

## ANNEXES

LIST OF PARTICIPANTS

DOMINICA

Mr. Hague Thomas	- Environmental Health Officer
Mr. Minchington Israel	- Environmental Health Officer
Ms. Ferdinia Carbon	- Environmental Health Officer
Mr. Michael Anselm	- Water Quality Supervisor CWA
Mr. Wilbur Scotland	- Assistant Engineer CWA

ST. VINCENT

Mr. Paul Lynch	- Supervisor CWSA
Mr. Earlston Shortte	- Public Health Engineering Technician
Mrs. Pamela Bonadie	- Hospital Administrator
Mrs. Valerie Murphy	- Health Educator

GRENADA

Mr. Curtis Edwards	- Chief Environmental Health Officer
Mr. André Worme	- Environmental Health Officer
Mr. Terrence Smith	- Engineer C.W.C.
Mr. Russell Bubb	- Lab Technician C.W.C.
Mr. Ricardo Trotman	- Environmental Health Officer

ST. LUCIA

Mr. Marcel Revriere	- Environmental Health Officer
Mr. Eldridge Poyotte	- Environmental Health Officer
Mr. Erroll Frederick	- Environmental Health Technician
Mr. Kenneth Raymond	- CWA Distribution Superintendent
Mr. Reney Biscombe	- CWA Control Room Officer
Ms. Ava Auguste	- Community Health Nurse

LIST OF RESOURCE PERSONS

Mr. Rob. Swart            - Course Instructor, Sanitary Engineer  
                             PAHO/PCDPPP, Antigua

Mr. Wilton Conliffe - PAHO Temporary Advisor, Senior Public Health  
                             Engineer, Barbados.

Dr. James St. Catherine - Ministry of Health, St. Lucia

Mr. Stanislaus James    - Co-ordinator Disaster Preparedness,  
                             St. Lucia

Eng. Pat Brown            - Consulting engineer, St. Lucia.

ANNEX B:

RESULTS OF WORKSHOP EVALUATION

- 15 out of 20 participants completed the evaluation form:  
9 public health, 5 water utility, 1 other
- Most important subjects covered during the workshop according to the participants.
  - 0 emergency operations plans development (15 participants)
  - 0 vulnerability analysis (13 participants)
  - 0 roles and responsibilities of environmental health (9 participants.)
  - 0 disaster effects and preparedness in environmental health and water supply (9 participants)
  - 0 environmental health and water supply in shelters and relief centers (9 participants)
  - 0 simulation exercise (6 participants)
  - 0 disaster resistant building techniques (5 participants)
- Least important subjects covered during the workshop according to the participants
  - 0 simulation exercise (4 participants)
  - 0 disaster resistant building techniques (3 participants)
  - 0 hazardous materials handling (2 participants)
- The majority of the participants would be "(very) much" able to transfer the learning back to the practical situation  
  
The participant answering "moderate" felt restrained by lack of interest and co-ordination from the side of the government.
- To apply the learning in their actual work participants would primarily need:
  - 0 co-operation and support from the side of their superiors/management (10 participants)
  - 0 equipment and supplies or a disaster preparedness budget (3 participants)
  - 0 interest and co-operation from fellow-workers (5 participants).

ANNEX (B) CONTINUED

- All participants thought, that the workshop was geared at the level of the attending participants
- 60% of the participants considered the time given for group discussions sufficient, 40% not
- As factors that impressed participants most the following were mentioned:
  - 0 informal/smooth/genuine atmosphere
  - 0 systematic approach to vulnerability analysis and planning
  - 0 quality of presentation and visual aids
  - 0 similarity of problems in the participating countries
  - 0 simulation exercise
- As factors that impressed participants least, only the simulation exercise was mentioned
- The participants gave the following recommendations for future workshops of this nature
  - 0 extend the length of the course to 5 days - 2 weeks to reduce the long days
  - 0 improve the simulation exercise (abbreviate it, do it later in the course, increase stress)
  - 0 allow more time for discussions
  - 0 include a field trip/practical exercise
  - 0 increase the number of handouts
  - 0 have policy makers attend
  - 0 have participants present their past efforts in the field

GRENADA

EMERGENCY ACTION PLAN

DISASTER PLAN FOR CENTRAL WATER COMMISSION

OBJECTIVES:- Have services restored, so that population could have a safe supply.

