



Recycled Water and Biosolids Regulations 2021

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Foreword

The Department of Energy (DoE) was established by Law No. (11) of 2018 on 20 February 2018 (the Law). Under that Law, the DoE is the successor Entity to the Regulation and Supervision Bureau (RSB) and the Abu Dhabi Water and Electricity Authority (ADWEA). Accordingly, any references to the Regulation and Supervision Bureau, the Bureau, RSB, the Authority or ADWEA in any document, template or correspondence shall now be interpreted as referring to the DoE.

The DoE is responsible for setting policy, standards and regulations for the Energy Sector (as defined under Law No. (11), which includes all persons, companies and Entities operating in the Recycled Water and Wastewater sectors in Abu Dhabi).

These revised Regulations supersede those issued in 2018 (Second Edition) and are effective from 1 January 2021. They shall be cited as the Recycled Water and Biosolids Regulations 2021 (Third Edition) referred hereafter as the Regulations.

The Regulations establish a legal framework for the safe and economic Reuse and management of Recycled Water and Biosolids in the Emirate of Abu Dhabi. They have been developed following an extensive consultation with sector companies and other relevant stakeholders.

They are also available in Arabic, but the reader should note they were first written in English. They may also be downloaded from DoE's website at www.doe.gov.ae.

MOHAMMED BIN JARSH AL FALASI

Undersecretary-Department of Energy



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The DoE gratefully acknowledges the contributions and comments provided by the following organisations:

Licensees;

- i. Abu Dhabi Distribution Company (ADDC)
- ii. Abu Dhabi Sewerage Services Company (ADSSC)
- iii. Al Ain Distribution Company (AADC)
- iv. Emirates Global Aluminium (EGA)

Government Organisations & Stakeholders;

- i. Abu Dhabi Agriculture and Food Safety Authority (ADAFSA)
- ii. Abu Dhabi National Energy Company PJSC (TAQA)
- iii. Abu Dhabi Public Health Centre (ADPHC)
- iv. Abu Dhabi Quality and Conformity Council (ADQCC)
- v. Department of Municipalities and Transport (DMT)
- vi. Environment Agency - Abu Dhabi (EAD)



History of Revisions

Revision	Date	Prepared by	Checked by	Issued to
0.0	June 2010	RMS	MG & CH	Publication
1.0	January 2018	TD	JS	Publication
2.0	January 2021	AR & MG	TD	Publication

This is the second revision to the Recycled Water and Biosolids Regulations since their publication in June 2010. This revision incorporates the following:

- Incorporation of relevant items from the previous Recycled Water and Biosolids Guide in the Regulations;
- Clarification regarding sampling, testing requirements, and Accreditation in Part 5: Monitoring Programme;
- Updates to reporting requirements and timelines for the Initial Entries and Water Quality Reports;
- Updated guidance regarding Supply Agreements, Recycled Water demand and Education and Awareness; and
- Other changes concerning the Regulations' structure.



Document Numbering

These Regulations use the following numbering system:

- Parts** are referenced by integers (e.g. 1, 2, 3, etc.)
- Regulations** are referenced by one full stop between numbers (e.g. 1.1, 1.2, etc.)
- Clauses** are referenced by two full stops between numbers (e.g. 3.1.2, etc.)
- Notes** are indicated below the Clause in square brackets and italic text. For example, *[Note: this Clause does not apply to Installations that have been ...]*



1. Introduction

1.1 Citation

1.1.1 These Regulations shall be cited as the Recycled Water and Biosolids Regulations 2021 (Third Edition).

1.2 Commencement

1.2.1 These Regulations come into force on 01 January 2021.

1.2.2 These Regulations are issued by the DoE in accordance with Article (4) of Law No. (11) of 2018 and Article (62) of Law No. (2) of 1998.

