	2,940	3,780	840	2,940	3,780	840	2,940	3,780	140	490	630
Dispatching	3,000	10,000	13,000	-	-	-	400	1,400	1,800	800	2,700	3,500	800	2,700	3,500	800	2,700	3,500	200	500	700
Contract No. 4																					
Distribution Reservoirs	5,100	12,500	17,600	-	-	-	800	1,900	2,700	2,000	5,000	7,000	2,000	5,000	7,000	300	600	900	-	-	-
Contract No. 5																					
Fijeh Pumping Station (permanent installation)	6,000	9,000	15,000	-	-	-	-	-	-	900	1,300	2,200	2,400	3,600	6,000	2,400	3,600	6,000	300	500	800
Sub-total	107,600	250,400	358,000	-	53,000	53,000	28,200	48,700	76,900	33,600	61,200	94,800	35,400	63,800	99,200	9,760	22,210	31,970	640	1,490	2,130
Physical Contingencies																					
Tunnel and Reservoir 10%	7,900	18,310	26,210	-	-	-	2,500	4,000	6,500	2,500	4,000	6,500	2,500	4,000	6,500	400	6,310	6,710	-	-	-
Other Works 15%	4,290	10,095	14,385	-	-	-	720	575	1,295	1,320	3,510	4,830	1,440	3,710	5,150	740	2,120	2,860	70	180	250
Subtotal	119,799	278,805	398,895	-	53,000	53,000	31,420	53,275	84,695	37,420	68,710	106,130	39,340	71,510	110,850	10,900	30,640	41,540	710	1,670	2,380
Design and Supervision[4]	2,000	8,000[3]	10,000	260	1,060	1,320	440	1,750	2,190	550	2,170	2,720	550	2,230	2,780	190	760	950	10	30	40
Training	400	400	800	-	-	-	100	100	200	100	100	200	100	100	200	100	100	200	-	-	-
Sub-total	122,190	287,205	409,395	260	54,060	54,320	31,960	55,125	87,085	38,070	70,980	109,050	39,990	73,840	113,830	11,190	31,500	42,690	720	1,700	2,420
Price Increase % (cumulative for given year)[5]				Advances only at 12/31/74 prices			(34.0)	(5.5)		(38.0)	(16.6)		(42.1)	(28.2)		(46.4)	(41.0)		(50.8)	(54.1)	
Price Increase	47,735	49,460	97,195	-	-	-	10,870	3,030	13,900	14,470	11,780	26,250	16,840	20,820	37,660	5,190	12,910	18,100	365	920	1,285
TOTAL	169,925	336,665	506,590	260	54,060	54,320	42,830	58,155	100,985	52,540	82,760	135,300	56,830	94,660	151,490	16,380	44,410	60,790	1,085	2,620	3,705

1/ Costs expressed as December 31, 1975.
2/ Contract awarded contains price variation clause covering 100% of price changes based on relevant indices.
3/ Assumes consultant uses expatriate personnel for supervision.
4/ On the basis of signed contracts.
5/ Price increase calculated by compounding following inflation rates:

Year	1975	1976	1977	1978	1979	1980
Local costs	32%	3%	3%	3%	3%	3%
Foreign costs						
equipment	nil	9%	8%	8%	8%	7%
civil works	nil	13%	12%	12%	12%	10%

Notes

1/ Local annual inflation rates based on price escalation formula in contract and assuming no increases in Government-controlled prices of cement, fuel and dynamite.

2/ Foreign inflation rate for 1975 is nil as calculated using French Government indices in price variation clause of Contract No. 1.

March 1976

ANNEX 1

BALANCE SHEET

ASSETS

Current Assets [a/]	
Cash and Equivalent [b/]	000
Receivables:	
Accounts Receivable	000
	000
Less Reserve for Bad Debts	000
	000
Stocks and Inventories:	
Chemicals	000
Pipes	000
Spare Parts and Supplies	000
Others (Specify)	000
	000
Other Assets (Specify)	000
Total Current Assets	000
Fixed Assets	
Land	000
Buildings	000
Machinery and Equipment	000
Gross Fixed Assets in Operation	000
Less: Accumulated Depreciation	000
Net Fixed Assets in Operation	000
Investments	000
Work in Progress [c/]	000
Other (Specify)	000
Total Assets	000

---

a/ Include only items which are reasonably expected to be converted into cash within the ensuing year in the ordinary course of business. Receivables, loans and securities (other than government) not expected to be liquidated within the year should be carried under "Investments," regardless of marketability. Materials earmarked for construction and advance payments on equipment or to contractors should be carried as Fixed Assets under "Work in Progress".

b/ Include short-term bank deposits and marketable government securities.

c/ Besides the items mentioned in Note a/, "Work in Progress" can include capitalized interest during construction and engineering fees, insofar as these are not yet allocated to specific fixed assets in service.

BALANCE SHEET (continued)

LIABILITIES

Current Liabilities[a/]	
Accounts Payable	000
Accrued Liabilities[b/]	000
Short-term Debt (see 6.09)	000
Other (Specify)	000
Total Current Liabilities	000
Reserves (Specify)	000
Long-term Debt (See 6.09)	
IDA or IBRD (if applicable)	000
Other Debt (Specify)	000
	000
Equity (See 6.10)	
If applicable:	
Contribution of Administering Authority	000
Customers' Contribution[c/]	000
Revaluation Surplus	000
Other Capital Surplus	000
Earned Surplus	000
Total Equity	000
Total Liabilities and Equity	000

---

a/ Include all items due or expected to come due within the ensuing year.

b/ Accrued expenses, interest, taxes, dividends declared, etc. Itemize.

c/ May include connection fees, if the related costs have been also capitalized under "Fixed Assets."

INCOME STATEMENT

Water Production (Physical Volume)	000
Water Sales (Physical Volume)	000
Total bills sent out: Number	000
: Value	000
Total bills collected: Number	000
: Value	000

Revenues from Billings - Water taxes	000
- Flat rate charges	000
- Metered charges	000
	000
Other revenues (Specify)	000
Total Revenues	000
Less Operating Costs:	
Power and Fuel	000
Chemicals	000
Maintenance	000
Salaries	000
Administration	000
Other	000
Depreciation	000
Total Operating Expenses	000
	000
Net Income before Taxes and Interest:	
Interest	000
Plus: Non-Operating Income (Specify)	000
Income before Taxes	000
Less Taxes (if applicable)	000
Net Income	000

CASH FLOW (where supplied)

Sources of Funds

Net Income before taxes and interest	000
Depreciation	000
Total cash generated from operations	000
Non-Operating Income	000
Customers' contributions	000
Increase in long-term debt:	
IDA or IBRD - if applicable	000
Other (Specify)	000
Increase in short-term debt	000
Increase in other current liabilities	000
Decrease in current assets (other than cash)	000
Other (Specify)	000
Total sources	000

Application of Funds

Investment in fixed assets:[1/]	
The project, if applicable	000
Other construction	000
Renewals and replacements	000
Interest on Loans:	
Amortization:	
IDA or IBRD - if applicable	000
Other long-term debt	000
Total interest and amortization (debt service)	000
Taxes, if applicable	000
Decrease in short-term debt	000
Decrease in other current liabilities	000
Increase in current assets (other than cash)	000
Other (itemize)	000
Total application	000
Cash Surplus or deficit for year	000
Cash Balance at beginning of year	000
Cash Balance at end of year	000

1/ Interest during construction, if capitalized, can be included here instead of under "Interest on Loans".

FORM NO. 27-OCR (5-77)

WORLD BANK OUTGOING MESSAGE FORM (Telegram, Cable, Telex)

IMPORTANT (PLEASE READ INSTRUCTIONS BELOW BEFORE TYPING FORM.)

Class of Service: TELEX Date: December 30, 1977

Telex No.: 680 440 F Originators Ext: 75343

12 10

Water Supply + Sewerage

0 START HERE

1 TO: CYRIL GOMELLA, SETUDE

CITY/COUNTRY: PARIS, FRANCE

MESSAGE NO.:

PRIMO PRIERE NOUS ENVOYER D'URGENCE VOTRE CV.

4 SECONDO AU SUJET DE VOS HONORAIRES JE LE REGRETTE

5 INFINIMENT MAIS IL PARAIT QUE LE CHIFFRE JOURNALIER QUE

6 JE VOUS AI TRANSMIS A PARIS EST PLUS ELEVE QUE LA SOMME

7 QUE LA BANQUE EST CAPABLE DE PAYER. JE SUIS CERTAIN QUE

8 VOUS COMPRENEZ QU'UNE ORGANIZATION PUBLIQUE INTERNATIONALE

9 TELLES QUE LA BANQUE NE PEUT PAS OFFRIR DES HONORAIRES QUI

10 SONT AU MEME NIVEAU DE CEUX DU SECTEUR PRIVE. IL PARAIT

11 QUE LE CHIFFRE MAXIMUM QUE NOUS POURRIONS PRENDRE EN

12 CONSIDERATION SERAIT DE L'ORDRE DE DOLLARS 2000 POUR

13 COUVRIR VOS HONORAIRES ET VOS DEPENSES. EN PLUS LA BANQUE

14 VOUS PAYERA LE VOYAGE EN AVION. VEUILLEZ CONFIRMER PAR CABLE

15 SI CES TERMES VOUS SONT CONVENABLES. ENSUITE NOUS FERONS

16 LES PREPARATIFS AU SUJET DU BILLETD'AVION ET NOUS

PREPARERONS UN CONTRAT EN DUE FORME.

18 TERTIO VOUS INFORME QUE DR LACY SE FERA ASSISTER PAR

19 WADE MILLER ET RIP RICE POUR SA PRESENTATION. VOIR

20 ARTICLE INTITULE - EUROPEAN WATER TREATMENT PRACTICES AND

21 END OF TEXT WHAT WE CAN LEARN FROM THEM - ECRIT PAR CES DERNIERS DANS

22 ~~etc~~

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SUBJECT: World Bank Water Seminar	DRAFTED BY: RMiddleton/JDidier:smo
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	DEPARTMENT: Energy, Water and Telecommunications
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SUBJECT: WORLD BANK WATER SEMINAR

DRAFTED BY: RMiddleton/JDidier:smo

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AUTHORIZED BY (Name and Signature): Richard H. Sheehan, Assistant Director

DEPARTMENT: Energy, Water and Telecommunications

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COMMUNICATIONS
SECTION

Water Supply & Sewerage
WRIC

Date Rec'd. 12/22
Date Ack'd.
Assigned to MacWilliam

File MISC-7-81

Atlas Copco AB
Group Headquarters

Mr R MacWilliam
Europe, Middle East and North Africa
Water Supply and Sewerage Division
World Bank
WASHINGTON D.C.

Your reference/Your letter	Our reference	Stockholm
	MI OL/TG	1977-12-16

Dear Mr MacWilliam,

A few years ago Atlas Copco was running a one-day seminar in Washington D.C. dealing with construction projects in developing countries.

After consultation with some officials in the World Bank and the Interamerican Development Bank we have concluded that so many new elements have entered this subject that it would be time for a new gathering. In cooperation with the Swedish Embassy we are therefore pleased to invite you to participate at a seminar along the following lines, and we would appreciate it, if you could reserve Thursday February 9, 1978 in your calendar.

The meeting will be at the Mayflower Hotel, from 9.30 a.m. to (approx) 2.30 p.m., including lunch. Early morning coffee will be served from 9.00 a.m.

We have felt it would be appropriate to concentrate on four topics, labeled as follows:

Methods and techniques for extraction of underground resources (mainly water and minerals).

Applications of "total cost" calculations.

Examples of infrastructure projects in various parts of the world - problems, experiences, solutions. (Projects to be discussed fall in the categories roads, railroads, tunnels, airports, harbors, irrigation, and hydropower projects.)

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"Software" aspects on projects in developing countries -
- education, training, project planning, systems approach, technical service, etc.

The subjects have not yet been hammered out in detail - your suggestions and comments on the above outline would be much appreciated.

After hearing from you and getting confirmation on your preliminary interest, we plan to send you a brief background of each of the subjects chosen to facilitate active participation from your end. At the seminar senior Atlas Copco staff will introduce the subjects, but most of the time available will be devoted to discussions. We hope you will be willing to share your views, ask pertinent questions and contribute cases, examples and problems.

Please mail the enclosed sheet to let us know of your interest to participate. Any comments or suggestions you may wish to make will be appreciated.

Sincerely yours,

ATLAS COPCO AB
International Office

Olle Lundquist

Encl Facts
Reply form
Addressed envelope

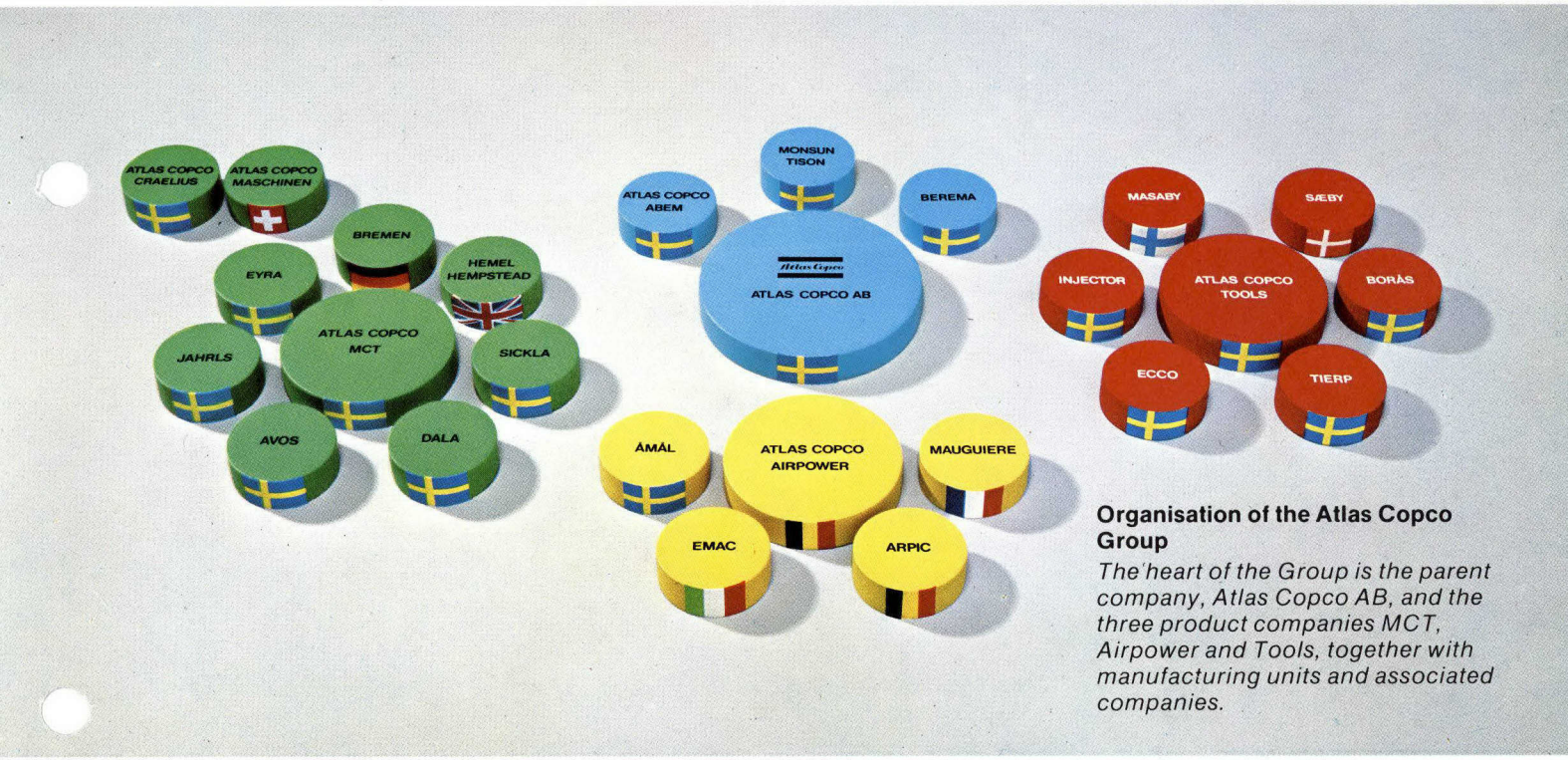
/EK

Atlas Copco 1977

Atlas Copco, one of Sweden's major industrial companies, is also one of the largest in the world engaged in modern compressed air technique.

Although we have made our name as compressed air specialists, we are actively engaged in many other fields as well. We usually describe our specialization as »pressure energy» — the technique of using gases or liquids to transfer energy and put it to useful work.

As you might expect, most of our 1 000 or so products are designed for compressed air. Some also incorporate hydraulics, while others are fully hydraulic, e.g. certain rock drills. And we do not hesitate to make use of other technologies to meet our customers' requirements.



Organisation of the Atlas Copco Group

The heart of the Group is the parent company, Atlas Copco AB, and the three product companies MCT, Airpower and Tools, together with manufacturing units and associated companies.

Group Management

Group management, located at the parent company **Atlas Copco AB,** is mainly concerned with strategic management and general group policy, as well as with financing, long-term planning, long-range research, and communications.

At the parent company there is also a sales department for handling trade through state trade organizations and another for trade via distributors.

Independent subsidiaries of Atlas Copco AB are:

Atlas Copco ABEM AB, Sundbyberg (Stockholm), which manufactures and markets geophysical and industrial measuring instruments.

Berema AB, with three manufacturing units in Sweden. Manufactures and markets motor drills and hydraulic truckmounted cranes.

Monsun-Tison AB, with two workshops in Sweden. Develops, manufactures and markets hydraulic components and systems. It also develops and manufactures pneumatic components.

The Product Companies

These engage in product development, manufacture, sales support, etc. As required, they also assist the sales companies with design and with the adaptation of products and methods to meet the special needs of customers.

Atlas Copco MCT AB. MCT (Mining and Construction Technique) has its Head Office and main manufacturing unit in Nacka, Stockholm. It develops and manufactures Group products for the mining and construction industry.

MCT's operations are grouped into seven market-oriented units. Each is responsible for its own budget, as well as for product development, production and marketing in its particular field. These fields are:

- *underground equipment,* with the manufacturing units Avos Works, Eyra Works, Orminge Works in Sweden and Atlas Copco Maschinen AG in Switzerland.
- *surface equipment,* with the manufacturing unit Atlas Copco MCT, G.m.b.H., in Germany.

- *contractor tools,* with the manufacturing units Jahrls Works and Dala Works, as well as Atlas Copco (Manufacturing) Ltd in Great Britain.
- *drill steel equipment* — Sandvik Coromant.
- *rock drills,* manufactured in Nacka, Stockholm.
- *exploration equipment,* — Atlas Copco Craelius AB and subsidiaries.
- *compressors,* manufactured at the Sickla Works. This unit works in close collaboration with Atlas Copco Airpower on certain types of compressors.

Atlas Copco Airpower N.V.

This company, with Head Office at its plant in Antwerp, manufactures and markets piston and rotary screw compressors, portable as well as stationary, and equipment for installation, such as air dryers, aftercoolers and control equipment for automatic operation. Airpower is also responsible for Atlas Copco equipment for lake restoration, ice prevention and the containing of oil spills on water (»bubble barriers»).

Atlas Copco Tools AB

This, the Group's product company for industrial technique, is located adjacent to its major manufacturing unit in Stockholm. The company manufactures and markets airpowered industrial tools such as air drills, screwdrivers and nutrunners, grinders, and riveting and chipping hammers. The range also includes finishing equipment, pneumatic components and automatic systems, air motors, hoists and air line accessories.

Sales Companies

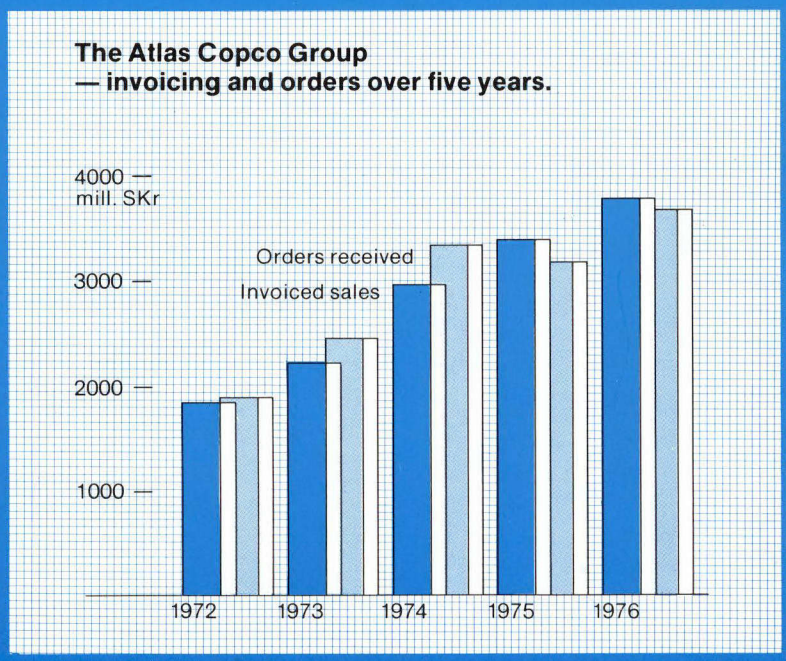
Atlas Copco is represented on the market in 40 countries by its own sales companies. Each has a local sales and service organization, and in some cases also manufacturing units.

In another 85 countries the Group's products and techniques are marketed through distributors.

Facts in brief

- Company founded in 1873
- Own sales companies in 40 countries
- Distributors in another 85 countries.
- Sixteen manufacturing units in Sweden and twelve abroad
- Markets more than 1,000 different products
- 18,400 employees in five continents
- Group invoicing for 1976: SKr 3,791 million
- Share capital: SKr 310,432,500
- Of total Group sales, 90 % goes outside Sweden

The Atlas Copco Group — invoicing and orders over five years.



Addresses

Group Headquarters:

Atlas Copco AB, S-105 23 Stockholm, Sweden. Phone 08-24 30 00.

Product Companies:

Atlas Copco MCT AB, Fack, S-102 60 Stockholm 4, Sweden. Phone 08-24 30 00.

Atlas Copco Airpower N.V., Boomse Steenweg 957, B-2610 Wilrijk, Belgium. Phone 031-87 68 70.

Atlas Copco Tools AB, Fack, S-104 60 Stockholm 20, Sweden. Phone 08-44 99 20.

Board of Directors

Elected by shareholders:

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Chairman

Kurt-Allan Belfrage
Deputy Chairman

Henry N Sporborg
Jan Hellner
Axel Iveroth
Erik Johnsson
Sture Ödner
Ulf-C Bratt
Curt G Olsson
Tom Wachtmeister
Managing Director

Appointed by the employees:

Bo Henning
Per-Erik Nyholm
Ingmar Berthelsen
(Deputy)
Kjell Nordström
(Deputy)

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Managing Director

Bengt Andersson
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Finance, Administration

Einar Liwendahl
Deputy Managing Director
Marketing — East

Göran Lundborg
Deputy Managing Director
Manufacture and technology

Sven-Ingvar Svensson
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Ivan Åkerman
Managing Director
Atlas Copco Airpower N.V.

Theo Dietz
Managing Director
Atlas Copco Tools AB

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Water Supply + Sewerage

F328

Mr. John M. Kalbermatten, CPSVP

December 15, 1977

H.W. Barker, Training Officer, EDC

Daniel Okun. Manpower Development and Training in the Water Sector. Responsibilities of the World Bank. PU Report No. 28, June 1977.

1. You asked for my comments on this report and in particular for any supplementary observations that I might have on Mr. Francis Lethem's memorandum dated September 14th, 1977.

2. Mr. Lethem's comments on the report are succinct, objective and, in the main, I agree with them. However, whereas the report does, perhaps, quote currently fashionable themes relating to the need for appropriate technologies and "promoters" for rural water supply projects, might it not equally be fashionable to conclude, as the memorandum does, that the report reveals nothing that the Bank has not already considered? Assuming this to be accurate and that the Regional Divisions take heed of the report, it is surely no bad thing to have the collective thinking of relevant Bank staff on these key issues incorporated between the covers of a single document.

3. Mr. Lethem's point about water sector training requirements being fundamentally different from those of any other sector, is well made. Water sector managers and specialists seem curiously unable or unwilling to make capital of this fact, preferring to be regarded, it seems, as the "silent service". But the water sector is not so much special because it needs good managers, and a variety of specialists who can deal with the problems of water. Of the features which distinguish the water sector from other sectors, those which generate the most prevalent managerial problems would appear to include:

(a) the nature of the work which tends to scatter the work force in small groups throughout the area of supply;

(b) the capital intensity of the sector, with a higher ratio of capital investment per employee than most if not all other sectors.

(c) the bulk of the assets are buried beneath the ground and, not infrequently, are inadequately mapped;

(d) the dilemma as to whether water is a public health service or one which provides a product to consumers on demand and at an economic price;

(e) the imbalance which exists between the status of water supply on the one hand and sewerage/sewage disposal on the other;

(f) the constraints which tend to hamper the introduction of modern business methods, caused by the influence of lay management bodies and supervisory boards;

The report could perhaps have done more in identifying these features and distilling from them the implications for manpower development and training.

4. Bank water project staff indeed need to know how to identify training needs and make realistic proposals for the design and implementation of training programs. Assuming their competency to do this, there remains the problem of allocating adequate time to full mission schedules to enable the investigations to be made and the data to be collected, if this exists. The fragmentation of the workforce particularly in the neglected area of operations and maintenance militates against this and accounts, presumably, for the observation that the training component tends to be considered by the appraisal team, "on the way to the airport".

5. These and other areas for strengthening the Bank's future attention to and provision of,,manpower development and training in the water sector will form the substance of the session on this subject at the forthcoming, and timely, Water Supply Training Course you have arranged for January 1978.

6. In conclusion the report's assertation that the usefulness of a water sector training specialist located within the Education Department will unavoidably be limited, requires some qualification. The availability of one such specialist is (hopefully) an advance on the situation that existed pre - July 1977, and the extent of the operational services that one man can provide to the six Regional Divisions, and others, will perforce be limited wherever he may be located.

Cleared with & cc: E.A. Chittleburgh.
cc: Messrs Aklilu, Lethem

GLP - Water Supply

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Files

DATE: November 21, 1977

FROM: John M. Kalbermatten (Water and Wastes Adviser, EWTDR)

SUBJECT: Ad Hoc Working Group on Rural Water Supply
Meeting of November 2 and 3 in New York 1/

Ad Hoc Panel Working Group Adjournment

The Working Group met to consider the Task Force report which recommended the establishment of an inter-agency mechanism to improve the coordination and promotion of rural water supply activities undertaken by the participating institutions.

A couple of days prior to this meeting, Dr. Mahler, Director-General, WHO, addressed a memo to some but not all agencies represented on the Panel recommending another alternative.

Partially as a result of this initiative, the initial discussions during the meeting did not only lack focus, as has been the custom, but turned at times acrimonious. Finally at the request of the Chairman, each participating organization was requested to state its reaction to the Task Force proposals.

UNDP and IDRC, in general, supported the Task Force proposals, while UNICEF, the Bank, WHO, and FAO, expressed reservations. The Bank and WHO further indicated they would not participate in the mechanism proposed by the Task Force. Both had an opportunity to explain their position (for details, see Mr. Rovani's memo to Mr. McNamara and Dr. Mahler's memo both attached) and, in particular, the possibility of providing other agencies an opportunity to participate in the formulation and execution of the Bank/WHO Cooperative Program activities.

In the course of the discussion, UNICEF suggested that WHO elaborate the proposals contained in Dr. Mahler's memo in consultation with the Bank, and present it to the agencies participating in the Working Group by letter or through individual contacts. This was accepted by the participants and the Working Group adjourned sine die. It was decided that the amounts remaining in the Trust Fund under WHO administration (about $79,000) should be frozen and that WHO should submit to participating agencies an audited statement as of December 31 of this year.

Cooperative Program Staffing

Some Working Group participants expressed strong doubts as to the capacity of WHO staff to undertake the work described by WHO and Bank. These

1/ This memorandum should be read against the background of Mr. Rovani's memorandum of October 27 to Mr. McNamara, reviewing the history of the Working Group, summarizing and reacting to the recommendations of the Task Force and outlining a proposed position for the Bank representatives at the November meeting.

doubts have been expressed before not only by the Working Group but by Bank staff as well. While in New York and afterwards, during Dr. Dieterich's visit to the Bank, I discussed with him the staffing of the Cooperative Program. Dr. Dieterich tentatively agreed to major modifications which were discussed with and approved by Mr. Rovani. According to our formal agreement, five of the present C. P. staff members, namely, Messrs. Jackson, Schultzberg, Laugeri, Vogel and Tomassi, would remain with the program. All the others would be assigned elsewhere. To complement these five we agreed to help WHO in a search for an economist and three financial analysts. Successful identification and hiring of these four would bring the Cooperative Program's staff strength to nine which, together with the two decentralized positions (Mr. Gunter Heyland in New Delhi and one as yet unidentified individual with PAHO) represent the full authorized strength of eleven positions.

Mar del Plata Follow Up

During the Working Group discussions, the on-going C. P. program reflecting Mar del Plata follow-up activities was explained in detail to convince the participants of the need to look at rural water supply as a component of the water supply and sanitation sector. While the discussions were lengthy and both the advantages and disadvantages of the approach were argued vehemently, unanimity was not reached, as again UNDP and IDRC believe that rural water supply should be treated in isolation.

Subsequently, Messrs. Rovani, Dieterich and I agreed to explore further the possibility of assigning C. P. staff to Washington for Mar del Plata follow-up work.

Attachments

cc and cleared with: Mrs. Boskey (IRDDR)

cc: Messrs. Baum, Rovani

JMKalbermatten:mk

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Mr. Robert S. McNamara
Through: Mr. Warren C. Baum
FROM: Yves Rovani

DATE: October 27, 1977

SUBJECT: The Ad Hoc Working Group on Rural Water Supply

1. The Ad Hoc Working Group on Rural Water Supply was set up in 1974 by five agencies (WHO, UNDP, UNICEF, IDRC and IBRD) to identify actions needed to promote investment in rural water supply and to ensure coordination between interested agencies.1/

2. In its three years of existence the Group has not produced any significant results. It has been badly affected by internal tensions, due to distrust of WHO by the other agencies. It began work with what has proven to be an erroneous concept, namely that technology diffusion was the principal sector constraint and therefore that the successful CGIAR model was relevant. About two years ago, at a meeting in Geneva at which a wide variety of institutions and both developed and developing country governments were represented, the Group presented a proposed program of training, information dissemination and research which had been developed by WHO on its behalf. The program envisaged a global network of centers which would develop specific projects suitable for funding by governments, development banks or other sources. The potential donor agencies represented at the meeting, while recognizing the need for accelerated provision of rural water supply, rejected the proposed "network of centers" approach. The Bank concurred with this view.

3. Subsequently, with the idea of demonstrating to donors the kinds of projects which would deserve support, a few pilot exercises were launched: WHO organized a workshop in Africa; the Bank employed a consultant to make case studies of country rural water programs; and IDRC prepared an outline of an information system. However, by any reasonable standard the activities and achievements have been minimal, and there has been growing restiveness and dissatisfaction within the Group. A consensus was reached that, while inter-agency coordination and collaboration was desirable, the Group as constituted and functioning was not successful. As a final effort, the Group therefore established a Task Force to recommend a more effective approach to collaboration.

4. Next Wednesday, November 2, the Group will meet for the last time, to consider the recommendations of the Task Force. These recommendations envisage the creation of a new inter-agency mechanism, and would, if accepted, involve the Bank in: membership in a Steering Committee of contributing agencies (initially the five members of the Group) meeting three times annually; an annual contribution by each agency of about $130,000 in support of a Service Unit of four staff, located in WHO HQ in Geneva but independent of WHO; and a moral commitment to provide staff support to the Service Unit.

1/ Subsequently, its area of concern was extended to include "urban fringes", but its emphasis has been almost entirely on the rural subsector.

5. We believe that the Bank should not agree to these proposals. The creation of yet another new mechanism is unlikely to be the most cost-effective way of achieving results and the proposed Service Unit would lack the "critical mass" necessary to have an impact on the sector. Furthermore, the problems of rural water supply should no longer be viewed in isolation but rather in the context of the HABITAT and U. N. Water Conference resolutions which called for: provision of safe water and sanitation to everybody by 1990; countries to prepare, by 1980, national programs to meet this objective; the period 1980-90 to be designated the Drinking Water Decade; and international organizations and developed countries to assist in the preparation and implementation of the programs to meet the decade goals. The Bank's most appropriate and effective role is in the support of this global effort, including within it, however, a special focus on the neglected rural and urban fringe areas, which would be in keeping with the Bank's objectives of focussing on the needs of the urban and rural poor.

6. We are presently working on alternative proposals which we will outline, in tentative form, at the November 2 Group meeting, in order to determine whether there is any support for them. We will make it clear that these proposals have not yet been discussed with Bank management and do not have their endorsement. The general principles underlying the proposals are likely to be:

(a) The promotion of investments in rural water supply should be dealt with as one specific component of the U. N. Water Conference resolution, rather than separately.

(b) The Group should recognize WHO's responsibility and mandate for the monitoring of progress in the provision of water supply and sanitation, and should entrust this function to WHO rather than set up a new unit.

(c) The Bank's experience in project lending and in sector analysis gives it a comparative advantage in assisting countries to plan strategies and programs in preparation for the 1980-90 decade. Provision of this assistance may require some regrouping of staff within the Bank. Follow-up would be by the IBRD/WHO CP staff (some of whom will be decentralized to WHO's regional offices during the coming year to improve their operational efficiency).

(d) Some inter-agency mechanism will be required to coordinate activities, oversee progress, and act as a point of contact for potential donors.

(e) Whatever mechanisms are finally adopted, there must be an injection of more resources into this effort if it is to command credibility.

7. If the meeting is responsive to these tentative proposals we will prepare a detailed paper for Bank management approval and subsequent discussion with the interested agencies. The reasons for bringing the matter to your attention at this stage are that:

(a) Mr. Mahler may refer to this matter when you see him at the ACC meetings next week.

(b) Mr. Hopper and others who promoted the Group may be disappointed at hearing our position (since they are concerned to minimize WHO influence over future action) and may wish to know our reasons.

cc and cleared with: Mrs. Boskey

cc: Messrs. Kalbermatten, Middleton

YRovani/SBoskey/JMKalbermatten/RNMiddelton:mk

WORLD HEALTH ORGANIZATION

Liaison Office with United Nations

ORGANISATION MONDIALE DE LA SANTÉ

Bureau de Liaison avec les Nations Unies

UNITED NATIONS
NEW YORK, 10017
TELEPHONE: 754-8132
CABLE ADDRESS-UNSANTE|NEWYORK-ADRESSE TELEGRAPHIQUE

27 October 1977

To : Mr Bradford Morse
Administrator, UNDP

From : Director-General, WHO

Subject : Cooperative action for the implementation of the Mar del Plata resolution on drinking water supply and sanitation

... I am enclosing WHO's present reflections on this subject.

It would seem to me that we first of all have to address ourselves to the following key questions:

1. Do we agree with the premise that we must move on a much broader frontthan hitherto conceived of?

2. Do we agree to strengthening existing mechanisms rather than creating a new and independent unit?

3. Do we agree to engage in a joint memorandum which would be negotiated along the lines of the organizational arrangements proposed with or without modifications which some of the organizations may wish to make?

4. Do we agree to a key role of the Resident Representative of UNDP and UNDP chairmanship of the high level standing committee referred to under item 3.2.(d).(iv)?

If we generally agree to answer these questions positively then we should instruct our representatives at the forthcoming Ad Hoc Working Group meeting accordingly.

H. Mahler, M.D.

... Enclosure

PROPOSALS FOR COOPERATIVE ACTION FOR THE IMPLEMENTATION OF THE MAR DEL PLATA RESOLUTION ON DRINKING WATER SUPPLY AND SANITATION

(A proposal made in response to the recommendation for the setting up of new mechanisms by the Ad Hoc Working Group on Rural Potable Water Supply and Sanitation)

1. During its existence, the Ad Hoc Working Group has focussed attention on the problem of rural potable water supply and sanitation and has contributed to the awareness in all agencies that existing programmes in this field need strong reorientation towards the populations most in need.

An important and welcome recommendation of the Ad Hoc Working Group is that coordination and cooperation of international agencies at the country level must be strengthened, and that the RRUNDP should become an essential instrument not only for this improved coordination and cooperation but also for more efficient inter-action with government in (i) stimulating national action; (ii) planning inputs from international agencies, and (iii) liaison and coordination with bilateral agencies relative to the Mar del Plata target for rural water supply and sanitation.

However, the recommendations made by the Task Force are considered insufficient because:

(i) only a few countries would benefit whereas the Mar del Plata resolution calls for wide-spread action during the preparatory phase (1978-1980) of the proposed International Drinking Water Supply and Sanitation Decade;

(ii) focus on needy groups requires a broad approach to the Mar del Plata target; this is ignored;

(iii) a new mechanism, in the form of an independent Service Unit is proposed, instead of building on existing collaborative mechanisms to meet the international water decade targets;

(iv) no funding commitments for country operations have been assured.

2. In the following paragraphs, proposals are made which are believed (i) to be more practical than those made by the AHWG, and (ii) would contribute to the current efforts to streamline the efficiency of the UN system (including efforts made in the UNDP Task Force).

3. WHO Proposals

3.1 Objectives:

To strengthen technical collaboration between inter-governmental agencies and Member States in implementing the Mar del Plata target for water supply and sanitation in as many countries as possible, through strengthened coordination and cooperation at the country, regional and global level.

The specific objectives to be pursued would be as follows:

(a) At the country level

(i) A substantial acceleration of development through national decision-making and political commitment, and more effective national participation in any required technical cooperation.

(ii) Coordination and joint efforts of the international agencies at the country level with a key role assigned to the RRUNDP.

(iii) Through this mechanism at the country level, to collaborate with governments specifically in formulation of national policies and programmes,

including the setting of targets both nation-wide and for the most needy populations; identification and preparation of projects for both internal and external funding; strengthening of institutional and managerial base, mobilization of self-reliance and community participation; the development of manpower; and the application of appropriate technology.

(b) At the WHO Regional Level

(i) To build up capacity in the WHO Regional Offices to provide technical support to the RRUNDP.

(ii) To monitor progress at the national and regional levels and liaise with other agencies.

(iii) Liaison between WHO Regional Offices and the Regional Economic Commissions in view of their role with respect to follow-up on the Mar del Plata Action Plan as a whole.

(c) At the Global Level

(i) Global political stimulation.

(ii) Continuous monitoring of needs and progress achieved towards the global target and maintenance of permanent liaison with the other concerned international agencies.

(iii) Convening of annual consultative meetings of all those concerned with a view to disseminating the information obtained through monitoring, stimulating increased flow of financial and other resources, and formulating mutually accepted development policies, criteria and approaches.

3.2 Organizational arrangements

(a) General

It would be proposed that the major international agencies (presumably FAO, IBRD, UNDP, UNICEF, WHO) hereinafter referred to as the participating agencies enter into a joint memorandum of understanding and agree on the arrangements and actions outlined above. The memorandum should be very flexible and allow for changes and expansion.

(b) At the Country Level

(i) To make technical cooperation effective it is indispensable that governments establish inter-ministerial task forces or committees as appropriate which would assume responsibility not only for the formulation and implementation of national programmes but also for international technical cooperation (they would follow the Country Health Programming model whereby nationals are responsible for the development of programmes).

(ii) In the light of the considerable number of national agencies involved the RRUNDP will be requested to interact with governments specifically on the subject of water supply and sanitation with a view to the following:

- general liaison for stimulating political awareness, interest and commitment
- liaison with bilateral and other international agencies

(iii) The participating agencies, through designated representatives and the WHO representatives, will consult regularly with the inter-ministerial

task forces or committees referred to in (i) above to ensure the widest possible coordination of international inputs into national programme development and implementation, and effective dissemination of relevant information to other international agencies at the country level.

(iv) Specific programmes or activities of technical cooperation would be executed by the individual agencies according to their normal procedures but would be coordinated through the mechanism described in (iii) above.

(c) At the Regional Level

(i) The regional organizations of the participating agencies would continue to function in accordance with their procedures and policies in executing specific technical cooperation activities following the outcome of country level coordination as described in (b).(iv) above.

(ii) In the case of WHO Regional Offices, they would in addition provide logistic and technical support services to the RRUNDP in the discharge of his functions as outlined in (b) above. Where the Regional Offices lack capacity, it would be understood that they be supported from resources available at the WHO global level (reference: Organizational Changes in EHE/HQ).

(iii) WHO Regional Offices would furthermore assume the additional role, in consultation with the regional organizations of the other participating agencies, of liaising and presenting the subject of water supply and sanitation vis-à-vis the Regional Economic Commissions which are given a major role in the overall follow-up on the total Mar del Plata Action Plan.

(iv) As part of the functions described in (iii) above, the WHO Regional Offices would also assume a monitoring function relative to the implementation of the Mar del Plata Drinking Water Supply and Sanitation target at the regional level.

(d) At the Global Level

(i) The Director-General of WHO, on behalf of the Executive Heads of all of the participating agencies, would invite, at least once a year, all agencies concerned, including Banks, multi- and bilateral agencies, inter-governmental agencies and NGO's, to attend a consultative meeting for the purpose of global political stimulation, reviewing progress and stimulating the flow of financial and other resources to identified programmes and projects. The participation of governments of the developing countries in these meetings is indispensable.

(ii) The Group for Global Promotion and Coordination, which will be established within EHE/HQ (under the new organization plan) will carry out global monitoring of progress, identify problems and issues for discussion by the consultative meeting referred to under (i) above. The Group will serve these meetings but should not be regarded as a formal secretariat.

(iii) The Group's task includes of course the permanent and systematic contact and liaison with the other agencies between the annual meetings.

(iv) This Group would also be the link on water supply and sanitation matters to the United Nations Centre for Natural Resources, Energy and Transport, which serves as the CNR's secretariat.

(v) The participating agencies would establish a standing committee which would periodically review and provide guidance concerning the implementation of the joint memorandum of understanding. It may be advantageous if UNDP were to assume chairmanship of this committee in view of the key role of the RRUNDP as well as the overall developments in the UN system (UNDP Task Forces).

3.3 Specific Actions by WHO

The following will make a major contribution to the implementation of the proposal:

(i) The WHO, together with IBRD, is in the process of undertaking a "rapid assessment" of countries' preparedness for the Decade. This activity would be a major starting point for the cooperation described in the above proposal. It would furthermore identify specific technical cooperation activities which should be undertaken between now and the beginning of the Decade and which would need support or funding by the participating agencies, and other concerned agencies.

(ii) The IBRD and WHO would invite the other participating agencies to take part systematically in the IBRD/WHO Cooperative Programme, particularly the periodic planning of programme activities and in follow-up activities.

(iii) Another major contribution to launch this joint arrangement would come from the WHO/UNICEF JCHP study "Water Supply and Sanitation Components of Primary Health Care".

(iv) Furthermore, the Secretary-General of the UN has agreed that WHO

assume the lead function for the in-depth study regarding the implications of the Mar del Plata Resolution II on Drinking Water Supply and Sanitation, to be presented to the forthcoming special session of the CNR in June 1978 and it would be most desirable to point out in that study that the major agencies concerned are taking measures to join forces.

GLP - Water Supply

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Files

DATE: October 19, 1977

FROM: Richard N. Middleton, Senior Sanitary Engineer (EWTDR)

SUBJECT: Pipelines - State-of-the-Art Paper
Bookman-Edmonston Engineering Inc.

On October 18, 1977 I discussed the progress of this study with Messrs. Langley (Vice President) and Cannon (responsible for report preparation). Mr. Cannon was in Washington to conduct further interviews with water supply staff as input into the paper. The following points were agreed.

- Some slippage has occurred in report preparation, mainly because of non-availability of Bank staff. However, Bookman-Edmonston will still endeavour to have a first draft ready by mid-November. This will be sufficiently polished to use as teaching material for the January 1978 Water Supply Training Course.

- Bookman-Edmonston will submit as soon as possible an outline for a one-day seminar during the course. If it appears that a longer presentation (say, 1-1/2 days) would be desirable, they will indicate this, together with an expanded outline, but they should not count on being allocated more than one day.

- Bookman-Edmonston will submit an estimate for supply of the report bibliography (which is fairly extensive) to the Water Supply Library.

- The deadline for completion of the report may need to be extended, depending on the reactions during the seminar and the amount of rewriting or insertion of new material required; this will be further discussed at the time.

cc: Messrs. Kalbermatten, Bharier (EWTDR)

RNMiddleton:jbe

620 - Water Supply
RES-R-620

September 26, 1977

Mr. A. C. Chaturvedi
Chairman, Environmental Division
Institution of Engineers (India)
B/6 3-Park Road, Lucknow 226001
India

Dear Mr. Chaturvedi:

Thank you for sending us your two-volume report entitled 'Control of Unaccounted-for Water', which we have now received and reviewed. We find your report provides considerable information about the problems of unaccounted-for water in projects financed by the World Bank.

Unfortunately, however, our conclusion is that your report does not meet the requirements spelled out in your terms-of-reference. These terms-of-reference (copy attached) gave you the specific assignment of preparing a manual on the control of unaccounted-for water, a manual which would draw on the fund of accumulated experience and would be a practical document of immediate operational use. In particular it was specified that you make recommendations on:

a. a standard definition of 'unaccounted-for water' and levels of 'unaccounted-for water' which can economically be achieved;

b. specific measures to reduce waste water and the costs and merits of these measures;

c. specific measures to improve the collection of revenues;

d. the justification for metering and methods of analyzing and quantifying its effectiveness; and

e. terms-of-reference for studies of control of unaccounted-for water.

Given your long discussions with Bank staff, extensive information you have already gathered, and your own background and experience, we are naturally disappointed that you have not been able to organize this information so as to produce the manual we requested. We therefore propose that you produce the manual by November 30, 1977, on the clear understanding that this revision and recasting of your work would not entail further expenses or fees to be paid for by the World Bank. Please let us know by return whether you agree to do this.

Meanwhile, we have approved for payment your statements of fees and expenses to date, and you should soon be receiving reimbursement for these.

Yours sincerely,

John M. Kalbermatten
Water and Wastes Adviser
Energy, Water and Telecommunications Department

Attachment

cc: Messrs. Rovani, Warford (EWTDR)
Ms. Stone (PER)

RMMiddleton:JBharier/jbe

GLP - WATER SUPPLY & SEWERAGE R G10

September 23, 1977

Professor Donald Lauria
601 Tinkerbell Road
Chapel Hill, North Carolina 27514

Dear Don:

Many thanks for your letter of September 15 setting out the procedures for field testing of the model. I have passed two copies of it to Sven Sandstrom, the leader of the Egypt urban mission; he in turn will pass one copy to John Kirke, the municipal engineer on the mission. John will, I hope, be able to arrange for spare copies of this data (which is all part of the information he should in any case be assembling during preappraisal) to be available for you when you pass through London in late October.

In due course I will also be discussing the requirements with Tony Pellegrini, who will be going to Manila in October, and I hope this may lead to resurrection of fieldwork in the Philippines.

The paper has at last been printed, and is being distributed throughout the water supply divisions. I enclose ten copies for your own use; please let me know if you would like some more.

With best regards,

Yours sincerely,

Richard N. Middleton
Senior Sanitary Engineer
Energy, Water and Telecommunications Department

Enclosures

RNMiddleton:jbe

GLP - Water Supply & Sewerage

Members of Sewerage Task Group:
Messrs. Pettigrew (Chairman), Bruestle, Cuellar,
Rasmusson, L. V. Chang, Serdahely

September 15, 1977

Water Supply - Gen

A. Saravanapavan (AEPEW)

Proceedings of the Third National Conference on Sludge Management Disposal and Utilization

1. I attended the conference last year, December 14-16, and only received the proceedings this month!

2. The papers are of special interest because they are presented against the background of EPA policy as developed under the "Marine Protection, Research and Sanctuaries Act of 1972," that ocean disposal of municipal sludges is to be phased out by 1981. For the developing countries, therefore, a substantial part of the research presented here in recycling of sludge as fertilizer or feedstuffs will be of great interest.

2. As this is the only copy of the proceedings, please have it hand-carried to the next member on the list who is not away on mission. Please send in your comments to Mr. Pettigrew and indicate if you wish to have a meeting to discuss the report.

Attachment

cc: Kalbermatten

ASaravanapavan:amb

AEP & Div. Files

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

Water Supply + Sewerage

Gellow

OFFICE MEMORANDUM

TO: Mr. Christopher R. Willoughby, Director, TRP **DATE:** September 14, 1977

FROM: Miguel E. Martinez MEM
Senior Economist, TRP

SUBJECT: Alternative Concepts of Marginal Cost for Public Utilities Pricing: Problems of Applications in the Water Supply Sector

1. I have reviewed the above paper and the comments that follow refer to

(a) the relationship between the paper and the research proposal submitted in March 1974 and

(b) the analysis and conclusions of the paper.

2. (a) Relationship between the paper and the original research proposal

My impression is that the paper does not fully correspond to the original research proposal. The main objective of the paper is " ... to clear up ambiguity in the definition of marginal cost in the water supply sector." While this is an interesting and useful objective, it is much more narrow than the objective of the research proposal which was: " ... to seek approaches to decide upon pricing policies based on economic principles which recognize constraints set by:

a. Low availability of information (e.g., as regards demand elasticities);

b. uncertainty;

c. income distribution;

d. technical and cost limitations to accurate metering;

e. externalities (e.g., health benefits in water supply);

f. financial and fiscal objectives;

g. institutional factors (e.g., what the institutions can be practically expected to accomplish; the problems of billing, etc.)"

Furthermore, it was stated that the general approach would consist of an examination of the trade-offs between efficiency and the various constraints and objectives listed in (a) to (g) above and it was also expected to test the principles so derived in concrete situations (case studies).

3. In my opinion the paper has not met those objectives. It starts with a general discussion about the problems of implementing marginal cost pricing and then presents alternative definitions of marginal cost and discusses the results

obtained through simulation in nine hypothetical cases. It is a paper on the definition of marginal costs rather than on the trade-offs between economic efficiency and the other objectives listed above.

4. A proper definition of marginal costs is fundamental for a proper analysis of the trade-offs, so, in my opinion, the paper can be considered as an important step toward the fulfillment of the research proposal, but the study of those trade-offs and the testing of the principles so derived in concrete situations have still to be done.

5. (b) The analysis and conclusions of the paper

The first part of the paper deals with the problems of application of marginal cost pricing in the water supply sector. This is an interesting discussion which draws on the general principles of marginal cost pricing in public enterprises. Some of the main ideas there developed were already contained in two documents issued at about the same time the research proposal was presented: Urban Water Supply and Sewerage Pricing Policy (PU Report No. PUN11 of March 1974) and Economic Evaluation of Public Utilities Projects (PU Report No. GAS10 of September 1974) and some others have been developed in recent papers: Economic Evaluation and Financing of Sewerage Projects (PU Report No. GAS13 of February 1977) and Shadow Pricing and Evaluation of Public Utility Projects (PU Report No. GAS14 of April 1977).

6. Some of the ideas have been elaborated upon a little further than in these papers, but my general impression is that the analysis is too descriptive and that to produce results useful from an operational point of view a more in-depth study of the trade-offs between the conflicting objectives of the pricing policy would be required. A possible approach might be to elaborate along the lines suggested by Turvey in his book, "Economic Analysis and Public Enterprises" (Rowman and Littlefield, 1971) supplemented by case studies.

7. The second and third parts of the paper dealt with alternative definitions of marginal cost and their performance in a simulation. Strict application of MC pricing (TMC using the paper's definition) would lead to prices equal to short run marginal cost until capacity is reached, when price would increase to ration consumption. This increase in price will signal the need for increases in capacity. After the increase in capacity, allocating efficiency requires prices to be reduced to short run marginal cost. To avoid these fluctuations in prices, three alternative definitions of marginal cost which include not only the short run marginal cost but also some cost component for future increases in system capacity are proposed in the paper and defined as: TLRIC, PWISC and AIC. A compromise between allocative efficiency and price volatility is implicit in these definitions of marginal cost. Their common feature is a welfare loss in the short run when there is excess capacity (prices are set above short run marginal cost), in order to obtain a more stable price over time.

8. One important aspect which is missing in the discussion is the theoretical foundation for the alternative definition of marginal cost. For example, if price volatility is not a constraint, optimal pricing requires that prices be

set equal to TMC. While if it is required that a uniform price be charged during a considerable period of time, Anderson and Turvey 1/ have proposed that the pricing rule that will maximize the present worth of willingness-to-pay for the product less the present worth of all cost is to set prices equal to TLRIC. It is not clear which are the theoretical foundations of PWISC and AIC and how the different definitions compare in terms of the short run welfare loss that they implied when compared with TMC, or in other words which are the costs (in terms of welfare losses because of the constraint of minimizing price volatility), associated with the use of TLRIC, PWISC and AIC.

9. In Part III the four definitions of marginal cost previously presented are used to compute the corresponding marginal cost in nine hypothetical situations. Assuming that price is equal to marginal cost, the performance of each definition is analyzed in terms of price and revenue variability, total amount of revenue generated, and deviations from TMC. This is an interesting mathematical exercise, but the results are seriously limited by the assumption that demand is completly inelastic. If that assumption holds, demand is independent of the pricing system and there is not an allocation of resources problem, which is precisely the problem that the authors attempt to solve through alternative definitions of marginal cost. The trade-off between allocative efficiency and price volatility is not relevant anymore and if the minimization of price fluctuation is the objective, why not keep the price constant over the life of the project?

10. In my opinion, the discussion about alternative definitions of marginal cost is relevant only in the context of a demand for water not fully inelastic, so the trade-off between short term allocative efficiency and price volatility can be studied, and this case is not dealt with in the paper.

11. If demand is not completely inelastic, the pricing system will affect consumption and therefore, the time at which new capacity has to be brought into operation. The system cost streams will then not be independent of the pricing system and even though the simulation would be more difficult, the results would be more relevant. I have some reservations about the statement that a price elasticity of demand of -0.2 would not affect the general conclusions of the paper. Even with such low price elasticity, substantial changes in consumption will result from the different pricing policies and therefore different streams of system cost will be relevant in each case and the assumption of independence between these streams and the pricing system used in the paper will not hold. For example, the following table shows for Case B (the most common case in water supply according to the authors) the reduction in water consumption in a given year if prices are increased from TMC to AIC in the ratio indicated by Table 6

1/ Anderson and Turvey, "Electricity Economics", Chapter 17

(page 48) and assuming a price elasticity of demand of -0.2:

	CASE	Percentage reduction in water consumption
	4	69
B	5	56
	6	8

12. This table clearly shows that even though the elasticity of demand is only -0.2, the point in time when system capacity will have to be increased would be different depending on whether prices are set equal to TMC or to AIC. Therefore, the assumption of similar system expansion cost streams under both pricing policies will not hold.

13. In conclusion, I think that the paper is very good in studying the performance of alternative definition of marginal cost in the case of a completely inelastic demand curve. But this is a very restrictive case, where there is not a problem of allocative efficiency and some generalization of the results would be very useful. This would require the development of optimum pricing rules under constraints about the degree of price fluctuation, which will clearly point out the trade-offs between that objective and short run welfare losses; and simulation using a demand curve not completely inelastic, so that system cost streams will not be independent of the pricing system.

cc: Messrs. Robin Bates (EAP)
Arthur Bruestle (AEP)
J.H. Collier (OED)
J. Culagovski (LCP)
Orville Grimes (VPD)
Jeremy Warford (EWT)
Dennis Anderson (DED)

MEMartinez:hps

Water Supply + Sewerage ES-672

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Files DATE: September 9, 1977

FROM: Richard N. Middleton, Senior Sanitary Engineer (EWTDR)

SUBJECT: Research Work at University of Maryland by Professor Sternberg

1. I called Professor Sternberg on September 6 to enquire about progress. The present situation is:

(a) The wear test on the simulated pump handles has terminated at 2 million + cycles. All combinations of impregnated wood/galvanized pipe showed a satisfactory performance. A report is being drafted and should be available for comment in 10-14 days. The report will not be released to IDRC prior to Bank clearance (Sternberg had already made this clear to Journey). Professor Sternberg agrees with me that further work should be in the field, undertaken by interested organizations in developing countries, so as to include the effects of local fabrication, rather than in the laboratory. He sees little merit in IDRC's (i.e., Journey's) request to extend the laboratory trials beyond 2 million cycles.

(b) USAID are funding research on the water metering device and on the automatic valve, of which we have already seen prototypes. The study, lasting one year, has just commenced.

(c) No funding has been found for research into simplified Fordilla-type valves or water metering devices for public hydrants. I said that in my view these could await and profit from the results of (b); the Bank would not be interested in funding this work at present.

cc: Messrs. Kalbermatten, Bharier (EWTDR)

RNMiddleton:jbe

RES-620

Water Supply + Sewerage

See Distribution Below

September 8, 1977

Richard N. Middleton, Senior Sanitary Engineer (EWTDR)

Manual on the Control of Unaccounted-for Water
Consultant's Draft Report

1. I attach (Annex 1) the two-volume draft report prepared by the consultant, Mr. Chaturvedi. I would be grateful if you would review this document, bearing in mind the following questions in particular:

(a) Does it respond to the terms of reference?(Annex 2)?
(b) If it does not, is the problem with over-ambitious or inappropriate terms of reference or with the consultant's approach to the study?
(c) What changes should be suggested to the present draft before it is finalized?
(d) What further work (field studies, seminars, etc.) should be undertaken?

2. A review meeting will be held at 2:00 p.m. on Wednesday, September 21, in Room D-1056; please attend if you can.

Attachment

Distribution

Messrs. Kalbermatten, Bharier (EWTDR), Beach (AEPEW), Erkmen (EAPEW), Salazar (WAPEW), Thys (EMPWS), Williams (ASPEW), Zavala(LCPWS), Yepes,(Maisch, Freedman (LCPWS), Skytta (ASPEW), Coyaud (EAPEW), Buky (WAPEW),

RNMiddleton:jbe

OFFICE MEMORANDUM

TO: Bookman-Edmondston Engineering Inc. DATE: September 7, 1977
(through Mr. Middleton)
FROM: R. C. Prevost (AEPEW)

SUBJECT: State of the Art on Pipelines Materials and Specs. Contributions

1. As I shall be overseas when the consultants start working, and because of my personal deep involvement in the subject, I believe it could be useful if I put a few considerations on the subject in writing. This subject is no doubt of prime importance, because pipelines whether for transmission or distribution probably never represent less than 70% and sometimes 90% of water supply project costs, /1 Further, my own experience suggests that quite substantial savings can be made through the use of available up-to-date specs. There are however major constraints to any action in this field and, I believe, we have to address ourselves to them first - technical problems usually are not major obstacles.

Constraints

2. The first constraint stems from the Bank's position. The Bank reviews projects prepared by others and, in the end, has to be satisfied that the proposed works comply reasonably with technical and least-cost requirements. The Bank cannot however often overrule a consultant and/or a borrower who stand firm on positions open at least to questions, such as standardization on a type of pipe. There have been instances in which I have felt that I could not advocate, for example, changes in the specifications for steel pipes beyond the use of the AWWA publications on the matter, although I knew that this was not enough, even that it was of no avail. I could not lecture our consultants/ borrowers about my personal work on thin steel pipes which would have probably induced them to follow AWWA on the design of steel pipelines . . . because I represented the Bank and for no other reason.

3. A second constraint, probably the major one, is the reluctance to change (to say the least) shown by consultants and water supply operators in departing from old well-proven design, which have yielded century-old systems. Such attitudes stem most often from sheer lack of cost consciousness and technical knowledge which leads to intellectual immobility, while technique progresses and the same techniques thought to be long established date from the end of the last century (reinforced concrete pipes), the 1920s (steel pipes), or the last war (plastic pipes).

4. The opposition to change is often based on the legitimate concern for standardization; there are obviously major problems where a distribution system is built out of different types of pipes, fittings and appurtenances. Spares and tools, together with costs, are increased; new types of pipes or

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/1 Similar percentages apply to sewerage.

techniques require labor training or some equipment and can cause problems in operations. However, such considerations do not apply usually to transmission pipelines, the design of which should be governed by costs and unbiased technical considerations.

5. Also commercial interests and relationships as well as established markets can be obstacles to progress.

6. There are ways to overcome the above constraints. The Bank's Procurement Guidelines can be adequate tools to settle commercial problems provided they are well applied, particularly in advertising the project./1 However, advertisement only may not be sufficient; therefore, a kind of promotional campaign may be required to interest large contractors and pipe suppliers, particularly if changes in pipe design are necessary (e.g. type of joints for sewer pipes locally manufactured), or if a pipe factory could be moved to the site. The "State of the Art" paper could deal with other constraints and help spread up-to-date, adequate and economic techniques. The paper should be prepared for our borrowers and international consultants throughout the world and needs only to set forth the quintessence of present day technique, referring to available standards and codes of practice or other publications in such a way that they could no longer be ignored. Further, the paper must be short; otherwise, it would not be read. It should be given to our borrowers before the start of detailed engineering and/or the drafting of terms of reference for the latter.

Bank's File Review

7. I do not believe much is to be gained from a thorough, but elusive, difficult, time consuming, review of past or ongoing Bank projects. I am confident that the conclusion of such a study would be:

(a) references to standards is most often adequate;

(b) types of pipe (e.g. ductile iron, asbestos cement, thin or heavy steel, etc.) are often not, at best, preselected and certain types are excluded without real justification; and

(c) laying conditions are not satisfactorily specified and are old-fashioned (particularly in tender documents prepared by European consultants); there is little use of notions of soil mechanics (fills compaction), with few references to existing codes of practice or similar documents;

/1 The advertisements for "contracts" may be unsatisfactory yet expensive because they focus on part of an ensemble; the advertisement for a project or a series of works or supplies shows the size of the market which will be opened and may raise much more interest from foreign potential bidders.

(d) design methods are inadequate or inadequately specified, or, for example, thicknesses (steel) are specified, but not determined by adequate design methods;

(e) testing after laying often does not fit local conditions, (e.g. unavailability of water); and

(f) provisions for inspection (laying) particularly are inadequate./1

8. In reviewing Bank files, I do not recommend relying on a questionnaire (we do not have time to fill them in, and the questionnaire I have seen would not be of much use); however I do recommend discussing the problem with engineers and procurement officers. All of the latter should be requested to hand over to our consultant a few of the more representative (good and bad) transmission and distribution pipe supply and/or laying contracts (contracts preferably to tender documents) with which they are dealing for their comments. Any other method would probably be ineffective.

Basic Facts

9. I feel free, being a European Engineer, to depart from European methods for pipe design and to recommend the use of American methods. I do not mean to say American pipe standards are better because European pipe standards, or ISO or other standards, are generally equivalent to them.

10. However, American designs are empiric based primarily on practice and experiments. Extensive researches on loads on buried circular structures "in situ" have been carried out only in the U.S. around the first world war (Iowa State College). There have been no other experiments of the kind anywhere, except about 1960 in Belgium; there have been many experiments in laboratories everywhere which do not mean much. The U.S. experiments have shown the paramount importance of the flexibility of pipes, of related "passive" (lateral) earth pressures and the interaction between external loads and interior pressures in the cases of cast iron, asbestos cement and prestressed concrete. The U.S. practice leads to a very simple method for computation of steel pipe thicknesses (which results in thicknesses usually one third of that calculated by European methods). These are applicable also to ductile iron pipes. Belgian experiments emphasize effects of interior pressure in the case of steel pipes without substantially changing the results of the American method on the whole.

/1 Often this is, to a large extent, one among other consultant tasks, but there is to my thinking no adequate provision which specifies the number of inspectors, (contract employee/consultant) or tests (compaction) to be made (contractor's contract).

11. Most European engineers (this was 10 years ago but I do not believe that the methods have much changed) want to make accurate calculations (particularly on concrete or steel pipes). However, they have scant knowledge of US research on earth loads, still take the diameter of the pipes instead of the width of the trenches as the major factor in computation of earth loads on pipes in trenches, take into account inadequate side pressures and ignore effects of flexibility and consider attentively bedding conditions which are of little consequences.

12. Another major factor which makes obsolete such rational methods is the inability of any theory applied to composite materials such as reinforced concrete (whether prestressed or not), asbestos cement, cast iron to:

(a) calculate with sufficient accuracy the deformation of as simple a structure as a ring;

(b) correctly predict the interaction between external loads and interior pressure. The usual theory demonstrates that this interaction is linear (on a graph, the permissible interior pressure decreases linearly as the external load grows). Experiments show that this relationship has the shape of a parabola; the permissible interior pressures are higher than the ordinary theory shows. This effect is taken into account in U.S. design methods.

Steel pipes of course respond quite well to more elaborate theories, taking into account the first degree effects of the deformation under external load, as long as the deformation is small. Experimental results are however blurred by the effects of shape defects (the best pipe is not circular!). Steel pipes prove to be much stronger than any theory suggests when deformations become large (the interaction curve shows a big bulge).

Recommendations

13. Therefore the "State of the Art" paper should recommend use of US documents such as:

(a) AWWA M11 Steel Pipe Design

(b) ANSI A211/AWWA C101 Thickness Design of Cast Iron Pipe

(c) AWWA C301 Prestress Concrete Pressure Pipe (Appendix A)

(d) ANSI A21.50/AWWA C150 Thickness Design of Ductile Iron Pipe

(e) (This list is incomplete).

AC pipe design is also among AWWA publications for design of pipe lines, i.e. the selection of class of pipes of a given diameter or thickness (in the case of steel or ductile iron pipes), in connection with interior pressure and external loads (earth and live loads) and the laying (and bedding)

conditions. Pipe strength (sometimes needed) can of course still be calculated; however it would become essential to know the bearing capacity of each class and size of pipe, except for steel, through three points tests.

14. The above design methods imply simultaneous selection of type of pipes (class, thickness) and their actual laying and backfilling conditions which will be carried out by a contractor. The contractor most often has little knowledge of soil mechanics and/or does not care unless pipe laying inspection is efficient. Savings on pipes (or thickness of steel pipes) can be made at the cost of better laying conditions. Before setting the laying conditions, a realistic assessment of the available contractors' capabilities must be made.

15. There are more standards for each different type of pipes (dimensions, specifications, tolerances, material specifications, tests, etc.) in the US than in other countries. However, all standards for the most-used pipes, whether US, ISO, or European, are generally equal, as noted above (some specify dimensions only). US standards will have to be metricized within the next few years; until then their use may create problems, and cannot be recommended without amendments and, except of course, when still required. There may be minor problems in adapting the "design" methods to metric pipes which are recommended above; this should be left to consultants. Further, the AWWA standards specifying steel pipe thicknesses include a footnote which implies possible use of very thin pipes that could be crushed by accidental vacuum; these should be excluded (I would not accept the use of pipes less than 1/100 of the diameter, unless I were fully satisfied with the contractor's capability to handle such pipes).

Miscellaneous Considerations

16. When several types of pipes (for example, steel and prestressed concrete) are in competition, there may be a problem arising out of small differences in roughness and actual diameters of the same nominal size (or from the use of different unit systems); this would happen primarily with transmission mains. The loss of head varies with the fifth power of the diameter for the same discharge, so a small difference in diameter does matter. It is obvious that, in the case of raising mains (following a pump station), the evaluation of bids must take care of the required energy; in the case of gravity line, the nominal diameter of part or all of the line may have to be adapted to match the available head (tender documents must take care of this).

17. The "paper" obviously must mention jointing methods and joint standards, their costs and technical characteristics. Steel pipe welding deserves special treatment. Though it is the method used on oil and gas pipelines because it is the most reliable technique, water suppliers seem to be reluctant to utilize it (except in Zaire!). There is a method for welding small-size, mortar-lined steel pipes without damaging the lining which seems worth mentioning (France).

18. Protection against corrosion (interior and exterior), must also be included. Could a table showing different methods and their recommended uses be the backbone of that chapter? The same remark applies to the uses of different types of pipes.

19. A point of particular interest is the wire for prestressed concrete pipes, a potential source of delayed problems of major magnitude. Prestressed concrete pipes without steel cylinders should not be omitted from the list of pipes types because of their uses in the Far East.

20. Large contracts for pipe supplies with a narrow range of sizes could justify moving a plant to the site of a project. It could be interesting to indicate the prerequisites of such an undertaking, the needed size and type of contract, type of pipes, companies who could move a plant (or did in the past), and how to proceed to interest such suppliers.

cc: J. Beach
J. Kalbermatten

RPrevost:hh

RES 612

Water Supply + Sewerage

September 7, 1977

Dr. J.M.G. van Damme, Manager
International Reference Centre
for Community Water Supply
P.O. Box 140
Leidschendam, the Netherlands

Dear Dr. van Damme:

Thank you for your letter of August 24 addressed to John Kalbermatten (who is at present away on mission) enclosing your book on handpumps and the bulletin on the handpump workshop. These will be welcome additions to our water supply library; there has been a real need to have a consolidated overview of the present situation in this field and of the research efforts now in progress.

I am glad to see that you anticipate issuing revised editions from time to time to reflect the results of pilot studies and research programs. There seems to be considerable activity worldwide at the present time, and in, say, a couple of years an updating would be well worthwhile. Please let us know when you are about to undertake this work, and we will see how we can be of assistance.

The only research project which we have in hand at present, which has a direct bearing on this topic, is the investigation of wooden pump handles being done by Professor Sternberg at the University of Maryland. I hope to have a draft report on this in the near future, and will let you have a copy in due course.

Regards,

Yours sincerely,

Richard N. Middleton
Senior Sanitary Engineer
Energy, Water and Telecommunications Department

cc: Mr. Kalbermatten (EWTDR)

RNMiddleton:jbe

..ORLD BANK / INTERNATIONAL FINANCE CORP ..ATION

File
RWM

OFFICE MEMORANDUM

TO: Mr. Richard Middleton, Senior Sanitary Engineer DATE: August 19, 1977

FROM: Christian Debaene

SUBJECT: State of the Art Paper on Pipelines B-E Eng, Inc.

I have been to all regional offices to discuss with the engineers about the "Pipeline Project Questionnaire" and arrange appointments. From these discussions, I can point out:

- Few engineers are or will be available. Most of them are on mission, home or annual leave.

- Among those I have met, some don't believe I could get these kind of informations by myself, considering the fact I don't know too much about each project. They will try to provide some informations from their experience. Others gave me their contract documents or the references in their Regional files, in order for me to provide all the informations for the questionnaire.

Following is a list of the engineers who received a copy of the questionnaire and/or who will be available next week:

EMENA
Mr. Cuellar (will be there next week only)
Mr. Mac William: Appointment Thursday 25th, 2:00 pm

LAC
Mr. Rodriguez (will be on mission next week)
Mr. Chang (will be back next week)

EAST ASIA AND PACIFIC

Mr. Prevost Appointment Thursday (to be arranged)
Mr. Bruestle

SOUTH ASIA

Mr. Pettigrew
Mr. Rasmusson
Mr. Shytta Appointment Thursday, 11:00 am

EASTERN AFRICA

Mr. Coyaud (will be may be on mission)
Mr. LaBahn (will be back next week)

WESTERN AFRICA

Mr. Rietveld Appointment Thursday, 10:00 am

Unfortunately, a lot of engineers will not be able to fill the questionnaire and/or to be available next week. Among those who were present at the World Bank, many suggested that late September will be a better time for Mr. Cannon's visit, arguing the fact that in late August and September, most of the engineers are on missions or vacation.

CDebaene:cju

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Messrs. J.Beach(AEPEW), E.Erkmen(EAPEW),R.Salazar(WAPEW), A. Thys(EMPWS), E.Williams(ASPEW), A.Zavala(LCPWS) DATE: August 18, 1977

FROM: Richard N. Middleton, Senior Sanitary Engineer (EWTDR)

SUBJECT: State-of-the-Art Paper on Pipelines

Mr. Cannon, of Bookman-Edmonston Engineering Inc., consultants for this study, will be visiting the Bank on August 25 and 26 to continue collecting data on Bank experience on pipelines. My secretary will be calling you shortly to arrange appointments. Meanwhile, it would be most helpful if project officers could complete copies of the attached questionnaire for as many projects as possible prior to Mr. Cannon's arrival. To help with this, I have asked Mr. DeBaene, one of our summer assistants, to get in touch with you.

Attachments

RNMiddleton:jbe

PIPELINE PROJECT QUESTIONAIRE

PROJECT NAME _____

LOCATION _____

DATE CONSTRUCTION COMPLETE _____

PIPE MATERIAL USED _____

APPLICABLE SPECIFICATIONS _____

MANUFACTURING PROCESS (TRADE NAME OR DESCRIPTION)

_____

SOIL TYPE (UNIFIED SOIL CLASSIFICATION IF AVAILABLE)

_____

BEDDING SPECIFICATIONS _____

BACKFILL SPECIFICATIONS _____

FITTINGS MATERIALS _____

CONSTRUCTION PROBLEMS _____

_____

_____

_____

PERFORMANCE SINCE CONSTRUCTION _____

_____

_____

_____

JOINT TYPE (SKETCH OR DESCRIBE) _____

Water Supply + Sewerage

FORM NO. 27
(11–75)

WORLD BANK / IFC
OUTGOING MESSAGE FORM
(TELEGRAM/CABLE/TELEX)

XX ☐ IBRD
☐ IDA
☐ IFC
☐ ICSID

Mr. A. C. CHATURVEDI
TO: CHAIRMAN, ENVIRONMENTAL DIVISION
INSTITUTION OF ENGINEERS (INDIA)
B/6, 3-Park Road
LUCKNOW -22601

DATE: August 11, 1977

ORIGINATOR'S EXT.: 5343

COUNTRY: INDIA

CLASS OF SERVICE: LT

CABLE NO. & TEXT:

REURLETS JULY 23 AND AUGUST 2 ALPHA WE HAVE RECEIVED FEW REPLIES TO SHIPMAN QUESTIONNAIRE SO FAR AND DO NOT CONSIDER WORTH FORWARDING AT THIS STAGE BETA WE WILL DECIDE ON ANY FURTHER ACTION IN CONNECTION WITH UK TECHNICAL WORKING GROUP DEFINITIONS ON RECEIPT AND REVIEW YOUR DRAFT REPORT GAMMA WE WILL NEED ALL POSSIBLE REPRINTS OR COPIES OF JOURNAL ARTICLES ETC TO WHICH YOU REFER STOP SUGGEST YOU ARRANGE TO FORWARD AS SOON AS POSSIBLE SO WILL BE AVAILABLE DURING REPORT REVIEW KEEPING COPY FOR YOUR OWN REFERENCE DELTA PLEASE RETURN APPRAISAL REPORTS AND SUPERVISION MEMOS THROUGH BANKS DELHI OFFICE

REGARDS

MIDDLETON

NOT TO BE TRANSMITTED

REFERENCE: RES-620 Unaccounted-for Water	AUTHORIZED BY *(Name)*: Richard N. Middleton, Sr. Sanitary Engineer
DRAFTED BY: RNMiddleton:jbe	DEPARTMENT: EWTDR
CLEARANCES AND COPY DISTRIBUTION:	SIGNATURE *(Of individual authorized to approve)*:
	SECTION BELOW FOR USE OF CABLE SECTION
	CHECKED FOR DISPATCH:

PINK - File Copy; WHITE - Transmittal Copy; YELLOW - Bill Copy

FORM NO. 27
(11-75)

WORLD BANK / IFC
OUTGOING MESSAGE FORM
(TELEGRAM/CABLE/TELEX)

☒ IBRD
☐ IDA
☐ IFC
☐ ICSID

TO: Mr. A. C. CHATURVEDI
CHAIRMAN, ENVIRONMENTAL DIVISION
INSTITUTION OF ENGINEERS (INDIA)
8/6, 3-Park Road
LUCKNOW -226 01

COUNTRY: INDIA

CABLE NO. & TEXT:

ORIGINATOR'S EXT.: 8343

CLASS OF SERVICE: LT

DATE: August 11, 1977

REVISED DRAFT REPORT GAMMA WE WILL NEED ALL POSSIBLE REPRINTS OR COPIES OF JOURNAL ARTICLES ETC TO WHICH YOU REFER STOP SUGGEST YOU ARRANGE TO FORWARD AS SOON AS POSSIBLE SO WILL BE AVAILABLE DURING REPORT REVIEW KEEPING COPY FOR YOUR OWN REFERENCE DELTA PLEASE RETURN APPRAISAL REPORTS AND SUPERVISION MEMOS THROUGH BANKS DELHI OFFICE

REGARDS

MIDDLETON

NOT TO BE TRANSMITTED

REFERENCE: RMS-620 Unaccounted-for Water

DRAFTED BY: RMMiddleton:jbe

CLEARANCES AND COPY DISTRIBUTION:

AUTHORIZED BY (Name): Richard N. Middleton, Sr. Sanitary Engineer

DEPARTMENT: EWTDR

SIGNATURE (OR initialed authorization to approve):

AUG 11 5 59 PM 1977

SECTION BELOW FOR USE OF CABLE SECTION

CHECKED FOR DISPATCH:

Pink - File Copy; WHITE - Transmittal Copy; YELLOW - 8th Copy

Water Supply + Sewerage

Mr. Harold Shipman, Consultant (EWTDR) August 8, 1977

H. W. Barker, Training Officer, EDC

The Economics of Metering

1. I refer to our discussion the other day on this subject and attach n/a a copy of the UK National Water Council (NWC) report on "Paying for Water". I hope that the paper on Metering at Appendix IV, page 31, together with the accompanying Tables, may be of some value to you in assembling your paper on this subject.

