

DOCUMENT ED/R01/001 (Revision 2)

Water Quality Regulations

DOCUMENT NO.:	ISSUED BY:	NO. OF CONTROLLED DOCUMENT ISSUED.
ED/R01/001 Rev. 1 : 18 Feb 2002 Rev. 2 : 1 Jan 2004	TECHNICAL DIVISION	1. AADC 2. ADDC 3. TRANSCO 4. BPC 5. ECPC 6. AMPC 7. APC 8. SCIPCo 9. GTTPC 10. UWEC 11. ATPC 12. Bureau's Library Total: 12

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 1 of 35			

TABLE OF CONTENTS

PART 1 INTRODUCTION.....	4
PART 2 WHOLESOMENESS	6
PART 3 RELAXATION OF REQUIREMENTS UNDER PART 2	7
PART 4 MONITORING OF WATER SUPPLIES	8
PART 5 RECORDS AND INFORMATION	13
PART 6 ENFORCEMENT.....	15

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 2 of 35			

THE WATER QUALITY REGULATIONS

The Regulation and Supervision Bureau for the Water and Electricity Sector in the Emirate of Abu Dhabi in exercise of its powers conferred under Article (62) of Law No (2) of 1998 Concerning the Regulation of the Water and Electricity Sector in the Emirate of Abu Dhabi, after consultation with the Abu Dhabi Water and Electricity Authority, hereby makes the following Regulations:

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 3 of 35			

PART 1 INTRODUCTION

1.1 These Regulations may be cited as the Water Quality Regulations and shall come into force on 31 January 2000.

1.2 The following words and expressions shall have the following meanings in these Regulations unless the context otherwise requires:

"Bureau": the Regulation and Supervision Bureau for the Water and Electricity Sector in the Emirate of Abu Dhabi;

"Consumer": a person to whom water is supplied for a purpose mentioned in paragraph 2.1;

"Distribution Companies": a distribution company established under the Law;

"Law": Law No (2) of 1998 Concerning the Regulation of the Water and Electricity Sector in the Emirate of Abu Dhabi;

"Licensed Supplier": the Supplier who holds a license granted by the Bureau;

"Licensed Transmission Operator": a person who is authorized by a license granted under the law to transmit electricity and/or water;

"Parameter": a property, element, organism or substance listed in the second column of the Tables in Schedule 1 to these Regulations.

"Prescribed Concentration or Value (PCV)": in relation to any Parameter, means the maximum or minimum concentration or value specified in relation to that Parameter in the Tables in Schedule 1 as measured by reference to the unit of measurement so specified;

"Sampling Point": a point that is determined as such by a Licensed Supplier for the purposes of Part 4 of these Regulations;

"Supplier": any person who delivers water to or conveys water through trunk mains pipelines or mains pipelines, or delivers water by road vehicle for a purpose mentioned in paragraph 2.1, and cognate expressions shall be construed accordingly;

"Water Supply Zone": an area that is designated by a Supplier (whether by reference to a source of supply, the number of persons supplied from any source, or otherwise) for the purposes of the provisions of these Regulations;

"Water Transmission Code": The transmission code or codes of that name required to be prepared by a Licensed Transmission Operator and approved by the Bureau as time from time revised with the approval of the Bureau;

"Year": calendar year, according to the Gregorian Calendar.

1.3 Words and expressions, other than those defined in paragraph 1.2 above, which are defined in the Law shall have the meanings ascribed to them in the Law.

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 4 of 35			

- 1.4 Words and expressions to which meanings are assigned by these Regulations shall (unless the contrary intention appears) have the same respective meanings in any document issued by the Bureau under these Regulations.
- 1.5 Unless the context otherwise require, any reference in these Regulations to a numbered Part, paragraph or Schedule is a reference to the Part, paragraph or Schedule of these Regulations bearing that number.
- 1.6 Any reference in these Regulations to a table is a reference to the relevant table in the numbered schedule in Part 7 of these Regulations.