1.2.3 These Regulations supersede and replace the Recycled Water and Biosolids Regulations 2018 (Second Edition).

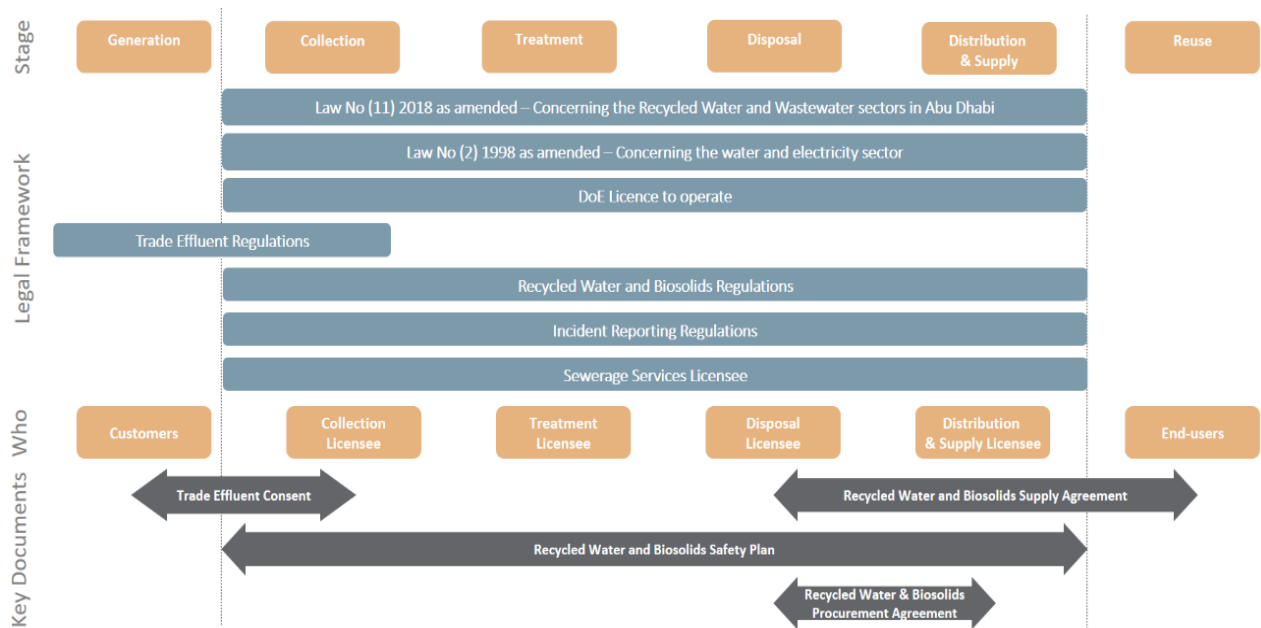
1.2.4 These Regulations may be amended or revoked by the DoE at any time.

1.3 Regulatory Framework

1.3.1 The purpose of these Regulations is to establish a legal framework for the safe and economic Reuse and management of Recycled Water and Biosolids in the Emirate of Abu Dhabi. Figure 1.1 illustrates the regulatory framework for the Recycled Water and Biosolids activities.



Figure 1.1 – Regulatory Framework



1.3.2 The Regulations require Licensees to manage Recycled Water and Biosolids by:

- implementing Supply Agreements;
- developing Safety Plans; and
- completing monitoring programmes.

1.3.3 The Regulations define the DoE functions to:

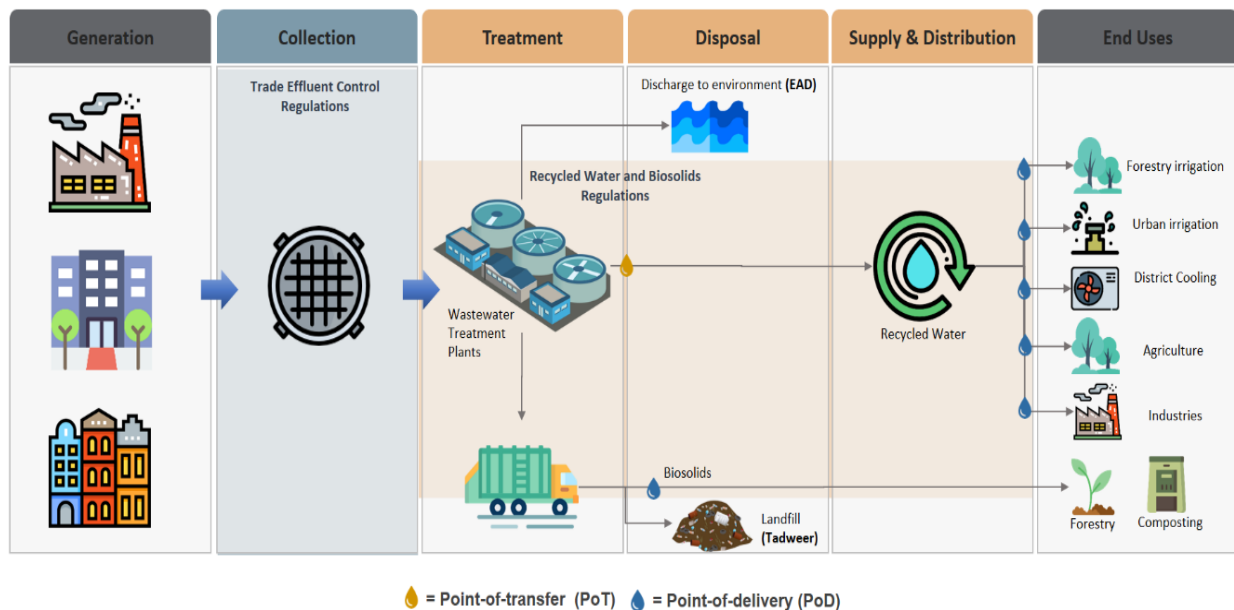
- set standards for the quality of Recycled Water and Biosolids;
- enforce compliance with the Regulations;
- collate Recycled Water and Biosolids production and supply data; and
- review any disputes between Licensees and Customers.