2. You will note that although the tone adopted is still somewhat guarded, the approaches recommended are more forward looking than the Malvern Report of 1969.

3. I think you will be interested also in the Second Report that I attach. This is the official NWC report on the methods used by the Water Authorities last year in England and water to tackle the unprecedented drought. The analysis of the principal technical and administrative problems which were faced could form a useful basis for a training session for any interdisciplinary group of water managers. Every senior level seminar or training course on water management should include one. I call it "The Management of Water under Crisis Conditions" and, as we know, this learning is relevant both to developed and developing countries.

4. I am in no great hurry for the return of the documents and perhaps you could pass them to John Kalbermatten to await his return from leave.

HWB:rak

cc: Mr. Kalbermatten
Mr. Chittleburgh/TAO 2/2

JMK for info → Task Grant
3z file.

Mr. Hans Pollan

August 3, 1977

Alain F. Thys

Attendance of Mr. Al-Khafaji at the International Congress on Desalination and Water Reuse

In agreement with the Water and Wastes Advisor in CPS, Mr. Kalbermatten, attempts are being made by the regional water supply divisions to assign some of their staff to keep abreast of the latest developments and innovations in selected technical areas of the sector. The goal is to advance and broaden the expertise of these individuals in these areas so that they could serve the Bank-wide need for such expertise.

Mr. Al-Khafaji was designated from our Division to follow up on developments and recent advances in the field of water desalination and related topics. He was involved in the review of the Saudi Arabia five-year water desalination program and currently working on the Montenegro Coastal Region Water Supply and Sewerage Project which could involve the use of reverse osmosis for treatment of brackish water. He has also been assigned to supervise the Engineering Loan to Oman for Power and Water Studies that will evaluate, inter alia, the development of dual purpose desalination plants to meet the projected power and water needs of Oman.

The International Congress on Desalination and Water Reuse, to be held in Tokyo November 27 to December 3, 1977, is sponsored by the International Desalination and Environmental Association and is expected to be an international forum for presentation and discussion of the latest advances in this field. We propose to have Mr. Al-Khafaji attend this conference and upon his return, report to the monthly meeting of staff of the water supply divisions, the highlights of the conference presentations.

Mr. Al-Khafaji is tentatively scheduled to visit Yugoslavia in mid-November for pre-appraisal of the Montenegro Coastal Region Water Supply and Sewerage Project (FY/79) and to visit Oman in late November for supervision of the Engineering Loan for Power and Water Studies. His travel arrangements to attend the conference will be coordinated with these missions. Conference attendance fees and related charges will be covered by the Training Division, Personnel Department.

May I have your concurrence.

cc: Messrs. Howard, Kalbermatten
Files

AK Al-Khafaji/ba

Water Supply + Sewerage

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

Yellow

OFFICE MEMORANDUM

TO: G.F. Darnell, Asst. Director, AGR, CPS

DATE: August 1, 1977

FROM: F.L. Hotes, Irrigation Adviser, AGRDR, CPS

SUBJECT: Attendance at Annual Meeting of Universities Council on Water Resources, Brookings, South Dakota, July 25-26, 1977

1. On July 25-26, 1977, I attended subject meeting, primarily to present, at the invitation of the Council, a paper entitled World Bank Activities in Financing International Water Resources Efforts. This was one of five papers presented at an afternoon session devoted to "International Exchange of Water Resources Information." The other four papers and their authors were as follows:

Non-U.S. Viewpoint: Dr. Ven Te Chow, President, International Water Resources Assoc.

The Role of U.S.A.I.D.: Dr. Frederick E. Hutchinson, Vice President for Research and Public Services, University of Maine

Consortia-A Review: Dr. Bruce H. Anderson, Consortium for International Development, Utah State University

Education and Training Exchange: Dr. Louis Goodman, Acting Director, Technical Development Institute, East-West Center, University of Hawaii, Honolulu

2. During informal discussions with meeting attendees over the two-day period I was asked several questions regarding the Bank and its operations. The question most frequently asked (by at least six different individuals) was "How many loan defaults has the Bank experienced?" My answer was: "None; but there have been special temporary moratoriums such as occurred after the change in government and the civil strife in Lebanon."

3. An interesting presentation with new (to me) information was given by Dr. Fred Hutchinson, Vice President for Research and Public Services, University of Maine, and a member of the AID Advisory Board on Agriculture. He indicated that the AID Administrator and the Board were still probing to find a good method of operating, since the Board, within its purview, was co-equal with the Administrator.

4. Dr. Hutchinson gave the example of sorghum as a crop to receive special attention and research efforts. The University of Missouri has been charged with writing a complete "State-of-the-Art" paper on sorghum, which will summarize knowledge and research needs. Missouri will not be one of the schools to conduct any of the specially-financed research on sorghum (to help maintain an unbiased report).

5. He also indicated, after my talk, that he would like to stop by the Bank on one of his next visits to Washington, D.C. to talk to some of the Bank staff about agricultural research. I told him that I'd be pleased to arrange some appointments (e.g. Yudelman, Darnell, Lejeune, Coulter, Fransen).

6. Dr. Bruce Anderson of Utah State University summarized the problems of the operations of Consortia comprised of several universities to assist in international agricultural development. He is Executive Director of the Consortium which includes Colorado State University, University of Arizona, University of California (Davis), Utah State University and three others. I had not previously been aware of the formation of a corporate entity for such work, to broaden the scope and depths of services available and to reduce impact on single university programs and staff. Anderson also mentioned that the costs of educating foreign students is, in effect, subsidized to the extent of 53% by the state of Utah. This is causing legislative concern especially when publicity is given to the fact that there are 200 Iranian students now in Utah universities.

7. During an afternoon meeting of a Committee on Technology Transfer I learned of the Newsletter Water Research in Action, which reports on such research in the 50 United States. I asked to be placed on the mailing list. Dr. Jack Jorgensen of the U.S. Office of Water Research and Technology stated that some people in the Bank do already receive it. I will try to arrange for a broader distribution within the Bank.

8. A copy of a bulletin on Guidelines for Water Resources Technology Transfer was obtained and will be circulated.

9. Some successes and failures of various university water resources institutes to have their findings distributed by state agricultural extension services, were reported. The consensus seemed to be that this avenue should be developed further.

10. A Seminar on desalination of brackish waters, groundwater, recharge, and conjunctive operation of surface and groundwater sources, is scheduled to be held in Orange County, California at "Water Factory No. 3." It would be useful for the Bank to have someone attend the seminar: perhaps Steve Allison and someone from John Kalbermatten's shop.

11. The Universities Council appeared eager to learn of Bank perceptions of research needs for water resource and agricultural development in LDC's. At various times during the sessions several of their representatives emphasized that their work is almost entirely "mission-or-problem-oriented, or should be," and that the universities need to make certain that key problems are focused upon.

FLHotes:dd

cc: M. Yudelman
J. Coulter
J. Fransen
J. Kalbermatten
S. Allison

Water Supply + Sewerage

Mr. W. J. Cosgrove, EMP July 22, 1977

H. W. Barker, Training Officer, EDC

Training Materials for Sewage Treatment Plant Operators

1. At the time of writing my memorandum to you dated July 13, 1977 I had not seen your letter dated June 28, 1977 to Mr. Alex Redekopp. The second paragraph of my memorandum is therefore answered. I would, nevertheless, be grateful for a copy of Mr. Redekopp's reply to your letter seeking information on training materials for use in French-speaking developing countries.

2. On the question of sources of information on technology transfer, the US Environmental Protection Agency has recently completed a project which had listed over 2,000 references which might be useful for water quality control training. This work has been assembled in the form of an Instructional Resources Information System (IRIS) for Water Quality. I hope to obtain a copy shortly and will be pleased to advise you on whether or not it could be relevant to your inquiry.

cc: Messrs. Pollan, Rietveld, Kalbermatten

HWBarker/jdb

File: TAO 18/3

Water Supply + Sewerage

Water Supply Reg.

Mr. R. M. Middleton (EWT) July 22, 1977

R. C. Prevost (AEPEW)

P.U. Report No. PUN 29, The Costs and Benefits of Water Metering, June 1977

1. In regard to our phone discussion on the above paper, I feel that it may be useful to clarify some aspects within the subject. Many of the following ideas expressed are implicit or implied assumptions within the above paper; they should be clearly and emphatically stated, whether or not they seem obvious. In essence, the paper attempts to set forth rules to make the decision to meter households based on "economic" considerations. The paper includes a two page essay (pp. 5 and 6) giving a general theory and three examples to which this theory is not directly applied and in which an estimate is made of the percentages of reduction required to balance metering costs against some of the consequent savings (foregone investments); these are followed by a judgment on whether such reductions can realistically be expected.

2. The first objective of metering has been, obviously, to enable the "utility" to charge for water. It is not the sole means by which charging can be accomplished but it is probably the most equitable and effective method. Since water charges or tariffs have been associated with metering from the onset, metering without "adequate" tariffs to meet the financial, social and conservation objectives which are sought makes little sense. Since "tariffs" are quite a sensitive issue in the Bank's operations, the association metering/tariffs is very important.

3. Although data are scarce - and indeed, they are difficult to be established - it can be considered as a fact of experience that metering plus tariffs reduce consumption up to 50%. Such a figure applies to cases where metering and tariffs have been instituted where none formerly existed.

4. As a result, metering/tariffs appear an efficient way to control consumption (or rather, to reduce wastage) and can be used for this purpose; it seems particularly suitable for use in LDCs. This has become a second objective for metering.

5. However, this kind of wastage control applies obviously to measurable wastage, therefore, to conscious uses of water. Water meters do not record small discharges of water and, hence, the normally tiny but continual flow due to inadequately maintained in-house systems: metering cannot control that kind of wastage, which is important and is a major part of the "unaccounted for" water.

6. Most generally, the consciously curtailed wastage of water has no "disutility" or other value, because most tasks can be thoroughly completed without "wasting" water (e.g., washing vegetables and cars, watering a garden, even taking a shower). Where the nonwasteful use of water stops and

wastage begins can be the subject of long discussions. The fact is, it is possible to satisfy one's needs fully with a limited amount of water, but one can waste a considerable amount of water before the harmful effects are noticed, and hence wastage is stopped.

7. There are, however, other means of controlling consumption: physical means, such as "ferrules" (orifice plates in the pipes), or special valves ("Fordilla" faucets, delivering a fixed volume of water per stroke). These create obvious inconveniences, or hazards, e.g., when associated with roof tanks, and, in most cases, do not primarily control wastage. Being generally used for unmetered connections, they increase the "unaccounted for" water. Further, a household which cannot afford a meter (costing say, US$20), can most probably not afford a connection, (costing say, US$100), and other water charges so there should be few of them. If there are few (potential) customers on a system, distribution is only possible through standpipes. Therefore, physical means of controlling consumption probably have limited applications - and is not a good solution because of their defects (although widespread in a number of countries).

8. The third major use of metering is statistics.

9. The fact that metering/tariffs may have quite a substantial impact on consumption is of prime importance, for determining the investments in production (source and transmission) and distribution. The amount of the investments may be much less in proportion to demand to be satisfied (simple extension); it may also grow much faster than demand (the new scheme would probably be much more expensive than the last one). As the paper points out, each case should be considered on its own merits. However, investments in urban water supply, whether for a new system or an extension of an existing system, usually amount to at least US$50 per capita served (c), up to more than US$300/c, not including the connection cost. For domestic consumers, the investments per household per connection, serving, say seven persons, would be at least US$350 + US$100 = US$450 and this may include a meter costing US$20 installed. The US$350 is paid by the utility and recovered later, the rest is invested by the customer. As the consumption foregone through metering/tariffs may be as high as the "useful" consumption, the decision about metering should be governed by the comparison between the cost of an installed meter (US$20), and the overall foregone investments, which are of the order of (at least) US$450 (or US$430) or a substantial part of the latter amount: the cost of the meter will most generally be a tiny fraction of the total investment for the community./1 A similar approach can be made in connection with the annual cost of the supply of water, in which metering, billing and collection represent only a small percentage of the total [illegible]; they are dwarfed by all pipeline and other capital costs, labor costs, and the other, usually less important power costs, etc. There is little doubt, therefore, that metering will be justified in most instances, but adequate tariffs have to be instituted or restored jointly. This is not the impression the reader gets from the paper.

/1 Even taking into account the short lifetime of a meter (which is more than five years).

10. That industry and large customers are to be metered is not questioned. In these cases, there may be a cost to foregone consumption, in connection, e.g., with substitutes.

11. Obviously, the reduction of consumption in connection with metering/tariffs is due to the customer safeguarding his own interest in avoiding unnecessary water charges. On the other hand, the utility decisions are not necessarily governed by considerations of the costs to its customers. The inequality called the "metering decision relationship," of page 6, mixing savings, some of them called costs, and costs to the consumer (some of them immaterial) and costs to the utility would apply to a regulatory or planning agency - or the Bank - concerned with the general interest of the community. There is, however, no need for semi-mathematical developments of imprecise notions when a few plain words can do - as the conclusion shows.

12. The three cases of the paper follow one of the right approaches for justifying or rejecting metering. Case A, however, becomes immediately suspicious because there is no mention of the distribution costs (always large) and the exceptionally high cost of the meters (at 1974 prices!) is not justified. Would it not be better to state the case as follows: "let us assume that the marginal cost of water is US 6¢/1000 Ig, as the result of exceptionally low cost of source and distribution work ...."? Indeed, in such a case, it may well not be justified to meter demand of about 100 Ig/cd (450 l/cd) in a very poor country!

13. In city B, the fact is stated that unmetered connections (how are they measured?) consume 40% more than metered connections: indeed savings of 10% can be expected through metering! What matters is that the 40% saved covers the metering costs with a substantial profit. But, it is not clear how the figure of $6.2 has been arrived at, or why the consumers save 40% when they are metered.

14. In the last case, contrary to the last para. of page 11, there is a worthwhile saving to the consumer equal to US$0.06/cu m (price of water) x 40 cu m/month (foregone consumption through metering) = US$2.4/month, which explains the suppression of the consumption from about 210 l/cd for consumers recently metered to 80 l/cd. The "consumer cost" (second para., page 12) or foregone consumption estimated at $1.20/month, does not seem to mean much; the same for the consumer cost K, whose calculation has something wrong with it (first para., page 12). Here again, what matters is to show that the annual cost of metering is a fraction of the annual capital cost of the foregone investments.

15. While the rationale in the three examples is basically correct (but there may be other ways to conduct it), the theory on pp. 5 and 6 needs a few corrections:

/1 Even when all cost to the community is considered.

(a) First para., p. 5: On the contrary, the demand is affected by price, otherwise there would be no decrease in consumption when metering is instituted.

(b) Seventh line, first para., p. 6: the quantity between the square brackets is equal to $1/2\ p(V_1 - V_2)$, which is -K not E.

$E = p\ (V_0 - V_1) - 1/2\ p(V_2 - V_1)$ (see figure bottom p. 5).

That $V_0 > V_2 > V_1$, should be taken into account.

16. In conclusion, it should suffice to state that the benefits of metering, which are all foregone costs, must exceed its cost and the best possible estimates of all factors involved should be made in each case. This is not exactly what is stated in the conclusion. Also when "the metering decision" is to be taken, the following should be considered:

(a) the system of water charges;

(b) data collection;

(c) possibility, ways and means, and program of implementation of the "decision"; and

(d) the distribution of water through standpipes, wherever the financial and conservation objectives are out of reach through metering, or, possibly, physical means of controlling consumption.

cc: Messrs. Kalbermatten, Beach
AEP and Division Files

RCPrevost:md

BOOKMAN-EDMONSTON ENGINEERING, INC.
SPECIALISTS IN WATER RESOURCES
102 NORTH BRAND BLVD., SUITE 600
GLENDALE, CALIFORNIA 91203

TELEPHONE
(213) 245-1883

OFFICES
GLENDALE, CALIF.
BAKERSFIELD, CALIF.
SACRAMENTO, CALIF.
WASHINGTON, D. C.
IN MEXICO CITY
HIDRO-CONSULT, S. A.

July 21, 1977.

Mr. R.N. Middleton
Senior Sanitary Engineer
Energy, Water & Telecommunications Dept.
International Bank for Reconstruction
& Development
1818 H. Street, N.W., Room D-1036
Washington, D.C. 20433.

Dear Dick:

In the "Scope of Work" for preparing the pipeline materials paper, there are included some words to the effect that analysis of the Bank's experience in some 70 water supply and sewerage projects in some 40 countries would be of considerable assistance. To this end, I have reviewed my notes on the meetings in Washington and find it difficult to correlate the comments with more than a very few specific projects. I am also not sure that all of the people involved were represented in the meetings. I have, therefore, prepared a short questionaire covering points I feel are critical to such an analysis. It would be helpful if, prior to my coming to Washington, these forms could be circulated to the cognizant parties in order that they could accumulate some of the data prior to our next meeting. As an example, I have filled out one copy of the form with information taken from the report on the Ivory Coast Project.

With regard to the next visit to Washington, I understand from Maurice Langley that you will be out of the country during the week of August 3. I have two commitments, one for the week of August 15 and another for the week of August 29, but could schedule the trip at any other time satisfactory to you. Please let me know what arrangements can be made.

I have so far accumulated a considerable volume of data, a large portion of which is from either the Bookman-Edmonston library or my own personal library. I do not know what your ideas on this material are;

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INCOMING MAIL UNIT

however, applicable material will be referenced in the bibliography. Some of it is available from manufacturers and some commercially. How this should be made available to you can be a subject for discussion during the Washington trip.

Maury also mentioned that you do not have a record of who we met with when I was in Washington. Enclosed is an internal memo prepared after the trip which lists the names as I got them at that time.

Very truly yours,

Bookman-Edmonston Engineering, Inc.

By:

James R. Cannon

Enclosure

MEMORANDUM

To: Files (360.4)

From: J. R. Cannon

Date: April 14, 1977

Subject: Meetings with World Bank Staff

On April 7 and 8, 1977 the writer met with World Bank staff members to discuss with them their concerns regarding pipeline materials and specifications. The purpose of the meetings was to determine the principal direction and emphasis that the upcoming paper should take.

The staff members met, and their areas of responsibility were:

J. Kalbermatten, Water and Wastes Adviser
R. Middleton, Senior Sanitary Engineer

Latin America and Caribbean

A. Zavala, Division Chief
L. Chang, Engineer
J. Freedman, Engineer
E. Maisch, Engineer
A. Sanchez, Engineer
C. Fernandez, Financial Analyst

Europe, Middle East and North Africa

W. Cosgrove, Deputy Division Chief
R. MacWilliam, Engineer
J. Renkewitz, Financial Analyst
A. Banerjee, Technical Assistant

East Asia and Pacific

A. Bruesfle, Engineer
A. Saravanapavan, Engineer

South Asia

E. R. Williams, Division Chief
J. Pettigrew, Engineer
P. Ware, Engineer

Western Africa

J. Buky, Engineer
E. Motte, Engineer

With each group there was a discussion of the problems and concerns that they had, and these were widely varied. This memo will attempt to generally categorize them.

Pipeline Materials

Suitability of prestressed concrete in sea water.

Use of PVC and PE in hot climates (ultraviolet).

Combined use of varied materials.

Cement and aggregate quality

Concrete pipe for sewers

Cast in place pipe (No Joint)

Ductile iron (cathodic protection)

Effect of salinity in water

Types which can be produced locally and which should not.

Castiron-carbonization
Vitrified clay

Pipe joints in all types

Expected life of various materials

Appurtenances

Air valve design and reliability

Standards for house connections

Connections to PVC (Hays Mfg. Co.)

Fittings made by gluing ends together and wrapping with fiberglass

Cutting RCP for fittings

Relative costs of available materials

Size of valves relative to size of pipe

Valve markers

Tracer lines on plastic or AC pipe

Bedding, Backfill and Soils

Working below the water table and in tidal areas

Aggresive soil (effect of pH)

Cities which are built on fill materials

Justification of changing bedding and backfill specifications with change in pipe materials

Frost action

Expansive soils

Testing for soils resistivity

Linings and Coatings

Epoxy (reliability, abrasion resistance, flexibility)

Lining in hot climates

Lining in place

Rehabilitation

Cleaning and lining

Polyethylene bags for castiron and ductile iron pipe

Miscellaneous

Pipelines in sea water

Seismic effect

Price trends

In-plant inspection

Performance record of various materials

Cover and wheel loads

At what point does it become economic to set up pipe plants?

Stress corrosion in prestressed pipe

Comparison of furnish and install contracts as opposed to separate contracts

Testing and inspection

Possibility of infection caused by joint lubricants

Storage and packaging

Water Supply + Sewerage
R-610
GLP-Water Supply

Water Supply Task Group Members July 21, 1977

Richard N. Middleton, Senior Sanitary Engineer (EWTDR)

Research by Professor Donald Lauria - Low-Cost
Water Distribution Systems

1. Professor Lauria has recently submitted his final report on his initial studies, covering water distribution networks in Bogota (Colombia), Sana'a (Yemen) and Ouagadougou (Upper Volta). The results appear far more useful than we had hoped when launching this study: simple equations relate variables such as persons per standpipe, per capita water use and average pipe size, allowing secondary distribution designs to be checked and costed by slide rule calculations. The effects of varying design criteria or of altering network staging can be quickly investigated.

2. We now propose to verify these mathematical models in further case studies of Bank projects. Meanwhile, the results appear interesting enough to justify publication, and a draft paper in the EWT Research Working Paper series has therefore been prepared. A copy is attached for your review, and I would be grateful for any comments by c.o.b. August 5.

Distribution

Messrs. Kalbermatten, Ringskog, Warford, Saunders (EWTDR), Bharier (CPS), Singh, Strombom, McCullough, Stone (URB)

cc: Mr. Lauria

Attachment

RNMiddleton:jbe

Water Supply + Sewerage

Mr. W. J. Cosgrove, EMP

July 13, 1977

Horace W. Barker, Training Officer, EDC

Training Materials for Sewage Treatment Plant Operators

1. I have noted your inquiry dated February 7, 1977, to the Training and Certification Section, Ministry of the Environment, Toronto in connection with training programs for personnel responsible for the operation and maintenance of water and waste water systems and would be pleased to offer you further advice on such training, should you require it.

2. Mr. R. R. Doddridge, in his reply to your letter, referred you to Mr. A. B. Redekopp, Chief, Training and Technology Transfer Division, Environment Protection Service, Ottawa, and I would be interested to know whether you have followed up this suggestion. I am reasonably familiar with Alex Redekopp's work, the central feature of which is the production of thoroughly evaluated audio-visual slide-tape instructional programs covering most, if not all, of the sewage treatment plant operations and processes both basic and complex. Although the instructional programs that I personally have seen used English scripts, I know that it was Mr. Redekopp's intention to produce programs using the French language. It is possible that he may, by now, have achieved this.

3. I have no doubt that selected samples of these programs could be demonstrated to you and your water engineers and know that Mr. Redekopp would be happy to cooperate in this way. I believe he will be visiting Washington in late August on other business and, if suitable to you, I would be pleased to pursue this on your behalf.

4. The attraction of these particular programs is that they have been designed to be used either for self-learning by individual plant operators (on remote stations), or, supported by appropriate instruction manuals, by supervisory staff for small group instruction of plant operators.

5. An additional source of training literature of the kind that you have in mind could be the Compagnie Generale Des Eaux, Paris, where the Training Manager M. Claude Dyard operates a comprehensive training program for water services operators and supervisors. M. Dyard's training resources includes a well equipped practical, off-the-job training center located at Orleans from which training manuals may be available upon request.

6. I know Claude Dyard well and, again, would be pleased to pursue this lead on your behalf.

cc: Messrs. Pollan, Rietveld, Kalbermatten, Chittleburgh

HWBarker/jdb

TA: ~~HH~~ 18/3

sent 7/22 Send cc to Rietveld, then B-E File.

BOOKMAN-EDMONSTON ENGINEERING, INC.
SPECIALISTS IN WATER RESOURCES
102 NORTH BRAND BLVD., SUITE 600
GLENDALE, CALIFORNIA 91203

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IN MEXICO CITY
HIDRO CONSULT, S. A.

7/21

July 11, 1977

Mr. R. N. Middleton
World Bank
Energy, Water and Tele-
Communications Department
1818 H Street
Washington, D. C. 20433

Dear Dick:

I have read with interest the report by Mr. Vos on the manufacture of concrete pipe in Abidjan. I would offer a few additional comments.

Apparently the pipe is to be used for sewers. Mr. Vos states that a lifetime of at least 25 years can be expected under normal conditions. There is a technique for estimating the life of concrete and asbestos-cement pipe used in sanitary sewer systems. This method is known, in this part of the world, as the "A-Z Method" and is put forth in "Process Design Manual for Sulfide Control in Sanitary Sewer Systems" EPA 625/1-74-005, U. S. Environmental Protection Agency, October 1974 and in the "Sewer Design Manual" distributed by Hydro Conduit Corporation P. O. Box 939, Corona, California.

I certainly concur with Mr. Vos that the pipe should be put into curing as quickly as possible. I do not know what the climate in Abidjan is, but if there are periods of low humidity this would be very important. As a practical matter, pipe curing is sometimes not started until enough units have been manufactured to provide a full curing area, but no later than the end of the day manufactured.

I note that Mr. Vos mentions a bedding factor of 1.8. Not having seen the specifications, I can't say whether this is reasonable; but I do know that it takes considerable care and effort to provide bedding of this capability. It would require compacted granular bedding under the pipe

and up to the horizontal diameter, or a bedding in granular fill shaped by template to the external diameter of the pipe. A designer would be wise to assume something much lower. I recently had occasion to testify at a hearing concerning a pipe failure where, among other things, the designer had assumed a bedding factor of 1.5 when the specifications would provide not more than 1.1.

I have had correspondence with ARC Concrete regarding their "Slimline" pipe. The material you had furnished left several questions in my mind, and Mr. Farahar has resolved most of them. One remaining, or rather new question, did arise. Mr. Farahar stated that current U. K. practice relates trench widths to the internal diameter of the pipe; however, the dimensions quoted do not appear to provide sufficient working room for adequate compaction. Incidentally, I note that ARC Concrete is a member of the Gold Fields Group. The Gold Fields Group has just acquired Hydro Conduit Corporation that I mentioned above.

As I expected, correspondence and obtaining specifications is taking longer than I hoped. The British Standards Institute, AFNOR and DIN publications are available from ANSI in New York. However, only AFNOR sent a list so that I am now trying to create a list of applicable British Standards. I have not been able to obtain information on the DIN standards.

We have also inquired about the Japanese Standards, but I am advised that these are only published in Japanese.

I have recently received information on a new type of fiberglass reinforced plastic pipe using a technique that results in a rigid pipe. The data I have so far received is sketchy, although I have talked to the developer. He is out of the country at present since they have shipped a plant to Taiwan to start producing the material there. Apparently the equipment is such that the pipe plant can be portable.

Very truly yours,

James R. Cannon
Chief Design Engineer

GLP - WATER SUPPLY

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Files

DATE: July 7, 1977

FROM: Richard N. Middleton (EWTDR)

SUBJECT: IDRC Activities

On July 6 I was telephoned by Mr. Journey (IDRC), who has just returned from a mission to Africa and Asia. Among the points raised were:

Thailand

Mr. Charan Burapharat (Chief, Infrastructure Project Division, NESDB) is interested in further development of indigenous hand pumps and simple drilling rigs.

IDRC are likely to support this project, working through Asian Institute of Technology, Bangkok. Tentative plans are to hold a workshop in Bangkok in October 1977, to discuss the problem and formulate the project more precisely. Mr. Journey will call the Bank divisions responsible in the course of the next two weeks to invite Bank participation.

Bangla Desh

The Cholera Research Laboratory is reorganizing and will now have an Environmental Division. This new division is planning a research project on the design of individual household systems incorporating simple pumps and some in-house storage.

Kenya

The newly-established Socio-Economic Research Division within MWD is seeking IDRC assistance in developing simple fluoride-removal techniques for small systems.

IDRC are sending the research division data on community participation in water supply schemes (mainly from LAC), for possible trials in Kenya (I repeated to Mr. Journey the information given me by Mr. Kozel - that vandalism had increased following community participation, since MWD had been unable to provide a good service and the villagers were naturally annoyed; this implies that participation is of little use without competent institutions).

The research division (headed by Mr. David Baker) are also interested in pumping technology - possibly using photovoltaic systems and Wanlass induction motors. Mr. Baker has apparently already developed a self-washing upflow filter, which is in successful operation in Uganda.

Desalting

An Australian invention is a polymer which will remove salts from brackish water. Back-flushing is by means of hot water, not chemicals. IDRC are obtaining further details.

cc: Messrs. Kalbermatten (EWTDR), Golan (AEP), Beach (AEPEW), Erkmen (EAPEW), Allison (AGP), Williams (ASPEW)

RNMiddleton:jbe

Water Supply + Sewerage

Files

July 7, 1977

Rafael I. Rodriguez

Kensington, New York - Refusal to Waterborne Sewerage

In the last Review Panel Meeting, the village of Kensington, New York was mentioned as not wishing to have sewers installed. Mr. Dick Salkai, EPA Sanitary Engineer in charge of the Nassau County where the village is located, explained to me that the area is one of large states where septic tanks are most economical than waterborne sewers. Furthermore, Mr. H. Richmond, Superintendent of the Sewer District of Great Neck - a neighbor village to Kensington - confirmed the statement and added that preliminary surveys had demonstrated that because of the topography of the land, 15 pumping stations would be needed if a waterborne system was to be installed, making the cost of it unnacceptable for a population of less than 4,000.

CC: Messrs. Kalbermatten, Gunnerson, Julius
RRodriguez:sp

IDENTIFY

G2D - WATER SUPPLY

RES
R620

July 6, 1977

Mr. A. C. Chaturvedi
Chairman, Environmental Division
Institution of Engineers (India)
B/6, 3-Park Road, Lucknow-226 001
INDIA

Dear Mr. Chaturvedi:

Thank you for your recent letter. I am glad to hear that your various visits to the water undertakings around the Far East were of value, and look forward to reading about your findings.

You should by now have received all the appraisal reports which we were able to collect. I regret that it has taken us somewhat longer to assemble the various supervision reports, but those listed in the attachment are now on their way to our Delhi office, with a request that they notify you when they arrive.

Your fees request is now being processed; unfortunately it arrived at the end of our financial year, when the various departments concerned have a particularly high work load, but I hope settlement will not be unduly delayed.

With my regards to your wife,

Yours sincerely,

Richard N. Middleton
Senior Sanitary Engineer
Energy, Water and Telecommunications Department

Attachment

RNMiddleton:jbe

ATTACHMENT

	Country	Project	Date of Supervision Report
East Africa	Kenya	Mombasa and Coastal Water Supply	02/04/77
	Zaire	Water Supply	03/15/77
	Swaziland	Water Supply & Sewerage	05/25/77
West Africa	Ghana	Accra Tema Water Supply	03/28/77
	Gabon	Libreville Water Supply	07/13/76
	Cameroon	Douala & Yaounde Water Sup.	05/30/73
EMENA	Egypt	Alexandria Water Supply	05/27/77
	Jordan	Amman Water Supply & Sewerage	04/18/77
	Tunisia	Urban Sewerage	05/02/77
	Yugoslavia	Sarajevo Water Sup. & Sewer.	04/04/77
		Sarajevo Air Pollution	05/ /77
East Asia and Pacific	Indonesia	First Water Supply	01/28/77
	Philippines	Manila Water Supply	06/16/75
	Malaysia	Kuala Lumpur Water Supply	04/16/77
		Kuala Lumpur Water Supply	02/14/77
		Kuala Lumpur Water Supply	02/07/77
	Singapore	Second Sewerage	02/11/77
		Environmental Control	02/11/77
	Thailand	Bangkog Water Supply	03/31/76
South Asia	Bangladesh	Chittagong Water Supply	04/07/77
		Dacca Water Supply	04/14/77
	Pakistan	Lahore Water Supply	05/03/77
	Nepal	Water Supply I	11/10/76
	India	Calcutta Water Supply	08/07/76
	Uttar Pradesh	Water Supply	01/26/77
	Bombay	Water Supply	01/11/77
LAC	Mexico City	Water Supply	05/18/77

	Country	Project	Date of Supervision Report
LAC	Panama	Water Supply	12/29/76
	Colombia	Palmira I	04/18/77
		Bogota I	06/16/76
		Cali Water	11/18/76
		Medium Cities	04/15/77
	Bolivia	Water Supply	03/10/77
	Brazil	Sao Paulo Water Supply	10/11/76
	Nicaragua	Managua 2nd	10/28/76
	Jamaica	Kingston Water	11/05/76
	Ecuador	Guayaquil and Guayas Water	05/27/77
	Bahamas	New Providence	05/06/77

Mr. John M. Kalbermatten June 30, 1977

Rafael I. Rodriguez

Project Investment and Operating Data

Introduction

1.1 Up until now, the World Bank has appraised and financed through IBRD loans and IDA credits over 85 Water Supply and/or Sewerage projects. Of these, 68 were approved after 1970 and 42 after 1974. If properly collected and analyzed, many loose data contained in and generated by past projects could produce much valuable information for better projects in the future.

2.1 The objective of the proposed undertaking is to obtain this information on past projects and institute a proper data reporting system aimed at retrieving useful information from project data. This involves identifying the possible sources of data within and outside the Bank, selecting and collecting the relevant data, creating a data base, preparing a computer program to process it to its final form, and setting the requirements for periodical updating to avoid obsolescence. According to the types of information described in paragraph 3, the exercise will yield two basic results: a) A summary of investment costs, tables and graphs that could be used for preliminary cost estimates and b) a project data sheet, containing basic statistics of any particular project that may serve either for calculating monitoring indicators, or as a basis for finding trends, design criteria, or simply judging elements of regional projects.

Types of Information

3.1 Two types of data are sought. The first kind relates essentially to capital costs at a given date, of major components of Water Supply and Sewerage projects (equipment - materials - labor). If allowances for import duties, freight, and other adjustments are taken into consideration, the information becomes a good estimate of regional average prices. The second type - operational data - refers specifically to the project and the institution carrying it out. It comprises technical, administrative and financial parameters from which a set of monitoring indicators can be derived. Unlike the first category, this group of data changes as the project develops and the indicators are subject to manipulation and corrective action by means of proper administrative measures.

3.2 Given the large number of parameters that could be included in both cases and the man-hours needed to collect and process them, it is necessary to restrict ourselves to a few elements for each of the tentative categories described in paragraph 3.1 . Besides, the very nature of the available sources of data impose certain restrictions. In the

case of bid documents, they often do not present quotations on every single component of a category of items but refer to an entire group including several items in it making it difficult to arrive at the real cost of the separate element. This, of course, is particularly true for investment costs. The limitations force us to prepare tables and graphs with average values only. This will necessarily restrict the usefulness of the results. The major constraint of the operating and monitoring data is the lack of information collected and presented in past projects.

3.3 A survey done in August 1975 by the LAC Water Supply Division on 36 projects approved after 1969, showed that a great number of projects lacked some of the most basic information required for sound project appraisal. Annex 3 presents the result of this survey in terms of percent of projects lacking selected items of data.

In both cases, steps can be taken to correct the deficiencies already incurred, what matters is that provisions are made for future data to fulfill the requirements of the data base and to ensure the validity of it.

Investment Cost

3.4 Under this category the unit cost of a major water supply and sewerage components are included. Since local availability determines prices to a large extent, it is necessary to make regional breakdown and investigate the situation in each of the six regions the Bank is divided into. CIF or FOB prices should be indicated where possible. Although price variations may be wide between countries; only three or four countries should be selected within each region. Since the purpose of the exercise is to serve as guidelines, it can be expected that for instance, prices of imported items in Ecuador will not be that much different from those in Colombia or in Seoul from those in Manila.

Investment Categories

3.5 Water Supply investment costs can be grouped into: a) Source of supply (i.e. wells-tanks-reservoirs), b) pumping plants (for wells and water distribution networks), c) treatment plant (treatment processes), d) transmission and distribution (pipes), and e) installation costs, especially related to lying of pipes. For sewerage, b) through e) apply as well.

Tables 1-A to 7-C show the proposedformat and items for water and sewerage components. (See Annex 1)

Sources of Information on Investment Costs

3.6 Bid documents held in Central Files and appraisal reports will provide some of the items required. Both sources should be looked at bearing in mind the limitations expressed in paragraph 3.2.

The most reliable sources of these data are the borrowers themselves. Other sources might be contractors, consulting firms and producers of equipment and materials, previously involved in Bank projects. Some trade publications such as Engineering News Records often provide updates on costs.

Operating and Monitoring Information

3.7 By calculating a number of monitoring indicators from basic parameters, this category is designed to provide specific technical and financial information from the projects, and the institutions that carry them out. The indicators can be grouped into: a) those by which one is able to assess the performance of the firms, by comparing actual with past results at periodical intervals i.e.: debt service ratio, monthly consumption, percent unaccounted-for water etc.; and b) those which relate exclusively to the project and serve as a measure of the overall achievements of the project (i.e. population served, rate of return, etc.). Choosing a proper set of control indicators that reflect the performance of a project or its executing agency is a rather controversial issue. The LAC Water Supply Region has developed 50 of these indicators[1/] (see attachment I) that are being presently used in the appraisals and supervisions of the region's projects. The indicators here mentioned are part of the ECOFI computer program developed by Mr. Fernandez (LACWPS) for the appraisal and supervision and sewerage projects. It is worthwhile mentioning that this program provide, beside a thorough technical, financial and economical analysis of the projects, any number of these indicators and if utilized by all the divisions, it will provide a standard reporting of information. Recently, Mr. Costa (LACWPS) has identified 19 of the most important of these indicators (see Annex 2) and presented them as a viable alternative to fulfill the needs of full reports.

So far, no agreement or discussion has taken place regarding the definitions of the indicators and/or variables involved. Most of the skepticism from engineers and financial analysists is not because of limited usefulness of the indicators, but rather because of the number that should be included and the time it would take to calculate them if there were to be many of them. It is true that the calculation may sometimes involve up to four different variables per indicator. But the parameters needed are basic to any project and should pose no difficulty to obtain.

An attempt should be made to standarize the quality and quantity of the data and information presented in appraisal and supervision reports and to provide some minimum control indicators in each project. Only then, will the efforts to obtain useful information yield positive results.

1/ Twenty-five of these 50 were selected and approved by the Division Chiefs.

Table 8 includes all the variables required to calculate any subset of the indicators proposed by Mr. Fernandez. The actual number of monitoring indicators above an established minimum will be the decision of the project officer. If this information is made available for each water supply and sewerage project, a very complete and comprehensive data base that will provide project, country and regional information can be set up.

Sources of Information

3.8 Appraisal Reports, Sector Studies and President Reports are the prime sources of data. Engineers and financial analysts will complement in most cases, missing data. The data base should contain at least all of the projects aproved since FY1974. Those for which data are not available have to be left as they are, but future projects must include a table of data similar to Table 8.

Updating

4.1 Once the initial data base is created, it will be necessary to update it periodically as price variations occur and enlarge it as new appraisals and supervisions take place. CPS should provide some initial assistance mainly in creating the required infrastructure, but thereafter, each region must be responsible for acquiring and processing its own data at least once a year. Blank tables could be provided to the missions which in turn will have the entities fill them out, as they are the most qualified vehicle for obtaining the data given their accessibility to local suppliers of equipment and materials. Unless the basis for periodical up-dates are set forth and the mechanisms implemented, the entire effort of the initial data collection will be meaningless.

Manpower Requirements

5.1 For the collection of data from the various Bank files, it is estimated that at least one man-day per project included will be required. In addition, six man-weeks are estimated to design and test a computer program to process the data. Both activities can be developed simultaneously. CPS through a summer assistant could undertake part of the task, and those divisions with temporary help could do their own data collection.

Attachments

RRodrigues:sp

TABLE 1-A

Source of Supply - Wells [1]

Country	Town	Year Construc.	Drilled	Dugged	Capacity Lt/Sec	Depth in Meters	Cost in US$	Additional Coments

1/ Excludes the cost of pumps. If prices are quoted including the pump as well as other items (screens, etc), please fill Table 1-B

TABLE 1-B

Source of Supply - Wells Complete

Country	Town	Year Construc.	Drilled	Dugged	Capacit Lt/sec	Depth (meters)	Cost in US$	Additional Coments

TABLE 1-C

Storage Tanks

Country	Town	Year Construc.	Volume		Elevated Reservoirs			Ground Reservoirs		Coments
			M^3	MG	Elevation	Material	Cost U.S.$	Material	Cost U.S.$	

TABLE 2

Water Pumping Stations

Country	Town	Year Installed	Capacity lts/sec	Head Meters	Unit Price US$	Comments

Table 3

Water Treatment Plants

Country	Town	Year	Design Capacity		Treatment Process									Unit Price US$	Coments
			m^3/sec	Mgd	Presettling	Prechlorinat.	Mixing	Flocculation	Sedimentation	Slow Filtrat.	Rapid Filtrat.	Chlorination	Other		

Table h- A

Water Supply Pipes [1]

Country	Town	Year	Diameter		Working Pressure		Asbestos Cement	Cast Iron	Steel	PVC				Availability		Price U.S.$ per		Coments
			Cm.	In.	Kg/cm^2	Atm.								Local	Other	Mt.	Ft.	

1/ Should include the costs of joints but exclude installation costs

Table 4-B

Water Supply Pipes - Installation Costs [1/]

Country	Town	Year	Diameter (Inch)	Depth (Ft.)	Type of Soil	Working Pressure (kg/cm^2)	Asbestos Cement	Cast Iron	Plastic	Steel		Cost/meter US$	Comments

1/ Should include: transportation costs, laying, joining, testing, excavation, refilling and repavement of trenches

TABLE 4-C

Water Supply Pipes - Complete Works 1/

Country	Town	Year	Diameter (cms)	Depth (mts)	Type of soil	Working Pressure (kg/cm2)	Asbestos Cement	Cast Iron	Steel	P.V.C.		Cost/meter US$	Comments

1/ Should include: Supply and installation.

TABLE 5-A

Waste Water Pumping Stations Equipment

Country	Town	Year	Capacity (lt/sec)	Head (meters)	Unit Price US$	Comments

TABLE 5-B

Waste Water Pumping Stations - Civil Works and Equipment

Country	Town	Year	Capacity (lt/sec)	Head (meters)	Unit Price US$	Comments

TABLE 6

Manhole Construction Costs

Country	Town	Year	Manhole Depth (meters)	Diameter (cms)	Unit Price US$	Comments

TABLE 7

Waste Water Treatment Faccilities

Country	Town	Year	Capacity	Procces	Cost US$	Comments

Table 8
Project Data Requirements

A

GENERAL

1 - Name of Project _____

2 - Loan/Credit Number _____ 3 - Region _____

4 - Country _____ 5 - City (ies) _____

6 - Local Currency _____ 7 - Income/Capita _____

8 - Date of Appraisal _____ 9 - Date of Last Supervision _____

B

	Water Only	Sewer Only	Water and Sewer
1 - Appraisal Cost of Project (M.US$)			
2 - Present Estimate (M.US$)			
3 - Executed Works to Date (M.US$)			
4 - Length of Pipes (Meters)			
5 - Design Population			
6 - Estimated Completion Date			

Project Description _____

Table 8

			At Appraisal 197_	197_	197_	197_	Estimate at completion 19_
		- Exchange Rate (US$ 1.0 = ___)					
G	Revenues	1- Tariff Revenues					
		2- Total Operating Revenues					
		3- Total Nonoperating Revenues					
		4- Total Revenues					
H	Costs	1 - Total Operating Cost					
		2 - Total Nonoperating Cost					
		3 - Total Cost					
I	Assets and Equity	1 - Fixed Assets in Operation 1/					
		2 - Average Net Assets in Operation 1/					
		3 - Work in Progress					
		4 - Depreciation					
		5 - Accumulated Depreciation					
		6 - Debt Service					
		7 - Total Liabilities					
		8 - Total Equity					

1/ Revalued ( ) Unrevalued ( ). If revalued, please provide date of last revaluation. _____.

Table 8

			At Appraisal Date _____	19__	19__	19__	Estimates at Completion 19___
C	SERVICE	1 - Total Population of Project Area					
		2 - Total Population with Water					
		3 - Population with House Connections					
		4 - Population with Standpost Supply					
		5 - Population with Other Supply					
		6 - Population with Sewer					
		7 - Population with Other Waste Disposal					
D	CAPACITY	1 - Storage Capacity					
		2 - Maximum Delivery Capacity (water)					
		3 - Maximum Treatment Capacity (sewer)					
E	DEMAND	1 - Volume Produced					
		2 - Volume Metered					
		3 - Volume Sold					
		4 - Percent Residential Consumption					
		5 - Percent Un-accounted for					
F	DISTRIBUTION	1 - Number of Metered Connections					
		2 - Number of Unmetered Connections					
		3 - Number of Residential Connections					
		4 - Number of Standposts					
		5 - Number of Sewer Connections					

A.0 Appraisal estimates means the total Project cost as estimated in the Appraisal Report.

A.1 Present estimates means the total Project cost as estimated at the end of the latest quarter.

A.2 Executed means the total amount of invoices regarding Project Cost.

A.3 Contracted means the total amount of the contracts signed by the Borrower to execute the Project with a provision for future price adjustments.

B.0 Annual Inflation Rate - Appraisal means the estimated rates of inflation appearing in the appraisal report for the years under consideration in Table B.

B.1 Annual Inflation Rate - Actual means the new estimates at the time of preparation of Table B.

B.2 Total Population Appraisal means the estimated population appearing in the appraisal report for the years under consideration in Table B.

B.3 Total Population Actual means the new estimates at the time of preparation of Table B.

C.0 Volume Produced means the total volume of water treated and delivered to the system (at plant output).

C.1 Volume Sold means the metered volume plus the volume of water which could be bought by the amount paid by unmetered connections (equivalent water sold).

C.2 Operational Revenues means revenues directly related to the services rendered. They cover: tariff revenues; other operational revenues (connection fees or rights1/; assigned taxes and miscellaneous revenues; late payment charges; other fees; etc.).

C.3 Operating Costs means all the costs incurred and directly related to providing the services, including taxes, but excluding depreciation, interest and non-operating costs, such as earnings on the sale of assets, etc.

C.e This year's updated budget means new estimates for the total year on the basis of the experience gained (C.c)

C.f Appraisal Estimates this year means the figures of appraisal for the year under review.

1/ Excluding connection charges.

D.0 Total Connections Before Project Start means the number of existing connections in the year the Project has been approved by the Bank.

D.2 Total Connections End Last Year means the number of connections at the end of the year preceding the one under review.

D.3 Total Connections End of This Period means the number of connections at the end of the quarter preceding the supervision mission.

D.6 Number Employees End of Period means the total number of full-time employees, plus the full-time equivalent of part-time employees. Since the number of employees is to be provided for water supply and for sewerage, each figure should include part of the employees involved in both services (e.g., administration).

E.0 Total Receivables means uncollected amounts due from customers at the time the Project was accepted by the Bank (Ea) and at the end of the quarter preceding the supervision mission (Eb). They are net of allowance for uncollectable accounts. They do not include, in principle, long-term receivables.

COMPUTATIONS

Monitoring Indicators		Computations
A.4	% Execution	$\frac{A_2}{A_1}$
A.5	% Contracted	$\frac{A_3}{A_1}$
B.4	Population Growth Appraisal	$\frac{\text{Year n - Year (n-1)}}{\text{Year (n-1)}}$
B.5	Population Growth Actual	Same as B.4
C.d	% Completion this year	$\frac{C_c}{C_b}$
C.g	% Completion updated Budget vs. Appraisal	$\frac{C_e}{C_f}$
C.4	Revenues Per Unit Produced	$\frac{C_2}{C_0}$ (In local currency and US$)

Monitoring Indicators		Computations
C.5	Costs Per Unit Produced	$\frac{C_3}{C_0}$ (In local currency and US$)
C.6	Average Tariff	$\frac{C_2}{C_1}$ (In local currency and US$)
C.7	Unaccounted-for Water (%)	$\frac{C_0 - C_1}{C_0} 100$
D.1	% Increase Appraisal Estimates	$\frac{\text{Total Estimated Connections at Completion of Project} - D_0}{D_0}$
D.4	% Increase End Period/ End last year	$\frac{D_3 - D_2}{D_2}$
D.5	% Increase End Period/ Before Project	$\frac{D_3 - D_0}{D_0}$
D.7	Employees/'000 Connections	$\frac{D_6}{D_3 \times 1000}$
D.8	Number persons per Connection	Latest Estimates
D.9	Population Served	$D_8 \times D_3$
D.10	% Total Population	$\frac{D_9}{B_3}$ (this year)
D.11	Volume sold/connection/month	$\frac{C_1 \text{ (from Column } C_c)}{D_3 \times \text{period covered (in months)}}$
E.1	Receivables in % of Billing	$\frac{E_0}{C_2}$ (from Column C_c)

	INFORMATION SOUGHT	% OF PROJECTS LACKING THE INFORMATION					
		1970	1971	1972	1973	1974	LAC Projects only 1974
Less Frequent Information	Other Direct Cost	100	100	100	100	100	83.33
	Number of Persons/connection	100	100	94.74	91.31	88.24	83.33
	Number of Employees	100	100	89.48	91.31	100	83.33
	Number of sewer connections	87.5	91.7	89.48	86.96	94.12	100.00
	General Costs	100	83.4	89.48	82.61	82.36	83.33
Frequent Information	Other Income or Costs (net)	87.5	75.	74.69	78.26	76.48	83.33
	Number of Water Meters	100	91.7	88.48	78.26	70.59	83.33
	% Long-term debt to total assets	87.5	83.4	84.22	69.57	64.71	16.66
	Average rate base *	87.5	66.6	68.43	69.57	58.83	0.0
	Number of water connections	100	58.4	68.43	56.53	52.95	66.66
	Population	87.5	75.	73.69	52.18	47.03	33.33
Most Frequent Information	Wages cost	75.	50.	47.37	47.83	61.18	50.
	Total volume sold	25.	25.	31.58	43.48	35.30	66.66
	Total Debt Service	87.5	50.	47.37	43.48	35.30	16.66
	Total investment	75.	41.7	31.8	39.14	41.18	33.33
	Total operating revenues	25.	25.	32.58	39.14	23.53	33.33
	Total volume produced	25.	33.4	48.11	34.79	35.30	50.00
	Total costs	12.5	0	15.79	31.44	23.03	13.33
	Rate of return *	75.	41.7	36.85	31.44	11.77	0
	Depreciation *	50.	33.4	15.79	26.19	23.53	0
	Water Revenues from sales	37.5	16.7	26.32	21.74	17.65	13.33
	Total assets *	62.5	41.7	26.32	13.05	5.89	0

* Includes revalued and unrevalued figures

Pyle

RAYMOND INTERNATIONAL INC.
POST OFFICE BOX 217, OAKLAND, N.J. 07436

W. E. McQueeney
ASST. VICE PRESIDENT-MANAGER

June 22, 1977

Mr. Richard Middleton, Senior Sanitary Eng.
International Bank for Reconstruction and
Development EWT D1035
1818 H Street, N.W.
Washington, D.C. 20433

Dear Mr. Middleton,

Thank you very much for attending our seminar on cleaning and cement-mortar lining of pipelines on June 15th.

We recognize the important responsibility you carry for water projects in your region, and we are hopeful that you found the seminar and film informative.

It could well be you will incur situations where cleaning and up-grading via cement-mortar lining is the best cost/benefit scheme for restoration of deteriorated transmission and distribution systems.

Tony Iammatteo and I are at your disposal to discuss the application of our service for such projects.

Please accept the enclosed penknife as a memento of the occasion. We hope you find it useful.

Cordially,

W.E. McQueeney

WEMcQ/cw
cc: A. Iammatteo
encl.

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Water Supply & Sewerage

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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

1818 H Street, N.W., Washington, D. C. 20433, U.S.A.

Area Code 202 · Telephone - EXecutive 3-6360 · Cable Address - INTBAFRAD

June 3, 1977

Mrs. Lourdes Flor
Program Officer
Health Sciences
International Development
Research Center
Box 8500
Ottawa, Canada KIG 3H9

Dear Mrs. Flor:

I appreciate the opportunity of cooperating with your organization by reviewing the proposed study on the Colombian Rural Water Supply and Sanitation Program. I am returning the documents you sent with your letter of May 13 and have the following comments.

General Observation

Almost all the countries in Latin America have received international loans, grants and technical assistance for rural water supply programs. Over a period of years these ranged from shallow dug wells with handpumps to the more complete type with distribution lines and house connections.

From the results of these experiences, it was found that community participation was the prime factor in the success of these projects and that instruction in basic personal hygiene and health education a necessary adjunct. The financial success, by which I mean the funds to guarantee minimum operation and maintenance, required that more than half the houses in the community be provided with house connections. Rarely were funds in excess of this obtained--even in Argentina or Venezuela. But perhaps Colombia has made more success.

The design criteria (design period, per capita consumption, etc.) is an old argument. It is especially critical if the supply has to be pumped. The fact is that very little measurement of actual consumption has been done.

Specific Comments on the Documents

Document No. 1

Page 1, line 3. "Easy access" may need to be defined. "Reliable supplies" may need to be defined.

Line 11. "Poor operation and maintenance capabilities" might indicate that the design of the systems should give more attention to this problem.

Line 13 and following — Another reason is that it is easier to collect tariffs from users with house connections. This is very important with diesel engine-driven pumps.

No mention is made of "safe water source" or disinfection by chlorination or treatment by slow sand filtration.

Page 2, line 1. "Implementation".

Line 5. "The collection of water rates". Does the community water "Junta" disconnect the user's connection for nonpayment or is some other means of enforcement used?

Line 14. "Unlike the vast majority of water supply programmes... tariff schemes are established in consultation with the community and considerable financial return is achieved." (I question this statement which may exaggerate the results, at least in Latin American rural water supply projects. Second, I would like to verify the financial statements of a larger sample of the "Juntas" as to whether they are successfully paying even operation and maintenance. Previous surveys in other countries have shown little village capacity to pay more than operation and maintenance, especially in pumped systems.) If the Colombian villages can do better, I think it is wonderful, and the proposed study could verify this.

Page 3, lines 2 and 3 . This seems to contradict previous paragraphs. Of course some villagers can pay more than others, so there would be a range, say from a tariff that covers only operation and maintenance to one that covers operation and maintenance plus small extensions and some debt service.

Concluding Paragraph

The design life of 20 years, if it refers to materials such as pipe, may be alright. However, the design period should obviously be much less--ranging from a system to satisfy the present population needs to one for, say 8 to 10 years in the future.

Page 5, Objectives

(a) It is assumed the term "sanitary education" includes the more usual ones of "health education" and "personal hygiene" in terms that the villagers can understand.

(d) It is assumed that this includes "administration" of the system.

Page 5, line 6. "Water flow limiting devices". These are not inexpensive and there are several types that have been used in Latin America. One is manufactured in Mexico and has a variable orifice and can be mounted in line; another has been used in Argentina, has a float-controlled orifice and requires a house tank; a third is a hydraulic type valve and must be actuated by hand and has been used on standpipes. One question to be answered (in a gravity system supplied by a source with a good flow) is whether the cost of flow control devices is justified.

Para. 2, items (4) and (5). This should include standardization of materials and equipment as well as the design of tanks and major structures. If several hundred systems are to be built, only 4 or 5 diameters and types of pipe, few types of pumps and appurtenances; and tank modules should be used. This permits simplified design, bulk purchases and warehousing of a fewer number of materials and fittings.

Page 6, item (f). A PERT diagram as is indicated will require constant revision throughout the project. It is assumed that this will include the selection of communities, the identification and development of water sources, as well as the other items mentioned. How more useful than a sample bar chart is questionable.

Page 7, line 3. The evaluation of the 700 systems can give valuable information if only a few important data are selected for which reliable information is readily available. Information as to the number of house connections, number of houses not connected, hours of service, actual tariffs and revenue collected, should be available.

Page 7, Second Stage — Line 7 from bottom,....."carry out a limited survey of sanitary, social and economic conditions...." It is not clear whether the source of water will be identified at this time or earlier. If a well is to be the source of water, there is no assurance of the yield or quality until the well has been drilled and tested. Somewhere this step has to be included, generally before the system is designed and sometimes is a costly and time-consuming affair. Similarly, spring sources should have the flow measured and water quality tested. The identification and development of the water source can be one of the greatest causes of delay.

Page 9, Third Stage

(a) "Reliability of service". Does this mean a constant minimum quantity, 24 hours a day, at a desired pressure?

"Water quality". I think this should include turbidity, taste, odor, some bacteriological index and any special locally occurring problem chemicals such as high chlorides and sulfates.

(b) Water demand. To measure water demand, a master meter should be installed at the inlet and outlet of the storage tank to measure production and total village consumption. Care should be taken in the selection of the meters to accurately measure low flows. It will be difficult to measure individual user consumption because the smallest commercially available domestic water meters operate at flows high above the average flows commonly found in rural communities. The care and maintenance of the chart read-out meters could also become a problem if adequate maintenance is not provided for.

(c) Water pumping regines. I wonder if diesel engines are used exclusively and are easier to maintain than the ubiquitous air-cooled gasoline engine. If diesel engine-driven pumps

are used (as any internal combusion engine), they must be operated at a speed that corresponds to the optimum speed of the pump. It might be interesting to include a tachometer to measure the speed of the engines and pumps and so the efficiency. Whenever possible, electricity would be advantageous but this means restricted hours.

(d) Local technical capacity and fabrication skills. Generally speaking, there will be a lack of special tools for cutting and threading pipe, wrenches, blow torches, masons and brickloggers' tools, carpenters' tools and spare parts and mechanics' tools for the engines and pump. Training alone will not suffice.

Page 10, (k) and (f). Simplified forms and records should be devised for the administrators of the water systems. Also, information should be obtained as to what the local policy is with regard to delinquent payment of water bills. Is the water shut off or is some other means employed?

Careful records should be kept of the cost of operating and maintaining the system as well as the tariffs and payments.

Page 10, last line "In-line water meters". As previously stated, it will be very difficult to find a commercially available meter that will register the low flows expected in the individual household connections. When the average consumption falls below about 30 gallons per capita per day (120 liters), the available meters may not register or will have an error of around 5%. If the householder has his own rooftank, the situation is aggravated. One possible way to circumvent this problem is to use one meter for a group of houses so that the flow is great enough to activate the meter.

Document No. 2

Page 6, line 2. How much money is actually in the sectional level revolving funds?

Page 7, construction No description is given as to how the wells are drilled or surface sources of water are developed. Nothing is mentioned about chlorination or slow sand filters. No explanation is given about pump installation.

Annex B-3. The village of Los Negritos is supplied with a deep well with an electric motor-driven pump. Most of the discussion in Document No. 1 has to do with diesel engine-driven pumps.

Document No. 3. I don't think enough emphasis is given to explaining the importance of washing hands with soap and water before preparing food and eating.

Conclusion

I think that the study will be useful to the other programs because it takes advantage of years of experience with many village water systems. It will be useful in revising design standards and revenue possibilities from tariffs. I think the most important aspects of the study will be the measurement of consumption patterns of different villages, the evaluation of the capacity of the villagers to meet their tariff and financial obligations, and an analysis of administration, operation and maintenance problems. I hope that my comments will be helpful.

Very truly yours,

Joseph Freedman

Joseph Freedman
Senior Sanitary Engineer
Water Supply and Sewerage Division
Latin America and the Caribbean Regional Office

JFreedman:clh

CONTROL NO. CO-7-135

Water Supply + Sewerage

See Distribution Below

May 27, 1977

John M. Kalbermatten, Water and Wastes Adviser (EWTDR)

Bag Lunch - New FORDILLA Valve

Mr. Richard Ford, retired President of Ford Meter Box Co., will be visiting the Bank on Tuesday, June 7 to present a new model of the "Fordilla" self-closing valve. This new model is specifically designed for installation on public hydrants, an application for which earlier models were unsuited. His presentation will be in Room D-1056 at 12:20 p.m., and is expected to be fairly brief.

Please bring this meeting to the attention of any staff who you believe would be interested but who may inadvertently have been left off the distribution list.

Distribution

Messrs. Warford, Saunders, Julius (EWTDR), Ramani (URB), Sternberg, Shipman, Pineo, Spangler (Consultants), Donaldson (PAHO), Huang (EDI), Olivero (IDB) Water Supply Staff

RNMiddleton:jbe

Water Supply + Sewerage

Mr. Yves Rovani

May 19, 1977

Klas Ringskog

Annual Review of OED Audits on Water and Sewerage Projects

1. Since our last review of PPARs (see the attached memo by Mr. Middleton to you dated November 9, 1976), OED have completed three project performance audit reports (PPARs) on water supply or sewerage projects. These are:

Malaysia (Loan 561-MA); Kuala Lumpur Water Supply Project
Cameroon (Loan 604-CN); Douala and Yaounde Water Supply Project
Botswana (Cr. 233-BT); Gaborone-Lobatse Water Supply Project

Comments on each of these are given below, and copies of the reports are attached for ease of reference.

2. Kuala Lumpur Water Supply Project - OED claim that no particular lesson can be drawn from this project. I agree with the exception of the outcome of the demand projections and the reporting requirements. These two points are further discussed in paras 5 and 6 below. On one point I disagree when the audit argues that the Bank appraisal mission's staging of the treatment plant capacity of 28 Imgd into two stages of 14 Imgd capacity was suboptimal. My opinion, and that of the regional projects division, is that the Bank appraisal mission was fully justified in staging the treatment plant and not only was this economically justified, but also it eased the utility's financial situation. As the treatment plant capacity did on no occasion constitute a bottleneck in the system capacity, it is difficult to see what OED's claim is based on. The present-worth comparison OED supply as justification is too simplified to form a valid argument.

3. Douala and Yaounde Water Supply Project - The audit states that this project is a good illustration of a successful project from the commercial, financial, technical and managerial points of view. It goes on to state, however, that the expected benefits have not benefitted the lowest income groups of the two cities to the extent desirable. The audit with its second guessing may have a point although it is notoriously difficult to base oneself on population estimates when making service coverage comparisons. The audit's claim that the percentage of the combined population served by the project in the two cities is likely to have dropped from about 65% in 1969 to about 43% in 1975, is obviously not valid if the population estimates are erroneous. The general lessons of the project are in the area of demand projections and will be treated in para 5 below.

4. Gaborone-Lobatse Water Supply Project - No general lessons can be learnt from this project except again the importance of demand projections. The project included the construction of a 32-mile pipeline that, with the wisdom of hindsight, proved to be premature by several years for satisfying demand. The decision to go ahead with the construction at the time of the project does appear justified to assure the continuous operation of an important local industry. Appropriately enough, the industry is servicing the debt of the portion of the credit related to the pipeline.

5. Lessons of Common Interest - In two of the projects reviewed, those of Botswana and Cameroon, mention is made of lower demand per connection. In Kuala Lumpur it is thought to have remained constant. For Botswana this is attributed to sharply higher tariffs in the period preceding the project and the abolishment of free water to civil service. For Cameroon water consumption per connection dropped by some 35% for Yaounde over the project period and by some 4% over the project period in Douala. This reduction in consumption we witness over and over again in Bank projects and can be attributed to the better administrative control of billings and collections, better metering, higher tariffs, extended service coverage, and the price elastic demand for water. It is certainly an important lesson and together with Mr. Rodriguez of the EMENA Water Supply Division, I am presently drafting guidelines for urban water demand forecasting which we intend to publish as public utility guidelines in the near future.

6. In two of the reports, those of Malaysia and Botswana, mention is made of complaints by the borrowers over excessive reporting requirements to the Bank. We may have to evaluate critically whether our benefits of the borrowers' project reports justify the substantial input of scarce staff time to prepare them. Data collection and presentation without a clear purpose and uses is too costly so as to oblige our borrowers to engage in it.

cc: Messrs. Kalbermatten, Middleton (EWTDR), Rajagopalan

KRingskog:jbe

May 17, 1977

Mr. James R. Cannon
Bookman-Edmonston Engineering, Inc.
600 Security Building
102 North Brand Blvd.
Glendale, California 91203

Dear James:

I enclose copies of two recent articles which raise matters which I would like you to cover in the pipelines paper.

The article on the Cali pipeline, although not very satisfactory in many respects, highlights the use of a zinc-epoxy lining system in place of thicker and less desirable coal tar or cement mortar linings, and also the problems of maintaining welding quality in a developing country. You could discuss this with our engineers concerned and get further details.

The second article, on the use of polyethylene pipe as a sewage force main, describes an application which might have considerable potential on Bank projects, particularly for "Temporary" mains (that is, mains which are designed to alleviate conditions for a few years while more permanent or larger capacity works are designed and constructed). A recent example occurred in our urban project in Manila, where the only existing outfall has to be renovated as a matter of urgency to allow port construction to proceed, but where the eventual pattern of sewage disposal, and hence the location and size of permanent outfall works, is currently undefined.

Please keep me in touch with progress on the paper, and let me know when you next plan to visit the Bank for discussions with staff.

Yours sincerely,

Richard N. Middleton
Senior Sanitary Engineer
Energy, Water and Telecommunications

Enclosures

RNMiddleton:jbe

Articles: Steel Epoxy-Lined Pipe Serves South American Water System by Donald F. Cook, Resident Engineer and William A. Garlow, Project Administrator, Gilbert Associates, Inc. - Water & Sewage Works, March '77

Polyethylene Sewer Force Main, Water & Sewage Works, April 1977

(RL 5 R-620)

Water Supply + Sewerage

May 13, 1977

Mr. B. G. Deshmukh
Municipal Commissioner
Municipal Corporation of Bombay
Mahapalika Marg
Fort, Bombay - 1
INDIA

Dear Mr. Deshmukh:

We attach herewith a questionnaire which is being sent out worldwide to a selected group of water supply organizations whose experiences on questions of water metering and unaccounted-for water should prove valuable in reaching conclusions on recommended practices and may allow undertaking of approaches employed in various countries. Because of the data which we believe may be available from your operations, your organization has been included on the list receiving the questionnaire.

It is possible that you will not have readily available all the information necessary to answer all questions asked, in which case, please feel free to omit the one concerned and pass on to the others. We hope that you will be able to return the completed questionaannire within about three weeks or sooner.

We hope, in due course, to be able to tabulate and analyze the data and to provide you with copies.

If by any chance you should also receive a copy of this questionnaire from the International Water Supply Association, please respond only to one. The copy attached contains all the information presented in the IWSA form plus two pages on unaccounted-for water. We will consolidate all data from both questionnaires in the tabulation.

Thank you for any help you can give in meeting this request.

Sincerely yours,

John M. Kalbermatten
Water and Wastes Adviser
Energy, Water and Telecommunications Department

Enclosures

JMKalbermatten:mk

cc: Mr. Shipman (EWTDR)

UR

RZ5 R-620

Water Supply + Sewerage

May 13, 1977

Mr. Rahman, Chairman
Dacca Water Supply & Sewerage Authority
156/157 Motijheel Commercial Area
Dacca 2, BANGLADESH

Dear Mr. Rahman:

We attach herewith a questionnaire which is being sent out worldwide to a selected group of water supply organizations whose experiences on questions of water metering and unaccounted-for water should prove valuable in reaching conclusions on recommended practices and may allow undertaking of approaches employed in various countries. Because of the data which we believe may be available from your operations, your organization has been included on the list receiving the questionnaire.

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Thank you for any help you can give in meeting this request.

Sincerely yours,

John M. Kalbermatten
Water and Wastes Adviser
Energy, Water and Telecommunications Department

Attachment

JMKalbermatten:mk

cc: Mr. Shipman (EWTDR)

RES R-620

Water Supply + Sewerage

May 13, 1977

Mr. Nazir Ahmad
Managing Director
Water and Sanitation Agency
4A Gulberg V
Lahore, PAKISTAN

Dear Mr. Ahmad:

We attach herewith a questionnaire which is being sent out worldwide to a selected group of water supply organizations whose experiences on questions of water metering and unaccounted-for water should prove valuable in reaching conclusions on recommended practices and may allow undertaking of approaches employed in various countries. Because of the data which we believe may be available from your operations, your organization has been included on the list receiving the questionnaire.

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Sincerely yours,

John M. Kalbermatten
Water and Wastes Adviser
Energy, Water and Telecommunications Department

Attachment

JMKalbermatten:mk

cc: Mr. Shipman (EWTDR)

Water Supply & Sewerage
(RESR620)
FHR

May 13, 1977

Mr. R. M. Shrestha
Project-in-Charge
Water Supply and Sewerage Board
Tripureshwar Road
Kathmandu, NEPAL

Dear Mr. Shrestha:

We attach herewith a questionnnaire which is being sent out worldwide to a selected group of water supply organizations whose experiences on questions of water metering and unaccounted-for water should prove valuable in reaching conclusions on recommended practices and may allow undertaking of approaches employed in various countries. Because of the data which we believe may be available from your operations, your organization has been included on the list receiving the questionnaire.

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Sincerely yours,

John M. Kalbermatten
Water and Wastes Adviser
Energy, Water and Telecommunications Department

Attachment

JMKalbermatten:mk

cc: Mr. Shipman (EWTDR)

Water Supply + Sewerage

INTERNATIONAL DEVELOPMENT RESEARCH CENTRE
CENTRE DE RECHERCHES POUR LE DÉVELOPPEMENT INTERNATIONAL

Box 8500, Ottawa, Canada, K1G 3H9 · Telephone (613) 996-2321 · Cable: RECENTRE · Telex: 053-3753

May 13, 1977

Ref: 3-P-76-0142

Mr. J. Freedman,
Water Supply and Sewerage Division,
Latin American and Caribbean Desk,
Energy, Water & Telecommunications Sector,
The World Bank,
1818 H Street, N.W.,
Washington D.C. 20433

Date Received May 23/77
Date Acknowledged June 3/77 (letter)
Assigned to JF

CO-7-135

Dear Mr. Freedman,

From my colleague, Mr. W.K. Journey, who is away from the Office at present, I am forwarding to you documents relating to a study on the Colombian Rural Water Supply and Sanitation Program. Document No. 1 describes a research proposal on this Program which has been submitted to IDRC for support. Before we present this proposal to our Board next June, we would greatly appreciate your assessment of the proposal, both from the point of view of its usefulness and its quality. Mr. Journey has indicated your in-depth knowledge of rural water programs in Latin America involving community participation. May I suggest your review look into the following aspects:

- contribution of this study to the available knowledge in this field, both for other Latin American programs and for the international organizations working in this field;
- usefulness of this study for the Colombian Rural Water and Sanitation Program;
- adequacy of the methodology put forward to achieve the specific objective set-out;
- any other aspects you feel relevant to comment upon.

As background information, I am enclosing document No. 2 which describes the history of the Colombian Program as well as document No. 3 "Manual de Educacion Sanitaria"(Manual of Health Education) which is one of the five or six Manuals published by INPES in relation to the Program. This document can give you an idea of the sort of norms and procedures the Colombians talk about in the study (as this is our only copy, would you please return document No. 3 to us with your comments).

Mr. Journey will be calling you on Monday, May 16, to elaborate further on this subject.

Thank you very much for your cooperation in this matter.

Yours sincerely,

Lourdes Flor (Mrs)
Program Officer
Health Sciences

cc: W.K. Journey

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Water Supply + Sewerage

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Files

DATE: May 12, 1977

FROM: Richard N. Middleton (EWTDR)

SUBJECT: Ad Hoc Working Group on Rural Water Supply
U. N. Study Proposal

1. On May 12 Mr. Rovani telephoned Dr. Dieterich (Director, EME, WHO-Geneva) to discuss the reasons for WHO's rejection of the proposal that the Ad Hoc Working Group (AHWG) be responsible for some studies following up on the March 1977 World Water Conference (WWC). The following note records the principal points raised during the discussions.

2. Mr. Rovani recapitulated the arguments set out in Mr. Kalbermatten's memorandum of May 9, as a result of which the Bank had expressed to the other members of AHWG its support in principle for the proposal:

- prompt follow up to WWC was essential if valuable momentum was not to be lost;

- the AHWG was an existing multi-agency group that could rapidly move into this follow-up work, and by so doing would perform a more useful function than in the past;

- the estimated cost, $16,000, was small in comparison to the likely benefits;

- the study would only last until October, after which time the AHWG could be disbanded and leave other agencies or bodies to follow-up on its recommendations.

3. Mr. Rovani stated that he had some reservations over the arguments in the memorandum (which admittedly had been drafted in some haste immediately prior to Mr. Kalbermatten's departure); in particular:

- it was questionable whether anything useful would come out of a three-month desk study;

- the proposal ran counter to established procedures and responsibilities within the UN family;

- the AHWG had shown incredible powers of survival so far, and some of the phrasing in the Fano proposal 1/ led him to fear that the study would merely serve to perpetuate and institutionalize the AHWG.

Nevertheless, in view of the small amount of money involved and the possibility of a positive outcome, Mr. Rovani was ready to consider proceeding with the proposal unless Dr. Dieterich had very strong arguments to the contrary.

1/ e.g., references to work subsequent to the study (para 1) or the possibility (only) of meeting the October 1977 deadline (para 3).

4. Dr. Dieterich said that his opposition to the proposal was essentially based on two objections:

- it was not going to produce any useful results;

- it was the wrong way to go about solving the problem.

His doubts over the likely outcome were based on discussions with Mr. Mageed (Secretary, WWC), who had told him that, after review of the papers submitted for the conference he had concluded that they did not contain data which would be useful for planning country strategies up to 1980 and for the 1980-90 Decade - simply because the countries had not been asked to submit such material. Desk review of the WWC papers would not therefore be profitable. Even if it were a job worth doing, he (Mr. Mageed) doubted that Mr. Krishnamurthy was suitable for this task (Dr. Dieterich also mentioned that prior to this discussion Mr. Mageed did not know of the proposal, nor of the suggestion that Mr. Krishnamurthy, a consultant on his staff, be involved; although Mr. Fano was in Geneva at the time, he had not raised the matter).

5. Dr. Dieterich's second objection was that the AHWG was a totally inappropriate body to attempt to carry out any review of sector status or of programming needs pre-1980. It had not been entrusted with this responsibility by WWC, and had no contacts with governments which would provide it with a workable means of assisting them in sector assessment and planning. The only effective way of doing this work was through existing agencies which had good channels of communication with Government, which had a good knowledge of sector conditions and of the problems in investing in the sector, and which could draw on an existing pool of manpower and expertise to carry out a difficult task within a short time frame.