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 5 of 35			

PART 2 WHOLESOMENESS

- 2.1 All water supplied for the purposes of drinking, washing, cooking or food production shall be wholesome.
- 2.2 Water supplied for the purposes of drinking, washing or cooking or for food production purposes shall be regarded as wholesome if the requirements of paragraph 2.3 below are satisfied, and, where the water has been softened or desalinated and is to be supplied for drinking or cooking or for food production purposes, the requirements of paragraph 2.4 below must also be satisfied.
- 2.3 The requirements of this paragraph are:
- (a) that the water does not contain any element, organism or substance (other than a Parameter) at a concentration or value which would be detrimental to public health;
 - (b) that the water does not contain any element, organism or substance (whether or not a Parameter) at a concentration or value which, in conjunction with any other element, organism or substance it contains (whether or not a Parameter), would be detrimental to public health;
 - (c) that the water does not contain concentrations or values of the Parameters listed in Tables A to Table F in Schedule 1 in excess of the prescribed concentrations or values;
- 2.4 The requirements of this paragraph are that the water's TDS, PH and Residual chlorine are not below the relevant minimum specified in Table A.
- 2.5 The Bureau will consider WHO (World Health Organization) Water Quality Guidelines as a reference for the Regulation's maximum Prescribed Concentration or Values (PCV) included in schedule 1 for all other parameter not included in the tables from A to F.

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 6 of 35			

PART 3 RELAXATION OF REQUIREMENTS UNDER PART 2

- 3.1 The Bureau may, upon the written application of a Supplier, authorise a relaxation of the provisions of Part 2 as respects supply by that Supplier.
- 3.2 Subject to paragraphs 3.3 and 3.4 the Bureau may at any time modify or revoke an authorisation (whether or not the authorisation is expressed to be given for a specified period) given pursuant to paragraph 3.1 above.
- 3.3 The Bureau shall not revoke or modify an authorisation without giving at least 6 months' notice or, if the holder of the authorisation agrees, on at least 6 weeks' notice by the Bureau of its intention to do so but the Bureau may revoke or modify an authorisation without notice if it appears to the Bureau that the immediate revocation or modification of the authorisation is required in the interests of public health.
- 3.4 A Supplier on whose application an authorisation has been given under this Part shall notify the Bureau as soon as the circumstances which gave rise to the application for the authorisation cease to exist, and, notwithstanding paragraph 3.3 above, the Bureau shall thereupon revoke the authorisation.

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 7 of 35			

PART 4 MONITORING OF WATER SUPPLIES

- 4.1 This part 4 applies to water supplied for any of the purposes described in paragraph 2.1
- 4.2 In this Part 4 :
- (a) "**revised number**" means any relevant reduced or increased number shown in a Table as an alternative to the standard number; and the Bureau shall have the discretion to require the Supplier to sample according to reduced or increased frequency as it finds it necessary to do so. Otherwise standard number shall be the applicable frequency.
- (b) "**the standard number**" means such number specified in the column headed "**Standard**" in Tables 1 to 7 as is applicable to the Parameter in question by reference purposes, for that purposes from that zone to the number of persons estimated to have been supplied or by reference to the volume of water supplied for domestic purposes and, if water is supplied for food production during that period: but a determination may not be varied after the beginning of the year for which it applies.
- 4.3 For the purpose of determining whether water to which this Regulation applies satisfies the provisions of Part 2 or, as the case may be, those provisions as relaxed by an authorisation given under Part 3, a Licensed Supplier shall take and analyse or cause to be analysed such number of samples of the water within each of its Water Supply Zones or from its road vehicles as is specified in this Part.
- 4.4 Subject to paragraph 4.8, a Licensed Supplier shall determine, in respect of each of its Water Supply Zones or road vehicles, such number and location of sampling points as will in its opinion secure that analysis of samples obtained from those points in respect of the Parameters listed in Tables A to F will, so far as is reasonably practicable, produce data which are representative of the quality of the water supplied by it.
- 4.5 In each year a Licensed Supplier to whom these regulations apply shall take from its sampling points for analysis for testing for compliance with each Parameter not less than such standard number of samples as is specified in Tables 1 to 7 in relation to the Parameter in question.
- 4.6 The number of samples to be taken in respect of any Parameter may, if the Bureau so authorises, be such reduced revised number, if any, as is specified in relation to that Parameter in the relevant table.