1.4 Scope

1.4.1 These Regulations apply to all Sewerage Services Licensees, Distribution and Supply Licensees and any Customer who receives Recycled Water or Biosolids in the Emirate of Abu Dhabi. Figure 1.2 illustrates the scope of the Regulations.



Figure 1.2 – Scope of the Regulations



1.4.2 Nothing in these Regulations is intended to conflict with or affect the operation of any relevant existing federal and Abu Dhabi Laws.

1.5 Relevant Regulations

1.5.1 These Regulations should be read in conjunction with the following regulations and codes:

- Trade Effluent Control Regulations;
- Wastewater Flow Monitoring Code of Practice;
- Recycled Water Distribution Code;
- The Customer Metering Regulations; and
- The Incident Reporting Regulations;

1.5.2 Where a conflict appears to exist between these Regulations and other regulations, codes, or any governmental legislation, the matter should be referred to the DoE for a binding decision in accordance with Part 7 of these Regulations.

1.6 Fees and Charges

1.6.1 Any tariffs, fees, fines, charges, deposits, expenses or financial amounts to be imposed on Customers in accordance with these Regulations and the way they are meant to be imposed or collected by a Licensee must be submitted in prior to the DoE for approval.



1.6.2 The Licensees are prohibited from imposing, amending or cancelling any tariffs, fees, fines, charges, deposits, expenses or financial amounts in accordance with these Regulations without the DoE's prior approval.

1.7 Provision of Information

1.7.1 All Licensees, Customers or any other relevant Entities are required to furnish the DoE with information to matters relating to these Regulations as the DoE may from time to time direct or request.

1.7.2 Failure to provide the requested information in the time and manner decided by the DoE shall be considered as a failure to comply with these Regulations.

1.8 Responsibility for Implementation

1.8.1 All parties mentioned in Clause 1.4.1 are responsible for implementing these Regulations.

1.9 References

1.9.1 References to a standard in these Regulations means the current edition of the standard cited or its replacement. Where relevant, UAE or Abu Dhabi mandatory standards which may be issued from time to time by the competent authorities shall be applied.

1.9.2 Relevant regulatory guidance may include, but is not limited to:

- a) 2012 Guidelines for Water Reuse – United States Environmental Protection Agency;
- b) Water Safety Plan Manual – World Health Organization;
- c) Sanitation Safety Planning Manual – World Health Organization; and
- d) Technical Guidance Document for Operational Environmental Management Plan – EAD.

1.9.3 Soft copies of the Regulations will be available on the DoE webpage.



2. Definitions

2.1 Interpretation

- 2.1.1 Words which are defined under this Part begin with capital letters when used in the Regulations.
- 2.1.2 Words and expressions used in these Regulations, other than those defined herein, shall have the meanings ascribed to them in Law No. (2) of 1998 or Law No. (11) of 2018 (as applicable).
- 2.1.3 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 DoE under these Regulations.
- 2.1.4 Unless the context otherwise requires, any reference in these Regulations to a numbered Part, Clause or Schedule is a reference to the Part, Clause or Schedule of these Regulations bearing that number.
- 2.1.5 Any reference in these Regulations to a table is a reference to the relevant table in the numbered Schedules of these Regulations.
- 2.1.6 Words using the singular or plural number also include the plural or the singular number respectively.
- 2.1.7 Unless otherwise specified, days shall mean calendar days.

