

Table of Contents

Contents	Page
BACKGROUND TO BUSINESS PLAN 2007-2011	vi
1. PART 1 – OVERVIEW.....	1
1.1 Disaggregation of Programmes/Projects	1
1.1.1 Water.....	1
1.1.2 Sewerage.....	1
1.1.3 Institutional Strengthening.....	1
1.2 Classification of Water and Sewerage Projects.....	2
1.2.1 Water Projects.....	2
1.2.2 Sewerage Projects.....	2
1.2.3 Water.....	2
1.2.4 Wastewater.....	3
1.3 KEY FUNCTIONS OF PROGRAMMES/PROJECTS.....	3
1.3.2 Sewerage Projects.....	4
1.4 MILESTONES TO BE ACHIEVED: 2007-2011	5
1.4.1 (a) Major water Sources	5
1.4.2 (b) Distribution Expansion	5
1.4.3 (c) Service Reservoirs	5
1.4.4 (d) Leak Management Programme.....	5
1.4.5 (e) Strategic Pipeline Replacement Programme.....	5
1.4.7 (f) Wastewater Projects.....	6
1.5 STATUS OF CAPITAL INVESTMENT.....	7
1.6 PRICE LIMITS.....	9
1.6.1 Proposed Tariff Structure.....	9
1.6.2 Features of the Tariff	10
1.7 ASSUMPTIONS	11
A full listing of these assumptions can be found in Appendix II.....	11
1.7.1 Methodology.....	11
1.8 CURRENT TARIFF STRUCTURE.....	13
1.8.1 Domestic Customers	13
1.8.2 Industrial/Commercial/Cottage Customers.....	13
1.8.3 Agriculture Customers	13

1.9	PROPOSED TARIFF STRUCTURE.....	17
1.9.1	Domestic Customers	17
1.9.2	Non-Domestic Customers.....	17
	Pt. Lisas Industrial and Commercial customers under the new structure will become one class.....	17
1.9.3	Agriculture Customers.....	17
1.9.4	Customer Bills for Base Year (Water).....	17
1.9.5	Domestic Customers:.....	18
	The new classes of customers will see the following changes in their bill:	18
1.10	WASTEWATER.....	19
1.11	STRUCTURE OF RATES AND CHARGES FOR BASE YEAR....	19
1.12	INTEREST OF CUSTOMERS.....	19
1.12.1	Subsidies	20
1.12.2	Transitional Arrangement	20
1.13	FINANCIAL PROJECTIONS.....	21
1.14	AQUARIUS 3 MODEL.....	21
1.15	EFFICIENCY IMPROVEMENTS.....	22
1.15.1	Variable Speed Pumps.....	22
1.15.2	Information Technology.....	22
1.16	THE AUTHORITY'S OUTLOOK.....	23
1.17	ENVIRONMENTAL SCAN.....	24
1.17.1	Software Systems.....	25
1.17.2	Network Modelling.....	26
1.17.3	Customer Information Management.....	26
1.17.4	Point of Sale.....	26
1.17.5	STORMS.....	27
1.17.6	MAXIMO	27
1.17.7	ALCIE.....	28
1.17.8	Human Resource Management System (HRMS)	28
1.17.9	Supervisory Control And Data Acquisition (SCADA).....	29
	ENVIRONMENTAL SUMMARY	30
	ECONOMIC	30
	FINANCIAL	32
	POLITICAL.....	33
1.18	FINANCING OF STRATEGIC OBJECTIVES.....	34
2.	PART 2 – MAIN SUBMISSION	35

2.1	ASSESSMENT OF THE ENVIRONMENT 2007- 2011	35
2.2	WATER.....	35
2.2.1	Demand and Supply Projections.....	35
2.2.2	Impounding Reservoirs.....	36
2.2.3	Desalination Plant.....	36
2.2.4	Groundwater Facilities.....	36
2.2.5	Surface Intakes.....	37
2.2.6	Supply Boosting Strategies.....	37
2.2.7	Demand Management Strategies	37
2.3	SEWERAGE.....	38
2.4	FINANCIAL	38
2.4.1	Elimination of Shortfalls on Operating Fund.....	38
2.4.2	Capital Structure Rationalization.....	39
2.4.3	Financing of System Strengthening Programmes.....	39
2.4.4	Fiscal Policies and Practices.....	39
2.4.5	Working Capital Improvements.....	39
2.5	HUMAN RESOURCES PROJECTIONS	40
2.6	SERVICE IMPROVEMENTS.....	41
2.7	STRATEGIES FOR THE ACHIEVEMENT OF DEMAND AND SUPPLY BALANCE.....	41
2.8	WASA'S ACHIEVEMENTS 2001-2006.....	44
2.8.1	Customer Service.....	44
2.8.2	Water Production	44
2.8.2	Unaccounted For Water (UFW) – Reduction Strategies	45
2.8.3	Pipe Laying Programmes (2003-2006) has to update.....	47
2.9	NATIONAL SOCIAL DEVELOPMENT PROGRAMME (NSDP).....	49
2.10	PUBLIC SECTOR INVESTMENT PROGRAMME (PSIP).....	52
2.11	DISASTER PREPAREDNESS PROGRAMME.....	55
2.12	ACCELERATED WATER SUPPLY PROGRAMME	56
2.13	INFRASTRUCTURE DEVELOPMENT FUND.....	58
2.14	WATER SECTOR MODERNIZATION PROGRAMME	59
2.15	SEWERAGE.....	61
2.16	FINANCIAL	61
2.17	TECHNOLOGY.....	65
2.18	FORECAST FOR THE PERIOD 2007-2011.....	66
2.18.1	Water Production	66
2.18.2	Pipe laying Plan (2007-2011)	67

2.19	UNIVERSAL METERING.....	68
2.29	LEAK DETECTION, PIPELINE REPAIR AND REPLACEMENT.....	77
2.30	SEWERAGE.....	79
2.31	RISKS AND UNCERTAINTIES.....	79
2.31.1	Monetary.....	79
2.31.2	Chemicals.....	79
2.31.3	Labour.....	79
2.31.4	Electricity.....	80
2.31.5	Dry Season.....	80
2.32	FINANCIAL.....	80
2.33	CUSTOMER PAYMENTS.....	81
2.34	MANAGEMENT OF RISKS AND UNCERTAINTIES.....	81
2.35	COST OF SERVICE STUDY.....	82
2.36	OPERATING EXPENDITURE.....	82
2.37	CUSTOMER GROUP.....	82
2.38	LABOUR.....	83
2.39	ACTIVITY (INFRASTRUCTURE MAINTENANCE).....	83
2.40	COST IDENTIFICATION.....	83
2.41	METHOD FOR ALLOCATING COMMON COST.....	84
2.42	EFFICIENT LEVELS OF COST.....	84
2.43	CAPITAL EXPENDITURE.....	85
2.44	REGULATORY ASSET BASE (RAB).....	85
2.45	DEPRECIATION.....	85
2.46	RATE OF RETURN ON CAPITAL.....	86
2.47	LOANS.....	86
2.48	DEBT SERVICING (INTEREST AND FINANCE CHARGES)....	86
2.49	GOVERNMENT GUARANTEED LOANS.....	87
2.50	RECEIVABLES & COLLECTION POLICY.....	87
2.51	DEMAND SUPPLY REPORT.....	88
	Projected System Balance for 2007-2012.....	90
	Projected System Balance for 2007-2012.....	91
2.52	SCHEDULE AREAS & NUMBER OF CUSTOMERS.....	92
2.53	WORST SERVED AREAS.....	93
2.54	ENVIRONMENTAL ASPECTS.....	94
2.55	PLANS FOR SEWERAGE SECTOR IMPROVEMENT.....	96
2.55.1	Background.....	96
2.55.2	Studies and Proposals.....	96
2.56	NATIONAL MASTER PLAN FOR WASTEWATER INFRASTRUCTURE DEVELOPMENT.....	99

2.57	MEASURES TO IMPROVE WATER QUALITY	100
2.58	AUDITED FINANCIAL REPORTS (1998-2004)	100
2.59	NUMBER OF EMPLOYEES	101
2.60	EFFICIENCY IMPROVEMENTS	101
3.	PUBLIC SUMMARY	102

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BACKGROUND TO BUSINESS PLAN 2007-2011

During the last five (5) years the Water and Sewerage Authority has embarked on a strategic path, aimed at significantly enhancing the quality of water and wastewater services provided to the people of Trinidad and Tobago. This endeavour which is articulated in the Authority's Strategic Plan, is based on four (4) performance areas: Customer Service, Regulatory Compliance, Organizational Effectiveness & Financial Viability, and Modernization & Expansion of the infrastructure.

The Strategic Plan lays the foundation for the achievement of the National 2020 Vision for the Water and Wastewater Sector. The Plan addresses inter alia improvements in service quality and the attainment of financial viability. It is recognized that a key driver for the delivery of service at the lowest cost possible is the review and redesign of the System Processes and Procedures (SPPs) for the operations and management of the Authority. The SPP programme is therefore one of the key strategic initiatives intended to contribute to the lowest possible cost of delivery of service to our customers. Another major initiative is financial viability, which includes the full recovery of efficiently incurred cost, consistent with the delivery of a satisfactory level of service to our customers. Consequently, the revision of the tariff structure and tariff is a major organizational imperative.

The Authority's aim is to change the basis of its pricing structure from a mixture of non-volumetric (principally the domestic consumer class) and volumetric to principally volumetric. The latter is usage sensitive and fosters conservative demand, particularly in the domestic customer class. This approach will be facilitated by a Universal Metering Programme, which is in the initial stages of implementation. The existing non-volumetric (ATV) system has contributed to significant inefficiencies in billing and collections and has thus negatively affected financial viability. In the interim the Authority is pursuing an incremental approach of targeted metering of customers, which will not adversely affect its financial viability.

Since 2002, in pursuit of the goal of an improved level of service to our customers, the Authority has engaged in programmes of upgrade, rehabilitation and development. The bases for our current drive are various projects under the five-year Investment Programme. This five-year Investment Programme (\$6.783Bn) includes the preparation of the Water and Wastewater Master Plan. The plan will provide the framework for the comprehensive rehabilitation, reconstruction and extension of the water and wastewater infrastructure. It will also inform the restructuring of industry and hence provide a sound foundation for the 2020 Vision. The Master Plan will also provide details of projects to be implemented after this initial five-year period 2007-2011 and beyond, to 2020.

The five (5) year Investment Programme is therefore the foundation for a long term development master plan (\$27B), and the mechanism used to meet the current urgent demands for increased water supply, improved water quality and to arrest the degradation of the sewer systems.

The Authority is confident its initial 5-year Investment Programme followed by the long-term development plan will favourably impact the quantity and quality of service levels to its customers.

The Five-year Investment Programme includes projects that fall under headings such as the Water Sector Modernization Programme (WSMP), the Infrastructural Development Fund (IDF), the National Social Development Programme (NSDP), the Disaster Preparedness (DP) and the Accelerated Water Supply Programme (AWSP).

1. PART 1 – OVERVIEW

The programmes and projects to be implemented by WASA are outlined in its (5) Five Year Investment Programme (2007-2011). These programmes/projects have been designed to upgrade, replace and improve the Authority's infrastructure, thereby enhancing the quality and reliability of service to our customers.

1.1 Disaggregation of Programmes/Projects

The programmes/projects have been disaggregated into the strategic focus areas (i) Water (ii) Sewerage and (iii) Institutional Strengthening.

1.1.1 Water

- Treatment and Production
- Transmission
- Distribution

1.1.2 Sewerage

- Collection
- Treatment

1.1.3 Institutional Strengthening

- Management Information System (MIS)
- Supervisory Control and Data Acquisition (SCADA)
- Master Plan
- Accommodation
- Environment
- Network Modelling
- Asset Management
- Institutional Strengthening Projects

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1.2 Classification of Water and Sewerage Projects

The water and sewerage projects are classified into groups as follows:

1.2.1 Water Projects

- Master Plan
- Boosters
- Service reservoirs
- Strategic pipelines
- Distribution pipelines
- Leakage management (pipeline repairs and replacement, metering)

1.2.2 Sewerage Projects

- Master Plan
- Refurbishment and upgrade of current Wastewater Treatment Plants
- Sewer Mains Repair and Replacement
- Adoption of National Housing Authority (NHA) Plants
- Adoption of Private Wastewater Treatment Plants

1.2.3 Water

1. Production and Treatment – water quality improvement, expansion of reservoirs, upgrade of reservoirs, well refurbishment, and new wells.
2. Transmission and Distribution – upgrade, replacement and expansion of transmission grid.
3. Distribution (Leakage Management) – Leak detection management, upgrade and replacement of pipelines, District Metered Areas (DMA).

1.2.4 Wastewater

1. Collection – sewer replacement and refurbishment of lift stations
2. Treatment – upgrade, refurbishment and construction of Water Treatment Plant (WTP)

1.3 KEY FUNCTIONS OF PROGRAMMES/PROJECTS

The programme will adopt an integrated approach, which is part of an ongoing strategy for establishing an effective Water Grid and Wastewater System, as summarized in Appendix I¹.

The Authority has estimated that its Five (5) Year Investment Programme will cost \$6.783 Bn, and will undertake critical infrastructure projects to enable the Authority to maintain the current level of service to customers, as well as undertake the preparation of a Water and Wastewater Master Plan.

The Water and Wastewater Master Plan is projected to be completed at the end of 2009 and will provide a detailed programme of projects to enable the Authority to achieve its long-term strategic objectives of 24/7 water supply to 98% of its customers with a 75% sewerage coverage by 2020.

The projected investment of \$ 6.783 Bn, under the various project headings, will be spent specifically on upgrading and modernizing the Water and Wastewater sector during the period 2007-2011.

1.3.1 Water Projects

A projected investment of \$3.274 Bn. will be spent in upgrading and modernizing the Water sector during the period 2007-2011.

The Developmental Projects will comprise the following:

¹ Cost of Capital Programmes and Projects

1. Rehabilitation of existing infrastructure, which will consist of mains, booster stations and storage reservoirs. These projects will assist in improving the reliability of the supply.
2. Non-revenue infrastructure works, which involves replacement of old pipes, defective valves and upgrades at the plants and pumping stations.
3. Operational Support Projects such as: Bulk Metering and Geographical Information Systems Development.
4. Network modelling, which will be critical to the success of the programme where hydraulic imbalances will be identified and solutions determined.

1.3.2 Sewerage Projects

A projected investment of \$344.3 Mn. will be made in upgrading and modernizing the Sewerage sector during the period 2007-2011.

In order to provide an adequate wastewater service, the following projects have been identified as being critical toward improving the adequacy of wastewater service:

5. The upgrade of sewerage systems in the cities of Port of Spain and San Fernando.
6. Extending the sewerage system in the East-West Corridor.
7. The construction and commissioning of the South-West Tobago Sewerage Treatment System.
8. The adoption of the National Housing Authority Sewerage Treatment Plants.

1.3.3 Institutional Strengthening Projects

A projected investment of \$93.5 Mn will be spent on Institutional Strengthening projects during the period 2007-2011.

Some of the following projects have been identified as being critical to the development of the WASA and its operations.

9. Development Implementation of the Water & Wastewater Master Plan.
10. Implementation of SCADA to monitor the water treatment process at production facilities.
11. Integration of the Authority's record keeping systems i.e. CIS, WatNET, Alcic Job Management & Asset Management Systems

Project Management services is estimated to cost \$829.8 Mn. This in addition to the costs of the Disaster Preparedness and the Accelerated Water Supply Programme will round off the Five-Year Investment programme to \$6.783 Bn. A summary of expenditure for capital expenditure on the elements listed above can be found in *Appendix 1 - Summary Table.*

* The total projected investment of \$9.5Bn for Institutional Strengthening Projects (ISP) is not included in the Project Management Services. (ISP) was not added as a single element but rather as a component of the Water Projects.

1.4 MILESTONES TO BE ACHIEVED: 2007-2011

Water Projects: The Authority anticipates that, at the end of the 5-year investment programme 572,613 persons will receive an improved supply from the projects, 550,427 in Trinidad and 22,186 Tobago.

1.4.1 (a) Major water Sources

It is estimated that 97,554 persons will benefit from the development of the major water sources.

1.4.2 (b) Distribution Expansion

The upgrade and expansion of the Boostex system will result in approximately 73,744 persons benefiting. It is estimated that 62,216 persons will benefit in North Trinidad, 9,804 in South Trinidad and 1,724 in Tobago.

1.4.3 (c) Service Reservoirs

Approximately 68,800 persons will benefit from the upgrading and expansion of service reservoirs. In North Trinidad, 45,344 persons will benefit, 22,454 in South Trinidad and 1,002 in Tobago.

1.4.4 (d) Leak Management Programme

The Leak Detection Programme will result in 255,562 beneficiaries. Approximately 26,528 persons will benefit from Bulk Metering, 14,963 (Trinidad) and 11,565 (Tobago), 144,034 persons from pipeline replacement 142,734 (Trinidad) and 1,300 (Tobago), and 85,000 from domestic metering.

1.4.5 (e) Strategic Pipeline Replacement Programme

It is estimated that 139,919 persons will benefit from the Strategic Pipeline Replacement Programme, 135,881 (Trinidad) and 4,038 (Tobago).

1.4.7 (f) Wastewater Projects

Wastewater projects are divided into adoption of private plants, adoption of NHA Plants and the upgrading of existing plants. The Authority anticipates 155,445 (154,789 Trinidad, 656 Tobago) persons will benefit from the wastewater projects by the end of the 3-year investment programme. The Adoption of Private Package Plants will result in 16,276 beneficiaries, while the Adoption of NHA Plants will account for 96,297 beneficiaries and existing plants 42,872 beneficiaries during the 5- year investment programme.

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1.5 STATUS OF CAPITAL INVESTMENT

In the water and wastewater industry, projects (construction of reservoirs and other infrastructure) have a gestation period of 1 - 3 years. This time frame is taken into consideration for projections of future demand. A number of operational categories have been identified and plans have been made to cater for changes in future demand:

- Capital expenditures associated with the expansion of the water and wastewater infrastructure. The water projects will explore the options of boosting supply through: impounding reservoirs, desalination plants, groundwater facilities and surface water intakes. The wastewater projects will involve increasing customer coverage and the expansion and maintenance of the sewerage system.
- Capital expenditures associated with the replacement and upgrade of existing facilities
- Expenditures associated with 'normal' ongoing repair and maintenance
- Prudent financial management
- System strengthening programmes e.g. human resources projections.

Other strategic initiatives will include:

- Demand management programmes
- Leak management programmes
- Water reuse programmes

The wastewater projects will involve increasing customer coverage and the expansion and maintenance of the sewerage system.

- Capital expenditures associated with the replacement and upgrade of existing facilities
- Expenditures associated with ‘normal’ ongoing repair and maintenance
- Prudent financial management
- System strengthening programmes e.g. human resources projection.

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1.6 PRICE LIMITS

Objectives of the Rates & Charges

- ✍ Ensure that the Authority becomes financially viable while undertaking network maintenance and expansion activities necessary for an improved level of service to customers;
- ✍ Promote the efficient use of water by sending the correct price signals to customers;
- ✍ Simplify the tariff structure, which is critical to customer satisfaction; and
- ✍ Avoid as far as possible the need for further tariff reviews during the period 2007-2011.

1.6.1 Proposed Tariff Structure

The tariff schedule proposal can be seen in Appendix II²

The proposed tariff schedule includes new rates and customer structures, which will result in the customer on average being charged higher rates. It is also designed to restructure the basis on which rates are calculated in the individual categories.

This will be done on the basis of measured consumption as opposed to the unmeasured Annual Rateable Value (ARV) charges that are currently principally relied upon to charge tariffs. Where customer supply is metered, the calculations are made on the basis of volumetric consumption.

Proxies were built into the assumptions to deal with consumption associated with non-metered customers, estimating their consumption based on that of their metered counterparts which were then used as a basis to levy tariff increases.

² WASA Tariff Book

This new rating structure will benefit both the Authority and its customers. Besides the recovery of cost, the Authority will become more financially viable and will be able to improve current levels of service and embark on new water winning projects that will increase the water supply and service to customers.

This rating structure will serve only as an interim structure pending the completion of the Authority's metering programme. When this programme is completed tariffs will be revisited and actual meter cubed (m³) consumption by each class of customers will be the basis for their average bill.

The new customer rates are based on customer usage per meter cube. The current customer classes are used only to determine consumption per class based on the JICA 1990, DELCAN 1994 structure. These structures are used to estimate per capita consumption for un-metered customers.

The volumetric formula was designed to calculate the consumption of the various customer classes and also calculate the per meter cube cost to the Authority. This analysis provides the basis for the average bill per customer class ignoring previous ATV and flat rate charges.

The rates proposed by the Authority incorporates a return investment for the 5yr capital works programme, projected payments for breach of Guaranteed & Overall Standards among other important elements then can be viewed in Appendix II³

1.6.2 Features of the Tariff

- ✍ Rates for customers in each Tariff category have been calculated to reflect the full cost of service. This approach is in keeping with modern principles of Tariff determination. The objective is to limit cross-subsidization of residential customers by the commercial and industrial groups, and thereby promote greater economic efficiency.

- ✍ The Per Capita Consumption represents demand by customer class where volumetric usage is not known

³ Tariff Book

- ✍ The base year is 2005/2006
- ✍ The Regulatory Asset Base is valued at \$1.935 Billion on the depreciated cost basis.
- ✍ The adoption of all Housing Development Corporation (HDC) formerly NHA (National Housing Authority) owned Wastewater Treatment Plants.

1.7 ASSUMPTIONS

- ✍ Metering of non domestic unmetered accounts
- ✍ Fixed Desalination expenses
- ✍ The customer base derived from the Customer Information System (CIS)
- ✍ Sewerage charges equal to water charge for customer on the Authority's network.

A full listing of these assumptions can be found in Appendix II.

1.7.1 Methodology

The projections for the rates and charges in the revised tariff structure are based on volumetric consumption and total cost recovery. The approximation of consumption was based on the JICA (1990) DELCAN (1991) and London Economic/Castalia Tariff Report (1998) studies on domestic consumer consumption.

In addition, data on the system balance, number of accounts and Water Production for the financial year 2005/06 is used. This data allows us to make assumptions on estimated consumption.

In doing this, a measure of volumetric usage was calculated per household. This data provides the basis for estimating the amount of water each household receives.

Where demand was unmeasured for the domestic class, the per capita consumption from the demand model was used to calculate customer demand.

Where demand was unmeasured for non-domestic accounts, consumption of the metered non-domestic accounts was used as a proxy for the consumption of these accounts.

The consumption of individual accounts was compiled to derive total consumption for the various classes. Weights derived from this were then used to apportion the costs of the Authority.

Costs were divided into the following categories:

- ✓ Fixed Cost
- ✓ Variable Cost
- ✓ Controllable Cost
- ✓ Uncontrollable Cost
- ✓ One off Cost

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The detailed Tariff Book can be seen in Appendix II.⁴

⁴ Tariff Book

1.8 CURRENT TARIFF STRUCTURE

1.8.1 Domestic Customers

Under the current customer classification, domestic customers are disaggregated into the following:

- A1: Domestic Customers without a water service connection (wsc).
- A2: Domestic Customers with a wsc, but not internally serviced.
- A3: Domestic Customers with a wsc and internally serviced.
- A4: Metered Domestic Customers with a wsc, and internally serviced.
- A5: Charitable Institutions and Churches that are internally serviced.
- A6: Metered Charitable institutions and Churches which are internally serviced.

1.8.2 Industrial/Commercial/Cottage Customers

Industrial/Commercial/Cottage customers are currently classified into the following groups:

- B3: Un-metered Industrial customers
- B4: Metered Industrial customers
- C3: Un-metered Commercial customers
- C4: Metered Commercial customers
- D3: Un-metered Cottage customers
- D4: Metered Cottage customers

1.8.3 Agriculture Customers

Agriculture customers are currently classified into:

- E3: Un-metered Agriculture customers
- E4: Metered Agricultural customers

1.8.4 International Domestic Water Rates

Comparative Analysis of Various Water Authorities, using WASA as a base.

The data attached shows the comparative analysis of water rate charges between WASA and various water authorities around the World. The prices shown are in US dollars per cubic meter.

In the Caribbean, **Netherlands Antilles** has the highest domestic water rate of **\$6.11**, which is **\$5.83** more than the domestic water rate of Trinidad and Tobago. This is 2182% times the water rate of Trinidad and Tobago. **Cuba**, on the other hand, has the lowest water rate of **\$0.01**, which is **\$0.27** less than the domestic water rate of Trinidad and Tobago. This is 3.6% times the water rate of Trinidad and Tobago. However, no figures were available for the commercial water rate for Cuba.

In the North/Latin American region, **Canada** has the highest domestic water rate of **\$1.23**, which is **\$0.95** more than the domestic water rate of Trinidad and Tobago. This is 439% times the water rate of Trinidad and Tobago. **Honduras**, on the other hand, has the lowest water rate of **\$0.06**, which is **\$0.22** less than the domestic water rate of Trinidad and Tobago. This is 21.4% times the water rate of Trinidad and Tobago.

In Europe, **Denmark** has the highest domestic water rate of **\$2.84**, which is **\$2.56** more than the domestic water rate of Trinidad and Tobago. This is 1014% times the water rate of Trinidad and Tobago. **Ukraine**, on the other hand, has the lowest water rate of **\$0.19**, which is **\$0.09** less than the domestic water rate of Trinidad and Tobago. This is 67.9% times the water rate of Trinidad and Tobago.

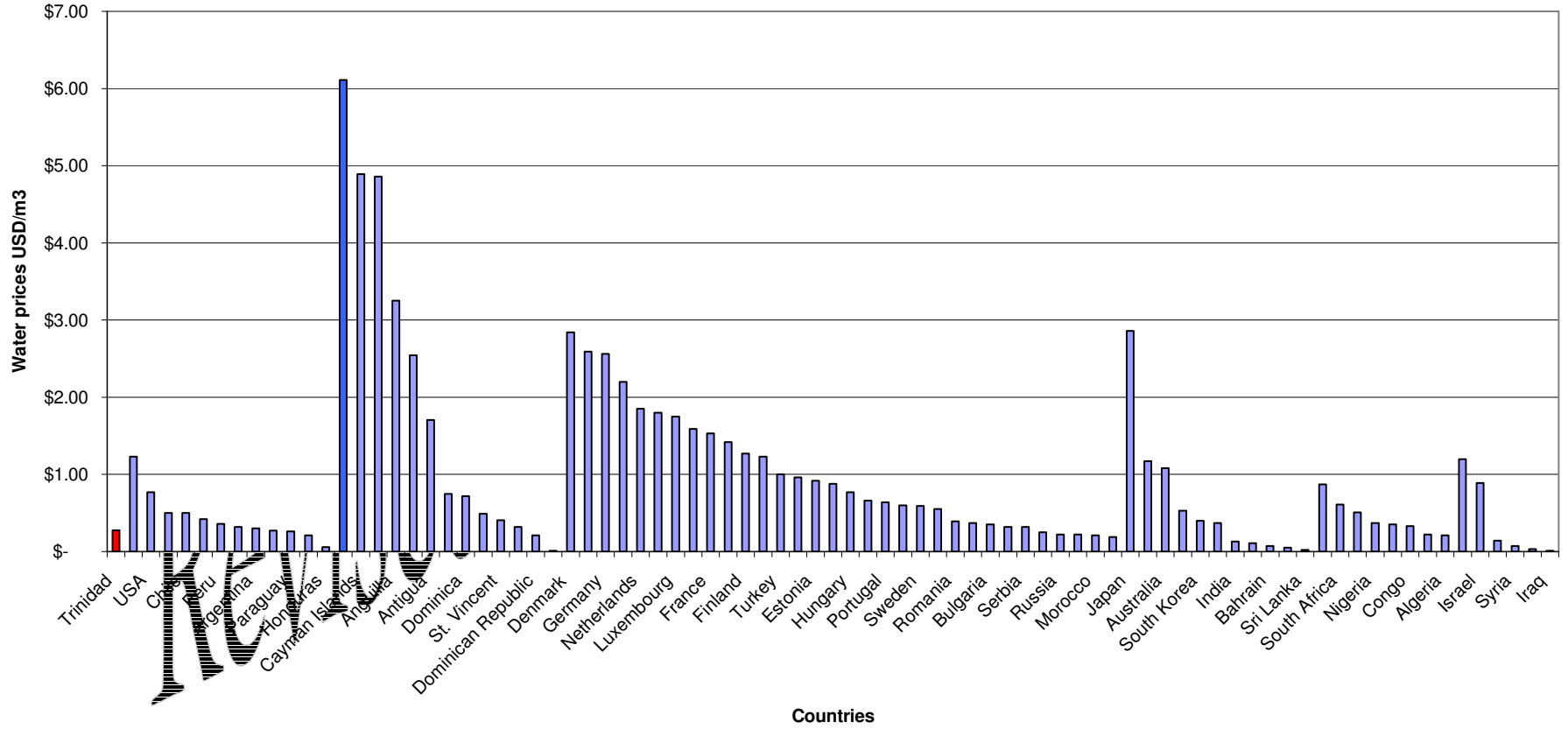
In Asia, **Japan** has the highest domestic water rate of **\$2.86**, which is **\$2.58** more than the domestic water rate of Trinidad and Tobago. This is 1021% times the water rate of Trinidad and Tobago. **Sri Lanka**, on the other hand, has the lowest water rate of **\$0.02**, which is **\$0.26** less than the domestic water rate of Trinidad and Tobago. This is 7.14% times the water rate of Trinidad and Tobago.

In the Middle East, **Qatar** has the highest domestic water rate of **\$1.20**, which is **\$0.92** more than the domestic water rate of Trinidad and Tobago. This is 428.6% times the water rate of Trinidad and Tobago. **Iraq**, on the other hand, has the lowest water rate of **\$0.01**, which is **\$0.27** less than the domestic water rate of Trinidad and Tobago. This is 3.6% times the water rate of Trinidad and Tobago.

In Africa, **Egypt** has the highest domestic water rate of **\$0.87**, which is **\$0.59** more than the domestic water rate of Trinidad and Tobago. This is 310.7% times the water rate of Trinidad and Tobago. **Algeria**, on the other hand, has the lowest water rate of **\$0.21**, which is **\$0.07** less than the domestic water rate of Trinidad and Tobago. This is 75% times the water rate of Trinidad and Tobago.

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Average Water rate prices (USD/m3) for selected Countries around The World compared to TT



1.9 PROPOSED TARIFF STRUCTURE

1.9.1 Domestic Customers

Under the proposed customer classification, Domestic customers who were currently disaggregated between A2-A6 will now be treated as one class and charged the same rate.

1.9.2 Non-Domestic Customers

Under the proposed customer classification, Industrial customers who were currently disaggregated between B3 and B4 will now be treated as one class and charged the same rate.

Under the proposed customer classification, Commercial customers who were currently disaggregated between C3 and C4 will now be treated as one class and charged the same rate.

Pt. Lisas Industrial and Commercial customers under the new structure will become one class.

1.9.3 Agriculture Customers

Under the proposed customer classification, Agricultural customers who were currently disaggregated between E3 and E4 will now be treated as one class and charged the same rate.

1.9.4 Customer Bills for Base Year (Water)

The average charges per customer class for the year 2005/2006 are used in the analysis as the base year. Projections for each successive year were then derived from the base year.

The following is a summary of the average bill per customer class for the base year:

- Internally un-metered (A3) customers – \$547.00
- Internally metered (A4) customers – \$547.00
- Industrial (B) customers - \$43,301.28
- Commercial (C) customers - \$11,267.64

- Agricultural (E) customers - \$2,272.68
- Point Lisas Customers -\$1,740,554.76

1.9.5 Domestic Customers:

The new classes of customers will see the following changes in their bill:

Table III. Sample of various Customer Bills based on the Proposed Tariff (2007).

Class	Current Quarterly Bill (2003)	Average Yearly Bill (2003)	Estimated Quarterly Bill	Estimate Yearly Bill (2007)	% Increase in Bill
	\$	\$		\$	
Domestic	\$136.75	\$547.00	\$378.45	\$1,513.78	176.74

Class	Current Quarterly Bill (2003)	Average Yearly Bill (2003)	Estimated Quarterly Bill	Estimate Yearly Bill (2007)	% Increase in Bill
	\$	\$		\$	
Industrial	\$10,825.32	\$42,391.28	\$5,840.05	\$211,360.20	388.12

Class	Current Quarterly Bill (2003)	Average Yearly Bill (2003)	Estimated Quarterly Bill	Estimate Yearly Bill (2007)	% Increase in Bill
	\$	\$		\$	
Commercial	\$2876.31	\$11,267.64	\$10,072.56	\$40,290.24	257.57

Class	Current Quarterly Bill (2003)	Average Yearly Bill (2003)	Estimated Quarterly Bill	Estimate Yearly Bill (2007)	% Increase in Bill
	\$	\$		\$	
Agricultural	\$568.17	\$2,272.68	\$4,869.90	\$19,479.60	757.12

Class	Current Quarterly Bill (2003)	Average Yearly Bill (2003)	Estimated Quarterly Bill	Estimate Yearly Bill (2007)	% Increase in Bill
	\$	\$		\$	
Point Lisas	\$435,138.69	\$1,740,554.76	\$1,138,818.21	\$4,555,272.84	161.71

Table III. shows the projected increase in the bill for the different customer classes from the old tariff structure (2003) to the new tariff structure (2007). The projected bill was determined upon the completion of an extensive cost of service study exercise performed by the Authority.

1.10 WASTEWATER

Methodology

The apportionment of costs for wastewater is based on the demand for water study. In the cost of service study water consumption for sewer customers was correlated to effluent flows, and then weighted according to customer class to determine service cost.

Eight percent (8%) of total cost was then apportioned to sewer accounts based on the weights calculated.

1.11 STRUCTURE OF RATES AND CHARGES FOR BASE YEAR

The average bill per customer class for the year 2005-2006 was used as the base year for wastewater. Projections for each successive year were then derived from the base year.

See Appendix U⁵ for further details.

1.12 INTEREST OF CUSTOMERS

The most recent cost of service study indicates that the Authority must introduce substantial increases in its current rates in order to cover the cost of delivering water and sewerage services. Any increase in the present water rates will result in additional financial burden on the Authority's customers. Proposals have been made to the Government of Trinidad and Tobago concerning the provision of financial assistance to those customers who may be unable to pay an increased rate and to ensure the smooth transition from current rates to new rates. Some of these are discussed in the strategies proposed for effectively implementing new tariff rates under the categories of Subsidies and Transitional Arrangements.

The Authority is very aware of the national view of its operations and in particular our customers, whose need for a high quality service is the main goal. At this time in its development thrust a number of projects and programmes are being formulated in keeping with the Government of Trinidad & Tobago's '2020' vision for the country. As we address the needs of our customers we will set out a comprehensive list of projects

⁵ Tariff Book

to benefit community-by-community outlining our plans to increase the 24/7 water supply and sewerage coverage.

Projected changes in the Tariff Charges remains a critical element in improving the level of service and we are committed to provide a reliable water supply and wastewater service to all our customers.

1.12.1 Subsidies

Government may wish to provide financial assistance to lower income households, as is the case with old age pensioners.

The two broad approaches for subsidizing water for low-income households are:

- Generic income support; and
- Specific water subsidies

Generic income support provides for low income households receiving government assistance to increase incomes to a level at which essential goods, such as water services, becomes affordable. This approach leaves consumption decisions in the hands of individual households and price signals are not greatly distorted.

Specific water subsidies can be implemented through:

- Reducing the price of water services (usually for a specified level of consumption) such that basic levels are affordable to low income consumers.
- Directly allocating income support directly allocated to the purchase of water services. This could be done through the issuing of water vouchers. This form of subsidization has been implemented by utilities in other countries and may also be considered for implementation.

1.12.2 Transitional Arrangement

To ensure that an effective transition is made from current rates to new rates a structured and systematic approach should be considered. The implementation of the new rates should begin with customers who are currently receiving a 24/7 water supply. Applicants for new developments and service connections should be required to pay the

new rates. As soon as the other customers receive a 24/7 water supply, they should also be required to pay the new rates.

There has been no confirmation on the part of government as to the strategy to be employed. Consequently, the Authority will continue to correspond with the government and other relevant agencies on the matter.

1.13 FINANCIAL PROJECTIONS

Projections for expenditure and revenue are built on full cost recovery and the economic principle Total Cost = Total Revenue.

The financial projections for the period 2007-2011 - (Appendix II⁶) - are calculated using the following assumptions:

Expenditure assumptions:

- Inflation increases by 3% per annum
- Wages and salaries increase by 5% per annum
- Monthly & Daily paid overtime increase by an average of 33 ½ % per annum
- Desalination costs remain fixed at \$204 Mn.

(These expenditure projections under full cost recovery and using the economic principle aforementioned become the revenue requirement).

1.14 AQUARIUS 3 MODEL

The Aquarius 3 Financial and Tariff Basket Model was used to calculate the Authority's Tariff rates. The Tariff Basket Model uses input data such as projected water and sewerage revenue, household and non-household to derive forecast revenues, which was imported into the Financial Model component of the Aquarius 3 Model.

The Financial Model uses the revenue and expenditure inputs to generate financial statements including cash flows. The model also generates other reports. See Appendix III⁷

⁶ Tariff Book

⁷ Aquarius 3 Model

The Financial Model uses both the accounting and economic costs to derive the Authority's true operating cost and hence the revenue required to meet these costs. See Appendix III⁸(b)

The total Regulatory Asset Base (RAB) for 2003 was \$1, 935,792,710. The cost based valuation method is used for calculation of particular/groups of assets. See Appendix IV⁹ for detailed information.

1.15 EFFICIENCY IMPROVEMENTS

1.15.1 Variable Speed Pumps

Innovations through the use of relatively new technology, e.g. Variable Speed Pumps (VSPs) can significantly reduce WASA's cost of supply. VSPs are unmanned pumps that automatically detect the pounds per square inch (p.s.i.) of water and adjust the pump speed accordingly. Manual pumps require workers to set pump speeds according to usage patterns of particular areas. For example, during the late night to early morning period, water usage tends to decrease dramatically. During this period workers may have to manually reduce the pressure in pipelines to prevent breakage. However, with the VSPs this process is done automatically using computer software. The use of VSPs can reduce regular pump energy cost by as much as 70%. Once a manual pump is set at a high speed it continues to operate at that rate until it is reset.

1.15.2 Information Technology

The Supervisory Control and Data Acquisition (SCADA) system is presently being implemented to monitor the water treatment process at production facilities. The SCADA system examines the source levels of water supplies, controls the automated processes of chemical treatment and tests final quality on a preset basis. The use of this software can result in the reduction by manpower by one half to two thirds and even more.

A SCADA system is being implemented by the Authority. This System can be utilized for:

⁸ Aquarius 3 Financial Model

⁹ Fixed Asset Schedule

- Road repairs
- Water treatment
- Sewerage treatment
- GIS improvement and
- New pipe technology

1.16 THE AUTHORITY'S OUTLOOK

Information technology in general has emerged as a major contributor to improved efficiency worldwide. At WASA, the investment in developing information technology systems has been relatively low. Scarce funding, when available, has been used in areas and have impacted directly on the delivery of pipe-borne water to customers.

Those investments have begun to show tangible results, the information technology available provides several opportunities for improving the Full Service Equivalent (FSE) and ultimately a 24-hr 7-days a week supply to all customers.

The Regulated Industries Commission (RIC) is in the process of finalizing measures to monitor the various levels of service being provided by the Authority. As a result, the Authority will continue to intensify its efforts to improve its service levels. The levels of service indicators will include financial performance indices, customer response management indices, and continuity of supply indices. Other agencies such as, the Environmental Management Agency (EMA) are also developing legislative framework, requiring a concomitant response from the Authority.

The challenge is therefore to prepare the staff to operate in a rapidly changing environment, review and improve the business processes and to employ information and other technologies that will enhance the Authority's capacity to deliver. This is the context within which this Information Technology Strategic Plan was developed.

Full implementation of an enhanced IT System is likely to cost the Authority approximately TT\$100M during the next five years in direct capital investment. At the end of the planning horizon however the technologies deployed will include:

- An integrated environment through which timely customer response is managed;

- A robust financial system that links revenue and expenditure to the customer;
- Operations decision support through SCADA, and computerized simulation of water supply management; and
- A wide area network that connects all of the Authorities facilities, enabling the implementation of a executive decision support system.

Some sources of funding are relatively inexpensive, but difficult to access. Other sources are more readily available, but require significant investment in the use of technology developed in the country from which the funding emanates. The latter option is attractive for the implementation of this IT Strategic Plan because of the amount of imported technology, software, hardware and the consultancy services upon which the plan is based.

1.17 ENVIRONMENTAL SCAN

Currently, the Authority has a number of electronic records keeping systems, the Customer Information System – CIS, the financial System-Alcie, Job Management and Asset Management Systems – STORMS and MAXIMO and ESRI's ArcInfo for Geographic Information Systems (GIS), HRPlus for Human Resource management among others. Each exist independent of the other, and each has its own data architecture, which in some cases do not readily allow for multidimensional analysis.

As noted above several applications exist, that allow many functional areas to perform key tasks efficiently. However the effectiveness of the separate systems is limited because of the absence of integration. While valuable data is available from this development path, no interface exists.

Data is also collected through SCADA. As is the case with the more common business applications, the utility of SCADA is partially lost when the data for each system is collected independently. SCADA has significant growth potential within the organization. It is an operations decision support tool that can revolutionize the way water and wastewater services are delivered.

Two decades ago, SCADA was introduced in the Authority with the commissioning of the Caroni Arena Water treatment plant. All the attendant support systems were not in

place to treat with the full range of services required to support such a venture. Services such as:

- Network and Telecommunications
- Application Support
- System Administration
- Backup and Recovery Support

These services are now available today, however although they have been institutionalised, integration with the SCADA system is still to be undertaken.

Some of the applications currently in use are described briefly below. The environmental scan also highlights the limitations of the existing IT infrastructure, and the mix of operating systems in the current environment. Significant upgrades are ongoing as it relates to the Local Area Network (LAN) and the Wide Area Network (WAN).

1.17.1 Software Systems

Geographic Information Management

Since 1989, WASA has been updating and digitizing land records for the country, and mapping its assets on the Geographic Information System – GIS. Today, WASA has one of the most accomplished systems for providing graphical and tabular databases using the ESRI ARC/INFO product in Trinidad and Tobago. The analogue to digital conversion of existing datasets is in an advanced state, and considered capable of integrating with other Information Systems to improve the management capability of the organization.

Computer aided design (CAD) is provided using AutoCAD. Both the GIS and CAD can exchange graphic data freely, through standard data exchange format. Computerized network modelling also takes advantage of data stored particularly on the GIS. The GIS is more efficient in terms of meeting deadlines.

1.17.2 Network Modelling

The WatNET software, that is currently in use is not user friendly, and does not readily lend itself to integration. Arrangements are being finalized with respect to the replacement software. Budgetary constraints have limited the possibility of obtaining a package that can be fully integrated. The solution is one that contains a GIS view interface, is scalable and models that can be migrated to the GIS.

1.17.3 Customer Information Management

Critical to the integration strategy is the acquisition and implementation of a new Customer Information and Billing System. Since 1997 Customer Information Management has been undertaken by the in-house developed Oracle database with a Microsoft Access'95 User Interface. It is capable of "on-line" customer account management for industrial and domestic billing, batch processing of billing adjustments and debt management.

The CIS database contains two (2) data fields relative to a customer. These are the Account Number (Account No.) and the Property Identification Number (PIN). The Account Number uniquely identifies who is the customer, while the PID, which is only partially populated, identifies where a customer is geographically located.

All customer support activities between CIS and GIS will be viewed from the data field aspect of the PID. The inclusion of this PID will facilitate the proposed link. One of the challenges of the integration process will be the completion of the PID database, either as a reengineered business process, or as a milestone within the project schedule.

1.17.4 Point of Sale

A Point of Sale system / Cash Remittance System has been recently installed as part of the Information Systems Integration Project. WASA presently processes payments at seven (7) of the Customer Service Centres using either a combination of client / server technology or a manual cashiering system.

Each of the customer service centres is equipped with two (2) NCR – Model 1105 Class 7058 cash registers with an attached VDU. Each cash register has a validator that is connected to a stand-alone P.C. server. The cash registers communicate with the server via an interface card and a connector. The server carries a program and a database written in C++ with limited outdated customer information. The transactions are captured on-line on the stand-alone server, downloaded to diskettes following a reconciliation process and posted to the Customer Information System (CIS) at the end of the day. Manual cash registers are used as backup.

1.17.5 STORMS

The Job Management process in WASA is undertaken by (STORMS) Severn Trent Operational and Resource Management System. This is an Oracle based application with a Power-Builder User Interface. STORMS is a fully functional application, which provides day-to-day operational control of work orders and related information throughout the life cycle of a job. Customer complains, pipe-line repairs, new services, reconnection, disconnections and the delivery of truck borne supplies where necessary, are managed through STORMS.

District Meter Areas (DMA's) have been demarcated to facilitate the management of jobs in those discrete areas. The DMA code within STORMS will provide for ready linkages with the GIS datasets.

The Authority is presently deliberating whether STORMS should be replaced by MAXIMO. The common solution integration approach proposed, could result in the replacement of both STORMS and MAXIMO in favour of a package that manages Customer Information, Billing, Call Centre and Work Flow Management in a single database.

1.17.6 MAXIMO

Prior to integration, the MAXIMO application data will require data redefinition and re-installation. MAXIMO is an Oracle based application with a user interface that was developed using a combination of Power Builder, SQL Windows and Centura Ver 1.1.2.

It contains at least twelve (12) modules that include an Asset Management, Work Order, Purchasing, Inventory, Facility and Fleet Management Modules.

To date, MAXIMO is primarily used to manage job management with respect to plant and equipment. While MAXIMO is the best in class solution, its deployment in the Authority has not had the same level of support as STORMS.

1.17.7 ALCIE

Alcie is the financial application being used by the Authority at this time. It is the system through which the Authority does its financial accounting (Accounts Payable, General Ledger/Budget), purchase requisitioning, purchase order preparation, and Inventory Management. Fixed assets are monitored through Alcie, however deployment to date has not been successful.

Alcie as a financial package has several weaknesses. While it is one package developed and marketed by a single company, some of the linkages between the modules are not automatic. Any facility that was not specified in the original development, including linking purchase requisitions to purchase orders and to the general ledger, is not available through licensing. Instead these are dealt with as client specific customisations.

This has had a negative impact on efficiency and control as it relates to both Logistics and Finance. Steps are currently being undertaken to address some of these pertinent issues.

1.17.8 Human Resource Management System (HRMS)

The HRMS package comprises a payroll system, PowerPay, and several HR Modules HRPlus, which includes administration, recruitment and safety. There is limited integration between the HR modules and Payroll that reduces the workload within the user departments.

There are other modules within the HR modules that have not yet been implemented. A major disadvantage of the application itself is that it is not integrated to the Alcie Financial application.

1.17.9 Supervisory Control And Data Acquisition (SCADA)

SCADA is deployed at 15 sites throughout the Authority. In addition, the Water Resources Agency, which for a number of years existed with some degree of autonomy, has a successful SCADA implementation.

The following Table (Table 4) provides a vivid picture of the way SCADA is being developed. Each implementation has its own characteristics. Specifications appear to have been broad, and have resulted in several different types of software and firmware being installed. The opportunity for SCADA consolidation exists and this will be one of the strategic directions to be taken during the next five years.

Table 4 SCADA Sites and Installations

Site	SCADA Software	SCADA Firmware	
		PLC Type 1	PLC Type 2
Caroni New		AB 505	
Caroni Old	Citect	AB 505	Telemecanique TSX 5703
North Oropouche	Freelance 2000		
Hollis	RS View	AB 503	
Navet	Citect, RS View	AB 504	AB 505
Gunapo	Citect	Virtuak Controller	
Tucker Valley	Wonderware	Moscad L RTU	
Techier	Wonderware	Moscad L RTU	
Tunapuna Booster			
Betham Old Sewr Treatment Plant	XMI	Zetron RTU	
Courland	Intellution Ifix	AB 503	
Hillsborough West			
Richmond	RS View	AB 503	
WRA	Miser	Zworld RTU	

One of the more critical observations that can be made about the Authority's hardware, which is central to its operations, is that there is no redundancy in the Server Room. The business applications are hosted on two servers, the STORMS database is deployed on a Sun Fire, CIS, MAXIMO, ALCIE, HRPlus and a number of smaller database are deployed on a Sun Enterprise server.

The servers have not been configured to provide redundancy for each other, nor is it advisable on the basis of the performance of Enterprise Server. There is an urgent need for a server consolidation review to be conducted to confirm just how the redundancy is to be achieved.

Apart from these main servers, all other functional servers in the main server room are either more than five years old, or are PC grade machines functioning as servers. The servers at the regional offices are also PC grade machines.

At Caroni Water Treatment Plant (WTP) two servers, Dell Power edge machines are in use, one a duty server, and the other a standby unit. Other SCADA deployments PC grade machines are in use.

In 2001 the GIS server was replaced by a Compaq Alpha Server that is configured for geo-processing. This is a stand-alone server, any failures will disrupt the GIS operations.

Back-up procedures are in place for servers in the server room and the GIS server only. At other sites the arrangements are either ad-hoc, or non-existent.

The computer aging report shows that of the 741 computers deployed in the organization, 359 are more than three years old. This has a negative impact on productivity, as many of the older machines have been relegated to less critical functions.

ENVIRONMENTAL SUMMARY

ECONOMIC

Gross Domestic Product. The total market value of all final goods and services produced in a country in a given year, equal to total consumer, investment and government spending, plus the value of exports, minus the value of imports.

- Current GDP at market prices in Trinidad & Tobago is estimated at approximately 20.4 as at the end of 2006.

Inflation. The overall general upward price movement of goods and services in an economy, usually as measured by the Consumer Price Index and the Producer Price Index.

- Inflation in 2006 rose to 8.3% from an unprecedented low of 6.2% in 2005.

Unemployment. Percentage of the civilian labor force which is unemployed. And is actively looking for employment.

- The unemployment rate dropped to 6.2% in 2006 down from 8% in 2005.

Population growth in Trinidad and Tobago is currently on a decline and exhibits negative growth as at July 2007.

These economic indicators must be considered when planning is being done by the Authority. Inflation increases the prices of goods and services that the Authority must purchase to carry out its operations for example chemicals to treat water. On the other side it negates or diminishes the value of the revenue that the Authority collects from its customers creating a doubly negative impact.

Negative population growth will affect the growth potential in customer base and as result revenues will be affected adversely. In the medium to long term it will affect the human resource potential of the Authority and the country as a whole if this trend continues.

Water being a necessity is a major reason why the Water & Sewerage Authority is Government owned.

Considered a natural monopoly, the high fixed costs of entering the water industry causes long run average costs to decline as output expands. It therefore makes it unfeasible/ unprofitable for other firms to consider entering in the Trinidad & Tobago context.

Water is considered a necessity and therefore possess a very low price elasticity of demand, left up to the free market the price of water would be extremely high in relation to its current price and for those reasons the Government chooses to run the WASA as a state owned entity.

FINANCIAL

The Authority's current investment programme is aimed at improving the level of service to areas underserved or not in receipt of a water supply. The programme is underscored by challenges facing the sector consisting of undersized and deteriorated pipe networks, high levels of unaccounted for water and a sub optimal transmission distribution infrastructure.

To undertake these projects in addition to those articulated in the Water and Wastewater Master Plan there is the need to borrow large sums of money to fund these projects. Over the next twenty years the Authority plans to borrow Twenty-Seven Billion dollars to complete the reform of the Water and Wastewater sector.

The high cost of borrowing articulated in the current interest rates poses a challenge. Current interest rate (*prime lending*) as at July 6th 2007 stand at 11.75%. It is expected that the Government of the Republic of Trinidad and Tobago (GOVTT) will provide guarantee for the monies the Authority intends to borrow to rehabilitate and improve the sector.

Trinidad and Tobago is also currently in an economic boom, which provides an answer to the challenge of finding funding sources, but it must be noted that this also comes with high interest charges for borrowing.

OPERATIONAL

Within recent times increasing emphasis is being placed on a number of operational standards. These include the Guaranteed and Overall standards set out by the RIC, international benchmarking standards and Occupational Health and Safety Act (OSHA). The Guaranteed and Overall standards outline service guidelines that the Authority should use as a guide for the provision of its water and wastewater services. It articulates minimum acceptable benchmarks for service.

Benchmarking is a process in which organizations evaluate various aspects of their processes in relation to best practice, within their sector. This is used for WASA to develop plans on how to adopt such best practice, usually with the aim of increasing some aspect (s) of performance. The Authority is using international benchmarking standards more and more to estimate levels of performance. Meeting these international standards specific to utilities will be given great importance over this regulatory period

and beyond. In the utility sector the significance of this process cannot be overemphasized

The OSHA provides for the establishment of joint health and safety committees in any workplace with more than 25 employees, and requires businesses to enhance basic safety procedures, such as ensuring clearly marked fire exits. Increased emphasis has been placed on this since the passing of the act in Parliament and is an important element of the operational environment WASA expects over the next five years. Changing of various procedures will become necessary to comply with the law and ensure the safety of the Authority's most valuable asset, its human resources.

This means that both internal and external pressures for efficiency and quality of service now drive the Authority and meeting these expectations is a challenge that cannot be taken lightly.

Another challenge on the operational side is the aged/deteriorated state of the pipeline network. As a result supply side leakage is high and more than half the water produced is lost daily. The challenge is therefore to reduce leakage off the network by a systematic method of pipeline repair and replacement. At the current rate of pipeline replacement based on available resources the rate of change that is possible would mean that before the entire pipeline is replaced those done earlier would become obsolete. This is based on the current rate of change possible and an average of twenty-five years of pipeline life before replacement becomes necessary.

POLITICAL

WASA is owned by the Government of the Republic of Trinidad & Tobago. All the policies relating to the Authority and its operations are decided by GORTT and mandated to WASA. All decisions taken are in keeping with the goal of 24/7 water for all by the year 2020. No change is expected in this status over the next five years.

1.18 FINANCING OF STRATEGIC OBJECTIVES

The strategic objectives as outlined in the Revised Strategic Plan (2005-2009) will be financed through loans from Government of the Republic of Trinidad & Tobago (GORTT).

- ✓ International multilateral lenders IADB (World Bank).
- ✓ Regional lending Agencies Caribbean Development Bank (CDB).
- ✓ Local financial institutions (RBTT, FINCOR, UTC, FCB, and Citicorp).

(Appendix X¹⁰ provides detailed information on current financing arrangements of the Authority). The proposed financing system will utilize three (3) types of borrowing. The borrowing will be for the following categories:

- (i) Capital Investment Programme
- (ii) Working Capital Financing
- (iii) Restructuring of Loans
- (iv) Institutional Strengthening

2. PART 2 – MAIN SUBMISSION

2.1 ASSESSMENT OF THE ENVIRONMENT 2007- 2011

The Authority's water and wastewater business is both capital intensive and heavily engineered intensive. Major projects, such as new reservoirs are characterized by long gestation periods. As a result, it is necessary to make projections of future demand in order to ensure that increases in demand are met. Furthermore, reducing the significant backlog of capital projects will facilitate the upgrading and or replacing of facilities and service lines. It is also necessary to project the maintenance expenditures that will be required over the horizon to keep ongoing operations functioning efficiently. As a corollary, three categories of projects are identified:

- i. Capital expenditure associated with the expansion of the water and wastewater infrastructure in order to improve service levels. Included here is capital expenditure associated with a universal metering programme;
- ii. Capital expenditure associated with the replacement and upgrade of existing facilities in order to provide continuation of service; and
- iii. Expenditure associated with 'normal' ongoing repair and maintenance (e.g. repair of pumping stations).

2.2 WATER

2.2.1 Demand and Supply Projections

Global demand (peak in demand plus UFW) will grow continuously during the period 2007-2011 for both Trinidad and Tobago respectively. This continuous increase in global demand will come about as a result of:

- i. The constant rise in both domestic and non-domestic demand as Gross Domestic Product grows;
- ii. Population growth;
- iii. Industrial growth; and
- iv. No reduction in the level of UFW

To meet the growing water demand the following Supply Boosting Strategies were developed:

- i. Recycled water
- ii. Expansion of existing production facilities
- iii. Demand Management Programme

Four (4) main sources have been identified to any significantly boost in the water supply:

- ii. Impounding reservoirs
- iii. Desalination Plant
- iv. Groundwater Facilities
- v. Surface water intakes

2.2.2 Impounding Reservoirs

The major advantages of developing these sources will be the provision of sustainable levels of an amplified water supply, with a relatively lower long run average cost of production. The major disadvantage, however, will be the high capital costs as well as the long gestation period (a minimum five years for completion).

2.2.3 Desalination Plant

Further investment in Desalination production facilities offers a quick solution especially when consideration is given to the special demands of the industrial sector of the economy. However, the major disadvantage of a plant the size of Desalcott will be the high costs of capital as well as operating expenses compared with traditional water winning and supply technologies.

2.2.4 Groundwater Facilities

Groundwater supply has steadily proven during the years to be a cost effective means of improving supply. The advantages of these sources are:

- Effective management of localized deficits;
- The source is less vulnerable to dry season challenges. Unit cost of production is relatively lower (quality of raw water requires much less treatment than salinated supplies);
- Gestation period is much shorter than an impounding reservoir or desalination plant; and
- There exists local expertise and a business sector capable of investing and managing wells production.

2.2.5 Surface Intakes

The Authority's surface water intakes have proven to be a reliable water source with relatively low operating costs. Water Resource Management Reports indicate the existence of high quality surface water sources in the Northern Range Valley of Trinidad: Mariann, Yarra, Madamas, Matura and Salybia Rivers. Short-term supply needs can be effectively supported by sourcing the higher yielding basins of Matura (5mgd/23mld) and Salybia (6.7 mgd/30mld).

2.2.6 Supply Boosting Strategies

Water shortage especially during the dry season is one of the major concerns of the Authority. Various supply-boosting strategies have been proposed to manage and improve the water supply during the dry season including recycling of water, expansion of facilities to increase supply capacity and introducing a demand management programme to reduce consumption.

2.2.7 Demand Management Strategies

In keeping with international standards for improving the water supply, Demand Management Strategies have become necessary. The three (3) key features of a Demand Management Programme will comprise:

- Pipeline Replacement

- Universal Metering
- Aggressive conservation programme

2.3 SEWERAGE

On the sewerage side a summary of the issues to be addressed are:

- i. Adoption and integration of HDC Wastewater Plants and Private Packaged Plants (Trinidad & Tobago)
- ii. Rehabilitation of the Port-Of-Spain sewer system
- iii. Rehabilitation of the San Fernando Wastewater Treatment Plant and Integration of Sewerage Areas

This will be done by an investment of \$430.8 Mn into the sewerage sector

2.4 FINANCIAL

The major issues that the Authority faces during the next five years are:

- i. Elimination of the shortfalls on the Operating Fund;
- ii. Capital structure rationalization;
- iii. Appropriate financing needed for system strengthening programmes; and
- iv. Continued improvement of fiscal policies and practices.

2.4.1 Elimination of Shortfalls on Operating Fund

Maintenance of operating expenditures at levels consistent with inflation and reductions where service levels have been stable for some time will be the focus of cost control methods.

However, it is well appreciated that normal customer growth will not produce material annual revenue growth. Unless a series of stepped tariff increases are implemented the Authority will not be able to achieve self-sufficiency.

2.4.2 Capital Structure Rationalization

During the last five (5) years WASA has borrowed heavily on the local financial markets to fund a number of development projects including the North Water Project (\$660M), (Interim Operating Agreement \$450M), VSEP (\$80M), South Water Project (\$640M). The result is that WASA has an accumulated debt of \$2.4 Bn. Projections on the repayment schedule indicate that WASA will have repaid \$7.4 Bn during the life of the loans. Given the current financial situation, WASA will not be able to meet these financial obligations. Financial restructuring is urgently required in order to reduce the financial burden on the Authority.

2.4.3 Financing of System Strengthening Programmes

Systems expansion projects particularly do not provide incremental revenues to offset increased debt servicing and operating expenses to the organization. As a result, system expansion and system strengthening projects impact negatively on the recurrent financial position.

2.4.4 Fiscal Policies and Practices

The Authority has changed its budget preparation methodology. The new method, accompanied by intense monitoring of resource consumption is expected to have a major influence on expenditure control.

2.4.5 Working Capital Improvements

The broad strategic areas for reducing deficits will be:

- Revenue generating (review of tariff price and structure);
- Cash flow maximizing (Treasury management and collection programme);
- Expenditure optimizing (Including process re-engineering); and
- Productivity enhancement (investment in technology and training).

2.4.6 Debt Management Strategy

The recommended actions for debt management are:

- Refunding of existing long-term debt;
- Approaching the GORTT to take over the Authority's long term debt or formalize arrangements for their direct servicing;
- Use of GORTT subventions rather than increasing debt to meet current debt service payments; and
- Examination of the use of convertible long-term debt to replace existing loan capital.

2.5 HUMAN RESOURCES PROJECTIONS

Institutional strengthening and internal capacity building will facilitate the transformation of the Authority and the achievement of specific targets and goals. This will be achieved through the following:

- Training and Development
- Performance Management System
- An incentive Programme based on performance
- Security, health and safety programme
- Healthy Industrial Relations Climate
- Employee Assistance Programme
- Employee Welfare Programmes
- Staff Accommodation
- Training needs analysis
- Job evaluation and restructuring
- Management Development Programme

2.6 SERVICE IMPROVEMENTS

The Authority will embark upon a number of water and wastewater projects to improve its infrastructure and the delivery of quality service to its customers. See Appendix I¹¹.

The water projects will include:

- Boosters
- Service Reservoirs
- Distribution Pipelines
- Leakage Management
- Pipeline Repair and Replacement
- Metering

The wastewater projects will include:

- The adoption of Private Plants
- The adoption of National Housing Authority Plants

Revised Draft

2.7 STRATEGIES FOR THE ACHIEVEMENT OF DEMAND AND SUPPLY BALANCE

The strategy to be employed by the Authority during the next five years and beyond to achieve supply/demand balance will involve the following:

- Leak reduction- Water Loss Programme
- Metering
- Development of new water supplies
- Construction & Rehabilitation Water Treatment Plants

See Appendix V¹² for detailed outline of strategy proposed.

¹¹ Capital Programmes 2005-2009

¹² Supply/Demand Report

Groundwater

The Water and Sewerage Authority (WASA) depends on the availability of groundwater to support surface water sources to meet the national potable water demand. To date, groundwater supplies account for approximately 25% of the national water supply with 65% being drawn from surface water sources and 10% from desalination.

In 1999, a study commissioned by the Water Resources Agency (WRA) indicated that groundwater production from traditional aquifers was generally near the limit identified by Aquifer Safe Yield Calculations. In the following year deep groundwater exploration was introduced on the island of Tobago and in 2001 in Trinidad. At present, WASA has embarked on an extensive groundwater development program under which 68 wells are expected to be drilled in both shallow and deep bedrock aquifer systems.

As a result, in some instances calculated aquifer safe yields will be exceeded, as such, a stringent monitoring program has been developed and partially implemented with full implementation envisaged by September 2008.

The drilling of coastal observation wells and the derivation and implementation of a Ground Water Management Framework are two (2) new initiatives by the WRA to support ongoing aquifer exploitation and existing monitoring programs.

These initiatives will guide the decisions with respect to over pumping of the aquifers and the inward movement of the salt water/fresh water interface on a real time basis and allow the WRA/WASA to take the necessary steps to alleviate any potential hazards.

Groundwater Recharge to the country's aquifer systems is a relatively slow process with peak groundwater levels usually occurring in the dry season. Aquifers are large storage mediums and if managed efficiently can yield substantially large quantities of high quality water.

A comprehensive management plan, even though in its embryonic stages is being developed by the WRA involving the conjunctive use of surface and groundwater resources.

Conjunctive use management is a tool employed in the development and management of water resources, and is based on the integration of surface water and groundwater resources for optimal use in a given river basin.

Conjunctive use management will allow water resources planners to utilize a combination of abstractions from surface and groundwater during the dry season period as a means of resolving perennial water shortage problems and at the same time enhancing water conservation during the wet season.

The concept is that during the wet season when surface water resources are relatively plentiful, surface water can be stored underground by recharge to aquifer systems for use during the drier months of the year, thus giving the option of increasing extractable volumes and at the same time making up for shortfalls when surface water abstraction from the river systems have decreased.

During the wetter months of the year where river flows have increased groundwater abstraction can be reduced to acceptable volumes thereby creating minimal negative impacts on the public water supply systems.

2.8 WASA'S ACHIEVEMENTS 2001-2006

During the period 2001-2006, the Authority embarked upon a number of programmes geared toward its mission of delivering consistent quality water and wastewater services to the population as well as becoming financially self-sufficient. The programmes spanned the gamut of activities that the Authority engages: customer service, water production, pipeline repairs and pipe laying, technology upgrades and financial issues.

2.8.1 Customer Service

The Authority has embarked upon a number of customer service initiatives aimed at increasing service levels and improving its corporate image.

Some of the facilities and amenities that have been developed and implemented include:

- The introduction of the 800-LEAK programme;
- The use of TTPOST and commercial banks (RBTT, Scotia Bank, Republic Bank, First Citizens Bank) as alternative payment centres.

2.8.2 Water Production

During the period 2003-2006, annual water production increased from 329M m³ to 365 M m³. This increase resulted from a number of factors:

- Drilling of new wells;
- Rehabilitation of existing wells; and
- Rehabilitation of existing water treatment plants.

2.8.2 Unaccounted For Water (UFW) – Reduction Strategies

The Water and Sewerage Authority's Strategy for reducing unaccounted for water tackles the problem from 3 approaches:

1. Routine Leak Repairs
2. DMA Management
3. Supply Zone Management

1. Routine Leak Repairs

The current routine approach to leakage management is a reactive one in which over 50,000 leaks are identified mainly from public reports and repaired by in-house crews as well as contractors, each year.

Usually the process starts when a member of the public calls in a leak to a toll free line (800-LEAK). The information is then logged, verified by internal staff and the assigned to operational crews through a job card system. Limited tracking is done using a computerized system, STORMS.

2. DMA Management

Since 1996 WASA has introduced the concept of District Meter Areas (DMA) management as an active leakage management tool.

A DMA is a geographical defined area of typically 1000 to 3000 properties, which receive a 24-hour supply. The pipeline network is fitted with an intake meter and data logger, with closed boundary valves. Data is collected which includes a house count, metered and un-metered properties as well as all other categories of consumers (domestic, commercial and industrial).

The continuous monitoring of minimum night flows into the DMA is the principal method of leakage control. Minimum Night Flow (MNF) is used as a measure of leakage and it comprises distribution losses (leakage glands, joints and minor bursts) and night flow delivered (consumer's use and losses within the consumer's supply pipe).

The Unaccounted For Water (UFW) value is subsequently derived from subtracting the MNF value from Total Demand. Flow audits are conducted every six months within the DMA. If MNFs are above the standard set, it is assumed that leaks are present. Follow-up investigation works are conducted and the leaks identified are reported for repairs. Over the past few years the Water Loss Control Department has accelerated its drive to establish DMAs. Presently there are fifty-two (52) DMAs established throughout Trinidad and Tobago.

The major shortcomings and constraints are:

- Piece meal approach to demand management and leakage management.
- Lack of capital expenditure in major activities like bulk metering.
- Limited data, some are unverifiable.
- Lack of resources, both equipment and manpower.
- Poor communication and co-ordination between the Water-loss and Control Department and other Departments.
- Demand management in played down priority given in visible programme of water sources development, pipeline extension and rehabilitation.

A Project under the Water Sector Modernization Programme is currently being undertaken to enhance this approach. Details of the projects are presented in Table 1.

3. Supply Zone Management

The activities for Supply Zone management will capture the components of leakage on trunk mains, reservoirs and correct under registration of production source meters. It must be noted that Supply Zone management is dependent on another programme, i.e. the Bulk Metering.

The intent is to approach the pipeline replacement necessary from a system approach. The project is being implemented on a phased basis with the replacement of the trunk main preceding that of the mains in the distribution sub-system.

2.8.3 Pipe Laying Programmes (2003-2006) has to update

During the period 2003-2005, approximately 718.53km of pipelines were laid as part of the Transmission-Distribution and National Social Development Programme (NSDP) throughout Trinidad and Tobago. To date approximately 227,000 consumers benefited.

Some of the highlights of the programme involve the Mayaro Water Supply System-installation and the replacement of 20km of pipeline between Rio Claro and Mayaro.

Some additional achievements spanning various areas of the Authority operations as at 2006 are as follows:

- Accident Frequency Rate ranged between 1.87 to 9.33 over the year.
- Grievance resolved averaged eighty six percent (86%).
- Implementation of the Cash Register System at Rate Payer Centers with an up-to-date Point of Sale System.
- Reduction in turn over time for Clearance Certificate.
- Improvement of Pipe laying and road works by instituting a Ministry of Works Road Restoration Certificate.
- The Commissioning of the New Beetham WWTP

- The adoption of packages plants from the Housing Development Corporation, the number of persons served by the wastewater system has increased.
- Public Awareness and education programmes which have resulted in the reduction of the number of negative reports from 816 in 2005/06 to 319 in 2006/07.
- Information Technology- Completion of Information Technology Audit Manual and Point of Sale deployment.
- Code of Conduct- The Water & Sewerage Authority recently became a signatory to Trinidad & Tobago Chamber of Industry and Commerce's Code of Conduct.

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2.9 NATIONAL SOCIAL DEVELOPMENT PROGRAMME (NSDP)

The NSDP, which was started in 2002, aims at providing a water supply to socially depressed areas that are underserved or un-served. Since its implementation more than 222,000 consumers have benefited. To date approximately 274.01 km of pipelines have been installed with others ongoing. Some of the projects completed are Booster Stations at Piparo, L'anse Mitan, St. Barbs, La Horquetta, Cocorite and Todds Road.

Some of the highlights of the programme are as follows:

2002 NSDP

- The completion of 132 projects;
- The installation of 80.5km of pipelines;
- The commissioning of 13 booster stations/tanks;
- The installation of 111 communal tanks in the North Region (45) and South Region (65);
- The drilling of 2 new wells; and
- Approximately 47,500 people are benefiting new and improve water supplies.

2003 NSDP

- Completion of 120 programmes;
- The installation of 77.2 km of pipelines;
- Upgrading works on 9 booster stations; and
- Approximately 52,853 people benefited from the infrastructure developments and new water supplies.

2004 NSDP

- Completion of 150 projects
- The installation of 81.6 km of pipelines

- 1 Booster Station
- 3,475 new customers
- 56,387 beneficiaries

2005 NSDP

- 195 projects proposed
- 109.1 kilometres of pipeline proposed
- Approximately 65,000 beneficiaries

2006 NSDP

- 24.71 Kilometres of pipeline
- 6 booster stations
- TT \$50.35 Mn expenditure

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Over the next five years (2008-2012) the NSDP programme will be continued, and funding will be provided by the Government of the Republic of Trinidad and Tobago (GORTT). The three agencies that will execute the programme on behalf of the Government are: The Water and Sewerage Authority (WASA), The Trinidad and Tobago Electricity Commission (T&TEC) and The National Commission for Self Help (NCSH). The NSDP will be undertaken in both Trinidad and Tobago. The total cost of is estimated to be \$507Mn. (See **Appendix I for details**).

The NSDP is comprised of three (3) components: -

- **Wells:** The development of new wells and intakes will contribute to an improved and reliable water supply. The construction of new wells helps to increase the water supplies to meet demand. Projects of this nature will also benefit society especially in the dry season when rainfall is low and there is a limited supply of water. The construction of new Wells is estimated to cost \$388.20Mn (\$147.70Mn in Trinidad and \$41.5Mn in Tobago). This programme will begin in 2009 and be completed in 2012.

- **Boosters:** The construction of Booster Stations is expected to cost \$36.6Mn in Trinidad and \$17.3Mn in Tobago. The duration of this project is four (4) years it will commence in 2009 and be completed in 2012.
- **Pipelines:** This project focuses on the aging infrastructure. This will entail the replacement and refurbishment of the existing pipelines at a projected total of \$356.4Mn. Pipeline replacement in Trinidad is approximated to cost \$322.8Mn and \$42.6Mn in Tobago. This is another five (5) year programme (2008-2012).

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2.10 PUBLIC SECTOR INVESTMENT PROGRAMME (PSIP)

The PSIP, which was started in 2002/03 funds the rehabilitation of existing water & wastewater system as well as the construction of new systems and facilities. It consists of projects, which aim to continue the upgrade of the major water distribution systems, improve the water quality, rehabilitate service reservoirs and booster-pumping stations and upgrade the water distribution programme. This is being done through a comprehensive pipeline replacement programme and seeks reduce the level of unaccounted for water through the leakage management programme.

Some of the highlights of the programme are as follows:

2003 PSIP

- 56 Completed Projects
- 41.3 km of pipelines
- 7 Booster Stations
- 7 Wells
- 1 Wastewater treatment station & 1km force main
- 65,251 Beneficiaries

2004 PSIP

- 58 completed Projects
- 30.9 km of pipelines
- 6 Booster Stations & 2 Service Reservoirs
- 3 Water quality projects
- 3 Wastewater treatment plant
- Desilt 2 dams and 1 accommodation project
- 73,729 Beneficiaries

2005 PSIP

- 33.9 kilometres of pipeline proposed
- 2 Booster Stations and 2 service reservoirs
- 3 water quality projects
- 1 well and 6 wastewater treatment projects
- 3 accommodation projects

2006 PSIP

- 8.51 kilometres of pipeline
- 4 water quality improvement projects
- 3 booster stations
- 4 wells

As at 2007 new projects were added to the PSIP, which consist of the following:

- The **Moruga Water Supply Project**, which is expected to cost \$880Mn and be completed over a five (5) year period (2008-2011).
- An **Upgrade of Water Distribution Systems** which is expected to be completed within four (4) years (by 2010), consists of
 - The ***Improvement of Water Quality***, which is estimated to cost \$30.2Mn.
 - The ***Rehabilitation of Service Reservoirs*** is anticipated to cost \$45.7Mn.
 - The ***Rehabilitation of Booster Pumping Stations***, projected to cost \$35.2Mn.
 - ***Leakage Management Programme***, expected to cost \$25.8Mn.
 - ***Priority Pipeline Projects*** which is estimated to cost \$43.1Mn.

- A **Short Term Investment Programme** over a four (4) year period (2007-2010) and estimated to cost \$30.5Mn.
- The **Construction of New Water Supply Facilities at Mamoral and Caparo** expected to be completed in one year (2009) and cost \$8Mn.
- Sanitary Services- **Rehabilitation of the San Fernando Wastewater Treatment Plant and Integration of Sewerage Areas** which is anticipated to cost \$77.8Mn and be completed by 2011.

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2.11 DISASTER PREPAREDNESS PROGRAMME

The Disaster Preparedness Programme forms part of the five- year Investment Plan of the Authority. It will be funded by the Government of the Republic of Trinidad and Tobago (GORTT) and is estimated to cost \$138Mn. This programme aims at reducing vulnerability to natural disasters. It was created via a joint effort between the Trinidad & Tobago Electricity Commission (T&TEC) and the Authority, under the directives of the Ministry of Public Utilities. It is scheduled to begin in 2008 and will be ongoing for four (4) years coming to its completion in 2010. It is intended to aid in disaster recovery operations, control the distribution of water via tankers and deploy limited emergency stocks closer to disaster recovery sites via containers. (See Appendix 1 for details).

OBJECTIVES

- Maintenance of systems annually to build capability within WASA. Information from subject experts.
- Provision of suitable standby power.
- Access to spares by WASA and contractors for recovery operations.
- Incident command team for disaster recovery operations.
- To aid in disaster recovery operations in the twin island.
- To have continuous assessments and updates.
- Control and distribution via water tankers in events of emergency.
- Deployment of limited emergency stocks closer to disaster recovery sites via containers. Creation of space allotment for large spares at centralized stores.
- To reactivate gas station to have accessible diesel for heavy equipment and generators.

2.12 ACCELERATED WATER SUPPLY PROGRAMME

Another project under the Authority's five (5) year Capital Investment Programme is the Accelerated Water Supply Programme. The objective of this programme is to increase the volume of water customers receive. Currently, less than 20% of the population is in class (1) and receives a 24-hour water supply. In order to increase water supply and to satisfy the demand of customers receiving a class (2) to class (5) water service, the Authority will implement this programme. Funding for this will be obtained from the Government of Trinidad and Tobago (GORTT) and is estimated to cost \$2.75Bn. (See Appendix I for details).

This programme consists of four (4) components -

- **Water Reuse Plan:** This plan will be initiated by three (3) organizations; WASA, The National Energy Corporation and The Caribbean Hydro Source Limited. In order to increase the supply of potable water to domestic and commercial customers, the Authority will engage in a Water Reuse Project. Wastewater will be treated and redistributed for industrial usage. Apart from industrial customers, this recycled water will be made available to the fire-fighting network. It is expected to cost the GORTT \$1Bn. Of this \$1Bn \$700 Mn will be spent in 2009 and \$300 Mn in 2011.
- **Ten Mobile Packaged Plants:** Ten (10) small Desalination Water Treatment Plants will be constructed in Trinidad. The implementation of this project is to increase the level of supply to customers in the worst served areas. The installation of these plants will be in areas where customers receive a class (4) and (5) level of service (receiving water less than 72 hours per week). The areas identified for the construction of the plants are; Ortoire- Mayaro, Guayagarare – Mayaro, Cedros, Point Fortin (2 Plants), Moruga, Erin, La Brea, Manzanilla and Chaguaramas. Over 40,000 customers will benefit from these plants. Capital injections will be made in 2011 and is estimated to cost \$100Mn
- **Demand Management Plan:** This programme aims at sensitizing customers to the importance of domestic leak repair. It will provide funding for homeowners

to address the problem of in-home leakage, (repairing faulty faucets and toilet tanks). This project seeks to promote the conservation of water through a partnership between the Authority and its customers, in an attempt to increase supply. Upon completion in 2010, it is expected to cost \$100Mn.

- **National Grid for Distribution of Desalinated Water:** This component will facilitate the transfer of desalinated water, via selected pipelines from Point Lisas to San Fernando, Point Fortin to Penal, Manzanilla to Sangre Grande and Chaguaramas to Westmoorings. It is estimated to cost \$1Bn. and is expected to begin in 2009 and be completed in 2012.

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2.13 INFRASTRUCTURE DEVELOPMENT FUND

The Infrastructure Development Programme (IDP) is an initiative of the Authority and falls under the Capital Investment Programme's five-year plan. It is funded by the GORTT and comprises a series of projects. These projects have been developed by the Authority in an effort to improve the quality of service being provided to its customers, to improve on the efficiency of the network by keeping leakage within an acceptable limit and to create distribution flexibility by the integration of the transmission system with other supply systems. This involves the rehabilitation and refurbishment of existing infrastructure as well as the implementation of new ones. The implementation of this programme will be beneficial to two hundred and forty-nine thousand, nine hundred and fifty persons (249,950) between the southwestern and southeastern peninsulas. This Programme is estimated to cost \$543Mn. (See Appendix I for details)

- The **Paramin Water Supply Project** (expected to be completed over a three (3) year period (2008-2010)), which is estimated to cost \$12Mn.
- The **Replacement of 35km of the Navel Trunk Main**, which is estimated to cost \$59Mn over a five (5) year period and expected to be completed by 2009.
- The **Rehabilitation of 5 wells**, which is expected to be completed over a three (3) year period (2007-2009) and estimated to cost \$16.5Mn.
- The **Rehabilitation of Private Wastewater Treatment Plants**, which is estimated to cost \$10Mn and be completed by 2008.

2.14 WATER SECTOR MODERNIZATION PROGRAMME

WASA's Water Sector Modernization Programme (WSMP) was established in December 2004. This programme is funded by the Government of the Republic of Trinidad and Tobago (GORTT), it is a long term investment programme aimed at modernizing the utility in keeping with Government 2020 vision. This programme is linked to government's development programme and is estimated to cost \$ 1.267 Bn. and will be achieved over the five-year period (2008 – 2012).

These projects under WSMP can be broken down into the categories water and wastewater between Trinidad and Tobago. Of this figure \$1.03 Bn. will be spent in Trinidad and \$186.7 Mn. will be spent in Tobago.

The Water Sector Modernization Programme includes the following project components:

- **Major Water Source Development:** New water sources will be developed to meet the increased demand in areas identified for industrial development including La Brea, Mayaro, Wallerfield, Pt. Lisas and Tobago. Activities under this project will develop and expand the infrastructure to meet the industrial and domestic demand associated with Government Industrial nodes at Wallerfield and La Brea. This investment will focus on the reconfiguration of the network following the upgrade of the San Fernando Booster, the design and construction of the service reservoirs at KTO and Vessigny, and the installation of 23.3km of transmission and distribution mains. The expenditure on major water source development is expected to cost approximately \$391.91 Mn., that is \$359.06 Mn, and \$32.85 Mn. in Trinidad and Tobago respectively. For major water sources in Trinidad this funding will be spent over the entire five-year period (2008 – 2012) whereas in Tobago this funding will be dispersed over the period 2008 – 2011.
- **Distribution Expansion:** The Distribution Expansion Project is geared toward increasing the number of persons who are served by the Authority's network. This intended expansion is necessary as a result of population increases and a

myriad of other causes. It will be achieved through the replacement, as well as the expansion of the transmission and distribution systems. The upgrade and expansion of the Booster system will result in approximately 73,744 persons benefiting. It is estimated that 62,216 persons will benefit in North Trinidad, 9,804 in South Trinidad and 1,724 in Tobago. A total of \$69.3 Mn. will be spent in Trinidad spanning the years 2008 – 2011 and \$1.8 Mn. will be spent in Tobago over the next two years (2008 – 2010).

- **Leak Detection:** The Leak Detection Programme will be used to make improvements to the systems which will ensure that wastage of water is decreased, and that accountability of the water supply takes place. Currently, between 55-60% water produced is lost as a result of leakage on the network, this is referred to as Unaccounted For Water (UFW). Pressure Reducing and Leak Reduction Technology will help conserve the water resources that are available. This programme will cost approximately \$153.9 Mn., \$120.9 Mn. being allocated for Trinidad and \$33 Mn. for Tobago. This funding will be spent over the period 2008 – 2011 for both Trinidad & Tobago.

2.15 SEWERAGE

In keeping with the Government's plans to make Trinidad and Tobago an industrialized country and WASA's Financial Viability Plan (2002-2020), the Authority embarked upon a sewerage sector development programme. The main aim of the programme is an improvement in service, which will result in the expansion of coverage of sewerage facilities.

Specific to the Sewerage Sector, the plan included improving the service to match domestic demand, eliminating health and environmental risks and generating potential revenue streams.

The first phase of this plan began in 2001 with the construction of a new Sewerage Treatment Plant at the Beetham Estate. The plant was commissioned in 2005 at a cost of over \$200M. This highly modernized plant is projected to service over 365,000 consumers in the Greater Port of Spain Area.

The Authority has already taken over the Edinburgh 500 Wastewater Treatment Plant and there are plans to takeover the 200 Private Package Plants and the 22 Sewerage Treatment Plants that are owned by the National Housing Authority (NHA).

2.16 FINANCIAL

There are five (5) issues, which have and continue to impact the financial situation of the Authority:

- A large and growing Operating Deficit;
- A serious receivables problem;
- A severe Debt Servicing Burden;
- The need for investment funding to continue the development of the water supply infrastructure in order to improve supply levels and meet the 2020 challenge of developed nation status; and

During the period 2001-2006, the Authority's expenditure exceeded its revenues (See Table 5 & Table 6 below), and deficits rose from \$246M to \$696M. Given the amount of capital outlay (\$6.783Bn) required to execute the development programmes during the next five (5) years, the current deficit is expected to increase.

Table 5. Revenue for the period 2001-2006

REVENUES	2001/2002	2002/2003	2003/2004	2004/2005	2005/2006
	\$'000	\$'000	\$'000	\$'000	\$'000
Water	358.3	374.6	388.9	414.5	439.6
Sewerage	27.5	27.7	28.9	35.6	36.7
Other Income	15.2	8.7	15.1	11.4	15.1
Total Revenue	401.0	411.0	432.9	461.5	491.4

Source: WASA's Income Statements 2001-2004 (Audited)

Unaudited 2004/05-2005/2006

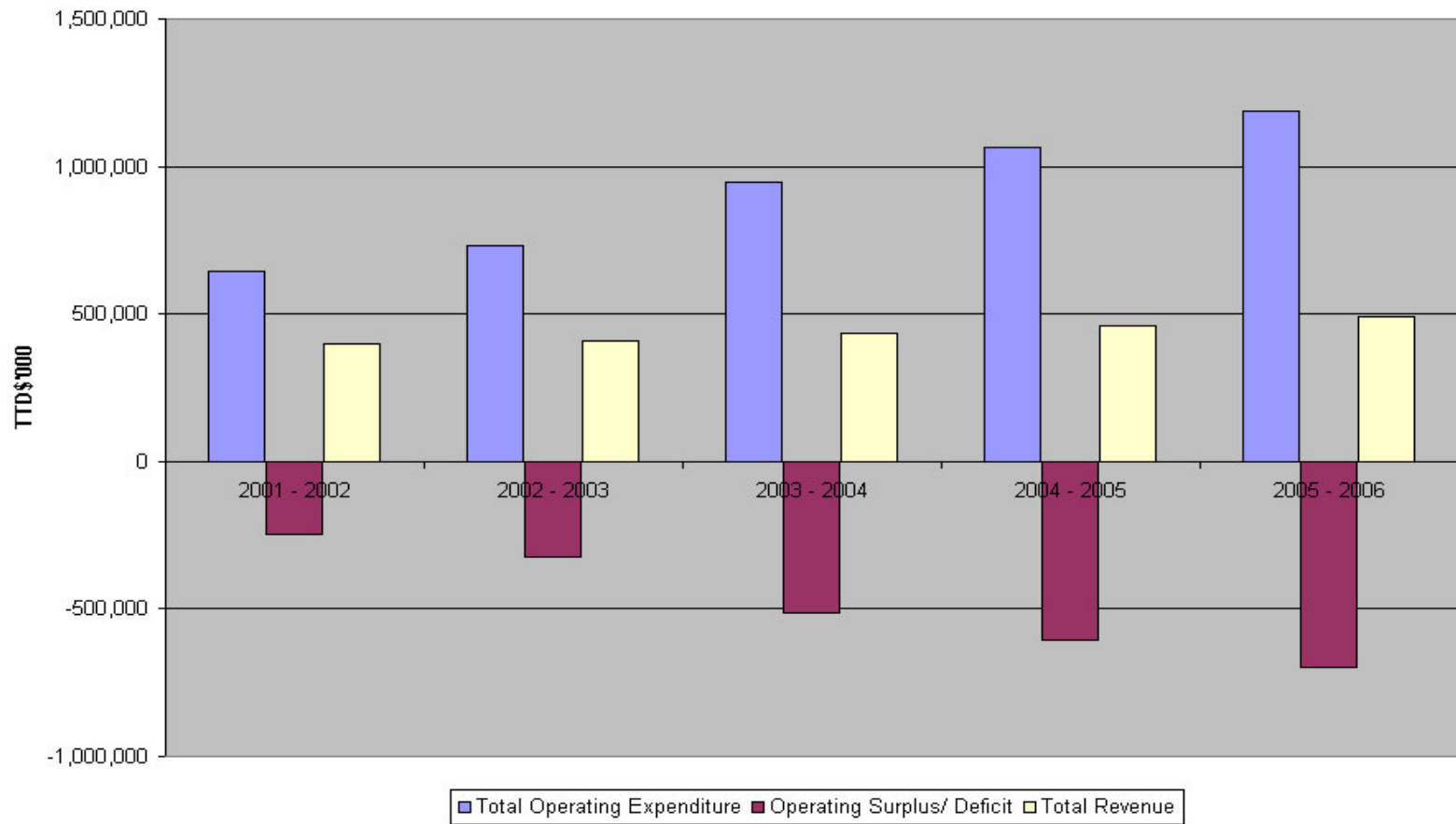
Table 6. Expenditure for the period 2001-2006

	2001 - 2002	2002 - 2003	2003 - 2004	2004 - 2005	2005 - 2006
	\$'000	\$'000	\$'000	\$'000	\$'000
Total Operating Expenditure	647,024	733,169	945,660	1,066,770	1,187,602
Operating Surplus/ Deficit	-246,024	-322,169	-512,760	-605,051	-696,132
Total Water Production	291,107,544	332,900,018	329,960,853	346,066,098	351,840,680

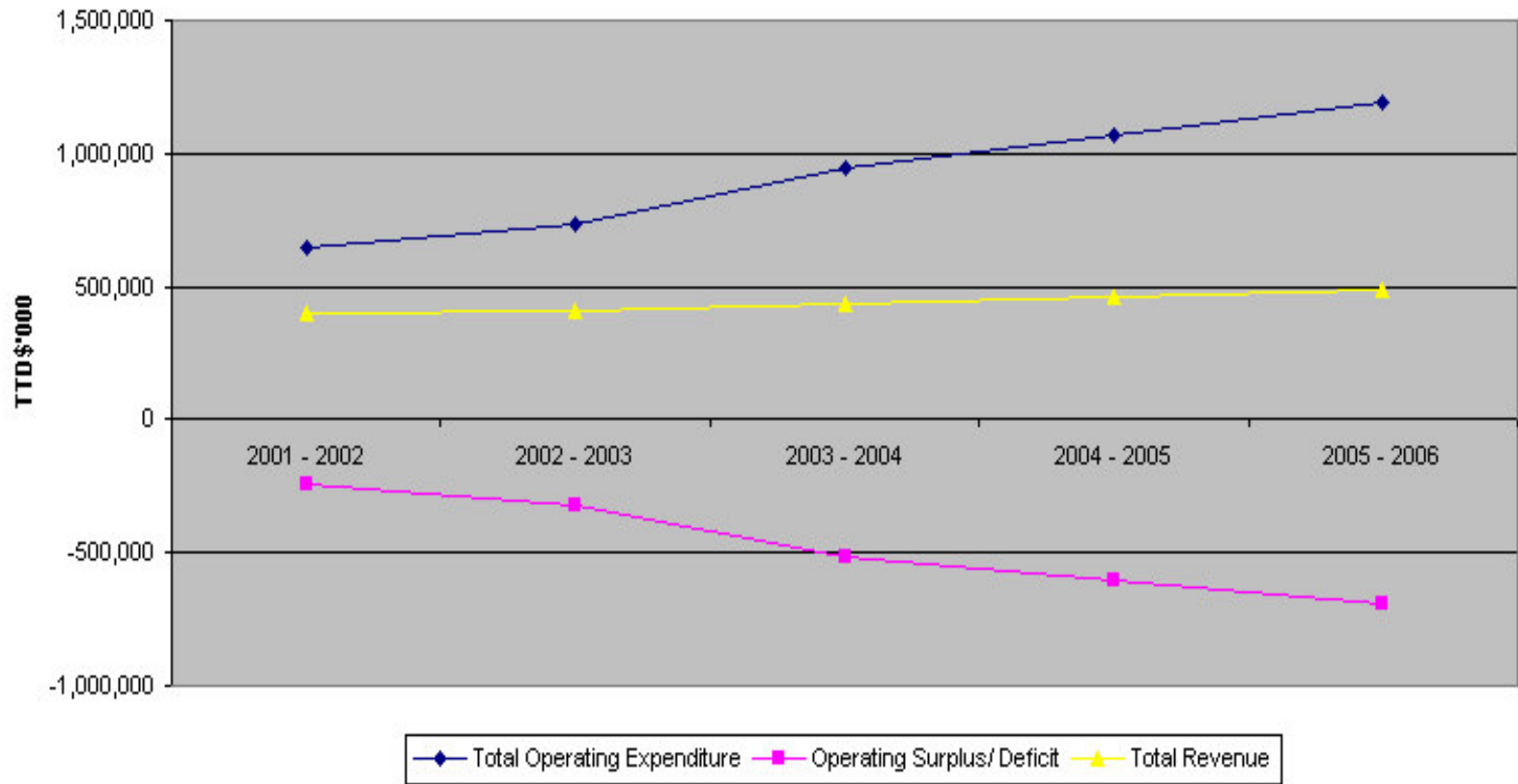
Source: WASA's Income Statements 2001-2003 (Audited)

Unaudited: 2004/05-2005/2006

Revenue and Expenditure for the period 2001-2006



Revenue and Expenditure for the period 2001-2006



The major drivers behind this trend have been relatively flat revenues accompanied by costs increases in line with inflation and increased water production, the addition of high-cost desalinated water and debt financing of all deficits and debt service expenses.

2.17 TECHNOLOGY

The Authority has embarked upon implementing cutting edge technology to increase efficiency and reduce costs. Some of these technologies include Variable Speed Pumps (VSPs) and System Control and Data Acquisition (SCADA).

- **VSPs** - are unmanned pumps that automatically detect the pounds per square inch (psi) and adjust speed accordingly. VSPs can save as much as 70% of regular pump energy costs.
- **SCADA**- this is a computerized system that monitors the complete water treatment process of water production. This system measures the source of levels of water supply, controls the automated processes of chemical treatment and test final quality on a preset time basis. The SCADA is available at the following facilities:
 - i. Caroni Water Treatment Plant
 - ii. Guanapo
 - iii. Hollis
 - iv. Freeport
 - v. North Oropouche

The Authority has also initiated a number of information technology projects with the aim of increasing the efficiency of operations and meeting the changing needs of customers.

Software package upgrades are being undertaken in some instances and new software is being sought where legacy packages cannot be adapted to the changing customer demands at reasonable cost and in reasonable time. Typical of these is the need to

replace the customer information systems with one that is designed to use spatial data in a fully integrated environment.

The Authority has installed firewall protection as a preparatory step to the use of e-business technology. The foundation has therefore been put in place for the implementation of a new Customer Information System that facilitates the use of this technology.

Integration of the Human Resources Information System (HRIS) and the payroll system is ongoing. This implementation includes limited integration to the general ledger.

A number of other initiatives are planned. These are identified in the year one to year three implementation programme of the Authority's Strategic Plan. The details of these are included in the IT Strategic Plan for the period 2004 to 2007.

2.18 FORECAST FOR THE PERIOD 2007-2011

2.18.1 Water Production

During the period 2007/2011 works on several reservoirs are to be carried out on a number of facilities throughout Trinidad and Tobago.

The details are provided below:

Facility	Production Capacity	Population to Benefit
<u>North Trinidad</u>		
	<i>(Million/Gallons)</i>	<i>(No of Persons)</i>
Richplain	2.1	11 450
Cleaver Road	1.023	10 960
Hololo	1.37	3 000
Mc Shine	0.546	20 334
Calvary	0.455	1 500
<u>South Trinidad</u>		
Dunmore Hill	2.273	22039

Tobago		
Mason Hall	0.227	370
	6.74823	69653

2.18.2 Pipe laying Plan (2007-2011)

During the period 2007-2011 the pipe-laying programme will cover two (2) areas: Strategic pipelines and Distribution pipelines. These enhancement programmes are forecasted to yield benefits to approximately 100,000 people in fourteen (14) communities. The following table highlights the aforementioned.

Table 1. Pipelines

Area	Length	Population to Benefit
Wallerfield	5km	7 210
Mayaro	29km	10 633
La Brea	14km	16 087
Sub Total	39km	33 930
Mayaro	9km	8 192
POS	10km	4 316
San Fernando	10km	9 557
Sub Total	29km	22 065
Tobago	15km	4 038
Rural	10km	5 710
Extremities	20km	24 522
Sub Total	45km	34270
Total	113	90265

2.19 UNIVERSAL METERING

In 1993, the Authority implemented a metering programme involving the installation of approximately 8,000 meters to commercial and industrial customers.

As at December 2006, out of 342,306 customers in Trinidad and Tobago only 9,509 are metered. This represents appropriately 3% overall. In the last quarter of 2006 the Authority successfully metered approximately 400 domestic customers in a pilot project conducted in Bacolet and Calder Hall in Tobago. New metering technologies i.e. Automatic Meter Reading technologies were successfully implemented in this project. The project was well received and supported in Tobago.