6. Dr. Dieterich's objections had been cabled in some detail to Mr. Cohen (copy to the Bank); on receipt of this cable, AHWG members could decide what future action or discussion was appropriate. Meanwhile, he agreed with Mr. Rovani that it was essential not to lose the momentum provided by the WWC. During the next two days, he expected to receive from the World Health Assembly instructions to prepare a proposal for implementing the work entrusted to WHO by the WWC Action Plan; that is, a proposal for a rapid intensive effort to assess sector programming needs as the first step in the three-year exercise leading up to the 1980 review. This proposal would be circulated to the various UN agencies for comment (he mentioned that recent discussions in Geneva had already indicated the likelihood of conflicts between WHO and CNRET on responsibility for executing the WWC Action Plan).

Future Action

7. It was agreed that the Bank would await Dr. Dieterich's cable (para 6) before deciding on further formal action.

8. Based on this telephone discussion, the appropriate future action for the Bank appears to be:

- notify the AHWG members that, based on discussions with WHO

of their objections to the proposal, the Bank has reconsidered its earlier support of the proposal;

- emphasize that follow-up action to WWC is nevertheless a matter of high priority.

- urge WHO to produce the proposal requested by WHA as soon as possible;

- defer decisions on the mechanism for WWC follow-up until the WHO proposal can be discussed.

(These items were not included in the telephone conversation, but were identified in my subsequent conversation with Mr. Rovani.)

cc: Messrs. Rovani, Kalbermatten (EWTDR), Kearns (OPD)
Mrs. Boskey (IRD)

RNMiddleton:jbe

Water Supply + Sewerage

Mr. Charles Weiss, Jr. (PAS) May 11, 1977

Richard N. Middleton (EWTDR)

Water Resources Projects

I regret that staff constraints prevent taking more than a cursory glance at the 100-page draft informal report; I imagine that most of my colleagues are similarly constrained, and if the document is to be seriously reviewed in the Bank it needs to be substantially shortened and edited.

The original plan - to identify projects which would benefit from a long-range, multi-sectoral analysis, and then provide the necessary expert assistance - seems well conceived. This would have helped to ensure that the report addressed actual problems met in Bank work, and that the measures it proposed were realistic within the framework of Bank policies and operations. As it is, the report is likely to be ignored by the regions, since it will probably be perceived as yet another document by a non-expert telling experts how to do the job they would in any case like to do if Bank organization, programming and budgeting constraints were removed.

The part of the document to which most attention is invited is the "Executive Overview." A number of statements in this section are highly questionable:

Page 3, (c): In our sector the "WR perspective" is largely irrelevant to the application or otherwise of low-level, small-scale technologies. It is not clear why the appropriate technology issue is raised at all at this point or elsewhere in the report; as the author says, it should be the subject of a separate investigation.

Page 3, (a): (and elsewhere) The logical focus within the Bank for expert review of basin implications of water resources projects is the Agriculture and Rural Development Department. Not only is this sector by far the largest consumptive user of water resources, but also the central staff could contribute considerable operational knowledge and expertise to the analyses. Good liaison relationships have already been established between that department and others, such as our own, which in some cases are potential competitors for the same resource.

Page 4, first para: The text states that "lack of multi-sectoral planning was a major problem in Bank water resource projects, and was the causal impediment to better choice of technology."
I seriously question the first statement. The second is simply untrue in our sector.

Page 10: The dismissal of distribution system rehabilitation or expansion as "a technical fix of a psycho-social, "people" based problem" is too simplistic to merit serious debate. Clearly the Bank (or, more correctly, its borrowers) needs to pay far more attention to consumer attitudes and consumer education - but while water is desperately short, systems are not adequately maintained, and many people have to be served through public hydrants for which they feel no personal responsibility, all these problems (illegal connections, losses, wastage) will persist.

Page 13: No one would question the need to employ staff who can appreciate the human as well as the technical implications of projects with which they are concerned (i.e., who are blessed with vicarious empathy). It would seem, however, to be a very retrograde step to employ "eminent social scientists" to advise on these matters, in particular developed country personnel. Wherever possible, these advisers should be drawn from the developing countries concerned, and could be at a very much lower level than the recommended professor - for example, community development officers at the barangay (500 family unit) level in the Philippines. (Of course, whatever change in approach is recommended is largely meaningless unless P&B are prepared to adjust staffing coefficients to reflect the inevitable large manpower commitment to psycho-social aspects of project development and supervision.)

cc: Messrs. Rovani, Kalbermatten (EWTDR), Hotes (AGP), Williams (ASPEW)

RMMiddleton:jbe

OFFICE MEMORANDUM

TO: Water Supply and Sewerage Task Group Members DATE: April 27, 1977

FROM: Richard M. Middleton (EWTDR)

SUBJECT: Register of Individual Consultants

One of the intended objectives of the Task Groups is to establish and maintain a register of individual consultants which will enable staff quickly to identify suitable candidates for consulting assignments, whether to assist us or our borrowers.

Experience has shown that the files maintained by Personnel Department take too long to sort through, do not include many candidates who are promising but who have not been employed by the Bank, and do not contain complete data even on the individuals who are on file. In the past, therefore, CPS has tried (without much success) to maintain a register; in addition many regional divisions are aware of consultants in their own area, but this information is usually not shared with other regions.

I therefore propose that we meet on Tuesday, May 3, at 2:00 p.m. in Conference Room D-1056, to discuss establishing a more efficient register (N.B. date not as Mr. Pettigrew's memo of 4/26/77 to the Sewerage Task Group Members). As a preliminary contribution, I have gone through the existing card files in this department, and have set out the results in the attached annexes:

Annex 1 - Consultants on file for whom data seems reasonably complete (although it may need updating or correction).

Annex 2 - A preliminary classification of the Annex 1 consultants by areas of expertise.

Annex 3 - Consultants on file for whom the data is so incomplete as to be virtually useless; unless it can be amplified these cards should be dropped.

Annex 4 - Various consultants employed on EWTDR research projects, not yet entered in the cards.

The present register kept by my secretary is a series of loose cards (a typical example is shown in Annex 5). They are in a variety of color, but that is of no significance.

The necessary future actions that I can foresee at present, and which I would like to discuss at the meeting, are:

1. Agreement on the form of the individual index card (Annex 5).

2. Agreement on a more comprehensive description of the individual, his competence, exact nature of work carried out, and evaluation

of his performance (a draft of such a sheet, prepared by the Management Task Group, but for companies rather than individuals, is attached as Annex 6).

3. Nomination of two staff per division who would have a continuing responsibility for identifying all consultants used by or known to that division who should be on file 1/, and for preparing draft cards and back-up sheets (we would endeavour to provide secretarial support from EWTDR).

4. A search of the information held by Personnel Department to determine what should be copied into our system.

5. Identification of gaps in the expertise in the consultants currently on file, and active effort to identify further consultants to fill these gaps.

We would also need to consider whether we include in this register individuals in large companies who are known to us and who might be useful for individual assignments, also individuals from organizations like WHO, PAHO, IDRC, etc.

Please call me if you have any matters you want to discuss prior to the meeting.

1/ e.g., Messrs. Grover (Oman project), Vos (Abidjan Sewerage Project), Flintoff (Calcutta Solid Wastes).

Water Supply Members: Messrs. Yepes, Maisch, Freedman (LCPWS), Skytta (ASPEW), Coyaud (EAPEW)

Sewerage Members: Messrs. Pettigrew, Rasmusson (ASPEW), Cuellar, Serda-hely (EMPWS), Bruestle, Saravanapavan (AEPEW)

cc: Mr. Kalbermatten

RNMiddleton:jbe

Consultants on File

EWTDR files contain cards on the following consultants, setting out: name; nationality; language competence; specialty; address; and experience on Bank projects. This information may not, however, be correct or complete, and needs verifying.

Jorge Arboleda (Colombia)	Water Treatment
Alfred Ashworth (Canddian)	Civil Municipal and Structural Engineering
Javier Bacigalupo (Peru)	Rural Water Supply
Harvey Banks (US)	Water Resource Development
Samuel Baxter (US)	Water Resource Planning and Management
Louis Bergeron (France)	Pumping Installations; Water Hammer
John Bethel (?US)	Environmental Engineering
Ralph Bloor (US)	Dam Construction
Roland Burlingame (US)	Water and Waste Water Treatment
Ruperto Casanueva (Chile)	Sanitary Engineering
John Cleasby (US)	Civil Engineering; Water Treatment
Delwyn Davies (UK)	Water Supply Management
Rolf Deininger (US)	Water Quality Planner
Anders Eriksson (Sweden)	Hydrology; Ground Water Exploration
Roger Faure (Switzerland)	Groundwater Development
John Fett (US)	Engineering Geology; Geohydrology; Geophysics
Aurora Gallagher (US)	Technical Editor
E. Gangarosa (US)	Bacterial Diseases
Sarkis Garabedian (Syria)	Sanitary Engineering
Earnest Gloyna (US)	Water Quality
Jack Graham (US)	Hydrology; Well Construction
Andrew Gram (US)	Health
Charles Gunnerson (US)	Wastewater
Heinz Gorges (US)	Solid Wastes Technology & Economies
Yves Gouriten (French)	Wells; Water Treatment; Water Distribution
John Hale (US)	Sanitary Engineering
Herbert Hudson (US)	Water Treatment
K. J. Yves (UK)	Water Treatment
John Jay (?Canada)	Effluent Treatment
P.S. Jeffcoate (UK)	Sanitary Engineering
Kaz Kawata (US)	Health
? Lagrange (French)	Water Distribution Systems
Maurice Leroy (French)	Concrete Arch Dams
Roland LeRoy (French)	Organization and Management; Training
Omar Lillevang (US)	Open Channel Flow; Sediment and Pt.
Costa Lindvall (Sweden)	Water Hammer Analysis
H. Lupton (UK)	Surge and Water Hammer
John Mann (US)	Hydrogeology; Water Rights Litigation
G. Marais (S. Africa)	Low Cost Sewage Collection and Treatment
Donald McCann (US)	Groundwater Geology; Engineering Geology
James Morgan (US)	Water Treatment Research

Victor Ojeda (Peru)	Solid Wastes Collection and Disposal
William Oswald (US)	Stabilization Ponds
David Parker (UK)	Hydrogeology; Well Drilling
Gunnar Peterson (Sweden)	Sewage Treatment
Charles Pineo (US)	Rural Water Supply and Sanitation
George Post (French)	Dams
Michael Powell (UK)	Engineering Economics; Management
John Scheliga (US)	Hydrogeology; Engineering Geology
Hillel Schuval (US)	Civil and Sanitary Engineering
M. Slivitzky (Canada)	Dams; Hydrology
Charles Spangler (US)	Rural Water Supply and Sanitation
Zane Spiegel (US)	Groundwater Hydrology
Don Stokoe (Canada)	Sanitary Engineering
Leib Wolofsky (Canada)	Geology; Dam Foundations
James Westfield (US)	Industrial Reuse of Wastewater
Adolfo Yanes (Venezuela)	Pumping Installations; Water Treatment and Distribution
Woodrow Wilson (US)	Civil Engineering

ANNEX 2

PRELIMINARY CLASSIFICATION OF CONSULTANTS BY AREA OF EXPERTISE

General Sanitary Engineering

Ashworth, Baxter, Bethel, Casanueva, Cleasby, Deininger, Carabedian, Gloyria, Gunnerson, Hale, R. LeRoy, Shuval, Spangler, Stokoe

General Civil Engineering

Wilson

Water Supply

Water Resources	Banks, Baxter, Scheliga
Hydrology	Slivitsky
Hydrogeology; Geophysics	Eriksson, Fett, Graham, Mann, McCann, Parker, Scheliga, Speigel
Dams	Bloor, M. Leroy, Post, Slivitsky, Wolofsky
Engineering Geology	Fett, McCann, Scheliga, Wolofsky
Wells and Groundwater Development	Graham, Gouriten, Faure, Parker
Pumping Installations	Bergeron, Yanes
Water Hammer	Bergeron, Lindvall, Lupton
Channel Flow	Lillevang
Water Quality and Treatment	Arboleda, Burlingame, Cleasby, Deininger, Gloyna Gouriten, Hudson, Yves, Morgan, Yanes
Distribution	Gouriten, LeRoy, Lagrange, Yanes
Rural Water Supply and Sanitation	Bacigalupo, Graham, Pineo, Spangler
Health	Gangarosa, Gram, Kawata, Kesic

Sewerage

Wastewater Treatment	Burlingame, Cleasby, Jay, Marais, Oswald, Peterson
Wastewater Reuse	Westfield

Solid Wastes

Gorges, Ojeda

Engineering Economics

Powell

Management

Davies, R. LeRoy

Miscellaneous

Editor	Gallagher

Incomplete Data

The EWTDR card files on consultants contain the names of the following individuals who were presumably recommended at some time or another for assignments. However, in most cases there are no details of address, specialty, or Bank experience. Unless otherwise stated, all appear to be general sanitary engineers.

Robert Clark (US)	
Edward Cleary (US)	
G. Clement (French)	
Willem Eysvogel (Dutch)	
Floyd Eunpo (US)	
Mohamed Galander (Sudan)	
Julio Gonzalez Guevara (Colombia)	
Joseph Haratani (US)	
Ed Healy (?)	Manpower/Organization
Arthur Holloway (US)	
? Houdaille (French)	Hydrogeology, Groundwater Exploration
D. Hugues (?UK)	
Earl Jackson	
Warren Kaufman (US)	
Eugene Kazmierczak (?)	Treatment
Eddy Kinsell (US)	
J. G. Kop (Dutch)	
Bong. T. Kown (?)	Nuclear and Pollution Control
Don Laverenty (?)	
Maurice Le Bosquet (US)	
Brashearers Leggette (US)	
N. Maasland (US)	
J. McKee (US)	
A. M. Milburn (Venezuela)	
P. Minart (French)	
P. Morgan	
William Oldham (Canada)	
Dean C. Pappas (US)	
D. Pastir (US)	
Rajini Patel (Kenya)	Water Hammer
Albert Petersen (US)	
George O. Pierce (US)	
? W. Rangeley (?)	
J. Ringonoldis (?)	
Vince Roach (US)	Iron Removal
?G. Rouiralta (Costa Rica)	
Domingo A. Ruiz-Delgado (Venezuela)	
Mario Salvador (?)	Well Drilling
John van Dyke Saunders (?)	
Isadore J. Silverstone (US)	
Clarence I. Sterling (US)	
J. van Dort (Dutch)	

These cards need to be completed, or else the cards should be withdrawn from the file.

EWTDR Consultants not yet on File

The following consultants employed on research projects supervised by EWTDR are not yet included on the card files; this will be remedied in due course:

Sammuel Kantor (Israel)	Survey of Rural and Urban Water Supply in LDCs (1974-75)
David Bradley (UK)	Health Impact of Water Supply (1975)
Alexander Langmuir (US)	" " " " " "
Abel Wolman (US)	" " " " " "
B. Cvjetanovic	" " " " " "
Donald Lauria (US)	Standards of Service (1976 -)
Peter Kolsky (UK)	" " " "
Gilbert White (US)	Water Supply Lending and the Urban Poor (1976-77)
W. K. Journey (US)	Mannually Operated Pumps (1976)
Daniel Okun (US)	Training in the Water Supply Sector (1976-77)
McGraw (?)	Editor (RES 2) (1976)
Yaron Sternberg (?)	Wood Bearings for Handpumps (1976-77)
Robert Curry (US)	Urban Poor Impact of Water Supply Lending (1977)
Daniel Goldberg (Israel)	Agricultural Reuse of Wastewater (1976-77)
Gomez (Colombia)	Meter Manual (1976)
Chaturvedi (India)	Control of Unaccounted-for Water (1977)

Note that these do not include the majority of the consultants who will be employed under research project 671-46 (Appropriate Technology in Wastes Disposal); it will be the particular responsibility of the Sewerage Task Group, in its review of this research project, to ensure that details of these consultants are transferred to the register.

ANNEX 5

SAMPLE CARD FROM CONSULTANT REGISTER

(Actual Size)

Name:	Marcel Savard
Nationality:	Canadian
Languages:	French, English
Specialty:	Financial Analyst
Address:	108 Wellington Street West Sherbrooke, Quebec Canada
Experience with Bank:	Served as financial analyst on the Bank's Appraisal Mission to Ivory Coast

Draft Consultant Registry Entry

The following is a draft prepared by the Management Group:

Consultant Register

Consultants: P.A. Management

Office Involved: Geneva : staffed from Paris office, Rue Bellini, 16e (727-35-79)

Head Office: London (International H. Q.), Australia, Europe, etc.

Techniques: Management, Organization, Production, Marketing, Finance and Accounting, Personnel Selection, Training, Project Planning, Computers.

Director: Mr. A. Bonafi (Paris Office) French National

Staff: Mr. R. Dagiral (organization expert)

Mr. M. Buhler (psychologist)

Mr. D. Antoni (expert comtable)

Project: Andekaleka Hydro Electric Project (Madagascar) IDA Credit of about $30 million.

Assignment:

1. Reorganization of newly formed JIRAMA which merges two former Electricity and Water Supply Companies (formerly operating concessions in Madagascar).
2. Selection and determination of duties and responsibilities of department and section chiefs.
3. Establishment of opening balance sheet (one company's accounts were 3 years behind).
4. Production of improved monthly operational and financial control statements including restructuring procedures and computer programs.

Comments: A very high professional standard of staff and, as far as can be judged, effective implementation. The consultants appear to have a very successful working relationship with management and staff.

Reason for Assignment: IDA insistence that this work was required.

TOR: Drafted by Consultants and reviewed by IDA staff.

Fees: About $100,000 for an aggregate of 12 man months plus local expenses and air fares.

Other Firms Considered:
1. Ed F
2. Peat Marwick Mitchell (Paris)
3. A local firm of expert-comptables

Financed by: JIRAMA (foreign currency provided by Central Bank).

Bank Staff: Pierre Roger du Mee (FNA)

Dan Ruiu (ENG)

Water Supply + Sewerage

Those Listed Below

April 20, 1977

John M. Kalbermatten, Water and Wastes Adviser (EWTDR)

Bag Lunch - Modern Pump for Village Water Supply,
April 26, 1977

Representatives of FORACO (Forage Rationnel Construction) will be visiting the Bank on April 26 to make a presentation on their VPRH drilling rig and on the Vergnet pump; the latter has been proposed for use on Bank projects, on the ground that this pump uses a radical new approach to the problem of maintenance. The maintenance for this pump can now be executed by a single man with only light tools. This has been achieved by using modern technology and materials. FORACO representatives will also present experiences in the Ivory Coast with the new drilling rig, the Vergnet pump and the location of new well sites by aerial photography.

The presentation will be in Room ~~D-1056~~ C-1006, from 12:30 p.m. till 2:00 p.m. The room has been reserved from 12 noon for the benefit of anyone who wishes to lunch early.

Please bring this meeting to the notice of any staff members who you think would be interested but who may inadvertently have been omitted from the distribution list.

Distribution

Messrs. Rajagopalan (ASP), Shipman (EWTDR), Allison, Hotes (AGP), Gamba (WAP), Huang (EDI), Sternberg (U.MD), Spangler, Pineo (Consultants), Henry (IDRC), Donaldson (PAHO), Olivero (IDB)
Water Supply Staff

RNMiddleton:jbe

Water Supply + Sewerage

Edward V.K. Jaycox
(through Nicolas Lethbridge)
Friedrich Kahnert

April 18, 1977

The Bank's Water Projects and Urban Poverty

As per your request I discussed with Mr. Kalbermatten how to promote the urban poverty impact of the Bank's water projects. Mr. Kalbermatten has now found the resources to hire a consultant, Mr. Curry, who is to develop a relevant methodology and test this methodology in the field. Mr. Curry will begin working on May the 16th and will in fact come to Washington as from May the 24th for a period of seven weeks. I attach his terms of reference which seem to cover the ground fully. April 7, 1977

For the field testing it is now expected that Colombia will be chosen where a considerable amount of data is available. Subsequent to the field testing and the availability of the results from the consultant, Mr. Kalbermatten hopes to examine the five year lending program and expected impact on the poverty target group. This would include an examination on how and to what extent the poverty impact of the lending program can be increased. He also expects to establish a monitoring system for the poverty impact of water projects.

Mr. Kalbermatten feels that the poverty unit can give him most useful support during the examination of the five year lending program in water and its possible reformulation in the light of poverty criteria, which should start sometime in July.

FK:srb

cc: Dunkerley, Churchill, McCulloch, Singh, Strombom, Beier, Courtney

Water Supply + Sewerage

FORACO

forage rationnel construction

Paris, April 14th, 1977
JB.CD

Mr. E. MAISCH
Room A 842
THE WORLD BANK
1818 H Street

N.W. WASHINGTON D.C. 20433

Dear Sir,

We are referring to the letter of our Chairman Mr. LAMOTHE of March the 19th, in which it was agreed upon with Mr. KALBERMATTEN that we will send you the documents relative to the content of the presentation titled "VILLAGE HYDRAULICS" which will be held at the World Bank on April the 26th.

Are sent by air mail for each participant to this group meeting :

behind file

- a pamphlet VILLAGE HYDRAULICS
  An integrated Ground Water Supply Service
  by the firm FORACO

- a pamphlet "The VERGNET hydropump"
  by the firm MENGIN

A 10" FORACO movie on the V.P.R.H. drilling machine will be also presented.

We wish you good receipt of these documents and welcome the opportunity to meet you at this group meeting.

Faithfully Yours
F O R A C O

Jean CHARLON
Business Development VP

Ops 8/26/77

Siège social, direction générale : 24, avenue George V, 75008-PARIS - Tél. 720-91-55 +
Télex : FORACO 610 439 F
Centre d'Etudes et d'Essais : Le Plan d'Aigues - B.P. 17 - 13760 SAINT-CANNAT
Tél. (91) 28.24.67, 28.21.46, 28.22.71, 28.23.24
Télex : FORACO SCANA 420 375 F
S.A. au capital de 1.975.000 F - N° SIRENE : 302 179 130 00026

Water Supply + Sewerage

OFFICE MEMORANDUM

TO: Mr. Robert Curry (Consultant) DATE: April 7, 1977

FROM: DeAnne Julius (EWTDR) DSJ

SUBJECT: Urban Poor Impact Study - Terms of Reference

Ltr. 16

You should arrive in Washington, D.C. on or about May 24 and spend a total of not more than 7 weeks accomplishing the following:

1. Background briefing

   (a) Review of Bank appraisal reports, project briefs, guidelines on financial and economic viability, and other documents pertaining to water supply projects to gain familiarity with Bank policies and operational practice.

   (b) Review appropriate Bank literature on urban poor lending, including the report of the Task Force on Urban Poverty and the quantification of urban poor by city prepared by UORSU.

   (c) Meet with Bank staff from both water supply and urban departments to discuss practical problems in identifying/designing for/incorporating the urban poor in water supply projects.

2. Develop measures of urban poor impact.

   (a) Examine conventional measures (proportion of population; proportion of water consumption; proportion of investment) and if appropriate, propose adaptations, expansions or new alternative measures to use as criteria for judging the impact of water supply projects on the urban poor.

   (b) Choose two or three recent water supply projects or urban projects with water supply components to study in depth, and compare the subjective evaluation of the staff involved with suggested objective measures of the urban poor impact of the projects.

3. Prepare preliminary report for discussion with EWT staff on alternative measures considered, results of discussion with other Bank staff and recommendations of most promising measures to be tested in the field.

4. Field testing of best alternative measures.

   (a) Determine data requirements, sources and availability for each measure.

   (b) Estimate reliability of data and test sensitivity of each measure to that range of uncertainty.

(c) Test which measures are most appropriate for specific pre-project/post-project conditions (in terms of service levels).

(d) Test effect on utility's financial viability of maximizing urban poor impact. Determine implications for tariff levels or municipal financing if the utility's financial performance is to continue to meet acceptable standards.

(e) Point out the site-specific conditions, if any, which would give misleading results for each measure.

5. Prepare and submit final report describing the measures considered, the results of the field tests (4a through 4e above) and recommendations for adoption. The report should include a step by step description designed for use by Bank staff on appraisal missions of how variables used in the measure(s) can be determined and how the measure(s) itself is calculated.

DeAnneJulius:mds

cc.and cleared with Messrs. Kalbermatten, Middleton
cc: Messrs. Warford, Saunders and Ms.Peter

OFFICE MEMORANDUM

TO: Messrs. J.Beach(AEPEW), E.Erkmen(EAPEW), R.Salazar(WAPEW), A.Thys(EMPWS),E.Williams(ASPEW),A.Zavala (LCPWS) DATE: April 1, 1977

FROM: Richard N. Middleton (EWTDR)

SUBJECT: State-of-the-Art Paper on Pipelines

I attach the terms of reference for the consultant, Bookman-Edmonston Engineering Inc., for preparation of the above paper. Mr. Cannon, the engineer with responsibility for the assignment, will be visiting the Bank for initial discussions on April 7 and 8. I confirm my request that you make your engineering staff available for these discussions, and suggest the following program:

Thursday April 7	-	9:30 a.m.	EWTDR
		10:30 a.m.	LAC
		14:00 p.m.	EMENA
		15:30 p.m.	South Asia
Friday April 8	-	10:00 a.m.	East Asia & Pacific
		14:00 p.m.	West Africa

(East Africa omitted due to staff mission commitments.)

Please let me know if these times are inconvenient.

Attachment

cc: Task Group #5: Water Supply (Messrs. Yepes, Maisch, Freedman, Ringskog Skytta, Coyaud, Buky)
Task Group #6: Sewerage (Messrs. Pettigrew, Cuellar, Rasmusson, Serdahely, Bruestle, Saravanapavan, Chang, Zavala)

RNMiddleton:jbe

Bookman - Edmonston Engineering Inc.

Basis for Quoted Fee

(not to be incorporated in contract with consultant. For information of Personnel Department and EWTDR only, as basis for any contract extension for field trips, etc.)

	Man-days	Rate	Cost
Prepare Paper			
Mr. Cannon and other principle engineers	41[1/]	275[2/]	11,275
Mr. Payne and other engineers	5	264[2/]	1,320
Drafting plates	18	158[2/]	2,844
Report printing	(To be done by World Bank)		-
Hold Workshop in Bank Mr. Cannon	4	275[2/]	1,100
Travel			
Plane fare: 3 trips to Washington @$384 (coach)			1152
Expenses = 18 days @ $60			1080
Telephone and miscellaneous expenses - allow			500
		Subtotal	19,271
		Contingencies 5%	964
		Total	20,235
		Say $20,000	

1/ Allows 28 days research and meetings with Bank staff; 8 days drafting and editing; 2 days review. 3 days field work in Japan is included (travel in connection with another assignment - no cost to Bank), but no other field work.

2/ Annual salary x 2.25 divided by 1840 hours/year, for each hour worked. Includes typing and support staff.

Water Supply & Sewerage.

Mar. 26/77

U. N. WATER CONFERENCE

MAR DEL PLATA, ARGENTINA

MARCH 13 - 26, 1977

Report by The World Bank Representatives

I. Introduction

In May, 1973, the U. N. Economic and Social Council (ECOSOC) approved the holding in 1977 of a United Nations Water Conference /Resolution 1761 C (LIV)/, in Argentina.

The proparatory work for the Conference, which began in early 1976, was focused on four separate activities. The Regional Economic Commissions organized regional meetings at which governments presented papers highlighting experiences, problems, and proposed solutions in water resource development. On the basis of reports on these meetings submitted by the Regional Economic Commissions, the Conference Secretariat prepared a report entitled: "Consolidated Action Recommendations," which became the basic working document for the Conference. The Conference Secretariat, with the assistance of the U. N. specialized agencies and consultants, prepared four thematic papers which served as technical background papers. Bank Staff contributed papers to this work. The specialized agencies were asked to prepare four papers devoted to particular water resource sectors. These papers had been reviewed, modified, and endorsed by Ad Hoc Panels of Experts before being submitted to the Conference. One of these on Community Water Supply was co-authored by WHO and the Bank. Finally, governments also submitted papers as background information.

II. Conference

The Conference was attended by 115 governmental delegations: 10 specialized agencies, 12 United Nations organizations (including the Regional Economic Commissions), 15 intergovernmental organizations, 63 nongovernmental organizations, and one organization in U. N. observer status. The Bank delegation was headed by Mr. Yves Rovani, Director, Energy, Water and Telecommunications Department.

The tone of the Conference, set by speakers at the Plenary sessions and followed by the delegations in the working committees, was one of cooperation, remarkably free of political overtones. This was illustrated by the fact that even in committees, recommendations and resolutions were adopted by consensus, although on occasions this was possible only after protracted debate and significant compromise. As a consequence, work in the committees was generally issue-oriented, resulting in a large number of action proposals. Regrettably, most of these recommendations are rather general and lack impact.

The major exception is the resolution on community water supply which, in addition to endorsing the HABITAT targets, recommends to governments a specific action program with target dates.

There was also noticeable agreement, expressed by speakers in both the Plenary session and in the committees, that water resource projects and programs should generally be financially viable and that beneficiaries should generate the necessary funds to the maximum extent possible. At the same time, it was felt that tariffs and charges necessary to achieve financial viability should reflect social considerations. There was general support for increasing funding of international lending institutions (the Bank was mentioned specifically) and a request was made to these institutions to take account of social benefits when considering water resources projects and when fixing terms of lending. Discussion of this item in committees provided an opportunity for the Bank delegation to explain Bank policies, informally to delegations and formally through intervention during committee deliberations.

Other themes generally accepted were: (a) the use of appropriate technology; that is, methods and designs suitable to local conditions, (b) use of local materials and labor-intensive methods for construction to reduce foreign exchange costs, (c) more liberal procurement terms on the part of international and bilateral lenders so that the purchase of foreign goods and equipment would not be restricted to single countries, (d) improvement in water use efficiency and the reuse of wastewater, (e) better intergovernmental and U. N. interagency coordination.

Probably the most important and divisive issues discussed at the Conference were the regional and international coordination of activities and the generation of investment funds. Some delegations strongly recommended a new water resources agency and water resources fund, while others equally strongly resisted any new organization or fund. Eventually, a compromise was reached in the form of a request to the U. N. Secretary-General to prepare a study of the most flexible and effective mechanism to increase the flow of financial resources specifically for water development and management and to report thereon to the General Assembly at its 32nd session.

Having resolved these two issues satisfactorily in a protracted late night committee session, the Conference ended on an upbeat note. To lend emphasis to water resources development, the Conference recommended that 1980-1990 be designated "International Water Resources Development Decade." The final resolution urged that governments faithfully implement Conference recommendations and designated the Conference resolutions and recommendations the "Plan of Action of Mar del Plata."

III. World Bank Participation at the Conference

The leader of the Bank delegation made a statement at a Plenary session, outlining general Bank concerns in the water resources area and, in view of the priority given to Community Water Supply as a result of the HABITAT recommendations, described the various types of projects and programs by which the Bank helps to expand community water supplies in developing countries. He also outlined the key factors which must be addressed in order for community water supply programs to achieve success.

The Bank delegation participated in Plenary and Committee sessions, and in informal meetings with country delegations and special interest groups. In the formal sessions, the Bank's role consisted primarily of explaining Bank practices and policies as they related to the specific issues which were raised. In particular, there seemed to be considerable misunderstanding among a number of country delegations about the way in which Bank lending rates are determined, and considerable ignorance of the basis on which IDA resources are allocated, in particular that it is not allocated on a sectoral basis. In addition, the Bank delegation found it necessary on several occasions to reiterate that the Bank is vitally interested in the social, health and environmental impacts of its water resource investment, and does not limit its project evaluation and justification to narrowly defined financial and economic considerations.

IV. Principal Conference Recommendations

Numerous proposals were considered and many recommendations made at the Conference. Generally, however, the Conference gave priority to water for agriculture and to community water supplies, with concerns over shared water resources also receiving significant attention. Somewhat less attention was given to the incidence of floods and droughts, water for industry, hydroelectric power generation, inland navigation, and matters related to pollution and environment. Conference recommendations of general interest included the following:

1. Since the assessment of water resources is an important prerequisite to investment planning and to the operation and maintenance of water resources, all nations should increase their efforts to improve the basic hydrological and meteorological data pertaining to their country and regions within their country.

2. Since developing countries are faced with severe resource scarcities -- particularly, with a lack of technical expertise and foreign exchange -- every effort should be made to assure that the technology used by countries is "appropriate" to their needs.

3. Since food production has to be increased to satisfy both present and future needs, countries should take steps to increase irrigation capacity by constructing additional irrigation projects, by improving water use efficiency, and by rehabilitating existing irrigation facilities.

4. Countries should formulate and adopt specific and detailed plans on water supply and sanitation services suited to their individual and specific conditions, so that all people may be provided with water in an efficient and equitable manner as soon as possible.

While these recommendations are clearly of general interest, several could, in the future, have a more direct and significant bearing on Bank operations:

1. Increased Financial Resources: The Conference unanimously recommended that increased financial allocations be made to existing

organizations within the United Nations system, particularly, the United Nations Development Programme, to increase the funds available to all developing, and in particular, the least developed countries to meet their needs in technical assistance and programs related to water resource development. The recommendation concerning additional funds referred to bilateral, subregional, regional and international organizations and programs, including those of the Bank and the regional development Banks and proposed that they review their terms and conditions in view of the economic and social implications of water development projects, with the objective of providing the best possible terms.

2. Feasibility Study: A group of delegations led by several African nations suggested the establishment of a fund under United Nations auspices to be used specifically for the development of water resources. Other delegations felt that increased development assistance would better come from existing sources. It was this diversity of opinion which led to the compromise resolution referred to above requesting the Secretary-General to undertake, after consultations with governments and U. N. organizations, a study of mechanisms to increase the flow of financing specifically for water development and management.

After the resolution was adopted, representatives of the U. N. Secretariat asked the Bank delegation informally for assistance in determining the scope of the proposed "feasibility study." It is likely that the Bank will be asked, as a minimum, to assist in drawing up terms of reference.

3. Water for Agriculture: The Conference recommended that countries make available, within two years, phased programs of financial requirements for the development and use of water for agriculture. These programs would be used to draw the attention of international financing agencies to the need to adapt to the intensified program, in recognition in particular of the severe constraints imposed by current methods of project financing for the development of water in agriculture. This calls, the resolution said, for a shift in the apportionment of funds, to give higher priority to water for agriculture. It also requires more flexibility in local currency financing and in introducing integrated program financing, in addition to traditional project financing, together with the development of new evaluation criteria and methodologies. Finally, it requires greater use of national and regional financing facilities and of local human and material resources. It is interesting to note that the recommendation as initially proposed by FAO called for program financing "rather than" traditional project financing.

5. Community Water Supply: Primarily as a result of the water supply goals set at the HABITAT Conference and of the general acceptance of the ideas put forth in the WHO/World Bank Community Water Supply

paper, the discussions on community water supply resulted not only in general recommendations, but also in the proposing of dates by which specific activities are to be achieved: the adoption of appropriate programs with realisitc standards for quality and quantity to provide water for urban and rural areas by 1990, if possible; the preparation, by 1980, of detailed plans for the implementation of these programs, including the identification of the necessary resources; and the review, in 1980, by an appropriate body to be defined by ECOSOC of the national plans, and of the resources already mobilized and still required to support them.

Also of significance to Bank involvement in community water supply was what seemed to be a general acceptance on the part of countries, including those which categorize drinking water as a so-called social good, that water supply projects and programs must be financially and economically sound, as well as responsive to social needs. The Conference recommendation which comes closest to an official expression states that countries should "adopt pricing policies and other incentives to promote the efficient use of water and the reduction of wastewater, while taking due account of social objectives."

Underlying these Conference recommendations was the general recognition that if the 1990 targets are to be achieved, annual investments in urban water supply will have to be at least twice those made during the first five years of the current Development Decade, while for rural water supply, annual investments would have to increase by approximately four times.

V. Conclusion

As might be expected at any meeting of delegations which consists primarily of water resource experts and diplomats, the U. N. Water Conference resulted in a general call for the allocation of increased resources to water resources sectors, along with numerous statements that water is a "special" resource and should therefore be among the highest priority claimants for investment in all developing countries.

In addition to these generally expected results, however, the Conference adopted a number of substantive positions which are reasonably consistent with Bank policy. Thus, there seemed to be a general understanding that the best way to solve existing and future water resource problems is to set goals, and then to develop plans and comprehensive policies through which an efficient and equitable allocation of resources can be achieved in meeting them. In other words, the Conference seemed to conclude that if significant programs in the water resource sectors is to be made, it must be done by countries taking the lead and adopting policies which are not only socially responsive, but also financially and economically sound.

A full set of resolutions and other Conference documentation has been placed in the Executive Directors' Library.

Energy, Water and Telecommunications Department
April 27, 1977

Statement Made By
The Head of The
World Bank Delegation
At the Plenary Session
March 15, 1977

Mr. President

Distinguished Delegates

Ladies, Gentlemen:

The World Bank has long been involved in Water Resources Projects, and on an increasing scale. While helping finance such projects, for irrigation, power, industry and water supply, we have met many of the complex issues facing this Conference: the problems arising from shortage, excess or misuse of water, the needs for planning, for river basin management, for drainage and flood control, for protection of health and the environment as well as the basic need of people for water and for food.

Today, however, I wish to restrict my remarks to only one subject, namely the provision of drinking water for people. This subject, which was highlighted last year by the HABITAT Conference is one which has received increasing attention within the Bank over the years. I will attempt to describe briefly the role of the Bank in helping expand community water supplies in developing countries, and then to outline, from our experience some of the key factors for success.

The Bank's Involvement in Water Supply and Sanitation

Since 1962, the World Bank has lent close to 1-1/2 billion dollars towards project costs of nearly 4-1/2 billion dollars, for water supply and sanitation projects in 29 countries. The amount lent last year for projects of this type was about 200 million dollars. In addition, we lent about 150 million dollars for water supply and sanitation purposes, as part of other multisector or integrated projects for urban development, rural development and agriculture.

Most of our water supply lending is still in urban areas although lending in rural areas is increasing significantly.

Urban Projects

The aim of our Urban Water Supply Projects is not only to provide water supply authorities with funds which help to finance the production, transmission and distribution components of supplies, but also to strengthen the institutions in the sector and to see that access to service is provided in all sections of cities, including the lowest income areas where the residents in many cases cannot afford to pay the full costs of supply. For example, a recent water supply project in Zaire, covering six cities, will increase access to service from the current 30 percent of the population to almost 100 percent. This was done when local authorities reallocated a significant proportion of the investment funds from the provision of house connections for a limited few, to public standposts which ensured a minimum level of service to all.

The Bank also lends for projects which concentrate exclusively on the Urban Poor. These projects include a variety of components such as services and basic infrastructure; serviced lots on which poor people can construct

their own homes; loans to homeowners to help complete their houses; loans to small-scale enterprises to foster employment; and social services such as schools, community centers, and health clinics. In all of these projects a significant proportion of the investment is for water supply and sanitation services, designed to standards that make the costs affordable even by the poorest members of society.

Rural Projects

The problem of providing a safe and convenient water supply to residents of rural areas of developing countries is in many cases more complex than its urban counterpart -- the costs of supply are sometimes higher, the people are poorer, trained personnel do not want to live in rural areas, institutional and logistic problems impede the efficient operation and maintenance of systems. When we first considered increasing our emphasis on lending in rural areas, we saw few solutions. As a result, we undertook an extensive world-wide survey of existing programs. Our findings have since been published in a summary Bank paper on "Village Water Supply," and in a comprehensive book by Saunders and Warford on "Village Water Supply: Economics and Policy in the Developing World." Thus we have reached the stage where the next step is to lend, and that is exactly what we are beginning to do. We are already lending for water supply and sanitation as components of integrated rural development projects, and we are now helping countries prepare national or regional rural water supply and sanitation programs which will be suitable for Bank financing.

Several years ago, the Bank and the World Health Organization joined efforts in a cooperative program designed to help countries to develop policies and investment programs for water supply and sanitation. We are now examining with WHO and others in the international community, principally FAO and UNICEF how this program could be used to foster more effectively the expansion of rural water supplies.

National or Regional Sector Loans

Another means by which the Bank has recently begun participating in water supply lending in developing countries is through loans which assist in the implementation of region-wide or country-wide water supply programs, rather than lending for individual projects within the sector on a one-at-a-time basis. We have considered such sector-wide loans in cases where there are established and stable institutions, skilled manpower capable of detailed project selection and appraisal on a large scale, and sector policies which promote efficient resource allocation, universal service to all income groups, and the financial viability of institutions in the sector. So far we have made several such loans, notably for the State of Minas Gerais in Brazil and the State of Uttar Pradesh in India.

Sanitation Projects

Through the years we have become increasingly involved in financing sanitation projects. To date we have helped finance 37 urban or regional sewerage projects, independently or as part of other types of projects.

The major problem with conventional waterborne sewerage is that it usually costs at least twice as much per capita as a water supply system. And given the difficulties associated with providing water for everyone, it is clearly not feasible in the foreseeable future to solve the human waste disposal problems through conventional waterborne systems.

Under present circumstances, we at the Bank deal with this problem on a case-by-case basis searching for the least cost solution to meet the most urgent waste disposal and drainage problems. Where pit privies or holding tanks are cheaper and feasible, we recommend serving a maximum number of people in this way, rather than serving just a few by the more costly waterborne sewerage. We also, of course, are not unaware that since increasing per capita water use generates increasing waste disposal problems, one alternative might be to encourage the consumption of less water on a per capita basis.

Thus, we need to know more about costs and about the social, economic and health implications of each of the alternative means of dealing with waste disposal and drainage problems. We have, therefore, embarked on an extensive world-wide survey of waste disposal alternatives. We hope that as a result of this effort we will in the near future be better able to advise developing countries on more appropriate and affordable technologies which will help to reach their service goals sooner.

Meeting this basic need of people for water supply and sanitation is part of the Bank's fundamental objective of improving the productivity and living standards of the poor. As such, I anticipate that this part of Bank lending will increase. How much this increase will be, depends on many factors which cannot yet be evaluated; factors such as the total resources of the Bank and IDA, countries' own priorities, and the availability of projects that can be properly prepared.

Strategies for More Rapid Progress

The goals are clear -- safe drinking water for 100 percent of the world's population. The 1976 HABITAT Conference suggested 1990 as the target date for this to be achieved. Such a task, however, is enormous. At this time, over a billion people -- or some 60 percent of the population of developing countries -- lack access to safe water. Nearly 70 percent are without adequate sanitation. Given existing population trends, if present real levels of investment are maintained for the next 13 years, only about half of the people in developing countries will have clean water, and only 40 percent will be provided with adequate sanitation. Thus, to achieve such goals by 1990 will require a massive effort. In most countries progress will depend partly on the availability of large additional investment funds. It will also depend significantly on the extent to which we are successful in dealing with the following crucial issues:

Firstly, it is clear that countries have many priorities besides water supply, agricultural and industrial production, health and nutrition services, education, transport, and so on. Water supply investments must compete more effectively for funds with these other priorities.

This implies sector strategies stressing the priority of basic human needs, effective planning and systematic efforts to minimize costs by adopting standards of service which are affordable and least cost technologies appropriate to the specific situation.

Secondly, to ensure orderly sector development and to avoid dependence on allocations from central government budgets, every attempt must be made to mobilize funds through water charges in developing countries where public funds are at a premium. This is absolutely central to the maintenance and expansion of water supply systems. Our experience indicates that social objectives can be accommodated through suitable tariff design: "lifeline" rates for small consumers, and subsidies for standpost supplies ensure that the poorest members of the community receive their basic needs at a price they can afford, while charges for larger quantities should approach the long run marginal costs of supply. Such a water supply tariff structure can allow all segments of society to benefit from the investment, will discourage wasteful use of the service, and can give water supply agencies the financial means to perform their functions.

Thirdly, effective and stable water supply institutions must be created and given a degree of autonomy by governments, so that sector responsibilities are clear, and so that detailed financial and engineering plans can be prepared and implemented in a smooth and continuous way over time.

Fourthly, the very real problems of recruiting and retaining skilled manpower within the sector -- at all levels from managers to operators -- must be solved. Few countries have adequate manpower development programs, and there is often a high rate of transfer to the private sector because salaries and service conditions within the government are noncompetitive.

Taken separately, all of these items are feasible: create a sector strategy; reassess technical approaches; implement tariffs which ensure financial viability and encourage efficiency and equity; create stable autonomous institutions with clear responsibilities and government support; develop manpower and ensure that the sector offers a worthwhile career to qualified staff. These items, however, are like individual links in a chain: if any one of them fails the chain breaks and scarce development funds are wasted.

Conclusion

I have the uneasy feeling that all I have done here today is essentially to restate the obvious. We all know what our goal is. We know that it must be achieved as quickly as possible, and we know that the tasks ahead of us are difficult. In fact, taken as a whole, these tasks appear forbidding. But taken one by one they can be dealt with and our goal can be achieved. It is an exciting challenge for governments and for people at all levels. We at the Bank associate ourselves with this challenge and we look forward to doing our share.

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Mr. J.M. Kalbermatten

DATE: March 24, 1977

FROM: John M. Pettigrew, ASPEW

SUBJECT: Sewerage Task Group

I was asked at a group meeting held to-day to take up the following points with you.

1. We discussed the Workbook on Municipal - Industrial wastewater re-use and one of the conclusions we came to was that the authors, Development Sciences Incorporated, had stuck fairly well to the brief they had prepared for themselves but that we might have helped them if the brief had been reviewed by the task group; we offer to conduct such reviews should the opportunity arise and if you think we can be of service.

2. Mr. Cosgrove intimated that Mr. Serdahely who has recently joined the Bank would like to join the sewerage task group. If you have no other plans for him please let me know and I will extend a welcome.

3. A decent interval having passed since the task groups were set up may we expect to see an indication of the doings of the task group organisation as a whole?

JPettigrew/ms

non Regional yellow

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

Water Supply & Sewerage

OFFICE MEMORANDUM

TO: Members of Water Supply Finance Task Group DATE: March 22, 1977

FROM: Ali N. Memon (WAPEW)

SUBJECT: Minutes of the Finance Task Group Meeting dated Wednesday, March 16, 1977

1. Messrs. Davis, L. V. Smith, Kapur, Chang, Hayden, Keilani and Memon attended the meeting.

2. Mr. Davis distributed copies of "The Purpose and Form of Financial Covenants in Public Utility Loans and Credits" to those present for information. He pointed out that the report was with Mr. Rovani for final approval.

3. Mr. L. V. Smith distributed a first draft of "Glossary of Financial Terms for Water Supply and Sewerage Projects (Based on EOFI Terminology)" which he has prepared. Members of the Task Group were asked to review and comment. The draft will be discussed during the next meeting.

4. Messrs. Kapur, Keilani and Chang agreed to make a start on in-house surveys of (a) the rate of return or other revenue covenant and (b) compliance with financial covenants in water/sewerage projects approved by the Bank group since 1970.

5. Mr. Memon agreed to look into the question of financial consulting work. As a start, an effort will be made to have a centralized collection in the water supply library of terms of reference and final reports for various types of financial consulting work done for the Bank group-financed water projects.

6. Mr. Hayden agreed to make a start on the questions of asset revaluation and inflation accounting.

7. The next meeting will be held in about one month.

ANMemon/bm

cc: Messrs. Esref Erkmen (EAP), R. Salazar (WAPEW), Jack Beach (AFP), Eric Williams (ASP), James J. Fish (EMP), Alain Thys (EMP), C. P. Vasudevan (EWT), E. C. Wessels (LCP), C. Alfonso Zavala (LCP), Carlo Rietveld (WAP), William J. Hayden (EMP), Charles G. Todd (LCP), W. M. Keilani (EMP), Jorge Culagovski (LCP), L. Victor Smith (ASP), P. C. Kapur (ASP), John Davis (EWT), J. Kalbermatten, R. Middleton (EWT).

Task Group file JMK only
Erkmen

With friends like these....

Mr. Esref Erkmen

March 22, 1977

E.A. LaBahn

Finance and Development

1. The following comments relate to Mr. Clark's memorandum of March 11 requesting suggestions as to possible future changes in the subject publication.

2. Most of the articles appearing in past issues of the publication, in my opinion, have been overly academic being weighted heavily in the areas of economics, research and theory. Only one article ("Energy Problems of the Non-OPEC Developing Countries, 1974-80") listed by Mr. Clark as of interest to Bank staff and included within the E&WS sectors was recently published. I believe that other subject material could be developed for the water supply and energy sectors although it is doubtful that regional staff have time to prepare such articles. CPS is a more logical candidate.

3. Same possible subjects of interest in the E&WS sectors include the following:

a) Marginal cost pricing and its significance in developing economies;

b) Utility service to the urban and rural poor;

c) Metering water deliveries to the urban poor;

d) Development of rural water supply projects.

EALaBahn:hmv

RM

cc: Messrs. Reekie, Bates, Kalbermatten (EWT)

file - Mgmt Task Group

March 16, 1977

Mr. John Kalbermatten, EWTDR

Pat Brereton, LCWS

Management Task Force Vacancy

Owing to the reassignment of Mr. Roger du Nee to the East Africa Agriculture Division, he will not be able to participate in the Water Supply Task Group on Management. Consequently the Management Group is seeking a new member who would be interested in studying the selection and use of consultants and compiling a consultant register (Mr. du Nee has done preliminary work on the latter project). To fill this vacancy, we would greatly appreciate your suggestions of any staff members who as yet have no task group commitment or who might be willing to transfer into the Management Group.

RduMée:ms
March 11, 1977

DRAFT

TO: Water and Power Engineers and Financial Analysts
Energy and Water Division Chief and relevant C.P staff
FROM: Pierre Roger du Mée

SUBJECT: Register of Consultants (Management and Organisation)

As you may know, water supply engineers and financial analysts have recently formed "task groups" to facilitate the co-ordination of existing information and acquisition of more extensive knowledge in specialised fields of our operations.

I belong to the management task group, together with S. Alber-Glanstaetten, W. Cosgrove, R. Costa, C. Fernandez, E. Pogson and K. Thomas.

Each of us has been allocated a particular specialised field to co-ordinate, and my own task is to compile a rigister of consultants who have undertaken assignments on the institutional side of Public Utilities, i.e. management, organization, accounting, staff selection, computer selection and installation, etc.

I should be grateful, if you should have knowledge of such consulting assignments in the past, or ongoing, if you would kindly pass on as much information as you can to me so that I can make it available to those collegues who may be thinking about having such work undertaken in their countries.

As a sample I enclose particulars of a current assignment with which I am involved.

Consultant Register

Consultants: P.A. Management

Office Involved: Geneva : staffed from Paris office, Rue Bellini, 16e (727-35-79)

Head Office: London (International H. Q.), Australia, Europe etc.

Techniques: Management, Organisation, Production, Marketing, Finance and Accounting, Personnel Selection, Training, Project Planning, Computers.

Director: Mr. A. Bonafi (Paris Office) French national

Staff: Mr. R. Dagiral (organization expert)

Mr. M. Buhler (psychologist)

Mr. D. Antoni (expert comtable)

Project: Andekaleka Hydro Electric Project (Madagascar) IDA Credit of about $ 30 million.

Assignment:

1. Reorganization of newly formed JIRAMA which merges two former Electricity and Water Supply Companies (formerly operating concessions in Madagascar).
2. Selection and determination of duties and responsibilities of department and section chiefs.
3. Establishment of opening balance sheet (one company's accounts were 3 years behind).
4. Production of improved monthly operational and financial control statements including restructuring procedures and computer programs.

Comments: A very high professional standard of staff and, as far as can be judged, effective implementation. The consultants appear to have a very successful working relationship with management and staff.

Reason for Assignment: IDA insistence that this work was required.

TOR: Drafted by Consultants and reviewed by IDA staff.

Fees: About $100,000 for an aggregate of 12 man months plus local expenses and air fares.

Other Firms Considered:

1. Ed F
2. Peat Marwick Mitchell (Paris)
3. A local firm of expert-comptables

Financed by: JIRAMA (foreign currency provided by Central Bank).

Bank Staff: Pierre Roger du Mée (FNA)

Dan Ruiu (ENG)

Task
Group
Project
Management

W..LD BANK / INTERNATIONAL FINANCE CORPORA..ON

OFFICE MEMORANDUM

TO: Members: Sewerage Task Force DATE: March 11, 1977

FROM: John M. Kalbermatten, Water and Wastes Adviser, (EWTDR)

SUBJECT: Municipal Industrial Wastewater Reuse Opportunities

I am sending you a draft report of a workbook on the above topic for your review. The workbook was prepared by Development Sciences, Incorporated, to serve both Bank staff and prospective borrowers where the question of wastewater reuse could have significant impact on the water supply and sewage disposal situation. For a better understanding, I am also attaching a copy of the terms of reference which were given to DSI. I would like to point out, however, that I am less interested to your opinion on whether DSI has lived up to the letter of the terms of reference, than on your comments on whether the workbook is useful and what improvements you would suggest for it.

I would appreciate it if you would send comments to my office by close of business March 28. I am asking Mr. Shipman by copy of this memorandum to review and consolidate these comments by the time I return on April 4. I will then send the consolidated comments to DSI who has agreed to join us on April 14 at 2:00 for a discussion of the workbook and the comments we make. If Mr. Shipman feels a meeting of the Sewerage Task Force would be beneficial to reach a consensus, he will call such a meeting. After the meeting with DSI on April 14, I anticipate that the workbook can be finalized and be the basis of a half or one day workshop for interested Bank staff.

cc: Messrs. Shipman (EWTDR), Cosgrove (EMP), Freedman (LCP), Middleton (EWTDR)

JMKalbermatten:sp

A PROPOSAL TO PREPARE A WORKBOOK COVERING MUNICIPAL-INDUSTRIAL WASTEWATER REUSE OPPORTUNITIES AND METHODS OF ENCOURAGEMENT

20 April 1976

Submitted to:

Mr. John M. Kalbermatten
Water and Wastes Advisor
Energy, Water, and Telecommunication
International Bank for Reconstruction
and Development
1818 H Street, N.W. - Room D1036
Washington, D. C. 20433

DEVELOPMENT SCIENCES INCORPORATED

MUNICIPAL-INDUSTRIAL WASTEWATER REUSE OPPORTUNITIES AND METHODS OF ENCOURAGEMENT: A WORKBOOK

Scope of Work

The following outline presents the suggested contents of a workbook. This workbook would be directed toward Bank engineers involved in project development, monitoring, management, and evaluation. The workbook would not be technical but would present general information of use to professionals familiar with some aspect of industrial and domestic wastewater reuse (economics, engineering, environmental, etc.). The focus of the workbook would be to present sufficient general information about municipal-industrial wastewater reuse to encourage and allow IBRD to include wastewater reuse in projects they fund. A workbook format has been suggested because, while there is a varied audience for this subject, there is a common goal to which each person must contribute. The workbook will thus lead a person from general descriptive information on what is being done and can be done through to possible Bank roles and postures to encourage, institute, and demonstrate reuse. The following outline for chapters in the workbook can also serve as a work task outline. Each chapter will also constitute a discrete project task and the completion of work on each task will involve production of a draft of the chapter.

Chapter I - Current Reuse Profile

A description of reuse projects currently underway, projects which have been demonstrated and types which are probable will be included in

this chapter. This will be highlighted by general examples (selected cases) for large-scale industrial uses of domestic wastewater as well as industrial reuses of their own wastewaters. Several cases will be described. The selection of actual cases will be the first item of work and this selection will be made in conjunction with Bank personnel. An additional initial item of work will involve meetings with several Bank engineers in order to better structure the workbook to meet varied needs of bank personnel who will be using the book.

Chapter II - Targets for Reuse

This chapter will include data tied to the SIC (Standard Industrial Classification) system showing, by quantity, quality, and selected process, those industrial types which use large amounts of water, provide usable wastewater, and which are targets for reuse.

Chapter III - Uncovering Opportunities

A discussion of technical and institutional characteristics necessary for successful reuse will be included in this chapter. This chapter will also contain a presentation of risks and ways of overcoming and distributing them. The information presented in this chapter will identify those general institutional, administrative, implementation stumbling blocks which have been found to commonly create problems in wastewater reuse programs.

Chapter IV - Roles for the Bank

This section will focus on two to four hypothetical cases of wastewater reuse. A topic (hypothetical case) such as industrial co-location and joint

use of domestic wastes will be highlighted and Bank roles discussed in this context. The selection of the type and number of tasks will be initiated following the completion of a draft of Chapter II.

General

Each chapter will be followed by a bibliography identifying principal publications, the type of information they contain, and, wherever possible, the source where a copy can be purchased. The work program will be culminated by a 1/2 day work session at the Bank offices. During this session, selected DSI personnel will explain and discuss the workbook and will go through its application using the cases presented in Chapter IV. This work session will serve as a final review of the workbook as a question, answer, and planning session for further expansion of this work.

Work Timing and Project Costs

The minimum time of completion for a draft of the workbook would be 1 1/2 months from receipt of written notification to proceed. The 1/2 day workshop could be held two weeks following delivery of 10 copies of the draft workbook to IBRD for review. Based on the discussions and comments at the workshop, DSI will finalize the workbook and deliver an original and 10 Xerox copies of the final workbook to IBRD within three weeks of the workshop.

The total costs for the project including manpower, travel, reproduction, and workshop presentation has been calculated as $9,100. Table 1 presents the breakdown of costs based on estimated manpower, travel, workshop, and miscellaneous printing and communication needs.

TABLE 1

ESTIMATED PROJECT COSTS

Category	Man-Months	Cost
Manpower	2	$ 8,000.
Travel (air & surface Boston-Washington)		500.
Workshop		300.
Misc. Printing & Communication (progress, draft, final reports)		300.
PROJECT TOTAL		$ 9,100.

Based on the above estimate, DSI will be willing to contract on a time and materials or a fixed-price basis, whichever is acceptable to IBRD. We will bill on a monthly basis for work performed with a holdback of 10 percent to be paid upon acceptance of the final report.

A set of resumes of personnel who would be most directly involved in the work are included as well as a discussion of DSI capability to undertake the work.

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

Non Regional West Africa files
Water Supply + Sewage

OFFICE MEMORANDUM

TO: R. Salazar (Chief WAPEW)

DATE: March 14, 1977

FROM: J. C. Rietveld (WAPEW) CR

SUBJECT: Water Supply Division Chief's Meeting with CPS (Kalbermatten and Rovani) on Thursday 3/10/77 on CPS Memo of 3/2/77 on New Direction of WHO/WB Cooperative Program.

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1. The new direction of the WHO/WB cooperative program (CP) is the result of WHO's evaluation of this program with the help of J. Kearns of the Bank. The new direction is summarized as follows:

(i) transfer of CP staff to WHO regional offices, where feasible. For the moment only to SEARO (new Delhi) and possibly PAHO (Washington);

(ii) direct communications between the CP and the WB water supply division chiefs;

(iii) delegation of a WB staff member as assistant CP division chief in Geneva;

(iv) a possible exchange of 2 staff members between the CP and the WB;

(v) diversifying the CP involvement into project preparation; and

(vi) workshop to train CP staff.

2. The program costs the Bank US$640,000 per year, which is the Bank's part of the total CP cost of US$850,000. Ten-man-years of CP time are available.

3. The general tone of the meeting was that the Divisions were very disappointed in the performance of the CP over the last five years, however, were ready to try again in view of the Bank's responsibilities. The major problem recognized was that it would be hard to regain the credibility of the WHO-CP and also the WHO in the countries.

4. Mr. Kalbermatten requested the water supply division chiefs to present a work program for the CP in their region before April 11, 1977. The date on which he wanted to make the complete work program for the CP. However, he also indicated that he or his assistants, would like to discuss the proposals as soon as they are ready.

CRietveld:js

Mr. Kalbermatten
D1036

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Management Task Group **DATE:** March 14, 1977

FROM: P. Brereton

SUBJECT: Terms of Reference of C. Fernandez

Attached is a copy of the terms of reference proposed by Mr. Claudio Fernandez. Any comments on the draft should be sent to Rm. A-842 by Friday, March 25, 1977. Thank you.

cc: Messrs. J. Kalbermatten
J. Davis

WATER SUPPLY TASK GROUP ON MANAGEMENT

BASIC COMPUTER PROGRAMS FOR PUBLIC UTILITIES

TERMS OF REFERENCE

1. Objectives

To collect and analyse information on the best computer programs being the more commonly used by public utilities, especially in the areas of General Management and Finance, and to produce a library of programs that can be used by the Bank and our Borrowers.

2. Justification

Even simple computer programs, such as billing, are most frequently improvised in utilities which are computerizing their systems or changing their computer. In many developing countries, good system analysers and programmers are also scarce. The results of these problems are:

(i) Many computers are used for only a few hours and have very few programs; thus, the cost-benefit ratio is low;

(ii) Programs are inaccurate, inefficient and difficult to maintain; there are no appropriate manuals and often serious mistakes are made;

(iii) Development of the initial program or its updating for a new machine may take several years because of lack of software capacity;

(iv) Output is incomplete, lacks statistical analysis or is not adequately summarized for management's decision;

(v) Large sums of money are invested for the development of programs by consultants who often have no experience in public utilities and very vague terms of reference;

(vi) Since there is little confidence in the programs, processes are manually duplicated; thus the use of computers is in many cases unjustified.

The tasks described below constitute an attempt to solve these problems through the provision of basic programs for easy use by the different utilities and the setup of an inter-utility technical assistance program.

3. Scope of the Study

The study will have three consecutive parts:

A. Machines and Programs Presently Used

Survey of water, power and telecom utilities to find the type of computers more commonly used, their characteristics, the language used and the utilities' experience with programs for tariff studies, billing, payroll, accounts receivable, inventories, accounts payable, general ledger, investment planning and control, etc. The questions to be answered are:

(i) Which computers are preferable for a given size of utility?

(ii) What configurations are preferred?

(iii) Which languages?

(iv) Which program should be developed?

(v) What time is required for each different application?

(vi) Which companies are willing to share programs?

(vii) Which companies have qualified personnel?

(viii) Which company could assist other utilities?

This information would be collected by means of a questionnaire that would be distributed to all P.U.s benefitting from a Bank loan.

B. Selection of the Most Appropriate Programs

Detailed analysis of input-output, and software of the programs rated better (by the users) in order to select the best fitted for each application and computer configuration. 1/ Visits will be made to more promising utilities which may have these programs.

C. Basic Library of Computer Programs

Start a library of programs, donated by users, and promote the creation of an "International Association of Computer Users in Public Utilities" which could update the library and facilitate the exchange of information between companies. The Management Task Group would serve as a liaison between the Association and Bank staff and would provide technical assistance to appraisal and supervision teams whenever necessary.

1/ Three basic configurations are considered: (a) below 16K bytes of memory, disk storage; (b) below 64K bytes of memory, disk storage; (c) more than 64K bytes, disk and tape files.

If one or more programs considered essential for a well-run utility are not obtained from donations, these programs will be developed by consultants using as reference the best models found in (B) above.

The following points should be determined for each program: The billing program, for example, should specify types of tariff structures to be considered, input system (casette, prepunched cards, magnetic ink, mark sensing), inconsistency reports, data file per user, identification codes (street, number, arbitrary), receivables control; billing summary; statistical water use; meter control and maintenance; readers control; safety precautions; auditing. Additional reports: overdue receivables, total water usage by city sections, houses without water or too little consumption, meter repair and inspection program, etc.

4. Resources Required (for Part 1-2)

(i) Personnel: 1 full-time YP or Research Assistant for 6 months and 1 full-time consultant for 6 months;

(ii) Missions: 1 per region, covering 3-4 public utilities (Water and/ or Power) in each mission;

(iii) Publication: Reference library of programs, computers and utilities using them. Manuals of selected programs (input-output and flow diagram).

5. Time

This study is expected to require one year. The writing of the programs which could not be obtained free from public utilities or which would be considered inappropriate may require an additional 6 months.

cc: Management Task Group

CFernandez/RCosta:nq:clh

March 9, 1977

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Mr. Richard Middleton DATE: March 4, 1977

FROM: John M. Pettigrew, Sanitary Engineer, ASPEW

SUBJECT: Treatment of Combined Sewer Overflows by High Gradient Magnetic Separation

You have asked if we should learn more about this. From the Banks' point of view I think it unlikely that we will encounter proposals for this sort of treatment in the countries we deal with for many years to come. But as engineers, yes, we should learn more about it. I read the paper with great interest and can think of places where the method could have attractions. In simple terms (probably over-simple) the method involves mixing weak sewage (storm sewage from combined systems) with magnetite (plus flocculants, pH correctors etc. where necessary) and passing the mixture through a graded magnetic field. The magnetised particles adhere to a mesh, the field is destroyed, a backwash takes the muck to a settling tank and the cycle is repeated.

The method can be applied to crude sewage and pages 65 and 66 give some indication of levels of capital and operational costs. The paper advocates application to combined sewer overflows and here we have to bear in mind the typical combined system - i.e. there are overflows in all sorts of places where locating anything more than a crude screen poses serious problems. On the other hand there is often enough storm water arriving at the sewage treatment works to make some form of treatment common; usually simple sedimentation. So perhaps there are possible applications here.

Evidently there is scope, for consideration at least, for application of the method on some existing combined systems. What about new systems? There are not many new systems of the combined type but there is a revival of interest in the combined system and there is a case for adopting combined systems from the outset in the towns and cities that come within the Bank's field of interest. In such instances there may be reason for considering this type of treatment, subject of course to normal justification on economic grounds when compared with the other methods available.

In answer to your second question - yes, we should have it in our library.

JPettigrew/ms

EPA-600/2-77-015
March 1977

TREATMENT OF COMBINED SEWER OVERFLOWS BY HIGH GRADIENT MAGNETIC SEPARATION

by

David M. Allen
Richard L. Sargent
John A. Oberteuffer
Sala Magnetics, Inc.
Cambridge, Massachusetts 02142

Contract No. 68-03-2218

Project Officer

Hugh Masters
Storm and Combined Sewer Section
Wastewater Research Division
Municipal Environmental Research Laboratory (Cincinnati)
Edison, New Jersey 08817

MUNICIPAL ENVIRONMENTAL RESEARCH LABORATORY
OFFICE OF RESEARCH AND DEVELOPMENT
U.S. ENVIRONMENTAL PROTECTION AGENCY
CINCINNATI, OHIO 45268

ABSTRACT

Seeded water treatment by high gradient magnetic separation techniques was carried out on combined storm overflows and raw sewage influents. Both bench-type and continuous pilot plant tests were performed to evaluate the effectiveness of the process in purifying waste waters. Critical parameters were varied to determine optimal removal efficiencies, sensitivities and relative importances of these variables. Attempts were also made to compare the effectiveness and economic feasibility of high gradient magnetic separation treatment with present methods of waste water treatment. Finally, recommendations for the next phases of study have been presented.

The results of the present study show this process to be a highly effective method of reducing most forms of pollutants present in CSO and raw sewage to low levels of contamination. Capital cost estimates for high gradient magnetic separation systems also compare favorably with traditional secondary plants. Several additional benefits are realized such as extremely high processing rates, small land requirements, and lower chlorine demand (ecological benefits).

This report was submitted in fulfillment of Contract No. 68-03-2218 by Sala Magnetics, Inc. under the sponsorship of the U. S. Environmental Protection Agency. This report covers the period of June, 1975 to July, 1976.

Mr. Kalbermatten

RF

OFFICE MEMORANDUM

TO: Water Supply Management Task Group DATE: March 4, 1977

FROM: P. Brereton

SUBJECT: Task Group on Management
Minutes of Second Meeting on February 24, 1977

1. The meeting reviewed four draft terms of reference for individual study topics and offered the comments summarized below:

(a) Organization Structures - W. J. Cosgrove

The meeting made the following comments:

(i) the objectives and end product of the study seemed unclear; would it draw conclusions or develop guidelines?

(ii) the intention outlined in para. 2 (to analyze the effects of organization structure on the functioning of specified institutions) was of less importance than identifying the reasons governing adoption of a particular organizational structure;

(iii) Para. 4 was found obscure since the terms extracted from A. Weiner's The Role of Water in Development are not understandable to anyone who has not read the book;

(iv) since the organization of water supply utilities seems to be weaker in handling distribution and commercial matters and stronger in bulk water collection, the study might try to determine if there is any organization structure which encourages the good management of distribution and sales;

(v) the study might consider whether there is any evidence to support the idea that publicly-owned water companies are better run if they are independent than if they are combined with other authorities like electricity;

(vi) the meeting wondered if the study should be confined to four specified countries in one region, or would not be more valuable if it covered a wider sample of regions;

(vii) staffing and travel requirements should be specified for budgetary purposes.

The meeting decided to refer the draft to Mr. Cosgrove for him to consider these comments.

(b) Management Objectives - R. Costa

The meeting suggested that the staff requested include one consultant and either one YP (if possible) or alternatively one Research Assistant. The travel should be decreased from seven missions to four (Far East, Europe, USA-Canada, and Latin America, the last done in conjunction with a Division mission).

(c) Human Resources Management - E. Pogson

Comments from the meeting have already been incorporated into the attached draft.

(d) Management Information - B. K. Thomas

Draft accepted with one emendation to staff requirements--a YP will be needed for six rather than three months; elapsed time for the total study will be one year. The meeting suggested that the published study include examples of good reporting system(s).

2. Terms of reference for studies (b), (c) and (d) were agreed to be circulated to Mr. J. Kalbermatten for:

(a) Approval of terms of reference for each study and

(b) Budgetary and any other authorization before the study commences for the required travel, staffing and facilities.

3. Terms of reference for the study by Mr. C. Fernandez will be circulated shortly and that for Mr. du Mee on his return to Washington.

cc: Messrs. J. Kalbermatten (EWTDR) ✓
J. Davis (EWTDR)

Attached 3/14
R.A

WATER SUPPLY MANAGEMENT TASK GROUP

MANAGEMENT OBJECTIVES, POLICIES, PLANNING AND DECISION-MAKING COORDINATION WITH URBAN DEVELOPMENT

Terms of Reference

A. Objectives

To collect and anlyse information and present conclusions on worldwide management techniques regarding the setup of objectives and policies and the planning and decision-making processes in public utilities (water supply) with special emphasis on the gaps, if any, between developed and developing countries and inter-relationship between management of water supply utilities and urban development strategies and techniques. The study is expected to be completed within one year.

B. Collection of Information and Analysis

(i) Desk research

Mostly in Washington - review of available materials in the Bank and Congress libraries. Preparation of a questionnaire to be filled by Project Officers in the Water Supply and Urban Development Divisions of the Bank.

(ii) Visits

To water supply utilities in major urban areas in the world, i.e., Los Angeles, Montreal, Mexico City, Buenos Aires, London, Paris, Tokyo and Manila.

(iii) Analysis and Conclusion

Preparation of reports on major topics of interest.

C. Presentation and Technical Assistance

(i) Presentation

In Washington to water supply and urban development personnel;

(ii) Technical Assistance

From Bank experts in the field. To be determined on basis of reports prepared and comments of staff during presentation.

D. Resources Required

(i) Personnel = 1 Full-time 6-month consultant
1 Full-time 6-month YP

(ii) Missions = 7-to Europe (2), USA (1), Latin America (2), Far East (2).

(iii) Coordination = through J. Kalbermatten (CPS), A. Stone (URB)

cc: Members of Management Task Group , Ms. Brereton (LCPWS)

DRAFT
EPogson:lma.

February 28, 1977

WATER SUPPLY TASK MANAGEMENT GROUP

Proposal for a Report on Methods which have been used Successfully to find managers in LDCs and to train them

Objective

The purpose of the study would be to give ideas and help to Projects staff who need to advise a borrower on ways of finding and training managers for water supply 1/ undertakings.

Method

The study would consist of a review of methods used successfully in public utilities and private enterprise. It would result in a written report and one (or more) lectures or seminars. The study would be direct and practical, would not include any research of new ground, and would be more concerned with on-the-job, not academic, training.

The study would be done in three phases:

(1) Collection of Information;

(2) Analysis of Information;

(3) Presentation.

Phase I Collection

1. Visit to the Management Development Branch of ILO Geneva (this organization has a computerized information retrieval service -- the first purpose of the visit would be to "pull" and review all the relevant published

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1/ The information would also be relevant outside the Sector.

information and the second to discuss the ILO experience world wide in management training.

2. Visits to some three or four multi-national companies who have successfully found and trained local managers (probably including Royal Dutch Shell - Amsterdam, British American Tobacco Co. - London).

3. Visit to one National Water Authority with training responsibilities, and ELECTRICITE de FRANCE (who have a wealth of experience in West African countries).

Phase II Analysis

Desk work in Washington to analyze and edit the information obtained and to organize the presentation.

Phase III Presentation

Probably one small report with case examples and the organization of one (or more) lectures.

Resources Required	Time Required
(i) Either one or two Bank staff members	About 6 weeks
or a consultant (principally for the collection of information)	About 10 weeks
(ii) A Y. P. or Research Assistant (principally for Analysis and Presentation)	About 12 weeks
(iii) Consultants / Lecturers	Fees for two people X 10 days
(iv) Travel and subsistence	
(a) 3 return air tickets equivalent Washington/Geneva/Washington 3 X US$750 = US$2250	

(b) Subsistence for about 6 X 1 week

= 30 X 50 = US$1500

Time Required - Dependent on the availability of Staff time, but the aim would be to present the information in January 1978.

To be coordinated with Mr. Chittleburgh.

EPogson:lma

Water Supply Task Group on Management

Management Information Study

Proposed Terms of Reference

Scope of Study

1. The study should identify the information required by managers at all levels in the sector for:

   a) planning;
   b) control of operations (including maintenance)

2. Planning information will include:

   a) long-term (strategic) planning data, such as:

      - population trends
      - urban/rural development
      - plans for industry/tourism/agriculture
      - water resources
      - funds requirements and sources

   b) short-term (tactical) planning data, including performance goals and related work plans for all main segments of activity, resource and financial budgets.

3. Operating (including maintenance) information will embrace all information required to measure performance in relation to goals, and to re-plan short term action as necessary. Principal types of information required will be:

   a) technical - e.g., production, water quality data;
   b) statistical - e.g., productivity and efficiency measures;
   c) financial

4. For all information the study should consider in relation to the needs and responsibilities of various levels of sector management:

   a) the nature of the information required;
   b) to whom it should be provided;
   c) the form and means of presentation;
   d) the frequency of reporting.

5. The study of operating information will involve a review of performance indicators. The study should identify which indicators are most valuable for measuring performance in the sector:

   - for managers in controlling sector activities
   - for the Bank in project supervision

The study should attempt to specify, on the basis of experience, a realistic quantitative value for each selected indicator. Because of differences between countries and between different kinds of water systems, this will probably involve a presentation in terms of median, upper and lower quartile values.

6. It is not intended that investigation should be made of information systems because

a) data processing has been assigned as a separate topic;
b) utilities differ so much in their degree of sophistication and equipment available.

Method of Working

7. The study will be based upon an examination (by questionnaire and interview) of experience in all Bank project divisions engaged in the sector. Since the resultant coverage will describe only LDCs, this should be related to best Western practice by visits to and examination of (say) two U.S. water utilities. The AWWA should be asked to give guidance.

Resource requirements

8. Assistance will be required with basic data collection for not less than three months. This could be a useful training assignment for a Young Professional, who would gain a valuable insight into utility and sector practice in a wide range of borrower countries.

The elapsed time for the total study will not be less than six months.

Task Group

OFFICE MEMORANDUM

TO: Water Supply Task Group on Management (see list below) DATE: February 15, 1977

FROM: B. Keith Thomas

SUBJECT: Management Information Study

As agreed at the last meeting of the Group, I attach proposed terms of reference for my assigned topic, for discussion at the meeting on February 24.

BKThomas/ba

cc: Mr. John Kalbermatten

cc: Messrs. Costa A 843
Cosgrove E 740
du Mee A 1000
Fernandez A 823
Pogson A 842

Water Supply Task Group on Management

Management Information Study

Proposed Terms of Reference

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The elapsed time for the total study will not be less than six months.