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2)	Document No. : ED/R01/001	Approved by:
	Issue Date: 1 Jan 2004		
Page 8 of 35			

- 4.7 Where no standard number is specified in relation to a Parameter listed in Schedule 1, a Licensed Supplier shall take sufficient samples from water within a Water Supply Zone or from its road vehicles in respect of that Parameter in order to establish whether or not water is wholesome as soon as it believes or has reasonable grounds for believing that:
- (a) the Prescribed Concentration or Value in respect of that Parameter has been exceeded or may be exceeded within the next three months; or
 - (b) the Prescribed Concentration or Value in respect of any other Parameter has been exceeded or may be exceeded within the next 3 months and the taking and analysis of samples in relation to the Parameter first mentioned would assist in deciding whether, and if so what remedial action should be taken.
- 4.8 A Licensed Supplier shall take sufficient samples from water within a Water Supply Zone or from a road vehicle in respect of any element, organism or substance, other than a Parameter, in order to establish whether or not that water is detrimental to public health as soon as it believes or has reasonable grounds for believing that that element, organism or substance, whether alone or in combination with a Parameter or any other element, organism or substance may cause the supply within that zone or from that vehicle to be a supply which does not satisfy the provisions of Part 2 or, where those provisions have been relaxed by an authorisation given under Part 3, those provisions as so relaxed.
- 4.9 Paragraph 4.10 applies as respects any source which has not been used for a period of 3 months proceeding the date on which the Supplier proposes to supply water from it.
- 4.10 A Supplier shall before it supplies water from a source mentioned in paragraph 4.9 take in accordance with paragraph 4.11 such samples of that water as will enable it to establish:
- (a) whether water can be supplied from that source without contravening these Regulations; and
 - (b) the treatment necessary to ensure that these Regulations are complied with in relation to the supply of that water.
- 4.11 Samples shall be taken in the case of a source mentioned in paragraph 4.9, in respect of:
- (a) each of the Parameters listed in Schedule 1; and
 - (b) any other element, organism or substance which, in the opinion of the undertaker, may cause the supply to contravene these Regulations.

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 9 of 35			

4.12 A Licensed Supplier shall secure, so far as is reasonably practicable, that in taking, handling, transporting, storing and analysing or causing to be analysed any sample taken for the purposes of Parts 4 and 5 of these Regulations, the appropriate requirements are satisfied.

4.13 In paragraph 4.12 "the appropriate requirements" means such of the following requirements as are applicable:

- (a) the sample is representative of the quality of the water at the time of sampling;
- (b) the sample is not contaminated when being taken;
- (c) the sample is kept at such temperature and in such conditions as will secure that there is no material alteration of the concentration or value for the measurement or observation of which the sample is intended;
- (d) the sample is analysed as soon as may be after it has been taken:
 - i) by or under the supervision of a person who is competent to perform that task;
 - ii) with the use of such equipment as is suitable for the purpose;
 - iii) by applying such analytical systems and methods as are capable of establishing, within acceptable limits of deviation and detection, whether the sample contains concentrations or values which contravene the prescribed concentrations or values; and
- (e) any laboratory at which samples are analysed has a system of analytical quality control that is subjected from time to time to checking by a person who is:
 - i) not under the control of either the laboratory or the person to whom these Regulations apply; and
 - ii) approved by the Bureau for that purpose.

4.14 In the event that value of one or more of the parameters included in the Table from A to F lies outside the Prescribed Concentration or Value (PCV) limit particularly to Table F (microbiological parameters) immediate remedial action shall be taken in accordance with the Operating Code of the Water Transmission Code.

4.15 A Supplier shall not, otherwise than for the purposes of testing or research, apply any substance or product to, or introduce any substance or product into, water which is to be supplied for drinking, washing, cooking or food production purposes unless:

- (a) the Bureau has for the time being approved the application or introduction of that substance or product and it is applied or introduced in accordance with any conditions attaching to that approval; and

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 10 of 35			

(b) the Supplier is reasonably satisfied that the substance or product either alone or in combination with any other substance or product in the water is unlikely to affect the quality of the water supplied;

4.16 The Bureau may, if it decides to issue an approval for the purpose of paragraph 4.15 (a) include in the approval such conditions as it considers appropriate and, subject to paragraph 4.18, may at any time revoke or vary any approval it has previously given.

4.17 The Bureau may by notice given in writing to a Supplier prohibit it for such period as is specified in the notice from applying to, or introducing into, water intended to be supplied for drinking, washing, cooking or food production purposes any substance or product which the Supplier would otherwise be authorised to apply or introduce by paragraph 4.15 (a).

4.18 The Bureau may:

(a) revoke in writing any approval given by it for the purposes of paragraph 4.15 (a);

(b) modify any such approval in writing by including conditions, or varying existing conditions;

(c) issue any such notice as is mentioned in paragraph 4.17;

but, unless it is satisfied that it is necessary to do so in the interests of public health without notice, shall not do any of those things without giving all such persons as are, in its opinion, likely to be affected by the revocation or modification of the approval or by the issue of the notice at least 6 months notice in writing of its intention.