2.2 Definitions

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

Accreditation – third-party attestation related to a conformity assessment body (e.g. laboratories), conveying formal demonstration of its competence to carry out specific conformity assessment tasks.

Accreditation Body – means any federal or local authority mandated or authorised to manage Accreditation schemes.

Biosolids – sewage sludge produced by a Wastewater Treatment System that has been treated and stabilised to the extent that it can be safely supplied for Reuse activities.

Collection Licensee – the holder of a Licence issued by the DoE for the collection of Wastewater from premises.

Customer – an Entity eligible to receive and use Recycled Water and/or Biosolids.



Discharge – the release of Recycled Water to the environment and Biosolids to landfill.

Disposal – the Regulated Activity which comprises Discharge, Reuse and/or Sale of various products from a Wastewater Treatment System.

Disposal System – a system consisting, wholly or mainly, of pipes, pumping stations, tankers and other plant and equipment owned, or operated, by a Licensee and used for the Disposal of Recycled Water and Biosolids.

Distribution and Supply – the Regulated Activities for the Distribution and/or Supply of Recycled Water through a Distribution System to the Point-of-delivery to Customers.

Distribution System - a system consisting, wholly or mainly, of Recycled Water networks owned or operated by the Distribution and Supply Licensee and used for the transfer of Recycled Water by pipeline or otherwise to the Point-of-delivery of a Customer and includes any plant and equipment, including metering equipment, owned or operated by the Licensee in connection with the transfer by networks of Recycled Water;

DoE – means the Department of Energy in the Emirate of Abu Dhabi, established under Law No. (11) of 2018.

Entity – an individual, establishment, company, association, society, partnership, corporation, municipality, institution, government organisation, agency or group.

Geometric Mean – the Geometric Mean of the values for all effluent samples collected during a month. The Geometric Mean shall be determined by calculating the nth root of the product of all measurements made in a calendar month, where n equals the number of measurements made. For any measurement equalling zero, a substituted value of one (1) shall be made for input into either computation method.

Grey Water – Wastewater sourced solely from baths, showers, hand basins, ablution facilities and domestic laundries.

Licence – means a Licence to carry out a Regulated Activity granted by the DoE.

Licensee – refers jointly to the holder of a Collection Licence, Treatment Licence, Disposal Licence or a Distribution and Supply Licence issued by the DoE.

Licensed Activities - the Regulated Activities permitted to be carried out by the Licensee pursuant to the conditions of the Licence.

Parameter – a property, element, organism or substance listed in Schedules A and B of these Regulations.

Percentile Limit - A 95 percentile limit that must be met for at least 95% of every Year as listed in Table C4 of Schedule C.



Point-of-delivery – the location or physical connection point at which Recycled Water or Biosolids are delivered to a Customer.

Point-of-discharge – the location at which Recycled Water is discharged to the environment or Biosolids are discharged to landfill.

Point-of-transfer – the location or physical connection point at which Recycled Water is transferred from a Treatment System.

Point-of-use – the location at which Recycled Water or Biosolids are used.

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 Schedules A and B of these Regulations as measured by reference to the unit of measurement so specified.

Public Nuisance – anything that disturbs the general public's reasonable use of property, endangers life and health, or is offensive to the general public.

Recycled Water – treated liquid effluent produced by a Wastewater Treatment System that is suitable for Reuse, Discharge and/or Sale to third parties.

Recycled Water Supply Zone – an area that is designated by a Distribution and Supply Licensee (whether by reference to source of Recycled Water supply, the number of Customers supplied from any source, or otherwise) for the purposes of the provisions of these Regulations.

Reduced Number or Increased Number - means any relevant Reduced or Increased sampling frequency shown in any of the Tables of Schedules C and D as an alternative to the Standard Number.

Regulated Activity – means an activity as defined in Law No. (11) of 2018.

Regulatory Authority – the relevant federal or local government authority responsible for regulating a specific sector.

Reuse – the beneficial use of Recycled Water and/or Biosolids for landscaping, industrial, commercial or agricultural purposes or any other type of Reuse in the built environment.

Safety Plan – a plan for safeguarding the quality and quantity of Recycled Water and Biosolids.

Sale - any Sale, gift, grant or any other supply or disposition to a third party.

