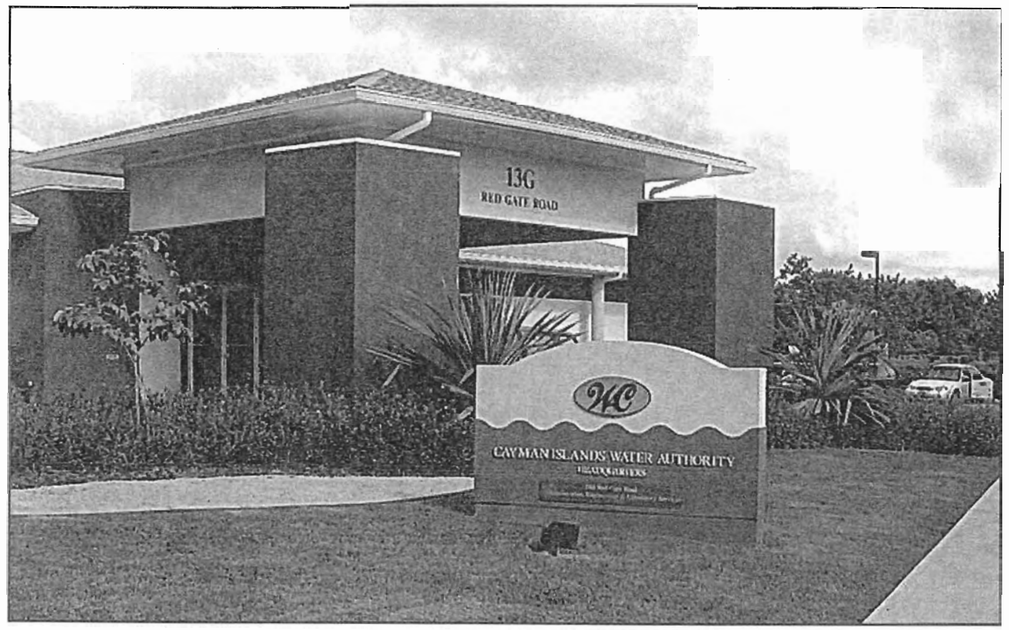
THE WATER AUTHORITY OF THE CAYMAN ISLANDS



ANNUAL REPORT 1998

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The Ministry of Agriculture, Communication, Environment, and Natural Resources

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Chairman's Report

The Year 1998

1998 was my first full year as Chairman of the Water Authority, and I must say it was a very busy year. In June the Authority broke ground on the East End Water Supply Project, which will provide piped water from Frank Sound Road, through my home district of East End, up to Morritt's Tortuga Club. The Water Authority Board has always been keenly aware that East End receives the least amount of rainfall in Grand Cayman, and a reliable and healthy supply of water has always been a struggle for residents. This project was already in the design stage when I took over as Chairman of the Water Authority, and I am very pleased to continue to support the Authority's long term vision to provide a safe and reliable source of water to all residents of the Cayman Islands.

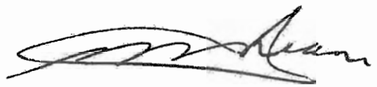
The highlight of 1998 for the Water Authority was the completion of the new Corporate Offices and Laboratory on Red Gate Road in George Town. The new facility provides much needed parking for customers, additional office space for staff, a spacious and convenient customer service and cashier area, and a state-of-the-art water quality laboratory. Construction of the building was completed in October, after a slight delay due to the passing of Hurricane Mitch, and the Authority relocated offices from the Tower Building in November. The move went extremely well and I offer my sincere thanks to the staff for their careful planning and hard work.

The Authority commissioned a second desalination plant in Grand Cayman, at the Lower Valley Water Works site in March 1998. The plant was built by Ocean Conversion (Cayman) Ltd. ("OCL") under a seven year lease purchase and operating agreement. By September it was already clear that continued growth in the demand for water necessitated that the production capacity of the new plant was expanded. At the end of the year work was underway to double the capacity of the new plant under the existing contract with OCL.

The Authority continued to strengthen financially despite increased administrative expenses (23% from 1997) resulting from the new administration building, higher pension and health insurance costs, and additional administrative staff. Total revenue increased by 8% from 1997. Operating expenses also increased by a reasonable 8%, most of which was due to higher water production costs required by higher sales. Despite the higher administrative costs, the Authority's net profit increased by a modest 1.7% from 1997.

The Authority continued to carry out its statutory functions with regard to protection of groundwater resources through monitoring of quarry operations, groundwater abstraction, and effluent disposal.

I look forward to the continued success of the Water Authority in the future, and appreciate the time and effort put in by each and every person whose contributions have made the Authority a model organization in the corporate community.



Hon. John B. McLean OBE MLA JP
Chairman

1. GENERAL INFORMATION

The Water Authority of the Cayman Islands is a statutory body, which was incorporated through the Water Authority Law, 1982 (Law 18 of 1982). The primary mission of the Water Authority is to provide public water supply and sewerage to the Cayman Islands, and to protect and manage the water resources of the country.

Over the past sixteen years the Water Authority has carried out a number of projects to map and monitor the groundwater resources of the country. In addition the Authority constructed the country's first public sewerage system in the West Bay Beach resort area, and constructed public water supply systems on both Grand Cayman and Cayman Brac. Expansion of these systems is on-going.

1998 Water Authority Board Members

Chairman:	Hon John B. McLean OBE MLA JP
Members:	Permanent Secretary, A, C, E, NR Mr. Kearney Gomez JP
	Senior Assistant Secretary, A, C, E, NR Mr. Timothy Hubbell
	Deputy Financial Secretary, Mr. A. Joel Walton JP
	Hon. Truman Bodden OBE MLA JP Mr. Harry Chisholm JP Mr. Richard Flowers Mr. Stanley Gourzong Mr. Brainard Watler Mr. Otto Watler Mr. Jerry Wood
Secretary:	Director of the Water Authority Mr. Frederick McTaggart

The Water Authority is managed by a Chief Executive Officer (or Director) on permanent employment terms, and a Board of Directors, which is appointed every two years by the Governor of the Cayman Islands. The Board generally meets once every two months and six meetings were held in 1998.

New Water Authority Headquarters Building– 13G Red Gate Road, George Town, Grand Cayman

The Authority's new headquarters were completed in October 1998 and its administrative and engineering staff relocated from the Tower Building to the new offices at 13G Red Gate Road, George Town in November. The laboratory was also moved into the new accommodations at that time. The new building offers more convenience to customers as well as additional office space and equipment for staff.

2. FINANCE

General Observations

The Water Authority maintained a positive financial position in 1998, despite increases in administrative expenses. Operating revenue increased by 9% from 1997, with an overall increase in revenue (including licensing and other income) of 8% from 1997. Operating expenses increased by 8% from 1997, with the largest part of that increase attributed to higher water purchase costs due to increased water sales. Administrative expenses increased by 23% from 1997 due mainly to increases in health insurance costs, pension costs and staff training. A significant percentage of staff, who were previously not receiving pension benefits, were required to enrol in a pension plan in mid-1998 due to changes in local legislation.

The Authority's operating profit increased by 8.5% from 1997, and net profit increased by a modest 1.7% (which reflects the higher administrative expenses as explained above).

Loans

The Water Authority entered into an agreement with CIBC Bank and Trust Company (Cayman) Limited. to provide $1.6 million in financing for the construction of the new Administrative Building on Red Gate Road. The new building and property were

offered as collateral for the loan. At year's end the loan had not been drawn down.

The Water Authority continued to make payments on existing loan facilities to CIBC Bank and Trust Company (Cayman) Limited, Caribbean Development Bank, the Cayman Islands Government, Ocean Conversion (Cayman) Ltd., and a small project loan. Total debt repayments for 1998 equalled $2,238,073.

Government Contribution

The Water Authority committed to pay $700,000 to the Cayman Islands Government as a dividend for 1998.

1998 Public Water Supply Rates

Group	$ per cubic meter
Groundwater	$2.33
Desalinated water Grand Cayman	
Residential under 12 m^3/month	$4.01
Residential over 12 m^3/month	$4.81
Commercial	$4.81
Public Authority	$4.35
Truck	$4.01
Desalinated water Cayman Brac	
Piped water (all customer types)	$5.60
Truck	$7.00

1998 Public Sewerage Rates

Group	SFU's per ft^2	SFU per Unit
Store	0.0275	
Office	0.0375	
Beauty salon, surgery, bar, club, water sports	0.0475	
Food handling, garage, photo lab	0.0575	
Schools, colleges and technical training facilities	0.0375	
Public swimming pools, public sports stadia and public parks:		
Toilet, plus		20
Urinal, plus		50
Wash basin.		20
Residential and Hotels		
Residential bedroom		6
Residential bathroom		14
Hotel room		18
Rate per SFU	$1.48 per month	

Water and Sewerage Rates

Rates for water supply and sewerage service remained unchanged from March 1995. Additional sewerage rate categories were added to the Water Authority Regulations in order to accommodate the possible integration of the Walkers Road Government Schools, Community College of the Cayman Islands and Truman Bodden Sports Complex into the public sewerage system.

3. HUMAN RESOURCES

The Authority's staff complement at the end of the year were as follows:-

Water Authority Staff Complement 1998

Director	F W McTaggart BSc
Deputy Director	G L Frederick-van Genderen PhD
Financial Controller	G Glidden BA CPA
New Works Engineer	T van Zanten MSc Eur Eng MCIWEM
Water Resources Engineer	H-J van Genderen MSc Eur Eng
Information Systems Manager	J Bodden BA
Operations Manager	T Hill Master Plumber
Resident Engineer	A Reid BSc
Resident Engineer	C Reid BSc
Water Resources Technologist	R Marsden Chem Tech Diploma
Assistant Financial Controller	S Glidden BA
Sr Accounting Officer	L Lawrence BA CPA
Administrative Assistant 1	L Wood
Accounts Receivable Officer	B Augero
Accounts Payable Officer	J Nicholas
Debt Collection Officer	S Ebanks
Procurement Officer	D Manderson
Cashier	B Ebanks
Cashier	H Ebanks
Sr Customer Service Representative	V Powery
Customer Service Representative	Z Bush-Ramos
Stores Clerk	K Connor
Messenger	K Powell
Connections Supervisor	B Whittaker AAs
Connections Assistant	A Archibold
Meter Reader	C Morgan
Meter Reader	J Parchman
Meter Reader	M Smith
Meter Reader	D Goddard
Senior Laboratory Technologist	B MacAree BSc MCIWEM
Laboratory Technician	M Martinez-Ebanks BSc
Laboratory Technician	W Warren BSc
Laboratory Assistant	N Powery
Draughtsman	G Welcome
Trainee Draughtsperson	I Webb
Trainee Draughtsperson	J Melville
Engineering Technician-Water Resources	V Rankine
Operations Manager-Cayman Brac	B Banks
Operator-Cayman Brac	C Scott
Executive Officer-Cayman Brac	K Lazzari
Executive Officer-Cayman Brac (Temp)	K Pietras
Superintendent-New Works	J Hunter
Superintendent-Sewerage	P Echenique
Operator-Heavy Equipment *New Works*	W Watler
Operator-Heavy Equipment *Operations*	B Watler
Operator-Heavy Equipment *Operations*	D Barnes
Operator-Heavy Equipment *Operations*	D Smith
Reinstatement Foreman	V Whittaker
Operator-Sewerage	L Tivy

Water Authority Staff Complement 1998 (cont.)

Operator-Sewerage	S Campbell
Water Supply Gang Leader	A Bennett
Water Supply Gang Leader	T Bodden
Pipe Layer	G Riapira
Pipe Layer	L Ramirez
Assistant Operator	C Ramoon
Assistant Operator	D Myles
Assistant Operator	V Grant
Assistant Operator	C Ebanks
Assistant Operator	E Hydes
Assistant Operator	M Powery
Assistant Operator	G Manning
Assistant Operator	G Smith
Labourer-Cayman Brac	D Martin
Labourer	H McField
Labourer	K Johnson
Labourer	G Kelly
Labourer	J Moore
Labourer	R Grant

The following changes in personnel occurred during the year:-

- J Bodden was employed as the Authority's Information Systems Manager with responsibility for the new department of Information Systems.
- L Lawrence was employed as Sr Accounting Officer.
- R Marsden joined the Authority as Water Resources Technologist with the Water Resources department.
- W Warren joined the Authority as a Laboratory technician after completing her bachelor's degree in biology.
- B Augero joined the Authority as Accounts Receivable Officer.
- T Bodden was employed as Water Supply Gang Leader with the Operations department.
- J Melville was employed as a Trainee Draughtsperson in the New Works department.
- H Ebanks was employed as a Cashier in the Financial Administration department.
- D Barnes was employed as Heavy Equipment Operator with the Operations department.
- G Manning and G Smith joined the Authority as Assistant Operators in the Operations department.
- J Moore, R Grant and D Martin joined the Authority as Labourers in the New Works, Operations and Cayman Brac departments, respectively.
- K Pietras was temporarily employed as Executive Officer-Cayman Brac.
- C McCoy left the Authority to pursue other interests.
- T Douglas left the Authority to work in the private sector.
- T Whittaker left the Authority to pursue other interests.
- J Smith left the Authority to work in the private sector.
- C Johnstone, E Solomon and C Solomon left the Authority to pursue other interests.
- B Martinez, C Seymour and C Barnes left the Authority in 1998.