2.19 OBJECTIVES

- To create a Universal Metering system throughout Trinidad & Tobago
- To develop a billing system that correlates with actual consumption
- To promote water conservation

2.20 PROGRAMME SCHEDULE & COSTING

The total cost of Phases 1 and 2 of the Universal Metering Programme for Trinidad and Tobago is estimated at **\$1.3 Billion dollars**. Phase 1 is estimated to cost **\$352,963,340.00**. The cost is allocated as follows:

Universal Metering Phase 1

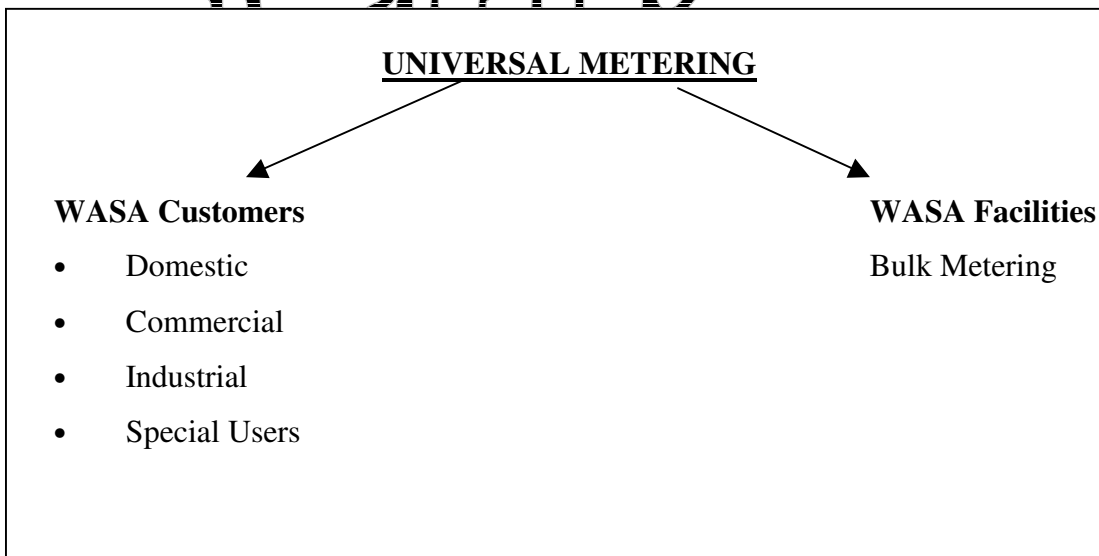
#	Project	Customers	Time	Cost
		#	Yrs	\$
1	Tobago	18,313	2.1	65,926,800.00
2	Trinidad 24 hr areas	67,000	2.3	241,200,000.00
3	Large users	4,108	2	14,788,800.00
4	Bulk Metering		2	31,047,740.00
		89,421	8.4	352,963,340.00

An average installation cost of each meter for the programme is approximately \$3600.00. This includes the installation cost, project management costs, maintenance costs, meter cost, meter box, curb valve and remote transmitter.

Phase 1 of the metering programme can be completed in less than three years if the projects listed above are undertaken simultaneously or in eight years five months if the projects are undertaken consecutively.

2.21 SCOPE

The Universal metering programme to be undertaken will encompass the entire population of Trinidad and Tobago. It can be classified broadly into two categories – WASA customers and WASA facilities



2.21.1 WASA Customers

WASA customers include all those that pay for the services that the Authority provides to them. Apart from domestic, commercial and industrial customers, the Authority has identified other categories of customers called Special users that include agricultural customers and private abstractors.

2.21.2 WASA Facilities

It is essential that the Authority measure the water that it produces and Bulk Metering will allow the Authority to do this. This includes measuring supply sources as well as transmission offtakes.

2.22 OPTIONS

A number of options are available for metering, these include:

1. A Pay Per Read System i.e. A finance, supply, install and read arrangement whereby companies will be asked to finance, supply, install, read and maintain the meters and the Authority will pay for each reading obtained.
2. A Performance Based Contracting System.
3. A Standard contract for installing meters in phases.

The first option under normal circumstances will be the most preferable choice because it does not include any initial capital expenditure by the Authority. This option will allow for the fastest method of metering all of the Authority's customers throughout Trinidad and Tobago. The last option however is convenient at this time mainly because the whole country does not as yet have a 24-hour water supply.

2.23 METHODOLOGY

The preliminary implementation plan has been structured to have the total works required to meter the entire country occur in two phases.

2.23.1 Universal Metering Phase 1

The first phase of Universal Metering involves a number of strategic projects that are feasible at this time for both the Authority and its customers. These projects include:

- 1) Bulk Metering Phase 1
- 2) Tobago
- 3) Large Users (Industrial & Commercial)
- 4) Trinidad 24-hour supply areas

2.23.1.1 Bulk Metering

A key element of the metering programme is a Bulk Metering Project. This entails the metering of major production sources within Trinidad and Tobago and the establishment of an Operational Control Centre (OCC) for Trinidad. The aim is to establish an effective system for the acquisition of flow data for the Caroni South, Caroni North, North Oropouche, Hollis, Navet, Richmond, Hillsborough and Courland transmission systems in Trinidad and Tobago. The Operational Control Centre in Trinidad will entail the installation of a wide area SCADA system connecting various bulk metering sites, reservoirs and booster stations so that Regional Centres at North, South and the main office in St. Joseph can receive data.

2.23.1.2 Tobago

The Authority recently metered Bacolet and Calder Hall in Tobago in a pilot project. This pilot employed the latest in metering technology in terms of the quality of meters and available Automatic Metering Reading (AMR) systems. The success of this project was further determined by the full support of residents of the two communities and the Tobago House of Assembly (THA). This kind of support is expected throughout the island, which has approximately 18,313 customers. This increase in commercial activities in the tourism industry makes it opportune to meter the entire island of Tobago at this time. Another factor that makes this strategy possible is the 67%-75% FSE that the island experiences.

2.23.1.3 Large Users (Industrial & Commercial)

Large users, which comprise of mainly Industrial and Commercial customers account for a considerable portion of the Authority's revenue. PUC order 78/79 allows for the Authority to charge industrial and commercial customers a fixed cost for a metered service. The Authority also intends to pursue the metering of commercial customers immediately with priority on those who use extraordinarily large quantities of water. This will further increase the Authority's revenue whilst encouraging the commercial customers to conserve water.

2.23.1.4 Trinidad 24-hour Supply Areas

A 24-hour supply is one parameter that the Authority has determined will guide the first installations of meters. In this regard the twenty percent (20%) of the country that is currently served with a 24-hour supply of water will be targeted first for meter installations. Additionally, functional District Metered Areas (DMAs), infrastructure and other strategic parameters will further guide the areas of installation.

2.24 Universal Metering Phase 2

The second phase of the metering programme is concerned with metering the rest of the country. This includes the remaining 80% of the customer base, some of which will be receiving a 24-hour water supply by this time, along with low consumption commercial users and Special Users. The rate at which WASA's capital programme improves customers' water supplies will greatly determine at which the rest of the country can be metered. Bulk Metering Phase 2 will be geared towards metering the rest of the Authority's production and supply facilities.

2.25 POLICY ISSUES

A number of policy issues must be addressed prior to the start of the metering programme, these include the following:

- Tariff
- Cost Recovery

- Condominiums/Apartment Buildings
- Illegal Customers
- Metering of standpipes
- Metering of customers' premises
- Tampering

2.25.1 Condominiums/ Apartments Buildings

These are buildings with many owners/tenants but with only one water connection. It was very easy to issue each owner/tenant with a bill using the ATV billings system.

However, with metering a problem arise, as there is only one connection. This problem can be easily addressed with future new structure by having the New Services Division ensure that all apartments have separate connections.

2.25.2 Illegal Customers

These fall into two categories: householders with land tenure but having a connections for which they are not billed; and householders who do not have land tenure (squatters) but have a water service connection. Case one is easy to deal with, for it only requires that WASA meters and regularizes these householders.

However case two requires an innovative approach since the nature of our new services application process makes it virtually impossible for these householders to qualify for a water connection.

2.25.3 Metering of Standpipes

All standpipes in the pilot areas should be metered. A listing of standpipes in the pilot areas should be sent to the respective Regional Corporations prior to metering, alerting them of the Authority's intention to meter. The Corporations will be required to pay the bills for these metered standpipes.

2.25.4 Metering on Customers' Premises

This programme involves placing meters on customers' premises. This is something new as it is not the norm for the Authority to conduct works on customers' premises. What if the customer objects to anyone entering his or her property to install meters? Does the Authority have any resource?

2.25.5 Tampering

It is anticipated that with the advent of the metering programme cases of tampering will be encountered. Laws pertaining to tampering will have to be enacted/revised in order to serve as a deterrent.

2.26.0 PROGRAMME PLANNING

The factors to be considered during the planning stage of this programme include the following:

2.26.1 Consultancy

The Authority will engage the services of a consultant to assist in determining:

1. Meter Specifications
2. Programme Structure
3. Installation Design
4. AMR Options
5. Preparation of Tender Documents

2.26.2 Use of Contractors

Contractors will be used for the implementation of the programme. Tenders will be issued for an Automatic Meter Reading system capable of reading different brands of meters and also a tender for the procurement of different sizes and types of meters that will be used in the programme.

2.26.3 Metering Structure

The Authority has established a Metering Team to plan and implement its metering programme. This team will increase with the implementation of the programme to include the required staff.

2.26.4 Customer Education Programme

This is a major aspect of the metering programme. Customers are naturally skeptical about any new development, which may impact on the payment of their bills. In the absence of proper information a lot of negativity can be generated about the programme and thus hinder its progress.

The programme should be designed to cater for all of the customers' questions and concerns. It should be designed to win the customer over by highlighting the benefits of metering. The programme will also inform customers about a customer survey, which will begin prior to the start of meter installations.

2.26.5 Customer Survey

Prior to actual start up of meter installations a customer survey must be conducted.

This is necessary in order to properly schedule meters for installation. The survey will get proper addresses, verify account numbers, establish correct customer classification and ensure that all properties are recorded on WASA's Customer Information System. All properties will be highlighted on street maps so that the GIS database can also be updated.

2.27 PROGRAMME MONITORING AND MAINTENANCE

2.27.1 Works Supervision

Quality Assurance Officers will be assigned to work with contractors to ensure that all works are done to standard and in accordance with the contract, that safety regulations are observed and to issue completion certificates that contractors will need to receive payment.

2.27.2 Meter Test Shop

The need for an effectively functioning meter Test Shop facility is paramount importance in sustaining the metering Programme. Maintenance activities will include the effective testing of meters, replacement of meters, repairing leaks at meters, cleaning and replacing strainers and any other meter related complaints.

2.28 BENEFITS

To the Customer:

- Fairer billing system for the customer, as they will now be billed for what they use
- Metering allows customers to better manage their payments
- Allows more water to customers

To the Organization:

- Reduction of customer side leakage
- Reduction of Unaccounted for Water
- Customer Consumption Data Acquisition
- Delays and/or Reduces Capital Investment in Water Treatment Plants
- Reduction in Water Treatment and Sewerage Treatment Costs

Detailed information for the universal metering programme is provided in Appendix XV¹³.

2.29 LEAK DETECTION, PIPELINE REPAIR AND REPLACEMENT

The proposed leak detection, pipeline repair and replacement programmes during the period 2007-2011 are expected to benefit 15% of the population in a number of communities throughout Trinidad and Tobago. Approximately fifty-four thousand (54, 000) people are to benefit directly from these programmes.

The principal objective of the Water Loss Programme is to reduce total losses from the current estimate of 55% to approximately 51% of water produced during a five-year implementation programme and to subsequently maintain total losses at this level, or lower.

The subsidiary objectives of this programme are as follows.

- i. To recruit and thoroughly train, all staff within the Leakage Services structure.
- ii. To control visible leakage, ensuring that all burst and leaks are repaired within 24 hours of reporting for major bursts and within 5 days of reporting for all other bursts and leaks.
- iii. To implement a six-month programme of systematic sounding in all Class 1, Class 2 and Class 3 supply areas not yet covered by operational district and waste meters.
- iv. To implement effective procedures to ensure that customers repair leaks identified by WASA on their supply pipes and internal plumbing systems and waste resulting from missing or faulty tank ball valves.
- v. To improve the quality of the existing GIS distributions records and complete the capture of distribution records in those areas not currently in the GIS, by the use of historic records and local knowledge.

¹³ Universal Metering

- vi. To implement effective permanent pressure zoning, designed to ensure minimum distribution pressures of 15 meters and maximum distribution pressures of 40 meters.
- vii. To implement effective pressure reducing schemes, where necessary, to reduce distribution system pressures to a maximum of 40 meters.
- viii. To implement effective district meter areas with meters continuously logged and downloaded on a daily basis via a PSTN system.
- ix. To implement effective waste districts, with all valves required for step testing in perfect working order so that they can be shut drop-tight when required.
- x. To create comprehensive GIS records for all pressure zones, PRV zones, DMA's and WWMD's and the creation of WWMD plans for field use.
- xi. To implement a planned service pipe replacement programme in areas where communication pipes are known to be in poor condition.
- xii. To implement a rolling programme of walking trunk mains.
- xiii. To implement a rolling programme of service reservoir inspections.
- xiv. To establish a leakage monitoring and reporting system to identify the areas of priority for leakage control resources and to report the progress of the project.

2.30 SEWERAGE

During the period 2007-2011 the Authority proposes to adopt a number of private packaged plants and NHA plants and to upgrade a number of WASA facilities. Approximately 148,000 people are forecasted to benefit from these activities during this time period.

2.31 RISKS AND UNCERTAINTIES

As with every other business entity, the Authority faces risks and uncertainties in its operations. To this end the Authority has to identify the manner in which it proposes to manage those risks and uncertainties.

2.31.1 Monetary

Both labour and chemical costs contribute significantly to the overall costs of operating the Authority. These costs are subjected to exogenous factors such as, union negotiations and fluctuations in the value of the U.S. dollar.

2.31.2 Chemicals

Most of the chemicals that are used in the treatment and production of water are imported. These products are priced in U.S. currency and hence the overall costs of chemicals are subjected to vagaries in the value of the U.S. currency. Furthermore, variations in local inflation will also impact upon the costs of chemicals.

2.31.3 Labour

Labour costs - direct and indirect -accounts for a significant portion of the overall costs of operating the Authority. Labour cost is dependent upon the outcome of wage and salary negotiations with respective employee union representatives.

2.31.4 Electricity

Annually, electricity costs amounts to approximately TT\$44M. This cost is expected to increase as the Authority embarks upon a number of projects to improve its facilities and due to the increase in tariffs charged by the Trinidad & Tobago Electricity Commission

2.31.5 Dry Season

The current volume of water produced is partially based on estimated values, as not all facilities are metered. During the dry season (January-June), some sources have a reduced output, due to the lower level of water in the rivers and impounding reservoirs. During this period output is reduced by 10%

2.32 FINANCIAL

Developing and maintaining a national water and wastewater infrastructure system is an extremely expensive operation. The investment requirement will be needed to:

1. Develop the infrastructure to provide a full service supply to the entire population (24/7 water supply);
2. Undertake investment to remove an aged and dilapidated infrastructure and replace and upgrade the physical facilities; and
3. Ensure that maintenance investments are made on the expanded and upgraded system so as to ensure that the system does not revert to the current state of inadequacy.

The short term project development costs for the period 2007-20011 is TT\$6.783 Mn. with long-term costs to 2020 standing at TT\$27B. The Authority is not in a financial position to meet the outlays of these development projects, as it is unable to meet its costs of operations.

2.33 CUSTOMER PAYMENTS

The Authority had outstanding receivables of \$599B as at 30th Sept 2006. Of this, \$485B has been provided for. The net receivables balance of \$114B is considered to be collectable.

2.34 MANAGEMENT OF RISKS AND UNCERTAINTIES

- ***New Sources of water***- several new sources of water are being examined. The new water sources are as follows:
 1. The rehabilitation of existing water infrastructure-Petrotrin owns several dams that lie dormant, unused or under-utilized. If some agreement can be reached with the oil company, these systems can be rehabilitated for localized water supply. Seven lakes in two areas - Mt. Foin (2) and La Brea (5)- have been identified.
 2. Additional groundwater sources are also being explored since they are more reliable than surface supply.
 3. New intakes and reservoirs- the development of new intakes on eight (8) rivers, and reservoirs on four (4) rivers, extending into the long term is being proposed in an effort to augment the national water supply in general, and also to allay the scarcity problems in South Trinidad and Tobago.

These programmes will form part of an integrated water management programme that will cater for changes in demand and seasonal variations.

- ***Customer Management Programme*** – the Authority will employ a number of customer management programmes that will maximize customer service satisfaction and customer payments. This is expected to impact positively upon the Accounts Receivables.

2.35 COST OF SERVICE STUDY

The Cost of Service Study analysed the service provided by the Authority categorized into five core activities:

- Water Production
- Water Transmission
- Water Distribution
- Sewage Collection
- Sewage Treatment

The direct cost of each activity was calculated to give an average per m³ cost of the service. See Appendix VI¹⁴.

2.36 OPERATING EXPENDITURE

Current operating costs and projections for the period 2007-2011 are broken down into three categories: customer group, labour and expenditure on infrastructure maintenance activities.

2.37 CUSTOMER GROUP

The Authority's customers are classified into three (3) main categories:

- (i) Domestic
- (ii) Non-Domestic
- (iii) Agricultural

¹⁴ Cost of Service Study

It is projected that operational expenditure for these three (3) categories of customers will increase from \$1.5 B in 2007 to \$1.7 B in 2011. Appendix VII¹⁵ provides detailed information.

2.38 LABOUR

Labour costs (salaries and wages) are projected to increase at a rate of 5% per annum for the period 2007-2011. Detailed analysis on the projected increases in cost are also provided in Appendix II¹⁶

2.39 ACTIVITY (INFRASTRUCTURE MAINTENANCE)

The projects that form part of the 2020 Vision will seek to develop and strengthen the institutional, technical and financial aspect of the Authority's operational activities. See Appendix I¹⁷

2.40 COST IDENTIFICATION

Costs are divided into a number of categories:

- i. Fixed
- ii. Variable
- iii. Controllable
- iv. Uncontrollable
- v. One-off

In 2005/06, the total cost of operations when allocated to the cost categories were:

i. Fixed	\$800,961,400
ii. Variable	\$625,924,300

¹⁵ Operational Expenditure for customer groups

¹⁶ Tariff Book

¹⁷ Capital Programmes 2007-2011

- iii. Controllable \$657,286,983
- iv. Uncontrollable \$344,571,311
- v. One-off \$219,601,041

Details of the aforementioned cost categories is provided in Appendix VIII¹⁸

2.41 METHOD FOR ALLOCATING COMMON COST

The volume of water consumed by the various customer classes (domestic, industrial and other) is used as the major cost driver. Common costs were apportioned calculated relative to this cost driver. See Appendix IX¹⁹

2.42 EFFICIENT LEVELS OF COST

A number of performance indicators are used to measure the operational activities of the Authority. Some of these indicators are:

- i. Water coverage
- ii. Wastewater coverage
- iii. Total water supplied
- iv. Unaccounted for water
- v. Pipe network performance
- vi. Water quality
- vii. Customer complaints
- viii. Financial performance

Details of each of the aforementioned indicators are provided in Appendix X²⁰.

¹⁸ Cost Identification

¹⁹ Allocating Common Cost

²⁰ Efficient Levels of Cost

2.43 CAPITAL EXPENDITURE

Capital expenditure for the period 2007-2011 is spread over the core areas of operational activities:

- i. Water source and supply
- ii. Water pumping
- iii. Water treatment
- iv. Water transmission and distribution
- v. General sewer system

The main capital projects for the period 2007-2011 are provided in Appendix I²¹.

2.44 REGULATORY ASSET BASE (RAB)

- i. The total Regulatory Asset Base (RAB) for the year 2003 was \$1,935,792,710.
- ii. The historic cost based valuation method is used for particular class/group of assets.
- iii. The list of assets by types with rates of depreciation is provided in Appendix III (c).²²

2.45 DEPRECIATION

The straight-line method of depreciation is used during the stipulated useful life of the asset, noting that consideration is given to a 15% salvage value on structures only. A listing of asset type and useful economic life is provided in Appendix IV (b).

²¹ Cost of Capital Projects

²² Fixed Asset Schedule (Asset Values)

2.46 RATE OF RETURN ON CAPITAL

Information is provided on a number of key issues relevant to computation of this measure:

- i. Individual loans with interest rates
- ii. Total debt servicing
- iii. Government guaranteed loans
- iv. Receivables and collection policy

2.47 LOANS

A number of loans under various categories have been utilized to undertake a variety of activities. These loan categories are:

- i. Capital investment loans
- ii. Working capital financing loans
- iii. Restructuring Financing loans

A detailed listing of each of the aforementioned categories of loans and interest rates is provided in Appendix XI²³.

2.48 DEBT SERVICING (INTEREST AND FINANCE CHARGES)

The total debt servicing with interest and finance charges are detailed in Appendix XI²⁴.

²³ Different Loans with Interest Rates

²⁴ Total Debt Servicing

2.49 GOVERNMENT GUARANTEED LOANS

Details of government guaranteed loans are provided in Appendix XIII²⁵.

2.50 RECEIVABLES & COLLECTION POLICY

A persistent problem in financing the Authority's operations is its inability to recover the proportion of its costs, represented by billings to its customers. This under-recovery of costs has been significant and the resulting excessive accounts receivables form a very large part of its current assets. See Appendix XIV²⁶

The inability to liquidate an adequate proportion of these receivables and generate sufficient cash has resulted inter alia, in inadequate inventories of operating materials and undue delay in settling suppliers' accounts.

An effective receivables management and debt recovery policy is an urgent business imperative. The debt recovery policies proposed are sensitive to the needs of the poor and disadvantaged.

The key proposals/policies considered are:

- ✓ Arrears Liquidation Agreement
 - General policies
 - Qualified customers and standard terms
 - Special considerations
 - Pensioners
 - Employees
- ✓ Disconnection/Reconnection
 - General policies
 - Procedures and practices

²⁵ Government Guaranteed Loans

²⁶ Receivables and Collection Policy

2.51 DEMAND SUPPLY REPORT

An increase in the price of water is expected to impact differently on the average water demand depending on the type of connection whether it is:

- Metered customers OR
- Un-metered customers

The supply of water is forecasted to increase with the rehabilitation of existing facilities and planned expansion through projects such as:

- The total Ground Water Project
- Extension of Trinidad Ground Water Project

A summary of the demand supply and projections can be seen in Table 1.

Detailed information on the water demand forecast is provided in Appendix V²⁷.

Revised Draft

²⁷ Supply Demand Report

TABLE 1
System Balance for the period 2002-2006

CLASS (imgd)	2002	2003	2004	2005	2006
Domestic Demand					
A1	2.298	2.240	2.209	2.177	2.104
A2	8.411	9.468	9.975	11.007	11.051
A3	81.886	84.410	85.710	87.308	91.083
A4	0.860	0.857	0.861	0.869	0.876
A5	0.318	0.221	0.219	0.452	0.656
A6	0.002	0.002	0.002	0.004	0.005
Total Domestic demand	93.77	97.20	98.98	101.82	105.78
Non Domestic Demand					
B3	2.377	2.014	1.814	1.775	1.848
B4	2.690	2.369	2.264	2.312	2.408
C3	6.044	6.218	6.359	6.163	6.510
C4	7.039	7.038	7.222	7.173	7.220
D3	0.130	0.119	0.162	0.164	0.215
D4	0.138	0.111	0.139	0.149	0.162
E3	0.435	0.439	0.419	0.351	0.419
E4	0.344	0.345	0.339	0.289	0.331
Total Non-domestic demand	19.20	18.65	18.72	18.37	19.11
Total domestic + Non Domestic demand(excluding Point Lisas)	112.97	115.85	117.70	120.19	124.89
Point Lisas demand	10.54	12.39	13.01	14.55	16.13
Total (including Point Lisas)	123.51	128.24	130.70	134.74	141.02
UPW	110.36	109.35	114.38	116.64	121.05
Total System Demand	233.87	237.59	245.08	251.38	262.07
Supply	200.65	198.82	207.96	212.07	220.09
Surplus/Deficit	-33.22	-38.77	-37.12	-39.31	-41.98

Projected System Balance for 2007-2012

	PROJECTED YEARS				
	2007	2008	2009	2010	2011
CLASS (imgd)					
Domestic Demand					
A1	2.06	2.01	1.97	1.93	1.88
A2	11.84	12.69	13.60	14.58	15.62
A3	93.54	94.14	93.59	92.25	92.03
A4	0.88	2.05	3.93	6.28	7.94
A5	0.85	1.11	1.44	1.88	2.44
A6	0.01	0.01	0.01	0.02	0.02
Total Domestic demand	109.19	112.01	114.54	116.93	119.95
Non Domestic Demand					
B3	1.61	1.41	1.23	1.08	0.94
B4	2.35	2.23	2.23	2.18	2.13
C3	6.67	6.83	7.00	7.17	7.34
C4	7.27	7.31	7.36	7.41	7.46
D3	0.25	0.28	0.33	0.37	0.43
D4	0.17	0.18	0.18	0.19	0.20
E3	0.419	0.42	0.42	0.42	0.42
E4	0.330	0.33	0.33	0.33	0.33
Total Non-domestic demand	19.06	19.05	19.08	19.14	19.23
Total domestic + Non Domestic demand(excluding Point Lisas)	128.25	131.07	133.62	136.06	139.18
Point Lisas Demand	17.96	19.99	22.25	24.77	27.57
Total (including Point Lisas)	146.21	151.06	155.87	160.83	166.75
UFW	118.85	116.65	112.24	107.84	99.04
Total System Demand	265.05	267.70	268.12	268.68	265.79
Supply	220.09	220.09	220.09	220.09	220.09
Surplus/Deficit	-44.97	-47.62	-48.03	-48.59	-45.70

2.52 SCHEDULE AREAS & NUMBER OF CUSTOMERS

One of the Authority's key tasks is the provision of a continuously adequate high quality supply of water to its consumers. However, due to the limited water resources coupled with high inefficiencies in supply, the Authority must schedule its water supply to ensure that its consumers have access to potable water. Customers are divided into five (5) classes based on the supply received:

- ✓ Class one (I) customers receive a 24-hour – 7-days per week (24/7) or a 168 hours per week supply of water,
- ✓ Class two (II) customers receive a supply of at least 120 hours per week supply,
- ✓ Class three (III) customers receive a supply of at least 84 hours per week supply,
- ✓ Class four (IV) customers receive a supply of at least 48 hours per week supply, while
- ✓ Class five (V) receive a supply of less than a 48-hour supply of water. A summary of the schedule areas and the projected population served is presented in the Table 7 below.

CLASS OF SUPPLY 2002 - 2006

2002

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	507,737	41%
2	120-168	314,957	25%
3	84-120	167,383	14%
4	48-84	136,326	11%
5	0-48	111,407	9%
Total		1,237,809	100%

2005

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	240,058	20%
2	120-168	454,055	38%
3	84-120	282,351	24%
4	48-84	108,593	9%
5	0-48	119,307	10%
Total		1,204,364	100%

2003

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	336,263	28%
2	120-168	351,391	29%
3	84-120	300,586	25%
4	48-84	129,504	12%
5	0-48	76,994	6%
Total		1,194,737	100%

2006

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	219,558	18%
2	120-168	389,735	32%
3	84-120	342,410	28%
4	48-84	140,249	11%
5	0-48	139,854	11%
Total		1,231,805	100%

2004

Class	AVERAGE HOURS OF SERVICE	Yearly average population	Average % population per class
1	168	327,637	27%
2	120-168	382,648	39%
3	84-120	246,328	20%
4	48-84	101,042	8%
5	0-48	73,310	6%
Total		1,230,405	100%

A detailed listing of primary source, of supply, town/village, projected population and class of supply is provided in Appendix XV²⁸.

2.53 WORST SERVED AREAS

Customers who receive a Class (IV) and Class (V) are considered to be the worst served consumers, their level of water supply ranges from (0 – 84) hours per week. Table 7 shows that Class (IV-V) customers account for approximately (10 – 15)% of the Authority customers.

²⁸ Schedule Areas and Number of Customers

The Authority's Capital Investment programmes, (NSDP and PSIP) are aimed at reducing the number of customers in the Class (IV-V). Additionally, the Authority's Strategic Plan (2005-2009) and its Tariff Business Plan (2007-2011) have identified projects to reduce the number of customers who are currently in Class (IV-V).

A Listing of the worst served areas is provided in Appendix XVI²⁹.

2.54 ENVIRONMENTAL ASPECTS

The significant environmental aspects which impact on the quality of the services, are listed in the table below

Revised Draft

²⁹ Worst Served Areas

LIST OF SIGNIFICANT ENVIRONMENTAL ASPECTS (See Appendix XVI³⁰)

No.	Environmental Aspect	Significant Impacts	Mitigation Measures
1	Pipe Laying Works and repairs to mains	Excavation of roadways generates spoil that needs to be disposed or stored. Disruption to traffic, poor road restoration, siltation of roadways and drains, generation of dust.	Investment in Trenchless technology for laying of pipelines, purchasing of noise meters, training of staff in new construction techniques.
2	Cleaning of Distribution Storage Tanks	Waste from cleaning exercise is normally discharged in nearby drains, leading to drainage problems and contamination of waterways.	Upgrade and improvement of design for sedimentation basins, sludge to be extracted, de-watered and transported to approved landfills.
3	Defective Wastewater Treatment Plants	Non-compliance with discharge standards, which poses a risk to human health, contaminates potable water surface and groundwater supplies and negatively affects aquatic ecosystems.	All current and future wastewater plants have to be upgraded to meet the discharge standards as outlined in the Water Pollution Rules. These Rules will supersede present TTBS 417:1993 standards.
4	Major Water Leaks	Causes flooding, erosion and resource waste.	On going pipeline repair and replacement programme
5	Poor Housekeeping	Poor housekeeping of facilities and disposal of waste lead to overall environment degradation and deterioration of human and occupational health.	Development of a Best Practice Environmental Management (BPEM) guidelines and enforcing adherence to the guideline entailed.
6	Poor Chemical Handling Procedures	Chlorine and mercury are extremely harmful to human health and environment. Mercury bioaccumulates in the environment. Alum handling and usage can lead to the release of fugitive emissions.	Phasing out the use of mercury in treatment plants. Adherence to BPEM guidelines pertaining to handling of chemicals. Investment in new equipment for dosing chlorine and mixing of Alum.
7	Mechanical Repairs	Air, water and soil pollution.	Frequent inspection of machinery and prompt repairs as the need arise.
8	Energy Consumption	Increased use of fossil fuels to provide electricity or power machinery contributes to global warming.	Outfit vehicles to operate using Compressed Natural Gas. Use energy saving devices on pumps and motors.
9	Water Abstraction	Decreases water availability for downstream users and aquatic life. May lead to salt water intrusion.	Metering to conserve water, replacement and repair of pipelines to reduce leaks. Conduct resource assessment to identify new sources and monitor current water quality of raw resources.
10	Reservoir Filling	Decreases water availability for downstream users and aquatic life. May lead to salt water intrusion.	Desilting reservoirs to maintain capacity, development of watershed management programme, repair to Dam towers, and valves to ensure scouring of reservoirs, thereby maintaining capacity and quality.

³⁰ Environmental Aspects

2.55 PLANS FOR SEWERAGE SECTOR IMPROVEMENT

2.55.1 Background

Although sewers were introduced in Port of Spain since 1861, it was not until 1962 that the first major sewerage project for Trinidad began. This project involved the construction of three (3) major sewage treatment plants with associated lift stations and collection systems. The project was completed in 1965 and resulted in the sewerage of the three (3) major population centres in Trinidad, Port of Spain and environs, San Fernando and Arima.

Since then, as the population grew and the demand for housing increased, WASA has been unable to expand the sewerage system to satisfy the increasing demand. To address this deficiency approval was granted to private housing developers, government institutions including schools, hotels and industry to construct, operate and maintain sewerage systems.

These approvals were given with the intent that WASA will eventually take over the operation and maintenance of these systems and collect sewerage rates. However, WASA has been unable to do so due to the rapid rate of increase in the number of these sewerage systems increased coupled with high cost of operations and maintenance. Today, WASA owns and operates thirty four (34) STP's, twenty-two (22) of which were formerly under the jurisdiction of the National Housing Authority (HDC). There are a further one hundred and fifty (150) STP's, which are privately owned. (See Appendices XVIII³¹ for full lists of plants).

The Authority's STP's are maintained to some level of functionality. However, the privately owned STP's are now in a state of disrepair.

2.55.2 Studies and Proposals

In an effort to deal with the poor infrastructure, to improve compliance levels, and to reduce pollution of the environment, a number of studies have been conducted during the past ten (10) years. These studies resulted in recommendations for investment projects, which were never implemented.

³¹ Status of Wastewater Sector

The key projects are as follows:

(i) *Greater Port of Spain Sewerage System (GPOSSS)*

The GPOSSS Study conducted in 1998 included:

- ◆ New Beetham Wastewater Facility
- ◆ Downtown Rehabilitation Pilot Project
- ◆ Maraval Sewer Extension
- ◆ Sewer Cleaning Program
- ◆ Infiltration & Inflow Study.

So far only the Beetham Facility project has been initiated and completed (at a cost of TT\$201,000.000).

(ii) *South West Tobago Wastewater System*

Thames Water International in association with Reid Growth and ADeB Consultants in 1994 conducted a study of the Tobago Wastewater System. They proposed the construction of a treatment facility at Crown Point with associated lift stations and collection systems at a cost of TT\$225,000,000.

Recently there has been renewed interest in this project and these proposals are presently under review.

(iii) *Rehabilitation of WASA Wastewater Treatment Plants*

The rehabilitation of WASA's Wastewater Treatment Plants was covered in a feasibility study done by Alpha Engineering in 1998. The study proposed improvement works at nine (9) of the twelve (12) WASA owned wastewater treatment plants; San Fernando, Arima, Trincity, Piarco, Santa Rosa, WASA Head Office, Penco Lands, Lange Park and Techier. Proposed works included site work; structural, electrical, mechanical, instrumentation and improvement in treatment processes.

Since this study, there has been very little refurbishment works at any of these treatment facilities.

(iv) *Rehabilitation of WASA Lift Stations*

In 1997 Team Engineering Systems in association with MTEC Engineering and APR Associates conducted a feasibility study and detailed designs for the rehabilitation of Wastewater Lift Stations and Drainage Area Studies. The scope covered restoration of the facilities for a life expectancy up to 2015 and included improvements in civil and building works, mechanical, electrical, controls, instrumentation and ancillary works.

(v) *Adoption of Private Wastewater Treatment Plants*

In 1997, two (2) studies were conducted:

- i) Strategy for the Adoption of Private Package Plants – Ian Sinclair – March 1997
- ii) Adoption of Private Sewage Treatment Works – TTWS – November 1997

The Sinclair Report recommended the development of a strategy for adoption based on economic, financial, engineering and technical considerations. The report underscored the need to obtain funding required to implement the strategy and to cover the costs of refurbishment and O & M costs. It was further recommended that there is need to establish a new wastewater tariff directly related to the true costs of collection, treatment and disposal of sewage.

The TTWS Report sought to develop strategies for four (4) pilot areas, two (2) in the north and two (2) in the south. The purpose of the pilot was to provide essential experience on the appraisal, feasibility, engineering design and transfer arrangements. This study also covered a plant and catchment evaluation for all the remaining plants and the development of integration of catchment strategies where appropriate.

The Ministry of Public Utilities approved the pilot strategies along with estimated costs and Design Briefs were issued to local consulting firms, however this project never materialized.

(vi) *Integration of Sewerage Systems*

In December 1997, Delcan International Corporation in association with AdeB Consultants Ltd. conducted a study on the Integration of Separate Sewerage Systems in Trinidad. A number of recommendations were made ranging from refurbishment of existing plants to development of integrated schemes and the construction of new plants.

(vii) *Rehabilitation of Chaguaramas Wastewater Systems*

In 1996, Trintoplan Consultants in association with Mott Mc Donald Ltd. conducted a study on the Chaguaramas Sewerage Infrastructure. This study assessed the water and wastewater infrastructure on the peninsula as being in need of almost complete replacement. They further concluded that the condition of the existing infrastructure was most serious for the wastewater collection systems, pumping stations and treatment facilities.

2.56 NATIONAL MASTER PLAN FOR WASTEWATER INFRASTRUCTURE DEVELOPMENT

In 1995, Terms of Reference were prepared for a Water and Wastewater Master Plan; the Preliminary Design for the first stage and an Implementation Strategy up to the year 2030. The goal was to focus on least cost options for improving service quality and national coverage by:

- ◆ Rehabilitating and upgrading existing facilities
- ◆ Identifying new facilities
- ◆ Assessing future development needs with complimentary institutional capacity building programmes.

The consultancy for the preparation of the Master Plan has commenced in 2007.

(viii) *In 2000, Dillon Consulting Ltd, Study*

Development of a Strategic Plan for the Wastewater Sector in Trinidad and Tobago had as its main objectives the following:

- ✓ Identifying the institutional and legal changes required to regulate the centralized and decentralized collection and treatment services, taking into account private sector participation in the operation of these services
- ✓ Defining a short, medium and long-term investment plan for wastewater, collection and treatment, establishing priorities in accordance with technical, economic and environmental criteria.
- ✓ Defining viable alternatives for financing of the recommended plan considering possible sources of financing from Government, private sector and multinational banks.

This report is the most comprehensive report on the Wastewater Sector and recommendations made should be urgently considered for implementation. See Appendix XVIII³².

2.57 MEASURES TO IMPROVE WATER QUALITY

The list of programmes identified in the Revised Strategic Plan 2005-2009 highlights the measures to be taken to improve water quality. Appendix I³³ provide detailed information of the programmes.

2.58 AUDITED FINANCIAL REPORTS (1998-2004)

During the period 1998-2004 the Authority's annual deficit widened. See Appendix XIX³⁴. The chronic financial situation resulted from heavy capital expenditure, continued operating fund shortfalls and the practice of debt financing of all operations and capital needs. Also included are unaudited reports for the years 2004/05 - 2005/06.

³² Status of Wastewater Sector

³³ Capital Programmes 2007-2011

³⁴ Financial Accounts

2.59 NUMBER OF EMPLOYEES

As at 2006, there were 3,284 employees in the Authority. Monthly paid employees amounted to 2,567 (1,380 permanent and 1,187 contract). Daily paid employees amounted for 717 (690 permanent and 27 contract). Further information is provided in Appendix XX³⁵

2.60 EFFICIENCY IMPROVEMENTS

A number of service performance indicators have been identified to measure the level of efficiency. Detailed information on these indicators is provided in Appendix XXI³⁶

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³⁵ Number of Employees

³⁶ Efficiency Improvements

3. PUBLIC SUMMARY

Introduction

To better serve its customers, the Water and Sewerage Authority of Trinidad and Tobago has developed a 5-year Investment Plan, which is a road map for the Authority as it addresses many of the problems that plague its operations today.

The 5-year Investment Plan was developed to guide the Authority as it responds to the questions:

“What does the customer want?”

“Which processes and procedures add the most value?”

“How can resources and new technologies be more efficiently managed?”

“Which programmes are required to bring maximum benefits to the greatest number of persons?”

“What is the investment needed to meet and subsequently exceed service standards?”

This Strategic Plan lays the foundation for the achievement of the National 2020 Vision for the water and wastewater sector. It will fuel socio-economic growth by supplying critical service to the petro-chemical industry, tourism, housing, health and other important sectors.

By the year 2020, a National Water Grid will allow WASA to redistribute water for emergency use for example, fires and natural disasters, and an upgraded pipeline network will provide a continuous water supply to 98% of consumers.

The creation of an integrated sewerage system and an ongoing public education programme will facilitate the connection of 75% of domestic and industrial customers thereby preserving the waterways and the environment.

The strategies outlined in the Strategic Plan will impact medium to long-term financial planning, service costs, water rates, sewerage rates, legislation, service quality, supply, efficiency and National development.

Situation Summary - Water

WASA's programmes for the period 2007-2011 are categorized into water service and supply enhancements. These categories include increased production, treatment, transmission, distribution and wastewater initiatives.

WASA's total water production is approximately 220 million gallons per day, while demand stands at some 250 million gallons per day. Leakage on the transmission and distribution mains is currently estimated at 55% of daily production. The Authority has inherited an aged pipeline system and a disconnected pipeline network. In several cases pipelines are more than 80 years old resulting in frequent supply disruptions due to leakage.

The development of a Water Master Plan has been initiated specifically to integrate the National pipeline network in order to increase system efficiency and improve service.

At present, WASA uses three customer bases - domestic, industrial and agricultural. Under the current customer classification, domestic customers are placed in one of the following six (6) categories:

- Domestic Customers without a water service connection (wsc), who live within access to a standpipe.
- Externally serviced or yard tap customers.
- Internally serviced customers.
- Internally serviced, metered domestic customers.
- Charitable Institutions and Churches that are internally serviced.
- Metered Charitable institutions and Churches, which are internally serviced.

On average, WASA's domestic customers pay between \$111.98 and \$554.36 per year for water as illustrated below:

Customers without water connections - \$111.98

Customers with yard taps - \$187.89

Customers with internal water connections - \$554.36

Charitable institutions - \$368.40

Industrial, Commercial and Agricultural customers as well as those who operate small businesses from their homes are also classified as follows:

Un-metered Industrial customers

Metered Industrial customers

Un-metered Commercial customers

Metered Commercial customers

Un-metered Cottage customers

Metered Cottage customers

Un-metered Agricultural customers

Metered Agricultural customers.

The following is a summary of the average yearly bill, which these customers are charged:

Industrial customers - \$195,753.08

Agricultural customers - \$79,045.25

Commercial customers - \$8,492.02

Cottage customers - \$1,534.63

At present, most of WASA's customers are unmetered. However, internationally there is sufficient evidence to suggest that water rates and water consumption are both reduced when metering is implemented.

In addition to the fact that the daily demand for water outstrips daily water production, the high percentage of losses on the transmission and customer sides of the system, has resulted in the need for water schedules. Unplanned disruptions are also a challenge. These are often as a result of power failures at water production facilities, major leaks, heavy rainfall and the failure of WASA's assets.

The Authority receives an average of between thirty-five hundred (3,500) and forty-five hundred (4,500) reports of leaks each month, leading to numerous unplanned disruptions in the water supply and schedules. WASA does not to date have the technology for automatic monitoring of supply and schedules.

Random checks are carried out regularly by the Authority on its supply and schedules. It is estimated that an average of approximately 56% of the established schedules are maintained.

Currently, the regularity of the existing water supply is categorized as follows. Using a five-year average it is estimated that 21% of WASA's customers in Trinidad receive a continuous water supply while 41% receive water at least 5 days per week (between 120 and 167 hours); 17% of customers receive water at least 3 days per week (between 84 and 119 hours); 9% receive water approximately two days per week (between 48 and 83 hours), while 12% of customers receive water less than 48 hours per week.

Water Initiatives

A key component of the Authority's Strategic Plan is the modernization of the pipeline network, with a view to reducing the need to rely on water schedules.

WASA's Water Sector Modernization Programme (WSMP) was established in December 2004 to manage the planning and implementation of water and wastewater projects and to develop a Water and Wastewater Master Plan, which will establish the framework for long-term projects. The funding for the first three years of this programme is \$TT 1.231 B.

This investment will be used to enhance the quality of life for more than 450,000 persons and increase the number of customers who receive a continuous water supply from the five-year average of 27% to 47% by 2011.

Major projects under the WSMP include the drilling of new wells in the Courland/Mason Hall area of Tobago and the rehabilitation of several older wells in both islands, the upgrading of service reservoirs, the construction of new water treatment facilities at Cumuto, Matura/Salybia, Mayaro, as well as, Louis D'or and Studley Park in Tobago and the construction and/or rehabilitation of twenty seven (27) booster stations throughout Trinidad and Tobago.

These combined improvement works will add an additional twenty eight (28) million gallons of water per day to the distribution system, thereby reducing the number of customers who receive a scheduled supply and improving water services to an estimated 100,745 customers in communities throughout the twin island such as La Brea, Wallerfield, Mayaro, Sangre Grande, Biche, Rio Claro, Guayaguayare, Castara, Bloody Bay, Louis D'or, Charlotteville, Black Rock, Speyside, Mt. St. George, Lambeau, Carnbee and Mt. Pleasant, which are currently some of the worst served areas in Trinidad and Tobago.

Two major initiatives have been identified to manage water losses and reduce water wastage - the annual replacement of approximately one hundred (100) kilometres of existing pipes using appropriate materials and technology, as well as, the implementation of a comprehensive and systematic metering programme.

Leakage management initiatives are expected to reduce total losses by 5% in five years and subsequently reduce water losses even further to between 25% and 30% by the year 2020. Additionally, the Authority will ensure that all leaks are repaired within twenty-four (24) hours of reporting for major bursts and within five (5) days of reporting for all

other bursts and leaks. The 800-LEAK campaign will continue as a major tool for the reporting and repair of leaks. Concurrently, a leakage monitoring and reporting system will identify the priority areas for leakage control resources. At present WASA uses the media to advise its customers of all planned disruptions and through improved workmanship makes every effort to ensure that water is restored in the shortest possible time as was advertised. Additionally WASA ensures that police officers are on site to direct traffic flow whenever major planned disruptions are scheduled.

With respect to metering, the Authority has implemented a metering programme, which in the first instance will install an estimated one hundred and sixty (160) bulk meters and 30,000 domestic meters in Trinidad and Tobago. Internationally metering is known to reduce water demand and encourage conservation leading to an increase in the available water supply, which it is anticipated will result in an improved service to persons who are currently underserved.

In 2005, a metering programme was launched at several of the Authority's smaller water production facilities. WASA's facilities at Tyrico, La Fillette and Cap-De-Ville were equipped with meters for the first time. During the period 2007 - 2011 it is proposed that all large industrial and commercial users will be metered together with all of the Authority's water production facilities.

The aforementioned modernization projects will be implemented in conjunction with two other ongoing programmes - Government's National Social Development Programme (NSDP) and the Public Sector Investment Programme (PSIP).

WASA has been working through the NSDP and PSIP programmes geared towards improving and expanding its service throughout the country. To date more than 500 projects have been completed throughout Trinidad and Tobago, improving the pipe borne supply to more than 150,000 consumers and increasing WASA's customer base by more than 10,000.

WASA has established a number of water trucking filling stations across Trinidad and Tobago and currently supplies customers with a truck borne supply upon request.

Dependence on this measure will decrease over time, since demand for truck borne water is projected to decrease as a result of improved levels of pipe borne supply.

Quality control in the area of drinking water has always been a priority for the Authority. Random daily tests are conducted at the laboratory to assess water quality. However, consistently maintaining high water quality in today's environment is a challenge due to the poor environmental practices of the general population.

To ensure that the quality of water meets national and international standards, treatment processes at facilities are constantly monitored and assessed. In addition, there is an ongoing programme to upgrade several existing water treatment plants during the next 5-years. The replacement of corroded water mains will also be intensified to reduce the occurrences of discoloured water.

The implementation framework for WASA's Strategic Plan consists of three areas – infrastructure improvements, system and process improvements and legal and business reform. The infrastructure improvements will be implemented through the National

Social Development Programme, the Public Sector Investment Programme and the Modernization Programme as outlined above. In tandem with these infrastructure programmes, the Authority continues to focus on its systems, processes and procedures with a view to achieving Six-Sigma thereby eliminating variations in WASA's processes and improving output.

Systematic measures will be taken to WASA's major existing processes that currently fall below specification. The approach has already yielded improvements in the area of new service connections, so much so that WASA estimates that more than 70% of applications are delivered within 5 days of payment. Billing, Communications and Procurement are three major processes that will see marked improvement during the next 5 years.

The Authority's multi-faceted approach of increasing water production, improving the retention of the water produced and instituting accurate means to measure the volume of water within the distribution and transmission systems will result in a measured improvement in the reliability of service to customers nationwide during the period 2007 - 2011.

Situation Summary – Wastewater

In spite of the fact that the Authority currently has the capacity to collect and treat more than twice that amount of waste, at present, only twenty percent (20%) of the national population is covered by the Authority's sewerage network. During the past 4 decades, Trinidad and Tobago has had little success in developing and enforcing adequate standards for the wastewater sector. As a result, sewer plants formally owned by the National Housing Authority (NHA) now Housing Development Corporation (HDC) and those currently owned by private developers are all in moderate to severe states of disrepair. Eighty percent (80%) of the population is served by privately owned, generally poorly maintained wastewater plants, soak away systems and pit latrines. This situation poses environmental and ecological concerns.

In September 2004, the Authority adopted 38 NHA plants with a capacity to treat waste from more than 100,000 persons. Additionally, with the commissioning of the Beetham Wastewater treatment plant in 2005, the Authority has the capacity to provide sewerage and wastewater treatment to more than 275,000 consumers from as far west as Carenage to as far east as Mount Hope. During the next 5 years, several initiatives have been identified for the wastewater sector.

Major Enhancement Programmes - Sewerage

The preparation of a Wastewater Master Plan has commenced as at 2007. This plan will identify feasible alternatives for collection, conveyance, treatment and effluent disposal, as well as, for the rehabilitation, expansion and integration of existing facilities in order to satisfy the expected customer demand through to the year 2035.

WASA's objective is primarily to increase the number of persons who are connected to its sewer system and to continue to ensure that the effluent meets accepted standards.

The following projects have been identified:

- The upgrade of sewerage systems in the cities of Port of Spain and San Fernando
- The implementation of South West Tobago Sewerage Treatment System

During the period 2007 - 2011, the Authority will integrate the NHA Sewerage Treatment Plants to serve an estimated 108,171 customers and will adopt 4 Private Packaged Plants with a total treatment capacity equivalent to cover 10,000 customers.

The number of consumers expected to benefit from WASA's sewerage treatment initiatives during the 5-year period is estimated at 120,000.

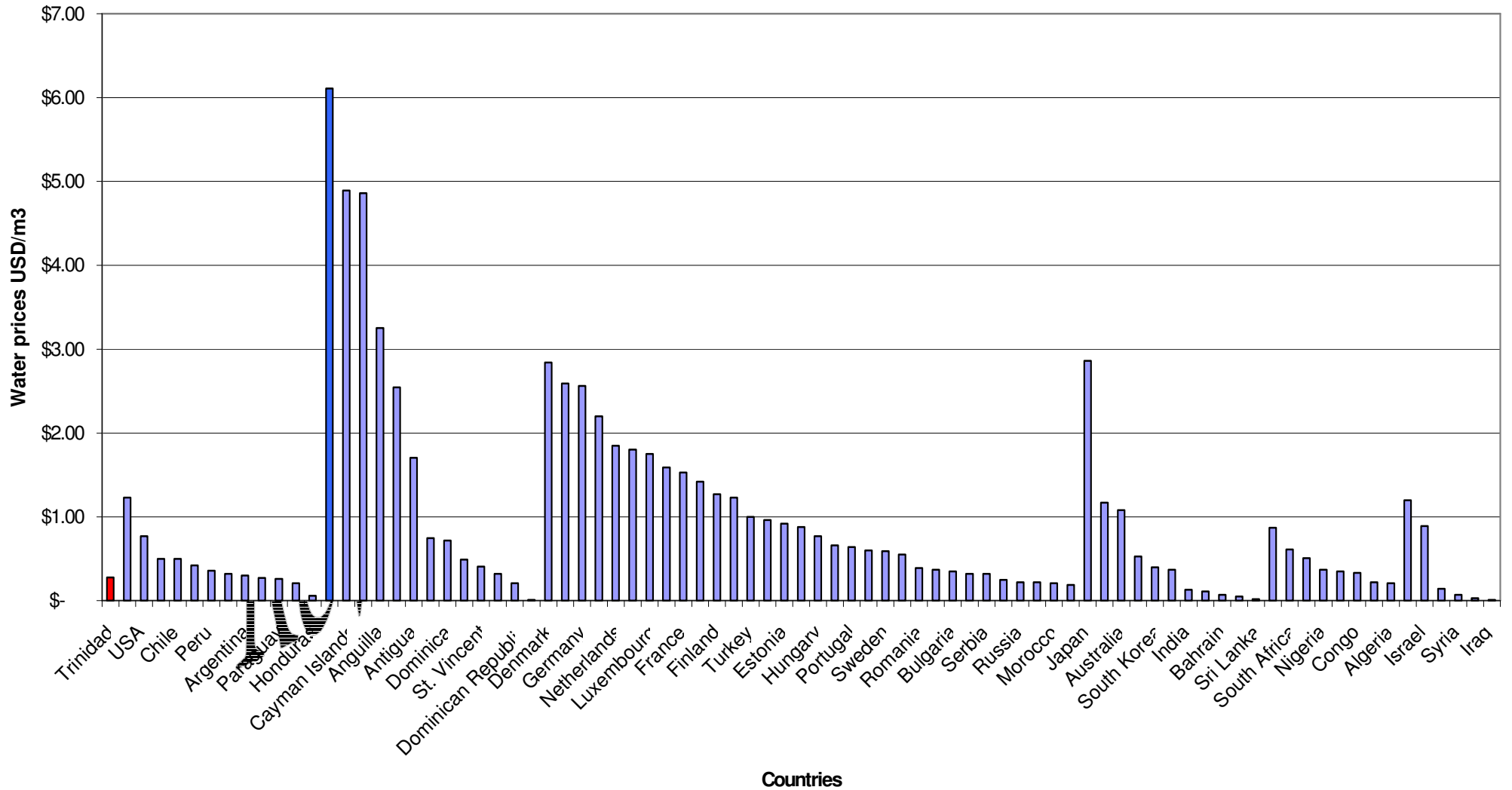
The process of finding, treating, storing, transmitting and distributing water and providing sewerage services are very costly. However, WASA remains committed to keeping its operating costs in line with benchmarking standards. Geographical distance and height of some customs therefore increase the cost of operations. The use of Variable Speed Pumps (VSPs) is with significantly reducing these costs. Variable Speed Pumps are unmanned and automatically detect water pressure and adjust the pump speed accordingly. Internationally, this has reduced energy costs by as much as 70%.

The application of alternative technologies has been proven to reduce operating costs. The use of computers to monitor water treatment processes, measure the levels of water supply, control the processes of chemical treatment and test the final quality on a preset time basis has already been implemented on a limited scale. The expansion of their use and further application of software during the period 2007-2011 will drive costs of production downward and further improve the quality of water that is provided to consumers.

New technology aimed at minimizing service delivery interruptions will also be implemented. These include “hot tapping” which allows interconnections of water mains to be made without the loss of water service to customers, and the use of a cement and aggregate-based material known as ‘flowable fill’ for road restoration.

The Authority considers itself a learning, service oriented organization and as a result will continue to dedicate resources to the development of staff, the use of Project Management practices and proven technologies which are expected to significantly reduce WASA's cost of supply and improve accountability, efficiency and customer satisfaction.

Average Water rate prices (USD/m3) for selected Countries around The World compared to TT



Comparative Analysis of Various Water Authorities, using WASA as a base.

The data attached shows the comparative analysis of water rate charges between WASA and various water authorities around the World. The prices shown are in US dollars per cubic meter.

In the Caribbean, **Netherland Antilles** has the highest domestic water rate of **\$6.11**, which is **\$5.83** more than the domestic water rate of Trinidad and Tobago. This is 2182% times the water rate of Trinidad and Tobago. **Cuba**, on the other hand, has the lowest water rate of **\$0.01**, which is **\$0.27** less than the domestic water rate of Trinidad and Tobago. This is 3.6% times the water rate of Trinidad and Tobago. However, no figures were available for the commercial water rate for Cuba.

In the North/Latin American region, **Canada** has the highest domestic water rate of **\$1.23**, which is **\$0.95** more than the domestic water rate of Trinidad and Tobago. This is 439% times the water rate of Trinidad and Tobago. **Honduras**, on the other hand, has the lowest water rate of **\$0.06**, which is **\$0.22** less than the domestic water rate of Trinidad and Tobago. This is 21.4% times the water rate of Trinidad and Tobago.

In Europe, **Denmark** has the highest domestic water rate of **\$2.84**, which is **\$2.56** more than the domestic water rate of Trinidad and Tobago. This is 1014% times the water rate of Trinidad and Tobago. **Ukraine**, on the other hand, has the lowest water rate of **\$0.19**, which is **\$0.09** less than the domestic water rate of Trinidad and Tobago. This is 67.9% times the water rate of Trinidad and Tobago.

In Asia, **Japan** has the highest domestic water rate of **\$2.86**, which is **\$2.58** more than the domestic water rate of Trinidad and Tobago. This is 1021% times the water rate of Trinidad and Tobago. **Sri Lanka**, on the other hand, has the lowest water rate of **\$0.02**, which is **\$0.26** less than the domestic water rate of Trinidad and Tobago. This is 7.14% times the water rate of Trinidad and Tobago.

In the Middle East, **Qatar** has the highest domestic water rate of **\$1.20**, which is **\$0.92** more than the domestic water rate of Trinidad and Tobago. This is 428.6% times the

water rate of Trinidad and Tobago. **Iraq**, on the other hand, has the lowest water rate of **\$0.01**, which is **\$0.27** less than the domestic water rate of Trinidad and Tobago. This is 3.6% times the water rate of Trinidad and Tobago.

In Africa, **Egypt** has the highest domestic water rate of **\$0.87**, which is **\$0.59** more than the domestic water rate of Trinidad and Tobago. This is 310.7% times the water rate of Trinidad and Tobago. **Algeria**, on the other hand, has the lowest water rate of **\$0.21**, which is **\$0.07** less than the domestic water rate of Trinidad and Tobago. This is 75% times the water rate of Trinidad and Tobago.

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APPENDIX I

CAPITAL PROGRAMMES 2007-2011

Three (3) year Investment Programme - Summary

PROJECT COMPONENT	ESTIMATED COST OF THREE (3) YEAR INVESTMENT PLAN PRIORITY 1	YEAR 1 ORIGINAL (2005)	YEAR 2 ORIGINAL (2006)	YEAR 3 ORIGINAL (2007)
1	2	3	4	5
TRINIDAD				
WATER				
MAJOR WATER SOURCES	\$359,060,799.92	\$104,445,834.81	\$101,136,915.11	\$153,478,050.00
DISTRIBUTION EXPANSION	\$69,375,880.88	\$25,392,457.88	\$9,075,541.00	\$34,907,882.00
LEAK DETECTION PROGRAMME	\$120,999,999.11	\$15,661,670.11	\$41,038,329.00	\$64,300,000.00
PIPELINE REPLACEMENT PROGRAMME	\$160,620,850.00	\$39,825,000.00	\$67,737,600.00	\$53,058,250.00
INSTITUTIONAL STRENGTHENING	\$78,500,000.00	\$24,600,000.00	\$31,185,000.00	\$22,715,000.00
SUB-TOTAL	\$788,557,529.91	\$209,924,962.80	\$250,173,385.11	\$328,459,182.00
WASTEWATER				
SEWERAGE SECTOR INITIATIVES	\$197,500,000.00	\$22,000,000.00	\$42,500,000.00	\$133,000,000.00
SUB-TOTAL	\$197,500,000.00	\$22,000,000.00	\$42,500,000.00	\$133,000,000.00
TOTAL TRINIDAD	\$986,057,529.91	\$231,924,962.80	\$292,673,385.11	\$461,459,182.00
TOBAGO				
WATER				
MAJOR WATER SOURCES	\$32,859,000.00	\$15,400,000.00	\$6,959,000.00	\$10,500,000.00
DISTRIBUTION EXPANSION	\$1,850,000.00	\$1,500,000.00	\$350,000.00	\$0.00
LEAK DETECTION PROGRAMME	\$33,000,000.00	\$5,500,000.00	\$17,000,000.00	\$10,500,000.00
PIPELINE REPLACEMENT PROGRAMME	\$48,035,700.34	\$14,297,850.17	\$22,397,850.17	\$11,340,000.00
INSTITUTIONAL STRENGTHENING	\$15,000,000.00	\$2,500,000.00	\$4,500,000.00	\$8,000,000.00
SUB-TOTAL	\$130,744,700.34	\$39,197,850.17	\$51,206,850.17	\$40,340,000.00
WASTEWATER				
SEWERAGE SECTOR INITIATIVES	\$56,000,000.00	\$27,500,000.00	\$10,000,000.00	\$18,500,000.00
SUB-TOTAL	\$56,000,000.00	\$27,500,000.00	\$10,000,000.00	\$18,500,000.00
TOTAL TOBAGO	\$186,744,700.34	\$66,697,850.17	\$61,206,850.17	\$58,840,000.00
GRAND TOTAL TRINIDAD AND TOBAGO	\$1,172,802,230.25	\$298,622,812.97	\$353,880,235.28	\$520,299,182.00
PROJECT MANAGEMENT SERVICES	\$58,640,111.51	\$14,931,140.65	\$17,694,011.76	\$26,014,959.10
TOTAL ORIGINAL THREE-YEAR INVESTMENT PLAN	\$1,231,442,341.76	\$313,553,953.62	\$371,574,247.04	\$546,314,141.10

CAPITAL PROGRAMMES 2007-2011

Year 1 Programme

PROJECT NO.	PROJECT ID.	PROJECT COMPONENT	WORK CONTENT	YEAR 1 (2005) PROJECTS	YEAR 1 (2005) PROJECTS REVISED COST
1	2	3		7	
TRINIDAD					
SUB-HEAD 01 - MAJOR WATER SOURCES DEVELOPMENT					
Group A LABIDCO					
1	Project 001	WTP	Construction of Water Treatment Plant Cumuto: 4 imgd (18.0 ML/D)	\$9,800,099.25	\$9,800,099.25
2	Project 002		Upgrading of the San Fernando Booster Pumping Station	\$1,500,000.00	\$1,500,000.00
3	Project 003		Reconfiguration of pipe work to facilitate direct transmission of water from San Fernando BPS to an existing 750mm pipeline that will be dedicated to service the La Brea system. The proposed works at Mon Repos Roundabout will also require an interconnection to the Navet 27" pipeline servicing the San Fernando Reservoirs and a direct connection from the San Fernando Booster to service the 20" Marabella Offtake into Gasparillo	\$1,000,000.00	\$1,000,000.00
4	Project 004		Upgrade of the existing Booster at St. Mary's Oropouche	\$200,000.00	\$200,000.00
5	Project 005		Reconfiguration of Network to service estate through St. Mary's BPS	\$250,000.00	\$250,000.00
6	Project 006	Pipelines	Installation of 5km of 600mm pipeline from Cumuto WTP to North Oropouche Transmission Main	\$15,000,000.00	\$15,000,000.00
7	Project 007		Installation of 1.5km of 300mm transmission pipeline from Cumuto Water Treatment Plant to the Wallerfield Industrial Estate	\$1,800,000.00	\$1,800,000.00
8	Project 008		Laying of 3.5km of 600mm diameter pipelines within Point Lisas	\$7,350,000.00	\$7,350,000.00
9	Project 009		Procurement of Ductile Iron Pipes and Fittings	\$3,150,000.00	\$3,150,000.00
10	Project 010		Installation of 6km of 800mm diameter from South Oropouche to La Brea	\$11,496,891.08	\$11,496,891.08
11	Project 011		Procurement of Ductile Iron Pipes and Fittings	\$3,450,000.00	\$3,450,000.00
12	Project 012		Interconnecting Pipework at Wells Wallerfield	\$3,886,657.20	\$3,886,657.20
Sub Total				\$58,883,647.53	\$58,883,647.53
Group B MATURA/SALYBIA					
13	Project 001		Design of Salybia Water Treatment Plant	\$3,500,000.00	\$3,500,000.00
14	Project 002		Consultancy Services for Network of 2km of 500mm transmission pipeline from Salybia to Matura		
15	Project 003		Procurement of Ductile Iron Pipes and Fittings	\$1,500,000.00	\$1,500,000.00
16	Project 004		Design of Matura Water Treatment Plant	\$2,460,000.00	\$2,460,000.00
Sub Total				\$7,460,000.00	\$7,460,000.00
Group C MAYARO					
17	Project 001		Develop intake at Pilote river and construct WTP: 3.0 imgd (13.5 ML/D)	\$1,350,000.00	\$1,350,000.00
18	Project 002		Design Pilote Water Treatment Plant	\$1,500,000.00	\$1,500,000.00
19	Project 003		Develop intake at Ortoire River and construct WTP: 2.0 imgd (9.0 ML/D)	\$900,000.00	\$900,000.00
20	Project 004		Design Ortoire Water Treatment Plant	\$1,000,000.00	\$1,000,000.00
21	Project 005		Installation of 20 km of 500 mm transmission pipeline Rio Claro to Mayaro	\$19,707,187.28	\$19,707,187.28
22	Project 006		Booster Station St. Joseph: 0.5 imgd (2.25 ML/D)	\$1,500,000.00	\$1,500,000.00
23	Project 007		Installation of 2km of 150 mm pipeline from St. Joseph BPS to Kernaham	\$1,560,000.00	included
			Installation of 22km of 400mm from Pilote Plant to Junction		\$2,495,000.00
			Installation of 1km of 400mm from Ortoire Plant to Rio Claro Main Road		\$1,750,000.00
Sub Total				\$27,517,187.28	\$30,202,187.28
Group D BLANCHISSEUSE					
24	Project 001	Blanchisseuse	Design Yarra Water Treatment Plant	\$500,000.00	\$500,000.00
Sub Total				\$500,000.00	\$500,000.00
Group E POINT FORTIN					
25	Project 001		Rehabilitation of wells at Chatham #5: 0.25 imgd (1.125 ML/D)	\$1,400,000.00	\$1,400,000.00
26	Project 002		Feasibility study of construction of a new plant to utilise existing storage reservoirs owned by Petrotrin which has a potential of 8.6 MLD (-1.9mgd) to	\$1,000,000.00	\$1,000,000.00
27	Project 003		Mains Replacement: 10km of distribution main	\$5,000,000.00	\$5,000,000.00
Sub Total				\$7,400,000.00	\$7,400,000.00
SUB TOTAL SUB-HEAD 01 - MAJOR WATER SOURCES				\$101,760,834.81	\$104,445,834.81

SUB-HEAD 02 - DISTRIBUTION EXPANSION						
	Group A	BOOSTER STATIONS NORTH				
28	Project 001	Brieves Road	Upgrade Booster Station: 1.75 imgd (7.875 ML/D)	\$1,500,000.00	\$1,500,000.00	
29	Project 002		Transmission pipelines: km of mm	\$250,000.00	\$250,000.00	
			Sub Total	\$1,750,000.00	\$1,750,000.00	
30	Project 003	Ariapita	Upgrade Ariapita Road Booster A&B: 0.38 imgd (1.72 ML/D)	-	-	
31	Project 004		Installation of 0.8km of 200mm pipeline from BPS along Ariapita Rd	\$788,000.00	\$788,000.00	
32	Project 005		Installation of 0.8km of 150mm pipeline from the end of the pipe along Ariapita Rd to Ariapita Tank	\$657,000.00	\$657,000.00	
			Sub Total	\$1,445,000.00	\$1,445,000.00	
33	Project 006	Lady Young BPS	Upgrade Booster Station: 4.5 imgd (20.25 ML/D)	\$2,000,000.00	\$2,000,000.00	
34	Project 007		Transmission pipelines: km of mm	\$500,000.00	\$500,000.00	
			Sub Total	\$2,500,000.00	\$2,500,000.00	
35	Project 008		Procurement of Ductile Iron Pipes & Fittings	\$1,260,000.00	incl under pline repl.	
36	Project 009	Sangre Grande	Upgrade Sangre Grande Booster Station: 3.0 mgd (13.5 ML/D)	\$2,200,000.00	\$2,200,000.00	
37	Project 010		Procurement of Ductile Iron Pipes & Fittings	\$2,100,000.00	incl under pline repl.	
			Sub Total	\$5,560,000.00	\$2,200,000.00	
		SUB TOTAL BOOSTER STATIONS NORTH			\$11,255,000.00	\$7,895,000.00
	Group B	BOOSTER STATIONS SOUTH				
38	Project 011	Tortuga Village	Upgrade Booster Station: 1.5 imgd (6.75 ML/D)	\$1,000,000.00	\$1,000,000.00	
39	Project 012		Design of Tortuga Reservoir	\$300,000.00	\$300,000.00	
40	Project 013		Installation of 3.2km of 200mm pipeline from booster to reservoir	\$3,200,000.00	\$3,200,000.00	
			Sub Total	\$4,500,000.00	\$4,500,000.00	
41	Project 014	Union Village, Agostini, Mafeking, Bristol	Design of Dades Trace Service Reservoir	\$450,000.00	\$450,000.00	
			Sub Total	\$450,000.00	\$450,000.00	
42	Project 015		Design of Caparo (Fletcher Road) Service Reservoir	\$500,000.00	\$500,000.00	
			Sub Total	\$500,000.00	\$500,000.00	
		SUB TOTAL BOOSTER STATIONS SOUTH			\$5,450,000.00	\$5,450,000.00
	Group C	SERVICE RESERVOIRS NORTH				
43	Project 016	Richplain	Installation of 5km of 200mm pipeline from Richplain Booster to Richplain Reservoir	\$2,500,000.00	\$2,500,000.00	
44	Project 017		Installation of 2km of 300mm ductile Iron Pipe from Orchard Avenue to Cameron	\$2,400,000.00	\$2,400,000.00	
			Sub Total	\$4,900,000.00	\$4,900,000.00	
45	Project 018	Hololo	Design Hololo Service Reservoir: 0.253 imgd (1.137 ML)	\$120,000.00	\$120,000.00	
			Sub Total	\$120,000.00	\$120,000.00	
46	Project 019	McShine	Design McShine Service Reservoir: 0.12 imgd (0.546 ML)	\$68,098.00	\$68,098.00	
			Sub Total	\$68,098.00	\$68,098.00	
47	Project 020	Calvary	Design Calvary Service Reservoir: 0.455 imgd (0.101 ML)	\$145,000.00	\$145,000.00	
			Sub Total	\$145,000.00	\$145,000.00	
		SUB TOTAL SERVICE RESERVOIRS NORTH			\$5,233,098.00	\$5,233,098.00
	Group D	SERVICE RESERVOIRS SOUTH				
48	Project 021	Flanagin Town, Mammoral	Well development within Caparo: 0.25 imgd (1.125 ML/D)	\$350,000.00	\$350,000.00	
49	Project 022	Chickland, Siewdass Rd	Design of new Arena Reservoir	\$450,000.00	\$450,000.00	
			Sub Total	\$800,000.00	\$800,000.00	
50	Project 023	Herreira Hill	Design of Reservoir	\$180,000.00	\$180,000.00	
			Sub Total	\$180,000.00	\$180,000.00	
51	Project 024	Morichal, Whiteland	Storage Reservoir at Centre Mountain: 0.601 imgd (2.705 ML/D)	\$5,834,359.88	\$5,834,359.88	
			Sub Total	\$5,834,359.88	\$5,834,359.88	
		SUB TOTAL SERVICE RESERVOIRS SOUTH			\$6,814,359.88	\$6,814,359.88
		SUB TOTAL SUB-HEAD 02 - DISTRIBUTION EXPANSION			\$28,752,457.88	\$25,392,457.88

SUB-HEAD 03 - LEAK DETECTION PROGRAMME								
	Group A	PROCUREMENT OF LEAK DETECTION EQUIPMENT	Leak Detection Equipment Trinidad			\$5,000,000.00	\$5,000,000.00	
52	Project 001	DETECTION EQUIPMENT				\$5,000,000.00	\$5,000,000.00	
			Sub Total					
53	Group B	BULK METERING	Procurement and Installation of Bulk Meters on the main transmission systems as follows:					
54	Project 003		Caroni South - 18					
55	Project 004		Caroni North - 15					
56	Project 005		North Oropouche - 12					
57	Project 006		Hollis - 18					
58	Project 007		Navet - 17					
59	Project 008		Procurement of Bulk Meters			\$5,000,000.00	\$5,000,000.00	
60	Project 009		Update Study on Bulk Metering			\$500,000.00	\$500,000.00	
			Sub Total			\$5,500,000.00	\$5,500,000.00	
61	Group C	PIPELINE REPLACEMENT	Pipeline Replacement Trinidad			\$5,161,670.11	\$5,161,670.11	
	Project 010							
			Sub Total			\$5,161,670.11	\$5,161,670.11	
		SUB TOTAL SUB-HEAD 03 - LEAK DETECTION PROGRAMME					\$15,661,670.11	\$15,661,670.11
SUB-HEAD 04 - PIPELINE REPLACEMENT PROGRAMME								
	Group A	NORTH PIPELINES						
62	Project 001	CARENAGE	Leakage Management within Tucker Valley for water recovery			\$500,000.00	\$500,000.00	
63	Project 002		Complete pipelaying off Scorpion Booster: 1km of 100mm			\$700,000.00	\$700,000.00	
64	Project 003		Installation of 0.45km of 200mm pipeline along Haig St. to replace existing AC main			\$450,000.00	\$450,000.00	
			Sub Total			\$1,650,000.00	\$1,650,000.00	
	Group B	NORTH	El Socorro/ Picton/ Lady Young					
65	Project 004		Installation of 1.3km of 400mm main from Lady Young Booster to Morvant Reservoir				\$2,275,000.00	
			Installation of 200m of 300mm main from Picton #1 Reservoir to provide suction to Pump Trace Booster				\$300,000.00	
			Installation of 800m of 300mm main from Picton #2 Reservoir to Laventille Reservoir				\$1,200,000.00	
			Installation of 800m of 200mm main from Laventille Reservoir to McShine Reservoir				\$800,000.00	
			Sangre Grande					
			Installation of 2.1km of 400mm main from Sangre Grande Fire Station to Sangre Grande BPS				\$3,675,000.00	
			Diego Martin Valley					
			Installation of 1700m of 200mm PVC distribution main to replace 200 AC main from Four Roads Pumping station to Majuba Cross Road.				\$1,700,000.00	
			Installation of 1200m of 300mm DI transmission main from River Estate P/Station to Cicada Drive				\$900,000.00	
			Installation of 800m of 150mm PVC distribution main along the North Post Road.				\$624,000.00	
			Installation of 720m of 150mm PVC distribution main along Blue Basin Ext. Road from North Post Road Junction.				\$561,000.00	
			Installation of 1000m of 300 DI transmission main to replace 250mm AC main from Cor. Western Main Rd. and Morne Coco Rd Jn to Four Roads P/Station.				\$1,500,000.00	
			Installation of 400m of 150mm PVC transmission main to newly proposed Quarry Road Booster.				\$312,000.00	
			Tucker Valley					
			Installation of 1600m of 300mm DI transmission main from Hartscut Booster to Tetron Barracks.				\$2,100,000.00	
			Installation of 6000m of 200mm PVC distribution main from Tucker Valley Pumping Station to Tetron Barracks.				\$3,000,000.00	
			Sub Total North Pipelines			\$10,000,000.00	\$18,947,000.00	
66	Project 005	PORT OF SPAIN NETWORK					\$5,000,000.00	\$5,000,000.00
			TOTAL PORT OF SPAIN			\$5,000,000.00	\$5,000,000.00	

	Group C	SOUTH PIPELINES						
67	Project 006		Installation of 1.2km of 400mm DI	from South Trunk Road	to Palmiste		\$2,100,000.00	
			Install 0.9km of 300mm DI main	from the corner of Culbin Road & St Joseph Road	to London Street along St Joseph Road		\$1,350,000.00	
			Install 4km of 300mm DI main	from Boodoosingh Road to Sobo	along the Southern Main Road		\$6,000,000.00	
			Install 1.5km of 300mm DI main	from Reform Village to Union Road	along the Tabaquite Guaracara Road		\$2,250,000.00	
			Sub Total South Pipelines				\$10,000,000.00	\$11,700,000.00
68	Project 007	SAN FERNANDO NETWORK					\$5,000,000.00	-
			GRAND TOTAL SAN FERNANDO				\$5,000,000.00	\$0.00
69	Project 008	EXTREMITIES OF THE NETWORK						
			Installation of 5200m of 200mm PVC distribution main	along Carapo Road and linking	to the Caroni North Bank Road.	\$5,000,000.00	\$1,625,600.00	
			Sub Total			\$5,000,000.00	\$1,625,600.00	
70	Project 009	RURAL AREAS						
			Installation of 4km of 200mm PVC pipeline	from Cottage Road to Papourie Road along Ciperio Road and from	Ciperio Road to New Colonial Road along Papourie Road	\$2,500,000.00	\$902,400.00	
			Sub Total			\$2,500,000.00	\$902,400.00	
			SUB TOTAL SUB-HEAD 04 - PIPELINE REPLACEMENT PROGRAMME			\$39,150,000.00	\$39,825,000.00	
		SUB-HEAD 05 - SANITARY SERVICES						
71	Group A Project 001	WASA Plants	Refurbish existing plants			\$7,000,000.00	\$7,000,000.00	
72	Group B Project 002	Private Plants	Private Packaged Plants			\$15,000,000.00	\$15,000,000.00	
			SUB TOTAL SUB-HEAD 05 - SANITARY SERVICES			\$22,000,000.00	\$22,000,000.00	
		SUB-HEAD 06 - ADMINISTRATION						
		TRINIDAD	Trinidad (Masterplan)					
73	Group A Project 001		MIS			\$2,500,000.00	\$2,500,000.00	
74	Group B Project 002		SCADA			\$2,500,000.00	\$2,500,000.00	
75	Group C Project 003		Masterplan			\$8,000,000.00	\$8,000,000.00	
76	Group D Project 004		Institutional Programs			\$1,500,000.00	\$1,500,000.00	
77	Group E Project 005		Accommodation			\$8,500,000.00	\$8,500,000.00	
78	Group F Project 006		Environmental			\$1,600,000.00	\$1,600,000.00	
			SUB TOTAL SUB-HEAD 06 - ADMINISTRATION			\$24,600,000.00	\$24,600,000.00	
			GRAND TOTAL TRINIDAD			\$231,924,962.80	\$231,924,962.80	

TOBAGO							
SUB-HEAD 01 - MAJOR WATER SOURCES DEVELOPMENT							
79	Group A Project 001	Wells	Further Well Development Bacolet: 1.0 imgd (4.5 ML/D)			\$8,000,000.00	\$8,000,000.00
			Sub Total			\$8,000,000.00	\$8,000,000.00
80	Project 002	Intakes and Water Treatment Plant	Development of intake at Louis D'Or River and Construction of a Water Treatment Plant: 0.75 imgd (3.375 ML/D)			\$3,375,000.00	\$3,375,000.00
81	Project 003		Design of Louis D'Or Water Treatment Plant			\$375,000.00	\$375,000.00
82	Project 004		Installation of 5km of 200mm pipeline from Richmond to Goodwood			\$2,500,000.00	\$2,500,000.00
83	Project 005		New Booster Station in Bel Aire and Storage Tank			\$400,000.00	\$400,000.00
84	Project 006		Upgrade equipment at Water Treatment Plant Bloody Bay			\$750,000.00	\$750,000.00
			Sub Total			\$7,400,000.00	\$7,400,000.00
SUB TOTAL SUB-HEAD 01 - MAJOR WATER SOURCES						\$15,400,000.00	\$15,400,000.00
SUB-HEAD 02 - DISTRIBUTION EXPANSION							
	Group A	BOOSTER STATIONS					
85	Project 001	Cove Industrial Park	New Booster Station at Government Farm: 2 imgd (9.0 ML/D)			\$1,500,000.00	\$1,500,000.00
			Sub Total			\$1,500,000.00	\$1,500,000.00
SUB TOTAL BOOSTER STATIONS						\$1,500,000.00	\$1,500,000.00
SUB TOTAL SUB-HEAD 02 - DISTRIBUTION EXPANSION						\$1,500,000.00	\$1,500,000.00
SUB-HEAD 03 - LEAK DETECTION PROGRAMME							
86	Group A Project 001	PROCUREMENT OF LEAK DETECTION EQUIPMENT	Leak Detection Equipment Tobago			\$2,000,000.00	\$2,000,000.00
			Sub Total			\$2,000,000.00	\$2,000,000.00
87	Group B Project 002	BULK METERING	Procurement and Installation of Bulk Meters on the main transmission systems as follows:				
88	Project 003		Tobago Hillsborough - 11				
89	Project 004		Tobago Courland - 8				
90	Project 005		Tobago Richmond - 2				
91	Project 006		Procurement of Bulk Meters			\$1,000,000.00	\$1,000,000.00
			Sub Total			\$1,000,000.00	\$1,000,000.00
92	Group C Project 007	PIPELINE REPLACEMENT	Pipeline Replacement Tobago			\$2,500,000.00	\$2,500,000.00
			Sub Total			\$2,500,000.00	\$2,500,000.00
SUB TOTAL SUB-HEAD 03 - LEAK DETECTION PROGRAMME						\$5,500,000.00	\$5,500,000.00
SUB-HEAD 04 - PIPELINE REPLACEMENT PROGRAMME							
93	Group A Project 001	L'Anse Fourmi to Charlotteville	Installation of 17km of 300mm pipeline	from L'Anse Fourmi	to Charlotteville	\$9,000,000.00	\$9,000,000.00
94	Project 002	Cove Industrial Park	Installation of 16km of 500mm pipeline	Bacolet		\$4,297,850.17	\$4,297,850.17
			Sub Total			\$13,297,850.17	\$13,297,850.17
95			PHASE 2				
			Drill and Equip one well			\$1,000,000.00	\$1,000,000.00
			Sub Total			\$1,000,000.00	\$1,000,000.00
SUB TOTAL SUB-HEAD 04 - PIPELINE REPLACEMENT						\$14,297,850.17	\$14,297,850.17

SUB-HEAD 05 - SANITARY SERVICES						
96	Group A Project 001	NHA PLANTS	Adoption of NHA Wastewater Treatment Plants		\$5,000,000.00	\$5,000,000.00
97	Group B Project 002	SOUTH WEST	Implementation of South West Tobago		\$20,000,000.00	\$20,000,000.00
98	Group C Project 003	WASA PLANTS	Refurbish existing plants		\$2,500,000.00	\$2,500,000.00
SUB TOTAL SUB-HEAD 05 - SANITARY SERVICES					\$27,500,000.00	\$27,500,000.00
SUB-HEAD 06 - ADMINISTRATION						
TOBAGO						
99	Group A Project 001		Tobago Network Modelling		\$1,000,000.00	\$1,000,000.00
100	Group B Project 002		Asset Management		\$1,000,000.00	\$1,000,000.00
101	Group C Project 003		SCADA		\$500,000.00	\$500,000.00
SUB TOTAL SUB-HEAD 06 - ADMINISTRATION					\$2,500,000.00	\$2,500,000.00
GRAND TOTAL TOBAGO					\$66,697,850.17	\$66,697,850.17
GRAND TOTAL TRINIDAD AND TOBAGO					\$298,622,812.97	\$298,622,812.97
SUB-HEAD 07 - PROJECT MANAGEMENT SERVICES - 5% OF TOTAL COST OF WORKS					\$14,931,140.65	\$14,931,140.65
TOTAL THREE YEAR INVESTMENT PLAN					\$313,553,953.62	\$313,553,953.62
SUB-HEAD 08 - DRY SEASON AND WELL DEVELOPMENT (SUPPLEMENTAL UNDER PSIP 2003/2004)						
WELLS						
102	Group A Project 001	Waterfield/ Cumuto Wells	Well development within Waterfield: <i>5.35 imgd (24.075 ML/D)</i>		\$15,265,466.30	\$15,265,466.30
103	Project 002	Rehabilitate	Arima #0		\$984,680.00	\$984,680.00
104	Project 003	wells in North	Waterfield #9		\$1,023,824.90	\$1,023,824.90
105	Project 004	& South	St. Clair #1		\$1,019,330.00	\$1,019,330.00
106	Project 005	Trinidad	Diego Martin #9		\$1,703,254.50	\$1,703,254.50
107	Project 006		Palo Seco #8		\$2,260,496.00	\$2,260,496.00
108	Project 007		Freeport #9		\$1,077,215.50	\$1,077,215.50
109	Project 008		Freeport #15		\$1,395,268.00	\$1,395,268.00
110	Project 009		Clarke Rd #5		\$1,498,177.00	\$1,498,177.00
111	Project 010		Carlsen Field #2		\$1,239,141.70	\$1,239,141.70
112	Project 011		Carlsen Field #3		\$1,290,411.00	\$1,290,411.00
113	Project 012		El Socorro #4		\$1,079,216.00	\$1,079,216.00
114	Project 013		El Socorro #7		\$1,056,160.00	\$1,056,160.00
115	Project 014		Freeport #1		\$1,480,039.00	\$1,480,039.00
116	Project 015		Freeport Todds Rd #9		\$1,201,317.00	\$1,201,317.00
117	Project 016		Freeport Todds Rd #13		\$1,160,471.00	\$1,160,471.00
118	Project 017		Development of Matura Well #3: <i>0.14 imgd (0.63 ML/D)</i>		\$1,179,212.00	\$1,179,212.00
119	Project 018		Rehabilitation of wells at Chatham #3: <i>0.331 imgd (1.49 ML/D)</i>		\$2,721,207.00	\$2,721,207.00
120	Project 019		Rehabilitation of wells at Point Fortin #9: <i>0.143 imgd (0.644 ML/D)</i>		\$1,054,548.00	\$1,054,548.00
121	Project 020		Rehabilitation of wells at Point Fortin #3: <i>0.143 imgd (0.644 ML/D)</i>		\$1,176,956.00	\$1,176,956.00
					\$40,866,390.90	\$40,866,390.90
122	Project 021		Courtland Well Development: <i>2 imgd (9.0 ML/D)</i>		\$16,359,000.00	\$16,359,000.00
123	Group B Project 022	WTP	Construction of Water Treatment Plant Cumuto: <i>4 imgd (18.0 ML/D)</i>		\$9,870,286.25	\$9,870,286.25
124	Group C Project 023	Boosters	Construction of a new booster station at South Oropouche: <i>12 imgd (54ML/D)</i>		\$923,652.00	\$923,652.00
					\$10,793,938.25	\$10,793,938.25
SUB TOTAL SUB-HEAD 08 - DRY SEASON AND WELL DEVELOPMENT (SUPPLEMENTAL UNDER PSIP 2003/2004)					\$68,019,329.15	\$68,019,329.15

SUB-HEAD 09 - WATER QUALITY								
125	Project 001		Caroni			\$6,000,000.00	\$6,000,000.00	
126	Project 002		Las Lomas			\$2,000,000.00	\$2,000,000.00	
127	Project 003		Penal			\$2,000,000.00	\$2,000,000.00	
128	Project 004		Courland			\$5,500,000.00	\$5,500,000.00	
			Project Management Services: Consultants, quantity surveying					
SUB TOTAL SUB-HEAD 09 - WATER QUALITY						\$15,500,000.00	\$15,500,000.00	
SUB-HEAD 10 - NHA WASTEWATER PLANTS								
129	Project 001		Consultancy Services			\$8,000,000.00	\$8,000,000.00	
130	Project 002		Operation and Maintenance of the Additional Treatment Plants & Lift Stations			\$15,000,000.00	\$15,000,000.00	
SUB TOTAL SUB-HEAD 10 - NHA WASTEWATER PLANTS						\$23,000,000.00	\$23,000,000.00	
SUB-HEAD 11 - BUILDING PROGRAMME								
131			Construction of a new Laboratory			\$7,000,000.00	\$7,000,000.00	
SUB TOTAL SUB-HEAD 11 - BUILDING PROGRAMME						\$7,000,000.00	\$7,000,000.00	
TOTAL BROUGHT FORWARD FROM 3 YEAR PLAN						\$313,553,953.62	\$313,553,953.62	
GRAND TOTAL						\$313,553,953.62	\$313,553,953.62	

CAPITAL PROGRAMMES 2007-2011

Year 2 Programme

NO	PROJECT COMPONENT	WORK CONTENT	YEAR 2 (2006)
1	2	3	13
TRINIDAD			
P100	MAJOR WATER SOURCES DEVELOPMENT		
	LABIDCO		
P101-08	Reservoirs	8 Construction of two (2) Service Reservoirs at KTO and Vessigny: 0.5 img (2.25 ML) per reservoir	\$5,000,000.00
P101-11	Pipelines	11a Completion of 2.5km of 400mm diameter pipeline from Point D'Or to Vance River along the old SMR	\$3,500,000.00
		11b Procurement of Ductile Iron Pipes and Fittings	\$1,500,000.00
P101-13		13a Laying of 12km of 1066mm diameter pipelines from Pt Lisas to San F'do	
		13b Procurement of Ductile Iron Pipes and Fittings	\$18,000,000.00
P101-15		15a Installation of 6km of 400mm diameter from South Oropouche to La Brea	\$8,332,297.23
		15b Procurement of Ductile Iron Pipes and Fittings	
P101-16		16 Install 2.8km of 200mm diameter pipe along Sobo Road from the junction of Boodoosingh Trace and the Southern Main Road, to the junction of Sobo Road and Southern Main Road	\$2,800,000.00
		Sub Total	\$39,132,297.23
P102-03	MATURA/	2b Construction of a Water Treatment Plant Salybia: 7 imgd (31.5 ML/D)	\$8,000,000.00
P102-06	SALYBIA	4b Construction of a Water Treatment Plant Matura: 5 imgd (22.5ML/D)	\$6,070,000.00
P102-07		5a Installation of 10km of 800mm transmission pipeline from Matura WTP to North Oropouche Trunk Main	
		5b Procurement of Ductile Iron Pipes and Fittings	\$12,000,000.00
		Sub Total	\$26,070,000.00
P103-02	MAYARO	1b Develop intake at Pilote river and construct WTP: 3.0 imgd (13.5 ML/D)	\$6,075,000.00
P103-04		2b Develop intake at Ortoire River and construct WTP: 2.0 imgd (9.0 ML/D)	\$4,050,000.00
P103-05		3a Installation of 20 km of 500 mm transmission pipeline Rio Claro to Mayaro	\$4,150,917.88
		Sub Total	\$14,275,917.88
P105-01	Brazil, Talparo Main Road	2 Installation of 3km of 200mm transmission pipeline along Tumpuna Road from Cumuto Junction to San Rafael Junction	\$1,500,000.00
P105-04	Mundo Nuevo	5 Commission existing 6km of 200mm in Mundo Nuevo	\$500,000.00
P105-05		6 Rehabilitate existing booster pump station at Talparo	\$500,000.00
		Sub Total	\$2,500,000.00
P106-02	Blanchisseuse	1b Develop intake and water treatment plant at Yarra River: 1 imgd (4.5 ML/D)	\$4,500,000.00
P106-03		2 Storage Tank: 0.25img (1.125 ML/D)	\$1,125,000.00
P106-04		3 Installation of 3.2km of 200mm transmission pipeline from Yarra WTP to Blanchisseuse	\$3,200,000.00
		Sub Total	\$8,825,000.00
SUB TOTAL MAJOR WATER SOURCES			\$90,803,215.11
DISTRIBUTION EXPANSION			
BOOSTER STATIONS NORTH			
Sangre Grande	7a	Installation of 5km of 400mm pipeline from Sangre Grande Booster Station to North Manzanilla	\$4,900,000.00
	7b	Procurement of Ductile Iron Pipes & Fittings	
	8a	Installation of 16km of 400mm transmission pipeline from Sangre Grande Booster Station to Biche along Plum Mitan Road	\$8,680,000.00
	8b	Procurement of Ductile Iron Pipes & Fittings	\$6,720,000.00
		Sub Total	\$20,300,000.00
SUB TOTAL BOOSTER STATIONS NORTH			\$20,300,000.00
BOOSTER STATIONS SOUTH			
Tortuga Village	2a	Construction of a new Tortuga Reservoir: 0.67 img (3.0 ML)	\$2,700,000.00
	4	Installation of 0.7km of 250mm pipeline from Reservoir to distribution system	\$770,000.00
		Sub Total	\$3,470,000.00
SUB TOTAL BOOSTER STATIONS SOUTH			\$3,470,000.00
SERVICE RESERVOIRS NORTH			
Richplain	4	Installation of 5km of 200mm pipeline from Richplain Booster to Richplain Reservoir	\$2,500,000.00
		Sub Total	\$2,500,000.00
Cleaver Road	1	Rehabilitate Service Reservoir: 0.227 img (1.023 ML)	\$1,800,541.00
		Sub Total	\$1,800,541.00
Calvary	1a	Rehabilitate Service Reservoir: 0.455 img (0.101 ML)	\$1,305,000.00
	1b	Design Calvary Service Reservoir	
		Sub Total	\$1,305,000.00
SUB TOTAL SERVICE RESERVOIRS NORTH			\$5,605,541.00
SUB TOTAL DISTRIBUTION EXPANSION			\$29,375,541.00
LEAK DETECTION PROGRAMME			
PROCUREMENT OF		Leak Detection Equipment Trinidad	\$5,000,000.00
DETECTION EQUIPM		Sub Total	\$5,000,000.00
BULK		Procurement and Installation of Bulk Meters on the main transmission systems as follows:	
METERING	1	Caroni South - 18	\$3,650,000.00
	2	Caroni North - 15	\$2,900,000.00
	3	North Oropouche - 12	\$2,150,000.00
	4	Hollis - 18	-
	5	Navet - 17	\$1,500,000.00
	6	Procurement of Bulk Meters	
	7	Update Study on Bulk Metering	
		Sub Total	\$10,200,000.00
PIPELINE		Pipeline Replacement Trinidad	\$19,838,329.00
REPLACEMENT		Sub Total	\$19,838,329.00
DOMESTIC	1	North Trinidad	
METERING	2	South Trinidad	
	3	Procurement of Domestic Meters	\$6,000,000.00
	4	Update Study on Domestic Metering	
		Sub Total	\$6,000,000.00
SUB TOTAL LEAK DETECTION PROGRAMME			\$41,038,329.00

PIPELINE REPLACEMENT PROGRAMME					
NORTH PIPELINES					
		West Main Rd.	Airways Rd. to	the Cove Chaguaramas	\$3,603,300.00
		Diego Martin	Union Road to	Fields Scrape	\$500,000.00
		Morne Coco Road	Cameron Road	Ravine Trace	\$4,000,000.00
		St. Lucien Rd.	Majuba Cross Road	Superville Quarry Road	\$350,000.00
		Cameron Road			\$560,000.00
		Morne Coco Rd	Simeon Road	Phillip Charles Road	\$400,000.00
		Along Old Cameron Road	Cameron Rank	Pioneer Drive	\$800,000.00
		Quarry Road	Diego Martin Main Road	New Quarry Booster	\$30,000.00
		Replace 4,000m of AC Main with 12" PVC from	Brierly Street	Sangre Grande Booster	\$6,000,000.00
		Flemming Local Road, Fishing Pond			\$2,028,000.00
		Sub Total North Pipelines			\$18,271,300.00
PORT OF SPAIN					
		TOTAL PORT OF SPAIN			\$5,000,000.00
SOUTH PIPELINES					
Central		Point Lisas	BO Offtake Caribbean Drive	Pacific Avenue Caspian Drive	\$1,312,400.00
		Grand Couva Road	Gran Couva Road	Flanagin Town	\$3,335,000.00
South East		Naparima Mayaro Road	Lothians Road	St. Croix Road	\$2,307,000.00
South West		Southern Main Road	Vessigny Junction	Vance River	\$2,690,000.00
		St. Clements	St. Clements	Guaracara Tabaquite Road along cross country	\$5,280,000.00
		5 Installation of 4km of 300mm ductile Iron Pipe from	St. Mary's	Sobo	\$4,800,000.00
Brasso Caparo		Along Esmeralda Road / Caparo Valley Road	Carlsen Field Wells #5	Todd's Road Booster	\$2,275,600.00
		Sub Total South Pipelines			\$22,000,000.00
SAN FERNANDO NETWORK					
		GRAND TOTAL SAN FERNANDO			\$5,000,000.00
EXTREMITIES OF THE NETWORK					
		6 Extremities of the Pipeline Network			\$5,000,000.00
		Sub Total			\$5,000,000.00
RURAL AREAS					
		7 Rural Areas			\$2,500,000.00
		Sub Total			\$2,500,000.00
SUB TOTAL PIPELINE REPLACEMENT PROGRAMME					\$57,771,300.00
SEWERAGE SECTOR INITIATIVES					
NHA Plants	1	Adoption of NHA Wastewater Treatment Plants			\$15,000,000.00
GPOSS	2	Greater Port of Spain (lateral Replacement)			\$4,500,000.00
SAFEGE		Integration of the East/West Corridor Sewerage Study			\$12,000,000.00
WASA Plants	3	Refurbish existing plants			\$6,500,000.00
Private Plants	4	Private Packaged Plants			\$4,500,000.00
SUB TOTAL SEWERAGE SECTOR INITIATIVES					\$42,500,000.00
INSTITUTIONAL STRENGTHENING					
TRINIDAD	1	Trinidad (Masterplan)			\$22,715,000.00
	2	MIS			\$3,000,000.00
	4	Institutional Programs			\$2,870,000.00
	5	Accommodation			\$2,600,000.00
		Sub Total			\$31,185,000.00
GRAND TOTAL TRINIDAD					\$292,673,385.11
TOBAGO					
MAJOR WATER SOURCES DEVELOPMENT					
Intakes and Water Treatment	3a	Development of intake at Sandy River and Construction of a Water Treatment Plant: 0.40 imgd (1.80 ML/D)			\$3,600,000.00
	4	Installation of 0.5km of 200mm pipeline to integrate into the network			\$500,000.00
	6a	Upgrade clarifiers and filters at Courland Water Treatment Plant to address rainy season problems			\$2,859,000.00
		Sub Total			\$6,959,000.00
SUB TOTAL MAJOR WATER SOURCES					\$6,959,000.00
DISTRIBUTION EXPANSION					
BOOSTER STATIONS					
L'Anse Fourmi to Charlotteville		PHASE 1			
Parlatuvier, Castara	3	Refurbish Booster Station between Bloody Bay to Parlatuvier			\$350,000.00
		Sub Total			\$350,000.00
SUB TOTAL BOOSTER STATIONS					\$350,000.00
SUB TOTAL DISTRIBUTION EXPANSION					\$350,000.00