Sampling Point – a point that is determined as such by a Licensee for the purpose of sampling as outlined in Part 5 of these Regulations.

Sewerage Services Licensee – the holder of a Licence, issued by the DoE, for one or more of the Regulated Activities of collection, Treatment or Disposal of Wastewater.



Sewerage System – a system consisting, wholly or mainly, of sewerage pipes, pumping stations, tankers and other plant and equipment owned or operated by a Collection Licensee and used for the transportation of Wastewater from premises to a Wastewater Treatment System.

Standard Number – means such number of sampling frequency specified in the column headed “Standard” in the Tables of Schedules C and D as is applicable to the Parameter in question.

Supply Agreement – an agreement between a Licensee and a Customer which defines the terms and conditions of supply for Recycled Water or Biosolids.

Trade Effluent - any Wastewater discharged to a Sewerage System which is produced in the course of any industrial, commercial, agricultural, medical, scientific or trade activity, but does not include domestic Wastewater.

Treatment – means the reception of Wastewater from the Sewerage System, the Treatment of such Wastewater and delivery of the resulting products and by-products to the Disposal System.

Treatment System – a system consisting, wholly or mainly, of pipes, pumping stations, tankers and other plant and equipment that is owned, or operated, by a Treatment Licensee and used for the Treatment of Wastewater and its residuals.

UAE – United Arab Emirates.

Wastewater – the water-borne wastes generated by any domestic, commercial or industrial activity including Grey Water and Trade Effluent.

Year – a calendar Year, according to the Gregorian calendar.



3. Reuse of Recycled Water and Biosolids

3.1 Prohibition

- 3.1.1 The use of Recycled Water for drinking, cooking, bathing, or swimming purposes is strictly prohibited.
- 3.1.2 A Licensee shall not provide, procure, acquire or supply:
- Recycled Water that does not meet the criteria set out in Schedule A of these Regulations; and
 - Biosolids that do not meet the criteria set out in Schedule B of these Regulations.
- 3.1.3 A Licensee must ensure safe Disposal, Distribution and Supply of Recycled Water and Biosolids to the Point-of-delivery with zero risk of contact with potable water supplies.

3.2 Unrestricted and Restricted Reuse

- 3.2.1 For the purpose of quality monitoring, Reuse of Recycled Water and Biosolids is divided into two categories described as follows:
- Unrestricted Reuse (referred to as P1 in the case of Recycled Water and B1 in the case of Biosolids) which involves frequent and uncontrolled exposure of the general public to Recycled Water and Biosolids; i.e. public access is not restricted; and
 - Restricted Reuse (referred to as P2 in the case of Recycled Water and B2 in the case of Biosolids) which involves infrequent and controlled exposure of the general public to Recycled Water; i.e. public access is restricted.

3.3 Supply Agreements

- 3.3.1 A Licensee must have a Supply Agreement with any Customer receiving Recycled Water or Biosolids.
- 3.3.2 The standard terms and conditions of the Supply Agreement template must be approved by the DoE.
- 3.3.3 The Reuse or further Treatment of Recycled Water or Biosolids beyond the Point-of-delivery is controlled by other Regulatory Authorities. Any Entity who receives Recycled Water or Biosolids from a Licensee must seek advice regarding the regulatory and operational requirements for their activity from either:
- Environment Agency - Abu Dhabi (EAD);
 - Abu Dhabi Waste Management Center (Tadweer);



- c) Abu Dhabi Agriculture and Food Safety Authority (ADAFSA); or
 - d) the appropriate Regulatory Authority.
- 3.3.4 A Customer may wish to reduce the operational risks by using Recycled Water or Biosolids of a higher quality than that defined in the Regulations. Further polishing or processing of the Recycled Water or Biosolids carried out by a Customer is not covered under these Regulations.
- 3.4 **Self-supply Schemes**
 - 3.4.1 A Licensee may use Recycled Water and Biosolids on its own premises subject to the following conditions:
 - a) the Licensee must notify the DoE of any self-supply scheme;
 - b) the Licensee must develop and submit a Safety Plan for each self-supply scheme which extends to the Point-of-use in accordance with Part 4 of the Regulations; and
 - c) The sampling and flow data must be recorded and submitted to the DoE in accordance with the requirements outlined in Regulation 5.4.
- 3.5 **Discharge to the Environment**
 - 3.5.1 Discharge of Recycled Water or Biosolids to the environment is subject to the regulations of the Environment Agency - Abu Dhabi and the operations of The Center of Waste Management - Abu Dhabi and any other Regulatory Authorities.
 - 3.5.2 A Licensee may, if necessary, discharge Recycled Water to the environment or Biosolids to landfill in fulfilment of the contingency planning requirements of Clause 4.2.2 (e) of these Regulations.
 - 3.5.3 Any Discharge made by a Licensee under Clause 3.5.2 must be:
 - a) made in accordance with the laws of Abu Dhabi Emirate and the Federal laws of the UAE;
 - b) made in accordance with the regulations and requirements of the Environment Agency – Abu Dhabi, and the requirements of the Abu Dhabi Waste Management Center and other relevant Regulatory Authorities; and
 - c) reported to the DoE in accordance with Regulation 5.4.
 - 3.5.4 Licensees must also report any Discharge of Recycled Water or Biosolids to the environment to the DoE. The DoE's Incident Reporting Regulations define the requirements for reporting incidents.