Tech Cooperation

February 7, 1977

Training and Certification Section
Ministry of the Environment
135 St. Clair Avenue West
Toronto, Ontario M4V 1P5
Canada

Operations Training Courses and Manuals

Dear Sirs:

As engineer involved in the water supply and sewerage sector in developing countries, I am often asked to provide guidance in the development of training programs for personnel responsible for the operation and maintenance of water supply and distribution networks, water treatment plants, sewer systems and sewage treatment plants. The World Bank has copies of some of your manuals in its Water Supply Library, but it would be useful for me to have a complete set within our own Division. Would it be possible for you to respond to this request?

I note that the manual on Basic Sewage Treatment Operation (3rd edition) does not contain a section on biological filters. Do you have a publication on the operation and maintenance of biological filters or could you refer me to another source? Finally, I wonder if you are aware of training material or Operations and Maintenance Manuals in the French language. (As an ex-member, I have already written to Association Québécoise des Techniques de l'Eau asking if they are aware of the availability of such material in French).

I will greatly appreciate any assistance or ideas you may have on the transfer of water supply and sewerage technology to developing countries.

Yours sincerely,

William J. Cosgrove
Deputy Chief
Water Supply and Sewerage Division
Europe, Middle East and North Africa Region

cc: Messrs. Pollan, Kalbermatten, Rietveld
EMENA Files, Division Files, Chron. File

WCosgrove:em

Water Supply & Sewerage
Western
Africa files

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Files

DATE: February 3, 1977

FROM: E. H. Motte (WAPEW)

SUBJECT: Points of Interest Raised at the Water and Wastes Division Chiefs Meeting of January 31, 1977.

I attended the January 31 meeting on behalf of our division. There will be no other meeting in February.

Urban Poverty

EWT intends to hire a consultant who will (i) investigate how one can measure the impact of water supply on reduction of urban poverty, and if so, (ii) look at the lending program together with the region staff. The consultant would come up with his own recommendations that could serve as a base for discussions with urban projects.

Under this plan the Liberia (Monrovia) and Senegal (Secondary Centers) water supply projects would come under review by the consultant during field preappraisal or appraisal.

Review of Usefulness of Project Brief

A memo by Mr. Van der Tak's office on the usefulness of project brief was circulated to and is now under review by the VPs. The consensus of the attendants at the present meeting was that it should (i) remain issue oriented; (ii) be updated at each new step and (iii) replace the back to office report if preparing the two reports became too cumbersome.

Hiring of Summer Students

EMENA mentioned it intended to hire a student to do some research at the unit costs and investigate their relation with cost indices. Other divisions will also hire one staff for such purpose. It was proposed that each division would investigate what research they want to have done. WAPEW could investigate with EAPEW the possibility of sharing such an employment on similar grounds to those mentioned by EMENA.

Training Program Within Water Entities in French Speaking Countries

After discussing this issue separately with CPS and EMENA I raised the point at the meeting. While most power companies in French speaking countries receive technical and training assistance from EDF, and thus get to be informed on sector developments, the water companies in those countries have no european correspondant, receive little advise on sector developments in other countries and resolve their training and financial issues with almost no knowledge of what is usually done in, or could be done with, water companies in neighbouring countries. The Bank could play a greater role in assisting in establishing closer contacts between them. It was proposed that a consultant (i) investigate the needs of these general managers; (ii) discuss available facilities and programs with training entities and other financing agencies; and (iii) present his final conclusions at a general managers/directors' meeting

which the Bank could sponsor. This meeting should hopefully open the way to closer ties between water entities, greater awareness of water supply issues and their possible solutions, and establishing of common training programs at all stall levels, possibly with the Bank assistance.

Since the beginning it became clear that the recruitment of a consultant could only come through the regional budgets and that CPS could only bring its coordinating assistance in this exercise. Before any action can be undertaken in the Bank, the matter should be discussed with EAPEW representative and then brought up with EWT.

EHMotte:js

cc: Mr. Salazar
Mr. Prenoveau
Mr. Buky
Mr. Rietveld.

OFFICE MEMORANDUM

JOK/KK

TO: See Distribution

DATE: February 2, 1977

FROM: W. Cosgrove

SUBJECT: Task Group on Management
Terms of Reference for a Comparative Study of Organization Structures

1. As I will be on mission at the time of the next meeting of the Task Group, I wish to set forth for discussion by the Group, my ideas concerning the specialist topic I am to address. This is described in the minutes of the last meeting as "Organization structures, political/executive relationships, responsibilities and chains of command."

2. My intent would be to attempt to obtain some insight into the effects the above-listed factors may have on institutions in our sector through a systematic comparison of the various institutions with which I am familiar. These would include -

(a) Office National de l'Eau Potable - Morocco
(b) Société National d'Exploitation et de Distribution des Eaux - Tunisia
(c) Office National de l'Assainissement - Tunisia
(d) Etablissement Public des Eaux de Figeh - Syria
(e) Etablissement Public des Eaux d'Alep - Syria
(f) National Water and Sewerage Authority - Yemen A.R.

The above list contains a national bulk supplier of treated water (1), a national retail supplier of treated water (2), a national sewerage organization (3), independent municipal water authorities (4 and 5), and a national water supply and sewerage authority (6). I have deliberately restricted the list to organizations with whome I have had personal dealings. This has the advantage that any criteria applied in judging performance will be uniformly applied to all cases. Although this obviously means that the study will be open to the criticism that it has been weighted by my personal prejudices, I believe this is preferable in a comparative study to the alternative of different weightings in judgement by several contributors.

3. In comparing the various institutions, I will consider the following factors:

(a) age (years since establishment)
(b) prior sector organization
(c) legal rights and obligations
(d) social, economic and financial goals
(e) organization structure
(f) strength of individuals in key posts
(g) training
(h) relationship with responsible (parent) ministry and other interested Government departments

(i) Government objectives in the sector
(j) effectiveness of the institution as viewed by others
(k) Bank's role in the establishment and/or development of the institution.

4. Weiner[1/] has identified six inputs as essential to successful development of a sector. These are:

Material

(i) major capital investment
(ii) supporting capital investments
(iii) current production inputs

Non-Material

(iv) means to control know-how and techniques
(v) means to modify psychological space
(vi) means to restructure institutional space.

In evaluating and comparing the six institutions, I will also attempt to establish whether there is any correlation between their strengths and weaknesses (as I see them) and the presence of these inputs (or lack thereof).

5. Because of my work load, I expect this study will not be completed before January 1978. In the initial period, I will be gathering the missing background information during missions, through consultation with others who have worked with the same institutions, or by reviewing the project files. I would expect the information gathering phase to be completed by the end of October 1977, and at that point would also expect to be able to submit a draft outline of the report for comments by the Task Group.

6. Your early comments on the above suggested terms of reference would be appreciated.

Cleared with and cc: Mr. Thys
cc: Messrs. Pollan, Kalbermatten, Costa, du Mee, Fernandez, Pogson, Thomas
EMENA Files, Division Files, Chron. File

WCosgrove:em
IBRD

1/ A. Weiner, The Role of Water in Development, McGraw-Hill, 1972.

JMK → Task Group files

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Mr. Richard N. Middleton, Sr. Sanitary Engineer DATE: January 31, 1977

FROM: John M. Pettigrew, Sanitary Engineer, ASPEW

SUBJECT: Task Group 6 Sewerage

Outline of Work Program

I refer to your memorandum of November 28, 1976. The task group met on January 28, 1977 and inter alia discussed this matter.

We would assume the general responsibility of keeping ourselves informed of developments in our field and to provide advice on our subject when called upon to do so and also to circulate to engineering staff items of general interest and application. In this respect we have already been called on to give consideration to certain aspects of the sewerage problems affecting Manila and, more recently, Lahore.

However, we have specific items to address and we have compiled the following:

(a) Review and update the Bank's sewerage questionnaire.

(b) Collect data about Bank-supported sewerage schemes - making use of Water Supply Library in so doing.

(c) Collect planning and design criteria for use by Bank staff, including guide lines for design of sewage treatment ponds.

We also hope to include state of the art studies on such subjects as (a) resistance of concrete pipes to acid attack, and (b) manufacture of clay pipes in developing countries. For these however we are very conscious of limitations on our time and if we are to pursue these interests we may need to ask for outside assistance perhaps from consultants. We would welcome your views.

JPettigrew/ms

Task Group #6 Sewerage

Water Supply

Mr. John Kalbermatten

January 31, 1977

Harold R. Shipman

Bank Policy on Water Supply Standards

In response to your request, I attach herewith some paragraphs which state policies on water quality which could be considered as guidelines for use on Bank-financed water projects. These statements will no doubt need some polishing but at this stage may serve to stimulate discussions with Division Chiefs. I believe the Urban Department ought also to be involved in any discussions since certain of the policy statements particularly on intermittent supply and water pressures may directly affect many of their projects.

HRShipman:cft

Water & Sewerage

Those Listed Below January 18, 1977

John M. Kalbermatten, Water and Wastes Adviser, EWTDR

Revision of GAS 4 (Sector Study Guidelines)

On September 24 and on November 17 a revised format for water and sewerage sector studies was circulated for your review. Some comments were received, notably from the WHO/Bank Cooperative Program and where practicable, have been incorporated. I now propose to amend on a trial basis Annex 6 in the present GAS 4 to be as annexed. It is understood that the proposed format is not meant to be a strait-jacket but a guideline.

Attachment

KBRingskog:sp

cc: Messrs, Rovani, Middleton, Shipman, Ringskog, Saunders, Warford (EWTDR)
Stone, (Urban Projects)
Kent, Becher, Jackson, Laugeri, MacNealy, Robinson, Schultzberg
Vallet (WHOCP)

OUTLINE FOR SECTOR STUDY REPORTS

I. SUMMARY AND RECOMMENDATIONS

(The summary should preferably be a maximum of two pages and concentrate on the present service situation, on set targets, on the constraints to achieve them, and finally recommend measures to speed up sector development)

II. COUNTRY AND SECTOR BACKGROUND

A. Geography and Climate
B. Water Resources
C. Population
D. Public Health
E. The sector in the economy
F. Sector Institutions

(This section should be purely descriptive and be as brief as possible. All detailed supporting information should be contained in the annexes. An additional bird's-eye view of the country and the sector is further contained in the "STATISTICAL SUMMARY" for quick reference.)

III. SECTOR DEVELOPMENT ANALYSIS (The section could be organized according to subsector or institutions active in the sector)

A. Present Service Levels
(Urban and Rural, Water Supply and Sewerage/Sanitation, Quantity and Quality)

B. Service Level Goals (either as proposed by the Government or alternatively by the mission, should the Government not have medium term targets)

(Urban and Rural, Water Supply and Sewerage/Sanitation, Quantity and Quality)

C. Implications of Meeting Goals

D. Constraints appearing upon comparing implications with available resources

E. Solutions recommended to remove or alleviate constraints
(This might include proposal for alternative targets)

(It is proposed that implications, constraints, and solutions be discussed under each area, the most important of which will likely be manpower, finances, institutional arrangements, planning, etc.)

V. MAP

VI. ANNEXES

(As a minimum detailed annexes on the population and its distribution, on the sector institutional arrangements according to functions, on actual and targetted service levels, and on past and projected sector investments should be included. Suggested follow-up either as preinvestment studies and project operation or in the form of an action programme may be conveniently included).

January 18, 1977

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January 18, 1977

Water Supply

Mr. J. M. Kalbermatten, Water & Wastes Adviser January 21, 1977

Richard N. Middleton, Senior Sanitary Engineer

Task Group #5: Water Supply

1. A first meeting of the Task Group was held on December 8, 1976; present were Messrs. Buky, Coyaud, Maisch, Skytta, Yepes and myself. Since this was an introductory meeting and since a number of CPS activities were already underway which would involve the Group, I agreed to introduce the subject and to act as rapporteur. For future activities the Group needs to elect a chairman.

2. I recapitulated the objectives of the Task Groups as set out in your earlier memoranda:

- to keep up to date on developments in water supply technology and practice through consultants' papers literature surveys, attendance at seminars, etc.;

- to review Bank operations in the light of these current developments and of Bank policy;

- to act as a vehicle for transferring Bank experience between operating divisions; and

- to present the Group's findings at staff meetings, training courses, etc.

3. As part of its task the Group would be expected to:

- maintain a current list of short-term consultants;

- ensure appropriate membership (by the Bank or individuals) of professional associations;

- recommend on any necessary additions to the Water Supply Library; and

- identify particular staff training needs.

4. The following ongoing or imminent consultant studies initiated by CPS are relevant to the work of this Group:

(1) Standards of Water Supply Service (Lauria)
(2) Domestic Water Meters (Gomez)
(3) Unaccounted-for Water (Proposed: possibly Chaturvedi)
(4) Pipelines (Proposed: possibly Bookman - Edmonston)
(5) Health Impact of Water Supply (Cvjetanovic)

(6) Public Hydrants (IRC)
(7) Wood Bearings for Hand Pumps (Sternberg)
(8) Rural Water Supply Programs (Pineo)
(9) Urban Poor Issues (White)

It was agreed that in principle the Group would concentrate on Items 1-5 above, leaving the remainder to be completed under CPS review.

5. Other suggested aspects which should be considered for attention as the Group gathers momentum were:

- The mechanisms for extending distribution systems or other means to serve the poor (given that our present involvement is generally confined to a short time-slice of the primary and possibly secondary network). This would build on the work done by Lauria and White and explore Bank involvement in tertiary networks and house connections, and in non-piped supplies such as these discussed by Professor White.

- Treatment plant design, specifications and procurement practices (now incorporated in CPS draft work plan for FY 78). (See also para 7 below.)

- Groundwater prospecting (including ERTS) and development (well design and materials selection).

- Rehabilitation and operations optimization of treatment plant and wells.

6. The Group also identified matters requiring attention which might be covered by Group #7: Project Documentation:

- Model terms of reference (for feasibility studies, various individual consulting assignments, etc.).

- Model water supply legislation (e.g., on water rights, establishment of water undertakings, etc. Reference was made to a water law compendium prepared by UN).

7. At the time of the meeting no proposals were made for bag lunches or staff seminars. I neglected to bring to the Group's attention the proposed treatment plant seminar (see Annex 1). Since the meeting it has also been suggested that Raymond International be invited to make a presentation on the "Centriline" pipe lining process (Annex 2).

8. It had been planned to hold a second Group meeting prior to the end-January staff meeting in order to firm up the Group presentation. Due to the rescheduling of my mission I have been unable to arrange this.

By copy of this memorandum I am keeping the Group in touch with developments, and I suggest you ascertain before the staff meeting who from the Group will be in attendance and ask one of them to make the appropriate presentation.

cc: Messrs. Buky (WAP), Coyaud (EAP), Freedman (LCP), Maisch (LCP), Ringskog (EWTDR), Skytta (ASP), Yepes (LCP), Zavala (LCPWS)

RMMiddleton:jbe

ANNEX 1

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Mr. John M. Kalbermatten DATE: October 29, 1976

FROM: Richard N. Middleton

SUBJECT: Water Treatment Plant Procurement -- Possible Staff Seminar

Arthur Bruestle reminded me that Asian Development Bank, in connection with their loan for Manila water supply, had arranged for staff from MWSS and the consultants (CDM, JMM) to travel round the world reviewing treatment plant procurement procedures. It would be very interesting to hear the conclusions of this survey, and learn the procurement procedures now proposed for Manila (and how these work out in practice). Arthur suggested that we invite CDM's staff member principally concerned, Paul Prendeville, to make a presentation. I support this and think it would be a good half-day seminar in the spring. Initially Saravanapavan probably ought to be the person to clear this with ADB and approach CDM.

RNMiddleton/cel

I agree. Please ask Sara to go ahead

JC

January 17, 1977

Mr. W. E. McQueeney
Raymond International Inc.
P. O. Box 217
Oakland, N.J. 07438

Pipe Lining: "Centriline Process"

Dear Mr. McQueeney:

Thank you for your letter of January 6, 1977 and the enclosure.

I have forwarded the information to our Central Projects Department and, hopefully, a seminar can be arranged in the near future with the presentation of your film.

I am looking forward to receiving the pricing information from you. Thank you again for the interesting discussion and the information provided.

Sincerely yours,

J. B. Buky

JBBuky/det

cc: Mr. R. Middleton

Mr. Middleton

RAYMOND INTERNATIONAL INC.
SERVICE CONTRACTS DIVISION
302 WEST OAKLAND AVENUE, OAKLAND, N. J. 07436
CABLE: RAYMONDINT

MAIL ADDRESS: P. O. BOX 217
OAKLAND, NEW JERSEY 07438

CENTRILINE DEPARTMENT
WILLIAM E. McQUEENEY
ASST. VICE PRESIDENT
MANAGER
(201) 337-4181

January 6, 1977

1.17.77

Misc. 7-1

Mr. Jozsef Buky
International Bank for Reconstruction
and Development
1818 H Street NW
Washington, D.C. 20433

Dear Mr. Buky,

Thank you very much for the opportunity of visiting with you on December 22, 1976. I found our discussion to be quite enlightening, and hope you also benefited.

Enclosed for your review and consideration is a copy of our booklet, "What is the Centriline Process". The information is presented in question and answer format and is specifically geared to those who have some awareness of the process of cleaning and cement mortar lining.

We believe our service is a particularly beneficial and cost efficient means for rehabilitating older pipelines that have become tuberculated and corroded, thus seriously impacting flow and water quality.

World Bank is deeply involved with water system upgrading, and we believe an awareness of the benefits of this service would be useful to your project staff. Perhaps our best method of communicating these benefits is a 30 minute, 16mm color/sound film, It addresses the subject from the viewpoint of the water system owner. We would be pleased to conduct a seminar for World Bank management featuring the film Centriline Methods.

We would appreciate your help in arranging such a seminar. Please be assured that as a Department of Raymond International, we are quite experienced at making professional technical presentations.

...../....

CENTRILINE PROCESS

To: Mr. Jozsef Buky
January 6, 1977

Presently, I am gathering information to provide you with budget prices for various diameters based on our experience in different parts of the world. You will hear from me shortly with this budget information.

I look forward to seeing you shortly.

Cordially,

RAYMOND INT'L INC.

Bill McQueeney

W.E. McQueeney

WEMcQ/lsf

Enc.

File Bookman - Edmonston Pipe line SA paper

DR. G. HOLFELDER
CONSULTING ENGINEERS

Hansjakobstrasse 156 · 78 Freiburg · Germany

World Bank
Attn. Mr. Rietveldt
1818; H. Street

Washington C. D. 20433

USA

Date Rec'd. JAN 2 8 1977

Date Ack'd.

Assigned to JCR

Main Office:
Hansjakobstrasse 156
78 Freiburg/Germany
Tel. (0761) 67997
Cable: Holing Freiburgbreisgau

YOUR LETTER 1/28 [illegible] YOUR REF. OUR REF. WC-SEW. 7.8.
53244
Pr/be

78 Freiburg,
January 20, 1977

Subject: Production of Concrete Pipes for Sewerage Projects in Tropical Countries

Dear Sirs,

Experience shows that the supply of pipes of sufficient chemical resistance for use in sewerage projects in tropical climates very often presents crucial technical and economic problems. Scientific knowledge of the complex processes of chemical attack under the special conditions encountered in sewers transporting highly septic waste water of relatively high temperatures has not yet been systematically assessed. To our knowledge there does not yet exist a systematic review of technological constraints and possibilities to produce pipes - particularly concrete pipes - which would guarantee satisfactory resistance to the particular forms of attack to be expected in sewers under hot climates.

Within the scope of the (project) Abidjan Sewerage and Drainage Project (loan 1076 - IVC) we have conducted studies on these problems which were specifically oriented towards the particular local problems. We believe that our conclusions and recommendations are fully justified, with the only possible exception that production methods for concrete pipes using only compaction by vibration of exterior and/or interior forms plus eventually axial hydraulic compression maybe should not be admitted. Such methods, although obtaining satisfactory results under very favorable conditions, may have such disadvantages for use in tropical countries that their elimination from tenders may well be technically justified.

As soon as pipe production in Abidjan (the city) will have overcome the habitual difficulties of start-up we shall assess the results against the specifications of the contract and we shall report to you about our conclusions. We shall furnish these services although not included in our contract, because we take a particular interest in these problems.

It may, however, be of interest to World Bank to have these questions studied on a broader scale and we should like to suggest to your consideration a general study of these problems. The scale and outline of such a study could be the following:

1. Case study of problems connected with pipe supply of four to five typical sewerage projects in hot climates, identifying the range of problems to be solved.

   Case studies will be based on the spot interviews and inquiries and shall be supported by photos and drawings.

2. Inventory of scientific knowledge and available technological means to solve these problems. In conclusion the spectrum of possible solutions should be presented in particular: basic choice of materials and outline specifications of materials which are recommended, appropriate or admissible for the required use.

3. Outline of general policies which may have a bearing on choices. Such policies concern promotion of the creation of new industries assuring maximum added value of local production, promotion of the creation of local employment and social progress. Due consideration will be given to IBRD directives on procurement.

4. Inventory, detailed description and technical evaluation of different production methods for pipes particularly methods for the production of concrete pipes and prefabricated elements. In conclusion it should be possible to classify the different production methods according to their technological qualification into several categories, for instance: recommendable, suitable, not recommandable, unsuitable. Descriptions will be supported by photos and drawings.

5. Economic evaluation of the different production methods, cost estimates of the different components distinguishing in a general way local costs and foreign currency costs. Appraisal of the different production methods on the basis of criteria derived from policy objectives as outlined under item 3.

6. Outline of special measures necessary in areas of particularly intensive chemical attack or other special conditions (coating, sheeting, choice of special pipe materials) and cost evaluation of such measures.

7. Outline of general considerations for implementation of pipe factories (range of break even points of production under typical conditions in tropical countries, market considerations, regional range of supply, possibilities for diversifications of production to other prefabricated elements such as telephone poles, beams, ties, etc.)

8. Outline of a typical implementation programme of local pipe factory, starting with study of local and regional quantity requirements, identification of constraints and quality requirements, tendering, etc. giving a check-list of questions to be treated and a typical CPM-diagramme of activities and indicating alternatives of procedure.

9. Conclusions and Recommendations

10. Outline of research necessary to clarify certain complexe questions not yet satisfactorily explored.

The study should be centered around problems connected with concrete pipes but should take into consideration plastic and other materials as alternatives. Problems connected with the supply of appropriate aggregates for concrete, phenomena concerning chemical attack on certain types of rock, criteria for the choice of resistent aggregates etc. should be treated under item 2.

The result should be a manual for the use of local sewerage authorities on the implementation of local pipe factories in tropical countries.

In case you should be interested in such a study we should be honored to submit to you a detailed proposal including terms of reference, work programme, curriculum vitae of experts scheduled to carry out the studies and a break-down of costs of the studies as well as all other relevant information.

Yours very sincerely

DR. G. HOLFELDER
CONSULTING ENGINEERS

Water & Telecom

January 13, 1977

Dr. Michael G. McGarry
Senior Program Officer
Population and Health Sciences
International Development Research Centre
Box 8500
Ottawa, Canada K1G 3H9

Dear Dr. McGarry:

Many thanks for sending us copies of the reports produced for the Sri Lanka Bio-Gas meeting which I look forward to read.

We are keeping a continuing interest in this field and are still looking for an opportunity to be of help. Our current thoughts are moving in the direction of including bio-gas pilot type installations in a dairy and a rural development project, and use these installations to better evaluate the economic and other feasibility issues which trouble us.

Best regards,

Yours sincerely,

Efrain Friedmann
Energy Adviser
Energy, Water and
Telecommunications Department

cc: Messrs. Weiss, I. Harvey
Fallen-Bailey (with incoming and attachments)

EFriedmann:mb

OFFICE MEMORANDUM

TO: Messrs. C. A. Morse (VPSVP), R. Wildeman (LCP), E. LaBahn (EAP), D. Jones (EMP), J. Gilling and H. Busz (WAP)

DATE: January 12, 1977

FROM: J. B. Buky JBB.

SUBJECT: Project Management Task Group

During the recent meetings of the Task Group a number of subjects/issues were discussed with a view to formulating a program for the Group for the next (say) 6 months.

Two basic points were initially agreed as follows:

(1) The group will concentrate on the problems of Project Management within the Bank and

(2) The group's "first" effort should be a modest one to test our capacity to complete a useful exercise.

The range of subjects proposed for the first 6 months were:

(i) The analyses, by means of a CPM, of the processing of a project from Appraisal to Effectiveness;

(ii) The evaluation of the performance of consultant(s) by the Borrower, the Bank and the consultant himself - evaluation methods, guidelines routine procedures;

(iii) Review and analyses of the process for Evaluation of Projects (on completion) by the Borrower; and

(iv) The analyses of preparing a Procurement Schedule (contract by contract) for a Project.

It was agreed that the first exercise will be item (i). An ongoing project, namely the Malawi Water Supply (now in yellow cover) was chosen for the first "trial run." E. LaBahn will distribute copies of the report to the group members for review and preparation of a sketch CPM using (say) 10 major lines of action.

Due to a number of group members traveling the next meeting to discuss further details will be called in late February.

Those group members present at the end of January Water Supply Staff meeting should inform the meeting of the above.

JBBUKY:br

cc: Messrs. Kalbermatten ✓
Middleton

Mr. Kalbermatten

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Water Supply Management Task Group DATE: January 3, 1977

FROM: B. Keith Thomas

SUBJECT: Task Group on Management
Minutes of First Meeting on December 23, 1976

Present: S. Alber-Glanstaetten, R. L. Costa, E. Pogson, B. K. Thomas

Apologies: W. J. Cosgrove, P. R. du Mee, C. Fernandez

Purpose of the Group: On the basis of the objectives set out in John Kalbermatten's memo of October 22, the group defined its principal purposes as being:

a) to coordinate and develop knowledge and experience available both within the Bank and outside in the area of specialism;

b) to organize the transfer of such knowledge and experience by the most effective means to other Bank staff concerned in the specialist area;

c) to act as in-house consultants/advisors to Bank project staff facing particular problems in the specialist area.

Confirmation is sought from John Kalbermatten that this statement of purpose is accepable.

Scope of Specialist area: The group adopted as a definition of its specialist area the management of water in the widest sense, and recognized at least four levels at which the science of management could be involved in this sector:

- national
- regional
- local
- corporate (i.e., the utility)

Some discussion took place as to the possible applicability of the group's work to services other than water, but it was agreed that it would be unwise to embark at the outset on too wide an area of study.

Method of Working: In view of the practical impossibility of assembling the group together at any one time, it was agreed that the majority of the work would be carried out on an individual basis. Meetings would generally be called only when any member saw a need to do so (for example, to discuss a draft paper), and on such occasions the member calling the meeting would take the chair. The group will not therefore have a permanent chairman; the group may be contacted by others through Ms. Pat Brereton (A 843, ext 2485) who will act as the group's coordinator and secretary.

Allocation of Specialist Topics: To implement the agreed method of working, specialist topics were allocated to the group members, so far as possible on the basis of interest expressed. The following is a tentative outline of the topics allocated:

Costa:	Management objectives, policies, planning and decision making; coordination of sector management with urban development.
Cosgrove:	Organization structures, political/executive relationships, responsibilities and chains of command.
du Mee:	Selection and use of consultants; consultant register.
Fernandez:	Data processing.
Pogson:	Human resources management; management selection and development.
Thomas:	Information systems for planning and control; including performance measurement.

Each member will prepare outline terms of reference for the work he is to carry out in his specialist topic, propose his own timetable in the light of his workload, and identify any resources he may need. These will be circulated to all members of the group and discussed at the next meeting.

Membership of the Group: In view of his other commitments, Stefan Alber Glanstaetten expressed his wish to withdraw from the group.

Next Meeting: Thursday, February 24, 1977 at 2:30 p.m. in Room C810. It is suggested that those unable to attend the meeting might still provide copies of their proposed terms of reference for discussion at the meeting.

cc: John Kalbermatten

BKT/ba

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

J/Are we going to have files for each task group? Discuss with JK + Mayank.

TO: Members of Water Supply Finance Task Group

DATE: December 29, 1976

FROM: Ali N. Memon (WAPEW)

SUBJECT: Minutes of the Finance Task Group Meeting dated Tuesday, December 28, 1976

---

1. Messrs. Davis, Rietveld, Hayden, Keilani, L. V. Smith, Kapur, and Memon attended the meeting.

2. The Group reviewed the suggestions on my memorandum dated November 16, 1976 received from Messrs. Salazar, Costa, and Mathai and, in general, agreed with them. This is reflected in the decisions made by the Group which are described below.

3. It was agreed that Mr. Davis will circulate copies of Mr. Fernandez' report on compliance with financial covenants, to each member of the Group. It was also agreed that more detailed information would be required and for this Messrs. Davis, Kapur, and Keilani would discuss with Mr. Zavala (LAC) the possibility of wider access to the detailed input which was utilized in preparing Mr. Fernandez' report. After obtaining the information, Messrs. Kapur and Keilani will then assemble it in an appropriate format and will prepare a proposal for further work required to be done on the question of rate of return.

4. Mr. Davis confirmed that the draft report on standard financial covenants was with Mr. Rovani for approval. He promised to obtain copies of the document for the members of the Group.

5. Mr. Hayden agreed to review with Mr. Mathai the work done to date on the questions of asset revaluation and inflation accounting. Mr. Hayden will subsequently prepare a proposal for any additional work which may be required to be done by the Group on those subjects.

6. Messrs. Rietveld and Smith will attempt to collect available material on glossary of financial terms for water supply. They will attempt to compile and propose a glossary to the Group for use throughout all the regions.

7. It was agreed that the next meeting of the Group should be held in about two months. On my return from mission in mid-February, I shall be contacting each one of you to discuss the progress on various subjects and to agree on date, time, place, and agenda for the next meeting.

cc: Members of the Task Group
Messrs. Davis, Kalbermatten, Middleton, Raizen,
Public Utilities Division Chiefs (For circulation to Financial analysts)

WC) BANK / INTERNATIONAL FINANCE CORPORA N

Task Manager
Central

OFFICE MEMORANDUM

TO: Mr. John Kalbermatten

DATE: December 27, 1976

FROM: W. Cosgrove

SUBJECT: Value Engineering

Further to my memo to you of July 29, 1976, I am attaching hereto another related technical article.1/ In my previous memo, I suggested we should have an internal (Bank) Value Engineering review of the design of selected projects. I note from this most recent article that EPA now requires Value Engineering reviews carried out at the expense of recipients of US Federal grants. Perhaps we should require the same type of review by our borrowers at their expense if we are unable to handle it because of staff constraints (or for policy reasons) within the Bank.

Attachment

cc: Messrs. Pollan
Thys

EMENA Files
Division Files
Chron. File

WCosgrove:em
IBRD

1/ Gordon L. Culp; Coping with EPA's Value Engineering Requirement; Water and Sewage Works, December, 1976.

Coping with EPA's Value Engineering Requirement

by Gordon L. Culp, President, Culp/Wesner/Culp, El Dorado Hills, California
and Leonard S. Horner, Value Engineering Manager, Martin Marietta Corporation, Denver, Colorado.

While value engineering has been in use for many years in other fields, it is a new concept to most sanitary engineers. The U.S. Environmental Protection Agency's proposed mandatory Value Engineering (VE) programs will require that VE studies be conducted on all wastewater projects with a grant eligible Step III construction cost of $10 million or more (excluding cost of sewers or interceptors).

VE is a disciplined effort to analyze the *functional requirements* of a project for the purpose of achieving the essential functions at the *lowest total costs* (capital, operating, and maintenance) over the life of the project. Value engineering is a systematic, organized approach to obtaining optimum value for each dollar spent. Through a system of investigation, using trained, multidisciplined teams, value and economy are improved by eliminating or modifying items not essential to required performance. By using creative techniques and current technical information on new materials and methods, alternative solutions are developed for specific functions. Unlike simple cost-cutting by using smaller quantities or cheaper material, VE analyzes the function of an item or method, asking such questions as:

- What is it?
- What must it do?
- What does it cost?
- What is it worth?
- What other equipment or method could be used to do the same job?
- What would the alternative cost?
- Should the alternative be used?

The heart of a VE study is the Project Workshop where the multidiscipline teams, under the guidance of the VE Team Coordinator, analyze the project for unnecessary costs. Cost reduction is accomplished without degrading essential performance, reliability, or maintainability. Through eliminating unnecessary design complexity, VE consistently *improves* reliability, maintainability and performance rather than degrading these factors. It is not an attempt to, for example, build a cheaper trickling filter but to find a way to achieve the same function as the trickling filter at a lower cost. Two of the key concepts underlying the VE approach are function and value.

Function

If there is a single concept that is unique to VE, it is that of function. When confronted with a need to improve value, the value engineer thinks first of function. Unlike value, a highly abstract concept, a function can be precisely defined in just two words, one verb, and one noun. The purpose of reducing the function to the verb-noun form is to eliminate confusion and to clear away all but the essentials so the mind can focus on other approaches which would provide the needed function.

In the examination of functions of the components of a wastewater project, more than one function will ordinarily be identified. Those can be categorized as *basic* functions without which the item would have no value, and *secondary* functions, which support the essential functions, but which might not even be present if a different design concept had been pursued. For example, the function of the aeration basin in an activated sludge plant is basic (treat waste) while the function of a walkway leading to a platform mounted aerator (provide access) is secondary to the wastewater treatment plant. Many VE studies have completely eliminated secondary functions by providing alternative designs which achieve the basic functions. For this reason, only basic functions are considered to have value.

Value

A discussion of value is difficult because of the many meanings of the word. Values usually are measured in relation to other values. Comparisons of values often can be simplified by being expressed in the common measurement of money. Cost values can be misleading, however. For example, the embroidered logo of an "in" fashion designer increases the market price of a man's tie or a woman's scarf above what the bare article would bring. Esteem value is the difference.

Use value is that part of value attributable to the functions that a thing performs and is the type of value with which VE is concerned. If we credit value to only basic functions, we arrive at the limit: *maximum value results when essential functions are provided at minimum cost.*

The walls of the building enclosing activated carbon columns in a wastewater treatment plant would have no value if the equipment could be designed to function outdoors year around. The white glazed tile on the inside walls of a vacuum filter building could have more than their apparent esteem value, through the useful enhance lighting, and minimize maintenance. Of course, these values must be balanced against their total costs.

VE vs Conventional Design Practice

Value engineering is not:

- what a good designer does anyway
- an effort to trade off essential functions to cut costs
- merely a review to eliminate "gold-plating"
- a method for reducing costs through degrading performance and reliability
- in any way intended as a reflection on the competence of the designer.

Oftentimes, after the Step 1 selection of the cost effective approach, many key components (i.e., treatment process sizing) of the plant are accepted by the design team as given and little added effort is made to consider the costs of other alternatives. As a result, conventional design reviews often center upon assuracne of adequate performance, contrad technical compliance, and progress toward contract schedules, with cost given lesser rank.

The thrust of VE is to give cost equal, but only equal, ranking throughout the design effort. It is not an effort to cheapen the design. It is not an effort to trade off essential functions to cut costs. Its purpose is to eliminate the costs related to non-essential functions, and to reduce to a minimum the cost to provide the es-

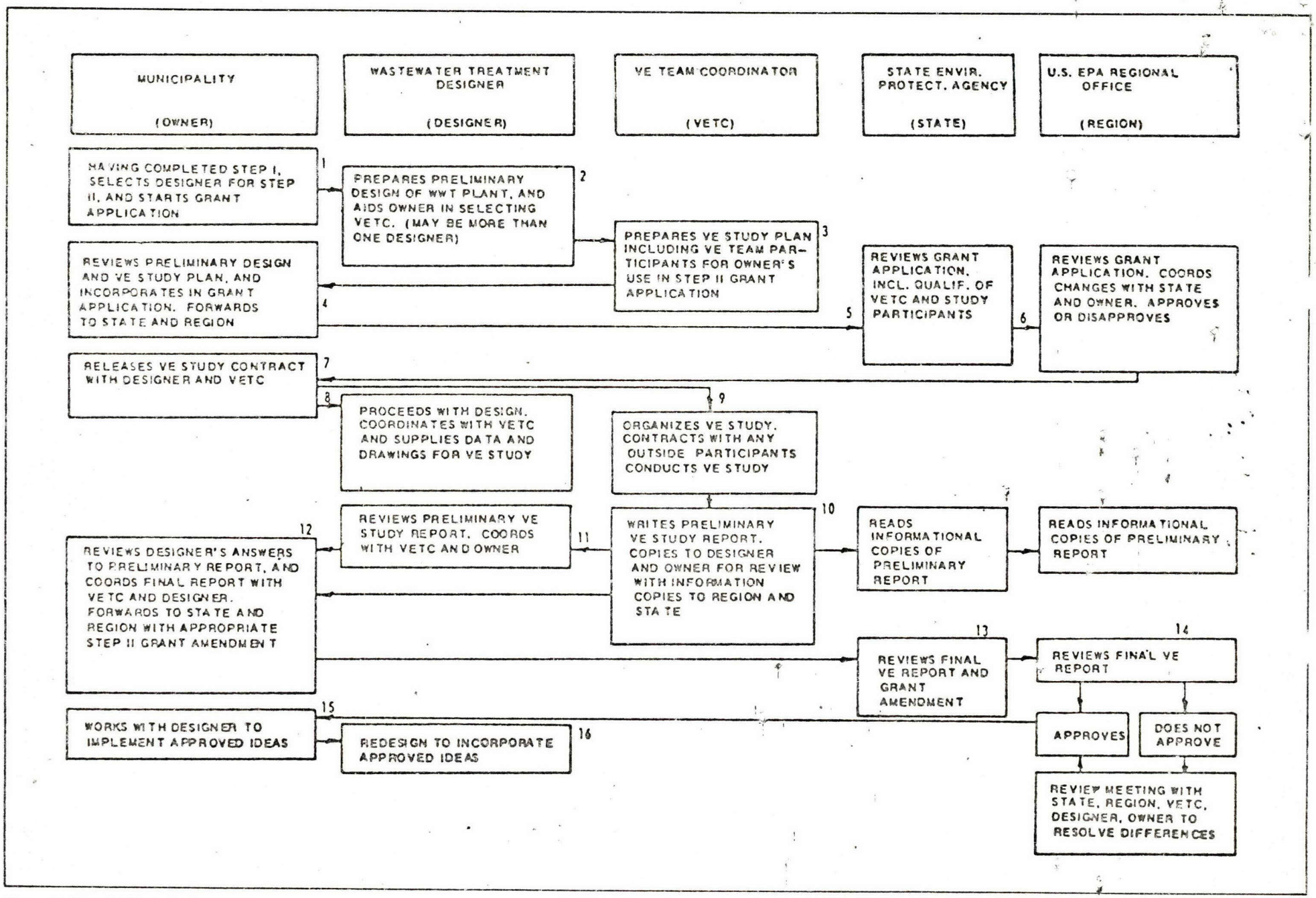

Figure 1. Step II VE study flowchart.

sential functions. It differs from ty practice in that VE does not depend on the chance occurrence of creative thinking by individual designers, but offers effective techniques and imposes mental disciplines that enable competent designers working together to channel their talents and experience in a way that achieves results ordinarily expected only from an exceptionally innovative and assertive few.

Grant Eligibility

The cost of conducting a VE study is grant eligible upon approval by the EPA Regional Administrator. A request for the VE study should be made concurrently with the basic Step 11 grant application. In some cases, VE costs may be added to an existing Step 11 grant.

The interplay between the municipality, its selected designer, the VE Team Coordinator, the State, and EPA can be best described by reference to **Figure 1.** With the advice of the designer, the owner (municipality) or designer solicits proposals for conducting the Step 11 VE study (1,2), and selects a VE Team Coordinator (as described in detail later), who will provide a detailed plan for the study (3). The VE study may be conducted by the designer provided that the VE study personnel have not been significantly involved in the Step 1 or 11 work on the project. The VE study plan is made a part of the Step 11 grant application (4) which is submitted to the State (5) and the EPA Regional Office (6). Upon approval, the owner may contract directly with the VE Team Coordinator to conduct the study, and the designer to support it (7,8,9), or the VE Team Coordinator may be a subcontractor to the designer. The detailed study is conducted by using multidisciplined teams, each with an assigned area to study for unnecessary costs. It may prove valuable to include as the last step in the VE study prior to preparation of the preliminary VE report, an oral presentation of the study results by the VE Team Coordinator to the owner, designer, State, and EPA. The purpose of this presentation is to make sure that all parties understand the recommended changes and to determine concerns which the preliminary VE report should address.

Immediately following the oral presentation, the VE Team Coordinator prepares the preliminary report (10). Comments during the earlier oral presentation should not cause the deletion of a change that had been favorably evaluated by the VE teams. Action copies of the preliminary report are presented to the Owner and the Designer, with information copies to the State and Federal environmental agencies. Each recommended change will be reviewed in detail by the designer. After the designer has evaluated the preliminary report, a conference should be scheduled between the owner, designer and VE coordinator to insure that no VE recommendations are rejected due to lack of communication between designer and VE Team Coordinator.

A final report is then prepared by the designer (11) representing the concensus of Owner and Designer as to feasibility and cost effectiveness of every recommendation of the preliminary VE report. A price tag is put on the design, construction, and operation effects of each recommended change. Reasons for rejection of recommended ideas are presented and documented. An amendment to the Step 11 grant application is prepared to reflect the change in design effort associated with implementing the VE changes. Copies of the final VE report (12) are distributed to the State environmental agency, to the EPA Regional Office for review and approval and to the VE Team Coordinator. If the EPA and/or State disagrees with the justification for rejection of any recommended VE change, they may call a meeting with the owner, designer, VE Team Coordinator, State, and EPA to resolve the difference so that approval may be granted. Having received approval from the Regional Offices, the owner works with the designer to incorporate the approved recommended VE changes (15,16).

The designer's Viewpoint

With a VE study now made a part of EPA's grant program, the designer may be exposed to a previously unexperienced level of design review. A natural first reaction is one of resentment and reluctance to cooperate based on concerns that his client will be puzzled by the need to conduct added design efforts, that unusual expertise or proprietary information may be exposed to competitors, that time will be wasted in responding to poorly thought our suggestions, that unjustified criticism by the owner may result and be aired in the public media, and the project will be delayed.

Each of these concerns needs to be addressed. First, the designer should recognize that VE provides another powerful approach beyond the scope of conventional design practice to provide cost savings and that the overriding goal is to achieve savings for the owner which will far outweight the costs of the VE study. The owner should seek the designer's advice in selecting a VE Team Coordinator and teams in order to avoid competitive conflicts of interest and to ensure selection of a technically qualified firm. The VE effort may be contracted for either directly by the owner or subcontracted by the designer as part of his contract extension.

A well planned VE study should not cause any unreasonable delay in the flow of the design. Delays can be minimized by scheduling the VE effort at points in the project when other major, intermediate design reviews (by the State or by the designer's own firm) would normally occur and by involving State review personnel in the VE study so that later review times are minimized. Careful screening of the VE Team Coordinator's qualifications, experience, and past performance will insure that the VE Team Coordinator selected produces results, not just paper exercises, so that frivolous ideas will not plague the program.

Too much emphasis cannot be given to making clear that no blame be placed or recriminations made when new ideas are found by the VE effort that result in cost savings. This attitude must prevail with all parties. A full commitment to the end result of minimum total life cycle cost for a system that meets all performance requirements is required. This goal can only be achieved by all parties working together in a harmonious and constructive atmosphere.

The Owner's Viewpoint

The owner, if unfamiliar with the opportunity for savings made possible by VE, may see the mandatory VE study as another hurdle to progress and as an additional expense or a dilution of the available design budget. The cost of the VE study should instead be weighed against the potential savings in total life cycle cost to design, construct, operate and maintain the facility. The potential savings identified in one VE study to the owner over the life of one 3.8 mgd wastewater treatment project were several million dollars. At the conclusion of the VE study, the owner will participate with the VE Team Coordinator and the designer in reviewing the recommended VE changes, and to make the final decision as to which changes to include in the final report recommendations to State and Federal environmental protection agencies.

When VE Should Be Done

There is a dilema in selecting the point in design when VE should be performed. The more complete the design, the more readily the VE teams will understand the functions of the entire system and evaluate and price the basic and alternative designs accurately.

However, the cost to incorporate a VE change will increase as more and more drawings are prepared and specifications detailed because and more work will have to be done over. While such design costs are linear, other costs are step functions, which, having been passed, are nearly impossible to reverse. Examples are the early procurement of long lead time equipment, where at the very least, termination costs will be incurred. Thus, it becomes necessary to strike a reasonable balance between these opposing factors: (1) accuracy of VE results increase with increasing completeness of design; (2) costs to implement VE changes also increase with increasing completeness of design.

In some larger and/or complex projects, it may be desirable to schedule two VE reviews during the course of the de-

sign. The first may occur when 10 to percent of the design is complete and would concentrate on basic factors such as project layout, processes used, general approach to electrical, instrumentation, controls, etc. The second review would occur when the design is complete enough (approximately 50 to 60 percent complete) so that a detailed review of the electrical, mechanical, and structural designs could be made.

In the many projects where only one VE review is made, this latter point is generally too late as basic changes resulting from the VE work are costly to implement. Thus, when one review is proposed, the timing must represent a reasonable balance between the ease of implementing VE ideas developed early in the project and the potential for added savings when detailed design information has been completed. EPA discourages any VE review after 80 percent design completion because of the costs associated with implementing changes at this late stage, the delays which could result, and the increased resistance of all parties to changes.

Organizing the VE Effort

When a number of multidiscipline teams has performed a good VE study of several areas of high cost, the savings in design and construction historically have far outweighed the cost of performing the study. There is often only one opportunity to make a VE savings, and that opportunity might be missed with too small an effort.

Depending on the size and complixity of the project, the VE effort may vary from one team and one study to multiple teams and/or multiple studies in order to adequately review the project. As noted above, some projects may justify two separate studies. The determination of how many teams and how many studies are appropriate must be made on a case-by-case basis. For example, a large advanced waste treatment project may readily justify separate teams, each with a study area such as structures, mechanical, electrical, process, and site. If the system in question is simply an add-on to an existing plant to provide a single process, the level of effort may be relatively small and readily handled in one VE review.

On the other hand, a small but highly refined system, to provide the ultimate that today's technology can achieve, would require above average effort, perhaps two reviews. If the conventional design is divided among two or more consultants, coordination and review efforts of VE would be above the norm. When a project has been divided into several sequential steps, the required VE effort is increased by the need for small studies, each with the same coordination, review and reporting costs. These factors illustrate the fact that the VE level of effort must be tailored to each specific project. Approval of the actual level of effort proposed lies with EPA and the State as part of the Step II grant-approval process. Obviously, the proposed level of effort must have a reasonable relationship to the potential savings which might result from the VE effort.

The VE Team Coordinator who will lead the VE study should have qualifications in both theoretical knowledge and practical experience in the use of the techniques of VE. He should have the first hand knowledge and experience to overcome the various negative response that can arise during a VE study.

A typical VE team has five members and is composed of members who bring interdisciplinary skills to the project. They should be highly qualified in the disciplines they represent. The creativity of the teams will be proportional to the competence of their members and to judicious selection of the mix of those disciplines. For a treatment plant, a typical team composition might be an electrical engineer, a mechanical engineer, a civil/structural engineer, a sanitary engineer, and a cost estimator. However, some projects may require other disciplines. The interdisciplinary composition of the Step 11 VE team is vital to the VE concept. *It is also vital that the VE team members be completely isolated from their normal duties during the Project Workshop.*

The team members must be experienced professionals in their own fields. It may be desirable to designate a leader for each team, preferably one with some VE experience, if the bulk of the team members have limited VE experience. It is acceptable that persons other than design engineers may constitute a part of the total study group. The Public Works Administrator, Sanitation District Director, City Auditor, Purchasing Division Manager, Treatment Plant Superintendent, and others from similar positions, or their designated subordinates often can contribute to a value study by providing a fresh viewpoint that "doesn't know that it can't be done." When such administrative persons share the responsibility for recommending value enhancing changes, the probability of adoption of the idea is often improved.

EPA's specific requirements for VE on wastewater projects are speeled out in EPA Program Guidance Memo No. 63 dated January 20, 1976. Copies of the memo should be available from your State Pollution Control Agency or from your Regional EPA office. It is likely that EPA will issue amendments or additions to their VE policies in future Program Guidance Memos.

We have recently completed a Value Engineering Workbook for EPA which outlines VE procedures for EPA projects in some detail. The workbook is scheduled to be in print this fall. One-week courses in VE are conducted several times a year in major cities by groups such as the American Consulting Engineers Council and the American Institute of Architects.

Acknowledgment

Portions of this article were prepared under EPA Contract 68-01-3582 (preparation of a VE Workbook) by Culp/Wesner/ Culp, Clean Water Consultants of El Dorado Hills, California. Martin Marietta Corporation, Denver, Colorado, served as subcontractor to Culp/Wesner/Culp. ■

Available Texts on VE

1. **Value Engineering in the Construction Industry,** *Alphonse Dell'Isola, 1973, $16.50, Construction Publishing Company, 2 Park Avenue, New York, N.Y. 10016 (Telephone: (212) 889-0170). This text is addressed specificially to the technologies of the construction trade. Its examples are more closely related to wastewater treatment design than other texts which treat factory fabricated assemblies. This is one of the texts used in the ACEC-AIA workshops.*
2. **Techniques of Value Analysis and Engineering,** *Lawrence D. Miles, 2nd Edition, 1972, $15.50, McGraw Hill, 1221 Avenue of the Americas, New York, N.Y. 10036, (Telephone (212) 997-1221). This is a new edition of the first VE text by the "Father of VE."*
3. **Value Management, Value Engineering and Cost Reduction,** *Edward D. Heller, 1973, $12.50, Addison-Wesley Publishing Company, Jacob Way, Reading, Mass. 08167, (Telephone: (617) 944-3700). Although this book is out of print, copies can still be obtained from the publisher and the book is worth searching for. Heller brings to a single volume a total and current "How To", technical, administrative, and political, with insights into designer and customer attitudes and management policy decisions. An elegant and uncontrived mathematical support for some of the judgement calls is intuitive to the successful VE practitioner.*
4. **Value Management, A GSA Handbook** *No. PBS 8000.1, Change 3, General Services Administration, Order from Director Value Management, Federal Supply Service, GSA, Washington, D.C. 20405, $1.00. This looseleaf handbook is directed specifically to GSA's Public Building Service and its approach to Value Engineering. Chapters 5, 6, and 7 which relate to GSA's contracting incentives and Contractor and A-E Programs are not applicable, but Chapter 3, VE Methodology, is exceptionally good, the equal of the above texts.*
5. **Value Management Workbook,** *GSA Form 2760. Order from Director-Value Management, Federal Supply Service, GSA, Washington, D.C. 20405, no charge.*
6. **Value Analysis in Design and Contruction,** *James J. O'Brien, P.E., 1976, McGraw Hill.*

J. Kalbermatter

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Management Task Group

DATE: December 22, 1976

FROM: René Costa (Acting Chief, LCPWS)

SUBJECT: First Meeting of December 23, 1976

1. For our meeting scheduled tomorrow, I propose to discuss the following items without pretending that they constitute an exhaustive list.

2. Items of Interest

(i) Definition of Management

- General Management
- Management of the Sector
- Management of Public Utilities Companies
- Managers

(ii) Definition of Organization

- Organization of the Sector (at the three levels)
- Organization of Public Utilities Companies

(iii) General Management

- Objectives and responsibilities of "sector" managers
- Long range Planning and Policies
- Short range objectives, planning and controlling
- Decision-making process
- Integration with other sectorial activities (urban development/rural development)

(iv) Organization

- Sectorial organization at national, regional and local levels (should cover legal framework)
- Public Utilities Companies organization
- Consulting services
- Use and limitations of committees

(v) Materials Management

(vi) Construction Management

(vii) Demand Management

(viii) Financial Management (should cover accounting and control)

(ix) Management of Human Resources

(x) Administration

(xi) Systems and Data Processing

3. Definition of Responsibilities Within the Task Group

4. Program of Actions for the Task Group

5. Training

(i) Training facilities for the Task Group (attendance at selected seminars, etc.);

(ii) Participation in ED courses;

(iii) Management training of Bank Public Utilities professionals.

6. Task Group Technical Assistance in Bank Project Preparation and Processing

cc: Members of Task Group
Messrs. Davis, Kalbermatten, Middleton (EWTDR), Raizen (PAS), Wyss (LCPDR), Zavala (LCPWS)
Public Utilities Division Chiefs
LCPWS Staff

RCosta/clh

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Mr. A. Memon (WAP) DATE: December 22, 1976

FROM: R. Costa (Acting Chief, LCPWS)

SUBJECT: Finance Task Group Meeting of December 13, 1976

1. I would like to comment on your memo of December 16, 1976 regarding the Finance Task Group's first meeting, held on December 13, 1976, and particularly on para. 3(d) - Compliance with Financial Covenants, para. 3(e) - Standardization of Financial Covenants, and para. 3(m) - Monitoring Indices.

2. Regarding the preparation of an in-house study of the degree of compliance with financial covenants, Mr. Claudio Fernandez (FNA, LCPWS) completed recently a thorough study on rate of return achievements in 40 IBRD water supply projects signed after January 1970. The results of this study were transmitted to CPS on October 12, 1976. Although the study was limited to rate of return covenants and to the water supply sector, I believe that the approach followed by Mr. Fernandez is adequate and that his study should serve as a basis for future and larger investigations.

3. Standardization of financial covenants has been a very debated subject during the last few years. In fact, the first studies were made by Mr. J. Jennings as early as 1973 (see my memo to Mr. Jennings of September 21, 1973 and Mr. Jennings memo to Public Utilities Financial Analysts of December 28, 1973). This subject was then discussed in length during various financial analyst seminars in 1974, the latest in date (that I am aware of) having been held on December 16, 1974. I would suggest that all of this documentation be compiled and that the task group prepare a draft for a CPS guideline on the matter.

4. The establishment of financial indices to be monitored for each project has been another "on the spot" subject of discussion. Guidelines for a Project Monitoring System for Public Utilities Projects was published by CPS on November 8, 1973. These guidelines "should be applied in all public utilities projects". In 1976, a new set of simplified financial and technical indicators for water supply projects was discussed among the water supply divisions of the Bank and CPS, with the general purpose of establishing a good reporting system from our borrowers. I thought that a final agreement had been reached on this matter.

5. I would like also to point out that one of the problems that Bank financial analysts have to cope with is the various definitions given to the same items in the financial statements that are presented to them for analysis. The same problem arises when computer use is needed. I would recommend that a dictionary of financial and economic terms be pre-

pared by the Finance Task Group. On this matter I would like to point out that a glossary for the use of Mr. Claudio Fernandez's ECOFI program (computer program for financial projections) has been recently distributed to all public utilities divisions.

The standardization of financial statements (para. 3(g) of your memo) should not present, from my standpoint, any particular problem once such a glossary has been agreed upon and the use of computers has been generalized among public utilities divisions.

cc: Members of the Task Group
Messrs. Davis, Kalbermatten, Middleton (EWTDR), Raizen (PAS), Wyss (LCPDR), Zavala (LCPWS), Jennings (PERS)
Public Utilities Division Chiefs
LCPWS Staff

RCosta:clh

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

Mr. Kalbermatten
D-1036

OFFICE MEMORANDUM

TO: Members of Water Supply Finance Task Group DATE: December 16, 1976

FROM: Ali N. Memon AM

SUBJECT: Minutes of the Finance Task Group Meeting dated Monday, December 13, 1976

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1. Messrs. Davis, Keilani, P. Kapur, Middleton, Memon and Rietveld attended the meeting.

2. Mr. Davis proposed Mr. Memon to be Chairman of the Group. Mr. Kapur seconded the motion. Mr. Memon was elected unopposed.

3. It was agreed that the following items were of interest to financial analysts and might be tentatively considered for inclusion in the work program:

a) Asset Revaluation - Determine the objectives of asset revaluation and their practicability in various countries. Study of the legal implications, methodology and accounting implications used in various countries in order to draw appropriate conclusions and if possible, establish guidelines for future use.

b) Finance Summary Sheet - Preparation of "Finance Summary Sheet" for each water/sewerage project, approved during the last, say, 2 years. The sheets to be distributed to all financial analysts in order to inform them about what is happening throughout the Bank.

c) Rate of Return - Preparation of a detailed in-house survey of the rate of return or other revenue covenant in water/sewerage projects approved by the Bank during the, say, last 2 years (the Finance Summary Sheets may be a good starting point) in order to know what has or has not been accepted by the Bank under various circumstances. This will help inform the analysts about available flexibility in preparation and processing of the new projects.

d) Compliance with Financial Covenants - Preparation of an in-house study of the degree of compliance with financial covenants (e.g. rate of return, debt service, financial management, audit, accounting system, etc.).

e) Standardization of Financial Covenants - Determine the need for and degree of required standardization.

f) Water supply/sewerage tariff structure, especially relating to low income groups.

g) Standardization of Financial Statements - Determine the need for standardization and the degree required. Carrying out a study of what has been done to date in this respect and what, if anything, needs to be done in the future.

h) The role of International Accounting Standards Committee (IASC).

i) Exchange of Information Between Regions on Financial Policies - Determining ways and means of effectively achieving the flow of information. The vehicle for this might be the Finance Summary Sheet (see para. b)) for each new project as it is approved by the Board.

j) Centralized collection in the water supply library of terms of reference and final reports for various types of financial consultancy work done for the Bank-financed water projects. Ensuring availability of the required text books in the Water Supply Library or General Library.

k) Choice among the available computer programs for preparing financial projections and the possibility of making them available to our borrowers.

l) Study of current Bank practice regarding acceptable capital structure of water supply entities.

m) Establishment of financial indices to be monitored for each project, and liaison with the Project Management Task Group on this matter.

4. Some of the above subjects might be of interest to power and telecom financial analysts. Accordingly, representatives from those two sectors would be invited to participate in the discussions at a later date when the present group has made some progress.

5. It was agreed that CPS and Regional Economists should be invited to participate in discussions on f).

6. It was agreed that initially, services of a research assistant would be required to collect data for the proposed studies. Mr. Davis promised to look into the possibility of arranging some assistance on a part-time basis. Mr. Middleton suggested hiring a research assistant for next summer. This question will be discussed further in the context of 'the agreed work program'.

7. The next meeting will be held on Tuesday, December 28 at 2:30 P.M., in room D-1056. The main item on the agenda will be to agree on a realistic work program.

cc: Members of the Task Group
Messrs. Davis, Kalbermatten, Middleton, Raizen
Public Utilities Division Chiefs (For circulation to Financial Analysts)

Task Group
#2
Finances

Water + Telecom

Mr. J. M. Kalbermatten

December 17, 1976

R. N. Middleton

December Meeting of Water Supply Division Chiefs

I called a meeting of the division chiefs on December 14. Present were Messrs. Erkmen, Williams, Kapur (Acting Chief) and Rietveld (delegated) (part-time: delayed by a Board meeting). Mr. Zavala missed the meeting due to a confusion over timing, but I briefed him on the discussions and he is in agreement with the conclusions. EMENA was not represented.

The following summarizes our discussions:

Interview Panels for Candidates

There is some dissatisfaction with our present techniques for interviewing engineer candidates: too much time is spent in "social" discussion, and there is not enough coordination between interviewers to ensure that all technical aspects are covered.

Financial analyst candidates are interviewed by Bank staff, each concentrating on one particular aspect of the work, e.g., financial analysis, accounting, project evaluation, etc. This ensures adequate in-depth interviewing, but has led to some wide differences of opinion between interviewers as to the candidates' suitability for employment. I therefore suggested we might consider a panel system (such as is already being used to some degree in South Asia). Candidates would still be interviewed individually by Personnel, the division chief or chiefs most likely to be concerned, and yourself. The remaining time at present devoted to perhaps four or five interviews with individual staff members, would be used for interviews by one or two panels (preferably the latter to keep them small). These would have members specializing in particular areas (perhaps drawn from the Task Groups) and would, to the extent possible, work to an agenda agreed beforehand, having regard to the region and type of job for which the candidate is being considered.

Action

There was general support for the concept, and if you agree I think we should now develop one idea further in discussions with Personnel and our staff.

Proposed Revision to Sector Guidelines (OAS 4)

The discussion was nominally based on Ringakog's proposals of 9/24/76, although in fact few of the comments were directly related to that draft.

There is general support for the sector brief/sector memorandum/sector

survey structure (para 5 and Ringskog's memorandum). However the principal comments were more general:

- Reports should be brief and readable.

- They should be available promptly.

- The expectations from surveys should be more closely defined in advance. If a general overview is required, then it will necessarily be somewhat superficial. It is still necessary to concentrate on specific issues and analyze them to the extent the data permits; there is a feeling that present reports "say nothing about everything" and give a spurious impression of accuracy by much juggling with unreliable numbers. Other surveys might be confined to more specific sector aspects, or selected sub-sectors; the depth of analysis in these would naturally tend to be deeper, but would depend on the data base and the end use of the report by Government.

- Whatever format is included in a revised GAS 4, it should not be a straitjacket; each survey will require presentation in an individual way, although some standardization is clearly desirable.

Mr. Erimen proposed that the sector reports be modelled on the "new style" appraisal reports, with the annex section being kept in loose-leaf format and continually updated by information obtained from routine missions. In this way revised sector briefs, memos, etc., showing the current country situation could quickly be prepared. However, the remainder of the participants considered that the suggestion was impractical and would make excessive demands on staff time.

Written comments on the proposals have been received from WHO (letter 11/25/76), and some comments from Mr. L.V. Smith are attached (Annex 1).

Action

I propose that we adopt the new outline on a trial basis (as is in fact being done), incorporating WHO's comments, but that we do not reissue GAS 4 until we are satisfied, from our experience with initial reports, that there are no unforeseen snags.

Routine Release of Bank Reports to WHO

This discussion centered on WHO's letter of 11/29/76.

There was unanimous, vehement and complete rejection by the chiefs of release of information to WHO except on a "need to know" basis. In this the chiefs have reaffirmed the position they have taken every time

the issue has been raised. The reasons remain the same:

- The lack of confidentiality within WHO, particularly within the Regional offices (and within HQ in relation to AfDB, which in a sense is "competing" with the Bank in the sector).

- The tentative nature of many reports, which represent only the views of missions or divisions rather than Bank management. In particular, the risk that Issues Papers and the like be taken as representing Bank positions.

- The premature disclosure of Bank negotiating and fallback positions on sensitive issues such as organisational structure, tariffs, squatter policies, etc.

- The confidential nature of supervision reports dealing with items such as management competence, financial performance, needed tariff increases, etc.

However, the chiefs expressed their general approval of the improvement in liaison which is already being achieved, for example by providing CP with country briefing material prior to missions, by briefing and debriefing of CP missions within the Bank, and by twice-yearly visits of the CP Coordinator to the Bank to have full discussions with Projects and Programs staff.

Action

We need to reply to WHO indicating the circumstances under which we are able to release documents to them (I have discussed this briefly with Mr. Rovani, who would like the matter cleared with IRD and with whoever handles present routine distribution to (WHO).

That reply should indicate that the divisions will be responding, to the appropriate extent, to the numerous questions raised in WHO's letter. We then need to agree these replies with the division concerned. Thought should be given to the implications for any decentralization of the CP (for example to SEARO or PAHO), when a number of confidential internal Bank documents would have to be sent to CP staff in WHO's regional offices (I imagine that the whole reorganization proposal would be subject to RVP assent, but this aspect should not be overlooked).

Attachment

cc: Messrs. Ringskog (EWTDR), Rovani (EWTDR), Beach (AEPEW), Ericsen (EAPEW), R. Salazar (WAPEW), Thys (EMPWS), Williams (ASPEW), Zavala (LCPWS)

RMHidleton:jbe

G-622

Water Supply & S -

December 16, 1976

Mr. David Donaldson
Area Program Coordinator
Division Environmental Health
Pan American Health Organization
525 Twenty-Third Street, N.W.
Washington, D.C. 20037

Dear David:

Thank you for your letter of December 3 (EPG/AMRO-2172/63/3) giving your comments on Professor Okun's draft paper. For some reason the letter has only just reached me, and I will not have a chance to reply in any detail before I depart on home leave; however, I will pass it to Professor Okun and leave him to make the necessary changes in the next version.

I think I must comment briefly on your comment A3, in which you suggest that the Bank lend for training. The simple answer is that we do: in our FY 76 loans there were funds included for training in nearly every case. Some details are annexed. Of course you are right in saying that these are project-related; on the other hand the borrower is frequently a national or regional agency so that the effect is very much broader than the label "project-related" might imply. Moreover, given the institutional weakness in the sector in most of the countries with which we deal, there doesn't seem to be much point in lending solely for training; it is essential to include the institution strengthening that can normally only be achieved in a project-related context.

I do not think the issue is whether we are ready to make funds available: clearly we are. Our primary problem is in identifying needs and supervising the measures taken to meet those needs.

Yours sincerely,

Richard N. Middleton
Senior Sanitary Engineer
Energy, Water and Telecommunications

Attachment

cc: Kalbermatten (EWTDR)
Professor Okun

RNMiddleton:jbe

TRAINING IN FY 76 WATER SUPPLY LOANS AND CREDITS

The following are extracted from project appraisal reports:

Loan/Credit	Training Component/Bank Contribution (US$M) (net of price & physical contingencies)	Training Agency
Mexico - Medium Cities	0.5/0.2	SRH (National Urban Water Agency)
Panama - 4 Cities	0.3/0.12 1/	IDAAN (National Water & Sewer Agency)
Kenya - Mombasa and Coastal	0.5/0.33	CPWB (Province Water Agency: covers 7.5% of national population)
Zaire - 6 Cities	4.1/0.1 2/	Regideso (National Urban Water Agency)
India - Uttar Pradesh	/0.5 3/	Jal Nigam (State Water Development Agency: covers 16% of national population)
Syria - Damascus II	0.22/0.11 4/	EPEF (Damascus Water Agency)
Pakistan - Lahore II	- 5/	WASA (Lahore Water & Sewer Agency)
Yugoslavia - Morava	0.09/0.05	Morava Region Water Community of Interest (River Basin Planning & Development Authority: covers 12% of national area)
Yugoslavia - Sarajevo	/1.67 3/	Sarajevo Water Supply & Sewerage Enterprise

1/ Including management assistance; costs not broken down in report. Bank's Training Adviser indicates 2.5% attributable to training.
2/ Program prepared by IDA consultants but funding on grant basis sought from other agencies.
3/ According to Bank's Training Adviser; details not given in report.
4/ Supplementary to training under Damascus I.
5/ To be funded by UNDP and bilateral agencies.

→ JK QR for info

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Distribution Below

DATE: December 13, 1976

FROM: Keith Thomas

SUBJECT: Water Supply Task Group on Management

Richard Middleton has asked me to arrange the initial meeting of the above group. As it was expected, inquiries of your secretaries indicate that there is no time before the next water supply staff meeting in January at which all of us can get together; however, the week of December 20 looks as though it would suit the majority and I have accordingly reserved room A 720 at 10:30 a.m. on Thursday, December 23 and hope that you will be able to be present.

The object of the initial meeting is "to prepare a work program and identify the resources needed to achieve the group's objectives". For your reference the objectives of the group set out in John Kalbermatten's original letter were:

a. Maintain proficiency in their speciality through professional literature, participation in professional activities, attendance at workshops, seminars or conferences;

b. Provide leadership in their area of expertise by informing and training water supply staff through staff working papers, workshops and individual consultation;

c. Identify and supervise consultants on appropriate state-of-the-art review and research papers;

d. Develop guidelines and policies for the use of Bank Staff on the topics of their expertise;

e. Maintain a roster of an contact with consultants competent in their area of expertise.

Distribution: Rene L. Costa, A 843; William Cosgrove, A 740; P. Roger de Mee, A 1000; Stefen Alber Glanstaetten, A 337; Eric Pogson, A 842.

cc: Messrs. Thys and Middleton ✓

BKT:ba

Task Group
Management

December 9, 1976

Mr. Maurice N. Langley
Vice President
Bookman-Edmonston Engineering, Inc.
1000 Vermont Avenue, Suite 1100
Washington, D.C. 20005

Dear Mr. Langley:

Thank you for your letters of November 29 and December 6 addressed to Mr. Kalbermatten, setting out your proposals for the state-of-the-art paper on pipelines and indicating the cost of an associated field trip to Europe.

As I mentioned to you in our recent telephone conversation, we have had some unexpected demands on our department budget which have unfortunately made it necessary to delay entering into new commitments. We will, however, shortly be undertaking our mid-year budget review which will enable us to reassess the situation more precisely, and I hope it will then be possible to launch this very important study.

Yours sincerely,

Richard N. Middleton
Sr. Sanitary Engineer
Energy, Water and Telecommunications Department

RNMiddleton:sp

cc: Kalbermatten, Peter

BOOKMAN-EDMONSTON ENGINEERING, INC.
SPECIALISTS IN WATER RESOURCES
1000 VERMONT AVENUE, SUITE 1100
WASHINGTON, D. C. 20005

TELEPHONE
(202) 347-1122

MAIN OFFICE
GLENDALE, CALIFORNIA

December 6, 1976

Mr. John M. Kalbermatten
Water and Waste Advisor
Central Projects Office, Room D-1036
World Bank
1818 H Street, N.W.
Washington, D.C. 20433

Dear Mr. Kalbermatten:

This letter will confirm my telephone conversation with Mr. Middleton today, and supplement our letter of November 29, proposing preparation of a "state-of-the-art" paper on pipeline materials and specifications and for presenting the paper at a workshop for your representatives in Washington, D.C., in mid-1977.

In Mr. Middleton's letter of October 29 to me, he suggested that at some stage in the study it would be very desirable for a member of our team to visit Europe, to discuss European pipeline practices. We concur in this suggestion, particularly in regard to contacts in France, Germany, and the United Kingdom. If such a trip is made solely for this purpose, it would add approximately $6,000 dollars to the $23,000 estimate contained in our November 29 letter, i.e.:

NB: Should be Y

Air fare, 1st class round trip, California to Frankfurt, Paris, and London	$1,800.00
12 man days @$275.00	3,300.00
12 days' expenses @$60.00	720.00
Local taxis, car rental, etc.	180.00
	$6,000.00

If the European trip could be combined with a technical assistance mission on a bank project involving significant pipeline problems, the incremental cost for this portion of the state-of-the-art study would be reduced.

Sincerely yours,

Maurice N. Langley

Maurice N. Langley
Vice President

MNL/dj

RECEIVED
1976 DEC -8 PM 12: 58
INCOMING MAIL UNIT

Urban Poverty
Water Supply & Sewerage

December 2, 1976

Mr. Edward Jaycox, URRDR

Mr. R. H. Sheehan, ENTDR

The Impact on the Urban Poor of the Bank's Water Supply Operations

1. In his discussions with you in later September Mr. Rovani agreed to examine further the impact on the urban poor of the present Bank lending program for water supply and if possible to propose appropriate sector targets. Subsequent discussions with our regional colleagues, while highlighting the problems (both conceptual and informational) attending this analysis, have led us to some preliminary conclusions as set out in this memorandum.

2. The present urban population of LDCs is of the order of 600 million.1/ Of these, about 75 per cent have some access to public water supply, although in many cases this service is unreliable, inconvenient or unsafe. By 1985 the urban population is projected to increase by about 50 per cent to just under 900 million. The people needing service by 1985 therefore number some 450 million, comprising 150 million present backlog and 300 million new inhabitants. Even to maintain the present level of coverage in the various regions would require serving about an additional 220 million people by 1985.

3. The projects resulting from the Bank's present 1976-81 lending program would serve only about 45 million people in addition to those who already have some access to service. This number is equivalent to 20 per cent of the number needed to maintain present coverage, or to 10 per cent of the number needed to clear the backlog. Regional staff have identified additional projects which could expand this program by about 50 per cent, if various constraints (IDA allocations, inter-sectoral allocations on country grounds, staff) were relaxed.2/

4. All the population figures above relate to total urban population, not to the urban poor as such. However, every water supply project undertaken by the Bank will have a high "urban-poor" content, since:

- clearing the present service backlog will mainly benefit the poorest sections of the community;

- those most benefitting from the improvement and rehabilitation of existing unsatisfactory systems are also the poor;

1/ UN medium-variant, medium-trend projections of 10/74. We understand your department will shortly be issuing revised projections to be used as a basis for further planning.

2/ Figures in this paragraph are subject to checking on receipt of the latest UORSU computerised analysis of the lending program.

- a high proportion of the population growth to be served by the projects will be due to poor migrants; and

- both the technical (service level, mix and pattern of water distribution) and financial (tariff structure and levels) aspects of project designs will be reviewed to ensure that as far as possible everyone living within the project area receivesaccess to the new service.

5. We have investigated the problems of quantifying the urban poor component of water supply projects and have not so far found a solution.3/ In due course we propose to engage a consultant to investigate a number of possible indices or measures of benefits and methods of evaluating costs and beneficiaries in water supply. By applying these to actual Bank projects we should be able to determine whether they are realistic and consistent, and whether they are useful operational tools for planning or monitoring. To be feasible, analytical methods will also have to take into account the constraints on Bank staff time and normal availability of data.4/

6. Meanwhile, if it is essential for you to use "a proportion of investment" index as a measure of the urban poor impact of water supply projects, I recommend that you use the larger of the following proportions of the project cost:

- urban poor (identified by UORSU) ÷ total urban population

- people supplied by public hydrants plus people supplied by connections charged at the "social tariff" ÷ total urban population.

3/ See Mr. Middleton's memorandum of 10.8.76 to Mr. Pavani. Ms. Julius has also been working on an elasticity index for testing project bias; see her memorandum of 10.20.76 to Mr. Kalbermatten. These memoranda were copied to Mr. Stone; additional copies are attached for your convenience.

4/ This work would, of course, be carried out in close collaboration with your staff; in fact, it probably could not make much progress until UORSU is able to provide more specific estimates of the numbers and location (present and forecast) of the target groups in the cities to be served by water projects, since Ms. Julius' work has indicated that the present regional or country wide estimates are unlikely to be satisfactory.

7. We are not yet in a position to say whether the Bank's lending program adequately responds to the problem of service to the urban poor. This is a country-specific problem and is affected by a number of factors, for example:

- country sector knowledge and planning competence;
- availability of properly prepared projects (including adequate provision for local manpower development);
- sectoral allocations and priorities of foreign exchange expenditures by government;
- availability of co-financing by other lenders;
- IDA allocations.

This is essentially a matter for analysis during the CPP process. We would therefore recommend that each CPP include a section specifically on the urban impact of the recommended program, including an evaluation of the country's investment program in water supply in relation to Habitat (or eventually World Water Conference) goals. We had planned to support this exercise by a consultant's study analysing our sector lending program, but this has recently had to be suspended due to illness in the consultant's family; it will be recommenced as soon as possible, either with the same or a new consultant (a staff member would be preferable, but as you know our requested "urban poor" position was deleted in the last budget).

RMiddleton:sp

cc: Messrs: Beach (AEPEW), Eriksen (EAPEW), Salazar (WAPEW), Thys (EMTW3), Williams (ASPEW), Zavala (LCPWS), Kalbermatten (EWTDR), Rovani (EWTDR), Ringskog (EWTDR), Saunders (EWTDR), Daly (WAPEW)

BOOKMAN-EDMONSTON ENGINEERING, INC.
SPECIALISTS IN WATER RESOURCES
1000 VERMONT AVENUE, SUITE 1100
WASHINGTON, D. C. 20005

TELEPHONE
(202) 347-1122

MAIN OFFICE
GLENDALE, CALIFORNIA

November 29, 1976

Mr. John M. Kalbermatten
Water and Waste Advisor
Central Projects Office, Room D-1036
World Bank
1818 H Street, N.W.
Washington, D.C. 20433

Dear Mr. Kalbermatten:

In accordance with your request, we are pleased to present this proposal for preparing a "state-of-the-art" Paper on Pipeline Materials and Specifications and for presenting the paper at a workshop for your representatives in Washington, D.C., in mid-1977.