4.19 The Bureau may at any time by notice in writing given to a Supplier require it to make an application to the Bureau for approval of the use of any process, and may prohibit it for such period as may be specified in the notice from using any such process in connection with the delivery or conveyance by it of water for drinking, washing, cooking or food production purposes.

4.20 The Bureau may refuse the application or impose on any approval given for the purposes of this regulation such conditions as it thinks fit and, subject to paragraph 4.21, may at any time by notice in writing to the person revoke an approval so given or modify or revoke any condition imposed by virtue of this paragraph.

4.21 The Bureau shall not:

(a) revoke any approval given for the purposes of this regulation;

(b) modify any condition imposed by virtue of paragraph 4.20; or

(c) prohibit a Supplier from using any process,

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 11 of 35			

unless it has given to the Supplier at least 6 months notice in writing of its intention provided that this paragraph shall not apply in any case in which the Bureau is of the opinion that the immediate revocation, modification or prohibition is necessary in the interests of public health.

- 4.22 The Bureau may, by notice in writing, require the Supplier who makes an application for an approval under paragraph 4.19 to pay to it a charge which reflects the administrative expenses (excluding the costs of conducting any tests) incurred or likely to be incurred by the Bureau in connection with that application; and in determining the amount of any charge the Bureau may adopt such methods and principles for its calculation as appear to it to be appropriate.

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 12 of 35			

PART 5 RECORDS AND INFORMATION

- 5.1 A Licensed Supplier shall prepare and maintain, in respect of each of its Plant, Water Supply Zones and its road vehicles, a record containing:
- (a) the name of the zone road vehicle, well field, desalination plant, reservoir or pumping station;
 - (b) as relevant, an estimate of the population of the zone or capacity;
 - (c) particulars of any relaxation granted under Part 3 which applies to water supplied in the zone;
 - (d) particulars of the result of any analysis of samples taken in accordance with Part 4 of these Regulations;
 - (e) information in the form in Schedule 3 hereto; and
 - (f) such particulars as the Licensed Supplier may determine.
- 5.2 A Licensed Supplier shall make:
- (a) initial entries in the register in respect of the matters mentioned in paragraph 5.1 (a) to (c) no later than 30 April 2000;
 - (b) entries relating to the results of the analysis of samples within 28 days of the day in which the result is first known to the person; and
 - (c) an entry of the information mentioned in paragraph 5.1(e) when paragraph 5.7 is complied with.
- 5.3 Without prejudice to paragraph 5.2, the Licensed Supplier shall at least once in each year review and bring up to date the record required to be kept by paragraph 5.1.
- 5.4 Nothing in this Regulation shall require a Licensed Supplier to retain a record of any information mentioned in paragraph 5.1 (d) or (e) at any time more than 5 years after the date on which the information was first entered in the record.
- 5.5 A Distribution Company shall make available for inspection by the public at all reasonable hours and free of charge at such of its offices as are normally open to the public any record maintained by it in accordance with paragraph 5.1.

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2)	Document No. : ED/R01/001	Approved by:
	Issue Date: 1 Jan 2004		
Page 13 of 35			

- 5.6 A Distribution Company shall afford to any person facilities to take or obtain a copy of any part of a record maintained in accordance with paragraph 5.1:
- (a) in the case of a person who receives a supply of water in the zone and whose request is confined to information relating to that zone, free of charge;
 - (b) in any other case, on payment of such reasonable charge as the Distribution Company may determine.
- 5.7 A Distribution Company shall include in or append to at least one of the accounts sent to each customer in any year a statement informing the public that records of water quality may be inspected by the public free of charge and of the address, telephone number and hours of opening of at least one of the offices at which an inspection can be made.
- 5.8 A Licensed Supplier shall prepare a report for each year and, in respect of the statement in paragraph (b) for each quarter, including:
- (a) a summary of the quality of water supplied by it;
 - (b) a statement as to the extent to which water supplied by it complied with Part 2 of these Regulations;
 - (c) particulars of any relaxation granted under Part 3 which applies to water supplied by it.
- 5.9 The statement required by paragraph 5.8 (b) shall specify, in the form set out in Form A (I – III) and Form B in Schedule 3 to these Regulations, the results of the analysis of samples required under paragraph 4.3.
- 5.10 On or before 31 March each year a Licensed Supplier shall send a copy to the Regulation and Supervision Bureau of the annual report referred to in paragraph 5.8 and on or before the last day of the month following the end of the quarter in question a copy of the quarterly report referred to in that paragraph.