3.6 Discharge to Storm Water Networks

- 3.6.1 Discharge of Recycled Water to storm water networks is subject to the regulations and requirements of the municipalities and any other relevant Regulatory Authority.



4. Safety Plans

4.1 Development of Safety Plan

- 4.1.1 A Safety Plan is the most effective means of consistently ensuring the safety of a Recycled Water & Biosolids supply.
- 4.1.2 This is achieved through the use of a comprehensive risk assessment and risk management approach that encompasses all steps in supply from catchment to Customer.
- 4.1.3 A Licensee must develop a Safety Plan covering its Licensed Activities for the supply of Recycled Water and Biosolids as applicable.
- 4.1.4 The Safety Plan should describe the operational and management controls that will be employed by Licensees to protect public health, safeguard the environment and minimise Public Nuisance.
- 4.1.5 Where collection, Treatment, Disposal and Distribution systems are interconnected, the upstream Treatment or Disposal Licensee must:
- provide any information and resources to interconnected Licensees as reasonably required to develop a Safety Plan; and
 - advise the interconnected Licensee, where applicable, of any changes to the Licensed Activities, which will require a change to a Safety Plan.

4.2 Scope of Safety Plan

- 4.2.1 The Safety Plan should be developed following the guidance outlined in the Water Safety Plan Manual and Sanitation Safety Planning Manual of the WHO. Additional guidance is available in the Technical Guidance Document for Operational Environmental Management Plan of the EAD.
- 4.2.2 The scope of the Safety Plan must include:
- the roles and responsibilities of the Licensees and Safety Plan team members;
 - a description of the systems and capabilities related to the Licensed Activities;
 - identification of the hazards and hazardous events that can affect the safety of the Recycled water and Biosolids supply as related to the Licensed Activities;
 - an assessment of the risk presented by each hazard and hazardous event;
 - the operational and management controls and contingency plans for each hazard and hazardous event identified in Clause 4.2.2(c);



- f) the monitoring programme referenced in Part 5 that will ensure the requirements of these Regulations are met and that the operational and management controls identified in Clause 4.2.2 (e) are effective;
- g) reporting and auditing requirements for the monitoring programme identified in Clause 4.2.2 (f) and in Part 5 of these Regulations; and
- h) supporting programmes to improve employee awareness and involvement.

4.3 Review of Safety Plan

- 4.3.1 A new Safety Plan of a Licensee must be submitted to the DoE for review at least 60 days before the supply of Recycled Water or Biosolids is due to start.
- 4.3.2 Existing Safety Plans must be resubmitted to the DoE for review:
 - a) a minimum of once every 5 Years;
 - b) following substantial changes to the source, Treatment process, or Distribution and supply system; and
 - c) following significant operational and/or environmental incidents.
- 4.3.3 The DoE shall complete a review of a Safety Plan within 60 days from the date of receiving the Plan.
- 4.3.4 The DoE will identify and report to the Licensee any changes it believes are required to:
 - a) protect public health;
 - b) safeguard the environment; and
 - c) minimise Public Nuisance.
- 4.3.5 Before the supply of Recycled Water or Biosolids begins, the Licensee must adopt any representations made by the DoE under Clause 4.3.4 and submit a revised Safety Plan to the DoE.
- 4.3.6 An assessment of the Safety Plan arrangements may be conducted as required by the DoE and/or by a person appointed by the DoE for ensuring the Safety Plan achieves its intended purpose.