SUB-HEAD 09 - WATER QUALITY							
125	Project 001		Caroni			\$6,000,000.00	\$6,000,000.00
126	Project 002		Las Lomas			\$2,000,000.00	\$2,000,000.00
127	Project 003		Penal			\$2,000,000.00	\$2,000,000.00
128	Project 004		Courland			\$5,500,000.00	\$5,500,000.00
			Project Management Services: Consultants, quantity surveying				
SUB TOTAL SUB-HEAD 09 - WATER QUALITY						\$15,500,000.00	\$15,500,000.00
SUB-HEAD 10 - NHA WASTEWATER PLANTS							
129	Project 001		Consultancy Services			\$8,000,000.00	\$8,000,000.00
130	Project 002		Operation and Maintenance of the Additional Treatment Plants & Lift Stations			\$15,000,000.00	\$15,000,000.00
SUB TOTAL SUB-HEAD 10 - NHA WASTEWATER PLANTS						\$23,000,000.00	\$23,000,000.00
SUB-HEAD 11 - BUILDING PROGRAMME							
131			Construction of a new Laboratory			\$7,000,000.00	\$7,000,000.00
SUB TOTAL SUB-HEAD 11 - BUILDING PROGRAMME						\$7,000,000.00	\$7,000,000.00
TOTAL BROUGHT FORWARD FROM 3 YEAR PLAN						\$313,553,953.62	\$313,553,953.62
GRAND TOTAL						\$313,553,953.62	\$313,553,953.62

CAPITAL PROGRAMMES 2007-2011

YEAR 3 PROGRAMME

NO	PROJECT COMPONENT	WORK CONTENT	YEAR 3 (2007)
1	2	3	14
TRINIDAD			
P100	MAJOR WATER SOURCES DEVELOPMENT		
	LABIDCO		
P101-05		5 Reconfiguration of pipe work to facilitate direct transmission of water from San Fernando BPS to an existing 750mm pipeline that will be dedicated to service the La Brea system. The proposed works at Mon Repos Roundabout will also require an interconnection to the Navet 27" pipeline servicing the San Fernando Reservoirs and a direct connection from the San Fernando Booster to service the 20" Marabella Offtake into Gasparillo	\$500,000.00
P101-08	Reservoirs	8 Construction of two (2) Service Reservoirs at KTO and Vessigny: 0.5 img (2.25 ML) per reservoir	\$5,000,000.00
P101-13	Pipelines	13a Laying of 12km of 1066mm diameter pipelines from Pt Lisas to San F'do 13b Procurement of Ductile Iron Pipes and Fittings	\$42,000,000.00
		Sub Total	\$47,500,000.00
P102-03	MATURA/	2b Construction of a Water Treatment Plant Salybia: 7 imgd (31.5 ML/D)	\$23,500,000.00
P102-04	SALYBIA	3a Laying of 3km of 500mm transmission pipeline from Salybia to Matura 3b Procurement of Ductile Iron Pipes and Fittings	\$3,500,000.00
P102-06		4b Construction of a Water Treatment Plant Matura: 5 imgd (22.5ML/D)	\$16,070,000.00
P102-07		5a Installation of 10km of 800mm transmission pipeline from Matura WTP to North Oropouche Trunk Main 5b Procurement of Ductile Iron Pipes and Fittings	\$28,000,000.00
		Sub Total	\$71,070,000.00
P103-02	MAYARO	1b Develop intake at Pilote river and construct WTP: 3.0 imgd (13.5 ML/D)	\$6,075,000.00
P103-04		2b Develop intake at Ortoire River and construct WTP: 2.0 imgd (9.0 ML/D)	\$4,050,000.00
P103-07		5 Laying of 5.0 km of 150mm distribution pipeline to supply villages between Rio Claro and Mayaro	\$3,900,000.00
P103-08		6 Laying of 3.5 km of 150 mm transmission main along the Naparima Mayaro Road in the Rio Claro area	\$2,730,000.00
P103-11		9 Petrotrin Facilities upgrade	\$5,000,000.00
		Sub Total	\$21,755,000.00
P105-01	Brazil	2 Installation of 3km of 200mm transmission pipeline along Tumpuna Road from Cumuto Junction to San Rafael Junction	\$1,500,000.00
P105-04	Talparo Main Road	5 Commission existing 6km of 200mm in Mundo Nuevo	\$500,000.00
P105-05	Mundo Nuevo	6 Rehabilitate existing booster pump station at Talparo	\$500,000.00
		Sub Total	\$2,500,000.00
P107-01	Santa Cruz	1 Well development within Santa Cruz: 1.0 imgd (4.5 ML/D)	\$1,500,000.00
		Sub Total	\$1,500,000.00
	Point Fortin	4a Construction of a new plant to utilise existing storage reservoirs owned by Petrotrin which has a potential of 8.6 MLD -(1.9imgd) to be completed by September 2005.	\$9,000,000.00
		Sub Total	\$9,000,000.00
SUB TOTAL MAJOR WATER SOURCES			\$153,325,000.00
DISTRIBUTION EXPANSION			
BOOSTER STATIONS NORTH			
	St. Anns Booster	1 Upgrade Booster Station: imgd	\$1,000,000.00
		2 Transmission pipelines: km of mm	\$500,000.00
		Sub Total	\$1,500,000.00
	Terracita Booster	1 Upgrade Booster Station: imgd	\$1,000,000.00
		2 Transmission pipelines: km of mm	\$500,000.00
		Sub Total	\$1,500,000.00
	Sangre Grande	5a Installation of 3km of 400mm transmission pipeline from Sangre Grande Fire Station to Sangre Grande Booster Pumping Station	\$2,940,000.00
		5b Procurement of Ductile Iron Pipes & Fittings	
		8a Installation of 16km of 400mm transmission pipeline from Sangre Grande Booster Station to Biche along Plum Mitan Road	\$7,000,000.00
		8b Procurement of Ductile Iron Pipes & Fittings	
		Sub Total	\$9,940,000.00
	Hutton Road	1 Upgrade Booster Station: 2.0 imgd (9.0 ML/D)	\$1,500,000.00
		2 Transmission pipelines: km of mm	\$500,000.00
		Sub Total	\$2,000,000.00
	Paramin	1 Construction of Storage Reservoir at	\$3,500,000.00
		2 Upgrade pumps at Levell #1 with the following duty: Flow - 40lps, Head - 120m	\$200,000.00
		3 Construction of Storage Reservoir at Level #2: 0.389 img (1.75 ML)	\$3,500,000.00
		4 Upgrade pumps at Levell #2 with the following duty: Flow - 34lps, Head - 115m	\$200,000.00
		5 Construction of Storage Reservoir at	\$3,300,000.00
		6 Upgrade pumps at Levell #3 with the following duty: Flow - 8lps, Head - 95m	\$150,000.00
		7 Refurbish Tank at Level #4	\$20,000.00
		8 Installation of pumps at Level #4 with the following duty: Flow - 3.78lps, Head - 127m	\$200,000.00
		9 Installation of 100m of 100mm pipeline from Level #4	\$800,000.00
		10 Installation of pumps on La Finette Road with the following duty: Flow - 1.8lps, Head - 50m	\$400,000.00
		11 Installation of two (2) 100mm pressure sustaining valves	\$25,000.00
		Sub Total	\$12,295,000.00
SUB TOTAL BOOSTER STATIONS NORTH			\$27,235,000.00

BOOSTER STATIONS SOUTH					
Union Village, Agostini	1	Booster Station Agostini: 3.0 imgd (13.5 ML/D) To determine source of supply			\$2,200,000.00
Mafeking, Bristol	2a	Construction of Service Reservoir at Agostini: 1.0 imgd (4.5 ML)			\$4,050,000.00
	2b	Design of Agostini Reservoir			
		Sub Total			\$6,250,000.00
SUB TOTAL BOOSTER STATIONS SOUTH					\$6,250,000.00
SERVICE RESERVOIRS NORTH					
Hololo	1a	Rehabilitate Service Reservoir: 0.253 imgd (1.137 ML)			\$1,080,000.00
	1b	Design Hololo Service Reservoir			
		Sub Total			\$1,080,000.00
McShine	1a	Rehabilitate Service Reservoir: 0.12 imgd (0.546 ML)			\$612,882.00
	1b	Design McShine Service Reservoir			
		Sub Total			\$612,882.00
SUB TOTAL SERVICE RESERVOIRS NORTH					\$1,692,882.00
SERVICE RESERVOIRS SOUTH					
Flanagin Town, Mammoral	3a	Construction of a new Reservoir at Arena: 1 imgd (4.5 ML/D)			\$4,050,000.00
Chickland	4	Installation of 2km of 200mm transmission pipeline from Carlsen Field to Arena Reservoir			\$2,000,000.00
Siewdass Road	5	Installation of 1km of 150mm transmission pipeline from Arena Reservoir to Caparo Valley Road			\$1,000,000.00
		Sub Total			\$7,050,000.00
Herreira Hill	2	Construction of Reservoir at Herreira Hill			\$1,620,000.00
		Sub Total			\$1,620,000.00
Monichal, Whiteland	2	Pipeline replacement from Centre Mountain to Guaracara Tabaqueite Road: 1km of 200mm			\$1,000,000.00
		Sub Total			\$1,000,000.00
SUB TOTAL SERVICE RESERVOIRS SOUTH					\$9,670,000.00
SUB TOTAL DISTRIBUTION EXPANSION					\$44,847,882.00
LEAK DETECTION PROGRAMME					
BULK METERING		Procurement and Installation of Bulk Meters on the main transmission systems as follows:			
	1	Caroni South - 18			
	2	Caroni North - 15			
	3	North Oropouche - 12			
	4	Hollis - 18			\$2,900,000.00
	5	Navet - 17			\$1,400,000.00
	6	Procurement of Bulk Meters			
	7	Update Study on Bulk Metering			
		Sub Total			\$4,300,000.00
PIPELINE REPLACEMENT		Pipeline Replacement Trinidad			\$10,000,000.00
		Sub Total			\$10,000,000.00
DOMESTIC METERING	1	North Trinidad			\$22,250,000.00
	2	South Trinidad			\$19,250,000.00
	3	Procurement of Domestic Meters			\$8,000,000.00
	4	Update Study on Domestic Metering			\$500,000.00
		Sub Total			\$50,000,000.00
SUB TOTAL LEAK DETECTION PROGRAMME					\$64,300,000.00
PIPELINE REPLACEMENT PROGRAMME					
NORTH PIPELINES					
NORTH		West Main Rd.	Airways Rd. to	the Cove Chaguaramas	\$1,196,700.00
		Diego Martin Main Rd	Morne Coco Road	Victoria Avenue	\$490,000.00
		Laventille Road	Picton 1 Highlift	Old & New St. Barbs Reservoir	\$2,251,200.00
		From Moka Maraval to Santa Cruz (through tunnel)	Moka Maraval	Santa Cruz	\$3,255,400.00
		Coalmine Junction Kowlessar Road along Cunapo Southern Road			\$2,418,000.00
			Old Golden Grove Road	Eastern Main Road	\$468,000.00
		Replace 4.5km of 8" P.V.C along Carapo Rd.			\$4,192,000.00
		Sub Total North Pipelines			\$14,271,300.00
SOUTH PIPELINES					
		Gasparillo	Bonne Adventure Road	Mahogany Street	\$4,908,000.00
		Caroni South Bank Road	Kelly Offtake	La Paille	\$7,260,000.00
Brasso Caparo		Along Esmeralda Road / Caparo Valley Road	Carlsen Field Wells #5	Todd's Road Booster	\$3,859,400.00
		Cunapo Southern Main Road	Rio Claro Tabaqueite	Biche BPS	\$1,972,600.00
	5	Installation of 4km of 300mm ductile Iron Pipe	St. Mary's	Sobo	\$4,800,000.00
		Sub Total South Pipelines			\$22,800,000.00
EXTREMITIES OF THE NETWORK					
	6	Extremities of the Pipeline Network			\$6,000,000.00
		Sub Total			\$6,000,000.00
RURAL AREAS					
	7	Rural Areas			\$5,000,000.00
		Sub Total			\$5,000,000.00
SUB TOTAL PIPELINE REPLACEMENT PROGRAMME					\$48,071,300.00
SEWERAGE SECTOR INITIATIVES					
NHA Plants	1	Adoption of NHA Wastewater Treatment Plants			\$83,000,000.00
GPOSS	2	Greater Port of Spain (lateral Replacement)			\$27,000,000.00
WASA Plants	3	Refurbish existing plants			\$18,500,000.00
Private Plants	4	Private Packaged Plants			\$4,500,000.00
SUB TOTAL SEWERAGE SECTOR INITIATIVES					\$133,000,000.00
INSTITUTIONAL STRENGTHENING					
TRINIDAD	1	Trinidad (Masterplan)			\$22,715,000.00
		Sub Total			\$22,715,000.00
GRAND TOTAL TRINIDAD					\$466,259,182.00
TOBAGO					
MAJOR WATER SOURCES DEVELOPMENT					
Wells	4	Well Development Campbellton: 1 imgd (4.5 ML/D)			\$8,000,000.00
		Sub Total			\$8,000,000.00
Intakes and Water Treatment Plant	2	Installation of 5km of 200mm pipeline from Richmond to Goodwood			\$2,500,000.00
		Sub Total			\$2,500,000.00
SUB TOTAL MAJOR WATER SOURCES					\$10,500,000.00
LEAK DETECTION PROGRAMME					
DOMESTIC METERING	1	Tobago			\$10,500,000.00
		Procurement of Domestic Meters			
		Sub Total			\$10,500,000.00
SUB TOTAL LEAK DETECTION PROGRAMME					\$10,500,000.00

PIPELINE REPLACEMENT					
Cove Industrial Park	3a	Upgrade Courland Transmission Pipeline to integrate Bacolet supply: 3km of 400mm		\$2,940,000.00	
	3b	Procurement of Ductile Iron Pipes & Fittings			
		Sub Total		\$2,940,000.00	
L'Anse Fourmi to Charlotteville		PHASE 2			
Parlatuvier, Castara	1	Installation of 12km of 300mm pipeline	Bloody Bay	Charlotteville	\$2,000,000.00
	2	Installation of 2km of 300mm transmission pipeline	Cambelton	Charlotteville	\$2,400,000.00
	3	Drill and Equip one well		\$4,000,000.00	
		Sub Total		\$8,400,000.00	
SUB TOTAL PIPELINE REPLACEMENT				\$11,340,000.00	
SEWERAGE SECTOR INITIATIVES					
NHA PLANTS		Adoption of NHA Wastewater Treatment Plants		\$12,000,000.00	
WASA PLANTS		Refurbish existing plants		\$1,500,000.00	
PRIVATE PLANTS		Private Packaged Plants		\$5,000,000.00	
SUB TOTAL SEWERAGE SECTOR INITIATIVES				\$18,500,000.00	
INSTITUTIONAL STRENGTHENING					
TOBAGO	1	Tobago		\$3,000,000.00	
	2	Network Modelling		\$4,000,000.00	
	3	Asset Management		\$1,000,000.00	
	4	SCADA			
		Sub Total		\$8,000,000.00	
GRAND TOTAL TOBAGO				\$58,840,000.00	
GRAND TOTAL TRINIDAD AND TOBAGO				\$525,099,182.00	
PROJECT MANAGEMENT SERVICES - 5% OF TOTAL COST OF WORKS				\$26,254,959.10	
TOTAL THREE YEAR INVESTMENT PLAN				\$551,354,141.10	
WATER QUALITY					
		Caroni			
		Las Lomas			
		Penal			
		Courland			
		Project Management Services: Consultants, quantity surveying			
				\$57,000,000.00	
BUILDING PROGRAMME					
				\$26,000,000.00	
TOTAL BROUGHT FORWARD FROM 3 YEAR PLAN				\$551,354,141.10	
GRAND TOTAL				\$551,354,141.10	

CAPITAL PROGRAMMES 2007-2011

IMPACT OF FIRST YEAR

DISTRICT	AREA	COMMUNITY	POPULATION	CLASS BEFORE YEAR 1	POPULATION TO BENEFIT	CLASS AFTER YEAR 1
TRINIDAD						
North East	Boosters					
	Sangre Grande	Sangre Grande	18,157	5	2,500	2
		North Manzanilla	627	5	627	4
		Guiaco	603	5	603	4
		Tamana	1,538	5	1,538	2
		Los Amadillos	758	5	758	2
	Well Development					
	Arima #8	Beckles Lane	120	3	120	2
		Arima Old Road	350	3	350	2
		Subero Road	200	3	200	2
		EMR near Arima Hospital	1800	3	1800	2
	Mausica	Mausica	900	4	900	3
	Matura #3	Matura	300	5	300	3
	Strategic Pipelines					
	Wallerfield: 5km	Cumuto	3,625	4	3,625	3
		Wallerfield	33,585	4	3,585	3
	Distribution Pipelines					
		North Manzanilla	950	4	950	3
		Valencia	6,947	4	1200	3
		Pinto Road	6,138	4	800	3
	Sub-total North East		76,598		19,856	
North Central	Distribution Pipelines					
		Maracas	721	4	721	3
		Acono Village	1,856	4	1856	3
	Sub-total North Central		2,577		2,577	
Port of Spain	Boosters/Well Development					
	Brieves Road/St Clair Well	Brieves Road	3,500	3	3,500	2
		Bergerac Road	800	3	800	2
	Upper Ariapita	Upper Aripita	1,800	4	1800	2
						2
	St. Ann's	St. Ann's	3,207	4	950	2
		Belmont Valley Road	1,200	4	450	2
	Boosters					
	St. Barb's Tank	St. Barb's	5,160	5	5,610	3
		Laventille West	6,957	5	6,957	3
	Lady Young	Lady Young	3,200	4	2,100	3
		Morvant	9,492	4	1500	3
		Coconut Drive	5,600	4	500	3
	Terracita	Terracita		3		
		Lady Chancellor Road	162	4	162	3
	Distribution Pipelines					
	Port of Spain: 10 km	Port of Spain	4,316	3	500	2
	Extremities					
		St. Ann's	3,513	4	2,500	3
	Sub-total Port of Spain		48,907		27,329	
North West	Boosters					
	Hotton Road	Hotton Road	750	4	750	2
	Service Reservoirs					
	Richplain	Richplain	2,756	4	2,756	2
	Diamond Vale		5,794	3	5,794	2
	Sierra Leone		2,900	3	2,900	2
	Well Development					
	El Socorro #4 & 7	El Socorro	1,000	4	1,000	3
	Diego Martin #9	Four Roads, Dorrington	1,200	4	1,200	3
	Distribution Pipelines					
	Extremities: 20km	Carenage	5,671	4	3,836	3
		Santa Cruz, Susconosco	1,068	5	500	3
		Blue Basin/Morne Coco Road	2,486	4	1500	3
		Cameron Road	829	4	829	3
	Sub-total North West		24,454		21,065	
San Fernando/Central	Well Development					
	Freeport	Preysal	1,500	4	1500	3
		Gran Couva				
	Carlsen Field	Chase Village	1,500		1500	3
		NHA Development, Carlsen Field				
	Distribution Pipelines					
	San Fernando: 10km	St. Joseph Village	2,097	3	500	2
		Pleasantville	5,581	3	1,000	2
	Rural Supply	Caparo, Flanagan Town	2,516	5	800	4
	Extremities					
		Longdenville	5,728	4	2500	3
		Enterprise	6,500	4	1200	3
		Lawrence Wong/Cunupia	2,500	4	2,500	3
		Las Lomas	3,820		3,820	3
	Sub-total San Fernando/Central		31,742		15,320	

South West	Boosters					
	South Oropouche	Oropouche	1,049	4	1,049	4
		Sobo Village	893	4	893	4
		Union	750	5	750	4
		Vance River	1,090	5	1,090	4
		St. Mary's Village	664	5	664	4
		La Brea	1,639	5	1,639	4
		Vessigny	1,385	5	1,384	4
		Siparia	5,988	5	1,639	4
		Oropouche	1,049	5	1,049	4
		Well Development				
	Palo Seco #3	Palo Seco	300	4	300	3
	Chatham #3	Point Fortin, Chatham	8,520	4	500	3
	Point Fortin Well #9 & 13	Vance River	1,500	5	250	3
	Clarke Road #5	Clarke Road	1,200	5	600	3
		Strategic Pipelines				
	La Brea	Boodoosingh	9,870	5	4,150	3
		Vesigny				
		Sobo				
	Union Village					
	La Brea					
	Distribution Pipelines					
	Fyzabad	2,567	4	1,200	3	
	Extremities					
	Cap de Ville	2,218	4	2,218	3	
	Pt. Fortin/Union Village	1,466	5	1,466		
Sub-total South West			86,710		43,681	
South East	Boosters					
	Dades Trace	Dades Trace	2,092	4	2,092	3
		Rio Claro, Tabaquite Road	1,181	4	1,181	3
		Ecclesville	1,876	5	1,876	3
	Agostini Village	Agostini Village	2,550	5	1,200	
		Ecclesville				
		Service Reservoirs				
	Dunmore Hill	Dunmore Hill/Devil's Woodyard	9,500	4	1250	3
		New Grant	4,896	4	2,200	3
		Strategic Pipelines				
	Mayaro:20km	St. Joseph	5,600	5	5,600	2
	Mayaro #7 Well	Plaisance	781	5	781	2
		Mafeking	1,466	5	1,466	2
		Distribution Pipelines				
Mayaro Grid: 9 km	Mayaro	4,133	4	2,067	3	
	Guayaguayare	1,659	4	750	3	
	Maloney	1,800	4	600	3	
	Tourne Bridge	600	4	250	3	
Sub-total South East			38,134		21,313	

CAPITAL PROGRAMMES 2007-2011 IMPACT OF FIRST YEAR

AREA	COMMUNITY	POPULATION	CLASS BEFORE YEAR 2	POPULATION TO BENEFIT	CLASS AFTER YEAR 2
Boosters					
Sangre Grande	Sangre Grande	18,157	2	15,657	3
	North Manzanilla	627	4	627	2
	Sangre Chiquito	3248		3248	2
	Plum Mitan	1575	5	1575	3
	Guiaco	603	4	603	2
	Tamana	1,538	2	1,538	2
	Los Amadillos	758	2	758	2
Strategic Pipelines					
Wallerfield: 5km	Cumuto	3,625	3	3,625	2
	Todds Road		5		3
	Monde Nuevo		5		3
	Wallerfield	3,585	3	3,585	2
Distribution Pipelines					
	North Manzanilla	950	3	950	2
	Manzanilla	327	5	327	2
	Valencia	6,947	3	1200	3
	Pinto Road	6,138	3	800	3
	Sub-total North East	48,078		34,493	
Distribution Pipelines					
	Maracas	721	3	721	3
	Acono Village	1,856	3	850	3
	Sub-total North Central	2,577		1,571	
Distribution Pipelines					
Port of Spain: 10 km	Port of Spain	4,316	2	1658	2
Extremities					
St. Barb's Tank	St. Barb's	5,160	3	5,610	2
	Laventille West	6,957	3	6,957	2
Lady Young	Lady Young	3,200	3	2,100	2
	Morvant	9,492	3	9492	2
	Coconut Drive	5,600	3	2,000	2
	St. Ann's	3,513	3	1,013	3
	Sub-total Port of Spain	38,238		28,830	
Service Reservoirs					
Richplain	Richplain	2,756	2	2,756	1
	Diamond Vale	5,794	2	5,794	1
	Sierra Leone	2,900	2	2,900	1
Well Development					
El Socorro	El Socorro	1,000	3	1,000	
Diego Martin	Four Roads, Dorrington	1,200	3	1,200	
	North Post Road		5		3
Distribution Pipelines					
Extremities: 20km	Carenage	5,671	3	1,836	3
	Santa Cruz, Susconosco	1,068	3	568	3
	Paramin	2,174	4	2174	3
	La Filette	1,250	5	1250	2
	Blue Basin/Morne Coco Road	2,486	3	1500	2
	Cameron Road	829	3	829	2
	Sub-total North West	27,128		21,807	
Well Development					
Freeport	Preysal	1,500	3	1500	
	Gran Couva				
Carlsen Field	Chase Village	1,500	3	1500	
	NHA Development, Carlsen Field				
Boosters					
Tortuga	Tortuga	1027	5	1027	3
	Caratal	1100	5	1100	3
	Gordon Village	543	5	543	3
	Indian Trail	302	5	302	2
Distribution Pipelines					
San Fernando: 10km	St. Joseph Village	2,097	2	549	2
	San Fernando	1,880	3	940	2
	Pleasantville	5,581	2	1,791	2
Rural Supply	Caparo	2,516	4	2016	3
Extremities					
	St Margaret's	2,413	4	1250	3
	Flanagin Town	913	5	913	3
	Mamoral	602	5	602	3
	Arena Road	1,500	4	1500	3
	Longdenville	5,728	3	2500	3
	Bonne Adventure	4,222	4	1850	3
	Enterprise	6,500	3	1200	3
	Lawrence Wong/Cunupia	2,500	3	2,500	2
	Las Lomas	3,820	3	3,820	2
	Sub-total San Fernando/Central	46,244		27,403	

Boosters					
South Oropouche	Oropouche	1,049	4	1,049	3
	Sobo Village	893	4	893	3
	Union	750	4	750	3
	Vance River	1,090	4	1,090	3
	St. Mary's Village	664	4	664	3
	La Brea	1,639	4	1,639	3
	Vessigny	1,385		1,384	
	Siparia	5,988	4	1,639	3
	Oropouche	1,049	4	1,049	3
Well Development					
Palo Seco	Palo Seco	300	3	300	
Chatham	Point Fortin, Chatham	8,520	3	500	
Point Fortin Well	Vance River	1,500	3	250	
Clarke Road	Clarke Road	1,200	3	600	
Strategic Pipelines					
Boodoosingh		9,870	3	5,870	2
La Brea	Vesigny				
	Sobo				
	Union Village				
	La Brea				
	LABIDCO				
Distribution Pipelines					
Rural	Fyzabad	2,567	3	1,367	3
Extremities					
	Delhi Settlement	3,056	4	3056	3
	Rochard Road	3,751	4	1200	3
	Cap de Ville	2,218	3	2,218	3
	Pt. Fortin/Union Village	1,466	4	1,466	3
Sub-total South West		48,955		26,984	
Boosters					
Dades Trace	Dades Trace	2,092	3	2,092	2
	Cunapo Southern Main Road	1,500	4	1,500	3
	Biche	1,063	5	1,063	3
	Rio Claro, Tabaquite Road	1,181	3	1,181	2
	Ecclesville	1,876	3	1,876	2
Agostini Village	Agostini Village	2,550	4	1,200	3
	Ecclesville				
Strategic Pipelines					
Mayaro:20km	St. Joseph	5,600	2	5,600	2
Mayaro #7 Well	Plaisance	781	2	781	2
	Bristol	1200	5	1200	2
	Kernaham		5		
	Union Village	1586	5	1586	2
	Mafeking	1,466	2	1,466	2
Distribution Pipelines					
Mayaro Grid: 9 km	Mayaro	4,133	3	2,067	2
	Guayaguayare	1,659	3	1,659	2
	Maloney	1,800	3	1,800	2
	Tourne Bridge	600	3	600	2
Princes Town	St Croix Road	2175	5	2175	3
	Papourie		5		3
Sub-total South East		31,262		27,846	

TOTAL - TRINIDAD		242,482		168,934	
Boosters					
Chateaux	Chateaux	1200	2	1200	2
Buccoo/Government Farm	Buccoo/Government Farm	722	4	722	2
Charlotteville/Hermitage	Charlotteville/Hermitage	1022	4	1002	2
Intakes					
Louis Dor	Delaford, Speyside and Kings Bay	1100	2	1100	2
Reservoirs					
Mason Hall	Mason Hall	370	4	370	2
Pipeline					
Bacolet		2518	3	2518	2
Charlotteville		1002	3	1002	2
Signal Hill		1016	4	1016	2
Castara		1163	5	1163	3
Goodwood		1228	5	1228	3
Well Development					
Courland	Hotel Industry				
	Plymouth	16,500	2	8,500	2
	Bethesda		2		2
	Black Rock		2		2
	Mount Irvine		2		2
	Crown Point		2		2
	Milford Road				
TOTAL - TOBAGO		27,841		19,821	
GRAND TOTAL - TRINIDAD & TOBAGO		270,323		188,755	









CAPITAL PROGRAMMES 2007-2011

Summary of 3Yr Investment Programmes – Detailed Breakdown

PROJECT COMPONENT	WORK CONTENT	ESTIMATED COST OF THREE (3) YEAR INVESTMENT PLAN PRIORITY 1	YEAR 1 (2005) PROJECTS	YEAR 1 (2005) PROJECTS REVISED COST	YEAR 2 (2006)	YEAR 3 (2007)
2	3	5	7	7	13	14
TRINIDAD						
MAJOR WATER SOURCES						
LABIDCO						
Wells	1 Well development within Wallerfield: 5.35 imgd (24.075 ML/D)		-	-	-	-
WTP	2 Construction of Water Treatment Plant Cumuto: 4 imgd (18.0 ML/D)	\$9,800,099.25	\$9,800,099.25	\$9,800,099.25	-	-
Boosters	3 Construction of a new BPS at South Oropouche: 12 imgd (54ML/D)				\$0.00	\$0.00
	4 Upgrading of the San Fernando Booster Pumping Station	\$1,500,000.00	\$1,500,000.00	\$1,500,000.00	\$0.00	\$0.00
	5 Reconfiguration of pipe work to facilitate direct transmission of water from San Fernando BPS to an existing 750mm pipeline that will be dedicated to service the La Brea system. The proposed works at Min Repos Roundabout will also require an interconnection to the Navet 27" pipeline servicing the San Fernando Reservoirs and a direct connection from the San	\$1,500,000.00	\$1,000,000.00	\$1,000,000.00		\$500,000.00
	6 Upgrade of the existing Booster at St. Mary's Oropouche	\$200,000.00	\$200,000.00	\$200,000.00		
	7 Reconfiguration of Network to service estate through St. Mary's BPS	\$250,000.00	\$250,000.00	\$250,000.00		
Reservoirs	8 Construction of two (2) Service Reservoirs at KTO and Vessigny: 0.5 imgd (2.25 ML) per reservoir	\$10,000,000.00	\$0.00	\$0.00	\$5,000,000.00	\$5,000,000.00
Pipelines	9a Installation of 5km of 600mm pipeline from Cumuto WTP to North Oropouche Transmission Main	\$15,000,000.00	\$15,000,000.00	\$15,000,000.00	-	-
	9b Procurement of Ductile Iron Pipes and Fittings					
	10 Installation of 7.5km of 300mm transmission pipeline from Cumuto Water Treatment Plant to the Wallerfield Industrial Estate	\$1,800,000.00	\$1,800,000.00	\$1,800,000.00		-
	11a Completion of 2.5km of 400mm diameter pipeline from Point D'Or to Vance River along the old SMR	\$3,500,000.00	\$0.00	\$0.00	\$3,500,000.00	
	11b Procurement of Ductile Iron Pipes and Fittings	\$1,500,000.00	\$0.00	\$0.00	\$1,500,000.00	
	12a Laying of 3.5km of 600mm diameter pipelines within Point Lisas	\$7,350,000.00	\$10,500,000.00	\$7,350,000.00		
	12b Procurement of Ductile Iron Pipes and Fittings	\$3,150,000.00	\$0.00	\$3,150,000.00		
	13a Laying of 12km of 1006mm diameter pipelines from Pt Lisas to San F'do	\$42,000,000.00				\$42,000,000.00
	13b Procurement of Ductile Iron Pipes and Fittings	\$18,000,000.00	\$0.00	\$0.00	\$18,000,000.00	
	14a Installation of 6km of 800mm diameter from South Oropouche to La Brea	\$11,496,891.08	\$11,496,891.08	\$11,496,891.08		
	14b Procurement of Ductile Iron Pipes and Fittings					
	15a Installation of 6km of 400mm diameter from South Oropouche to La Brea	\$8,332,297.23			\$8,332,297.23	
	15b Procurement of Ductile Iron Pipes and Fittings	\$3,450,000.00	\$3,450,000.00	\$3,450,000.00		
	16 Install 2.8km of 200mm diameter pipe along Sobo Road from the junction of Boodoosingh Trace and the Southern Main Road, to the junction of Sobo Road and Southern Main Road	\$2,800,000.00	-	-	\$2,800,000.00	-
	17 Interconnecting Pipework at Wells Wallerfield	\$3,886,657.20	\$3,886,657.20	\$3,886,657.20		
	Sub Total	\$145,515,944.76	\$58,883,647.53	\$58,883,647.53	\$39,132,297.23	\$47,500,000.00
MATURA						
	1 Development of Matura Well #3: 0.14 imgd (0.63 ML/D)				-	-
SALYBIA						
	2a Design of Salybia Water Treatment Plant	\$3,500,000.00	\$3,500,000.00	\$3,500,000.00		
	2b Construction of a Water Treatment Plant Salybia: 7 imgd (31.5 ML/D)	\$31,500,000.00			\$8,000,000.00	\$23,500,000.00
	3a Laying of 2km of 500mm transmission pipeline from Salybia to Matura	\$3,500,000.00	-	-		\$3,500,000.00
	3b Procurement of Ductile Iron Pipes and Fittings	\$1,500,000.00	\$1,500,000.00	\$1,500,000.00		
	4a Design of Matura Water Treatment Plant	\$2,460,000.00			\$2,460,000.00	
	4b Construction of a Water Treatment Plant Matura: 5 imgd (22.5ML/D)	\$22,140,000.00			\$6,070,000.00	\$16,070,000.00
	5a Installation of 10km of 800mm transmission pipeline from Matura WTP to North Oropouche Trunk Main	\$28,000,000.00				\$28,000,000.00
	5b Procurement of Ductile Iron Pipes and Fittings	\$12,000,000.00	\$0.00	\$0.00	\$12,000,000.00	
	Sub Total	\$104,600,000.00	\$7,460,000.00	\$7,460,000.00	\$26,070,000.00	\$71,070,000.00
MAYARO						
	1a Design Pilote Water Treatment Plant	\$1,500,000.00	\$1,500,000.00	\$1,500,000.00		
	1b Develop intake at Pilote river and construct WTP: 3.0 imgd (13.5 ML/D)	\$13,500,000.00	\$1,350,000.00	\$1,350,000.00	\$6,075,000.00	\$6,075,000.00
	2a Design Ortoire Water Treatment Plant	\$1,000,000.00	\$1,000,000.00	\$1,000,000.00		
	2b Develop intake at Ortoire River and construct WTP: 2.0 imgd (9.0 ML/D)	\$9,000,000.00	\$900,000.00	\$900,000.00	\$4,050,000.00	\$4,050,000.00
	3a Installation of 20 km of 500 mm transmission pipeline Rio Claro to Mayaro	\$23,858,105.16	\$19,707,187.28	\$19,707,187.28	\$4,150,917.88	-

36 Procurement of Ductile Iron Pipes and Fittings						
	4 Booster Station St. Joseph: 0.5 imgd (2.25 MLD)	\$1,500,000.00	\$1,500,000.00	\$1,500,000.00		-
	5 Laying of 5.0 km of 150mm distribution pipeline to supply villages between Rio Claro and Mayaro	\$3,900,000.00	-	-		included
	6 Laying of 3.5 km of 150 mm transmission main along the Naparima Mayaro Road in the Rio Claro area	\$2,730,000.00	-	-		included
	7 Installation of 2km of 150 mm pipeline from St. Joseph BPS to Kernaham	\$1,560,000.00	\$1,560,000.00	included	-	-
	Installation of 22km of 400mm from Pilote Plant to Junction		part funded under leakage	\$2,495,000.00	\$10,333,700.00	\$6,783,050.00
	Installation of 4km of 400mm from Junction to St. Joseph Booster					
	Installation of 1km of 400mm from Ortoire Plant to Rio Claro Main Road			\$1,750,000.00		
	8 Development of five (5) wells at Mayaro/Guayaguayare		-	-	-	-
	9 Petrotrin Facilities upgrade	\$5,000,000.00	-	-		\$5,000,000.00
	Sub Total	\$63,548,105.16	\$27,517,187.28	\$30,202,187.28	\$24,609,617.88	\$21,908,050.00
Brazil	1 Construction of Water Treatment Plant Cumuto: 4 imgd (18.0 MLD)		included above	-	-	-
Talparo Main Road	2 Installation of 3km of 200mm transmission pipeline along Tumpuna Road from Cumuto Junction to San Rafael Junction	\$3,000,000.00	-	-	\$1,500,000.00	\$1,500,000.00
Mundo Nuevo	3 Installation of 2km of 150mm distribution pipeline from Mundo Nuevo to Mammoral		-	-		-
	4 Installation of 5km of 200mm transmission pipeline from Wallerfield to Guatapajaro		-	-	-	-
	5 Commission existing 6km of 200mm in Mundo Nuevo	\$1,000,000.00	-	-	\$500,000.00	\$500,000.00
	6 Rehabilitate existing booster pump station at Talparo	\$1,000,000.00	-	-	\$500,000.00	\$500,000.00
	Sub Total	\$5,000,000.00	\$0.00	\$0.00	\$2,500,000.00	\$2,500,000.00
Blanchisseuse	1a Design Yarra Water Treatment Plant	\$500,000.00	\$500,000.00	\$500,000.00		
	1b Develop intake and water treatment plant at Yarra River: 1 imgd (4.5 MLD)	\$4,500,000.00	-	-	\$4,500,000.00	-
	2 Storage Tank: 0.25img (1.125 MLD)	\$1,125,000.00	-	-	\$1,125,000.00	-
	3 Installation of 3.2km of 200mm transmission pipeline from Yarra Water Treatment Plant to Blanchisseuse	\$3,200,000.00	-	-	\$3,200,000.00	-
	Sub Total	\$9,325,000.00	\$500,000.00	\$500,000.00	\$8,825,000.00	\$0.00
Santa Cruz	1 Well development within Santa Cruz: 1.0 imgd (4.5 MLD)	\$1,500,000.00	-	-	-	\$1,500,000.00
	2 Installation of 4km of 200mm transmission pipeline between Moka to Santa Cruz		-	-	-	-
	3 Susconosco Mains Replacement: 5 km of 200mm		-	-	-	-
	Sub Total	\$1,500,000.00	\$0.00	\$0.00	\$0.00	\$1,500,000.00
Point Fortin	1 Rehabilitation of wells at Chatham #3: 0.331 imgd (1.49 MLD)				-	-
	Rehabilitation of wells at Chatham #5: 0.25 imgd (1.125 MLD)	\$1,400,000.00	\$1,400,000.00	\$1,400,000.00		-
	2 Rehabilitation of wells at Point Fortin #9: 0.143 imgd (0.644 MLD)				-	-
	Rehabilitation of wells at Point Fortin #13: 0.143 imgd (0.644 MLD)				-	-
	3 Construction of a new Storage Reservoir within Hariman Park, Point Fortin: 1 imgd (4.5 ML)		-	-	-	-
	4a Construction of a new plant to utilise existing storage reservoirs owned by Petrotrin which has a potential of 8.6 MLD - (1.9mgd) to be completed by September 2005.	\$9,000,000.00	-	-		\$9,000,000.00
	4b Feasibility study of construction of a new plant to utilise existing storage reservoirs owned by Petrotrin which has a potential of 8.6 MLD - (1.9mgd) to be completed by September 2005.	\$1,000,000.00	\$1,000,000.00	\$1,000,000.00		
	5 Mains Replacement: 10km of distribution main	\$5,000,000.00	\$5,000,000.00	\$5,000,000.00		
	Sub Total	\$16,400,000.00	\$7,400,000.00	\$7,400,000.00	\$0.00	\$9,000,000.00
SUB TOTAL MAJOR WATER SOURCES		\$345,889,049.92	\$101,760,834.81	\$104,445,834.81	\$101,136,915.11	\$153,478,050.00

DISTRIBUTION EXPANSION							
BOOSTER STATIONS NORTH							
Brievies Road	6	Upgrade Booster Station: 1.75 imgd (7.875 ML/D)	\$1,500,000.00	\$1,500,000.00	\$1,500,000.00	-	-
	7	Transmission pipelines: km of mm	\$250,000.00	\$250,000.00	\$250,000.00	-	-
		Sub Total	\$1,750,000.00	\$1,750,000.00	\$1,750,000.00	\$0.00	\$0.00
Ariapita	2	Installation of 0.8km of 200mm pipeline from BPS along Ariapita Rd	\$788,000.00	\$788,000.00	\$788,000.00	-	-
	3	Installation of 0.8km of 150mm pipeline from the end of the pipe along Ariapita Rd to Ariapita Tank	\$657,000.00	\$657,000.00	\$657,000.00	-	-
		Sub Total	\$1,445,000.00	\$1,445,000.00	\$1,445,000.00	\$0.00	\$0.00
St. Anns Booster	1	Upgrade Booster Station: imgd	\$1,000,000.00	-	-		\$1,000,000.00
	2	Transmission pipelines: km of mm	\$500,000.00	-	-		\$500,000.00
		Sub Total	\$1,500,000.00	\$0.00	\$0.00	\$0.00	\$1,500,000.00
Lady Young BPS	1	Upgrade Booster Station: 4.5 imgd (20.25 ML/D)	\$2,000,000.00	\$2,000,000.00	\$2,000,000.00	-	-
	2	Transmission pipelines: km of mm	\$500,000.00	\$500,000.00	\$500,000.00	-	-
		Sub Total	\$2,500,000.00	\$2,500,000.00	\$2,500,000.00	\$0.00	\$0.00
Terracita Booster	1	Upgrade Booster Station: imgd	\$1,000,000.00	-	-		\$1,000,000.00
	2	Transmission pipelines: km of mm	\$500,000.00	-	-		\$500,000.00
		Sub Total	\$1,500,000.00	\$0.00	\$0.00	\$0.00	\$1,500,000.00
Sangre Grande	1	Construction of a Water Treatment Plant Salybia: 7 imgd (31.5 ML/D)	included above	-	-	-	-
	2	Laying of 2km of 500mm transmission pipeline from Salybia to Matura	included above	-	-	-	-
	3	Construction of a Water Treatment Plant Matura: 5 imgd (22.5ML/D)	included above	-	-	-	-
	4	Installation of 10km of 800mm transmission pipeline from Matura Water Treatment Plant to North Oropouche Water Treatment Plant	included above	-	-	-	-
	5a	Installation of 3km of 400mm transmission pipeline from Sangre Grande Fire Station to Sangre Grande Booster Pumping Station	\$2,940,000.00				incl under pline repl.
	5b	Procurement of Ductile Iron Pipes & Fittings	\$1,260,000.00	\$1,260,000.00	incl under pline repl.		
	6	Upgrade Sangre Grande Booster Station: 3.0 mgd (13.5 ML/D)	\$2,200,000.00	\$2,200,000.00	\$2,200,000.00	-	-
	7a	Installation of 5km of 400mm pipeline from Sangre Grande Booster Station to North Manzanilla	\$4,900,000.00			incl under pline repl.	-
	7b	Procurement of Ductile Iron Pipes & Fittings	\$2,100,000.00	\$2,100,000.00	incl under pline repl.		
	8a	Installation of 16km of 400mm transmission pipeline from Sangre Grande Booster Station to Biche along Plum Mitan Road	\$15,680,000.00			incl under pline repl.	incl under pline repl.
	8b	Procurement of Ductile Iron Pipes & Fittings	\$6,720,000.00	\$0.00	\$0.00	incl under pline repl.	
		Sub Total	\$35,800,000.00	\$5,560,000.00	\$2,200,000.00	\$0.00	\$0.00
Hutton Road	1	Upgrade Booster Station: 2.0 imgd (9.0 ML/D)	\$1,500,000.00	-	-		\$1,500,000.00
	2	Transmission pipelines: km of mm	\$500,000.00	-	-		\$500,000.00
		Sub Total	\$2,000,000.00	\$0.00	\$0.00	\$0.00	\$2,000,000.00

Paramin	1	Construction of Storage Reservoir at Level #1: 0.389 (1.75 ML)	\$3,500,000.00	-	-		\$3,500,000.00
	2	Upgrade pumps at Level #1 with the following duty: Flow - 40lps, Head - 120m	\$200,000.00	-	-		\$200,000.00
	3	Construction of Storage Reservoir at Level #2: 0.389 (1.75 ML)	\$3,500,000.00	-	-		\$3,500,000.00
	4	Upgrade pumps at Level #2 with the following duty: Flow - 34lps, Head - 115m	\$200,000.00	-	-		\$200,000.00
	5	Construction of Storage Reservoir at Level #3: 0.30 (1.5 ML)	\$3,300,000.00	-	-		\$3,300,000.00
	6	Upgrade pumps at Level #3 with the following duty: Flow - 8lps, Head - 95m	\$150,000.00	-	-		\$150,000.00
	7	Refurbish Tank at Level #4	\$20,000.00	-	-		\$20,000.00
	8	Installation of pumps at Level #4 with the following duty: Flow - 3.78lps, Head - 127m	\$200,000.00	-	-		\$200,000.00
	9	Installation of 100m of 100mm pipeline from Level #4	\$800,000.00	-	-		\$800,000.00
	10	Installation of pumps on La Finette Road with the following duty: Flow - 1.8lps, Head - 50m	\$400,000.00	-	-		\$400,000.00
	11	Installation of two (2) 100mm pressure sustaining valves	\$25,000.00	-	-		\$25,000.00
		Sub Total	\$12,295,000.00	\$0.00	\$0.00	\$0.00	\$12,295,000.00
SUB TOTAL BOOSTER STATIONS NORTH			\$58,790,000.00	\$11,255,000.00	\$7,895,000.00	\$0.00	\$17,295,000.00
BOOSTER STATIONS SOUTH							
Tortuga Village	1	Upgrade Booster Station: 1.5 (6.75 ML/D)	\$1,000,000.00	\$1,000,000.00	\$1,000,000.00	-	-
	2a	Construction of a new Tortuga Reservoir: 0.67 (3.0 ML)	\$2,700,000.00			\$2,700,000.00	-
	2b	Design of Tortuga Reservoir	\$300,000.00	\$300,000.00	\$300,000.00		
	3	Installation of 3.2km of 200mm pipeline from booster to reservoir	\$3,200,000.00	\$3,200,000.00	\$3,200,000.00	-	-
	4	Installation of 0.7km of 250mm pipeline from Reservoir to distribution system	\$770,000.00			\$770,000.00	-
		Sub Total	\$7,970,000.00	\$4,500,000.00	\$4,500,000.00	\$3,470,000.00	\$0.00
Union Village, Agostini	1	Booster Station Agostini: 3.0 (13.5 ML/D) To determine source of supply	\$2,200,000.00	-	-		\$2,200,000.00
Mafeking,	2a	Construction of Service Reservoir at Agostini: 1.0 (4.5 ML)	\$4,050,000.00	-	-		\$4,050,000.00
Bristol	2b	Design of Dades Trace Service Reservoir	\$450,000.00	\$450,000.00	\$450,000.00		
		Sub Total	\$6,700,000.00	\$450,000.00	\$450,000.00	\$0.00	\$6,250,000.00
		Design of Caparo (Fletcher Road) Service Reservoir	\$500,000.00	\$500,000.00	\$500,000.00		
		Sub Total	\$500,000.00	\$500,000.00	\$500,000.00		
SUB TOTAL BOOSTER STATIONS SOUTH			\$15,170,000.00	\$5,450,000.00	\$5,450,000.00	\$3,470,000.00	\$6,250,000.00
SERVICE RESERVOIRS NORTH							
Richplain	3	Well development at Diego Martin #9 to service Richplain Reservoir: 0.551 (2.48 ML/D)		-	-		-
	4	Installation of 5km of 200mm pipeline from Richplain Booster to Richplain Reservoir	\$5,000,000.00	\$2,500,000.00	\$2,500,000.00	\$2,500,000.00	-
	5	Installation of 5km of 400mm pipeline from Richplain Service Reservoir to Diego Martin Main Road					
	6	Installation of 2km of 300mm ductile Iron Pipe from Orchard Avenue to Cameron	\$2,400,000.00	\$2,400,000.00	\$2,400,000.00		
	7	Procurement of Ductile Iron Pipes & Fittings					
		Sub Total	\$7,400,000.00	\$4,900,000.00	\$4,900,000.00	\$2,500,000.00	\$0.00

Cleaver Road	1	Rehabilitate Service Reservoir: 0.227img (1.023 ML)	\$1,800,541.00	-	-	\$1,800,541.00	
			\$0.00				
		Sub Total	\$1,800,541.00	\$0.00	\$0.00	\$1,800,541.00	\$0.00
Hololo	1a	Rehabilitate Service Reservoir: 0.253img (1.137 ML)	\$1,080,000.00				\$1,080,000.00
	1b	Design Hololo Service Reservoir	\$120,000.00	\$120,000.00	\$120,000.00		
		Sub Total	\$1,200,000.00	\$120,000.00	\$120,000.00	\$0.00	\$1,080,000.00
McShine	1a	Rehabilitate Service Reservoir: 0.12img (0.546 ML)	\$612,882.00				\$612,882.00
	1b	Design McShine Service Reservoir	\$68,098.00	\$68,098.00	\$68,098.00		
		Sub Total	\$680,980.00	\$68,098.00	\$68,098.00	\$0.00	\$612,882.00
Calvary	1a	Rehabilitate Service Reservoir: 0.455img (0.101 ML)	\$1,305,000.00			\$1,305,000.00	
	1b	Design Calvary Service Reservoir	\$145,000.00	\$145,000.00	\$145,000.00		
		Sub Total	\$1,450,000.00	\$145,000.00	\$145,000.00	\$1,305,000.00	\$0.00
SUB TOTAL SERVICE RESERVOIRS NORTH			\$12,531,521.00	\$5,233,098.00	\$5,233,098.00	\$5,605,541.00	\$1,692,882.00
SERVICE RESERVOIRS SOUTH							
Matilda, Mango Road	1	Construction of Reservoir at Dunmore including pipework: 0.505img (2.273 ML)		-	-		
		Sub Total	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
Flanagin Town	1	Well development within Caparo: 0.25img (1.125 ML/D)	\$350,000.00	\$350,000.00	\$350,000.00		
Mammoral	3a	Construction of a new Reservoir at Arena: 1img (4.5 ML/D)	\$4,050,000.00	-	-		\$4,050,000.00
Chickland	3b	Design of new Arena Reservoir	\$450,000.00	\$450,000.00	\$450,000.00		
Siewdass Road	4	Installation of 2km of 200mm transmission pipeline from Carlsen Field to Arena Reservoir	\$2,000,000.00	-	-		\$2,000,000.00
	5	Installation of 1km of 150mm transmission pipeline from Arena Reservoir to Caparo Valley Road	\$1,000,000.00	-	-		\$1,000,000.00
		Sub Total	\$7,850,000.00	\$800,000.00	\$800,000.00	\$0.00	\$7,050,000.00
Herreira Hill	1	Design of Reservoir	\$180,000.00	\$180,000.00	\$180,000.00		
	2	Construction of Reservoir at Herreira Hill	\$1,620,000.00				\$1,620,000.00
	3	Associated pipework and Reservoir and plant repairs at Trinity waterorks					
		Sub Total	\$1,800,000.00	\$180,000.00	\$180,000.00	\$0.00	\$1,620,000.00
Morichal	2	Pipeline replacement from Centre Mountain to Guaracara Tabaquite Road: 1km of 200mm	\$1,000,000.00	-	-		\$1,000,000.00
Whiteland	3	Storage Reservoir at Centre Mountain: 0.601img (2.705 ML/D)	\$5,834,359.88	\$5,834,359.88	\$5,834,359.88	-	
		Sub Total	\$6,834,359.88	\$5,834,359.88	\$5,834,359.88	\$0.00	\$1,000,000.00
SUB TOTAL SERVICE RESERVOIRS SOUTH			\$16,484,359.88	\$6,814,359.88	\$6,814,359.88	\$0.00	\$9,670,000.00
SUB TOTAL DISTRIBUTION EXPANSION			\$102,975,880.88	\$28,752,457.88	\$25,392,457.88	\$9,075,541.00	\$34,907,882.00

LEAK DETECTION PROGRAMME								
PROCUREMENT OF LEAK	Leak Detection Equipment Trinidad			\$10,000,000.00	\$5,000,000.00	\$5,000,000.00	\$5,000,000.00	
DETECTION EQUIPMENT	Sub Total			\$10,000,000.00	\$5,000,000.00	\$5,000,000.00	\$5,000,000.00	0
BULK METERING	Procurement and Installation of Bulk Meters on the main transmission systems as follows:							
	1	Caroni South - 18		\$3,650,000.00			\$3,650,000.00	
	2	Caroni North - 15		\$2,900,000.00			\$2,900,000.00	
	3	North Oropouche - 12		\$2,150,000.00			\$2,150,000.00	
	4	Hollis - 18		\$2,900,000.00			-	\$2,900,000.00
	5	Navet - 17		\$2,900,000.00			\$1,500,000.00	\$1,400,000.00
	6	Procurement of Bulk Meters		\$5,000,000.00	\$5,000,000.00	\$5,000,000.00		
	7	Update Study on Bulk Metering		\$500,000.00	\$500,000.00	\$500,000.00		
		Sub Total		\$20,000,000.00	\$5,500,000.00	\$5,500,000.00	\$10,200,000.00	\$4,300,000.00
PIPELINE REPLACEMENT	Pipeline Replacement Trinidad			\$35,000,000.00	\$5,161,670.11	\$5,161,670.11	\$10,950,079.00	
		Mayaro mains replacement - part funding	Installation of 22km of 400mm from Pilote Plant to Junction				\$8,868,250.00	\$10,000,000.00
		Arouca DMA						
	1	Installation of 1490m of 150mm along Serbian Drive	from Serbian Avenue	along La Resource South onto Eastern Main Road			\$766,489.44	
	2	Installation of 1107m of 150mm along Red Hill & Sanderling Boulevard	from Eastern Main Road	to Maloney Boulevard			\$996,671.75	
	3	Installation of 340m of 100mm along Harper Circular off Reid Lane	from Reid Lane	along Harper Circular			\$262,251.44	
	4	Installation of 319m of 100mm along Boys Lane side streets (1st, 2nd, 3rd)	from Eastern Main Road	to side streets off Boys Lane			\$315,831.63	
	5	Installation of 200m of 100mm along Mahabir Lane	from Piarco Old Road	to Maloney			\$248,412.81	
	6	Installation of 100m of 100mm along Grandison Drive	from Eastern Main Road	to Priority Bus Route			\$109,031.74	
	7	Installation of 200m of 100mm along David Brown Terrace	from Eastern Main Road	to Priority Bus Route			\$194,953.81	
	8	Installation of 5200m of 150mm along Eastern Main Road D'Abadie	from Arouca Highlift	to Cleaver Road			\$3,764,649.02	
	9	Installation of 1520m of 150mm along Piarco Old Road	from Piarco Old Road	to Churchill Roosevelt Highway			\$1,638,445.37	
		Sub Total Arouca DMA					\$8,296,937.01	
		Pleasantville DMA						
	1	Installation of 900m of 300mm DI along Chaconia Avenue	from San Fernando Bye Pass	to Pleasantville Circular			\$785,471.86	
	2	Installation of 2100m of 300mm DI along Pleasantville Circular	from Pleasantville Circular	to Pleasantville Circular			\$1,773,864.76	
	3	Installation of 2000m of 300mm DI along Corinth Road	from Cipero Road	St. Clement Junction			\$1,706,240.12	
	4	Installation of 400m of 300mm DI along NHA Development	from LP#29 Pleasantville Circular	Corinth Road			\$450,191.26	
	5	Installation of 650m of 300mm DI along Reform Village Road	from San Fernando Bye Pass	to Pleasantville Circular			\$654,011.28	
	6	Installation of 1000m of 150mm PVC along Pleasantville Terrace	from San Fernando Bye Pass	to Chaconia Avenue			\$921,353.20	
	7	Installation of 600m of 200mm PVC along Balisier Avenue	from Chaconia Avenue	to Victoria Village			\$436,872.58	
	8	Installation of 500m of 150mm PVC along Circular Drive	from Pleasantville Circular	to Pleasantville Circular Drive			\$368,330.18	
	9	Installation of 225m of 200mm PVC along Sobia Lane	from Pleasantville Circular Drive	to Corilleta Avenue			\$335,856.24	
	10	Installation of 400m of 150mm PVC along Corilleta Avenue	from Corilleta Avenue Dead End	to Lady Bird Crescent			\$495,249.71	
	11	Installation of 400m of 150mm PVC along Lady Bird Crescent	from Butterfly Avenue	to Sobia Lane			\$500,241.87	
	12	Installation of 300m of 150mm PVC along Poinsetta Lane	from Pleasantville Circular	to Corilleta Avenue			\$404,987.45	
	13	Installation of 200m of 150mm PVC along Gerbra Lane	from Butterfly Avenue	to Corilleta Avenue			\$302,235.89	
	14	Installation of 210m of 150mm PVC along Butterfly Avenue	from Poinsetta Avenue	to Zinnia Lane			\$318,807.79	
	15	Installation of 120m of 150mm PVC along Petunia Drive	from Butterfly Avenue	to end of Petunia Drive			\$202,676.64	
	16	Installation of 250m of 150mm PVC along Zinnia Lane	from Pleasantville Circular	to Pleasantville Circular			\$324,459.31	
	17	Installation of 600m of 150mm PVC along Pleasantville Avenue	from San Fernando Bye Pass	to Pleasantville Terrace			\$596,370.38	
	18	Installation of 2100m of 150mm PVC along Pleasantville Circular	from Pleasantville Circular	to Pleasantville Circular			\$1,157,939.60	
	19	Installation of 200m of 150mm PVC along Geranium Crescent	from Pleasantville Circular	to Pleasantville Circular			\$203,299.26	
	20	Installation of 70m of 150mm PVC along Palm Street	from Balisier Avenue	to end of Palm Street			\$131,880.70	
	21	Installation of 56m of 150mm PVC along Rubble Lane	from Balisier Avenue	to end of Rubble Lane			\$123,771.77	
	22	Installation of 775m of 150mm PVC along Cedar Drive	from Hibiscus Drive	to Chaconia Avenue			\$753,937.01	
	23	Installation of 200m of 150mm PVC along Teak Lane	from Cedar Drive	to end of Teak Lane			\$242,494.64	
	24	Installation of 460m of 150mm PVC along Blitz Village Street	from Blitz Village	to end of Blitz Village Street			\$479,517.19	
		Sub Total Pleasantville DMA					\$13,690,062.69	
		Sub Total Pipeline Replacement Leakage					\$21,986,999.70	
		Sub Total		\$35,000,000.00	\$5,161,670.11	\$5,161,670.11	\$19,838,329.00	\$10,000,000.00
DOMESTIC METERING	1	North Trinidad		\$22,250,000.00				\$22,250,000.00
	2	South Trinidad		\$19,250,000.00				\$19,250,000.00
	3	Procurement of Domestic Meters		\$14,000,000.00	\$0.00	\$0.00	\$6,000,000.00	\$8,000,000.00
	4	Update Study on Domestic Metering		\$500,000.00	\$0.00	\$0.00		\$500,000.00
		Sub Total		\$56,000,000.00	\$0.00	\$0.00	\$6,000,000.00	\$50,000,000.00
SUB TOTAL LEAK DETECTION PROGRAMME				\$121,000,000.00	\$15,661,670.11	\$15,661,670.11	\$41,038,329.00	\$64,300,000.00

PIPELINE REPLACEMENT PROGRAMME							
NORTH PIPELINES							
CARENAGE	1	Leakage Management within Tucker Valley for water recovery			\$500,000.00	\$500,000.00	\$500,000.00
	3	Complete pipelaying off Scorpion Booster: 1km of 100mm			\$700,000.00	\$700,000.00	\$700,000.00
	4	Installation of 0.45km of 200mm pipeline along Haig St. to replace existing AC main			\$450,000.00	\$450,000.00	\$450,000.00
		Sub Total			\$1,650,000.00	\$1,650,000.00	\$1,650,000.00
NORTH		El Socorro/Picton/Lady Young					
	1	Laying of 1.3km of 16" D.I. pipeline	from Lady Young Booster	to Morvant Reservoir			\$2,275,000.00
	2	Laying of 2.0km of 12" D.I. pipeline	from Black River	to Coconut Drive to Link with Morvant Reservoir Supply			\$2,000,000.00
	3	Installation of 200m of 300mm D.I. Mains	from Picton #1 Reservoir	to provide suction to Pump Trace Booster			\$300,000.00
	4	Installation of 800m of 300mm D.I. Mains	from Picton #2 Reservoir	to Laventille Reservoir			\$1,200,000.00
	5	Installation of 800m of 200mm D.I. Mains	from Laventille Reservoir	to McShine Reservoir			\$800,000.00
		Sangre Grande					
	1	Installation of 2.1km of 400mm pipeline	from Sangre Grande Fire Station	to Sangre Grande BPS			\$3,675,000.00
	2	Installation of 9.6km of 400mm pipeline	from Sangre Grande BPS	to Plum Mitan Junction			\$8,400,000.00
	3	Installation of 16km of 400mm pipeline	from Plum Mitan Junction	to Eliche along Plum Mitan Road			\$14,000,000.00
	4	Installation of 3km of 300mm pipeline	from Plum Mitan Junction	to Manzanilla Beach			\$4,500,000.00
		Hollis Transmission Main					
	1	Replacement of 2.1km of 450mm pipeline	from Head Office to Aranguez Road	along the Priority Bus Route			\$1,968,750.00
	2	Replacement of 200m of 450mm pipeline	from Eighth to Tenth Avenue	along the Priority Bus Route			\$187,500.00
	3	Replacement of 1300m of 450mm pipeline along the St. Joseph Old	from Success Laventille School	to the Mac Foods outlet			\$1,218,750.00
	4	Replacement of 1km of 525mm mains	along the Eastern Main Road	west of Arigo Junction			\$937,500.00
	5	Replacement of 500m of 525mm pipeline	from Temple Street	to Quesnel Street in Arima			\$468,750.00
	6	Replacement of 200m of 525mm pipeline	on Quarry Road	starting just north of Quarry Booster			\$187,500.00
		Diego Martin Valley					
	1	Installation of 2000m of 300mm DI transmission main	from Simeon Road	to Cameron Tank.			\$3,000,000.00
	2	Installation of 1700m of 200mm PVC distribution main to replace 200 AC	from Four Roads Pumping station	to Majuba Cross Road.			\$1,700,000.00
	3	Installation of 1200m of 300mm DI transmission main	from River Estate P/Station	to Cicada Drive			\$900,000.00
	4	Installation of 800m of 150mm PVC distribution main	along the North Post Road.				\$624,000.00
	5	Installation of 300m of 300mm DI transmission main	from Cicada Drive	to the River Estate Reservoir.			\$450,000.00
	6	Installation of 720m of 150mm PVC distribution main	along Blue Basin Ext. Road	from North Post Road Junction.			\$561,600.00
	7	Installation of 1000m of 300 DI transmission main	from Cor. Western Main Rd. and Mome Coco Rd Jn.	to Four Roads P/Station.			\$1,500,000.00
	8	Installation of 1000m of 150mm PVC main distribution main	from Mome Coco Rd Jn	to Four Roads P/Station.			
	9	Installation of 400m of 150mm PVC transmission main	to newly proposed Quarry Road Booster				\$312,000.00
	10	Installation of 2500m of 300mm transmission main	along St. Lucien Road linking Sierra Leone Road	and River Estate P/Station.			\$1,875,000.00
	11	Installation of 600m of 300mm DI transmission main	along Majuba Cross Road linking Mome Coco Road	and St Lucien Road.			\$900,000.00
	12	Installation of 900m of 300mm DI transmission main	along Sierra Leone Road linking Diego Martin Main Road	and Mome Coco Road.			\$675,000.00
	13	Installation of 500m of 200mm transmission main	from Cicada Drive along North Post Road	to provide suction to Salandy Trace Booster			
	14	Installation of 1.3km of 300mm DI transmission mains	along Mome Coco Road from Saut D'Eau Road maraval	to Le Platte Booster			
	15	Installation of 900m of 200mm DI transmission main	from Le Platte Booster	to Cameron Tank			
		Tucker Valley					
	1	Installation of 5200m of 400mm DI transmission main	from Tucker Valley Pumping Station	to Hartscut Booster.			\$2,300,000.00
	2	Installation of 1600m of 300mm DI transmission main	from Hartscut Booster	to Tetron Barracks.			\$2,100,000.00
	3	Installation of 6000m of 200mm PVC distribution main	from Tucker Valley Pumping Station	to Tetron Barracks.			\$3,000,000.00
		Sub Total North Pipelines			\$42,542,600.00	\$10,000,000.00	\$18,947,600.00
							\$37,200,000.00
							\$39,068,750.00
PORT OF SPAIN NETWORK							
	2	Port of Spain Network			\$10,000,000.00	\$5,000,000.00	\$5,000,000.00
		TOTAL PORT OF SPAIN			\$10,000,000.00	\$5,000,000.00	\$5,000,000.00
SOUTH PIPELINES							
	1	Install 9km of 400mm DI main	from Joe Singh Caroni South Bank Road	to the Curepe intersection along the South Bank Road			\$5,875,000.00
	2	Installation of 1.2km of 400mm DI	from South Trunk Road	to Palmiste			\$2,100,000.00
	3	Install 4.8km of 400mm DI main	from Palmiste	to Wallington Road along the Dumfries Road			\$4,200,000.00
	4	Install 0.9km of 300mm DI main	from the corner of Cutbin Road & St Joseph Road	to London Street along St Joseph Road			\$1,350,000.00
	5	Install 4km of 300mm DI main	from Boodooosingh Road	to Soboo along the Southern Main Road			\$6,000,000.00
	6	Install 12km of 400mm DI main	from Vessigny to Frisco Junction	along the Southern Main Road			\$2,000,000.00
	7	Install 1.5km of 300mm DI main	from Reform Village to Union Road	along the Tabaquite Guaracara Road			\$2,250,000.00
		Sub Total South Pipelines			\$50,000,000.00	\$10,000,000.00	\$11,700,000.00
							\$10,075,000.00
							\$9,287,500.00
SAN FERNANDO NETWORK							
	4	San Fernando Network			\$10,000,000.00		
		GRAND TOTAL SAN FERNANDO			\$10,000,000.00	\$5,000,000.00	\$0.00
							\$0.00
EXTREMITIES OF THE NETWORK							
		Extremities of the Pipeline Network			\$16,000,000.00		
	1	Laying of 2.7km of (transmission) 12" D.I.	From Corner Quare Rd. and Valencia Old Road	to Plantation Road, along the Valencia Old Road			\$2,025,000.00
	2	Installation of 5200m of 200mm PVC distribution main	along Carapo Road and linking to the Caroni North Bank Road.				\$1,625,000.00
	3	Laying of 5.0km of 8" PVC mains	from Talparo Booster	to Mundo Nuevo			\$1,000,000.00
	4	Laying of 4.3 km of 150mm PVC distribution mains	from Corner Quare Rd. and Valencia Old Rd	to Tattoo Trace along Valencia Old Rd.			\$1,677,000.00
		Sub Total			\$16,000,000.00	\$5,000,000.00	\$1,625,000.00
							\$3,575,000.00
							\$4,702,000.00
RURAL AREAS							
		Rural Areas			\$10,000,000.00		
	1	Laying of 4.5km of 8" dia PVC main	from Tamana Intake to Carmichael Rd. along Tamana Rd. , Cumuto Main Road	Tamana Section & Road			\$4,500,000.00
	2	Laying of 5.5km of 6" dia PVC main	from Cottage Road to Papourie Road along Cipero Road	to Coryal Junction			\$4,250,000.00
	3	Install 4km of 200mm PVC pipeline	from Cottage Road to Papourie Road along Cipero Road	and from Cipero Road to New Colonial Road along Papourie			\$902,400.00
		Sub Total			\$10,000,000.00	\$2,500,000.00	\$902,400.00
							\$11,887,600.00
							\$0.00
SUB TOTAL PIPELINE REPLACEMENT PROGRAMME					\$140,192,600.00	\$39,150,000.00	\$39,825,000.00
							\$67,737,600.00
							\$53,058,250.00

SEWERAGE SECTOR INITIATIVES									
NHA Plants	1	Adoption of NHA Wastewater Treatment Plants		\$110,000,000.00				\$15,000,000.00	\$83,000,000.00
OPOSS	2	Greater Port of Spain (lateral Replacement)		\$31,500,000.00				\$4,500,000.00	\$27,000,000.00
SAFEQE		Integration of the East West Corridor Sewerage Study						\$12,000,000.00	
WASA Plants	3	Refurbish existing plants		\$32,000,000.00	\$7,000,000.00	\$7,000,000.00		\$6,500,000.00	\$18,500,000.00
Private Plants	4	Private Packaged Plants		\$24,000,000.00	\$15,000,000.00	\$15,000,000.00		\$4,500,000.00	\$4,500,000.00
SUB TOTAL SEWERAGE SECTOR INITIATIVES				\$197,500,000.00	\$22,000,000.00	\$22,000,000.00		\$42,500,000.00	\$133,000,000.00
INSTITUTIONAL STRENGTHENING									
TRINIDAD	1	Trinidad (Masterplan)		\$78,500,000.00				\$22,715,000.00	\$22,715,000.00
	2	MIS			\$2,500,000.00	\$2,500,000.00		\$3,000,000.00	
	3	SCADA			\$2,500,000.00	\$2,500,000.00			
	3	Masterplan			\$8,000,000.00	\$8,000,000.00			
	4	Institutional Programs			\$1,500,000.00	\$1,500,000.00		\$2,870,000.00	
	5	Accommodation			\$8,500,000.00	\$8,500,000.00		\$2,600,000.00	
	6	Environmental			\$1,600,000.00	\$1,600,000.00			
		Sub Total		\$78,500,000.00	\$24,600,000.00	\$24,600,000.00		\$31,185,000.00	\$22,715,000.00
GRAND TOTAL TRINIDAD				\$986,057,530.80	\$231,924,962.80	\$231,924,962.80		\$292,673,385.11	\$461,459,182.00
TOBAGO									
MAJOR WATER SOURCES DEVELOPMENT									
Wells	1	Further Well Development Bacolet: 1.0 imgd (4.5 ML/D)		\$8,000,000.00	\$8,000,000.00	\$8,000,000.00			
	2	Courland Well Development: 2 imgd (9.0 ML/D)							
	3	Well Development between L'Anse Fourmi to Charlotteville: 0.5 imgd (2.25 ML/D)							
	4	Well Development Campbellton: 1 imgd (4.5 ML/D)		\$8,000,000.00					\$8,000,000.00
		Sub Total		\$16,000,000.00	\$8,000,000.00	\$8,000,000.00		\$0.00	\$8,000,000.00
Intakes and Water Treatment Plant	1a	Development of intake at Louis D'Or River and Construction of a Water Treatment Plant: 0.75 imgd (3.375 ML/D)		\$3,375,000.00	\$3,375,000.00	\$3,375,000.00			
	1b	Design of Louis D'Or Water Treatment Plant		\$375,000.00	\$375,000.00	\$375,000.00			
	2	Installation of 5km of 200mm pipeline from Richmond to Goodwood		\$5,000,000.00	\$2,500,000.00	\$2,500,000.00			\$2,500,000.00
	3a	Development of intake at Sandy River and Construction of a Water Treatment Plant: 0.40 imgd (1.80 ML/D)		\$3,600,000.00				\$3,600,000.00	
	3b	New Booster Station in Bel Aire and Storage Tank		\$400,000.00	\$400,000.00	\$400,000.00			
	4	Installation of 0.5km of 200mm pipeline to integrate into the network		\$500,000.00				\$500,000.00	
	5	Upgrade equipment at Water Treatment Plant Bloody Bay		\$750,000.00	\$750,000.00	\$750,000.00			
	6a	Upgrade clarifiers and filters at Courland Water Treatment Plant to address rainy season problems		\$2,859,000.00				\$2,859,000.00	
	6b	Design of Courland Works							
		Sub Total		\$16,859,000.00	\$7,400,000.00	\$7,400,000.00		\$6,959,000.00	\$2,500,000.00
SUB TOTAL MAJOR WATER SOURCES				\$32,859,000.00	\$15,400,000.00	\$15,400,000.00		\$6,959,000.00	\$10,500,000.00
DISTRIBUTION EXPANSION									
BOOSTER STATIONS									
Cove Industrial Park	1	New Booster Station at Government Farm: 2 imgd (9.0 ML/D)		\$1,500,000.00	\$1,500,000.00	\$1,500,000.00			
		Sub Total		\$1,500,000.00	\$1,500,000.00	\$1,500,000.00		\$0.00	\$0.00
L'Anse Fourmi to Charlotteville	PHASE 1								
Parlatuvier, Castara	3	Refurbish Booster Station between Bloody Bay to Parlatuvier		\$350,000.00				\$350,000.00	
		Sub Total		\$350,000.00	\$0.00	\$0.00		\$350,000.00	\$0.00
	PHASE 2								
L'Anse Fourmi to Charlotteville	3	Construction of a Booster Station at Hermitage: 0.5 imgd (2.25 ML/D)							
Parlatuvier, Castara				\$0.00	\$0.00	\$0.00		\$0.00	\$0.00
SUB TOTAL BOOSTER STATIONS				\$1,850,000.00	\$1,500,000.00	\$1,500,000.00		\$350,000.00	\$0.00
SERVICE RESERVOIRS									
L'Anse Fourmi to Charlotteville	PHASE 2								
Parlatuvier, Castara	4	Construction of a Service Reservoir at Hermitage: 0.5 imgd (2.25 ML)							
		Sub Total		\$0.00	\$0.00	\$0.00		\$0.00	\$0.00
SUB TOTAL RESERVOIRS				\$0.00	\$0.00	\$0.00		\$0.00	\$0.00
SUB TOTAL DISTRIBUTION EXPANSION				\$1,850,000.00	\$1,500,000.00	\$1,500,000.00		\$350,000.00	\$0.00

LEAK DETECTION PROGRAMME								
PROCUREMENT OF LEAK DETECTION EQUIPMENT	1	Leak Detection Equipment Tobago		\$5,000,000.00	\$2,000,000.00	\$2,000,000.00	\$3,000,000.00	
		Sub Total		\$5,000,000.00	\$2,000,000.00	\$2,000,000.00	\$3,000,000.00	\$0.00
BULK METERING		Procurement and Installation of Bulk Meters on the main transmission systems as follows:						
	1	Tobago Hillsborough - 11		\$1,125,000.00			\$1,125,000.00	
	2	Tobago Courland - 8		\$1,125,000.00			\$1,125,000.00	
	3	Tobago Richmond - 2		\$750,000.00			\$750,000.00	
		Procurement of Bulk Meters		\$1,000,000.00	\$1,000,000.00	\$1,000,000.00		
		Sub Total		\$4,000,000.00	\$1,000,000.00	\$1,000,000.00	\$3,000,000.00	\$0.00
PIPELINE REPLACEMENT	1	Pipeline Replacement Tobago		\$10,000,000.00	\$2,500,000.00	\$2,500,000.00	\$7,500,000.00	
		Sub Total		\$10,000,000.00	\$2,500,000.00	\$2,500,000.00	\$7,500,000.00	\$0.00
DOMESTIC METERING	1	Tobago		\$10,500,000.00				\$10,500,000.00
		Procurement of Domestic Meters		\$3,500,000.00	\$0.00	\$0.00	\$3,500,000.00	
		Sub Total		\$14,000,000.00	\$0.00	\$0.00	\$3,500,000.00	\$10,500,000.00
SUB TOTAL LEAK DETECTION PROGRAMME				\$33,000,000.00	\$5,500,000.00	\$5,500,000.00	\$17,000,000.00	\$10,500,000.00
PIPELINE REPLACEMENT								
TOBAGO PIPELINE REPLACEMENT 20Mn								
	1	Hope Winward Road to Mt St. George Greenhill (5km of 400mm)		\$2,000,000.00			\$2,000,000.00	
	2	Government Farm to Signal Hill (3km of 400mm)		\$3,000,000.00			\$3,000,000.00	
	3	Installation of 17km of 300mm pipeline from L'Anse Fourmi to Charlotteville		\$9,000,000.00	\$9,000,000.00	\$9,000,000.00		
		Sub Total		\$14,000,000.00	\$9,000,000.00	\$9,000,000.00	\$5,000,000.00	
Cove Industrial Park	1a	Installation of 16km of 500mm pipeline	Bacolet	\$8,595,700.34	\$4,297,850.17	\$4,297,850.17	\$4,297,850.17	
	1b	Procurement of Ductile Iron Pipes & Fittings						
	3a	Upgrade Courland Transmission Pipeline to integrate Bacolet supply: 3km of 400mm		\$2,940,000.00				\$2,940,000.00
	3b	Procurement of Ductile Iron Pipes & Fittings						
		Sub Total		\$11,535,700.34	\$4,297,850.17	\$4,297,850.17	\$4,297,850.17	\$2,940,000.00
L'Anse Fourmi to Charlotteville		PHASE 1						
Parlatuvier, Castara	1	Upgrade pipes within Castara: 1km of 100mm		\$700,000.00			\$700,000.00	
		Sub Total		\$700,000.00	\$0.00	\$0.00	\$700,000.00	\$0.00
L'Anse Fourmi to Charlotteville		PHASE 2						
Parlatuvier, Castara	1	Installation of 12km of 300mm pipeline	Bloody Bay Charlotteville	\$14,400,000.00			\$12,400,000.00	\$2,000,000.00
	2	Installation of 2km of 300mm transmission pipeline	Cambelton Charlotteville	\$2,400,000.00				\$2,400,000.00
	3	Drill and Equip one well		\$5,000,000.00	\$1,000,000.00	\$1,000,000.00		\$4,000,000.00
		Sub Total		\$21,800,000.00	\$1,000,000.00	\$1,000,000.00	\$12,400,000.00	\$8,400,000.00
SUB TOTAL PIPELINE REPLACEMENT				\$48,035,700.34	\$14,297,850.17	\$14,297,850.17	\$22,397,850.17	\$11,340,000.00

SEWERAGE SECTOR INITIATIVES									
NHA PLANTS		Adoption of NHA Wastewater Treatment Plants			\$20,000,000.00	\$5,000,000.00	\$5,000,000.00		\$12,000,000.00
SOUTH WEST		Implementation of South West Tobago			\$27,000,000.00	\$20,000,000.00	\$20,000,000.00	\$10,000,000.00	
WASA PLANTS		Refurbish existing plants			\$4,000,000.00	\$2,500,000.00	\$2,500,000.00		\$1,500,000.00
PRIVATE PLANTS		Private Packaged Plants			\$5,000,000.00	-	-		\$5,000,000.00
SUB TOTAL SEWERAGE SECTOR INITIATIVES					\$56,000,000.00	\$27,500,000.00	\$27,500,000.00	\$10,000,000.00	\$18,500,000.00
INSTITUTIONAL STRENGTHENING									
TOBAGO	1	Tobago			\$15,000,000.00			\$3,000,000.00	\$3,000,000.00
	2	Network Modelling				\$1,000,000.00	\$1,000,000.00		\$4,000,000.00
	3	Asset Management				\$1,000,000.00	\$1,000,000.00		\$1,000,000.00
	4	SCADA				\$500,000.00	\$500,000.00	\$1,500,000.00	
		Sub Total			\$15,000,000.00	\$2,500,000.00	\$2,500,000.00	\$4,500,000.00	\$8,000,000.00
GRAND TOTAL TOBAGO					\$186,744,700.34	\$66,697,850.17	\$66,697,850.17	\$61,206,850.17	\$58,840,000.00
GRAND TOTAL TRINIDAD AND TOBAGO					\$1,172,802,231.14	\$298,622,812.97	\$298,622,812.97	\$353,880,235.28	\$520,299,182.00
PROJECT MANAGEMENT SERVICES - 5% OF TOTAL COST OF WORKS					\$58,640,111.56	\$14,931,140.65	\$14,931,140.65	\$17,694,011.76	\$26,014,959.10
TOTAL THREE YEAR INVESTMENT PLAN					\$1,231,442,342.70	\$313,553,953.62	\$313,553,953.62	\$371,574,247.04	\$546,314,141.10
SUPPLEMENTAL UNDER PSIP 2003/2004: DRY SEASON AND WELL DEVELOPMENT									
WELLS									
Wallerfield/ Cumuto Wells	1	Well development within Wallerfield: 5.35 imgd (24.075 ML/D)				\$15,265,466.30	\$15,265,466.30		
Rehabilitate	1	Arima #6				\$984,680.00	\$984,680.00		
wells in North	2	Wallerfield #9				\$1,023,824.90	\$1,023,824.90		
& South	3	St. Clair #1				\$1,019,330.00	\$1,019,330.00		
Trinidad	4	Diego Martin #9				\$1,703,254.50	\$1,703,254.50		
	5	Palo Seco #3				\$2,260,496.00	\$2,260,496.00		
	6	Freeport #9				\$1,077,215.50	\$1,077,215.50		
	7	Freeport #15				\$1,395,268.00	\$1,395,268.00		
	8	Clarke Rd #5				\$1,498,177.00	\$1,498,177.00		
	9	Carlsen Field #2				\$1,239,141.70	\$1,239,141.70		
	10	Carlsen Field #8				\$1,290,411.00	\$1,290,411.00		
	11	El Socorro #4				\$1,079,216.00	\$1,079,216.00		
	12	El Socorro #7				\$1,056,160.00	\$1,056,160.00		
	13	Freeport #1				\$1,480,039.00	\$1,480,039.00		
	14	Freeport Todds Rd #9				\$1,201,317.00	\$1,201,317.00		
	15	Freeport Todds Rd #13				\$1,160,471.00	\$1,160,471.00		
	1	Development of Matura Well #3: 0.14 imgd (0.63 ML/D)				\$1,179,212.00	\$1,179,212.00		
	1	Rehabilitation of wells at Chatham #3: 0.331 imgd (1.49 ML/D)				\$2,721,207.00	\$2,721,207.00		
	2	Rehabilitation of wells at Point Fortin #9: 0.143 imgd (0.644 ML/D)				\$1,054,548.00	\$1,054,548.00		
		Rehabilitation of wells at Point Fortin #13: 0.143 imgd (0.644 ML/D)				\$1,176,956.00	\$1,176,956.00		
						\$40,866,390.90	\$40,866,390.90		
	2	Courland Well Development: 2 imgd (9.0 ML/D)				\$16,359,000.00	\$16,359,000.00		
WTP	2	Construction of Water Treatment Plant Cumuto: 4 imgd (18.0 ML/D)				\$9,870,266.25	\$9,870,266.25		
Boosters	3	Construction of a new booster station at South Oropouche: 12 imgd (54ML/D)				\$923,652.00	\$923,652.00		
						\$10,793,938.25	\$10,793,938.25		

WATER QUALITY								
	Caroni				\$6,000,000.00	\$6,000,000.00	\$32,521,739.13	
	Las Lomas				\$2,000,000.00	\$2,000,000.00	\$4,000,000.00	
	Penal				\$2,000,000.00	\$2,000,000.00	\$3,000,000.00	
	Courland				\$5,500,000.00	\$5,500,000.00	\$3,000,000.00	
	Project Management Services: Consultants, quantity surveying						\$7,878,260.87	
					\$15,500,000.00	\$15,500,000.00	\$50,400,000.00	\$57,000,000.00
NHA WASTEWATER PLANTS								
	Consultancy Services				\$8,000,000.00	\$8,000,000.00		
	Operation and Maintenance of the Additional Treatment Plants & Lift Stations				\$15,000,000.00	\$15,000,000.00		
					\$23,000,000.00	\$23,000,000.00	\$0.00	\$0.00
BUILDING PROGRAMME								
YEAR 1								
	1 Construction of a new Laboratory				\$7,000,000.00	\$7,000,000.00		
YEAR 2								
	1 NRV Maintenance Building						\$1,500,000.00	
	2 Commercial Department at Head Office						\$800,000.00	
	3 Sangre Grande Area Office						\$750,000.00	
	4 New South Regional Office						\$10,000,000.00	
	5 D'Abadie Tacarigua Area Office						\$1,500,000.00	
	6 Renovation of Water Sector Modernization Unit						\$2,500,000.00	
	7 Lowlands Major Maintenance Workshop						\$2,430,000.00	
	8 Courland Accommodation						\$100,000.00	
	9 Hillsborough Environmental Office						\$1,000,000.00	
					\$7,000,000.00	\$7,000,000.00	\$20,580,000.00	\$26,000,000.00
	TOTAL BROUGHT FORWARD FROM 3 YEAR PLAN				\$1,231,442,342.70	\$313,553,953.62	\$371,574,247.04	\$546,314,141.10
GRAND TOTAL					\$313,553,953.62	\$313,553,953.62	\$371,574,247.04	\$546,314,141.10

APPENDIX II

WATER REVENUE REQUIREMENTS 2007-2011

Table 1. ANALYSIS OF CHANGE IN REVENUE REQUIREMENTS

CUSTOMER CATEGORY	2003	2004	2004	2005	2005	2007	2007	2008	2008	2009	2009	2010	2010	2011	2011
	Base Year														
Domestic Demand	TOTAL REVENUE	TOTAL REVENUE	% CHANGE	TOTAL REVENUE	% CHANGE	TOTAL REVENUE	% CHANGE	TOTAL REVENUE	% CHANGE	TOTAL REVENUE	% CHANGE	TOTAL REVENUE	% CHANGE	TOTAL REVENUE	% CHANGE
A4 Metered Internal	\$ 15,613,516.00	\$ 12,554,261.14	-20%	\$ 13,241,767.12	5%	\$ 45,173,169.05	241%	\$ 49,445,816.01	9%	\$ 55,291,702.01	12%	\$ 61,373,789.23	11%	\$ 68,124,906.04	11%
A1 Standpipes	\$ 6,625,353.00	\$ 1,551,511.04	-77%	\$ 1,636,476.06	5%	\$ 5,582,699.74	241%	\$ 6,110,732.32	9%	\$ 6,833,192.73	12%	\$ 7,584,843.93	11%	\$ 8,419,176.76	11%
A2 Yard Tap	\$ 5,828,062.00	\$ 28,025,591.72	381%	\$ 29,560,350.47	5%	\$ 100,842,636.52	241%	\$ 110,380,709.54	9%	\$ 123,430,813.60	12%	\$ 137,008,203.10	11%	\$ 152,079,105.44	11%
A3 Unmetered Internal	\$ 120,284,185.00	\$ 233,048,247.73	94%	\$ 245,810,612.97	5%	\$ 838,562,124.58	241%	\$ 917,876,460.75	9%	\$ 1,026,395,271.52	12%	\$ 1,139,298,751.39	11%	\$ 1,264,621,614.04	11%
A5 A6 Charitable	\$ 541,918.00	\$ 1,110,285.27	105%	\$ 1,171,087.55	5%	\$ 3,995,066.18	241%	\$ 4,372,934.46	9%	\$ 4,889,938.29	12%	\$ 5,427,831.50	11%	\$ 6,024,892.96	11%
Non-Domestic															
B Industrial	\$ 84,369,578.00	\$ 60,611,016.55	-28%	\$ 63,930,243.09	5%	\$ 218,092,619.46	241%	\$ 238,720,633.57	9%	\$ 266,944,125.91	12%	\$ 296,307,979.76	11%	\$ 328,901,857.53	11%
C Commercial	\$ 53,864,861.00	\$ 63,263,142.04	17%	\$ 66,727,606.30	5%	\$ 227,635,587.53	241%	\$ 249,166,211.19	9%	\$ 278,624,664.56	12%	\$ 309,273,377.66	11%	\$ 343,293,449.20	11%
D Cottages	\$ 3,256,967.00	\$ 926,141.89	-72%	\$ 976,859.98	5%	\$ 3,332,475.24	241%	\$ 3,647,673.18	9%	\$ 4,078,930.74	12%	\$ 4,527,613.12	11%	\$ 5,025,650.56	11%
Agriculture															
E Agriculture	\$ 2,030,856.00	\$ 2,614,802.63	29%	\$ 2,757,996.44	5%	\$ 9,408,671.70	241%	\$ 10,298,578.99	9%	\$ 11,516,160.65	12%	\$ 12,782,938.32	11%	\$ 14,189,061.54	11%
TOTAL	\$ 292,415,296.00	\$ 403,705,000.00	38%	\$ 425,813,000.00	5%	\$ 1,452,625,050.00	241%	\$ 1,590,019,750.00	9%	\$ 1,778,004,800.00	12%	\$ 1,973,585,328.00	11%	\$ 2,190,679,714.08	11%

AVERAGE BILL PER CUSTOMER CLASS (WATER 2007-2011)

Table 2. ANALYSIS OF CHANGE IN AVERAGE BILL

PERCENTAGE CHANGE OF AVERAGE BILL BASED ON PER CAPITA CONSUMPTION										
	Base Year (2005-2006)		2006-2007		2007-2008		2008-2009		2009-2010	
	\$	% Change	\$	% Change	\$	% Change	\$	% Change	\$	% Change
Average Bill	\$ 547.00		\$ 1,513.78		\$ 1,520.16		\$ 1,506.69		\$ 1,450.93	
Percent Change		177%		0%		-0.89%		-4%		-1%

PERCENTAGE CHANGE OF AVERAGE BILL BASED ON METERED CONSUMPTION										
	Base Year (2005-2006)		2006-2007		2007-2008		2008-2009		2009-2010	
	\$	% Change	\$	% Change	\$	% Change	\$	% Change	\$	% Change
Average Bill	\$ 547.00		\$ 1,513.78		\$ 1,574.65		\$ 1,544.09		\$ 1,450.93	
Percent Change		177%		4%		-2%		-6%		0%

PERCENTAGE CHANGE OF AVERAGE BILL BASED ON COMMERCIAL CONSUMPTION										
	Base Year (2005-2006)		2006-2007		2007-2008		2008-2009		2009-2010	
	\$	% Change	\$	% Change	\$	% Change	\$	% Change	\$	% Change
Average Bill	\$ 938.97		\$ 3,357.52		\$ 3,552.30		\$ 3,632.35		\$ 3,664.15	
Percent Change		258%		6%		2.25%		1%		-10%

PERCENTAGE CHANGE OF AVERAGE BILL BASED ON INDUSTRIAL CONSUMPTION										
	Base Year (2005-2006)		2006-2007		2007-2008		2008-2009		2009-2010	
	\$	% Change	\$	% Change	\$	% Change	\$	% Change	\$	% Change
Average Bill	\$ 3,608.44		\$ 17,613.35		\$ 18,057.02		\$ 17,885.72		\$ 16,451.05	
Percent Change		388.12%		2.52%		-1%		-8%		2%

PERCENTAGE CHANGE OF AVERAGE BILL BASED ON AGRICULTURAL CONSUMPTION										
	Base Year (2005-2006)		2006-2007		2007-2008		2008-2009		2009-2010	
	\$	% Change	\$	% Change	\$	% Change	\$	% Change	\$	% Change
Average Bill	\$ 189.39		\$ 1,623.30		\$ 1,705.12		\$ 1,029.21		\$ 969.95	
Percent Change		757%		5%		-39.64%		-6%		5%

PERCENTAGE CHANGE OF AVERAGE BILL BASED ON PONT LISAS CONSUMPTION										
	Base Year (2005-2006)		2006-2007		2007-2008		2008-2009		2009-2010	
	\$	% Change	\$	% Change	\$	% Change	\$	% Change	\$	% Change
Average Bill	\$ 145,046.23		\$ 379,606.07		\$ 410,379.74		\$ 425,840.47		\$ 405,274.67	
Percent Change		162%		8%		4%		-5%		8%

REVENUE REQUIREMENTS PER CUSTOMER CLASS (WASTEWATER) 2007-2011

Table 3. ANALYSIS OF CHANGE IN REVENUE REQUIREMENTS

		2003	2004	2004	2005	2005	2007	2007	2008	2008	2009	2009	2010	2010	2011	2011
		BASE YEAR Total Revenue	Total Revenue	% Change	Total Revenue	% Change	Total Revenue	% Change	Total Revenue	% Change	Total Revenue	% Change	Total Revenue	% Change	Total Revenue	% Change
Domestic Customers																
A4	Metered Internal	\$ 2,368,520.00	\$ 965,441.71	-59%	\$ 1,182,796.91	23%	\$ 3,396,444.86	187%	\$ 4,668,746.81	37%	\$ 5,289,619.79	14%	\$ 6,160,741.25	16%	\$ 6,947,026.80	13%
A3	Unmetered Internal	\$ 11,967,177.00	\$ 18,575,821.26	55%	\$ 22,757,688.09	23%	\$ 65,360,141.93	187%	\$ 89,637,776.52	37%	\$ 101,776,245.09	14%	\$ 118,537,274.06	16%	\$ 133,665,996.78	13%
X	Other Institutions	\$ 61,425.00	\$ 70,577.27	15%	\$ 86,466.72	23%	\$ 249,292.36	187%	\$ 340,571.18	37%	\$ 366,690.27	14%	\$ 450,372.39	16%	\$ 507,652.69	13%
Industrial & Commercial Customers																
B	Industrial	\$ 19,707,655.81	\$ 5,801,914.26	-72%	\$ 6,863,104.03	23%	\$ 19,707,655.81	187%	\$ 27,032,082.80	37%	\$ 30,692,663.28	14%	\$ 35,747,310.25	16%	\$ 40,309,682.29	13%
C	Commercial	\$ 14,787,739.34	\$ 4,203,424.73	-72%	\$ 5,149,764.87	23%	\$ 14,787,739.34	187%	\$ 20,283,660.22	37%	\$ 23,030,410.32	14%	\$ 26,823,175.26	16%	\$ 30,246,574.23	13%
D	Cottages	\$ 469,530.00	\$ 93,517.52	-80%	\$ 114,571.63	23%	\$ 328,996.66	187%	\$ 451,269.55	37%	\$ 512,379.06	14%	\$ 596,760.25	16%	\$ 672,923.81	13%
Agriculture Customers																
E	Agricultural	\$ 11,243.00	\$ 9,303.25	-17%	\$ 11,397.75	23%	\$ 32,729.05	187%	\$ 44,892.93	37%	\$ 50,972.19	14%	\$ 59,366.55	16%	\$ 66,943.41	13%
		\$ 27,699,079.00	\$ 29,520,000.00		\$ 36,166,000.00		\$ 103,852,000.00		\$ 142,449,000.00		\$ 161,739,000.00		\$ 188,375,000.00		\$ 212,417,000.00	

AVERAGE BILL PER CUSTOMER CLASS (WASTEWATER) 2007-2011

Table 4. ANALYSIS OF CHANGE IN AVERAGE BILL

PERCENTAGE CHANGE ANALYSIS FOR THE AVERAGE BILL FOR THE PERIOD 2006-2011

	Base Year (2005-2006)	% Change	2006-2007	% Change	2007-2008	% Change	2008-2009	% Change	2009-2010	% Change	2010-2011
DOMESTIC											
A2	\$ 305.39	382.0%	\$ 1,471.96	0.3%	\$ 1,476.19	-0.2%	\$ 1,473.55	-0.8%	\$ 1,462.11	-1.5%	\$ 1,439.67
A3	\$ 305.39	382.0%	\$ 1,471.96	0.3%	\$ 1,476.19	-0.2%	\$ 1,473.55	-0.8%	\$ 1,462.11	-1.5%	\$ 1,439.67
A4	\$ 2,568.89	-42.7%	\$ 1,471.96	0.3%	\$ 1,476.19	-0.2%	\$ 1,473.55	-0.8%	\$ 1,462.11	-1.5%	\$ 1,439.67
A5	\$ 293.90	400.8%	\$ 1,471.96	0.3%	\$ 1,476.19	-0.2%	\$ 1,473.55	-0.8%	\$ 1,462.11	-1.5%	\$ 1,439.67
A6	\$ 293.90	400.8%	\$ 1,471.96	0.3%	\$ 1,476.19	-0.2%	\$ 1,473.55	-0.8%	\$ 1,462.11	-1.5%	\$ 1,439.67
INDUSTRIAL											
B3	\$ 298,600.85	-4.4%	\$ 285,531.58	-6.5%	\$ 267,066.98	-6%	\$ 249,796.10	-6.5%	\$ 233,638.99	-6.5%	\$ 218,520.50
B4	\$ 298,600.85	-4.4%	\$ 285,531.58	-6.5%	\$ 267,066.98	-6%	\$ 249,796.10	-6.5%	\$ 233,638.99	-6.5%	\$ 218,520.50
COMMERCIAL											
C1	\$ 5,478.97	-73.1%	\$ 1,471.96	0.3%	\$ 1,476.19	0%	\$ 1,473.55	-0.8%	\$ 1,462.11	-1.5%	\$ 1,439.67
C2	\$ 5,478.97	-73.1%	\$ 1,471.96	0.3%	\$ 1,476.19	0%	\$ 1,473.55	-0.8%	\$ 1,462.11	-1.5%	\$ 1,439.67
C3	\$ 5,478.97	-73.1%	\$ 1,471.96	0.3%	\$ 1,476.19	0%	\$ 1,473.55	-0.8%	\$ 1,462.11	-1.5%	\$ 1,439.67
C4	\$ 5,478.97	-73.1%	\$ 1,471.96	0.3%	\$ 1,476.19	0%	\$ 1,473.55	-0.8%	\$ 1,462.11	-1.5%	\$ 1,439.67
COTTAGE											
D3	\$ 1,771.81	-16.9%	\$ 1,471.96	0.3%	\$ 1,476.19	0%	\$ 1,473.55	-0.8%	\$ 1,462.11	-1.5%	\$ 1,439.67
D4	\$ 1,771.81	-16.9%	\$ 1,471.96	0.3%	\$ 1,476.19	0%	\$ 1,473.55	-0.8%	\$ 1,462.11	-1.5%	\$ 1,439.67
AGRICULTURAL											
E3	\$ 1,124.30	30.9%	\$ 1,471.96	0.3%	\$ 1,476.19	0%	\$ 1,473.55	-0.8%	\$ 1,462.11	-1.5%	\$ 1,439.67
E4	\$ 1,124.30	30.9%	\$ 1,471.96	0.3%	\$ 1,476.19	0%	\$ 1,473.55	-0.8%	\$ 1,462.11	-1.5%	\$ 1,439.67