1. Work force mobilization
2. Survey - to know extent of damages
3. Water Quality checks, for bacterial safety
4. Prevention of loss of any water stored
5. Setting up of Central distribution points (priority list)  
Handling and storage of water
6. Full restoration of all services

EMERGENCY PHYSICAL AND MATERIAL PLANNING

There are 24 water systems throughout the country.

Dam Structures:- Structures at intake points are designed to withstand flood conditions and a good amount of vibration. They are fitted with by pass lines that will be chlorinated. Most dam locations are not available by motorable roads. The need for communication equipment will be important as most dams are away from treatment facilities. The need for 4-5 wheel drive vehicles for out parishes, lorry mounted cement mixer, portable welding machines and galvanized tanks.

Materials Resource:- Front end loader (1); backhoe (1); crane (1); trucks (2); 4 wheel drive vehicles (3); compressor (1); portable pumps (2); light vehicles (6).

Materials to be stockpiled:- variety of ductile iron and galvanized pipes and fittings, chlorine cylinders, chlorine tablets, galvanized sectional tanks and accessories; fuel (diesel).

Light tools:- chain saws, cutlasses, pecks spades, forks heavy hammers, sledges, cables, ropes, pulleys, cement assortment of lumbers for stays, fire hoses and accessories, flashlights, lanterns, trouble lamps.

#### PRE-DISASTER EMERGENCY PROGRAMME

1. To mobilize emergency crews throughout the country.
2. Management immediate release on radio asking consumers to store water in clean covered containers, to insure post disaster supply; and to use water from safe supplies, as will be determined by central Water Commission.
3. Manager, Engineers, Superintendent, Supervisors and crews would be on stand-by in respective areas  
  
Supervisors to laise directly with Manager and other National Committee heads in their respective areas for any late changes or up dates.
4. List of all officers and backup crews available to manager
5. Radio release by management, that all drinking water should be boiled. Under no circumstances use water from questionable sources especially for children.

#### POST D-SASTER EMERGENCY PROGRAMME

1. Survey of damages island wide by crews in respective areas.
2. Central distribution points to be made known to consumers and areas of safe supplies.
3. Repair of major damages and restoration of services to priority areas.

MECHANICS OF IMPLEMENTATION PRE AND POST EMERGENCY PERIOD

1. Laising with all officers in their respective areas.
2. In each area 2 persons to man whatever communication system available.
3. All vehicles to be checked for whatever they may need.
4. All drivers in respective areas to be on standby
5. All materials and equipment stockpiled will be the responsibility of area supervisors.



# MANPOWER LIST

NOS:	NAMES	AREAS
1.	L. Neckles Secretary Manager	St. George's.
2.	H. Roberts Engineer	"
3.	L. Tamas Superintendent (M&D)	"
4.	V. Cenas " " (Q&P)	"
5.	A. Alexander (M)	"
6.	A. Depedrain Assistant	"
7.	F. Baney Supervisor	"
8.	A. Fisher Assistant	"
9.	G. Hopley Supervisor M (M)	Part of St. David
10.	G. Read	"
11.	J. John Ast. Supervisor (M)	St. Andrew's & part of St. David
12.	L. Gritten Assistant	"
13.	R. Walker	"
14.	E. Edmund Supervisor (M)	St. Patrick's
15.	G. Drakeo (Assistant)	"
16.	G. Johnson Supervisor (M)	St. Mark's & St. John's
17.	N. Wilson (Assistant)	"
18.	L. Hosten Eng. Assistant	"
19.	D. Thomas - Surveyer	Eng. Division Main Office
20.	O. Antoine - Eng. Assistant	"
21.	J. Brathwaite - Trainee Droughtsman	"
22.	H. Bruma " "	"
23.	R. Thomas Administration	
24.	D. Henry "	
25.	Raymond Cartiate Mechanism	
26.	G. Gabriel "	
27.	M. Harry "	
28.	T. Baptiste "	
29.	T. Davis "	
30.	C. Francia Weldor	