5. Monitoring Programme

5.1 Monitoring Programme

- 5.1.1 Each Year, Licensees shall sample and test each relevant Parameter listed in Schedules A and B of these Regulations to confirm that the quality of the Recycled Water or Biosolids conforms to the criteria outlined therein;
- 5.1.2 A Licensee shall determine such number and location of Sampling Points that are representative of the quality of the Recycled Water and Biosolids supplied by it.
- 5.1.3 These Sampling Points must be designated at the Point-of-transfer or Point - of-delivery as related to the Licensed Activity.
- 5.1.4 Monitoring for self-supply schemes must be performed at the Point-of-use or at a location which is representative of the quality of the Recycled Water and Biosolids.
- 5.1.5 Sample sites in a Recycled Water Supply Zone should give good geographic representation of the Recycled Water Distribution system.
- 5.1.6 Any sampling or analysis done by a Licensee as a condition of a monitoring programme must be done at the Licensee's expense.

5.2 Sampling Frequency

- 5.2.1 The sampling frequency shall not be less than the Standard Number of samples as listed in the tables of Schedules C and D in relation to the Parameter in question.
- 5.2.2 The DoE shall have the discretion to require the Licensee to sample according to the Reduced Number or Increased Number frequency as it finds necessary to do so; otherwise, the Standard Number shall apply.
- 5.2.3 A Licensee can request from the DoE, after submitting acceptable justification, a Reduced frequency in the annual sampling for one or more Parameters required in its monitoring activities.
- 5.2.4 The frequency of sampling at the Sampling Points within each Recycled Water Supply Zone must be representative of the distribution of the Recycled Water within that zone.
- 5.2.5 The DoE shall have the discretion to require further sampling at particular Sampling Points in each Recycled Water Supply Zone.



5.3 Initial Entries

- 5.3.1 The monitoring programme details must be outlined by the Licensees in their annual initial entries submission.
- 5.3.2 The initial entries must contain:
- a) a sampling schedule programme for the following Year;
 - b) test methods for each of the Parameters included in Schedules A and B of the Regulations;
 - c) the name or identification number of the Treatment plant, zone or area, at which sampling will be performed;
 - d) as relevant, an estimate of the Treatment plant capacity, or volume of Recycled Water distributed to the zone;
 - e) any relaxation granted under Regulation 7.4 which applies to Recycled Water or Biosolids supplied in the zone; and
 - f) other relevant information in the initial entries forms 1 to 3 outlined in Schedule E of the Regulations.
- 5.3.3 The Licensees shall submit their initial entries to the DoE by 30 September of each Year.

5.4 Data Collection and Reporting

- 5.4.1 A Licensee shall collate all flow, monitoring and sampling data generated by its monitoring programme, including details of the:
- a) Points-of-delivery or Points-of-transfer as applicable;
 - b) source of the Recycled Water and Biosolids supplied;
 - c) flows and loads received at each of their systems;
 - d) volume or mass of Recycled Water and Biosolids produced or supplied at each of their systems;
 - e) quality of Recycled Water and Biosolids produced or supplied at each of their systems; and
 - f) other relevant data as stated in Clause 5.3.2.
- 5.4.2 The results of the sampling analyses shall be submitted to the DoE within 30 days of the sample collection date via a web-based portal, electronic format and/or in hard copy as directed by the DoE.
- 5.4.3 Sampling results that fail to comply with the Regulations must be reported to the DoE in accordance with Regulation 8.1.
- 5.4.4 The Licensee shall retain records of all sampling and monitoring data for at least ten (10) Years.