**APPENDIX IV
FIXED ASSETS SCHEDULE**

WATER AND SEWERAGE AUTHORITY																
SCHEDULE SHOWING MOVEMENTS OF FIXED ASSETS																
FIXED ASSETS SCHEDULE																
AND DEPRECIATION CHARGES.																
FOR PERIOD 01/10/2002 TO 30/09/2003																
SUMMARY																
COST																
DEPRECIATION																
WASA ONLY	1	2	3	4	5	6	7	8	9	10	11	12	13	WRITTEN DOWN VALUE		
ASSET CATEGORY	Opening Balance	CURRENT YEAR	Balance b/f	OFFICE FUR/QUIP	Addition	Inter Category	Disposals	Balance	Balance b/f	CHARGE THIS YEAR	Disposals	Adjustment	Balance at 30/09/03	30/09/02	30/09/03	
ALCIE	as at 1/10/2002	ADJUSTMENTS	1/10/2002	Recurrent	1/10/02-30/09/03	Transfers		AS AT 30/09/03	1/10/2002	AS AT 30/09/03			Acc. Deprec			
REFER WATER SOURCE AND SUPPLY LIFE																
SOIN 100- Intangibles	N/A	11,732,959	11,732,959					11,732,959	(7,339,220)	(2,056,917)			(9,396,137)	4,393,739	2,336,822	
SOLL 101- Land & Land Rights	N/A	6,195,891	6,195,891					6,195,891						6,195,891	6,195,891	
SOSI 102- Structures & Improvem	30	88,976,504	88,976,504		2,055,226			88,976,504	(19,396,816)	(2,455,597)			(21,852,413)	69,579,688	67,124,091	
SOCR 103- Collection Reservoirs	30	433,370,623	433,370,623					435,425,849	(342,228,879)	(1,421,516)			(343,650,395)	91,141,744	91,775,454	
SORS 104- Rivers & Springs Intake	30	5,832,941	5,832,941		7,730,982			5,832,941	(4,557,072)	(39,999)			(4,597,071)	1,275,869	1,235,870	
SOB/W 105- Boreholes & Wells	20/25	142,727,785	142,727,785					150,458,767	(33,153,522)	(5,178,497)			(38,332,019)	109,574,263	112,126,748	
SOSM 106- Supply Mains	30	4,502,027	4,502,027					4,502,027	(3,301,367)	(18,008)			(3,319,375)	1,200,660	1,182,652	
		693,338,729	693,338,729		9,786,208			703,124,937	(409,976,876)	(11,170,534)			(421,147,410)	283,361,854	281,977,527	
WATER PUMPING LIFE																
PINT 200- Intangibles	N/A	8,027,400	8,027,400					8,027,400	(2,009,147)	(2,670,565)			(4,679,712)	6,018,253	3,347,688	
PULL 201- Land & Land Rights	N/A	1,504,652	1,504,652					1,504,652						1,504,652	1,504,652	
PSTI 202- Structures & Improvem	20	61,349,007	61,349,007		1,213,156			62,562,163	10,767,750	(2,614,911)			(13,382,661)	50,581,257	49,179,502	
PEEQ 203- Electrical Pump Equipme	15	16,934,616	16,934,616	408,859				17,343,474	(13,045,696)	(214,022)			(13,259,718)	3,888,920	4,083,756	
POEQ 204- Other Pump Equipme	15	8,934,962	8,934,962					8,934,962	(5,325,339)	(237,092)			(5,562,431)	3,609,623	3,372,531	
		96,750,637	96,750,637	408,859	1,213,156			98,372,652	(31,147,932)	(5,736,590)			(36,884,522)	65,602,705	61,488,130	
WATER TREATMENT LIFE																
WTIN 300- Intangible	N/A	15,233,841	15,233,841					15,233,841	(5,269,711)	(4,736,823)			(10,026,534)	9,944,130	5,207,307	
WTLL 301- Land & Land Rights	N/A	2,284,756	2,284,756					2,284,756						2,284,756	2,284,756	
WTSI 302- Structures & Improvem	20	367,287,838	367,287,838		8,199,671			375,487,509	(49,744,505)	(15,867,867)			(65,612,372)	317,543,333	309,875,137	
WTEQ 303- Water Treatment & Equ	15	25,443,178	25,443,178	48,808	26,426			25,518,412	(20,335,769)	(236,890)			(20,572,659)	5,107,409	4,945,753	
		410,249,613	410,249,613	48,808	8,226,097			418,524,518	(75,369,985)	(20,841,580)			(96,211,565)	334,879,628	322,312,953	

			COST								DEPRECIATION					WRITTEN DOWN VALUE	
WASA ONLY			1	2	3	4	5	6	7	8	9	10	11	12	13	30/09/02	30/09/03
ASSET CATEGORY			Opening Balance as at 1/10/2002	CURRENT YEAR ADJUSTMENTS	Balance b/f 1/10/2002	OFFICE FUR/QUIP Recurrent	Additions 1/10/02-30/09/03	Inter Category Transfers	Disposals	Balance AS AT 30/09/03	Balance b/f 1/10/2002	CHARGE THIS YEAR AS AT 30/09/03	Disposals	Balance at 30/09/03 Acc. Deprec			
ALCIE																	
REFER	WATER TRANS/ DISTRIBUTION	LIFE															
TDIN	400- Intangibles	N/A	49,639,986		49,639,986				9,387,784		59,027,770	(14,796,619)	(16,153,651)		(30,950,270)	34,843,367	28,077,500
TDLL	401- Land & Land Rights	N/A	1,451,871		1,451,871					1,451,871						1,451,871	1,451,871
TDSI	402- Structures & Improvem	30	19,928,022		19,928,022					19,928,022	(14,110,284)	(2,179,260)		(16,289,544)	5,817,738	3,638,478	
TDRT	403- Distribution Res.&T	20	11,083,410		11,083,410					11,083,410	(9,018,371)	(46,075)		(9,064,446)	2,065,039	2,018,964	
TDTM	404- Transmission Mains	30	621,905,800		621,905,800				77,770,903	(333,606)	699,343,098	(88,788,266)	(9,755,712)		(98,543,978)	533,117,534	600,799,120
TDDM	405- Distribution Mains	30	105,196,326		105,196,326				34,390,034		139,586,360	(36,481,456)	(1,305,376)		(37,786,832)	68,714,870	101,799,528
TDSE	406- Services	15	4,870,306		4,870,306					4,870,306	(4,049,183)	(6,973)		(4,056,156)	821,123	814,150	
TDME	407- Meters	20	23,221,368		23,221,368					23,221,368	(11,030,899)	(718,574)		(11,749,473)	12,190,469	11,471,895	
TDWS	408- Water Supplies		92,245,160		92,245,160				376,660	(53,800)	92,568,021	(8,045,896)	(2,601,337)		(10,647,233)	84,199,264	81,920,788
TDCV	409- Curb Valves Installations		7,968,508		7,968,508					526,037	8,494,545	(1,136,101)	(451,549)		(1,587,650)	6,832,407	6,906,895
			937,510,757		937,510,757				122,451,418	(387,405)	1,059,574,770	(187,457,075)	(33,218,507)		(220,675,582)	750,053,682	838,899,188
	GENERAL	LIFE															
GINT	500- Intangibles	N/A	37,592,101		37,592,101				15,086		37,607,187	(37,464,434)	(63,833)		(37,528,267)	127,667	78,920
GLLR	501- Land & Land Rights	N/A	3,153,641		3,153,641					3,153,641						3,153,641	3,153,641
GSTI	502- Structures& Improvem	30	85,333,014		85,333,014		34,349			85,367,363	(29,103,783)	(1,673,447)		(30,777,230)	56,229,231	54,590,133	
GOSB	503- Office & Stores Build	30	6,488,349		6,488,349					6,488,349	(4,666,990)	(72,238)		(4,739,228)	1,821,359	1,749,121	
GHWO	504- Housing for WWV Opera	30	2,750,500		2,750,500					2,750,500	(2,290,595)	(3,504)		(2,294,099)	459,905	548,401	
GHAS	505- Housing for Admin. St	30	75,181		75,181					75,181	(49,610)	(1,167)		(50,777)	25,571	24,404	
GOFE	506- Office Furniture &Eq	6	9,381,534		9,381,534		597,578	1,306,634		11,285,746	(6,173,828)	(565,951)		(6,739,779)	3,207,706	4,545,967	
GSEQ	507- Stores Equipment	10	5,957,315		5,957,315		48,750	53,424		6,059,489	(4,601,033)	(295,263)		(4,896,296)	1,356,282	1,163,193	
GTGA	508- Toolshop & Garage	20	7,497,555		7,497,555		154,683			7,652,238	(3,797,601)	(162,910)		(3,960,511)	3,699,954	3,691,727	
GLAB	509- Laboratory	10	2,149,622		2,149,622					2,149,622	(1,609,136)	(94,147)		(1,703,283)	540,486	446,339	
GCOM	510- Communication	6	4,856,400		4,856,400		188,164			5,044,564	(3,497,331)	(201,391)		(3,698,722)	1,359,069	1,345,842	
GTHE	511- Transport	6	7,326,829		7,326,829					7,326,829	(6,197,789)	(16,147)		(6,213,936)	1,129,040	1,112,893	
GOEQ	512- Other Equipment	10	33,069,719		33,069,719		114,988	277,094		33,461,801	(12,849,171)	(2,577,154)		(15,426,325)	20,220,548	18,035,476	
GCEQ	513- Computer Equipment	3	19,219,407		19,219,407		31,583	694,036		19,945,026	(17,775,038)	(1,045,831)		(18,820,869)	1,444,369	1,124,157	
			224,851,168		224,851,168		1,170,095	2,346,274		228,367,537	130,076,339	6,772,983		(136,849,322)	94,774,829	91,518,215	

			COST								DEPRECIATION					WRITTEN DOWN VALUE	
WASA ONLY			1	2	3	4	5	6	7	8	9	10	11	12	13	30/09/02	30/09/03
ASSET CATEGORY			Opening Balance	CURRENT YEAR	Balance b/f	OFFICE FUR/QUIP	Addition	Inter Category	Disposals	Balance	Balance b/f	CHARGE THIS YEAR	Disposals	Balance at 30/09/03	30/09/02	30/09/03	
ALCIE	REFER		as at 1/10/2002	ADJUSTMENTS	1/10/2002	Recurrent	1/10/02-30/09/03	Transfers		AS AT 30/09/03	1/10/2002	AS AT 30/09/03			Acc. Deprac		
SEWER SYSTEM: LAND																	
		LIFE															
SCIL	600- Intangibles	N/A															
SCLL	601- Sewer Line Land & Lan	N/A	99,633		99,633					99,633						99,633	99,633
SCPL	602- Pumping Station Land	N/A	52,100		52,100					52,100						52,100	52,100
SDTL	603- Treatment Plant	N/A	2,026,539		2,026,539					2,026,539						2,026,539	2,026,539
SDGL	604- General Land	N/A	2,242,207		2,242,207					2,242,207						2,242,207	2,242,207
			4,420,479		4,420,479					4,420,479						4,420,479	4,420,479
SEWER STRUCTURES																	
		LIFE															
SCIT	700- Intangibles	N/A	2,138,357		2,138,357					2,138,357	(670,011)	(704,187)		(1,374,198)		1,468,346	764,159
SCTL	701- Trunk Lines & Appurte	30	90,251,466		90,251,466		14,588			90,266,054	(44,246,670)	(835,808)		(45,082,478)		46,004,796	45,183,576
SCLA	702- Lateral Lines & Appur	30	41,928,209		41,928,209					41,928,209	(31,886,136)	(121,291)		(32,007,427)		10,042,073	9,920,782
SCHC	703- House Connections	30	11,638,734		11,638,734					11,638,734	(8,505,917)	(134,506)		(8,640,423)		3,132,817	2,998,311
SCPS	704- Pump Station Struct.	30	3,691,202		3,691,202					3,691,202	(2,053,502)	(68,150)		(2,121,652)		1,637,700	1,569,550
SDSI	705- Treatment Stuct. & Im	30	17,212,857		17,212,857					17,212,857	(7,846,438)	(424,449)		(8,270,887)		9,366,419	8,941,970
			166,860,825		166,860,825		14,588			166,875,413	(95,208,674)	(2,288,391)		(97,497,065)		71,652,151	69,378,348
SEWER EQUIPMENT																	
		LIFE															
SDIN	800- Intangibles	N/A	4,274,361		4,274,361					4,274,361	(4,274,361)			(4,274,361)			
SDPS	801- Pumping Station	30	2,656,875		2,656,875					2,656,875	(2,177,256)	(11,710)		(2,188,966)		479,619	467,909
SDTP	802- Treatment Plant	15	7,124,679		7,124,679					7,124,679	(5,070,749)	(83,684)		(5,154,433)		2,053,931	1,970,247
SDOE	803- Other Equipment	10	6,116		6,116					6,116	(1,040)	(520)		(1,560)		5,076	4,556
			14,062,031		14,062,031					14,062,031	(11,523,406)	(95,914)		(11,619,320)		2,538,626	2,442,712
TOTAL WATER																	
			2,362,700,903		2,362,700,903	1,627,762	144,023,153	(387,405)		2,507,964,413	(834,028,207)	(77,740,194)		(911,768,400)		1,528,672,697	1,596,196,013
TOTAL SEWER																	
			185,343,336		185,343,336		14,588			185,357,923	(106,732,080)	(2,384,305)		(109,116,385)		78,611,256	76,241,539
SUB TOTAL																	
			2,548,044,239		2,548,044,239	1,627,762	144,037,741	(387,405)		2,693,322,337	(940,760,286)	(80,124,499)		(1,020,884,785)		1,607,263,953	1,672,437,552
			1	2	3	4	5	6	7	8	9	10	11	12	13		
Note	Column	Cost															
	1	Asset Cost Value b/f			2,548,044,239									BF 01/10/2002			30/09/2003
	4	Asset Value Capitalised Recurrent Exp.			1,627,762			Column					WORK IN PROGRESS	6,022,222			BALANCE
	5	Capital Projects Capitalised for Period under review			144,037,741			9	Acc Dep Bal b/f	(940,760,286)			CAPITAL PROJECTS	219,981,565	37,351,372		257,332,937
	6	Adjustments						10	Actual Deprac Charge	(80,124,499)							
	7	Disposals Vehicles															263,355,159
	8	Net Asset Value before depreciation			2,693,709,742					(1,020,884,785)							
GRAND TOTAL														226,003,787	37,351,371		1,935,792,710

APPENDIX IV (b)

ASSET TYPE	USEFUL ECONOMIC LIFE (YEARS)	
	F/A REGISTER	REVISED (AS PER OPERATIONS)
Administrative Buildings Concrete & Brick	50/30	
Administrative Building Steel & Cladding	50/30	
Wells & Boreholes (Excluding Mechanical & Electrical Equipment) Wells in South	30	20
Las Lomas Wells & Boreholes (Excluding Mechanical & Electrical Equipment) Wells in North Trinidad	30	25
Pipes, water mains & sewers Cast Iron	30	50
Pipes, water mains & sewers Ductile Iron	30	50
Pipes, water mains & sewers PVC	30	50
Pipes, water mains & sewers steel	30	50
Reservoirs and Dams	30	
Structures(e.g.. Civil works Exc. M & E)	50/30	
Mechanical & Electrical Plant & Equipment (Large Booster Stations and Water treatment plants)	15	20
Mechanical & Electrical Plant & Equipment (Equipment in waterwells)	15	15
Bulk Meters	10	20
Office Equipment	6	
Meters (revenue) & Curb Valves	15	

ASSET TYPE	USEFUL ECONOMIC LIFE (YEARS)	
	F/A REGISTER	REVISED (AS PER OPERATIONS)
Tool Shop Equipment	10	20
Garage Equipment	10	5
Laboratory Equipment	10	
Computers Printers Plotters	3	
Stores Equipment	10	
Trucks and Heavy Transport	0	
Medium Transport	6	
Light Vehicles (in cars)	6	
Transport Equipment	6	

Notes: 1) A salvage value of cost is required on all Assets, except the category of computers and peripheral equipment which carry a nil residual value

2) The Straight Line Method of depreciation is used over the stipulated useful life of the asset, noting that consideration is given to a 15% salvage value.

APPENDIX III

AQUARIUS 3 FINANCIAL MODEL

Aquarius 3 has been developed to support the price setting process for the 2004 price review and beyond.

It comprises two spreadsheet models linked by a database and graphical user interface. The two models are the:

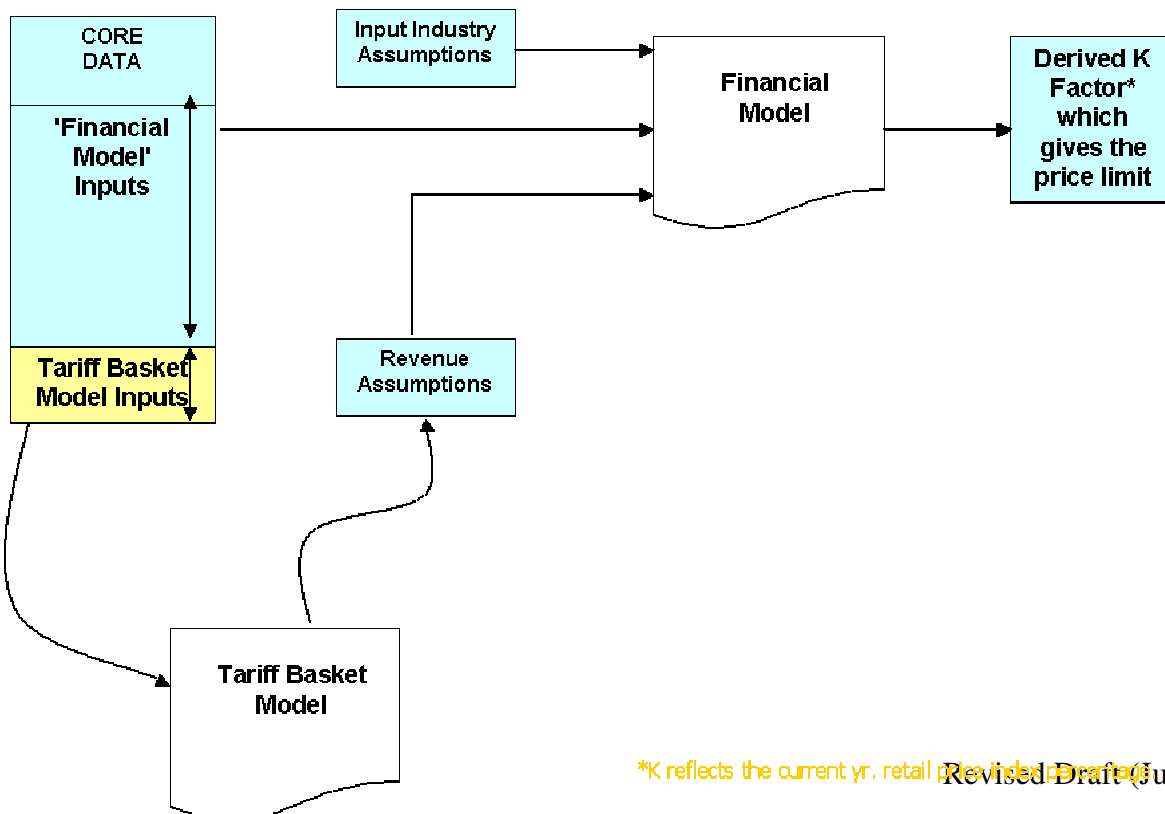
- Tariff basket model; and
- Financial model.

The structure of Aquarius 3 is shown in flowchart F0. The equations in the financial model do not link directly to the equations in the tariff basket model.

The financial model retrieves the information it needs from the database once the tariff basket model has been run and a revenue dataset created.

Figure 1. Structure of Aquarius 3 Financial Model

HOW AQUARIUS 3 CALCULATES TARIFF RATES



K Factor

The model calculates the K factor systematically by first calculating Tariff Basket Revenues and Non Tariff Basket Revenues using the Tariff Basket Model feature in Aquarius 3.

Tariff basket model

The Tariff Basket Model uses the inputs to derive forecast revenues, charges etc. which will be input into the Financial Model component of the Aquarius 3 Model

The principal outputs from the tariff basket model are:

- Forecast tariff basket revenue streams; and
- Forecast non-tariff basket revenue streams.

An illustration of the operations of the Tariff Basket model is given in figure 2 and figure 3.

Figure 2. Tariff Basket Inputs

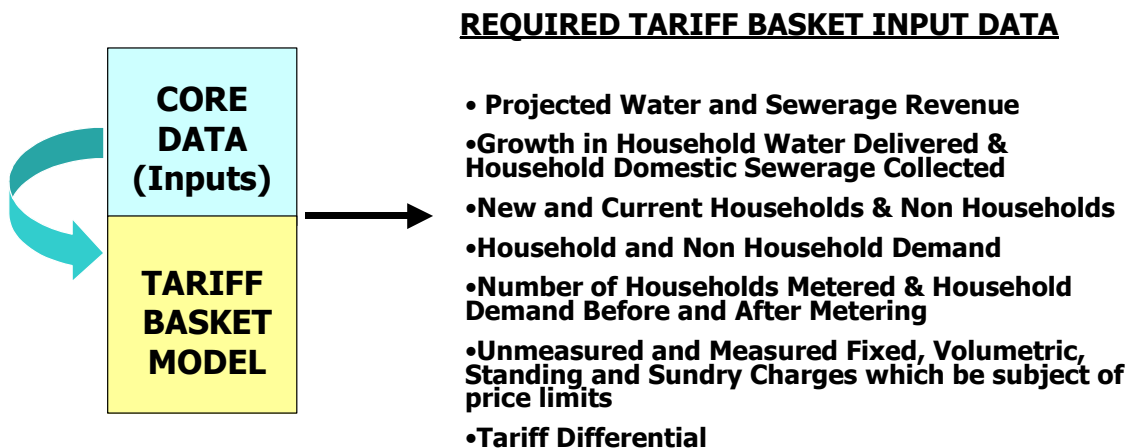
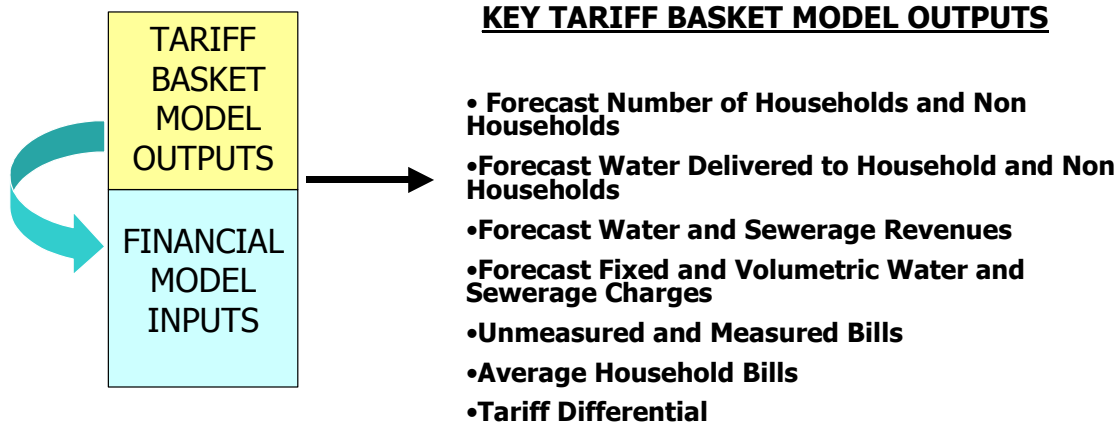


Figure 3. Tariff Basket Outputs



Financial Model

The Financial Model Inputs are then uploaded into the Aquarius 3 Model, where it uses the revenue and expenditure inputs to generate financial statements, including cash flows. The model also generates various reports.

The main decision making reports generated by the Aquarius 3 Financial Model for use by management are:

1. Quality Control Report
2. Revenue Requirement
3. Cash Flow Statement
4. Profit and Loss
5. Balance Sheet

An illustration of the operations Financial Model is given in figure 4 and figure 5.

Figure 4. Financial Model Inputs

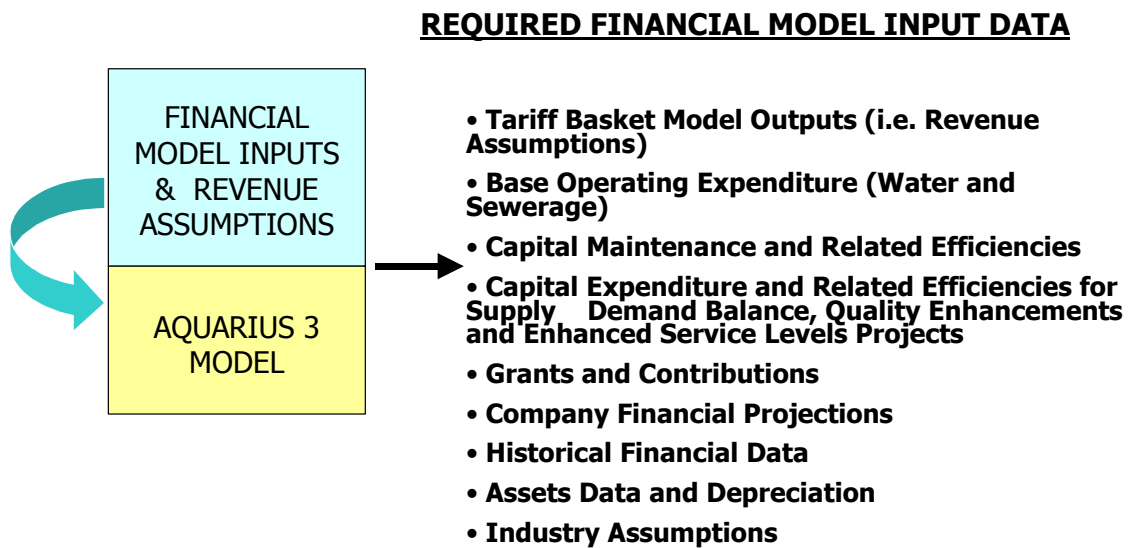
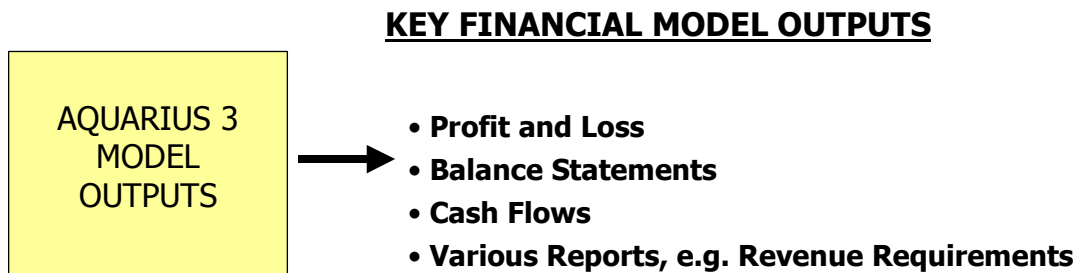


Figure 5. Financial Model Outputs



Description of AQ3 Reports

Revenue Requirement Report

This Report shows:

- a. K factor which is the amount by which the Authority can increase (or must decrease its average charge above (or below) inflation each year to finance it's services and meet its legal obligation.
- b. Revenue Requirement for water services
- c. Revenue Requirements for sewerage services
 - The financial model uses both accounting and economic costs to derive the Authority's true operating coat and the revenue required to meet these costs.
 - The financial model uses both accounting and economic costs to derive the Authority's true operating cost and the revenue required to meet these costs.

Quality Control Report

This report is the audit sheet of the model and checks that all the key data has been entered in the model.

Cash flow Statement

This report shows:

- a. Net cash flow from operating activities
- b. Returns on investment and servicing of finance
- c. Capital expenditure and financial investment
- d. Financing

Profit and Loss

This report shows:

- Total Turnover
- Operating Costs including Capital Maintenance
- Profit on Ordinary Activities before Interest
- Net Interest
- Profit on Ordinary Activities before Tax
- Profit for the year
- Retained Profit
- Final K Factor.

Balance Sheet

This Report shows:

- Fixed Assets
- Current Assets
- Creditors: Amounts falling due with one year
- Net Current Assets
- Creditors: Amount falling due after one year
- Provisions for liabilities and charges
- Capital and Reserves
- Final K Factor

APPENDIX V

SUPPLY/DEMAND REPORT

1. Methodology

The demand forecast includes a breakdown by area and category of customers;

- Domestic customer demand is derived from expected per capita demand of each domestic consumer category. The study focuses on the likely changes in the consumption of each category of consumers, due to metering, Tariff increases, upgrade of existing connections, regularisation of unregistered connections after the cadastre study, etc. and
- Non-domestic customer demand on macro-economic forecasts. The key variables are, present estimated consumption and the forecast growth in industrial and commercial activity in Trinidad and Tobago.

2. Sources of information

The key sources of information used in the demand forecast include:

- Reports from previous studies, especially studies conducted by JICA (Japan International Cooperation Agency), Delcan, and Halcrow;
- The WASA Water Demand Survey, including phase 1 on the Customer Demand Monitor carried out by TTWS;
- Recent information on customer classification, number of connections for each category for water and sewerage services, provided by the Customer Service Division;
- The forecast increase in supply capacity from information provided in the 3 year Investment programme;
- The projection of consumption provided by the industrial customers at Point Lisas;
- The estimation of UFW from previous studies including the pilot study programme on DMA management undertaken by the operations division; and
- Extensive discussion and review by members of the Executive Management Group

A model has been developed in Microsoft Excel. It highlights the basic data and main assumptions of the demand and supply of water so that updates can be easily facilitated as more information becomes available.

3. Domestic Customers

In developing the demand forecast, four main factors/impacts were identified as causing changes in the number and the structure of WASA's domestic demand. For Domestic customers the following:

- New connections;
- Upgrade of existing connections;
- Regularization of illegal connections; and
- Installation of meters on existing connections
- New Housing Developments

Domestic demand is impacted upon by the following factors:

- Changes in household income;
- The tariff level for metered customers
- Government Housing policy

The elasticity of demand (EOD) for water is -30% and is expected to:

- Reduce the demand by metering customers
- Unmetered consumers will continue to consume due to the lack of incentive to decrease consumption.

3.1 Unaccounted for Water (UFW)

UFW is estimated at 55% in 2005-2006. A plan to reduce UFW is expected to result in a figure of 48% by 2015.

System Balance should come into place in 2015 this would be as a result of:

- Pipe replacement and repair programme.
- The increase in the supply capacity;
- Reduction in demand resulting from the metering programme; and
- District Metering Area (DMA) programme.

It is estimated that supply and demand will balance around 2015.

Despite current attempts to increase the supply to meet the demand, a shortfall exists due to:

- An estimated increase in the Domestic demand of between 15% - 20%
- An estimated reduction of between 10% - 15% in supply depending on the severity of the dry season
- High level of leakage of the pipeline network.

4 Domestic Demand

The demand of domestic customers cannot be calculated from the commercial departments database, as less than 1% of account categories are currently metered.

Thus the estimates per capita demand for each category of consumers are based on studies conducted by Halcrow, Delcan, London Economics & Castalia and WASA. Most of these studies refer to the 1990-1991 JICA project. From the above information the following estimates are provided.

Table 1 shows per capita demand for various categories of consumers.

Customer Class	Water Demand * (l/h/d)
Internal metered	282
Standpipe metered	361
Yard tap unmetered	305
Internal unmetered	376
Illegal connection	376

* Litres per head per day

It is estimated that metering of domestic customers can result in a reduction of usage of between 15% - 20%.

The actual consumption of water may be lower in areas with a scheduled supply. However, private storage tanks are used extensively throughout the country to reduce the impact of scheduling. It is estimated that, about three quarters of connections have storage tanks with an average capacity of three or four days' use. It is the unconstrained demand (the demand if there were no restrictions on supply) that is forecasted. Consequently, for both reasons, no reduction in demand due to scheduling is considered in one of the scenarios of the demand forecast.

It should be noted, that the estimated per capita usage of unmetered customers varies slightly between studies. This may reflect sampling variances and/or changing consumption patterns. A demand monitor study will be necessary for accurate estimates of the average demand for internal metered connections.

4.1 Future per capita demand

In the future, average demand per capita will be affected by:

- Changes in the household incomes; and
- The Tariff level for metered customers.

As the focus is on unconstrained demand and not on actual usage, the improvement in the quality of supply is studied here. An improved supply will first allow WASA to reduce shortages of water and to meet a higher proportion of the unconstrained demand, and later to meet the full demand.

4.2 Impact of the changes in household incomes

Increases in average household income are likely to have an impact on average per capita demand. The increase in household income can be estimated from the forecasted GDP growth rate: i.e. 2% per year in real terms (or 7% per year in nominal terms).

In the demand forecast, it has been assumed that the effective impact of the increase in household income on demand depends on the category of connection:

- For connections metered internal plumbing (A4), unmetered internal plumbing (A3) and yard taps (A2), demand will rise in line with increase in GDP; and
- For standpipe users- it is unlikely that standpipe users will increase their consumption in the future (*the demand estimate for standpipes includes the quantity of water carried away by users but not water used at the standpipe location, which is part of the unaccounted for water*). This is partially because, A1 customers who have higher needs /ability to pay for water will tend to seek an individual connection for standpipe users is assumed to remain constant in the future.

Present Situation

At present, most metered connections with internal plumbing (i.e. A4) are in fact not residential customers but small businesses that are not VAT registered.

4.4 Capital investment domestic metering

The capital investment programme includes a component of domestic metering, where by:

- 85,000 meters will be installed on domestic accounts in Trinidad & Tobago

When metered these accounts are transferred from A3 (internal plumbing-unmetered) to the A4 category (internal plumbing-metered).

The average use of water customers with internal plumbing is 376 litres per capita per day, whereas it is only 282 litres per capita per day for metered customers. This suggests that the average demand of one connection can be reduced by 25%, by the installation of a meter.

4.5 Price elasticity of demand

An increase in the price of water is expected to impact differently on the average demand of customers, depending on the type of connection:

- Metered customers, will benefit directly from reduced usage; while
- Unmetered customers will continue to consume, as they will have no incentive to decrease usage.

An elasticity of demand to price of -30% (1998 London Economics & Castalia Tariff Studies) for domestic customers has been assumed. This figure means that each time the Tariff increases

by 10%, demand decreases by 3%. Such a rate has commonly been observed in other countries, where Tariff adjustments have been implemented.

This may be a conservative assumption in Trinidad, compared to the JICA estimate of 73%. However, JICA figure (1990) included both the impact of installation of a meter and subsequent Tariff increases, whereas WASA's estimate applies to the consumption of a metered customer facing a Tariff increase.

International experience suggests that customers are not sensitive to proportionately low rates of increase, in particular to a rate of increase at or below the rate of inflation. Consequently, if tariffs increase by 10% in nominal terms and the inflation rate is 3%, customers will in fact react to a real increase of 7% and demand will only decrease by 2.1%.

5. Non-Domestic Demand

5.1 Point Lisas

Demand forecasting in Point Lisas has been taken from WASA's demand forecast model.

All customers in Point Lisas are already metered, so no change is assumed due to metering. The assumed elasticity of Point Lisas' demand is likely to be low compared with other categories of customers in Trinidad. Elasticity of demand is estimated at 5%.

Up to 2020, we have assumed that demand will rise at a steady rate of 3% per year.

5.2 Non-domestic demand (excl. Point Lisas).

The demand for other non-domestic consumers has been forecast using:

- Estimates of actual present consumption
- Assumed annual increase for each category of consumers of 2.5% per year, except for commercial activities in Tobago which are assumed to increase by 5% per year.

The demand forecast takes into account the future tariff increase. Demand elasticity is assumed to be -10%. Figure 3 shows the non-domestic demand.

6.0 Supply

WASA provides water from over 100 surface and/or groundwater sources. Most of these supply an integrated transmission and distribution system that covers the main populated areas in the country.

Other local plants supply remote areas in; the North East and South East of Trinidad, as well as in Tobago.

6.1 Supply Capacity

The current volume of water produced is partially based on estimated values, as not all facilities are metered. During the dry season (January-June), some sources have a reduced output, due to the lower level of water in rivers and impounding reservoirs. It is generally assumed that output is reduced by 10% during this period. The recommended output and possible dry season throughout.

6.2 Unaccounted for water

WASA's unaccounted for water (UFW) was estimated at 55% in 2006. The Operations Divisions as a pilot study established 5 DMAs in 2001. The UFW derived from the results of that exercise averaged 60%. The variation was widespread ranging from 18% to as high as 90%. Without DMA's and universal metering, the actual rate of UFW is uncertain. However the current condition of the transmission and distribution system is average to poor, which seems to be consistent with a high (UFW). For the purpose of this exercise, it is assumed that UFW is 55%.

A basic analysis of the breakdown of UFW is summarised in Table 2.

	2002	2003	2004	2005	2006
Unaccounted for water	55%	55%	55%	55%	55%
Commercial Losses	6	6	6	6	6
Physical Losses	49	49	49	49	49

7.0 Customer Classifications

It is desirable to simplify customer classification, as much as possible. A proliferation of categories creates confusion, dispute, increased administrative costs and revenue loss.

Consideration may have to be given to abolishing some of the categories with the exception of standpipe users and the industrial consumers in Point Lisas.

The demand forecast is based on existing categories as existing data is in that form.

In the demand forecast, there are a number of factors influence changes in the number and the structure of WASA's domestic accounts, these are:

- New connections
- Installation of metres on existing connections.

7.1 New Connections

The increase in the number of connections will result from:

- The estimated annual population increase of 1.2% per annum. This is expected to result in an equivalent number of new households in WASA's service area;
- The extension of WASA's network. This is expected to increase connections by 0.2% per year; and
- Government Housing Programme (projected 10,000 new houses per annum).

The percentage of the population has access to potable water is 90% in 2006/2007.

7.2 Upgrade of existing customer class/category

WASA will also upgrade the class of many of its existing standpipe and yard tap customers. This forecast include the following targets:

- Standpipe users will be reduced from 20% of all households in 2006/2007 to 16% in 2010/2011.
- Yard tap connections will be reduced more quickly: from 7% in 2006 to 1% in 2009/10 onwards. Parts of this "upgrading" is merely administrative work, as it is likely that many connections registered as yard taps have already been improved with internal plumbing.

7.3 Regularisation of illegal consumers

It is estimated that 10% of the population of Trinidad and Tobago is presently supplied through unregistered or illegal connections. This is assumed to include:

- 118,000 persons (equivalent to 29,400 households) in Trinidad; and
- 5000 persons (equivalent to 1,500 households) in Tobago.

It is likely that such premises consume as much water as households do with unmetered internal plumbing.

Estimates of the global demand for illegal consumers' of water is projected to be approximately 14% of the domestic demand.

The cadastre survey will permit the identification of most of the unregistered connections. WASA will be able to proceed immediately with their regularization, which consists mainly of integrating those connections into the customer file. It is assumed that the regularization will be completed within 2 years. By 2008/09, the number of illegal connections is expected to stabilize at around 2% of all connections. This level of illegal connections would be a respectable performance compared with similar countries.

The benefits from regularisation are significant: only 3750 illegal connections should remain in 2006/07. The total "illegal demand" will decrease to about 3%.

8.0 Total supply and demand

In this section total unconstrained demand forecast is discussed according to the assumptions presented above, and compared to the future supply capacity and UFW.

The base scenario corresponds to the data and assumptions presented above.

8.1 Demand per connection

Demand per domestic connection is calculated for each category of customer, according to the corresponding per capita demand and the average household size. Average household size of 4.1 heads per household is assumed to remain constant for all years and consumer categories.

8.2 Domestic demand

The total demand of domestic customers form:

- The average demand per capita per connection, for each category; and
- The number of connections per category.

8.3 Total non-domestic demand

Non-domestic demand is expected to remain stable based on current consumption patterns.

8.4 Total water supply

The water supply capacity in Trinidad and Tobago is forecast using;

- The recommended output of existing facilities. For facilities where actual production exceeded the recommended rate of use in 2006/2007, it has been assumed that the recommended output will be used in the future; and
- The forecast output of new facilities and extensions to existing plants.

A planned expansion of the water supply is assumed to take place during the forecast period 2007-2011. This is based on estimates of increase demand. The supply projections take into account the production of water through desalination and other projects.

The supply forecast takes into account, the reduction in output during the dry season. During the dry season (January-June), some sources have a reduced output due to lower levels of surface water. It is generally assumed that during this period, the output is reduced by 20%, which is taken into account by decreasing average annual output by 10%.

8.5 Reduction of unaccounted for water

The UFW rate is estimated at 55% in 2006. This includes:

- Technical losses in the transmission and distribution system;
- The consumption by unregistered connections; and
- Standpipe losses.

Several programmes in WASA's capital expenditure programme deal with reduction of UFW. WASA expects that total losses will be reduced to 48% in 2015 and will continue to fall. The UFW reduction strategy involves three elements:

- Identification and regularisation of illegal connections. Identification will be achieved through the cadastre survey.
- A short-term leakage reduction program. This programme focuses on rapid detection and fixing of leaks, so as to minimise water losses. We assume that the programme will be completed over a 4-year period, from 2006/07 to 2009/10, and will be the main cause of the reduction in technical losses during that period; and
- Medium and long term programmes for rehabilitating the transmission and distribution network. Although such programmes have already started, real reduction in technical losses will only appear when substantial parts of the network have been rehabilitated. WASA considers that, as long as only part of a main pipe or distribution network area is replaced, leaks simply move from that section to another weak section. Therefore it is assumed that the gains from rehabilitation will first appear in 2008, and will keep increasing afterwards.

In the demand forecast, it is assumed that the rehabilitation works and the Water Loss Reduction programme will result in a reduction in the rate of technical losses from 44% in 2001 to 40% in 2011.

As a result, the total UFW rate should decrease from 55% in 2006/07 to 48% in 2015.

9.0 System Balance

The term system balance is used to indicate the point at which total annual demand equals total annual supply capacity.

From this study, it is evident that the demand and supply of water is impacted by a number of critical factors. The level of UFW and metering impacts upon the demand for water, while the supply of water is impacted upon by the distribution network system and the expansion projects undertaken.

Based on these exiting factors, two (2) scenarios can be derived:

- During the dry season there will be a deficit in supply to meet total demand, 172 MI/d in 2001 and 84 MI/d in 2003. The water supply capacity is 840 MI/d as of 2001 and 1032 MI/d in 2003.

- During the wet season there will be a small deficit in supply to meet total demand. The deficit is 92 MI/d in 2001 and 4 MI/d in 2003. The supply capacity is 894 MI/d in 2001 and 1086 MI/d in 2003.

Given these scenarios, it is imperative that steps be taken to address the factors that affect the demand and supply of water. On the demand side, focus should be stressed upon reducing the level of UFW and increasing the level of metering. Reducing the level of UFW will have two (2) impacts:

- Reduction in the wastage of water; and
- Extension of supply in terms of coverage.

On the supply side additional water is to be obtained from a number of projects:

- Trinidad ground water project: 70 ML/d in 2001/02;
- Desalination plant 109ML/d;
- Extension of Trinidad Ground Water project 4ML/d from 2003-2006; and
- Other small projects.

It is important that there is maintenance of the levels of production and the existing distribution system in terms of coverage.

In the future, effort should be directed toward demand side management and reduction of UFW as opposed to seeking additional supply from other sources.

GLOSSARY

Demand Forecast	Total water supply forecast to meet demand
RIC	Regulated Industries Commission
Supply Capacity	Recommended daily output of potable water
Supply Balance	The point at which total annual demand Equals total water available.
Water Availability	Total water supply less unaccounted for Water (UFW).
Tariff	The pricing structure
Unaccounted For Water (UFW)	The difference between output and legitimate Consumption.
Unconstrained Demand	Demand for the use of water without the Application of constraints

APPENDIX VI

COST OF SERVICE 2003-2004 (Desal Not Included)

Activities	Area	Operating Costs (OC)		Total Operating Cost	Apportioned Overhead Cost		Total \$
		Direct Cost	Indirect Cost		% of OC		
Water Production	Trinidad	51,924,010.00	2,917,330.00	54,841,340.00	24.84	157,857,547.93	212,698,887.93
	Tobago	2,052,950.00	175,000.00	2,227,950.00	1.01	6,413,022.07	8,640,972.07
Water Transmission	Trinidad	70,955,712.40	7,883,968.00	78,839,680.40	35.71	226,935,348.90	305,775,029.30
	Tobago	6,519,265.20	724,362.00	7,243,627.20	3.28	20,850,351.72	28,093,978.92
Water Distribution	Trinidad	44,484,300.80	4,942,699.00	49,426,999.80	22.39	142,272,690.45	191,699,690.25
	Tobago	12,879,169.00	1,431,018.00	14,310,187.00	6.48	41,191,025.42	55,501,212.42
Wastewater Collection	Trinidad	5,475,813.74	608,423.00	6,084,236.74	2.76	17,513,114.97	23,597,351.71
	Tobago	117,945.00	13,105.00	131,050.00	0.06	377,219.66	508,269.66
Wastewater Treatment	Trinidad	6,855,796.36	761,755.15	7,617,551.51	3.45	21,926,670.69	29,544,222.20
	Tobago	31,788.00	3,532.00	35,320.00	0.02	101,666.53	136,986.53
		201,296,750.50	19,461,192.15	220,757,942.65		635,438,658.35	856,196,601.00

Notes:

- 1) Direct and Indirect Costs result from each specific activity.
- 2) Total Operating Cost equals Direct Cost add Indirect Cost.
- 3) % of OC represents percentage of each activity cost (e.g. Water Production) of Total Operating Cost.
- 4) Overhead Cost represents all other costs incurred by WASA not directly attributable to its Five core activities e.g. HR Division.
- 5) Desalination Cost of \$170,609,334 **is not** included in Water Production, Direct Cost, Trinidad

COST OF SERVICE 2003-2004 (Desalination Included)

Activities	Area	Operating Costs (OC)		Total Operating Cost	Apportioned Overhead Cost		Total \$
		Direct Cost	Indirect Cost		% of OC		
Water Production	Trinidad	222,533,344.00	2,917,330.00	225,450,674.00	57.61	267,769,153.74	493,219,827.74
	Tobago	2,052,950.00	175,000.00	2,227,950.00	0.57	2,646,149.93	4,874,099.93
Water Transmission	Trinidad	70,955,712.40	7,883,968.00	78,839,680.40	20.14	93,638,373.87	172,478,054.27
	Tobago	6,519,265.20	724,362.00	7,243,627.20	1.85	8,603,300.63	15,846,927.83
Water Distribution	Trinidad	44,484,300.80	4,942,699.00	49,426,999.80	12.63	58,704,752.01	108,131,751.81
	Tobago	12,879,169.00	1,431,018.00	14,310,187.00	3.66	16,996,297.22	31,306,484.22
Wastewater Collection	Trinidad	5,475,813.74	608,423.00	6,084,236.74	1.55	7,226,285.44	13,310,522.18
	Tobago	117,945.00	13,105.00	131,050.00	0.03	155,648.89	286,698.89
Wastewater Treatment	Trinidad	6,855,796.36	761,755.15	7,617,551.51	1.95	9,047,412.83	16,664,964.34
	Tobago	31,788.00	3,532.00	35,320.00	0.01	41,949.78	77,269.78
		371,906,084.50	19,461,192.15	391,367,276.65		464,829,324.35	856,196,601.00

Notes:

- 1) Direct and Indirect Costs result from each specific activity.
- 2) Total Operating Cost equals Direct Cost add Indirect Cost.
- 3) % of OC represents percentage of each activity cost (e.g. Water Production) of Total Operating Cost.
- 4) Overhead Cost represents all other costs incurred by WASA not directly attributable to its Five core activities e.g. HR Division.
- 5) Desalination Cost of \$170,609,334 is included in Water Production, Direct Cost, Trinidad

COST OF SERVICE 2003-2004 (TRINIDAD)

Water Activity	Total Cost	Surface	Ground	Desalination
Water Production	221,339,860.00	143,870,909.00	77,468,951.00	170,609,334.00
		60%	30%	10%
Water Transmission	333,869,008.22	200,321,404.92	100,160,702.46	33,386,901.00
Water Distribution	247,200,902.67	148,321,541.60	74,160,270.80	24,720,090.26
Total	802,409,770.90	348,642,946.52	174,320,973.26	58,106,991.26

COST OF SERVICE 2003-2004 (TOBAGO)

Water Activity	Total Cost	Surface	Ground	Desalination
Water Production	57,069,290.00	143,870,909.00	77,468,951.00	170,609,334.00
		60%	30%	10%
Water Transmission	15,133,307.60	200,321,404.92	100,160,702.46	33,386,901.00
Water Distribution	247,200,902.67	148,321,541.60	74,160,270.80	24,720,090.26
Total	319,403,500.27	348,642,946.52	174,320,973.26	58,106,991.26

COST OF SERVICE PER CUBIC METER (Desal Not Included)

Activities	Area	Operating Costs (OC)			Indirect Cost per m ³	Total Operating Cost	Total Operating Cost per m ³	Apportioned Overhead Cost		Total \$	Total per m ³
		Direct Cost	Direct Cost per m ³	Indirect Cost				% of OC	Amt. To be Apportioned		
Water Production	Trinidad	51,924,010.00	0.16	2,917,330.00	0.01	54,841,340.16	0.17	24.84	157,857,547.96	212,698,888.11	0.64
	Tobago	2,052,950.00	0.01	175,000.00	0.00	2,227,950.01	0.01	1.01	6,413,022.07	8,640,972.08	0.03
Water Transmission	Trinidad	70,955,712.40	0.21	7,883,968.00	0.02	78,839,680.61	0.24	35.71	226,935,348.91	305,775,029.53	0.92
	Tobago	6,519,265.20	0.02	724,362.00	0.00	7,243,627.22	0.02	3.28	20,850,351.72	28,093,978.94	0.08
Water Distribution	Trinidad	44,484,300.80	0.13	4,942,699.00	0.01	49,426,999.93	0.15	22.39	142,272,690.46	191,699,690.39	0.58
	Tobago	12,879,169.00	0.04	1,431,018.00	0.00	14,310,187.04	0.04	6.48	41,191,025.43	55,501,212.46	0.17
Wastewater Collection	Trinidad	5,475,813.74	0.02	608,423.00	0.00	6,084,236.76	0.02	2.76	17,513,114.98	23,597,351.73	0.07
	Tobago	117,945.00	0.00	13,105.00	0.00	131,050.00	0.00	0.06	377,219.66	508,269.66	0.00
Wastewater Treatment	Trinidad	6,855,796.36	0.02	761,755.15	0.00	7,617,551.51	0.02	3.45	21,926,670.64	29,544,222.15	0.09
	Tobago	31,788.00	0.00	3,532.00	0.00	35,320.00	0.00	0.02	101,666.53	136,986.53	0.00
		201,296,750.50	0.61	19,461,192.15	0.06	220,757,943.24	0.66		635,438,658.35	856,196,601.59	2.58

Notes:

- 1) Direct and Indirect Costs result from each specific activity.
- 2) Total Operating Cost equals Direct Cost add Indirect Cost.
- 4) Overhead Cost represents all other costs incurred by WASA not directly attributable to its Five core activities e.g. HR Division.
- 5) Desalination Cost of \$170,609,334 **is not** included in Water Production, Direct Cost, Trinidad
- 6) WASA total water production of 332,003,856 m³ per year was used to calculate unit costs

APPENDIX VII

OPERATIONAL EXPENDITURE FOR CUSTOMER CATEGORIES

YEARS	2003	2004	2005	2007	2008	2009	2010	2011
DOMESTIC	\$ 525,692,190.00	\$ 648,802,110.00	\$ 704,046,840.00	\$ 1,063,150,575.21	\$ 1,182,823,747.58	\$ 1,324,293,473.29	\$ 1,475,841,806.83	\$ 1,640,390,571.52
INDUSTRIAL	\$ 278,307,630.00	\$ 343,483,470.00	\$ 372,730,680.00	\$ 237,800,275.27	\$ 265,752,716.37	\$ 297,636,809.18	\$ 332,055,290.01	\$ 369,211,539.82
OTHER	\$ 226,769,180.00	\$ 279,875,420.00	\$ 303,706,480.00	\$ 255,526,199.51	\$ 283,892,286.05	\$ 317,813,517.52	\$ 354,063,231.17	\$ 393,494,602.74

APPENDIX IX

ALLOCATING COMMON COST

Class	No. Accounts	No. of Consumption m3 (2003)	FSE.69	Cost Apportionment Factor based on a proportion of Total Adjusted Weighted Demand
Internally Metered	3,631	5,155,544.93	5,155,544.93	0.031097611
Internally Metered	218,664	138,701,184.26	95,703,817.14	0.577273622
Yard Tap	26,509	16,679,733.91	11,509,016.40	0.069420968
Standpipe	61,841	923,398.57	637,145.01	0.00384318
Charitable Industry Charitable Industry(M)	1,413	660,798.28	455,950.81	0.002750239
B4 (Pt.Lisas + other)	296	24,000,017.78	24,000,017.78	0.144765147
Industrial	369	1,290,667.34	890,560.46	0.005371751
C4 (Pt.Lisas + other)	4,280	12,191,702.87	12,191,702.87	0.073538848
Commercial	5,713	19,982,608.37	13,787,999.77	0.083167514
Cottage(M)	426	234,486.39	234,486.39	0.001414393
Cottage	384	211,368.01	145,843.93	0.000879713
Agri Cultural Metered	441	569,952.02	569,952.02	0.00343788
Agri Cultural	565	730,210.64	503,845.34	0.003039133
Total	413,237	221,331,673.37	165,785,882.86	1

EFFICIENCY LEVELS OF COST

OPERATIONAL INDICATORS

April 2004

Performance Indicators (Average)

OPERATIONAL INDICATORS/WATER/WASTEWATER/FINANCIAL/OTHER

WATER

	INDICATORS	COMPONENTS	PERFORMANCE LEVEL 2004 (Avg)	PERFORMANCE LEVEL 2005 (Avg)	PERFORMANCE LEVEL 2006 (Avg)
1.	Coverage 1. Water Coverage	Population with easy access to water expressed as a percentage of total population	90.7 %	91.2 %	94.7 %
	2. Sewerage Coverage	Population with sewerage services expressed as a percentage of water connection	19.6 %	20.6 %	20.7 %
2.	Water Production 1. Total Water Supplied	Total Monthly water supplied to the pipeline network divided by the capacity of facilities	97.4 %	91.6 %	94.8%
3.	<u>Unaccounted for Water</u> 1. % Unaccounted for Water (UFW) 20 DMA	Total average daily flows DMA's	55 %	55 %	55%

	INDICATORS	COMPONENTS	PERFORMANCE LEVEL 2004 (Avg)	PERFORMANCE LEVEL 2005 (Avg)	PERFORMANCE LEVEL 2006 (Avg)
4.	Pipe Network Performance 1. Main Repairs	$\frac{\text{No. of pipe breaks}}{\text{Length of network}}$.45 breaks per km/period

	INDICATORS	COMPONENTS	PERFORMANCE LEVEL 2004 (Avg)	PERFORMANCE LEVEL 2005 (Avg)	PERFORMANCE LEVEL 2006 (Avg)
5.	<u>Water Quality</u> % of samples in compliance with WHO guidelines.	No. of samples in compliance with the guidelines-	97.9 %	92..3 %	97 %
6.	<u>**Quality of Service</u> Number of people receiving a 24/7 water supply	# of people receiving 24/7 water supply divided by Total Population	27.1 %	26 %	18.4 %
	2. Customer complaints	<u>Complaints x 100</u> Water & sewerage connections		7.5 %	7.88 %

FINANCIAL

	INDICATORS	COMPONENTS	PERFORMANCE LEVEL 2004 (Avg)	PERFORMANCE LEVEL 2005 (Avg)	PERFORMANCE LEVEL 2006 (Avg)
2.	<u>Financial Performance</u> 1. Operating Ratio	$\frac{\text{Operating Costs-Depreciation}}{\text{Operating Revenues}}$	2.0:1	2.1:1	2.2:1
	2. Current Ratio	$\frac{\text{Current Assets}}{\text{Current Liabilities}}$.16	.24	.54

WASTEWATER

	INDICATORS	COMPONENTS	PERFORMANCE LEVEL 2004 (Avg)	PERFORMANCE LEVEL 2005 (Avg)	PERFORMANCE LEVEL 2006 (Avg)
1.	<u>Pipe Network Performance</u> 1. No. of Sewerage Blockages within 24hrs Within 72hrs	$\frac{\text{No. of blockages}}{\text{Length of network}}$	70.4 78.9	82.4 87.8	
1.	<u>Customer Service</u> 1. % Increase in Customers	No. of new customers divided by Total no. of customers	.15	.07	.22
	2. % of New Connections Completed.	$\frac{\% \text{ of requests} \times 100}{\text{no. of requests for new connection}}$	80.1	71.1	86.5
	3. % of Metered Customers	$\frac{\% \text{ of metered customer}}{\text{Total customers}}$	2.8	2.8	2.8

APPENDIX XI

DIFFERENT LOANS WITH INTEREST RATES AS AT 2006

PURPOSE/ PROJECT	Lender	Date	Tenure	Principal				Interest			Lender	Date	Tenure	Principal			Interest			Security	Call Option	Comments	
				Original (\$Mn)	Capitalised Interest (\$Mn)	Mora- torium (Yrs)	Loan Amount (\$Mn)	Payment Terms	Rate	Type				Mora- torium (Yrs)	Re- financed (\$Mn)	Capitalised Interest (\$Mn)	Mora- torium (Yrs)	Rate	Type				Mora- torium (Yrs)
Capital Investment Loans																							
IBRD - WSIS Project	IBRD	01.07.90	1994 - 2009	119	None		119	Serial	7.09	Fixed		None	None	None	None			None	None		GORTT		
CDB - Leeward & Rural Water Supply Project	CDB	17.12.90	1990 - 2012	16 135	None		16 135	Serial	9.3	Fixed		None	None	None	None			None	None		GORTT	Available	Note 1
South Water Loan 1	RBTT	25.09.98	1998 - 2018	300	55		355	Balloon	11.50	Fixed	2										Sinking Fund	Not Available	
Loan 2	FINCOR		1999 - 2019					Serial	11.45	Fixed		None	None	None	None			None	None		GORTT		
* Tranche 1		07.10.99		110																			
* Tranche 2		01.11.99		233																			
				343	60	10	403				2											Available	Note 2
North Water Loan 1	UTC		2000-2020			10	412	Serial	11.40	Fixed	2	None	None	None	None			None	None		GORTT	Available	Note 3
* Tranche 1		10.04.00		85	21																		
* Tranche 2		06.06.00		100	25																		
* Tranche 3		03.08.00		145	36																		
				330	82																		
Loan 2	FINCOR	21.11.01	2001-2021	330	96	5	426	Serial	11.50	Fixed	3	None	None	None	None			None	None		GORTT	Available	Note 4
NSDP - Phase II	FCB	14.08.03	2003-2008	52	None		52	Serial	5.60	Fixed		None	None	None	None			None	None		GORTT	Available	Note 5 & 6
Total - Capital Investment Loans				1,490	293		1,783																

NOTES:

1. 45 days notice to Bank
2. Available only through open market purchase and subsequent cancellation of bonds.
3. Available only through open market purchase subsequent cancellation of bonds.
4. Available only through open market purchase subsequent cancellation of bonds.
5. Penalty terms to be determined by tender.
6. The \$52m - NSDP Phase II is a fixed rate loan issue.

PURPOSE/ PROJECT	Lender	Date	Tenure	Principal				Interest			Lender	Date	Tenure	Principal			Interest			Security	Call Option	Comments
				Original (\$Mn)	Capitalised Interest (\$Mn)	Mora- torium (Yrs)	Loan Amount (\$Mn)	Payment Terms	Rate	Type				Mora- torium (Yrs)	Re- financed (\$n)	Capitalised Interest (\$Mn)	Mora- torium (Yrs)	Rate	Type			
Working Capital Financing Loans																						
Working Capital * Tranche	FCMB		1990-2015		None			Serial	Note 5	Floating		None	None	None	None		None	None		GORTT	Available	Note 1
* Tranche		15.10.90		35			27															
* Tranche		15.11.90		13			10															
* Tranche		14.12.90		7			6															
Desalinated Facility				55			43															
* Credit Facility 1	FINCOR	14.06.02	2002 - 2003	189	None		189	None	Note 6	Floating		FINCOR	09.01.04	2003 - 2004	189		7	Floating		GORTT		Note 2
* Credit Facility 2	FINCOR	09.01.04	2004 - 2005	189	None		189		Note 6	Floating												
Deficit Financing * 2nd Qtr. 2002/03	Citicorp	27.06.03	2003 - 2013	413	None	5	413	Serial	6.75	Fixed	2	None	None	None	None		None	None		GORTT	Available	Note 3
4th Qtr. 2002/03 Deficit Financing / Desalinated Water Purchases/Trinidad Ground Water Project Payments	Citicorp	22.12.03	2003 - 2004	144	None		144	Serial	5.85	Fixed		Citicorp	20.04.04	2003 - 2018	145		5.85	Bond		GORTT	Currently Commercial Paper	
Commercial Paper / Deficit Financing	FINCOR	31.12.03	2003 - 2015	271	None	1.5	271		6.10	Fixed	1.5	None	None	None	None		None	None		GORTT	Available	Note 4
Total - Working Capital Financing loans	1,261			1,249											334							

NOTES:

- Three (3) mths written notice in accordance with Condition 13; notice shall expire on any of the dates fixed under Conditions 4 (a) or 4 (b) for payment of installments of principal and in default of proper notice 3 mths interest will be payable. Also through open market purchase and subsequent cancellation of bonds.
- The Desalinated Facility is a Credit Financing Facility.
- On the 5th Anniversary of 1st drawing. No penalty.
- On or after the 5th anniversary. Giving at least 90 dys notice in accordance with Condition 12 repay on any interest payment date falling on or after the 10th interest payment date. Penalty - 5 - 8yrs - 0.50% of principal, if prepayment takes place on or before the 16th interest payment date; 8 - 12 yrs - 0.25% if prepayment takes place after the 16th interest payment date; Also through open market purchase and subsequent cancellation of bonds.
- Interest on Series A = 1.5% below prime and Interest on Series B = 1% below prime
- 0.5% Below prime rate

PURPOSE/ PROJECT	Lender	Date	Tenure	Principal					Interest			Lender	Date	Tenure	Principal			Interest			Security	Call Option	Comments	
				Original (\$Mn)	Capitalised Interest (\$Mn)	Mora- torium (Yrs)	Loan Amount (\$Mn)	Payment Terms	Rate	Type	Mora- torium (Yrs)				Re- financed (\$n)	Capitalised Interest (\$Mn)	Mora- torium (Yrs)	Rate	Type	Mora- torium (Yrs)				
Restructuring Financing Loans																								
VESP	FINCOR	13.06.91	1991-2011	50	None		50	Balloon	Note 1	Floating		None	None	None	None		None	None		GORTT				
VESP	FINCOR	18.05.03	1993 - 2013	79	21	2	55	Serial	Note 2	Floating	2	None	None	None	None		None	None		GORTT	Available	Note 5		
IOA	Citicorp	30.04.96	1996 - 2016	342	108		450	Balloon	Note 3	Fixed/ Floating		Citicorp	07.11.01	2001 - 2021	456		None	11.75	Fixed	3	GORTT Bond			
VESP	FINCOR	08.06.98	1998 - 2013	80	13		93	Balloon	Note 4	Floating		Citicorp	30.12.01	2001 - 2026	99		None	11.75	Fixed	3	Investment Fund			
Total - Restructuring Financing Loans				551	142		648								556									

NOTES:

1. 1.5% Below average prime rate
2. 3.5% Below average prime rate
3. Fixed rate component = 12.50% and Floating rate component = 2.4% Below prime
4. The prime lending rate less 3.40% subject to a cap of 16.10% and a floor of 13.60% per annum
5. Sixty (60) dys notice in accordance with Condition 12; Must be repaid on any interest payment date falling in or after May 1994 at their principal amount accrued interest. Also through open market purchase and subsequent cancellation of bonds

APPENDIX XII

TOTAL DEBT SERVICING AS AT 2006

PARTICULARS	31	1	2	3	4	5	6	7	8	9	10	11	12	Total Expenses
		Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	
Local Prime Rate 9.5%														
		Long-Term Loan Principles Outstanding												
Bonds														
South Water 1	354,783	354,783	354,783	354,783	354,783	354,783	354,783	354,783	354,783	354,783	354,783	354,783	354,783	354,783
South Water 2	403,365	403,365	403,365	403,365	403,365	403,365	403,365	403,365	403,365	403,365	403,365	403,365	403,365	403,365
North Water 1	411,921	411,921	411,921	411,921	411,921	411,921	411,921	411,921	411,921	411,921	411,921	411,921	411,921	411,921
North Water 2	390,086	412,701	412,701	412,701	412,701	412,701	412,701	412,701	436,366	436,366	436,366	436,366	436,366	436,366
CITICORP \$413 M	413,000	413,000	426,939	426,939	426,939	426,939	426,939	426,939	426,939	441,348	441,348	441,348	441,348	441,348
CITICORP \$145 M			145,000	145,000	145,000	145,000	145,000	145,000	149,241	149,241	149,241	149,241	149,241	149,241
FINCOR \$271.4 M			271,400	271,400	271,400	271,400	271,400	271,400	279,678	279,678	279,678	279,678	279,678	279,678
NSDP \$52 M	52,000	52,000	52,000	52,000	52,000	52,000	46,800	46,800	46,800	46,800	46,800	46,800	41,600	48,539
IOA Zero-Coupon Bond	456,419	456,419	456,419	456,419	456,419	456,419	456,419	456,419	456,419	456,419	456,419	456,419	456,419	456,419
VESP	99,327	99,327	99,327	99,327	99,327	99,327	99,327	99,327	99,327	99,327	99,327	99,327	99,327	99,327
Total Principal	2,580,901	2,603,516	3,033,854	3,033,854	3,033,854	3,033,854	3,028,654	3,028,654	3,064,838	3,079,248	3,079,248	3,079,248	3,074,048	2,976,660
GORTT Loans														
FINCOR \$50 M	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000	50,000
FCB Series A \$55 M	8,469	8,235	8,015	8,015	8,015	8,015	8,015	8,015	8,015	8,015	8,015	8,015	8,015	8,070
FCB Series B \$55 M	35,884	35,185	34,849	34,849	34,849	34,849	34,849	34,849	34,849	34,849	34,849	34,849	34,849	34,963
FINCOR \$78.6M	55,386	52,617	52,617	52,617	52,617	52,617	52,617	52,617	49,848	49,848	49,848	49,848	49,848	51,694
TOTAL GORTT Loans	149,731	146,037	145,481	145,481	145,481	145,481	145,481	145,481	142,711	142,711	142,711	142,711	142,711	144,727
Principal Repayments														
South Water 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Water 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Water 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Water 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CITICORP \$413 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CITICORP \$145 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FINCOR \$271.4 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NSDP \$52 M	0	0	0	0	0	5,200	0	0	0	0	0	5,200	0	10,400
IOA Zero-Coupon Bond	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VESP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Principal	0	0	0	0	0	5,200	0	0	0	0	0	5,200	0	10,400
GORTT Loans														
FINCOR \$50 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FCB Series A \$55 M	700	225	220	0	0	0	0	0	0	0	0	0	0	1,145
FCB Series B \$55 M	1865	699	336	0	0	0	0	0	0	0	0	0	0	2,900
FINCOR \$78.6M	0	2759	0	0	0	0	0	0	2769	0	0	0	0	5,539
TOTAL GORTT Loans	2,565	3,694	556	0	0	5,200	0	0	2,769	0	0	5,200	0	9,584
Total Long Term Loans Pmts.	2,565	3,694	556	0	0	5,200	0	0	2,769	0	0	5,200	0	19,984
Sinking Fund Payments:														
South Water 1							3,777,536						3,777,536	7,555,072
South Water 2														0
North Water 1														0
North Water 2														0
CITICORP \$413 M														0
CITICORP \$145 M														0
FINCOR \$271.4 M														0
NSDP \$52 M														0
IOA Zero-Coupon Bond														0
VESP	0	0	0	0	0	0	3,777,536	0	0	0	0	0	3,777,536	7,555,072
GORTT Loans														
FINCOR \$50 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FCB Series A \$55 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FCB Series B \$55 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FINCOR \$78.6 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TOTAL GORTT Loans	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total all Sinking Fund Pmts.	0	0	0	0	0	0	3,777,536	0	0	0	0	0	3,777,536	3,777,536

PARTICULARS		1	2	3	4	5	6	7	8	9	10	11	12	Total Expenses
	31	Oct 31	Nov 30	Dec 31	Jan 31	Feb 29	Mar 31	Apr 30	May 31	Jun 30	Jul 31	Aug 31	Sep 30	
Local Prime Rate 9.5%														366
Long-Term Loan Principles Outstanding														
Bonds														
South Water 1	11.50%	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	40,800
South Water 2	11.45%	3,923	3,796	3,923	3,912	3,659	3,912	3,786	3,912	3,786	3,912	3,912	3,786	46,217
North Water 1	11.40%	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	46,959
North Water 2	11.50%	3,810	3,901	4,031	4,020	3,761	4,020	3,890	4,250	4,113	4,250	4,250	4,113	48,410
CITICORP \$413 M	6.75%	2,323	2,323	2,402	2,402	2,402	2,402	2,402	2,402	2,483	2,483	2,483	2,483	28,986
CITICORP \$145 M	5.85%			353	707	707	707	707	728	728	728	728	728	6,819
FINCOR \$271.4 M	6.10%			690	1,380	1,380	1,380	1,380	1,422	1,422	1,422	1,422	1,422	13,317
NSDP \$52 M	5.60%	247	239	247	247	231	222	215	222	215	222	222	191	2,719
IOA Zero-Coupon Bond	11.70%	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	53,401
VESP	11.75%	973	973	973	973	973	973	973	973	973	973	973	973	11,671
Total Principal		23,038	22,995	24,381	25,402	24,875	25,378	25,115	25,671	25,482	25,752	25,752	25,458	299,299
GORTT Loans														
FINCOR \$50 M	10.00%	425	411	425	423	396	423	410	423	410	423	423	410	5,003
FCB Series A \$55 M	10.04%	72	68	68	68	64	68	66	68	66	68	68	66	811
FCB Series B \$55 M	10.54%	321	305	312	311	291	311	301	311	301	311	311	301	3,688
FINCOR \$78.6M	6.0%	282	259	268	267	250	267	259	253	245	253	253	245	3,104
Total GORTT Loans		1,100	1,043	1,073	1,070	1,001	1,070	1,036	1,056	1,022	1,056	1,056	1,022	12,606
Total Interest Incurred		24,139	24,039	25,455	26,472	25,876	26,448	26,150	26,727	26,504	26,808	26,808	26,480	311,904
Interest Capitalised to Fixed Assets														
South Water 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
South Water 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Water 1	0	0	0	0	0	0	0	0	0	0	0	0	0	0
North Water 2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CITICORP \$413 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CITICORP \$145 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0
FINCOR \$271.4 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0
NSDP \$52 M	0	0	0	0	0	0	0	0	0	0	0	0	0	0
IOA Zero-Coupon Bond	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VESP	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interest Capitalised		0	0	0	0	0	0	0	0	0	0	0	0	0
Interest Expensed to Income - Current Month														
South Water 1		3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	40,800
South Water 2		3,923	3,796	3,923	3,912	3,659	3,912	3,786	3,912	3,786	3,912	3,912	3,786	46,217
North Water 1		3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	46,959
North Water 2		3,810	3,901	4,031	4,020	3,761	4,020	3,890	4,250	4,113	4,250	4,250	4,113	48,410
CITICORP \$413 M		2,323	2,323	2,402	2,402	2,402	2,402	2,402	2,402	2,483	2,483	2,483	2,483	28,986
CITICORP \$145 M		0	0	353	707	707	707	707	728	728	728	728	728	6,819
FINCOR \$271.4 M		0	0	690	1,380	1,380	1,380	1,380	1,422	1,422	1,422	1,422	1,422	13,317
NSDP \$52 M		247	239	247	247	231	222	215	222	215	222	222	191	2,719
IOA Zero-Coupon Bond		4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	53,401
VESP		973	973	973	973	973	973	973	973	973	973	973	973	11,671
Interest Expensed		23,038	22,995	24,381	25,402	24,875	25,378	25,115	25,671	25,482	25,752	25,752	25,458	299,299
GORTT Loans														
FINCOR \$50 M		425	411	425	423	396	423	410	423	410	423	423	410	5,003
FCB Series A \$11.4 M		72	68	68	68	64	68	66	68	66	68	68	66	811
FCB Series B \$43.6 M		321	305	312	311	291	311	301	311	301	311	311	301	3,688
FINCOR \$78.6 M		282	259	268	267	250	267	259	253	245	253	253	245	3,104
TOTAL GORTT Interest Expd.		1,100	1,043	1,073	1,070	1,001	1,070	1,036	1,056	1,022	1,056	1,056	1,022	12,606
Total Interest Expensed		24,139	24,039	25,455	26,472	25,876	26,448	26,150	26,727	26,504	26,808	26,808	26,480	311,904

Interest On Moratorium - Deferred/Compounded															
South Water 1															
South Water 2															
North Water 1															
North Water 2															
IOA Zero-Coupon Bond															
VESP	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Interest Compounded	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Interest Payable After Accounting for Deferrals															
Bonds															
South Water 1		3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	3,400	40,800
South Water 2		3,923	3,796	3,923	3,912	3,659	3,912	3,786	3,912	3,912	3,912	3,912	3,912	3,786	46,217
North Water 1		3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	3,913	46,959
North Water 2		3,810	3,901	4,031	4,020	3,761	4,020	3,890	4,250	4,113	4,250	4,250	4,113	3,913	48,410
IOA Zero Coupon Bond		4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	4,450	53,401
VESP		973	973	973	973	973	973	973	973	973	973	973	973	973	11,671
Total Payments		20,469	20,433	20,689	20,668	20,156	20,668	20,412	20,898	20,635	20,898	20,898	20,635	20,635	247,458
GORTT Loans															
FINCOR \$50 M		425	411	425	423	396	423	410	423	410	423	423	410	410	5,003
FCB Series A \$55 M		72	68	68	68	64	68	66	68	66	68	68	66	66	811
FCB Series B \$55 M		321	305	312	311	291	311	301	311	301	311	311	301	301	3,688
FINCOR \$78.6M		282	259	268	267	250	267	259	253	245	253	253	245	245	3,104
TOTAL GORTT Loans		1,100	1,043	1,073	1,070	1,001	1,070	1,036	1,056	1,022	1,026	1,056	1,022	1,022	12,606
Total Interest Payable - Curr. Mth.		21,569	21,476	21,762	21,738	21,157	21,738	21,447	21,954	21,657	21,954	21,954	21,657	21,657	260,064
Interest Payments															
Bonds															
South Water 1							20,400,003							20,400,003	40,800,006
South Water 2		23,155,910						23,029,375							
North Water 1		6,047,748		7,114,998		10,316,748		6,047,749		7,114,998		10,316,748			46,958,988
North Water 2															0
CITICORP \$413 M															0
CITICORP \$145 M															0
FINCOR \$271.4 M															0
NSDP \$52 M						1467967						1,306,810			2,774,777
IOA Zero Coupon Bond															0
VESP															0
Total Payments		29,203,658	0	7,114,998	0	11,784,715	20,400,003	29,077,124	0	7,114,998	0	11,623,558	20,400,003	136,719,056	
GORTT Loans															
FINCOR \$ 50 M				2,506,849						2,493,151					5,000,000
FCB Series A \$55 M															0
FCB Series B \$55 M		1,564,445	574,689	319,912				1,361,540	497,488	279,815					4,597,888
FINCOR \$78.6M			2,221,516						2,098,908						4,320,425
TOTAL GORTT Loans		1,564,445	2,796,205	2,826,761	0	0	0	1,361,540	2,596,396	2,772,966	0	0	0	0	13,918,312
Total Long Term Loans Pmts.		30,768,103	2,796,205	9,941,759	0	11,784,715	20,400,003	30,438,664	2,596,396	9,887,964	0	11,623,558	20,400,003	150,637,368	
SHORT TERM FINANCING:															
<i>Interest Cost</i>															
Commercial Paper		0	0	19,388,056	0	0	0	0	0	0	0	0	0	0	19,388,056
Desalinated Water Facility		1,338,729	1,338,729	1,338,729	483,487	597,479	719,334	837,257	959,112	1,077,035	1,198,890	1,320,744	1,438,668	1,438,668	12,648,191

APPENDIX XIII

GOVERNMENT GUARANTEED LOANS AS AT 2006

PURPOSE/ PROJECT	Lender	Date	Tenure	Principal			Interest			Lender	Date	Tenure	Principal			Interest			Security	Call Option	Comments
				Original (\$Mn)	Capitalised Interest (\$Mn)	Mora- torium (Yrs)	Loan Amount (\$Mn)	Payment Terms	Rate				Type	Mora- torium (Yrs)	Re- financed (\$n)	Capitalised Interest (\$Mn)	Mora- torium (Yrs)	Rate			
Capital Investment Loans																					
IBRD - WSIS Project	IBRD	01.07.90	1994 - 2009	119	None		119	Serial	7.09	Fixed		None	None	None	None		None	None		GORTT	
CDB - Leeward & Rural Water Supply Project	CDB	17.12.90	1990 - 2012	16 135	None		16 135	Serial	9.3	Fixed		None	None	None	None		None	None		GORTT	Available Note 1
Loan 2	FINCOR		1999 - 2019					Serial	11.45	Fixed		None	None	None	None		None	None		GORTT	
* Tranche 1		07.10.99		110																	
* Tranche 2		01.11.99		233 343	60	10	403														Available Note 2
North Water Loan 1	UTC		2000-2020			10	412	Serial	11.40	Fixed	2	None	None	None	None		None	None		GORTT	Available Note 3
* Tranche 1		10.04.00		85	21																
* Tranche 2		06.06.00		100	25																
* Tranche 3		03.08.00		145 330	36 82																
Loan 2	FINCOR	21.11.01	2001-2021	330	96	5	426	Serial	11.50	Fixed	3	None	None	None	None		None	None		GORTT	Available Note 4
NSDP - Phase II	FCB	14.08.03	2003-2008	52	None		52	Serial	5.60	Fixed		None	None	None	None		None	None		GORTT	Available Note 5 & 6
Total - Capital Investment Loans				1,190	238		1,428														

NOTES:

- 45 days notice to Bank
- Available only through open market purchase and subsequent cancellation of bonds.
- Available only through open market purchase subsequent cancellation of bonds.
- Available only through open market purchase subsequent cancellation of bonds.
- Penalty terms to be determined by tender.
- The \$52m - NSDP Phase II is a fixed rate loan issue.

PURPOSE/ PROJECT	Lender	Date	Tenure	Principal				Interest			Lender	Date	Tenure	Principal			Interest			Security	Call Option	Comments
				Original (\$Mn)	Capitalised Interest (\$Mn)	Mora- torium (Yrs)	Loan Amount (\$Mn)	Payment Terms	Rate	Type				Mora- torium (Yrs)	Re- financed (\$n)	Capitalised Interest (\$Mn)	Mora- torium (Yrs)	Rate	Type			
Working Capital Financing Loans																						
Working Capital * Tranche	FCMB	15.10.90	1990-2015	35	None		27	Serial	Note 5	Floating		None	None	None	None		None	None		GORTT	Available	Note 1
* Tranche		15.11.90		13			10															
* Tranche		14.12.90		7			6															
Desalinated Facility * Credit Facility 1	FINCOR	14.06.02	2002 - 2003	189	None		189	None	Note 6	Floating		FINCOR	09.01.04	2003 - 2004	189		7	Floating		GORTT		Note 2
* Credit Facility 2	FINCOR	09.01.04	2004 - 2005	189	None		189		Note 6	Floating												
Deficit Financing * 2nd Qtr. 2002/03	Citicorp	27.06.03	2003 - 2013	413	None	5	413	Serial	6.75	Fixed	2	None	None	None	None		None	None		GORTT	Available	Note 3
4th Qtr. 2002/03 Deficit Financing / Desalinated Water Purchases/Trinidad Ground Water Project Payments	Citicorp	22.12.03	2003 - 2004	144	None		144	Serial	5.85	Fixed		Citicorp	20.04.04	2003 - 2018	145		5.85	Bond		GORTT	Currently Commercial Paper	
Commercial Paper / Deficit Financing	FINCOR	31.12.03	2003 - 2015	271	None	1.5	271		6.10	Fixed	1.5	None	None	None	None		None	None		GORTT	Available	Note 4
Total - Working Capital Financing loans	1,261			1,249											334							

NOTES:

- Three (3) mths written notice in accordance with Condition 13; notice shall expire on any of the dates fixed under Conditions 4 (a) or 4 (b) for payment of installments of principal and in default of proper notice 3 mths interest will be payable. Also through open market purchase and subsequent cancellation of bonds.
- The Desalinated Facility is a Credit Financing Facility.
- On the 5th Anniversary of 1st drawing. No penalty.
- On or after the 5th anniversary. Giving at least 90 dys notice in accordance with Condition 12 repay on any interest payment date falling on or after the 10th interest payment date. Penalty - 5 - 8yrs - 0.50% of principal, if prepayment takes place on or before the 16th interest payment date; 8 - 12 yrs - 0.25% if prepayment takes place after the 16th interest payment date; Also through open market purchase and subsequent cancellation of bonds.
- Interest on Series A = 1.5% below prime and Interest on Series B = 1% below prime
- 0.5% Below prime rate

PURPOSE/ PROJECT	Lender	Date	Tenure	Principal					Interest			Lender	Date	Tenure	Principal			Interest			Security	Call Option	Comments
				Original (\$Mn)	Capitalised Interest (\$Mn)	Mora- torium (Yrs)	Loan Amount (\$Mn)	Payment Terms	Rate	Type	Mora- torium (Yrs)				Re- financed (\$n)	Capitalised Interest (\$Mn)	Mora- torium (Yrs)	Rate	Type	Mora- torium (Yrs)			
Restructuring Financing Loans																							
VESP	FINCOR	13.06.91	1991-2011	50	None		50	Balloon	Note 1	Floating		None	None	None	None		None	None		GORTT			
VESP	FINCOR	18.05.03	1993 - 2013	79	21	2	55	Serial	Note 2	Floating	2	None	None	None	None		None	None		GORTT	Available	Note 5	
IOA	Citicorp	30.04.96	1996 - 2016	342	108		450	Balloon	Note 3	Fixed/ Floating		Citicorp	07.11.01	2001 - 2021	456		None	11.75	Fixed	3	GORTT Bond		
VESP	FINCOR	08.06.98	1998 - 2013	80	13		93	Balloon	Note 4	Floating		Citicorp	30.12.01	2001 - 2026	99		None	11.75	Fixed	3	Investment Fund		
<u>Total - Restructuring Financing Loans</u>				551	142		648								556								

NOTES:

1. 1.5% Below average prime rate
2. 3.5% Below average prime rate
3. Fixed rate component = 12.50% and Floating rate component = 2.4% Below prime
4. The prime lending rate less 3.40% subject to a cap of 16.10% and a floor of 13.60% per annum
5. Sixty (60) dys notice in accordance with Condition 12; Must be repaid on any interest payment date falling in or after May 1994 at their principal amount accrued interest. Also through open market purchase and subsequent cancellation of bonds

APPENDIX XIV

RECEIVABLES AND COLLECTION POLICY

1.0 Executive Summary

The major financial objective of credit control policies is to be able to maintain accounts receivable at a proper level. These policies are extremely important to the Authority because of an out-of-control accounts receivable asset. This is not to say that the build up of this asset to current levels has solely been the result of inadequate credit controls. Several other factors have, and continue still to act to increase this asset: a grossly inadequate customer information system, poor billings control system, improper customer management and (probably, most important) a widely-held view that water is to be a “free” good.

In the past, the Government through subventions, would fund the Authority’s cash flow shortfalls created by operating deficits and growth in the accounts receivable. This is no longer an option and effective debt recovery policies are imperative.

The debt recovery policies proposed in this document are sensitive to the needs of the poor and disadvantaged.

The document first provides some perspectives on the issues and size of the current accounts receivable problem, the magnitude and contributory factor can be appreciated. This appreciation is necessary to understanding the direction of the policies proposed in the second section of the document and, as importantly, the need for supporting initiatives regarding social issues.

The key proposals/ policies dealt with are:

- * Arrears Liquidation Agreement
 - General policies
 - Qualified customers and standards terms
 - Special considerations
 - Pensioners
 - Employees
- * Disconnection/ Reconnection
 - general policy
 - procedures and practices

2.0 Background

2.1 General

A long persistent problem of financing the Authority's operations arises from its inability to recover its costs, as billed to its customers. This under-recovery of costs has been significant and the resulting accounts receivable forms a very large part of its current assets (refer to Table 1 below)

Part inability to liquidate these receivables and generate sufficient cash has resulted inter 'alia', in inadequate inventories of operating materials and unpaid creditors. The cause of this large receivable is as much a result of erroneous billings as it is of inadequate debt recovery practices.

TABLE 1
PROPORTION OF WORKING CAPITAL IN RECEIVABLES

Particulars	1994	1993	1992	1991	1990	1989
Accounts Receivable Gross	305.5	254.5	264.9	245.2	216.9	184.0
Accounts Receivable - Net	190.8	137.4	154.6	154.0	185.9	161.5
Current Assets	241.0	312.9	253.5	247.5	193.1	177.5

NOTE: All figures in millions of dollars

SOURCE: WASA's Financial Statements

Over the last four to five years, the receivables generally represented more than twelve months billings, as seen in Table 2 on the following page. While accounts receivable have generally exceeded 12 months worth of billings, production, distribution and administrative inputs have generally been supplied on 10-day to 30-day credit periods. This has necessitated extra external funding to maintain a resulting working capital cycle that is, on average, 345 days long. GORTT subventions has long been one of the main sources of this financing.

TABLE 2
ACCOUNTS RECEIVABLES INVESTMENT SECTOR

Transactions	1995/6	1994	1993	1992	1991	1990	1989
AR at Start	246.1	250.6	257.4	221.3	219.9	197.6	196.9
Annual Billings	349.3	142.0	148.6	179.5	127.2	143.5	147.5
Annual Collections	290.3	146.5	154.8	144	125.7	120.4	124.8
AR at Year-End	339.7	246.1	250.6	257.4	221.3	219.9	197.6
Months in Billings	16	21	20	17	21	18	16
Collections Shortfall	9.6	4.5	6.2	35.5	1.5	23.1	22.7
Change in Year-End AR level Inc./ (Dec)	93.6	(4.5)	(6.8)	36.1	1.4	22.3	32.7

The relationship between GORTT's financing and the working capital demands are depicted in Table 3 below. In any year, GORTT contributions bear a fairly close relationship to the sum of the increase in receivables and operating deficits of the previous year; differences are explained by depreciation charges and development funding.

The table clearly shows the funding provided by GORTT varying directly with the level of operating deficits of the previous year. This pattern would have been broken during this year as GORTT provided no operations-support funding to the Authority. Later analysis will show that GORTT's assumption of all the Authority's liabilities essentially remedies all past operating and capital deficits of the Authority.

TABLE 3

GORTT HISTORICAL WORKING CAPITAL SUPPORT

\$ (Millions)	1994	1993	1992	1991	1990	1989
Change in Year-End AR Investment Inc./ (Dec)	(4.5)	(6.8)	36.1	1.4	22.3	32.7
Operating Deficits		59.3	6.0	54.3	43.5	N.A.
GORTT Subventions (relates to prev. yr, deficits)	66.1	36.5	58.6	59.5	75.6	N.A.

N.A. not available

SOURCE: WASA's Financial Statements

2.2 Debt Recovery Task

Debt recovery actions are central to one of the Authority's strategic objectives: i.e. reducing the accounts receivable to acceptable levels. The Customer Accounting department has set a goal of reducing the level of accounts receivable to an equivalent of 2.5 billing periods, on average, by 1997 March 31 (Refer to Appendix 1). Whether a customer group is monthly-or quarterly-billed, that group's debt should be no more than 2.5 times its periodic billings. The level at 1996 March 31 was in excess of 17 months worth of billings.

The size of the task is somewhat formidable when one considers the following:

	\$ (Millions)
1. Accounts Receivable at 1996 March 31	\$340
2. Target at 1997 March 31	\$102

- Fiscal 1996/97 annual billings \$240 million
- Non-Domestic @ 48 percent = \$115 @ 2.5 mths = \$24
- Domestic @ 52 percent = \$125 @ 2.0 qtrs = \$78

3. Reduction required	<u>\$ 238</u>
-----------------------	---------------

Doubtful Debt Provisions

This required reduction of \$238 million is just about equal to the 1995/1996 fiscal year's-end provision for doubtful debts (\$240 million). One expected consequence of the receivables reduction goal is a significant reduction of the doubtful debt provision. By that time, it is expected that it will address more specific unrecoverable or doubtful debt situations than is possible at this time. Past billing errors, are now being written back against provisions for doubtful debts.

Reflected in the current provision (which is 71 percent of the gross accounts receivable) are concerns for (a) the full amount of A1 debt (\$41.4 million), (b) the legitimacy of billings made in respect of disaggregation, assessment, re-assessment (\$24.1 million) and (c) questionable application of the 35% rate increase (estimated at 12.0 million), the latter two affecting mainly the A3 customer. There are also grave concerns about the Authority's ability to recover debts older than three years.

These concerns are not new. Over the course of the last five years, provisions for doubtful debts have been a very significant level of gross receivables, which has inflated the asset value of the Authority.

2.3 Key Customer Performance Variables

An understanding of credit control performance is facilitated by recognizing customer behavioural variables which influence it. We have settled on two quantifiable variables for this purpose, so far:

- Customer Activity – number of customers paying, (as measured by the number of receipts) compared to the number billed.
- Customer Responsiveness – the average collection to the average bill, expressed as a percentage.

The measures are maintained for each customer class/ area.

A summary of transaction factors influencing the 1995 financial performances in this area is shown in the table below.

TABLE 1

1995 CUSTOMER TRANSACTIONS- SALIENT STATISTICS

	Customer Segment		Total	Standpipe	Domestic	Business		
						Unmetered	Metered	Other
	<u>Base Data:</u>							
1	Billings \$(mm)		289.2	7.4	125.4	46.5	107.9	2.1
2	Collections \$(mm)		226.7	2.2	99.4	29.4	93.7	1.9
3	Avg.-year-end AR \$(mm)		303.9	36.5	178.9	53.2	29.2	6.2
4	Mailed bills (No)		1,160,141	222,377	849,275	40,602	16,319	31,568
5	Receipts (No)		418,589	15,671	371,313	16,616	11,189	3,800
6	Avg. customer level		285,763	54,978	202,463	3,892	3,084	22,393
	<u>Salient Points</u>							
7	Receipts: Bills (%)	-5:4	36	7	44	41	69	12
8	Collection Billings (%)	-2:1	78	30	79	63	87	90
9	Avg. debt (\$)	- 3÷6	1,063	2,330	885	13,670	9,470	277
10	Avg. customer bill	- 1÷4	249	33	148	1,145	6,612	67
11	Avg. customer payment	- 2÷5	542	140	268	1,769	8,374	500
12	Avg. BPO* (No) & billing frequency	- 3÷1	1.05 Year	19.7 Qtr.	5.7 Qtr.	13.7 Mth	3.2 Mth	11.8 Otr

*BPO = billing periods outstanding

One can obtain several stories in the above table. Three perspectives on the figures are discussed. First, the accounts receivable at 1996 March 31 averaged just over one year worth of billings, the gross investment being equivalent to more than 17 months. The Standpipe and Unmetered Business customer groups are the chief offenders in this. The situation is quite different with the Domestic and the Metered Business customers who, while not yet at the target performance level are rather close.

Second, customer activity (indicated at row 7) is one factor of the final performance level discussed above, and shows that only a little over one-third (36 percent) of mailed bills are paid, judged by the

number of receipted transactions. Standpipe customers, along with the “Other” segment (agriculture, churches and charitable organizations) are by far the least active. Only 7 percent of the standpipe and 12 percent of “Other” customers’ bills are responded to.

Customer responsiveness, as measured by the relationship of the average payment to the average billing, showed that during 1995, customers paid a lot of their previous year’s arrears. The average payment was more than twice the average current year bill, reflecting the very intense debt collections activities of that year (notably disconnections).

All customer groups show a better responsiveness than activity value. Mainly, this is the “ability to pay” factor at work: larger business customers typically pay their bills better than the smaller ones, the same holds for the domestic customers, although to a lesser extent.

In addition to working on customer activity and responsiveness, the Authority has to work towards ensuring that all consumers are billed and pay for services delivered and consumed: customer penetration. The relationships between its consumers and its paying customers are depicted in Figure I. Each of the problem areas shown therein are being addressed through one initiative or another. The Customer Accounting department is liaising with the Central Statistical Office’s figures as the “actual” number of consumers in existence. An important metric in this regard is the number of customers on our database, compared with the census provided by that institution.

The term debt recovery refers to the set of actions taken by the Authority to reduce the indebtedness of its customers and improve the quality of its cash inflows. Reminders about upcoming payment due dates as well as easy-payment plans offered to the customer body, in general are pre-emptive rather than recovery attempts to correct a situation after it has occurred. Debt recovery actions include overdue debt reminders, agreements, disconnections and in extreme cases, property sales; as such they may be either punitive or positive. It also includes overtures to the GORTT for relief, in respect of customers who are either unable to or unwilling to pay for their service.

2.4 Environmental Difficulties

These objectives are being pursued within rather difficult environments: internally, we are afflicted by poor data quality and information shortages; externally tasks are hampered by ineffective by-laws, an ambiguous and outdated WASA Act, unimplementable PUC order provisions and inactive local rating authorities.

Each of these issues creates tremendous problems for the Authority in pursuit of its mandate. All of them are to be addressed to a greater or lesser extent during the current fiscal year.

2.5 Organization

During the last two years, two significant changes were effected to the responsibility and organization of the Authority's receivables management efforts. First, responsibility for domestic accounts receivable fell to the Operations Division, leaving the Commercial Department with the non-domestic accounts and second the organization of the non-domestic accounts was along industry sector classification lines. Those two changes have been recalled and the collections activities are now organized as follows:

- (i) full responsibility for accounts receivable management lies with the Commercial Department
- (ii) all collections and receivables management is structured on an area basis except for:
 - (a) special account situations: AAA, Government (Central and Regional) and multi-location customer accounts;
 - (b) problematic account groupings which are being addressed by teams; at present, these are inactive business accounts, standpipe customers and cottage account groups
- (iii) staff responsibility goes beyond collections to overall management of the customer

2.6 Management of Domestic Accounts

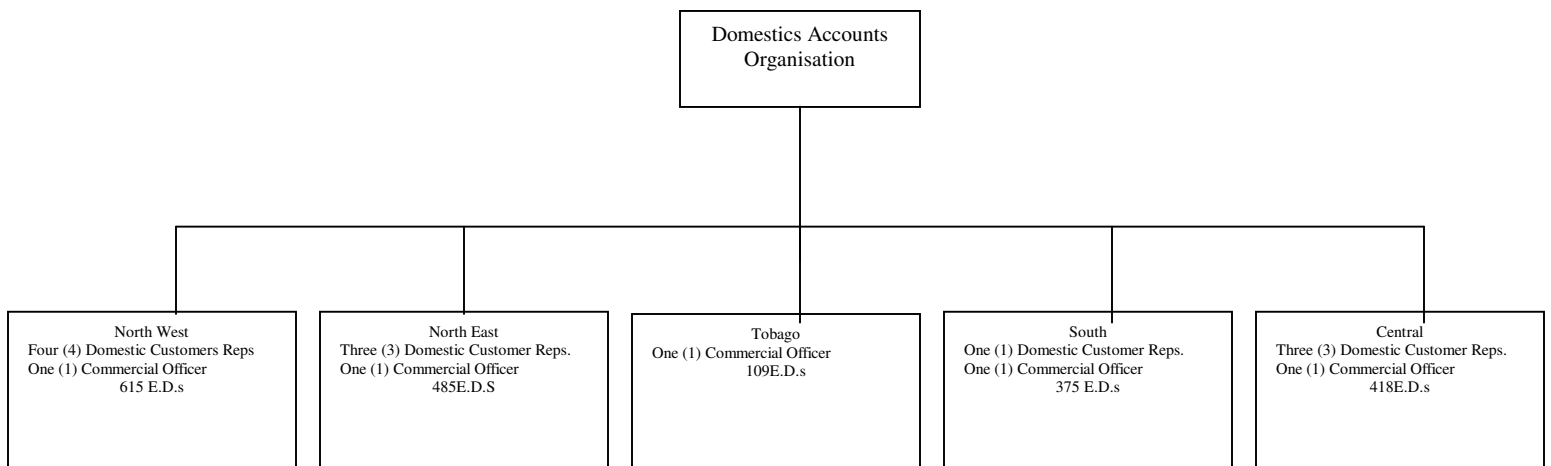
The domestic group of accounts is to be subdivided into individual portfolios according to enumeration districts. It is planned that approximately 100 – 120 “E.D. s”, (depending on the distribution of the E.D.s) which equates to approximately 15,000 accounts to be awarded to selected officers. This recommendation is based on the temporary assignment of E.D.’ s for debt recovery action in the Chaguanas Office and comparison data from other public utilities, namely TSTT. It should be noted however that they accomplish this via greater levels of technology. Each grouping of 15,000 accounts is to be treated as an individual portfolio on which the performance of the officer is to be evaluated.