Attached is a proposed outline for the paper. As work proceeds, some minor modification to this outline may be made to more completely cover the subject. However, we expect the final paper will be in substantial conformity with the outline, except for such new subjects as we may mutually agree upon.

This firm has designed, prepared specifications and administered construction contracts for more than 500 miles of pipelines in diameters from 6 inches to 132 inches and including prestressed and modified prestressed concrete, steel, reinforced concrete, asbestos cement, fiberglass reinforced plastic mortar and plastic materials. The firm and its principals have had world-wide experience and are currently, or has been in recent months, involved in Latin America, Asia, Africa, and the Middle East.

We propose that the preparation and presentation of the paper be under the direction of Mr. James R. Cannon, the firm's Chief Design Engineer. Other firm members, with both pipeline and overseas experience, will be called upon for advice as needed. Mr. Cannon was co-author with Mr. R. M. Edmonston of a paper entitled, "Recent Developments in Irrigation Pipeline Systems," which he presented to the national meeting of the American Society of Civil Engineers in January 1974. In addition to the firm's experience mentioned above, Mr. Cannon has supervised construction of non-reinforced concrete and cast-in-place concrete pipelines. A resume of his experience is attached.

Called 12/6
Supplemental letter should include trip to Europe for budget purposes
R.

RECEIVED
1976 DEC -2 AM 11: 07
INCOMING MAIL UNIT

In estimating the cost of this undertaking, we have included the costs of Mr. Cannon holding three review and research sessions with your staff at the World Bank. The first session would be when the paper is approximately one-third completed; the second at about two-thirds completion; and the third for the purpose of setting up and conducting the workshop. We propose to bill the cost of this work at a per diem rate of $275 for Mr. Cannon's and other principal's time, and to bill the time of other employees in accordance with the attached Schedule of Fees. Expenses would be billed at cost. We estimate that the total cost of this study, including preparation of all drawings and 100 copies of all material in loose leaf form for the workshop, would not exceed $23,000, and would agree to this maximum. A breakdown of our estimate is attached.

If any additional research, report writing, and printing are desired after the workshop, the cost would depend upon what additions and revisions you may wish, and upon the number of copies, type of binding, etc.

The confidence you have shown in our firm is greatly appreciated, and we look forward to working with you on this assignment.

Very truly yours,

Maurice N. Langley

Maurice N. Langley
Vice President

Attachment

MNL/dj

OUTLINE

PIPELINE MATERIALS AND SPECIFICATIONS
THE STATE OF THE ART

I. INTRODUCTION

A. Scope of Paper

1. Will discuss various available materials, their applications and limitations.

2. Will discuss basis of comparing alternative materials.

a. Expected life.

b. Hydraulic efficiencies including changes over time. Susceptibility to cleaning to improve efficiency.

c. Relative ease of repair, rehabilitation, and replacement.

3. Will discuss specifications requirements for various materials.

a. Manufacturing and delivery.

b. Proper excavation, bedding, and backfilling.

c. Joint materials and assembly, including pipes of different materials.

d. Special installation requirements.

e. Water hammer limitations.

4. Will discuss inspection procedures.

5. Will discuss possible mitigation of problems, including repair of defects.

II. PIPE MATERIALS, APPLICATIONS AND LIMITATIONS

A. Under each type of pipe will be discussed:

1. Description of pipe and joints

a. Friction factors

b. Life expectancy

2. Fields of application

3. Limitations in application (including sophistication of installers and interior and exterior corrosion).

   a. Collapse under internal vacuum

4. Thrust anchorages

5. Manufacturing methods and variations thereof:

   a. Requirements for special qualifications or equipment.

   b. Testing

6. Fittings

7. Handling and shipping

8. Installation methods

9. Field testing

10. Maintenance

B. Pipe and related materials to be discussed

1. Rigid pipe

   a. Unreinforced concrete

   b. Reinforced concrete

   c. Non-cylinder prestressed pipe

   d. Cylinder prestressed pipe

   e. Cast iron

   f. Asbestos cement

   g. Vitrified clay

   h. Cast-in-place

2. Flexible pipe

   a. Steel

      1. Joint types

2. Available coatings and linings (including field repair)

b. Concrete cylinder pipe

c. Ductile iron

d. Corrugated metal

e. Plastic

1. Thermoplastic

2. Thermosetting

3. Anchorages at bends, ties, blank flanges, valves, etc.

III. SPECIFICATIONS

A. Purpose of specifications

1. Must convey designers requirements to manufacturers, constructors, and inspectors.

2. Wording must be clear, definite, and unambiguous.

3. Should not include materials and procedures beyond that necessary to insure proper performance of the completed project.

B. Types of contracts and their advantages and pitfalls.

1. Furnish and install

2. Separate procurement and installation contracts

C. Materials

1. Standard specifications

2. Materials for which no standards are available

3. Special materials

a. Linings

b. Coatings

c. Cathodic protection

4. Manufacture and delivery

D. Installation

1. Trenching
2. Bedding
3. Handling and laying
4. Joint makeup (including pipes of different materials)
5. Anchorages
6. Backfilling
7. Repair of damaged coating and lining
8. Cleaning (initially and in service)

E. Hydrostatic testing (including comments on permissible leakage with various types of rigid and non-rigid joints)

F. Appurtenances

G. Warranty

IV. BID EVALUATION AND COMPARISON OF ALTERNATIVES (including sensitivity of costs to delivery time and raw material markets; choice between fixed-cost vs. rise-and-fall clause contracts)

V. INSPECTION AND TESTING PROCEDURES (for each type of pipe)

A. In-plant

B. Field

VI. PIPE OF THE FUTURE

A. Trends in pipeline technology

VII. ANNEX - GLOBAL RANGE OF TYPICAL UNIT COSTS AND TRENDS

Record Removal Notice

The World Bank Group Archives & Records Management

File Title	Barcode No.
Bank Administration and Policy - Water Supply and Sewerage 1975 / 1977 Correspondence - Volume 2	30045481

Document Date	Document Type	
11/29/1976	CV / Resumé	

Correspondents / Participants

Subject / Title
Resume

Exception(s)
Personal Information

Additional Comments

The item(s) identified above has/have been removed in accordance with The World Bank Policy on Access to Information. This Policy can be found on the World Bank Access to Information website.

Withdrawn by	Date
Chandra Kumar	11/25/2013

Pipelines

November 23, 1976

Mr. Maurice N. Langley
Bookman-Edmonston Engineering, Inc.
1000 Vermont Avenue, Suite 1100
Washington, D.C. 20005

Dear Mr. Langley:

I have discussed your draft proposal of November 16th with a number of our engineers. Many of their comments are matters of detail which would doubtless be covered in any case in your paper, but it may be helpful to repeat them here.

- The paper should discuss specification requirements and hydrostatic testing provisions to allow for water hammer.

- The problems of jointing pipes of different materials, and specifications for the specials required, should be included.

- The section on hydrostatic testing should also include comments on permissible leakages with various types of rigid and non-rigid joints.

- The discussion on flexible pipelines should include the problems of collapse under internal vacuum.

- Anchorages at bends, tees, blank flanges, valves, etc., should be discussed. In addition to thrust blocks forconcrete pipes and strap harnesses for steel pipes, the paper should cover the use of special lengths of welded steel mains (either buried so as to develop the required resistance by friction, or laid unrestrained on the surface, the stresses being carried by the pipe itself).

- The comparison of alternatives should also touch on the relative ease of repair of both pipes and specials (e.g. welded steel mains which can be patch-plated and where valves can be freely removed vs. pre-stressed concrete mains that cannot be repaired easily in situ and where valves may be solid between thrust blocks).

- Under III D, there should be a section on pipe cleaning (both initially and in service) and on remedial lining in order to rehabilitate the pipe structually or restore/improve its carrying capacity. To the extent that this affects cost comparisons, it should also be covered under IA2.b.

- Bid evaluation and comparison of alternatives is included in the "Scope of the Pipes" (IA2) but does not seem to reappear in the main text.

- Recent years have emphasized the sensitivity of costs to delivery time (high inflation) and raw materials markets (petrochemicals for plastic pipe). The discussion on choice between alternative materials should deal with this, and fixed cost vs. rise-and-fall clause contracts should

- IIIA.3 should presumably read "should not include materials ..... beyond those necessary".

- There is little explicit mention of costs, though obviously differences in cost underly much of the material. Although this is a very fluid and ever-changing part of the subject, it is obviously essential to attempt to discuss current cost trends, not only of raw materials but also of other input such as transportation and of course of completed installations, and the factors underlying them. One of the useful results of your discussions with our staff members should be to get this information on a global basis, for a wide variety of applications. I would like to see an annex setting out a range of typical unit costs and trends; this could then be updated quite separately from the rest of the paper (i.e. so that we would not worry to correct or update regularly the various cost figures which would inevitably be scattered throughout the paper).

- A final section should be on the "pipe of the future", discussing recent trends in pipeline technology development. Should we be expecting on-site extrusion of larger diameter plastic pipes, or field fabrication of helically-welded steel mains, or what?

We are in the process of setting up in our sector a number of professional task groups, whose responsibility it would be to supervise "state-of-the-art" papers such as this one. I would expect this group to act as the review panel for your assignment, although your formal point of contact with the Bank would be through Mr. Kalbermatten's office. I would expect the first review session to be at the completion of the initial visit to the Bank and discussions with our staff; at that time it should be possible for you to give a clear and detailed description of exactly what will be included in the paper, and we will be able to discuss possible visits to manufacturers, participation in missions, or other activities necessary to complement the desk study. However, I do not think it is necessary to reflect this formally in your proposal; the present provision for two review meetings at unspecified dates plus a workshop is satisfactory.

I would be grateful if you would now finalise your proposal, taking into account my comments above; I will then submit it through our own channels for formal approval.

Sincerely,

Richard N. Middleton
Sr. Sanitary Engineer
Energy, Water and Telecommunications Department

RNMiddleton/sp

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Mr. R. N. Middleton (EWTDR) DATE: November 19, 1976

FROM: Ernesto Maisch (EGR, LCPWS)

SUBJECT: Comments on "State of the Art" Paper on Pipeline Materials

The outline of the paper looks quite complete. A few points which, perhaps, could be included in the discussion are:

1) Pipe anchorage in bends, reduction, valves and plugs or blind flanges.

   (a) Welding of steel pipes to develop by friction the resistance to offsetting forces. Use of harnesses;

   (b) Anchorage blocks;

   (c) Other methods for concrete pipes.

2) Flexible pipe collapsing under vacuum.

3) Pipelines for sewers.

   (a) Protection of the pipe crown against H_2S attack;

   (b) Use of special kind of cement;

   (c) Ocean outfalls.

EMaisch/clh

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Mr. R.N. Middleton (EWTDR) DATE: November 19, 1976

FROM: Guillermo Yepes (LCPWS)

SUBJECT: Bookman-Edmonston Engineering Inc., letter of November 16, 1976.

Per your request I have reviewed the proposed terms of reference to prepare a paper on the "state-of-the-art" on Pipeline Materials and Specifications. The scope of the work is well identified and covers most of the variables used in the design of pipelines.

I have the following suggestions for the proposed paper:

1. Discuss specification requirements for working pressures with and without allowance for water hammer in relation to bursting pressures and hydrostatic pressure testing.

2. Discuss specifications for special fittings required to connect pipes from di erent materials (e.g. plastic and pre-stressed pipes).

3. Leakage allowances and experiences with non-rubber or flexible joints (e.g. mortar joints, etc.)

GYepes:ybs

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Mr. R. N. Middleton (EWTDR) DATE: November 18, 1976

FROM: J. B. Buky (WAPEW)

SUBJECT: Pipeline Materials and Specifications
State-of-the-Art Paper

My comments on the Bookman-Edmonston proposals for the above are as follows:

1. The "outline" appears very comprehensive, perhaps too much. We should not spend too much time (perhaps at the expense of more relevant subjects) on vitrified clay and cast-in-situ pipes.

2. Item III.A.3. is somewhat unclear. Do they mean ... should not include ...?

3. I should like to see the following points included:

   (i) A short presentation on the present direction of pipe developments. What is the "pipe of the future"? Are we going to have "on-site extruded jointless plastic pipes" or the "on-site manufactured, continuous, helically welded steel pipes", etc.? This could also include something on the trend of the "basic" cost of pipes, that is, raw material and manufacture as far as it is likely to influence future preferences for materials. Alternatively, could we have a separate lecture on costs?

   (ii) Under installation, testing and performance, a presentation on pipe cleaning (initial "proving free of obstruction" and subsequent) and possibilities of rehabiliation and improving of carrying capacity as this is influenced by the pipe material.

   (iii) Pipeline security and maintenance as influenced by the different materials.

4. How did we come to choose this firm? Five hundred miles of pipelines does not sound very much.

JBBuky:fm

November 16, 1976

Mr. Maurice N. Langley
Vice President
Bookman-Edmonston Engineering, Inc.
1000 Vermont Avenue, Suite 1110
Washington, D.C. 20005

Dear Mr. Langley:

This week we have been visited by Mr. Costa Midis, Vice-President of Vacrete (Vacuum Concrete (Overseas) Company, Inc.), who made a presentation on the pipes produced by his company. The manufacturing method is unusual if not unique (non-cylinder prestressed concrete pipes, both core and cover coat being vertically cast vibrated concrete, from which excess water is removed by vacuum applied to perforated moulds), but what attracted most attention was the contractual arrangements under which Vacrete prefer to operate. They see themselves essentially as a licensing company rather than as a contractor, and so apart from their good name have little motive for ensuring satisfactory project execution. This has led to major problems in India (where the licensee continued to make pipes - of a very poor standard - after the arrangements had been terminated) and in Brazil (where the laying contractor was said to be totally inexperienced but nevertheless was not adequately trained or supervised). The consensus of our informal staff meeting was that Vacrete would be unlikely to win contracts on our projects unless these contractual arrangements were revised to ensure that Vacrete take greater responsibility, particular in countries where the domestic industry is not very developed.

Mr. Midis apparently visits this country regularly and expressed a willingness to meet with you to discuss both technical and other aspects of his company's work. I hope this may be possible shortly; meanwhile, I look forward to receiving your research proposal, so we may put this activity on a more formal footing.

Sincerely,

Richard N. Middleton
Senior Sanitary Engineer
Energy, Water and Telecommunications
Department

RNMiddleton/sp

BOOKMAN-EDMONSTON ENGINEERING, INC.
SPECIALISTS IN WATER RESOURCES
1000 VERMONT AVENUE, SUITE 1100
WASHINGTON, D. C. 20005

TELEPHONE
(202) 347-1122

MAIN OFFICE
GLENDALE, CALIFORNIA

November 16, 1976

Mr. John M. Kalbermatten
Water and Waste Advisor
Central Projects Office, Room D-1036
World Bank
1818 H Street, N.W.
Washington, D.C. 20433

Dear Mr. Kalbermatten:

In accordance with your request, we are pleased to present this proposal for preparing a "state-of-the-art" Paper on Pipeline Materials and Specifications and for presenting the paper at a workshop for your representatives in Washington, D.C., in mid-1977.

Attached is a proposed outline for the paper. As work proceeds, some minor modification to this outline may be made to more completely cover the subject. However, we expect the final paper will be in substantial conformity with the outline, except for such new subjects as we may mutually agree upon.

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We propose that the preparation and presentation of the paper be under the direction of Mr. James R. Cannon, the firm's Chief Design Engineer. Other firm members, with both pipeline and overseas experience, will be called upon for advice as needed. Mr. Cannon was co-author with Mr. R. M. Edmonston of a paper entitled, "Recent Developments in Irrigation Pipeline Systems," which he presented to the national meeting of the American Society of Civil Engineers in January 1974. In addition to the firm's experience mentioned above, Mr. Cannon has supervised construction of non-reinforced concrete and cast-in-place concrete pipelines. A resume of his experience is attached.

DRAFT FOR REVIEW AND COMMENT
BEFORE FORMAL SUBMITTAL

In estimating the cost of this undertaking, we have included the costs of Mr. Cannon holding three review and research sessions with your staff at the World Bank. The first session would be when the paper is approximately one-third completed; the second at about two-thirds completion; and the third for the purpose of setting up and conducting the workshop. We propose to bill the cost of this work at a per diem rate of $275 for Mr. Cannon's and other principal's time, and to bill the time of other employees in accordance with the attached Schedule of Fees. Expenses would be billed at cost. We estimate that the total cost of this study, including preparation of all drawings and 100 copies of all material in loose leaf form for the workshop, would not exceed $23,000, and would agree to this maximum. A breakdown of our estimate is attached. In Mr. Middleton's letter of October 29, 1976, he suggested that at some stage in the study it would be very desirable for a member of our team to visit Europe to discuss European practices. We concur in this suggestion, particularly in regard to contacts in France, Germany, and the United Kingdom. If such a trip is made solely for this purpose, it would add approximately $6,000 to the above estimate as follows:

Air fare, 1st class, round trip, California to Frankfurt, Paris, and London	$1,800.00
12 man days @$275.00	3,300.00
12 days expenses @$60.00	720.00
Local taxis, car rental, etc.	180.00
	$6,000.00

If the European trip could be combined with a technical assistance mission on a bank project involving significant pipeline problems, the incremental cost for the state-of-the-art-study would be reduced.

If any additional research, report writing, and printing are desired after the workshop, the cost would depend upon what additions and revisions you may wish, and upon the number of copies, type of binding, etc.

The confidence you have shown in our firm is greatly appreciated and we look forward to working with you on this assignment.

Very truly yours,

Maurice N. Langley
Vice President

Attachment

MNL/dj

OUTLINE

PIPELINE MATERIALS AND SPECIFICATIONS
THE STATE OF THE ART

I. INTRODUCTION

A. Scope of Paper

1. Will discuss various available materials, their applications and limitations.
2. Will discuss basis of comparing alternative materials.

   a. Expected life.
   b. Hydraulic efficiencies including changes over time.

3. Will discuss specifications requirements for various materials.

   a. Manufacturing and delivery.
   b. Proper excavation, bedding and backfilling.
   c. Joint materials and assembly.
   d. Special installation requirements.

4. Will discuss inspection procedures.
5. Will discuss possible mitigation of problems, including repair of defects.

II. PIPE MATERIALS, APPLICATIONS AND LIMITATIONS

A. Under each type of pipe will be discussed:

1. Description of pipe and joints

   a. Friction factors
   b. Life expectancy

2. Fields of application
3. Limitations in application (including sophistication of installers and interior and exterior corrosion).
4. Manufacturing methods and variations thereof:

   a. Requirements for special qualifications or equipment.
   b. Testing

5. Fittings
6. Handling and shipping
7. Installation methods
8. Field testing
9. Maintenance

B. Pip3 materials to be discussed

1. Rigid pipe

a. Unreinforced concrete
b. Reinforced concrete
c. Non-cylinder prestressed pipe
d. Cylinder prestressed pipe
e. Cast iron
f. Asbestos cement
g. Vitrified clay
h. Cast-in-place

2. Flexible pipe

a. Steel

1. Joint types
2. Available coatings and linings (including field repair)

b. Concrete cylinder pipe
c. Ductile iron
d. Corrugated metal
e. Plastic

1. Thermoplastic
2. Thermosetting

III. SPECIFICATIONS

A. Purpose of specifications

1. Must convey designers requirements to manufacturers, constructors and inspectors.
2. Wording must be clear, definite and unambiguous.
3. Should not exclude materials and procedures beyond that necessary to insure proper performance of the completed project.

B. Types of contracts and their advantages and pitfalls.

1. Furnish and install
2. Separate procurement and installation contracts

C. Materials

1. Standard specifications
2. Materials for which no standards are available
3. Special materials

a. Linings
b. Coatings
c. Cathodic protection

4. Manufacture and delivery

D. Installation

1. Trenching
2. Bedding
3. Handling and laying
4. Joint makeup
5. Backfilling
6. Repair of damaged coating and lining

E. Hydrostatic testing

F. Appurtenances

G. Warranty

IV. INSPECTION AND TESTING PROCEDURES (for each type of pipe)

A. In-plant

B. Field

Record Removal Notice

The World Bank Group Archives & Records Management

File Title	Barcode No.
Bank Administration and Policy - Water Supply and Sewerage 1975 / 1977 Correspondence - Volume 2	30045481

Document Date	Document Type	
11/16/1976	CV / Resumé	

Correspondents / Participants

Subject / Title
Resume

Exception(s)
Personal Information

Additional Comments

The item(s) identified above has/have been removed in accordance with The World Bank Policy on Access to Information. This Policy can be found on the World Bank Access to Information website.

Withdrawn by	Date
Chandra Kumar	11/25/2013

Water Supply & Sewerage

October 29, 1976

Mr. Maurice N. Langley
Vice President
Bookman-Edmonston Engineering, Inc.
1000 Vermont Avenue, Suite 1110
Washington, D. C. 20005

Dear Mr. Langley:

As I mentioned to you on the telephone, two representatives from Pont-a-Mousson visited the Bank on Monday to describe their products to our sanitary engineering staff. Two items in particular may be of interest in connection with the proposed pipelines paper: firstly, the use by Pont-a-Mousson of a metallized zinc coating for small diameter (10-inch or less) ductile iron pipes, since these pipes have thin walls and if corroded are liable to collapse under external loadings (lack of such protection has apparently given rise to trouble both in Germany and the USA); secondly, the problem of interconnection between existing and new pipes and specials where these are constructed to different national or international standards (even where external diameters are compatible, steps in internal diameter give rise to increased hydraulic roughness). They also mentioned that in France all pipes, regardless of material, are regarded as having the same hydraulic characteristics, a remark which you may wish to follow-up with our own French engineers and in the literature.

The Pont-a-Mousson representatives welcomed the idea of the proposed pipelines paper when I outlined it to them; in particular, they felt it offered a chance to reconcile various conflicting specifications and resolve procurement difficulties. They promised every cooperation in providing information for the paper, and I consider that it would be very desirable if at some stage in the study a member of your team visited Europe to discuss European practices. This might conceivably be combined with technical assistance on a Bank project where significant pipeline problems are being met. We can discuss details in due course; meanwhile I suggest you include an appropriate amount in your budget proposal.

I mentioned to you that a representative of a prestressed pipe manufacturer has asked to visit the Bank next month to make a presentation to our staff. I have now been approached by a pipe lining company with a similar request. I hope you may be free to sit in on these presentations; I will let you know the dates in due course.

Sincerely,

Richard N. Middleton
Senior Sanitary Engineer
Energy, Water and Telecommunications
Department

cc: Mr. Kalbermatten

WORLD BANK / INTERNATIONAL

OFFICE MEMORANDUM

DATE: October 22, 1976

TO: Water Supply Staff

FROM: John M. Kalbermatten (Water and Wastes Adviser, EWTDR)

SUBJECT: Professional Development and Participation in Bank Policy Development in the Water Supply and Wastes Sector

In my memorandum of September 17, I suggested 3
Following discussions with many of you, I have come to the conclusion that larger groups would be preferrable and that a limited number of task groups with the opportunity to emphasize any of a number of topics would be a better way of organizing our effort. I have, therefore, prepared a revised list of task groups which includes suggestions and recommendations some of you made (Attachment 1).

Following receipt of your replies to my memorandum of September 17, 1976 and the discussions at the last regular staff meeting, I have attempted to identify task group participants. To the maximum extent possible, I have tried to make assignments on the basis of the priorities you expressed. Unfortunately, I found it difficult in those cases where first priority was given to 7 or 8 topics. The assignments are not cast in concrete and I suggest you discuss preferences with Mr. Middleton, if you feel reassignments to another group would make your contribution more useful.

In Attachment 3, I list the names of all those who returned the questionnaire. If your name is not on the list, I suggest you let me know which group you would like to join.

In order to start this effort and accomplish something productive as soon as possible, I request each group prepare a work program and identify the resources needed to achieve their objectives. I suggest furthermore that you prepare a brief note of your program for discussion at the staff meeting on January 25, 1977.

For your information, I reproduce below the objectives of the task groups.

a. Maintain proficiency in their speciality through professional literature, participation in professional activities, attendance at workshops, seminars or conferences;

b. Provide leadership in their area of expertise by informing and training water supply staff through staff working papers, workshops and individual consultation;

c. Identify and supervise consultants on appropriate state-of-the-art review and research papers;

d. Develop guidelines and policies for the use of Bank Staff on the topics of their expertise;

e. Maintain a roster of and contact with consultants competent in their area of expertise.

Attachments

cc: Messrs. Bronfman (EAPDR)
Howell (AEPDR)
Pollan (EMPDR)
Rajagopalan (ASPDR)
Rowe (ASPDR)
Wyss (LCPDR)
Rovani (EWTDR)
Davis "
Smith "
Warford "
Saunders "
Ringskog "
Middleton "
Morse (VPSVP)

JMKalbermatten/hhs

Management

Topics:
- Organization
- Planning
- Information Systems
- Computer Applications
- Staffing
- Training (Initial and Continuous)
- Inventory Management

Finances

- Accounting
- Financial Analysis and Projections
- Asset Valuation
- Billing and Collection
- Tariffs
- Financial Covenants
- Unaccounted for Water

Project Management

Topics:
- Project Logistics of Preparation and Implementation
- Project Analysis
- Consultant Selection and Performance Review
- Procurement (specifications, ICB contract administration, evaluation)
- Appropriations of design and selection of materials

Water Resources

Topics:
- Multipurpose Projects
- Major Civil Works (Dams, Tunnels)

Water Resources

Topics - continued

- Surface Water
- Groundwater (Modelling, Recharge)
- Water Quality and Standards (raw, treated, reuse, receiving waters)

Water Supply

Topics:

- Demand
- Treatment (Traditional, Advanced)
- Transmission
- Distribution
- Leak Detection and Repair
- Metering
- Pumps, Water Hammer
- Rural Water Supply

Sewerage

Topics:

- Quantity and Quality
- Treatment (Domestic, Industrial)
- Collection
- Disposal

Solid Waste

Project Documentation

Topics:

- Questionnaires - Feasibility Report Outlines
- Project Briefs
- Appraisal Reports
- Supervision Reports
- Borrowers Reports
- Completion Reports
- Standard Data and Information
- Audits (what have we learned)

Attachment # 2

Revision of 11-4-76

TASK GROUP ASSIGNMENTS

1 Management

Costa (1) (2); Alber-Glanstaetten (1);

Fernandez (1); du Mee (1); Cosgrove (1) (3); Pogson (1)

2 Finances

Memon (1); Rietveld (1); Hayden (1); Todd (1); Keilani (1)

Culagovski; V. Smith

3 Project Management

Buky (1); Gilling (1); Wildeman (1) (3); Jones (1); La Bahn (1);

Busz (1); /Morse (1)/

4 Water Resources

Motte (1); Sanchez (1); Prevost (1); Rodriguez

5 Water Supply

Yepes (1); Maisch (1); Freedman (1); Ringskog (1);

Skytta (1); Middleton (1); Coyaud (1); /Buky/

6 Sewerage

Pettigrew (1) (2); Cuellar (1) (2) (3); Rasmusson (1);

Bruestle (1); Saravanapavan (1)

7 Project Documentation

Morse (1); Fernandez (3); Skytta (4); Kalbermatten (1)

8 Solid Wastes

MacWilliam (1); Saunders (1); [Freedman]

/ / Implies interested in this as second field of activity.

Attachment # 3

Revision of 11-4-76

LIST OF STAFF WHO RETURNED QUESTIONNAIRE

Alber-Glanstaetten
Fernandez
du Mee
Cosgrove
Memon
Rietveld
Hayden
Todd
Morse
Buky
Gilling
Wildeman
Jones
La Bahn
Motte
Sanchez
Prevost
Yepes
Freedman
Ringskog
Skytta
Middleton
Coyaud
Pettigrew
Cuellar
Rasmusson
Bruestle
Rodriguez
Maisch
Busz
Keilani
Saravanapavan
Pogson
Culagovski
Smith
Saunders

Water Supply & Sew

Mr. Yves Rovani, Director, EWTIR through
Mr. John M. Kalbermatten, Water & Wastes Adviser, EWTIR

October 21, 1976

Richard M. Middleton, Senior Sanitary Engineer, EWTIR

"Urban Poor" Elements in the Water Supply Lending Program

1. My memorandum to you dated October 8 (copy attached) outlined some of the problems in quantifying the "urban poor" element in water supply projects, using proportions either of project costs or of water consumption. As proposed in that memorandum, we have therefore proceeded with investigations of indices based on numbers of people served, and have held meetings with the Water Supply Division Chiefs to obtain data for analysis; the results of this work are shown in Ms. Julius' memorandum dated October 20, 1976 to Mr. Kalbermatten (copy attached). The conclusion from our work so far is that due to both definitional and data problems we are still a long way from developing a useful and consistent index which can be used for improving project design and for project monitoring.

2. To improve the situation we need to invest much more staff and consultant time to derive an appropriate index, which would be acceptable to the regional divisions and which would not place undue demands on project staff time. Having reached that stage the Bank would be able, for example, to include suitable provisions in the terms of reference of consultants preparing feasibility reports, and the "urban poor" emphasis, including the use of this index, would become routine throughout our work. However, there appears to be at the present time some confusion over the Bank's attitude towards "urban poor" indexing, and we are reluctant to proceed until better liaison is established and the objectives clarified. (In fact, at least one regional manager has instructed staff not to spend time on urban poverty target exercises until the Vice Presidents reach agreement on action to be taken and issue appropriate instructions.) For example:

- The indexing approach proposed in Mr. Jaycox's memorandum on "Programming Urban Poverty" was apparently strongly attacked in a Regional Vice Presidents' meeting at the end of last month. It was reported that no agreement was reached, and the meeting was to be reconvened in Manila.

- Comments on the memorandum have also been made by Messrs. Gilmartin (S. Asia) and Pollan (EMENA) which indicate that the method proposed may not be acceptable in those regions. (Similar comments may have been received from other regions, but since the "Task Force" has not been convened to discuss the memorandum no consensus has emerged).

- Nevertheless, the most recent instruction from UORSU to the Regional Task Group Coordinators (dated October 4) states that the target "we" are trying to achieve is that by 1980 35-40% of Bank lending shall directly benefit the target population. This not

only implies that the "proportion of investment" method has been agreed, but also sets a higher target than the 25-30% which would be derived from the February 1976 report data, the latest which we have to work on. This information is required by October 22 to form the basis for a report to Mr. McNamara.

-- The "Task Force" as such seems to be disintegrating. Communications are now being sent to Regional Chief Economists or to Assistant Projects Directors rather than to all Task Force members, meetings are no longer held, and the concept of a Bank-wide effort to address the problems and reach agreed solutions seems to have been abandoned.

3. I propose that a memorandum should be sent to Mr. Jaycox, as Task Force Chairman, setting out the following position and proposals for future action:

-- We do not at present accept the methodology proposed in "Programming Urban Poverty" as applicable to water supply projects, for the reasons set out in my memorandum of October 8.

-- We therefore consider that any calculations based on this methodology are not appropriate for a report to be sent to Mr. McNamara purporting to be the agreed findings of the Task Force.

-- We will endeavor to develop other indices of urban poor lending which are appropriate to the sector.

-- We propose to test out both the "Programming Urban Poverty" methodology, and any alternatives that we may develop, in a study by a consultant. Realistically, this may take several months, due to data and staff constraints.

-- It is not sufficient to consult the Task Force by memorandum, on a "no objection" basis, particularly where there are serious differences over methodology, as appears to be the case at present. Any group finding needs to be arrived at in group discussion, not from individual reactions. Moreover, regional and CPS Task Force members need to be in a position to brief their respective Vice Presidents on group developments, findings and recommendations, before policy decisions are taken at senior management level. There is a risk that "Task Force" reports degenerate into thinly disguised UCRSU reports, in which case they will command little impact on the pattern of our operations. At the present time there appears to be very little real commitment to "urban poor" objectives at regional level, and this could be attributed directly to the way in which this extremely complex and difficult subject is being handled.

Attachment.

cc: Ms. Julius

RMMiddleton/cal

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Mr. Y. Rovani (EWTDR) DATE: October 12, 1976

FROM: A. Zavala (Chief, LCPWS)

SUBJECT: Financial Covenant in Loan Agreements

We have completed our study on rates of return and average tariffs performances in water supply projects to which you refer in your memo of September 8, 1976. I am fully prepared to coordinate our work with Mr. John Davis, to whom the results of our study are being forwarded today.

RCosta:lma

cc: Messrs. Davis (EWT), ~~Kalbermatten~~ (EWTDR), R. Costa, C. Fernández (LCPWS), H. Wyss (LCPDR)

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Mr. John Davis (EWTDR) DATE: October 12, 1976

FROM: R. Costa (Deputy Chief, LCPWS)

SUBJECT: Financial Covenant in Bank Loan Agreements

1. I understand that a guideline paper on financial covenants is being prepared, and I would like to convey to you the results of a study we have just completed on rates of return and average tariffs performances in water supply.

2. Without entering into the details of this study I would like to summarize here its major findings:

(i) Only three Borrowers have complied with the annual financial rate of return covenants of their loan agreements. It is worthwhile to note that two of these covenants stipulate that the rate of return would be calculated on non-revalued fixed assets;

(ii) In general, our Borrowers have been able to set up tariffs sufficient to generate an annual financial rate of return on revalued fixed assets of about 3%.

3. Should you have any question regarding this study, please contact Mr. C. Fernández (FNA, LCPWS).

RCosta:lma

cc: Messrs. Rovani, Davis, Kalbermatten (EWTDR), LCPWS Staff, H. Wyss (LCPDR)

TABLE 1

COVENANTED RATES OF RETURN (CRR)

Frequency Distribution

CRR CLASS	1973		1974		1975		1976		1977		1980	
%	#	%	#	%	#	%	#	%	#	%	#	%
0 - 1.5	1	(8)	3	(16)	4	(15)	4	(17)	1	(4)	0	(0)
1.6 - 3.0	0	(0)	1	(5)	4	(15)	3	(13)	5	(21)	3	(11)
3.1 - 4.5	6	(46)	9	(47)	4	(15)	2	(9)	4	(17)	7	(25)
4.6 - 6.0	3	(23)	2	(11)	9	(35)	9	(39)	8	(33)	5	(18)
6.1 - 7.5	1	(8)	1	(5)	3	(12)	2	(9)	2	(9)	3	(11)
7.6 - 9.0	2	(15)	2	(11)	1	(4)	2	(9)	3	(12)	8	(29)
9.1 - 10.5	0	(0)	1	(5)	1	(4)	1	(4)	1	(4)	2	(7)
TOTAL	13	(100)	19	(100)	26	(100)	23	(100)	24	(100)	28	(100)

TABLE 2

COVENANTED RATES OF RETURN (CRR)

Cumulative Frequency Distribution

CRR CLASS	1973		1974		1975		1976		1977		1980	
%	#	%	#	%	#	%	#	%	#	%	#	%
LESS THAN 1.5	1	(8)	3	(16)	4	(15)	4	(17)	1	(4)	0	(0)
3.0	1	(8)	4	(21)	8	(31)	7	(30)	6	(25)	3	(11)
4.5	7	(54)	13	(68)	12	(46)	9	(39)	10	(41)	10	(36)
6.0	10	(77)	15	(79)	21	(81)	18	(78)	18	(75)	15	(54)
7.5	11	(85)	16	(84)	24	(92)	20	(87)	20	(83)	18	(64)
9.0	13	(100)	18	(95)	25	(96)	22	(96)	23	(96)	26	(93)
10.5	13	(100)	19	(100)	26	(100)	23	(100)	24	(100)	28	(100)
TOTAL	13	(100)	19	(100)	26	(100)	23	(100)	24	(100)	28	(100)

TABLE 3

MEANS AND VARIANCES OF RATES OF RETURN

(A) Covenanted Rate of Return (CRR)

	1973	1974	1975	1976	1977	1980
MEAN	5.11	5.14	4.44	4.75	5.01	6.04
S.D.	1.88	2.14	2.33	2.42	2.36	2.21
MAX.	9.0	10.0	10.0	10.0	10.0	10.0
MIN.	1.0	1.0	0.3	1.0	1.0	1.0
# OF OBSER.	13	19	26	23	24	28

(B) Actual Rates of Return (ARR)

	1973	1974	1975	1976		
MEAN	4.11	3.75	2.17	3.32		
S.D.	3.94	3.57	3.57	4.04		
MAX.	10.6	11.8	11.0	10.0		
MIN.	(4.0)	(1.9)	(4.8)	(10.7)		
# OF OBSER.	21	22	22	14		

TABLE 4

ACTUAL RATES OF RETURN (ARR)

Frequency Distribution

ARR CLASS	1973		1974		1975		1976	
	#	%	#	%	#	%	#	%
< (6.0)	0	0	0	0	0	0	1	7
(6.0) - (4.6)	0	0	0	0	1	4	0	0
(4.5) - (3.1)	1	5	0	0	1	4	0	0
(3.0) - (1.6)	1	5	2	9	3	13	2	14
(1.5) - (0.1)	1	5	0	0	0	0	1	7
0 - 1.5	4	19	7	32	6	26	4	29
1.6 - 3.0	2	10	0	0	2	9	1	7
3.1 - 4.5	3	14	6	27	6	26	2	14
4.6 - 6.0	2	10	3	14	2	9	0	0
6.1 - 7.5	1	5	1	4	1	4	2	14
7.6 - 9.0	3	14	1	4	0	0	0	0
9.1 - 10.5	2	10	1	4	0	0	1	7
10.5 - 12.0	1	5	1	4	1	4	0	0
TOTAL	21	100	22	100	23	100	14	100

TABLE 5

ACTUAL RATES OF RETURN (ARR)

Cumulative Frequencies

ARR CLASS	1973		1974		1975		1976	
%	#	%	#	%	#	%	#	%
LESS THAN								
< (6·0)	0	(0)	0	(0)	0	(0)	1	(7)
(4·5)	0	(0)	0	(0)	1	(4)	1	(7)
(3·0)	1	(5)	0	(0)	2	(8)	1	(7)
(1·5)	2	(10)	2	(9)	5	(21)	3	(21)
0	3	(15)	2	(9)	5	(21)	4	(28)
1·5	7	(34)	9	(41)	11	(47)	8	(57)
3·0	9	(44)	9	(41)	13	(56)	9	(64)
4·5	12	(58)	15	(68)	19	(82)	11	(78)
6·0	14	(68)	18	(82)	21	(91)	11	(78)
7·5	15	(73)	19	(86)	22	(95)	13	(92)
9·0	18	(87)	20	(90)	22	(95)	13	(92)
10·5	20	(97)	21	(95)	22	(95)	14	(100)
12	21	(100)	22	(100)	23	(100)	14	(100)
TOTAL	21	(100)	22	(100)	23	(00)	14	(100)

TABLE 6

MEANS AND VARIANCES OF ACTUAL RATES OF RETURN (ARR)

Revalued and Historical

STATISTIC	1973		1974		1975		1976	
	REVALUED	HISTORICAL	REVALUED	HISTORICAL	REVALUED	HISTORICAL	REVALUED	HISTORICAL
MEAN	2.52	4.61	1:93	4:41	1.86	2.13	(3.86)	3.21
S.D.	3.39	4.32	1.79	4.13	2.14	4.45	6.20	4.15
VARIANCE	11.49	18.66	3.20	17.06	4.58	19.80	38.44	17.22
NO. OF OBSERVATIONS	(5)	(16)	(7)	(14)	(6)	(14)	(3)	(8)

TABLE 7

COVENANTED VS. ACTUAL RATES OF RETURN

Number of Cases of Excesses and Shortfalls

CRR	1973			1974			1975			1976			TOTAL 1973-1976		
CLASS	EXC	SHT	TOT	EXC	SHT	TOT	EXC	SHT	TOT	EXC	SHT	TOT	EXC	SHT	TOT
%															
0 - 1	1	0	(1)	1	0	(1)	2	0	(2)	1	1	(2)	5	1	(6)
0 - 1															
1.1 - 2	0	0	(0)	0	0	(0)	2	1	(3)	2	0	(2)	4	1	(5)
2.1 - 3	0	0	(0)	0	1	(1)	1	0	(1)	1	1	(2)	2	2	(4)
3.1 - 4	1	2	(3)	1	1	(2)	0	3	(3)	0	2	(2)	2	8	(10)
4.1 - 5	1	4	(5)	1	4	(5)	1	0	(1)	1	1	(2)	4	9	(13)
5.1 - 6	0	1	(1)	0	2	(2)	1	3	(4)	0	2	(2)	1	8	(9)
6.1 - 7	0	1	(1)	0	1	(1)	0	1	(1)	0	0	(0)	0	3	(3)
7.1 - 8	1	0	(1)	1	0	(1)	0	0	(0)	0	0	(0)	2	0	(2)
8.1 - 9	0	1	(1)	0	0	(0)	0	0	(0)	0	0	(0)	0	1	(1)
9.1 - 10	0	0	(0)	0	1	(1)	0	1	(1)	0.	0	(0)	0	2	(0)
TOTAL	4	9	(13)	4	10	(14)	7	9	(16)	5	7	(12)	20	35	(55)
% TO TOTAL	31	69	100	29	71	100	44	56	100	42	58	100	36	64	100

EXC = Excess SHT = Shortage TOT = Total

RATES OF RETURN IN IBRD WATER SUPPLY PROJECTS

(by Claudio Fernández, FNA,LCPWS)

1. SUMMARY

1.1 The covenanted Rates of Return (CRR) of 40 IBRD Water Supply projects, signed after January 1970, were obtained from Back-to-Office reports and project officers by Mr. Kishore Nadkarni, Research Assistant, LCPWS.

1.2 The actual Rates of Return (ARR) during the period 1973-1976 were compared with the covenanted rates. The results are summarized in Graph 1 and Graph 2, which plot the actual and covenanted ROR for all revalued and unrevalued rates and for the real (revalued) Rates of Return (RR). The following statistical results may be drawn:

(i) There is little evident correlation between the actual and covenanted rate of return. The correlation coefficient (R^2) is less than 0.17 and stays below 0.10 for most years.

(ii) A linear regression (see Graph 1) of all RR data (revalued and unrevalued) shows that the (actual % rate) ARR may be estimated at 1.5 plus 25% of the covenanted rate.

(iii) A linear regression (see Graph 2) of only the revalued ARR shows that the actual rate may be estimated as -1.7 plus 58% of the covenanted rate.

(iv) The average ARR (revalued and unrevalued) in 1976 is 3.3%, lower than in 1973 when it reached 3.5%. The average ARR for the revalued RR available is 2.3%.

(v) Out of the 20 cases in which both the covenanted (CRR) and the actual (ARR) were expressed in revalued terms, only 3 met or exceed the CRR. Moreover, in these cases the CRR was always less than 2%.

(vi) The Rate of Return is the most common covenant and was used in 86% of the loan agreements. Most CRR's are on a revalued basis (70%), but it is difficult to establish from Bank supervision reports which rates are revalued (real) or unrevalued (historical).

2. DATA BASE

2.1 The study covers water supply projects for which loan agreements were signed after January 1, 1970. Projects dealing solely with sewerage are not included in the analysis as sufficient information regarding them has not been as yet collected. Their ROR are always lower than those for water.

2.2 Of a total of 40 Bank financed water supply projects since January 1, 1970, information concerning ROR and average tariffs (AVT) is available to varying degrees for 37 projects. These 37 projects cover 26 countries within the different water supply divisions. The total number of loan agreements for which some information is available is 50, including 15 sub-loans (between Bank Borrowers and Subborrowers).

3. COVENANTED RATE OF RETURN (CRR)

3.1 The Rate of Return is the most common financial covenant. It was used in 86% of the cases (43 of 50). The CRR is usually revalued (70% of cases) but it is often difficult to establish from Bank reports whether the rate is on a revalued or historical basis.

3.2 The frequency distribution of covenanted rates of return (CRR) is given in Table 1. The cumulative frequency distribution is given in Table 2. This table shows that the distribution of rate covenants is more or less consistent during the period 1973-1977; on the average, 3% or less ROR was requested in 23% of the cases, 4.5% or less in 50% of the cases, and 6% or less in 78% of cases.

3.3 The average covenanted rate of return (revalued and unrevalued) for the period 1973-1977 is 4.9% with a maximum of 10 and a minimum of 1% (Table 3A).

4. ACTUAL RATES OF RETURN

4.1 The frequency distribution for actual rates of return (ARR) is given in Table 4. The cumulative frequency distribution for ARR's is given in Table 5. This table shows a continuous decreare in the ARR, with 15% of cases with negative rates in 1973 and 28% by 1976. For the period 1974-1976 the ARR was 1.5% or less in 48% of cases, 3% or less in 54% of cases and 6% or less in 84% of cases. In only 2 cases (from 23) was ARR higher than 6% in 1975.

4.2 Table 6 shows means and variances of the actual rate of return separately on a real (revalued) or historical basis. Actual rates obtained occur in fewer cases (in proportion 1:2.5). The average ARR decreases between 1973 and 1976 (2.5, 1.9, 1.9, -3.9). The average for all revalued ARR's available is 2.3%.

4.3 The maximum and minimum revalued ARR ranged between -10% to 10%.

5. COMPARISON OF COVENANTED AND ACTUAL RATES OF RETURN

5.1 Graph 1 shows a comparison of the covenanted and actual rates of return (revalued and unrevalued). Separate Graphs appear for each year from 1973 to 1976. If the covenanted and actual rates would coincide, they would be in a 45° line.

5.2 A linear regression for each year was also used, and the result is shown in Graph 1. There seems to be little relationship between the covenanted and actual rates of return: the correlation coefficient is less than 0.13 for all years. Even so, the linear regression lines are also drawn in Graph 1 and the separation gap between the covenanted and actual rates is easily observed.

5.3 The overall regression (revalued and unrevalued) during the period 1973-1976 estimates the actual rate as 1.5% plus 2% of the covenanted rate. During this period the CRR was met or exceeded in 36% of cases and presented shortfalls in 64% of cases.

5.4 Table 7 shows the number of cases in which different levels of CRR's were met, were exceeded, or presented shortfalls. Most of the shortfalls (89%) were for a CRR higher than 3%. Most of the cases with excess (55%) were for CRR's of 3% or less.

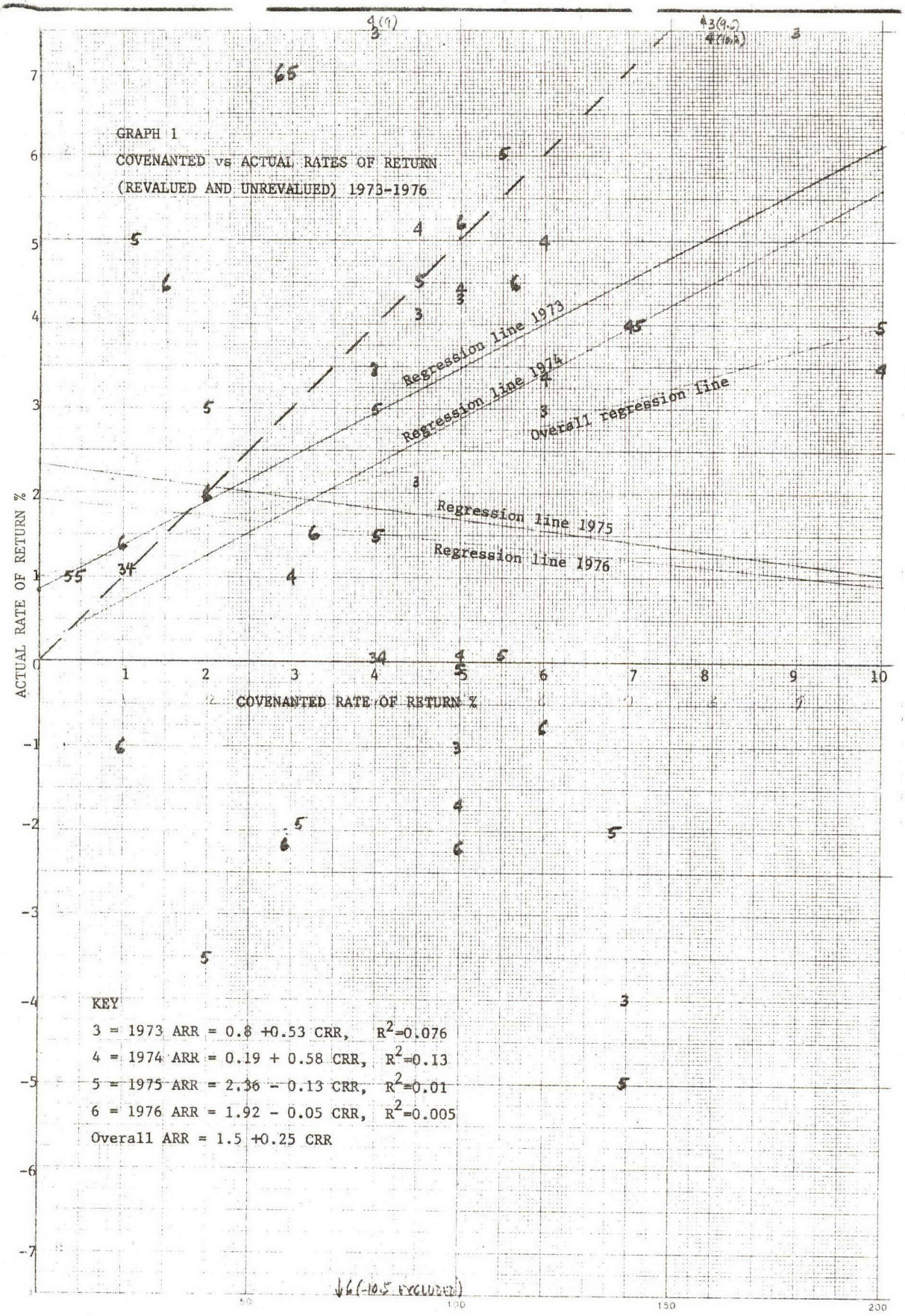
5.5 In the period 1971-1976, a study comparing 61 CRR's and ARR's showed that for all cases in which CRR was exceeded, the mean CRR was 3.7, and for all cases of shortfalls, the mean CRR was 4.9% . The two means were found statistically different at a 90% level of significance.

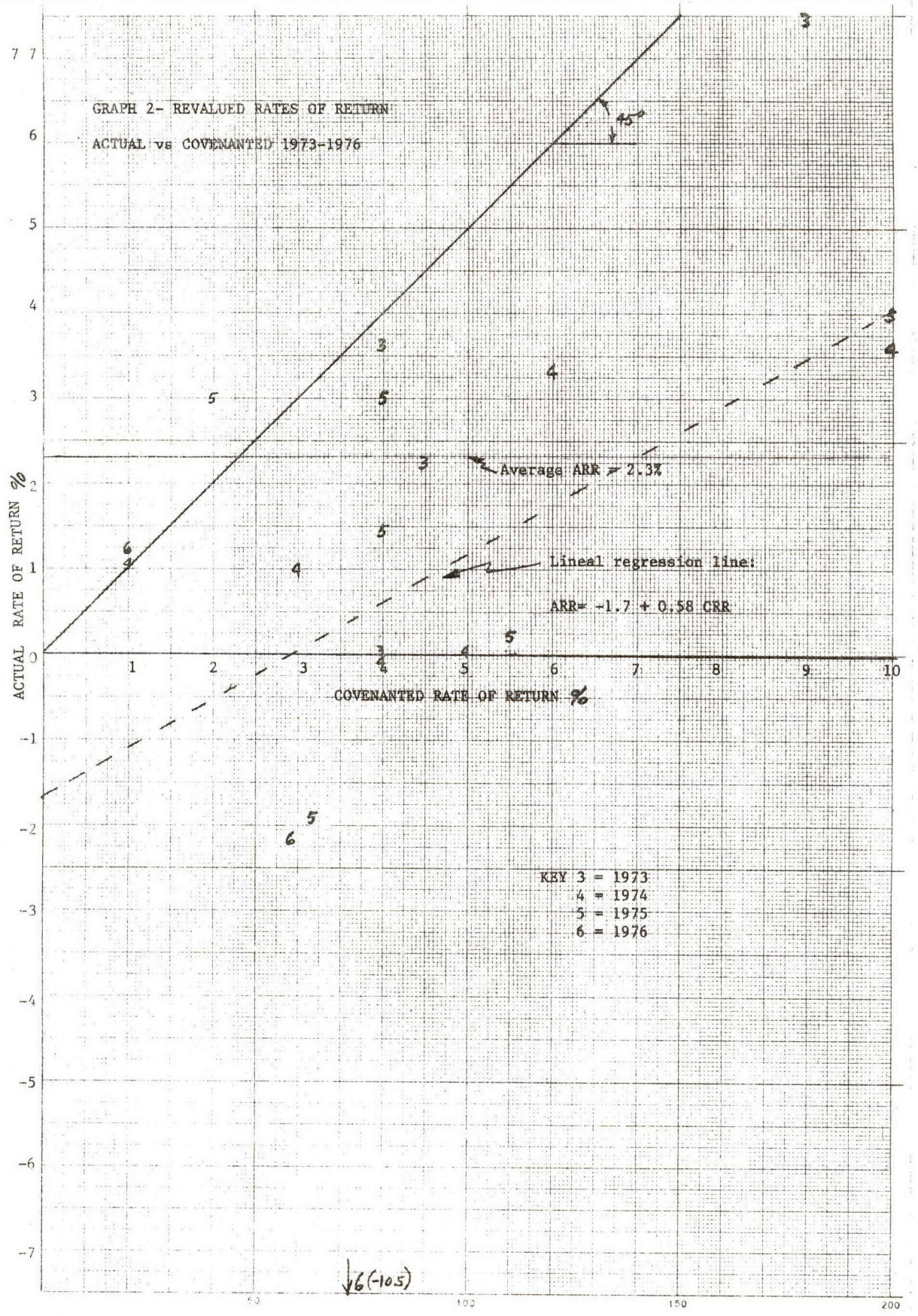
5.6 Graph 2 includes only those cases where both, the CRR and the ARR are expressed in revalued terms. In only 3 of the 20 cases covered, CRR was met or exceeded. The excesses occur for CRR's of 2% or less. The linear regression shows little correlation between CRRs and ARRs (0.17), with a forecasted actual rage given as ARR = -1.7 + 0.58 CRR.

GRAPH 1

COVENANTED vs ACTUAL RATES OF RETURN

(REVALUED AND UNREVALUED) 1973-1976




GRAPH 2- REVALUED RATES OF RETURN
ACTUAL vs COVENANTED 1973-1976
45°
Average ARR = 2.3%
Lineal regression line:
ARR= -1.7 + 0.58 CRR
ACTUAL RATE OF RETURN %
COVENANTED RATE OF RETURN %
KEY 3 = 1973
4 = 1974
5 = 1975
6 = 1976
6(-10.5)

Urban Dev
✓ cc Water Supply

Mr. Yves Rovani, Director, EWTDR through
Mr. John M. Kalbermatten, Water & Wastes Adviser, EWTDR

October 8, 1976

Richard N. Middleton, Senior Sanitary Engineer, EWTDR

Quantifying Water Supply Lending to the Urban Poor -- Discussion Paper

The General Problem

1. Mr. Jaycox's memorandum "Programming Urban Poverty" proposes that the Bank adjust its lending program so that in each country the ratio of "urban poor" lending to total urban lending corresponds to the ratio of the "urban poor" population to the total urban population. This would imply that water supply projects, to be acceptable, should have an "urban poor" component of perhaps 25 to 33 percent.1/

2. This approach, while apparently sensible and simple, to be useful requires definition of each of the four parameters in a way that can be applied consistently throughout all sectors of Bank operations. However, despite the establishment of the Urban Poverty Task Force and the UORSU, not much progress has been made in the last year in reaching acceptable definitions: , the basis for the "total urban" populations used by UORSU is still not clear to us, and "urban poor" may be defined in many ways, for example in terms of absolute or relative income, purchasing power, or access to shelter and basic services. Considerable further thought and discussion -- Bank-wide and not just within UORSU -- is needed before these initial concepts are embodied into some Procrustean code with which all Bank operations have to comply.

3. The purpose of this paper is to focus on one of the definitions -- that of "urban poor" lending -- specifically as it relates to water supply. The Jaycox memorandum uses a water supply project as an example of this sort of quantification, but in a simplistic way that ignores definitional problems and in fact underestimates the proportion of any water supply investment which is directed toward the poor.

Specific Difficulties in Quantifying "Urban Poor" Lending

4. Assuming, for the moment, that at some future date, the "urban poor" can be consistently identified as a target group, the problem remains how to determine the proportion of any investment which can reasonably be attributed to service to that group. The three "obvious" methods are based on allocation of benefits (i.e., quantity of water consumed), on proportion of population served, or on allocation of investment. None, however, is simple to apply in practice.

Allocation of Benefits

5. Bank policy is that service standards to the urban poor should be low enough to ensure project replicability. In most cases this will mean

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1/ From data in Urban Task Force report, February 19, 1976, para. 12.

that the poor will be served through public standpipes; at best, patio or yard connections are likely. A common rule of thumb is that the poorest 60 percent of domestic consumers use only 20 percent of the total domestic water consumption -- the figures vary from country to country, but the point is that if the "poor" constitute, say, 25 percent of the urban population, they are unlikely to use even 10 percent of total water supply.1/ This percentage is unlikely to increase significantly, even with some relaxation of affordability or replicability criteria. On this basis, water supply projects would not be eligible for Bank financing. The poor would therefore remain without service.

6. Although, as discussed above, the poor consume only a small part of total supply, a more appropriate approach for Bank projects would be to consider the share of the poor in the incremental benefits to be provided by a project. In theory, the Bank could finance water supply projects designed so that a stated percentage of the additional water produced would be earmarked for the poor: if poor areas without service could be clearly identified, the distribution network would be extended to those areas, and measures taken in system operation to ensure that this new service was properly supplied. There are, however, a number of problems in translating this concept into practice. Firstly, such projects would in the majority of cases be far too small to qualify for Bank assistance. Secondly, only rarely do the poor live in convenient discrete communities that lend themselves to this sort of analysis: more commonly they are scattered throughout urban areas. Thirdly, many systems have an extremely high percentage of unaccounted-for water (frequently 50 percent), and are quite simply not operated or managed well enough to provide properly monitored service to particular areas in the way envisaged. Fourthly, there is the political problem that water service in most urban areas in developing countries is poor; it may be impossible to restrict improvements to one section of the community (no matter how poorly that section has been served in the past). Finally, such poor-oriented projects are likely to jeopardize the financial viability of the undertaking, since the charges to the poor for water (i.e., socialized tariffs, or free) are not usually enough to cover the full cost of service.

7. Another difficulty (which becomes more critical in the case of allocation by costs) is that of the varying capacities of project components. Local distribution networks may have capacity only sufficient for the neighborhood they serve, whereas source and transmission works may have considerable spare capacity when first constructed. The population finally benefitting from the water from, for example, a new dam will therefore not only be much larger than the initial population but also different in income composition (assuming that present trends continue, with high urbanization rates resulting in a steady increase in the proportion of poor).

1/ This could be refined somewhat by placing shadow values on water consumed, since evidently the initial 20 lcd needed to survive and sustain a tolerable standard of hygiene has a far higher value than subsequent increments.

Proportion of Population Served

8. Conceptually, this is relatively simple: if a water supply project serves an urban area within which X percent of the population is classified as "poor," then X percent of the project is poor-related. Alternatively, taking an incremental approach, if Y percent of those currently without service and who would be supplied by the project are poor, then Y percent is poor-related.

9. There are, however, a number of problems with this simplistic approach. Firstly, as noted above, the income distribution pattern of any urban area changes with time, and different project components reach full capacity at different times, so neither X nor Y is constant over time. Secondly, there is the problem of defining who is without service and who benefits from the project. This is fairly simple where the project involves a major change in level of service (for example, projects in Latin America where water is supplied through house connections, or urbanization projects in which a new section of network is installed into hitherto unserved areas). Even in these cases it ignores the fact that before the project people had been obtaining water from some source or other; if that source was the municipal system, then the project increases convenience but does not increase total access. The method, however, becomes difficult to apply where there is no marked change in service level, and this is likely to be the case in most water supply projects. The poor will continue to be served by standpipes, but these will probably be closer than previously and have a more reliable supply. Apart from those who, as a result of the project, switch from vendors to fetching their own water, there will be few "new" beneficiaries.

10. This leads naturally to the third problem with this method, the problem of intermittent or poor quality supplies. In many urban areas pressures during hours of peak demand fall to nearly zero, so that the poor can only obtain adequate supplies at hours when the demands of other consumers have been satisfied (typically, at night). Nevertheless, most of the poor may live in areas which are normally served, in the sense that there are public hydrants and distribution mains. A water supply project may result in water being available at more convenient hours, but does not necessarily result in any greater per capita consumption or in more people receiving benefits. This suggests that we need to redefine "access to service" so as to specify maximum distance to a hydrant, together with minimum hours of operation and reliable discharge, and a maximum number of persons dependent on each hydrant. Collecting information to this level of detail would be a problem on many projects.

Allocation by Investment

11. This method is the one recommended in the Jaycox memorandum, but the method proposed in the latter is manifestly unsatisfactory since it considers only investment in distribution works as directly benefitting the

poor. It is evident that some part of all components of a project -- source, transmission, treatment, storage, distribution, leakage reduction measures, metering -- benefit the poor; the problem is in deciding how much.

12. The poor will consume a relatively small proportion of the water produced by any project (see para. 5 above). Because of economies of scale and the hydraulic characteristics of pipes, the cost of providing this service will be an even smaller proportion of project cost, if service to the poor is regarded as incremental to the remainder of the project. However, in Bank operations it would be proper to regard supply to the poor not as incremental but as central to the whole purpose of the project; cost allocations need therefore to be approached on this basis. The classic approach -- "separable costs; remaining benefits" -- used on multipurpose schemes would however be difficult to apply, since the only separable costs (if any) would be minor distribution works, and the benefits are, as discussed above, hard to quantify. Some alternative cost allocation needs to be developed, possibly using the concept of a notional scheme to supply only urban poor needs (the cost of this notional scheme, plus the project cost less incremental costs for urban poor supply, then forming a notional project cost. The "urban poor" proportion would then be the ratio of the costs of the notional scheme to those of the notional project). This however would be extremely cumbersome to apply in practice, and it is questionable whether theoretical analyses of this sort are the best use of Bank staff time.

13. Most of the difficulties already touched upon in preceding paragraphs also apply to this method. For example, firstly, unless the poor are located in discrete communities it is extremely difficult to identify the project components which specifically benefit them. Also, although projects may have spare supply capacity initially, the distribution networks are constructed only as populations grow and thus expand; at the time of appraisal the cost of such extensions, and the persons to be served, are usually not known with precision except for a very few years ahead. Secondly, where there is a high percentage of unaccounted-for water, remedial works to cure leakage in one part of the system may make more water available and increase pressures in other parts of the system, serving the poor. Thirdly, where supplies are intermittent, substantial investment may be needed in source works to provide water to an existing distribution network; the poor will be benefitted by such investments even if they are not classified by UORSU as "poor-related" (the classic case is Bombay). Fourthly, since supplies to the poor are cross-subsidized by supplies to the more prosperous, some part of the investments benefitting the latter have to be regarded as "poor-related" (unless, contrary to Bank policy, financial autonomy and performance are to be sacrificed and urban poor supplies funded by direct grants for construction, operation and maintenance). Finally, allocation on the basis of the investments in one particular project is unreliable since it ignores the complementary investments that will be necessary in later years, for example, distribution system extensions or transmission line duplication (or even major source works omitted from the project, e.g., Jakarta).

Future Action

14. Following internal discussions of a draft of this memorandum, Ms. Julius is preparing a brief analysis of some recent projects to see whether an elasticity index can be developed which will give us a better means of rating projects.1/ Any index value over 1.0 would indicate that the project was biased towards urban poor needs. In some countries where most of the better-off already have service, quite high targets might be appropriate. However, we will have to analyze the financial implications for utilities of setting high target values before making any specific recommendations. Ms. Julius hopes to complete an initial analysis in the course of the next few days.

15. We will be meeting with division chiefs during the next two weeks to discuss the problems outlined in this memorandum and to agree on a future course of action. In the course of these meetings we will also update our estimate of the urban poor component of the future lending program (as requested in Mr. Stone's memorandum of October 4, 1976).

16. In the longer term, we need to devise various methods of quantification, and then to apply these methods to selected projects. From this analysis, one should be able to determine which method or methods gave results which are consistent (and which seem to correspond to a common-sense assessment of anticipated project benefits). Due to staff constraints, it seems unlikely that this work can be done in-house. I therefore propose employment of a short-term consultant. The estimated duration of the study is one month, and the cost $5000. Please say we discuss this.

cc: Messrs. Rovani, Warford, Saunders, Stone
Ms. Julius

RMiddleton/cel

1/ One possible definition for this elasticity is

$$\frac{\text{Incremental number of urban poor served/total number of urban poor}}{\text{Total incremental number of persons served/total population.}}$$

In the baseness of any clear definition of "urban poor" for these projects, we will use as a first approximation the ratio urban poor:total urban population appropriate for the region, applied to the population of the project area.

Water Supply

Mr. John M. Kalbermatten

October 7, 1976

Harold R. Shipman HR

A Ad Hoc Rural Water
IDRC Report - Global Information Program

I have briefly reviewed the above report forwarded by IDRC with their letter of 28 September 1976. My comments are in two parts, the first concerned with the merits of the recommendations, and the second with what we do or say about them.

1. Merits of the Recommendations

There are four broad recommendations which can be boiled down to:

1. A political mandate from governments should be obtained that they are ready to become involved in the design and operation of a global program in community water and sanitation including a global information program.

   The above is accompanied by a further recommendations that the Ad Hoc Working Group make its best effort to ensure that the question is discussed at the Water Conference and that appropriate resolutions are adopted.

2. The Ad Hoc group should take steps to establish an international planning team whose task is to define a global information program.

3. The report coming out of the planning team study should be presented to governments, and the Secretariat should obtain comments from governments on implimentation of the recommendations.

4. Since the previous 3 steps will take time, a few interim projects should be started which will be without prejudice to the global program. The list of interim projects presented for illustration include the following:

   1) a journal or newsletter, 2) the drafting of a detailed definition of the subject, 3) the translation of high priority materials, 4) writing of specific experience studies, 5) preparation of a catalog, 6) preparation of bibliographies on high priority topics, 7) preparation of a draft thesaurus.

A. Comments on Recommendations

1. Recommendation No.1

The agreement of governments to take part in a global rural water program is proposed. The information program would be included as part of the global effort. The question of where the Ad Hoc group goes from here (or after Ouagadougow) needs to be settled before deciding on this recommendation. If the decision is to proceed, discussions at the Water Conference may be in order. The question of information system is so small when compare to the bigger issues needing resolution, that it ought not be raised at this point.

2. Recommendations Nos. 2 & 3

Recommendations 2, & 3, start with the assumption that a global information system is of high priority in the rural water effort. Action is to begin by defining what a global information program is supposed to be. I had expected that the IDRC study was to do this. At the February meeting in New York, Harold Groves was highly critical of the loose talk about an information system. Paragraph 1 on page two states what the IDRC team believes to be the service which an ideal information system can render; "a service to which one can address a question and which then gives an answer in the right form at the right level at the right time and based on the latest and most accurate information". The paragraph recognizes that few systems will do this and notes that for a successful program the system must get information into the minds of the users by "link to other activities such as investigation, education, demonstration and extension".

Each of the Centers is now doing something by way of information collection. I believe they, along with IRC, could work out by themselves what they think is feasible. Another study team and more reports are not needed.

3. Recommendation No. 4

The list of interim projectd do not appear of high priority. The one exception might be the proposal for a journal or newsletter. IRC now prepares this and what is needed is to give them more support and to enlarge and improve the present effort.

II. What do we do or say

I would suggest that we propose no further consideration of the recommendations until after a decision is taken on where the ad hoc activities are to go. If they go ahead and if the Water Conference and the doner countries support the rural program, then the role of IRC could and should be defined. The ball on information should therefore be placed in IRC's court. If IDRC wants to do more now or later by way of financing any of the activities proposed in recommendation 4, we should have no objection but we certainly should not encourage them by leaving impressions that we think the activities (other than the newsletter) are high priority.

cc: Ms. Shirley Boskey

HShipman:nc

File – Pipelines stds

OFFICE MEMORANDUM

TO: Mr. John M. Kalbermatten DATE: October 7, 1976

FROM: Richard N. Middleton

SUBJECT: Proposed State-of-the-Art Paper on Pipelines

1. I have reviewed the revised draft proposal by Bookman-Edmondston Engineering, Inc., for this paper, and am concerned that it still does not fully reflect the scope of work which I hoped would be covered when I first suggested the project. I am therefore putting some thoughts on paper to serve as a basis for further discussion between ourselves and with BEE.

2. My starting point is that the paper is intended to assist our staff in operational work. It must therefore focus on the problems encountered in developing countries, in the context of World Bank-financed projects. Standards and procedures recommended in the paper must be realistic for the sorts of projects in which we find ourselves involved (this does not necessarily mean that standards have to be relaxed below those in developed countries, only that they need to be carefully justified). If this approach is agreed, then the consultant should plan to spend quite some time in the Bank discussing their experiences with project engineers, analyzing bidding documents, etc. I doubt whether field trips will be necessary.

3. My second basic point is that the paper should cover sewerage as well as water supply. This would imply adding some materials (clay, unreinforced concrete) to the present list, and placing much more emphasis on accuracy of laying and adequacy of internal protection against corrosion.

4. Given these basic positions, I have a number of comments of detail on the proposed outline. These are listed below by cross-references to the draft, but this is for convenience only; I think it likely that the draft will need to be rewritten.

IA.1,2 In most of our projects the specifications should express the designers requirements rather than "concepts". It is questionable how much discretion can be left to local contractors of limited experience; in fact we have to enable our borrowers to deal with such contractors. The paper should expand on situations where the contractor should be encouraged to develop his own alternatives and ones where no latitude is permitted.

I.A.3 The paper needs to deal in some detail with the evaluation of alternatives, particularly (a) the comparison of alternatives with differing lives, hydraulic efficiencies, or other factors which affect economic analysis, (b) the bidding procedures to obtain the least cost for supply and installation where a number of alternative materials should be considered.

I.B Generally this should be "Purpose and Scope of Paper" and should precede I.A.

I.B.1 Comparative costs should be included.

I.B.2,3 this should be expanded once the contents of the rest of the paper are more clearly defined.

II. This section will be the critical part of the paper; it will set out the basic data from which recommendations on specifications and inspection procedures (Sections III and IV) will be derived. It needs to discuss each alternative type of pipe in considerable detail (again, in the context of Bank operations). The sorts of headings that should be included for each pipe are:

--General description of pipe, joint systems, specials, etc.

--Applications

--Limitations (chemical, bacterial, physical, etc.)

--Protection (linings, coatings, cathodic, etc.)

--Manufacture of pipes, joints and specials (including suitability for local manufacture and notes on particular raw materials needs).

--Installation procedures (trenching, bedding, pipe handling, jointing, backfill, specials, etc., including special installations for submarine or other non-standard uses, and also including needs for expertise or equipment not commonly available in developing countries).

--Testing and acceptance limits

--Maintenance

--Costs

This discussion should reflect the consultant's experience in fields other than municipal water supply and sewerage (for example, in irrigation or oil and gas transmission), where relevant to the sector.

II.A Unreinforced concrete pipe should be added (for small sewer applications).

II.A.1 --The paper should distinguish between horizontally spun and vertically cast pipe.

--It should also discuss sleeve joints (external sleeves on plain ended or ogee jointed pipes, as distinct from bell and spigot).

II.A.6 If this category refers to land drainage pipes it should be omitted. The paper should however cover clay pipes for sewer applications.

II.B.1 This category might include corrugated steel culvert (ARMCO or similar) used for sewers, and also galvanized iron pipes.

II.B.3 If this category is to cover all thermoplastic materials it should include polyethylene (water mains, sewers, remedial works on existing sewers).

II.B.4 As well as FRP pipes the paper should cover any other applications of non-thermoplastic materials.

II.C This section should be incorporated into the discussion on individual pipes (see notes on II, above).

III. The purpose of this section is in my opinion, threefold:

--To collect relevant material or international standards and specifications (copies to be placed in the Water Supply Library) and to prepare a critical comparison.

--To suggest basic specification clauses which should be included in some form in the bidding documents for any Bank pipeline project.

--To identify common specification or standard clauses which could be unnecessarily restrictive and which should not be used in projects subject to ICB procedures.

III.A.1 This needs to be expanded in line with the general notes on III above.

III.A.3 --Other corrosive conditions could also be envisaged (e,g., saline water in reclaimed areas or submarine applications) and special provisions necessary where dual systems are used (e.g. fresh water for potable water supply, saline water for toilet flushing etc.)

--The paper should also discuss (here or in Section II) measures which should be taken, in addition to or in place of lining or coating to reduce corrosion or maintain capacity. For example: cathodic protection; pH adjustment of water; chemical corrosion inhibitors or additives (e.g., sodium hexametaphosphate); chlorination to control algal and mollusc problems, etc.

III.B.C The paper must discuss the merits and drawbacks of combined or separate supply and lay contracts, in particular where alternative pipe materials are to be considered. The paper should also discuss the method of obtaining alternative proposals. For example should the engineer prepare an outline only, and let various pipe manufacturers provide detailed working drawings (and, if so, how are laying bids obtained?) or should he prepare detailed drawings for his preferred alternative, the onus being on the proposer of another material to provide suitable drawings.

III.C The logical order of sub-sections would be:

1. Trenching; 2. Bedding; 3. Laying and jointing; 4. Backfilling;

5. Special applications (e.g., marine works).

If the specifications for trenching require wider trenches for some types of joint/pipe than for others, which could affect the cost of excavation and the load on the pipe (and so the pipe class) this should be made clear here or in Section II.

III.D This section needs expansion to cover:

--Evaluation of alternative bids (supply and lay as one contract versus supply as one contract, lay as another).

--Evaluation of alternative supply bids in the absence of installation bids (how to select least cost total price)

--Evaluation of alternative materials (usually pipes of different materials will have different true diameters, C values initially and later, lives, and bedding or other construction requirements

--Evaluation of local capacity to manufacture or install pipes. (this also raises the more general problem of performance bonds, retention money and similar provisions).

In brief, it needs to specify how to identify what is really the least-cost solution.

IV.A,B This section should cover not only procedures but also equipment required (and its likely availability in developing countries, or alternatives that would be available or could be improvised), not only for testing but also for locating and repairing defects.

IV.B This presumably also includes inspection at point of handover from supply contractor to laying contractor. Section III should cover how liability is determined.

IV.B The section presumably covers not only acceptance tests of completed lines but also of individual joints, where required (e.g., welded and fettled steel mains). Should it also include cleaning (by swabs or otherwise) and disinfection and bacteriological testing (where applicable, including special techniques such as the use of bactericidal lubricants)?

RNMIDDLETON/reb

Water Supply & Sewerage

Mr. Y. Rovani September 29, 1976

Harold R. Shipman

A Proposed Approach to the Recruitment, Assignment, and Reassignment of Water Supply Engineers within the Bank

As directed in your Terms of Reference, February 1976, I have prepared a proposal for the recruitment and use of water supply engineers within the Bank. The proposal while specific, and limited to water supply engineers could, with minor alterations, probably be applied to most of the technical staff of the Bank engaged in field and supporting functions. The proposal is divided into two parts, the first dealing with an explanation of the objectives and methodology, and the second presenting a specific staffing plan covering the next three years.

A. Objectives and Methodology

1. Objectives

(a) To achieve a balance of technical competency between regions;

(b) to facilitate the lateral and upward movement of water supply staff under arrangements compatible with their career development;

(c) to establish a mechanism which permits movement of staff between regions and CPS under a plan agreed to in advance;

(d) to provide a system which staff understand and under which they have a greater opportunity to shape their future in the Bank.

2. Policy Implications

The proposal visualizes that few if any changes to existing personnel policies are required. It does visualize that an explanation be given of how such policies will be applied.