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2)	Document No. : ED/R01/001	Approved by:
	Issue Date: 1 Jan 2004		
Page 14 of 35			

PART 6 ENFORCEMENT

- 6.1 Pursuant to Article 66 of Law No. 2 of 1998, failure of any person to comply with these regulations is contrary to the Law.
- 6.2 These Regulations are subject to modification or revocation by the Bureau at any time and from time to time.

Issued in Abu Dhabi:

*On 24 January, 2000 and revised on 18 February 2002 (rev. 1) and
January, 2004 (rev. 2).*

1

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 15 of 35			

SCHEDULE 1

Prescribed Concentrations or Values

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 16 of 35			

TABLE A

Item	Parameters	Units of Measurement	Concentration or Value (maximum unless otherwise stated)
1.	Colour	Mg/l pt/Co scale	15
2.	Turbidity (including suspended solids)	Formazin turbidity units	4
3.	Odour (including hydrogen sulphide)	Dilution number	Unobjectionable
4.	Taste	Dilution number	Unobjectionable
5.	Total dissolved Solids	mg/l	100-1000 at 25°C
6.	Calcium Hardness	mg/l as CaCO ₃	200 at 25 °C
7.	Total hardness (i)	mg/l as CaCO ₃	300 at 25°C
8.	Residual chlorine	mg/l Cl ₂	0.2~0.5 (when arriving to consumers)
9.	Conductivity	□mhos/cm	160-1600
10.	Hydrogen ion(ii)	pH value	9.2(maximum) 6.5 (minimum)

- (i) The water supplied should not be aggressive and if measured by Langelier Index, the value should be slightly positive and falls in the range 0.0 to 0.3. The total of Magnesium and Calcium Concentration should not exceed the total Hardness.
- (ii) The optimum level for pH shall range from 7 to 8.5.

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2)	Document No. : ED/R01/001	Approved by:
	Issue Date: 1 Jan 2004		
Page 17 of 35			

TABLE B

Item	Parameters	Units of Measurement	Concentration or Value (maximum unless otherwise stated)
1.	Sulphate	mg SO ₄ /l	250
2.	Magnesium	mg Mg/l	30
3.	Sodium	mg Na/l	150
4.	Potassium	mg K/l	12
5.	Chlorides	mg CL/l	250
6.	Nitrate	mg NO ₃ /l	50
7.	Nitrite	mg NO ₂ /l	0.1
8.	Ammonium (ammonia and ammonium ions)	mg NH ₄ /l	0.5
9.	Total organic carbon	mg C/l	No significant increase Over that normally observed
10.	Dissolved or emulsified hydrocarbons; mineral oil	mg/l	0.01
11.	Aluminium	mg Al/l	0.2
12.	Iron	mg Fe/l	0.2
13.	Manganese	mg Mn/l	0.05
14.	Copper	mg Cu/l	1
15.	Zinc	mg Zn/l	5
16.	Phosphorus	mg P/l	2.2
17.	Fluoride	mg F/l	1.5

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 18 of 35			

TABLE C

Item	Parameters	Units of Measurement	Concentration or Value (maximum unless otherwise stated)
1.	Arsenic	µg As/l	50
2.	Cadmium	µg Cd/l	5
3.	Cyanides	µg CN/l	50
4.	Chromium	µg Cr/l	50
5.	Mercury	µg Hg/l	1
6.	Nickel	µg Ni/l	50
7.	Lead	µg Pb/l	10
8.	Antimony	µg Sb/l	5
9.	Selenium	µg Se/l	10
10.	Barium	µg Ba/l	700
11.	Boron	µg B/l	1000

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2)	Document No. : ED/R01/001	Approved by:
	Issue Date: 1 Jan 2004		
Page 19 of 35			

TABLE D

Item	Parameters	Units of Measurement	Concentration or Value (maximum unless otherwise stated)
1.	Endrine	µg/l	0.2
2.	Lindane	µg /l	2
3.	Methoxychlor	µg /l	20
4.	2,4 dichlorophexy acetic acid	µg/l	100
5.	2,4,5 trichlorophenoxy propionic acid	µg/l	10
6.	Phenols	µg /l	0.5
7.	Heptachlor	µg/l	0.03
8.	Aldrin	µg/l	0.03
9.	DDT	µg/l	2
10.	Chlordane	µg/l	0.2
11.	Dieldrin	µg/l	0.03
12.	Heptachlor epoxide	µg/l	0.03