During the year, the following employees were promoted:

- B Banks' post of Superintendent was upgraded to Operations Manager-Cayman Brac.
- C Scott was promoted to Operator-Cayman Brac.
- P Echenique was promoted to Superintendent-Sewerage with the Operations department.
- I Webb was promoted from Receptionist to Trainee Draughtsperson.

At the end of the year the total staff complement stood at 68 of which 71% are Caymanian. Sixty-seven percent of the non-Caymanian staff are married to Caymanians or have Caymanian family connections.

Pensions

With the introduction of the National Pensions Law in the Cayman Islands, the Water Authority-Cayman Board of Directors made the decision in 1998 to ensure that all employees are provided with pension benefits. Previously only Caymanian employees were eligible to join the Public Service Pension Scheme leaving permanent residents and others with Caymanian

connections without a pension benefit. The relevant employees were consulted and the majority requested to join the British Caymanian Pension Plan. All new employees are enrolled in the British Caymanian Plan.

The Authority is cognisant of the fact that the employment market in Cayman is highly competitive and consequently, it is beneficial to have compensation benefits that can compete in the current employment climate. The Authority's most valuable assets are its human resources and the provision of pension benefits can only assist in making the Authority attractive to potential employees.

Restructuring of Operations Department

As the Authority continues to expand it became evident in 1998 that the organisational structure of the Operations Department required reviewing. A restructuring plan was prepared by the Deputy Director and accepted by the Water Authority's Board of Directors in the middle of the year.

The functions of the Operations Department will be split into three separate Divisions. These Divisions will be dedicated to specific operational functions of the Authority. Thus, creating a structure that will meet the needs of the Water Authority-Cayman for the provision of excellent quality of service to its customers and the Authority itself. It is expected that the newly formed Divisions will move from incident-driven to preventative approaches and to place more emphasis on service to customers.

Taking into consideration that the responsibilities of the department are numerous, widely varied and critical to the overall performance of Authority, the following four major changes are planned:

1. Establish the Cayman Brac section as an Operations Division in its own right, with an Operations Manager answering directly to the Director.

2. Combine all engineering expertise into one department and place responsibility for meeting the engineering requirements of the Water Supply and Wastewater Divisions with the New Works Department (to be renamed Engineering Services Department).

3. Responsibility for meter reading, disconnections, reconnections and customer complaints are returned to the Financial Administration Department. The meter reading section will not be required to install meters, carry out meter testing or repairs, this will be delegated to the Water Supply Division.

4. Split the remaining functions of the Operations Department into two separate entities with clearly distinct functions and duties, the Water Supply Division and the Wastewater Division. Each division will be managed by an Operations Manager who will report to the Director and consult with the Engineering Services Department as required.

By the end of 1998 efforts were already underway to effect the changes recommended in the plan. With the hiring of an Operations Manager-Wastewater in early 1999, the majority of the restructuring will be completed. The Authority expects that these changes will enable it to ensure improved customer service as well as to continue to protect and maintain its infrastructure in order to provide safe, affordable drinking water and proper wastewater collection, treatment and disposal.

Information Systems Department

In 1998, the post of Information Systems Manager was created to address the Authority's rapidly growing needs in the area of computer and information technology. The

Authority retained the services of a person with the relevant experience to manage and run this new department within the Authority.

Awards

In 1998, the Authority recognised employees in the following categories: the prestigious Chairman's Award, the "Employee-of-the-Quarter" and the ten-year service award.

Chairman's Award-1998

The distinguished Chairman's Award for 1998 was awarded to Mr Burnstein Banks. After retiring from going to sea, Mr Banks began working in the Operations Department of the Authority in 1990 as Superintendent-Cayman Brac. He is responsible for the entire operations in Cayman Brac. His duties are varied and include operating the reverse osmosis plant and administrative responsibility for the office in the Brac. In 1998, his post was upgraded to Operations Manager-Cayman Brac. He is a very hardworking employee and is willing to do whatever it takes to get the job done. Mr Banks is well respected by his colleagues for his hard work and loyal commitment to the Authority.

Ten and Fifteen Years of Service Award-1998

At the annual Christmas dinner, several employees were recognised for their ten or more years of continuous service to the Authority. These were:

15 Years of Service

Mr Clydeton Morgan, Meter Reader

10 Years of Service

Dr Gelia Frederick-van Genderen, Deputy Director
Mr Hendrik-Jan van Genderen, Water Resources Engineer
Mr Samuel Campbell, Operator-Sewerage
Mr Vincent Grant, Assistant Operator
Mr Calvin Ramoon, Assistant Operator

Employee-of-the-Quarter Awards-1998

January-March 1998

The first quarter award was given to Marcela Martinez-Ebanks, Laboratory Technician, in recognition of her commitment and dedication to the work in the laboratory under very demanding circumstances.

April-June 1998

The second quarter award was presented to Jack Hunter, New Works Superintendent, for his excellent performance and hard work during the Walker's Road Schools' Project.

July-September 1998

The third quarter award was presented to Vernon Whittaker, Reinstatement Foreman, for his hard work and dedication while carrying out his duties in the Operations Department.

October-December 1998

The fourth quarter award was granted to Antoney Reid, Resident Engineer, for his outstanding coordination of the Water Authority's move to its new Headquarters on Red Gate Road.

Training

Training remains an important aspect of the Authority's commitment to the development of its human resources. Employees are encouraged to participate in local and regional seminars, courses, workshops and conferences. Full time education overseas is also encouraged. The Authority's Board approved the post of Training Coordinator in 1998. However, the Authority was unable to fill the post in 1998 due to lack of physical space at the office in the Tower Building. This post will be filled very early in 1999.

The Authority continued its participation in the Caribbean Basin Water Management Programme (CBWMP), a training programme for water utilities in the Caribbean region. Institutional support for the programme continues to be provided by the Caribbean

Environmental Health Institute (CEHI), St Lucia. In 1998, with renewed vision and mission, CBWMP hired an Executive Director to lead its evolution into a dynamic centre for human resource development in water related industries.

The Authority was able to participate in the following CBWMP training activities:

- P Echenique attended the Water Works Operations/Sewage Plant Operations & Maintenance Course at the University of Technology, Jamaica 20 July-28 August 1998.
- B MacAree and R Marsden attended the course on Transforming Data to Information for Decision-Making in Antigua.
- A Reid attended a Technical Seminar on Value for Engineering in Trinidad. This seminar was facilitated and co-sponsored by - Century Eslon.

Several Authority employees enrolled in a variety of courses at the Community College of the Cayman Islands (CCCI):

- Two employees enrolled and completed the English for Business Communications Levels 1 & 2 course.
- Two employees enrolled and completed the Bookkeeping & Accounts Level 1 course.
- One employee completed the English as 2nd Language course.
- One employee completed the Basic Mathematics course.
- Four employees completed the Introduction to Computers course.
- One employee completed a course on Internet Introduction.
- One employee completed the Introduction to Windows 95 course.
- Seven employees participated in the Excel'97-Introduction course.
- One employee participated in the Excel'97-Intermediate course.
- Three employees participated in the Word '97-Introduction course.
- Four employees participated in the Word '97-Intermediate course.
- Two employees participated in the Access'97 course.
- J Nicholas completed her final exams with the ATT diploma programme at the CCCI.

Other training received by Authority employees:

- Five of the Authority's middle managers and supervisors participated in a Senior Management "Trans4mation" Programme facilitated by UK Consultants – Plus Consulting and Quirk & Company.
- F McTaggart and G Frederick-van Genderen attended a presentation by Ruth Richardson on the practice of Modern Public Management - the New Zealand Experience.
- Fourteen of the Authority's senior managers, middle managers and supervisors participated in One to One Feedback-Management Skills Assessment Sessions facilitated by Ros Taylor of Plus Consulting. This assessment activity is a follow-up from the Trans4mation programme and is used as a positive tool in developing employee's managerial and supervisory skills.
- B Whittaker successfully completed a yearlong certificate programme in Supervisory Management administered by Napier University, UK and sponsored by the PTU.
- I Webb and J Melville completed the AutoCAD-Basic course. J Melville also completed the AutoCAD-Intermediate course. The MicroCAD Institute facilitated both courses.
- T V Zanten, H-J v Genderen, C Reid, and G Welcome participated in the AutoMAP course facilitated by MicroCAD Institute.

- J Hunter attended the Employee Assistance Programme (EAP) Supervisors' Refresher Course.
- I Webb attended a Telephone Etiquette Course facilitated by Motivational International.
- Z Ramos attended a Customer Service workshop presented by Motivational International.
- Eight employees attended 1st Class Employee training sessions facilitated by Corinne Glasgow of First Place, Ltd.
- P Echenique participated in a one-day Communication Skills workshop facilitated by the PTU.
- B MacAree attended a QA/QC course featuring the DR4000 spectrophotometer at the HACH Training Center in Loveland, Colorado.
- W Warren and M Martinez-Ebanks attended a Wastewater analysis workshop at the HACH Training Center in Loveland, Colorado.
- N Powery attended a Microbiological analysis workshop at the HACH Training Center in Loveland, Colorado.
- The Sr Laboratory Technologist conducted various in-house training exercises in chlorine analysis and the use of new monitoring instruments for Operators and Meter Readers.

The Authority continues to assist school groups and other organisations with educational tours of the laboratory and operation facilities.

4. QUALITY CONTROL AND RESEARCH

Laboratory

In late 1998, the laboratory moved into its new facilities in the Water Authority Headquarters on Red Gate Road. The new accommodations are larger and have excellent facilities.

The major monitoring programmes of the laboratory continue to be:

- Quality control of the piped public water supplies (Grand Cayman and Cayman Brac) and East End reservoir and wellfield;
- Monitoring of Lower Valley and East End groundwater resources;
- Research and monitoring of the West Bay Beach sewerage system and sewage treatment works;
- Coastal water monitoring in the Hog Sty Bay area;
- Providing water quality monitoring services for other Authority projects or research as required;
- Providing the public with laboratory services for water analyses.

Monitoring Programmes

Most of the work carried out by the laboratory comprises of comprehensive monitoring programmes related to the Authority's operations. The Authority's operations include piped water supplies (George Town to Frank Sound Junction; Cayman Brac), East End reservoir and wellfield, West Bay Beach sewerage and wastewater treatment works, and customer inquiries.

Seventy-eight percent of all samples analysed in 1998 related directly to the Authority's operations. Samples analysed for various Government departments accounted for 9%. The remaining 13% were private requests; this is double the percentage in 1996. The total number of samples processed by the laboratory in 1998 was 2805.

The online monitoring system for chlorine residuals, pH and electrical conductivity (EC) for the Grand Cayman public piped water supply system installed by the Operations department in 1997 did not function satisfactorily in 1998. This will be reviewed in 1999. The Authority intends to undertake a project to implement SCADA systems for

monitoring of operational and performance data.

Public Piped Water Supply-Grand Cayman

In March 1998, the OCL reverse osmosis plant was commissioned and commenced production of desalinated water in Lower Valley.

Monitoring of the distribution system continued with regular testing of chlorine residuals, total and faecal coliform bacteria, heterotrophic plate count bacteria (HPC), EC, total dissolved solids (TDS), pH, zinc and orthophosphate at specific sampling points.

Water produced by OCL, at Red Gate Water Works and the Lower Valley Water Works, is tested twice daily for the TDS and pH levels prior to storage in the Authority's reservoirs. Water entering the distribution system is analysed twice daily for TDS, pH and chlorine residuals. Zinc and orthophosphate analyses are carried out weekly. Bacteriological analyses are carried out daily during the working week (Mon-Fri). Monitoring of sample taps within the distribution system are carried out regularly.

Quality of Water entering Distribution System from Red Gate Water Works

Parameters	Mean
Free Chlorine *mg/l*	0.48
pH *units*	7.68
EC *µS/cm*	364
TDS *mg/l*	170
Zinc *mg/l*	0.24
Orthophosphate *mg/l*	0.73
Heterotrophic bacteria, *estimated cfu/ml*	0

All faecal coliform bacteria results were negative.