3. The Methodology

Briefly stated, this proposal suggests that each year a selected number of water engineers would be reassigned to other regions, or to CPS according to a plan which covers a three year period; which is annually updated; and which has been agreed to in advance by all concerned. It is proposed that a draft plan would be prepared which, after general agreement with the concerned departments and the staff members involved, would be the

guide for making reassignments. There would be no change in the responsibilities carried by the Personnel Department and by the concerned Projects Departments from those currently established. The difference in approach occurs through the establishment of a three year plan which would guide reassignments and which will permit needed preparation for language training, more orderly transfer, and better participation by staff. It will not prevent problems from arising due to unforeseen events which will still necessitate ad hoc actions to fill vacancies.

4. The Proposal

(a) A three year period is selected as the one most likely to avoid too many uncertainties and yet is long enough to give advance notice to staff and those responsible for staffing. Each year the plan would be updated by adding a year. As vertical movements occur, the plan would require interim adjustment as would also be the case when vacancies develop for other reasons or new posts are created necessitating recruitment.

(b) The present policy statement on reassignment of staff for which periodic movement is normal indicates that reassignment will occur after, at most, five years. Engineering staff are expected to seek reassignment after at least three years. Reassignment occurs at staff members request, or after a career review following five years in a department. Obligatory transfer occurs after ten years in one Vice Presidential group. Reassignments of staff at any time in the interest of the Bank are made by authority of the Chief of Personnel after appropriate consultation. This proposal is compatible with the policy statement.

5. Proposed Actions

The following actions would be required under this proposal:

(i) Assignment of the general responsibility for preparation and updating of a draft plan to the Department of Energy, Water and Telecommunications, with specific responsibility to the Water Supply Advisor of that Department. The Water Supply Advisor as part of his responsibilities on quality control of regional water operations should have continuing consultations with Division Chiefs and staff to know the capabilities and limitations of the staff. This will permit judgement on assignments best suited to the staff and in the best interest of the Bank. Opportunities for in-service training and short courses to enlarge staff competence will also be identified through such knowledge.

(ii) Implimentation of the Plan would be by the Personnel Department through an annual consultation between that Department, the Regional Projects Directors and the EWT Department. The purpose of this consultation would be to reach agreement on the three year plan after which reassignments shown in the plan would need no further major clearance. Unscheduled movements would be dealt with as at present with proposals on appropriate

staff prepared by EWT for use by Personnel and the department concerned.

(iii) Consultation would occur periodically with staff and Division Chiefs before the plan is extended. This would permit inputs to the scheduling of future reassignments. Currently, problems exist on lateral transfers because of language requirements. Advance information on reassignment to posts requiring a language competence will permit a more serious effort and a knowledge of how and when the proficiency will be needed.

6. Basis for Preparing the Plan

The following factors have been considered in preparing a first three year plan:

(i) In any one year, the transfers in and out of a region should not exceed more than two people and preferably should be limited to one.

(ii) Seniority in the Bank, time spent on the current assignment, staff preferences, technical background and experience, judgement, and performance as determined by a review of the Personnel records and by the observations of Division Chiefs, Deputy Department Directors, and the Water Supply Advisor, would form the basis for measuring staff capabilities and interest, and which will afford a means for balancing the resources between the various divisions and departments.

B. A Proposed Three Year Plan

1. Taking the present roster of Water Supply engineers as tabulated by the Personnel Department, the situation as of September 1, 1976 appears as in the upper section of the chart shown as Annex 1. Years of service in the Region or CPS Department, observations on technical strengths and weaknesses both in individuals and in the makeup of the staff of the Regions, and judgement on assignments which will contribute to staff members professional development, have entered into the selection of staff to be reassigned. Staff members have not been specifically consulted for this exercise because it was felt desirable not to create confusion among them if this proposal is not implimented. It is probable that some changes will occur after discussions with the concerned staff.

2. It will be noted that vacancies exist now and increase through the three year period. One benefit of the plan becomes evident in that reassignment or new recruitment for the vacancies can be better studied and resources balanced.

3. The first actions which can likely occur under this proposal would be around January 1, 1977 so this date is used for preparation of the second section of the chart. Periods beginning in January 1978 and 1979 are also shown in the other two sections of the chart.

4. In use, this chart would be the draft plan prepared after a discussion with Division Chiefs and staff to learn of their present and future needs and interests. The plan would be put together after discussion with the Division or Unit Chiefs, and would reflect as far as possible the interest of both staff and the Chiefs. The draft plan similar to that shown here would then be taken up by the Personnel Department with each Project Department Head of each Region and of CPS. The Water Supply Advisor would be present to clarify and explain the proposal. He would assist Personnel in revising the plan to accommodate comments received. The plan when agreed to by each department would be made known to the concerned staff. While some changes to the plan during a three year period can be anticipated due to unforeseen events, it is proposed that to the greatest extent possible, the plan when approved would be retained and not changed.

Specific Actions Now Proposed

The attached Annex II shows the sequence of actions to be taken by the staff, divisions, and departments, in order to prepare the plan which will be applied for the next three years. These actions would start as soon as agreement is reached on this proposal.

Conclusion

As a final commentary, it is believed that the evaluation of staff and the preparation of a plan for their assignment is not an exercise that lends itself to a computer. The run-outs on length of service, time in grade, time in current assignment, age, etc. are useful to those preparing the plan. However, it is only after this point has been reached that the professional competence comes into play. The balancing of staffs, the introduction of staff changes which cause a minimum of disruption, the requirements and opportunities for training, and actions which leave all concerned with the least unhappiness, are actions which can't be computerized. How far this personal approach could be applied to larger groups of professionals than encountered in water supply will need further examination.

HRShipman:cft

Attachments

ANNEX I

THREE YEAR WATER ENGINEER STAFFING PROPOSAL (a)

PERIOD	EAST AFRICA	WEST AFRICA	EMENA	LAC	E. ASIA & PAC.	S. ASIA	CPS	TOURISM
As of Sept. 1976	Erkman Reekie Callejas Coyaud Kozel La Bahn	Salazar Rietveld Motte Buky	Thys Cosgrove Cuellar MacWilliam Rodriguez Sardehely [Al Khafaji] 1/ Vacancy (b)	Zavala Friedman Chang Yepes Maisch Sanchez Vacancy-Brazil(d)	Williams Saravanapavan Bruestle Prevost	Beach Rasmusson Ware Pettigrew Skytta	Kalbermatten Middleton Ringskog Shipman	Vacancy (a)
1/ Detached service three months								
As of Jan. 1 1977	"	Vacancy (c)	" Vacancy (b) Al Khafaji	" Vacancy-Brazil(d)	Williams [Middleton] Bruestle Saravanapavan	"	Kalbermatten Ringskog [Buky]	[Prevost]
As of Jan 1 1978		Salazar Motte [Friedman] Vacancy (c)	[Buky]	[Rietveld] Vacancy-Brazil(d)	Vacancy-Indonesia(e)	"	Kalbermatten [Cosgrove] Vacancy (g)	"
As of Jan 1 1979	[Rasmusson]	[Maisch] Vacancy (c)	[Prevost] Vacancy (b) Chang	[Motte] Vacancy-Brazil(d) Bruestle	[MacWilliam] Vancancy-Indonesia(e)	[Coyaud]	[Al Khafaji]	Vacancy (h)

[ ] means reassigned to this post

ANNEX II

Schedule of Actions

1. Propose Draft Plan

   (a) CPS (Water Supply Advisor) prepares draft three year plan.

   (b) Draft plan agreed with Personnel.

2. Clear Plan with Division Chief

   (a) Draft plan explained to each Division Chief by CPS (Water)

   (b) " " agreed or modified and then agreed.

   (c) Agreement reached to discussed with concerned staff.

3. Clear Plan with each staff member concerned

   (a) CPS (Water) discusses with staff member concerned and plan agreed or modified if possible.

   (b) If plan modified, affected Division Chiefs again consulted and an agreed plan completed.

4. Clear Plan with Deputy Director, Regional Projects

   (a) Final plan agreed by staff and concerned Division Chiefs presented by Personnel to Deputy Project Directors (individually) for approval or modification. CPS (Water) present to discuss technical consideration.

   (b) If plan substantially modified, resubmission to staff for agreement.

5. Plan Approved

   (a) Personnel submits agreed final plan to Director of each Regional Projects Department for approval following which it becomes operationally binding.

OFFICE MEMORANDUM

TO: Mr. J. Kalbermatten (EWTDR) DATE: September 27, 1976

FROM: R. Costa (Deputy Chief, LCPWS) RC

SUBJECT: Professional Development and Participation in Bank Policy Development in the Water Supply and Wastes Sector

Please find enclosed a brief summary of my comments (Annex 1) on your memo of September 17, 1976 regarding the above mentioned subject together with my preferences (Annex 2) for the topics of interest accompanying your memo.

RCosta:lma
Enc.
cc: Mr. A. Zavala (Chief, LCPWS), Division Staff

COMMENTS ON MR. J. KALBERMATTEN'S

MEMO OF SEPTEMBER 17, 1976

REGARDING PROFESSIONAL DEVELOPMENT

TASK GROUPS IDEA	- Praiseworthy.
CONSTRAINTS	- Professional time available. - Expertise available.
NEEDS	- Definition of objectives for every group (general objectives are already defined in memo). - Programmation of task groups' workload. - Coordination with staff responsibilities in divisional activities. - Definition of responsibilities (e.g. for P.U. management task groups, what would be the role of the financial and economic advisors?). - Budgetary allocations available for attendance by task groups members or leaders to professional seminars outside the Bank, purchases of literature, etc....
ASSISTANCE TO OTHER STAFF	- Should be extended to field mission. In certain instances profitable assistance cannot be provided without large involvement; for example, in project appraisal mission and appraisal report writing. This subject deserves further development.
GENERAL COMMENTS	- Synthesis of technical developments necessary and obviously of great help for staff. - Management matters - much more difficult to synthesize except again in very specific areas such as tariff setting, computer uses and accounting.

SUGGESTIONS

- Case studies, i.e., selection of recently approved projects and divulgation of keen solutions given to problems presenting a general interest to staff.
- Decision making process should be added to P.U. management topics.
- Other areas of interest:
  * The role of P.U. in urban development
  * Government possible approaches to solving the sector problems and Bank role in our different regions of activity (e.g., this would cover sector work).
  * Technical assistance to Borrowers. Bank limitations. Field missions/pro and cons. Transfer of technology from country to country. Use in Washington of representatives from Borrowers.
  * Technical assistance from brother organizations (PAHO, WHO, AID, IDB). Combined approach to sector problem solving. Coordination. Optimum use of staff.

WORL ANK / INTERNATIONAL FINANCE CORPORATI

Mr. Rietveld

OFFICE MEMORANDUM

TO: John Kalbermatten - Water and Wastes Adviser (EWTDR) DATE: September 27, 1976

FROM: Renato E. Salazar, Chief (WAPEW)

SUBJECT: Our Division's comments to your proposals on professional Participation in Bank Policy Development in the Water Supply and Wastes Sector.

---

1. I have circulated your memo of September 17 on the above subject to my division staff and requested their first comments. Please find attached a first list of their preferences for constituting task groups on the various topics. It should be pointed out that when selecting the topics most people expressed their interests rather than their present expertise; the staff welcomes the idea of such groups, and sees them initially as a way to learn and a vehicle to exchange ideas on the related subjects, and eventually as a mean to assume the responsibilities described in your memo.

2. To the list of proposed topics we would like to include the following:

(i) the inventory management in the public utility management section;

(ii) Major Civil Works such as dams and tunnels in the water supply section;

and would like to see the procurement topic cover "Procurement and contracts administration".

3. The Division's financial analysts and economist are also dealing with the telecom and power sectors and feel that the P.U. Management aspects should be viewed in common for the three sectors. In view of similar multisectoral set-ups for water and power in other regions we wonder if you would not find it desirable to extend participation of other P.U. staff in some of the task groups.

EMorbe:js

cc: WAPEW's water engineers and financial analysts
Mr. Gilling

Attachment 1.

OFFICE MEMORANDUM

TO: Mr. J. Kalbermatten DATE: September 24, 1976

FROM: D. Coyaud

SUBJECT: You Memo September 17 on Task Group Specialities.

I offer the following suggestions about the list of task group specialities:

1°. Treatment Plant Water Supply and Sewerage. Instead of dividing in 3 specialities "Design", "O and M" and "Optimization", I suggest to divide in "Classical" and "Advanced Techniques".

For water supply, "Classical" would cover floculation, sedimentation, filtration, sterilization. "Advanced Techniques" would cover polishing techniques (Ex. use of activated carbon-powder or granular, ozonization etc.), sludge treatment comprising filtration, centrifugation, floculant recirculation etc.

For sewerage "Advance Techniques" would cover tertiary treatment, sludge treatment other than drying beds etc.

2°. I would add to the list of task groups the following specialities:

a) Rural water supply (handpumps, wells etc).

b) Water resources. This would cover for example (1) dam, (2) multipurpose reservoirs (hydroelectricity, irrigation, recreation), (3) hydrogeology (artificial recharge, mathematic model of aquifers, aerial photography etc.).

c) Quality of water including (1) raw water as well as treated water and (2) biological (bacteria and virus) as well as chemical or physical pollution.

d) Desalinization.

3°. I would include:

- "transmission main", "pumps", and "water hammer" in "distribution".
- "hydrology" and "ground water" in "Water resources".
- "Waste water reuse" in "Treatment plant - Advanced Techniques".
- "Leak detection and repair in "Distribution".

My first choices for participation in the task groups are:

- Water supply - Treatment plant - Advanced techniques
- Quality of water

My second choices are:

- Water resources
- Industrial waste treatment

DCoyaud:mb
cc: Reekie
Erkmen

Water Supply & Sewerage

Distribution List

September 24, 1976

Klas B. Ringskog, Sanitary Engineer, EWTDR

Complement to Guidelines for Sector Work in the Water Supply and Waste Disposal Sector (GAS 4)

1. Our present guidelines for water sector work date back to 1973 and, although comprehensive and generally well focussed, the need has arisen to complement them. This need has come about for three reasons. First, the application of the sector guidelines by the WHO/Bank Cooperative Program (CP) staff and the Bank staff have revealed a tendency not to focus enough on what is really of priority in each country's situation, and in many cases the reports have become much too long and unstructured. This has considerably diminished the use of the reports use in the Bank and elsewhere, and partly for this reason most sector studies have not had the desirable spill-over into project preparation work. It would thus seem that the guidelines in their present form do not help the staff enough to focus and structure the reports, but provide only a checklist without specifying what aspects should be stressed.

2. Secondly, the Bank's increasing preoccupation with specific population strata among the developing nations, notably the rural and urban poor, has created a need to more clearly identify the service situation and needs of such groups, as well as propose measures geared to assist them. In contrast, invariably in past sector surveys it has not been possible to identify coverage of public services among, say, the urban poor, neither the amounts of financial and other assistance reaching them in the sanitation field, and consequently it has been difficult to devise investment strategies aimed at these groups. It is recognized that in most cases data are not readily available, and the data generated in the field may well be outside the scope of an ordinary sector mission, but at least the sector survey format should conveniently focus on and accommodate pertinent information.

3. Thirdly, the need has been felt to put a number of Bank sector reporting requirements on a more rational footing, and let the full sector survey generate sector information of different kinds. As is known, there are presently three types of sector documents in use or requested within the Bank. One is the full sector survey mainly addressing itself to the specialists in the water supply divisions, and also to irrigation staff, urban projects staff, etc. Obviously, such a study should ideally cover comprehensively and with supporting information a wide range of issues. The second sector document is the sector memorandum, a shorter document of maybe 15 pages to yield a short, accurate sector description and highlight the principal obstacles to more rapid sector development. Finally, routinely in the preparation of CPPs a page or two of water sector information is required. The latter could conveniently be elaborated on the basis of a sector brief, a few pages describing and analyzing the sector. Naturally, a severe burden is imposed upon Bank projects staff to prepare this amount

of sector information, at times on three different occasions. Ideally the sector studies with proper structuring should combine all three documents, i.e., full sector survey, briefer sector memorandum, and the sector brief as an input to CPPs.

Proposed New Guideline Complement

4. To answer the above needs, in the first instance, a new outline for sector study reports will be substituted for the present one in the OAS 4 (see Annex 6). The new format would comprise two main parts, one descriptive and one analytical. The structure is shown below and is further detailed in Annex 1 that would replace the guidelines' present Annex 6:

Descriptive Part

(i) Physical Statistics (Geography, Climate, Hydrology)
(ii) Vital Statistics (Population and Health)
(iii) Institutional Arrangements

Analytical Part

(i) Actual Service Levels
(ii) Targetted Service Levels
(iii) Implications from Meeting Targets
(iv) Constraints appearing when comparing implications with real resources
(v) Solutions to remove constraints and recommendations.

5. The reports should in this way be shorter with a maximum of 15-20 pages including two pages of summary. They should further carry one summary data sheet and at least four annexes, viz, one on population, one on institutions by functions, one on actual and targetted service levels, and one on consolidated sector investments and their financing. With proper structuring the reports could be thought of as comprising one sector brief synonomous to the two page summary; one sector memorandum, identical to the 15 page main text; and one full sector survey in which all the detailed information, aimed at the project water staff, would go into the annexes. There could thus be as many annexes as needed with no restriction on the length.

Added Advantages of New Format

6. Apart from stressing the primary function of any sector study, i.e., the analytical side, the new format concentrates on essentials, such as present and targetted service levels, and ways to raise them. It should be pointed out that the new format will probably best serve each country's planning authorities and national and international lending institutions.

Any more detailed information on, say, institutional problems or on hydrological resources could be easily incorporated among the report's annexes, however.

7. The clear partition between a single descriptive part and one analytical makes it worthwhile to upgrade the sector reconnaissance missions that at present precede the full sector missions, at least when undertaken by the WHO/Bank Cooperative Program. From being at present mere acquaintance and preparation missions, the reconnaissance missions could conceivably aim at collecting information sufficient to produce the descriptive section on geography, climate, population, sector topology, etc. The full sector mission would then be fully familiar with the background which would enable it to better focus on the analytical section.

Example of New Format

8. Annexed you will also find a copy of a recently prepared draft water sector survey for Guatemala which tries to incorporate the new format. I would be grateful for any comments on the report as such and on the proposed changed format.

cc: Messrs. Rovani, Kalbermatten, Shipman, Middleton, Saunders, Warford (EMTIR)
Beach (AEPEM), Ehrmen (RAPEM), Salazar (WAPEM), Thye (EMPWS),
Williams (ASPEM), Zavala (LCPWS), Stone (Urban Projects)
Kent, Becher, Jackson, Laugeri, MacNealy, Robinson, Schultzberg,
Vallet (WHOCP)

KERingskog/cel

OFFICE MEMORANDUM

TO: Water Supply Staff

DATE: September 17, 1976

FROM: John M. Kalbermatten, Water and Wastes Adviser, EWTDR

SUBJECT: Professional Development and Participation in Bank Policy Development in the Water Supply and Wastes Sector

Maintaining and updating professional skills is always difficult due to time constraints. In the Bank I find this especially true because we are no longer designers, operators or constructors but primarily reviewers of other professionals' work. As a consequence, it is easy to lose contact with the latest developments in the field and even when we stay up-to-date, we are not practicing what we learn.

When the Bank reorganized staff was concerned about the effect this would have on the free and informal exchange of ideas and experience. Actually, the dreaded professional isolation we worried about was not too pronounced the first couple of years. Nevertheless, I must admit that at least during the latter part of my tenure as a division chief, I was already beginning to feel somewhat isolated, simply because I no longer knew all my colleagues. Engineers and financial analysts hired after the Bank's reorganization were only names to me rather than colleagues I had worked with. This process will probably continue unless we do something about it.

Because of Mr. Shipman's long tenure in the Bank and personal relationships he managed to establish during those years, most of us also had an opportunity to provide input into guidelines, policies and other CPS activities, sometimes informally, sometimes on a formal basis. Again, however, I believe there is a potential danger that this input is restricted to the "oldtimers" and that it is necessary to make an effort to provide everybody with an opportunity to participate in the development of sector policies and other CPS activities which affect regional staff. Because all of us have different backgrounds and different fields of expertise (consultant practice, public utility management, work in health agencies and international organizations, etc.), I believe we jointly have the capacity to handle work in most areas of the sector while individually, and probably even within individual divisions, we do not.

I, therefore, propose that we form small task groups of three professionals each in specific areas of expertise. These task groups would be responsible to:

(a) Maintain proficiency in their specialty through professional literature, participation in professional activities, attendance at workshops, seminars or conferences;

(b) Provide leadership in their area of expertise by informing and training water supply staff through staff working papers, workshops and individual consultation;

(c) Identify and supervise consultants on appropriate state of the art review and research papers;

(d) Develop guidelines and policies for the use of Bank staff on the topics of their expertise;

(e) Maintain a roster of and contact with consultants competent in their area of expertise.

Each of these groups would be composed of professionals from different divisions, provide the professional leadership in their areas of competence and lend assistance (internal consultant services) to other divisions and other sectors within the Bank. I will coordinate activities and obtain CPS administrative and budget support (consultants to write state of the art papers, to prepare workshops, etc., to "fill in" for staff members on loan to other divisions, etc).

I believe implementation of this task group system would not only assist us in maintaining our professional skills, but would allow everyone to more actively participate in policy development, improve the exchange of ideas and experience and improve our effectiveness vis-a-vis borrowers. It would also, incidentally, facilitate eventual transfers of staff between regions.

As a first step in the setting up of this task force system, I invite you to consider this proposal and be prepared to discuss it at our regular staff meeting on September 28. (At the division chiefs' meeting of August 9 those present fully supported this proposal). In the meantime, I welcome any suggestions and comments. I also request you return, by September 24, the attached list of topics indicating your choice for participation. Please add to the attached table other task force areas you believe to be of interest. All those on mission now are invited to comment and indicate their preferences as soon as possible after their return so I can report the results at a staff meeting planned for October 19.

Attachment

JMKalbermatten:mk

cc: Messrs. Bronfman(EAPDR), Howell (AEPDR), Pollan (EMPDR), Rajagopalan(ASPDR), Rowe(ASPDR), Wyss(LCPDR), Rovani, Davis/Smith, Warford, Saunders, Ringskog, Middleton(EWTDR), Morse (VPSVP)

TASK GROUP SPECIALTIES

	CHOICE			
	1st	2nd	3rd	4th
Public Utility Management				
Organization				
Information Systems and Computer Application				
Accounting				
Auditing				
Procurement				
Tariff Setting				
Project Analysis (Economic & Finan.)				
Billing and Collecting				
Finances				
Training				
Water Supply				
Treatment Plant: (i) Design				
(ii) Opera. & Main.				
(iii) Optimization				
Distribution: (i) Design				
(ii) Opera. & Main.				
Leak Detection and Repair				
Metering				
Any Other Areas of Interest				
Transmission Main				
Pumps				
Air Hammer				
Hydrology				
Groundwater				
Waste Disposal				
Sewage Treatment: (i) Design				
(ii) Opera. & Main.				
(iii) Optimization				
Industrial Waste Treatment				
Collection Systems: (i) Design				
(ii) Opera. & Main.				
Waste Water Reuse				
Marine Disposal				
Solid Waste Disposal				
Project Documentation				
(i) Project Briefs				
(ii) Questionnaires				
(iii) Appraisal Reports & Standard Background Information				
(iv) Supervision Reports				
(v) Borrowers' Quarterly Reports				
(vi) Reports on Experience (Audits)				

OFFICE MEMORANDUM

TO: Mr. John M. Kalbermatten DATE: August 17, 1976

FROM: Richard N. Middleton

SUBJECT: Preparation of "Information Packages"

I would like to suggest an extension of your concept of professional development through the creation of mini "task forces" to keep up to date with technical developments, which was discussed and approved at the last division chiefs' meeting. I believe it would be very useful if each task force prepared a basic package of documents which could be quickly copied and distributed to borrowers, engineers (or staff members) -- for example, on leak detection, metering, water or sewage treatment. Each package might contain a brief statement of Bank experience, a brief review of other important work in the field, and a bibliography. We would hold the more interesting bibliography items in the Water Supply Library so that they could be selected and attached to the package to suit each individual case.

I have been mulling over this proposal for a long time, but the need for some such scheme has been highlighted by recent enquiries, all on stabilization ponds. Firstly, when I was in Manila last year, I was urging the use of stabilization ponds both as temporary treatment for the slum upgrading program and as permanent treatment for the Looc Tourism Project. Secondly, in Egypt I was endeavoring to convince all the various authorities concerned that pumping sewage several kilometers into the desert and then providing full conventional treatment was folly. Thirdly, we have the problems of the disputed treatment process for the Lahore Project, where the borrower is raising a number of environmental problems (smell, fly breeding, etc.) and needs reassurance, and if possible some information on the more positive aspects of pond use such as fish culture (which might provide an alternative occupation for displaced agriculturists, both in Lahore and in Lower Egypt). In each case it would have been very useful to be able to obtain quickly sufficient information to give the borrower a clearer idea of the implications of stabilization ponds.

Obviously, this would mean an extension of the work of the task forces and so would place even more burdens on staff. However, I think this could be largely overcome by the provision of sufficient CPS support -- I have in mind, for example, that we could provide summer students who would collect the basic literature, under the supervision of Phyllis Peter (who as Librarian would in any case have to be closely involved in this work).

You may like to consider including some ideas along these lines when you circularize staff about the task forces.

RNMiddleton/cel

Mr Zavala

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: ALL DIVISION CHIEFS, WATER SUPPLY & SEWERAGE DIV. DATE: August 6, 1976

FROM: Alfonso Zavala, Chief, LCPWS

SUBJECT: Reviewing recent Bank experience concerning Borrowers' capacity to meet covenanted financial targets -

The question of what constitutes suitable terms to be included in the Bank's financial covenants with Borrowers is an ever-present one. At present, little information is available in a collected form as to how far have Borrowers actually been able to meet covenanted terms. We feel that the availability of such information would be useful to all concerned when considering setting appropriate financial covenants in the future.

We therefore wish to undertake the collection of the financial information necessary for the purpose and request your cooperation in this effort. The information required is only the covenanted and present rates of return, projected average tariffs and tariffs actually achieved. A proforma for the purpose is attached hereto.

We would appreciate it very much if the information is given to Mr. K. L. Nadkarni, of our Division, who could collect it from the officer in charge of the project. Alternatively, Mr. Nadkarni could himself collect the information from the relevant files, if it is available.

Needless to say, anonymity would be maintained in presenting the findings, which of course would be sent to you for your information.

cc: Mr. J. M. Kalbermatten, EWTDR

Encl. Proforma

DISTRIBUTED TO:

Messrs: E. Erkmen, Chief, Publ. Utilities, East Africa A-1037
Renato Salazar, Chief, Pub. Util, West Africa A-337
E. Williams, Chief, Water Supply, Asia A-442
A. F. D. Thys, Chief, Water Supply, EMENA A-742
Mr. J.M.Kalbermatten, EWTDR D-1036

KLNadkarni:nq

/ORMA

COMPARISON OF COVENANTED AND ACTUALLY ACHIEVED FINANCIAL RATIOS

IN WATER SUPPLY (W) AND SEWERAGE (S) PROJECTS

(For Loans and Credits Signed After January 1, 1970)

A. LOAN DETAILS

LOAN NUMBER:

COUNTRY:

CITY:

YEAR OF SIGNING LOAN:

TYPE OF PROJECT:

B. FINANCIAL INFORMATION

(1) Rate of Return

Based on Historical or Revalued Assets	Covenanted or Achieved	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
	Covenanted											
	Achieved											

(2) Average Tariff

Units for Average Tariff	Projected or Achieved	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980
	Projected											
	Achieved											
Foreign Exchange Rate: US$ = 1 unit local currency =												

This space available for any comments you may wish to make concerning the above information.

PLEASE RETURN TO: K. L. Nadkarni, LCPNS, Room A-842, xt. 2353

8/76

Covenants

Citizens Water Supply Project
c/o New York State Department of Law
Environmental Protection Bureau
2 World Trade Center (47th Floor)
New York City 10047
(212) 488-3609

August 5, 1976

Mr. John Kalbermatten
World Bank
1818 H Street, N.W.
Washington, D.C.

Dear Mr. Kalbermatten:

I much enjoyed our conversation, Monday, and I'm looking forward to a long weekend's read, reviewing the material you'll be sending us.

Meantime, here are two papers on our Citizens Water Supply Project. New Agenda for Planning presents the project in the context of basic planning issues. Statement of Purpose focuses more directly on water supply in the New York Metropolitan Area.

Again, thanks for your interest and aid.

Sincerely,

Robert Alpern
Project Director

new file

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CITIZENS WATER SUPPLY PROJECT

STATEMENT OF PURPOSE

CONTENTS

Need for the Project

Goals of the Project

A Reconnaissance of the Issues

A. Threshhold Questions

1. "Water Supply Deficit"

2. Population

3. The Crisis of the Existing System

B. Immediate Tasks

C. Broader Implications

Current Progress

Sponsorship

CITIZENS WATER SUPPLY PROJECT

No public interest group is scrutinizing the plans for the New York Metropolitan Area's fundamental life support system: water supply.

This Project provides that scrutiny.

The context is a major effort to describe a "New Agenda for Planning," for the Region and the Nation, in the next decade.

Need for the Project

For the Metropolitan Area, the Project is overdue.

Official figures suggest a major crisis. In 1970, the "water supply deficit" in the Region was 140 million gallons per day (mgd), according to the federal Northeastern United States Water Supply Study (NEWS). If major new sources are not developed, NEWS predicts, the deficit will grow to 310 mgd in 1980, 950 mgd in the year 2000, and 1910 mgd in 2020.

Compared to other projections, NEWS is conservative. In a 1970 report, the Tri-State Regional Planning Commission, official planning agency for the Metropolitan Area, projected deficits of 600 mgd in 1985 and 1700 mgd in the year 2000. A recent, but unreleased, Tri-State report anticipates a deficit of 2300 mgd in 2020.

But who pays attention?

The media? Only rarely since the drought of the 1960's has regional water supply made headlines -- most notably, the week the Trenton water system broke down, in 1975. Recently, there have been features on droughts in Africa, England and France, California and Minnesota. But nothing on lessons for New York.

The planners? Most land use and functional plans in the Region simply ignore water supply as a shaper and constraint. When the Regional Plan Association tried to focus grass-roots attention on planning in its "Choices for '76" program, options relating to water supply were not among the choices. Nor was water supply one of the "Critical Issues" in the New York City Planning Commission's Plan for New York.

This year in March, the chairmen of the Tri-State Regional Planning Commission, the Regional Plan Association and the Federal Regional Council convened a landmark conference to discuss the issues facing the Tri-State Region. From that conference and from a series of local meetings and sample surveys of households in the Region, a list of "major topics that require regional attention" emerged. Water supply was not on the list.

Yet, if a crisis exists, the Region must make major changes in its way of life.

It might try to cut the number of consumers and shift the way they are distributed. It might try to drastically change patterns of consumption. It might spend billions of dollars to make new sources available -- billions on top of the billions that may be required to preserve the aging water supply systems already in place.

These issues, of course, are not unique to the New York Region.

Goals of the Project

The Project must answer three basic questions and then provide the leadership to translate the answers into action, if necessary.

Is there in fact a crisis? If there is, how grave? and what kind?

What is an appropriate response to the crisis, if one exists?

What institutional and fiscal reforms does that response, if necessary, imply?

A Reconnaissance of the Issues

A. Threshhold Questions

Is there in fact a crisis? If there is, how grave? and what kind?

1. "Water Supply Deficit."

The fundamental problem in methodology is what the reports mean by "water supply deficit."

"Water supply deficit" is the widening gap between "average annual water demand" and "safe yield" of the water supply systems.

- "Average annual water demand" is good-times consumption. Thus, the average annual demand figures for the Metropolitan Area don't reflect our experience of emergency reductions during past droughts of roughly 20%. Demand is not need. Or, to quote the National Water Commission, itself quoting Rene Dubos, "Trend is not destiny."

- "Safe yield" for surface-water supplies is drought-time capacity, the maximum amount of water available from the reservoirs during a critical dry period. Thus, the figures for "safe yield" in the Metropolitan Area assume the extreme drought conditions of 1961-66, the worst on record, though an episode of comparable severity is said to have a "statistical return period" of 400 years.

- "Safe yield" for ground-water supplies is the amount of water that can be withdrawn from the aquafers each year "without producing an undesired result." "Undesired," of course, depends on who is evaluating results. On Long Island, for example, the currently used figures for "safe yield" ignore the opinion of some experts that "planned overdevelopment" would be acceptable, allowing salt water to move inland to new stable positions.

Other, more sophisticated methodologies are possible. In Maryland, for example, the Bi-County Task Force on Water Supply Policy (Montgomery County and Prince George's County) is comparing the costs of shortage with the costs of new supply under a variety of assumed conditions. At the very least, figures for "water supply deficit" could be developed at more than one level of risk (i.e. "safe yield" in different "design droughts" and with different assumptions regarding management of groundwater supplies) and at demand levels reflecting minimum requirements as well as unconstrained use.

In any case, questions should be raised about many of the assumptions accepted as "givens" in determining "safe yield." Emergency sources are excluded from "safe yield," including many in fact used in past droughts. Considerable reservoir capacity is excluded from "safe yield" as a "contingency reserve." "Safe yield" in the watersheds of upstate New York is limited by water release requirements for downstream use. "Safe yield" in the Long Island groundwater system is limited by a definition of "water budget area" that excludes major freshwater supplies off-shore. In many parts of the Region, "safe yield" is reduced by failure to make rational interconnections among local systems and across County or State lines.

We need better measures of need.

2. Population.

The fundamental data problem is what we don't know about how many people live and work in the Metropolitan Area. If estimates of current population are wrong, the estimates of current per capita consumption are wrong, too, and projections of future population and future consumption are practically worthless.

In fact, the population data in the Metropolitan Area involve at least three deeply troubling issues.

- There is evidence of underestimation on a massive scale, particularly of illegal aliens. In Spring 1975, officials of the U.S. Immigration and Naturalization Service estimated 1.8 million illegal aliens in the Metropolitan Area, 1.3 million of them unaccounted for by census enumeration techniques. New York City estimates its uncounted illegal alien population at 750,000. The Census Bureau acknowledges that illegal aliens do not appear in its 1970 Census count or in its official estimate of undercount.

- There are serious divergencies in the official projections of the Federal Government, the States, and the various regional agencies and localities in the Region. Thus, the Tri-State Regional Planning Commission, the Regional Clearinghouse for Federal aid, projects a New York City population of 7,660,000 in the year 2000. The "interim" but "official" projection of the New York State Economic Development Board, to be used by State agencies in making and evaluating plans, is 6,876,000. And the OBERS 1972 Series E projection of the U.S. Department of Commerce, used by NEWS in projecting "water supply deficit" is 8,400,000.

- Frequently there are discrepancies in the projections used by localities in planning by different agencies or planning for different functions.

In theory, these differences should be highlighted and resolved by one or more of the processes for intergovernmental project review, e.g. the "A-95" Project Notification and Review System of the federal Office of Management and Budget, or the Environmental Impact Statement procedures mandated under the National Environmental Policy Act (NEPA). In practice, these processes hardly come to grips with the problem.

Better approaches to population estimation and projections are required -- particularly relating to undercount -- and better ways to resolve disagreements about basic data.

3. The Crisis of the Existing System.

The fundamental planning problem is what to give attention to and how to assign priorities.

In its chapter on the Metropolitan Area, the NEWS Interim Report presents a "decision tree" with five "branches" -- some fourteen basic projects in five different mixes and sequences. Capital costs projected through 2020 range from $2.760 billion to $4.670 billion. But none of the projects in the decision tree relates directly to rehabilitation and repair of the existing systems. Existing systems were not part of the NEWS Mission.

In fact, however, there appear to be two crises: the crisis in new supply and the crisis in old.

In New York City, concern over the condition of the City's primary distribution system has prompted planning and construction of a Third City Water Tunnel (recently curtailed as a result of the City's fiscal crisis). Estimated cost of Stages 1 and 2 of the Third Tunnel is now over $1 billion. Scattered reports suggest deterioration in some of the older upstate reservoirs and aqueducts of the New York City system. A steadily rising rate of water main breaks may indicate trouble in the City's secondary distribution network.

Conditions in systems outside New York City are probably much worse. (New York City has a unique reputation for care in replacement and maintenance.) Hoboken, New Jersey, may lose as much as 50% of its water through leakage, according to research by the Stevens Institute of Technology. Poughkeepsie, New York, can trace only slightly more than half of the water entering the City system.

In Fall 1974, staff at the Tri-State Regional Planning Commission estimated the total capital costs for water supply through 2020 at $11.6 billion. $3.4 billion was for new sources of supply, treatment and transmission; $3.1 billion was for new local distribution systems for new development. Significantly, the most money, $5.1 billion, was for "upgrading and replacement of aged or obsolete facilities."

Moreover, maintenance cutbacks in a time of fiscal stringency may well accelerate the pace of decay.

Programs of planning and funding are needed that focus on the condition of existing urban systems.

B. Immediate Tasks

1. The NEWS Project.

The most important near-term target date is Fall/Winter 1976, when the Northeastern United States Water Supply Study is expected to issue an Environmental Impact Statement and hold hearings on a Project proposal. Project elements will include a Hudson River High-Flow Skimming Project, to divert Hudson water into the New York City water system, and, probably, sections of the Third City Water Tunnel, principally to bring part of the augmented New York City supply to Nassau County.

Hearings are the only formal citizen participation element in the NEWS process.

In preparing its comments, the Citizens Project will examine water need, the NEWS proposal's environmental impact and financing, and possible alternative projects and programs. Alternatives may include schemes for regional use of the vast groundwater supplies of Long Island, on and off-shore. Conservation programs to be reviewed include universal water metering, structured water pricing, modification of industrial technology and programs for leakage control. NEWS is expected to require universal metering in New York City as a condition for federal action.

2. Planning in the Region.

Other targets relate to the monitoring of planning studies in the Region about to begin or already in progress:

- Water supply studies, such as those for the New Jersey Water Supply Master Plan and Overall State Water Supply Planning Program, and the Survey of Sources of New York City Water Supply soon to be initiated by the City's Department of Health;

- Comprehensive land use studies, which should be keyed to water supply, including federally-funded planning throughout the Region for Coastal Zone Management and for the land use element in "701" Comprehensive Planning and Management studies;

- Functional plans related to water, including the seven "208" Area-wide Waste Treatment Plans covering the Region, and the Comprehensive River Basin Plan for the Hudson River being prepared for the Federal government by the New York State Department of Environmental Conservation.

3. Legislation.

The Citizens Project must also review legsilation affecting water supply, locally, in the three State capitols, and in Washington. In New York City, for example, a legislative package on conservation and metering has been promised by the City's Environmental Protection Administration. In Washington, proposals for Federal aid to water supply systems are anticipated in connection with NEWS.

Current Progress

The Project has already begun, thanks to the dedication of a small volunteer staff. Temporary office space has been donated. A Project library has been established, including an extensive directory of contacts and resources. Research on working papers is well under way.

Computer assistance has been offered by a major brokerage company.

A close cooperative relationship has been established with the Bureau of Environmental Protection of the New York State Attorney General's Office and with major New York City civic and professional groups.

Sponsorship

The Citizens Planning Project is a special program of the Citizens Union Research Foundation. CURF is a non-profit research organization associated with Citizens Union, one of the oldest of New York City's public interest groups.

C. Broader Implications

Water supply planning has intrinsic importance. The headline-catching dramas of budget crisis, social confrontation and environmental pollution that preoccupy the planners, day to day, are all played in a setting determined by water. At some fundamental level, all planning must be about freedom from drought. To the extent that water supply establishes the "carrying capacity" of the land, the Citizens Project is ultimately about land use and comprehensive planning generally and a reassessment of priorities.

At the same time, water supply planning has illustrative importance. Flaws in the planning processes for water supply are flaws, also, of the planning processes for many other functions: questionable standards of need; questionable population counts, estimates and projections; inattention to the condition of existing facilities, particularly in older cities; failure to consider non-structural, conserving alternatives. The lessons of an in-depth study of water supply, thus, imply fundamental changes in the procedures for planning of all kinds.

CITIZENS WATER SUPPLY PROJECT

BACKGROUND PAPER:
A NEW AGENDA FOR PLANNING

A New Agenda for Planning

The planning issues of the next decade have already announced themselves. But policy-makers are not paying attention.

1. Immigration.

The Nation is said to be approaching Zero Population Growth and its central cities are said to be in a period of increasing population loss.

But in one critical (and central-city-oriented) sector, the population may be growing dramatically. Some estimates suggest that the number of illegal aliens in the United States is already more than 8 million; for the New York Metropolitan Area alone, the estimate of the U.S. Immigration and Naturalization Service was 1.8 million in 1975. As the gap widens between American affluence and the poverty of other parts of the World, particularly in this hemisphere, the influx of immigrants, legal and illegal, can be expected to grow.

Meanwhile, the Census Bureau acknowledges that illegal aliens do not appear in its 1970 Census count or in its official estimate of undercount. And at virtaully no level of government do official projections of future population take illegal immigration, past or to come, into consideration.

The result could be underdesign of vital projects and programs and underinvestment in the central cities where, historically, immigrants tend to congregate.

2. Urban Systems on Borrowed Time.

America still thinks of itself as a young country.

But many of its cities, and increasingly its suburbs, are old in terms of the "life expectancy" of basic urban systems. When part of the elevated West Side Highway fell to the street in New York City, it was no isolated incident -- for New York or the Country. The problem extends visibly to such systems as streets and parks and invisibly to sewerage, water mains and underground utilities. In a period of fiscal belt-tightening, moreover, under-maintenance accelerates the decay.

Meanwhile, most of the planning and funding for urban physical "infrastructure" is still designed to meet new needs and create new systems. Even where attention is paid to what already exists (as, for example, in recent Federal transportation programs), the emphasis is on more intensive use, not on rehabilitation, replacement and a critical minimum of maintenance for an already badly weakened plant.

The result could be breakdown of the systems that hold the Nation's major centers together and ultimately hold together the Nation itself.

3. Life-Support Systems and Planned Capacity.

Most Americans think of water supply as virtually unlimited.

But much of the Nation and the World is experiencing unprecedented drought, and major parts of the United States are already in "water supply deficit" -- current consumption exceeds the "safe yield" of the supply system in the worst local drought of record. For the New York Metropolitan Area, for example, the deficit was 140 million gallons per day in 1970, according to the federal Northeastern United States Water Supply Study (NEWS). Habit and technology are driving per capita consumption still higher.

Meanwhile, the focus of national concern is not water supply but water quality. And local and regional plans ignore water supply as a major shaper and constraint for land use and population.

The Citizens Water Supply Project

The purpose of the Citizens Water Supply Project is to bring these issues into dramatic focus -- in an urgent context, in a critical, highly visible region.

The region is the New York Metropolitan Area.

The context is the findings of "water supply deficit" by the NEWS Study and the preparation by NEWS of multi-million dollar proposals to meet those deficits, proposals that will be the subject of public hearings, late this fall.

If the planning agenda were different, the deficits that justify the projects would reflect population data we could rely on; the projects themselves would provide not only for new demand but for maintenance of the existing system; and the debate on need and projects would be central -- as it now is not -- in the processes of land use and comprehensive planning in the Region.

We have an opportunity for asking fundamental questions: it must not be lost.

Robert
Alpern

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Water Supply Staff DATE: August 5, 1976

FROM: John M. Kalbermatten, Water and Wastes Adviser, EWTDR

SUBJECT: Professional Development and Participation in Bank Policy Development in the Water Supply and Wastes Sector

Maintaining and updating professional skills is always difficult due to time constraints. In the Bank I find this especially true because we are no longer designers, operators or constructors but primarily reviewers of other professionals' work. As a consequence, it is easy to lose contact with the latest developments in the field and even when we stay up-to-date, we are not practicing what we learn.

When the Bank reorganized staff was concerned about the effect this would have on the free and informal exchange of ideas and experience. Actually, the dreaded professional isolation we worried about was not too pronounced the first couple of years. Nevertheless, I must admit that at least during the latter part of my tenure as a division chief, I was already beginning to feel somewhat isolated, simply because I no longer knew all my colleagues. Engineers and financial analysts hired after the Bank's reorganization were only names to me rather than colleagues I had worked with. This process will probably continue unless we do something about it.

Because of Mr. Shipman's long tenure in the Bank and personal relationships he managed to establish during those years, most of us also had an opportunity to provide input into guidelines, policies and other CPS activities, sometimes informally, sometimes on a formal basis. Again, however, I believe there is a potential danger that this input is restricted to the "oldtimers" and that it is necessary to make an effort to provide everybody with an opportunity to participate in the development of sector policies and other CPS activities which affect regional staff. Because all of us have different backgrounds and different fields of expertise (consultant practice, public utility management, work in health agencies and international organizations, etc.), I believe we jointly have the capacity to handle work in most areas of the sector while individually, and probably even within individual divisions, we do not.

I, therefore, propose that we form small task groups of three professionals each in specific areas of expertise. These task groups would be responsible to:

(a) Maintain proficiency in their specialty through professional literature, participation in professional activities, attendance at workshops, seminars or conferences;

(b) Provide leadership in their area of expertise by informing and training water supply staff through staff working papers, workshops and individual consultation;

(c) Identify and supervise consultants on appropriate state of the art review and research papers;

(d) Develop guidelines and policies for the use of Bank staff on the topics of their expertise;

(e) Maintain a roster of and contact with consultants competent in their area of expertise.

Each of these groups would be composed of professionals from different divisions and would, in addition to the three members, include a representative of CPS. In short, I would expect these task groups to provide the professional leadership in their areas of competence and to provide assistance (internal consultant services) to other divisions and other sectors within the Bank. (As I already mentioned earlier, the EWT consultant budget could be tapped for consultants to replace a staff member on assignment to another region). I believe implementation of this task group system would not only assist us in maintaining our professional skills, but would allow everyone to more actively participate in policy development, improve the exchange of ideas and experience and improve our effectiveness vis-a-vis borrowers. It would also, incidentally, facilitate eventual transfers of staff between regions.

As a first step in the setting up of this task force system, I invite you to consider this proposal and be prepared to discuss it at our regular staff meeting on September 28. In the meantime, I welcome any suggestions and comments you care to make. I also request you return, by September 20, the attached list of topics indicating your choice for participation. I would also appreciate if you would add to the attached table other task force areas you believe to be of interest.

Attachment

JMKalbermatten:mk

TASK GROUP SPECIALTIES

	CHOICE			
	1st	2nd	3rd	4th
Public Utility Management				
Organization				
Information Systems				
Accounting				
Auditing				
Procurement				
Tariff Setting				
Project Analysis (Economic & Finan.)				
Billing and Collecting				
Computer Application				
Finances				
Training				
Water Supply				
Treatment Plant Design				
Treatment Plant Opera. & Mainte.				
Treatment Plant Optimization				
Distribution Design				
Opera. & Maintenance				
Leak Detection and Repair				
Metering				
Waste Disposal				
Sewage Treatment Design				
Sewage Treatment Opera. & Mainte.				
Sewage Treatment Optimization				
Industrial Waste				
Collection Systems Design				
Opera. & Maintenance				
Marine Disposal				
Solid Waste Disposal				
Any Other Areas of Interest				

Task
Groups

Water Supply & Sewerage

FORM NO. 27
(11–75)

WORLD BANK / IFC
OUTGOING MESSAGE FORM
(TELEGRAM/CABLE/TELEX)

☒ IBRD
☐ IDA
☐ IFC
☐ ICSID

TO: INTERNATIONAL REFERENCE CENTER
WATER SUPPLY
THE HAGUE

DATE: JULY 19, 1976

ORIGINATOR'S EXT.: 5345

COUNTRY: NETHERLANDS

CLASS OF SERVICE: LC / LT

TELEX NO. 33604

CABLE NO. & TEXT:

FOR TJIOOK - CONCERNING BANK PARTICIPATION INTERNATIONAL SEMINAR ON COMMUNITY WATER SUPPLY COMMA SHIPMAN WILL BE PRESENT TO COVER TOPICS ORIGINALLY ASSIGNED TO ME IN VIEW OF MY SCHEDULING PROBLEMS FOR SEPTEMBER STOP REGARDS

KALBERMATTEN
INTBAFRAD

NOT TO BE TRANSMITTED

REFERENCE:	AUTHORIZED BY *(Name)*: John M. Kalbermatten, Water and Wastes Adviser
DRAFTED BY: HRShipman:mk	DEPARTMENT: Energy, Water and Telecommunications
CLEARANCES AND COPY DISTRIBUTION: cc: Mr. Shipman (EWTDR)	SIGNATURE *(Of individual authorized to approve)*: John M. Kalbermatten
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WORLD BANK/IFC
OUTGOING MESSAGE FORM
(TELEGRAM/CABLE/TELEX)

TO: INTERNATIONAL REFERENCE CENTER
WATER SUPPLY
THE HAGUE

COUNTRY: NETHERLANDS

CABLE NO. & TEXT:

DATE: JULY 19, 1976

ORIGINATOR'S EXT: 5345

CLASS OF SERVICE: LT
TELEX NO. 33504

FOR TJIOCK - CONCERNING BANK PARTICIPATION INTERNATIONAL SEMINAR ON COMMUNITY WATER SUPPLY COMMA SHIPMAN WILL BE PRESENT TO COVER TOPICS ORIGINALLY ASSIGNED TO ME IN VIEW OF MY SCHEDULING PROBLEMS FOR SEPTEMBER STOP REGARDS

KALBERMATTEN
INTBAFRAD

REFERENCE:

DRAFTED BY: HRShipman:mk

CLEARANCES AND COPY DISTRIBUTION
cc: Mr. Shipman (EWTDR)

TRANSMITTED
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AUTHORIZED BY (Name): John M. Kalbermatten, Water and Wastes Adviser

DEPARTMENT: Energy, Water and Telecommunications

SIGNATURE (Or name of authorized to approve)

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SECTION
COMMUNICATIONS
JUL 19 7 43 PM 1976
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Water Supply & Sewerage.

Messrs. Ericsen, Salazar, Thys, Williams, Zavala,
Jennings, Warford, Saunders, Ringskog

June 23, 1976

Richard N. Middleton, Senior Sanitary Engineer, EWTDR

Monthly Division Chiefs' Meeting

As agreed at our last meeting, I attach for your review and comment prior to our next meeting:

a) A proposed schedule of Monitoring Indices, prepared by Mr. Fernandez to reflect the discussions in our last meeting.

b) A simplified form prepared by Mr. Reekie of Sections I-V of the proposed revised Water Supply Feasibility Report outline. (Your comments on this simplified version should not of course repeat those which you are already preparing on the full version.)

cc: Mr. Kalbermatten

RNMiddleton/cel

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

TO: Mr. Richard Middleton (EWTDR)

DATE: June 21, 1976

FROM: Claudio Fernández (FNA, LCPWS)
Through Joseph Freedman, Actg. Chief, LCPWS)

SUBJECT: Monitoring Indicators:

Annexed is the list of indicators and their definitions requested in the last meeting of Water Division Chiefs. We understand that these indicators and their definitions will be distributed to all Water and Sewerage Division Chiefs for discussion during the next meeting.

cc: Mr. A.Zavala, Chief, LCPWS

CFernández:nq

LATIN AMERICA AND CARIBBEAN WATER SUPPLY PROJECTS

FINANCIAL AND TECHNICAL MONITORING INDICATORS

Several of these indicators may be used for the company as a whole or for one part of the areas served by the company; the definitions below are in general for the entire company.

The order intends to weight the relative importance; that is, if only five values should be requested, the first five should be preferred. Obviously, the relative importance of these indicators depend on the particular institution, and may change at different periods of the same institution.

There are many other indicators which may be used, but these are the most commonly used.

Annex 1 contains the list of indicators; the square in the right hand may be used to rank them in a different order. The definitions are given in Annex 2; the definitions after the 25th are the other variables required to calculate these indicators; a total of 25 variables or numbers is required to calculate these indicators. The numbers within parenthesis represent references to other definitions.

ANNEX 1

MONITORING INDICATORS FOR WATER PROJECTS
(in order of preliminary importance)

1. % Population with water
2. % Population served
3. % Population served by sewerage
4. % Rate of Return
5. Water production
6. Volume metered
7. Volume Sold
8. Volume sold per connection per month
9. Water connections
10. Unaccounted-for water %
11. Average water revenues US$/$m^3$
12. Operating costs US$/$m^3$ (per cubic meter produced)
13. Minimum hours of service
14. Employees per 1000 connections (or per m^3 produced)
15. Operating ratio %
16. % personnel cost of total cost
17. Per capita production - LCD
18. % Contribution to (average) investment
19. Internal cash ratio
20. Average tariff
21. % Used of system capacity
22. Debt service ratio
23. % receivables on billing
24. % metered
25. % overtime

ANNEX 2

MONITORING INDICATORS DEFINITIONS

1. % POPULATION WITH WATER: Population with water (28) as a percent of total population (30).

2. % POPULATION (WELL) SERVED: Population (well) served (29) as Population (well) served (29) as a percent of total population (30).

3. % POPULATION SERVED BY SEWERAGE: Population served by sewer connections (37) as a percent of total population (30).

4. RATE OF RETURN % (Real): Operating revenues (27) less operating costs (26) and depreciation, as a percent of the average net assets in operation (33).

5. VOLUME PRODUCED: Total volume of water treated and delivered to the system (at plant output).

6. VOLUME METERED: Total volume metered to metered connections or other users

7. VOLUME SOLD: Is the volume metered (6) plus the volume of water which could be bought by the amount paid by the flat rate users.

8. VOLUME SOLD PER CONNECTION PER MONTH: Total monthly volume sold (7) divided by total number of water connections(9).

9. WATER CONNECTIONS: Total number of properties with a different link to the water distribution lines.

10. % UNACCOUNTED-FOR WATER: Difference between water produced (5) and water sold (7) as a percent of water production (5).

11. AVERAGE WATER REVENUE: Total water operating revenues (27) divided by total volume sold (7).

12. UNIT OPERATING COST: Total operating costs (26) divided by total volume produced (5).

13. MINIMUM HOURS OF SERVICE: Number of hours without water (less than two meters of pressure) during days in which service was most rationed. Only those days of maximum water service rationing should be used and rationing due to unusual problems should be excluded.

14. EMPLOYEES PER 1,000 CONNECTIONS: Number of employees (34) divided by the total number of connections (9, 36) (water or sewerage)

15. % OPERATING RATIO: Total operating costs (26) as a percent of total operating revenues (27).

16. % PERSONNEL COST OF TOTAL COST: Total personnel expenditures (41) as a present of total operating costs (26).

17. PER CAPITA PRODUCTION: Water produced (5) divided by 365 and by the population (well) served (29). Usually expressed in liters per capita per day (LCD).

18. % CONTRIBUTION TO INVESTMENT: The internal cash generation (35), less debt service (38) as a percent of annual investment. To smoo[illegible] investment peaks, the average three year investment (present, past and future) is commonly used.

19. % INTERNAL CASH RATIO: Internal cash generation (35), less debt service (38) divided by the sum of net assets in operation (33) plus work in progress (39).

20. AVERAGE TARIFF: Tariff revenue (42) divided by volume sold (7).

21. % USED OF (system) CAPACITY: Volume produced (5) as a percent of system capacity (32).

22. DEBT SERVICE RATIO: Internal cash generation (35) divided by debt service (38).

23. % RECEIVABLES ON BILLING: Receivables from operating revenues as a percent of total operating revenues (27).

24. % METERED: Number of meters in operation (40) as a percent of total connections (9).

25. % OVERTIME: Total amount paid for overtime divided by the personnel cost (41) (without overtime).

ADDITIONAL DEFINITIONS REQUIRED

26. OPERATING COSTS: All costs related to normal operation, excluding interest and depreciation.

27. OPERATIONAL REVENUES: All revenues from tariffs (42), water taxes, installation rights (the recovery of connection costs is considered a customer contribution). Other revenues related to operation such as surcharges, late payment sanctions, etc.

28. POPULATION WITH WATER: Population (well) served (29) plus the estimated population whch has easy access to safe water (standpipes, water vendors, safe wells, etc).

29. POPULATION (WELL) SERVED: Estimated number of persons with adequate water service through house connections. This is usually found by multiplying the number of connections (9) by the average number of persons per connection.

30. TOTAL POPULATION: Total number of persons living within the areas for which the company is responsible.

31. TOTAL PER CAPITA WATER: Volume produced (5) divided by 365 and by the total population with water (28).

32. SYSTEM CAPACITY: Maximum volume of water which could be produced in a period after considering all bottlenecks (production, pumping, treatment, storage, distribution).

33. AVERAGE NET ASSETS IN OPERATION: Sum of the net assets (43) in operation at the beginning and at the end of the year. The assets should be revalued, normally using the cost of living index.

34. NUMBER OF EMPLOYEES: Total number of full-time employees plus the full-time equivalent of part-time employees (water, sewer and/or both).

35. INTERNAL CASH GENERATION: Sum of all revenues less all cost, less debt service (38).

36. SEWER CONNECTIONS: Number of water connections (9) which have water-borne sewerage.

37. POPULATION SERVED - SEWERAGE: Number of persons served by sewer connections (36).

38. DEBT SERVICE: Total amount due, principal plus interest for loans.

39. WORK IN PROGRESS: Value of the investment under construction which still is not ready to be operated.

40. NUMBER OF METERS IN OPERATION: Total number of metered connections less those which are unreadable or broken.

41. PERSONNEL COST: Total wages, allowances, subsidies, insurance, social security and other personnel expenses.

42. TARIFF REVENUES: Total revenues from the sale of water, meter maintenance and flat charges.

43. NET ASSETS IN OPERATION: Total fixed assets in operation less their accumulated depreciation.

SIMPLIFIED FORM

DRAFT OF 6/76

WATER SUPPLY FEASIBILITY REPORT

- Suggested Outline -

I. BORROWER AND PROJECT AGENCY

1.01 Give a brief history of the agency which will carry out the Project and be responsible for operating the water supply system. Include information on organization, administration, relationship to government departments, and organization charts. Describe existing legislation, regulations, charters, or by-laws that outline the agency's responsibilities and its powers to carry out the proposed project, to borrow funds, to charge fees and taxes, and to enforce their collection. Describe any proposed changes.

1.02 Provide a schedule giving by categories of work, the number of people employed by the water agency at the end of each of the last three years.

II. PRESENT WATER SUPPLY SITUATION

2.01 Furnish a general schematic map showing all present water systems including the areas served by each, supply sources, and (by-symbols) the location of treatment plants, pumping stations, storage tanks, reservoirs, and transmission and principal distribution mains. Give information on the average % of time each system is under pressure. Give details of capacity (design and present actual) and physical condition of the major components of each system.

2.02 Describe raw water sources for each water system, give withdrawal data, static and pumping levels, any trend of change and results of recent analyses of the untreated water.

2.03 Describe the scope and cost of expansion (or replacement projects) for the major parts of the water systems during the last five years and those now in progress. Give dates. Describe whether work was done by the water agency, by contract, or other means.

2.04 Describe pertinent information bearing upon the rights of the water systems to use their raw water sources, present and proposed.

Analysis of Consumption

2.05 For each of the last three years give total water produced for each water system and the total for all systems. Provide actual data if available; otherwise provide the best possible estimates. Describe how the above production data are determined (master meters, pump rating, hours of operation, or otherwise), and what is the probable margin of error in % ? Explain all estimates. Describe any efforts to check or verify data or estimates.

2.06 For each of the last three years, give the distribution of water as follows for each individual system:

Class of Water User	No. of Service Connections			Annual Distribution (Volume)		
	Metered	Not Metered	Total	Metered	Not Metered	Total
Domestic						
Commercial						
Industrial						
Public Fountains or taps						
Public or Government						
Free (give details)						
Wholesale to other systems						
Other (give details)						
Unaccounted-for water						

N.B. If actual data are not available, estimates should be provided and fully explained. Explain your definition of these classes. Other classifications may be used if they provide a detailed breakdown of water uses equal to that given in this suggested table. Is the metered distribution shown in the table calculated on the assumption that all customers have used at least the quantity allowed for the minimum charge?

2.07 Give a table showing, for each of the last three years, the average (actual or estimated) water consumption per person per day by areas for (a) the total population (b) the population served.

III. EXPECTED DEMAND

3.01 Discuss the growth of population and the pattern of growth in the project area, and indicate the assumptions made regarding future population growth, density, etc. in the preparation of the project. Attach supporting data from census records, studies and forecasts for development of the area.

3.02 Provide estimates of expected total water consumption during the year for each year for which population estimates are given. These should be based upon analyses of present consumption and water use practices as well as trends in population, domestic, commercial, industrial, and other significant types of consumption, unaccounted-for-water, use of public watering points, installation of modern plumbing, use of water service and all other factors which could affect water consumption. The estimates of the yearly design consumption should be broken down into the consumptions by various user categories.

IV. THE PROJECT

Water Resources Development

4.01 Describe the long term plans for the staged development of water resources to meet the long term demand. Describe how the proposed project fits in this development.

Description of Project

4.02 Give a general description of the proposed project. Include a map showing principal roads and geographic features, existing built-up areas, the areas now served by water systems, the areas to which service will be extended under the proposed construction project, and approximate areas which are expected to be served by successive future extensions.

On the same map or a separate map, show the location of principal components of the proposed project, such as, main supply lines, pumping stations, reservoirs, and the like.

4.03 Provide the general capacity criteria used for design of the major elements of the proposed project - distribution, transmission, storage, pumping, treatment, supply elements, etc. Explain generally how the capacity of the major elements would be expanded in the future to accommodate future extensions and increases in water demand. Describe the methodology used to select the most economic size for the major project components.

4.04 Describe the results of studies on the yield and the chemical and bacteriological quality of the various sources of supply which have been considered. Explain the reasons for selecting the proposed sources.

4.05 Describe the program for extension replacement and improvement of secondary mains, meters etc. and all other works not included in the project but necessary for fulfillment of the objectives of the proposed project.

4.06 Describe the present status and schedule of project planning, detail design, further studies, procurement and construction. Explain how the work is proposed to be done -- by force account, contract, etc.

4.07 Provide a construction schedule for the major items of work on the proposed project.

V. COST ESTIMATES

5.01 Cost estimates should be given in sufficient detail, subdivided into logical project elements, and supported by assumptions and bases for figures in adequate detail to permit detailed analysis. The estimates and any revisions thereon should be dated and should show local currency and foreign exchange costs, land costs, local duties and taxes, design, supervision, legal, and administrative costs associated with the project, consultant's fees, and allowances for price increases and contingencies.

5.02 Cost estimates should be prepared on the basis that there will be international competition for all contracts, and the sources of unit prices given in the supporting data should be identified, such as, "recent construction costs", "orders placed", "bids received", "informal information from potential suppliers and contractors", etc.

5.03 Provide an estimated schedule of expenditures, by year, for the estimated project costs given by foreign exchange and local currency expenditures. The schedule should be subdivided to show requirements for the major parts of the project and should be coordinated with the preliminary construction schedule. Show expenditures already made as of a given date and estimated expenditures for subsequent periods. Dates of expenditures should be the dates cash payments are due. A specimen table is attached as Annex 1.

5.04 Provide a similar schedule for other secondary works estimated not included in the main project but necessary for fulfillment of the objectives of the proposed project.

VI. FINANCES

Rates and Billings

6.01 Give complete details of present water service charges or taxes including minimum charges, consumption allowed for minimum charge (if metered), charges for different service sizes or classes, penalty or rebate provisions for delayed or prompt payments, basis of charges for public taps, etc. Are there any special charges or discounts for government, military, charitable and other special users? Who owns and maintains meters on service connections?

6.02 Describe any changes in the rate schedules within the last ten years.

Water Supply & Sewerage.

Mr. W. K. Journey

June 17, 1976

R. N. Middleton

Seminar on Simple Hand Pumps - Terms of Reference

Following discussions with IDRC in Ottawa (not covered under these Terms of Reference), on Thursday, July 8 you will proceed to England for discussions at the National College of Agricultural Engineering on the fabrication of wood bearings and other low cost well components.

You will then travel to The Hague, Netherlands, to participate in the international seminar on hand pumps, sponsored by IRC, and to present the paper resulting from your research carried out under your assignment with the Bank. You should arrive in The Hague on Sunday, July 11, and make contact with Mr. Joseph Freedman (LCPWS), who will have arrived the previous week for another seminar.

On conclusion of the IRC seminar you will travel to Hannover, Germany for discussions on July 19 with Preussag AG on rate-of-wear and efficiency experiments being carried out on pvc pump units.

On return to Washington you will submit within one week reports on each of these activities and, if considered necessary after discussions with this department, you will update the paper presented to the seminar in order to reflect the comments made.

RNMiddleton:mk

Cleared with and cc: Mr. Freedman (LCPWS)

cc: Messrs. Kalbermatten, Allison, Edgerton
Ms. Peter

Water Supply & Sewerage

Mr. Charles S. Pisco (Consultant) June 23, 1976

Richard N. Middleton, Senior Sanitary Engineer, EMTDR

Study and Report on Rural Water Supply Progress in Selected Developing Countries

I regret that, for operational reasons, it will be necessary to postpone your scheduled visit to Kenya and Upper Volta. Cables to this effect have already been sent to the Kenya Government and to our Resident Representative in Ouagadougou. The visit should be rescheduled to coincide with a study evaluating the Kenya rural water supply program in preparation for a rural water supply project which is proposed for Bank financing. This evaluation is expected to be completed in late August or early September, and we expect you to join our engineer Mr. Kozal who will be in the field about that time. Tentatively, you should plan to arrive in Kenya at the beginning of September and, after a stay of about ten days, proceed to Upper Volta.

Future Action

1. You should arrange to visit IBRD as soon as possible to discuss with them the format of the reports to be prepared as a result of your studies.

2. You should complete, by July 31 at the latest, the draft reports on the work already carried out in Latin America.

3. You should submit to this office a proposed timetable for completion of your assignment, on the assumptions that

- your rescheduled work in Africa begins on September 1;
- you complete the draft reports on Upper Volta and Kenya before proceeding to visit countries in Asia;
- your Asian trip covers Bangladesh, Malaysia and Korea, allowing ten days in each country; and
- on completion of all the country reports, you prepare an overall summary statement of your conclusions.

4. The Bank will make the following administrative arrangements:

- agree with the Kenya Government the most appropriate dates for your visit;
- arrange for clearance of your visit to Upper Volta;
- consult with other member institutions of the Ad Hoc Committee on the countries which it would be desirable that you should visit in Asia, and arrange for clearance for your visits to the agreed countries.
- make the appropriate travel arrangements.

All these arrangements will, of course, be made in close liaison with yourself.

cc and cleared: Messrs. Erbaum, Levi, Salazar and Miss Sato
cc: Messrs. Halberstadter, Williams, Shipman and Ms. Peter

RNMiddleton/cel

(Selected)
Water Supply & Sewerage

Mr. Mervyn L. Weiner (through Mr. Y. Rovani) May 26, 1976

John M. Kalbermatten

ODA - Rural Water Supply Evaluation
Comments on Letter and Proposal

1. You have requested comments on the letter of 19th May and attachment received from Mr. Cracknell of ODA. Ours are as follows:

1. By way of background a rural water and sanitation inter-agency meeting was held in Geneva in November, 1975, convened by the ad hoc Rural Water and Sanitation Groups of which IBRD has been a member. The meeting was attended by interested multilateral and bilateral agencies (ODA was represented). In February of this year the panel met to decide on what actions to take to respond to the conclusions reached at the inter-agency meeting and which might set the stage for a second meeting of the bilateral and other agencies. Four actions were proposed, one of which was a review of selected rural water projects for the purpose of noting successes and failures, and the reasons and factors behind the conclusions reached.

2. IBRD agreed to carry out this study on a selected group of countries using one consultant (Chas. Pineo) and with the active participation of CIDA and WHO. We attach a copy of the terms of reference for Mr. Pineo covering the general approach he is to take. You will note that as per 2(a) he is to have discussions with knowledgeable staff, including those of bilateral agencies. We will ask him to call on ODA enroute to Africa (probably in June) and if ODA feels it appropriate, he could meet with Feachem and Carruthers.

3. It is apparent that the study which we are financing will not go into the depth which the ODA proposal suggests, but it will involve most of the items of enquiry which are listed. It would not result in a handbook or a guideline for rapid evaluation.

4. We are interested to note the Lesotho study which has been done with collaboration of ODA and believe a copy of the report for our files would be useful, if available. We have been aware that OECD was considering a study of rural water projects, and also know of a study being initiated in Ethiopia by SIDA. There is currently a sector study being done in Tanzania with primary emphasis on the rural water subsector. This study is under the responsibility of WHO and carried out by the WHO/IBRD

cooperative program staff. This latter study will not focus on the items of interest to Messrs. Carruthers and Feachem to the extent that the others will. Mr. Pineo will be working in Peru, Dominican Republic, Kenya, Upper Volta and probably Korea on our study.

5. The preceding is a rather elaborate introduction to answering your specific questions but we thought that at least some of this information would be of interest to ODA and might reflect on your reply. Our judgement concerning the points in question are as follows:

a) Does the proposal have merit?

Yes, with some reservations on the handbook idea, on Bank participation, and on areas where studies are to be done.

b) Should it be reviewed by the Research Committee?

No.

c) Should it form part of CPS, DPS work program?

No.

d) Does it overlap work underway?

Yes.

6. You will note in Pineo's T.O.R., that item 2(b) calls for identification of projects and programs on which follow-up and more intensified study will be warranted. You might wish to call this to the attention of ODA with the view that later collaboration either with us, the ad hoc Panel Group, WHO, or the taking over of full responsibility by ODA, would seem feasible if any such projects or programs are found.

7. It may be worth calling to your attention that the Carruther's proposal, attached to the ODA letter, is identical to one sent us directly by Carruthers and replied to in my absence by Mr. Middleton (copy attached). There seems to be some possibility

that the study mentioned as of interest to OECD might also be of Carruthers' origin, although we are only speculating here with no knowledge as to the basis for their study. This may be a case of approaching several agencies with the same project, hoping that one may buy it.

Attachments: Mr. Pineo - TOR
Mr. Middleton's letter to Carruthers

cc: Messrs. Rajagopalan
Saunders
Middleton

HRShipman/dmc

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

OFFICE MEMORANDUM

DATE: March 3, 1976

TO: Mr. Charles S. Fineo (CONS)

FROM: John M. Kalbermatten, Water and Wastes Adviser, (PEPER)

SUBJECT: Study and Report on Rural Water Supply Programs in Selected Developing Countries
Terms of Reference

1. Starting about March 15, 1976 you will study selected national and regional rural water supply and sanitation projects and programs in developing countries, both those in progress and those which have been completed. You should evaluate the experiences, both good and bad, for lessons which may be useful to other countries in improving existing programs, or initiating new ones. You will include not only specifically water supply programs and projects which are aimed at rural communities and dispersed populations but also other types of projects (e.g., in integrated rural development or agriculture) which have a water supply or sanitation component.

2. The study will involve:

(a) A review of existing reports and discussions with knowledgeable staff in (i) the Bank; (ii) WHO and its regional offices; (iii) other UN agencies, particularly UNICEF; (iv) other bilateral agencies; and (v) other agencies.

(b) Identification of projects and programs on which follow-up and more intensified study will be warranted;

(c) Field visits to countries to be agreed upon between us.

(d) A careful analysis of each of the projects and programs studied, including the technical, financial, organizational and managerial aspects, looking for innovative approaches, characteristics which have contributed to certain successes and failures.

(e) The preparation of a report which presents the conclusions of your analysis and which presents proposals for approaches which may be adapted to help improve existing programs or the development of new projects.

(f) A review of the Bank's policy paper, "Issues in Village Water Supply" including the recommendation of changes and improvements to the paper.

3. It is expected that your study and preparation of the report will require approximately three months including time spent in travel status and in the Washington area. A draft report should be submitted by no later than August 1, and a final report prepared within four weeks after receipt of comments by IDRD, IDAC and WHO. Terms of reference for a similar study originally

planned to evaluate rural water supply in Peru are attached. You might find them useful for the preparation of questionnaires, etc.

Attachment

cc: Messrs. Mashler (UNDP), Dieterich/Kent (WHO), Beyer (UNICEF), Hopper/McGarry (IDRC), Olivero (IDB), Christoffersen (ARD), Erkmen (EAPPB), Thys (EMPWS), Williams (ASPWS), Zavala (LCPWS), Ribi (WAPPB), Middleton (PBPDR)
Mrs. Boskey (IRD), Ms. Peters (PBPDR)

CSPineo/HShipman/RMiddleton:mk

May 13, 1976

Mr. Ian Carruthers
School of Rural Economics and
Related Studies
Wye College
University of London
Near Ashford
Kent TN25 5AH
United Kingdom

Dear Mr. Carruthers:

Mr. Saunders has passed to me your outline proposal for an evaluation study of rural water supply programs. My initial reaction is that the Bank is most unlikely to agree to sponsor a research program of anything like the magnitude suggested (about $300,000, excluding inflation). We will of course be undertaking from time to time research investigations into the effectiveness of our own lending operations -- there is a special unit in the Bank for this purpose -- and possibly also broader examinations of countries' strategies (providing the countries themselves consent). For example, an engineering and management consultant is at present carrying out a rural water supply evaluation for us in several countries as part of our obligations to the Ad Hoc Committee, to which you refer, and we have also been requested to do the same sort of exercise in another country, using the resources of our Cooperative Program with the World Health Organization. Once we receive these reports, we will be in a better position to evaluate our own evaluations, so to speak, and decide whether a different or more elaborate approach or follow-up is necessary; this could be the point at which you and your colleagues would be able to help us, although I am sure that it would be on a much more modest scale than you presently envisage.

Our Water and Wastes Advisor, Mr. Kalbermatten, returns to Washington next week and I will let him have your proposals and ask his opinion. Meanwhile, despite this somewhat negative reaction, I would like to thank you for letting us have your ideas -- I hope we can find some way to make use of them in our work.

Sincerely,

Richard M. Middleton
Senior Sanitary Engineer
Energy, Water and Telecommunications
Department

cc: Messrs. Kalbermatten, Warford, Saunders

RMMiddleton/cel

Water Supply & Sewerage

Mr. John M. Kalbermatten

May 20, 1976

Richard M. Middleton

Comparative Water Supply Data in Appraisal Reports

Mr. Rovani has asked us to develop a standard annex for appraisal reports, which would give comparative data on access to water service. This is intended to be broadly comparable to the annex on telephone statistics routinely attached to telecommunications project reports (see Attachment 1).

This job could easily be done by a summer assistant once we have agreed a format (see Attachment 2) and have certain basic input data:

— Population and GNP figures (World Bank Atlas)
— Access to service data (WHO, 1962, 1970, 1975)
— Morbidity/mortality statistics for water-related diseases (being prepared by WHO CP).

The major problem currently is with WHO's 1975 data, which do not seem to make sense for LAC (according to Fernandez) and are inconsistent for some other countries; Buky is working on this as part of the urban poor exercise. You may wish to discuss this further with him.

You may also wish to review the "Social Indicators" annex attached to the President's Report, which is weak on water supply and wastes disposal.

Attachments.