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2)	Document No. : ED/R01/001	Approved by:
	Issue Date: 1 Jan 2004		
Page 20 of 35			

TABLE E

Item	Parameters	Units of Measurement	Concentration or Value (maximum unless otherwise stated)
1.	Trichloroethene	µg/l	30
2.	Tetrachlormethane	µg/l	3
3.	Tetrachloroethene	µg/l	10
4.	Chloroform	µg/l	200
5.	Polycyclic aromatic Hydrocarbons (i)	µg/l	0.2
6.	Trihalomethanes (ii)	µg/l	The sum of the ratio of the conc. of each to its respective PCV should not exceed 1
7.	1,2 Dichloroethane	µg/l	3
8.	Benzene	µg/l	1
9.	Benzo(a)pyrene	µg/l	0.01
10.	Bromoform	µg/l	100
11.	Dichloromethane	µg/l	5
12.	Dibromochloromethane(DBCM)	µg/l	100
13.	Bromodichloromethane(BDCM)	µg/l	60
14.	Chlorobenzene	µg/l	300

i. The sum of the detected concentrations of benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(ghi)perylene, indeno(1,2,3-cd)pyrene.

ii. The sum of detected concentration of chloroform, Bromodichloromethane (BDCM), dibromochloromethane (DBCM) and bromoform as calculated in the equation below.

$$\text{Total Trihalomethanes} = \frac{\mathbf{C} \text{ Bromoform}}{\mathbf{PCV} \text{ Bromoform}} + \frac{\mathbf{C} \text{ DBCM}}{\mathbf{PCV} \text{ DBCM}} + \frac{\mathbf{C} \text{ BDCM}}{\mathbf{PCV} \text{ BDCM}} + \frac{\mathbf{C} \text{ Chloroform}}{\mathbf{PCV} \text{ Chloroform}} \leq 1$$

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2)	Document No. : ED/R01/001	Approved by:
	Issue Date: 1 Jan 2004		
Page 21 of 35			

TABLE F

Item	Parameters	Units of Measurement	Concentration or Value (maximum unless otherwise stated)
1.	Total coliforms (i)	Number/100ml	0
2.	E.coli or thermotolerant Faecal coliform bacteria (i)	Number/100ml	0
3.	Enterococci	Number/100ml	0
4.	Total Bacterial Count	Number/1 ml at 22°C or 37°C	100 at 22°C or 10 at 37°C

(i) Immediate action must be taken if either E.Coli or Total coliform bacteria are detected.

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 22 of 35			

SCHEDULE 2

SAMPLING FREQUENCIES

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 23 of 35			

TABLE 1
SAMPLING FREQUENCIES AT DISTRIBUTION SUPPLY
POINTS TO CONSUMERS.

Water Supply Zone or Combination of Zones		Sampling Frequency (number per annum)					
Volume distributed (m³/d)	Population Supplied	Table A Parameters			Table B Parameters		
		Reduced	Standard	Increased	Reduced	Standard	Increased
≤100	≤500	2	4	8	2	4	8
101- 1000	501- 5000	3	6	12	2	4	8
1001- 2000	5001- 10000	6	12	24	2	4	8
2001- 4000	10001- 20000	12	24	48	3	6	12
4001-10000	20001-50000	18	36	72	6	12	24
10001-20000	50001-100000	18	36	72	6	12	24
Volume distributed (m³/d)	Population Supplied	Table C Parameters			Table D Parameters		
		Reduced	Standard	Increased	Reduced	Standard	Increased
≤100	≤500	2	4	8			
101- 1000	501- 5000	2	4	8			
1001- 2000	5001- 10000	2	4	8			
2001- 4000	10001- 20000	2	4	8			
4001-10000	20001-50000	2	4	8			
10001-20000	50001-100000	3	6	12			
Volume distributed (m³/d)	Population Supplied	Table E Parameters			Table F Parameters		
		Reduced	Standard	Increased	Reduced	Standard	Increased
≤100	≤500	1	2	4	6	12	24
101- 1000	501- 5000	1	2	4	6	12	24
1001- 2000	5001- 10000	2	4	8	12	24	48
2001- 4000	10001- 20000	3	6	12	12	24	48
4001-10000	20001-50000	3	6	12	18	36	72
10001-20000	50001-100000	3	6	12	18	36	72