The Aged Debtors Report, May 1996 reveals a receivables figure of \$255.4 million which translates into approximately 248,719 customers. Each customer accounting officer would be required to

manage three (3) ED's or 450 customer accounts per week, that is 12 ED's or 1800 customer accounts per month. This average is arrived at based on a pilot project done in the Chaguanas Office.

As the enumeration district can be defined using map data, each district may be located within regions (North East, North west, Central, South and Tobago) already identified. In examining the data (i.e the number of ed's in each area) an ideal staffing requirement is described below.

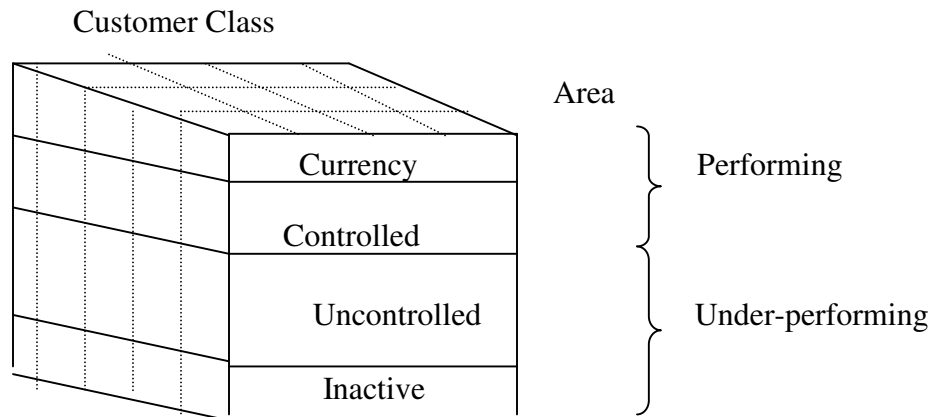
However, the department has been re-organised to operate with the available staff. (Refer to Appendix II)



In the case of the domestic customer, there is similarity among the accounts i.e. problems to deal with them on a wider scale. A prime example is the common complaint of retroactive rates based on reassessments, all requiring inspection of the rolls of the District Revenue Office. In addition, unlike the management of the commercial accounts where the customer service aspect of the job is highlighted and long term relationships encouraged, domestic customer service is to be limited to the practice of good customer relations in interacting with the domestic customer. The scope of work of the current officers is, however to be expanded to include the resolution of domestic queries up to the point of investigation and research of relevant data.

A simple classification of outstanding accounts has been put in place to focus the efforts of the customer accounting staff. This classification is illustrated in the Figure 2 below.

FIGURE 2
CUSTOMER ARREARS CLASSIFICATION



The attributes of these portfolio segments are:

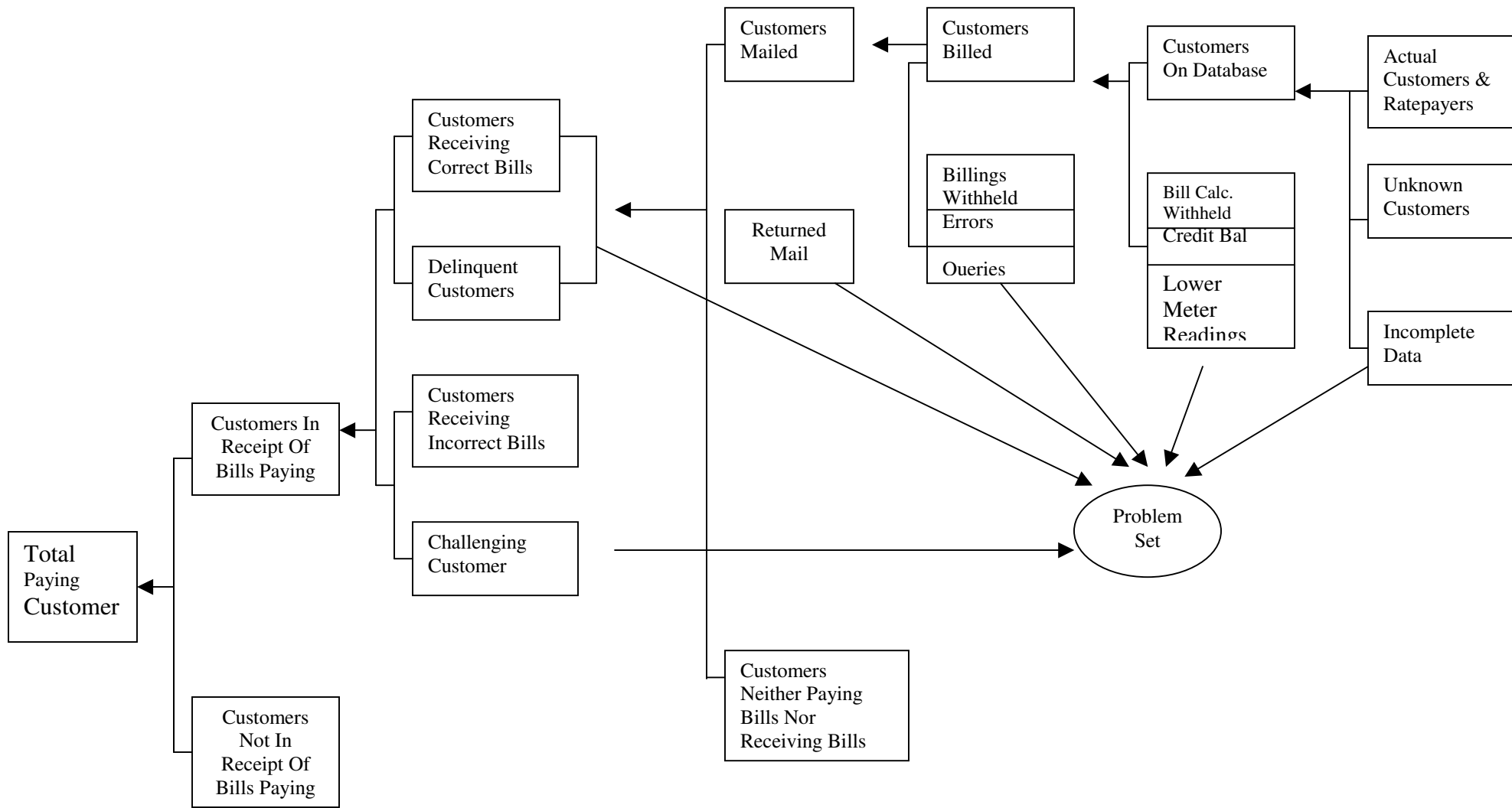
<u>Quarterly Billed (Domestic A3)</u>	<u>Accounts Class</u>	<u>Monthly Billed Dom. & Non- Dom</u>
< 1 quarter	Current	< 1 mth.
> 1 qtrs. and <= 2 qtrs	Controlled	> 1 mth. And <= 2.5 mths
> 2 qtrs and <= 4 qtrs	Uncontrolled	> 2.5 mths. And <= 12 mths
> 4 qtrs	Inactive	> 12 mths

Customer accounting staff focus their efforts on maximizing the “performing” portion of their portfolio of accounts. This means migrating the uncontrolled accounts into the controlled area, ensuring at the same time that none of the performing accounts fail out of that group. So far, a special team has been established to eliminate the current set of “Inactive“ business accounts. Their final deadline is 1997 March 01. Other teams will be established to review and make recommendations on how the Authority should treat with Standpipe, Cottage and Yard Tap/Building Tap customer categories.

Customer accounting staff is being provided with all clerical and operating guidelines possible to facilitate their work, strategically aligned with more accounting information and analysis being available from the EDP systems. On the following pages is a flowchart of the customer handling process for use by customer accounting staff working on reducing accounts receivable.

The reporting organization structure for the credit control function is depicted in Appendix II. There are six customer account management groups, each of which is to be led by a Senior Customer Accounting Officer reporting to the Assistant Customer Accounting Manager – Credit Control. However, task relationships are stronger on the customer class than on the region/area basis. This is so largely because business customer handling/management, transactions and credit considerations are, more often than not, quite different from those for households.

Figure 1: W.A.S.A's Consumers vs. Customers



Accounting Department Debt Recovery Strategy

Planned Standard Billing and follow-up Activity Schedule

(I) DOMESTIC CUSTOMER QUARTERLY BILLINGS IN ADVANCE	Quarter 1			Quarter 2			Quarter 3		
	1	2	3	4	5	6	7	8	9
Bill Calculation & Dispatch in Advance	▶ Bill dispatched by			15 th day of the month in quarter					
Period for payment	▶			Customers then have remainder of quarter to pay					
General reminders of payment Due Date	▶			Reminders made through broadcast media					
Grace Period	▶								
Disconnection Notices Broadcasted	▶			Further use of broadcast media					
Disconnection activity	▶			▶					

Action before start of following update

(II) DOMESTIC CUSTOMER QUARTERLY BILLINGS IN ARREARS	Quarter 1			Quarter 2			Quarter 3		
	1	2	3	4	5	6	7	8	9
Bill Calculation & Dispatch in Advance	▶			Bill dispatched by 15 th day of month in last quarter					
Period for payment	▶			▶ Customers have 15 days after and of quarter to make payment.					
General reminders of payment Due Date	▶			▶ Reminder made through broadcast of media					
Grace Period	▶			▶					
Disconnection Notices Broadcasted	▶			▶ Use of broadcast media					
Disconnection activity	▶			▶					

Action before start of following quarter

(II) DOMESTIC CUSTOMER QUARTERLY BILLINGS IN ARREARS	CURR MTIL	Month 1				Month 2				Month 3			
		01.07	08.15	15.22	22.31	01.07	08.15	15.22	22.31	01.07	08.15	15.22	22.31
Bill calculation & dispatch on daily basis	▶	Billings to go out early in month (flat-rate) as read (Metered)											
General reminders of payment Due Date	▶	Use of broadcast media											
Grace Period	▶												
Specific Reminders of Past Due Date	▶	Reminders to business- letters and telephone calls											
Disconnection activity	▶	To begin at the start of the third month after month											

CUSTOMER ACCOUNTING POLICY MANUAL		
SECTION 6: Agreements	PART: 1	
POLICY NAME:	NO:	
ISSUED DATE:	REVISION	PAGE:

Purpose:

The Authority offers every opportunity to customers experiencing financial difficulty to pay off their arrears of water rates or consumption charges. Customers can meet their obligations to the Authority in as convenient and reasonable a manner as possible to themselves, through the mechanism of an agreement. In the past, improper controls resulted in ineffective management of this process and numerous violations by customers. At any point in time, the Authority did not know how many and what agreements were outstanding, nor their credit status. Customers were accordingly able to default and make new arrangements at different locations and thereby avoid disconnections.

The Authority has, however, not retreated from this offering because of these problems. It has, instead, moved to firm up qualifying criteria, reviewed and improved the controls and tries to ensure equity in its dealings. In so doing, the Authority also benefits by creating predictable cash inflows streams, establishing communication links with the customer and encourages the customer into a planning habit. Appendix B illustrates the general procedures and guidelines which Customer Accounting Officers (Accounts Receivable) should follow in managing customer accounts, and leading up to and beyond the making of agreements.

Policy Statements

- 1.0 Accounts receivable, as assets incur financing costs, which must be recognized in the Authority's product and services pricing and as an investment to be minimized.
- 1.1 Customer Accounting Officers managing accounts receivable portfolios must communicate with customers directly about their arrears, with communications to be made through public notices. Arrears accumulate through customer ignorance, inability or unwillingness to pay or by retroactively applied billings.
- 1.2 Greatest priority must be given to communication with the largest customer debts in terms of billings represented by the arrears balance.
- 1.3 Outstanding customers arrears older than six months will attract interest at current money market rates less prime.
- 1.4 Customers should be advised, first of all, to seek loans with a leading institution to liquidate their arrears; our own agreement facilities should be offered when this fails.
- 2.0 Water rates properly charged in accordance with WASA Act of 1965, PUC Orders and other relevant laws are not eligible for write-offs.
- 2.1 Billing adjustments are charges and credits effected to a customer's account to correct errors made in respect of billings. These adjustments must be approved by unit supervisors, at a minimum. Large adjustments are to be approved at higher levels, in keeping with the delegation of authorities provided for under the IOA (Internal Operating Agreement).

- 2.2 Payment adjustments are charges and credits effected to a customer's account to correct past errors made in respect of collections. These adjustments must be approved by unit supervisors. Larger adjustments are approved by higher authorities.
- 2.3 Arrears written-off are credits to customers account as a result of debt forgiveness or low probability of debt recovery. Negotiations with customers on write-off of arrears and writing off such arrears against a customer's account is prohibited.
- 3.0 All customers in arrears displaying an honest intention to eliminate his/her liability through reasonable extended payment arrangements will be accommodated. Concessionary terms will be provided to recipients of old age pension.

3.1 Customer Arrears Liquidation Agreements are to be made with “qualified” customers only. In all cases, three (3) forms of identification must be obtained.

3.1.1 *A customer qualifies for an agreement when:*

- (i) arrears have arisen from retroactively attached billing;
- (ii) his/her payment history has been regular up until the start of the accumulation of the arrears;
- (iii) he/she is not in default under an existing agreement;
- (iv) he/she is an old age pensioner.

3.2 Customer Arrears Liquidation Agreements must reflect the convenience of the customer and the best interest of the Authority, all things considered.

3.2.1 Customer Accounting Officers, when making agreements, take into consideration the following factors:-

- a) Whether or not contact has been at the initiative of the customer;
- b) Ignorance of customer about the charge(s) and the arrears accumulation;
- c) Inability to pay;
- d) Displayed unwillingness to pay;
- e) Number of billings represented in the arrears;
- f) Class of customer;
- g) Whether debt relates to water/sewer charges or non-recurrent charges.

3.2.2 Customers must be advised of the effects of the agreement on their finances. Each customer should be reminded that their current charges are to be met along with their commitments under the agreements. Each customer must be provided with a debt liquidation schedule.

3.3 All agreements must be approved by a Senior Customer Accounts Officer.

4.0 Customers will not be disconnected for a first-time failure to meet a payment deadline under an agreement, unless the response from him/her to his default and our efforts is either non-existent or unacceptable. Level 1 recovery action is taken.

4.1 A first-time defaulter under an agreement will be contacted within two working days of such default and reminded of his/her obligation. Contact, if orally established, must be confirmed in writing and noted on the customer’s record.

- 4.2 Re-scheduling of the debt payments is allowed only if the customer claims and proves changed circumstances. In the absence of such a claim and proof, the customer is required to make good on the full extent of the missed payment.
- 4.3 If the customer fails to contact the Customer Accounting Department or to respond to its efforts to contact him/her then he/she may be disconnected for the default.
- 5.0 A second default on an agreement accelerated payment of the entire unpaid balance of the agreement. Level II action will be taken in the event of failure on the part of the customer to meet this demand.
- 5.1 If a customer defaults on an agreement, a second or other time, a demand notice is to be delivered to him/her within three working days, seeking payment of the unpaid balance of the debt within seven (7) working days after the date of such notice.
- 5.2 Failure on the part of the customer to meet this demand must result in action to disconnect his/her supply. Any exception to this rule must have prior authorization of the Commercial Manager or the Director-Finance.

Specific Considerations When Making Agreements

A. Domestic Customers

- (i) Agreement should be made for arrears of \$500.00 or for the equivalent of four (4) billing periods whichever is greater, such arrears to be paid in full.
- (ii) A minimum monthly payment of \$100.00 must be enforced.
- (iii) Domestic agreements should be made in accordance with the undermentioned schedule.

Domestic Customers Recommended Payment Schedule

Arrears Value (\$)	Down Payment %	No. of Months
5,000 and above	10-15	12
4,000 – 4,999	15-20	10
3,000-3,999	20-30	8
1,000 – 2,999	20-40	6
500 – 999	50	2-5
Under 500	100	Nil

B. Business Customers

- (i) No agreements are to be made for the accounts in arrears, \$2,500.00 and lower.
- (ii) A down payment of between 30% - 50% of the outstanding arrears, but not less than \$ 2, \$ 500.00 whichever is the higher must be paid.
- (iii) A repayment of two (2) to six (6) months must be observed. Note: Where, because of retroactive charges, an account has gone into substantial arrears, then a more flexible arrangement can be entertained, i.e., a repayment period of up to ten (10) months.

C. Recipients of Public Assistance/' Approved' Pensioners

1. An account must be in the name of the pensioner / recipient of public assistance, and be approved by the Ministry of Social Security in order to qualify for special treatment.
2. The pensioner must provide proof of his/her status as a pensioner / recipient of public assistance.
3. Reasonable attempts must be made to ascertain if the pensioner has any other income.
 - Pensioners with income from any source under \$500.00 per month - \$50.00 per month and continuing.
 - Pensioners with income over \$500.00 to \$1000.00 per month - \$75.00 per month and continuing
 - Pensioners with income over \$1200.00 per month - \$100.00 per month on arrears and current rates when due.

If the pensioner's property is disconnected, the reconnection fee can be added to the arrears and an agreement made in accordance with 1-3 as is appropriate. Where an agreement is made, the earlier installments amounting to \$500.00 should go towards the reconnection fee.

D. Employee Agreements

Employees can exercise the option of paying rates and charges / arrears through salary deductions.

Conditions under which employees can exercise this option are:

(1) Employees can be responsible for no more than (3) accounts

(2) A written letter must be sent in by the employee, to the Officer-in-Charge, Debt Recovery unit Commercial department, stating the particular option he / she would like to exercise and the accounts for which they will be held responsible. This letter should be accompanied by a completed salary / wages deduction form authorizing the Authority to make the relevant deductions.

If the employee dishonours the agreement and is disconnected he / she will be liable to pay the \$500.00 reconnection fee.

Daily rated employees (wages deductions)

Payments per wages deduction should not be less than \$50.00 per fortnight, per account.

Monthly rated employees (salary deductions)

Payments per salary deduction should not be less than \$100.00 per month per account.

CUSTOMER ACCOUNTING POLICY MANUAL		
SECTION 6: Disconnection/Reconnection Policy		PART: 1
POLICY NAME:		NO:
ISSUED DATE:	REVISION	PAGE:

Purpose:

Disconnection is the first punitive act against a customer for non-payment of rates and charges. The Authority does not wish to disconnect its customers and this action is taken only after all supportive actions have been pursued in recovery of debt. At all times during the disconnection process, the Authority is cognizant of water as a most basic of necessities, and will go to lengths to urgently restore a supply, once some proper arrangement has been made for payment of the liquidated sum.

Appendix B illustrates the general procedures and guidelines which customer account officers (Accounts Receivable) should follow in managing customer accounts, and leading up to and beyond the disconnection action.

Policy Statements:

- 1.0 Disconnection, as an act of last resort, may be carried out where it is clear that the Authority is in danger of not recovering its delivery costs of water and services.
 - The Authority will disconnect where:
 - (a) It appears that all attempts to achieve payment for services delivered and properly charged have failed;
 - (b) The debtor has failed on more than one occasion to comply with the agreements with the Authority;
 - (c) The occupier or owner of the serviced premises is making illegal use of his water supply, e.g. supplying water to a disconnected customer.
 - (d) The occupier or owner of the serviced premises is attempting to defraud the Authority of its revenues, e.g., by-passing a meter provided by the Authority to inform on consumption.
- 1.1 The Authority may, on its own accord, carry out partial disconnection of a property, which has several service lines, at no cost to the customers.
- 1.2 Persons in receipt of old age pensions will not be disconnected for arrears of debt.
- 1.3 No disconnection is to be carried out where a customer produces to the disconnection crew, evidence of having paid the debt for which they were listed for disconnection.
 - 1.3.1 All disconnection crews must be provided with the necessary geographical information of the customer as well as the amount of debt for which they are to be disconnected.
- 1.4 No customer will be disconnected on the last working day before a Public Holiday or weekend.
- 2.0 At least seven (7) days notice must be given to customer prior to any disconnection action.

- 2.1 A customer will be visited with a disconnection notice in the form of “Notice to Disconnect” card. If no one is present at the time of the visit, the card will be left (preferably hung on the door knob) for the occupants.
- 3.0 A customer must pay for expenses incurred by the Authority in the disconnection process, once such process has commenced.
- 3.1 A disconnection / reconnection fee will be charged to all customers, based on prior approval of the Public Utilities Commission. The present agreed rates are as follows:- -
\$500.00, if disconnection is carried out;
- \$100.00, once the customer is listed, even though disconnection does not occur;
- \$312.00, for requested disconnection
- 3.2 A pensioner, if disconnected in error, will not be required to pay a disconnect fee.
- 4.0 The Authority must re-connect a customer within a reasonable time after he has paid or made an agreement for paying off his liability.

- 4.1 A customer who has paid his debt for which he has been disconnected or made an agreement to do so, must be re-connected within 72 hours of payment of the debt for which he/she was disconnected or making of an agreement for liquidation of the said debt.
- 4.2 A wrongly disconnected customer must be reconnected on the same day that the disconnection error is discovered.
- 4.2.1 Such an aggrieved customer will be delivered a letter of apology signed by either the Chief Executive Officer, the Heads of Operations or Finance, or the Commercial Manager along with his reconnection.

General Disconnection Procedures and Practices.

- (1) Attempts must be made to contact customers prior to issuing accounts for disconnection. These attempts should include:
- Telephone Calls
 - Mail
 - Broadcast media reminders
- (2) If on arrival of the disconnection crew to a property identified for disconnection, the customer produces a receipt covering the total amount of arrears as at the issue date of disconnection or earlier, or a valid and current agreement, no disconnection is to be carried out.
- (3) Once a property is disconnected the full fee of \$500.00 must be paid before the service is restored. In the case of Pensioners and Social Welfare recipients these said fees may be paid in installments and dictated by the guidelines for making agreements in relation to pensioners and recipients of public assistance.
- (4) No disconnection should be carried out on a Friday, of the day immediately preceding a public holiday.
- (5) Reconnections of service will be carried out within no more than five (5) working days of payment having been received at any of the Authority's offices.
- (6) In the event that a property is disconnected in error the supply will be restored within 24 hours of discovery of such error.

CUSTOMER ACCOUNTING POLICY MANUAL		
SECTION 6: Sale of Property for Non-Payment of Rates		PART: 1
POLICY NAME:		NO:
ISSUED DATE:	REVISION	PAGE:

Purpose

The sale of a customer’s property is the very last and reluctant step taken by the Authority to recover a debt due for rates and /or charges. It is not taken lightly, and several controls are in place to ensure that the Authority is not acting properly.

Traditionally, this action is taken only agreed a disconnected customer fails to respond to the Authority’s requests for payment over a prolonged period of time. The present approach is to reduce this prolonged waiting period to a more reasonable two months period, so that initiation commences much earlier.

Policy Statements:

- 1.0 Sale of a customer’s property must be carried out consistent with the provisions of the Rates and Charges Recovery Act Chap 74:03
- 1.1 All property recommended for sale must first be listed on at least one local newspaper, at least once per week for three (3) consecutive weeks, in order to afford parties with an interest in the property to respond to the Authority’s actions.
- 1.2 The Authority will declare a sale null and void if it becomes apparent that there was fraud or improper conduct of the sale or a material error in the description of the premises or the rate or charge for non-payment.
- 2.0 Sale of a property may be initiated only after the property has been disconnected for a prolonged period of time, and the customer has failed to respond to WASA’s documented requests for payment and its warnings of possible sale of the property.
- 2.1 No action will be taken on any disconnected property unless three months has elapsed since the date of disconnection.

- 3.0 The pursuit of the sale of any property must follow due process of law and good faith on the part of the Authority.
- 3.1 All recommendations for the sale of properties must proceed through the following levels of approvals:
- Credit Controller
 - Customer Accounting Manager
 - Director Finance
 - Review Committee
 - Chief Executive Officer
- 3.2 The Chairman may postpone the sale of any property either generally or to some day specified.
- 3.3 The Authority will cease to proceed with the sale of any property at any stage, if an acceptable proposal is received from the owner(s) or mortgage(s).

SCHEDULE OF AREAS

ASSUMPTIONS

- All Wet Season Schedules assume full continuous production from all water sources.
- The dry season schedules can be extrapolated as an approximation for a worst-case scenario wet season schedule since the amount of water in production is at a minimum during the dry season.
- Schedules, therefore, will seldom be worse during the wet season.

2005

SOURCE OF SUPPLY	AREAS SERVED	DRY SEASON SCHEDULE
CARONI WTP	GONZALES	Monday, Wednesday, Friday 8:00pm - 5:00am
CARONI WTP	BELMONT UPPER	Tuesday, Thursday, Saturday, Sunday 8:00am - 5:00pm
CARONI WTP	BELMONT UPPER, DURANT STREET	Tuesday, Thursday, Saturday, Sunday 8:00am - 5:00pm
CARONI WTP	BULLER TRACE UPPER/DAWN TRACE	Sunday, Thursday 7:00pm - 11:00pm
CARONI WTP	BELMONT, MC KAI ROAD	Monday, Wednesday, Friday 9:00am - 5:00pm
CARONI WTP	UPPER ST. FRANCOIS VALLEY RD, MARIE ROAD	Wednesday, Saturday 8:00pm - 11:00pm
CARONI WTP	CANTARO VILLAGE	Sunday, Tuesday 6:00am - 5:00pm
CARONI WTP	CASCADE, ST ANNS (LOWER) UP TO FONCETTE RD.	Tuesday, Thursday, Saturday, Sunday 8:00am - 5:00pm
CARONI WTP	BELMONT WEST (LOW LEVELS)	Tuesday, Thursday, Saturday 8:00pm - 5:00am
CARONI WTP	KNAGGS HILL, LADY CHANCELLOR, P.O.S	Sunday, Tuesday, Thursday, Saturday 8:00pm - 5:00am
CARONI WTP	HUTTON ROAD, ST. ANNS	Sunday, Tuesday, Thursday, Saturday 8:00pm - 5:00am
CARONI WTP	TERRACITA/ LADY CHANCELLOR	Tuesday, Thursday, Saturday, Sunday 8:00pm - 5:00am

CARONI WTP	HOLOLO MOUNTAIN ROAD (LOWER) CASCADE	Sunday, Monday, Thursday 6:00pm - 6:00am
CARONI WTP	HOLOLO MOUNTAIN ROAD LOWER (HIGH POINT) CASCADE	Sunday, Monday, Thursday 6:00pm - 6:00am
CARONI WTP	MIDDLE ARIAPITA, CASCADIA TO PLAISANCE, ST. ANNS	Tuesday 6:00pm - Thursday 6:00am Friday 6:00pm - Sunday 6:00am
CARONI WTP	HOLOLO MOUNTAIN ROAD (UPPER) CASCADE	Monday, Thursday 6:00am - 6:00pm
CARONI WTP	HILLSIDE / CASCADE	Sunday, Tuesday, Friday 6:00am - 6:00pm
CARONI WTP	FONCETTE ROAD, CASCADE	Tuesday, Thursday, Saturday 8:00am - 5:00pm
CARONI WTP	MON REPOS, CASCADE	Tuesday, Thursday, Saturday 8:00am - 5:00pm
CARONI WTP	ST JAMES COCORITE, FORT GEORGE	Tuesday, Thursday, Saturday 8:00pm - 5:00am
CARONI WTP	BOURNES ROAD (UPPER), ST. JAMES	Tuesday, Thursday, Saturday 8:00pm - 5:00am
CARONI WTP	BOSSIERE # 1/MARAVAL, FLAG STAFF	Daily 24 hrs
CARONI WTP	CASCADE ROAD (UPPER) BEYOND FONCETTE RD.	Monday, Tuesday, Thursday, Saturday 8:00am - 5:00pm
CARONI WTP	BRUNTON ROAD	Tuesday, Thursday, Saturday 8:00am - 5:00pm
DORRINGTON GARDENS WTP	PETTIT VALLEY, CAMERON ROAD & ENVIRONS	Wednesday, Saturday 6:00am - 6:00am
DORRINGTON GARDENS WTP	PETTIT VALLEY, PIONEER DRIVE & ENVIRONS	Sunday, Tuesday, Thursday 6:00am - 6:00am
DORRINGTON GARDENS WTP	PETTIT VALLEY, RAVINE ROAD & ENVIRONS	Monday, Wednesday, Friday, Saturday 6.00 am - 6.00 am
EL SOCORRO HL	WOODBROOK/ POS/ NEWTOWN	Daily 5:00pm - 5:00am
EL SOCORRO HL	BELMONT EAST, HIGH LEVELS	Tuesday, Thursday, Saturday, Sunday 8:00pm - 5:00am

EL SOCORRO HL	GONZALES (LOWER) BELMONT	Tuesday, Thursday, Saturday 6:00pm - 6:00am
EL SOCORRO HL	GONZALES, HIGH LEVELS, BELMONT	Tuesday, Thursday, Saturday 6:00pm - 6:00am
EL SOCORRO HL	GONZALES, HIGH LEVELS, BELMONT	Tuesday, Thursday, Saturday 6:00pm - 6:00am
EL SOCORRO HL	QUARRY STREET, LAVENTILLE, P.O.S	Daily 5:00am - 5:00pm
EL SOCORRO HL	BAT ALLEY, CLIFTON HILL, LAVENTILLE	Daily 5:00am - 5:00pm
FOUR ROADS HL	DIEGO MARTIN INDUSTRIAL ESTATE	Monday, Wednesday, Friday 6:00am - 6:00pm
FOUR ROADS HL	RICH PLAIN, LOWER RICHPLAIN ROAD	Monday - Wednesday 6:00am - 6:00pm
FOUR ROADS HL	FOUR ROADS, DIEGO MARTIN MAIN RD. TO GOPAUL AVE.	Daily 6:00am - 6:00pm
FOUR ROADS HL	VANDERPOOL LANE, DIEGO MARTIN	Daily 6:00am - 6:00pm
FOUR ROADS HL	FOUR ROADS, UPPER UNITY & FARM RD, RICHPLAIN	Monday - Wednesday 6:00am - 6:00pm
FOUR ROADS HL	LA ESTANCIA, DIEGO MARTIN	Monday, Tuesday, Wednesday, Thursday, Friday 6:00am - 6:00am
FOUR ROADS HL	UPPER LA PUERTA ROAD, DIEGO MARTIN	Monday, Friday 6:00pm - 6:00am
FOUR ROADS HL	VICTORIA GARDENS, DIEGO MARTIN, WEST MOORINGS	Daily 6:00am - 6:00pm
FOUR ROADS HL	RAINBOW RIDGE, GOODWOOD PARK EAST, GOODWOOD PK.	Wednesday, Saturday 8:00am - 8:00am
FOUR ROADS HL	LING FIELD ROAD, GOODWOOD PARK EAST AND WEST	Sunday, Tuesday, Thursday 8:00am - 8:00am
FOUR ROADS HL	SIMEON ROAD, PETIT VALLEY	Sunday, Tuesday, Thursday 8:00am - 8:00am
MARAVAL WTP	MARAVAL, HIGH POINTS WEST ON SADDLE ROAD	Daily 24 Hrs
MARAVAL WTP	MARAVAL, HIGH POINTS EAST ON SADDLE ROAD	Daily 24 Hrs
MARAVAL WTP	BAMBOO TRACE MARAVAL	Daily 24hrs
MARAVAL WTP	MOKA, MARAVAL (UPPER)	Daily 24hrs
MARAVAL WTP	MORNE COCO ROAD, (LOWER) MARAVAL	Daily 24hrs
MARAVAL WTP	DUNDONALD HILL UPPER, ST. JAMES	Sunday, Monday, Thursday 6:00pm - 6:00am
MARAVAL WTP	DUNDONALD HILL LOWER, ST. JAMES	Sunday, Monday, Thursday 6:00am - 6:00pm
MARAVAL WTP	BELLE VUE ROAD, LONG CIRCULAR, ST. JAMES	Wednesday, Saturday 6:00am - 6:00am
MARAVAL WTP	DIBE ROAD AND BRIEVES ROAD (LOWER) ST. JAMES	Tuesday, Friday 6:00am - 6:00am
PARAMIN WTP	MT CYRIL UPPER, MARAVAL	Saturday 6:00 pm - 6:00 pm
PARAMIN WTP	MT CYRIL LOWER, MARAVAL	Friday 6:00 pm - 6:00 pm
PARAMIN WTP	PARAMIN LEVEL 1	Daily 24 hrs
PARAMIN WTP	LE PLATTE VILLAGE, MARAVAL	Daily 24 hrs
PARAMIN WTP	SANT D'EAU, MARAVAL	Daily 24hrs
PARAMIN WTP	PARAMIN LEVEL 3	No Supply
RIVER ESTATE WTP	RIVER ESTATE, BLUE BASIN, NHA	Monday, Wednesday, Friday 6:00am - 6:00am

RIVER ESTATE WTP	RIVER ESTATE, BAGATELLE, DIEGO MARTIN	Daily 6:00am - 6:00pm
RIVER ESTATE WTP	BAGATELLE, DIEGO MARTIN	Daily 6:00am - 6:00pm
RIVER ESTATE WTP	COVIGNE, DIEGO MARTIN	Tuesday, Thursday, Saturday 6:00am - 6:00am
RIVER ESTATE WTP	BLUE RANGE, DIEGO MARTIN	Monday, Wednesday, Friday 24hrs Tuesday, Thursday,
RIVER ESTATE WTP	PETIT VALLEY, ROXBOROUGH ST, DIEGO MARTIN	Tuesdays. Thursday. Saturday. 6am to 6
RIVER ESTATE WTP	PETIT VALLEY, HIGH LEVELS, BLUE RANGE	Monday, Wednesday. Friday
ST ANNS RES	FONDES AMANDES, CASCADE	Sunday 6:00am - Tuesday 6:00pm
TUCKER VALLEY WTP	CARENAGE, (HIGH LEVELS HAIG STREET)	Tuesday, Thursday, Saturday 9:00am - 9:00am
TUCKER VALLEY WTP	CARENAGE, (HIGH LEVELS LANSE MITAN ROAD)	Tuesday, Thursday, Saturday 9:00am - 9:00am
TUCKER VALLEY WTP	THE PARK & GULF VIEW	Daily 24 Hrs
TUCKER VALLEY WTP	THE PARK & GULF VIEW (SENORA PARK)	Sunday, Tuesday, Thursday 9:00am - 9:00am
TUCKER VALLEY WTP	WEST VALE PARK	Daily 24 Hrs
FOUR ROADS	SPARROW DRIVE	Saturday, Monday, Wednesday 6 am - 6 pm
CARONI WTP	WEST MOORINGS	Daily 24hrs
COVIGNE INTAKE	COVIGNE (UPPER)	Daily 24hrs
DORRINGTON GARDENS	PETIT VALLEY	Daily 24hrs
SIERRA LEONE WELL #10	PETIT VALLEY	Daily 24hrs
DORRINGTON GARDENS	LA BURHAM AVENVUE	Daily 24hrs
TUCKER VALLEY	MACQURIBE	Daily 24hrs
TUCKER VALLEY	MACQURIBE	Daily 24hrs
TUCKER VALLEY	LA HORQUETTE	Daily 24hrs
TUCKER VALLEY	WESTERN MAIN ROAD	Daily 24hrs
TUCKER VALLEY	GLENCO	Daily 24hrs
DIAMOND VALE 14 &15	DIAMOND VALE	Daily 24hrs

2005

SOURCE OF SUPPLY	AREAS SERVED	DRY SEASON SCHEDULE
VALSAYN HIGHLIFT (WELLS)	ST. AUGUSTINE (HIGH LEVELS), RAGBIR STREET, NOEL TRACE, FOREST GATE, TUNAPUNA (HIGH LEVELS), ST. JOHN'S ROAD, BASANTA UPPER TUNAPUNA ROAD, 1ST TRACE, UPPER FAIRLEY STREET AND ENVIRONS	Tuesday, Thursday & Saturday 9pm - 4am
VALSAYN HIGHLIFT (WELLS)	SANTA MARGARITA, NEIL TRACE, LOS GODOS	Monday, Wednesday, &
VALSAYN HIGHLIFT (WELLS)	ST. AUGUSTINE (LOW LEVEL), MONTE GRANDE	Daily 6am -6pm
VALSAYN HIGHLIFT (WELLS)	TUNAPUNA EAST HIGH LEVEL: BALTHAZAR ST, UPPER EL DORADO RD, COLLEGE RD, HENRY RD	Monday, Wednesday, Friday
NORTH OROPUCHE	SANGRE GRANDE (TOWN)	Monday, Wednesday & Friday 6am - 6am
NORTH OROPUCHE	SANGRE GRANDE, VEGA DE OROPUCHE, LOWER TOCO ROAD	Monday, Wednesday & Friday
NORTH OROPUCHE	SANGRE GRANDE (EXTREME OF SYSTEMS) - MANZANILLA #2, #3, CAIGULA, NORTH MANZANILLA, FISHING POND, COALMINE, CORYAL VILLAGE	Monday & Friday 6pm - 4am
NORTH OROPUCHE	O'MEARA ROAD CHURCHILL ROOSEVELT HIGHWAY TO 2ND SERVICE STATION INCLUDING INDUSTRIAL ESTATE	Tuesday & Saturday 5am -
NORTH OROPUCHE	MALONEY, MALABAR PHASE 1, 3 &4, CARAPO	Tuesday & Saturday 5am -
NORTH OROPUCHE	LA HORQUETTA, BRAZIL	Tuesdays & Saturday 3pm - 8 pm
NORTH OROPUCHE	CUMUTO	Monday & Friday 9pm - 4am
NORTH OROPUCHE	TALPARO/MUNDO NUEVO	Tuesday & Saturday 11pm-
GUANAPO	ARIMA	Monday - Saturday 6am - 5pm
GUANAPO	ALENORE GARDENS PHASE 1, WALL STREET	Tuesday, Thursday, Saturday & Sunday
GUANAPO	CALVARY BRANCH ROAD	Tuesday-Saturday 9pm-5am
GUANAPO	BLANCHISSEUSE ROAD	Monday-Friday 9pm-5am
GUANAPO	MT. PLEASANT	Tuesday, Thursday, Saturday 6am-2pm

GUANAPO	GUARVADO ROAD/MATURITA CEMETERY STREET, DUMP ROAD	Monday, Wednesday &
GUANAPO	ALENORE GARDENS PHASE 2	Monday, Wednesday & Friday
ARIPO	SANTA ROSA HEIGHTS, SMITHLANDS	Monday, Wednesday &
ARIPO	WALLERFIELD BLOCK 2/3, TRACTOR POOL ROAD	Tuesday, Thursday & Saturday 6am-6pm (foll. day)
ARIPO	TUMPUNA ROAD- MALABAR ROAD, HENRI STREET	Sunday, Tuesday, Thursday & Saturday 6am-2pm
SALYBIA WELL	SALYBIA/MATHURA	Daily
CAURA	PARADISE GARDENS, MADOO HILL/UPPER EL DORADO	Tuesday, Thursday, Saturday & Sunday 9pm-4am
CAURA	DINSLEY MAIN ROAD, TACARIGUA EASTERN MAIN ROAD - ORANGE GROVE TO ST. MICHAEL, EL DORADO (NORTH EASTERN MAIN ROAD) , BEALIEU GARDENS	Daily 6am -6pm
HOLLIS	LYNTON GARDENS 1 & 2 AND ENVIRONS	Sunday & Wednesday 9pm-4am
HOLLIS	HIGH LEVEL OLTON RD, MAHOGANY DRIVE, ARIMA TOWN LOWER, TEMPLE STREET	Tuesday, Thursday, Saturday 9pm-4am
HOLLIS	ARIMA OLD ROAD, TED & MARTINEZ, CAPILDEO LANDS	Monday 5.00am - Tuesday 5.00pm & Friday 5am - Saturday 5pm
HOLLIS	BON AIR WEST - AROUCA	Sunday 6.00am - 4.00am Monday, Wednesday 6.00am - 4.00am Thursday & Friday 6am - Saturday 4am
TACARIGUA	SMITH DEVELOPMENT, FIVE RIVERS AROUCA, UPPER HILLVIEW DRIVE FIVE RIVERS	Monday Wednesday & Friday 11pm - 4am
TACARIGUA	KANDAHAR ROAD, MANIRAM ROAD, MISSION ROAD	Monday, Wednesday & Friday 11pm-4am
CARONI	LOWER FIVE RIVERS/RANGE ROAD, EASTERN MAIN ROAD FIVE RIVERS, CROWN STREET TO DICKSON ST	Wednesday & Friday
CARONI	GOLDEN GROVE ROAD, CUREPE, VALSAYN (NORTH), ST.JOSEPH EASTERN MAIN ROAD, LOWER CHAMPS FLEUR, LOWER QUARRY ROAD, LOWER HILLTOP, ST. AUGUSTINE (SOUTH)	Daily
CARONI	UPPER CHAMPS FLEUR, UPPER QUARRY ROAD, UPPER HILLTOP	Daily 9pm-5am
TACARIGUA HIGHLIFT (WELLS)	MACOYA GARDENS/INDUSTRIAL ESTATE	Daily 6am-6pm

TACARIGUA HIGHLIFT (WELLS)	TRINCITY	Daily except 6pm-6am
TACARIGUA HIGHLIFT (WELLS)	PARADISE WEST, PARADISE EAST	Daily
TACARIGUA HIGHLIFT (WELLS)	PARADISE WEST (HIGH LEVEL)	Daily 9pm-4am
TACARIGUA HIGHLIFT (WELLS)	ORANGE GROVE	Daily 6am-6pm
LLUENGO/NARANJO -WATERWORKS	NORTH OF VALLEY VIEW JUNCTION - LLUENGO ROAD, EL CHORRO, GUARITA, ACCONO ROAD, CAURITA ROAD	Monday to Friday 4pm-4am
LLUENGO/NARANJO -WATERWORKS	LA SEIVA VILLAGE, MARACAS ROYAL ROAD, AVONDALE GARDENS, LA MANGO, UPPER & LOWER VALLEY VIEW, SILK COTTON	Monday, Wednesday & Friday 9am-2pm
LLUENGO/NARANJO -WATERWORKS	BUENA VISTA, CAIMAN CIRCLE, ROSE DRIVE, LA BAJA, MARACAS GARDENS, BALATA TRACE, WARF TRACE, MOUNTAIN VIEW	Wednesday & Sunday 9pm-4am
NORTH OROPUCHE	MAUSICA RD, CRESCENT GARDENS	Monday, Tuesday, Thu, Friday & Saturday 5am - 12 noon
TACARIGUA	LAUREL HILL, MANIMORE, BERTIE RD FIVE RIVERS	Monday Wednesday Friday 11pm - 4am
HOLLIS	ARIMA OLD RD, AROUCA UPPER SECTION	Monday & Friday 11pm - 4 am
HOLLIS	LILIAN HEIGHTS, D'ADADIE	Monday & Thu 9pm-5am
HOLLIS	BREGON PARK, D'ABADIE	Tuesday & Saturday 9pm-5am
QUARE INTAKE	VALENCIA, SAN PEDRO	Daily

2005

SOURCE OF SUPPLY	AREAS SERVED	DRY SEASON SCHEDULE
CARONI WTP	ST BARBS, MORVANT, LAVENTILLE, TROU MACQUE (Pic. #1)	Monday to Saturday 6.00pm - 6.00am
CARONI WTP	ST BARBS, BELMONT (Pic #1) DURANT STREET, BELMONT ROAD, MC KAI	Monday, Saturday 6:00pm - 6:00am
CARONI WTP	ST BARBS (Pic. #1) LOWER ST. BARBS, SERRANEAU RD	Monday, Saturday 6:00pm - 6:00am
CARONI WTP	GONZALES (Pic. #1)	Monday, Wednesday, Friday 6:00am - 6:00pm
CARONI WTP	VILLAGE COUNCIL STREET - BLONDELL ALLEY, MENTOR ALLEY	Thursday, Sunday 7.00 pm - 6.00 am
CARONI WTP	PICTON (Pic #1) UPPER PICTON RD, STREAKER VILLAGE	Monday, Wednesday, Friday 6.00 pm - 6.00 am
CARONI WTP	PICTON (Pic #1) PICTON ROAD, DANKELLY	Monday to Sunday 6.00am - 6.00pm
CARONI WTP	LAVENTILLE (Val B) KERR RD, EASTERN QUARRY, ERIC ST.	Monday to Sunday 9.00pm - 6.00am
CARONI WTP	MORVANT (Upper (Pic #1) TROUMACAQUE	Monday, Thursdays 6.00 pm - 6.00 am
CARONI WTP	MORVANT (Lower (Val B) WHARTON ST, PASHLEY ST, THOMASINE ST.	Monday to Sunday 9.00pm - 6.00am
EL SOCORRO HL	MORVANT (El Socorro HL) TROUMACAQUE RD, BULLER TRACE	Monday, Wednesday, Friday 9.00 pm - 6.00 am
EL SOCORRO HL	MORVANT (El Socorro HL) ALEXIS ST, UPPER PASHLEY ST, MORGAN LANE	Tuesday, Friday 8.00 am - 6.00 pm
EL SOCORRO HL	MORVANT (El Socorro HL) LA POMPE RD, RED HILL	Tuesday, Sunday 6.00 pm - 6.00 am
EL SOCORRO HL	MORVANT (El Socorro HL) BOX HILL TRACE, LAVENTILLE RD	Sunday, Tuesday 10.00 pm - 6.00 am
EL SOCORRO HL	MORVANT (El Socorro HL) MAPLAND, CRITCHLOW HILL	Tuesday, Sunday 6:00pm - 6:00am

EL SOCORRO HL	(Val A) CIPRIANI ST, CAIMITE, MORVANT AVE.	Monday - Friday 6.00 am - 6.00 am foll.
EL SOCORRO HL	MORVANT (El Socorro HL) GREEN ACRES, UPP. BULLER ST.	Monday to Sunday 6.00 am - 6.00 pm
CARONI WTP	MORVANT (Val B) LOW. THOMASINE, PASHLEY & WHARTON ST.	Monday - Sunday 6.00 pm - 6.00 am
EL SOCORRO HL	MORVANT WHARTON STREET (EL Socorro HL)	Monday - Sunday 6.00 pm - 6.00 am
CARONI WTP	BARATARIA, MORVANT, SAN JUAN, COCONUT DRIVE	Daily
EL SOCORRO HL	ANGELINA TERRACE, (High Level)	Monday 6:00pm - 6:00am
CARONI WTP	MON REPOS, MORVANT	Monday, Thursday 6:00am - 6:00pm
CARONI WTP	BELMONT UPPER (St Barbs Tank)	Monday, Thursday 6:00pm - 6:00am
CARONI WTP	MORVANT, MON REPOS, ROMAINS LAND	Monday, Friday 6.00 pm - 6.00 am
CARONI WTP	LAYON HILL (Lower)	Wednesday 6:00pm - 6:00am
CARONI WTP	ST BARBS, BELMONT UPPER LAYLAN HILL (Upper)	Saturday 6:00pm - 6:00am
CARONI WTP	MORVANT, BLOCK 22 (Pic. #1)	Monday, Wednesday, Friday 6:00am - 6:00pm
CARONI WTP	BELMONT, MORVANT (Morvant Res.)	Tuesday, Wednesday, Friday, Saturday 6.00 am - 6.00 pm
CARONI WTP	BULLER STREET, MORVANT (Val. B)	Monday, Wednesday, Friday
EL SOCORRO HL	BEETHAM PHASES 1, 2, 3 (El Socorro HL)	Monday - Sunday 24hrs
CARONI WTP	SANTA CRUZ, PIPIOL (Val A)	Sunday, Tuesday, Wednesday, Friday 6:00 am - 6:00 pm
CARONI WTP	CANTARO VILLAGE (Val A)	Sunday, Tuesday, Wednesday, Friday 6:00 pm - 6:00 am
CARONI WTP	SANTA CRUZ UPPER (Val A) SAMBOUCAUD	Sunday, Tuesday, Wednesday, Friday 6:00 pm - 6:00 am
CARONI WTP	SANTA CRUZ UPPER (Val A) CUTUCUPANO	Tuesday, Friday 6:00 pm - 6:00 am

CARONI WTP	SANTA CRUZ NORTH (Val A)	Sunday, Tuesday, Wednesday, Friday 6:00 pm - 6:00 am
CARONI WTP	SANTA CRUZ UPPER (Val A)	Sunday, Tuesday, Wednesday, Friday
CARONI WTP	BARATARIA (V2 Caroni)	Daily
CARONI WTP	HOLOLO MOUNTAIN ROAD LOWER (Val A)	Sunday, Tuesday, Wednesday, Friday 6:00 pm - 6:00 am
CARONI WTP	HOLOLO MOUNTAIN ROAD (UPPER) (Val A)	Sunday, Tuesday, Wednesday, Friday 6:00 pm - 6:00 am
EL SOCORRO HL	EL SOCORRO ROAD (El Socorro HL)	Daily
EL SOCORRO HL	EL SOCORRO ROAD (El Socorro HL)	Daily
EL SOCORRO HL	EL SOCORRO ROAD CROISEE TO GLEN LANE (Val A)	Monday - Sunday 6:00pm - 6:00am
CARONI WTP	LAVENTILLE ROAD FEBEAU VILLAGE (Val B)	Wednesday - Saturday 6:00 pm - 6:00 am
CARONI WTP	BAGATELLE EXTENSION (Val B)	Sunday - Tuesdays 6:00 pm - 6:00 am
CARONI WTP	EVR FROM ST JOSEPH TO SAN JUAN, MT. LAMBERT	Daily
CARONI WTP	PETITE CURACAYE, QUARRY ROAD, UPPER MT DOR, UPPER MT HOPE	Daily - 9:00 pm - 6:00 am
CARONI WTP	MT HOPE, PETITE BOURGE, SANTA CRUZ OLD ROAD, QUARRY ROAD, MT DOR IRVING ST, VALSAYN NORTH	Daily 6:00 pm - 6:00 am
CARONI WTP	OLD ST JOSEH ROAD SADDLE ROAD FEBEAU VILLAGE LOWER	Daily
CARONI WTP	GRAND CURACAYE GRACE GARDENS	Saturday 9.00pm - Sunday 6.00am Thursday 9.00pm - Friday 6.00am

2005

SOURCE	AREA SERVED	DURATION OF SUPPLY
NAVET WATER WORKS	Princes Town	Daily 10:00 p.m. - 5:00 a.m.
	Aldana Street	Daily 10:00 p.m. - 5:00 a.m.
	Circular Street	Daily 10:00 p.m. - 5:00 a.m.
	High Street	Daily 10:00 p.m. - 5:00 a.m.
	Charlotte Street	Daily 10:00 p.m. - 5:00 a.m.
	Armor Street	Daily 10:00 p.m. - 5:00 a.m.
	Lothians Main Road	Daily 10:00 p.m. - 5:00 a.m.
	Centenary Street	Daily 10:00 p.m. - 5:00 a.m.
	Buen Intento, Princes Town	Daily
	Railway Road, Princes Town	Daily 10:00 p.m. - 5:00 a.m.
	St. Croix Road up to Realize Road	Monday 10:00 p.m. - 5:00 a.m. Tuesday 10:00 p.m. - 5:00 a.m. Wednesday 10:00 p.m. - 5:00 a.m.
	Jalim Street	Daily 10:00 p.m. - 5:00 a.m.
	Malgretoute Road	Daily 10:00 p.m. - 5:00 a.m.
	Khanhai North from Rochard Douglas Road to	Daily
	Rees Road	Daily
	St. Croix Road (from Rees Road - 4 1/2mm)	Daily
	Lengua Road	Monday 10:00 p.m. - 5:00 a.m. Tuesday 10:00 p.m. - 5:00 a.m. Wednesday 10:00 p.m. - 5:00 a.m.
	Realize Road (up to Lp 7)	Thursday 10:00 p.m to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m. Saturday 10:00 p.m. Sunday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m
	Jaipaulsingh Road	Saturday 10:00 p.m to Sunday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m
	Papourie Road(LP 102 - LP 132)	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.

Williamsville	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Kent Street	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Yankee Dam	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m. Saturday 10:00 p.m. to Sunday 5:00 a.m. Sunday 10:00 p.m. to Monday 5:00 a.m. Monday 10:00 p.m. to Tuesday 5:00 a.m.
Guaracara/Tabaquite Road from Morne Roche Quarry Road to Garth Road	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Eckles Village	Saturday 10:00 p.m. - Sunday 5:00 a.m. Sunday 10:00 p.m. - Monday 5:00 a.m. Monday 10:00 p.m. - Tuesday 5:00 a.m.
Garth Road from Iere Village Branch Road to Guaracara Tabaquite Road	Wednesday 8:00 p.m. to Tuesday 5 a.m.
Iere Village	Daily
Iere Village Branch Road	Daily
Morne Roche Road, Sancho/Montique	Saturday 10:00 p.m. - Sunday 5:00 a.m. Sunday 10:00 p.m. - Monday 5:00 a.m. Monday 10:00 p.m. - Tuesday 5:00 a.m.
Manahambre Road	Daily
Garth Road (from Naparima/Mayaro Road to Iere Village Branch Road)	Daily
Corial Road	Tuesday 9:00 p.m. - Wednesday 5:00 a.m.
La Paille	Daily 10:00 p.m. - 5:00 a.m.
Cedar Hill	Daily 10:00 p.m. - 5:00 a.m.
Solomon Street	Daily 10:00 p.m. - 5:00 a.m.
Cedar Hill Extension Road	Daily 10:00 p.m. - 5:00 a.m.
Churkoo Village	Daily
Woodland Road	Daily
Jalim Street	Daily
Malgretoute Road	Daily
Buen Intento Road	Daily
Dyers Village	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Hardbargin	Daily
Sisters Road (from Buen Intento to Lp 100)	Daily 10:00 p.m. - 5:00 a.m.
Rio Claro/Tabaquite Road (from Torrib/Tabaquite Junction to Naparima/Mayaro Road)	Daily
San Pedro Road	Daily
Dades Trace	Daily
Liberville	Daily
Rio Claro	Daily
Hibiscus Arch Road	Daily 10:00 p.m. - 5:00 a.m.
Clearwater Road	Daily 10:00 p.m. - 5:00 a.m.
Cemetery Street	Daily
Guayaguayare Old Road	Daily
Deep Ravine	Daily 10:00 p.m. - 5:00 a.m.
Tabaquite	Daily 10:00 p.m. - 5:00 a.m.

Quarry Road	Daily 10:00 p.m. - 5:00 a.m.
Church Road	Daily 10:00 p.m. - 5:00 a.m.
Stone Road	Daily 10:00 p.m. - 5:00 a.m.
Cunapo Southern Road up to Navet Village	Daily 10:00 p.m - 5:00 a.m.
Charuma Village	Daily 10:00 p.m - 5:00 a.m.
Cushe Village	Daily 10:00 p.m - 5:00 a.m.
Brasso	Monday 12MN - Tuesday 8:00 a.m.
Poole	Daily 10:00 p.m. - 5:00 a.m.
Fonrose	Daily 10:00 p.m. - 5:00 a.m.
Cunapo Southern Road 20-1/2mm-18mm	Monday 11:00 p.m. to Tuesday 5:00 a.m. Wednesday 11:00 p.m. to Thursday 5:00 a.m.
Pascal Road	Daily
Stafford Road	Daily
Robertson Road	Daily
Sisters Road	Daily
Torrib Trace	Daily
Mc Clean Road	Daily
Lewis Road	Daily
North Trace	Daily
Williamsmith/Mantacool Road	Daily 10:00 p.m. - 5:00 a.m.
Ants Nest Road	Daily 10:00 p.m. - 5:00 a.m.
Tableland Local Road	Daily 10:00 p.m. - 5:00 a.m.
George Village	Daily 10:00 p.m. - 5:00 a.m.
Gaffoor Trace	Daily
Robert Village North	Daily 10:00 p.m - 5:00 a.m.
Williamsmith Road	Daily
Premier Trace	Daily
Naparima/Mayaro Road from Tableland Police Station to Glod Road	Daily
Lightfoot Trace	Saturday 9:00 a.m to Sunday 9:00 a.m
Hoseinee Trace	Daily 10:00 p.m. - 5:00 a.m.
Pancho Trace	Saturday 9:00 a.m to Sunday 9:00 a.m
Stone Road	Daily
Piparo Main Road	Daily 10:00 p.m. - 5:00 a.m.
Mappipire Road	Friday 10:00 p.m. to Saturday 6:00 a.m.

Esmeralda Road	Thursday 10:00 p.m. to Friday 6:00 a.m.
Mayo Road from Whiteland junction to LP22 Mayo Road	Saturday 10:00 p.m. to Sunday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m
Guaracara/Tabaquite Road from Morne Roche Quarry Road to Piparo Road	Daily 10:00 p.m. - 6:00 a.m.
Harry John Road	Daily
Sancho Road	Daily
Post Office Trace	Daily
Maingot Road	Daily
St.George Road	Daily
Moruga Road from Naparima Mayaro Road to Poui Road	Daily
Matilda Road	Daily
Perry Young Road	Daily
St.Julien Road	Daily
Monkey Town Road	Daily
Hindustan Road	Daily
Naggee Road	Daily
Sixth Company Circular Road,	Daily
Mc Nish Road	Daily
Hindustan Estate Road	Daily
Contention Road	Tuesday 10:00 a.m. - Thursday 10:00 a.m.
Loney Road, Mandingo Road	Daily
Cumuto Road	Daily 10:00 p.m. - 5:00 a.m.
Realize Road	Daily 10:00 p.m. - 5:00 a.m.
Poui Road	Daily
Gunness Trace	Daily
Teelucksingh Trace,	Daily
Subrattee Road	Daily
Rochard Douglas Road	Daily
Cunjal Road	Daily
Saunders Trace	Daily
Burton Trace	Daily
Blackwell Trace	Daily
Gomez Trace	Daily
St. Mary's Village	Daily
Rock River	Daily 10:00 p.m. - 5:00 a.m.
La Ruffin	Daily
Bois Jean Jean	Daily
Cachipe	Daily 10:00 p.m. - 5:00 a.m.
Basse Terre	Daily 10:00 p.m. - 5:00 a.m.
Gran Chemin	Daily
La Lune	Daily
Marac	Daily 10:00 p.m. - 5:00 a.m.

BICHE WATERWORKS	Kowlessar Trace	5:00 a.m. - 10:00 a.m. daily
	O'Brien Trace	5:00 a.m. - 10:00 a.m. daily
	Biche Village	5:00 a.m. - 10:00 a.m. daily
	Fitz Road	5:00 a.m. - 10:00 a.m. daily
GUARACARA SPRING	Guaracara/Tabaquite Road (from Seecharan Trace to Rebecca Richmond Road)	Daily 10:00 p.m. - 5:00 a.m.
MORICHAL SPRING	Whiteland	Saturday 10:00 p.m. to Sunday 6:00 a.m. Sunday 10:00 p.m. to Monday 6:00 a.m.
	Sankerlal Development	Saturday 10:00 p.m. to Sunday 6:00 a.m. Sunday 10:00 p.m. to Monday 6:00 a.m.
	Poonah Road	Monday 10:00 p.m. to Tuesday 6:00 a.m. Tuesday 10:00 p.m. to Wednesday 6:00 a.m.
MAYARO WATERWORKS	Plaisance	Thursday 9:00 a.m. to Friday 5:00 a.m.
	Ortoire Village	Friday 9:00 a.m. to Saturday 5:00 a.m.
	Resthouse Village	Friday 9:00 a.m. to Saturday 5:00 a.m.
	Peter Hill	Friday 9:00 a.m. to Saturday 5:00 a.m.
	Mafeking Road	Tuesday 9:00 a.m. - Wednesday 5:00 a.m.
	Cedar Groove	Tuesday 9:00 a.m. - Wednesday 5:00 a.m.
	Mafeking Village	Tuesday 9:00 a.m. - Wednesday 5:00 a.m.
	Manzanilla	Wednesday 11:00 a.m. to Thursday 5:00 a.m.
MALONEY WATER TREATMENT PLANT	Church Street	Sunday 8:00 p.m. - Monday 5:00 a.m., Wednesday 8:00 p.m. - Thursday 5:00 a.m., Saturday 8:00 p.m. - Sunday 1:00 p.m.
	Gill Street	Sunday 8:00 p.m. - Monday 5:00 a.m., Wednesday 8:00 p.m. - Thursday 5:00 a.m., Saturday 8:00 p.m. - Sunday 1:00 p.m.
	Guayaguayare Rd from Maloney to Beaumont Road	Sunday 8:00 p.m. - Monday 5:00 a.m., Wednesday 8:00 p.m. - Thursday 5:00 a.m., Saturday 8:00 p.m. - Sunday 1:00 p.m.
STONEBRIGHT WATER	Sansucker Road	Daily
	Frontin Road	Daily
	Guayaguayare Main Road (4 1/2mm - 6mm)	Daily
GUAYAGUAYARE WATER TREATMENT	La Savanne	Daily 6:00 a.m. - 6:00 p.m.
	Newlands	Daily 6:00 a.m. - 6:00 p.m.
	Guayaguayare Village	Daily 6:00 a.m. - 6:00 p.m.
	Kalmapas	Daily
	Isthmus Road	Daily

SOURCE	AREAS SERVED	DURATION OF SUPPLY
CARONI WATER TREATMENT PLANT	Alexander Road	Tuesday & Thursday 9:00 a.m.- 2:00 p.m.
	North Road	Tuesday & Thursday 9:00 a.m.- 2:00 p.m.
	Wharton Street	Tuesday & Thursday 9:00 a.m.- 2:00 p.m.
	Gill Street	Tuesday & Thursday 9:00 a.m.- 2:00 p.m.
	Upper Sumadh Gardens	Tuesday & Thursday 9:00 a.m.- 2:00 p.m.
	Hafza Ave	Tuesday & Thursday 9:00 a.m.- 2:00 p.m.
	Jennifer Heights	Wednesdays, Fridays & Sundays 9:00 a.m. - 2:00 p.m
	San Fernando City	Daily 5:00 a.m. - 9 a.m.
	Sumadh Gardens	Mondays & Saturdays 9:00 a.m - 2:00 p.m
	Waddell Street	Mondays & Saturdays 9:00 a.m - 2:00 p.m
	Hafza Avenue	Mondays & Saturdays 9:00 a.m - 2:00 p.m
	Montano Street	Mondays & Saturdays 9:00 a.m - 2:00 p.m
	Aleong Street	Mondays & Saturdays 9:00 a.m - 2:00 p.m
	Zucher Street	Mondays & Saturdays 9:00 a.m - 2:00 p.m
	Vistabella Road	Daily 9:00 p.m. - 4:00 a.m.
	Rawle Lands	Daily 9:00 p.m. - 4:00 a.m.
	Ramnarine Avenue	Daily 9:00 p.m. - 4:00 a.m.
	Hubert Rance	Daily 9:00 p.m. - 4:00 a.m.
	Jarvis Street	Daily 9:00 p.m. - 4:00 a.m.
	Arch Street	Daily 9:00 p.m. - 4:00 a.m.
	Pond Street	Daily 9:00 p.m. - 4:00 a.m.
	Lambie Street	Daily 9:00 p.m. - 4:00 a.m.
	Central Street	Daily 9:00 p.m. - 4:00 a.m.
	Ogeer Ali Street	Daily 9:00 p.m. - 4:00 a.m.
	Lange Street	Daily 9:00 p.m. - 4:00 a.m.
	Guppy Street	Daily 9:00 p.m. - 4:00 a.m.

Archibald Street	Daily 9:00 p.m. - 4:00 a.m.
Circular Road	Daily 9:00 p.m. - 9:00 a.m.
Lower Vistabella	Daily 9:00 p.m. - 9:00 a.m.
Happy Hill, St. Joseph Village	Daily 9:00 p.m. - 4:00 a.m.
Southern Main Road Claxton Bay	Thursday 10:00 a.m. - Saturday 8:00 a.m. Sunday 10:00 a.m. - Wednesday 8:00 a.m.
Cedar Hill (Upper) from Southern Main Road to Joe Flemming Hill	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Sum Sum Hill	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Cedar Hill (lower)	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Soledad	Sunday 9:00 a.m. - Wednesday 8:00 a.m.
Cunupia	Tuesday 9:00 a.m. - Friday 5:00 a.m. Saturday 9:00 a.m. - Monday 5:00 a.m.
Enterprise	Tuesday 9:00 a.m. - Friday 5:00 a.m. Saturday 9:00 a.m. - Monday 5:00 a.m.
Longdenville	Tuesday 9:00 a.m. - Friday 5:00 a.m. Saturday 9:00 a.m. - Monday 5:00 a.m.
Boodram Development	Tuesday 9:00 a.m. - Friday 5:00 a.m. Saturday 9:00 a.m. - Monday 5:00 a.m.
Ragoonanan Road (Lower)	Tuesday 9:00 a.m. - Friday 5:00 a.m. Saturday 9:00 a.m. - Monday 5:00 a.m.
Welcome Road	Tuesday to Friday 10:00 p.m. - 5:00 a.m. Saturday to Monday 10:00 p.m.- 5:00a.m.
Brasso Caparo Valley Road in vicinity of Wong Sing	Tuesday 10:00 p.m. to Wednesday 5:00 a.m. Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Saturday 10:00 p.m. to Sunday 5:00a.m. Sunday 10:00 p.m. to Monday 5:00a.m.
Longdenville	Tuesday 10:00 p.m. to Wednesday 5:00 a.m. Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Saturday 10:00 p.m. to Sunday 5:00a.m. Sunday 10:00 p.m. to Monday 5:00a.m.
Penco Lands	Tuesday 10:00 p.m. to Wednesday 5:00 a.m. Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Saturday 10:00 p.m. to Sunday 5:00a.m. Sunday 10:00 p.m. to Monday 5:00a.m.
Ragoonanan upper	Tuesday 10:00 p.m. to Wednesday 5:00 a.m. Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Saturday 10:00 p.m. to Sunday 5:00a.m. Sunday 10:00 p.m. to Monday 5:00a.m.
Jerningham, Pierre Road	Wednesday 6:00 a.m.-Thursday 5:00a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.

Assaraff Road	Wednesday 6:00 a.m.-Thursday 5:00a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Kohalal Road	Wednesday 6:00 a.m.-Thursday 5:00a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Clarke Road (West)	Wednesday 6:00 a.m.-Thursday 5:00a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Warner Village Upper Cunupia,	Wednesday 6:00 a.m.-Thursday 5:00a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Ackbar Trace	Wednesday 6:00 a.m.-Thursday 5:00a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Akaloo Trace	Wednesday 6:00 a.m.-Thursday 5:00a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Francis Lalla Clarke Road (East) Cacandee	Wednesday 6:00 a.m.-Thursday 5:00a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Kelly Village	Monday 10:00 a.m. to Wednesday 5:00 a.m Thursday 10:00 a.m to Sunday 5:00 a.m
Frederick Settlement	Daily 10:00 p.m. - 5:00 a.m. except Sunday and Wednesday
La Paille Village	Sunday 12:00 a.m. to Monday 5:00 a.m. Wednesday 12:00 a.m to Thursday 5:00 a.m
Hin Kin Trace	Daily
Dyette Estate	Daily
Mon Plaisance Road	Daily
Chaguanas Main Road	Daily
Chaguanas Commercial Centre from Caroni Savannah Road to Southern Main	Daily
Peters Field	Tuesday 6:00 a.m. - Friday 5:00 a.m. Saturday 6:00 a.m. - Sunday 6:00 p.m.
Edinburgh Village	Tuesday 6:00 a.m. - Friday 5:00 a.m. Saturday 6:00 a.m. - Sunday 6:00 p.m.
Cacandee and Felicity	Wednesday 9:00 p.m. -Thursday 5:00 a.m. Friday 9:00 p.m. - Sunday 4:30 a.m. Monday 9:00 p.m. - Tuesday 5:00 a.m.
Rodney Road Extension	Wednesday 9:00 p.m. -Thursday 5:00 a.m. Friday 9:00 p.m. - Sunday 4:30 a.m. Monday 9:00 p.m. - Tuesday 5:00 a.m.
Lange Park	Tuesday 8:00 a.m. - Friday 5:00 a.m. Saturday 8:00 a.m. - Sunday 6:00 a.m.
Edinburgh 500	Tuesday 8:00 a.m. - Friday 5:00 a.m. Saturday 8:00 a.m. - Sunday 6:00 a.m.
Montrose	Tuesday 8:00 a.m. - Friday 5:00 a.m. Saturday 8:00 a.m. - Sunday 6:00 a.m.

Edinburgh Village	Tuesday 8:00 a.m. - Friday 5:00 a.m. Saturday 8:00 a.m. - Sunday 6:00 a.m.
Homeland Gardens	Tuesday 8:00 a.m. - Friday 5:00 a.m. Saturday 8:00 a.m. - Monday 5:00 a.m.
Point Pleasant Park	Tuesday 8:00 a.m. - Friday 5:00 a.m. Saturday 8:00 a.m. - Monday 5:00 a.m.
Jonathan Trace	Tuesday 8:00 a.m. - Friday 5:00 a.m. Saturday 8:00 a.m. - Monday 5:00 a.m.
Bhagaloo Street	Tuesday 8:00 a.m. - Friday 5:00 a.m. Saturday 8:00 a.m. - Monday 5:00 a.m.
Boodram Development	Tuesday 8:00 a.m. - Friday 5:00 a.m. Saturday 8:00 a.m. - Monday 5:00 a.m.
Caroni Savannah Rd	Daily
Orchard Gardens	Daily
Union Village	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
West Carapichaima	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
Perseverance Bank Village	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
Carapichaima	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
St. Mary's	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
Beaucarro (Upper)	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
Chase Village	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
McBean (Upper)	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
Couva	Daily
Perseverance	Daily
Basta Hall, Dow Village	Daily
Springvale from Cedar Hill Road to Community Centre	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m to Friday 5:00 a.m. Saturday 10:00 p.m. to Sunday 5:00a.m. Monday 10:00 p.m to Tuesday 5:00a.m.
Diamond high point	Sunday 10:00 a.m. - Monday 10:00 a.m.
Esperanza	Daily
Springvale from Community Centre to Mount Pleasant Trace	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m to Friday 5:00 a.m. Saturday 10:00 p.m. to Sunday 5:00a.m. Monday 10:00 p.m to Tuesday 5:00a.m.

FREEPORT WATERWORKS	Indian Trail	Daily
	Gordon Village	Daily
	Boissierre	Daily
	Tortuga	Tuesdays 10:00 p.m. to Wednesday 5:00 a.m. Sundays 10:00 p.m. to Monday 5:00 a.m.
	Caratal	Tuesdays & Sundays 10:00 p.m. to 5:00 a.m.
	Mayo Village Gran Couva	Daily 10:00 p.m. - 5:00 a.m.
	Tortuga Village, Gran Couva	Daily 10:00 p.m. - 5:00 a.m.
	Melanie Gardens	Daily
	Central Park	Daily
	Balmain Gardens, Balmain	Daily
	Calcutta #2	Daily
	Calcutta Settlement Roads #1 & #3	Daily
	Sapatay	Daily
	Lower Couva Road	Daily
	Sesame Street	Daily
	Chickland Road	Daily
	Nelson Road	Daily
	Lime Fruit Road	Daily
	Christian Village	Daily
	Siewdass Road	Daily
	Flanagin Town	Mondays 10:00 p.m. to Tuesday 5:00 a.m., Wednesdays 10:00 p.m. Thursday 5:00 a.m. Friday 10:00 p.m. Saturday to 5 a.m.
	Brasso Piedra	Mondays 10:00 p.m. to Tuesday 5:00 a.m., Wednesdays 10:00 p.m. Thursday 5:00 a.m. Friday 10:00 p.m. Saturday to 5 a.m.
	CARLSEN FIELD WATER TREATMENT	Arena Road (lower)
Fairview Park		Sunday 6:00 a.m. - Monday 9:00 p.m. Wednesday 6:00 p.m. - Thursday 9:00 p.m.
Nadira Gardens		Sunday 6:00 a.m. - Monday 9:00 p.m. Wednesday 6:00 p.m. - Thursday 9:00 p.m.
Arena Road (upper)		Monday 9:00 p.m. - Tuesday 6:00 a.m. Thursday 9:00 p.m. - Friday 6:00 a.m.
La Cuesa Road		Monday 9:00 p.m. - Tuesday 6:00 a.m. Thursday 9:00 p.m. - Friday 6:00 a.m.
Thompson		Sunday 10:00 a.m. - Tuesday 6:00 a.m. Wednesday 10:00 a.m. to Friday 6:00 a.m.
Carlsen Field		Tuesday 9:00 a.m. - Wednesday 6:00 p.m. Friday 9:00 a.m. - Sunday 6:00 a.m.

CARLSEN FIELD WELL NO. # 5	Freeport Todds	Tuesday 10:00 p.m. - Wednesday 5:00 a.m.
	Todds Fletcher	Monday 6:00 p.m. - Tuesday 9:00 a.m.
	Chickland Caparo	Saturday 10.00 p.m. to Sunday 5:00 a.m
	Mamoral #1	Wednesday 9:00 p.m. - Friday 9:00 a.m.
	Mamoral #2	Thursday 10:00 p.m. - Friday 8:00 a.m.
	Caparo Main Road	Saturday 11:00 a.m to Sunday 6:00 p.m
	Caparo Main Road (upper)	Wednesday 11:00 a.m. - Thursday 4:00 p.m.
	Chin Johnson Road	Monday 10:00 a.m. - Tuesday 6:00 p.m. Wednesday 10:00 a.m. - 9:00 p.m. Thursday 10:00 a.m. - 4:30 p.m. Saturday 10:00 a.m.- Saturday 12:00 p.m
Palmiste	Daily	
RAVINE SABLE WATER TREATMENT PLANT	Upper Ravine Sable near Sand Pit	Daily 10:00 p.m to 5:00 a.m.
	Lower Ravine Sable	Daily
LAS LOMAS WATER TREATMENT PLANT	Las Lomas #1	Tuesday, Thursday & Saturday 8:00 p.m.- 4:00 a.m.
	Las Lomas #2	Monday, Wednesday & Friday 8:00 p.m - 4:00 a.m.
	Las Lomas #3	Tuesday, Thursday & Saturday 8:00 p.m.- 4:00 a.m.
	Chin Chin (East) of Madras Rd.	Tuesday, Thursday & Saturday 8:00 p.m.- 4:00 a.m.
	Mahaica	Monday, Wednesday & Friday 12MN - 4:00 a.m.
NAVET WATER WORKS	Plaisance Park, Teak Ave	Daily
	Marabella	Daily
	Lumsden Street	Daily
	Allen Street	Daily
	Ragoobar Lands	Daily
	Thompson Road	Daily
	Bonne Aventure Main Road	Daily
	Bhagwansingh Trace	Tuesday 9:00 p.m.- Wednesday 6:00 a.m. Sunday 6:00 a.m. - 6:00 p.m.
	San Fabien Road, Springlands	Monday 6:00 a.m. - Tuesday 9:00 p.m.
	Marylands	Wednesday 6:00 a.m.- Thursday 5:00 a.m.
	Cocoa Piece & Bonne Aventure Main to Dalloo Road	Thursday 11:00 a.m. - Friday 6:00 p.m.
	School Trace	Saturday 6:00 p.m. - Sunday 6:00 a.m.
	Cotton Hill	Saturday 6:00 p.m. - Sunday 6:00 a.m.

Caratal #1	Sunday 6:00 p.m.- Monday 5:00 a.m.
Old Parforce	Friday 6:00 p.m. - Saturday 6: 00 a.m.
New Parforce	Saturday 6:00 a.m. - Saturday 6:00 p.m
St. Margaret's (Upper)	Daily
Bandoo Trace	Daily
Laloo Trace	Daily
Phillip Lane	Daily
Caratal	Daily
Ramsaroop	Daily
Macaulay/Bagi Tola	Daily
Ramsesar/Boodoo	Daily
Teak Avenue/Botham Avenue	Daily

SOURCE	AREA SERVED	SCHEDULE OF SUPPLY
CARONI WATER TREATMENT PLANT	Palmiste Blocks 1 to 7, Lazzari Lands, Roberts Rd., Phillipine Rd., Bryans Gate, Sunkist Development	Monday 10:00 a.m. - Tuesday 6:00 a.m. Wednesday 10:00 a.m. - Friday 5:00 a.m. Saturday 10:00 a.m. - Sunday 6:00 p.m.
	Esperance Village and Side Streets up to Mowassie Hill	Wednesday 10:00 p.m. - Friday 5:00 a.m. Saturday 10:00 p.m. - Sunday 5:00 a.m.
	Green Acres, Bel Air, Coconut Drive, Gulf View	Thursday 10:00 a.m. - Saturday 5:00 a.m., Sunday 10:00 a.m. - Wednesday 5:00 a.m. Sunday 10:00 a.m. - Wednesday 5:00 a.m.
	Union Hall, Duncan Village	Monday - Thursday 10:00 p.m. to 5:00 a.m.
	Pleasantville, Green Acres	Friday 8:00 p.m. - Saturday 5:00 a.m. Saturday 8:00 p.m. - Sunday 5:00 a.m. Monday 8:00 p.m. - Tuesday 5:00 a.m. Tuesday 8:00 p.m. - Wednesday 5:00 a.m. Wednesday 8:00 p.m. - Thursday 5:00 a.m.
	Southern Main Road La Romain from Devon Chad Drive to TJs	Tuesday 12:00 p.m. - Monday 5:00 a.m.
	Rambert Village, Pond Street, Seepaul Boulevard,	Daily
	Windsor Street, Hermitage Village, Beach Road, Penn Avenue	Daily
	Debe Trace, Gandi Village	Monday 10:00 p.m. - Tuesday 6:00 a.m. Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.
	Debe Main Road (from Debe Wellington Road to Ramai Trace)	Daily

	Ramsamooj Trace and Lalbeharry Trace. (up to Branch Trace #1), Mahadeo Trace, Ramai Trace low pts	Daily 10:00 p.m. - 5:00 a.m.
	Cuchawan Trace East and West, Ramai Trace, Debe N.H.A Development	Daily 10:00 p.m. - 5:00 a.m.
	Harbajan Hill, Laltoo Trace, Soomai Trace, Suchit Trace, Boodoo Trace, Mohess Road	Daily
	Jamoonie Trace, Ragoonanan Trace, Gopie Trace	Daily 10:00 p.m. - 5:00 a.m.
	Puzzle Island, Ramai Trace high pt	Daily 10:00 p.m. - 5:00 a.m.
	Siparia Old Road from Fyzabad Road to Thick Village Community Centre Saltmine Trace, Seepaulsingh Trace, Ali's Trace, Super Trace	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.
	Seukeran Trace	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.
	Fyzabad/Guapo Road from Charlie King Junction to Fyzabad Comprehensive School, Bissoon Trace, Ramlogan Avenue	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.
	Lum Tack Hill, Standard Road	Friday 10:00 a.m to Sunday 5:00 a.m. Monday 10:00 a.m to Thursday 5:00 a.m
	Hickling Village, Bushe Village, Mawle Village	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.
	Fyzabad Main Road (from Avocat Junction to Fyzabad Health Centre), Thompson Street, Richardson Street, Sewlal Street, Mortelle Street	Friday 8:00 p.m. - Saturday 5a.m. Saturday 8:00 p.m. - Sunday 5:00 a.m. Monday 8:00 p.m. - Tuesday 5:00 a.m. Tuesday 8:00 p.m. - Wednesday 5:00 a.m. Wednesday 8:00p.m - Thursday 5:00 a.m
	Robert Hill and Environs Avocat Village, Siparia Old Road up to Fyzabad / Siparia Old Road Junction, St. John's Trace	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.
	Ackbar Trace	Daily
	San Francique Road up to Timital Junction, Harris Village, South Oropouche	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00p.m. - Friday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m. Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m. - Monday 5:00 a.m.
	Oropouche Health Centre, Partap Trace, Berridge Trace	Daily
NAVET WATERWORKS	Cipero Road	Monday 6:00 a.m. - Tuesday 5:00 am, Wednesday 6:00 a.m. - Sunday 5:00 a.m.
	Corner Cottage Road and Papourie Road, Rochard Road up to Clarke Road Booster	Daily 10:00 p.m. - 5 a.m.
	New Colonial Road	Daily
	Upper Barrackpore	Daily 10:00 p.m. - 5 a.m.
	Congo Village	Daily 10:00 p.m. - 5 a.m.
	Pierre Trace	Daily 10:00 p.m.- 5 a.m.
	Lal Beharry Trace #1	Daily 10:00 p.m.- 5 a.m.
	Monkey Town	Daily 10:00 p.m.- 5 a.m.
	Cemetery Street	Daily 10:00 p.m.- 5 a.m.
	Borde Narve	Daily 10:00 p.m.- 5 a.m.
	Old Clarke Road	Daily 10:00 p.m.- 5 a.m.
	From Barrackpore Police Station to LP 168 Papourie Road	Daily 10:00 p.m.- 5 a.m.
	G.P. Road	Daily 10:00 p.m.- 5 a.m.
	Trintoc Barrackpore	Daily 10:00 p.m.- 5 a.m.

	Rochard Douglas Road from No. 2 Scale to Kanhai Trace (North & South)	Daily 10:00 p.m.- 5 a.m.
	St. Charles Village (Manahambre Road)	Daily
	Rochard Road from Clarke Road to Penal Rock Road, Penal Rock Road Junction up to Rock Road 5 1/2mm	Thursday 8:00 p.m. - Friday 5:00 a.m. Friday 8:00 p.m. - Saturday 5:00 a.m.
	Platinite Road	Thursday 8:00 p.m. - Friday 5:00 a.m. Friday 8:00 p.m. - Saturday 5:00 a.m.
	Rock Road 6mm - 8 1/2mm	Thursday 8:00 p.m. - Friday 5:00 a.m. Friday 8:00 p.m. - Saturday 5:00 a.m. Saturday 10:00 p.m - Sunday 5:00 a.m.
	From Clarke Road Booster along Clarke Road to Lachoos Road	Sunday 10:00 p.m. - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Tuesday 10:00 p.m. - Wednesday 5:00 a.m.
	Digity Village & Transfer Village including Sanahie Trace, Panoo Trace, Upper Mohess Road	Saturday 8:00 p.m. - Sunday 5:00 a.m. Sunday 8:00 p.m. - Monday 5:00 a.m.
CARONI WATER TREATMENT PLANT	La Fortune Pluck Road from Southern Main Road to Tennant Trace, Woodland, Jacksingh Trace, Mungal Trace, Claude Street, Elizabeth Street, La Plaisance Road, Baig Trace	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m. Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m. - Monday 5:00 a.m.
	Alana Trace, Hector Trace, Maude Trace, Ramcharan Trace	Tuesday 8:00 p.m. - Wednesday 6:00 a.m. Wednesday 8:00 p.m. - Thursday 6:00 a.m. Thursday 8:00 p.m. - Friday 6:00 a.m. Friday 8:00 p.m. - Saturday 6:00 a.m. Saturday 8:00 p.m - Sunday 6:00 a.m. Sunday 8:00 p.m. -
	Jokhan Trace, Tennant Trace, Doorbassa Trace Centeno Trace	Tuesday 10:00 p.m. - Wednesday 6:00 a.m. Wednesday 10:00 p.m. - Thursday 6:00 a.m. Thursday 10:00 p.m. - Friday 6:00 a.m. Friday 10:00 p.m. - Saturday 6:00 a.m. Saturday 10:00 p.m - Sunday 6:00 a.m. Sunday 10:00 p.m. - Monday 6:00 a.m.
	Timital Junction to 2mm San Francique Road, Ramnath Trace, Murray Trace, Red Hill, Timital Junction	Tuesday 10:00 p.m. - Wednesday 6:00 a.m. Wednesday 10:00 p.m. - Thursday 6:00 a.m. Thursday 10:00 p.m. - Friday 6:00 a.m. Friday 10:00 p.m. - Saturday 6:00 a.m. Saturday 10:00 p.m - Sunday 6:00 a.m. Sunday 10:00 p.m. - Monday 6:00 a.m.
	Dow Village, South Oropouche	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
	Otaheite Village, Mon Desir	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
	Rigg Road, Grove Park #1 & 2	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
	Pond Road, Sankarlal Development, Aripere Development	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
	Rousillac Main Road and Side Streets from LP 1425 - LP 1454	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.

	From the corner of Church Street & La Brea Road including Lagan D'or Street, New Lands, Bassa Hill, Cassava Alley, Railroad Avenue Ext.	Monday 10:00 p.m. - Tuesday 6:00 a.m. Wednesday 10:00 p.m - Saturday 6:00 a.m. Sunday 10:00 p.m. - Tuesday 6:00 a.m.
	Southern Main Road, Vessigny including all Side Streets from LP 1613 to Vessigny Beach (LP 1625), Celestial Park, Bushy Park	Monday 8:00 p.m. - Tuesday 6:00 a.m. Wednesday 8:00 p.m - Saturday 6:00 a.m. Sunday 8:00 p.m. - Tuesday 6:00 a.m.
	Southern Main Road, Vessigny including all Sides Streets from LP 1600 - LP 1613	Monday 8:00 p.m. - Tuesday 6:00 a.m. Wednesday 8:00 p.m - Saturday 6:00 a.m. Sunday 8:00 p.m. - Tuesday 6:00 a.m.
	Vance River	Monday 8:00 p.m. - Tuesday 6:00 a.m. Wednesday 8:00 p.m - Saturday 6:00 a.m. Sunday 8:00 p.m. - Tuesday 6:00 a.m.
	Boodoosingh Trace, Sobo Circular Road, Sobo Extension	Monday 8:00 p.m. - Tuesday 6:00 a.m. Wednesday 8:00 p.m - Thursday 6:00 a.m. Sunday 8:00 p.m. - Monday 6:00 a.m.
	Sobo Road, Chin Fong Alley	Thursday 9:00 p.m. - Friday 5:00 a.m. Friday 9:00 p.m. - Saturday 5:00 a.m.
	De Gannes Village, Lily Trace,	Sunday 10:00 a.m. - Monday 5:00 a.m.
	S. S. Erin Road from the Junction of S.S Erin Road & Siparia Old Road to the 14-1/4mm LP#442 including Well Road, Logie Street, Poco Alley, Coconut Alley, Dandy Lane, Cotton Trace, Thompson Trace & Balli Hosein Trace	Monday 10:00 p.m. - Tuesday 5:00 a.m.
	S. S. Erin Road from 14-1/4mm to the 17-3/4 mm inclusive of Quarry Settlements #1 & #2, Quarry Road, Sookram Trace, Ramdass Trace, Waddle Village, Alexander Settlement, Jacob Settlements # 1, #2 & # 3, School Street	Tuesday 8:00 p.m. - Wednesday 5:00 a.m.
	S. S. Erin Road from 17-3/4mm to 21-3/4mm including Victoria Street, Shearer Street, Bennett Village Road., #4 Rd., #8 Rd., Lorensothe Rd., Lasalle St., Rancho South Tr., Oilfield Road, Webber St., #9 Rd., Palo Seco Branch Tr.	Wednesday 8:00 p.m. - Thursday 5:00 a.m.
	S. S. Erin Road from 21-3/4mm to 24-1/2mm including Palo Seco Beach Road, Los Iros Beach Road, Carapal Road, Erin Beach Road	Thursday 8:00 p.m. - Friday 5:00 a.m.
	Cap De Ville Erin Road from Erin Junction to Cap De Ville Junction	Saturday 8:00 p.m. - Sunday 5:00 a.m.
NAVET WATERWORKS	Palmyra, Reform Road, Naparima Mayaro Road between Manahambre Road and Reform Road	Daily 6:00 p.m. - 6:00 a.m.
	Reform Village, Tateco Avenue, London Street, Ali's Lane, Guaracara / Tabaquite Road between Reform Road and Alma Street	Daily 6:00 p.m. - 6:00 a.m.
	Priam Street, Picton Settlement, Picton Street	Daily 6:00 p.m. - 6:00 a.m.
	Petit Morne Settlement, Cocoyea, Ciperio Road, Retrench Settlement	Daily
	Diamond Village, Debe-Wellington Road, Ragoo Village, Harripaul Village	Daily 9:00 p.m. - 5:00 a.m.
	Manahambre	Daily 9:00 p.m. - 5:00 a.m.
	Corinth Settlement, Corinth Extension. Road	Daily
	Mowassie Hill	Daily 9:00 p.m. - 5:00 a.m.
PENAL WATERWORKS	Penal proper	Monday 6:00 p.m. - Tuesday 5:00 a.m. Tuesday 6:00 p.m. - Wednesday 5:00 a.m.
	Penal Rock Road 1 1/2mm to 3mm, Daebodial Road	Sunday 10:00 p.m. - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Tuesday 10:00 p.m. - Wednesday 5:00 a.m.
	Lowkie Trace, SS Erin Road from Penal Water Treatment Plant to Clarke Road, Quinam Road	Monday 6:00 p.m. - Tuesday 5:00 a.m. Tuesday 6:00 p.m. - Wednesday 5:00 a.m. Wednesday 6:00 p.m - Thursday 5:00 a.m. Thursday 6:00 p.m. - Friday 5:00 a.m. Friday 6:00 p.m. - Saturday 5:00 a.m.
	San Francique up to 3-1/4mm	Thursday 11:00pm - Saturday 6:00am
	Batchyia Branch Trace, Batchyia Trace, Railway Road	Wednesday 9:00 p.m. - Thursday 5:00 a.m.

CHATHAM WATERWORKS	TNA Road, Fanny Village, Point Ligoure, New Village, Main Road	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Saturday 10:00 p.m. - Sunday 5:00 a.m.	
	Hollywood	Wednesdays 10:00 p.m. - Thursday 5a.m.	
	Kaloo Road, Salazar, 6th Street, Tom Trace, Roberts Lane, Chunilal Trace	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Saturday 10:00 p.m. - Sunday 5:00 a.m.	
	Warden Road	Daily	
	Cap De Ville Main Road	Monday 10:00 p.m. - Tuesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.	
	Upper Harriman Park	Monday 10:00 p.m. - Tuesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.	
	South Central Road	Daily	
	New Village	Monday 10:00 p.m. - Tuesday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m.	
	Lot 10	Fridays 10:00 p.m. - Saturday 5:00 a.m.	
	Soomai Trace, North Trace	Daily	
	Techier	Saturday 8:00 p.m. - Sunday 6:00 a.m. Sunday 8:00 p.m. - Monday 6:00 a.m.	
	Point Fortin (proper)	Monday 10:00 p.m. - Tuesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.	
	Country Trace & M Street	Tuesday 9:00 a.m. - 9p.m. Thursday 9:00 a.m. - 9p.m.	
	Chatham North & South	Tuesday 5:00 a.m. - 6:00 p.m. Thursday 5:00 a.m. - 6:00 p.m. Sunday 5:00 a.m. - 6:00 p.m.	
	Southern Main Road, Chatham	Tuesday 6:00 a.m. - Wednesday 6:00 a.m. Thursday 6:00 a.m. - Friday 6:00 a.m.	
	Syfoo Trace up to Boodram Trace Extension	Sunday 6:00 a.m. - Sunday 6:00 p.m.	
	COORA WATERWORKS	Sennon Village,	Daily
		La Pastora	Monday 8.00 a.m. - Wednesday 1.00 p.m.
		Alta Garcia Trace, Hunte Street	Thursday 6:00 p.m. - Friday 6:00 a.m.
		Darsan Lane De Gannes Lane	Tuesday 8:00 a.m. - Thursday 8:00 p.m.
Quinam Road		Monday 8.00 a.m. - Wednesday 4.00 p.m.	
Upper Mary , George, Victoria ,Street Siparia		Friday 9:00 a.m. - Saturday 9:00 a.m.	
Mendez V,ge, High Street Siparia .Siparia proper		Daily	
Alexander Street, Coora Road, Prana Homes		Monday 10:00 p.m. - Tuesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.	
Coora Hernandez Rd		Daily	
FYZABAD WATERWORKS		Easy Street, Winston Campbell Trace, Khan Trace, Guapo Fyzabad Road from Butler Memorial to Junction of Delhi Road and Fyzabad Road	Daily
POINT FORTIN WATERWORKS	Parrylands	Wednesday 10:00 p.m - Friday 5:00 a.m Friday 10:00 p.m. -Saturday 5:00 a.m.	
	Cochrane , Hubertstown	Friday 10:00 p.m. -Saturday 5:00 a.m.	
	Brighton Cato	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m.	
	Salick Trace	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m.	

GRANVILLE WATERWORKS	Syfoo Trace, Coromandel, Granville	Daily
	Bonasse	Daily
	Bamboo, Bois Bourg	Sunday 10:00 p.m. - Monday 10:00 a.m. Monday 10:00 p.m - Tuesday 10:00 a.m. Tuesday 10:00 p.m. - Wednesday 10:00 a.m.
	Point Coco, Boodram Trace,	Daily
	Point Coco Extension	Daily
	Fullerton	Thursday 10:00 p.m. - Friday 10:00 a.m. Friday 10:00 p.m. - Saturday 10:00 a.m. Saturday 10:00 p.m - Sunday 10:00 a.m.
	Icacos, Los Gallos	Thursday 10:00 p.m. - Friday 10:00 a.m. Friday 10:00 p.m. - Saturday 10:00 a.m. Saturday 10:00 p.m - Sunday 10:00 a.m.
SCOTTS ROAD WELLS # 1 & # 2	Scotts Road	Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
	Morne Diablo	Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m. Saturday 10:00 p.m - Sunday 5:00 a.m.
	Mendez	Monday 9:00 a.m. - Tuesday 5:00 a.m.
CLARKE ROAD BOOSTER CLARKE ROAD WELL # 5	Clarke Road (upper), Satnarine Trace, Teemul Trace	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m.
CAP DE VILLE WATERWORKS	Buenos Aires, Puerto Grande	Daily
CARAPAL WATERWORKS	Carapal Road, Carapal Branch Road, Arena Village	Friday 9:00 p.m.- Saturday 5:00 a.m. Saturday 9:00 p.m. - Sunday 5:00 a.m. Sunday 9:00 p.m. - Monday 5:00 a.m.
	Los Iros, Erin	Sunday 8:00 p.m. - Monday 8:00 a.m.
	Rancho Quemado	Monday 9:00 p.m. - Tuesday 9:00 a.m.
	Chambersville	Tuesday 9:00 p.m. - Wednesday 9:00 p.m.
	Carapal Road	Friday 8:00 p.m. - Sunday 8:00 a.m.
	Los Chorros, Palo Seco Road, Los Bajos	Tuesday 9:00 p.m. - Wednesday 5:00 a.m. Wednesday 9:00 p.m. - Thursday 5:00 a.m. Thursday 9:00 p.m. - Friday 5:00 a.m.