Quality of Water entering Distribution System from Lower Valley Water Works

Parameters	Mean
Free Chlorine *mg/l*	0.44
pH *units*	7.65
EC *µS/cm*	348
TDS *mg/l*	156
Zinc *mg/l*	0.38
Orthophosphate *mg/l*	1.17
Heterotrophic bacteria, *estimated cfu/ml*	2.0

All faecal coliform bacteria results were negative.

Feedwater samples from the reverse osmosis plants in George Town and Lower Valley were analysed overseas for micropollutants. There were no significant levels of these compounds detected in the feedwaters. Water entering the piped distribution system was also analysed for the presence of micropollutants, and disinfection by-products. The results of the analyses on the distributed water were below the World Health Organisation (WHO) Drinking Water Guideline Values, apart from the result for boron, which was approximately twice as high as the WHO guideline value. Boron is a metal that is naturally present in the feedwater of the reverse osmosis plants and it is assumed that its removal in the reverse osmosis process is poor. The WHO guideline value is based on the allocation of 10% of the total boron intake from drinking water, and there is no evidence of carcinogenicity. The Authority in conjunction with Ocean Conversion Ltd. intends to investigate this issue further in 1999.

Customer queries investigated in 1998 represented 0.09% of all public water supply customers. Written reports were provided to customers, and where necessary, they were advised on the action to take regarding problems encountered on their side of the meter box.

Public Piped Water Supply-Cayman Brac

Monitoring of the Cayman Brac distribution system continued with regular testing of chlorine residuals, total and faecal coliform bacteria, pH, TDS and zinc concentration at specific sampling points.

The TDS and pH of water entering the reservoir from the reverse osmosis plant are tested on a daily basis. Water entering the distribution system is analysed daily for TDS, pH and chlorine residuals. Bacteriological and zinc analyses are carried out weekly. Three sample taps within the distribution system are monitored monthly.

Quality of Water entering Distribution System from West End Water Works

Parameters	Mean
Free Chlorine *mg/l*	0.31
pH *units*	7.60
TDS *mg/l*	177
Zinc *mg/l*	0.54
Heterotrophic bacteria, *estimated cfu/ml*	0.14

All faecal coliform bacteria results were negative.

No significant levels of micropollutants were detected in the feedwater of the Cayman Brac reverse osmosis plant. The results of the analyses for micropollutants and disinfection by-products of the product water were below WHO guideline values, apart from the result for boron, which was found at a similar level as in the product water from the reverse osmosis plants in Grand Cayman.

East End Observation Wells and Wellfield

The Authority monitored 4 observation wells located in the East End lens during the dry and wet seasons of 1998. Two of the wells are in the brackish water zone. The following table summarises the 1998 data:

East End Observation Wells Monitoring Results

	Number of samples with Total coliform bacteria ≥10 cfu/100ml	Number of samples with Faecal coliform bacteria >0 cfu/100ml
Dry Season (Apr)	1	2
Wet Season (Oct)	2	2

The feedwater of the East End reservoir was analyzed overseas for the presence of micropollutants such as heavy metals, pesticides and fuel related hydrocarbons. The product water was analyzed for disinfection by-products such as trihalomethanes and halogenated acetic acids. Laboratory results for micropollutants and halogenated acetic acids were below the WHO guideline values, however the levels of trihalomethanes (THMs) continue to exceed the WHO guideline values. The Authority continues to examine the methods to reduce THMs to within WHO guideline values.

Lower Valley Domestic Wells

Selected domestic wells in the Lower Valley area are tested twice yearly for total and faecal coliform bacteria, TDS, EC, and pH. Analyses were carried out during the dry season (29 wells) and the wet season (28 wells). The 1998 bacteria and salinity data are summarised in the following table:

Lower Valley Domestic Wells Monitoring Results

	Percentage with Total coliform bacteria ≥10 cfu/100ml	Percentage with Faecal coliform bacteria >0 cfu/100ml	Percentage with EC ≥1600µS/cm
Dry Season (Apr)	29	17	38
Wet Season (Oct)	28	18	18

Wastewater Treatment Works

The performance of the waste stabilisation ponds was monitored on a monthly basis. Twelve pumping stations continued to be monitored weekly for electrical conductivity (EC) which is used as an indicator of groundwater intrusion into the sewerage system.

In terms of the overall unfiltered biochemical oxygen demand (BODuf) removal efficiency of the waste stabilisation ponds, there was again significant improvement over the 1997 removals. BOD removal efficiencies for 1998 were the highest since the ponds' first year of operation in 1988. However, faecal coliform removal efficiency remained at just over 2 logs.

Operational Performance of the Sewage Treatment Works

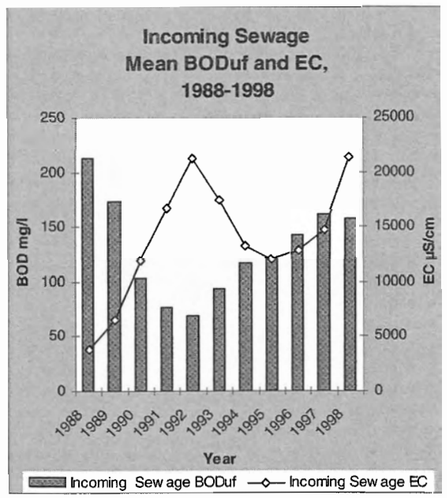
Year	Average BOD-5 day (mg/l) Raw sewage	Final effluent	%age removal	Average Daily Flow (m^3/day)	*Average Raw sewage EC (µS/cm)*
1988	213.0 (g)	13.0 (g)	*94.0*	*728.3*	3787 (g)
1989	174.0 (g)	36.0 (g)	*80.0*	*1611.2*	6551 (g)
1990	103.5 (c)	25.4 (g)	*75.0*	*2898.2*	11955 (c)
1991	76.4 (c)	20.8 (g)	*73.0*	*4116.9*	16749 (c)
1992	68.9 (g)	19.6 (g)	*71.5*	*4843.9*	21282 (g)
1993	94.2 (g)	22.8 (g)	*75.8*	*2954.6*	17462 (g)
1994	117.6 (c)	26.0 (g)	*77.9*	*2979.9*	13303 (c)
1995	121.0 (c)	23.4 (g)	*81.0*	*2936.1*	12106 (c)
1996	142.4 (c)	31.5 (g)	*77.9*	*3232.1*	12907 (c)
1997	161.8 (c)	34.6 (g)	*78.6*	*3542.0*	14564 (c)
1998	122.2 (c)	26.7 (g)	*83.0*	*5249.0*	21229 (c)

NOTE: BOD = Biochemical Oxygen Demand; EC electrical conductivity; g = grab sample; c = 24hr composite sample. Average flows are corrected for flow meter errors.

Operational Performance of the Sewage Treatment Works Average FC (cfu/100ml)			
Year	Raw sewage (g)	Final effluent (g)	%age reduced
1988	4.39×10^6	1.68×10^3	*99.962*
1989	1.62×10^8	2.87×10^3	*99.998*
1990	3.18×10^8	7.30×10^3	*99.998*
1991	2.77×10^6	1.55×10^4	*99.440*
1992	1.52×10^6	5.84×10^3	*99.616*
1993	3.22×10^6	4.26×10^3	*99.868*
1994	9.29×10^7	2.04×10^4	*99.904*
1995	1.38×10^7	2.53×10^4	*99.817*
1996	6.89×10^6	2.75×10^4	*99.601*
1997	4.36×10^6	2.13×10^4	*99.512*
1998	3.46×10^6	1.53×10^4	*99.558*

NOTE: FC=Faecal coliform bacteria; cfu = colony forming units; g = grab sample; c = 24hr composite sample.

The following graph is a comparison of the EC and unfiltered BOD since the commissioning of the West Bay Beach Sewerage System in 1988.



The average salinity of the incoming sewage showed a significant increase in 1998, rising to 31% above the mean levels in 1997. In addition, the average daily flow of wastewater entering the treatment plant increased by around the same percentage, 33%. These results indicate that approximately 1/3 of the flow collected and pumped, is on account of groundwater infiltration. The level of salinity by the end of 1998 reached similar levels as in 1992, prior to major rehabilitation work carried out in 1993. Further evidence is provided in salinity data from the pumping stations, which clearly show that groundwater infiltration is increasing as well. The Authority is aware of several major leaking sewers and will be undertaking a major diagnostic review and repair of the collection system in 1999.

Sludge depth is monitored annually as part of the operational performance monitoring of the sewage treatment works.

The mean sludge depth in facultative pond 1.1 increased by 49% from that of 1997 while facultative pond 1.2 showed a higher increase of 63%.

Both maturation ponds showed increases in mean sludge depth from that measured in 1997. Maturation pond 2.1 increased by 21%, and pond 2.2 increased even higher by 47% over last year's levels. The significant increases in the facultative ponds further reduce the pond volume available to treat the wastewater. Previously the rate of sludge accumulation was considerably lower; the changes experienced in 1998 may be attributed to the increased flows as well as other factors such as the use of the aerators.

Average Sludge Depth in Waste Stabilisation Ponds				
Year	Pond 1.1 (metres)	Pond 1.2 (metres)	Pond 2.1 (metres)	Pond 2.2 (metres)
1990	0.145	0.164	0.054	0.041
1991	0.346	0.294	0.215	0.241
1992	0.385	0.362	0.177	0.217
1993	0.345	0.371	0.303	0.298
1994	0.343	0.345	0.123	0.126
1995	0.318	0.243	0.144	0.140
1996	0.388	0.341	0.162	0.133
1997	0.405	0.365	0.140	0.122
1998	0.605	0.594	0.169	0.179

With the various operational problems relating to salinity and hydraulic loading, the waste stabilisation ponds performed as expected.

George Town Harbour Water Quality Monitoring Programme

The George Town Harbour Water Quality (formerly called, Hog Sty Bay) monitoring programme commenced in 1991 as a joint study between the Water Authority and the Department of the Environment (DoE). The results to date have not identified any significant pollution, however, the programme will continue in order to identify and observe trends.

The location of the main 17 sample points, sampling methods and frequency are outlined in the Water Authority's Annual Report 1992. In March 1998 an additional sample point was added in the Hog Sty Bay area. This was done in order to monitor an area that has in the past been the subject of concern due to the presence of white filamentous algal particles and sulphide odour. All samples were analysed for faecal coliform and enterococci bacteria in addition to various physico-chemical parameters.

The highest average faecal coliform result in 1998 was 4.3 cfu/100ml at sample point 1-additional. The highest individual faecal coliform result obtained in 1998 was 32 cfu/100ml at sample point 3-bottom.

As in 1997, the overall average enterococci bacteria densities in 1998 did not change significantly. The highest average for enterococci was 1.3 cfu/100ml at sample point 5-bottom with the same sample point having the highest individual enterococci result of 16.0 cfu/100ml.

George Town Harbour Water Quality Monitoring Programme Results		
Year	Mean Faecal coliform bacteria (cfu/100ml)	Mean Enterococci bacteria (cfu/100ml)
1991	1.9	3.2
1992	9.8	2.4
1993	19.2	1.4
1994	0.6	0.5
1995	0.4	0.3
1996	2.1	0.5
1997	0.4	0.2
1998	1.0	0.2

Samples were analysed by DoE and the Department of Environmental Health (DEH) for nitrate (NO_3 as N), reactive phosphate (PO_4 as P) and suspended solids (SS). Based on limited information and data available, the concentrations reported are less than literature-derived tolerance levels for coral reefs.

Hog Sty Bay Marine Monitoring Programme Nutrient Analysis *Mean of all results*			
Year	NO_3 as N *(µm/l)*	PO_4 as P *(µm/l)*	SS mg/l
1995	0.42	0.07	3.0
1996	0.42	0.11	1.3
1997	0.31	0.05	2.0
1998	0.33	0.07	1.2

The physico-chemical parameters of the 17 main sample points are as expected for tropical marine coastal waters. Salinity results for sample point 1-additional are generally lower than that of the other 17 samples. This is sample collected at a fissure in the ironshore of the coast and appears to be influenced by the outflow of brackish groundwater containing hydrogen sulphide. The Authority will continue to include this point in the monitoring programme.

Both bacteriological parameters, faecal coliforms and enterococci, are within the United States Environmental Protection Agency and the European Union standards for bathing water for all samples.

Research

The Authority is collaborating with the University of Surrey on further waste stabilisation pond research. The title of the project is "Integrating field monitoring, using biological tracers and a hydraulic model for the optimisation of waste stabilisation pond design for pathogen removal and reuse".