Key: M&D Maintenance & Distribution, Q&P Production & Quality  
M Maintenance

# ANNEX D

## ST. LUCIA CENTRAL WATER AUTHORITY

### HURRICANE PLAN

	By Mid May	Whole Gale Warning	Hurricane warning	Immediately After a Hurricane
PLANT SUPERINTENDENT AND ZONE SUPERVISOR/FOREMAN	(1) Check security of all structures: Windows: Doors: Roof: Shutter: Hooks: Latches: Galvanized sheeting: Report and make necessary repairs.	Make certain all sites are protected and secure	Recheck security.	Check all sites and report conditions to control room.
	(2) Check emergency stocks. Nails, hammer, wire, rope, pliers, flash lamp, hurricane lamp, kerosene, first aid kits, cutlasses & files.	Liaise with Control Room for latest information and give location.	Collect perishable food stocks from main stores or purchase locally.	All men report to nearest water works site to home as soon as possible.
	Throughout the season maintain good diesel and lubricating oil stocks		Move vehicles to strategic points: Head office: Treatment plants except Union: Report positions to Control Room	
OPERATIONS MANAGER & SUPERINTENDENTS			Any men who wish to; may return home	
	Check Mobile, water tanks and keep record of location.	Check 1 & 2 above with supervisors.	Either remain at head office or in Radio/Telephone contact.	Take action to restore supplies: ration available water according to priority list. Liaise with secretary/Manager & Emergency centre
	Make arrangements for local truck & tank hire.	Fill all storage reservoirs ensure mobile tanks are sterilize and ready for use		
		Procure local hire arrangements.		

	By Mid May	Whole Gale Warning	Hurricane Warning	Immediately after a hurricane
FOREMAN/ MECHANIC	Maintain high levels of diesel stocks at all generator sites and vehicle fuel stocks at head office.	Know location of all vehicles and ensure vehicles at head office with radios are sheltered where possible.	Confirm. of whole gale warning: Arrangement vehicle safety.	Assist as required
PURCHASING OFFICER	Check emergency stores as for Superintendent	Stand-by	Stand-by	Issue stores as required for remedial work.
SUPPORT SERVICES	Locate and make provisional arrangements to hire diesel pump generator.	Confirm Mid May arrangements.	Stand-by	Assist as Required.
WATER QUALITY	Ensure that chemicals stocks at works are never less than two month supplies.	Check water quality with Supervisors.	Stand-by	Monitor water island wide if possible. Visit and check all Treatment Plants as soon as possible liaise with Public Health Department.
CONTROL ROOM	Securely brace all station radio antenna. Repair all faulty radios. Provide protective shelter for radios and associated equipment.	Test and ensure good island wide communications.	Check availability of duty officer in accordance with rota; liaise with emergency centre and keep all station duty officers and all other C.W.A. mobile users informed of situation.	Mann control room in accordance with rota.

JUNE 1982

ST. LUCIA CENTRAL WATER AUTHORITY  
NATIONAL DISASTER PREPAREDNESS PLAN  
APPENDIX 11

For emergency relief the undermentioned officers should be contacted and liaison with them maintained:

POST	NAME	ADDRESS	HOME TEL.	RESPONSIBILITY
Engineer/ Managers	J.C. Calixte R.M. Sanchez	Rockhall - San Soucis	2522 4598	Engineering/ Operation Control Island Wide
Operations Managers	T. Yorke	La Clery	4604	Island wide Northern District
Treatment Superintendent Acting	A. Etienne	Reduit Park		Intakes/Water Treatment Island wide
Superintendent North *	T. Alcindor	La Clery	5514	Distribution/ Storage Reservoirs Northern District
Superintendent South	K. Raymond	Vieux Fort Water Plant	6326**	Distribution Storage Reservoirs Southern District
Supervisor of Works	C. Jalim	Residence of Mr. George	15-424**	Mabouya Valley
Supervisor of Works	V. Fevrier	Police Station Will relay message	5333**	Dennery
Supervisor of Works	J. Charlery	C/o E. Gaston Mon Repos	14-256**	Micoud/Patience Desruisseaux
Supervisor of Works	C. Jn. Baptiste	New Dock Road	6185	Vieux Fort Treat- ment Works
Supervisor of Works	I. Quinlan	Vieux Fort Water Plant	6326**	Vieux Fort/Laborie Distribution
Supervisor of Works	K. Charlemagne	Soufriere Town Hall will relay message	7218	Soufriere/ Choiseul/ Canaries
Support Services Manager	J. Charles	Entrepot	5270	Electrical) Mechanical) Island Transport) Wide
Supplies Officer	D. Heath	Block 7 Apt. 6 St. Louis St.	3507	Stores/Supplies

\* North District - island north of Abse La Raye - Denniere Riviere

\*\* No home telephone - contact phone No. on'y

ST. LUCIA CENTRAL WATER AUTHORITY  
NATIONAL DISASTER PREPAREDNESS PLAN

APPENDIX 1

The undermentioned officers will be responsible for the following:

Plan of Action	Secretary/Manager
Telecommunications	Operations Manager
Transport	Foreman/Mechanic
Materials	Purchasing Officer
Labour Recruitment	Operations Manager
Water Treatment and Water Quality	Supervisor/Water Quality
Control of Water Supply	Operations Manager
Co-ordination of Repairs	Operations Manager
Medical Supplies	Purchasing Officer
Public Relations/Information Service	Secretary/Manager
Finance	Accountant
Electricity, Pumps etc.	Support Services
Food Supplies	Purchasing Officer
Liaise with Central Emergency Commity	Duty Officer/Control Room Attr
Duty Officer Rota	Operations Manager

ST. LUCIA CENTRAL WATER AUTHORITY  
NATIONAL DISASTER PREPAREDNESS PLAN

APPENDIX 111

Emergency Stocks:

Nails, hammers, wire, rope, pliers, axes,  
flashlamp and battery hurricane lamps,  
cutlasses, kerosene, First Aid equipment,  
emergency food supplies.

INTRODUCTION

The 1980 manual by the Central Emergency Relief Organisation

"..... the winds achieve great speed of motion revolving anti clockwise ..... usually accompanied by high seas, thunder and lightning and torrential rain.

From the Authority's point of view, the torrential rains have the most damaging effect.

Intake structure and pipe works could become blocked and/or washed away with heavy rains falling for several hours.

The main intakes are all liable to become affected in any one storm. This could result in a disruption of over (70%) seventy percent of the water distributed by the Authority.

Steep-sided valley terrain and poor access roads make repairs difficult and lengthy, since manual labour is the only solution.

The out-of-season rains in May 1981 and the resulting long delay in restoring the Majorca supplies is a vivid example of what could take place.

Figure one shows the location of the main intake works and transmission lines, with access routes.

The water retained in the storage reservoirs and water from spring sources that are properly enclosed would provide the immediate needs in an emergency.

Priority distribution would be as follows:-

- (1) Hospital and Health Centres
- (2) Day care and children centres
- (3) Relief centres and emergency services- Police etc.
- (4) Crowded Communities
- (5) Hard hit residential and remote areas.

A prerequisite to this plan is the implementation of the preparedness measures. This is an absolute necessity and MUST BE OBSERVED.

# EMERGENCY RESPONSE SYSTEM

## 1. KEY PERSONNEL

POST	NAME	ADDRESS	TEL NO
Manager	R.W. France	Cane Hall	84182
Accountant	R. Bennett	Villa	84662
Engineer	D. Cummings	R. Sharpe	71351
Engineering Asst.	E. Cambridge	N. Montrose	61604
Ch. Supervisor	P. Lynch	N. Montrose	71743
Per. Officer	P. Campbell(Mrs)	Cane Garden	71356
Sup. Source	G. Lynch	N. Montrose	71743
Sup. Kingstown	J. Hamilton	Sion Hill	71798
Ag. Insp. N. Leeward	E. Layne	Troumaca Pol. Stn.	
Sup. S & C. Leeward	F. Patterson	Frenches	71196
Ag. Sup. S. Windward	J. Davis	Carriore -Evesham P.O.	
Sup. C. Windward	N. Browne	Villa	
Sen. Insp. N. Windward	L. Collins	Georgetown	
Store Keeper	M. John	Murray Village	
Sen. Insp. Laboratory	C. James	Mesopotamia	

N.B. CRIMINALS affairs would be handled by management comprising the first six officers.

## 2. RESPONSE ACTIONS

### (a) Warning period

- Notice by Radio release to home owners to store water in suitable containers.
- All workers make themselves available.
- Management meets to review plans and give necessary directions.
- Outlets from reservoirs to be closed down by caretakers after giving sufficient time for home owners to full up.
- Drivers are to fill up their vehicles with fuel and keep them in their possession, ready to report for duty at short notice.
- Caretakers are to close down river intakes when sufficient storage is collected in the reservoirs.

- Information on the use of water and water quality to be given again to home owners.

fill up notices	- reservoir outlets closed.	intake
	reservoirs fill up	closed
_____ (a) _____	_____ (b) _____	_____ (c) _____

- Time intervals (a), (b) and (c) are to be determined by management and depends on the length of the warning period.

(b) EMERGENCY PERIOD:

- All fit workers report as soon as possible to head office or report from remote areas via the police stations.
- Immediate needs analysed by management and supervisors.
- Teams are to be set up and sent to survey the reported hard hit areas.
- Reports to be studied by management.
- Liaison with other agencies and departments to be done by the Manager or such persons appointed by him.
- Services suitable for reoperation are to be restarted only on the advice of management.
- Truck borne water for distribution is to be done according to the priority basis established or as directed by the Manager.
- Water quality analysis to be done on a regular basis at all Camps and hard hit areas as well as operating systems.
- Chlorine tablets to be administered by Lab personnel or persons trained for this purpose.