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 24 of 35			

TABLE 2
FREQUENCIES AT MAIN PUMP STATION EXIT LINES
AS WELL AS CONNECTION SUPPLY POINTS

<i>Water Supply Zone or Combination of Zones</i>	<i>Sampling Frequency (number per annum)</i>					
<i>Volume distributed (m³/d)</i>	<i>Table A Parameters</i>			<i>Table B Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
≤100	2	4	8	2	4	8
101- 1000	3	6	12	2	4	8
1001- 2000	6	12	24	2	4	8
2001- 4000	6	12	24	3	6	12
4001-10000	12	24	48	3	6	12
10001-20000	12	24	48	6	12	24
20001-30000	18	36	72	6	12	24
30001-60000	18	36	72	6	12	24
>60000	24	48	96	6	12	24
<i>Volume distributed (m³/d)</i>	<i>Table C Parameters</i>			<i>Table D(i) Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
≤100	2	4	8	1	1	2
101- 1000	2	4	8	1	1	2
1001- 2000	2	4	8	1	1	2
2001- 4000	2	4	8	1	1	2
4001-10000	3	6	12	1	2	4
10001-20000	3	6	12	2	4	6
20001-30000	3	6	12	2	4	6
30001-60000	6	12	24	2	4	6
>60000	6	12	24	4	8	12
<i>Volume distributed (m³/d)</i>	<i>Table E(i) Parameters</i>			<i>Table F Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
≤100	1	1	2	2	4	8
101- 1000	1	1	2	2	4	8
1001- 2000	1	1	2	2	4	8
2001- 4000	1	1	2	3	6	12
4001-10000	1	2	4	6	12	24
10001-20000	2	4	6	6	12	24
20001-30000	2	4	6	12	24	48
30001-60000	2	4	6	18	36	72
>60000	4	8	12	18	36	72

(i)Ground water source only

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 25 of 35			

TABLE 3
SAMPLING FREQUENCIES AT DESALINATION PLANTS CONNECTION POINTS By
Thermal Desalination Processes (MSF, MED,SOLAR)

<i>Water Supply Zone or Combination of Zones</i>	<i>Sampling Frequency (number per annum)</i>					
<i>Volume distributed (m³/d)</i>	<i>Table A Parameters</i>			<i>Table B Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
1000-4000	15	30	60	3	6	12
4001-10000	30	60	240	3	6	12
10001-20000	60	120	240	6	12	24
20001-30000	60	180	720	6	12	24
30001-60000	180	360	720	12	24	48
60001-100000	180	360	720	12	24	48
100001-200000	180	360	720	18	36	72
>200000	180	360	720	18	36	72
<i>Volume distributed (m³/d)</i>	<i>Table C Parameters</i>			<i>Table D Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
1000-4000	2	4	8			
4001-10000	2	4	8			
10001-20000	2	4	8			
20001-30000	3	6	12			
30001-60000	3	6	12			
60001-100000	3	6	12			
100001-200000	5	10	20			
>200000	6	12	24			
<i>Volume distributed (m³/d)</i>	<i>Table E Parameters</i>			<i>Table F Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
1000-4000				2	4	8
4001-10000				2	4	8
10001-20000				3	6	8
20001-30000				3	6	12
30001-60000				3	6	12
60001-100000				5	10	20
100001-200000				10	20	40
>200000				12	24	48

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2)	Document No. : ED/R01/001	Approved by:
	Issue Date: 1 Jan 2004		
Page 26 of 35			

TABLE 4

**SAMPLING FREQUENCIES AT DESALINATION PLANTS CONNECTION POINTS BY
Electrically / Mechanically Driven Desalination Processes (R.O.)**

<i>Water Supply Zone or Combination of Zones</i>	<i>Sampling Frequency (number per annum)</i>					
<i>Volume distributed (m³/d)</i>	<i>Table A Parameters</i>			<i>Table B Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
1000-4000	2	4	8	3	6	12
4001-10000	2	4	8	3	6	12
10001-20000	3	6	12	6	12	24
20001-30000	6	12	24	6	12	24
30001-60000	12	24	48	12	24	48
60001-100000	12	48	96	12	24	48
100001-200000	24	48	96	18	36	72
>200000	48	96	144	18	36	72
<i>Volume distributed (m³/d)</i>	<i>Table C Parameters</i>			<i>Table D Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
1000-4000	1	1	2	2	4	8
4001-10000	1	1	2	2	4	8
10001-20000	1	1	2	2	4	8
20001-30000	1	2	4	3	6	12
30001-60000	2	3	6	3	6	12
60001-100000	3	6	12	3	6	12
100001-200000	6	12	24	6	12	24
>200000	6	12	24	6	12	24
<i>Volume distributed (m³/d)</i>	<i>Table E (i) Parameters</i>			<i>Table F Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
1000-4000	2	4	8	6	12	24
4001-10000	2	4	8	6	12	24
10001-20000	2	4	8	6	12	24
20001-30000	3	6	12	12	24	48
30001-60000	3	6	12	12	24	48
60001-100000	3	6	12	12	24	48
100001-200000	6	12	24	24	36	72
>200000	6	12	24	24	36	72

(i) Ground water source only.