The UK Department for International Development (DIFD) approved funding for the project in 1997. No bacteriophage-related experimental work was carried at the

Authority in 1998, as the new laboratory was not completed until late in the year. Professor B Lloyd and one of his PhD students carried out further tracer studies using a variety of bacteriophages at waste stabilisation ponds in Colombia. Further fieldwork is expected to be carried out in India, Mexico and Grand Cayman in 1999.

Conferences, Papers and Reports

Conferences
Staff of the Water Authority attended the following conference during the year:

D Manderson attended the 7th Annual Conference and Exposition of the Caribbean Water and Wastewater Association (CWWA) held 6-9 October 1998 in Antigua.

Papers
None published in 1998.

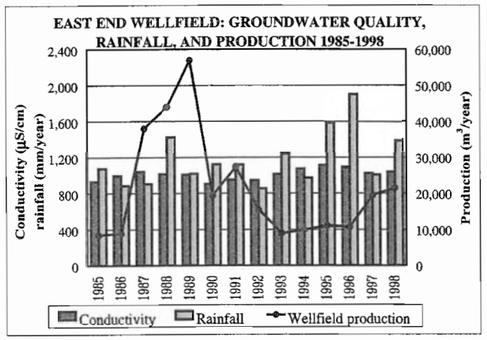
Reports

- Report on Walker's Road Schools' Sewerage
- Recommendations for the Provision of Pension Benefits for Non-Caymanian Employees as Required under The National Pensions Law and Regulations
- A Plan for Restructuring the Operations Department
- Sewage Treatment Works Upgrade - Project Identification Report
- East End Quarry - Quarry Permits and Impacts on East End Fresh Water Lens
- Tarpon Springs - Quarry Permit

5. WATER RESOURCES

Groundwater Monitoring
Since its inception the Authority has collected hydrogeological data from a network of observation wells, piezometers, water level recorders and an island-wide network of rain gauges. In 1998 a pilot project commenced for continuous monitoring of groundwater levels and water quality in four monitoring wells in Lower Valley.

By the end of 1997, monitoring of the possible effects of the new reverse osmosis plant on the Lower Valley lens commenced. The data collected from the 25 monitoring wells that were installed for this purpose indicated that the plant does not have an effect on the fresh water lens.

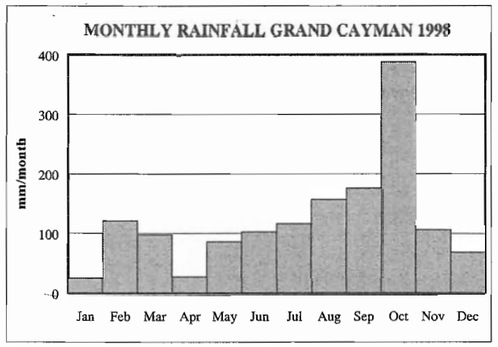


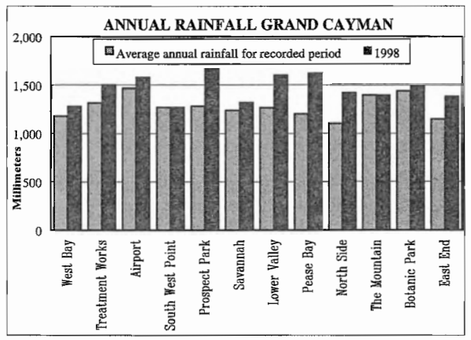
The water quality of each of the ten production wells of the Authority's wellfield in East End is monitored frequently; there were no significant changes in 1998. The electrical conductivity of groundwater pumped from the Authority's wellfield in East End remained fairly stable throughout the year; the average electrical conductivity of the product water from the reservoir was 1,040 µS/cm, and minimum and maximum values were 973 µS/cm and 1,140 µS/cm respectively.

Rainfall Distribution
The Authority has a network of rain gauges throughout Grand Cayman; data are collected by dedicated volunteers. In addition the Mosquito Research Control Unit, the Civil Aviation Authority and the Queen Elizabeth II Botanic Park provide the Authority with information on rainfall.

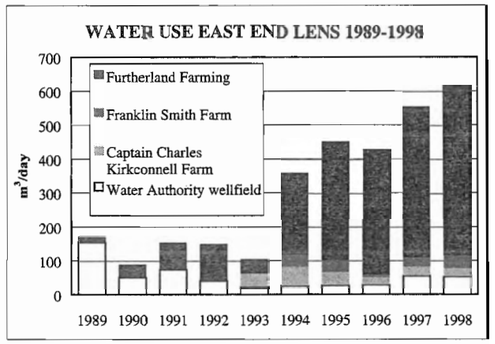
The first part of 1998 was a relatively dry period, marked by low rainfall in the months

of May, June, and July, which are usually wet months. In October hurricane Mitch passed 200 miles south of the Cayman Islands resulting in substantial rainfall. Due to the heavy rainfall caused by hurricane Mitch, 1998 was a relatively wet year; the island wide average of all stations was 1,403 mm (55"), compared to 896 mm (35") in 1997 and 1,869 mm (74") in 1996. Distribution of rainfall throughout Grand Cayman was relatively even with Prospect Park receiving the highest amount of rain, 1,669 mm (66") and West Bay receiving the smallest amount of rain, 1,282 mm (50").





Groundwater Use East End Lens
In 1998 the Authority continued to monitor groundwater use from the East End lens. The largest users are the Authority's East End wellfield, and three farms, which use the fresh groundwater for irrigation. These farms are Captain Charles Kirkconnell farm, Franklin Smith farm and Furtherland farm. The total abstraction averaged 618 m^3/day (163,000 US gal/day) in 1997, compared to 556 m^3/day (147,000 US gal/day) in 1996.



Groundwater Pollution
Since 1994 the Authority has been involved in several cases of groundwater pollution. The approach is that the responsible party is held liable for the pollution and remediation. The Authority in conjunction with the Department of the Environment and the Department of Environmental Health oversee and agree on the various activities that are carried out to monitor, assess and remediate the situation. In 1998 three new cases of groundwater pollution were discovered and monitoring and remediation of two existing cases continued.

ESSO Jackson Point Terminal
ESSO continued the remediation of the Jackson Point Terminal, where a gasoline spill had occurred in 1995. The Oxygen Release Compound, which was installed in the wells after completion of the vapour extraction treatment, enhances biodegradation of the remaining hydrocarbons. Several wells are monitored on a bi-annual frequency for the presence of BTEX, which is the most water soluble fraction of gasoline. Levels of BTEX in selected monitoring wells continued to decline in 1998.

Texaco Walkers Road Service Station
By the end of 1998, Fluor Daniel GTI, a US environmental company completed the design and installation of the equipment to remediate the Texaco Walkers Road service station. The

Valley. This additional storage will provide a total of three million US gallons storage capacity at the site. With the additional tank, the Authority will have close to 4 days of full storage capacity.

Total desalinated water sales increased by 10% in 1998. The increase in water sales for 1998 was lower than in previous years. New customer connections increased to 7,192 by the end of December, 1998, representing growth of 14%.

Average daily water sales for the year was 4,664 m^3 per day representing 58% of the installed water capacity. In the table below, the reduction in daily sales as a percentage of capacity for 1998 reflects the added capacity of the Lower Valley RO plant.

Public Water Supply-GCM
Summary of Operations

	1998	1997	1996	Unit
Total Water Purchased	1,900,488	1,633,080	1,394,885	m^3
Total Water Sold	1,702,349	1,549,850	1,330,327	m^3
Pipeline Sales	1,664,911	1,501,073	1,301,306	m^3
Trucked Sales	37,438	48,777	29,021	m^3
Other Sales	-	-	-	m^3
Unaccounted for Water*	10.1	5.30	4.63	%
# of Pipeline Connections	7,192	6,288	5,587	m^3
Average Daily Water Sales	4,664	4,235	3,635	m^3
Daily Sales as % of Capacity	58	85	73	%
Water purchased from CWC	24,150	3,349	-	m^3
Water Sold to CWC	3,651	-	-	m^3
Electricity Consumed	468,700	405,00	303,360	m^3
Pump Station Efficiency	0.259	0.222	0.222	kWh/ m^3

The percentage of unaccounted for water showed significant increases in 1998. The increase may be attributable to the method of calculating water balances for previous years. Additionally, about 50% of all installed consumer flow meters are over 5 years old (approximately 10% are more than 10 years old). It is believed that the latter has contributed to an apparent over-estimation of pipeline loses due to the under-estimation of consumption. Nevertheless, the increase in unaccounted for water between 1997 and 1998 bears further investigation and subsequent action to further improve the overall efficiency of the Authority's operations.

In 1998, the Authority continued its planned replacement of sections of the 250mm main pipeline from the junction of South Sound and Crewe Road up to Prospect Drive. In 1999, this replacement programme will continue up to the Spotts Landing.

Public Water Supply-GCM
Water Sales by Consumer Group (m^3)

	1998	1997	1996
Single Residential	1,082,563	971,890	811,167
Multi-Residential	99,226	95,628	96,977
Commercial & Industrial	365,651	321,652	299,965
Public Authority	117,472	106,708	84,397
Truckers	37,438	48,777	29,021

Public Water Supply-GCM
Connections per Customer Type for 1998

Month	Single Resident	Multi-Residential	Commer	Public Auth	Truck	Total
Dec-97	*5,446*	*61*	*691*	*90*	*5*	*6,293*
Jan-98	5,486	61	716	91	4	6,354
Feb-98	5,560	61	723	93	4	6,437
Mar-98	5,592	61	741	94	4	6,488
Apr-98	5,688	61	753	97	4	6,599
May-98	5,741	61	761	97	4	6,660
Jun-98	5,794	60	761	97	4	6,712
Jul-98	5,876	60	772	97	4	6,805
Aug-98	5,942	60	785	98	4	6,885
Sep-98	6,028	63	795	99	4	6,985
Oct-98	6,065	63	803	99	4	7,030
Nov-98	6,127	60	798	100	4	7,085
Dec-98	6,232	60	800	100	4	7,192

Public Water Supply-GCM
Average Usage per Consumer Group (m^3/Connection)

Month	Single Resident	Multi-Residential	Commer	Public Auth	Total Pipe	Truck
Dec-97	*12.19*	*114.25*	*33.29*	*74.12*	*16.38*	*877.00*
Jan-98	19.24	163.30	52.97	117.77	25.84	1,126.85
Feb-98	14.47	130.75	41.38	91.84	19.71	850.73
Mar-98	15.07	136.62	39.31	101.31	20.24	1,093.18
Apr-98	16.23	142.24	37.99	117.18	21.36	1,869.23
May-98	17.49	140.72	40.17	113.74	22.62	1,831.10
Jun-98	15.08	131.92	39.12	98.57	20.06	185.20
Jul-98	15.01	153.07	37.39	99.84	19.98	738.90
Aug-98	15.65	122.31	38.82	88.77	20.26	561.60
Sep-98	15.30	130.53	38.82	95.52	20.15	121.23
Oct-98	15.93	139.40	38.91	113.23	21.03	154.23
Nov-98	12.66	113.35	35.51	84.40	17.10	85.30
Dec-98	13.57	124.17	37.43	92.43	18.24	742.08
1998 Averages	**15.48**	**135.70**	**39.82**	**101.21**	**20.55**	**779.97**

From the tables above, water sales to the Authority's single residential customers increased by 11% while the number increased by 14%. Multi-residential customers showed little growth in water sales, 4%, while the numbers decreased slightly by 1%. The highest percentage increases in water sales was to commercial customers, 14%. For the year the number of commercial customers increased by 16%, the largest increase of any customer type.

Water Truckers

The Water Authority has four trucked water accounts. Three account holders deliver potable water to the general public and one account holder uses water for construction purposes. Truckers are as follows:

- Flowers and Sons (2 accounts)
- Wilford Ryan
- Island Paving (company use only)

Trucked water sales from the Red Gate Water Works decreased by 23% 1998. Total trucked water demand during 1998, including groundwater and Cayman Water Company sales, decreased by 15%.

Trucked Water Sales-GCM
(units in million US Gallons)

	1998	1997	1996	1995
Cayman Water Company	1.267	1.270	1.133	1.949
East End	4.901	4.715	2.462	2.520
Red Gate Water Works	9.890	12.887	7.667	10.816
Walkers Road (estimated)	Closed	Closed	0.011	0.102
TOTALS:	**16.058**	**18.872**	**11.273**	**15.387**

7. WASTEWATER OPERATIONS

Public Sewerage-GCM

Customers connected to the public sewerage system increased marginally from 253 to a total of 258 at the end of 1998. Revenue generated from sewerage charges increased by less than 2%. However, revenue from the six septage truckers decreased in 1998 by about 3%.