RMMiddleton/cel

EAST AFRICA

EAST AFRICAN POSTS AND TELECOMMUNICATIONS CORPORATION (EAPTC)

International Telephone Statistics

COUNTRY	POPULATION 1/	GROSS NATIONAL PRODUCT - 1973		TELEPHONES - JANUARY 1975									
				NATIONAL				PRINCIPAL CITIES			REST OF COUNTRY		
	1/1/75 (000's)	Per Capita US$	Per Capita Growth Rate (1965-73)	Total Number (000's)	Per 100 Population	Av. Annual Growth Rate (1965-75) %	Automatization %	Total Number (000's)	Per 100 Pop.	Percentage of Nat'l %	Total Number (000's)	Per 100 Pop.	Percentage of Nat'l %
AFRICA													
East Africa	37,283	149	2.7	215	0.58	10.5	84.6	156	8.3	73.0	59	0.2	27.0
Egypt, Arab Rep. of	36,730	250	0.8	503	1.37	n.a.	96.7	364	4.0	72.4	139	0.5	27.6
Ethiopia	27,495	90	1.6	66	0.24	12.1	88.5	52	3.4	78.8	14	0.1	21.2
Morocco	16,726	320	2.5	189	1.13	2.5	82.0	128	3.2	67.7	61	0.5	32.3
Nigeria	69,674	210	8.3	111	0.16	6.4	83.4	68	3.9	61.3	43	0.1	38.7
Rhodesia	6,205	430	3.5	172	2.77	6.2	93.4	138	14.2	80.2	34	0.7	19.8
South Africa	24,914	1,050	2.0	1,936	7.77	5.5	82.6	1,399	24.2	72.3	537	2.8	27.7
Sudan	18,112	130	-0.6	56	0.31	4.5	91.4	49	3.0	87.5	7	0.1	12.5
Tunisia	5,628	460	4.9	114	2.03	12.7	92.6	49	2.4	43.0	65	1.8	57.0
Syria	4,687	430	-0.2	68	1.45	8.2	97.8	29	3.3	42.7	39	1.0	57.3
AMERICA													
Argentina	25,225	1,640	2.9	2,374	9.41	4.9	96.8	1,378	18.9	58.1	996	5.6	41.9
Brazil	106,069	760	6.0	2,652	2.50	7.7	94.6	1,992	8.3	75.1	660	0.8	24.9
Canada	22,661	5,450	3.5	12,454	54.96	5.9	97.8	6,254	59.0	50.2	6,200	51.5	49.8
Colombia	25,025	440	3.1	1,186	4.74	11.5	99.7	813	7:8	68.6	373	2.6	31.4
Costa Rica	1,960	710	3.5	98	5.02	16.1	99.0	88	10.5	89.8	10	0.9	10.2
El Salvador	4,065	350	0.8	50	1.22	8.6	97.2	44	2.9	88.0	6	0.2	12.0
Mexico	58,265	890	2.8	2,546	4.37	13.4	94.8	2,069	10.2	81.3	477	1.3	18.7
Trinidad & Tobago	1,060	1,310	2.2	66	6.26	6.0	99.9	41	41.8	62.1	25	2.6	37.9
US	212,013	6,200	2.5	143,427	67.65	5.0	99.9	75,904	73.5	52.9	67,523	62.1	47.1
Venezuela	11,918	1,630	1.3	554	4.65	7.9	99.2	477	9.3	86.1	77	1.1	13.9
ASIA													
China, Rep. of	15,856	660	7.3	901	5.68	19.8	92.5	591	12.0	65.6	310	2.8	34.4
India	582,596	120	1.5	1,690	0.29	8.4	82.3	879	2.7	52.0	811	0.2	48.0
Indonesia	123,840	130	4.5	285	0.23	3.4	63.3	201	1.4	70.5	84	0.1	29.5
Iran	33,565	870	7.4	806	2.40	16.1	94.1	541	5.3	67.1	265	1.1	32.9
Iraq	10,770			153	1.42	9.4	93.1	126	2.9	82.4	27	0.4	17.6
Israel	3,408	3,010	6.7	735	21.57	13.1	100.0	562	30.9	76.5	173	10.9	23.5
Japan	110,626	3,630	9.6	41,905	37.88	13.1	97.4	26,527	42.9	63.3	15,378	31.5	36.7
Malaysia	11,738	570	3.7	259	2.21	7.9	96.6	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Nepal 2/	12,423	90	-0.1	11	0.09	13.9	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Pakistan 2/	69,710	120	2.5	214	0.31	5.9	83.0	n.a.	n.a.	n.a.	n.a.	n.a.	n.a.
Philippines	40,941	280	2.6	446	1.09	11.4	96.0	374	4.3	83.9	72	0.2	16.1
Singapore	2,237	1,830	9.4	280	12.53	13.5	100.0	280	12.5	100.0	-	-	-
Syria 3/	7,121	400	3.6	152	2.14	7.8	89.7	126	5.2	82.9	26	0.6	17.1
Thailand	41,036	270	4.5	271	0.66	15.3	96.0	234	4.4	86.4	37	0.1	13.6
EUROPE													
France	52,742	4,540	5.0	12,405	23.52	8.1	94.0	4,546	46.2	36.7	7,859	18.3	63.3
Germany, Fed. Rep. of	62,040	5,320	4.0	18,767	30.25	8.7	100.0	8,185	46.1	43.6	10,582	23.9	56.4
Sweden	8,178	5,910	2.4	5,178	63.32	4.3	100.0	2,529	75.1	48.9	2,649	55.1	51.1
Switzerland	6,375	6,100	3.0	3,790	59.46	5.9	100.0	1,798	76.2	47.4	1,992	49.6	52.6
Turkey	39,127	600	4.4	900	2.30	11.3	78.9	618	8.6	68.7	282	0.9	31.3
UK	56,102	3,060	2.3	20,342	36.26	7.4	99.9	8,087	45.8	39.8	12,255	31.9	60.2
USSR	253,323	2,030	3.5	15,782	6.23	8.2	94.8	4,234	17.4	26.8	11,548	5.1	73.2
Yugoslavia	21,243	1,060	6.0	1,143	5.38	11.9	97.2	532	17.3	46.6	611	3.4	53.4
OCEANIA													
Australia	13,337	4,350	3.0	5,000	37.49	6.5	95.2	3,840	42.9	76.1	1,196	26.8	23.9
New Zealand	3,106	3,680	2.0	1,495	48.12	4.5	92.7	1,135	53.0	75.9	360	37.4	24.8

1/ Population at January 1, 1975 derived from the "Total Telephones" and "Telephones per 100 Population" appearing in AT&T's publication, World Telephones (January 1, 1975).

2/ Telephone and population statistics for Nepal and Pakistan are not available in AT&T's World Telephones (January 1, 1975). The figures shown are estimates derived from information available from reports in the Bank.

3/ Telephone and population statistics for Syria is not available in AT&T's World Telephones (January 1, 1975). The figures shown are derived from STE's Statistical Abstract of Telecommunications, 1975.

SOURCE - GNP Statistics: World Bank Atlas 1975.

- Telephone Statistics: World Telephones by AT&T (1975).

March 25, 1976

ATTACHMENT 2

Possible Format

Country		A	B	C	D	etc.
Date of information		---				
Population (millions)	Urban	---(---)				
(Growth rate, % p.a.)	Rural	---(---)				
	Total	---(---)				
GNP (US$/capita)						
Access to water supply as % of population	Urban	---				
	House conn.	---				
	Public Hyd.	---				
	Total urban	---				
	Rural	---				
	Total	---				
Access to waste disposal as % of population	Urban	---				
	Public sewers	---				
	Other methods	---				
	Total urban	---				
	Rural	---				
	Total	---				
Morbidity/mortality due to water related diseases (cases/100,000)		---/---				

Water Supply & Sewerage

Mr. John M. Kalbermatten May 12, 1976

Richard N. Middleton

Water Supply Division Chiefs' Meeting

I chaired a meeting of the water supply division chiefs (Mr. Reekie deputizing for Mr. Erkmen) on May 10, at which the principal topic was the simplified water supply questionnaire developed for use in EMENA, a copy of which is attached. (In your memo to me of 4/19, you had suggested we review the project brief system, but as yet there did not appear to be sufficient experience to make this worthwhile.) It was generally agreed that this new questionnaire was a step in the right direction, but that it was still too long for many of our less-sophisticated borrowers. It was agreed that Messrs. Thys and Williams would revise the present draft, making it more concise and improving the treatment of financial aspects. This revision will be essentially an aid to preparing a feasibility study in an urban area where the local institution has some degree of competence. Deadline for this would be the next meeting, Monday, June 13. Subsequently, Mr. Reekie will prepare a much more basic document, which will serve either as a guide for an identification mission or as a questionnaire for projects where the local institution is very weak (e.g., rural water supply).

LAC is endeavoring to establish common regional monitoring indices based on data requested from their borrowers. Mr. Zavala agreed that Mr. Fernandez should liaise with Mr. Jennings on appropriate indices. By the next meeting an agreed set of indices should be available for this region, which could then be extended to others. I offered CPS help in compiling this information, which I suggest should be regularly updated and circulated.

There was general support for re-introducing a system for recording unit cost data, while recognizing that even with CPS support this would impose an extra burden on regional staff. I agreed to prepare an outline proposal for discussion at the next meeting.

In discussions with Messrs. Denton and Mehltretter, we had agreed that for a trial period a memorandum on recruitment should be attached to the terms of reference of each mission (see my memo of 1/30/76 to division chiefs). In fact, this has not been done, and in view of the staff rotations since January I agreed to recirculate my January memorandum for possible further discussion at our next meeting. It is therefore annexed to this memorandum.

Attachments

cc: Messrs. Erkmen, Salazar, Thys, Williams, Zavala,
Shipman, Jennings, Ringskog

RNMiddleton/cel

Water Supply & Sewerage.

Mr. John M. Kalbermatten May 4, 1976

Richard M. Middleton

Procurement of Water Meters

Further to my memorandum to you of April 26:

I was called today by Mr. Beguery, Technical Assistant to the Executive Director for France, concerning the water meter specifications for Managua. He asked to be reassured that the high copper content of the meter bodies was required to resist the corrosive effects of the soil, and not because the water itself was particularly aggressive. I confirmed that this was my understanding from Mr. Freedman; however, if French manufacturers wished to have formal confirmation on this matter they should seek clarification from the borrower, since any views expressed by the Bank would have no legal validity under the contract.

I was also informed today, by Messrs. Maurin and Hai Chrun of Compagnie Europeenne de Traitement des Eaux, that they understand that the Asian Development Bank has rejected the consultants' specification for meters for the Manila water supply project, and has called for a new specification which would reflect common manufacturing practice in countries other than USA. This suggests that we might engage in a joint exercise with ADB in developing an appropriate specification for ICB.

cc: Messrs. Zavala, Lithgow, Saravanapavan

RMMiddleton/eel

Water Supply & Sewerage.

Messrs. Davis, Erkmen, Thys, Williams, Zavala

April 30, 1976

Richard N. Middleton, Senior Sanitary Engineer, EWTDR

Water Supply Library

We have hired Ms. Sharlene Krantz for a period of two months from May 3 to assist Phyllis Peter and introduce a new and improved indexing system for the water supply library. We hope that this will improve library service in several ways:

--make it easier for staff to know what books we have;

--hence, identify present gaps and what books we should purchase;

--provide a system for information retrieval from technical journals; and

--cross-reference to other sources of information within the Bank (especially the Bank's central library and central/regional filing systems).

As part of the exercise, we will be collecting all books which have been purchased by the Bank either for the library or for individual division, so that they can be included in the new index. I would be grateful if you would let staff members know what is going on and ask them to return any books surplus to their immediate requirements as soon as possible. We will follow this up with a visit to each division to record which books are still held for regular reference, and to collect books from the shelves of members who are absent on mission.

cc: Mr. Kalbermatten
Ms. Peter
Ms. Krantz
Mr. Zlatich

RNMiddleton/cel

Li- WHO/IBRD Coop. Progr. F-244

INTERNATIONAL DEVELOPMENT ASSOCIATION | INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT | INTERNATIONAL FINANCE CORPORATION

cc: Water Supply & Sewerage

OFFICE MEMORANDUM

TO: Files

DATE: April 30, 1976

FROM: Klas B. Ringskog

SUBJECT: Evaluation of Bank/WHO Water Sector Surveys

Introduction

1. The cooperative program between the Bank and WHO was established in 1971, supposedly to enable the Bank to draw from WHO's experience in the sanitation and health fields. The executing unit in WHO is the pre-investment and planning (PIP) unit, whose main undertaking has been water supply and sewerage sector surveys. On a few occasions PIP staff have also participated in project identification.

2. The usefulness for the Bank of the WHO Cooperative Program (CP) has repeatedly been questioned. The first sector surveys were often of very little use and were produced under friction as the WHO early drafts needed extensive rewriting and better focus on issues relevant to the Bank's project work. The difficulties were compounded as it was at times not very obvious why the Bank/WHO CP had been created and what for. WHO staff complained of no clear directives what the Bank expected to get out of the programme whereas Bank staff at times questioned whether WHO had anything to teach the Bank. Certainly, it was argued, it would have been preferable to do the sector work within the Bank and not have to train WHO staff to do it.

3. Although there is some evidence that CP sector surveys are slowly improving, a reluctance among the different regions to use the program has also developed. This is a reflection of negative Bank experience from earlier CP studies that clearly were of little or no use in project work. Often regions now prefer to undertake sector surveys in a low key way with their own staff, mostly in connection with a project identification or supervision mission. An expanded use of the WHO/Bank CP to follow up with project identification after sector surveys, certainly a logical step, is altogether ruled out by most Bank water staff who feel that WHO just will not produce any workable projects.

Purpose of the Memo

4. In the light of what has been said above this memo examines the 29 Bank/WHO water sector surveys available in at least draft form, and gauges their quality roughly. After evaluating the most apparent deficiencies several recommendations are made to make the sector surveys more useful.

Evaluation of Surveys - Timeliness

5. Annexed is an analysis of those 29 sector surveys done to date. With regard to their timeliness, as measured by the time required from field trip to final report, some 40% of the studies were completed in less than one year. One year can be regarded as a maximum allowable. Most of WHO CP surveys have thus not been timely. This is likely due to excessive scheduling of the CP staff and to cumbersome clearance of the reports. Lately, an effort has been made to spread WHO staff over fewer studies, which should lead to faster completion.

Evaluation of Surveys - Length

6. For any survey to be read the main text should be short, preferably no more than 15 to 20 pages. In this respect the WHO CP studies have failed. The average length of those examined is 27 pages of main text, excluding average summary length of 5 pages; 9 (35%) were 40 pages or more.

Evaluation of Surveys - Usefulness

7. The surveys were graded using four grades, to wit: "of little use," "of limited use," "of use," and "of much use". The grade distribution found is shown below:

	No.	Percentage
"Of little use"	14	48%
"Of limited use"	10	35%
"Of use"	5	17%
"Of much use"	-	-
Total	29	100%

8. The results are not encouraging. A majority of the studies have been of little or limited use. However, there has been a trend towards better and more useful studies. Among the more recent better ones are those for Chile, Algeria and Indonesia.

Main Deficiencies of Surveys

9. The flaws of each survey have also been listed in the Annex. The four main types of flaws are: "lacking focus," "lacking a clear structure," "lacking analysis of data collected," and "lacking style" (that could at least partly interest the reader). Those surveys "of little use" generally suffer from all four deficiencies. In general it seems that lack of clear thinking behind the surveys has spilled over into lack of clear writing. The reader, if he persists in finishing a study, is often left asking himself what he has just read.

Corrective Measures

10. It is obviously unacceptable for the Bank to keep funding to the tune of close to US$ 700,000 per year, a program unable to produce useful studies. One solution would be to slowly diminish the cooperative program by not renewing the contracts of marginal CP staff, of which there are several. However, this would not solve the problem of making much needed sector studies, as it seems that the Bank is not more consistent itself in the quality of its sector output. Two recent Bank water sector studies are unfortunately as bad as the WHO average, and certainly worse than some of WHO's recent and better studies.

11. Consequently the Bank/WHO CP will likely continue making sector studies and needs to improve. Any improvement will necessarily be evolutionary and will have to start in the early stages of each survey, but already some simple actions could be taken.

Action 1 - Improving timeliness

12. It is unacceptable for any study to take longer than one year from field mission through final report. There seems to be a correlation between rapid studies and heavy Bank staff input, however, and the recently adopted principle that a field WHO CP mission never go out without Bank staff participating should be stricly adhered to. For all the upcoming six new surveys, i.e. Portugal, Egypt, Syria, Congo, Tanzania and Philippines, Bank staff are already slated to participate. This will have added advantages of adapting the studies better to the Bank requirements.

Action 2 - Improving focus and structure

13. To improve structure and to reflect policy evolution (e.g. the Bank's preoccupation with the urban poor) new guidelines for the studies should be published. These are scheduled to be circulated for regional comments in mid-June. They are thereafter planned to be applied for the upcoming studies in Portugal, Egypt, Syria, Congo, Tanzania and the Philippines. The new guidelines will likely have the following framework:

(i) Analysis of existing service-levels;
(ii) Analysis of targeted or recommended service levels;
(iii) Analysis of the implications to achieve such service levels;
(iv) Analysis of the constraints appearing and proposals how to overcome them;
(v) Discussion of suitable projects and what the Bank's input could be to assist sector development.

14. The additional advantages of such an outline is that the main text of maximum 15 pages could serve as the Bank's internal sector memorandum. The summary could serve as sector briefs to form the input into CPP's.

Action 3 - Improving focus

15. Lack of clear focus is serious and it is proposed that two measures be taken. One first measure is to limit the main text to 15 pages and the summary to 2 pages. This will force the WHO staff to concentrate on what is truly important and set priorities. Any new study of more than 15 pages should be returned to WHO to be abridged. Additional text will have to go into annexes. A second measure to make the surveys more relevant for the Bank's project work is a wider use of proper briefing and debriefing of WHO staff to explain what the Bank expects to get out of each study. This has been an area where the Bank at times has passed up an opportunity to improve the studies.

Action 4 - Improving analysis

16. Data collected by WHO CP teams will have to be analysed before being included. As it is now there is a tendency to include irrelevant data, albeit in the annexes, that make the reports swell unduly. Such peripheral data should henceforth be rejected. The proposed heavier input of Bank staff should also improve the analysis. Necessarily, the analysis applied will only improve gradually, and it is too late for the Bank to have an impact when receiving WHO's first drafts unless Bank staff are quite familiar with the countries.

Action 5 - Improving style

17. The recent use of an editor on WHO reports is justified although there are limits to what good cosmetics can do to irrelevant data and text. The participation of Bank staff at the early stages of the survey, i.e. the field mission, will likely help style, as will the new guidelines to be produced. What is more lacking than correct grammar is lack of clear thinking and a more rigid structure of the studies will undoubtedly help.

Action 6 - Upgrading WHO Staff

18. Undoubtedly several of the ten PIP staff funded by the Bank are not quite up to the standards required and no amount of guidelines and improved Bank supervision can change that. Therefore at each semi-annual review of the CP working program the WHO staff available should be weighed against the tasks planned. If a certain WHO staff member does not fit well with the scheduled activities over the medium term the only logical step is to replace the person by not renewing his contract. Thereafter new staff,better reflecting the requirements, should be brought in .

ANNEX

cc: Messrs. Rovani, Kalbermatten, Shipman, Middleton, Jennings, Warford, Saunders, Williams, Morse, Erkmen, Thys, Salazar, Zavala, Buky, Nwaneri, Gillings, Bates, Culagovski.

KRingskog:mds

WHO/IBRD COOPERATIVE PROGRAM

ANNEX

. EVALUATION OF WATER & SEWERAGE SECTOR SURVEYS

Region and Country	Timing of Sector Study: Field Trip	First Draft	Country Presentation	Final Report	Time Lapsed from Field Trip to Final Report	Length of Survey, pages c/: Summary	Main Text	Usefulness of Survey b/	Main Deficiencies of Survey
Latin America & Caribbean									
Argentina	IV/75	X/75	VI/76 a/	N.A.	14 months	5	50	Of little use : 1	Lacking focus, analysis and style
Bermuda	IV/75	VI/75	VII/75	N.A.	15 months	3	42	Of little use : 1	Lacking focus, analysis and style
Bolivia	IX/73	II/74	VI/74	VI/74	9 months	6	43	Of limited use: 2	Lacking financial analysis and precision
Brazil	IX/72	VIII/73	N.A.	N.A.	N.A.	4	52	Of limited use: 2	Lacking focus, structure, analysis & style
Chile	X/74	II/75	X/75	N.A.	10 months	5	46	Of use : 3	Lacking analysis and style
Costa Rica d/	IV/74	X/74	N.A.	N.A.	More than 24 months	7	13	Of little use : 1	Lacking focus, structure, analysis & style
El Salvador d/	IV/74	X/74	N.A.	N.A.	More than 24 months	7	14	Of little use : 1	Lacking focus, structure, analysis & style
Honduras d/	IV/74	X/74	N.A.	N.A.	More than 24 months	8	14	Of little use : 1	Lacking focus, structure, analysis & style
Mexico d/	I/74	III/75	X/75	III/76	26 months	4	42	Of little use : 1	Lacking focus, structure, analysis & style
Nicaragua d/	IV/74	X/74	N.A.	N.A.	More than 24 months	6	16	Of little use : 1	Lacking focus, structure, analysis & style
West Africa									
Cameroon	I/74	IV/74	VI/74	XI/74	23 months	4	13	Of use : 3	Lacking focus
Upper Volta d/	XII/73	X/74	N.A.	N.A.	10 months	1	8	Of little use : 1	Lacking focus, structure, analysis & style
East Africa									
Ethiopia	I/73	.	.	IV/74	15 months	6	28	Of limited use: 2	Lacking focus
Sudan	XI/74	II/75	N.A.	N.A.	N.A.	2	16	Of little use : 1	Lacking focus, structure, analysis & style
Tanzania	IX/71	.	.	V/72	8 months	3	17	Of use : 3	Lacking structure
Zaire	IV/73	.	.	III/74	11 months	4	16	Of limited use: 2	Lacking focus, structure
Zambia	X/73	I/74	XI/74	VI/75	16 months	8	33	Of little use : 1	Lacking focus, structure, analysis & style
EMENA									
Algeria	IV/75	III/76	VI/76	N.A.	N.A.	20	45	Of use : 3	Lacking focus and structure
Iran	IV/74	X/74	XII/74	I/75	9 months	9	19	Of limited use: 2	Lacking focus and structure
Oman	III/74	VII/74	II/75	N.A.	11 months	5	28	Of little use : 1	Lacking focus, structure, analysis & style
Turkey d/	XI/74	II/75	IX/75	N.A.	10 months	3	15	Of limited use: 2	Lacking focus and style
Yemen Arab Republic	IX/72	.	.	II/73	5 months	3	19	Of limited use: 2	Lacking focus and structure
Yemen PDR	IX/72	.	.	II/73	5 months	3	20	Of limited use: 2	Lacking focus and structure
South Asia									
Bangladesh d/	X/73	XII/73	V/76	N.A.	At least 20 months	6	17	Of little use : 1	Lacking focus, structure and style
India - Madya Pradesh	XI/74	III/75	XII/75	N.A.	13 months	9	38	Of limited use: 2	Lacking focus, structure and style
Nepal d/	IX/75	.	IV/76	N.A.	At least 8 months	6	23	Of little use : 1	Lacking focus, structure, analysis & style
Pakistan d/	I/74	VII/74	V/76	N.A.	At least 29 months	7	42	Of little use : 1	Lacking focus, structure, analysis & style
East Asia & Pacific									
Indonesia	IV/75	IX/75	V/76	N.A.	At least 13 months	4	22	Of use : 3	Lacking structure and style
Korea	IX/74	I/75	II/75	V/75	13 months	5	40	Of limited use: 2	Lacking focus, structure and style

N.A. = Not Applicable

a/ Preliminary date

b/ Graded on 4 grades: Of little use = 1
Of limited use = 2
Of use = 3
Of much use = 4

c/ When survey is in double space a reduction factor of 0.75 to single space has been used

d/ Based on early drafts by WHO

April 28, 1976

✓ Water Supply + Sew
cc Transp + Urban

Mr. Alastair J. Stone, Chief, TRUDR
Through Yves Revani, Director, EWTDR

April 23, 1976

Richard M. Middleton, Senior Sanitary Engineer, EWTDR

Urban Poverty Task Group -- Progress Report on EWT Input

As you requested, I attach a brief note setting out the current status of our department's input into the water supply and wastewater aspects of the Task Group's work. Please let me know if you would like further details.

Attachment.

cc: Messrs. Kalbermatten, Shipman, Warford, Saunders, Ringskog, Duky

RMMiddleton/cel

1. The work of the department in relation to the Urban Poor policy can be divided into two broad categories: firstly, direct assistance to the Regions in analyzing their lending programs and in assessing the adequacy of the Bank's response to water supply and wastewater disposal needs; and, secondly, preparation of research papers, guidelines, etc., to assist Regions in incorporating the Bank's new policy into their projects.

2. A first round of lending program analysis has already been carried out for water supply projects. This indicates, as might be expected, that Bank sector lending will have only a marginal effect on the needs of the growing urban population; the situation is particularly bad in South Asia, where Bank projects will supply water to less than 7% of the 1975-85 increase in population, without reducing the existing backlog. This analysis is now being refined to provide a more realistic basis for target setting and consequent lending program revisions, but the exercise is hampered by poor basic data. An important input, which has been delayed, is the result of WHO's 1975 survey; a Bank mission visiting Geneva this month will again request that the figures are released to us on a confidential basis.

3. A similar analysis for lending for wastewater disposal is not feasible, due to lack of data on existing methods of disposal. It is apparent that provision of conventional sewerage will not be appropriate or affordable in many instances, and further research on this subject is necessary. Meanwhile, the Regions are compiling lists of the principal cities in which sewerage schemes appear essential within the next decade, as a guide to target setting.

4. A first step in changing the content of Bank projects so as to reflect the Bank's new policy emphasis is changing the attitudes of our staff and our borrowers. The paper being prepared by Professor Gilbert White on "Water Supply Service for the Urban Poor: Issues" is being reviewed in draft and will be the subject of a staff seminar this summer. The guidelines for sector work carried out by the IBRD/WHO Cooperative Program will be revised to strengthen the emphasis on affordable and appropriate service to all sections of the community, and assistance is being given to the Regions in developing responsive Sector Memoranda and Project Briefs.

5. Design criteria for water supply are being re-examined. Professor Lauria is about to complete his report on initial studies on design criteria and staging of investment in Colombia, and to submit proposals for further case studies. WHO, through the Cooperative Program, is critically reviewing commonly used design criteria, based on its experience as Executing Agency for UNDP. WHO has also been asked to compile, as soon as staff can be made available, comparative drinking water standards from various countries and to comment on the underlying rationale.

6. Many large metropolitan areas are approaching the limit of readily-exploitable cheap water resources. Reuse of reclaimed wastewater for industry or agriculture could free higher quality sources for domestic use, and so enable cities to extend service to their growing population at lower cost. Discussions are being held this month with consultants to prepare a state-of-the-art paper on reuse, for completion later this year.

7. Another neglected "resource" is unaccounted-for water, which in many cities may amount to 40 percent of production. This may be lost through leakage, used through illegal connections, or simply not billed because of administrative inefficiency. Whatever the cause, it represents lost water or revenue or both. Virtually all Bank projects include provision for reduction in unaccounted-for water. A case study is proposed to analyze the effectiveness of these provisions; at present, we are trying to find a suitable consultant for this work.

8. The Task Group has placed much emphasis on the need to provide jobs for the urban poor. We have engaged a consultant (Professor Miernyk of West Virginia University) to undertake a study on "The Employment Impact of Water/Sewerage Investments". The outline has been agreed, and the paper should be completed later this year.

9. The Task Group's reports have stressed the need for water supply undertakings to maintain financial standards even though they are extending service to poorer areas. Monitoring of these standards will continue to be part of our routine project review, and no special guidelines are necessary at this time. However, we are undertaking several related items of research. Professor Mann (West Virginia University) is preparing a paper (due June 1976) on various means of estimating marginal costs, which will aid our analysis of internal cross-subsidies implicit in tariffs, and improve our pricing policies. An in-house paper on public utility pricing and inflation, now being finalized, demonstrates that in most instances there is no reason for borrowers to resist raising tariffs on the grounds that such a step would fuel inflation. Later this summer we plan to begin a desk study of the financial implications of extending water supply service to the urban poor, using actual Bank projects to provide basic data.

10. At this point, research into wastewater disposal has been given a lower priority than research into water supply. We have begun an in-house study into the impact of sewer installation on water use and on utilities' costs, for completion this summer. An in-house paper on alternative methods of charging for sewerage services has been postponed due to staff constraints. As far as alternatives to conventional sewerage are concerned, a first staff seminar has been given by Dr. McGarry of IDRC, and we plan to keep up this contact. We also expect to participate in low-cost sanitation studies undertaken by IDRC or Urban Projects Department.

Water Suffly & Sewerage

Yves Rovani

April 28, 1976

Richard N. Middleton

Unit Costs for Common Project Items

We have been requested to provide "typical" unit costs for common project items, for an updating of CPM 9.1. Due to staff absence on mission and the short time allowed for preparation of the data, I have only been able to assemble from the regional divisions very approximate figures, and have not been able to explore the reasons for the wide range of values reported. The attached table shows the original CPM 9.1 values, the values now reported, and the values I suggest we might forward for inclusion in the revision. It should be clearly understood that these are not suitable for estimating purposes. Further work on developing and maintaining a useful unit cost retrieval system is undoubtedly necessary.

Attachment

cc: Mr. Kalbermatten

RNMiddleton/cel

	Original CPM	West Africa*	East Africa*	LAC*	EMENA**	Recommended for new CPM
Water charges for reasonably run systems, $/1000 US gallons	0.30-0.90	0.7-1.4	0.60-1.20	0.45-3.50	-	0.5-2.5
Municipal water systems, New or major expansions, Capital costs $/capita served	100-300	50-200	106	35-300	-	100-300
Municipal sewer systems, Capital costs $/capita served	100-350	-	-	18-100	-	100-350
Water treatment plant capital costs US$/US mgd capacity	100,000-300,000	200,000-400,000	-	70,000-150,000	140,000-210,000	100,000-300,000
Storage, capital costs $						
--Surface reservoir/US mg	50,000-75,000	50,000	-	75,000-100,000	80,000-140,000	75,000-125,000
--Elevated (40 ft to low water)						
0.2 US mg	40,000-70,000	-	-	50,000-100,000	95,000	50,000-100,000
0.8 US mg	90,000-130,000	-	-	100,000-150,000	245,000	100,000-200,000
Pipelines (pipes and fittings installed) US$/in.dia/ft.	1.00 (range 0.75-1.25)	0.6-1.75	5.0	0.30-1.80	1.40-1.75	0.75-1.75
Capital investments:						
--gross assets, $/1000 USg.	1.50-2.33	2.5	2.60-5.80	5.0-10.0	-	2.5-7.5
--incremental investment $/1000 USg of additional capacity	1.90-3.00	3.5	8.30-10.20	1.20-5.70	-	3 - 6

* As reported 4/76; no data vailable from ASPWS.
** Region accepted original CPM figures; new tabulation based on regional analysis of 1975 + 15%.

Water Supply + Sewerage

Mr. L. Rasmussen, Projects, South Asia April 14, 1976

Alastair [illegible], Chief, Urban Operations Review and Support Unit

Review of Draft Entitled "Water Supply and Sanitation Sector Study" Prepared by the IBRD-WHO Cooperative Program on Indonesia

1. I have reviewed the draft and found it promising but lacking in clarity especially with respect to the argumentation for the recommendations. These comments are constrained or perhaps unrestrained by my now having sighted terms of reference for the study, earlier drafts, and the annexes referred to throughout the text.

2. My review included an assessment of the report in regard to the Bank's policy emphasis on the poverty groups both rural and urban. While the field work for the report is now some 12 months old, the policy emphasis of the Bank especially on the rural side has been with us formmany years now and I believe the sector report should reflect this emphasis and every attempt should be made to bring this out in the report under review.

3. The first task of any sector report is obviously to define the current situation. The report contains much information on this and obviously more is in the annexes, however, given our new policy emphasis I believe we can ask for a more explicit definition of criteria used to judge whether a population is connected to a water supply or not. A second and major addition to our informational requirements is the description in income terms of the population with respect to those connected and those not. Much of this data will not be readily available but the orientation of these investigations towards these issues will show up the gaps in our knowledge and thereby define a demand for this information against which the authorities can begin to seek answers. In regard to the information that is presented, paragraph 3 in the Summary suggests that roughly one quarter of the population in 1975 is urban. To coincide with the detailed figures that follow in the text this statement should be amended to read roughly one fifth instead of one quarter.

4. The largest omission from the report in terms of focus and detail is a discussion of the relevant allocation to this sector vis a vis other sectors. This discussion should be conducted at two levels, one from the point of view of the consumer in terms of how he had to allocate his household budget, and secondly from the point of the government in terms of how it allocates its budget. I would imagine that the mission can make some very worthwhile judgements as to the reasonableness of present allocations and that these judgements should enter into the calculus for defining appropriate targets for the government. Similarly I would like to see more discussion regarding allocation within the sector, namely a definition of the different requirements between urban and rural, greater discussion of the allocation between water supply and human waste disposal as well as some discussion of the drainage problems associated with upgrading either or both of these services. In this discussion of allocation between different areas and to different items within the sector, the question of

unit costs in the different environments should be pursued. In the section on the proposed development program, unit costs for urban and rural are presented which suggest enormous diseconomies of scale in the urban areas when compared with the rural. An explanation of this would be most interesting and I look forward to seeing a copy of Annex 15 when it becomes available.

5. In the discussion on the kampung improvement program in para 3.11 it will now be appropriate to include a statement to the effect that the allocation to water supply and human waste disposal has been increased in the Bank's second project to 30% of the total investments as compared with 9% invested in these items in the first project.

6. A further point of emphasis in the report which I believe to be misleading is the discussion of the ratio of house connections to public hydrants and the need to "optimize" this ratio. Unless this discussion is placed in the context of varying rates of use, different sources of investment funds (household financing connections as compared to public financed hydrants), a breakdown of costs between house connections and the reticulation system and hydrants, etc., the outcome of the discussions tends to just highlight the different level in total cost of providing and operating the different levels of service. The discussion should explore the possibilities of differential rates and the impact that that would have on the investment program and a discussion of need to spread the access to the available water over as large a group as possible with a reasonable proportion to the poverty group.

7. The recommendations contained in the report are comprehensive and wide ranging but again they lack clarity with respect to the priorities that should be attached to each element. In this regard I believe the report should be able to argue for a substantial increase in the allocation of government funds to this sector, both from the point of view of the need that exists; and from the point of view of the comparison of the current allocations with norms established from experience of the mission in other countries. Again much information may be contained in Annex 14 but without it, it is impossible to judge. A time sequence of investment requirements related to numbers of people to be contacted, unit costs and the description of those persons in income terms would allow the government and the Bank to form a better judgement on the program that is now possible.

AStone:dd

Water Supply & Sewerage

All Water Supply Division Chiefs April 14, 1976

John M. Kalbermatten (Water and Wastes Adviser, EWTDR)

Typical Unit Costs of Common Project Items

We have been asked to update unit costs contained in CPM 9.1. You might recall that this memorandum was cancelled when rapid inflation made the presentation of this information difficult. I am attaching a copy of the water supply data of the earlier memorandum. Please feel free to add other items if you feel the list is not representative.

This should not be a statistical analysis but your best estimate of typical costs in your region. If you can establish a reasonable average all the better, but I doubt whether this is possible with the great variation in costs in the countries.

Please let us have your reply by c.o.b. April 21.

Attachment

JMKalbermatten:mk

cc: Messrs. Shipman (EWTDR), Middleton (EWTDR), Ringskog (EWTDR)

WATER SUPPLY

	Cost per 1000 gal in US$	Cost per cu meter in US$
Water Charges assessed for reasonably run systems	0.30-0.90	0.07-0.24

	Capital costs per capita served in US$
Municipal Water Systems New or involving major expansions	100-300
Municipal Sewer Systems	100-350
Water Treatment Plant costs/million gals Surface water	100,000-300,000
Storage - surface reservoir/million gals	50,000-75,000
- elevated (40 ft to low water) 0.2 MG	40,000-70,000
0.8 MG	90,000-130,000
Pipelines (rule of thumb) Pipe and fittings installed	$1.00/in. diamater/ft Range $0.75-1.25
Capital investment 1/ in fixed assets per unit of water production capacity at end of recent or ongoing expansion program:	
Gross assets per unit of total annual capacity - per m^3	Range $0.40-0.60
- per 1000 US gals	$1.50-2.33
Incremental investment 1/ per unit of annual capacity added by expansion program - per m^3	Range $0.50-0.80
- per 1000 US gals	$1.90-3.00

1/ Including cost of detailed design, construction supervision and any management consulting expenditures, during expansion program.

Water Supply & Sewerage

FORM NO. 27
(11–75)

WORLD BANK / IFC
OUTGOING MESSAGE FORM
(TELEGRAM/CABLE/TELEX)

☐ IBRD
☐ IDA
☐ IFC
☐ ICSID

TO: VAN DAMME
WORLDWATER
THE HAGUE

DATE: APRIL 12, 1976

ORIGINATOR'S EXT.: 5345

LT/LT

COUNTRY: NETHERLANDS

CLASS OF SERVICE: ~~TELEX 51 9 1247~~

CABLE NO. & TEXT: REURTELEX MEETING WITH HAND PUMPS APRIL NINETEEN

PRIMARILY FOR INTERNAL CONSUMPTION IF YOU WISH TO ATTEND YOU ARE

WELCOME STOP IF AVAILABLE MISTER JOURNEY WILL ACCOMPANY BANK

REPRESENTATIVE TO JULY MEETING THE HAGUE TO REPORT ON HIS WORK

KALBERMATTEN
INTBAFRAD

NOT TO BE TRANSMITTED

REFERENCE:	AUTHORIZED BY *(Name)*: John M. Kalbermatten, Water and Wastes Adviser
DRAFTED BY: JMKalbermatten:mk	DEPARTMENT: Energy, Water and Telecommunications
CLEARANCES AND COPY DISTRIBUTION:	SIGNATURE *(Of individual authorized to approve)*: John M. Kalbermatten
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Water Supply & Sewerage

April 12, 1976

Mr. Saul Arlosaroff
Deputy Water Commissioner
City of Tel Aviv
P.O. Box 7043, Hakirya
Tel Aviv, Israel

Dear Saul:

I am sending you a copy of a letter I wrote to Professor D. Goldberg asking him to prepare a state of the art paper on Reuse of Waste Water for Food Production. As you can see I mentioned to him that I would ask you to prepare a paper on the institutional and economic aspects.

Concurrently with this paper, I am having another one prepared on the potentials of Waste Water Reuse for Industrial applications. Subsequently I hope to use Mexico City as a case study. As you know, in Mexico we will not only be talking about technical aspects of waste water treatment and subsequent reuse, but more importantly, institutional arrangements. I am sure it will be a challenging task and hope that you would be able to participate in the field work when the time comes.

In the meantime, I would like you to provide the input for the institutional and economic aspects of treating and transporting waste water to the agricultural/industrial consumer. At this stage, your work would obviously be concerned with the more general and basic aspects only, as details will vary from case to case.

I look forward to my forthcoming visit and hope we will have the time to review this project and some possible future activities.

Sincerely yours,

John M. Kalbermatten
Water and Wastes Adviser
Energy, Water and
Telecommunications Department

Encl.
JMKalbermatten:mk

Water Supply & Sewerage

April 12, 1976

Professor D. Goldberg
Irrigation Department
The Hebrew University
Rehovot, Israel

Dear Professor Goldberg:

We met about a year and a half ago during the Workshop on Waste Water Reuse, sponsored jointly by the Government of Israel and WHO, held in Herzliya. I was impressed at the time with your work in Waste Water Reuse in Irrigation.. Recently, I have assumed the position of Water and Wastes Adviser for the Bank. As part of my new duties, I am reviewing past and exploring future activities by the Bank in the Reuse of Waste Water.

As you know, the major share of Bank loans in the water supply and sewerage sector has been for water supply; however, we are beginning to finance more and more waste water diposal projects. At least one region is very heavily involved in the financing of sewerage projects. Consequently, it is time to ask whether we should not move from waste disposal to the reuse of waste water. I am writing you today to find out whether you would be willing to prepare for the Bank a state of the art paper on the reuse of waste water for food production. In view of yuur own research in this field, there is no doubt that you are eminently qualified to prepare such a report. I will be travelling in the Middle East in early May and plan to stop in Tel Aviv on May 6. If it is convenient, I could meet with you on May 7 to discuss the details of such an agreement.

In brief, the paper I have in mind would review present practices in waste water irrigation, fish or algae culture, indicate areas in which further research and development is needed and recommend potential pilot projects the Bank could finance as part of its lending program in water supply and sewerage projects. Some of the topics to be covered would be the suitability of crops, methods of irrigation, effect of increased soil salinity on productivity, potential of groundwater contamination, danger of contamination by handling of produce, appropriate treatment, effects of toxic substances and heavy metals.

We are proceeding to contract a parallel study for industrial reuse of waste water with similar objectives. In view of Mr. Saul Arlosaroff's experience in utility operations, I plan to contact him in an effort to have him prepare a report on the institutional aspects and the economics of treating and supplying waste water to the consumer for both these studies. I will therefore send him a copy of this letter for his information. While I plan to make individual arrangements with you and Mr. Arlosaroff, I have, of course, no objection if you wish to discuss this study with him prior to my arrival in Tel Aviv.

I hope you will have the time to undertake this study for the Bank. I do not propose to include any field work as part of this study, but anticipate future activities resulting from this effort which could require travelling abroad. If there is any need to contact me prior to my arrival in Tel Aviv you can do so through Mr. Horning of FAO in Rome where I will participate in the ACC Sub-Committee on Water Resources from April 26-30. In the hope of seeing you shortly, I remain

Sincerely yours,

John M. Kalbermatten
Water and Wastes Adviser
Energy, Water and
Telecommunications Department

cc: Mr. Saul Arlosaroff (Tel Aviv)

cc: Messrs. Shipman (EWTDR), Middleton (EWTDR), Hotes (ARD)

JMKalbermatten:mk

Transportation & Urban [illegible]

Cc Water Supply & Sewerage

Messrs. Davis, Erkmen, Thys, Williams, Zavala

April 12, 1976

Richard M. Middleton, Senior Sanitary Engineer, EMTDR

Urban Poverty Task Group

My memorandum to you of April 2 commented on the water supply targets set out in the recent Interim Report. The report did not deal with similar targets for sewerage services, principally because the need for these services is much more a function of city size; targets expressed on a national basis therefore tend to be irrelevant. Moreover, in smaller towns or less-densely populated areas, waterborne wastes disposal may not be the appropriate solution. Given the tremendous backlog in the provision of waste disposal services, the immediate need is to identify the major conurbations in which sewerage services will be required in the period up to, say, 1985. It is possible that you have already been approached for this information by your representatives on the Task Group; if so, I would appreciate receiving a copy of your response. If not, I would be grateful for tabulated data showing:

- Country
- City
- Estimated 1976 population
- Estimated 1985 population
- Present access to sewerage service
- Investment needs to serve 1985 population (expressed in 1976 $ per capita, and 1976 $ total).
- Whether sewerage services for these cities are included in the current lending program.

Please let me know if you consider these headings inappropriate or would like to suggest modifications. I realize that many staff are at present away on mission and that compilation of this data will take some time. Nevertheless, please try to let me have first estimates by April 26, so that we can produce a consolidated list by the end of the month.

cc: Messrs. Kalbermatten, Jennings, Saunders, Ringskog, Stone
Mr. Kent (WHO)

RMMiddleton/cel

LI-WHO/IBRD

Coop Prog
Water Supply Draw

Mr. John M. Kalbermatten

cc April 9, 1976

Richard H. Middleton

Clearance Procedures for Sector Studies Executed by
the IBRD/WHO Cooperative Program

Situation

1. As I discussed with you yesterday, I have been concerned for some time that there are no clear guidelines for clearance of these sector studies. Most have been cleared on an ad hoc basis by the regional water supply divisions through whatever levels of regional management they considered appropriate, and subject of course to review in this department. The procedure has probably been least formalized in the two Asia regions (where the reports are referred to as working documents, to be used where applicable in Bank work), and most formal in East Africa, where reports have appeared in Bank grey covers.

Problem

2. These informal procedures have two major drawbacks:

- Not all interested parties may be invited to review and clear the reports. This is particularly likely now that other departments (Urban, Rural Development) are seeking to have an impact on policy within the public utility sector, and are independently developing water and wastes projects.

- Reports undertaken at WHO's request, in countries where the Bank had at the time of the survey no particular sector interest (e.g., Argentina), or reports which the Bank has decided to review only cursorily, may be taken by governments as representing the Bank's position since the reports have the Cooperative Program cover, even though such reports have not been fully cleared within the Bank. This could be particularly damaging in cases where the Bank lending strategy suddenly changes (e.g., most recently, Portugal).

3. A minor consequence, of no operational significance, of these procedures is that a number of surveys have been carried out without the Region taking full responsibility and issuing a Form 700. The work has therefore been coded 5¢ and tends to lead to confusion and mis-statement in PSE's analyses. Moreover, since the Bank staff updating these Forms 700 that are fully coded do not know WHO's workplan in sufficient detail, the manpower data recorded on the forms is usually completely incorrect.

Background

4. An attempt was made to formalize procedures shortly after the Bank's reorganization, when it was realized that the "Blue Book" procedures were not

entirely applicable to Cooperative Program work. The results are summarized in a memorandum from Mr. Shipman to Mr. John King, dated April 19, 1974, attached as Annex 1. The principle new features of these procedures were:

- They applied only to reports which would eventually be issued in grey cover by the Bank; that is, they excluded (implicitly) WHO-initiated studies or studies in the two Asia regions.

- The Issues Paper was replaced by the first draft report.

- The Decision Meeting is essentially a Projects Division/CPS affair, others attending by invitation. The Decision Memorandum is replaced by comments sent to WHO, with very limited distribution.

- Clearance of what would normally be Yellow or Green covers is the responsibility of the Projects Division Chief. It is not clear when he has to consult at this stage.

5. Our experience with the quality of Cooperative Program reports continued to be bad; in particular the first drafts were frequently so badly written as to be almost impossible to review constructively. It was therefore agreed that an attempt should be made to introduce the Issues Paper/Decision Memorandum process, to draw out key problems early in the drafting stage, and generally to conform more closely to Bank guidelines. This attempt was abandoned fairly soon after its inception, for two major reasons:

- by the time WHO had prepared an Issues Paper, held a Decision Meeting, prepared a Decision Memorandum, transmitted it to the Bank, and received Bank comments, so much time had elapsed that the mission members needed to have completed their report in readiness for a new assignment;

- the number of stages involved in the whole process meant that it was excessively cumbersome and time-consuming, particularly after allowing for mailing delays and staff absence on mission (affecting each organization). This is well set out in WHO's letter of April 29, 1975, attached as Annex 2.

6. Following the abandonment of the 4/75 proposals, the procedures reverted to the informal ad hoc system in existence today.

Proposals

7. As a basis for discussion, I propose the following measures to improve the present situation. These are labelled either "NO CHANGE", where they merely formalize existing procedures, or "CHANGE", where they depart from current practice.

(a) All studies, however initiated, should be handled in the same way. The largely artificial distinction between IDRD-initiated and WHO-initiated studies should be dropped. (CHANGE)

(b) Responsibilities for clearing mission timings with governments, which are at present determined by which agency initiated the study, should be determined ad hoc. Generally the Bank will clear missions to countries where it has a resident mission or an active sector lending program, WHO the rest. (CHANGE)

(c) The Bank will, as far as possible, be represented on every survey mission. In countries where there is a sector lending program, the Bank staff member would normally be drawn from the regional projects division. In other countries staff might be regional or from CPS, depending on availability. (NO CHANGE)

(d) All studies should be incorporated into the PDB time recording system, but the Form 700 to be used should be redesigned to reflect the procedures suggested below. The task code should indicate that the work is being undertaken by the Cooperative Program and that special procedures apply. Form 700 updates (target dates, manpower inputs) should be prepared by WHO and not by the Bank. (CHANGE)

(e) The contents of the CP workplan will be decided in outline during regular six-monthly meetings in Washington, attended by Projects Divisions, CPS and WHO representatives. Regional projects division chiefs will have the responsibility of ensuring compliance with their regional sector work program. (NO CHANGE)

(f) Projects Division Chiefs will be responsible for briefing WHO on the Bank's position vis-a-vis each country on the workplan and on the particular objectives of each study, as seen from the Bank's perspective. This briefing material, to be released confidentially to CP, will include Sector Briefs and Memoranda, CPPs, Project Briefs, mission and Appraisal Reports, etc. Programs Division clearance will normally be required. Initial briefing material should reach WHO well in advance of the reconnaissance mission. (NO CHANGE)

(g) CPS will continue to be the main channel of communication with WHO on all matters of scheduling, liaison, general administration, etc. Regional Projects Divisions will take over responsibility for review of all incoming material (terms of reference, draft reports) and for transmittal of the Bank's consolidated comments to WHO (for mission staffing responsibility see (c) above). Where workload or mission commitments make it necessary, Projects Divisions may ask CPS for assistance. CPS will have one staff member devoted virtually full time to this work, thus providing a central pool from which regions can draw. (CHANGE)

(h) Terms of Reference for missions will be prepared by WHO and reviewed by the Bank (CPS; Programs; divisions or departments in other sectors; regional projects department) under the chairmanship of regional Projects Divisions. (Note: special procedures may apply in East Asia and Pacific region, where the Assistant Projects Director holds an Initiating Meeting on all sector work). (CHANGE)

(i) The Issues Paper/Decision Memorandum procedure will not be used. Instead, a Mission Position Paper will be prepared as soon as possible after the end of the missive, setting out very concisely the principle issues and the way the mission proposes to handle them in the report. Ideally, this should be prepared in the field, so that it can be agreed with the Bank staff member (who will normally have joined the mission at least for the wind-up discussions with government). The MPP would be distributed by the Projects Division to the same people that commented on the mission terms of reference; comments (within five days) would be consolidated and forwarded to WHO. (CHANGE)

(j) The first draft report from WHO (effectively a "yellow cover") would be distributed more widely than at present and reviewed more thoroughly. Distribution would be as in (h) and (i) above, with written comments (possibly followed by a meeting) due within five days. (CHANGE) The Projects Division would take responsibility for this stage (see (g) above). For this to be a practical procedure WHO needs to improve their present performance in three ways:

— not sending "very rough drafts to get your preliminary reactions before x goes on mission";

— not sending drafts which are virtually unintelligible until edited; and

— not sending edited drafts with requests for clearance in three days because of already-scheduled missions for presentation to government.

The implications for WHO are:

— employment of an editor (possibly part-time);

— review of present manpower/scheduling procedures to allow sufficient time for internal review; and

— critical assessment of staff competence in report preparation. It is doubtful whether the CP, which is essentially devoted to report writing, can afford to retain staff who, while technically competent, cannot express themselves in writing.

(k) If the "yellow cover" standard can be improved, then clearance of the second draft from WHO (in Bank parlance, a "green cover") should be much easier than at present. If WHO agree with the Bank's comments on the first draft, and incorporate them, then the report is cleared by the Projects Division with the Programs Division (that is, the "Blue Book" procedure), keeping CPS informed. If WHO does not agree with the Bank's comments, and does not incorporate them, then further actions will have to be decided on an ad hoc basis. In many cases it may be best to record clearly the areas of disagreement and resolve these during discussions with government (see (l) below). (NO CHANGE)

(l) Ideally, both Bank and WHO staff should participate in presenting the "green cover" to government. This is especially vital where the Bank has an active lending program in the country or where the report contains unresolved major issues on which tripartite discussions are advisable. In these cases the Bank staff members should be carefully briefed by both Projects and Programs divisions (and possibly CPS) before departure. (NO CHANGE)

(m) Finalization of the report follows the "Blue Book" procedures, no matter whether it is printed in Geneva (normal) or Washington (exceptional).

8. The appropriate time to explore these procedures with WHO would seem to be the next liaison meeting in Washington (June/July this year). Prior to that, we will need to have a series of discussions departmentally, with our front office and P&D, and with our regional colleagues.

cc: Messrs. Ringskog, Saunders, Shipman

RSM:[illegible]/Beton/cal

Water Supply & Sewerage

Dr. James A. Lee

April 9, 1976

J. Tixhon JT

P.U. Report No. PUN 21 - PRICING AS A MEANS OF CONTROLLING THE USE OF WATER RESOURCES

Introduction

1. The Public Utilities Department of CPS published the above report as a means of controlling the use of water resources. It is issued, among other reasons, "for the information and guidance of Bank staff working in water and wastes".

2. Under Chapter 4, p. 10--Pollution Control, the report discusses the different methods of controlling effluent and comes out in favor of the effluent charge system. This Chapter 4 is a verbatim quotation of "Effluent Charges" found in the policy paper "Environment and Development", p. 29-31, with two paragraphs omitted. In the policy paper, effluent charges are described as being one way to control pollution. In PUN 21 the reader is led to believe that the Bank official policy is to promote effluent charges, which it is not (see policy paper, p. 32, 1st para.). I disagree with the report for the reasons given below.

Effluent Charge System

3. Theoretically there is no doubt that the polluter being fined according to the amount of discharged pollutants is the solution that is closest to the economic optimum.

4. However, the procedure to arrive at the total amount of pollutants and at the ratio between it and the fine to pay is already fraught with difficulties.

5. Each amount of pollutant will have to be weighed according to its toxicity. A ppm of lead is more toxic than a ppm of BOD. How much more is open to question. Synergy between two pollutants can complicate the addition.

6. Even the same pollutant can vary in toxicity depending on the receiving waterways. Mercury can stay as inorganic mercury or be methylated depending on the bacteria in the riverbed. Who will decide how much will be methylated and what the results of that methylation will be?

7. The report compares the system of effluent charges to a uniform regulation. The regulation does not have to be uniform. The effluent factors like pH, temperature, BOD, TSS, can vary according to the respective flows of the effluent and the waterway. This is the procedure we applied in several industrial projects.

8. The international experience with effluent charge systems is not that good. It creates problems of inter-border pollution and friction between countries. The Rhine River is a case in point. In 1973 everybody in Switzerland, Germany and mainly France (Potasses d'Alsace) was dumping chlorides into the river with the result that in Holland, chloride concentration was at the level of several hundred ppm. The Dutch phosphoric acid plant, Albatros (Rotterdam), had to run the process 10°C below design to decrease corrosion. Despite this, they were losing pump rotors every few weeks. Should they be compensated? If so, how much? Another case is the Bank project CEL in San Salvador. If CEL is allowed to dump arsenic and boron into an international river, the Rio Paz, how much should Guatemala be paid? What happens if fish and shellfish are poisoned by arsenic, if people are poisoned? What happens if after ten or twenty years several thousand hectares of irrigated soil are rendered unproductive by boron poisoning?

9. The report then rejects uniform standards as inefficient with respect to enterprises with different marginal costs. It may be so. But, is not pollution control installed for the protection of health and life? If the standard achieves this, it can afford to be inefficient from time to time. On the other side, the optimal solution from an economic point of view cannot be achieved without giving a price to human life and a cost to sickness or happiness. Only God or a politician can do that.

10. Individually adjusted standards are claimed to create overwhelming information and administrative problems. This is not the case here where we apply them. Even if it were so, I still think that because of the monitoring problems the effluent charge system will be more complicated and more cumbersome.

11. The statement is made that marginal costs increase exponentially with the decrease of pollutants in the effluents. This is true for the same plant being revamped. This is not always true for a new plant whose design incorporates the necessary abatement equipment. And, this is definitely not true if changes of process are possible. The caustic chlorine industry in the US went from the amalgam cell to the diaphragm cell, eliminating mercury completely (zero discharge), without any discernible effect on costs or profits. In other words, technology does not stand idle. What was impossible five years ago may be commercially available now or in the near future. To take another example, zero discharge of SO_2 in a sulfuric plant could be achieved easily now by cooling the absorption ~~fumes of gas~~ tower off-gases at -10°C to liquify the SO_2 and separate it from the nitrogen and the oxygen. The SO_2 could then be reinjected into the SO_3 converter. The investment cost would increase but, depending on the future price of sulfur, the total cost might decrease. The case for a rigorous system of charges may become stronger in a theoretical economic study. It is much weaker in real life if possible technological advances are taken into account.

12. Finally, the report states that the effluent charge system may be a source of funds for environmental improvement (i.e. collective treatment works). These funds can be found elsewhere, however, as in the IFC project of Zenica (Yugoslavia). There, the steel plant pretreats its

effluent (cyanides-phenols). The treatment is then completed in the town sewage treatment plant (Yugoslavia has uniform standards).

Conclusion

13. I hope the preceding argumentation convinces you that the system of effluent charges is not the panacea described in PUN 21.

14. I also regret that the report writer did not discuss the pollution control with us before issuing the paper. PUN 21 is an official document. My job with IFC or Bank engineers may be more difficult if they argue about individual standards (uniform or not).

15. I believe an organization like the Bank should not simply equate pollution with dollars and cents. Before looking at the least cost solution, we should first make sure that this solution does not imply any trade-off between economic profit on one side with health and life on the other. We should also make sure that the environment is not irreversibly destroyed. If we are sure of these two things, the way to achieve them is of secondary importance.

16. I believe the paper should not be presented as it is now to the UN World Water Resources Conference in Argentina during 1977 and that Chapter 4, "Pollution Control", should be rewritten. I have the impression that the writer is only thinking about biodegradable pollutants (i.e. BOD, temperature) and not about permanent toxicants (i.e. Hg, As).

Attachment

JT:fb

cc: R. Overby

Transportation & Urban Dev
re Water Supply and Sewerage

Mr. Richard N. Middleton (PBPDR) April 1, 1976

Jozsef B. Buky (WAPPB)

Water Supply Service for the Urban Poor
Issues Draft Paper by Professor Gilbert White

Professor White's paper provides an excellent summary of all the questions and background information which has already been discussed from time to time in various forms. I only wish to make a few comments on selected issues as follows:

1. In connection with his discussions on the Urban Poor in the so-called shanty towns (2.11 onwards), my experiences are that governments (municipal or state) generally tend to discourage this form of settlement mainly because of the "no fixed address" population and it is almost impossible to collect any form of taxes or charges in respect of however minimal municipal services. Furthermore, these kind of settlements seldom if ever develop into higher grade organized residential areas (attempts for slum upgrading notwithstanding) and therefore it is extremely difficult to decide on the level of service to be provided (if any). In most cases, slums remain slums for a very long time and people who can afford it move out and new migrants take their place. Provision of water supply services which may be made on public health considerations inevitably draw demands for other municipal services (roads, street lighting, etc.) with little hope of cost recovery.

2. Type of Service

I believe experience in general will show that intermittent service in any urban development has always started unintentionally as a matter of emergency and, if circumstances so developed, such emergencies tended to extend over a long period. It would be interesting to find out if anyone has deliberately designed a new system to provide intermittent supply. The difficulties in operating such a system are well-known and the assumption of severe health hazards is logical but I doubt that conclusive proof could be found either way with a research study. Other references to shortcomings in design, particularly of distribution systems often quoted as deliberately neglecting the Urban Poor, may be more difficult to analyze. It is well-known that we generally do not get involved in distribution during project preparation as distribution extensions tend to follow the main project on an extended time-scale and are generally left to the utility to carry out. We should certainly try to do more on this front but it may involve greater manpower use following project completion, i.e. specific supervision issue. I do not entirely agree with Professor White's views on the design of different types of distribution systems or levels. A good design will fully take into account the level of consumption in specific districts or areas of the

city which usually retain their character over a very long period. In other words, high income residential areas will remain consumers while high density low income areas will generally remain small consumers. It is, therefore, perfectly feasible to use within one city practically all the forms of services quoted by Professor White without a policy commitment to any one type.

3. Water Quality

Just a brief comment. People in poor areas, or rich for that matter, do not understand coliform counts but they do understand color, taste and odor; while the water must be free from bacterial contamination, the visible effects produced by conventional water treatment are essential if the public is to accept the water. Standards and degrees of treatment will of course vary according to raw water quality and that must be the criteria for the treatment ultimately provided rather than some economical level of expenditure.

JBB
JBBuky:fm

/ Water Supply & Sewerage
cc 2I - WHO / IBRD Cop/Berg

Mr. Yves Rovani, PBPDR

March 26, 1976

Richard N. Middleton, PBPDR

Country Sector Work -- CPS Activities

The following rough working notes, concerning the water and wastes sector, are in response to Mr. Ray's memorandum of March 22 to Mr. Warford, requesting a working paper by April 2nd to serve as a background to a meeting on April 9.

1. Sector work in the water and wastes sector is carried out in three principal ways:

   - as part of project identification and preparation
   - through special missions by regional projects divisions
   - through the IBRD/WHO Cooperative Program (CP).

   The first and third are the most important; a list of CP activities to date is attached for reference.

2. The need for sector studies is reviewed twice yearly during WHO/IBRD CP liaison meetings in Washington. At these meetings the Bank's lending program and level of sector knowledge are reviewed, requests for sector work from WHO and its regional offices are submitted, and the work plan and allocation of work between the Bank and the CP are agreed.

3. The Bank participates in work carried out by the CP, using CPS and regional sector staff, as follows:

   - review of terms of reference for reconnaissance and sector survey missions
   - debriefing of missions on return
   - participation in missions to the extent possible, in particular in "wind-up" discussions with government at the end of the survey and in presentation of the final reports to government
   - review of the reports at all stages. However, these are prepared in Geneva and do NOT go through the Bank's multicolor process (although some final reports are issued in grey cover). Paragraph 7 of Attachment III of Mr. Ray's memorandum does not therefore apply in this case.

4. CPS is also involved in regional projects division activities through:

- the six-monthly planning review (para. 2)
- reviewing all terms of reference, back-to-office reports, appraisal reports, etc.
- review of the timetable for sector memoranda and sector briefs, and review of these documents when they are drafted.

5. Guidelines for sector work carried out by CP (and, by implication, for sector work carried out by Bank staff) have been issued: see CAS 4 of November 9, 1973. Proposals to introduce a more standardized format for sector reports have been raised from time to time (most recently at the November 1975 liaison meetings), but no consensus has been reached on whether this would be more efficient than present practice. Guidelines for sector memoranda and briefs are under consideration (see memo Rovani to P.U. division division chiefs of March 9, 1976).

6. Special sector topics are normally handled by regional divisions in the course of project preparation, often through UNDP studies (e.g., organizational, financial or legal reforms). Others may be special Bank missions, with CPS specialist support (e.g., Lahore and Bangkok tariff studies).

7. When an extra staff member joins this office in early April, we plan not only to improve the quality of review of sector reports but also, through analysis of past and ongoing reports, to produce a series of information papers analyzing particular sector aspects in some detail.

8. At present, reports on CP work are prepared by WHO quarterly and annually. These are summarized on a calendar year basis, following UN practice. Reports summarizing Bank regional sector activities are not seen by CPS.

9. P & B's analyses, based on computer printouts, have not yet been able to reproduce the time spent on sector work. They consistently differ from CP timesheets, which are hand-processed in Geneva. As a result, analyses such as that presented in the May 5, 1975 memorandum are inaccurate; for example, 5.5 man-years are shown as a projected total for FY75, at a time when the CP had 9 full time staff plus consultants; the actual time allocated to sector work was 7.7 man-years, and in effect the whole staff input (10.4 man-years) could have been taken under this category.

10. To undertake the analysis envisaged in Mr. Ray's memo, we would need:

- more accurate Form 700s (which would need to be processed both by the Bank and by WHO)

- much more accurate data processing by P & B

This would not be undertaken by the Department alone at its present staffing level; very substantial input would be required from the regions and from WHO. P & B would also have to be able to process data more promptly and accurately than at present.

11. There are a number of WHO-originated sector reports, or reports for which the Bank does not take responsibility, which are classified under SWØ. In the past P & B has refused to allocate a code to these activities on the grounds that a Form 700 has not been issued. Attachment IV, para. 6 of Mr. Ray's memorandum suggests that these will now be coded, to reduce the SWØ classification. Has this been agreed with P & B? Is there any reason why reports not subject to approval by the Bank should be given a Bank code -- or would the new category, Co-op Reports, ignore all these distinctions?

12. The above notes cover most of the points raised by Mr. Ray's memorandum. I would like to comment that the deadline (one week) is too short -- Mr. Ray's memorandum obviously reflects a considerable amount of time and thought and a similar amount should be allowed for a response.

13. I believe certain basic questions need to be raised concerning Mr. Ray's proposals:

(a) What are the purported benefits of additional administration monitoring, and what are the likely costs?

(b) Is there any point in striving for consistency between sector work (at all levels of detail) in all parts of the Bank and the Cooperative Program?

(c) Is Mr. Ray aware of the considerable effort now being made by WHO to improve CP management -- as evinced by appointment of Mr. Schultzberg as a full time manager -- and of WHO's dislike of constant "second guessing" by a patronizing Bank? Any increased CP monitoring activity should be first agreed with WHO and then implemented in Geneva rather than in Washington.

(d) Does Mr. Ray know that attempts to fit CP into the Bank's complex review process (issues paper/decision meeting/white/yellow/green/grey) have been tried and rejected as simply too cumbersome. The number of steps involved, the fact that all discussion has to be my mail, the heavy travel commitment by both CP and Bank staff (which make assembly of review panels difficult) all lead to excessive delays. Some reports are not still completed after two years. Our response to this has to seek to place increasing responsibility on WHO for the quality and timeliness of their reports, and to provide Bank staff input in the field whenever possible. It is not possible to ask WHO staff to be present in Washington throughout the review process -- apart from the cost, it would add considerably to their travel time, which is already high (three, four or five week trips a year, plus minor missions). The solution must be to build up their own competence, so that a sector report can be issued under a CP cover and used with confidence in Bank work.

Attachment

cc: Messrs. Kalbermatten, Warford, Saunders (PBPDR),
Ms. Peter (PBPDR)

RNMiddleton:mk

SECTOR STUDIES TO MARCH 23, 1976 Country (Mission Date)

EAST AFRICA (6)

Ethiopia (1/73); Zaire (4/73); Zambia (10/73); Somalia (2/76); Sudan (11/74); Tanzania (9/71)

WEST AFRICA (1)

Cameroon (1/74)

EMENA (6)

Iran (4/74); Algeria (10/75); Oman (3/74); Turkey (11/74); Yemen PDR (9/72); Yemen AR (9/72)

LAC (10)

Bermuda (4/75); Bolivia (9/73); Argentina (7/75); Central America - Honduras, El Salvador, Nicaragua, Costa Rica (4/74); Chile (10/74); Mexico (1/74); Brazil (8/72)

ASIA (9*)

Bangladesh (10/73); Korea (9/74); India-Madhya Pradesh (1/75); Indonesia (4/75); Malaysia (2/75); Nepal (9/75); Pakistan (1/74); Thailand (3/76); India-Uttar Pradesh (7/75)

*Uttar Pradesh and Madhya Pradesh taken separately.

OTHER RECONNAISSANCE

Liberia (2/73); Guatemala (3/74); India (5/72); Malawi (10/73); Burma (73)

Special Assistance Missions

PRE-APPRAISAL MISSIONS

Israel (11/71); Iran (Lar River) (6/72); Syria (3/72); Brazil (2/73); Ivory Coast (3/73); Gambia (3/73); Senegal (3/73); Greece (9/75)

APPRAISAL MISSIONS

Mexico (1/72); Israel (4/72); Iran (ar) (12/73)

ECONOMIC MISSION

Lebanon (6/74)

SECTOR REVIEWS

Niger (5/73); Mauritania (5/73); Upper Volta (12/73); Kenya (2/75)

LENDING PROGRAM DEVELOPMENT

Senegal (9/73); Pakistan (2/74)

PROJECT IDENTIFICATION AND FORMULATION

Yemen PDR (11/71); Yugoslavia (2/72); Gambia (3/72); Syria (4/72); Yemen PDR (4/72); Fiji (4/72); Yemen AR (9/72); Oman (10/72); India (2/75); Philippines (8/75); Korea (9/75); Cameroon (12/75)

PROJECT GUIDANCE MISSIONS

Nepal (4/72); Morocco (4/72); Guyana (9/72)

SUPERVISORY MISSION

Israel (12/72)

COORDINATION OF WHO/UNDP-ASSISTED AND WORLD BANK FINANCED PROJECTS

Kenya (3/72); Indonesia (2/73); Ivory Coast (6/73)

Water Supply & Sewerage

March 26, 1976

Mr. Daniel Alexander Okun
526 Dogwood Drive
Chapel Hill, N.C. 27514

Dear Mr. Okun:

Mrs. Stone sent me a copy of your letter of March 18 in which you request instructions regarding your travel from Chapel Hill to Washington. I suggest we keep the arrangements as simple as possible; therefore, I authorize you to make one trip a month to Washington without prior authorization. I suggest you prepare an outline of your work plan, indicating trips you plan to make to Washington. I would then authorize the additional trips on the basis of this work plan. Obviously, any trips you make in connection with other business which are not charged to the Bank do not require any authorization from the Bank. I would suggest you let us know before you arrive to make sure the people you wish to see will be available.

After dictating the above, I received your letter of March 19. I will be in my office on the morning of April 1. The people to see in the Education Department are: Mr. Edward H. Chittleburgh, Training Adviser, Telephone No. 477-5374, Room D714, and Mr. Richard W. Van Wagenen, Training Officer, Telephone No. 477-5375, Room D715. In the Agriculture and Rural Development Department, you should see Mr. Leif E. Christoffersen, Assistant Director, Rural Development and Nutrition, Telephone No. 477-4685, Room D841; Mr. David J. Turnham, Chief, Rural Development Division, Telephone No. 477-6823, Room D1014; and Mr. Ted J. Davis, Chief, Rural Operations Review and Support Unit, Telephone No. 477-5306, Room D842.

With best regards.

Sincerely yours,

John M. Kalbermatten
Water and Wastes Adviser
Public Utilities Department

cc: Mr. Middleton (PBPDR)

JMKalbermatten:mk

Water Supply & Sewerage

March 12, 1976

Mr. Newton Bowles
Deputy Director, Program Division
UNICEF
866 UN Plaza
New York, New York 10017

Dear Mr. Bowles:

The Bank has engaged Mr. Tim Journey to report on current handpump technology and to demonstrate several prototype models in the patio of the offices. The Public Utilities and Agriculture Departments will be holding a seminar on manual pumping toward the end of March where recent developments in the state of the art will be discussed.

I hope that you, in Mr. Martin Beyer's absence, or whomever you may deputize may be able to participate in the seminar. As soon as a definite date and time has been fixed we shall telephone you.

Following the seminar, if it is considered that the new type of handpump should be exposed to a wider audience, we would propose to make a presentation at the IRC seminar on this topic, at which no doubt you will be represented.

Sincerely,

Richard N. Middleton
Sanitary Engineer
Public Utilities Department

cc: Mr. Journey

RNMiddleton/cel

Water Supply & Sewerage

March 11, 1976

Dr. George Curlin
Dacca (I.D.)
U. S. Department of State
Washington, D.C. 20521

Dear Dr. Curlin:

The World Bank, in common with other lending institutions, is very interested in quantifying the linkages between improved water supply and better health, as an aid to our investment decisions.

Mr. Tim Journey, who has been engaged by the Public Utilities Department and the Agriculture and Rural Development Department of the World Bank to prepare a report on low cost technologies for manually operated pumps for rural water supply, mentioned to me that the Cholera Research Laboratory and UNICEF were to have conducted an applied research program in 1974/75 to measure the impact of the presence of a tubewell upon the incidence of enteric diseases in Matlab Thana.

I should very much appreciate receiving a copy of any publication which has resulted from the study, since there is so little reliable information available on the subject.

Sincerely,

Richard N. Middleton
Sanitary Engineer
Public Utilities Department

TJourney/RNMiddleton/cel

Water Supply & Sewerage

March 8, 1976

Mr. Frank A. Butrico
Chief, Division of Environmental Health
Pan American Health Organization
525-23rd Street, N.W.
Washington, D.C. 20037

Dear Mr. Butrico:

On March 17 and 18 we are having a seminar on groundwater development given by Mr. John S. Fryberger, Vice President, Engineering Enterprises, Inc. Norman, Oklahoma. Mr. Fryberger is an eminently qualified expert in groundwater development and we look forward to the seminar.

I would like to take this opportunity to invite you and your staff to attend the seminar. I would appreciate your letting me know as soon as possible, but not later than the end of this week, about how many of your staff you expect to participate, so we can make appropriate arrangements. I shall inform you on Monday, March 15, of the time and place the seminar is to be held.

On April 6, Degremont will make a presentation on Sewage Disposal, similar to the one on Water Treatment about a year ago. The presentation will start at 12:30 p.m. in Room D556 and will be "bag lunch" style. You and members of your staff are cordially invited to attend. The formal presentation will take place from 12:30 p.m. to 2:30 p.m., but Degremont staff will stay over for discussions, if participants wish to extend the session.

With best personal regards.

Sincerely yours,

John M. Kalbermatten
Water and Wastes Adviser
Public Utilities Department

JMKalbermatten:mk

Water Supply & Sewerage

March 8, 1976

Ing. Humberto Olivero
Chief, Sanitary Engineering Section
Inter-American Development Bank
808 17th Street, N.W.
Washington, D.C. 20006

Dear Ing. Olivero:

On March 17 and 18 we are having a seminar on groundwater development given by Mr. John S. Fryberger, Vice President, Engineering Enterprises, Inc., Norman, Oklahoma. Mr. Fryberger is an eminently qualified expert in groundwater development and we look forward to the seminar.

I would like to take this opportunity to invite you and your staff to attend the seminar. I would appreciate your letting me know as soon as possible, but not later than the end of this week, about how many of your staff you expect to participate, so we can make appropriate arrangements. I shall inform you on Monday, March 15, of the time and place the seminar is to be held.

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With best personal regards.

Sincerely yours,

John M. Kalbermatten
Water and Wastes Adviser
Public Utilities Department

JMKalbermatten:mk

Water Supply & Sewerage
cc Health
cc Energy
cc LI-UNESCO

Mr. M. Yudelman, Director, AGPDR, through
G.F. Darnell, Assistant Director, AGPDR
F.L. Hotes, Irrigation Adviser, AGPDR

March 4, 1976

Back-to-Office Report on Attendance at International Symposium on Arid Lands Irrigation in Developing Countries, Environmental Problems and Effects, Alexandria, Egypt, February 16-21, 1976

1. In accordance with Terms of Reference dated February 3, 1976, I arrived in Alexandria on February 15 to attend subject symposium. Following the Conference I departed Alexandria on February 21, returning to Washington, D.C. on February 22. This memo summarizes the highlights of the Symposium, one of which was the fortuitous field trip arranged for the attendees to the nearby irrigated areas west of the Noubaria Canal. This is the area in which the proposed Bank-financed Fruit and Vegetable Development Project would be located. Upon return to headquarters, it was my responsibility to review the irrigation and drainage aspects of the Draft Yellow Cover Appraisal Report for the project, and the field trip was of great assistance in helping to understand the complex and serious drainage problems of the area.

Conference Sponsorship and Attendance

2. The Conference was convened by the Committee on Water Research (COWAR) of the International Council of Scientific Unions, and organized jointly by COWAR, UNESCO, and the Academy of Sciences and the Ministry of Irrigation of Egypt. Other agencies providing support were UNEP, FAO, and WHO, while international non-governmental agencies cooperating were IAHS, IAH, ICID, ICOLD, ISSS, IUBS and IUPAC.

3. About 240 persons from 41 different countries were in attendance, with the largest representation being from the host country, Egypt. There were 14 from FAO (attributable largely to the staff of the UNDP/FAO West Noubaria Waterlogging and Salinity Study Project), 3 from UNESCO, 2 or 3 from WHO, 2 from UNEP, 1 from the UN Secretariat, and myself from the World Bank.

Program

4. Four of the five days were devoted to eight formal sessions. One day was set aside for the field trip mentioned in para. 1. At the formal sessions simultaneous translation facilities into Arabic, English and French were provided. Following an overview of the topic of each session by its Chairman, each panelist gave a summary of the highlights of their paper. Most papers had been pre-printed in a Symposium booklet; others were distributed in advance of the sessions. Following the summary presentations, general discussion ensued from the floor and the panel.