2006

SOURCE OF SUPPLY	AREAS SERVED	DRY SEASON SCHEDULE
CARONI WTP	GONZALES	Monday, Wednesday, Friday 8:00pm - 5:00am
CARONI WTP	BELMONT UPPER	Tuesday, Thursday, Saturday, Sunday 8:00am - 5:00pm
CARONI WTP	BELMONT UPPER, DURANT STREET	Tuesday, Thursday, Saturday, Sunday 8:00am - 5:00pm
CARONI WTP	BULLER TRACE UPPER/DAWN TRACE	Sunday, Thursday 7:00pm - 11:00pm
CARONI WTP	BELMONT, MC KAI ROAD	Monday, Wednesday, Friday 9:00am - 5:00pm
CARONI WTP	UPPER ST. FRANCOIS VALLEY RD, MARIE ROAD	Wednesday, Saturday 8:00pm - 11:00pm
CARONI WTP	CANTARO VILLAGE	Sunday, Tuesday 6:00am - 5:00pm
CARONI WTP	CASCADE, ST ANNS (LOWER) UP TO FONCETTE RD.	Tuesday, Thursday, Saturday, Sunday 8:00am - 5:00pm
CARONI WTP	BELMONT WEST (LOW LEVELS)	Tuesday, Thursday, Saturday 8:00pm - 5:00am
CARONI WTP	KNAGGS HILL, LADY CHANCELLOR, P.O.S	Sunday, Tuesday, Thursday, Saturday 8:00pm - 5:00am
CARONI WTP	HUTTON ROAD, ST. ANNS	Sunday, Tuesday, Thursday, Saturday 8:00pm - 5:00am
CARONI WTP	TERRACITA/ LADY CHANCELLOR	Tuesday, Thursday, Saturday, Sunday 8:00pm - 5:00am
CARONI WTP	HOLOLO MOUNTAIN ROAD (LOWER) CASCADE	Sunday, Monday, Thursday 6:00pm - 6:00am
CARONI WTP	HOLOLO MOUNTAIN ROAD LOWER (HIGH POINT) CASCADE	Sunday, Monday, Thursday 6:00pm - 6:00am
CARONI WTP	MIDDLE ARIAPITA, CASCADIA TO PLAISANCE, ST. ANNS	Tuesday 6:00pm - Thursday 6:00am Friday 6:00pm - Sunday 6:00am
CARONI WTP	HOLOLO MOUNTAIN ROAD (UPPER) CASCADE	Monday, Thursday 6:00am - 6:00pm
CARONI WTP	HILLSIDE / CASCADE	Sunday, Tuesday, Friday 6:00am - 6:00pm
CARONI WTP	FONCETTE ROAD, CASCADE	Tuesday, Thursday, Saturday 8:00am - 5:00pm
CARONI WTP	MON REPOS, CASCADE	Tuesday, Thursday, Saturday 8:00am - 5:00pm
CARONI WTP	ST JAMES COCORITE, FORT GEORGE	Tuesday, Thursday, Saturday 8:00pm - 5:00am
CARONI WTP	BOURNES ROAD (UPPER), ST. JAMES	Tuesday, Thursday, Saturday 8:00pm - 5:00am

CARONI WTP	BOSSIERE # 1/MARAVAL, FLAG STAFF	Daily 24 hrs
CARONI WTP	CASCADE ROAD (UPPER) BEYOND FONCETTE RD.	Monday, Tuesday, Thursday, Saturday 8:00am - 5:00pm
CARONI WTP	BRUNTON ROAD	Tuesday, Thursday, Saturday 8:00am - 5:00pm
DORRINGTON GARDENS WTP	PETIT VALLEY, CAMERON ROAD & ENVIRONS	Wednesday, Saturday 6:00am - 6:00am
DORRINGTON GARDENS WTP	PETIT VALLEY, PIONEER DRIVE & ENVIRONS	Sunday, Tuesday, Thursday 6:00am - 6:00am
DORRINGTON GARDENS WTP	PETIT VALLEY, RAVINE ROAD & ENVIRONS	Monday, Wednesday, Friday, Saturday 6.00 am - 6.00 am
EL SOCORRO HL	WOODBROOK/ POS/ NEWTOWN	Daily 5:00pm - 5:00am
EL SOCORRO HL	BELMONT EAST, HIGH LEVELS	Tuesday, Thursday, Saturday, Sunday 8:00pm - 5:00am
EL SOCORRO HL	GONZALES (LOWER) BELMONT	Tuesday, Thursday, Saturday 6:00pm - 6:00am
EL SOCORRO HL	GONZALES, HIGH LEVELS, BELMONT	Tuesday, Thursday, Saturday 6:00pm - 6:00am
EL SOCORRO HL	GONZALES, HIGH LEVELS, BELMONT	Tuesday, Thursday, Saturday 6:00pm - 6:00am
EL SOCORRO HL	QUARRY STREET, LAVENTILLE, P.O.S	Daily 5:00am - 5:00pm
EL SOCORRO HL	BAT ALLEY, CLIFTON HILL, LAVENTILLE	Daily 5:00am - 5:00pm
FOUR ROADS HL	DIEGO MARTIN INDUSTRIAL ESTATE	Monday, Wednesday, Friday 6:00am - 6:00pm
FOUR ROADS HL	RICH PLAIN, LOWER RICHPLAIN ROAD	Monday - Wednesday 6:00am - 6:00pm
FOUR ROADS HL	FOUR ROADS, DIEGO MARTIN MAIN RD. TO GOPAUL AVE.	Daily 6:00am - 6:00pm
FOUR ROADS HL	VANDERPOOL LANE, DIEGO MARTIN	Daily 6:00am - 6:00pm
FOUR ROADS HL	FOUR ROADS, UPPER UNITY & FARM RD, RICHPLAIN	Monday - Wednesday 6:00am - 6:00pm
FOUR ROADS HL	LA ESTANCIA, DIEGO MARTIN	Monday, Tuesday, Wednesday, Thursday, Friday 6:00am - 6:00am
FOUR ROADS HL	UPPER LA PUERTA ROAD, DIEGO MARTIN	Monday, Friday 6:00pm - 6:00am
FOUR ROADS HL	VICTORIA GARDENS, DIEGO MARTIN, WEST MOORINGS	Daily 6:00am - 6:00pm
FOUR ROADS HL	RAINBOW RIDGE, GOODWOOD PARK EAST, GOODWOOD PK.	Wednesday, Saturday 8:00am - 8:00am
FOUR ROADS HL	LING FIELD ROAD, GOODWOOD PARK EAST AND WEST	Sunday, Tuesday, Thursday 8:00am - 8:00am
FOUR ROADS HL	SIMEON ROAD, PETIT VALLEY	Sunday, Tuesday, Thursday 8:00am - 8:00am
MARAVAL WTP	MARAVAL, HIGH POINTS WEST ON SADDLE ROAD	Daily 24 Hrs
MARAVAL WTP	MARAVAL, HIGH POINTS EAST ON SADDLE ROAD	Daily 24 Hrs

MARAVAL WTP	BAMBOO TRACE MARAVAL	Daily 24hrs
MARAVAL WTP	MOKA, MARAVAL (UPPER)	Daily 24hrs
MARAVAL WTP	MORNE COCO ROAD, (LOWER) MARAVAL	Daily 24hrs
MARAVAL WTP	DUNDONALD HILL UPPER, ST. JAMES	Sunday, Monday, Thursday 6:00pm - 6:00am
MARAVAL WTP	DUNDONALD HILL LOWER, ST. JAMES	Sunday, Monday, Thursday 6:00am - 6:00pm
MARAVAL WTP	BELLE VUE ROAD, LONG CIRCULAR, ST. JAMES	Wednesday, Saturday 6:00am - 6:00am
MARAVAL WTP	DIBE ROAD AND BRIEVES ROAD (LOWER) ST. JAMES	Tuesday, Friday 6:00am - 6:00am
PARAMIN WTP	MT CYRIL UPPER, MARAVAL	Saturday 6:00 pm - 6:00 pm
PARAMIN WTP	MT CYRIL LOWER, MARAVAL	Friday 6:00 pm - 6:00 pm
PARAMIN WTP	PARAMIN LEVEL 1	Daily 24 hrs
PARAMIN WTP	LE PLATTE VILLAGE, MARAVAL	Daily 24 hrs
PARAMIN WTP	SANT D'EAU, MARAVAL	Daily 24hrs
PARAMIN WTP	PARAMIN LEVEL 3	No Supply
RIVER ESTATE WTP	RIVER ESTATE, BLUE BASIN, NHA	Monday, Wednesday, Friday 6:00am - 6:00am
RIVER ESTATE WTP	DIEGO MARTIN, GREENHILL VILLAGE	Monday, Friday 9:00 pm - 5:00 am
RIVER ESTATE WTP	RIVER ESTATE, BAGATELLE, DIEGO MARTIN	Daily 6:00am - 6:00pm
RIVER ESTATE WTP	BAGATELLE, DIEGO MARTIN	Daily 6:00am - 6:00pm
RIVER ESTATE WTP	COVIGNE, DIEGO MARTIN	Tuesday, Thursday, Saturday 6:00am - 6:00am
RIVER ESTATE WTP	BLUE RANGE, DIEGO MARTIN	Monday, Wednesday, Friday 24hrs Tuesday, Thursday,
RIVER ESTATE WTP	PETIT VALLEY, ROXBOROUGH ST, DIEGO MARTIN	Tuesdays. Thursday. Saturday. 6am to 6

RIVER ESTATE WTP	PETIT VALLEY, HIGH LEVELS, BLUE RANGE	Monday, Wednesday, Friday
ST ANNS RES	FONDES AMANDES, CASCADE	Sunday 6:00am - Tuesday 6:00pm
TUCKER VALLEY WTP	CARENAGE, (HIGH LEVELS HAIG STREET)	Tuesday, Thursday, Saturday 9:00am - 9:00am
TUCKER VALLEY WTP	CARENAGE, (HIGH LEVELS LANSE MITAN ROAD)	Tuesday, Thursday, Saturday 9:00am - 9:00am
TUCKER VALLEY WTP	THE PARK & GULF VIEW	Daily 24 Hrs
TUCKER VALLEY WTP	THE PARK & GULF VIEW (SENORA PARK)	Sunday, Tuesday, Thursday 9:00am - 9:00am
TUCKER VALLEY WTP	WEST VALE PARK	Daily 24 Hrs
FOUR ROADS	SPARROW DRIVE	Saturday, Monday, Wednesday 6 am - 6 pm
CARONI WTP	WEST MOORINGS	Daily 24hrs
COVIGNE INTAKE	COVIGNE (UPPER)	Daily 24hrs
DORRINGTON GARDENS	PETIT VALLEY	Daily 24hrs
SIERRA LEONE WELL #10	PETIT VALLEY	Daily 24hrs
DORRINGTON GARDENS	LA BURHAM AVENUE	Daily 24hrs
TUCKER VALLEY	MACQUIRIPE	Daily 24hrs
TUCKER VALLEY	MACQUIRIPE	Daily 24hrs
TUCKER VALLEY	LA HORQUETTE	Daily 24hrs
TUCKER VALLEY	WESTERN MAIN ROAD	Daily 24hrs
TUCKER VALLEY	GLENCO	Daily 24hrs
DIAMOND VALE 14 &15	DIAMOND VALE	Daily 24hrs

SOURCE OF SUPPLY	AREAS SERVED	DRY SEASON SCHEDULE
VALSAYN HIGHLIFT (WELLS)	ST. AUGUSTINE (HIGH LEVELS), RAGBIR STREET, NOEL TRACE, FOREST GATE, TUNAPUNA (HIGH LEVELS), ST. JOHN'S ROAD, BASANTA UPPER TUNAPUNA ROAD, 1ST TRACE, UPPER FAIRLEY STREET AND ENMIRONS	Tuesday, Thursday & Saturday 9pm - 4am
VALSAYN HIGHLIFT (WELLS)	SANTA MARGARITA, NEIL TRACE, LOS GODOS	Monday, Wednesday, &
VALSAYN HIGHLIFT (WELLS)	ST. AUGUSTINE (LOW LEVEL), MONTE GRANDE	Daily 6am-6pm
VALSAYN HIGHLIFT (WELLS)	TUNAPUNA EAST HIGH LEVEL: BALTHAZAR ST, UPPER EL DORADO RD, COLLEGE RD, HENRY RD	Monday, Wednesday, Friday
NORTH OROPUCHE	SANGRE GRANDE (TOWN)	Monday, Wednesday & Friday 6am - 6am
NORTH OROPUCHE	SANGRE GRANDE, VEGA DE OROPUCHE, LOWER TOCO ROAD	Monday, Wednesday & Friday
NORTH OROPUCHE	SANGRE GRANDE (EXTREME OF SYSTEMS) - MANZANILLA #2, #3, CAIGULA, NORTH MANZANILLA, FISHING POND, COALMINE, CORYAL VILLAGE	Monday & Friday 6pm - 4am
NORTH OROPUCHE	O'MEARA ROAD CHURCHILL ROOSEVELT HIGHWAY TO 2ND SERVICE STATION INCLUDING INDUSTRIAL ESTATE	Tuesday & Saturday 5am -
NORTH OROPUCHE	MALONEY, MALABAR PHASE 1, 3 &4, CARAPO	Tuesday & Saturday 5am -
NORTH OROPUCHE	LA HORQUETTA, BRAZIL	Tuesdays & Saturday 3pm - 8 pm
NORTH OROPUCHE	CUMUTO	Monday & Friday 9pm - 4am

NORTH OROPUCHE	TALPARO/MUNDO NUEVO	Tuesday & Saturday 11pm-
GUANAPO	ARIMA	Monday - Saturday 6am - 5pm
GUANAPO	ALENORE GARDENS PHASE 1, WALL STREET	Tuesday, Thursday, Saturday & Sunday
GUANAPO	CALVARY BRANCH ROAD	Tuesday-Saturday 9pm-5am
GUANAPO	BLANCHISSEUSE ROAD	Monday-Friday 9pm-5am
GUANAPO	MT. PLEASANT	Tuesday, Thursday, Saturday 6am-2pm
GUANAPO	GUARVADO ROAD/MATURITA CEMETERY STREET, DUMP ROAD	Monday, Wednesday &
GUANAPO	ALENORE GARDENS PHASE 2	Monday, Wednesday & Friday
ARIPO	SANTA ROSA HEIGHTS, SMITHLANDS	Monday, Wednesday &
ARIPO	WALLERFIELD BLOCK 2/3, TRACTOR POOL ROAD	Tuesday, Thursday & Saturday 6am-6pm (foll. day)
ARIPO	TUMPUNA ROAD- MALABAR ROAD, HENRI STREET	Sunday, Tuesday, Thursday & Saturday 6am-2pm
SALYBIA WELL	SALYBIA/MATHURA	Daily
CAURA	PARADISE GARDENS, MADOO HILL/UPPER EL DORADO	Tuesday, Thursday, Saturday & Sunday 9pm-4am
CAURA	DINSLEY MAIN ROAD, TACARIGUA EASTERN MAIN ROAD - ORANGE GROVE TO ST. MICHAEL, EL DORADO (NORTH EASTERN MAIN ROAD) , BEALIEU GARDENS	Daily 6am -6pm
HOLLIS	LYNTON GARDENS 1 & 2 AND ENVIRONS	Sunday & Wednesday 9pm-4am
HOLLIS	HIGH LEVEL OLTON RD, MAHOGANY DRIVE, ARIMA TOWN LOWER, TEMPLE STREET	Tuesday, Thursday, Saturday 9pm-4am
HOLLIS	ARIMA OLD ROAD, TED & MARTINEZ, CAPILDEO LANDS	Monday 5.00am - Tuesday 5.00pm & Friday 5am - Saturday 5pm
HOLLIS	BON AIR WEST - AROUCA	Sunday 6.00am - 4.00am Monday, Wednesday 6.00am - 4.00am Thursday & Friday 6am - Saturday 4am
TACARIGUA	SMITH DEVELOPMENT, FIVE RIVERS AROUCA, UPPER HILLVIEW DRIVE FIVE RIVERS	Monday Wednesday & Friday 11pm - 4am

TACARIGUA	KANDAHAR ROAD, MANIRAM ROAD, MISSION ROAD	Monday, Wednesday & Friday 11pm-4am
CARONI	LOWER FIVE RIVERS/RANGE ROAD, EASTERN MAIN ROAD FIVE RIVERS, CROWN STREET TO DICKSON ST	Wednesday & Friday
CARONI	GOLDEN GROVE ROAD, CUREPE, VALSAYN (NORTH), ST.JOSEPH EASTERN MAIN ROAD, LOWER CHAMPS FLEUR, LOWER QUARRY ROAD, LOWER HILLTOP, ST. AUGUSTINE (SOUTH)	Daily
CARONI	UPPER CHAMPS FLEUR, UPPER QUARRY ROAD, UPPER HILLTOP	Daily 9pm-5am
TACARIGUA HIGHLIFT (WELLS)	MACOYA GARDENS/INDUSTRIAL ESTATE	Daily 6am-6pm
TACARIGUA HIGHLIFT (WELLS)	TRINCITY	Daily except 6pm-6am
TACARIGUA HIGHLIFT (WELLS)	PARADISE WEST, PARADISE EAST	Daily
TACARIGUA HIGHLIFT (WELLS)	PARADISE WEST (HIGH LEVEL)	Daily 9pm-4am
TACARIGUA HIGHLIFT (WELLS)	ORANGE GROVE	Daily 6am-6pm
LLUENGO/NARANJO -WATERWORKS	NORTH OF VALLEY VIEW JUNCTION - LLUENGO ROAD, EL CHORRO, GUARITA, ACONO ROAD, CAURITA ROAD	Monday to Friday 4pm-4am
LLUENGO/NARANJO -WATERWORKS	LA SEIVA VILLAGE, MARACAS ROYAL ROAD, AVONDALE GARDENS, LA MANGO, UPPER & LOWER VALLEY VIEW, SILK COTTON	Monday, Wednesday & Friday 9am-2pm
LLUENGO/NARANJO -WATERWORKS	BUENA VISTA, CAIMAN CIRCLE, ROSE DRIVE, LA BAJA, MARACAS GARDENS, BALATA TRACE, WARF TRACE, MOUNTAIN VIEW	Wednesday & Sunday 9pm-4am
NORTH OROPUCHE	MAUSICA RD, CRESCENT GARDENS	Monday, Tuesday, Thu, Friday & Saturday 5am - 12 noon
TACARIGUA	LAUREL HILL, MANIMORE, BERTIE RD FIVE RIVERS	Monday Wednesday Friday 11pm - 4am
HOLLIS	ARIMA OLD RD, AROUCA UPPER SECTION	Monday & Friday 11pm - 4 am
HOLLIS	LILIAN HEIGHTS, D'ADADIE	Monday & Thu 9pm-5am
HOLLIS	BREGON PARK, D'ABADIE	Tuesday & Saturday 9pm-5am
QUARE INTAKE	VALENCIA, SAN PEDRO	Daily

SOURCE OF SUPPLY	AREAS SERVED	DRY SEASON SCHEDULE
CARONI WTP	ST BARBS, MORVANT, LAVENTILLE, TROU MACQUE (Pic. #1)	Monday to Saturday 6:00pm - 6:00am
CARONI WTP	ST BARBS, BELMONT (Pic #1) DURANT STREET, BELMONT ROAD, MC KAI	Monday, Saturday 6:00pm - 6:00am
CARONI WTP	ST BARBS (Pic. #1) LOWER ST. BARBS, SERRANEAU RD	Monday, Saturday 6:00pm - 6:00am
CARONI WTP	GONZALES (Pic. #1)	Monday, Wednesday, Friday 6:00am - 6:00pm
CARONI WTP	VILLAGE COUNCIL STREET - BLONDELL ALLEY, MENTOR ALLEY	Thursday, Sunday 7.00 pm - 6.00 am
CARONI WTP	PICTON (Pic #1) UPPER PICTON RD, STREAKER VILLAGE	Monday, Wednesday, Friday 6.00 pm - 6.00 am
CARONI WTP	PICTON (Pic #1) PICTON ROAD, DAN KELLY	Monday to Sunday 6:00am - 6:00pm
CARONI WTP	LAVENTILLE (Val B) KERR RD, EASTERN QUARRY, ERIC ST.	Monday to Sunday 9:00pm - 6:00am
CARONI WTP	MORVANT (Upper (Pic #1) TROUMACAQUE	Monday, Thursdays 6.00 pm - 6.00 am
CARONI WTP	MORVANT (Lower (Val B) WHARTON ST, PASHLEY ST, THOMASINE ST.	Monday to Sunday 9:00pm - 6:00am
EL SOCORRO HL	MORVANT (El Socorro HL) TROUMACAQUE RD, BULLER TRACE	Monday, Wednesday, Friday 9.00 pm - 6.00 am
EL SOCORRO HL	MORVANT (El Socorro HL) ALEXIS ST, UPPER PASHLEY ST, MORGAN LANE	Tuesday, Friday 8.00 am- 6.00 pm
EL SOCORRO HL	MORVANT (El Socorro HL) LA POMPE RD, RED HILL	Tuesday, Sunday 6.00 pm- 6.00 am
EL SOCORRO HL	MORVANT (El Socorro HL) BOXHILL TRACE, LAVENTILLE RD	Sunday, Tuesday 10.00 pm- 6.00 am
EL SOCORRO HL	MORVANT (El Socorro HL) MAPLAND, CRITCHLOW HILL	Tuesday, Sunday 6:00pm - 6:00am
EL SOCORRO HL	(Val A) CIPRIANI ST, CAIMITE, MORVANT AVE.	Monday - Friday 6.00 am - 6.00 am foll.
EL SOCORRO HL	MORVANT (El Socorro HL) GREEN ACRES, UPP. BULLER ST.	Monday to Sunday 6.00 am - 6.00 pm
CARONI WTP	MORVANT (Val B) LOW. THOMASINE, PASHLEY & WHARTON ST.	Monday - Sunday 6.00 pm - 6.00 am
EL SOCORRO HL	MORVANT WHARTON STREET (EL Socorro HL)	Monday - Sunday 6.00 pm - 6.00 am

CARONI WTP	BARATARIA, MORVANT, SAN JUAN, COCONUT DRIVE	Daily
EL SOCORRO HL	ANGELINA TERRACE, (High Level)	Monday 6:00pm - 6:00am
CARONI WTP	MON REPOS, MORVANT	Monday, Thursday 6:00am - 6:00pm
CARONI WTP	BELMONT UPPER (St Barbs Tank)	Monday, Thursday 6:00pm - 6:00am
CARONI WTP	MORVANT, MON REPOS, ROMAINS LAND	Monday, Friday 6:00 pm - 6:00 am
CARONI WTP	LAYON HILL (Lower)	Wednesday 6:00pm - 6:00am
CARONI WTP	ST BARBS, BELMONT UPPER LAYLAN HILL (Upper)	Saturday 6:00pm - 6:00am
CARONI WTP	MORVANT, BLOCK 22 (Pic. #1)	Monday, Wednesday, Friday 6:00am - 6:00pm
CARONI WTP	BELMONT, MORVANT (Morvant Res.)	Tuesday, Wednesday, Friday, Saturday 6.00 am - 6.00 pm
CARONI WTP	BULLER STREET, MORVANT (Val. B)	Monday, Wednesday, Friday
EL SOCORRO HL	BEETHAM PHASES 1, 2, 3 ((El Socorro HL)	Monday - Sunday 24hrs
CARONI WTP	SANTA CRUZ, PIPIOL (Val A)	Sunday, Tuesday, Wednesday, Friday 6:00 pm - 6:00 am
CARONI WTP	CANTARO VILLAGE (Val A)	Sunday, Tuesday, Wednesday, Friday 6:00 pm - 6:00 am
CARONI WTP	SANTA CRUZ UPPER (Val A) SAM BOUCAUD	Sunday, Tuesday, Wednesday, Friday 6:00 pm - 6:00 am
CARONI WTP	SANTA CRUZ UPPER (Val A) CUTUCUPANO	Tuesday, Friday 6:00 pm - 6:00 am
CARONI WTP	SANTA CRUZ NORTH (Val A)	Sunday, Tuesday, Wednesday, Friday 6:00 pm - 6:00 am
CARONI WTP	SANTA CRUZ UPPER (Val A)	Sunday, Tuesday, Wednesday, Friday
CARONI WTP	BARATARIA (V2 Caroni)	Daily
CARONI WTP	HOLOLO MOUNTAIN ROAD LOWER (Val A)	Sunday, Tuesday, Wednesday, Friday 6:00 pm - 6:00 am
CARONI WTP	HOLOLO MOUNTAIN ROAD (UPPER) (Val A)	Sunday, Tuesday, Wednesday, Friday 6:00 pm - 6:00 am
EL SOCORRO HL	EL SOCORRO ROAD (El Socorro HL)	Daily
EL SOCORRO HL	EL SOCORRO ROAD (El Socorro HL)	Daily
EL SOCORRO HL	EL SOCORRO ROAD CROISEE TO GLEN LANE (Val A)	Monday - Sunday 6.00pm - 6.00am

CARONI WTP	LAVENTILLE ROAD FEBEAU VILLAGE (Val B)	Wednesday - Saturday 6:00 pm - 6:00 am
CARONI WTP	BAGATELLE EXTENSION (Val B)	Sunday - Tuesdays 6:00 pm - 6:00 am
CARONI WTP	EMR FROM ST JOSEPH TO SAN JUAN, MT. LAMBERT	Daily
CARONI WTP	PETITE CURACAYE, QUARRY ROAD, UPPER MT DOR, UPPER MT HOPE	Daily - 9:00 pm - 6:00 am
CARONI WTP	MT HOPE, PETITE BOURGE, SANTA CRUZ OLD ROAD, QUARRY ROAD, MT DOR IRVING ST, VALSAYN NORTH	Daily 6:00 pm - 6:00 am
CARONI WTP	OLD ST.JOSEPH ROAD SADDLE ROAD FEBEAU VILLAGE LOWER	Daily
CARONI WTP	GRAND CURACAYE GRACE GARDENS	Saturday 9.00pm - Sunday 6.00am Thursday 9.00pm - Friday 6.00am

2006

SOURCE	AREA SERVED	DURATION OF SUPPLY
NAVET WATER WORKS	Princes Town	Daily 10:00 p.m. - 5:00 a.m.
	Aldana Street	Daily 10:00 p.m. - 5:00 a.m.
	Circular Street	Daily 10:00 p.m. - 5:00 a.m.
	High Street	Daily 10:00 p.m. - 5:00 a.m.
	Charlotte Street	Daily 10:00 p.m. - 5:00 a.m.
	Armor Street	Daily 10:00 p.m. - 5:00 a.m.
	Lothians Main Road	Daily 10:00 p.m. - 5:00 a.m.
	Centenary Street	Daily 10:00 p.m. - 5:00 a.m.
	Buen Intento, Princes Town	Daily
	Railway Road, Princes Town	Daily 10:00 p.m. - 5:00 a.m.
	St. Croix Road up to Realize Road	Monday 10:00 p.m. - 5:00 a.m. Tuesday 10:00 p.m. - 5:00 a.m. Wednesday 10:00 p.m. - 5:00 a.m.
	Jalim Street	Daily 10:00 p.m. - 5:00 a.m.
	Malgretoute Road	Daily 10:00 p.m. - 5:00 a.m.
	Khanhai North from Rochard Douglas Road to	Daily
	Rees Road	Daily
	St. Croix Road (from Rees Road - 4 1/2mm)	Daily
	Lengua Road	Monday 10:00 p.m. - 5:00 a.m. Tuesday 10:00 p.m. - 5:00 a.m. Wednesday 10:00 p.m. - 5:00 a.m.
	Realize Road (up to Lp 7)	Thursday 10:00 p.m to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m. Saturday 10:00 p.m. Sunday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m
	Jaipaulsingh Road	Saturday 10:00 p.m to Sunday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m
	Papourie Road (LP 102 - LP 132)	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Williamsville	Wednesday 10:00 p.m to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.	
Kent Street	Wednesday 10:00 p.m to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.	

Yankee Dam	Wednesday 10:00 p.m to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m. Saturday 10:00 p.m to Sunday 5:00 a.m. Sunday 10:00 p.m. to Monday 5:00 a.m Monday 10:00 p.m. to Tuesday 5:00 a.m
Guaracara/Tabaquite Road from Morne Roche Quarry Road to Garth Road	Wednesday 10:00 p.m to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Eckles Village	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m Monday 10:00 p.m - Tuesday 5:00 a.m.
Garth Road from Iere Village Branch Road to Guaracara Tabaquite Road	Wednesday 8:00 p.m. to Tuesday 5 a.m.
Iere Village	Daily
Iere Village Branch Road	Daily
Morne Roche Road, Sancho/Montique	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m Monday 10:00 p.m - Tuesday 5:00 a.m.
Manahambre Road	Daily
Garth Road (from Naparima/Mayaro Road to Iere Village Branch Road)	Daily
Corial Road	Tuesday 9:00 p.m. - Wednesday 5:00 a.m.
La Paille	Daily 10:00 p.m. - 5:00 a.m.
Cedar Hill	Daily 10:00 p.m. - 5:00 a.m.
Solomon Street	Daily 10:00 p.m. - 5:00 a.m.
Cedar Hill Extension Road	Daily 10:00 p.m. - 5:00 a.m.
Churkoo Village	Daily
Woodland Road	Daily
Jalim Street	Daily
Malgretoute Road	Daily
Buen Intento Road	Daily
Dyers Village	Wednesday 10:00 p.m to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Hardbargin	Daily
Sisters Road (from Buen Intento to Lp 100)	Daily 10:00 p.m. - 5:00 a.m.
Rio Claro/Tabaquite Road (from Torrib/Tabaquite Junction to Naparima/Mayaro Road)	Daily
San Pedro Road	Daily
Dades Trace	Daily
Liberville	Daily
Rio Claro	Daily
Hibiscus Arch Road	Daily 10:00 p.m. - 5:00 a.m.
Clearwater Road	Daily 10:00 p.m. - 5:00 a.m.
Cemetery Street	Daily
Guayaguayare Old Road	Daily
Deep Ravine	Daily 10:00 p.m. - 5:00 a.m.
Tabaquite	Daily 10:00 p.m. - 5:00 a.m.
Quarry Road	Daily 10:00 p.m. - 5:00 a.m.
Church Road	Daily 10:00 p.m. - 5:00 a.m.
Stone Road	Daily 10:00 p.m. - 5:00 a.m.
Cunapo Southern Road up to Navet Village	Daily 10:00 p.m - 5:00 a.m.
Charuma Village	Daily 10:00 p.m - 5:00 a.m.
Cushe Village	Daily 10:00 p.m - 5:00 a.m.
Brasso	Monday 12MN - Tuesday 8:00 a.m.
Poole	Daily 10:00 p.m. - 5:00 a.m.

Fonrose	Daily 10:00 p.m. - 5:00 a.m.
Cunapo Southern Road 20-1/2mm-18mm	Monday 11:00 p.m. to Tuesday 5:00 a.m. Wednesday 11:00 p.m. to Thursday 5:00 a.m.
Pascal Road	Daily
Stafford Road	Daily
Robertson Road	Daily
Sisters Road	Daily
Torrib Trace	Daily
Mc Clean Road	Daily
Lewis Road	Daily
North Trace	Daily
Williamsmith/Mantacool Road	Daily 10:00 p.m. - 5:00 a.m.
Ants Nest Road	Daily 10:00 p.m. - 5:00 a.m.
Tableland Local Road	Daily 10:00 p.m. - 5:00 a.m.
George Village	Daily 10:00 p.m. - 5:00 a.m.
Gaffoor Trace	Daily
Robert Village North	Daily 10:00 p.m. - 5:00 a.m.
Williamsmith Road	Daily
Premier Trace	Daily
Naparima/Mayaro Road from Tableland Police Station to Glod Road	Daily
Lightfoot Trace	Saturday 9:00 a.m. to Sunday 9:00 a.m.
Hoseinee Trace	Daily 10:00 p.m. - 5:00 a.m.
Pancho Trace	Saturday 9:00 a.m. to Sunday 9:00 a.m.
Stone Road	Daily
Piparo Main Road	Daily 10:00 p.m. - 5:00 a.m.
Mappipire Road	Friday 10:00 p.m. to Saturday 6:00 a.m.
Esmeralda Road	Thursday 10:00 p.m. to Friday 6:00 a.m.
Mayo Road from Whiteland junction to LP22 Mayo Road	Saturday 10:00 p.m. to Sunday 5:00 a.m. Sunday 10:00 p.m. to Monday 5:00 a.m.
Guaracara/Tabaquite Road from Morne Roche Quarry Road to Piparo Road	Daily 10:00 p.m. - 6:00 a.m.
Harry John Road	Daily
Sancho Road	Daily
Post Office Trace	Daily
Maingot Road	Daily
St. George Road	Daily
Moruga Road from Naparima Mayaro Road to Poui Road	Daily
Matilda Road	Daily
Perry Young Road	Daily
St. Julien Road	Daily
Monkey Town Road	Daily
Hindustan Road	Daily
Naggee Road	Daily
Sixth Company Circular Road,	Daily
Mc Nish Road	Daily
Hindustan Estate Road	Daily
Contention Road	Tuesday 10:00 a.m. - Thursday 10:00 a.m.
Loney Road, Mandingo Road	Daily
Cumuto Road	Daily 10:00 p.m. - 5:00 a.m.
Realize Road	Daily 10:00 p.m. - 5:00 a.m.
Poui Road	Daily
Gunness Trace	Daily
Teelucksingh Trace,	Daily
Subrattee Road	Daily
Rochard Douglas Road	Daily
Cunjai Road	Daily
Saunders Trace	Daily
Burton Trace	Daily
Blackwell Trace	Daily

	Gomez Trace	Daily
	St. Mary's Village	Daily
	Rock River	Daily 10:00 p.m. - 5:00 a.m.
	La Ruffin	Daily
	Bois Jean Jean	Daily
	Cachipe	Daily 10:00 p.m. - 5:00 a.m.
	Basse Terre	Daily 10:00 p.m. - 5:00 a.m.
	Gran Chemin	Daily
	La Lune	Daily
	Marac	Daily 10:00 p.m. - 5:00 a.m.
BICHE WATERWORKS	Kowlessar Trace	5:00 a.m. - 10:00 a.m. daily
	O'Brien Trace	5:00 a.m. - 10:00 a.m. daily
	Biche Village	5:00 a.m. - 10:00 a.m. daily
	Fitz Road	5:00 a.m. - 10:00 a.m. daily
GUARACARA SPRING	Guaracara/Tabaquite Road (from Seecharan Trace to Rebecca Richmond Road)	Daily 10:00 p.m. - 5:00 a.m.
MORICHAL	Whiteland	Saturday 10:00 p.m. to Sunday 6:00 a.m. Sunday 10:00 p.m. to Monday 6:00 a.m.
SPRING	Sankerlal Development	Saturday 10:00 p.m. to Sunday 6:00 a.m. Sunday 10:00 p.m. to Monday 6:00 a.m.
	Poonah Road	Monday 10:00 p.m. to Tuesday 6:00 a.m. Tuesday 10:00 p.m. to Wednesday 6:00 a.m.
MAYARO WATERWORKS	Plaisance	Thursday 9:00 a.m. to Friday 5:00 a.m.
	Ortoire Village	Friday 9:00 a.m. to Saturday 5:00 a.m.
	Resthouse Village	Friday 9:00 a.m. to Saturday 5:00 a.m.
	Peter Hill	Friday 9:00 a.m. to Saturday 5:00 a.m.
	Mafeking Road	Tuesday 9:00 a.m. - Wednesday 5:00 a.m.
	Cedar Groove	Tuesday 9:00 a.m. - Wednesday 5:00 a.m.
	Mafeking Village	Tuesday 9:00 a.m. - Wednesday 5:00 a.m.
	Manzanilla	Wednesday 11:00 a.m. to Thursday 5:00 a.m.

MALONEY WATER TREATMENT PLANT	Church Street	Sunday 8:00 p.m. - Monday 5:00 a.m., Wednesday 8.00 p.m. - Thursday 5.00 a.m., Saturday 8.00 p.m. - Sunday 1.00 p.m.
	Gill Street	Sunday 8:00 p.m. - Monday 5:00 a.m., Wednesday 8.00 p.m. - Thursday 5.00 a.m., Saturday 8.00 p.m. - Sunday 1.00 p.m.
	Guayaguare Rd from Maloney to Beaumont Road	Sunday 8:00 p.m. - Monday 5:00 a.m., Wednesday 8.00 p.m. - Thursday 5.00 a.m., Saturday 8.00 p.m. - Sunday 1.00 p.m.
STONEBRIGHT WATER	Sansucker Road	Daily
	Frontin Road	Daily
	Guayaguayare Main Road (4 1/2mm - 6mm)	Daily
GUAYAGUAYARE WATER TREATMENT	La Savanne	Daily 6:00 a.m. - 6:00 p.m.
	Newlands	Daily 6:00 a.m. - 6:00 p.m.
	Guayaguayare Village	Daily 6:00 a.m. - 6:00 p.m.
	Kalmapas	Daily
	Isthmus Road	Daily

2006

SOURCE	AREAS SERVED	DURATION OF SUPPLY
CARONI WATER TREATMENT PLANT	Alexander Road	Tuesday & Thursday 9:00 a.m.- 2:00 p.m.
	North Road	Tuesday & Thursday 9:00 a.m.- 2:00 p.m.
	Wharton Street	Tuesday & Thursday 9:00 a.m.- 2:00 p.m.
	Gill Street	Tuesday & Thursday 9:00 a.m.- 2:00 p.m.
	Upper Sumadh Gardens	Tuesday & Thursday 9:00 a.m.- 2:00 p.m.
	Hafza Ave	Tuesday & Thursday 9:00 a.m.- 2:00 p.m.
	Jennifer Heights	Wednesdays, Fridays & Sundays 9:00 a.m. - 2:00 p.m
	San Fernando City	Daily 5:00 a.m. - 9 a.m.
	Sumadh Gardens	Mondays & Saturdays 9:00 a.m - 2:00 p.m
	Waddell Street	Mondays & Saturdays 9:00 a.m - 2:00 p.m
	Hafza Avenue	Mondays & Saturdays 9:00 a.m - 2:00 p.m
	Montano Street	Mondays & Saturdays 9:00 a.m - 2:00 p.m
	Aleong Street	Mondays & Saturdays 9:00 a.m - 2:00 p.m
	Zucher Street	Mondays & Saturdays 9:00 a.m - 2:00 p.m
	Vistabella Road	Daily 9:00 p.m. - 4:00 a.m.
	Rawle Lands	Daily 9:00 p.m. - 4:00 a.m.
	Ramnarine Avenue	Daily 9:00 p.m. - 4:00 a.m.
	Hubert Rance	Daily 9:00 p.m. - 4:00 a.m.
	Jarvis Street	Daily 9:00 p.m. - 4:00 a.m.
	Arch Street	Daily 9:00 p.m. - 4:00 a.m.
	Pond Street	Daily 9:00 p.m. - 4:00 a.m.
	Lambie Street	Daily 9:00 p.m. - 4:00 a.m.
	Central Street	Daily 9:00 p.m. - 4:00 a.m.
	Ogeer Ali Street	Daily 9:00 p.m. - 4:00 a.m.
	Lange Street	Daily 9:00 p.m. - 4:00 a.m.
	Guppy Street	Daily 9:00 p.m. - 4:00 a.m.
	Archibald Street	Daily 9:00 p.m. - 4:00 a.m.
	Circular Road	Daily 9:00 p.m. - 9:00 a.m.
	Lower Vistabella	Daily 9:00 p.m. - 9:00 a.m.
	Happy Hill, St. Joseph Village	Daily 9:00 p.m. - 4:00 a.m.
	Southern Main Road Claxton Bay	Thursday 10:00 a.m. - Saturday 8:00 a.m. Sunday 10:00 a.m. - Wednesday 8:00 a.m.
	Cedar Hill (Upper) from Southern Main Road to Joe Flemming Hill	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Sum Sum Hill	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.	

Cedar Hill (lower)	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Soledad	Sunday 9:00 a.m. - Wednesday 8:00 a.m.
Cunupia	Tuesday 9:00 a.m. - Friday 5:00 a.m. Saturday 9:00 a.m. - Monday 5:00 a.m.
Enterprise	Tuesday 9:00 a.m. - Friday 5:00 a.m. Saturday 9:00 a.m. - Monday 5:00 a.m.
Longdenville	Tuesday 9:00 a.m. - Friday 5:00 a.m. Saturday 9:00 a.m. - Monday 5:00 a.m.
Boodram Development	Tuesday 9:00 a.m. - Friday 5:00 a.m. Saturday 9:00 a.m. - Monday 5:00 a.m.
Ragoonanan Road (Lower)	Tuesday 9:00 a.m. - Friday 5:00 a.m. Saturday 9:00 a.m. - Monday 5:00 a.m.
Welcome Road	Tuesday to Friday 10:00 p.m. - 5:00 a.m. Saturday to Monday 10:00 p.m. - 5:00 a.m.
Brasso Caparo Valley Road in vicinity of Wong Sing	Tuesday 10:00 p.m. to Wednesday 5:00 a.m. Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Saturday 10:00 p.m. to Sunday 5:00 a.m. Sunday 10:00 p.m. to Monday 5:00 a.m.
Longdenville	Tuesday 10:00 p.m. to Wednesday 5:00 a.m. Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Saturday 10:00 p.m. to Sunday 5:00 a.m. Sunday 10:00 p.m. to Monday 5:00 a.m.
Penco Lands	Tuesday 10:00 p.m. to Wednesday 5:00 a.m. Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Saturday 10:00 p.m. to Sunday 5:00 a.m. Sunday 10:00 p.m. to Monday 5:00 a.m.
Ragoonanan upper	Tuesday 10:00 p.m. to Wednesday 5:00 a.m. Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Saturday 10:00 p.m. to Sunday 5:00 a.m. Sunday 10:00 p.m. to Monday 5:00 a.m.
Jerningham, Pierre Road	Wednesday 6:00 a.m. - Thursday 5:00 a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Assaraff Road	Wednesday 6:00 a.m. - Thursday 5:00 a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Kohalal Road	Wednesday 6:00 a.m. - Thursday 5:00 a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Clarke Road (West)	Wednesday 6:00 a.m. - Thursday 5:00 a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Warner Village Upper Cunupia,	Wednesday 6:00 a.m. - Thursday 5:00 a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Ackbar Trace	Wednesday 6:00 a.m. - Thursday 5:00 a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Akaloo Trace	Wednesday 6:00 a.m. - Thursday 5:00 a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Francis Lalla Clarke Road (East) Cacandee	Wednesday 6:00 a.m. - Thursday 5:00 a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Kelly Village	Monday 10:00 a.m. to Wednesday 5:00 a.m. Thursday 10:00 a.m. to Sunday 5:00 a.m.
Frederick Settlement	Daily 10:00 p.m. - 5:00 a.m. except Sunday and Wednesday
La Paille Village	Sunday 12:00 a.m. to Monday 5:00 a.m. Wednesday 12:00 a.m. to Thursday 5:00 a.m.
Hin Kin Trace	Daily
Dyette Estate	Daily
Mon Plaisance Road	Daily
Chaguanas Main Road	Daily
Chaguanas Commercial Centre from Caroni Savannah Road to Southern Main	Daily
Peters Field	Tuesday 6:00 a.m. - Friday 5:00 a.m. Saturday 6:00 a.m. - Sunday 6:00 p.m.
Edinburgh Village	Tuesday 6:00 a.m. - Friday 5:00 a.m. Saturday 6:00 a.m. - Sunday 6:00 p.m.
Cacandee and Felicity	Wednesday 9:00 p.m. - Thursday 5:00 a.m. Friday 9:00 p.m. - Sunday 4:30 a.m. Monday 9:00 p.m. - Tuesday 5:00 a.m.

	Beaucarro (Upper)	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
	Chase Village	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
	McBean (Upper)	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
	Couva	Daily
	Perseverence	Daily
	Basta Hall, Dow Village	Daily
	Springvale from Cedar Hill Road to Community Centre	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m to Friday 5:00 a.m. Saturday 10:00 p.m.to Sunday 5:00a.m. Monday 10:00 p.m to Tuesday 5:00a.m.
	Diamond high point	Sunday 10:00 a.m. - Monday 10:00 a.m.
	Esperanza	Daily
	Springvale from Community Centre to Mount Pleasant Trace	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m to Friday 5:00 a.m. Saturday 10:00 p.m.to Sunday 5:00a.m. Monday 10:00 p.m to Tuesday 5:00a.m.
FREEPORT WATERWORKS	Indian Trail	Daily
	Gordon Village	Daily
	Boissierre	Daily
	Tortuga	Tuesdays 10:00 p.m to Wednesday 5:00 a.m. Sundays 10:00 p.m. to Monday 5:00 a.m.
	Caratal	Tuesdays & Sundays 10:00 p.m. to 5:00 a.m.
	Mayo Village Gran Couva	Daily 10:00 p.m. - 5:00 a.m.
	Tortuga Village, Gran Couva	Daily 10:00 p.m. - 5:00 a.m.
	Melanie Gardens	Daily
	Central Park	Daily
	Balmain Gardens, Balmain	Daily
	Calcutta #2	Daily
	Calcutta Settlement Roads #1 & #3	Daily
	Sapatay	Daily
	Lower Couva Road	Daily
	Sesame Street	Daily
	Chickland Road	Daily
	Nelson Road	Daily
	Lime Fruit Road	Daily
	Christian Village	Daily
	Siewdass Road	Daily
Flanagin Town	Mondays 10:00 p.m to Tuesday 5:00 a.m., Wednesdays 10:00 p.m Thursday 5:00 a.m Friday 10:00 p.m. Saturday to 5 a.m.	
Brasso Piedra	Mondays 10:00 p.m to Tuesday 5:00 a.m., Wednesdays 10:00 p.m Thursday 5:00 a.m Friday 10:00 p.m. Saturday to 5 a.m.	

CARLSEN FIELD WATER TREATMENT	Arena Road (lower)	Sunday 11:00 a.m. - Monday 9:00 p.m. Wednesday 11:00 p.m. - Thursday 9:00 p.m.
	Fairview Park	Sunday 6:00 a.m. - Monday 9:00 p.m. Wednesday 6:00 p.m. - Thursday 9:00 p.m.
	Nadira Gardens	Sunday 6:00 a.m. - Monday 9:00 p.m. Wednesday 6:00 p.m. - Thursday 9:00 p.m.
	Arena Road (upper)	Monday 9:00 p.m. - Tuesday 6:00 a.m. Thursday 9:00 p.m. - Friday 6:00 a.m.
	La Cuesa Road	Monday 9:00 p.m. - Tuesday 6:00 a.m. Thursday 9:00 p.m. - Friday 6:00 a.m.
	Thompson	Sunday 10:00 a.m. - Tuesday 6:00 a.m. Wednesday 10:00 a.m. to Friday 6:00 a.m.
	Carlsen Field	Tuesday 9:00 a.m. - Wednesday 6:00 p.m. Friday 9:00 a.m. - Sunday 6:00 a.m.
CARLSEN FIELD WELL NO. # 5	Freeport Todds	Tuesday 10:00 p.m. - Wednesday 5:00 a.m.
	Todds Fletcher	Monday 6:00 p.m. - Tuesday 9:00 a.m.
	Chickland Caparo	Saturday 10:00 p.m. to Sunday 5:00 a.m.
	Mamoral #1	Wednesday 9:00 p.m. - Friday 9:00 a.m.
	Mamoral #2	Thursday 10:00 p.m. - Friday 8:00 a.m.
	Caparo Main Road	Saturday 11:00 a.m. to Sunday 6:00 p.m.
	Caparo Main Road (upper)	Wednesday 11:00 a.m. - Thursday 4:00 p.m.
	Chin Johnson Road	Monday 10:00 a.m. - Tuesday 6:00 p.m. Wednesday 10:00 a.m. - 9:00 p.m. Thursday 10:00 a.m. - 4:30 p.m. Saturday 10:00 a.m.- Saturday 12:00 p.m.
Palmiste	Daily	
RAVINE SABLE WATER TREATMENT PLANT	Upper Ravine Sable near Sand Pit	Daily 10:00 p.m. to 5:00 a.m.
	Lower Ravine Sable	Daily
LAS LOMAS WATER TREATMENT PLANT	Las Lomas #1	Tuesday, Thursday & Saturday 8:00 p.m. - 4:00 a.m.
	Las Lomas #2	Monday, Wednesday & Friday 8:00 p.m. - 4:00 a.m.
	Las Lomas #3	Tuesday, Thursday & Saturday 8:00 p.m. - 4:00 a.m.
	Chin Chin (East) of Madras Rd.	Tuesday, Thursday & Saturday 8:00 p.m. - 4:00 a.m.
	Mahaica	Monday, Wednesday & Friday 12MN - 4:00 a.m.

NAVET WATER WORKS	Plaisance Park, Teak Ave	Daily
	Marabella	Daily
	Lumsden Street	Daily
	Allen Street	Daily
	Ragoobar Lands	Daily
	Thompson Road	Daily
	Bonne Aventure Main Road	Daily
	Bhagwansingh Trace	Tuesday 9:00 p.m. - Wednesday 6:00 a.m. Sunday 6:00 a.m. - 6:00 p.m.
	San Fabien Road, Springlands	Monday 6:00 a.m. - Tuesday 9:00 p.m.
	Marylands	Wednesday 6:00 a.m. - Thursday 5:00 a.m.
	Cocoa Piece & Bonne Aventure Main to Dalloo Road	Thursday 11:00 a.m. - Friday 6:00 p.m.
	School Trace	Saturday 6:00 p.m. - Sunday 6:00 a.m.
	Cotton Hill	Saturday 6:00 p.m. - Sunday 6:00 a.m.
	Caratal #1	Sunday 6:00 p.m. - Monday 5:00 a.m.
	Old Parforce	Friday 6:00 p.m. - Saturday 6:00 a.m.
	New Parforce	Saturday 6:00 a.m. - Saturday 6:00 p.m.
	St. Margaret's (Upper)	Daily
	Bandoo Trace	Daily
	Laloo Trace	Daily
	Phillip Lane	Daily
	Caratal	Daily
	Ramsaroop	Daily
	Macaulay/Bagi Tola	Daily
	Ramsesar/Boodoo	Daily
	Teak Avenue/Botham Avenue	Daily

2006

SOURCE	AREA SERVED	SCHEDULE OF SUPPLY
CARONI WATER TREATMENT PLANT	Palmiste Blocks 1 to 7, Lazzari Lands, Roberts Rd., Phillipine Rd., Bryans Gate, Sunkist Development	Monday 10:00 a.m. - Tuesday 6:00 a.m. Wednesday 10:00 a.m. - Friday 5:00 a.m. Saturday 10:00 a.m. - Sunday 6:00 p.m.
	Esperance Village and Side Streets up to Mowassie Hill	Wednesday 10:00 p.m. - Friday 5:00 a.m. Saturday 10:00 p.m. - Sunday 5:00 a.m.
	Green Acres, Bel Air, Coconut Drive, Gulf View	Thursday 10:00 a.m. - Saturday 5:00 a.m., Sunday 10:00 a.m. - Wednesday 5:00 a.m. Sunday 10:00 a.m. - Wednesday 5:00 a.m.
	Union Hall, Duncan Village	Monday - Thursday 10:00 p.m to 5:00 a.m.
	Pleasantville, Green Acres	Friday 8:00 p.m. - Saturday 5:00 a.m. Saturday 8:00 p.m. - Sunday 5:00 a.m. Monday 8:00 p.m. - Tuesday 5:00 a.m. Tuesday 8:00 p.m. - Wednesday 5:00 a.m. Wednesday 8:00 p.m - Thursday 5:00 a.m
	Southern Main Road La Romain from Devon Chad Drive to TJs	Tuesday 12:00 p.m. - Monday 5:00 a.m
	Rambert Village, Pond Street, Seepaul Boulevard, Windsor Street, Hermitage Village, Beach Road, Renn Avenue	Daily Daily
	Debe Trace, Gandi Village	Monday 10:00 p.m. - Tuesday 6:00 a.m. Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.
	Debe Main Road (from Debe Wellington Road to Ramai Trace)	Daily
	Ramsamooj Trace and Lalbeharry Trace. (up to Branch Trace #1), Mahadeo Trace, Ramai Trace	Daily 10:00 p.m. - 5:00 a.m.
	Cuchawan Trace East and West, Ramai Trace, Debe N.H.A Development	Daily 10:00 p.m. - 5:00 a.m.
	Harbajan Hill, Laltoo Trace, Soomai Trace, Suchit Trace, Boodoo Trace, Mohess Road	Daily
	Jamoonie Trace, Ragoonanan Trace, Gopie Trace	Daily 10:00 p.m. - 5:00 a.m.
	Puzzle Island, Ramai Trace high pt	Daily 10:00 p.m. - 5:00 a.m.
	Siparia Old Road from Fyzabad Road to Thick Village Community Centre Saltmine Trace, Seepaulsingh Trace, Ali's Trace, Super Trace	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.
	Seukeran Trace	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.
	Fyzabad/Guapo Road from Charlie King Junction to Fyzabad Comprehensive School, Bissoon Trace, Ramlogan Avenue	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.
	Lum Tack Hill, Standard Road	Friday 10:00 a.m to Sunday 5:00 a.m. Monday 10:00 a.m to Thursday 5:00 a.m
	Hickling Village, Bushe Village, Mawle Village	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.
	Fyzabad Main Road (from Avocat Junction to Fyzabad Health Centre), Thompson Street, Richardson Street, Sewlal Street, Mortelle Street	Friday 8:00 p.m. - Saturday 5 a.m. Saturday 8:00 p.m. - Sunday 5:00 a.m. Monday 8:00 p.m. Tuesday 5:00 a.m. Tuesday 8:00 p.m. - Wednesday 5:00 a.m. Wednesday 8:00 p.m - Thursday 5:00 a.m

NAVET WATERWORKS	Cipero Road	Monday 6:00 a.m. - Tuesday 5:00 am, Wednesday 6:00 a.m. - Sunday 5:00 a.m.
	Corner Cottage Road and Papourie Road, Rochard Road up to Clarke Road Booster	Daily 10:00 p.m. - 5 a.m.
	New Colonial Road	Daily
	Upper Barrackpore	Daily 10:00 p.m. - 5 a.m.
	Congo Village	Daily 10:00 p.m. - 5 a.m.
	Pierre Trace	Daily 10:00 p.m.- 5 a.m.
	Lal Beharry Trace #1	Daily 10:00 p.m.- 5 a.m.
	Monkey Town	Daily 10:00 p.m.- 5 a.m.
	Cemetery Street	Daily 10:00 p.m.- 5 a.m.
	Borde Narve	Daily 10:00 p.m.- 5 a.m.
	Old Clarke Road	Daily 10:00 p.m.- 5 a.m.
	From Barrackpore Police Station to LP 168 Papourie Road	Daily 10:00 p.m.- 5 a.m.
	G.P. Road	Daily 10:00 p.m.- 5 a.m.
	Trintoc Barrackpore	Daily 10:00 p.m.- 5 a.m.
	Carat Hill	Daily 10:00 p.m.- 5 a.m.
	Ramsabad Trace	Daily 10:00 p.m.- 5 a.m.
	Julien Trace	Daily 10:00 p.m.- 5 a.m.
	Rochard Douglas Road from No. 2 Scale to Kanhai Trace (North & South)	Daily 10:00 p.m.- 5 a.m.
	St. Charles Village (Manahambre Road)	Daily
	Rochard Road from Clarke Road to Penal Rock Road, Penal Rock Road Junction up to Rock Road 5 1/2mm	Thursday 8:00 p.m. - Friday 5:00 a.m. Friday 8:00 p.m. - Saturday 5:00 a.m.
	Platinite Road	Thursday 8:00 p.m. - Friday 5:00 a.m. Friday 8:00 p.m. - Saturday 5:00 a.m.
	Rock Road 6mm - 8 1/2mm	Thursday 8:00 p.m. - Friday 5:00 a.m. Friday 8:00 p.m. - Saturday 5:00 a.m. Saturday 10:00 p.m - Sunday 5:00 a.m.
	From Clarke Road Booster along Clarke Road to Lachoos Road	Sunday 10:00 p.m. - Monday 5:00 a.m Monday 10:00 p.m - Tuesday 5:00 a.m. Tuesday 10:00 p.m. - Wednesday 5:00 a.m.
Digit Village & Transfer Village including Sanahie Trace, Panoo Trace, Upper Mohess Road	Saturday 8:00 p.m. - Sunday 5:00 a.m. Sunday 8:00 p.m. - Monday 5:00 a.m.	
CARONI WATER TREATMENT PLANT	La Fortune Pluck Road from Southern Main Road to Tennant Trace, Woodland, Jacksingh Trace, Mungal Trace, Claude Street, Elizabeth Street, La Plaisance Road, Baig Trace	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m. Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m. - Monday 5:00 a.m.

Alana Trace, Hector Trace, Maude Trace, Ramcharan Trace	Tuesday 8:00 p.m. - Wednesday 6:00 a.m. Wednesday 8:00 p.m. - Thursday 6:00 a.m. Thursday 8:00 p.m. - Friday 6:00 a.m. Friday 8:00 p.m. - Saturday 6:00 a.m. Saturday 8:00 p.m. - Sunday 6:00 a.m. Sunday 8:00 p.m. -
Jokhan Trace, Tennant Trace, Doorbassa Trace Centeno Trace	Tuesday 10:00 p.m. - Wednesday 6:00 a.m. Wednesday 10:00 p.m. - Thursday 6:00 a.m. Thursday 10:00 p.m. - Friday 6:00 a.m. Friday 10:00 p.m. - Saturday 6:00 a.m. Saturday 10:00 p.m. - Sunday 6:00 a.m. Sunday 10:00 p.m. - Monday 6:00 a.m.
Timal Junction to 2mm San Francique Road, Ramnath Trace, Murray Trace, Red Hill, Timal Junction	Tuesday 10:00 p.m. - Wednesday 6:00 a.m. Wednesday 10:00 p.m. - Thursday 6:00 a.m. Thursday 10:00 p.m. - Friday 6:00 a.m. Friday 10:00 p.m. - Saturday 6:00 a.m. Saturday 10:00 p.m. - Sunday 6:00 a.m. Sunday 10:00 p.m. - Monday 6:00 a.m.
Dow Village, South Oropouche	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m. - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
Otaheite Village, Mon Desir	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m. - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
Rigg Road, Grove Park #1 & 2	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m. - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
Pond Road, Sankarlal Development, Aripero Development	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m. - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
Rousillac Main Road and Side Streets from LP 1425 - LP 1454	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m. - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
Rousillac Main Road & Side Streets from LP 1454 -LP 1505, Boodoosingh, Chinese Village, Virginia Avenue	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m. - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
Grants Trace Extension, Pablito, National Mining, Mon Desir Road up to Sparrow Junction including Otaheite Industrial Estate, Church Street, Mon Desir Delhi Road	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m. - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
Point D'or Road , Point D'or Scheme up to La Brea Market, Potter Street, Freeling Street, Lodge Street, Victor Street from La Brea Market to La Brea Road including Industry Lane East & West, Da Silva Street, Ellis Street, New Jersey, Three Hands, Cemetery Street, Marshall Street	Monday 8:00 p.m. - Tuesday 6:00 a.m. Wednesday 8:00 p.m. - Saturday 6:00 a.m. Sunday 8:00 p.m. - Tuesday 6:00 a.m.
From the corner of Church Street & La Brea Road including Lagan D'or Street, New Lands, Bassa Hill, Cassava Alley, Railroad Avenue Ext.	Monday 10:00 p.m. - Tuesday 6:00 a.m. Wednesday 10:00 p.m. - Saturday 6:00 a.m. Sunday 10:00 p.m. - Tuesday 6:00 a.m.
Southern Main Road, Vessigny including all Side Streets from LP 1613 to Vessigny Beach (LP 1625), Celestial Park, Bushy Park	Monday 8:00 p.m. - Tuesday 6:00 a.m. Wednesday 8:00 p.m. - Saturday 6:00 a.m. Sunday 8:00 p.m. - Tuesday 6:00 a.m.

	San Francique Road from SS Erin Road to 2 1/4mm, Lachoos Road 0mm-1mm	Thursday 9:00 p.m. - Friday 8:00 a.m. Friday 9:00 p.m. - Saturday 8:00 a.m. Saturday 9:00 p.m. - Sunday 8:00 a.m. Sunday 9:00 p.m. - Monday 8:00 a.m. Monday 9:00 p.m. - Tuesday 5:00 a.m. Tuesday 9:00 p.m. - Wednesday 5:00 a.m. Wednesday 9:00 p.m. - Thursday 5:00 a.m.
	SS Erin Road from Lowkie Trace to Penal Market Sunress Road, Ramjohn Trace	Thursday 9:00 p.m. - Friday 5:00 a.m. .
CHATHAM WATERWORKS	TNA Road, Fanny Village, Point Ligoure, New Village, Main Road	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Saturday 10:00 p.m. - Sunday 5:00 a.m.
	Hollywood	Wednesdays 10:00 p.m. -Thursday 5a.m.
	Kaloo Road, Salazar, 6th Street, Tom Trace, Roberts Lane, Chunilal Trace	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Saturday 10:00 p.m. - Sunday 5:00 a.m.
	Warden Road	Daily
	Cap De Ville Main Road	Monday 10:00 p.m. - Tuesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.
	Upper Harriman Park	Monday 10:00 p.m. - Tuesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.
	South Central Road	Daily
	New Village	Monday 10:00 p.m. - Tuesday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m.
	Lot 10	Fridays 10:00 p.m. - Saturday 5:00 a.m.
	Soomai Trace, North Trace	Daily
	Techier	Saturday 8:00 p.m. - Sunday 6:00 a.m. Sunday 8:00 p.m. - Monday 6:00 a.m.
	Point Fortin (proper)	Monday 10:00 p.m. - Tuesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.
	Country Trace & M Street	Tuesday 9:00 a.m. - 9p.m. Thursday 9:00 a.m. - 9p.m.
	Chatham North & South	Tuesday 5:00 a.m. - 6:00 p.m. Thursday 5:00 a.m. - 6:00 p.m. Sunday 5:00 a.m. - 6:00 p.m.
	Southern Main Road, Chatham	Tuesday 6:00 a.m. - Wednesday 6:00 a.m. Thursday 6:00 a.m. - Friday 6:00 a.m.
	Syfoo Trace up to Boodram Trace Extension	Sunday 6:00 a.m. - Sunday 6:00 p.m.
	COORA WATERWORKS	Sennon Village,
La Pastora		Monday 8.00 a.m. - Wednesday 1.00 p.m.
	Alta Garcia Trace, Hunte Street	Thursday 6:00 p.m. - Friday 6:00 a.m.
	Darsan Lane De Gannes Lane	Tuesday 8:00 a.m. - Thursday 8:00 p.m.
	Quinam Road	Monday 8.00 a.m. - Wednesday 4.00 p.m.
	Upper Mary , George, Victoria ,Street Siparia	Friday 9:00 a.m. - Saturday 9:00 a.m.
	Mendez V,ge, High Street Siparia .Siparia proper	Daily
	Alexander Street, Coora Road, Prana Homes	Monday 10:00 p.m. - Tuesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.
	Coora Hernandez Rd	Daily
FYZABAD WATERWORKS	Easy Street, Winston Campbell Trace, Khan Trace, Guapo Fyzabad Road from Butler Memorial to Junction of Delhi Road and Fyzabad Road	Daily
POINT FORTIN WATERWORKS	Parrylands	Wednesday 10:00 p.m - Friday 5:00 a.m Friday 10:00 p.m. -Saturday 5:00 a.m.
	Cochrane , Hubertstown	Friday 10:00 p.m. -Saturday 5:00 a.m.
	Brighton Cato	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m.
	Salick Trace	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m.

GRANVILLE WATERWORKS	Syfoo Trace, Coromandel, Granville	Daily
	Bonasse	Daily
	Bamboo, Bois Bourg	Sunday 10:00 p.m. - Monday 10:00 a.m. Monday 10:00 p.m - Tuesday 10:00 a.m. Tuesday 10:00 p.m. - Wednesday 10:00 a.m.
	Point Coco, Boodram Trace,	Daily
	Point Coco Extension	Daily
	Fullerton	Thursday 10:00 p.m. - Friday 10:00 a.m. Friday 10:00 p.m. - Saturday 10:00 a.m. Saturday 10:00 p.m - Sunday 10:00 a.m.
	Icacos, Los Gallos	Thursday 10:00 p.m. - Friday 10:00 a.m. Friday 10:00 p.m. - Saturday 10:00 a.m. Saturday 10:00 p.m - Sunday 10:00 a.m.
SCOTTS ROAD WELLS # 1 & # 2	Scotts Road	Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
	Morne Diablo	Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m. Saturday 10:00 p.m - Sunday 5:00 a.m.
	Mendez	Monday 9:00 a.m. - Tuesday 5:00 a.m.
CLARKE ROAD BOOSTER CLARKE ROAD WELL # 5	Clarke Road (upper), Satnarine Trace, Teemul Trace	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m.
CAP DE VILLE WATERWORKS	Buenos Aires, Puerto Grande	Daily
CARAPAL WATERWORKS	Carapal Road, Carapal Branch Road, Arena Village	Friday 9:00 p.m.- Saturday 5:00 a.m. Saturday 9:00 p.m. - Sunday 5:00 a.m. Sunday 9:00 p.m. - Monday 5:00 a.m.
	Los Iros, Erin	Sunday 8:00 p.m. - Monday 8:00 a.m.
	Rancho Quemado	Monday 9:00 p.m. - Tuesday 9:00 a.m.
	Chambersville	Tuesday 9:00 p.m. - Wednesday 9:00 p.m.
	Carapal Road	Friday 8:00 p.m. - Sunday 8:00 a.m.
	Los Chorros, Palo Seco Road, Los Bajos	Tuesday 9:00 p.m. - Wednesday 5:00 a.m. Wednesday 9:00 p.m. - Thursday 5:00 a.m. Thursday 9:00 p.m. - Friday 5:00 a.m.

2007

SOURCE	AREA SERVED	DURATION OF SUPPLY
NAVET WATER WORKS	Princes Town	Daily 10:00 p.m. - 5:00 a.m.
	Aldana Street	Daily 10:00 p.m. - 5:00 a.m.
	Circular Street	Daily 10:00 p.m. - 5:00 a.m.
	High Street	Daily 10:00 p.m. - 5:00 a.m.
	Charlotte Street	Daily 10:00 p.m. - 5:00 a.m.
	Armor Street	Daily 10:00 p.m. - 5:00 a.m.
	Lothians Main Road	Daily 10:00 p.m. - 5:00 a.m.
	Centenary Street	Daily 10:00 p.m. - 5:00 a.m.
	Buen Intento, Princes Town	Daily
	Railway Road, Princes Town	Daily 10:00 p.m. - 5:00 a.m.
	St. Croix Road up to Realize Road	Monday 10:00 p.m. - 5:00 a.m. Tuesday 10:00 p.m. - 5:00 a.m. Wednesday 10:00 p.m. - 5:00 a.m.
	Jalim Street	Daily 10:00 p.m. - 5:00 a.m.
	Malgretoute Road	Daily 10:00 p.m. - 5:00 a.m.
	Khanhai North from Rochard Douglas Road to Rees Road	Daily
	Rees Road	Daily
	St. Croix Road (from Rees Road - 4 1/2mm)	Daily
	Lengua Road	Monday 10:00 p.m. - 5:00 a.m. Tuesday 10:00 p.m. - 5:00 a.m. Wednesday 10:00 p.m. - 5:00 a.m.
	Realize Road (up to Lp 7)	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m. Saturday 10:00 p.m. to Sunday 5:00 a.m. Sunday 10:00 p.m. to Monday 5:00 a.m.
	Jaipaulsingh Road	Saturday 10:00 p.m. to Sunday 5:00 a.m. Sunday 10:00 p.m. to Monday 5:00 a.m.
	Papourie Road (LP 102 - LP 132)	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
	Williamsville	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
	Kent Street	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
	Yankee Dam	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m. Saturday 10:00 p.m. to Sunday 5:00 a.m. Sunday 10:00 p.m. to Monday 5:00 a.m. Monday 10:00 p.m. to Tuesday 5:00 a.m.
	Guaracara/Tabaquite Road from Morne Roche Quarry Road to Garth Road	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
	Eckles Village	Saturday 10:00 p.m. - Sunday 5:00 a.m. Sunday 10:00 p.m. - Monday 5:00 a.m. Monday 10:00 p.m. - Tuesday 5:00 a.m.
	Garth Road from Iere Village Branch Road to Guaracara Tabaquite Road	Wednesday 8:00 p.m. to Tuesday 5 a.m.
	Iere Village	Daily 10:00 p.m. - 5:00 a.m.
	Iere Village Branch Road	Daily 10:00 p.m. - 5:00 a.m.
	Morne Roche Road, Sancho/Montique	Saturday 10:00 p.m. - Sunday 5:00 a.m. Sunday 10:00 p.m. - Monday 5:00 a.m. Monday 10:00 p.m. - Tuesday 5:00 a.m.
	Manahambre Road	Daily
	Garth Road (from Naparima/Mayaro Road to Iere Village Branch Road)	Daily
	Corial Road	Tuesday 9:00 p.m. - Wednesday 5:00 a.m.
La Paille	Daily 10:00 p.m. - 5:00 a.m.	
Cedar Hill	Daily 10:00 p.m. - 5:00 a.m.	
Solomon Street	Daily 10:00 p.m. - 5:00 a.m.	
Cedar Hill Extension Road	Daily 10:00 p.m. - 5:00 a.m.	

Hardbargin	Daily
Sisters Road (from Buen Intento to Lp 100)	Daily 10:00 p.m. - 5:00 a.m.
Rio Claro/Tabaquite Road (from Torrib/Tabaquite Junction to Naparima/Mayaro Road)	Daily
San Pedro Road	Daily
Dades Trace	Daily
Liberville	Daily
Rio Claro	Daily
Hibiscus Arch Road	Daily 10:00 p.m. - 5:00 a.m.
Clearwater Road	Daily 10:00 p.m. - 5:00 a.m.
Cemetery Street	Daily
Guayaguayare Old Road	Daily
Deep Ravine	Daily 10:00 p.m. - 5:00 a.m.
Tabaquite	Daily 10:00 p.m. - 5:00 a.m.
Quarry Road	Daily 10:00 p.m. - 5:00 a.m.
Church Road	Daily 10:00 p.m. - 5:00 a.m.
Stone Road	Daily 10:00 p.m. - 5:00 a.m.
Cunapo Southern Road up to Navet Village	Daily 10:00 p.m - 5:00 a.m.
Charuma Village	Daily 10:00 p.m - 5:00 a.m.
Cushe Village	Daily 10:00 p.m - 5:00 a.m.
Brasso	Monday 12MN - Tuesday 8:00 a.m.
Poole	Daily 10:00 p.m. - 5:00 a.m.
Fonrose	Daily 10:00 p.m. - 5:00 a.m.
Cunapo Southern Road 20-1/2mm-18mm	Monday 11:00 p.m. to Tuesday 5:00 a.m Wednesday 11:00 p.m. to Thursday 5:00 a.m.
Pascal Road	Daily
Stafford Road	Daily
Robertson Road	Daily
Sisters Road	Daily
Torrib Trace	Daily
Mc Clean Road	Daily
Lewis Road	Daily
North Trace	Daily
Williamsmith/Mantacool Road	Daily 10:00 p.m. - 5:00 a.m.
Ants Nest Road	Daily 10:00 p.m. - 5:00 a.m.
Tableland Local Road	Daily 10:00 p.m. - 5:00 a.m.
George Village	Daily 10:00 p.m. - 5:00 a.m.
Gaffoor Trace	Daily
Robert Village North	Daily 10:00 p.m - 5:00 a.m.
Williamsmith Road	Daily
Premier Trace	Daily
Naparima/Mayaro Road from Tableland Police Station to Glod Road	Daily
Lightfoot Trace	Saturday 9:00 a.m to Sunday 9:00 a.m
Hoseinee Trace	Daily 10:00 p.m. - 5:00 a.m.
Pancho Trace	Saturday 9:00 a.m to Sunday 9:00 a.m
Stone Road	Daily
Piparo Main Road	Daily 10:00 p.m. - 5:00 a.m.
Mappipire Road	Friday 10:00 p.m. to Saturday 6:00 a.m.
Esmeralda Road	Thursday 10:00 p.m. to Friday 6:00 a.m.
Mayo Road from Whiteland junction to LP22 Mayo Road	Saturday 10:00 p.m. to Sunday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m
Guaracara/Tabaquite Road from Morne Roche Quarry Road to Piparo Road	Daily 10:00 p.m. - 6:00 a.m.
Harry John Road	Daily
Sancho Road	Daily
Post Office Trace	Daily
Maingot Road	Daily
St.George Road	Daily

	Moruga Road from Naparima Mayaro Road to Poui Road	Daily
	Matilda Road	Daily
	Perry Young Road	Daily
	St.Julien Road	Daily
	Monkey Town Road	Daily
	Hindustan Road	Daily
	Naggee Road	Daily
	Sixth Company Circular Road,	Daily
	Mc Nish Road	Daily
	Hindustan Estate Road	Daily
	Contention Road	Tuesday 10:00 a.m. - Thursday 10:00 a.m.
	Loney Road, Mandingo Road	Daily
	Cumuto Road	Daily 10:00 p.m. - 5:00 a.m.
	Realize Road	Daily 10:00 p.m. - 5:00 a.m.
	Poui Road	Daily
	Gunness Trace	Daily
	Teelucksingh Trace,	Daily
	Subrattee Road	Daily
	Rochard Douglas Road	Daily
	Cunjaj Road	Daily
	Saunders Trace	Daily
	Burton Trace	Daily
	Blackwell Trace	Daily
	Gomez Trace	Daily
	St. Mary's Village	Daily
	Rock River	Daily 10:00 p.m. - 5:00 a.m.
	La Ruffin	Daily
	Bois Jean Jean	Daily
	Cachipe	Daily 10:00 p.m. - 5:00 a.m.
	Basse Terre	Daily 10:00 p.m. - 5:00 a.m.
	Gran Chemin	Daily
	La Lune	Daily
	Marac	Daily 10:00 p.m. - 5:00 a.m.
BICHE WATERWORKS	Kowlessar Trace	5:00 a.m. - 10:00 a.m. daily
	O'Brien Trace	5:00 a.m. - 10:00 a.m. daily
	Biche Village	5:00 a.m. - 10:00 a.m. daily
	Fitz Road	5:00 a.m. - 10:00 a.m. daily
GUARACARA SPRING	Guaracara/Tabaquite Road (from Seecharan Trace to Rebecca Richmond Road)	Daily 10:00 p.m. - 5:00 a.m.
MORICHAL	Whiteland	Saturday 10:00 p.m.to Sunday 6:00 a.m. Sunday 10:00 p.m. to Monday 6:00 a.m.
SPRING	Sankerlal Development	Saturday 10:00 p.m.to Sunday 6:00 a.m. Sunday 10:00 p.m. to Monday 6:00 a.m.
	Poonah Road	Monday10:00 p.m. to Tuesday 6:00 a.m. Tuesday 10:00 p.m. to Wednesday 6:00 a.m.

MAYARO WATERWORKS	Plaisance	Thursday 9:00 a.m to Friday 5:00 a.m
	Ortoire Village	Friday 9:00 a.m. to Saturday 5:00 a.m.
	Resthouse Village	Friday 9:00 a.m. to Saturday 5:00 a.m.
	Peter Hill	Friday 9:00 a.m. to Saturday 5:00 a.m.
	Mafeking Road	Tuesday 9:00 a.m. - Wednesday 5:00 a.m.
	Cedar Groove	Tuesday 9:00 a.m. - Wednesday 5:00 a.m.
	Mafeking Village	Tuesday 9:00 a.m. - Wednesday 5:00 a.m.
	Manzanilla	Wednesday 11:00 a.m. to Thursday 5:00 a.m.
MALONEY WATER TREATMENT PLANT	Church Street	Sunday 8:00 p.m. - Monday 5:00 a.m., Wednesday 8.00 p.m. - Thursday 5.00 a.m., Saturday 8.00 p.m. - Sunday 1.00 p.m.
	Gill Street	Sunday 8:00 p.m. - Monday 5:00 a.m., Wednesday 8.00 p.m. - Thursday 5.00 a.m., Saturday 8.00 p.m. - Sunday 1.00 p.m.
	Guayaguayare Rd from Maloney to Beaumont Road	Sunday 8:00 p.m. - Monday 5:00 a.m., Wednesday 8.00 p.m. - Thursday 5.00 a.m., Saturday 8.00 p.m. - Sunday 1.00 p.m.
STONEBRIGHT WATER	Sansucker Road	Daily
	Frontin Road	Daily
	Guayaguayare Main Road (4 1/2mm - 6mm)	Daily
GUAYAGUAYARE WATER TREATMENT	La Savanne	Daily 6:00 a.m. - 6:00 p.m.
	Newlands	Daily 6:00 a.m. - 6:00 p.m.
	Guayaguayare Village	Daily 6:00 a.m. - 6:00 p.m.
	Kalmapas	Daily
	Isthmus Road	Daily

SOURCE	AREAS SERVED	DURATION OF SUPPLY
CARON WATER TREATMENT PLANT	Alexander Road	Tuesday & Thursday 9:00 a.m- 2:00 p.m
	North Road	Tuesday & Thursday 9:00 a.m- 2:00 p.m
	Wharton Street	Tuesday & Thursday 9:00 a.m- 2:00 p.m
	Gill Street	Tuesday & Thursday 9:00 a.m- 2:00 p.m
	Upper Sumadh Gardens	Tuesday & Thursday 9:00 a.m- 2:00 p.m
	Hafza Ave	Tuesday & Thursday 9:00 a.m- 2:00 p.m
	Jennifer Heights	Wednesdays, Fridays & Sundays 9:00 a.m - 2:00 p.m
	San Fernando City	Daily 5:00 a.m - 9 a.m
	Sumadh Gardens	Mondays & Saturdays 9:00 a.m- 2:00 p.m
	Waddell Street	Mondays & Saturdays 9:00 a.m- 2:00 p.m
	Hafza Avenue	Mondays & Saturdays 9:00 a.m- 2:00 p.m
	Montano Street	Mondays & Saturdays 9:00 a.m- 2:00 p.m
	Aleong Street	Mondays & Saturdays 9:00 a.m- 2:00 p.m
	Zucher Street	Mondays & Saturdays 9:00 a.m- 2:00 p.m
	Vistabella Road	Daily 9:00 p.m - 4:00 a.m
	Pawle Lands	Daily 9:00 p.m - 4:00 a.m
	Pammarine Avenue	Daily 9:00 p.m - 4:00 a.m
	Hubert Pance	Daily 9:00 p.m - 4:00 a.m
	Jarvis Street	Daily 9:00 p.m - 4:00 a.m
	Arch Street	Daily 9:00 p.m - 4:00 a.m
Pond Street	Daily 9:00 p.m - 4:00 a.m	
Lambie Street	Daily 9:00 p.m - 4:00 a.m	

Central Street	Daily 9:00 p.m. - 4:00 a.m.
Ogeer Ali Street	Daily 9:00 p.m. - 4:00 a.m.
Lange Street	Daily 9:00 p.m. - 4:00 a.m.
Guppy Street	Daily 9:00 p.m. - 4:00 a.m.
Archibald Street	Daily 9:00 p.m. - 4:00 a.m.
Circular Road	Daily 9:00 p.m. - 9:00 a.m.
Lower Vistabella	Daily 9:00 p.m. - 9:00 a.m.
Happy Hill, St. Joseph Village	Daily 9:00 p.m. - 4:00 a.m.
Southern Main Road Claxton Bay	Thursday 10:00 a.m. - Saturday 8:00 a.m. Sunday 10:00 a.m. - Wednesday 8:00 a.m.
Cedar Hill (Upper) from Southern Main Road to Joe Flemming Hill	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Sum Sum Hill	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Cedar Hill (lower)	Thursday 10:00 p.m. to Friday 5:00 a.m. Friday 10:00 p.m. to Saturday 5:00 a.m.
Soledad	Sunday 9:00 a.m. - Wednesday 8:00 a.m.
Cunupia	daily
Enterprise	daily
Longdenville	daily
Boodram Development	daily
Ragoonanan Road (Lower)	daily
Welcome Road	daily
Brasso Caparo Valley Road in vicinity of Wong Sing	daily
Longdenville	daily

Penco Lands	daily
Ragoonanan upper	daily
Jerningham, Pierre Road	daily
Assaraff Road	daily
Kohalal Road	daily
Clarke Road (West)	daily
Warner Village Upper Cunupia,	daily
Ackbar Trace	daily
Akaloo Trace	daily
Francis Lalla Clarke Road (East) Cacandee	Wednesday 6:00 a.m.-Thursday 5:00a.m. Friday 6:00 a.m. - Tuesday 5:00 a.m.
Kelly Village	Monday 10:00 a.m. to Wednesday 5:00 a.m Thursday 10:00 a.m to Sunday 5:00 a.m
Frederick Settlement	Daily 10:00 p.m. - 5:00 a.m. except Sunday and Wednesday
La Paille Village	Sunday 12:00 a.m. to Monday 5:00 a.m. Wednesday 12:00 a.m to Thursday 5:00 a.m
Hin Kin Trace	Daily
Dyette Estate	Daily
Mon Plaisance Road	Daily
Chaguanas Main Road	Daily
Chaguanas Commercial Centre from Caroni Savannah Road to Southern Main Road	Daily
Peters Field	daily
Edinburgh Village	daily
Cacandee and Felicity	daily
Rodney Road Extension	daily
Lange Park	daily
Edinburgh 500	daily
Montrose	daily
Edinburgh Village	daily
Homeland Gardens	daily
Point Pleasant Park	daily
Jonathan Trace	daily
Bhagaloo Street	daily
Boodram Development	daily
Caroni Savannah Rd	Daily
Orchard Gardens	Daily

	Union Village	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
	West Carapichaima	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
	Perseverance Bank Village	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
	Carapichaima	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
	St. Mary's	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
	Beaucarro (Upper)	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
	Chase Village	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
	McBean (Upper)	Thursday 10:00 p.m. to Friday 5:00 a.m Friday 10:00 p.m. to Saturday 5:00 a.m. Sunday 10:00 p.m to Monday 5:00 a.m Monday 10:00 p.m Tuesday 5:00 a.m. Tuesday 10:00 p.m. to Wednesday 5:00 a.m.
	Couva	Daily
	Perseverance	Daily
	Basta Hall, Dow Village	Daily
	Springvale from Cedar Hill Road to Community Centre	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m to Friday 5 :00 a.m. Saturday 10:00 p.m.to Sunday 5:00a.m. Monday 10:00 p.m to Tuesday 5:00a.m.
	Diamond high point	Sunday 10:00 a.m. - Monday 10:00 a.m.
	Esperanza	Daily
	Springvale from Community Centre to Mount Pleasant Trace	Wednesday 10:00 p.m. to Thursday 5:00 a.m. Thursday 10:00 p.m to Friday 5 :00 a.m. Saturday 10:00 p.m.to Sunday 5:00a.m. Monday 10:00 p.m to Tuesday 5:00a.m.
FREEPORT WATERWORKS	Indian Trail	Daily
	Gordon Village	Daily
	Boissierre	Daily
	Tortuga	Tuesdays 10:00 p.m to Wednesday 5:00 a.m. Sundays 10:00 p.m. to Monday 5:00 a.m.
	Caratal	Tuesdays & Sundays 10:00 p.m. to 5:00 a.m.
	Mayo Village Gran Couva	Daily 10:00 p.m. - 5:00 a.m.
	Tortuga Village, Gran Couva	Daily 10:00 p.m. - 5:00 a.m.
	Melanie Gardens	Wednesday 10 p.m to Monday 8 a.m
	Central Park	Wednesday 10 p.m to Monday 8 a.m
	Balmain Gardens, Balmain	Wednesday 10 p.m to Monday 8 a.m
	Calcutta #2	Wednesday 10 p.m to Monday 8 a.m
	Calcutta Settlement Roads #1 & #3	Wednesday 10 p.m to Monday 8 a.m
	Sapatay	Wednesday 10 p.m to Monday 8 a.m
	Lower Couva Road	Wednesday 10 p.m to Monday 8 a.m

	Sesame Street	Wednesday 10 p.m to Monday 8 a.m
	Chickland Road	Wednesday 10 p.m to Monday 8 a.m
	Nelson Road	Wednesday 10 p.m to Monday 8 a.m
	Lime Fruit Road	Wednesday 10 p.m to Monday 8 a.m
	Christian Village	Wednesday 10 p.m to Monday 8 a.m
	Siewdass Road	Wednesday 10 p.m to Monday 8 a.m
	Flanagin Town	wednesday 10 p.m to Thursday 5 a.m
	Brasso Piedra	Mondays 10:00 p.m to Tuesday 5:00 a.m., Wednesdays 10:00 p.m Thursday 5:00 a.m Friday 10:00 p.m. Saturday to 5 a.m.
CARLSEN FIELD WATER TREATMENT PLANT	Arena Road (lower)	Sunday 11:00 a.m. - Monday 9:00 p.m. Wednesday 11:00 p.m. - Thursday 9:00 p.m.
	Fairview Park	Sunday 6:00 a.m. - Monday 9:00 p.m. Wednesday 6:00 p.m. - Thursday 9:00 p.m.
	Nadira Gardens	Sunday 6:00 a.m. - Monday 9:00 p.m. Wednesday 6:00 p.m. - Thursday 9:00 p.m.
	Arena Road (upper)	Monday 9:00 p.m. - Tuesday 6:00 a.m. Thursday 9:00 p.m. - Friday 6:00 a.m.
	La Cuesa Road	Monday 9:00 p.m. - Tuesday 6:00 a.m. Thursday 9:00 p.m. - Friday 6:00 a.m.
	Thompson	Sunday 10:00 a.m. - Tuesday 6:00 a.m. Wednesday 10:00 a.m to Friday 6:00 a.m.
	Carlsen Field	Tuesday 9:00 a.m. - Wednesday 6:00 p.m. Friday 9:00 a.m. - Sunday 6:00 a.m.
CARLSEN FIELD WELL NO. # 5	Freeport Todds	Monday 8 p.m to Thursday 8 a.m
	Todds Fletcher	Monday 8 p.m to Thursday 8 a.m
	Chickland Caparo	Monday 8 p.m to Thursday 8 a.m
	Mamoral #1	Thursday 8 p.m to Monday 8 a.m
	Mamoral #2	Thursday 8 p.m to Monday 8 a.m
	Caparo Main Road	Thursday 8 p.m to Monday 8 a.m
	Caparo Main Road (upper)	Thursday 8 p.m to Monday 8 a.m
	Chin Johnson Road	Monday 8 p.m to Thursday 8 a.m
Palmiste	Daily	

RAVINE SABLE WATER TREATMENT PLANT	Upper Ravine Sable near Sand Pit	Daily
	Lower Ravine Sable	Daily
LAS LOMAS WATER TREATMENT PLANT	Las Lomas #1	Tuesday, Thursday & Saturday 8:00 p.m. - 4:00 a.m.
	Las Lomas #2	Monday, Wednesday & Friday 8:00 p.m. - 4:00 a.m.
	Las Lomas #3	Tuesday, Thursday & Saturday 8:00 p.m. - 4:00 a.m.
	Chin Chin (East) of Madras Rd.	Tuesday, Thursday & Saturday 8:00 p.m. - 4:00 a.m.
	Mahaica	Monday, Wednesday & Friday 12MN - 4:00 a.m.
NAVET WATER WORKS	Plaisance Park, Teak Ave	Daily
	Marabella	Daily
	Lumsden Street	Daily
	Allen Street	Daily
	Ragoobar Lands	Daily
	Thompson Road	Daily
	Bonne Aventure Main Road	Daily
	Bhagwansingh Trace	Tuesday 9:00 p.m. - Wednesday 6:00 a.m. Sunday 6:00 a.m. - 6:00 p.m.
	San Fabien Road, Springlands	Monday 6:00 a.m. - Tuesday 9:00 p.m.
	Marylands	Wednesday 6:00 a.m. - Thursday 5:00 a.m.
	Cocoa Piece & Bonne Aventure Main to Dalloo Road	Thursday 11:00 a.m. - Friday 6:00 p.m.
	School Trace	Saturday 6:00 p.m. - Sunday 6:00 a.m.
	Cotton Hill	Saturday 6:00 p.m. - Sunday 6:00 a.m.
	Caratal #1	Sunday 6:00 p.m. - Monday 5:00 a.m.
	Old Parforce	Friday 6:00 p.m. - Saturday 6:00 a.m.
	New Parforce	Saturday 6:00 a.m. - Saturday 6:00 p.m.
	St. Margaret's (Upper)	Daily
	Bandoo Trace	Daily
	Laloo Trace	Daily
	Phillip Lane	Daily
	Caratal	Daily
	Ramsaroop	Daily
	Macaulay/Bagi Tola	Daily
Ramsesar/Boodoo	Daily	
Teak Avenue/Botham Avenue	Daily	

SOURCE	AREA SERVED	SCHEDULE OF SUPPLY
CARONI WATER TREATMENT PLANT	Palmiste Blocks 1 to 7, Lazzari Lands, Roberts Rd., Phillipine Rd., Bryans Gate, Sunkist Development	Monday 10:00 a.m. - Tuesday 6:00 a.m. Wednesday 10:00 a.m. - Friday 5:00 a.m. Saturday 10:00 a.m. - Sunday 6:00 p.m.
	Esperance Village and Side Streets up to Mowassie Hill	Wednesday 10:00 p.m. - Friday 5:00 a.m. Saturday 10:00 p.m. - Sunday 5:00 a.m.
	Green Acres, Bel Air, Coconut Drive, Gulf View	Thursday 10:00 a.m. - Saturday 5:00 a.m., Sunday 10:00 a.m. - Wednesday 5:00 a.m. Sunday 10:00 a.m. - Wednesday 5:00 a.m.
	Union Hall, Duncan Village	Monday - Thursday 10:00 p.m to 5:00 a.m.
	Pleasantville, Green Acres	Friday 8:00 p.m. - Saturday 5:00 a.m. Saturday 8:00 p.m. - Sunday 5:00 a.m. Monday 8:00 p.m. - Tuesday 5:00 a.m. Tuesday 8:00 p.m. - Wednesday 5:00 a.m. Wednesday 8:00 p.m - Thursday 5:00 a.m
	Southern Main Road La Romain from Devon Chad Drive to TJs	Tuesday 12:00 p.m. - Monday 5:00 a.m
	Rambert Village, Pond Street, Seepaul Boulevard, Windsor Street, Hermitage Village, Beach Road, Renn Avenue	Daily Daily
	Debe Trace, Gandhi Village	Monday 10:00 p.m. - Tuesday 6:00 a.m. Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.
	Debe Main Road (from Debe Wellington Road to Ramai Trace)	Daily
	Ramsamooj Trace and Lalbeharry Trace. (up to Branch Trace #1), Mahadeo Trace, Ramai Trace low pts	Daily 10:00 p.m. - 5:00 a.m.
	Cuchawan Trace East and West, Ramai Trace, Debe N.H.A Development	Daily 10:00 p.m. - 5:00 a.m.
	Harbajan Hill, Laltoo Trace, Soomai Trace, Suchit Trace, Boodoo Trace, Mohess Road	Daily
	Jamoonie Trace, Ragoonanan Trace, Gopie Trace Puzzle Island, Ramai Trace high pt	Daily 10:00 p.m. - 5:00 a.m. Daily 10:00 p.m. - 5:00 a.m.
	Siparia Old Road from Fyzabad Road to Thick Village Community Centre Saltmine Trace, Seepaulsingh Trace, Ali's Trace, Super Trace	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.
	Seukeran Trace	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.
	Fyzabad/Guapo Road from Charlie King Junction to Fyzabad Comprehensive School, Bissoon Trace, Ramlogan Avenue	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.

	Lum Tack Hill, Standard Road	Friday 10:00 a.m to Sunday 5:00 a.m Monday 10:00 a.m to Thursday 5:00 a.m
	Hickling Village, Bushe Village, Mawle Village	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.
	Fyzabad Main Road (from Avocat Junction to Fyzabad Health Centre), Thompson Street, Richardson Street, Sewlal Street, Mortelle Street	Friday 8:00 p.m.- Saturday 5a.m. Saturday 8:00 p.m. - Sunday 5:00 a.m. Monday 8:00 p.m. - Tuesday 5:00 a.m Tuesday 8:00 p.m. - Wednesday 5:00 a.m. Wednesday 8:00p.m - Thursday 5:00 a.m
	Robert Hill and Environs Avocat Village, Siparia Old Road up to Fyzabad / Siparia Old Road Junction, St. John's Trace	Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m - Monday 5:00 a.m Monday 10:00 p.m - Tuesday 5:00 a.m. Wednesday 10:00 p.m - Thursday 5:00 a.m. Thursday 10:00 p.m - Friday 5:00 a.m.
	Ackbar Trace	Daily
	San Francique Road up to Timital Junction, Harris Village, South Oropouche	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00p.m. - Friday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m. Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m. - Monday 5:00 a.m.
	Oropouche Health Centre, Partap Trace, Berridge Trace	Daily
NAVET WATERWORKS	Cipero Road	Monday 6:00 a.m. - Tuesday 5:00 am, Wednesday 6:00 a.m. - Sunday 5:00 a.m.
	Corner Cottage Road and Papourie Road, Rochard Road up to Clarke Road Booster	Daily 10:00 p.m. - 5 a.m.
	New Colonial Road	Daily
	Upper Barrackpore	Daily 10:00 p.m. - 5 a.m.
	Congo Village	Daily 10:00 p.m. - 5 a.m.
	Pierre Trace	Daily 10:00 p.m.- 5 a.m.
	Lal Beharry Trace #1	Daily 10:00 p.m.- 5 a.m.
	Monkey Town	Daily 10:00 p.m.- 5 a.m.
	Cemetery Street	Daily 10:00 p.m.- 5 a.m.
	Borde Narve	Daily 10:00 p.m.- 5 a.m.
	Old Clarke Road	Daily 10:00 p.m.- 5 a.m.
	From Barrackpore Police Station to LP 168 Papourie Road	Daily 10:00 p.m.- 5 a.m.
	G.P. Road	Daily 10:00 p.m.- 5 a.m.
	Trintoc Barrackpore	Daily 10:00 p.m.- 5 a.m.
	Carat Hill	Daily 10:00 p.m.- 5 a.m.
	Ramsabad Trace	Daily 10:00 p.m.- 5 a.m.
	Julien Trace	Daily 10:00 p.m.- 5 a.m.
	Rochard Douglas Road from No. 2 Scale to Kanhai Trace (North & South)	Daily 10:00 p.m.- 5 a.m.

	St. Charles Village (Manahambre Road)	Daily
	Rochard Road from Clarke Road to Penal Rock Road, Penal Rock Road Junction up to Rock Road 5 1/2mm	Thursday 8:00 p.m. - Friday 5:00 a.m. Friday 8:00 p.m. - Saturday 5:00 a.m.
	Platinite Road	Thursday 8:00 p.m. - Friday 5:00 a.m. Friday 8:00 p.m. - Saturday 5:00 a.m.
	Rock Road 6mm - 8 1/2mm	Thursday 8:00 p.m. - Friday 5:00 a.m. Friday 8:00 p.m. - Saturday 5:00 a.m. Saturday 10:00 p.m - Sunday 5:00 a.m.
	From Clarke Road Booster along Clarke Road to Lachos Road	Sunday 10:00 p.m. - Monday 5:00 a.m. Monday 10:00 p.m - Tuesday 5:00 a.m. Tuesday 10:00 p.m. - Wednesday 5:00 a.m.
	Digity Village & Transfer Village including Sanahie Trace, Panoo Trace, Upper Mohess Road	Saturday 8:00 p.m. - Sunday 5:00 a.m. Sunday 8:00 p.m. - Monday 5:00 a.m.
CARONI WATER TREATMENT PLANT	La Fortune Pluck Road from Southern Main Road to Tennant Trace, Woodland, Jacksingh Trace, Mungal Trace, Claude Street, Elizabeth Street, La Plaisance Road, Baig Trace	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m. Saturday 10:00 p.m - Sunday 5:00 a.m. Sunday 10:00 p.m. - Monday 5:00 a.m.
	Alana Trace, Hector Trace, Maude Trace, Ramcharan Trace	Tuesday 8:00 p.m. - Wednesday 6:00 a.m. Wednesday 8:00 p.m. - Thursday 6:00 a.m. Thursday 8:00 p.m. - Friday 6:00 a.m. Friday 8:00 p.m. - Saturday 6:00 a.m. Saturday 8:00 p.m - Sunday 6:00 a.m. Sunday 8:00 p.m. -
	Jokhan Trace, Tennant Trace, Doorbassa Trace Centeno Trace	Tuesday 10:00 p.m. - Wednesday 6:00 a.m. Wednesday 10:00 p.m. - Thursday 6:00 a.m. Thursday 10:00 p.m. - Friday 6:00 a.m. Friday 10:00 p.m. - Saturday 6:00 a.m. Saturday 10:00 p.m - Sunday 6:00 a.m. Sunday 10:00 p.m. - Monday 6:00 a.m.
	Timital Junction to 2mm San Francique Road, Ramnath Trace, Murray Trace, Red Hill, Timital Junction	Tuesday 10:00 p.m. - Wednesday 6:00 a.m. Wednesday 10:00 p.m. - Thursday 6:00 a.m. Thursday 10:00 p.m. - Friday 6:00 a.m. Friday 10:00 p.m. - Saturday 6:00 a.m. Saturday 10:00 p.m - Sunday 6:00 a.m. Sunday 10:00 p.m. - Monday 6:00 a.m.
	Dow Village, South Oropouche	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
	Otaheite Village, Mon Desir	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
	Rigg Road, Grove Park #1 & 2	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
	Pond Road, Sankarlal Development, Aripere Development	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
	Rousillac Main Road and Side Streets from LP 1425 - LP 1454	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.