A review of the sewerage system in 1998 indicated the need for thorough cleaning and videotape inspection, this has been scheduled to be done in 1999. Several severe leaks were detected in the area of the Cinema, these among others expected to be found during the inspection will be repaired in 1999. From the operational data, the average daily flow to the treatment works has increased by almost 30% while the number of customers has increased slightly by less than 2%. Additionally, the salinity of the wastewater has increased. These factors indicated that saline groundwater infiltration is increasing.

Public Sewerage System-GCM
Revenue Details

Month	Sewerage Charges Total Charges	Sewerage Charges # Users	Septic Hauler Charges Total Charges	Septic Hauler Charges # Users	Septic Hauler Charges # of Loads
Jan-98	$176,230	253	$5,272	6	326
Feb-98	$174,352	253	$5,865	6	232
Mar-98	$182,560	253	$2,200	6	267
Apr-98	$180,625	253	$3,452	6	214
May-98	$180,814	261	$3,511	6	217
Jun-98	$181,156	262	$3,743	6	233
Jul-98	$180,073	258	$5,542	6	345
Aug-98	$173,992	259	$1,735	6	107
Sep-98	$173,756	258	$5,253	6	347
Oct-98	$175,045	259	$6,633	6	279
Nov-98	$168,725	259	$4,205	6	260
Dec-98	$174,013	258	$5,064	6	313
TOTALS:	$2,121,339		$52,476		**3140**

Public Sewerage System-GCM
Summary of Operations

	1998	1997	1996	Unit
Total Sewage Treated	1,494,164	1,182,588	1,182,949	m^3
Average Daily Flow	4,094	3,231	3,232	m^3
Average Daily Septage		36	31	m^3
Pump Station Elec.	306,495	222,277	213,658	kWh
Pump Station Effic.	0.21	0.19	0.18	kWh/m^3
Treatment Works Elec.	206,040	152,680	146,440	kWh
Treatment Works Effic.	0.14	0.13	0.12	kWh/m^3
Aspirator Elec.	330,240	310,716	-	kWh
Aspirator Effic.	0.22	0.26	-	kWh/m^3
Total Electricity Effic.*	0.56	0.57	0.30	kWh/m^3
Total # of Connections	258	253	259	
Total Sewerage Fees	$2,121,339	$2.09	$2.03	Mil CI$
Monthly Avg Charge per Connection	$685	$689	$654	
# of Septage Customers	6	6	5	
Total Septage Fees	$52,476	$53,996	$47,712	
Monthly Avg Cost per Customer	$729	$750	$795	

**NB: correction to 1997 Annual Report data for Total Electricity Efficiency.*

Sewage Treatment Works

Mechanical aeration of the facultative waste stabilisation ponds (Ponds 1.1 and 1.2) continued in during the year. The annual survey of sludge depth in the ponds indicated significant increases in sludge accumulation compared to increases over the last few years. The increase in sludge accumulation may be attributed to the age of the ponds (>10 years)

lens. After Quarry Products Ltd. was made aware of these concerns, a programme was implemented to limit the risks of groundwater pollution from the heavy equipment workshop and fuel and lubricant storage. The Authority conducted a groundwater survey of several monitoring wells in the vicinity of the fuel storage and vehicle workshop area. Water samples from these wells were analyzed for contaminants relating to gasoline, diesel, motor oils and lubricants. Analyses were carried out by a USEPA certified laboratory in Florida. The results were that there were no significant amounts of pollutants detected in the samples.

Since the Water Authority notified Quarry Products Ltd. of the negative effects of excavation below water table the company has discontinued this practice. In 1998 the Authority was not in the position to issue a quarry permit for the Crown owned property as no lease agreement had been finalized between Quarry Products Ltd. and Government. Furthermore no permits have been issued for any other properties that are being quarried by Quarry Products Ltd.

Water Supply Concessions

Cayman Water Company

The Cayman Water Company had a 6.3% increase in water sales in 1998 compared to the previous year. The royalty payment increased by 15.8% to $475,332.16.

Little Cayman Beach Resort

The Little Cayman Beach Resort produces water under a licence from government since 1996. Production in 1998 was 10,200 m^3 (2,700,000 US gals), and the Royalty payment increased by 28% to $4,706.17.

Cayman Water Company Operational Performance (US Gallons)

	1997	1998	% Change 1997-1998
Water Produced	410,636,500	435,284,900	*6.0*
Water purchased	319,085	957,198	*200.0*
Water Sold	376,762,955	400,550,168	*6.3*
Seven Mile Beach	240,346,840	258,317,950	*7.5*
West Bay Service	81,349,670	95,236,630	*17.1*
Water Authority	884,715	6,379,778	*621.1*
Trucks	1,267,270	1,678,200	*32.4*
Safe Haven (non potable)	52,914,460	38,937,610	*-26.4*
Unaccounted for water	8.32%	8.18%	*-1.7*
Average fuel adjustment factor per 1,000 US gals	$ 0.88	$0.70	*-20.1*
Royalty payment	$410,507.00	$475,332.16	*15.8*

Morritt's Tortuga Club

Morritt's Tortuga Club completed the second year of operation of its reverse osmosis plant under the licence to produce and distribute potable water. In 1998 Morritt's Tortuga Club produced 52,400 m^3 (14,000,000 US gals) water, and the Royalty payment increased by 56% to $12,675.14.

6. WATER SUPPLY OPERATIONS

East End Wellfield

Sales of groundwater from the East End wellfield and reservoir increased by 4% in 1998 compared to 1997. The overall water loss doubled in 1998 to 11.8%, this significant increase was caused by a leak in the pipeline between the ten production wells and the reservoir. It took a substantial time to find and repair the leak. The public tap, which provides water free of charge, delivered 363 m^3 (96,000 US gals).

East End Wellfield Performance Data

Year	Hours run	Average Pumping Rate (m^3/hr)	Quantity Produced (m^3)	Loss (%)	Power Consumption (kWhr/m^3)	Quantity Sold (m^3)
1986	603	14.7	8,877	1.0	0.46	4,191
1987	2,712	14.0	37,973	1.4	0.47	29,263
1988	3,134	14.0	43,879	1.4	0.45	33,815
1989	3,440	16.5	56,928	1.1	0.40	57,973
1990	1,310	14.8	19,408	1.0	0.43	19,704
1991	1,816	15.1	27,438	4.6	0.45	26,323
1992	1,182	13.2	15,546	13.9	0.44	11,653
1993	540	16.5	8,916	14.3	0.43	6,489
1994	623	16.0	9,945	9.4	0.43	9,013
1995	672	16.4	11,048	9.9	0.45	9,538
1996	653	16.3	10,633	8.9	0.46	9,319
1997	1,224	15.9	19,503	6.3	0.45	17,847
1998	1,428	15.0	21,458	11.8	0.45	18,563

Public Water Supply-CYB

In 1998, annual water sales for the Authority's Cayman Brac operation increased by 18%. Pipeline sales showed an increase of 14% while trucked sales increased significantly by approximately 28%. The number of active pipeline accounts slightly increased from 80 in 1997 to 83.

Public Water Supply-CYB Summary of Operational Data

Water Balance	1998	1997	1996	Unit
Total Water Produced	63,932	45,622	41,522	m^3
Total Water Sold	54,641	46,145	40,648	m^3
Total Storage Losses	9,085	399	n/a	m^3
Total Pipeline Losses	-107	-405	n/a	m^3
Water Loss as % of Production	14.04	-0.12	-0.32	%

Production/Sales Summary	1998	1997	1996	Unit
Approx. Cost of Sales	$4.96	$5.50	$2.40*	CI$/$m^3$
Pipeline Sales	37,072	32,411	33,073	m^3
Number of Active Connections	83	80	62	No.
Trucked Sales	17,549	13,734	7,575	m^3
Daily Water Sales (% of Nominal Plant Capacity 227m^3/day)	65.9	55.7	48.9	%

NB: note this represented cost of purchase of water from OCL, 1997 & 1998 data includes cost of water production, distribution & related expenses.

Summary of RO Plant Operations	1998	1997	1996	Unit
Total Water Produced	63,932	45,622	41,522	m^3
Avg. Plant Production Capacity	226.4	232.9	228.6	m^3/day
Electricity Consumed	285,920	192,792	163,040	kWh/m^3
RO Plant Efficiency	4.472	4.226	3.927	m^3

Storage losses for 1998 averaged about 760m^3 per month. Investigations into the storage losses confirmed that the 0.5 million gallon reservoir on site was badly leaking. Towards the end of the year, arrangements were made for the construction of a new storage reservoir in 1999, and in the mean time two 190m^3 capacity collapsible storage tanks were purchased and put into operation in October.

Operating costs reported in previous annual reports were based solely on the costs to purchase from the previous owner of the RO Plant, Ocean Conversion Cayman Ltd. The approximate cost of water production presented above for 1997 and 1998 takes into account other relevant 'production costs' such as the cost of distribution, chemicals, salaries, and other related expenses. The 1997 annual report did not reflect this change.

In preparation for the year 2000, the electrical and control system of the Cayman Brac RO plant will be upgraded in 1999. The production capacity of the plant will also be upgraded in 1999 to 530m^3 per day in order to meet the increased demand for water in the Brac.

Average Usage per Consumer Group (m^3/Connection)

Month	Single Resident	Commercial	Public Authority	Trucked
Dec-97	*12.59*	*108.14*	*18.08*	*10.16*
Jan-98	11.44	109.66	15.26	12.61
Feb-98	13.13	105.68	15.62	9.86
Mar-98	11.84	135.24	15.80	11.65
Apr-98	12.65	121.97	22.44	10.80
May-98	12.36	115.56	27.70	14.20
Jun-98	13.86	100.41	16.22	12.73
Jul-98	14.49	103.73	17.16	13.20
Aug-98	12.18	97.18	18.64	12.30
Sep-98	10.98	83.53	12.44	9.98
Oct-98	10.89	96.99	20.54	9.98
Nov-98	12.77	117.90	17.60	11.63
Dec-98	13.68	103.32	16.80	13.10
1998 Averages	**12.52**	**107.60**	**18.02**	**11.84**

Public Water Supply-GCM

Due to the increased overall demand for water in 1997, the Authority moved up plans for a new RO plant at the Lower Valley site. In March 1998, the Authority's contracted water supplier, Ocean Conversion (Cayman) Ltd. Completed the construction of and commissioned a Seawater Reverse Osmosis Water Production Plant in Lower Valley. This plant has the rated capacity of 1,500m^3 per day. In 1999, the Authority expects to increase the production at the Lower Valley plant to 3,000m^3 per day in order to meet the dry season demands.

The pumping capacity of the water pumping station at the Lower Valley Water Works was upgraded in 1998. This was necessary in order to accommodate the increased production from the new RO plant.

In December 1998, the Authority completed the construction of a 2 million US gallon glass-fused-to-steel water reservoir in Lower

treatment consists of product recovery pumps that remove free product from the groundwater, soil vapour extraction to remove free product, and a sparging system to bioremediate the dissolved hydrocarbons. The extracted soil vapours, which contain hydrocarbons, are treated by a catalytic oxidation unit prior to discharge into the air. In mid-1998, the two old remaining single wall fuel storage tanks were also removed from the service station. Monitoring of BTEX levels in selected monitoring wells continued on a quarterly basis, and the data indicate that the plume is not spreading.

Texaco Jackson Point Terminal

In May, the Authority became aware that an un-quantified amount of diesel fuel had leaked from an underground pipeline at the Texaco Jackson Point Terminal. Subsequently diesel fuel was detected in several wells within the terminal. In order to assess the risk to the public and the environment the Water Authority together with the Department of the Environment collected groundwater samples from the nearest residential wells and marine samples from the sea close to the terminal. These samples were analyzed by a USEPA (United States Environmental Protection Agency) certified laboratory in Florida for the presence of contaminants related to gasoline and diesel fuel. The analytical results for the marine and the domestic wells were below detection limit. Texaco, together with its environmental consultant, has initiated a recovery programme of the free product and carried out a preliminary site assessment. It is expected that a more detailed site assessment will be carried out in 1999 followed by remediation of the site.

Texaco West Bay Road Service Station

In June, Texaco notified the Authority that a leak had occurred in one of the underground fuel pipelines at the West Bay Road service station. It was estimated that a quantity of approximately 3,500 USgallons unleaded gasoline had leaked into the ground. Texaco initiated a recovery programme of the free product and installed several monitoring wells. The Water Authority carried out a survey of all development within a 200 m (600') radius from the site and found no abstraction wells at direct risk from pollution. Texaco's consultant will carry out further site assessment in the early part of 1999 and work out the details of further remediation.