(c) REHABILITATION PERIOD:

- Initial survey report to be studied by Emergency section.
- Badly affected systems to be given detailed inspection.
- Reports of the extent to damage done, together with the cost and time estimates to be promptly prepared and submitted to the Manager.
- Re-established systems to be monitored frequently both for operations and water quality standards.



APPENDIX 11  
STOCK LIST OF ESSENTIAL MATERIALS

ITEM	DESCRIPTION	QUANTITY
(a) CONTAINERS	400 gals 200 gals 100 gals 5 gals	
(b) VEHICLES & ACCESSORIES	Trucks Pick-ups Cycles Compressor	
(c) CHEMICALS	Chlorine in cylinder Hypochlorite Tablets Mixing containers Tubing Scales	
(d) PIPLS AND FITTING	Pipe size, bends, elbow, reducers unions (i) 12" (ii) 10" (iii) 8" (iv) 6" (v) 4" (vi) 3" (vii) 2 1/2" (iii) 2" (ix) 1 1/2" (x) 1" (xi) 3/4" (xii) 1/2"	

ITEM	DESCRIPTION
Accessories	Shovels Spades Cutlasses Gloves Water boots Buckets Ropes Crow bars Wrenches Spanners Axes Lantern and Fuel

WATER SUPPLY SURVEY FORM-A  
POST DISASTER

DISTRIBUTION AREA .....  
NAME OF COMMUNITY .....  
NORMAL SOURCE OF SUPPLY .....

WATER SUPPLY STATUS

(1) WATER AVAILABILITY

- ° APPROXIMATE NO OF FAMILIES WITHOUT WATER .....
- ° INSTITUTIONS WITHOUT WATER :

TYPE	LOCATION	PROBLEM
HEALTH CENTRES	.....	.....
SCHOOLS	.....	.....
OTHERS	.....	.....

- SYSTEM ESTIMATED CAPACITY

° .....G.P.D.

° PER CAPITA RATE.....GALS/PERSON/DAY

- Physical appearance of water, smell taste etc

- Lab analysis of water .....

(2) STATUS OF WATER SYSTEM

ITEM	LOCATION	EXTENT OF DAMAGE	ESTIMATED TIME FOR REPAIRS(DAYS)
CATCHMENT	.....	.....	.....
INTAKE STRUCTURE	.....	.....	.....
ACCESS ROAD	.....	.....	.....
MAINS	.....	.....	.....
SEDIMENTATION TANK	.....	.....	.....
CHLORINATOR	.....	.....	.....
CONTROL VALVES	.....	.....	.....
GAUGES	.....	.....	.....
STORAGE/BREAK PRESSURE TANK(S)	.....	.....	.....
DISTRIBUTION LINES	.....	.....	.....
HOUSE CONNECTIONS	.....	.....	.....
OTHER	.....	.....	.....

STATUS OF PERSONNEL

CATEGORY	NO. AVAILABLE	NO. ABSENT
<ul style="list-style-type: none"> <li>• INSPECTORS</li> <li>• PIPE FITTERS</li> <li>• LABOURERS</li> </ul>		

STATUS OF MATERIALS/SUPPLIES

ITEM	NO. DAMAGED	NO. AVAILABLE

INVENTORY OF NEEDS

CARPENTERS .....  
 .....  
 MASONS .....  
 .....  
 PIPE FITTERS .....  
 .....  
 SUPERVISOR .....  
 .....

(b) PIPES

SIZES	QUANTITIES

(c) TOOLS

TYPES	QUANTITIES

APPENDIX 111

(e) TRANSPORTATION:

DATE.....

SURVEYOR(S)	DESIGNATION
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....
.....	.....

APPENDIX 1v

VEHICLE ALLOCATION

VEHICLE REG. NO	TYPE	DRIVER NAME	ADDRESS	T.L. NO
7223	DAIHATSU	L. JAMES	FAIRHALL	
7377	DAIHATSU	E. JOSEPH	FAIRBAINE	
3864	LAND ROVER	L. HARRY	GLEN	
5724	LAND ROVER	A. WILLIE	FAIRHALL	
6595	TRUCK	H. JACKSON	CALDER	