5. The papers and discussions covered a wide range of topics, from "traditional" papers on world irrigation development and influence of irrigation on mankind, to socio-economic aspects, influence of irrigation on land use, soils, water quality, the hydrological processes, biological balances of the environment, efficiency of irrigation schemes, and health problems in irrigation areas. A list of the chairmen, panelists, and papers is attached as Annex 1. I participated as a panelist at Session 3, where I discussed a paper for which I was the senior author on "Effects of Irrigation on Water Quality."

6. This was one of the best Symposiums I have attended. The papers, although covering many disciplines, were well-written and easy to understand. The various experts, including those in the audience, were knowledgeable and there was a vigorous and useful exchange of information and viewpoints. Some highlights are noted in following paragraphs.

Highlights

7. Clyde Houston (FAO) paper on "Irrigation Development in the World"

i) New irrigation systems needed by 1985 - 23 million ha; cost $40 billion.

ii) Improvements to systems required by 1985 - 50 million ha; cost 25 billion.

iii) Proposes that a World Survey of Water Resources and Irrigation Potential be undertaken as a co-operative project by relevant international agencies and interested countries. Cost to start - $10 million.

8. Dez Irrigation Project - Iran. Dr. E. Ehlers of the University of Marburg/Lahn, Germany, gave a paper on "Social and Economic Consequences of Large Scale Irrigation Developments - The Dez Irrigation Project/Khuzestan, Iran." This project is partially financed by the Bank. Comparisons were given of the economic and social effects of four different types of agriculture in the project area: (i) agro-industries, (ii) agribusiness, (iii) farm corporations, and (iv) traditional farming. The paper is worth reading, although his differentiation between an agro-industry (sugar cane plantation) and an agribusiness (large scale mechanized farms under foreign management) is too simplistic and fails to recognize that the latter could have (and did) include plans for associated processing industries. I had a good personal discussion with him later during the week.

9. Influence of Irrigation on Precipitation in Semi-Arid Climates, by Schickedanz and Ackerman of the U.S.A.. A study was made as to whether or not the phenomenal growth of irrigation in the Great Plains of North America has had an appreciable effect on the region's climate. Tentative conclusions are that this has not produced additional clouds or precipitation.

10. Probability of Droughts and Secondary Salinization on World Soils by Kovda, Rozanov and Onishenko of the USSR contained some very interesting tables on complex ameliorations for main soil groups of arid regions under irrigation and a proposed classification scheme for aridity, drought probability and secondary salinization of irrigated soils, with a map.

11. A Comparison of Mosquito Populations in Irrigated and Non-irrigated Areas of the Kano Plains, Kenya was presented by Messrs. Hill, Chandler and Highton. They reported that the household entry rate of mosquitos in ricefield areas was approximately 4 times greater than in non-irrigated areas. The seven project villages were located adjacent to the rice fields, while the authors recommended that villages be located beyond the flight range of malaria vector mosquitos. Mosquito bite rates of 200 bites/person/night were reported.

12. The values of producing fish in connection with irrigation schemes were presented in two papers. During the discussion I mentioned that the Bank would consider financing such components of irrigation projects, and that this was done in the case of the Lower Sao Francisco Polders Project in Brazil.

13. Water weed problems in irrigation systems and reservoirs was the topic of an outstanding slide-illustrated presentation by Mitchell of the University of Rhodesia. I later discussed with him the problems of preparing a manual on the subject for Bank staff and Borrowers. Available publications should be evaluated first, but apparently this problem is not receiving the attention it deserves from economic, hydraulic, and health standpoints.

14. The results of a worldwide questionnaire survey of irrigation efficiences was reported by Bos of the International Institute for Land Reclamation and Improvement, Wageningen. His Table 2 summarizes reported farm, ditch, field application, distribution and overall efficiencies from 91 irrigated areas in 29 countries. Most overall project efficiencies were in the 20% to 30% range. The greatest weakness of the study is that much, if not most, of the submitted data were not based on actual measurements. The value of the report is that it dramatizes the tremendous inefficiencies in current systems and practices, the potential for improvement and conservation of resources, with resultant increased agricultural production.

15. Health and Irrigation by Dr. Coumbaris of the Faculty of Medicine, Paris, gave an excellent overview of this subject. He remarked that "we do not yet know how to eliminate completely bilharziasis and malaria in developing countries, but a reasonable goal might be to prevent infection more often than every 2 or 3 days." Some 200 to 300 million people suffer from bilharziasis, for which there is not yet a universally safe, sure, cure.

16. An excellent summary of irrigation and malaria in arid lands was given by Dr. Farid, formerly of WHO.

17. The problems of Bilharziasis in the Irrigation Schemes of the Sudan were presented by Drs. Amin and Idris. They gave the World Bank a big (unsolicited) pat-on-the-back for including a major control program for the disease in the recently approved second stage development of the Rahad Project.

Wrap-Up Session

18. This was chaired by Dr. Gilbert White, famed geographer from the University of Colorado. He noted that at this symposium no one had proposed a panacea such as Sea Water Distillation, Cloud Seeding, or Solar Pumps, to solve all problems. Although these had been mentioned, they were recognized as being of value only in special situations. More application of available information is needed, and the technical disciplines must work together for an integrated approach. He noted that little was said about the role of economic and social efficiencies, but that these were important considerations in all cases. While problems were discussed frankly, he appreciated the positive outlook of most participants.

Symposium Proceedings

19. A copy of the Symposium pre-print is available in my office (Ext. 2763). It is hoped that the entire proceedings, including the pre-prints, can be published at a later date.

FLHotes:nw

Attachment

cc: Messrs. M. Burney
J. A. Lee

INTERNATIONAL SYMPOSIUMS ON ARID LANDS
IRRIGATION IN DEVELOPING COUNTRIES

ENVIRONMENTAL PROBLEMS AND EFFECTS

Alexandria, Egypt, 16-21 February 1976

SESSION CHAIRMEN AND AUTHORS

Session 1 - Areas and Methods

- E.B. WORTHINGTON (President of COWAR): Introduction to the symposium
- M. BATISSE (UNESCO): General remarks
- C.E. HOUSTON (FAO): Irrigation development in the world
- A.H. TABA (WHO): The influence of irrigation on mankind

Session 2 - Case Studies

- E.B. WORTHINGTON (COWAR): General report
- ABDEL AZIM ABUL ATA (Minister of Irrigation, Egypt): The conversion of basin irrigation to perennial irrigation
- A. COUMBARAS (France): A pluridisciplinary approach (irrigation and health) in two integrated irrigation projects
- E. EHLERS (Federal Republic of Germany): Social and economic consequences of large scale irrigation developments: The Dez irrigation project, Khuzestan, Iran
- E. URROZ, A. HAUSER (Mexico): Waste water re-use for irrigation and its effect on agriculture

Session 3 - Influence of Irrigation on Hydrological Processes: Quantity and Quality

- G. KOVACS (Hungary): General report
- ABDEL EL-FATTAH FAHMI (Egypt): The effect of irrigation on the atmospheric branch of the hydrological cycle, especially on evapotranspiration

Session 3 - (Continued)

- W.C. ACKERMANN, P.T. SCHICKEDANZ (U.S.A.): Influence of irrigation on precipitation in semi-arid climates

- T. PECZELY (Hungary): Some observations concerning the change in the hydrological cycle caused by irrigation

- G.V. BOGOMOLOV, A.V. LEBEDER, Yu. G. BOGOMOLOV (U.S.S.R.): Influence of irrigation on hydrogeological processes in the aeration zone

- F.L. HOTES, E.A. PEARSON (U.S.A.): Effect of irrigation on water quality

- S. PELS, M.E. STANNARD (Australia): Environmental changes due to irrigation development in semi-arid parts of New South Wales, Australia.

Session 4 - Land Use, Soils and Water Quality

- I. SEABOLCS (Hungary): General report on behalf of V.A. KOVDA (U.S.S.R.)

- P. ANTOINE, A. DELACOURT (Maroc): Observations sur deux sols argileux (vertisols) irrigues depuis 25 ans dans la plaine du Gharb, Maroc.

- G. VARALLYAY (Hungary): Survey of irrigated areas, related to soil salinization and/or alkalinization and water-logging in Hungary

- D.R. BHUMBLA (India): Chemical composition of irrigation water and its effect on crop growth and soil properties

- V. DUKHOVNY, L. LITVAK (U.S.S.R.): Effect of irrigation on Syr Darya water regime and water quality

- M. EL-GABALY (FAO): Problems and effects of irrigation in the Near East Region

- V.A. KOVDA, B.G. ROSANOV, S.K. ONESHENKO (U.S.S.R.): On probability of droughts and secondary salinization on world soils.

Session 5 - Effects of Irrigation on the Biological Balances of the Environment

- A.M. KASSAS (Egypt): General report

- M.N. HILL, J.A. CHANDLER, R.B. HIGHTON (U.K.): A comparison of mosquito populations in irrigated and non irrigated areas of the Kano Plains, Nyanza Province, Kenya

- J. DAGET (France): La production de poissons de consommation dans les ecosystemes irrigues

Session 5 - (Continued)

- R.L. WELCOMME (FAO): Inland fisheries in arid zones

- D.S. MITCHELL (U.K.): Water weed problems in irrigation systems

Session 6 - The Efficiency of Irrigation Schemes

- M. HOLY (C.S.S.R.): General report

- M.G. BOS (Netherlands): Some influences of project management on irrigation efficiencies

- I.Z. KINAWY (Egypt): The efficiency of water use in irrigation in Egypt

- A. AMAYA BRONDO (Mexico)

Session 7 - Human Problems in Irrigation Areas

- A. COUMBARAS (France): General report

- M.A. AMIN (Sudan): Problems and effects of schistosomiasis in irrigation schemes in the Sudan

- M.A. FARID (Egypt): Irrigation and malaria in arid lands

- M. LARIVIERE (France): Sante publique et projets d'irrigation: Role de l'assainissement et de l'hygïene du milieu

Session 8 - Synthesis: Reports of Working Groups and Conclusions

- PROF. GILBERT WHITE (U.S.A.) plus session chairmen

Water Supply and Sewerage

Professor Daniel A. Okun

March 4, 1976

Yves Rovani, Director, PBPDR

Training for Water Supply Personnel

1. Over the period of years in which the Bank has been engaged in lending in the fields of water supply and waste disposal, recognition has continually been given to the importance of the training of the staff of the agencies to which we lend. Within the last two years the Bank has placed increasing emphasis on this activity; all appraisal reports should now include statements concerning training needs. While this has served to focus the attention of appraisal missions on the training side of our projects, our staff have limited expertise in this field, and in many countries, it also appears unlikely that the necessary actions will be taken by our borrowers to make the training program a meaninful part of their work.

2. We are therefore concerned to identify any further actions the Bank should take during the period of project development and appraisal which would lead to a more organized and effective approach for the development and execution of training programs. It has therefore been decided to commission a study which would evaluate the entire training activity in the field of water supply and wastes, and which would lead to recommendations which the Bank could consider for strengthening its approach in these sectors.

3. You have been selected to carry out the training study. For this purpose you will conduct interviews with the Training Adviser in our Education Department; all the water supply staff and all the Division Chiefs in the Water Supply Divisions; staff of our Rural Development Department; appropriate officials of the Economic Development Institute; and staff of other departments, divisions and units of the Bank that are concerned with training in the developing countries. You should also have discussions with staff of the IBRD/WHO Cooperative Program and with other concerned officials at WHO Headquarters in Geneva. You will review a selected number of appraisal reports to gain an understanding of the present approaches taken; certain of the sector studies carried out through the Cooperative Program between WHO and IBRD; the specific reports prepared on countries where manpower and training surveys have been conducted, and where programs have been proposed; and such other documents and reports as may come to your attention prepared by other agencies, both international and bilateral. It is expected that during your study you will visit certain countries, to be mutually agreed upon, where training facilities or expertise are available, where training activities have been initiated, or where problems have developed which have resulted in only limited progress being made towards achieving training objectives.

4. Your attention should be focused on two broad areas: firstly, the actions which the Bank might take to improve the methods by which it deals with training needs in the water supply and waste disposal field;

and secondly, the activities which countries themselves should be expected to undertake and administer. In considering improvements on Bank operations, you should be fully aware of constraints on Bank staffing; your recommendations should be conservative of staff time and should result in the least need for increase in Bank manpower. In designing recommendations, therefore, your priority should be to identify means to improve the efficiency with which Bank or Cooperative Program staff handle training issues; for example, the holding of seminars on how to analyze and forecast training needs or the development of manuals or other aids that staff could use in the field to orient utilities' data gathering and project preparation work. In considering country activities you should consider programs which would involve the countries themselves to the maximum extent, but which would lead as soon as possible to a feasible and effective program which might lend itself to Bank support. In this respect, you should consider means by which national authorities and utility managers can be made more sensitive to the need for training of appropriate staff, and provoked to do something about it.

5. You will work closely with the Training Adviser and the Public Utilities Department on all matters. Your formal point of contact within the Bank will be Mr. John M. Kalbermatten, Water and Wastes Adviser in the Public Utilities Department. Any questions, clarifications, or proposed changes in the scope or objectives of your work should be submitted to Mr. Kalbermatten for his approval. You will also refer to him all decisions concerning possible field trips. Upon completion of your background studies a report should be prepared in draft and submitted to the Bank for review, following which a final report should be prepared reflecting any comments received on the draft. It is expected that this assignment will require approximately 60 mandays plus around 14 days of travel time. It is expected that you would complete your draft report by not later than October 31, with completion of the final report within approximately one month from the time when you receive our comments.

cc: Messrs. Chittleburgh (EDU), Kalbermatten (PBPDR), Middleton (PBPDR), Ms. Peter (PBPDR)

RNMiddleton:mk

LI - WHO
✓ cc Water & Sanitation

February 27, 1976

Mr. Fred S. Kent
Chief, Pre-Investment Planning
Division of Environmental Health
World Health Organization
1211 Geneva 27
Switzerland

Dear Fred:

Thanks for your letter of February 11 with which you forward copies of reports on rural water supplies prepared by SEARO for seven countries in that region. We appreciate very much the timeliness of the receipt of these reports since we are planning to begin work on a commitment made to the Ad Hoc Rural Panel on experiences gained on past rural water supply projects. By this means I should like to fill you in on our plans and perhaps you could make this information available to Luis Orihuela and to Berndt on the proposal.

At the meeting of the Ad Hoc Rural Panel (now called the Steering Committee) in New York two weeks ago at which Berndt was present, four areas of action were agreed upon for the interim period which spans roughly the next twelve months. One of these was a commitment on our part to undertake a review of experiences on rural water projects worldwide, and to identify reasons why certain actions succeeded or failed. For this purpose we agreed to employ a consultant and Charles Pineo has agreed to undertake this work for us. We further agreed to this being more or less a joint activity between WHO and IBRD with the IDRC also involved. We proposed that first a terms of reference for Pineo would be set up with copies sent to you for your general guidance. Secondly, we would propose to have Pineo make a brief visit to IDRC and to then have meetings with WHO in Geneva and with UNICEF in New York. His meetings with you would be to indicate the nature of the information which he wishes to obtain, and both from reports and from conversations with your staff, to compile a list of rural water supply projects which have been carried out in the past. Those on which it is believed a fair amount of information could be obtained would be singled out for further explorations, either by personal interviews with people associated with the projects, by review of appropriate reports, and in some instances, by visits to the countries. I had opportunity to talk to Martin Beyer in New York concerning this study and I received his full endorsement on the proposal and an expression of UNICEF's willingness to fully collaborate. He indicated that they have some reports with evaluations which he felt would be useful.

We would be guided by and welcome ideas which WHO, IDRC and UNICEF might have as to all aspects of this study and to possible approaches which we have not thought about. The final objective is to prepare a report which would not only be a catalog of actions which have been taken and which have led to some successes, but also to examples of projects which failed and the underlying judgments as to the principal reasons for this. It is my view that while as an internal document we would have to name countries and projects, that if at some stage a report for general distribution were prepared, we would have to eliminate particular country names to avoid embarrassment.

It is understood that Mr. Pineo would be available about mid-March and would begin the work at that time. We would let WHO know in advance of the time when he would visit Geneva, and would like to obtain as early as possible, your views as to whether some resources from WHO can be committed for this activity. We would have no objection to use of Cooperative Program staff for this purpose provided it did not interfere with already agreed upon work schedules.

As noted earlier, I would appreciate your calling the foregoing to the attention of Berndt and Luis, and would appreciate any comments which, collectively, you may wish to provide us. Please accept my best regards.

Very truly yours,

Harold R. Shipman
Water Supply Adviser
Public Utilities Department

cc: Mr. Kalbermatten (with incoming and reports)
Mr. Middleton
Mr. Rovani

HRShipman:j

Water + Sewage

Mrs. Adrienne Massau, TRUDR

February 26, 1976

Richard H. Middleton, Sanitary Engineer, PEPDR

Monitoring Quality of Water Supplies

1. You called me recently enquiring about simple means of monitoring the quality of water delivered from standpipes and stored in homes. Since talking to you I have had a chance to reflect more on the problem, and would like to amplify my initial off-the-cuff reactions.

2. It seems self-evident that there is no point in monitoring quality within the house unless you have base-line information on quality at the hydrant, otherwise you will not be able to distinguish between effects due to contaminated supply and those due to contamination during collection and storage.

3. The principle problem with standpipe supplies in many cities is that the supply is intermittent. Poor drainage and absence of sewage disposal result in a high heavily polluted groundwater table, which can infiltrate into a leaky water distribution system during periods when the supply is shut off. The effects of this pollution will not usually be fully overcome when supply is restored, even if the water supply is chlorinated, since the chlorine residual and the contact period may be too small to be effective. Any water drawn from an intermittent supply is therefore suspect, particularly that drawn immediately after resumption of supply. The first monitoring indicator must therefore be adequacy of supply -- is the supply available 24 hours a day at a satisfactory pressure? Pressure criteria must be set to match each individual case; a standpipe at the bottom of a hill may show a reasonable pressure even though it is actually acting wholly or partially as a syphon and drawing in ground water where the pipeline crosses the hill.

4. If it can be established that 24-hour adequate supply is available at the hydrant, monitoring of the quality of this supply becomes much easier. Chlorine residual measurements will usually be sufficient for routine monitoring; these can be carried out very simply by technicians or semi-skilled labor using color comparison tests. The minimum acceptable residual should be decided for each particular project, depending on system layout and other circumstances. In addition, bacteriological testing should be carried out throughout the water supply system, either by the water undertaking or by the medical officer of health (or local equivalent) or both, at the intervals recommended in the International Standards for Drinking Water or in locally-adopted standards. As I indicated to you in our earlier conversation, this is a complex test requiring special equipment and considerable care if reliable results are to be obtained. It is not one that I would recommend delegating to a project monitoring unit.

5. Monitoring of contamination occurring after delivery of the water from the standpipe is likely to be complex and technically difficult. Presumably the principal contaminants will result from a dirty faucet at the

standpipe, from handling the container with dirty hands or from failure to clean it properly. Storage vessels in the home may also serve as breeding places for mosquito larvae or worms. While gross contamination can be detected by eye, it will be necessary to carry out the rather sophisticated differential coliform test to detect faecal contamination, and filtration followed by microscopic examination will be required to detect and identify parasites. Any large-scale exercise is likely to be expensive and require a considerable input of skilled manpower. Sampling errors will be high and the results obtained will always be suspect. The public health significance of contaminated individual containers are of much less importance from an overall public health standpoint than the quality of water at the source.

6. I believe that the effort which would have to be put into monitoring of water quality in containers might be better directed to improving the way in which the water is dispensed and used. One obvious problem is that many public standpipes are not provided with adequate drainage nor with a place to rest containers; they become surrounded by a sea of mud and containers, user's hands and eventually the water become contaminated (incidentally, we will be issuing this year the results of a study by the International Reference Centre in the Hague on public standpipes). Another problem may be the poor design of the containers themselves, so that they are difficult to clean or, more commonly, do not have a handle, so that they are grasped by the lip. Health education on the need for cleanliness, coupled with container redesign, may be necessary.

7. If you cannot satisfy yourself that the standpipe supply is entirely satisfactory (along the lines I have discussed in 3 above), then further monitoring steps are not justified. The emphasis in these cases should be on supply improvements to obtain **continuous pressures, coupled** with distribution system monitoring (for example, local chlorination in known low pressure zones may be needed), and design improvements such as I have outlined in (6) above.

8. Finally, of course, health education and other promotional means should be used to encourage the gradual transition from dependence on public standpipes to service through private house connections, since the evidence suggests that only in this way can enough water usage be ensured to have a real impact on some causes of disease.

cc: Messrs. Stone, Cook

RMMidd[illegible]leton/cel

✓ - Water Supply & Sewerage
cc LI - WHO

Mr. John M. Kalbermatten, Chief, LCPWS February 23, 1976

Harold R. Shipman, Water Supply Adviser, PBPDR HR

Meetings with WHO Regional Directors

During the period of late October and early November, Mr. Fred Kent of the PIP Unit, WHO, and myself visited the Regional Offices of WHO located in Alexandria, Egypt; New Delhi, India; and Manila, Philippines. We had meetings respectively with Dr. Shoib, Deputy Regional Director, EMRO; Dr. Gunaratne, Regional Director, SEARO; and Dr. Dy, Regional Director, WPRO. The following is a brief resume of the discussions.

1. The meetings with the staff of the EMRO Region in Alexandria were eminently unsatisfactory since they had misunderstood the letter which Mr. Kent had written them as to the purpose of the visit and aside from having made certain appointments for us in Alexandria, the meetings in the Regional Office were disorganized and, for the most part, a waste of time.

A meeting had been set up with Dr. Shoib and this I thought was fairly profitable in that he expressed his interest in the Region doing more in the field of water and sewerage and expressed a desire to undertake whatever staff training as might be possible. There were no commitments on his part other than to suggest that they could probably cover the costs of certain of their staff to attend training sessions if this were arranged.

2. The meeting with Dr. Gunaratne in New Delhi was one in which he expressed the view that his regional engineers and those stationed in countries should be doing more sector work and that he felt the need for training of this staff to the level where they could undertake this kind of work. He would support fully any activities that would be initiated in his region for a seminar or workshop for the engineers and he would be prepared to pick up the costs for his engineers. Mr. Kent and I indicated a general willingness to explore this matter further. Dr. Gunaratne's complaint seemed to be primarily against WHO Headquarters whom he felt were attempting to usurp some of his responsibilities in the region. He felt there was just reason to decentralize the entire PIP Unit and to station the people in the regions where they would do more good. Mr. Kent was quite upset with some of the accusations directed at the PIP Unit and I had the impression that most of them were not well founded. Nevertheless, this reflects the Regional Director's view for the Southeast Asia Region.

The regional engineers had set up an excellent program of work for us in the region and had invited a number of their engineers to attend a one-day session at which Mr. Kent and myself went into details on a number of points on which they had questions. All arrangements were handled in a professional manner and were quite in contrast with the experience in the EMRO Region.

3. The meeting in Manila with the Regional Director, Dr. Dy, was pleasant, and he took essentially the same position as Dr. Gunaratne had taken with respect to desires for staff training. He would support the costs of bringing his engineers into a meeting and was interested in doing much more in the field of water and sewerage than in the past.

His staff had made excellent arrangements and the various activities with which we were concerned in Manila had been well scheduled and our sessions with the regional office staff were productive.

From the foregoing, I conclude that the New Delhi (SEARO) and Manila (WPRO) Regions are the ones which should be given the preference for any attention that we give to scheduling training sessions for WHO staff. I have proposed to Mr. Kent that if EMRO wanted to tack on some engineers on one of these courses, this opportunity ought to be presented. I would doubt, however, that based on the quality of engineers in the EMRO Region, a special course for that group could be justified.

I am writing to Mr. Kent, asking whether he plans to prepare a more detailed report on our visit, since I had understood this was to be his responsibility.

cc: Messrs. Middleton, Rovani - PBPDR

HRShipman:j

Water Supply & Sew.

February 19, 1976

Dr. J. M. G. van Damme
Manager
WHO International Reference Centre
for Community Water Supply
P. O. Box 140
Leidschendam
The Netherlands

Dear Dr. van Damme:

I have your letter of January 30 in which you ask our views concerning a seminar proposed for the week of September 6-10 on the subject of community water supply in developing countries and to be attended by engineers and managers from the developing areas. You explain that the proposed timing for the seminar is to permit those attending to stay over for the IWSA International Conference. I am very pleased to see you take initiative on this approach since it is one which I have consistently called to the attention of WHO and IWSA as the mechanism by which we could obtain a much better representation from the developing countries than has been possible in the past.

You have asked for our comments concerning the tentative program, and on the names of possible participants in the seminar. I am attaching herewith a list of the countries and agencies where loans have been made for water supply, and at the same time designating individuals from the respective agencies which we believe would be good candidates for consideration. Concerning the program itself, I have discussed the contents very briefly with Mr. John Kalbermatten who will shortly be succeeding me in my post, since I will be retiring from this assignment on the first of March. We both agree that the program as now constituted covers far too many topics and we believe the participants would be more confused than enlightened. It is therefore our suggestion that the seminar focus on only two or three of the major problems which are common to most of the countries. Whether you elect to adopt this proposal or to stay with the present program, you could rely on us to make available one or two staff members to cover the topics assigned.

One problem which you will have concerns the type of participants who will attend. If it is those similar to what are listed on our attached sheet, they will be, for the most part, general managers of water utilities, either at the national level or at major city municipal level. These are the ones who would normally profit from IWSA programs in contrast with those who are working purely in the rural field. It will be true that in a few instances, some may have responsibility for all water, both urban and rural, but this will be the exception rather than the rule. Depending, therefore,

on what the principal make-up of the seminar participants will be, the program would logically be tailored to accommodate their interests. If the program is to be boiled down, it could be separated into two major categories: (1) management, and (2) technology. It would seem further that in an introductory statement, which could be the first or second item on the program, the findings of the 1975 WHO survey of the developing countries ought to be presented, and specifically for the countries which would be represented at the seminar. It would seem further that for each of these countries, projections could have been made to at least 1985 and possibly to year 2000 showing the number of people that will have to be served in the period to reach certain goals. Similarly, some estimates on costs might be presented. With this kind of a background, it would then be more meaningful to move into the actual discussion of the seminar, attempting to answer the question, what will they need to do now, and in the immediate future, to meet their responsibilities. This would introduce the general matter of planning; of the adoption of least cost solutions; of the means by which projects can be financed; of what policies, financial and otherwise, will have to be adopted; and of manpower needs and training.

We would be happy to explore the possible agenda further with you along the foregoing lines if this seems to have any appeal to you. However, should you decide to stay with the present proposal, there would be no advantage in further amplifying our views at this time.

Again, may I commend your efforts in putting together this seminar at this particular time, and to wish you every success. Please be assured that we will make whatever staff contribution as may be indicated for the topics assigned to us.

Very truly yours,

Harold R. Shipman
Water Supply Adviser
Public Utilities Department

Attachment

cc: Mr. John M. Kalbermatten, LCPWS

HRShipman:j

IRC Seminar on Community Water Supply

Candidates for Consideration

Dr. Jaime Arizabaleta Calderon
General Manager
and
Ing. Jose Manuel Montero Trivino
Chief, Master Plan
Empresas Municipales de Cali
Apartado Aereo 18, Cali-Valle
Colombia

Mr. Danilo Plata Hurtado
General Manager
Empreses Publicas Municipales
de Palmira
Calle 31, No. 24-86
Palmira, Colombia

Dr. Klaus Reinach
President
Companhia de Saneamento Basico
do Estado de Sao Paulo
Rua Costa Carvalho
300, Sao Paulo, Brazil

Sr. Luis Pereira de Nueda
General Manager
Empresa Aguadora de Managua
Apartado 3599
Managua, D. N., Nicaragua

Dr. Gustavo Dajer Chadid
Executive Director
Instituto Nacional
de Fomento Municipal
Apartado Aereo 8638
Bogota, Colombia

Ing. Alberto Barocio Moll
Vocal Ejecutivo
Comision de Aguas del Valle
de Mexico
Balderas 55
Mexico D. F., Mexico

Doutor Fabio Alvares
Executive Secretary
Banco Nacional da Habitacao
Avenida Chile 230
Rio de Janeiro, Guanabara
Brazil

Ing. Jose Arce Crovari
Manager
Empresa Municipal de Agua Potable
de Guayaquil
Casilla 5253, Guayaquil
Ecuador

Mr. S. W. Parke
General Manager
The Water Commission
28-30 Church Street
Kingston, Jamaica

Ing Ariel Cano
Gerente de Proyectos Especiales
Secretaria de Recursos Hidraulicos
Paseo de la Reforma No. 50 - 5° piso
Mexico 1, D. F., Mexico

Ing. Mario Gutierrez Llinas
General Manager
Empresa de Acueducto y Alcantarillado
de Bogota
Apartado Aereo No. 80186
Bogota D. E., Colombia

Mr. D. A. Nunoo-Quarcoo
Managing Director
and
Mr. S. K. George
Accra Area Manager
Ghana Water and Sewerage Corporation
P. O. Box M194
Accra, Ghana

Mr. J. van Beuzekom
Director
Water and Sewerage Corporation
P. O. Box 20
Mbabane, Swaziland

Mr. E. A. Ngunya
Director, Water Development
Ministry of Water Development
P. O. Box 30521
Mombasa, Kenya

Mr. A. A. Rouf
Chairman
Chittagong Water & Sewerage Authority
67, Panchalish Residential Area
Chittagong, Bangladesh

Mr. M. B. Rahman
Chairman, Dacca Water Supply
and Sewerage Authority
156/157, Motijheel Commercial Area
Dacca 2, Bangladesh

Mr. V. D. Desai
Deputy Municipal Commissioner
(Special Engineer)
Municipal Corporation of
Greater Bombay
Municipal Office Extn. Bldg.
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Fort Bombay 1, India

Mr. Low Theng Heng, Director
Water Supplies Selangor
Pejahat Pengarah
Bekalan Air Selangor
Peti Surat 2001
Jalan Pantai Bahru
Kuala Lumpur 22-07, Malaysia

Mr. Lee Yong Siang, Director
Environmental Engineering Division
Ministry of Environment
Princess House, Alexandra Road
Singapore 3
Republic of Singapore

Mr. Divungi di N'Dinge
Director General
and
Mr. Billon Tyrard
Assistant Director
Societe d'Energie et d'Eau du Gabon
B. P. 21871
Libreville, Gabon

Mr. Y. Camerlo
Director
and
Mr. Surateau
Technical Director
Service Autonome de
l'Hydraulique Humaine
Ministry of Plan
Abidjan, Ivory Coast

Mr. Stapfer
Director
and
Mr. Peterschmidt
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Societe de Distribution d'Eau
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Mr. A. Moche
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General Manager
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Mr. Rida Mourtada
Director-General
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Rue El-Nassr
Syrian Arab Republic

Mr. M. Jubari
General Manager
National Water and Sewerage Authority
Sana'a, Yemen Arab Republic

Mr. Jakir Celestin
Director
VODOVOD
Vladimir Nazoro 21
Dubrovnik, Yugoslavia

Mr. Abdul Satar
President
Central Authority for Water Supply
and Sewerage
Nadir Shah Mina
Kabul 2, Afghanistan

Water Supply & Sewerage

Mr. Y. Rovani, Director, PBPDR

February 18, 1976

H. R. Shipman, Water Supply Adviser, PBPDR HRS

Meeting of the Ad Hoc Working Group on Rural Potable Water Supply and Sanitation - New York, February 9-10

I attended the above meeting in New York together with Mrs. Boskey and Mr. Kalbermatten. This is to provide information on a few details covered in the meeting and the decisions taken. It is understood that the Secretariat will provide a full minute of the meeting.

1. A meeting of the Executive Committee was held in the first morning attended by the representatives of UNDP (Mr. Mashler and Mr. Berna, Mr. Mashler acted as Chairman), WHO (Mr. Dieterich), IDRC (Mr. McGarry), Secretariat (Mr. Harold Graves and Mr. Myer Cohen), and IBRD. The purpose of the morning session was presumably to take certain decisions which would expedite the afternoon meeting. The exact opposite occurred and the morning meeting was absolute chaos, with the Chairman pulling one way and most of the members insisting that until it was known what would be the program for the forthcoming months, the organizational structure which would surround such activities could not be defined. The meeting adjourned at noon with nothing accomplished.

2. The afternoon session was attended by those present in the morning plus Mr. David Hopper of IDRC and representatives of UNEP, FAO, and UNCNRET. The afternoon session was chaired by Mr. Myer Cohen.

3. This was the first Ad Hoc Working Group meeting attended by FAO and UNCNRET. During the course of the meeting FAO, UNEP and UNCNRET were informed that while it had not been a precondition of membership on the Ad Hoc Working Group that the agency make a financial contribution to the support of the work, this had been one of the factors which had initially surrounded selection of members for the group. The UNEP representative indicated that following the meeting he was to explore with his agency a possible cash contribution to the trust fund. FAO and CNRET indicated that unfortunately they were unable to support the group and its work by means other than some staff time.

4. There was general agreement that a meeting of the larger group similar to the one held in Geneva last November should be held, possibly a year from now at a time when a sufficient amount of information and a clear-cut understanding on a plan of action could be available. It would be better to delay the meeting to obtain such material than to schedule the meeting earlier and not have it available. The period between now and when that meeting occurs has been referred to as an interim phase at which certain activities will be initiated and completed, and others initiated but not completed.

5. The question on whether to eventually form a consultative group or some other kind of forum for exchange of views is to be postponed until a later time for resolution.

6. The present uncommitted funds in the trust account total something like $81,000. While Mr. Mashler of UNDP had volunteered to find additional funds, the group took the position that no new activities should now be approved unless funds were available and in the account. It was brought out in the discussions that two of the bilateral agencies have expressed interest in supporting certain projects almost immediately, and if so, some of the projects discussed in the following paragraphs might be presented to them for financing. The trust fund would thus be relieved of this responsibility. It seems highly probable that UNEP will make a contribution and UNDP might, toward the end of the year, find some means to contribute small additional amounts. IDRC also felt that it would be able to contribute if necessity arose. From our side, the Bank did not make any commitments on funding other than as noted below, which would not be in the form of a cash contribution.

7. The actions to take place during the period between now and the next meeting of the larger group can be broken into four principal headings. These are:

a) One workshop for a group of countries would be held at which the problems and opportunities surrounding rural water and sanitation programs will be presented, and to which representatives from a group of developing countries in one region would be invited. Representatives would be from planning agencies, the rural water agencies, and rural development organizations, among others. In the event that during the workshop certain countries made known their interest in some preparatory activity, I indicated, and Mr. Dieterich agreed, that we could probably commit some CP resource for the follow-up activity. This workshop would be administered by WHO with the assistance of UNDP. It is tentatively scheduled for sometime around next September.

b) A review of experiences on past rural water and sanitation projects is to be undertaken. This study is to be the responsibility of IBRD with the assistance of WHO and IDRC. We agreed to commit a consultant to this task and it is proposed to review the sector studies carried out by the Bank and by the CP, and to supplement information obtained by this means by data from UNICEF reports and such other sources as can be found. Because of IDRC's interest, we indicated a willingness to have them participate in this particular review to the extent of possibly financing part of the cost of the consultant. Alternatively, we suggested

that they might wish to make their contribution as cash to the trust fund, but these matters were to be sorted out after the representatives returned to Canada. We indicated that we would approach Mr. Charles Pineo as the consultant most qualified to undertake this work. We would propose to get this study underway as soon as possible. I mentioned a figure of around $15,000 as a possible cost for the consultant expenses, assuming some travel and approximately three months' work.

c) A third activity is to be a study on communications and information transfer. This is of particular interest to IDRC and although there was scepticism expressed on the proposal as presented by an IDRC representative, since IDRC is willing to finance the study, it appears that they will proceed with it.

d) The fourth category of items represent selected studies which had been identified and recorded in the report which went to the large group last November. A number of the studies have been selected from that list, and it is proposed that these would be held up to various bilateral agencies as soon as possible with the thought that some might be funded. It was agreed that each of these needed to be reshaped in line with some comments which we offered and which would necessitate substantive changes to avoid duplication or misdirection. WHO will handle this activity.

8. No provision has been made for maintaining a permanent Secretariat. The interim activities will be carried out under the responsibilities as noted above. Where there is need for decisions to be taken, for example, approval of any activities involving the trust fund, these would have to be submitted to the Executive Committee.

9. The term, Ad Hoc Working Group on Rural Potable Water Supply and Sanitation, is to be dropped and it will now be referred to as the Steering Committee on Rural Water Supply and Sanitation.

10. I raised the question as to whether the terms of reference set forth in Montreal still prevailed. At that time the scope of interest was to include not only rural water and sanitation, but the fringe areas. The decision of the group was to continue to include fringe areas as a concern but recognizing that these would have to be dealt with separately. Therefore, in the report which we are to prepare, it would probably have to be in two parts: one concerned with fringe areas and the other with what would normally be classified as rural.

11. It was agreed that the Executive Committee would continue as now formulated, namely with representation from UNDP, WHO, IDRC and IBRD. It was also agreed that at a session which would probably be convened sometime in August or September, this Committee should elect its own Chairman. Under this arrangement I am not certain who will take the initiative to convene the Committee, but presume that Mr. Mashler of UNDP, following up on his previous assignment, would have the authority.

cc: Mrs. S. Boskey, IRDDR
Mr. J. Kalbermatten, LCPWS

HRShipman:j

TRANSPORTATION & URBAN DEV
cc Water Supply & Sewerage

WORLD BANK / INTERNATIONAL FINANCE CORPORATION

(R-612)

OFFICE MEMORANDUM

TO: Files

DATE: February 10, 1976

FROM: Richard N. Middleton, Sanitary Engineer, PBPDR

SUBJECT: Professor Gilbert White -- Research Paper on Water Supply to the Urban Poor

Professor White called me today to apologize for missing the end-January deadline for the first draft of this paper. Due to staff illness and other travel commitments he does not now expect to have an acceptable draft prior to March 5.

I told Professor White that this slippage would not cause us any serious problems, provided that he let me have by March 1 an outline of the follow-up studies he considers desirable. We can then discuss with Professor Lauria, who will be visiting the Bank on March 1 and 2, how these studies might be integrated into the next phase of Professor Lauria's work.

cc: Messrs. Shipman, Warford, Saunders
Ms. Peter

RNMiddleton/cel

Water + Sewerage

January 28, 1976

Professor William J. Oswald
CSO International, Inc.
Suite 100
2450 Stanwell Drive
Concord, California 94520

Dear Bill:

I enclose a transcript of the notes which I made during your seminar here. I am sorry it has taken so long to prepare: it is fairly complicated typing, and had to take its turn in the queue while we cleared the backlog of work that had accumulated during the week's training course.

As I discussed with you, I would like to take all the course material -- the background paper, the material handed out during the seminar, and my notes -- and combine them into one manual for the use of our staff. We would also include in this manual a few worked examples. Probably I could undertake the first part of this consolidation and re-writing myself, but I would obviously need to consult with you from time to time, and in particular I would need help on the worked examples. For this, I would plan to visit you to discuss the text and visit some systems. I would propose that for this assistance the Bank would pay you a daily fee on the same basis as for the seminar. I know that at the present time you are very busy with university matters; if you can give me some indications of the dates later this year (possibly June) when you are likely to be less committed, then I can try and schedule my work accordingly.

I am sure you will be pleased to know that, when I asked our staff to evaluate the whole week's course, your seminar led the field. Our staff evidently shared my views, finding your talk extremely interesting and highly relevant to our work, and I am sure that you have made many new pond converts.

Sincerely,

Richard M. Middleton
Sanitary Engineer
Public Utilities Department

Enclosure

cc: Ms. Peter

RMMiddleton/cel

Waste Stabilization Ponds -- Professor W. J. Oswald -- Seminar Notes

January 5-6, 1976

Brief History and Background

Sanitary engineering is basically a product of the cold, northern European countries -- England and Germany. Only slowly was it realized that processes and design criteria could be very different in warmer climates. The "cold climate" techniques -- activated sludge and trickling filters -- were the basic syllabus in universities; waste pond technology has been introduced into courses only recently, largely as a result of work done at Texas (Gloyna) and California (Oswald), followed by work in India and the Middle East.

Ponds are now being used in all climates, but above a certain boundary -- say 100 g cal/cm^2/day of visible solar radiation -- ponds are not so effective. Note that radiation values (Syllabus Table I) are less (perhaps 5-10% lower) than would be calculated from weather data, due to reflection at water surface. Below this value, which occurs at about 26° north latitude, year-round photosynthetic oxidation cannot be depended upon. Many ponds are used for fish production -- Munich, throughout Czechoslovakia and Hungary, and in much of the Orient. In the Orient ponds are started by spreading wastes on depressions in the ground and seeding with fingerlings.

The earliest scientific paper on ponds was by Caldwell (1943), followed by Lindstrom (Sweden) and data on North Dakota. Publications on work in California began in the early 1950s.

The question is no longer the feasibility of ponds, but the most effective way to design and operate ponds. It is relevant to consider basic

systems criteria (see pp. 6, 7 of 1975 Conference reprint).

1) Efficiency throughout life

Ponds have greater inherent flexibility than conventional plants, which are usually operating at their design capacity for only a brief period of their lives.

2) Reliable and fail-safe

Most conventional plants are highly susceptible to mechanical failure or process failure (e.g., pump outages, digester breakdown). Ponds are inherently fail-safe since they do not require sludge management systems.

3) Environmental impact

The only adverse effects of ponds may be insects or smell; the latter is most unlikely in a well-operated pond.

4) Cost-effectiveness

Ponds are usually very cost effective because earthwork is cheaper than concrete.

5) Reclamation opportunities

Reclamation of water to potable standards is unlikely to be economically viable for any form of sewage treatment, because of the serious public health implications. Some use for non-potable purposes (e.g., toilet flushing) might be envisaged, but is likely to be uneconomic, and may cause corrosion problems. Reclamation for agriculture or power plant cooling does however look feasible.

6) Capability to incorporate new processes

Conventional treatment is difficult to modify to incorporate new developments; ponds can be rearranged or, if desirable, "recycled" at low cost and rebuilt in new form.

7) Short design/implementation period

This can save large sums in times of high inflation.

Design process

Basic data

Population projections

Terrain -- ponding sites (preferably all gravity)

Weather data

Evaporation data: Figure 2 gives nomograph but requires much data, which is unlikely to be available. Existing ponds will frequently give a rough guideline (but may be complicated by percolation). Note that 1 cm/day is often a reasonable estimate, since 500 Langleys/day will evaporate about this amount.

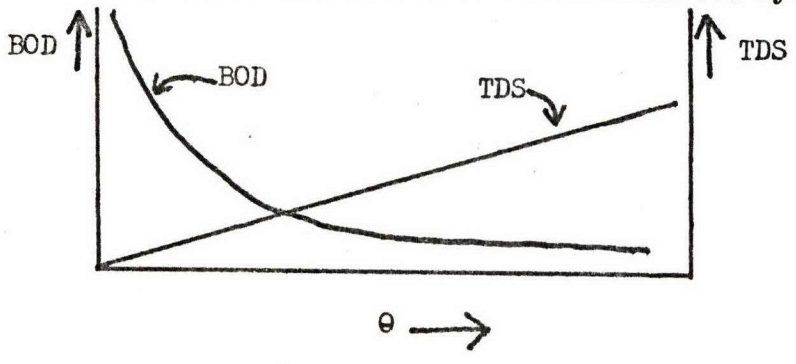
Percolation: Permeability coefficients as determined by ordinary soils tests are usually unreliable because of gradual sealing of pond floor and sides by sludge. The test illustrated in Figure 4 is more appropriate. This should be done using at least two water levels. The design rate is then of the order of 5% of the observed rate, to allow for sealing effects. This test is designed to measure stable values, usually reached after 14 days. Short-term (e.g., 1 day) tests may be too optimistic by an order of

magnitude! Long-term percolation will be determined either by the soil or by the "barrier layer" that gradually accumulates on it. The latter appears to be of the order of 0.6 cm/day, and to be relatively independent of head (i.e., pond depth) (e.g., Richon ponds at Tel Aviv, built on sand: originally accepting more than 10 cm/day, now after 3 years stable at 0.7 cm/day). This rate is reached whether the pond is initially sealed (by compaction) or not -- but if groundwater is being abstracted nearly, sealing may be desirable to avoid high percolation rates during initial period of operation (and periodically after each pond cleaning, when the barrier layer is removed, since the sealing effect does not penetrate significantly into underlying soil).

Ponds can be used for aquifer recharge and at the same time to prevent seawater intrusion; this is tolerable from the point of view of bacterial or viral contamination (die-off being very rapid) but not if soluble chemical contaminants are present, which travel much further.

Note that $\Theta = \frac{Ad}{Q_{in} - A(e_n - P_n)}$ (Equation 9)

The effects on BOD and TDS of Θ are illustrated by:



Hence to improve quality (without greatly increasing TDS due to evaporation from larger A) it is essential to increase d. However, smaller A also has smaller solar energy input into pond.

A deep pond is essential to remove carbonaceous BOD. Shallow ponds, producing CO_2, leave CO_2 in the pond, since the gas is effectively infinitely soluble in water (gases discharged by ponds are virtually free of CO_2). Hence methane fermentation, which demands anaerobic conditions is essential. (Other requirements are pH in the range of about 7.0 to 7.5, temperatures above about 12 to 15°C, and of course an initial presence of methane-producing organisms. Start-up may take, according to Oakland, California experiments, one month after seeding or one year if unseeded. The organisms have not been clearly identified, but evidently two stages are needed: organics -- organic acids -- methane. Well established septic tank sludge will provide a source; a digestor may be a suitable source, but the organisms here may be thermophilic or mesophilic and not suitable for ponds, in which cryophilic organisms may be more suitable. Do <u>not</u> start ponds at the onset of cold weather -- otherwise odors will develop).

Organisms process organic acids ($CH_3COOH \rightarrow CO_2 + CH_4$), but cannot operate at pH below about 7.0 (some say 6.8).

Hence rapid disposal of acid is necessary if pond is not to "go sour" -- rapid start-up, which implies seeding, is therefore essential.

The effects of detention time on settleable solids, BOD and coliform count are illustrated on Table VI, Table VIII and Figure 13, respectively.

The variants which affect design are, in order of importance, MPN, BOD and SS: design to satisfy MPN requirements will meet criteria for the other two.

Example

P_{net} = 0.3 in/day

e_{net} = 0.1 in/day

T_{min} = 15°C (daily average)

Desired effluent MPN: 10/100 ml (NB excessively high standard: taken to illustrate need for several ponds)

From Figure 13, for MPN = 10; T = 15, Θ = 100 days or more

Then

(a) For overflowing ponds:

$$\Theta = \frac{Ad}{Q_{in} - A(e_{net} + P_{net})}$$

$$100 = \frac{Ad}{Q_{in} - \frac{0.4A}{12}}$$

(where A in acre-ft)

(b) For non-overflowing ponds:

$$Q_{in} = A(e_{net} + P_{net})$$

$$Q_{in} = 0.4A$$

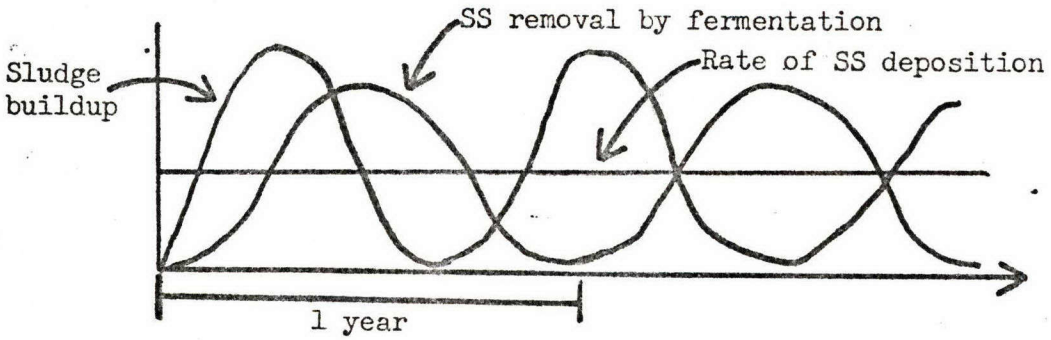
$$A = 2.5\ Q_{in}$$

To solve (a), d must be selected.

Depth Selection

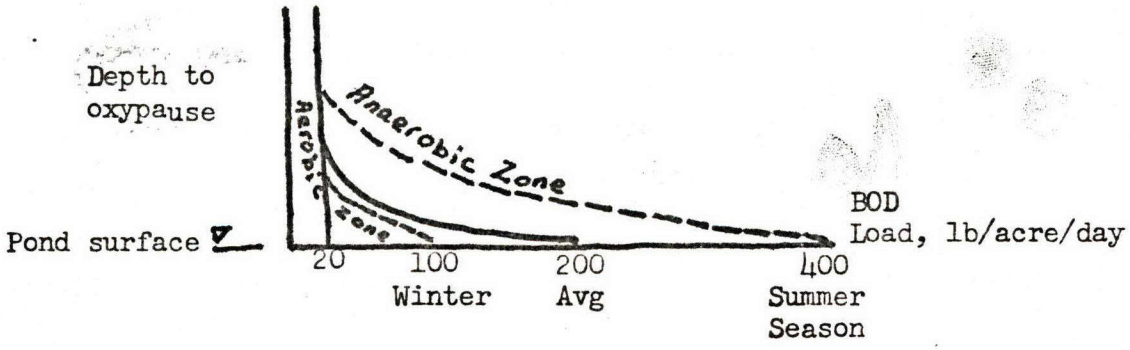
The temperature gradient in any body of water is usually of the order of $1^{o}C/m$ (the "thermal lapse rate"). Domestic waste usually has an influent temperature of $18\text{-}22^{o}$; by injecting this at the bottom some degree of methane fermentation can often be maintained year-round. However, once bottom temperature falls to 15°, fermentation will cease (Equation 35).

For complete fermentation, 1 lb BOD will release about 10 ft^3 of gas; fermentation is complete when $450\ (T\text{-}15) = 10\ B$ where B = BOD load/acre/day. Field data inserted in Equation 35 therefore gives some indication of effectiveness of BOD removal due to methane fermentation. Fermentation is seasonal:



Therefore sludge must be balanced over the year. There will always be some build-up due to grit (1-10 ft^3/mg; usually 1-3 ft^3/mg) and to residuals from sludge (0.1 ft^3/cap/year).

Field measurements indicate that the oxypause varies with loading as follows (at latitude $37^{o}N$ approx.):



When the oxypause reaches the surface, the whole pond becomes anaerobic.

Hence for facultative pond which never becomes anaerobic in winter, loading must not be greater than 100 lb/acre/day at 37°N latitude.

If persons eat 3000 kcalories/day, about 20%, is excreted unoxidized, i.e., about 600 kCal. Since 1 gm BOD $\simeq$ 3.67 kCal, BOD of excreta $\simeq$ 160 gm/cap/day. Evidently this is far too high for developing countries (and also this is ultimate BOD, not BOD_5).

Oxygen-dependent processes dispose of only about 20 lb/acre/day; the remaining 80-380 lb/acre/day is dependent on anaerobic conditions. With large ponds, wind circulation will introduce O_2-laden surface water into the lower layers and stop fermentation immediately. The inlet section of the pond should therefore be carefully protected by bunds or piles to prevent O_2 contamination; at the same time this retains influent heat and promotes fermentation.

Photosynthetic organisms absorb light, and convert approximately 4% of the light energy into cells, and about 90% into heat. This effect will overcome the thermal lapse rate effect described above,

and will also stabilize the lagoon by establishing a greater density gradient and so preventing wind turnover. Night time cooling would draw surface water (in "tubes") down to the anaerobic layer; again, construction of a bunded inlet section will prevent this effect due to incoming flow.

Q_{in} = 1 USmgd = (Note: 1 acre ft = 326,000 g

1 mgd = 3.07 acre-ft.)

$$Q = \frac{Ad}{Q_{in} - A(P_n + i_n)}$$

$$100 = \frac{Ad}{3.07 - \frac{0.4A}{12}}$$

For A = 10 $\quad 100\ (3.07 - \frac{0.4\ A}{12}) = 10\ d$

$$10\ (3.07 - 0.33) = d$$

$$d = 27.4$$

For A = 5 $\quad 100 = \frac{5d}{3.07 - \frac{5 \times 0.4}{12}}$

$$d = 20\ (3.07 - 0.17)$$

$$= 20 \times 2.90$$

$$= 58 \text{ ft.!}$$

For 40 acres:

$$100 = \frac{40\ d}{3.07 - \frac{0.4 \times 40}{12}}$$

$$d = 2.5 \times (3.07 - 1.33)$$

$$= 2.5 \times 1.74$$

$$= 4.35 \text{ feet.}$$

For non-overflow conditions,

$$Q_{in} = A(P_{net} + e_{net})$$

$$3.07 = A(\frac{0.4}{12})$$

$A \simeq 92$ acres (for higher A, d becomes negative)

If ponds develop odor, this can often be suppressed by lime addition, since at pH of about 8.0 all H_2S is present as $(HS^- + H^+)$

Photosynthetic processes

Total incident energy, $H = \Theta SA$

S = Langleys/day

A = area in cm^2

Θ = detention time in days

Total energy utilization = hC_c

h = heat of combustion of algae, cal/mg

C_c = concentration of algae, mg/l

Consider an element of the pond, of total volume 1 litre = 1000 ml.

The surface area = $\frac{1000}{d}$ (d = depth in cm)

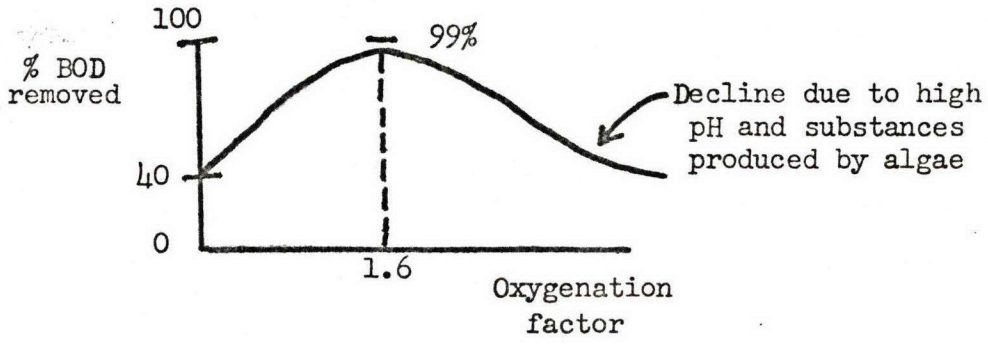
If F = efficiency of conversion,

$$h\,C_c = \Theta S\,\frac{1000}{d}$$

But $\frac{d}{\Theta}$ = hydraulic loading rate = $\frac{1000\ S}{h\ C_c}$

Note that formation of 1 gm of algae is associated with production of 1.6 gm of O_2 (p. 39). The adequacy of this amount of O_2 is expressed by the oxygenation factor = $\frac{\text{Photosynthetic } O_2}{\text{BOD}}$

Experiments have indicated that excess O_2 is necessary:



Because the optimum oxygenation factor $\simeq$ BOD/O_2 conversion, one may substitute BOD for C_c

$$\frac{d}{\theta} = \frac{1000\ FS}{h(BOD)}$$

$h \simeq 6$ cals/g

$$\frac{d}{\theta} = \frac{167\ FS}{(BOD)}$$

For this process, the depth is limited by light penetration, which is governed by equation 32.

Photosynthesis only occurs when the energy input is equal to algal respiration energy needs, about 10 milliLangleys/minute. We may therefore calculate the maximum effective depth for photosynthesis.

Example: BOD = 220 mg/l

S = 160 calories/cm^2/day Maximum 800 milliLangleys/min.

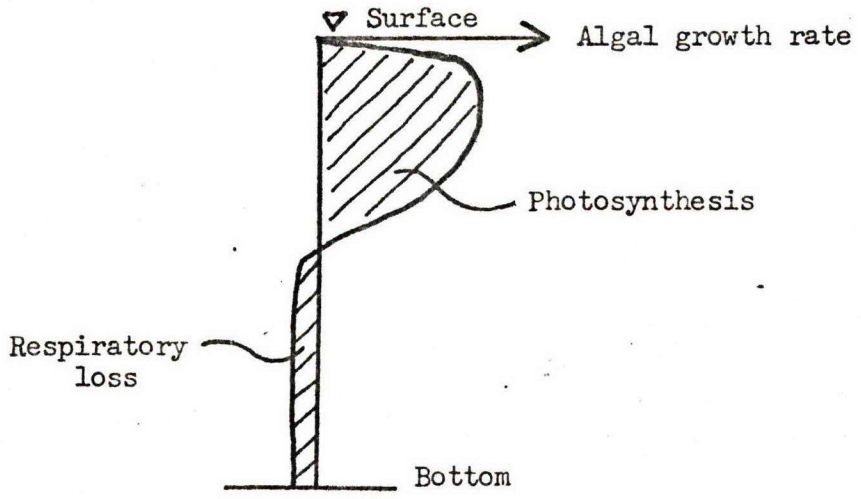
F = 4%

$$d = \frac{\ln So - \ln Sd}{C_c \alpha} = \frac{6.7 - 2.3}{220 \times 1.28 \times 10\text{-}3}$$

$$= 15.4\ \underline{cm}$$

However, this very shallow depth does not apply in practice = horizontal flow velocities result in a steady turnover of surface layers, so that the actual effective depth $\simeq$ 3 x theoretical depth (for horizontal velocity 0.1 fps).

Algae actually lose weight by respiration in the darker portions of the pond.



This could mean that with sufficiently deep ponds (say 10 m) complete destruction of the algae would occur.

Although average velocity may be 0.1 fps or so, for shallow ponds a daily flush of about 1 fps is necessary to stir up bottom sediments to prevent them from becoming septic and to provide algal nutrients.

Algae production is accompanied by a rise in pH. Pathogens cannot exist with pH of the order of 10, so this process is also a disinfection mechanism.

Ponds are most suitable in the north and south arid zones ("arid" being defined as where evaporation exceeds precipitation). The north belt includes the Sahara, Middle East, much of India and China, and contains about 70% of the world's population. The southern belt covers parts of South Africa and South America (the rest of the belt being over the oceans) and only holds about 5% of the world's population.

Largest current system: 200 acres mixing channel, 4 ft. deep, capacity about 1 million m^3, serving Modesta, California.
40,000 lb O_2/day produced, with about 25,000-30,000 lb algae (not harvested)
Only problems are during canning season, when upstream primary plant fails due to overloading, and 200,000 lb BOD/day are discharged to the ponds.

Algal discharge may be 150 mg/l SS. These will remain suspended at velocities above 0.1 fps and will give no problems -- in fact, will support food chain. Requirements for algal removal (e.g., Napa Valley, California) have little justification.

High rate photosynthetic ponds may have solar utilization efficiency of 4% -- about 25 tons organic matter (dry)/acre/year at 37°N latitude (compared to 1% efficiency for facultative pond, producing about 8 tons/acre/year).

Algal separation : centrifuge — high cost for power : 2500 kwh/mg
Small units (20 inch: 0.1 mgd) cost about $0.50/lb. algae. With larger units cost may fall to $0.02/lb.

Chemical coagulation:	Lime addition to raise pH to 11.0. Sludge drawn off may be 40-60% algae, depending on water quality and seasonal algal productivity. Effluent usually does not need filtering; CO_2 addition may be needed for pH correction.
Flotation:	Capital expense slightly higher than for coagulation + sedimentation. 3-4 mg/l polyelectrolyte are needed for algae to coalesce.
Micro-straining:	Applicable only to a few filamentous algae -- which probably means developing a mono-culture pond.. Research on this is in hand. Operating costs may be as low as $20/mg, producing a 5-10% solids slime.

Dried algae ca. 50% protein 5% fat 30% carbohydrate. University of California experiments equate this to bone meal for swine, soy meal for chickens, etc. Dilution (10:1) with cheap carbohydrates is necessary. Although build-up of carcinogens, toxic materials, etc., is not known, it is obvious (?!) that providing protein to starving people is beneficial regardless of possible very long term effects.

Chickens reject a proportion of N as fibrous material which can be used for algal production and fed back to chickens. In Formosa pigs are being reared on "green water" -- algal culture produced from their wastes.

Chickens can be fed up to 15% algae as addition to meal (more would waste N) with no detectable effects on growth or egg production.

Normally, chickens use 5 lb protein in food to produce 1 lb eggs

cattle 9 1 lb product. By treating chicken wastes, 3 lb protein can be recovered, with two benefits: (a) new food requirements are reduced from 5 to 2; (b) wastes are reduced from 4 to 1.

For 10,000 head cattle feedlot, 300 - 400 acres of ponding system might be needed for recycling. (Compared to 100,000 - 200,000 acres required to grow conventional feed). The waste needs initial filtration -- solids going to the animals, liquid (with 80% N) to ponds.

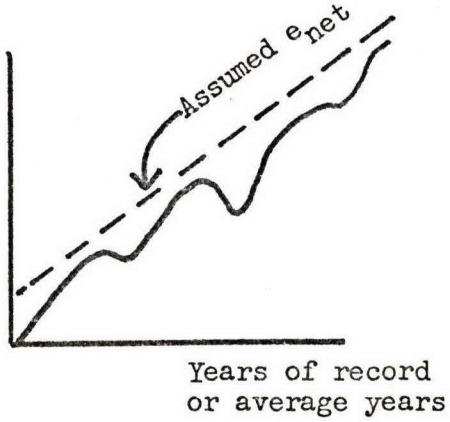
Note that a pond with power aerators is a very efficient activated sludge unit. If earthwork costs $\$2.50/m^3$, a 10 ha pond (reactor volume 350,000 m^3, earthwork 100,000 m^3) will cost ca. \$250,000. This might have a detention period of 100 days. For an activated sludge plant detention might be about 0.25 day, or $\frac{350,000}{400} = 875\ m^3$. The cost of this at $\$10/ft^3$ ($\$300/m^3$) is about \$262,000. The costs are therefore comparable, but the high detention period of a pond is beneficial. Spacing of aerators is not crucial provided total O_2 transfer is adequate; in fact, due to the mixing induced by aerators, it will be necessary to bund off an anaerobic zone for methane fermentation.

Design process

A. Non-overflowing ponds

Determine net evaporation, e_{net}:

Determine or estimate net percolation, P_{net}



For this form of pond there are two hazards:

(a) overflow and hence unintentional inundation or pollution

(b) drying-up and collapse of process.

Then basic formula $A = \frac{Q_{in}}{e_n + P_n}$, checking units for homogeneity, e.g., A = acres

Q = acre-ft/day

e_n, P_n = ft/day

For example for A = 1 acre-ft/day (0.3 mgd)

$$e_n + P_n = 0.4 \text{ in/day (as earlier example)}$$

$$A = \frac{1.0}{0.4/12} = \frac{12}{0.4} = 30 \text{ acres.}$$

This is a very large area of land: about 100 acres/mgd, but the pond will be maintenance free.

With an influent BOD of 200 mg/l, total BOD = 8.34 x 220.

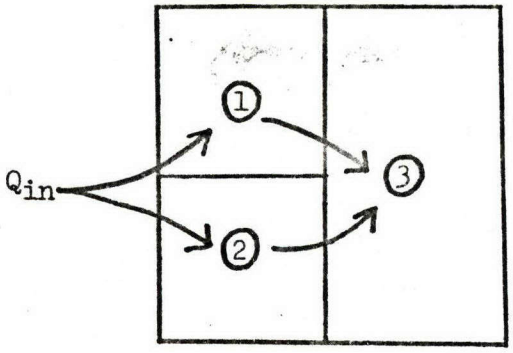
$\simeq$1700 lb/mg

$\simeq$600 lb/acre-ft

Hence loading on pond $\simeq$ 20 lb/acre/day

This is satisfactory: oxypause depth curve becomes asymptotic at this low loading, so entire pond is aerobic.

However, seasonal variations in loss factor may mean that pond partially dries up. Since biological processes may take 6 months to establish, this cannot be tolerated. Therefore divide pond into cells, and bring varying numbers into use with season, maintaining at least 3 ft depth in each. If water levels fall below this, pump out cell and dry it completely. For example:



1, 2: reactor ponds, used in series or parallel

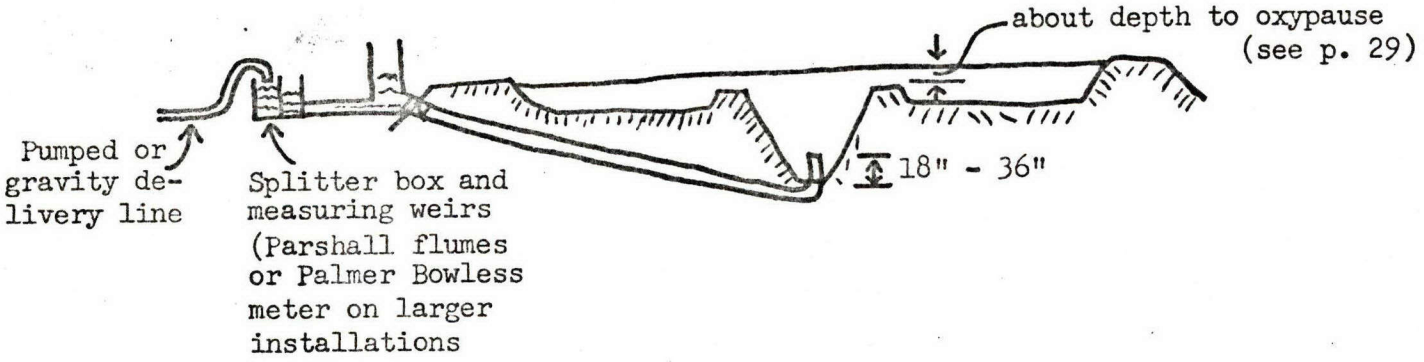
3: reactor pond at peak times, maturing pond for past year, dry for some of year.

This subdivision will mean that the initial pond may occasionally be loaded at 80 lb/acre/day, which will mean that this pond becomes anaerobic. The inlet ponds will therefore need to be deeper to achieve effective methane fermentation under anaerobic conditions (this will anyway be necessary to remove C, unless algal or fish harvesting is practiced).

Non-overflowing ponds will eventually be heavily laden by salts, possibly toxic (Cr, Vd), especially if percolation is low (see equation 8b in Texas paper). Full sealing of ponds is therefore undesirable from the point of view of the pond; it also avoids the problem of eventually cleaning out and disposing of highly saline contents. Salt removal may be possible by cleaning the ponds subject to intermittent drying.

Inlet systems

Regular flushing (by cutting off the inflow, filling the inlet header pipe, and then releasing the water) is advisable to keep grit from accumulating:



The capacity of the inlet digester should usually be 2-3 ft^3/cap. (based on untreated digester criteria) plus 0.2 ft^3/cap/year for grit. Note the use of berms round the digester -- these prevent the intrusion of cold bottom water, and prevent overturn. Attempts to induce circulation by injecting flow into corners of pond, parallel to berms, result in local shoaling, overloading, and unsatisfactory conditions. A central inlet is to be preferred in every case.

Interconnections

To avoid raw sewage from flowing to later ponds, interconnections must be designed to prevent short-circuiting. In winter raw sewage will be warmer than the water in the pond and will rise to the surface; similarly, in winter it will be at or near the bottom. To avoid grease transfer between ponds the first interconnection must be below surface level (low level transfer: LLT; c.f. surface drawoff, high level transfer, HLT). For absolute certainty that final pond will never receive raw sewage or grease, there must be four ponds in series with drawoffs arranged LLT - HLT - LLT - HLT. Inlets into secondary, tertiary, etc. ponds need not be to center

of pond. Hydraulically, these interconnections must carry not only sewage but also rainfall on pond surface (note that 1 in/hr on 1 acre $\simeq$ 1 cusec).

Spillways

All ponds -- "non-overflowing" or not -- should have a spillway (regardless of local regulations about discharges from primary treatment facilities!). To retain water in ponds (using freeboard as storage) interconnections may be fitted with adjustable weirs, which are raised during floods. This is only likely to be effective on larger systems.

B. Overflowing facultative pond

Loadings will be of the order of 200 lb/acre/day in the primary pond and 50 lb/acre/day overall, if odors are to be entirely avoided. Loadings may be doubled if odor is acceptable (but 50 lb/acre/day for an ultimate BOD loading of about 0.2 lb/day is sufficient for 250 persons/acre).

Figure 3 (Texas paper) shows likely BOD reduction as function of temperature and time. Note that overall reductions in excess of 90% are unlikely because of new BOD being generated by algae.

C. Integrated ponding systems

These systems usually comprise a series operation of facultative -- aerated (high rate) -- maturation ponds. The facultative pond is designed for methane fermentation, the high rate ponds for

photosynthetic oxidation of the residue, and the maturation ponds to provide sufficient storage for coliform die-away.

The facultative ponds will not usually have deep pockets, but berms across their width to prevent overturn and creation of aerobic conditions. These ponds are workable only where S exceeds about 100 Langleys/day.

Odor control

The only time when odors are likely to be difficult is at pond start-up. At this time use of an aerator for a time may be a solution. Location of aerators is not usually critical -- i.e., they will not inhibit development of methane fermentation. Note that aeration will be needed to satisfy all BOD, since the mixing inherent with aeration will reduce algal concentration to very low levels and hence also oxygen derived from photosynthesis.

Reuse for irrigation

At least two ponds in series are required, primary pond effluent being excessively rich.

Proliferation

The number of organisms after time t, N_t is given by $N_t = N_o\, 2^{t/g}$ where g = generation time. Most algae follow this equation with g = ½ day approx., but selected species (which cannot yet be cultivated in ponds) may follow a much more rapid curve:

$$N_t = N_o\, 16^{t/g}$$

Removals

Facultative	40% C	60% N	5-10% P	
Photosynthetic	40-50% C	10% N	?	Removed as algae

Phosphate removal is related to increase in pH with algal growth, since algae remove HCO_3^-, and pH changes according to the relationship

$$pH = pK_1 + \log \frac{(CO_3^{=})}{(HCO_3^-)}$$, where unit concentrations are in meq/l.

This high pH (up to 11.0; commonly 9.5 to 10.5) disinfects pond and also converts greases to fats and soap which are biodegradable. As a result, P is precipitated out as $Ca_3(PO_4)_2$.

Recovery

(a) Cassava: algae grown on processing wastes might be decoloured and mixed into the product, possibly boosting protein content from 1% to 4%. Obvious problems are colour and taste; research is in hand.

(b) Carbohydrate: by making the end of a channel in a high rate pond very shallow (ca. 2 in), high intensity sunlight bleaches algae by converting green proteins to white carbohydrates -- but at a considerable loss of food value.

Diagram illustrates concept of fish rearing -- the question is of the bleed rate into various tanks in phased stocking system.

Ratios reported in the literature of dry algal weight to fish weight vary from 1:1 to 4:1. Assuming the fish consume half the available algae, the conversion ratio might on average be 1:2x2, or 1:4.

From domestic sewage, with 50% conversion ratio, 15° N latitude, yield might be 6000 - 10,000 kg/ha/year of tilapia. Very approximately, assuming a market value of 45 cents/kilo, a profit of about 17-23 cents/kilo seems possible (if land costs of the ponds are ignored), giving a return of 12-20%.

Past experience varies widely: in Indonesia fish are grown in raw sewage, in other places the system fails and the fish die.

Information on commercial operation of fish harvesting is extremely limited; feasibility studies are now essential.

WATER SUPPLY & SEWERAGE

December 29, 1975

Dr. Abel Wolman
209 Ames Hall
The Johns Hopkins University
Baltimore, Maryland 21218

Dear Dr. Wolman:

We are enclosing herewith copies of the report prepared by the panel on which you were a member and which convened last spring. We had not expected quite such a delay in getting the report out, but because of the need to accommodate the various comments received which, among other things, required some editorial revisions, a longer time was required than had been visualized.

We wish to again thank you for your participation on the panel and hope that we may be able to call upon you again in the not too far distant future.

Very truly yours,

Harold R. Shipman
Water Supply Adviser
Public Utilities Department

Enclosures

HRShipman:j

Water + Sewerage

January 26, 1976

Dr. J. M. G. van Damme
Manager
WHO International Reference Centre
for Community Water Supply
P. O. Box 140
Leidschendam
The Netherlands

Dear Dr. van Damme:

I must apologize for the long delay in letting you have our comments on the draft final report on public hydrants. This delay has been caused by the absence on mission of many of our staff from whom we wished a review of the draft, and by the break over Christmas and the New Year. However, we have now had the opportunity to obtain the reactions of many of our water supply staff, and in addition of course we discussed the draft with Mr. de Vlieger and Mr. Zandvoort when they visited the Bank in November.

I think I can best sum up the reactions of our staff by saying that they all considered that the report would be a useful contribution to the literature on this subject, but that it becomes progressively less well argued and less convincing as it moves away from physical equipment into more subjective aspects such as management. This is perhaps inevitable in such a study, but there seem to be several steps that could be taken to tighten up the presentation.

Firstly, the report should clearly differentiate between urban and rural areas, since different cost recovery methods and management will usually apply.

Secondly, the report should very clearly relate its assertions or conclusions to actual country experience. Many of the present very generalized statements would be far more convincing if they were clearly derived from the authors' own observations in a particular country, or from the observations of others who have published studies in this field. The extent to which country sensitivities might be touched by direct reference would of course have to be assessed, and reflected in the wording.

Thirdly, since we hope that this report will eventually receive fairly wide circulation, and may be relied upon for design in some countries, it is essential that the design and cost data are accurate. At present, key

tables (I, II, Annex II.2) do not seem to be based on field observations or on actual cost data collected in the countries visited. If this data was not available to the authors, it is possible that we can assist by obtaining it from our records or from our borrowers in the course of Bank missions, but this might entail unacceptable delay.

Fourthly, the discussion on management of public hydrants (whether they should be unattended, attended by a guard employed by the municipality or water undertaking, or operated by a licensee) is diffuse and does not appear to draw on country observations. It is self-evident that the most desirable system is one in which a simple tap is used with care by enlightened citizens; the question is -- since this does not work in many instances, what have been found to be the most effective alternatives? Most of us are aware in general terms of the possible solutions proposed in the report, but we do not have adequate experience of how they work out in practice to be able to advise our borrowers.

Finally, there seems to be general agreement among us that the third section of the report really adds very little to the earlier sections, and could to a large degree be omitted. Most of the section does not have a direct bearing on the main theme of the report, and in many instances in the part dealing with Kenya statements made about the organization of the sector and on the programs of various agencies are definitely incorrect. We discussed this point at length with Messrs. de Vlieger and Zandvoort, and came to the conclusion that this material should only be retained to the extent that it cast light on particular problems raised in Section II -- for example, on the cost or reliability of a particular type of installation, or on the equity or effectiveness of various methods of cost recovery. This material could then form annexes to Section II.

You will gather from these comments that, in response to the question raised in your letter of 31 October, we believe that the studies should be compiled in one report rather than separately. We doubt whether any material of real value will have to be omitted if this is done.

As far as follow-up is concerned, we will comment further when we see the next draft of the report. Our initial reaction is that this is too specialized a subject to need a training manual or course on its own; it would be more usefully introduced as part of, for example, a course on rural water supplies or on slum upgrading.

I attach some detailed comments, principally on Sections I and II. In the interests of clarity these comments are given much as they were received from staff; we had a very useful frank and open dialogue with your consultants, and I hope that continuation of this frankness now that we have to communicate in writing will not cause any offense. Mr. de Vlieger mentioned that you were still in the process of editing the draft, and so we

have not commented on minor changes and corrections. Please let me have your views on our observations, in particular your anticipated timetable for completing the report, and whether we can be of any assistance in collecting further data. If you think it would be helpful, we could arrange for Mr. Middleton, who discussed this report with your consultants, to visit you to discuss the next draft of the report prior to its publication.

Very truly yours,

Harold R. Shipman
Water Supply Adviser
Public Utilities Department

Attachment

cc: Mr. Callejas
Mr. Saunders
Mr. Warford

RMiddleton/cel