Former ESSO Kaibo Service Station

In October, Texaco notified the Water Authority that they had found dissolved petroleum hydrocarbons at the Kaibo in Rum Point. This location was previously used by ESSO as a service station, and was recently taken over by Texaco. As part of the re-development of the site, Texaco carried out an environmental assessment. No free product had been detected in any of the monitoring wells, and the old fuel storage and dispensing equipment had been removed prior to the renovation. The Authority determined that no nearby residences used groundwater. ESSO accepted liability for the existing pollution and will work together with the Authority and the Department of the Environment on further assessment, monitoring and remediation.

Fuel pipelines

In light of the recent problems with fuel storage facilities the Authority is concerned about the protection and integrity of underground fuel transfer pipelines. ESSO and Texaco operate a diesel transfer pipeline between the Jackson Point terminals and Caribbean Utilities Company's generating plant on North Sound Road and Texaco operates a aviation fuel transfer pipeline between their Jackson Point terminal and Owen Roberts Airport. Both pipelines were installed in 1987.

The Authority carried out a survey of the current international standards on protection of underground fuel transfer pipelines and initiated a dialogue with the parties involved to ensure that the necessary activities to

protect and monitor the pipelines were in place. Since 1987 both oil companies carry out annual programmes of pressure testing and cathodic protection survey of the pipelines. In October 1998, the Authority, ESSO, Texaco, and CUC agreed to produce accurate as-built drawings, to install sufficient warning signs at strategic locations, and to notify the Authority prior to any surveys regarding the integrity of the pipelines. By the end of 1998 ESSO had initiated a new survey of the pipeline to produce up to date as-built drawings.

Caribbean Utilities Company - Groundwater Abstraction and Disposal

In the early part of 1998 Caribbean Utilities Company approached the Water Authority about the possibility of using groundwater as cooling water for its 1999-2008 generator expansion project. As a result of the discussions between CUC and the Authority it became clear that not all the existing abstraction wells and disposal wells already in use for cooling water purposes had received the required licences from the Authority. CUC applied for these licences, which were granted by the Authority. The 24" pipeline that CUC uses to dispose cooling water in the North Sound was also licensed.

As a condition to licence further abstraction and disposal of groundwater for cooling water for the new generators, the Water Authority required CUC to carry out an investigation to assess the feasibility of this project. CUC's consultant initiated this survey and it is expected that it will be completed in 1999.

Quarries

In 1997 the Authority initiated the process to ensure that all operating quarries have a quarry permit as required under the Water Authority Law. As the Tarpon Springs quarry, which is located in Breakers did not have a permit, the owners were advised on the procedures. In response to the advertisements in the newspaper, a group of residents objected to the quarry on the basis of potential damage caused by the blasting. In 1998 the Authority gave both the owners of the quarry and the objectors the opportunity to substantiate their views on the matter. As a result the Board decided to grant the licence with several conditions to prevent any damage to adjacent properties.

East End Quarry

Since 1997 the Authority has been in dialogue with the management of Quarry Products Ltd. about the quarry located over the East End fresh water lens. The main concerns of the Authority are that the quarry does not have a current quarry permit as required under the Water Authority Law and that the quarrying may result in negative impacts on the fresh groundwater lens.

In 1980, the Central Planning Authority granted this quarry permission to quarry on several parcels, and in 1989 the CPA granted permission to quarry on a parcel owned by the Crown. Condition of the planning permission was that no excavation could be carried out to within 2 feet above the water table.

In 1998 the Authority carried out an extensive survey of the quarry, this survey concluded that part of the quarry had been excavated to below the water table. Under the prevailing meteorological conditions evaporation from the exposed water surface exceeds the rainfall, thus resulting in no recharge and slow salinization of the lens. The survey also concluded that several areas had been excavated without Planning permission, and that quarrying was being carried out on Crown owned property. As there was no current lease agreement between government and Quarry Products Ltd., the company was advised to discontinue quarrying on Crown property until the matter was resolved.

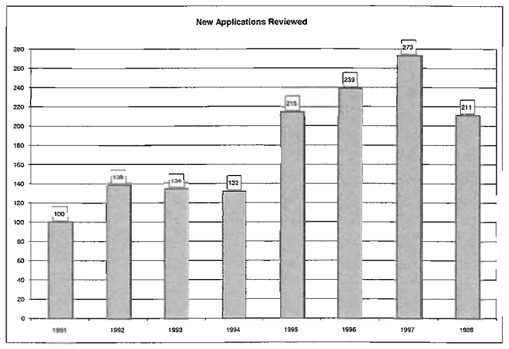
The Authority was also concerned about the risk of the heavy equipment workshop and fuel and lubricant storage on the fresh water

as well as the aerators being used continuously during the year. These factors signify that the treatment efficiency of the ponds is decreasing due to the decrease in pond volume available for treatment of the wastewater.

8. NEW WORKS

Development Control

The Water Authority continued to review wastewater treatment and disposal systems for all new developments at the planning stage, with the exception of single houses and duplexes, which are reviewed by the Building Control Unit. The trend of increasing number of developments reviewed each year did not continue this year, as only 211 new developments were reviewed in 1998.



New Works Crew

In 1998 the New Works crew installed in excess of 8,500 metres of pipework. The majority of the work involved the completion of the low-pressure sewer system and centralized sewage treatment plant for the Walker's Road Schools (a more detailed description is given below). In addition the extension of the piped water supply to East End was commenced and by the end of the year approximately 1 mile of pipework had been installed from Frank Sound Junction eastwards.

The following areas were provided with piped water during the year:

- various new sub-divisions (i.e., in Savannah (Village of Newlands (Phase 3), off Poinciana Drive, off West Lane), in Bodden Town (behind Bodden Town Primary School, opposite Bodden Town Primary School, off Beach Bay Road), and in George Town (off Old Crewe Road, near Triple C School, off North Sound Road)
- Melody Lane (off Crewe Road)
- Orange Drive (Prospect)
- St. Lucia Drive (Northward)

The installation of pipes in the Savannah Meadows subdivision (Phase 3) was also commenced in 1998.

The New Works crew installed pipelines and carried out various other activities at the Lower Valley site to connect the second storage tank and the new Reverse Osmosis plant that was commissioned in early 1998 (see below for further details).

In its fourth year of operation the New Works crew continued to perform very well. A detailed cost analysis indicates that the pipeline extensions carried out by the New Works crew in 1998 were significantly more economical than if they had been carried out by an outside contractor (An overall cost savings of approximately 28% based on the average overall cost on the Bodden Town Project (1991-1994), or nearly 37% when allowing for inflation). Almost all costs incurred in 1998 by the New Works Crew (labour, plant and materials) were reimbursed by contributions from the various developers/clients.

Lower Valley Site

As a result of the continued growth of the water distribution system and the associated increase in demand, the production capacity

of the existing water production plant at Red Gate Road would have become insufficient in early 1998.

In June 1997 the Water Authority signed a contract with Ocean Conversion (Cayman) Ltd., for the construction and operation of a reverse osmosis plant with an initial production capacity of 1,500 cubic meters per day (400,000 US gallons per day) at its Lower Valley facility.

The construction of the reverse osmosis plant building commenced in late September 1997 and was completed in early February 1998. On March 13, 1998 the Plant first delivered the contracted quantity of potable water and the Lower Valley facility has since become an important part of the public water distribution system.

The original Contract included a provision to double the production capacity of the plant to 3,000 cubic meters per day (800,000 US gallons per day) at any time during its term. The rapid growth in water demand dictated that this increase would be required within twelve months of its original date of commission. The Water Authority entered into negotiations with Ocean Conversion in August 1998 and work on the plant expansion commenced on December 1998. It is anticipated that the increased production capacity will be available in March 1999.

In June 1998 tender documents were sent to four tank manufacturers/suppliers for the contract to supply and erect a 2 million US gallon capacity bolted steel storage tank. This contract was subsequently awarded to the lowest tenderer, Florida Aquastore from Boca Raton. FL. The construction of the glass-fused to steel tank with aluminium dome roof was substantially completed by the end of the year. It is anticipated that the tank can be commissioned in mid-February 1999.

Sewage collection system and sewage treatment works for Walker's Road schools

The installation of a sewage collection system (i.e., a low pressure sewer system) and a centralised sewage treatment plant for the Government high schools (John Gray and George Hicks), the Community College and the Truman Bodden Sports Complex was commenced in late November 1997.

The project comprises the installation of twenty-six (26) grinder pumping stations, nearly 10,000 linear feet of pressure main, and a wastewater treatment plant with a treatment capacity of 30,000 us gallons per day. This project will improve the sanitation of these properties, as the multitude of on-site treatment tanks (i.e., septic tanks) and disposal wells will be eliminated.

This project was substantially completed by late April 1998. The total project cost was nearly 12% less than the contracted sum of CI$ 590,000.00.

Although no maintenance contract had been agreed with Government, the Water Authority continued to operate and maintain the collection system and the treatment plant for the remainder of the year.

GPS System

In August 1998 the Water Authority commenced the project to transfer the water distribution and wastewater collection system records into a digitised format by the end of the year 2000, using the GPS equipment which was purchased in 1997. Once all data are available in a digitised form, pipelines and valves etc. can be retrieved with a high level of accuracy in the field using handheld units.

Sewage Treatment Works

In April 1998 a Project Identification Report was prepared for the proposed upgrade of the existing wastewater treatment works.

The report concluded that the existing waste stabilisation ponds must be upgraded as soon as possible for the following reasons:

- The chronic odour problems caused by the ponds result in complaints from the neighbouring property owners.
- For the long term operation of the treatment works, reliable and more energy-efficient processes than the presently used floating surface aerators should be investigated to treat the wastewater adequately and economically;
- The inflow from the existing wastewater collection system is anticipated to exceed the design capacity of the wastewater treatment works within the next eighteen (18) months;
- Any extensions to the wastewater collection system will not be possible unless the treatment capacity of the sewage treatment works is increased;
- Major repairs to the existing treatment works will be required within the next few years.

The Sequencing Batch Reactor (SBR) process was found to be the most cost-effective option of seven (7) wastewater treatment options that were investigated in detail.

In September 1998 contracts were awarded to Globaltech, Inc. from Boca Raton, FL for the provision of general, mechanical and structural engineering services and to Polytron, Inc. from Atlanta, GA for the provision of electrical engineering services.

A preliminary design was prepared in mid-October 1998 and a preliminary cost estimate was subsequently prepared. The first phase of the upgrade, i.e., a treatment plant with a design capacity of 2.5 mgd, was estimated to cost CI$ 8.1 million (or approximately US$ 9.6 million). It is anticipated that this first phase can be commenced in late 1999 and be completed by mid-December 2001.

9. WATER AND SEWERAGE STATUTORY LICENCING

Water Resource Licencing

In compliance with statutory obligations the Water Authority continued to issue licences and permits for activities that impact groundwater resources. In 1998 the Authority issued the following licences and permits:

- Discharge Permits 221
- Groundwater Abstraction Licence 12
- Quarry Permit 3
- Canal Work Permit 1

Well drillers

Under the Water Authority Law, the Authority is charged with the duty to licence well drillers. In 1998 five well driller's licences were issued: Watler and Hislop Plumbing Services Ltd. (2 licences), Industrial Services and Equipment Ltd. (2 licences), and Scott Development Co. Ltd. (1 licence).

Septage Truckers

The Water Authority Law requires that septage truckers obtain a licence from the Authority. The following companies were licenced: Industrial Services and Equipment Ltd., Waste Management Services, Mr. James Piercy, Mr. Harris Wright, and Mr. John Francis.

Plumbers Licencing

The Plumbers Examination Board met on three occasions in 1998 to review application for plumbers' licences. Theoretical examinations were held on three occasions during the year to assess applicant's abilities. The following licences were approved:

Category	1998	Total at 31-Dec-98
Apprentice	33	150
Journeyman	5	118
Master	3	37

Members of the Plumbers Examination Board are:

Chairman:	Mr. Thomas Hill *Operations Manager WAC*
Members:	Mr. James Merren *Master Plumber* Mr. Delano Hislop *Master Plumber* Mr. Arthur Arch *Plumbing Inspector, BCU*
Secretary:	Mrs. Lisa Wood *Administrative Assistant, WAC*

The Ministry of Agriculture, Communication, Environment, and Natural Resources

THE WATER AUTHORITY
OF THE CAYMAN ISLANDS

FINANCIAL STATEMENTS
1998

Table of Contents

Cayman Islands

Water Authority of the Cayman Islands

CERTIFICATE OF THE AUDITOR GENERAL

To the Members of the Water Authority of the Cayman Islands
And the Financial Secretary of the Cayman Islands

I have audited the financial statements of the Water Authority of the Cayman Islands for the year ended 31 December 1998 as set out on pages 30 to 44 in accordance with the provisions of Section 17(1) of the Water Authority Law (1996 Revision), and Section 45(1) of the Public Finance and Audit Law (1997 Revision).