	Rousillac Main Road & Side Streets from LP 1454 -LP 1505, Boodoosingh, Chinese Village, Virginia Avenue	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m. - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
	Grants Trace Extension, Pablito, National Mining, Mon Desir Road up to Sparrow Junction including Otaheite Industrial Estate, Church Street, Mon Desir Delhi Road	Tuesday 9:00 a.m. - 6:00 p.m. Wednesday 9:00 a.m. - 6:00 p.m. Thursday 9:00 a.m. - 6:00 p.m. Friday 9:00 a.m. - 6:00 p.m. Saturday 9:00 a.m. - 6:00 p.m. Sunday 9:00 a.m. - 6:00 p.m.
	Point D'or Road , Point D'or Scheme up to La Brea Market, Potter Street, Freeling Street, Lodge Street, Victor Street from La Brea Market to La Brea Road including Industry Lane East & West, Da Silva Street, Ellis Street, New Jersey, Three Hands, Cemetery Street, Marshall Street	Monday 8:00 p.m. - Tuesday 6:00 a.m. Wednesday 8:00 p.m. - Saturday 6:00 a.m. Sunday 8:00 p.m. - Tuesday 6:00 a.m.
	From the corner of Church Street & La Brea Road including Lagan D'or Street, New Lands, Bassa Hill, Cassava Alley, Railroad Avenue Ext.	Monday 10:00 p.m. - Tuesday 6:00 a.m. Wednesday 10:00 p.m. - Saturday 6:00 a.m. Sunday 10:00 p.m. - Tuesday 6:00 a.m.
	Southern Main Road, Vessigny including all Side Streets from LP 1613 to Vessigny Beach (LP 1625), Celestial Park, Bushy Park	Monday 8:00 p.m. - Tuesday 6:00 a.m. Wednesday 8:00 p.m. - Saturday 6:00 a.m. Sunday 8:00 p.m. - Tuesday 6:00 a.m.
	Southern Main Road, Vessigny including all Sides Streets from LP 1600 - LP 1613	Monday 8:00 p.m. - Tuesday 6:00 a.m. Wednesday 8:00 p.m. - Saturday 6:00 a.m. Sunday 8:00 p.m. - Tuesday 6:00 a.m.
	Vance River	Monday 8:00 p.m. - Tuesday 6:00 a.m. Wednesday 8:00 p.m. - Saturday 6:00 a.m. Sunday 8:00 p.m. - Tuesday 6:00 a.m.
	Boodoosingh Trace,Sobo Circular Road, Sobo Extension	Monday 8:00 p.m. - Tuesday 6:00 a.m. Wednesday 8:00 p.m. - Thursday 6:00 a.m. Sunday 8:00 p.m. - Monday 6:00 a.m.
	Alta Garcia Trace, Hunte Street	Sunday 10:00 a.m. - Monday 5:00 a.m.
	Darsan Lane De Gannes Lane	Sunday 10:00 a.m. - Monday 5:00 a.m.
	Sobo Road, Chin Fong Alley	Thursday 9:00 p.m. - Friday 5:00 a.m. Friday 9:00 p.m. - Saturday 5:00 a.m.
	De Gannes Village, Lily Trace,	Sunday 10:00 a.m. - Monday 5:00 a.m.
	S. S. Erin Road from the Junction of S.S Erin Road & Siparia Old Road to the 14-1/4mm LP#442 including Well Road, Logie Street, Poco Alley, Coconut Alley, Dandy Lane, Cotton Trace, Thompson Trace & Balli Hosein Trace	Monday 10:00 p.m. - Tuesday 5:00 a.m.
	S. S. Erin Road from 14-1/4mm to the 17-3/4 mm inclusive of Quarry Settlements #1 & #2, Quarry Road, Sookram Trace, Ramdass Trace, Waddle Village, Alexander Settlement, Jacob Settlements # 1,#2 & # 3, School Street	Tuesday 8:00 p.m. - Wednesday 5:00 a.m.
	S. S. Erin Road from 17-3/4mm to 21-3/4mm including Victoria Street, Shearer Street, Bennett Village Road., #4 Rd., #8 Rd., Lorensette Rd., Lasalle St., Rancho South Tr., Oilfield Road, Webber St., #9 Rd., Palo Seco Branch Tr.	Wednesday 8:00 p.m. - Thursday 5:00 a.m.
	S. S. Erin Road from 21-3/4mm to 24-1/2mm including Palo Seco Beach Road, Los Iros Beach Road, Carapal Road, Erin Beach Road	Thursday 8:00 p.m. - Friday 5:00 a.m.
	Cap De Ville Erin Road from Erin Junction to Cap De Ville Junction	Saturday 8:00 p.m. - Sunday 5:00 a.m.
NAVET WATERWORKS	Palmyra, Reform Road, Naparima Mayaro Road between Manahambre Road and Reform Road	Daily 6:00 p.m. - 6:00 a.m.
	Reform Village, Tateco Avenue,London Street, Ali's Lane, Guaracara / Tabaqueite Road between Reform Road and Alma Street	Daily 6:00 p.m. - 6:00 a.m.
	Priam Street, Picton Settlement, Picton Street	Daily 6:00 p.m. - 6:00 a.m.

	Petit Morne Settlement, Cocoyea, Ciperio Road, Retrench Settlement	Daily
	Diamond Village, Debe-Wellington Road, Ragoo Village, Harripaul Village	Daily 9:00 p.m. - 5:00 a.m.
	Manahambre	Daily 9:00 p.m. - 5:00 a.m.
	Corinth Settlement, Corinth Extension. Road	Daily
	Mowassie Hill	Daily 9:00 p.m. - 5:00 a.m.
PENAL WATERWORKS	Penal proper	Monday 6:00 p.m. - Tuesday 5:00 a.m. Tuesday 6:00 p.m. - Wednesday 5:00 a.m. Sunday 10:00 p.m. - Monday 5:00 a.m. Monday 10:00 p.m. - Tuesday 5:00 a.m. Tuesday 10:00 p.m. - Wednesday 5:00 a.m.
	Lowkie Trace, SS Erin Road from Penal Water Treatment Plant to Clarke Road, Quinam Road	Monday 6:00 p.m. - Tuesday 5:00 a.m. Tuesday 6:00 p.m. - Wednesday 5:00 a.m. Wednesday 6:00 p.m. - Thursday 5:00 a.m. Thursday 6:00 p.m. - Friday 5:00 a.m. Friday 6:00 p.m. - Saturday 5:00 a.m.
	San Francique up to 3-1/4mm	Thursday 11:00pm - Saturday 6:00am
	Batchyia Branch Trace, Batchyia Trace, Railway Road	Wednesday 9:00 p.m. - Thursday 5:00 a.m.
	San Francique Road from SS Erin Road to 2 1/4mm, Lachoos Road 0mm-1mm	Thursday 9:00 p.m. - Friday 8:00 a.m. Friday 9:00 p.m. - Saturday 8:00 a.m. Saturday 9:00 p.m. - Sunday 8:00 a.m. Sunday 9:00 p.m. - Monday 8:00 a.m. Monday 9:00 p.m. - Tuesday 5:00 a.m. Tuesday 9:00 p.m. - Wednesday 5:00 a.m. Wednesday 9:00 p.m. - Thursday 5:00 a.m.
	SS Erin Road from Lowkie Trace to Penal Market Sunress Road, Ramjohn Trace	Thursday 9:00 p.m. - Friday 5:00 a.m.
CHATHAM WATERWORKS	TNA Road, Fanny Village, Point Ligoure, New Village, Main Road	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Saturday 10:00 p.m. - Sunday 5:00 a.m.
	Hollywood	Wednesdays 10:00 p.m. - Thursday 5a.m.
	Kaloo Road, Salazar, 6th Street, Tom Trace, Roberts Lane, Chunilal Trace	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m. Saturday 10:00 p.m. - Sunday 5:00 a.m.
	Warden Road	Daily
	Cap De Ville Main Road	Monday 10:00 p.m. - Tuesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.
	Upper Harriman Park	Monday 10:00 p.m. - Tuesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.

	South Central Road	Daily
	New Village	Monday 10:00 p.m. - Tuesday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m.
	Lot 10	Fridays 10:00 p.m. - Saturday 5:00 a.m.
	Soomai Trace, North Trace	Daily
	Techier	Saturday 8:00 p.m. - Sunday 6:00 a.m. Sunday 8:00 p.m. - Monday 6:00 a.m.
	Point Fortin (proper)	Monday 10:00 p.m. - Tuesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.
	Country Trace & M Street	Tuesday 9:00 a.m. - 9p.m. Thursday 9:00 a.m. - 9p.m.
	Chatham North & South	Tuesday 5:00 a.m. - 6:00 p.m. Thursday 5:00 a.m. - 6:00 p.m. Sunday 5:00 a.m. - 6:00 p.m.
	Southern Main Road, Chatham	Tuesday 6:00 a.m. - Wednesday 6:00 a.m. Thursday 6:00 a.m. - Friday 6:00 a.m.
	Syfoo Trace up to Boodram Trace Extension	Sunday 6:00 a.m. - Sunday 6:00 p.m.
COORA WATERWORKS	Sennon Village,	Daily
	La Pastora	Monday 8.00 a.m. - Wednesday 1.00 p.m.
	Quinam Road	Monday 8.00 a.m. - Wednesday 4.00 p.m.
	Upper Mary , George, Victoria ,Street Siparia	Friday 9:00 a.m. - Saturday 9:00 a.m.
	Mendez V,ge, High Street Siparia .Siparia proper	Daily
	Alexander Street, Coora Road, Prana Homes	Monday 10:00 p.m. - Tuesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Friday 10:00 p.m. - Saturday 5:00 a.m.
	Coora Hernandez Rd	Daily
FYZABAD WATERWORKS	Easy Street, Winston Campbell Trace, Khan Trace, Guapo Fyzabad Road from Butler Memorial to Junction of Delhi Road and Fyzabad Road	Daily
POINT FORTIN WATERWORKS	Parrylands	Wednesday 10:00 p.m - Friday 5:00 a.m Friday 10:00 p.m. -Saturday 5:00 a.m.
	Cochrane , Hubertstown	Friday 10:00 p.m. -Saturday 5:00 a.m.
	Brighton Cato	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m.
	Salick Trace	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m.

GRANVILLE WATERWORKS	Syfoo Trace, Coromandel, Granville	Daily
	Bonasse	Daily
	Bamboo, Bois Bourg	Sunday 10:00 p.m. - Monday 10:00 a.m. Monday 10:00 p.m. - Tuesday 10:00 a.m. Tuesday 10:00 p.m. - Wednesday 10:00 a.m.
	Point Coco, Boodram Trace,	Daily
	Point Coco Extension	Daily
	Fullerton	Thursday 10:00 p.m. - Friday 10:00 a.m. Friday 10:00 p.m. - Saturday 10:00 a.m. Saturday 10:00 p.m. - Sunday 10:00 a.m.
	Icacos, Los Gallos	Thursday 10:00 p.m. - Friday 10:00 a.m. Friday 10:00 p.m. - Saturday 10:00 a.m. Saturday 10:00 p.m. - Sunday 10:00 a.m.
SCOTTS ROAD WELLS # 1 & # 2	Penal Rock Road 1 1/2mm to 3mm, Daebedal Road	Friday 10:00 p.m. to Saturday 6 a.m.
	Morne Diablo and Scotts Road	Monday 10:00 p.m. - Tuesday 5:00 a.m. Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m.
	Mendez	Saturday 9:00 a.m. - Monday 5:00 a.m.
CLARKE ROAD BOOSTER CLARKE ROAD WELL # 5	Clarke Road (upper), Satnarine Trace, Teemul Trace	Tuesday 10:00 p.m. - Wednesday 5:00 a.m. Wednesday 10:00 p.m. - Thursday 5:00 a.m. Thursday 10:00 p.m. - Friday 5:00 a.m.
CAP DE VILLE WATERWORKS	Buenos Aires, Puerto Grande	Daily
CARAPAL WATERWORKS	Carapal Road, Carapal Branch Road, Arena Village	Friday 9:00 p.m.- Saturday 5:00 a.m. Saturday 9:00 p.m. - Sunday 5:00 a.m. Sunday 9:00 p.m. - Monday 5:00 a.m.
	Los Iros, Erin	Sunday 8:00 p.m. - Monday 8:00 a.m.
	Rancho Quemado	Monday 9:00 p.m. - Tuesday 9:00 a.m.
	Chambersville	Tuesday 9:00 p.m. - Wednesday 9:00 p.m.
	Carapal Road	Friday 8:00 p.m. - Sunday 8:00 a.m.
	Los Chorros, Palo Seco Road, Los Bajos	Tuesday 9:00 p.m. - Wednesday 5:00 a.m. Wednesday 9:00 p.m. - Thursday 5:00 a.m. Thursday 9:00 p.m. - Friday 5:00 a.m.

2007

SOURCE OF SUPPLY	AREAS SERVED	DRY SEASON SCHEDULE	WET SEASON SCHEDULE
CARONI WTP	St. Barbs, Morvant, Laventille, Troumacaque (Pic # 1)	Monday to Saturday 6:00pm - 6:00am	Monday to Saturday 6:00pm - 6:00am
	St. Barbs, Belmont (Pic # 1), Durant Street, Belmont Road, Mc Kai	Monday to Saturday 6:00pm - 6:00am	Monday to Saturday 6:00pm - 6:00am
	St. Barbs (Pic # 1) Lower St. Barbs, Serraneau Road	Monday, Saturday 6:00pm - 6:00am	Monday, Saturday 6:00pm - 6:00am
	Gonzales (Pic # 1)	Sunday 6:00am - 6:00pm, Tuesday 6:00pm - 6:00pm	Daily 24 hours
	Village Council Street - Blondell Alley, Mentor Alley	Monday to Sunday 7:00am - 6:00pm	Monday to Sunday 7:00am - 6:00pm
	Picton (Pic # 1) Upper Picton Road, Streaker Village	Sunday to Friday 6:00pm - 6:00am	Sunday to Friday 6:00pm - 6:00am
	Picton (Pic # 1) Picton Road, Dan Kelly	Monday to Sunday 24 hours	Monday to Sunday 24 hours
	Laventille (Val B) Kerr Road, Eastern Quarry, Eric Street	Monday to Sunday 24 hours	Monday to Sunday 24 hours
	Morvant (Upper Pic # 1) Troumacaque	Monday, Thursday 6:00pm - 6:00 am	Monday, Thursday 6:00pm - 6:00 am
	Morvant (Lower Val B) Wharton Street, Pashley Street, Thomasine Street	Monday to Sunday 24 hours	Monday to Sunday 24 hours
	Morvant (Val B) Low. Thomasine, Pashley & Wharton Street	Monday to Sunday 24 hours	Monday to Sunday 24 hours
	Barataria, Morvant, San Juan, Coconut Drive	Monday to Sunday 24 hours	Monday to Sunday 24 hours
	Mon Repos, Morvant	Sunday, Monday, Saturday 6:00am 6:00pm	Sunday, Monday, Saturday 6:00am 6:00pm

Belmont Upper (St. Barbs Tank)	Monday,Thursday, Saturday 6:00am - 6:00pm	Monday,Thursday, Saturday 6:00am - 6:00pm
Morvant, Mon Repos, Romains Land (Morvant Reservoir)	Monday,Saturday 6:00am - 6:00 pm	Monday,Saturday 6:00am - 6:00 pm
Belmont Upper (St. Barbs Tank)	Tuesday,Thursday, Saturday 6:00am-6:00pm	Tuesday,Thursday, Saturday 6:00am-6:00pm
St. Barbs, Belmont Upper Laylan Hill (St. Barbs Tank)	Monday,Wednesday, Thursday 6:00pm - 6:00am	Monday,Wednesday, Thursday 6:00pm - 6:00am
Mango Alley (Morvant Res.)	Tuesday,Thursday, Saturday, Thursday 6:00:am - 6:00pm	Tuesday,Thursday, Saturday, Thursday 6:00:am - 6:00pm
Belmont, St Barbs, Durrant Street (St. Barbs Tank)	Tuesday, Thursday, Saturday 6:00am - 6:00 pm	Tuesday, Thursday, Saturday 6:00am - 6:00 pm
Morvant, Block 22 (Pic # 1)	Monday,Wednesday, Friday 6:00am - 6:00pm	Monday,Wednesday, Friday 6:00am - 6:00pm
Belmont, Morvant (Morvant Res)	Tuesday,Wednesday, Friday, Saturday 6:00am - 6:00pm	Tuesday,Wednesday, Friday, Saturday 6:00am - 6:00pm
Buller Street, Morvant (Val B)	Monday to Sunday 24 hours	Monday to Sunday 24 hours
Santa Cruz, Pipiol (Val A)	Sunday, Tuesday, Wesnesday,Friday 6:00pm - 6:00am	Sunday, Tuesday, Wesnesday,Friday 6:00pm - 6:00am
Cantaro Village (Val A)	Sunday,Tuesday, Wesnesday,Friday 6:00 pm - 6:00am	Sunday,Tuesday, Wesnesday,Friday 6:00 pm - 6:00am
Santa Cruz Upper (Val A) Sam Boucaud	Sunday,Tuesday, Wesnesday,Friday 6:00pm - 6:00am	Daily 24 hours
Santa Cruz Upper (Val A) Cutucupano	Sunday,Tuesday, Wesnesday,Friday 6:00pm - 6:00am	Daily 24 hours
Santa Curz North (Val A)	Sunday,Tuesday, Wesnesday,Friday 6:00pm - 6:00am	Daily 24 hours
Santa Cruz Upper (Val A)	Sunday,Tuesday, Wesnesday,Friday 6:00pm - 6:00am	Daily 24 hours
Barataria (V2 Caroni)	24 hours Daily	24 hours Daily
Hololo Mountain Road Lower (Val A)	Sunday,Tuesday, Wednesday,Friday 6:00pm - 6:00am	Daily 24 hours
Hololo Mountain Road Lower (Val A)	Sunday,Tuesday, Wednesday,Friday 6:00pm - 6:00am	Daily 24 hours
Hololo Mountain Road (Upper) (Val A)	Sunday,Tuesday, Wednesday,Friday 6:00pm - 6:00am	Daily 24 hours
Laventille Road Febeau Village (Val B)	Monday to Sunday 6:00pm - 6:00am	Monday to Sunday 6:00pm - 6:00am

	Bagatelle Extension (Val B)	Monday to Sunday 6:00pm - 6:00am	Monday to Sunday 6:00pm - 6:00am
EL SOCORRO HL	Morvant (El Socorro HL) Troumacaque Road, Butler Trace	Monday, Thursday 8:00am - 6:00pm	Monday, Thursday 8:00am - 6:00pm
	Morvant (El Socorro HL) Alexis Street, Upper Pashley Street, Morgan Lane	Tuesday, Thursday 8:00am - 6:00 pm	Tuesday, Thursday 8:00am - 6:00 pm
	Morvant (El Socorro HL) La Pompe Road, Red Hill	Tuesday, Friday, Sunday 6:00pm - 6:00am	Tuesday, Friday, Sunday 6:00pm - 6:00am
	Morvant (El Socorro HL) Boxhill Trace, Laventille Road	Sunday, Tuesday, Friday 10:00pm - 6:00am	Sunday, Tuesday, Friday 10:00pm - 6:00am
	Morvant (El Socorro HL) Mapland, Critchlow Hill	Tuesday, Friday 6:00pm - 6:00 am	Tuesday, Friday 6:00pm - 6:00 am
	(Val A) Cipriani Street, Caimite, Morvant Avenue	Monday to Sunday 6:00pm - 6:00am	Monday to Sunday 6:00pm - 6:00am
	Morvant (El Socorro HL) Green Acres, Upper Buller Street	Thursday, Sunday 6:00pm - 6: 00am	Thursday, Sunday 6:00pm - 6: 00am
	Morvant Wharton Street (El Socorro HL)	Monday to Sunday 24 hours	Monday to Sunday 24 hours
	Angelina Terrace, (El Socorro via Morvant Reservoir)	Sunday, Monday, Saturday 6:00am - 6:00pm	Sunday, Monday, Saturday 6:00am - 6:00pm
	Picton (El Socorro HL - Pic # 1)	Monday, Tuesday, Thursday, Saturday 6:00am - 5:00 pm	Monday, Tuesday, Thursday, Saturday 6:00am - 5:00 pm
	Beetham Phases 1,2,3 (El Socorro HL)	Monday to Sunday 24 hours	Monday to Sunday 24 hours
	El Socorro Road (El Socorro HL)	Monday to Sunday 24 hours	Monday to Sunday 24 hours
	El Socorro Road (El Socorro HL)	Monday to Sunday 24 hours	Monday to Sunday 24 hours
	El Socorro Road Croisse to Glen Lane (Val A)	Monday to Sunday 24 hours	Monday to Sunday 24 hours
	ONE BOOSTER	Mt. D'or, Mt. Hope, Petite Bourg, Santa Cruz Old Road, Santa Cruz	Sunday to Saturday 24 hours
Petite Curacaye, Quarry Road, Upper Mt. D'or, Upper Mt. Hope		Daily-6:00pm-6:00am	Daily-6:00pm-6:00am
TWO BOOSTERS	Mt. D'or, Mt. Hope, Petite Bourg, Santa Cruz Old Road, Quarry Road, Santa Cruz	Tuesday, Thursday, Saturday, Thursday 6:00pm - 6:00am	Tuesday, Thursday, Saturday, Thursday 6:00pm - 6:00am
	Petite Curacaye	Daily-6:00pm-6:00am	Daily-6:00pm-6:00am
TWO BOOSTERS	Mt. Hope, Petite Bourg, Santa Cruz Old Road, Quarry Road, Petite Curacaye, Santa Cruz	Sunday to Saturday 6:00pm - 6:00am	Sunday to Saturday 6:00pm - 6:00am
	Mt. D'or	Daily-6:00pm-6:00am	Daily-6:00pm-6:00am

SOURCE OF SUPPLY	AREAS SERVED	DRY SEASON SCHEDULE	WET SEASON SCHEDULE
CARONI WTP	Gonzales	Monday, Wednesday, Friday 8:00pm - 5:00am	Daily 24 hours
	Belmont Upper	Tuesday, Thursday, Saturday and Sunday 8:00am - 5:00pm	Daily 24 hours
	Belmont Upper, Durant Street	Tuesday, Thursday, Saturday and Sunday 8:00am - 5:00pm	Daily 24 hours
	Buller Trace, Upper/Dawn Trace	Sunday, Thursday 7:00pm - 11:00pm	Daily 24 hours
	Belmont, Mc Kai Road	Monday, Wednesday, Friday 9:00am - 5:00pm	Daily 24 hours
	Upper St. Francois Valley Road, Marie Road	Wednesday, Saturday 8:00pm - 11:00pm	Daily 24 hours
	Cantaro Village	Sunday, Tuesday 6:00am - 5:00pm	Sunday, Tuesday 6:00am - 5:00pm
	Cascade, St. Ann's (Lower) up to Foncelette Road	Tuesday, Thursday, Saturday and Sunday 8:00am - 5:00pm	Daily 24 hours
	Belmont West (Low Levels)	Tuesday, Thursday, Saturday 8:00pm - 5:00am	Daily 24 hours
	Knaggs Hill, Lady Chancellor, Port-of-Spain	Sunday, Tuesday, Thursday and Saturday 8:00pm - 5:00am	Daily 24 hours
	Hutton Road, St. Ann's	Sunday, Tuesday, Thursday and Saturday 8:00pm - 5:00am	Daily 24 hours

	Terracita / Lady Chancellor	Tuesday, Thursday, Saturday and Sunday 8:00pm - 5:00am	Daily 24 hours
	Hololo Mountain Road (Lower) Cascade	Sunday, Monday, Thursday 6:00pm - 6:00am	Daily 24 hours
	Hololo Mountain Road Lower (High point) Cascade	Sunday, Monday, Thursday 6:00pm - 6:00am	Daily 24 hours
	Middle Ariapita, Cascadia to Plaisance, St. Ann's	Tuesday to Thursday 6:00pm - 6:00am Friday to Sunday 6:00pm - 6:00am	Daily 24 hours
	Hololo Mountain Road (Upper) Cascade	Monday, Thursday 6:00am - 6:00pm	Daily 24 hours
	Hillside / Cascade	Sunday, Tuesday, Friday 6:00am - 6:00pm	Daily 24 hours
	Foncette Road, Cascade	Tuesday, Thursday, Saturday 8:00am - 5:00pm	Daily 24 hours
	Mon Repos, Cascade	Tuesday, Thursday, Saturday 8:00am - 5:00pm	Daily 24 hours
	St. James Cocorite, Fort George	Tuesday, Thursday, Saturday 8:00pm - 5:00am	Daily 24 hours
	Bournes Road (Upper) St. James	Tuesday, Thursday, Saturday 8:00pm - 5:00am	Daily 24 hours
	Bossiere # 1 Maraval, Flaf Staff	Daily 24 hours	Daily 24 hours
	Cascade Road (Upper) Beyond Foncette Road	Monday, Tuesday, Thursday and Saturday 8:00am - 5:pm	Daily 24 hours
	Brunton Road	Tuesday, Thursday, Saturday 8:00am - 5:00pm	Daily 24 hours
DORRINGTON GARDENS WTP	Petit Valley, Cameron Road and Environs	Wednesday, Saturday 6:00am - 6:00am	Wednesday, Saturday 6:00am - 6:00am
	Petit Valley, Pioneer Drive and Environs	Sunday, Tuesday, Thursday 6:00am - 6:00am	Sunday, Tuesday, Thursday 6:00am - 6:00am
	Petit Valley, Ravine Road and Environs	Monday, Wednesday, Friday and Saturday 6:00am - 6:00am	Monday, Wednesday, Friday and Saturday 6:00am - 6:00am
EL SOCORRO HL	Woodbrook / Port-of-Spain / Newton	Daily 5:00pm - 5:00am	Daily 24 hours
	Belmont East, High Levels	Tuesday, Thursday, Saturday, Sunday 8:00pm - 5:00am	Tuesday, Thursday, Saturday, Sunday 8:00pm - 5:00am
	Gonzales (Lower) Belmont	Tuesday, Thursday, Saturday 6:00pm - 6:00am	Daily 24 hours
	Gonzales, High Levels, Belmont	Tuesday, Thursday, Saturday 6:00pm - 6:00am	Daily 24 hours

	Gonzales, High Levels, Belmont	Tuesday, Thursday, Saturday 6:00pm - 6:00am	Tuesday, Thursday, Saturday 6:00pm - 6:00am
	Quarry Street, Laventille, Port-of-Spain	Daily 5:00am - 5:00pm	Daily 5:00am - 5:00pm
	Bat Alley, Clifton Hill, Laventille	Daily 5:00am - 5:00pm	Daily 5:00am - 5:00pm
FOUR ROADS HL	Diego Martin Industrial Estate	Monday, Wednesday, Friday 6:00am - 6:00pm	Monday, Wednesday, Friday 6:00am - 6:00pm
	Rich Plain, Lower Richplain Road	Monday to Wednesday 6:00am - 6:00pm	Monday to Wednesday 6:00am - 6:00pm
	Four Roads, Diego Martin Main Road to Gopaul Avenue	Daily 6:00am - 6:00pm	Daily 6:00am - 6:00pm
	Vanderpool Lane, Diego Martin	Daily 6:00am - 6:00pm	Daily 6:00am - 6:00pm
	Four Roads, Upper Unity and Farm Road, Richplain	Monday to Wednesday 6:00am - 6:00pm	Monday to Wednesday 6:00am - 6:00pm
	La Estancia, Diego Martin	Monday, Tuesday, Wednesday, Thursday, and Friday 6:00am - 6:00am	Monday, Tuesday, Wednesday, Thursday, and Friday 6:00am - 6:00am
	Upper La Puerta Road, Diego Martin	Monday to Friday 6:00pm - 6:00am	Monday to Friday 6:00pm - 6:00am
	Victoria Gardens, Diego Martin, West Moorings	Daily 6:00am - 6:00pm	Daily 6:00am - 6:00pm
	Rainbow Ridge, Goodwood Park East, Goodwood Park	Wednesday, Saturday 8:00am - 8:00pm	Wednesday, Saturday 8:00am - 8:00pm
	Ling Field Road, Goodwood Park East and West	Sunday, Tuesday, Thursday 8:00am - 8:00am	Sunday, Tuesday, Thursday 8:00am - 8:00am
	Simeon Road, Petit Valley	Sunday, Tuesday, Thursday 8:00am - 8:00am	Sunday, Tuesday, Thursday 8:00am - 8:00am
MARAVAL WTP	Maraval, High Points West on Saddle Road	Monday, Wednesday, Friday, Sunday 6:00am - 6:00pm	Monday, Wednesday, Friday, Sunday 6:00am - 6:00pm
	Maraval, High Points East on Saddle Road	Monday to Saturday 6:00am - 6:00pm	Monday to Saturday 6:00am - 6:00pm
	Bamboo Trace Maraval	Daily 24 hours	Daily 24 hours
	Moka Maraval (Upper)	Daily 24 hours	Daily 24 hours
	Morne Coco Road, (Lower) Maraval	Daily 24 hours	Daily 24 hours
	Dundonald Hill Upper, St.James	Sunday, Monday, Thursday 6:00pm - 6:00am	Sunday, Monday, Thursday 6:00pm - 6:00am
	Dundonald Hill Lower, St.James	Sunday, Monday, Thursday 6:00am - 6:00pm	Sunday, Monday, Thursday 6:00am - 6:00pm
	Belle Vue Road, Long Circular, St .James	Wednesday, Saturday 6:00am - 6:00am	Wednesday, Saturday 6:00am - 6:00am
	Dibe Road and Brieves Road (Lower) St. James	Tuesday, Friday 6:00am - 6:00am	Tuesday, Friday 6:00am - 6:00am
PARAMIN WTP	Mt. Cyril Upper, Maraval	Saturday 6:00pm - 6:00pm	Saturday 6:00pm - 6:00pm
	Mt. Cyril Lower, Maraval	Friday 6:00pm - 6:00pm	Friday 6:00pm - 6:00pm
	Paramin Level 1	Daily 24 hours	Daily 24 hours

	Le Platte Village, Maraval	Daily 24 hours	Daily 24 hours
	Sant D'eau, Maraval	Daily 24 hours	Daily 24 hours
	Paramin Level 3	No supply	No supply
RIVER ESTATE WTP	River Estate, Blue Basin, NHA	Monday,Wednesday, Friday 6:00am - 6:00am	Monday,Wednesday, Friday 6:00am - 6:00am
	Diego Martin, Greenhill Village	Daily 6:00am - 6:00pm	Daily 6:00am - 6:00pm
	River Estate, Bagatelle, Diego Martin	Daily 6:00am - 6:00pm	Daily 6:00am - 6:00pm
	Bagatell, Diego Martin	Daily 6:00am - 6:00pm	Daily 6:00am - 6:00pm
	Covigne, Diego Martin	Tuesday,Thursday, Saturday 6:00am - 6:00am	Tuesday,Thursday, Saturday 6:00am - 6:00am
	Blue Range, Diego Martin	Monday,Wednesday, Friday 24 hours Tuesday,Thursday, Sunday 6:00pm - 6:00am	Monday,Wednesday, Friday 24 hours Tuesday,Thursday, Sunday 6:00pm - 6:00am
	Petit Valley, Roxborough Street, Diego Martin	Daily 6:00AM - 6:00PM	Daily 6:00AM - 6:00PM
	Petit Valley, High Levels, Blue Range	Monday,Wednesday, Friday	Monday,Wednesday, Friday
	ST ANNS RES	Fondes Amandes, Cascade	Sunday to Tuesday 6:00am - 6:00pm Sunday,Monday, Thursday 6:00pm - 6:00am
TUCKER VALLEY WTP	Carenage,(High Levels Haig Street)	Tuesday,Thursday, Saturday 9:00am - 9:00am	Tuesday,Thursday, Saturday 9:00am - 9:00am
	Carenage,(High Levels Lanse Mitan Road)	Tuesday,Thursday, Saturday 9:00am - 9:00am	Tuesday,Thursday, Saturday 9:00am - 9:00am
	The Park and Gulf View	Daily 7:00am - 1:00pm	Daily 7:00am - 1:00pm
	The Park and Gulf View (Senora Park)	Sunday, Tuesday, Thursday 9:00am - 9:00am	Sunday, Tuesday, Thursday 9:00am - 9:00am
	West Vale Park	Daily 1:00pm - 7:00am	Daily 1:00pm - 7:00am
FOUR ROADS	Sparrow Drive	Saturday, Monday, Wednesday 6:00am - 6:00pm	Saturday, Monday, Wednesday 6:00am - 6:00pm
CARONI WTP	West Moorings	Daily 24 hours	Daily 24 hours
COVIGNE INTAKE	Covigne(Upper)	Daily 24 hours	Daily 24 hours
DORRINGTON GARDENS	Petit Valley	Daily 24 hours	Daily 24 hours
SIERRA LEONE WELL #10	Petit Valley	Daily 24 hours	Daily 24 hours
DORRINGTON GARDENS	La Burham Avenue	Daily 24 hours	Daily 24 hours
TUCKER VALLEY	Macquripe	Daily 24 hours	Daily 24 hours
	Macquripe	Daily 24 hours	Daily 24 hours
	La Horquette	Daily 24 hours	Daily 24 hours
	Western Main Road	Daily 24 hours	Daily 24 hours
	Glenco	Daily 24 hours	Daily 24 hours
DIAMOND VALE 14 &15	Diamond Vale	Daily 24 hours	Daily 24 hours

SOURCE OF SUPPLY	AREAS SERVED	DRY SEASON SCHEDULE	WET SEASON SCHEDULE
VALSAYN HIGHLIFT (WELLS)	St. Augustine (High Levels), Ragbir Street, Noel Trace, Forest Gate, Tunapuna (High Levels), St. John's Road, Basanta Upper Tunapuna Road, 1st Trace, Upper Fairley Street and Environs	Tuesday, Thursday, Saturday 6:00pm - 6:00am	Tuesday, Thursday, Saturday 6:00pm - 6:00am
	Santa Magarita, Neil Trace, Los Godos	Monday, Wednesday, Friday 6:00pm - 4:00pm 9:00pm - 4:00am	Monday, Wednesday, Friday 6:00pm - 4:00pm 9:00pm - 4:00am
	St. Augustine (Low Level), Monte Grande	Daily-6:00am-6:00pm	Daily-6:00am-6:00pm
	Tunapuna East High Level, Balthazar Street, Upper El Dorado Road, College Road, Henry Road, Green Street, Dookie Street	Monday, Wednesday, Friday 6:00pm - 4:00am	Monday, Wednesday, Friday 6:00pm - 4:00am
	Macoya Gardens / Industrial Estate	Daily 6:00am - 6:00pm	Daily 24 hours
	Trinicity	Daily Except 6:00pm - 6:00am	Daily 24 hours
	Paradise East, Paradise West	Daily	Daily 24 hours
	Paradise West (High Level)	Daily 9:00pm - 4:00am	Daily 9:00pm - 4:00am
	Orange Grove	Daily 6:00am - 6:00pm	Daily 24 hours
NORTH OROPUCHE	Sangre Grande (Town)	Monday, Wednesday, Friday 6:00am - 6:00am	Daily 24 hours
	Sangre Grande, Vega de Oropouche, Lower Toco Road	Monday, Wednesday, Friday 6:00am - 6:00am	Daily 24 hours
	Sangre Grande (Extreme of Systems) - Manzanilla # 2, # 3, Caigual, North Manzanilla, Fishing Pond, Coalmine, Coryal Village	Monday and Friday 6:00pm - 4:00 am	Monday and Friday 6:00pm - 4:00 am
	O'Meara Road Churchill Roosevelt Highway to 2nd Service Station including Industrial Estate	Tuesday and Saturday 5:00am - 2:00pm	Daily 24 hours
	Maloney, Malabar Phase 1,3 and 4, Carapo	Tuesday and Saturday 5:00am - 12:00noon	Daily 24 hours
	La Horquetta, Brazil	Tuesday and Saturday 3:00pm - 8:00pm	Daily 24 hours
	Cumuto	Monday and Friday 9:00pm - 4:00am	Daily 24 hours
	Talparo / Mundo Nueva	Tuesday and Saturday 11:00pm - 4:00am	Tuesday and Saturday 11:00pm - 4:00am
	Mausica Road, Crescent Gardens	Monday, Tuesday, Thursday, Friday and Saturday 5:00am - 12:00noon	Daily 24 hours
GUANAPO	Arima Town	Monday to Saturday 6:00am - 5:00pm	Daily 24 hours
	Alenore Gardens Phase 1, Wall Street	Tuesday, Thursday, Saturday and Sunday 6:00am - 2:00pm	Daily 24 hours

	Calvary Branch Road	Tuesday to Saturday 9:00pm - 5:00am	Tuesday to Saturday 9:00pm - 5:00am
	Blanchisseuse Road	Monday to Friday 9:00pm - 5:00am	Monday to Friday 9:00pm - 5:00am
	Mt. Pleasant	Tuesday, Thursday, Saturday 6:00am - 2:00pm	Tuesday, Thursday, Saturday 6:00am - 2:00pm
	Guarvado Road / Maturita Cemetery Street, Dump Road	Monday, Wednesday, Friday 9:00pm - 5:00am	Monday, Wednesday, Friday 9:00pm - 5:00am
	Alenore Gardens Phase 2	Monday, Wednesday, Friday 5:00am - 2:00pm (Foll Day)	Monday, Wednesday, Friday 5:00am - 2:00pm (Foll Day)
ARIPO	Santa Rosa Heights, Smithlands	Monday, Wednesday, Friday 6:00am - 6:00pm (Foll Day)	Monday, Wednesday, Friday 6:00am - 6:00pm (Foll Day)
	Wallerfield Block 2/3, Tractor Pool Road	Tuesday, Thursday, Saturday 6:00am - 6:00pm (Foll Day)	Tuesday, Thursday, Saturday 6:00am - 6:00pm (Foll Day)
	Tumpuna Road-Malabar Road, Henri Street	Sunday, Tuesday, Thursday and Saturday 6:00am - 2:00pm	Daily 24 hours
SALYBIA WELL	Salybia	Tuesday, Thursday, Saturday 10:00am - 6:00am	Daily 24 hours
	Mathura	Monday, Wednesday, Friday 10:00am - 6:00am	Daily 24 hours
CAURA	Paradise Gardens, Madoo Hill/Upper El Dorado	Tuesday, Thursday, Saturday and Sunday 9:00pm - 4:00am	Tuesday, Thursday, Saturday and Sunday 9:00pm - 4:00am
	Dinsley Main Road, Tacarigua Eastern Main Road - Orange Grove to St. Michael, El Dorado (North Eastern Main Road), Bealieu Gardens	Daily-6:00am-6:00pm	Daily 24 hours

HOLLIS	Lynton Gardens 1 & 2 and Environs	Sunday and Wednesday 11:00pm - 4:00am	Sunday and Wednesday 11:00pm - 4:00am
	High Level Olton Road, Mahogany Drive, Arima Town Lower, Temple Street	Tuesday, Thursday, Saturday 9:00pm - 4:00am	Tuesday, Thursday, Saturday 9:00pm - 4:00am
	Arima Old Road, Ted and Martinez, Capildeo Lands	Monday and Friday 5:00am - 5:00pm (Foll Day)	Monday and Friday 5:00am - 5:00pm (Foll Day)
	Arima Old Road, Arouca Upper Section	Monday and Friday 11:00pm - 4:00am	Daily 24 hours
	Lilian Heights, D'Abadie	Monday and Thursday 9:00pm - 5:00am	Daily 24 hours
	Bregon Park, D'Abadie	Tuesday and Saturday 9:00pm - 5:00am	Daily 24 hours
TACARIGUA	Bon Air West - Arouca	Sunday and Wednesday 11:00pm - 4:00am High Point 11:00pm - 4:00am	Daily 24 hours
	Smith Development, Five Rivers Arouca, Upper Hillview Drive, Five Rivers, Manimore, Bertie Road	Sunday and Wednesday 11:00pm - 4:00am	Sunday and Wednesday 11:00pm - 4:00am
	Kandahar Road, Maniram Road, Mission Road, Davis Road, Upper Five Rivers	Monday and Friday 11:00pm - 4:00am	Monday and Friday 11:00pm - 4:00am
	Laurel Hill, Manimore, Bertie Road Five Rivers, William Trace	Monday and Friday 11:00pm - 4:00am	Monday and Friday 11:00pm - 4:00am
CARONI	Lower Five Rivers / Range Road, Eastern Main Road Five Rivers, Crown Street to Dickson Street	Monday, Wednesday, Friday 6:00am - 5:00pm	Daily 24 hours
	Golden Grove Road, Curepe, Valsayn (North), St. Joseph Eastern Main Road, Lower Champs Fleur, Lower Quarry Road, Lower Hilltop	Daily	Daily 24 hours
	Upper Champs Fleur, Upper Quarry Road, Upper Hilltop	Daily 9:00pm - 5:00am	Daily 24 hours
LLUENGO/NARANJO - WATERWORKS	North of Valley View Junction- lluengo Road, El Chorro, Guarita, Acono Road, Caurita Road	Monday to Friday 4:00pm - 4:00am	Daily 24 hours
	La Seiva Village, Maracas Royal Road, Avondale Gardesn, La Mango, Upper and Lower Valley View, Silk Cotton	Monday, Wednesday, Friday 9:00am - 2:00pm	Daily 24 hours
	Buena Vista, Caiman Circle, Rose Drive, La Baja, Maracas Gardens, Balata Trace, Warf Trace, Mountain View	Wednesday and Sunday 9:00pm - 4:00am	Daily 24 hours
QUARE INTAKE	Valencia	Daily 24 hours	Daily 24 hours
	San Pedro, Pilot Farm (Valencia Ext)	Nightly	Nightly

APPENDIX XVI

WORST HIT AREAS

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION	CLAS
CARLSEN FIELD WELL #5	CAPARO	14	
CARLSEN FIELD WELL #5	BRASSO TAMANA	0	
CARLSEN FIELD WELL #5	TODD`S STATION	57	
CARLSEN FIELD WELL #5	TODD`S ROAD	229	
CARLSEN FIELD WELL #5	TODD`S ROAD	1619	
CARLSEN FIELD WELL #5	MUNDO NUEVO	21	
CARLSEN FIELD WELL #5	MAMORAL NO.2	415	
CARLSEN FIELD WELL #5	MAMORAL	466	
CARLSEN FIELD WELL #5	CHICKLAND	90	
CARLSEN FIELD WELL #5	CAPARO	118	
CARLSEN FIELD WELL #5	CAPARO	0	
CARLSEN FIELD WELL #5	CAPARO	0	
CARLSEN FIELD WELL #5	BRICKFIELD NAVET	0	
CARLSEN FIELD WELL #5	BRASSO TAMANA	0	
CARLSEN FIELD WELL #5	BRASSO TAMANA	0	
CARLSEN FIELD WELL #5	BRASSO TAMANA	0	
CARLSEN FIELD WELL #5	BRASSO TAMANA	0	

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION
CARLSEN FIELD WELL #5	BRASSO TAMANA	0
CARLSEN FIELD WELL #5	FLANAGIN TOWN	386
CARLSEN FIELD WTP	CARLSEN FIELD	0
CARLSEN FIELD WTP	FIREBURN	0
CARLSEN FIELD WTP	FREEPORT	35
CARLSEN FIELD WTP	FREEPORT	14
CARLSEN FIELD WTP	CARLSEN FIELD	0
CARLSEN FIELD WTP	CARAPICHAIMA	41
CARLSEN FIELD WTP	CARAPICHAIMA	12
CARLSEN FIELD WTP	CHASE VILLAGE	1920
CARLSEN FIELD WTP	FAIRVIEW PARK	15
CARONI WTP	ST. ANNS MENTAL HOSPITAL	71
CARONI WTP	PORTE GRANDE/CHATHAM	83
CARONI WTP	PUERTO GRANDE	98
CARONI WTP	QUARRY VILLAGE	933
CARONI WTP	QUARRY VILLAGE	116
CARONI WTP	ST. ANNS	76
CARONI WTP	ST. ANNS	120
CARONI WTP	ST. ANNS	139
CARONI WTP	ST. ANNS	188

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION
CARONI WTP	ST. ANNS	363
CARONI WTP	ST. ANNS MENTAL HOSPITAL	0
CARONI WTP	ST. ANNS MENTAL HOSPITAL	0
CARONI WTP	ST. ANNS MENTAL HOSPITAL	368
CARONI WTP	ST. ANNS MENTAL HOSPITAL	71
CARONI WTP	TROUMACAQUE	2
CARONI WTP	CAP-DE-VILLE	50
CARONI WTP	PICTON	32
CARONI WTP	ST. ANNS MENTAL HOSPITAL	0
CARONI WTP	CASCADE	88

CARONI WTP	BELMONT	0
CARONI WTP	BELMONT	0
CARONI WTP	BLONDELL ALLEY	0
CARONI WTP	BOISSIERE	0
CARONI WTP	BUENOS AYRES	209
CARONI WTP	CASABLANCA	37
CARONI WTP	CAP-DE-VILLE ROAD	314
CARONI WTP	LOS IROS	284
CARONI WTP	CASCADE	1486
CARONI WTP	EAST DRY RIVER	551

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION	CL
CARONI WTP	ERIN	173	
CARONI WTP	LADY CHANCELLOR	97	
CARONI WTP	LADY CHANCELLOR	0	
CARONI WTP	LADY CHANCELLOR	0	
CARONI WTP	LADY CHANCELLOR	7	
CARONI WTP	LAVENTILLE	757	
CARONI WTP	LORENSOTTE VILLAGE/ARENA	46	
CHATHAM WTP	RESERVOIR HILL	0	
CHATHAM WTP	TECHIER VILLAGE	1896	
CHATHAM WTP	POINT LIGOURE	1418	
CHATHAM WTP	HOLLYWOOD	546	
CHATHAM WTP	FANNY VILLAGE	0	
CHATHAM WTP	FANNY VILLAGE	3354	
CHATHAM WTP	CAP-DE-VILLE	292	
CHATHAM WTP	CAP-DE-VILLE	35	
CHATHAM WTP	GONZALES VILLAGE	0	
CHATHAM WTP		0	
DORINGHTON GARDENS H/L	PETIT VALLEY	328	
DORINGHTON GARDENS H/L	PETIT VALLEY	263	
DORINGHTON GARDENS H/L	PETIT VALLEY	234	

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION
EL SOCORRO H/L	PICTON (N.H.A)	531
EL SOCORRO H/L	PORT OF SPAIN	0
EL SOCORRO H/L	PICTON	274
EL SOCORRO H/L	OVID ALLEY	0
EL SOCORRO H/L	LAVENTILLE	18
EL SOCORRO H/L	GONZALES	41
EL SOCORRO H/L	EAST DRY RIVER	4467
EL SOCORRO H/L	CLIFTON HILL	258
EL SOCORRO H/L	CLIFTON HILL	722
EL SOCORRO H/L	BELMONT	67
EL SOCORRO H/L	BELMONT	32
EL SOCORRO H/L	EAST DRY RIVER	1573
EL SOCORRO H/L	PORT OF SPAIN	0
FOUR ROADS H/L	GOODWOOD PARK	279
FOUR ROADS H/L	RICH PLAIN	393
FOUR ROADS H/L	RICH PLAIN	399
FOUR ROADS H/L	RICH PLAIN	559
FREEPORT WTP	BONNE AVENTURE	0
FREEPORT WTP	TORTUGA	97
FREEPORT WTP	PARFORCE	4

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION
FREEPORT WTP	PARFORCE	0
FREEPORT WTP	HERMITAGE	167
FREEPORT WTP	CARATAL	535
FREEPORT WTP	BONNE AVENTURE	262
FREEPORT WTP	BONNE AVENTURE	20
HOLLIS WTP	CARIB HOMES	0
HOLLIS WTP	SHERWOOD PARK	417
HOLLIS WTP	LA RESOURCE	0
HOLLIS WTP	LA RESOURCE	231
HOLLIS WTP	SHERWOOD PARK	9
HOLLIS WTP	D`ADABIE	797
HOLLIS WTP	CARIB HOMES	25
HOLLIS WTP	ARIMA BOROUGH	65
HOLLIS WTP	ARIMA	462
HOLLIS WTP	CLEAVER ROAD	95
HOLLIS WTP	CLEAVER ROAD	90
LLUENGO/NARANJO WTP	VALLEY VIEW	231
MARAVAL INTAKE	ST. JAMES	62
MARAVAL INTAKE	UPPER BOURNES ROAD	274
MARAVAL INTAKE	ST. JAMES	53

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION
MARVAL INTAKE	DUNDONALD HILL	15
MARVAL INTAKE	DUNDONALD HILL	895
MARVAL INTAKE	DUNDONALD HILL	0
MARVAL INTAKE	DUNDONALD HILL	403
MARVAL INTAKE	DIBE ROAD	40
MARVAL INTAKE	DIBE ROAD	556
MARVAL INTAKE	BELLE VUE	298
MARVAL INTAKE	BELLE VUE	77
MARVAL INTAKE	BELLE VUE	0
MARVAL INTAKE	BELLE VUE	1774
MARVAL INTAKE	UPPER BOURNES ROAD	304
MARVAL INTAKE	DUNDONALD HILL	5
MORICAL SPRING	SANKARLAL LANDS	293
MORICAL SPRING	WHITELAND	0
MORICAL SPRING	WHITELAND	311
MORICAL SPRING	SANKARLAL LANDS	58
MORICAL SPRING	POONAH	237
MORICAL SPRING	POONAH	210
MORICAL SPRING	BONNE AVENTURE	5
MORICAL SPRING	SANKARLAL LANDS	198

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION
NAVET WTP	KANHAI	57
NAVET WTP	BROTHER`S SETTLEMENT/ST. JUL	152
NAVET WTP	DYERS VILLAGE	36
NAVET WTP	ECCLESVILLE	1462
NAVET WTP	FARNUM VILLAGE	22
NAVET WTP	GARTH ROAD/CORYAL VILLAGE	268
NAVET WTP	HOPE ROAD	0
NAVET WTP	KONJAL ROAD	7
NAVET WTP	SISTER'S ROAD'	8
NAVET WTP	HOPE ROAD	0
NAVET WTP	WHITELAND	455
NAVET WTP	ST. CROIX, LOWER BARRACKPORE	155
NAVET WTP	ST. CROIX VILLAGE	4
NAVET WTP	ST. CROIX VILLAGE	359
NAVET WTP	SISTER'S ROAD'	4
NAVET WTP	RIVERS DALE GUARACARA	0
NAVET WTP	POONAH	112
NAVET WTP	KONJAL ROAD	64
NAVET WTP	ST. CROIX VILLAGE	78
NAVET WTP	KONJAL ROAD	85

NAVET WTP	KANHAI	57
NAVET WTP	BROTHER'S SETTLEMENT/ST. JUL	152
NAVET WTP	DYERS VILLAGE	36
NAVET WTP	ECCLESVILLE	1462
NAVET WTP	FARNUM VILLAGE	22
NAVET WTP	GARTH ROAD/CORYAL VILLAGE	268
NAVET WTP	HOPE ROAD	0
NAVET WTP	KONJAL ROAD	7
NAVET WTP	SISTER'S ROAD'	8
NAVET WTP	HOPE ROAD	0
NAVET WTP	WHITELAND	455
NAVET WTP	ST. CROIX, LOWER BARRACKPORE	155
NAVET WTP	ST. CROIX VILLAGE	4
NAVET WTP	ST. CROIX VILLAGE	359
NAVET WTP	SISTER'S ROAD'	4
NAVET WTP	RIVERS DALE GUARACARA	0
NAVET WTP	POONAH	112
NAVET WTP	KONJAL ROAD	64
NAVET WTP	ST. CROIX VILLAGE	78
NAVET WTP	KONJAL ROAD	85

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION
NAVET WTP	PASCARR ROAD	0
NAVET WTP	LENGUA	249
NAVET WTP	LENGUA	187
NAVET WTP	LENGUA	235
NAVET WTP	LOTHIAN	328
NAVET WTP	MAYO	158
NO SUPPLY	QUASHVILLE	504
NO SUPPLY	WALLER FIELD	199
NO SUPPLY	WALLER FIELD	0
NO SUPPLY	TAMANA	0
NO SUPPLY	SANGRE GRANDE	0
NO SUPPLY	SANGRE GRANDE	118
NO SUPPLY	SANGRE GRANDE	155
NO SUPPLY	SAMAROO VILLAGE	115
NO SUPPLY	WALLER FIELD	63
NO SUPPLY	D`ADABIE	0
NO SUPPLY	MARAJ HILL	468
NO SUPPLY	WALLER FIELD	50
NO SUPPLY	BRAZIL	148
NO SUPPLY	COAL MINE	144

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION
NO SUPPLY	EMERALD GARDENS	189
NO SUPPLY	FOUR ROADS TAMANA	54
NO SUPPLY	GUAICO	385
NO SUPPLY	GUAICO	0
NO SUPPLY	LA HORQUETTA	0
NO SUPPLY	LA HORQUETTA	0
NORTH OROPOUCHE WTP	WALLER FIELD	184
NORTH OROPOUCHE WTP	TODD`S STATION	0
NORTH OROPOUCHE WTP	TAMANA MAIN ROAD	0
NORTH OROPOUCHE WTP	TAMANA MAIN ROAD	0
NORTH OROPOUCHE WTP	TODD`S STATION	133
NORTH OROPOUCHE WTP	TAMANA MAIN ROAD	0
NORTH OROPOUCHE WTP	TODD`S STATION	25
NORTH OROPOUCHE WTP	TUMPUNA ROAD	6
NORTH OROPOUCHE WTP	VALENCIA	0
NORTH OROPOUCHE WTP	TAMANA MAIN ROAD	451
NORTH OROPOUCHE WTP	VALENCIA	76
NORTH OROPOUCHE WTP	GUATAPAJARO	88
NORTH OROPOUCHE WTP	WALLER FIELD	316
NORTH OROPOUCHE WTP	WALLER FIELD	189

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION
NORTH OROPOUCHE WTP	VALENCIA	0
NORTH OROPOUCHE WTP	BRAZIL	0
NORTH OROPOUCHE WTP	ARIPO HEIGHTS	115
NORTH OROPOUCHE WTP	BICHE	123
NORTH OROPOUCHE WTP	BICHE	720
NORTH OROPOUCHE WTP	MUNDO NUEVO	182
NORTH OROPOUCHE WTP	BRAZIL	0
NORTH OROPOUCHE WTP	TALPARO MAIN ROAD	0
NORTH OROPOUCHE WTP	CANQUE	283
NORTH OROPOUCHE WTP	COALMINE	245
NORTH OROPOUCHE WTP	COALMINE	0
NORTH OROPOUCHE WTP	CUMUTO	1011
NORTH OROPOUCHE WTP	MUNDO NUEVO	11
NORTH OROPOUCHE WTP	SANGRE CHIQUITO	385
NORTH OROPOUCHE WTP	TALPARO MAIN ROAD	0
NORTH OROPOUCHE WTP	BRAZIL	0
PARAMIN WTP	HALELAND PARK	0
PARAMIN WTP	SAUT D'EAU	49
PARAMIN WTP	SAUT D'EAU	147
PARAMIN WTP	SAUT D'EAU	191

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION
PARAMIN WTP	PARAMIN	1085
PARAMIN WTP	BEAU PRES	39
PARAMIN WTP	BEAU PRES	5
PARAMIN WTP	BEAU PRES	215
PARAMIN WTP	PARAMIN	270
PENAL WTP	CHARLO VILLAGE	0
PT FORTIN WTP	GONZALES VILLAGE	0
PT FORTIN WTP	VANCE RIVER	1155
PT FORTIN WTP	GONZALES VILLAGE	0
PT FORTIN WTP	GONZALES VILLAGE	64
PT FORTIN WTP	COCHRANE	761
RIVER ESTATE H/L	DIAMOND VALE	99
RIVER ESTATE H/L	GREEN HILL VILLAGE	5
RIVER ESTATE H/L	ST. LUCIEN ROAD	65
RIVER ESTATE H/L	ST. LUCIEN ROAD	16
RIVER ESTATE H/L	RIVER ESTATE	977
RIVER ESTATE H/L	RIVER ESTATE	68
RIVER ESTATE H/L	PATNA VILLAGE	285
RIVER ESTATE H/L	NORTH POST	124
RIVER ESTATE H/L	GREEN HILL VILLAGE	187

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION
RIVER ESTATE H/L	ST. LUCIEN ROAD	0
RIVER ESTATE H/L	BAGATELLE	1248
RIVER ESTATE H/L	DIEGO MARTIN	1307
RIVER ESTATE H/L	BAGATELLE	657
RIVER ESTATE H/L	GREEN HILL VILLAGE	9
RIVER ESTATE H/L	BLUE BASIN	1163
RIVER ESTATE H/L	BLUE RANGE	48
RIVER ESTATE H/L	BLUE RANGE	148
RIVER ESTATE H/L	DIAMOND VALE	274
RIVER ESTATE H/L	DIEGO MARTIN	416
RIVER ESTATE H/L	BAGATELLE	919
SANS SOUCI WELL		0
SANS SOUCI WELL		0
SANS SOUCI WELL		0
SANS SOUCI WELL		0
SANS SOUCI WELL		0
SANS SOUCI WELL		0
SANS SOUCI WELL	SAN SOUCI	465
SANS SOUCI WELL	MISSION	125
SANS SOUCI WELL	L`ANSE NOIR	0

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION	CLAS
SANS SOUCI WELL	L`ANSE NOIR	442	
SANS SOUCI WELL		0	
SANS SOUCI WELL		0	
SCOTTS RD WELLS	DABIEDIAL/SOLOMON KNOX	193	
SCOTTS RD WELLS	SOLOMON KNOX/BEST TRACE	23	
SCOTTS RD WELLS	LACHOOS ROAD	130	
SCOTTS RD WELLS	DABIEDIAL/SOLOMON KNOX	29	
SCOTTS RD WELLS	DABIEDIAL	0	
SCOTTS RD WELLS	DABIEDIAL	127	
SCOTTS RD WELLS	LACHOOS GOODMAN	41	
SIPARIA WTP	COORA ROAD	0	
SIPARIA WTP	DE GANNES VILLAGE	44	
SIPARIA WTP	SIPARIA	1124	
SIPARIA WTP	WELL ROAD	0	
ST ANNS INTAKE	ST. ANNS	311	
ST ANNS INTAKE	ST. ANNS MENTAL HOSPITAL	0	
ST ANNS INTAKE	ST. ANNS	20	
ST JOHNS INTAKE	MT. ST. BENEDIICT MONASTERY	56	
ST JOHNS INTAKE	ST. AUGUSTINE	702	
ST JOHNS INTAKE	TUNAPUNA	71	

PRIMARY SOURCE	TOWN/VILLAGE	PROJECTED POPULATION
TACARIGUA H/L	CANE FARM	0
TACARIGUA H/L	KANDAHAR	1571
TRINITY WTP	BASSETERRE	491
TRINITY WTP	ROCK RIVER	0
TRINITY WTP	BASSETERRE	2
TRINITY WTP	ROCK RIVER/BASTERRE	220
VALSAYN H/L	ST. AUGUSTINE	0
VALSAYN H/L	CUREPE	459
VALSAYN H/L	LA MANGO VILLAGE	0
VALSAYN H/L	SANTA MARGARITA	944
VALSAYN H/L	SANTA MARGARITA	0
VALSAYN H/L	SANTA MARGARITA	39
VALSAYN H/L	ST. AUGUSTINE	26

ENVIRONMENTAL ASSESSMENT

TABLE OF CONTENTS

Executive Overview

- 1.0 Vision Statement**
- 2.0 Mission Statement**
- 3.0 Objectives**
- 4.0 Stakeholder Analysis**
- 5.0 Organization Structure**
- 6.0 Legal Framework**
- 7.0 Environmental Scan**
- 8.0 Comparison / Benchmarking**
- 9.0 Environmental Strategic and Operational Objectives**
 - 9.1 Development of maintenance of an EMS**
 - 9.2 Development and implementation of a Wastewater Discharge Quality Monitoring System**
 - 9.3 Development of a plan to upgrade wastewater plants to comply with the Water Pollution Rules (WPR)**
 - 9.4 Development of an inventory of sources and potential sources of pollution in watersheds**
 - 9.5 Liaise with the EMA and WRA to facilitate regulatory compliance**
 - 9.6 Obtaining Environmental Regulatory approvals for operational and development projects**
 - 9.7 Management of hazardous products**
 - 9.8 Development of Best Management Practices**
 - 9.9 Environmental Impact Studies and Reviews**
 - 9.10 Environmental Preservation Project**

10.0 Environmental Action Plan

11.0 Capital and Operational budget

12.0 Assumptions

13.0 Impact Analysis

Summary

EXECUTIVE OVERVIEW

The Water and Sewerage Authority's Strategic Plan 2004-2006 identifies two key environmental challenges facing the Authority:

- a. The effective management and operations of the Authority have been constantly threatened by environmental hazards outside its control. Climatic conditions, industrial and business malpractices, unplanned housing developments and poor agricultural practices continue to affect surface and ground water sources.
- b. WASA's standards of operations have also adversely impacted upon the wider environment and the hydrological system in particular. Under investment in the wastewater sector has increased the risk of the contamination to surface and underground water sources. Poor handling of chemicals and wastes as well as unacceptable work practices continue to negatively impact upon the environment, worker's health and public confidence.

If environmental threats and hazards remain uncontrolled or unchecked, there is a huge potential for irreparable damage to the environment. These damages may be manifested via a decrease in water availability and deterioration in ambient water quality. In Tobago, the degradation of the environment is threatening to reach crisis proportions in light of increased demand for tourism development and economic activity. Coastlines have been degraded, natural habitats destroyed and the relatively limited water resources and overall public health need urgent protection.

In consideration of all these environmental problems WASA is confronted with a range of environmental issues, which must be factored in the drafting of a way forward to improve the water and wastewater sector. These issues include but are not limited to the following:

Sustainable use of water resources;

- ❖ Protection of sources for water supply;
- ❖ Ambient water compliance with WHO guidelines;
- ❖ Environmentally acceptable standards for water treatment and wastewater systems and disposal products;
- ❖ Regulatory compliance;
- ❖ Conduct of environment impact studies and reviews;
- ❖ Environmental information, management and monitoring systems;
- ❖ Training awareness and sensitization;
- ❖ Enabling policy and regulatory framework and;
- ❖ Stakeholder interaction.

The Authority's success however, is predicated upon certain key factors. WASA must, for example, determine the most relevant environmental goals that will have the highest impact on the population and operations. Additionally, the Authority must look for innovative ways to address high-priority environmental problems, making full use of best available technology.

WASA offers its commitment to work assiduously to achieve results that will make tangible differences to its employees and fellow citizens, offering them a safer, healthier environment; creating stronger partnerships with all sectors of society; implementing reforms that will help us improve our environmental performance and to communicate our progress as clearly and effectively as possible to the public and employees we have been mandated to serve. These themes have shaped WASA's strategic and operational environmental objectives and they are reflected in the Action Plan for October 2003 to September 2004.

The sections that follow will discuss the aims, objectives, and describes the means and strategies, which will be adopted when working with partners and the mechanisms employed to achieve them. Additionally, we present the critical programmes and strategies that cut across all the goals through which WASA will accomplish its objectives.

1.0 VISION STATEMENT

To be the leading exemplar in environmental performance and management for utilities both nationally and throughout the Caribbean.

2.0 MISSION STATEMENT

The Water and Sewerage Authority is committed to protecting and conserving the natural environment to enhance the quality of utility provided by promoting:

- environmentally responsible behaviour;*
- compliance with the relevant environmental legislations and national environmental policies;*
- environmental awareness throughout the organization; and*
- development of programmes, procedures and policies for the protection and conservation of natural resources, attainment of eco-efficiency, and a reduction in energy consumption, waste, emissions and discharges*

This is to be achieved in an atmosphere of mutual respect, professionalism, accountability, transparency and collaboration.

3.0 OBJECTIVES

ENVIRONMENTAL POLICY

The Board of Commissioners at its 560th Ordinary Meeting held on 22nd February 2001 approved the following policy statement:

The Water and Sewerage Authority is committed to the constructive use and conservation of the environment. We will provide our customers with safe, reliable and responsive utility service at reasonable rates. We will do so in an environmentally sensitive and responsible manner by adhering to the following principles:

1) Organisation Priority

To recognize environmental management as being among the highest in corporate priority and as a key determinant of sustainable development; to establish policies, programs and practices in conducting operation in an environmentally sound manner.

2) Integrated System

To integrate these policies, programs and practice fully into each area of activity/facility as an essential element of management in all its functions.

3) Employee Education

To educate, train and motivate employees to conduct their activities in an environmentally responsible manner.

4) Environmental Assessment

To assess the environmental impacts before implementing any new project and before decommissioning any facility or leaving/abandonment a site.

5) Precautionary Approach

To minimize any significant adverse impacts of new projects by use of new technologies and design.

6) Reduce Consumption

To minimize the consumption of natural resources.

7) Adoption by Interested Parties

To promote the adoption of these principles by our customers, consultants and suppliers as well as developers.

8) Emergency Preparedness

To develop and maintain, where significant hazards exist, emergency preparedness plans.

9) Compliance

We will comply with all applicable laws, regulations and guidelines. We will employ appropriate resources to implement proactive programs and procedures to assure compliance. Adherence to Environmental Standards will be a key ingredient in training and incentives to employees.

10) Pollution Prevention

We will prevent pollution by employing management systems and procedures specifically designed to prevent activities and/or conditions that pose a threat to human health, safety or the environment. We will minimize risk and protect our employees and the communities in which we operate. We will set and review environmental objectives and targets that will minimize the amount of toxicity and waste generated. We will also ensure the safe treatment and disposal of waste generated and promote the use of environmentally safe materials and technologies.

11) Targets

We are committed to the setting of appropriate performance targets annually in accordance with requirements of the regulatory agencies and our Corporate Objectives.

12) Continuous Improvement

We are committed to continual improvement and will continuously seek opportunities to improve our adherence to these principles; we will periodically reward progress and set new targets, and will communicate and reinforce this policy throughout the organization.

13) Review

We will undertake a comprehensive review of the policy every two years.

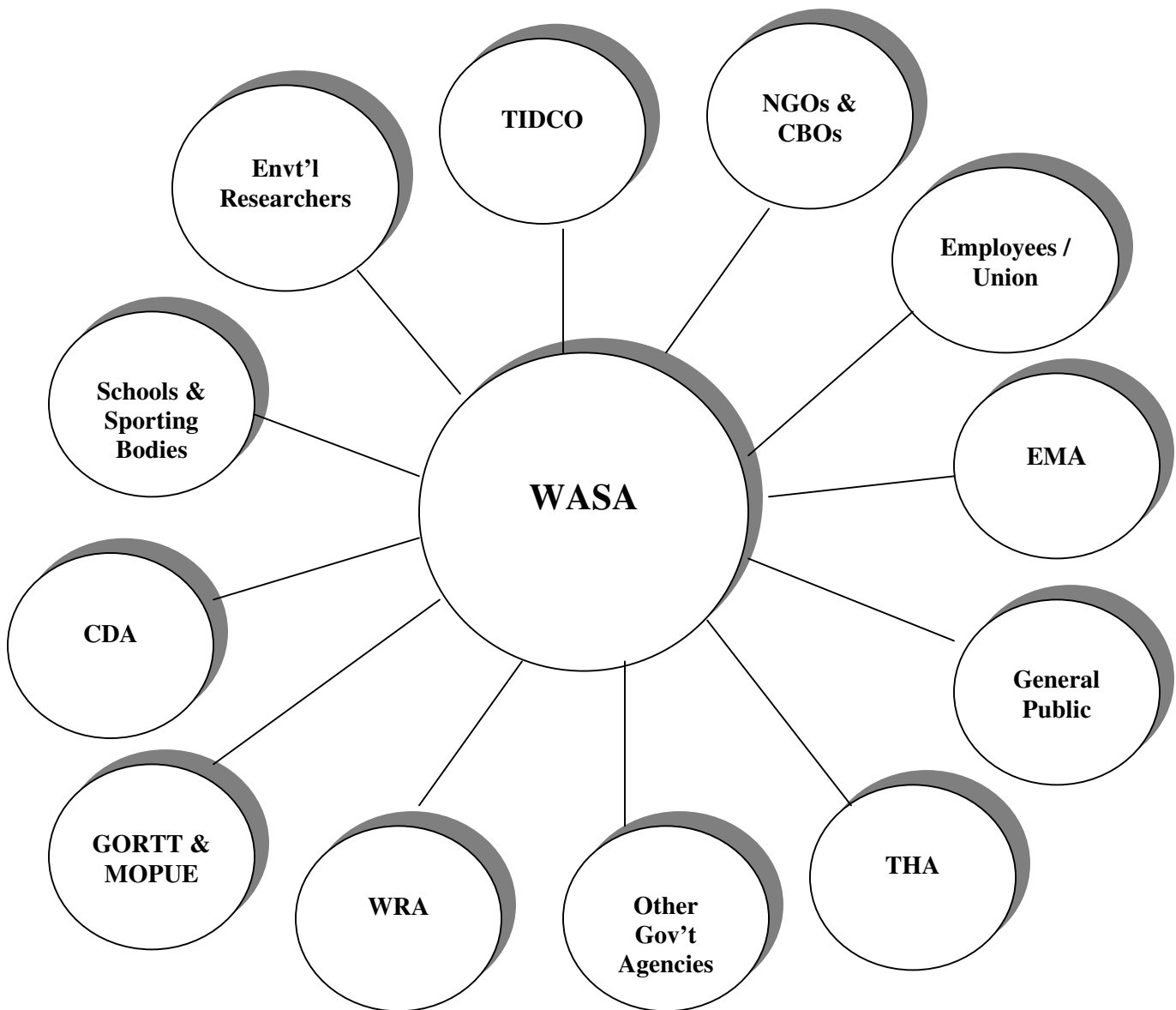
In consideration of the legal mandate and the Authority's environmental policy as well as the vision and mission statements, the Authority's Environmental objectives will be:

- *To develop and maintain of an Environmental Management System (EMS);*
- *To assess the Environmental Impacts of development and land use on water resources;*
- *To establish Environmental/watershed policies, strategies and plans;*
- *To comply with respective environmental legislations, policies and standards;*
- *To develop and maintain policies, strategies, procedures and plans to ensure the preservation and conservation of natural resources, eco-efficiency, reduction in energy consumption, reduction in waste, emissions and discharges;*
- *To predict, assess, minimize/mitigate, monitor and review the environmental impacts of the Authority's activities;*
- *To communication with stakeholders and regulatory agencies including WRA and EMA on operational impacts;*
- *To facilitate and promote institutional strengthening between other regulatory and government agencies;*
- *To promote environmental awareness and education;*
- *To continuously monitor, review and update environmental plan, procedures and policies.*

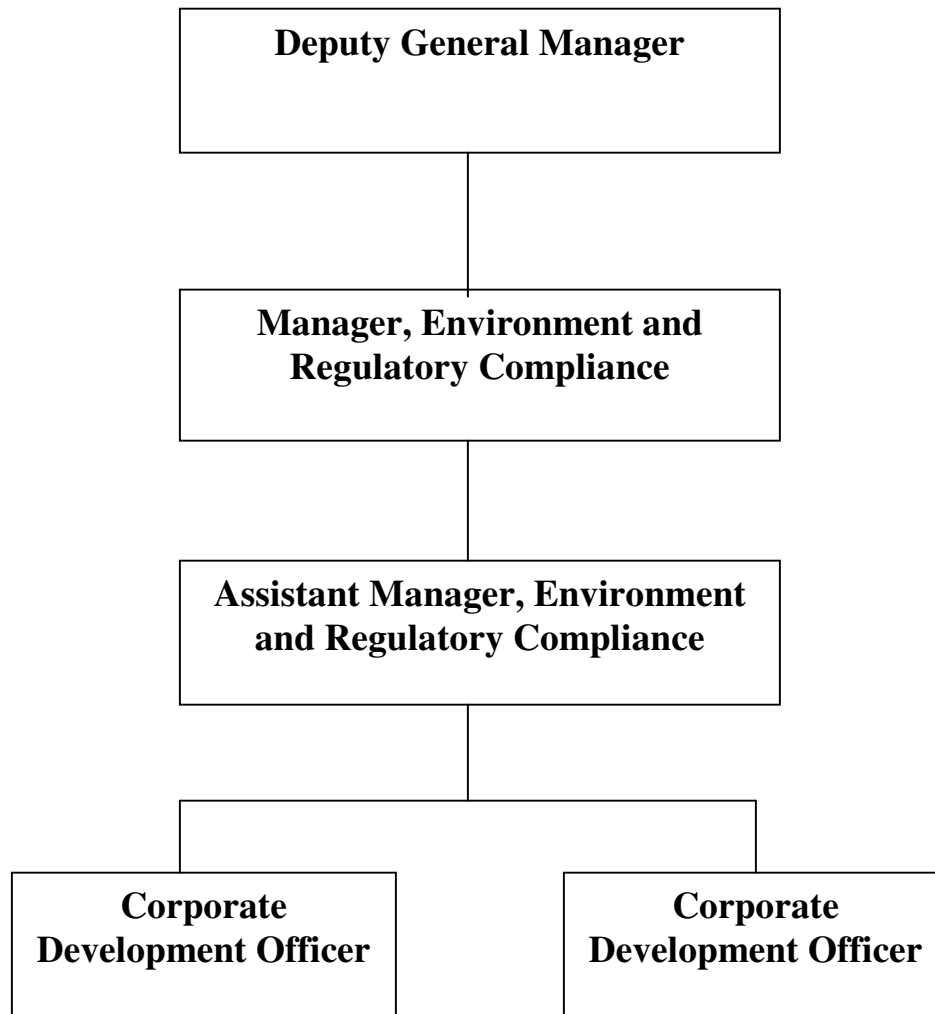
4.0 STAKEHOLDER ANALYSIS

The key stakeholders to the Authority include our employees, general public, community based organizations (CBO), non-governmental organizations (NGOs), TIDCO, THA, Government of the Republic of Trinidad and Tobago (GORTT), Environmental Management Authority (EMA) and other government bodies and regulatory agencies.

The role of these stakeholders will be important in their own specialized way. They are important to the Authority as it endeavors to run an efficient, effective and environmentally responsible organization. The wider population will undoubtedly focus closely on WASA and as such the Authority's image will again be at stake. Thus, we need to incorporate more than ever these bodies into our environmental programmes, plans and policies.



5.0 ORGANIZATIONAL STRUCTURE



6.0 LEGAL FRAMEWORK

Key Environmental instruments that primarily affect the Authority's operations are:

THE ENVIRONMENTAL MANAGEMENT ACT 2000

The Environmental Management Act (hereinafter referred to as the Act) became law on March 07, 1995 and was repealed and reenacted in March 2000. This Act provides for the sound management of the environment in Trinidad and Tobago and the protection of the country's natural resources, through the implementation of framework legislation for air, water, soil and noise pollution, hazardous waste control and the encouragement of environmental management systems.

The Act establishes the formation of an Environmental Management Authority (EMA), which reports to the Ministry of Environment and is funded in part by the Environmental Trust Fund. It also provides for the incorporation of an Environmental Commission as a superior court of record. The Act seeks to achieve its objectives through the active participation of stakeholders in all aspects of environmental management within the country.

A significant feature of the Act provides for the prosecution of individuals or groups who knowingly or deliberately violate any environmental requirements contained in the Act (s. 71). The penalties imposed include stiff fines and imprisonment of person(s) accountable for the action (s. 70). This would mean that directors, managers and supervisors can be left open to law suits and may be held liable for actions that are not in keeping with the Act.

The Act also provides for enabling legislation for the control of air, water, land and noise pollution and the requirement for Certificates of Environmental Clearance for the conducting of specific activities. This has resulted in the drafting of several new rules. These rules are as follows:

- Certificates of Environmental Clearance Rules (2001)
- Environmentally Sensitive Areas Rules (2001)
- Environmentally Sensitive Species Rules (2001)
- Water Pollution Rules (2000 Draft)
- Air Pollution Rules (Draft)
- Noise Pollution Control Rules (2001)

The National Environmental Policy

Trinidad and Tobago's National Environmental Policy was drafted in accordance with sections 18(3) and 28 of the Act and is aimed at providing a rational, practical and comprehensive framework for environmental management in Trinidad and Tobago. It recognizes the interdependence of all forms of life, the need to use knowledge, resources and skills effectively and the need for incentives and opportunities for effective co-operation at all levels.

This Policy is broad based and therefore applies to all sectors and areas of activity. It will provide general guidelines for the conceptualization and development of plans; programmes and projections while the new environmental regulations will serve as statutory controls.

This Policy is aimed at the conservation and sustainable use of the natural resources of Trinidad and Tobago to ensure the growth of economic and social development.

The specific objectives of the Policy are to:

- a) Prevent, reduce or eliminate various forms of pollution to ensure adequate protection of the environment and consequently the health and well being of all humans.
- b) Conserve the biological diversity of the country and the stability and resilience of the ecosystems.
- c) Undertake retrospective analysis or evaluations to correct past development decisions that might be inimical to the continued environmental health of the country.

ENVIRONMENTAL REGULATIONS

Certificate of Environmental Clearance Rules (2001)

These Rules are particularly relevant to development activities both new and significantly modified and were made by the Minister of Environment under sections 26(h) and 35 of the Environmental Management Act 1995 'for the purpose of any new or significantly modified construction process, works or other activity' (s.35 [1]). The Rules were promulgated on July 07, 2001 and provides for:

- The designation of activities requiring a Certificate of Environmental Clearance (hereinafter referred to as "Certificate") which is achieved through the Schedule to the Certificate of Environmental Clearance (Designated Activities) Order 2000;
- The rules outlining the procedures for application for a Certificate; and

- A National Register of Environmental Clearance which will contain the details and status of every application for a Certificate, transfer or refusal of a Certificate as well as copies of actual Certificates that have been issued.

The Environmental Management Authority (EMA) is responsible for determining if an EIA report is required in order for a Certificate to be issued and in any instance where the Authority determines that an EIA is required, 'no other entity shall grant any permit, license, or any other documentary authorization until a Certificate has been issued by the Authority' (s.38 [3]). There are also provisions for the monitoring of the performance of the activity to ensure compliance with any conditions in a Certificate that has been issued, and to confirm that performance is in keeping with the description provided in the application for the Certificate and the information provided in any EIA reports.

Environmentally Sensitive Areas Rules (2001)

The EMA proposes to designate areas according to specified standards and guidelines. The designation of an area as 'environmentally sensitive' requires meeting one or more of three (3) categories of objectives:

- Conservation of natural resources and protection of the environment.
- Sustainable economic and human development.
- Logistic support as environmental education, and information sharing.

Other criteria also for the selection of sensitive areas include:

- ~ Uniqueness, rarity or important biological features.
- ~ Good representation of a naturally occurring ecological system.
- ~ An appreciable or significant assemblage of endangered, or threatened species of plants and animals.
- ~ High productivity.
- ~ Performing an integral role in the functioning of the wider ecosystem.
- ~ The actual or prospective habitat of any environmentally sensitive species.

Environmentally Sensitive Species Rules (2001)

These Rules are directly related to the rules governing sensitive areas in that an area can be considered sensitive if it is deemed to be the actual or prospective habitat of an environmentally sensitive species. The designation of species as ‘environmentally sensitive’ requires meeting one or more of three (3) general categories of objectives as outlined in Schedule I of the Rules. These are:

- Conservation of biological diversity and protection of the environment.
- Sustainable economic and human development.
- Logistic support e.g. environmental education, information sharing, etc.

The disturbance of wild animals particularly during breeding, incubation, aestivation or migration, as well as other periods of biological stress will be prohibited or regulated by the EMA. With respect to plants, and its parts and products, where appropriate, all forms of destruction and disturbance, including the picking, collecting, cutting or uprooting may also be regulated or prohibited.

Water Pollution Rules (Draft)

The draft *Water Pollution Rules 2001* states that the EMA may request that any person who releases a water pollutant into a receiving environment outside the permissible level that is likely to cause harm to human health or to the environment apply for a permit. Any water pollutant outside the permissible levels is generally prohibited unless that person has a valid permit granted by the EMA. Within each permit the EMA must establish:

- a) the water pollutant authorized to be released;
- b) the quantity, conditions and concentrations the permittee may release;
- c) the exact conditions where sampling of the release shall be performed;
- d) and reporting requirements.

Within each permit the EMA may also establish certain conditions including the following for a period of at least four years from the date of the expiration of a permit:

- a) that a permittee shall take all reasonable steps to –
 - i. avoid all adverse environmental impacts which could result from the activity;
 - ii. minimize the adverse environmental impacts where the avoidance is impractical; and
 - iii. mitigate the impact where the impact cannot be avoided;

- b) that monitoring of the condition of the permit be conducted in accordance with the methods specified therein;
- c) that the permittee shall retain records of monitoring.

The *First Schedule* of the draft *Water Pollution Rules* contains a register of Water Pollutants while the *Second Schedule* outline the maximum permissible levels for substances and the receiving environment. While these rules have not yet been promulgated it is recommended that the Authority should observe them as far as possible.

TRINIDAD AND TOBAGO BUREAU OF STANDARDS

The Trinidad and Tobago Bureau of Standards is the National Standards Body of Trinidad and Tobago. It operates as the national standards body, the national quality certifying body and the national accrediting body. A Standards Council, appointed by the Ministry of Trade and Industry, manages the Bureau. The Trinidad and Tobago Bureau of Standards has established voluntary and compulsory standards for effluents. The Compulsory standards refer to Liquid Effluent from Domestic Waste Water Treatment Plants into the Environment (TTS 417:1993).

This standard specifies the maximum permissible levels of the 5-day Biochemical Oxygen Demand (BOD₅), Suspended Solids, pH, Total Residual Chlorine and Faecal Coliforms. The standards also provide reference to the methods to assess compliance with the specified maximum permissible levels.

Noise Pollution Control Rules (2001)

These Rules establish three (3) zones for which maximum sound pressure levels have been determined:

- Zone I - Industrial Areas
- Zone II - Environmentally Sensitive Areas
- Zone III - The General Areas

Any person proposing to conduct an activity or an event that will cause sound in excess of the prescribed standards will be required to apply to the Authority for a variation.

Sounds produced from various activities (cutting, clearing, grading and drilling etc) are likely to be significant.

Air Pollution Rules (Draft)

Under the Environmental Management Act (2000), no person (any individual or firm, business, company, enterprise, body corporate, trust, un-incorporated association, partnership, or governmental entity) shall release or cause to be released any air pollutant into the environment, which is in violation of any applicable standards, conditions or permits requirements under this act. The *Draft Air Pollution Rules 2000* require that any person releasing air pollutants at or above the maximum permissible limits apply for a permit from the EMA. The *First Schedule - Air Pollutant* lists the maximum permissible limits of nineteen (19) substances that are regarded as air pollutants. The *Second Schedule - Fugitive Releases Limits*, outlines the short term and long term limits of sixteen (16) compounds or substances.

7.0 ENVIRONMENTAL SCAN

An environmental scan entailed the screening of activities, products and services to assess those environmental aspects that might result in any significant environmental impact. These significant aspects are those, which the Authority can control or over which it can be expected to have an influence. These significant aspects were considered in the determination of the Authority's strategic and operational environmental objectives for which targets will be set. The establishment of an Environmental Action Plan will be used to ensure that these objectives and targets are achieved.

LIST OF SIGNIFICANT ENVIRONMENTAL ASPECTS

No.	Environmental Aspect	Significant Impacts
1	Pipe Laying Works and repairs to mains	Excavation of roadways generates spoil that needs to be disposed or stored. Disruption to traffic, poor road restoration, siltation of roadways and drains, generation of dust.
3	Cleaning of Distribution Storage Tanks	Waste from cleaning exercise is normally discharged in nearby drains, leading to drainage problems and contamination of waterways.
4	Defective Wastewater Treatment Plants	Non-compliance with discharge standards, which poses a risk to human health, contaminates potable water surface and groundwater supplies and negatively affects aquatic ecosystems.
5	Major Water Leaks	Causes flooding, erosion and resource waste.
6	Poor Housekeeping	Poor housekeeping of facilities and disposal of waste lead to overall environmental degradation and deterioration of human and occupational health.
7	Poor Chemical Handling Procedures	Chlorine and mercury are extremely harmful to human health and environment. Mercury bioaccumulates in the environment. Alum handling and usage can lead to the release of fugitive emissions.
8	Mechanical Repairs	Air, water and soil pollution.
9	Energy Consumption	Increased use of fossil fuels to provide electricity contributes to global warming.
10	Water Abstraction	Decreases water availability for downstream users and aquatic life. May lead to salt water intrusion.
11	Reservoir Filling	Decreases water availability for downstream users and aquatic life. May lead to salt water intrusion.

8.0 COMPARISON / BENCHMARKING

The Water Industry in the United Kingdom is subject to specific regulations targeted at improving the quality of drinking water as well as sewerage standards and the cleanliness of rivers and coastal waters. The industry invests approximately 3 billion per year, of which typically a third is for environmental improvement. Although performance against standards has progressed, the industry is still responsible for many serious pollution incidents and this is reflected in the continuing heavy fines of almost £1million incurred by nine out of the ten big companies.

Generally, compliance with discharge conditions is high and has leveled off at around 99% since 1998. In 2002 Wessex Water and Yorkshire Water achieved 100% compliance, Yorkshire Water for the fourth time in the last five years. South West Water has been the least compliant in all years. All the other major companies achieved 99% compliance in 2002.

Of the substances that sewerage treatment works are allowed (consented) to discharge, there were further reductions in biochemical oxygen demand and suspended solids in 2002. Ammonia rose slightly (7%), but was still less than in 2000, and the long term trend is towards improvement.

With regard to pollution incidents, the water industry is responsible for one in six serious pollution incidents that affect water, despite considerable improvement since the mid-1990's. This high number is partly because the water companies have more discharges than most companies in other sectors. However, as they are primarily in the business of higher environmental standards, exemplary performance should be expected.

In 2002 the industry caused 150 serious water pollution incidents. This is 7% less than 2001 and includes substantial improvements by United Utilities, Wessex Water and Dwr Cymru. While Thames Water caused the most incidents in 2002 and Wessex Water the least, these companies serve very different areas and population sizes. Relative to population, United Utilities had the best performance (lowest pollution incidents) and South West Water the worst. This ranking, though, takes no account of differences in area served (e.g. length of sewer) or climate (e.g. rainfall).

Between October 2002 to July 2003 results from the 12 plants operated by the Water and Sewerage Authority indicated that average compliance with discharge standards for pH, Suspended solids and BOD₅ were 97%, 79% and 69% respectively. Only the Scarborough plant achieved 100% compliance with Faecal Coliforms levels.

9.0 ENVIRONMENTAL STRATEGIC AND OPERATIONAL OBJECTIVES

The demand on the country's water resources is increasing at exponential rates, fuelled on the one hand by the need for survival, and on the other hand, by the desire for accelerated economic growth. WASA must challenge itself to find the best mix between quality environmental performance, best available technology and financial and operational efficiency that balances the nation's needs with our available resources.

The two questions that face us are quite clear:

1. How does WASA harmonize our operations with the environment?
2. How does WASA address the many urgent environment problems that impact on our operations?

The Authority can ill afford to abdicate our responsibility to the citizens of Trinidad and Tobago who demand a consistent reliable, quality water and wastewater services at a reasonable economic cost and minimal impact on the environment.

Thus, mindful of the Authority's stakeholders' potential concerns as well as findings from the environmental scan, we will focus on the attainment of these objectives over the next year:

- *Development of maintenance of an EMS;*
- *Development and implementation of a Wastewater Discharge Quality Monitoring System;*
- *Development of a plan to upgrade wastewater plants to comply with the Water Pollution Rules (WPR);*
- *Development of an inventory of sources and potential sources of pollution in watersheds;*
- *Liaise with the EMA and WRA to facilitate regulatory compliance;*
- *Obtaining environmental regulatory approvals for operational and development projects;*
- *Management of hazardous products;*
- *Development of Best Management Practices;*
- *Environmental Impact Studies and Reviews;*
- *Environmental Preservation Project;*

In pursuing these objectives, the notion of sustainable development will be the basis for our decision-making. We believe there is an urgent need to consider all environmental factors, regulatory instruments, national development framework and industry standards from the very first stage of formulating policies, plans and procedures for the operation and development of an environmentally friendly WASA.

9.1 DEVELOPMENT AND MAINTENANCE OF AN EMS

An Environmental Management System may be defined as a management tool, which can enable an organization to control and systematically achieve the environmental performance that it sets itself.

The Water and Sewerage Authority is becoming increasingly concerned about achieving and demonstrating sound environmental performance by controlling the impact of their activities on the performance, taking into account their environmental policy and objectives. They do so in the context of increasing stringent legislation, the development of economic policies and other measures to foster environmental protection.

Additionally, many organizations have undertaken environmental “reviews” or audits to assess their environmental performance. On their own, however, these “reviews” and “audits” may not be sufficient to provide an organization with the assurance that its performance not only meets, but will continue to meet, its legal and policy requirements. To be effective, they need to be conducted within a structured management system and integrated with overall management activity. It is within this context that the Authority has decided to embark on achieving ISO 14001 certification in EMS, which will demonstrate its environmental commitment as identified in the mission statement.

9.2 DEVELOPMENT AND IMPLEMENTATION OF A WASTEWATER DISCHARGE QUALITY MONITORING SYSTEM

Its primary purpose is to ascertain the quality of the wastewater discharge at various sewage treatment plants in Trinidad and Tobago, the extent of non-compliance with the relevant standards and evaluate the quality of sludge produced to ensure that is in compliance with the relevant national/international standards and guidelines.

9.3 DEVELOPMENT OF A PLAN TO UPGRADE SYSTEMS TO COMPLY WITH THE WATER POLLUTION RULES

As mentioned in the executive overview of this document point source discharge of sewage was identified as a major problem affecting surface water quality. While permits will be issued to persons owning and operating such facilities, the majority of sewage treatment plants (STP) including small package treatment plants are non-functional and also have no identifiable owner/operator. The only solution to the problem of abandoned and malfunctioning sewage treatment plants in the country maybe the construction of a few large-scale municipal wastewater treatment plants thereby removing the plethora of individual STP's. As conceded by all, this would require a huge capital investment and the benefits to be derived would only be realized in the medium to long term.

While the above solution is ideal there is urgent need to address the situation in the short term. In this respect the Authority in conjunction with the EMA will develop a plan to upgrade existing STPs so that they will meet the standards outlined within the Water Pollution Rules.

Since capital expenditure is a prerequisite to both the adoption and rationalization process, the Authority with the assistance of all stakeholders will try to identify and secure some loan facility or grant. Once available individual plants can be upgraded to an acceptable standard, it is expected that sewerage rates would then be applied. The Authority sees this as the first step in dealing with a situation that if left unchecked has the potential of causing serious risk to human and environmental health.

9.4 DEVELOPMENT OF AN INVENTORY OF SOURCES AND POTENTIAL SOURCES OF POLLUTION IN WATERSHEDS

A watershed approach is a strategy for effectively protecting and restoring aquatic ecosystems and protecting human health. This strategy has as its premise that many water quality and ecosystem problems are best solved at the watershed level rather than at the individual water body or discharger level. Major features of a Watershed Protection Approach are: targeting priority problems, promoting a high level of stakeholder involvement, integrated solutions that make use of the expertise and authority of multiple agencies, and measuring success through monitoring and other data gathering.

As part of the strategy for watershed management, facilities/sources (significant) must be identified and their contribution to water pollution assessed. Facilities/sources shall be characterized based on the following factors:

- (1) type of polluters;
- (2) type of pollutants emitted;
- (3) whether the facility includes point source emissions, non-point (area) source emissions;
- (4) quantification of pollutants discharged.

9.5 LIAISE WITH THE EMA AND WRA TO FACILITATE REGULATORY COMPLIANCE

Government's policy emphasizes the promotion of a co-operative environmental management approach between Government, industry and interested stakeholders.

In this "co-regulation" approach, Government prescribes environmental rules and guidelines, while compliance with the legal requirements is conducted in a collaborative manner by industry and the Government.

As part of its strategy for compliance with the necessary regulatory instruments, the EMA will develop a system of co-regulation with the respective regulators for various environmental impacts. Because of the resources required (skills, finance, etc.), the system of co-regulation is especially well suited for application to large industrial facilities. The benefits offered by such an approach include cost effectiveness and partnership with industry.

Formal mechanisms with relevant public authorities that administer environmental legislation will also be established and the Authority will coordinate/work with them for the proactive and effective enforcement of the law. The initiative for this programme must emanate from the highest level of the organizations. Adequate and timely resources (e.g. personnel, equipment, finances) as well as appropriate training must be provided.

9.6 OBTAINING REGULATORY APPROVALS FOR OPERATIONAL AND DEVELOPMENTS PROJECTS

The EMA has implemented the Certificate of Environmental Clearance Rules (CEC) 2001. This certificate is a prerequisite for undertaking certain activities that may adversely affect the environment and in such cases the EMA may direct that an Environmental Impact Assessment (EIA) be undertaken.

One of the general functions of the EMA is to take all appropriate action for the prevention and control of pollution and conservation of the environment. Section 35 (1) of the EM Act provides that for the purpose of determining the environmental impact, which might arise out of any new or significantly modified construction, process, works or any other activity, the Minister may by order subject to negative resolution of Parliament, designate list of activities requiring a Certificate of Environmental clearance (CEC). Section 35 (2) ensures that no activity that the Minister has designated as requiring such a CEC can proceed unless that CEC is granted by the EMA.

Of key significance to the Authority will be the legal requirement to obtain CECs for the conduct of works relating to:

- (1) Establishment of catchment, abstraction of treatment of potable/process water;
- (2) Establishment of surface impoundments, dams or reservoirs for storage of water;
- (3) Establishment of water distribution systems;
- (4) Establishment of wastewater or sewage treatment facilities.

9.7 MANAGEMENT OF HAZARDOUS PRODUCTS

Due to the risk (proven and potential) posed to human health and the environment, as well as their inherent nature of some hazardous like mercury to bioaccumalate, it is essential that programmes are designed and implemented to reduce the levels being emitted into the environment and eventually eliminate their use entirely. Mercury is presently used at both the Arima and San Fernando Waste Water Treatment Plants as a seal to counter balance the central arm on these trickle filter systems. It is essential that some programme be implemented to efficiently manage the use of this substance. The essential components of a Hazardous Product Management Programme are as follows:

1. Information System: Planning and developing the programme can only be properly facilitated if accurate data is captured on usage, storage facilities etc.
2. Manifest System: This provides accountability of the waste from generation to disposal.
3. Procedures for use and handling
4. Emergency and Spill Response

5. Monitoring and Enforcement
6. Education and Training
7. Funding: Adequate resources must be earmarked and allocated for the implementation of alternative technology.

9.8 DEVELOPMENT OF BEST MANAGEMENT PRACTICES (BMPs)

These practices will specify procedures, processes, equipment and technology that will be effective in controlling environmental pollution at a reasonable cost. These practices will be based on an integrated approach to pollution prevention, and be amenable to independent auditing.

Traditionally, BMPs have focused on good housekeeping measures and good management techniques intended to avoid contact between pollutants and the environment as a result of leaks, spills, and improper waste disposal. However, BMPs now include the universe of pollution prevention encompassing production modifications, operational changes, material substitution, materials and water conservation, and other related measures. The concept of BMP is really one of source reduction and waste minimization. Although BMPs do not necessarily target a single media, its applicability to the overall operation of the Authority and its supplement control in environmental performance is of major importance.

9.9 ENVIRONMENTAL IMPACT STUDIES AND REVIEWS

The nature of the business of the Authority whereby land use and activities in the various watersheds impact on the water resources, makes the Authority one of the major stakeholders in the EIA Review Process.

The Authority's involvement in the EIA Review Process is important to protect its interest thus ensuring sustainable use of its water resources and sustainability of its business to support socio-economic development.

Currently, the EIA Review process is managed by the Environmental Management Authority as is mandated by the Environmental Act, 2000. It is imperative that as part of the environmental objectives that WASA continues to be part of the review committee. This will entail participation in site visits and review meetings as well as provide guidance to the EMA as required in the development of Terms of References (TORs) for the conduct of EIAs.

9.10 ENVIRONMENTAL PRESERVATION PROJECT

The Water and Sewerage Authority is committed to the constructive use, preservation and conservation of the environment. The Authority has recognized that it is perceived by the public as having a poor image and therefore is determined to reverse this outlook by embarking on a number of Environmental Preservation Projects. These projects are intended to provide recreation, education for the general public and extend nature based tourism and training / conferencing facilities including retreats.

The Hollis Dam and City Yard in Trinidad and the Courland Water Works in Tobago were identified as priorities for immediate action. These three sites were chosen mainly because of their rich cultural heritage, their pleasant scenery and recreational opportunities for visitors to relax, bird watch and enjoy its scenic beauty which makes these sites a real income generator for the Authority. During the next year a business case will be developed for the Farrel Pumping Station thereby ensuring the continual commitment made by the Authority for the enhancement and preservation of our assets.

10.0 ENVIRONMENTAL ACTION PLAN

The Action Plan details the activities planned for each of strategic and operational objectives. There are some projects that are classified as Proposed and others which are classified as Recurrent.