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 27 of 35			

TABLE 5

SAMPLING FREQUENCIES AT WELL FIELD CONNECTION POINTS

Water Supply Zone or Combination of Zones		Sampling Frequency (number per annum)					
Volume distributed (m³/d)	Population Supplied	Table A Parameters			Table B Parameters		
		Reduced	Standard	Increased	Reduced	Standard	Increased
≤100	≤500	2	4	8	2	4	8
101- 1000	501- 5000	3	6	12	2	4	8
1001- 2000	5001- 10000	6	12	24	2	4	8
2001- 4000	10001- 20000	12	24	48	3	6	12
4001-10000	20001-50000	30	60	120	3	6	12
10001-20000	50001-100000	30	60	120	6	12	24
Volume distributed (m³/d)	Population Supplied	Table C Parameters			Table D Parameters		
		Reduced	Standard	Increased	Reduced	Standard	Increased
≤100	≤500	2	4	8	1	1	2
101- 1000	501- 5000	2	4	8	1	2	4
1001- 2000	5001- 10000	3	6	12	3	6	12
2001- 4000	10001- 20000	3	6	12	3	6	12
4001-10000	20001-50000	6	12	24	6	12	24
10001-20000	50001-100000	12	24	36	6	12	24
Volume distributed (m³/d)	Population Supplied	Table E Parameters			Table F Parameters		
		Reduced	Standard	Increased	Reduced	Standard	Increased
≤100	≤500	2	4	8	2	4	8
101- 1000	501- 5000	2	4	8	2	4	8
1001- 2000	5001- 10000	2	4	8	2	4	8
2001- 4000	10001- 20000	4	6	12	3	6	12
4001-10000	20001-50000	4	6	12	6	12	24
10001-20000	50001-100000	8	12	24	12	24	48

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2)	Document No. : ED/R01/001	Approved by:
	Issue Date: 1 Jan 2004		
Page 28 of 35			

TABLE 6
SAMPLING FREQUENCIES FOR ROAD VEHICLES (TANKERS)

<i>Water Supply Zone or Combination of Zones</i>	<i>Sampling Frequency (number per annum)</i>					
<i>Volume distributed (m³/d)</i>	<i>Table A Parameters</i>			<i>Table B Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
For various sizes	2	4	8			
<i>Volume distributed (m³/d)</i>	<i>Table C Parameters</i>			<i>Table D Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
For various sizes	1	2	4			
<i>Volume distributed (m³/d)</i>	<i>Table E Parameters</i>			<i>Table F Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
For various sizes				2	4	8

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 29 of 35			

TABLE 7
SAMPLING FREQUENCIES FOR POTABLE WATER RESERVOIRS AT MAIN PUMP STATIONS AS WELL AS STORAGE TANKS AND WATER TOWERS

<i>Water Reservoirs</i>	<i>Sampling Frequency (number per annum)</i>					
<i>Capacity in m³</i>	<i>Table A Parameters</i>			<i>Table B Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
<2000						
2000-10000						
10001-50000						
50001-200000						
>200000						
<i>Capacity in m³</i>	<i>Table C Parameters</i>			<i>Table D Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
<2000						
2000-10000						
10001-50000						
50001-200000						
>200000						
<i>Capacity in m³</i>	<i>Table E Parameters</i>			<i>Table F Parameters</i>		
	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>	<i>Reduced</i>	<i>Standard</i>	<i>Increased</i>
<2000				2	4	8
2000-10000				2	4	8
10001-50000				3	6	12
50001-200000				5	10	20
>200000				10	20	40

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 30 of 35			

SCHEDULE 3

FORMS (A&B)

Title: Water Quality Regulations			
Prepared by: JS	Issue No. : 1 Rev (2) Issue Date: 1 Jan 2004	Document No. : ED/R01/001	Approved by:
Page 31 of 35			