Respective Responsibilities of Management and the Auditor General

These financial statements are the responsibility of the Authority's management. My responsibility is to express an opinion on the financial statements based on my audit.

Basis of Opinion

My examination was made in accordance with International Standards on Auditing which require that I plan and perform my audit to obtain reasonable assurance about whether the financial statements are free of material misstatement. An audit includes examining, on a test basis, evidence supporting the amounts and disclosures in the financial statements. An audit also includes assessing the accounting principles used and significant estimates made by management, as well as evaluating the overall financial statement presentation. I believe that my audit provides a reasonable basis for my opinion.

Opinion

In my opinion, these financial statements present fairly, in all material respects, the financial position of the Water Authority of the Cayman Islands as at 31 December 1998, and the results of its operations and its cash flows for the year then ended in accordance with International Accounting Standards and the Water Authority Law (1996 Revision).

N K Esdaile
Auditor General

19 September 2000

Water Authority of the Cayman Islands
Balance Sheet
As At 31st December 1998
(Stated in Cayman Islands Dollars)

	Notes	1998	1997 (Restated)
CURRENT ASSETS			
Cash On Hand		1,550	1,550
Cash At Bank		291,439	380,754
Cash On Fixed Deposit		563,802	2,811,109
Total Cash & Cash Equivalents		**856,791**	**3,193,413**
Accounts Receivable	3	1,242,714	1,166,358
Inventory	4	427,430	439,485
Prepaid Expenses		40,701	17,158
Accrued Interest		712	19,093
Total Current Assets		**2,568,348**	**4,835,507**
CURRENT LIABILITIES			
Bank Overdraft	5	-	774,568
Accounts Payable		992,598	338,113
Contract Retention Payable		105,000	-
Interest Payable	6	32,912	32,912
Customer Deposits		642,403	551,675
Customer Deposit on Construction Contract		45,312	40,650
Customer Project Loans	8	68,423	70,072
Current Maturities On Long Term Liabilities	9	2,628,886	2,256,439
Total Current Liabilities		**4,515,534**	**4,064,429**
NET CURRENT (LIABILITIES)/ASSETS		**(1,947,186)**	**771,078**
FIXED ASSETS			
Land-Freehold		1,248,353	1,248,353
Buildings		1,947,866	-
Water Supply System		18,535,389	17,224,266
Sewerage System		8,819,823	9,055,771
Other Assets		1,099,644	805,276
Construction in Progress		904,534	71,991
Total Fixed Assets	7	**32,555,609**	**28,405,657**
TOTAL NET ASSETS		**30,608,423**	**29,176,735**
LONG TERM LIABILITIES	9	**(19,886,278)**	**(21,086,408)**
NET ASSETS		**$ 10,722,145**	**$ 8,090,327**
EQUITY REPRESENTED BY:			
Contributed Capital	10	1,006,859	829,940
Retained Earnings		9,715,286	7,260,387
Total Equity		**$ 10,722,145**	**$ 8,090,327**

On behalf of the Board on the 19th September 2000:

Hon. John B. McLean OBE JP
Chairman

Frederick W. McTaggart
Director

The accompanying notes form an integral part of these financial statements.

Water Authority of the Cayman Islands
Statement of Income and Expenses
For the Year Ended 31st December 1998
(Stated in Cayman Islands Dollars)

	Notes	1998	1997 (Restated)
INCOME			
Gross operating revenue	11	11,771,652	10,814,930
Less: Operating expenses		(7,680,324)	(7,091,454)
Gross operating surplus for year		**4,091,328**	**3,723,476**
Sundry income	12	708,624	697,021
Operating surplus for year		**4,799,952**	**4,420,497**
OTHER EXPENSES			
Administrative expenses		(1,645,053)	(1,317,949)
Net surplus for year		**3,154,899**	**3,102,548**
Retained Earnings at the Beginning of the Year			
Balance as previously reported		7,808,899	6,250,833
Less: Prior year adjustment	16(b)	(548,512)	(592,994)
Restated balance		**7,260,387**	**5,657,839**
Retained Earnings before Contribution to Government		10,415,286	8,760,387
Contribution to Government		(700,000)	(1,500,000)
Retained Earnings at End of Year		**$ 9,715,286**	**$ 7,260,387**

The accompanying notes form an integral part of these financial statements.

Water Authority of the Cayman Islands
Statement of Income
For the Year Ended 31st December 1998
(Stated in Cayman Islands Dollars)

	Notes	1998	1997 (Restated)
OPERATING REVENUE			
Water Sales		8,905,402	8,054,070
Sewerage Fees		2,114,161	2,082,426
Septage Disposal		51,692	52,940
Agency Work	16(c)	446,357	291,832
Connection and Miscellaneous Fees		254,040	333,662
Total Operating Revenue		**11,771,652**	**10,814,930**
SUNDRY INCOME			
Royalties		492,713	422,304
Statutory Licencing Fees		17,318	23,945
Interest Earned		125,932	154,205
Other		72,661	96,567
Total Sundry Income		**708,624**	**697,021**
TOTAL REVENUE		**$ 12,480,276**	**$ 11,511,951**

The accompanying notes form an integral part of these financial statements.

Water Authority of the Cayman Islands
Statement of Expenses
For the Year Ended 31st December 1998
(Stated in Cayman Islands Dollars)

	1998	1997 (Restated)
OPERATING EXPENSES		
Water Purchase	3,221,899	2,907,101
Loan Interest	1,248,428	1,255,770
Salaries	1,111,135	1,036,744
Depreciation Expense	899,051	778,592
Repairs and Maintenance	435,370	439,970
Electricity	286,785	262,517
Wages	261,543	231,668
Supplies	158,934	99,654
Miscellaneous	57,179	69,355
Obsolete Inventory Expense	-	10,083
Total Operating Expenses	**7,680,324**	**7,091,454**
ADMINISTRATIVE EXPENSES		
Salaries	687,218	538,004
Staff Training and Benefits	475,799	329,062
Insurance	103,557	106,732
Office and Lab Supplies	64,610	58,804
Telephone and Utilities	59,134	38,721
Miscellaneous	57,991	66,716
Depreciation Expense	56,228	53,721
Bad Debt Expense	44,014	28,000
Office Rental	28,117	28,813
Legal Fees	27,058	35,370
Licenses and Dues	26,875	16,914
Audit Fees	12,000	12,000
Repairs and Maintenance	2,452	5,092
Total Administrative Expenses	**1,645,053**	**1,317,949**
TOTAL OPERATING AND ADMINISTRATIVE EXPENSES	**$ 9,325,377**	**$ 8,409,403**

The accompanying notes form an integral part of these financial statements.

Water Authority of the Cayman Islands
Statement of Cash Flows
For the Year Ended 31st December 1998
(Stated in Cayman Islands Dollars)

	1998	1997 (Restated)
CASH FLOWS FROM OPERATING ACTIVITIES		
Net Surplus for year	3,154,899	3,102,548
Adjustments to reconcile net surplus to net cash provided by operating activities:		
Depreciation	955,279	832,313
Gain on Sale of Fixed Assets	(14,950)	
Interest Earned	(125,932)	(154,205)
Interest Expense	1,248,428	1,255,770
	5,217,724	5,036,426
Net Change in Working Capital		
Interest Paid	(1,248,428)	(1,302,112)
Accounts Receivable	(76,356)	(188,432)
Inventory	12,055	(194,533)
Prepaid Expenses	(23,543)	322
Accounts Payable	654,485	165,871
Contract Retention Payable	105,000	(24,573)
Customer Deposits	90,728	73,429
Customer Deposits on Construction Contract	4,662	29,650
Customer Project Loans	(1,649)	(760)
Net Cash Provided By Operating Activities	4,734,678	3,595,288
CASH FLOWS FROM INVESTING ACTIVITIES		
Interest Received	144,313	144,303
Cost of Fixed Assets Purchased	(2,756,086)	(302,489)
Proceeds From Sale of Fixed Assets	14,950	-
Construction in Progress	(832,543)	(395,097)
Contributed Capital	176,919	61,013
Net Cash Used by Investing Activities	(3,252,447)	(492,270)
CASH FLOWS FROM FINANCING ACTIVITIES		
Repayment of Long Term Debt	(2,344,285)	(1,474,907)
Overdraft Facilities	(774,568)	774,306
Contribution to Government	(700,000)	(1,500,000)
Net Cash Used by Financing Activities	(3,818,853)	(2,200,601)
Net Increase In Cash & Cash Equivalents During the Year	(2,336,622)	902,417
Cash & Cash Equivalents at the Beginning of the Year	3,193,413	2,290,996
Cash & Cash Equivalents at End of The Year	**$ 856,791**	**$ 3,193,413**

The accompanying notes form an integral part of these financial statements.

Water Authority of the Cayman Islands
Notes to the Financial Statements
For the Year Ended 31st December 1998
(Stated in Cayman Islands Dollars)

1. Establishment and Principal Activity

The Water Authority of the Cayman Islands ("the Water Authority") is a statutory body established on 1st January 1990 under the Water Authority Law (Law 18 of 1982), as amended.

The Water Authority is principally engaged in the management of water supply and sanitation affairs of the Cayman Islands including the provision of public water supplies, sewerage systems and the management, development and protection of water resources.

2. Significant Accounting Policies

The significant accounting policies adopted by the Water Authority in these financial statements are as follows:

(a) Basis of accounting

The financial statements of the Water Authority are prepared on the accrual basis under the historical cost convention and are in accordance with International Accounting Standards.

(b) Depreciation

Fixed assets are recorded at acquisition cost and with the exception of freehold land, are depreciated on the straight-line basis sufficient to write off the cost of each asset over its useful life as follows:

Buildings	50 Years
Water and Sewerage Systems	15 - 50 Years
Other Assets	5 - 10 Years

(c) Foreign currency translation

Assets and liabilities denominated in currencies other than Cayman Islands Dollars are translated at exchange rates in effect at the balance sheet date. Revenue and expense transactions denominated in currencies other than Cayman Islands Dollars are translated at exchange rates ruling at the date of those transactions. Gains and losses arising on exchange are included in the Statement of Income and Expenses.

(d) Allowance for bad debts

Management of the Authority establishes an allowance for bad debts when it believes that accounts receivable balances are uncollectible. The allowance is expensed and an equal amount is set-up as a provision for bad debts, which is netted off against gross accounts receivable balances.

Management determines the extent of the allowance based on its knowledge of individual debtors' past performance.

(e) Inventory and Allowance for Obsolete Inventory

Inventory is accounted for on the first-in, first-out basis, and is stated at the lower of cost and net realizable value.

No account is taken of water inventory held in storage tanks and pipelines at 31 December 1998 due to its immateriality.

Management of the Authority establishes an allowance for obsolescence of inventory items when it believes that those items are no longer usable in the Authority's operations. The allowance is expensed and an equal amount is set-up as a provision for obsolete inventory, which is netted-off against gross inventory balances. The allowance is equal to the book value of inventory that management considers no longer usable.

Water Authority of the Cayman Islands
Notes to the Financial Statements
For the Year Ended 31st December 1998
(Stated in Cayman Islands Dollars)

7. Fixed Assets (continued)

Construction-in-Progress principally relates to expenses incurred in connection with the following:

1.	Construction of a 2 million gallon water reservoir at Lower Valley	$593,483
2.	Extension of the public water supply system to East End, completing approximately one mile of pipe by December 1998	$101,009
3.	Engineering services, subsoil investigations and site preparation for subsoil investigations relating to the 2.5 MGD upgrade of the West Bay Beach Sewerage Treatment Works. See also Note 15.	$160,851
4.	Incomplete installation of water mains in two subdivisions which are funded by contributions from developers	$ 49,191
		$904,534

8. Customer Project Loans

Customer project loans represent balances outstanding at the year-end in respect of funds collected from private individuals to carry out capital works in the South Sound area of George Town in 1989. These funds. are interest free and are repayable by way of a 10% rebate on the individual's annual water consumption charges.