The Timeframe Legend is as follows:

P – Proposed

R – Recurrent

Environmental Objectives	Performance Indicators	Start Date	Finish Date	Time Frame	Costs
Development & Implementation of an EMS					
Training for Trainers Programme	40% of employees exposed.	November 2003	January 2004	P	50,000
Development and Implementation of ISO 14001 at CAWTP	Complete Implementation	November 2003	September 2004	P	300,000
Wastewater Discharge Quality Monitoring System	% compliance with TTBS 417:1993	December 2003	February 2004	P	50,000
Upgrade Wastewater Plants to comply with WPR	Preparation of a plan	March 2004	August 2004	P	100,000
Inventory of pollution sources in watersheds	Preparation of a report	April 2004	September 2004	R	20,000
Liase with EMA and WRA to facilitate regulatory compliance	Quarterly meetings with the EMA and WRA	November 2003	September 2004	R	-
Environmental Regulatory Approvals	100% compliance with CEC Rules	November 2003	September 2004	R	-

Environmental Objectives	Performance Indicators	Start Date	Finish Date	Time Frame	Costs
Management of hazardous waste	Preparation and Implementation of Plan for Mercury	December 2003	March 2004	P	-
Development of Best Management Practices	Preparation and Implementation of BMP for construction works	November 2003	December 2003	P	-
Environmental Impact Studies and Reviews	100 % Attendance of EIA Review Meetings and Site visits. Submission of reports to the EMA within two (2) weeks of Review Meeting	November 2003	September 2004	R	-
Environmental Preservation Project	Preparation of Business Cases for two additional sites in Trinidad and Tobago	January 2004	July 2004	P	-

The promotion of a healthy environment remains a daunting yet necessary task for the Water and Sewerage Authority. We are at a historical juncture, where we can make a positive impact on the environment, in which we live and work.

11.0 CAPITAL AND OPERATIONAL BUDGET **ENVIRONMENTAL AND REGULATORY** **DEPARTMENT**

Code	Item Description	Cost
601	Office Equipment Inventory	\$4,000.00
602	Office Furniture Inventory	\$5,000.00
410	Foreign Travel	\$110,000.00
460	Professional Fees, Expenses	\$520,000.00
707	Membership Dues & Subscriptions	\$15,000.00
707	Books & Magazines	\$5,000.00
180	Upkeep	\$50,000.00
630	Postage	\$1,000.00
700	Miscellaneous	\$5,000.00
		\$715,000.00

A departmental budget is necessary in order to carry out and implement our core environmental plan. A plan that will impact heavily on the Authority's operation and more so our public image.

12.0 ASSUMPTIONS

- ❖ **Management Commitment**
- ❖ **Stakeholder Commitment**
- ❖ **Financial Resources**
- ❖ **Human Resources**

13.0 IMPACT ANALYSIS

Some impacts that can be expected from the implementation of the action plan are:

- ❖ **An improved and cleaner environment;**
- ❖ **Improved corporate image;**
- ❖ **Improved compliance with legislative and regulatory requirements;**
- ❖ **Reduction in liability and risk;**
- ❖ **Pollution prevention and waste reduction;**
- ❖ **Access to capital;**
- ❖ **Interest in attracting a high-quality work force; and**
- ❖ **Rise in water and sewage rates.**

SUMMARY

While people recognize that there are a number of environmental issues affecting the Authority, few definitive steps have been taken to address these concerns. It is expected that by establishing a comprehensive environmental management and awareness programme we will now be better equipped to embrace the environmental challenges that lie ahead.

There is indeed a tremendous need for environmental management, which will ensure that the Authority does not neglect issues that have gone unchecked and will continue to impact negatively upon the environment. Failure to address these problems exposes the Authority to legal action and increased public criticism.

The practice of environmental management will be guided by principles that are based on prudence and sound ethics which will be continuously monitored and improved and will be supported by all parties concerned especially by management.

With a modern legislation in place, the National Environmental Policy as our guide and a vibrant environmental management and awareness programme, the Authority is poised to enter a new phase of operation where our unpriced and unprotected natural resources are not consumed and destroyed in an irresponsible manner. The Authority looks forward to the next year, confident that it will meet the environmental goals that have been set out.

APPENDIX XVIII

STATUS OF WASTEWATER SECTOR

1. Background

Although sewers were introduced in Port of Spain since 1861, it was not until 1962 that the first major sewerage project for Trinidad began. This project involved the construction of three (3) major sewage treatment plants with associated lift stations and collection systems. The project was completed in 1965 and resulted in the sewerage of the three (3) major population centers in Trinidad, Port of Spain and environs, San Fernando and Arima.

Since then, as the population grew and the demand for housing increased, WASA was unable to expand sewerage systems to satisfy the increasing demand. Approvals were therefore given to private housing developers, government institutions including schools, hotels and industry to construct, operate and maintain sewerage systems.

These approvals were given with the intent that WASA will eventually take over the operation and maintenance of these systems and collect sewerage rates. However, the number of these sewerage systems was increasing at a rapid rate and due to the high cost of operations and maintenance, WASA was unable to do so. Today, WASA owns and operates twelve (12), while twenty-two (22) fall under the jurisdiction of the Ministry of Housing and Settlement. There are a further one hundred and fifty (150), which are privately owned (See Appendices XIX (a) and XIX (b) for full lists of plants). Only persons who are connected to WASA system pay sewerage rates.

While the Government owned systems were maintained to some level of functionality, the privately owned, especially those in housing developments were not maintained and are now in a state of disrepair.

Today almost forty (40) years after proper sewage treatment was first introduced, the entire wastewater sector is in a state of disrepair after almost thirty (30) years of neglect.

2. Current Status

2.1 Existing Infrastructure

2.1.1 WASA Sewerage Systems

The problems presently confronting the Authority are:

a) Collection System

- Infiltration – this causes increased flows during the rainy season often resulting in flooding of the wet well and hydraulic overload
- Properties are being built over the sewers and manholes preventing access for maintenance and repair works
- Undersized mains – Especially in Port of Spain; the mains are very old and are now undersized
- Defective valves
- Manholes in rivers caused by erosion
- Broken sewers
- Collapsed sewers
- Leaking sewers

This has severe impact on our corporate image and the health and safety of the population. Sewers and manholes within private property may result in litigation.

b) Lift Stations

Problems identified at lift stations include:

- Malfunctioning equipment
- No standby equipment
- No existing pump station
- Deteriorating physical infrastructure e.g. leaking roofs, faulty electrical wiring.

Sewage Treatment Plants

Some of the major problems identified at sewage treatment plants are:

- No preliminary treatment- Non-functional comminutors and absence of screens. This often results in damage to pumps
- Absence of functional standby generators or, if present, generator malfunctions or cannot be started automatically
- Corroded digester covers
- Deteriorated physical infrastructure – roof, floors and walls in dire need of repair as well as process components e.g. tanks and troughs
- Non-functional and malfunctioning pumps
- Valves need replacing
- Faulty electrical wiring
- Underutilized treatment plants. Very few customers are connected to the Scarborough STP
- Non-functional STP- The treatment plant at Santa Rosa has been out of service for about ten (10) years and the raw sewage is discharged into the adjacent river.

2.1.2 Sewerage Systems owned by the Ministry of Housing

There are thirty-five (35) sewerage systems and associated lift stations that are owned by the Ministry of Housing and Settlement. These plants are located in the following areas:

- Charlieville
- Couva
- Harmony Hall
- Malabar
- Bonair
- Valencia
- Five Rivers
- Cantaro
- Bon Accord
- Buccoo
- Real Spring
- Maloney

- Strikers Village
- Debe
- La Paille
- Curepe
- Buen Intento
- Oropune
- Orange Field
- Bamboo Settlement

2.1.3 Private Sewerage Systems

There are fifty-one (51) wastewater treatment plants in housing developments, fifty-three (53) at various institutions owned by the government, eleven (11) at industrial/commercial sites and nine ((9) at various hotels. In addition to these treatment facilities, there are also a number of lift stations. A complete list of plants can be found in Appendix XIX (c).

2.2 Coverage

The existing sewerage systems serve about 30% of the population. The WASA system covers 20% while the NHA and privately owned systems cover the other 10% of the population. It is reported that about 58% of the population use private on-lot systems i.e septic tanks and soak-aways.

3.0 Key Projects

Over the past ten (10) years a number of recommendations for investment projects have been made. The key projects are as follows:

(i) Greater Port of Spain Sewerage System (GPOSSS)

The GPOSSS Study conducted in 1998 included:

- New Beetham Wastewater Facility
- Downtown Rehabilitation Pilot Project

- Maraval Sewer Extension
- Sewer Cleaning Program
- Infiltration and Inflow Study

So far capital funding for only the Beetham Facility has been made available and this plant is presently under construction at a cost of TT\$ 201, 000.00

(ii) South West Tobago Wastewater System

Thames Water International in association with Reid Crowther and AdeB Consultants in 1994 conducted a study of the Tobago Wastewater System and proposed construction of a treatment facility at Crown Point with associated lift stations and collection systems at a cost of TT\$225,000,000.

(iii) Rehabilitation of WASA Wastewater Treatment Plants

The rehabilitation of WASA's Wastewater Treatment Plants was covered in a feasibility study done by Alpha Engineering in 1998. The study proposed improvement works at nine (9) of the twelve (12) WASA owned wastewater treatment plants; San Fernando, Arima, Trincity, Piarco, Santa Rosa, WASA Head Office, Penco Lands, Lange Park and Techier. Proposed works included site work; structural, electrical, mechanical, instrumentation and improvement in treatment processes.

Since this study, there has been very little refurbishment works at any of these treatment facilities.

(iv) Adoption of NHA and Private Wastewater Treatment Plants

In 1997, two (2) studies were conducted:

- a) Strategy for the Adoption of Private Package Plants-Ian Sinclair- March 1997
- b) Adoption of Private Sewage Treatment Works-TTWS-November 1997

The Sinclair Report recommended the development of a strategy for adoption based on economic, financial, engineering and technical considerations and underscored the need to obtain funding required to implement the strategy and to cover the costs of

refurbishment and O & M costs. It also mentioned the need to establish a new wastewater tariff directly related to the true costs of collection, treatment and disposal of sewage.

The TTWS Report sought to develop strategies for four (4) pilot areas, two (2) in the north and two (2) in the south. The purpose of the pilot was to provide essential experience on the appraisal, feasibility, and engineering design and transfer arrangements. The Ministry of Public Utilities approved the pilot strategies with estimated costs and Design Briefs were issued to local consulting firms. However, this project never materialized.

This study also covered a plant and catchment evaluation for all the remaining plants and the development of integration of catchment strategies where appropriate.

(v) Integration of Sewerage Systems

In December 1997, Delcan International Corporation in association with AdeB Consultants Ltd. conducted a study on the Integration of Separate Sewerage Systems in Trinidad.

A number of recommendations, which ranged from refurbishment of existing plants to development of integrated schemes and the construction of new plants, were made.

(vi) National Master Plan for Wastewater Infrastructure Development

In 1995, Terms of Reference were prepared for a Water and Wastewater Master Plan; the Preliminary Design for the first stage and an Implementation Strategy up to the year 2030.

The goal was to focus on least costs options for improving service quality and national coverage by:

- Rehabilitating and upgrading existing facilities
- Identifying new facilities
- Assessing future development needs with complimentary institutional capacity building programmes.

4. Current Initiatives

The initiatives, which are currently being pursued by WASA for improving the wastewater sector, are as follows:

4.1 Adoption

The issue of WASA adopting all sewerage facilities has been discussed for over a decade.

4.2 Public Sector Investment Programme (PSIP)

Under the PSIP, a number of wastewater development initiatives are planned and funds are being requested for the following projects for the next fiscal year 2003/2004.

(i) Pilot Integration Project

The Pilot Integration Project will involve the adoption of the following privately owned systems:

- Palmiste/Sunkist
- Paradise Gardens/Ridgwood Heights
- Gulf City
- La Florissante/La Resource

(ii) Refurbishment of Wastewater Treatment Plants

Both the San Fernando and Santa Rosa Wastewater Treatment Plants are to be refurbished.

(iii) Wastewater Lift Stations

Lift Stations at Santa Rosa and Diego Martin will be refurbished.

(iv) Extension of sewers along Maraval Road from Moka to La Sieva

(v) Development of a Wastewater Master Plan

(vi) Completion of East/West Communities Integrated Sewerage Design.

5. Recommendations

Short Term

For the Wastewater Sector to move forward and for Trinidad and Tobago to achieve its goal of ‘Developed Country’ status by 2020, - 75% wastewater coverage- a number of recommendations have to be to considered. These include:

- Development and implementation of a wastewater policy and strategic plan for the wastewater sector
- Provision of adequate resources to enhance the institutional capacity building, capital investment and maintenance programmes
- Commitment to a progressive wastewater rate increase
- Formulation and implementation of a National Wastewater Master Plan

WASA’S SEWERAGE SYSTEMS

Table (a)

Plant	Flows (m³/ d)	Lift Stations
San Fernando	17080	Pleasantville
Arima	6520	El Rancho, tropical, Fiddlers Dream, Dundee, Darceuil AND Carib Homes
Trinicity	1000	Trinicity Industrial and Trincity Residential
Piarco	176	-
Santa Rosa	1560	Santa Rosa
WASA Headquarters	130	Transport
Penco Lands	143	-
Lange Park	681	Lange Park
Techier	454	-
Beetham	56780	Diego Martin, Ocean Avenue, Boundary Road and Mt. Hope
Scarborough Tobago	3550	Scarborough
Chaguaramas	N/A	BB1, A19C24, 83 rd Teteron

N/A Not Available

WASTEWATER ADOPTION PROJECTION
LIST OF WASTEWATER TREATMENT FACILITIES TO BE ADOPTED

Table (b)

NO.	Names of Wastewater Facility	Location	Owner	No. of Lots as per Cadastral Sheet
1	Bon Air Arouca Pumping Station	14 th Avenue Bon Air Gardens Arouca	NHA	213
2	Bon Air Arouca STP	Swift Drive, Bon Air Gardens	NHA	1270
3	Bon Air West STP	Off Priority Bus Route, Lopinot Road Arouca	NHA (Previously PEU)	1286
4	Bon Accord Lift Station	Milford Court, Bon Accord, Tobago	NHA	-
5	Bon Accord STP	Milford Court, Bon Accord, Tobago	NHA	213
6	Buccoo STP	Buccoo, Tobago	NHA	197
7	Buen Intento STP	Buen Intento Road, Princess Town	NHA (Previously PEU)	338
8	Charlieville	IDE Road Charlieville	NHA	193
9	Couva North Lift Station, Phase III	Off Perseverance Rock Road	NHA (previously PEU)	757
10	Couva Lift Station	Roystonia Garden, Couva	NHA	18
11	Couva North STP	Lisas Boulevard Couva	NHA (previously PEU)	
12	Couva STP	Lisas Boulevard Couva	NHA	1134

NO.	Names of Wastewater Facility	Location	Owner	No. of Lots as per Cadastral Sheet
13	Curepe STP	Southern Main Road, Curepe	NHA	85
14	Cantaro STP	Sam Boucaud Road, Santa Cruz	NHA	164
15	Debe Phase II STP	Wellington Road, Debe	NHA	
16	Edingburg 500 STP	Chaguanas	NHA (previously PEU)	1200
17	Frederick Settlement Lift Station	La Paille Village, Caroni	Previously PEU	N/A
18	La Paille STP	Frederick Settlement, La Paille, Caroni	NHA (previously PEU)	
19	Five Rivers, Arouca STP	Guanapo Avenue, Five Rivers, Arouca	NHA	N/A
20	Harmony Hall Lift Station	Orian Drive, Harmony Hall, Gasparillo	Previously PEU	N/A
21	Harmony Hall STP	IDC Estate Union Road, Marabella	Previously PEU	519
22	La Horquetta Lift Station	Phase 7 La Horquetta	NHA	3561 Lots & Apartments
23	Malabar Lift Station	Corner of O'Meera Rd.& Newstones Crescent, Arima	NHA	445
24	Malabar STP	IDC Industrial Estate Off Churchill Roosevelt Highway, Malabar, Arima	NHA	5500
25	Maloney STP	Off Churchill Roosevelt Highway, D'Abadie	NHA	3526 Lots and Apts
26	Real Spring STP	NUGFW housing Development off SMR,	NHA	N/A

NO.	Names of Wastewater Facility	Location	Owner	No. of Lots as per Cadastral Sheet
		Curepe		
27	Strikers Village STP	South Central Road, New Village, Point Fortin	NHA	148
28	Union Hall Lift Station no.1	Union Hall, San Fernando	NHA (previously PEU)	768 at Lift Station No. 1&2
29	Union Hall Lift Station no.2	Union Hall, San Fernando	NHA (previously PEU)	768 at Lift Station No. 1&2
30	Old Valencia STP	Flambouyant Crescent, Valencia	NHA	367
31	New Valencia STP	Off Toco Main Road	NHA	173
32	Bamboo Settlement no.3 STP	Grand Bazaar, Valsayn	LSA	
33	Orange Field Road Housing Development STP	Carapichaima	Sugar Welfare	161
34	Oropune STP	Trincity	UDECOTT	205
35	Oropune Lift Station	Trincity	UDECOT	

PRIVATELY –OWNED WASTEWATER TREATMENT PLANTS
(Taken from Report on Adoption of Private Treatment Works-Nov 1997)

Table (c)

Private Sewerage Treatment Plants – Housing Developments

	NAME	LOCATION	PLANT CAPACITY (POP. EQUIV.)	CATCHMENT POPULATION
1	School Street	Carenage	0	
2	Providence Gardens	Santa Cruz	318	113
3	Sam Boucard Gradens	Cantaro	N/A	630
4	Sam Boucard	Santa Cruz	1261	450
5	Mountain View	Maracas Valley	N/A	189
6	Maracas Gardens	Maracas Valley	990	122
7	Poolside	Maracas, St. Joseph	764	77
8	La Joya	Curepe	232	225
9	Camelot	Valsayn	305	90
10	Auzonville	Tunapuna	732	90
11	St. Benedict's Gardens	Tunapuna		171
12	El Dorado Gardens	El Dorado	732	800

1 Excellent

2 Good

3 Adequate

4 Normal

5 Poor

		NAME	LOCATION	PLANT CAPACITY (POP. EQUIV.)	CATCHMENT POPULATION
1					
Exc elle nt	13	Ridge View Heights	Tacarigua	0	194
	14	Frederick Settlement	Private	1347	0
	15	La Florisante TP	D'Abadie		1823
	16	Lillian Heights	D'Abadie	0	63
2 Goo d 3	17	La REsource	D'Abadie	1683	671
	18	Santa Monica Gardens	D'Abadie	1388	608
	19	Hermitage Heights	Arima		221
Ade quat e	20	Dundonald Hill Villas	Port of Spain	459	
	21	Gordon Street Villas	Santa Maragarita		140
	22	Paradise Gardens	Tacarigua	1054	194
	23	Trincity Lagoons	Trincity		22500
4 Nor mal 5 Poo r	24	Smith's Development	Arouca	0	180
	25	Green Acres	D'Abadie		248
	26	Lynton Gardens	D'Abadie	0	261
	27	Tumpuna Gardens	Arima		266
	28	Santa Rosa Heights	Arima		
	29	Bregon Park	D'Abadie	1010	423

		NAME	LOCATION	PLANT CAPACITY (POP. EQUIV.)	CATCHMENT POPULATION
1					
Exc elle nt	30	Windsor Heights	Arima		14
	31	Simon Development	Cunupia		81
	32	Midway Park	St. Mary's	0	
2	33	Fairview Park	Carapichiamama		423
	34	East End Foundary	Chaguanas	236	
Go od	35	Boodram	Chaguanas	0	36
3 Ad equ ate	36	Balmain Gardens	Couva	0	648
	37	Central Park TP	Couva	928	792
	38	Melanie Gardens	Preysal		203
	39	Orchard Gardens	Chaguanas		1017
4 Nor mal 5 Po or	40	Hariss Jaglal	Chase Village		0
	41	Point Pleasant	Cunupia		473
	42	Homeland Gradens	Cunupia		1233
	43	Brasso Road	Chaguanas	0	45
	44	West Park	San Fernando		
	45	Palmiste	Palmiste	4945	3375
	46	Sun Kist	Palmiste		212

	NAME	LOCATION	PLANT CAPACITY (POP. EQUIV.)	CATCHMENT POPULATION
47	Gulf City	La Romain	2330	4500
48	Allison Park	Sangre Grande		270
49	Leisureville	Mayaro	N/A	
50	ABCD	Mayaro	0	15
51	Bon Accord Int. Dev.	Tobago		90

1 Excellent
3 Adequate
5 Poor

2 Good
4 Normal

**WATER AND SEWERAGE AUTHORITY
WASTEWATER DEPARTMENT**

**PRIVATELY –OWNED WASTEWATER TREATMENT PLANTS
(Taken from Report on Adoption of Private Treatment Works-Nov 1997)**

Private Sewerage Treatment Plants – Industrial/ Commercial

	NAME	LOCATION	PLANT CAPACITY (POP. EQUIV.)	CATCHMENT POPULATION
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1	Neal & Massy Car Pla	Arima	N/A	
2	West Indian Tobacco	Champ Fleurs	260	200
3	NP Gas	Caroni West		0
4	Centre City Plaza	Chaguanas	311	350
5	Ramsaran Park	Chaguanas		104
6	Mid Centre Mall	Chaguanas	221	400
7	Plipdeco Point Lisas	Couva	693	250
8	Ispat Metal	Point Lisas	N/A	840
9	Ispat Cement	Point Lisas	N/A	
10	KFC	La Romain	232	50
11	Trintoc La Fortune	Point Fortin	0	

**WATER AND SEWERAGE AUTHORITY
WASTEWATER DEPARTMENT**

**PRIVATELY –OWNED WASTEWATER TREATMENT PLANTS
(Taken from Report on Adoption of Private Treatment Works-Nov 1997)**

Private Sewerage Treatment Plants – Hotels

	NAME	LOCATION	PLANT CAPACITY (POP. EQUIV.)	CATCHMENT POPULATION
1	Maracas Bay Hotel	Maracas		N/A
2	Arthurs By the Sea	Tobago		N/A
3	Valley View Hotel	Port of Spain		296
4	Calypso Beach Resort	Gasparee Island		718
5	Coco Reef Hotel	Tobago		242
6	Turtle Beach Hotel	Tobago		693
7	Conrado Beach Hotel	Tobago		
8	Mount Irvine Bay Hotel	Tobago		242
9	Grafton Beach Resort	Tobago		

**WATER AND SEWERAGE AUTHORITY
WASTEWATER DEPARTMENT**

**PRIVATELY –OWNED WASTEWATER TREATMENT PLANTS
(Taken from Report on Adoption of Private Treatment Works-Nov 1997)**

Private Sewerage Treatment Plants – Government Owned

NO.	NAME	LOCATION	PLANT CAPACITY (POP. EQUIV.)	CATCHMENT POPULATION	CO S
1	University of WI	St. Augustine			
2	BWIA	Piarco	N/A		
3	St. Augustine Senior Compr.	St. Augustine	210	1500	
4	Cipriani Labour College	Valsayn	311		
5	Curepe Secondary School	Curepe	243	1998	
6	Tunapuna Market	Tunapuna	N/A		
7	El Dorado Youth Camp	El Dorado	310	594	
8	Golden Grove Prison	Arouca	600	2800	
9	Piarco Airport	Piarco			
10	Maximum Security Prison	Arouca	1408	100	
11	Pt. Gourde	Chaguaramas	N/A		
12	Coast Guard		239		

	NAME	LOCATION	PLANT CAPACITY (POP. EQUIV.)	CATCHMENT POPULATION
13	San Juan Comprehensive	Santa Cruz	6390	1750
14	Caura	El Dorado	1164	500
15	Mt. Hope Medical Complex	St. Joseph		1800
16	Valsayn Teachers College	Valsayn	N/A	500
17	El Dorado J & S Secondary	El Dorado	1187	1450
18	Mausica Teachers Training	Mausica	N/A	0
19	Sugar Welfare	Orangefield		702
20	Chaguanas Senior Compr.	Chaguanas	834	2950
21	Tabaquite Composite School	Tabaquite		680
22	Claxton Bay Secondary	Claxton Bay	291	700
23	Carapichaima Sen. Compre.	Carapichaima	716	2300
24	Marabella Junior Secondary	Marabella		1881
25	Gasparillo Composite School	Gasparillo		1500
26	Princes Town J/S School	Princes Town		2100
27	Princes Town S. Comp.	Princes Town	686	2515
28	Trintoc La Fortune	Point Fortin	0	
29	Petrotrin Water Treatment	Petrotrin		
30	Pt. Fortin Senior Sec. School	Point Fortin		1500
31	Pt. Fortin Junior Secondary	Point Fortin		2070
32	Penal Junior Secondary	Penal		2035

NO.	NAME	LOCATION	PLANT CAPACITY (POP. EQUIV.)	CATCHMENT POPULATION
33	Barrackpore Sen. Com.	Barrackpore	547	1672
34	Moruga Comp. School	Moruga	516	755
35	Marabella S. Comp. School	Marabella		1500
36	San Fernando Tech. Insti.	Marabella		950
37	Plaisance Park	Plaisance Park		
38	Vessigny Beach Resort	La Brea	172	
39	Fyzabad Comp. School	Fyzabad	303	1700
40	Barrackpore J.S. School	Barrackpore	710	1475
41	Cedros Composite School	Cedros		860
42	Siparia Sen. Comp. School	Siparia	295	1500
43	IDC Industrial Estate	Marabella		
44	Toco Composite School	Toco	516	700
45	Camp Cumuto	Cumuto	279	
46	Rio Claro Senior Comp.	Rio Claro	53	705
47	Mayaro Composite School	Mayaro	241	1284
48	Sangre Grande Hospital	Sangre Grande		225
49	Sangre Grande Jun. Sec.	Sangre Grande	222	1605
50	Manzanilla Beach Resort	Manzanilla	N/A	
51	Signal Hill School	Tobago	310	990

NO.	NAME	LOCATION	PLANT CAPACITY (POP. EQUIV.)	CATCHMEN POPULATIO
52	Roxborough Fire Station	Tobago	N/A	12
53	Crown Point Airport	Tobago	365	
54	Studley Park W. Disp.	Tobago		
55	Maracas Beach	Maracas Bay	338	

FINANCIAL ACCOUNTS

APPENDIX XX

NUMBER OF EMPLOYEES

AVERAGE YEARLY MANPOWER FIGURES FOR THE PERIOD							
	YEAR						
	2001	2002	2003	2004	2005	2006	2007
STATUS (MONTHLY PAID):							
PERMANENT	1157	1175	1402	1444	1414	1380	1338
TEMPORARY	543	619	641	835	1058	1187	1337
SUB TOTAL (MP)	1700	1794	2043	2279	2472	2567	2675
STATUS (DAILY PAID):							
PERMANENT	782	773	748	742	734	690	682
TEMPORARY	36	34	33	32	32	27	27
SUB TOTAL (DP)	818	807	781	774	766	717	709
TOTAL	2518	2601	2824	3053	3238	3284	3384

Projection based number of employees due to retire in 2007:

42 monthly and 8 daily

Temporary Employees: Assumed to be those without permanent appointments, includes **contract employees**

Source: Human Resource Division

APPENDIX XXI

EFFICIENCY INDICATORS

CLASS OF SUPPLY 2002 - 2006

Class	AVERAGE HOURS OF SERVICE	Yearly average population (2002)	Average % population per class (2002)
1	168	507,737	41%
2	120-168	314,957	25%
3	84-120	167,383	14%
4	48-84	136,326	11%
5	0-48	111,407	9%
Total		1,237,809	100%

Class	AVERAGE HOURS OF SERVICE	Yearly average population (2005)	Average % population per class (2005)
1	168	240,058	20%
2	120-168	454,055	38%
3	84-120	282,351	24%
4	48-84	108,593	9%
5	0-48	119,307	10%
Total		1,204,364	100%

Class	AVERAGE HOURS OF SERVICE	Yearly average population (2003)	Average % population per class (2003)
1	168	336,263	28%
2	120-168	351,391	29%
3	84-120	300,586	25%
4	48-84	129,504	12%
5	0-48	76,994	6%
Total		1,194,737	100%

Class	AVERAGE HOURS OF SERVICE	Yearly average population (2006)	Average % population per class (2006)
1	168	219,558	18%
2	120-168	389,735	32%
3	84-120	342,410	28%
4	48-84	140,249	11%
5	0-48	139,854	11%
Total		1,231,805	100%

Class	AVERAGE HOURS OF SERVICE	Yearly average population (2004)	Average % population per class (2004)
1	168	327,677	27%
2	120-168	482,048	39%
3	84-120	246,328	20%
4	48-84	101,042	8%
5	0-48	73,310	6%
Total		1,230,405	100%

Sewer Coverage

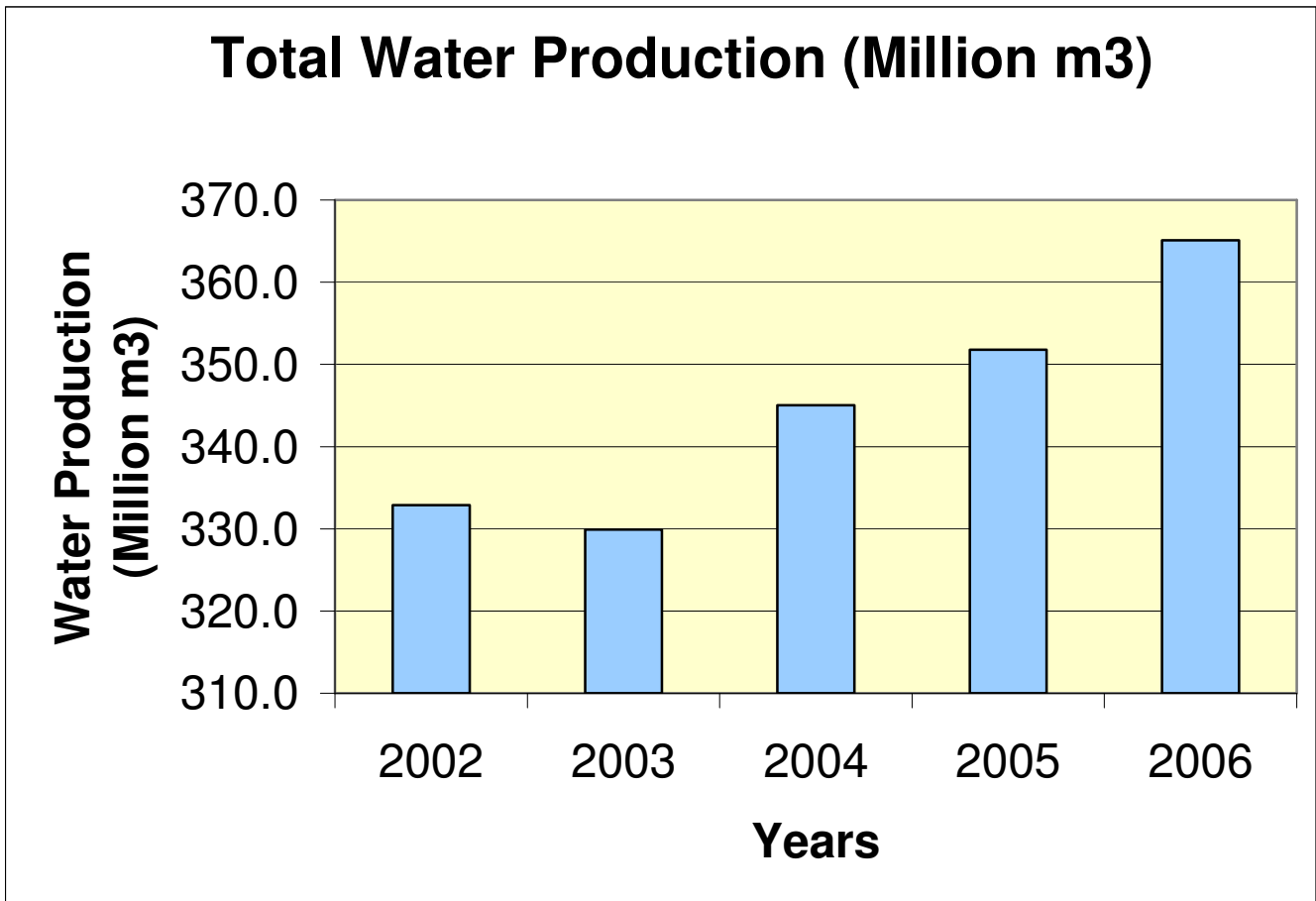
	2002-03	2003-04	2004-05	2005-06	2006-2007 (April)	2007
Sewer coverage	20%	20%	20.6%	20.7%	21.3%	*27%

21.3% as at April 2007 represents WASA sewer facilities only.

* Represents total sewer coverage as a result of WASA's taking over a number of the NHA & Private Packaged Plants.

Total Water Production

	2002	2003	2004	2005	2006
Total Water Production (m ³)	332.9	329.9	345.0	351.8	365.1



METERING LEVEL AS AT 2006

Number of Operating Connections	9,372
Total Number of Connections	330,736
Percentage %	3 %

NUMBER OF LEAKS PER KILOMETER

	2001	2002	2003	2004	2005	2006
No. of Km of pipe	5800	5900	5800	5800	5800	5800
No. of Reported leaks	6929	8565	7348	7646	8558	8030
No. of Leaks pe Km	1.19	1.45	1.27	1.32	1.48	1.38

AVERAGE TARIFF AS AT 2006

CLASS	WATER	SEWERAGE
A4 Internally serviced (metered)	Up to 150 cubic metres-\$1.75 per cubic meter/qtr.	50% of water bill
B4 Industrial (metered)	\$3.50 per cubic meter/mth.	50% of water bill

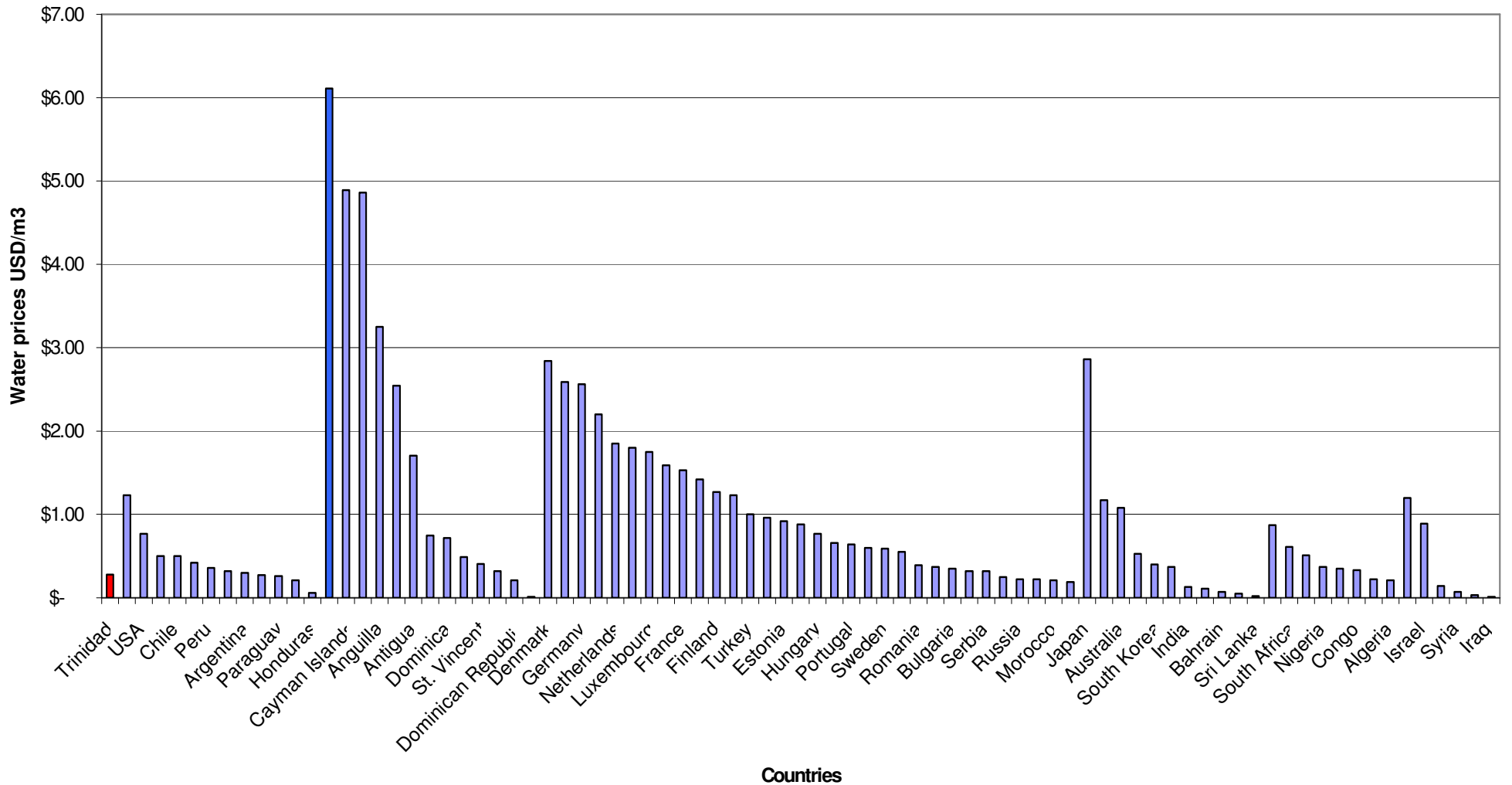
LIST OF SELECTED COUNTRIES AND WATER TARIFFS IN USD/m3

	Country	Average Domestic tariff in US\$ per m3	Average Domestic tariff in TT\$ per m3	Difference to Trinidad and Tobago in USD/m3
North/Latin American Countries	Trinidad	\$ 0.28	\$ 1.75	-
	Canada	\$ 1.23	\$ 7.74	\$ 0.95
	USA	\$ 0.77	\$ 4.84	\$ 0.49
	Brazil	\$ 0.50	\$ 3.15	\$ 0.22
	Chile	\$ 0.50	\$ 3.15	\$ 0.22
	Uruguay	\$ 0.42	\$ 2.64	\$ 0.14
	Peru	\$ 0.36	\$ 2.26	\$ 0.08
	Colombia	\$ 0.32	\$ 2.01	\$ 0.04
	Argentina	\$ 0.30	\$ 1.89	\$ 0.02
	Ecuador	\$ 0.27	\$ 1.70	\$ (0.01)
	Paraguay	\$ 0.26	\$ 1.64	\$ (0.02)
	Venezuela	\$ 0.21	\$ 1.32	\$ (0.07)
	Honduras	\$ 0.06	\$ 0.38	\$ (0.22)
	Caribbean Countries	Trinidad	\$ 0.28	\$ 1.75
Netherland Antilles		\$ 6.11	\$ 38.43	\$ 5.83
Cayman Islands		\$ 4.89	\$ 30.76	\$ 4.61
US Virgin Islands		\$ 4.86	\$ 30.57	\$ 4.58
Anguilla		\$ 3.25	\$ 20.45	\$ 2.97
Guadeloupe		\$ 2.54	\$ 16.00	\$ 2.26
Antigua		\$ 1.71	\$ 10.73	\$ 1.43
Barbados		\$ 0.75	\$ 4.70	\$ 0.47
Dominica		\$ 0.72	\$ 4.51	\$ 0.44
Grenada		\$ 0.49	\$ 3.07	\$ 0.21
St. Vincent		\$ 0.41	\$ 2.56	\$ 0.13
Costa Rica		\$ 0.32	\$ 2.01	\$ 0.04
Dominican Republic		\$ 0.21	\$ 1.32	\$ (0.07)
Cuba		\$ 0.01	\$ 0.06	\$ (0.27)
European Countries	Trinidad	\$ 0.28	\$ 1.75	\$ (0.00)
	Denmark	\$ 2.84	\$ 17.86	\$ 2.56
	Switzerland	\$ 2.59	\$ 16.29	\$ 2.31
	Germany	\$ 2.56	\$ 16.10	\$ 2.28
	Belgium	\$ 2.20	\$ 13.84	\$ 1.92
	Netherlands	\$ 1.85	\$ 11.64	\$ 1.57
	UK	\$ 1.80	\$ 11.32	\$ 1.52
	Luxembourg	\$ 1.75	\$ 11.01	\$ 1.47
	Austria	\$ 1.59	\$ 10.00	\$ 1.31
	France	\$ 1.53	\$ 9.62	\$ 1.25
	Norway	\$ 1.42	\$ 8.93	\$ 1.14
	Finland	\$ 1.27	\$ 7.99	\$ 0.99
	Italy	\$ 1.23	\$ 7.74	\$ 0.95
	Turkey	\$ 1.00	\$ 6.29	\$ 0.72
	Czech Republic	\$ 0.96	\$ 6.04	\$ 0.68
	Estonia	\$ 0.92	\$ 5.79	\$ 0.64
Spain	\$ 0.88	\$ 5.54	\$ 0.60	

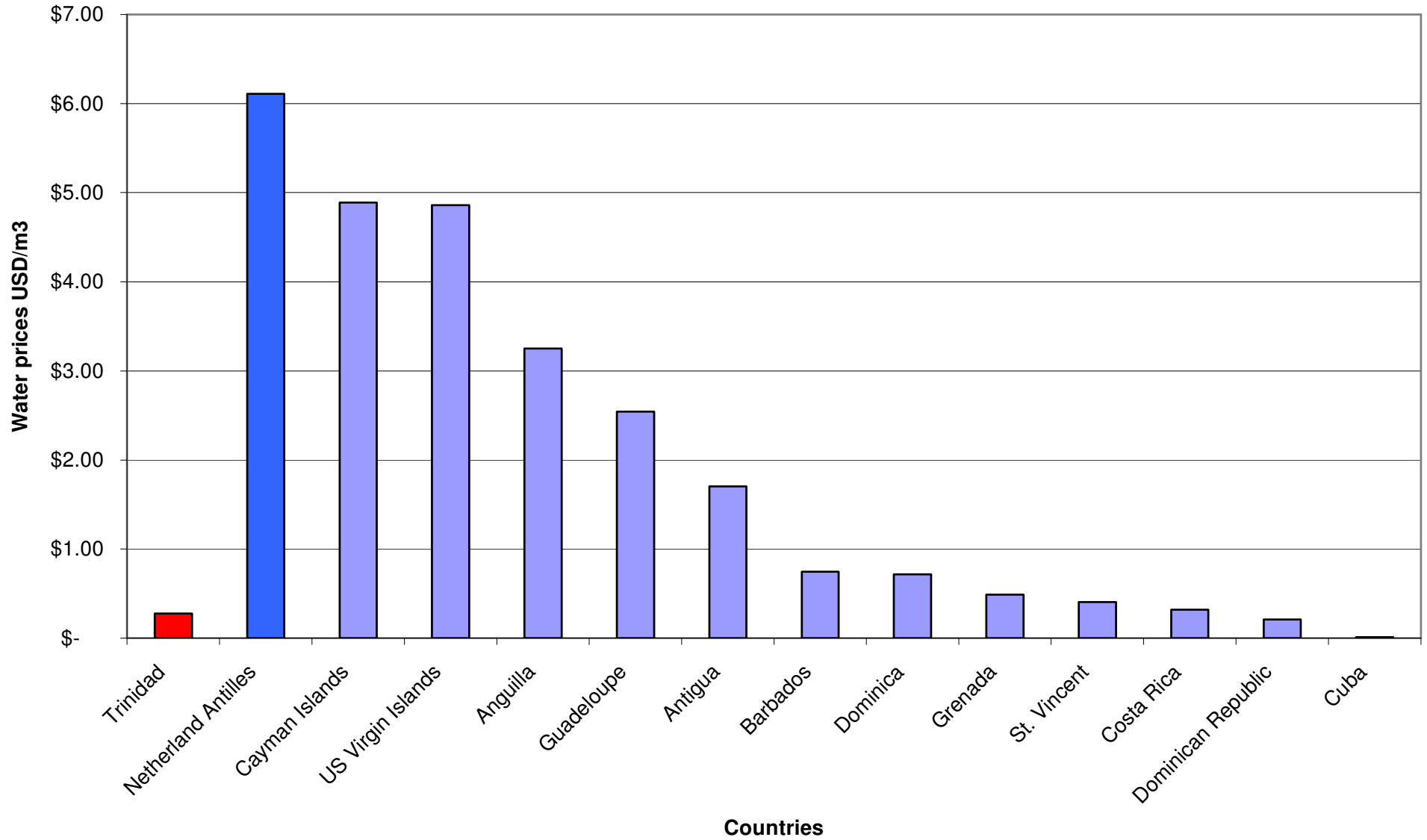
LIST OF SELECTED COUNTRIES AND WATER TARIFFS IN USD/m3

	Country	Average Domestic tariff in US\$ per m3	Average Domestic tariff in TT\$ per m3	Difference to Trinidad and Tobago in USD/m3
European Countries Cont'd	Hungary	\$ 0.77	\$ 4.84	\$ 0.49
	Poland	\$ 0.66	\$ 4.15	\$ 0.38
	Portugal	\$ 0.64	\$ 4.03	\$ 0.36
	Indonesia	\$ 0.60	\$ 3.77	\$ 0.32
	Sweden	\$ 0.59	\$ 3.71	\$ 0.31
	Croatia	\$ 0.55	\$ 3.46	\$ 0.27
	Romania	\$ 0.39	\$ 2.45	\$ 0.11
	Slovakia	\$ 0.37	\$ 2.33	\$ 0.09
	Bulgaria	\$ 0.35	\$ 2.20	\$ 0.07
	Greece	\$ 0.32	\$ 2.01	\$ 0.04
	Serbia	\$ 0.32	\$ 2.01	\$ 0.04
	Lebanon	\$ 0.25	\$ 1.57	\$ (0.03)
	Russia	\$ 0.22	\$ 1.38	\$ (0.06)
	Philippines	\$ 0.22	\$ 1.38	\$ (0.06)
	Morocco	\$ 0.21	\$ 1.32	\$ (0.07)
Ukraine	\$ 0.19	\$ 1.20	\$ (0.09)	
Australia/Asian Countries	Trinidad	\$ 0.28	\$ 1.75	\$ (0.00)
	Japan	\$ 2.86	\$ 17.99	\$ 2.58
	Singapore	\$ 1.17	\$ 7.36	\$ 0.89
	Australia	\$ 1.08	\$ 6.79	\$ 0.80
	China	\$ 0.53	\$ 3.33	\$ 0.25
	South Korea	\$ 0.40	\$ 2.52	\$ 0.12
	Fiji	\$ 0.37	\$ 2.33	\$ 0.09
	India	\$ 0.13	\$ 0.82	\$ (0.15)
	Vietnam	\$ 0.11	\$ 0.69	\$ (0.17)
	Bahrain	\$ 0.07	\$ 0.44	\$ (0.21)
	Iran	\$ 0.05	\$ 0.31	\$ (0.23)
Sri Lanka	\$ 0.02	\$ 0.13	\$ (0.26)	
African Countries	Trinidad	\$ 0.28	\$ 1.75	\$ (0.00)
	Egypt	\$ 0.87	\$ 5.47	\$ 0.59
	South Africa	\$ 0.61	\$ 3.84	\$ 0.33
	Mali	\$ 0.51	\$ 3.21	\$ 0.23
	Nigeria	\$ 0.37	\$ 2.33	\$ 0.09
	Botswana	\$ 0.35	\$ 2.20	\$ 0.07
	Congo	\$ 0.33	\$ 2.08	\$ 0.05
	Ethiopia	\$ 0.22	\$ 1.38	\$ (0.06)
	Algeria	\$ 0.21	\$ 1.32	\$ (0.07)
Middle Eastern Countries	Trinidad	\$ 0.28	\$ 1.75	\$ (0.00)
	Qatar	\$ 1.20	\$ 7.55	\$ 0.92
	Israel	\$ 0.89	\$ 5.60	\$ 0.61
	Jordan	\$ 0.14	\$ 0.88	\$ (0.14)
	Syria	\$ 0.07	\$ 0.44	\$ (0.21)
	Saudi Arabia	\$ 0.03	\$ 0.19	\$ (0.25)
	Iraq	\$ 0.01	\$ 0.06	\$ (0.27)

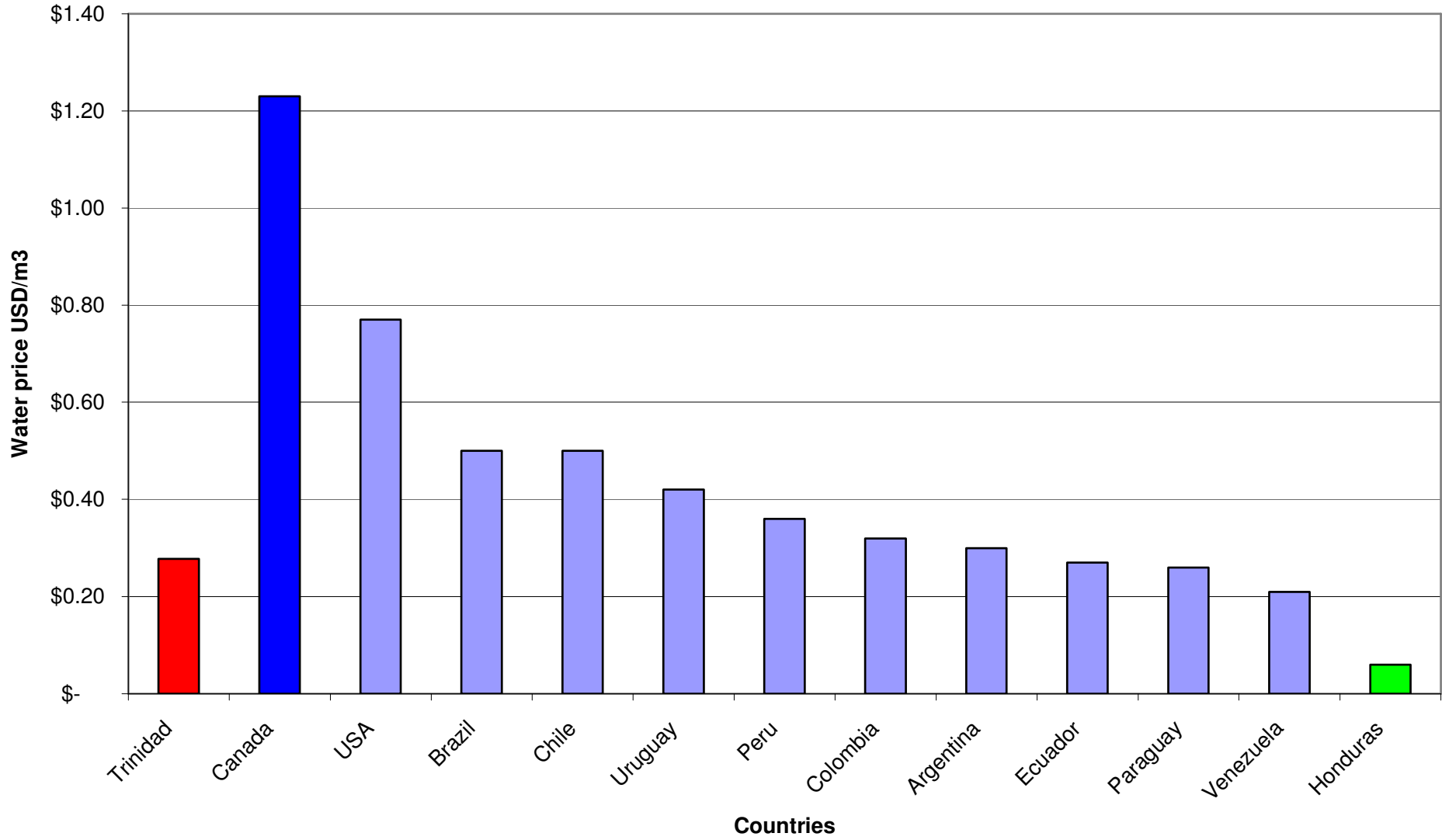
Average Water rate prices (USD/m³) for selected Countries around The World compared to TT



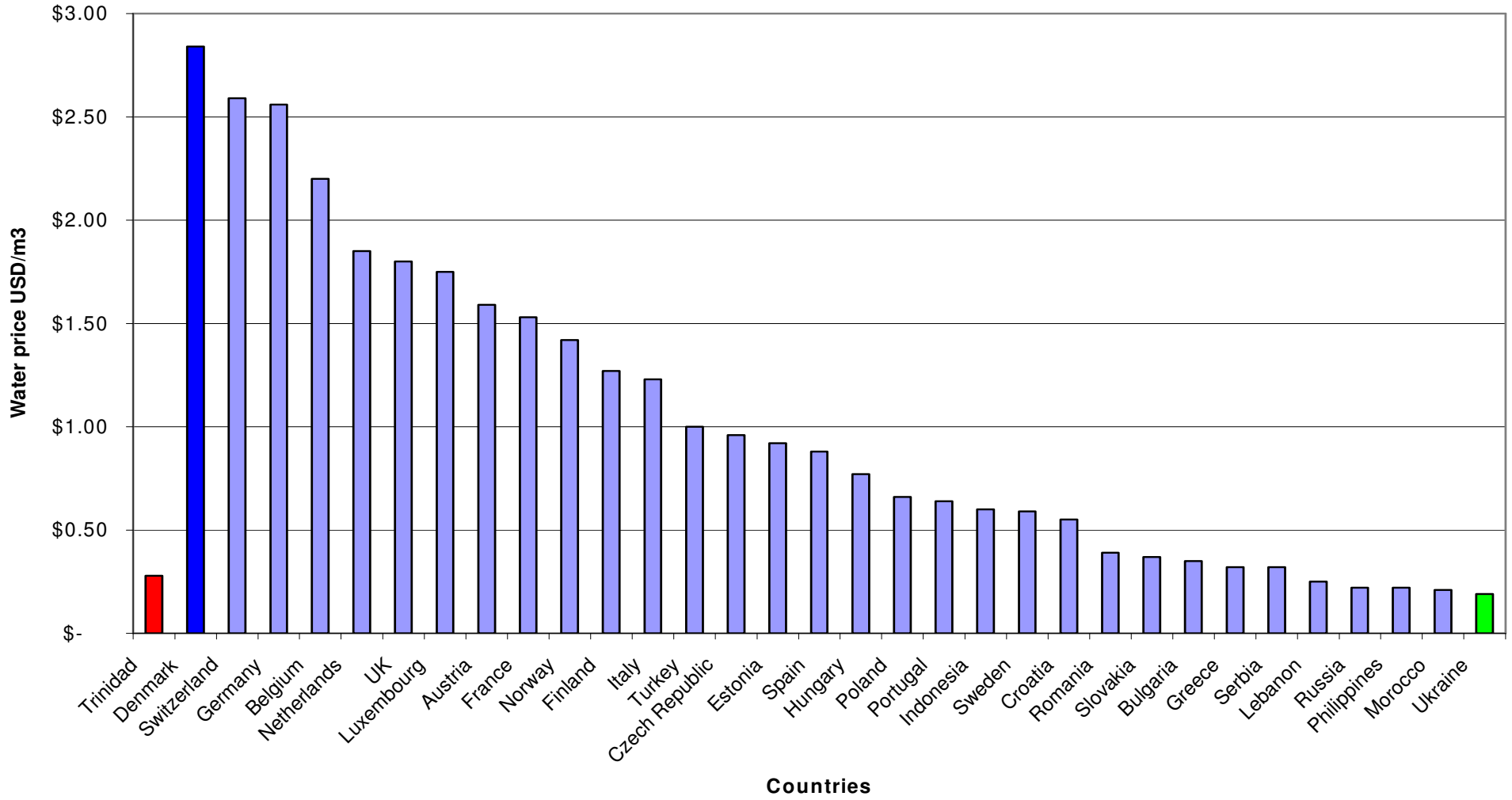
Average Water rate prices (USD/m3) for selected Caribbean countries compared to TT.



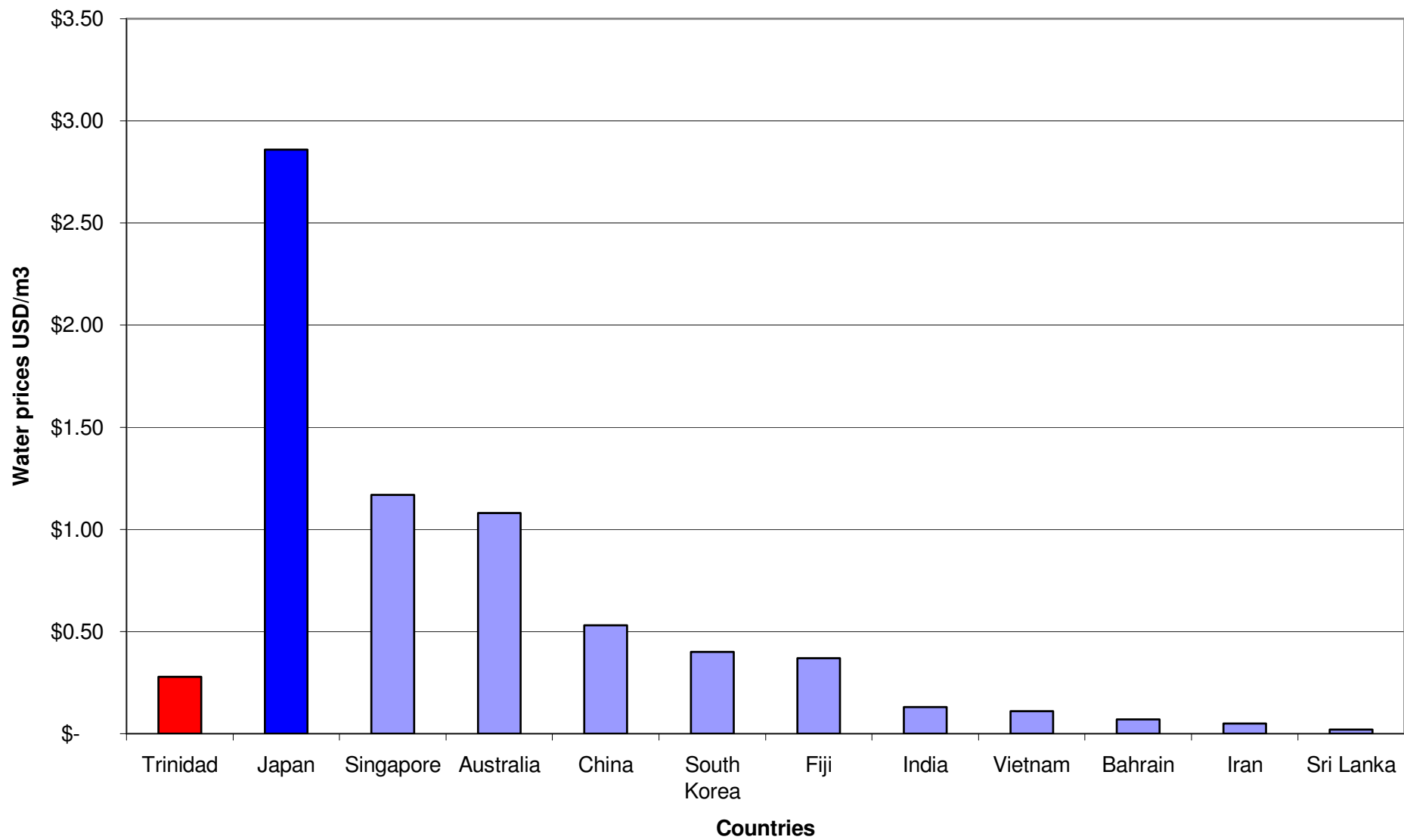
Average Water rate prices in USD/m3 for selected North/Latin America countries compared with TT



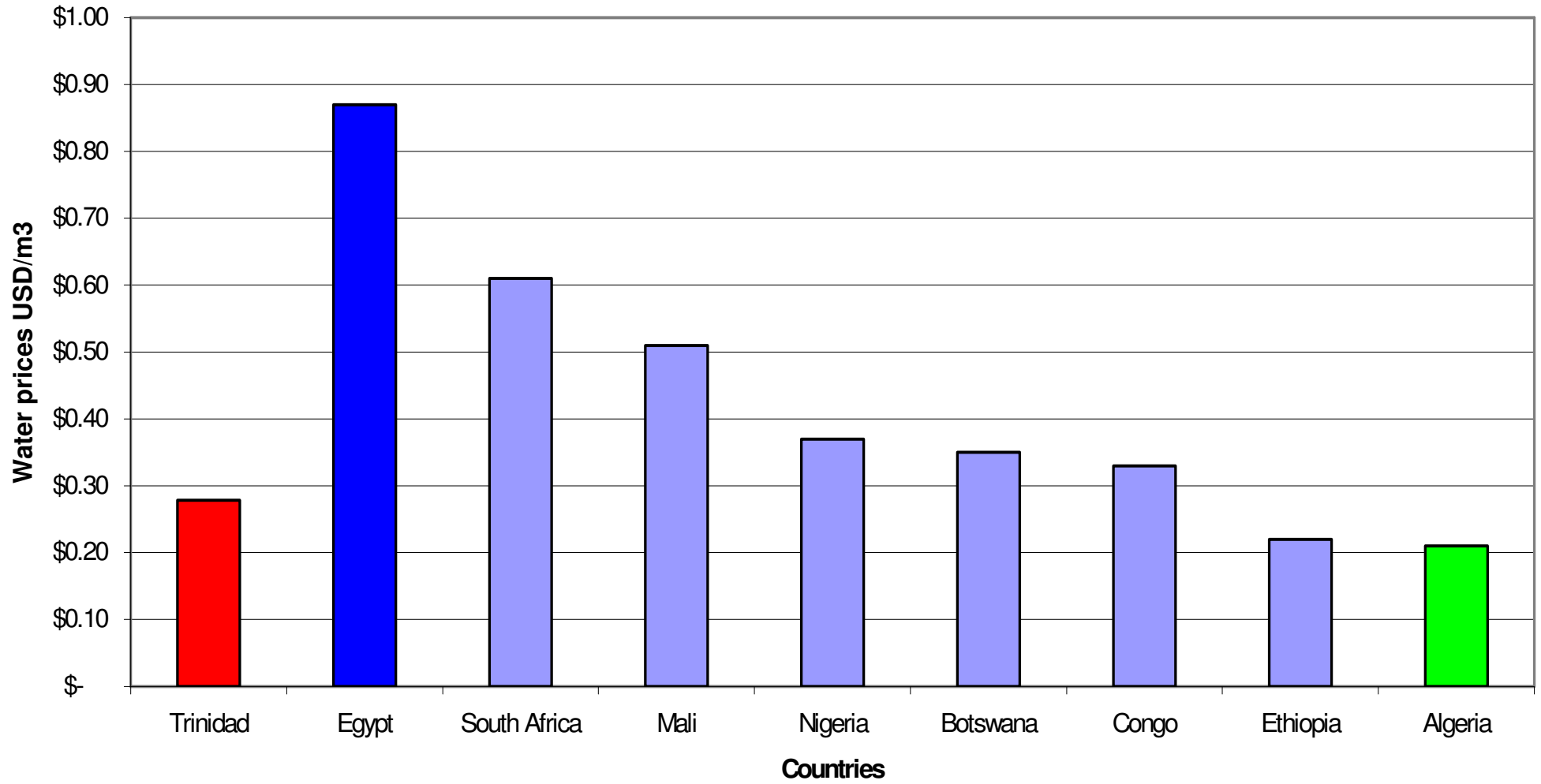
Average water rate prices (USD/m³) for selected European countries compared to TT.



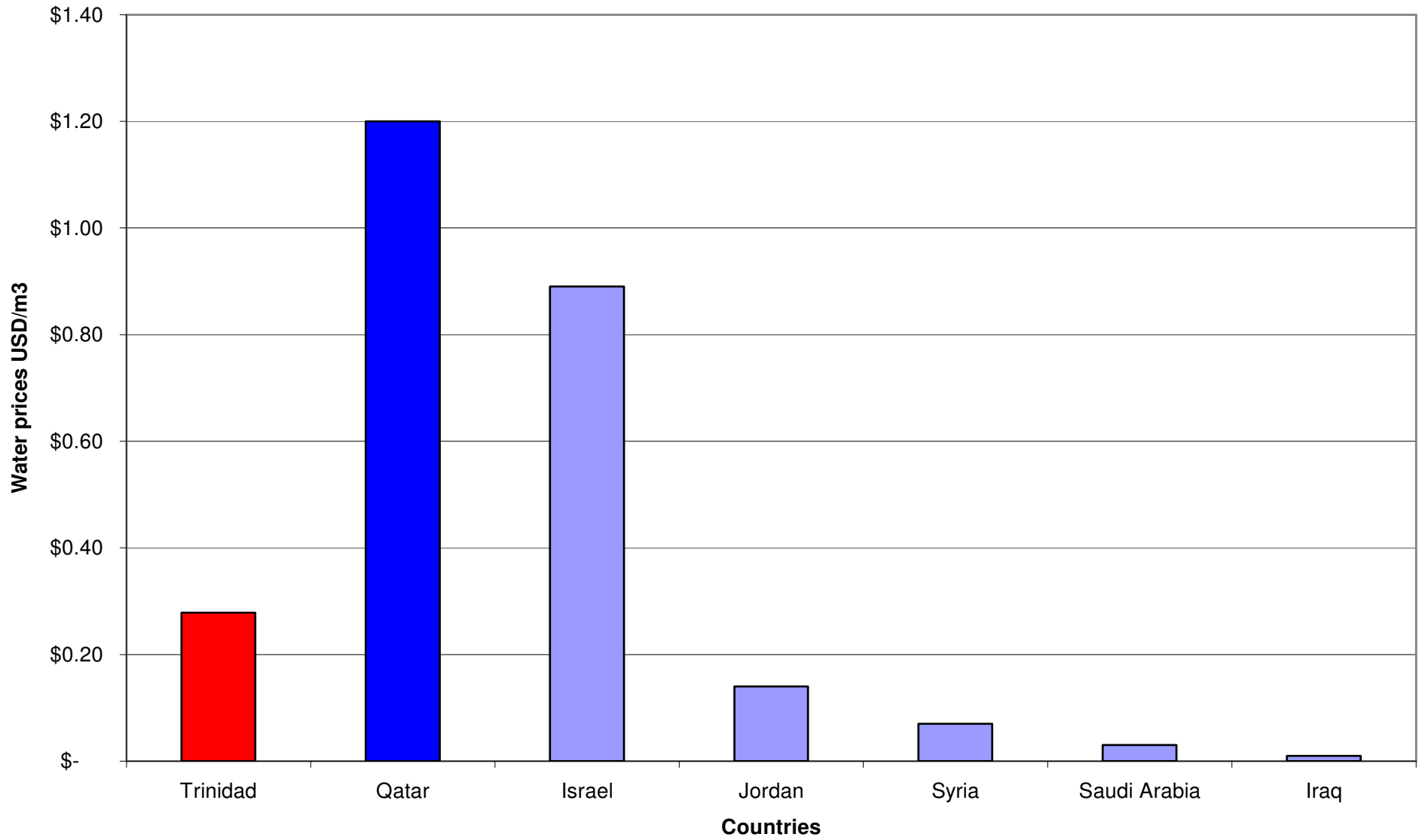
Average water rate prices (USD/m³) for selected Asian countries and Australia compared to TT.



Average water rate prices (USD/m³) for selected African countries compared to TT.



Average water rate prices (USD/m³) for selected Middle Eastern countries compared to TT.



CONTRACTED OUT OF SERVICE COST VS OPERATIONAL COST

Contracted out service cost	\$ 74,206,766
Operational cost	\$ 722,495,796
Percentage %	10.3

INDUSTRIAL TO RESIDENTIAL CHARGE AS AT 2006

Industrial Charges	\$ 3.50
Residential Charge	\$ 1.75
Ratio	2:1

FINANCIAL RATIOS FOR THE YEAR 2002 - 2006

FINANCIAL RATIOS		YEARS				
RATIOS	DESCRIPTION	2002	2003	2004	2005	2006
Current Ratio	Current Assets/ Current Liabilities	0.2:1	0.2:1	0.2:1	0.2:1	0.5:1
Working Ratio	Opr. Exp less Depr/ Operating Revenue.	1.4:1	1.6:1	2.0:1	2.1:1	2.2:1
Operating Ratio	Total Expense/ Total Revenue	1.7:1	2.2:1	2.2:1	2.3:1	2.4:1
Debt Ratio	Total Debt/ Total Assets	1.4:1	1.5:1	1.7:1	1.8:1	1.6:1
Collection Period	Accts Receivable/ Revenue x 12 months	17 Months	17 Months	16 Months	16 Months	15 Months
Revenue Collection Ratio	Revenue/ Cash Collection	1.0:1	1.0:1	1.0:1	1.0:1	1.0:1

APPENDIX XXII

System Balance for the period 2002-2006

	2002	2003	2004	2005	2006
CLASS (imgd)					
Domestic Demand					
A1	2.298	2.240	2.209	2.177	2.104
A2	8.411	9.468	9.975	11.007	11.051
A3	81.886	84.410	85.710	87.308	91.083
A4	0.860	0.857	0.861	0.869	0.876
A5	0.318	0.221	0.219	0.452	0.656
A6	0.002	0.002	0.002	0.004	0.005
Total Domestic demand	93.77	97.20	98.98	101.82	105.78
Non Domestic Demand					
B3	2.377	2.014	1.814	1.775	1.848
B4	2.690	2.309	2.264	2.312	2.408
C3	6.044	6.218	6.359	6.163	6.510
C4	7.039	7.018	7.222	7.173	7.220
D3	0.130	0.169	0.162	0.164	0.215
D4	0.138	0.141	0.139	0.149	0.162
E3	0.435	0.439	0.419	0.351	0.419
E4	0.344	0.345	0.339	0.289	0.331
Total Non-domestic demand	19.20	18.65	18.72	18.37	19.11
Total domestic + Non Domestic demand(excluding Point Lisas)	112.97	115.85	117.70	120.19	124.89
Point Lisas demand	10.54	12.39	13.01	14.55	16.13
Total (including Point Lisas)	123.51	128.24	130.70	134.74	141.02
UFW	110.36	109.35	114.38	116.64	121.05
Total System Demand	233.87	237.59	245.08	251.38	262.07
Supply	200.65	198.82	207.96	212.07	220.09
Surplus/Deficit	-33.22	-38.77	-37.12	-39.31	-41.98

Projected System Balance for the period 2007-2012

	PROJECTED YEARS				
	2007	2008	2009	2010	2011
CLASS (imgd)					
Domestic Demand					
A1	2.06	2.01	1.97	1.93	1.88
A2	11.84	12.69	13.60	14.58	15.62
A3	93.54	94.14	93.59	92.25	92.03
A4	0.88	2.05	3.93	6.28	7.94
A5	0.85	1.11	1.44	1.88	2.44
A6	0.01	0.01	0.01	0.02	0.02
Total Domestic demand	109.19	112.01	114.54	116.93	119.95
Non Domestic Demand					
B3	1.61	1.41	1.23	1.08	0.94
B4	2.35	2.29	2.23	2.18	2.13
C3	6.67	6.83	7.00	7.17	7.34
C4	7.27	7.31	7.36	7.41	7.46
D3	0.25	0.28	0.33	0.37	0.43
D4	0.17	0.18	0.18	0.19	0.20
E3	0.419	0.42	0.42	0.42	0.42
E4	0.330	0.33	0.33	0.33	0.33
Total Non-domestic demand	19.06	19.05	19.08	19.14	19.23
Total domestic + Non Domestic demand(excluding Point Lisas)	128.25	131.07	133.62	136.06	139.18
Point Lisas demand	17.96	19.99	22.25	24.77	27.57
Total (including Point Lisas)	146.21	151.06	155.87	160.83	166.75
UFW	118.85	116.65	112.24	107.84	99.04
Total System Demand	265.05	267.70	268.12	268.68	265.79
Supply	220.09	220.09	220.09	220.09	220.09
Surplus/Deficit	-44.97	-47.62	-48.03	-48.59	-45.70

APPENDIX XXIII

WATER AND SEWERAGE AUTHORITY

PROPOSAL FOR UNIVERSAL METERING 2007

1.0 INTRODUCTION

The Water and Sewerage Authority has determined that Universal Metering is a key component in its Water Sector Modernisation Programme. Water is essential for life and its scarcity is now engaging the attention of the world as can be seen through its inclusion in the Millennium Development Goals. Water provision and management is therefore critical to ensuring that this commodity is available in the future. WASA therefore plans to embark on a number of strategic initiatives with regard to providing a 24-hour potable water supply to the country by the year 2020 and metering is a key initiative in the achievement of this goal.

2.0 BACKGROUND

Attempts at Universal metering have been plagued with more failures than successes throughout the Authority's history. The widespread use of metering has been recommended as far back as 1874 i.e. over 130 years ago.

- ❑ In 1970, WASA Board approved that metering be carried out on all new connections. However this never materialised and the policy was never implemented.
- ❑ In 1972, a first phase programme of metering 35,000 customers over the period 1973-1980 was developed. This was to be funded by a loan agreement between the Government of Trinidad and Tobago & IDB. The agreement was later modified to meter only 12,000 customers and subsequently the number of meters scaled down to 4,000 as a pilot project in Diamond Vale. Though the meters were installed, they were never used for billing purposes.

- ❑ The availability of money in the oil boom years (1970's) enabled government to independently finance expansion/construction projects, thus ignoring any requirements of the International Lending Agencies concerning metering. The pursuit of Universal Metering was reduced and later abandoned.
- ❑ In 1985 the PUC recommended that WASA implement a metering programme.
- ❑ In 1993, the Authority implemented a metering programme involving the installation of approximately 8,000 meters to commercial and industrial customers.

Today out of 330,736 customers in Trinidad and Tobago only 9,372 are metered. This represents approximately 3% overall. In the last quarter of 2006 the Authority successfully metered approximately 400 domestic customers in a pilot project conducted in Bacolet and Calder Hall in Tobago. New metering technologies i.e. Automatic Meter Reading technologies were successfully implemented in this project. The project was well received and supported in Tobago.

3.0 OBJECTIVES AND BENEFITS

OBJECTIVES

- To create a Universal Metering system throughout Trinidad & Tobago
- To develop a billing system that correlates with actual consumption
- To promote water conservation

BENEFITS

TO THE CUSTOMER:

- ✓ Fairer billing system for the customer, as they will now be billed for what they use
- ✓ Metering allows customers to better manage their payments
- ✓ Allows more water to customers

To the Organisation:

- ✓ Reduction of Customer side leakage
- ✓ Reduction of Unaccounted for Water
- ✓ Increased Revenue
- ✓ Customer Consumption Data Acquisition
- ✓ Delays and/or Reduces Capital Investment in Water Treatment Plants
- ✓ Reduction in Water Treatment and Sewerage Treatment Costs

4.0 METHODOLOGY

A number of options are available for metering, these include:

1. A finance, supply, install and read arrangement whereby contractors will be asked to fund, supply, install, read and maintain the meters and the Authority will pay for each reading obtained.
2. Another option is the Performance Based Contracting System.
3. A third is a standard contract for installing meters in phases.

The last option is preferable at this time mainly because the whole country does not as yet have a 24-hour water supply and potential problems may arise with respect to meters reading air, as well as the effect of air on the lifetime of the meters.

The Authority at this time is aggressively pursuing a system upgrade programme i.e. The Water Sector Modernisation Programme (WSMP), geared towards improving the class of supply to its customers.

The plan therefore, is to first meter the twenty percent (20%) of the population in Trinidad who now have a 24-hour supply and later as the Water Sector Modernisation Programme unfolds and the supply in other areas improve, to meter those new areas.

It is also planned in the first phase of the programme to meter the entire island of Tobago. Tobago has approximately 18,000 customers and their overall class of supply is quite good. Also a pilot-metering programme was just successfully completed in Tobago and already there is buy-in from some of the major stakeholders there for the programme.

The first phase of the programme will also include commercial and industrial customers in Trinidad who are not yet metered.

All new building developments are currently being metered by the developers and very soon the policy will be to meter all new service connections.

Overall it is estimated that the first phase of the programme will involve the installation of approximately 85,000 meters, 67,000 in Trinidad and 18,000 in Tobago. This will be completed in approximately three years in Trinidad and two years in Tobago.

The other phases will roll out and be completed five to six years later.

5.0 POLICY ISSUES

Prior to the start of the metering programme a number of issues must be addressed if the programme is to be successful, these issues include the following:

- Tariff
- Condominiums/ Apartment Buildings
- Illegal Customers
- Tampering
- Abandoned houses & Empty lots
- New Services
- Cost Recovery
- Metering properties with - number of accounts different to the number of service lines
- Application of metered rates to customers who have been metered
- Metering of standpipes
- Metering on customers' premises

5.1 Tariff

The Authority is currently using a tariff structure that is not supportive of the organisation's metering strategy. Aside from metering, the current level of tariffs does not allow the Authority to cover recurrent expenditure much less capital expenditure. Metering then would have the effect of reducing the revenue derived from bill payments from domestic customers. Also for metering to have the desired impact on conservation, the metered rate must be such that customers who waste water should see it reflected in their bills. An application for a sustainable rate increase would have to be sought by the RIC for metering to become an asset instead of a liability for the Authority.

5.2 Condominiums/Apartment Buildings

These are buildings with many owners/tenants but with only one water connection. It was very easy to issue each owner/tenant with a bill using the ATV billing system, however, with metering a problem arises, as there is only one connection. This problem can be easily addressed with future new structures by having the New Services Division ensure that all apartments have separate connections.

5.3 Illegal Customers

These fall into two categories: householders with land tenure but having a connection for which they are not billed; and householders who do not have land tenure (squatters) but have a water service connection. Case one is easy to deal with for it only requires that WASA meter and regularize them. However case two requires an innovative approach since the nature of our new services application process makes it virtually impossible for these householders to qualify for a water connection.

A suggestion is that they be issued a temporary status similar to what is done by T&TEC with the understanding that disconnection will occur if or when there is objection by the landowner.

5.4 Tampering

It is anticipated that with the advent of the metering programme cases of tampering will be encountered. Laws pertaining to tampering will have to be enacted/revised in order to serve as a deterrent to others.

5.5 Abandoned Houses and Empty Lots

Metering is a very expensive exercise and abandoned properties should not be metered. Abandoned properties should be disconnected, but this should only be done after confirmation that bills have not been paid for an extended period of time. Empty lots should not be immediately metered but would be metered when the owner applies for a new service connection. The owner would then be required to pay for the meter installation.

5.6 New Services

All new services should be metered and the cost of the installation be paid by the customer.

5.7 Cost Recovery

The cost of metering is very high and a decision must be taken on whether to pass the cost of metering on to the customer. It is recommended that the cost be spread over a eight to ten year period (the expected lifetime of a meter).

5.8 Metering properties with number of accounts different to the number of service lines

Each building should have a separate metered connection. However, problems will arise if within one building there are tenants with different billing classes.

5.9 Application of metered rates

A determination must be made on the time period between installing meters on premises and billing the customers as metered customers. Also can the Authority reserve the right to bill only certain customers on the metered rate.

5.10 Metering of stand pipes

All standpipes in the pilot areas should be metered. A listing of standpipes in the pilot areas should be sent to the respective Regional Corporations prior to metering, alerting them of the Authority's intention to meter. The Corporations will be required to pay the bills for these metered standpipes.

5.11 Metering on customers' premises

This programme involves placing meters on customers' premises. This is something new as it is not the norm for the Authority to conduct works on customers' premises. What if the customer objects to anyone entering his or her property to install meters? Does the Authority have any recourse?

6.0 PROGRAMME PLANNING AND EXECUTION

6.1 Project Design

The following design elements must be completed prior to the start of the programme. It is proposed to engage the services of a consultant to assist in fine-tuning the design and implementation of the programme.

- (a) **Meter Specifications** - These have already been completed but must be revisited prior to invitation of bids.
- (b) **Installation Design** - It is proposed to install meters within one metre inside of the customers' property boundary line in a polymer meter box. Automatic Meter Reading technology will be utilised. A curb valve will be installed outside the customers' premises to facilitate isolations and disconnections.
- (c) **Preparation of Tender Documents** - These have already been completed but must be revisited prior to invitation of bids.

6.2 Customer Education Programme

This is a major aspect of the metering programme. Customers are naturally skeptical about any new development, which may impact on the payment of their bills. In the absence of proper information a lot of negativity can be generated about the programme and thus hinder its progress.

The programme should be designed to cater for all of the customers' questions and concerns. It should be designed to win the customer over by highlighting the benefits of metering. The communications process will incorporate the electronic and print media and pamphlets will be placed in billing envelopes and post boxes. Town meetings will be held with communities to allay fears and answer questions about the programme.

Frequently asked questions on metering in other countries have been sourced as well as other helpful hints on water conservation. Customers will be shown how to read their meters and how to check for leaks in their toilet tanks and on their property in general.

The programme will also inform customers about a customer survey, which will begin prior to the start of meter installations. Information required by the survey personnel will be communicated to them so that they can have the information on hand when the field officers make their visit.

6.3 Customer Survey

Prior to actual start up of meter installations a customer survey must be conducted. This is necessary in order to properly schedule meters for installation. The survey will get proper addresses, verify account numbers, establish correct customer classification and ensure that all properties are recorded on WASA's Customer Information System. All properties will be highlighted on street maps so that the GIS database can also be updated.

6.4 **Meter Installations**

Contractors will be utilised to install meters over the three-year period in Trinidad and the two-year period in Tobago for the first phase of the programme. Each contractor will be required to have a minimum of three crews who can each install three meters per day minimum. Installations will be done as per contract document and will be closely monitored by Quality Assurance Officers.

6.5 **Staff Structure**

Appendix 1 provides the staff structure required to manage this metering programme. It is proposed that a metering unit be formed headed by a Programme Manager and that there be Project Engineers who would be required to manage the different areas targeted for installation. Supporting staff for the Project Engineers will include Quality Assurance Officers, technicians and Customer Service Officers. The main metering unit will be staffed with planner/schedulers, data entry personnel, metering coordinators, field survey and customer service personnel.

7.0 **PROGRAMME MONITORING AND MAINTENANCE**

7.1 Works Supervision

A Quality Assurance Officer will be assigned to each contractor to ensure that the works are done to standard and in accordance with the contract. The Quality Assurance Officer will be required to submit job report cards for each job completed, these job cards must be submitted daily to the metering centre for updating of the customer database.

Once a job has been completed and there are no outstanding works to be done a completion certificate will be completed and a copy forwarded to the contractor. The Quality Assurance Officer, the Engineer and the Project Manager must sign this certificate. The contractor will then forward this certificate together with his invoice for payment.

7.2 Meter Test Shop

The need for an effectively functioning meter Test Shop facility is of paramount importance, for maintenance is a key element in sustaining the metering programme. Maintenance activities would include the effective testing of meters, replacement of meters, repairing of leaks at meters, cleaning and replacing strainers and any other meter related complaints.

A meter test shop facility must be re established at St Joseph. This section will monitor, analyse, correct and predict meter performance as well as make recommendations for replacements based on field and test shop data. This section will also refurbish and re- calibrate meters at the test shop.

8.0 PROGRAMME COSTING

The total cost of the Universal Metering Programme is approximated at **1.4 Billion** Dollars. The first phase of the programme will cost approximately 340 million dollars, 268 million dollars for Trinidad and 72 million dollars for Tobago.

9.0 PROJECT FUNDING

The funding for this programme is expected to come from the Metering allocation under the disbursements for the Water Sector Modernisation Programme (WSMP) administered by WASA.

8.0 CONCLUSION

The metering of Trinidad and Tobago is vital for the success of the Water and Sewerage Authority for the benefits are tremendous. There are however some challenges that the programme now faces. Key among them are funding, buy-in from the major stake holders and a revised tariff structure.

It is hoped that this proposed phased installation will allow for a smooth transition from customers being billed on the ATV system to a metered rate system and that all the attendant challenges which the programme now faces will be adequately addressed prior to start up of the programme.

APPENDIX XXIV

BASELINE EXPLANATORY DATA – WATER

Section A – Water Volume Data

No.	Variables	Units	2001	2002	2003	2004	2005
1.	Maximum Daily treatment	m3	902,316	1,042,396	1,057,550	1,088,799	1,114,227
2.	Water produced	m3/year	304,949,840	346,917,590	343,946,396	362,249,935	372,428,409
3.	Water abstract	m3/year	307,090,000	328,530,000	294,740,000	322,150,000	345,230,000
4.	Imported treated water	m3/year	Nil	25,859,219	35,132,252	37,623,870	39,599,670
5.	Billed metered consumption	m3/year	41,615,351	39,670,187	42,870,318	44,313,012	46,470,745
6.	Billed unmetered consumption	m3/year	87148468	107,381,451	102,971,764	108,631,314	109,061,122
7.	Billed authorized consumption	m3/year	130,998,395	149,805,008	148,482,384	155,729,744	158,328,306
8.	Unbilled metered consumption	m3/year					
9.	Unbilled unmetered consumption	m3/year	1,096,248	1,060,586	1,137,765	1,177,461	1,231,680
10	Water losses	m3/year					
11.	Non revenue water	m3/year					347,179,110.98

- Assumptions:**
1. Unaccounted for Water assumed to be 55%
 2. Illegal connections to be 2.5 % of connections

Section B – Personnel Data

No.	Variables	Units	2001	2002	2003	2004	2005
1.	Management and support personnel	No					929
2.	Financial and commercial personnel	No					337
3.	Customer service personnel	No					235
4.	Technical services personnel	No					2437
5.	Total training time	Days			209	224	1118
6.	Normal work	Hour					

Section C – Physical Assets

No.	Variables	Units	2001	2002	2003	2004	2005
1.	Impounding reservoirs capacity	m3	68,704,545	68,704,545	68,704,545	68,704,545	68,704,545
2.	Transmission & distribution storage tanks capacity	m3					3,805,000
3.	Daily treatment capacity	m3					1,057,135
4.	Pumping stations	No					
5.	Mains length	km	*	*	*	*	*
6.	Cast iron mains	km	*	*	*	*	*
7.	Ductile iron mains	km	22.853	14.284	10.288	7.718	14.200
8.	Steel mains	km	0.052	1.502			
9.	Asbestos cement mains	km	*	*	*	*	*
10.	Polyethylene mains	km	*	*	*	*	*
11.	Polyvinyl chlorine mains	km	87.169	90.655	125.717	100.00	117.786
12.	Concrete mains	km	*	*	*	*	*
13.	Other material mains	km	*	*	*	*	*
14.	Service connections	No	248,835	253,992	263,173	268,698	277,289

* No longer in use since 2000

Section D – Operational Data

No.	Variables	Units	2001	2002	2003	2004	2005	
1.	Pumping energy consumption	Wh			143,180,426	155,220,084	181,019,878	
2.	Permanent vehicles	No		248	268	273	248	
3.	Service connection rehabilitation	No	227	357	222	148	235	
4.	Mains failures	No	9,484	13,736	11,495	11,332	12,654	
5.	Service connection failures	No	31,777	37,437	33,806	33,603	33,988	
6.	Time system is pressurized	h						
7.	Interruptions	No	769	503	418	2,232	2,663	
8.	Industrial customer meter reading frequency	No/meter/year	Monthly Except for Pt. Lisas which is read forth nightly					
9.	Meter replacement	No						
10.	Water quality tests performed	No	63,382	42,436	24,656	24,707	28,446	
11.	Microbiological tests performed	No	18,920	22,809	16,339	14,987	16,021	
12.	Water quality tests required	No	88,668	88,668	88,668	88,668	89,676	
13.	Compliance of microbiological tests	No	3,6405	42,360	30,446	27,679	28,971	

Section E – Demography and Customer Data

No.	Variables	Units	2001	2002	2003	2004	2005
1.	Households and businesses supplied	No	247,839	251,964	262,153	267,194	274,707
2.	Buildings supplied	No	1096796	1119905	1161144	1185830	1224148
3.	Resident population	No	1,119,758	1,142,964	1,184,279	1,209,141	1,247,801
4.	Customer meters	No	43,254	43,390	43,702	43,937	44,554
5.	Residential customer meters	No	16,619	16,583	16,565	16,605	16,808
6.	Industrial customer meters	No	1,301	1,319	1,355	1,391	1,395

Section F – Quality Service Data

**

No.	Variables	Units	2001	2002	2003	2004	2005
1.	Population supplied	Persons	1,072,188	1,096,700	1,134,585	1,159,290	1,197,603
2.	Population supplied with service pipes	Persons	794,214	822,564	864,900	893,331	936,432
3.	Population served by public taps or standpipes	Persons	277,974	274,136	269,685	265,959	261,171
4.	New connections within a target time	No	2,681	3,080	3,515	3,016	4,230
5.	New connections requested	No					
6.	Connections repaired within a target time	No					
7.	Connections repaired	No	24,440	30,264	26,811	37,023	26,119
8.	Service complaints	No	80,514	47,109	39,544	49,665	79,292
9.	Pressure complaints	No	2,679	1,969	2,585	1,619	2,520
10.	Continuity complaints	No	80,514	47,109	39,544	49,665	79,292
11.	Water quality complaints	No	910	873	1,200	483	997
12.	Complaints on interruptions	No	80,514	47,109	39,544	49,665	79,292
13.	Billing complaints	No	8,151	9,369	8,509	10,841	11,315
14.	Other complaints and queries	No	85,043	88,771	99,232	113,568	119,096
15.	Written responses	No					
16.	Written complaints	No	**	**	155	507	2,041

Collation of data commenced in 2003

Section G - Financial Data

No.	Variables	Units	2001	2002	2003	2004	2005
1.	Annual costs	US\$/year	123,231	133,144	154,121	189,622	205,518
2.	Annual capital costs	US\$/year	47,610	47,336	52,549	55,227	61,548
3.	Operational costs	US\$/year	34,174	47,315	61,829	74,192	74,950
4.	Internal manpower costs	US\$/year	41,542	38,150	39,743	60,202	69,020
5.	Energy costs	US\$/year	6,540	6,749	7,128	7,461	8,906
6.	Annual depreciation costs	US\$/year	19,251	12,493	12,168	11,426	9,359
7.	Interest expenses costs	US\$/year	2,292	3,815	6,857	8,025	6,119
8.	Annual revenue	US\$/year	59,514	58,864	60,140	64,080	67,589
9.	Operating revenues	US\$/year	59,134	58,839	60,125	64,020	67,482
10.	Sales revenues	US\$/year	59,134	58,839	60,125	64,020	67,482
11.	Interest income	US\$/year	380	26	15	60	107
12.	Net interest	US\$/year	1,912	3,789	6,842	7,965	6,012
13.	Annual investments in tangible assets	US\$/year					
14.	Annual investments for new assets	US\$/year					
15.	Annual investments for assets replacement	US\$/year					
16.	Capitalized cost of self-constructed assets	US\$/year					

17.	Year-end accounts receivable from drinking water	US\$/year	17,347	17,058	14,717	9,929	6,126
18.	Cash flow	US\$/year	30,596	54,454	80,633	105,838	124,391
19.	Total debt	US\$/year	421,131	526,507	635,496	776,077	909,008
20.	Current assets	US\$/year	28,767	32,521	38,796	36,150	70,126
21.	Capital employed (Total assets)	US\$/year					
22.	Long term liabilities	US\$/year	327,890	387,948	466,912	543,706	678,078
23.	Current liabilities	US\$/year	93,242	1,38559	168,584	232,371	230,930
24.	Net operating income	US\$/year	35,454	39,093	53,599	81,741	85,739
25.	Net income	US\$/year	63,813	73,936	93,981	125,542	137,929
26.	Net current assets	US\$/year	203,603	192,097	185,630	148,077	203,398
27.	Inventories	US\$	848,643.67	1,632,779.92	2,376,046.70	1,284,207.71	519,4313.33

Baseline Explanatory Data – Wastewater

Section A – Environmental Data

No.	Variable	Units	2001	2002	2003	2004	2005
1.	Wastewater treated	m3	41731325.55	42730328.6	42733331.69	47432342.78	67434349.92
2.	Sludge produced in WWTP	tons	5300	5400	5400	6000	8700

Item no. 2:r Data only for Trinidad, no measuring equipment in Tobago.

Section B – Personnel Data

No.	Variable	Units	2001	2002	2003	2004	2005
1.	WWT personnel	No.	71	71	74	73	74
2.	Sewer system personnel	No.	61	61	60	59	60
3.	Technical services personnel	No.	4	4	5	16	16
4.	Operation and maintenance personnel	No.	118	118	123	134	134
5.	Vaccinated personnel	No.	127	127	n/a	n/a	140
6.	Training Time	Hour	12	10	13	18	21
7.	Normal work	Hour	216200	216200	2304000	241040	235800

Item 6: Data is for Tobago only.

Section C – Physical Assets Data

No.	Variable	Units	2001	2002	2003	2004	2005
1.	Total sewer length	km	419	419	438	568.8	573
2.	Wastewater system pumping stations	No.	26	26	27	63	65
3.	Sewer system pumping stations	No.	19	19	19	29	31
4.	Manhole chambers	No.	6292	6301	6610	8518	8524
5	Connected Properties	No.	40961	42380	41615	59398	60281
6	Sewer Connections	No.	41000	43000	42000	60000	61000

Item 5 & 6: Data is for Trinidad only.

Section D – Operational Data

No.	Variable	Units	2001	2002	2003	2004	2005
1.	Sewer inspection	km	121.8	152.6	104.1	84.8	204.6
2.	Sewer cleaning	km	150.5	200.7	103	83.5	203.6
3.	Manhole chamber inspection	No.	13309	12312	15316	10321	18307
4.	Power failures	Hour	410	615	313	312	417
5.	Sewer replacement	km	2	2	0.51	1.52	1
6.	Sewer and joints repair	No.	47	52	36	28	47
7.	Manhole chamber replacement, renewal, renovation or repair	No.	228	204	247	69	96
8.	Manhole covers replacement	No.	18	10	8	6	9
9.	Service connection replacement or renewal	No.	8	7	6	13	8
10.	Pump replacement	KW	25	250	50	600	150
11.	Sewer blockages	No.	500	340	320	740	700
12.	Flooding from sanitary sewers	No.	14	16	11	11	11
13.	Sewer collapses	No.	13	25	15	12	15
14.	Wastewater quality tests carried out	No.	2656	1872	884	1127	2757
15.	BOD tests carried out	No.	781	598	363	358	736
16.	TSS tests carried out	No.	927	634	257	379	992
17.	Other wastewater quality tests carried out	No.	948	640	264	390	1029
18.	Wastewater quality tests required	No.	2760	2760	2760	2760	3540
19.	BOD tests required	No.	552	552	552	552	708
20.	TSS tests required	No.					
21.	Other wastewater quality tests required	No.	1656	1656	1656	1656	2124
22.	Permanent vehicles	No.	-	29	28	27	27

Section E – Demography and Customer Data

No.	Variable	Units	2001	2002	2003	2004	2005
1.	Resident population	Inhab.	245,000	245,000	250,000	320,000	325,000
2.	Resident population served by WWTP	Inhab.	245,000	245,000	250,000	320,000	325,000
3.	Resident population not served	Inhab.	1,055,000	1,055,000	1,050,000	980,000	975,000

Section F – Quality of Service Data

No.	Variable	Units	2001	2002	2003	2004	2005
1.	Collected sewage	m3	41,300,000	42,300,000	42,400,000	47,000,000	67,000,000
2.	New connections established	No.	3,938	6,591	5,699	5,729	5,839
3.	New service connections establishment time	Day					
4.	Connections repaired	No.					
5.	Connections repair time	Day					
6.	Total complaints	No.					
7.	Blockage complaints	No.					
8.	Flooding complaints	No.					
9.	Customer account related complaints	No.					
10.	Other complaints	No.					
11.	Responses to complaints	No.					
12.	Traffic disturbances	No.					

Section G – Economic and Financial Data

No.	Variable	Units	2001	2002	2003	2004	2005
1.	Total revenues	US\$000	4147.514	4447.568	4188.104	4685.771	5740.571
2.	Total operating revenues	US\$000	4147.514	4447.568	4188.104	4685.771	5740.571
3.	Service revenues	US\$000	4147.514	4447.568	4188.104	4685.771	5740.571
4.	Total costs	US\$000	9122.392	8559.812	9493.341	12308.64	13606.47
5.	Capital costs	US\$000	2538.426	1128.121	660.9596	622.1896	1087.335
6.	Operational costs	US\$000	2971.695	4114.342	5376.44	6451.502	6517.374
7.	Internal manpower costs	US\$000	3612.33	3317.371	3455.886	5234.997	6001.715
8.	Depreciation costs	US\$000	2538.426	1128.121	660.9596	622.1896	1087.335
9.	Interest expenses costs	US\$000			n/a	n/a	n/a
10.	Interest income	US\$000			n/a	n/a	n/a
11.	Net interest	US\$000			n/a	n/a	n/a
12.	Investment in tangible assets	US\$000					
13.	Investment for new assets and reinforcement of existing assets	US\$000					
14.	Investment for assets replacement and renovation	US\$000					
15.	Capitalized costs of self-constructed assets	US\$000					
16.	Accounts receivable	US\$000			n/a	n/a	n/a
17.	Cash-flow	US\$000			n/a	n/a	n/a
18.	Total debt	US\$/000 year			n/a	n/a	n/a
19.	Current assets	US\$000			n/a	n/a	n/a
20.	Capital employed (Total assets)	US\$/000 year					
21.	Inventories	US\$000	n/a	N/a	n/a	n/a	n/a
22.	Long term liabilities	US\$/000 year			n/a	n/a	n/a
23.	Current liabilities	US\$000			n/a	n/a	n/a
24.	Operating income	US\$/000 year	(4974.94)	(4112.27)	(5305.18)	-7622.92	-7865.85
25.	Net income	US\$/000 year	(4974.94)	(4112.27)	(5305.18)	-7622.92	-7865.85