9. Long Term Liabilities

Long Term Liabilities	1998	1997
a) CIBC Bank and Trust Co. Cayman Ltd.		
Water Supply and Sewerage	13,806,902	15,527,592
b) Caribbean Development Bank		
Water Supply	1,311,204	1,465,756
c) Cayman Islands Government		
Grand Cayman	4,500,773	4,693,667
Cayman Brac	772,200	842,400
Medical Expenses	91,632	91,632
Public Service Pension Plan Unfunded Past Service Pension Liability	615,789	677,000
d) Capital Contribution Loan	38,400	44,800
e) Ocean Conversion (Cayman) Ltd.	1,378,264	-
Total long term liabilites	22,515,164	23,342,847
Less current maturities	(2,628,886)	(2,256,439)
	$ 19,886,278	$ 21,086,408

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9. Long Term Liabilities (continued)

a) The CIBC Bank and Trust Co. Cayman Ltd. (CIBC) loan represents a financing package of US$22,350,000, which includes a US$500,000 overdraft facility. The total package refinanced previous Barclays Bank and Caribbean Development Bank loans, and provided funding for the Bodden Town Water Supply project and Lower Valley Reservoir and Pumping Station project. The loan is provided at an interest rate of 1% over London Interbank Offered Rate (LIBOR) and is repayable, on a monthly basis, over a ten-year period which commenced on the 1st of March 1995. Monthly payments are due as follows:

1995-November 1997	US$200,000
November 1997-2004	US$275,000

The CIBC loan is held in the name of the Water Authority and is secured by a guarantee by the Cayman Islands Government.

b) The Caribbean Development Bank (CDB) water supply loan is to be repaid over 15 years at variable interest rates. Repayment commenced on the water supply loan in quarterly instalments in March 1992. The principal repayments currently being made on this loan are approximately US$46,250 each quarter, plus interest.

The CDB loan is in the name of the Cayman Islands Government and is on lent to the Water Authority. The Water Authority is responsible for all interest and principal repayments on this loan.

c) The Cayman Islands Government loan for Grand Cayman is interest free and is being repaid in quarterly instalments of CI$48,223 over a period of twenty five years which commenced on the 1st of April 1995. This loan was increased by CI$450,000 in February 1997 in exchange for a 1.3-acre parcel of land that was sold to the Authority by the CI Government. As at year-end the terms of repayment relating to this additional loan have not been agreed upon.

The Cayman Islands Government loan for Cayman Brac attracts interest at a fixed rate of 8% per annum. This loan is repaid in quarterly instalments of CI$17,550, over a period of 15 years which commenced on the 1st of April 1995.

The loan payable to the Cayman Islands Government for medical expenses is in respect of injuries incurred by a cyclist in 1991 for which the Water Authority has assumed liability. The loan is interest free and repayable in monthly instalments of CI$2,500 each. No repayments were made from 1995 through 1998.

d) Refer to *Note 14* for explanation of the Public Service Pensions Fund Past Service Pension Liability.

e) The capital contribution loan represents the cost of certain capital work carried out in 1991 and funded by a customer to facilitate the Water Authority to construct a pipeline through a third party property to provide the water connection to the customer concerned. The cost of this work was $64,000. In 1995 management agreed to repay the loan in ten (10) annual instalments of $6,400 each. This loan is interest free and the first instalment was made on the 1st of June 1995.

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9. Long Term Liabilities (continued)

f) The Water Authority contracted with Ocean Conversion (Cayman) Ltd. ("OCL") on the 17th of June 1997 to provide and operate a reverse osmosis seawater desalination plant at Lower Valley, Grand Cayman under a lease purchase and operating agreement. There was no movement in cash in respect of this transaction and consequently the Statement of Cash Flows does not reflect the increase in Plant and Loans, which arise therefrom. The plant was completed in March 1998 and is financed at an interest rate of 5% per annum. Under the terms of the agreement, the Authority commenced payments to OCL in April 1998, making monthly payments of US$17,325 and CI$6,998 for a duration of seven years.

10. Contributed Capital

	1998	1997
Balance at beginning of year	829,940	768,927
Add: Received during year	176,919	61,013
Balance at end of year	$1,006,859	$829,940

Contributed capital represents funds received from private individuals to fund capital work that was completed by the Water Authority. The relevant costs have been capitalised as water and sewerage works (see Note 7).

11. Gross Operating Revenue

Gross operating revenue comprises the amount of water sales, sewerage fees, septage disposal fees, connections/disconnection charges, profit on agency work, and meter rental charges billed to customers during the year.

12. Sundry Income

Sundry income consists of royalties from water production and supply concessionaires, interest, statutory licence fees, and miscellaneous income.

13. Related Party Transactions

The Cayman Islands Government appoints the Chairman and members to the Water Authority Board of Directors. The following transactions occurred during the year between the Water Authority and Cayman Islands Government.

1. The Authority made loan repayments to Government during the year of $263,094.
2. The Auditor General has statutory responsibility for the audit of the Authority's financial statements. The Authority is required to pay an annual fee of $12,000 to Government for audit services.
3. The Authority retains the services of the Government's Legal Department to advise on all legal matters at an agreed fee of $25,000 per annum.
4. The Authority recognized contributions to Government in the amount of $700,000. $200,000 was paid during the year and the remaining balance is outstanding.

During the year, the Water Authority provided at no charge to the Cayman Islands Government the availability and use of water for fire fighting, free sewerage service to a number of indigent persons in the Watler's Road area, supervision of water resources, administration of Plumbers Examination Board, consultative services for development control, and water at a reduced Public Authority rate.

As detailed in *Note 14* the Authority and its eligible employees paid contributions to the Public Service Pensions Fund during the year.

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14. Pensions

In August 1993, the Governor approved the inclusion of the Water Authority's staff as being in employment under the term "Public Service" for the provision of the Pensions Law. At that time all employees who had been "seconded" from the Public Service Commission resigned and were employed directly by the Water Authority. The pension contributions for those employees and subsequent eligible Caymanian employees hired by the Water Authority are paid directly to the Public Service Pensions Fund (the "Fund").

The Fund is administered by the Public Service Pensions Board (the 'Pensions Board'). The Fund has both an underlying defined benefit and defined contribution element. Before 14 April 1999 the scheme underlying the Fund is a defined benefit scheme. Participants joining the Fund after 14 April 1999 have their benefits defined by a defined contribution scheme.

As detailed in Note 16 (a) an actuarial assessment, using the projected unit credit method of measuring costs and obligations, determined that the Authority's un-funded past service liability for pensions as of 1st January 1997 was $677,000. Notwithstanding that some of these benefits have accrued whilst some of the Authority's present employees were employed by the Cayman Islands Government, the Authority has decided to recognise the entire amount of the un-funded past service liability in its financial statements. The Authority has started funding the past service liability by paying monthly contributions at the rate of 5% of eligible employees' monthly salaries to the Fund; a rate that was pronounced by the Pensions Board.

The Authority and its eligible employees also make contributions in respect of current pensions benefits, at rates prescribed by the Pensions Board. During the current year the Authority and its eligible employees each contributed 6% (1997: employer's rate of 6% and employee's rate of 4%) of employees' monthly salary.

The 1st January 1997 actuarial assessment of the Authority also determined the required contribution rates to adequately fund pension benefits accruing to its employees. The assessment identified that if the past service liability of $677,000 was not immediately paid, total contributions (employees' and employer's contributions) would have to be at 22% of employees' emoluments to adequately fund pension benefits. The Authority and its employees pay contributions at the rate specified by the Pensions Board: 6% each for employee and employer plus, an additional 5% in respect of the un-funded past service liability, a total contribution rate of 17%.

The main actuarial assumptions used in the 1 January 1999 valuation were: a retirement age of 58 years, inflation rate of 3%, expected rate of return on the Fund's assets of 8%, expected salary and pension increase rates of 5% and 3%, respectively. The responsibility for the payment of pension benefits to the Authority's eligible employees rests with the Fund and, ultimately with the Cayman Islands Government.

No instructions have been issued by the Pensions Board to vary the contribution rates from those mandated as at 1st January 1998.

In accordance with the National Pensions Law of June 1998, employees who are not qualified to join the Public Service Pensions Fund are enrolled in an approved local pension plan. During 1998 the Authority and its employees paid 5% and 5% respectively of salary contributions.

The total amount recognised as a pension expense during 1998 was $224,279 (1997: $134,236).

Based on *International Accounting Standards (IAS) 2000*, "if an enterprise applies *IAS19 Revised 1998*, to retirement benefit cost for financial statements covering periods beginning before 1st January 1999, the enterprise should disclose the fact that it has applied this Standard instead of *IAS 19*, Retirement Benefit Cost, approved in 1993. The Authority has adhered to this standard.

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15. Commitments

Commitments at December 31,1998 are as follows:

Authorised and Contracted	Cost Incurred to 31/12/98	Estimated Cost to Completion	Total Cost
	$	$	$
a) Engineering and Consultancy Fees:			
Globaltech Inc.	24,375	93,473	117,848
Polytron Inc.	32,596	48,895	81,491
b) Ocean Conversion (Cayman) Ltd.	-	980,000	980,000
	56,971	1,122,368	1,179,339

a) In August 1998 consulting engineers were invited to bid on the Tender Documents of the Sewage Treatment Works Upgrade for the "Provision of General and Mechanical Engineering Services" and for the "Provision of Electrical Engineering Services." These contracts were awarded in late September 1998 to Globaltech Inc. and Polytron Inc. respectively.

b) The Authority contracted with Ocean Conversion (Cayman) Ltd. to increase the water production capacity of the Lower Valley Seawater Reverse Osmosis Plant to 3,000 cubic meters per day by March 1999 at a capital cost to the Authority of CI$980,000.

16. Prior Year Adjustments and Reclassification

a) In June 1997 an actuarial assessment of the Authority's unfunded past service liability for pensions was completed. The liability was assessed at $677,000 as of 1st January 1997. The matter was not accounted for in the Authority's 1997 financial statements because, in 1997, the Pensions Law did not contain any provisions relating to unfunded past service liability for pensions.

On 8th December 1998 the Pensions (Contribution Rate) Regulations, 1998 was passed. Those Regulations allowed the Authority to recognise the unfunded past service liability within its financial statements. The Authority has reduced its Retained Earnings as of 1st January 1997 by $677,000 and accordingly, the 1997 financial statements have been restated.

b) Prior to 1998 the Authority did not have a fixed asset register. A fixed asset register was established during 1998. It was found that fixed assets had been over depreciated by $128,488. Of this amount $44,482 occurred in 1997 and the remaining $84,006 related to 1996 and prior years.

This matter was corrected in the preparation of the 1998 financial statements and accordingly, the 1997 results have been restated.

The overall effect of recognising the unfunded past service liability for pensions and the write-back of over-depreciation of fixed assets is to reduce Net Assets and Retained Earnings by $548,512 at 31st December 1997 (1996: $592,994).

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16. Prior Year Adjustments and Reclassification (continued)

c) Revenue from Agency Work was reported under the caption of Sundry Income in the 1997 audited financial statements. Income from this source has been reclassified and reported as part of Operating Revenue in the current year's financial statements.

17. Leases

The Water Authority leased office space from the Cayman Islands Government for its administrative office at a cost of $2,326 per month from January to November 1998, when it moved into the new office building at Red Gate Road.

18. Fair value disclosure of financial instruments

International Accounting Standards require all entities to disclose the fair value of financial instruments, both assets and liabilities that are recognised and not recognised in the balance sheets for which it is practicable to estimate their fair value. At December 31, 1998 the following methods and assumptions were used by management to estimate the fair value of each of the financial instruments:

(a) Bank Balances
The carrying amount approximates fair value.

(b) Accounts receivable/other receivables/accounts payable and other liabilities
The carrying amount approximates fair value.

(c) Current and long term debt
Included in these balances are certain fixed rate and non-interest bearing loans. The carrying value of these loans represents the principal balance owing. The anticipated future principal repayments have not been discounted, as it would not provide any additional relevant information.

All other loans are floating rate and therefore bear interest at the market rate. The carrying value of these loans approximates fair market value.

Fair value estimates are made at a specific point in time, based on market conditions and information about the financial instrument. These estimates are subjective in nature and involve uncertainties and matters of significant judgement and therefore cannot be determined with precision. Changes in assumptions could significantly affect the estimates.

19. Year 2000 Compliance

At 31st December 1998 the following mission critical systems were Year 2000 compliant:

- All hardware comprising the Authority's office computer network, including workstations, servers, network hubs, and printers;
- The Lower Valley Reverse Osmosis Plant;
- All plant comprising the Public Wastewater System in Grand Cayman;
- The Authority's commercial accounting system.

At 31st December 1998 the following mission critical systems were not Year 2000 compliant:

- The Utility Customer Billing System;

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19. Year 2000 Compliance (continued)

- The Red Gate Road Reverse Osmosis Plant.

The Authority intends and has the ability to commit the necessary resources to complete its year 2000 remediation plan on a timely basis. The Authority's plan is to renovate or replace all mission critical systems. Mission-critical systems *"are those systems which in the absence of an effective remediation program, any systems failure or processing error will cause, health and safety risks, significant revenue losses, increased operating costs, financial penalties for failure to comply with terms of contracts, or other financial difficulties."*

All Mission-critical systems have performed satisfactorily post 1st January 2000.

20. Reclassification

Certain of the prior years' figures have been reclassified to conform to the presentation adapted in the current year.