5.5 Sampling and Testing Requirements

- 5.5.1 The Licensee shall carry out sampling collection and handling in accordance with ISO/PRF 5667-10: Guidance on sampling of Wastewater and ISO 5667-13:2011: Guidance on sampling of sludges.
- 5.5.2 Sampling of water for Legionella testing shall be carried out by BS 7592: Sampling for Legionella bacteria in water systems (or equivalent).
- 5.5.3 Licensees must ensure that:
- a) the sample is representative of the quality of the Recycled Water or Biosolids at the time of sampling;
 - b) the sampling frequency from the Sampling Points are distributed at equal intervals throughout the Year;
 - c) the sample is not contaminated when being taken or transported;
 - d) the sample is kept at such temperature and in such conditions as will secure that there is no material and quality alteration of the concentration or value for the measurement or observation of which the sample is intended; and
 - e) the sample is analysed as soon as may be practicable after it has been taken:
 - i. by or under the supervision of personnel who are trained, competent and authorised to perform that task;
 - ii. with the use of such equipment as is suitable for the purpose, and has been validated for performance against standard methods and approved for use; and
 - iii. by applying such recognised analytical systems and methods capable of establishing, within acceptable limits of deviation and detection, whether the sample contains concentrations or values which contravene the Prescribed Concentrations or Values.
 - f) sampling activities shall be conducted in an accredited laboratory according to ISO/IEC 17025 for the required Parameters.
- 5.5.4 In accordance with Clause 5.5.3 (a), the appropriate Parameters outlined in Schedule A, Table A1 of the Regulations should be determined on site as they can quickly degrade after sampling.
- 5.5.5 If a Licensee is unable to determine in this way, ensure that a representative sample is taken and that recommended filling, preservation and holding times are met.
- 5.5.6 The laboratory must be accredited by an Accreditation Body for all of the parameters outlined in Schedules A and B of the Regulations. The DoE does not accredit or approve laboratories.



5.5.7 Licensees shall notify the DoE within 3 working day about their laboratories withdrawal or suspension of Accreditation, or if there is a change in the Accreditation scope.

5.6 Quality Compliance

5.6.1 Percentile Limits will be applied to the Parameters outlined in Tables A1, A3, A4 and B2 of Schedules A and B. The permitted number of exceedances for a particular number of required samples in a Year is outlined in Table C4 of Schedule C.

5.6.2 Prescribed Concentrations and Geometric Means will be applied to the Parameters outlined in Tables A2 and B1 of Schedules A and B.

5.6.3 If an exceedance of the Parameters outlined in Tables A2 and B1 of Schedules A and B is indicated, a repeat sample should be collected from the original sample location within one working day of the result being known. If the repeat sample also indicates an exceedance, the Licensee must implement the corrective actions outlined in their Safety Plan.

5.6.4 Licensees shall notify the interconnected Licensees regarding exceedances in accordance with the notification requirements of the Recycled Water Code.

5.6.5 When determining quality compliance, the DoE shall assess the frequency and magnitude of any non-compliant monitoring results and consider other relevant factors.

5.7 Annual Recycled Water and Biosolids Reports

5.7.1 A Licensee shall prepare for the DoE a report for each Year which includes:

- a) a summary of the Recycled Water and Biosolids quality compliance with the limits detailed in Schedules A and B, and the quantities supplied by it;
- b) Recycled Water and Biosolids quality related issues that have affected the regulatory requirements with details on how and why the issues occurred, e.g. operational incidents, catchment or process changes;
- c) updated risk assessments and control measures to address the issues noted in Clause 5.7.1 (b);
- d) the adherence to the sampling frequency requirements in Schedules C and D;
- e) details of any relevant relaxation granted under Regulation 7.4; and
- f) a list of the new and updated Safety Plans pursuant to Clause 5.7.1 (c);

5.7.2 The Annual Report submission is not required for self-supply schemes.

5.7.3 The Licensees shall submit a copy of the annual Recycled Water and Biosolids quality report to the DoE by 1 March of each Year.



6. Audits and Assessments

6.1 DoE Audit

- 6.1.1 To ensure compliance with these Regulations the DoE may conduct periodic audits to assess the implementation of the Licensees Safety Plans.
- 6.1.2 The audit may cover analytical arrangements, Treatment processes, sampling processes, data quality and reporting. The audit may also:
- review and validate the results of the Recycled Water and Biosolids submissions;
 - review the accuracy and reliability of the data collected by Licensees;
 - identify any shortcomings, failures, non-compliance and areas of concern; and
 - include other related matters in conjunction with these Regulations.

6.2 Third Party Audit

- 6.2.1 In order to establish whether Licensees are complying with their monitoring obligations, the DoE may appoint or request Licensees to appoint a technically competent third party auditor which may review and/or audit the items outlined in Regulation 6.1.



7. Review of DoE Decision

7.1 Application for Review

7.1.1 Any application for enquiry, clarification, or dispute relevant to these Regulations must be made in writing to the DoE and submitted with supporting documents.

7.2 Timescale for Application for Review

7.2.1 The timescale for application to be reviewed by the DoE is 30 days.

7.2.2 Licensees will be informed in case of any extension of time required for application for review.

7.3 DoE Request for Information

7.3.1 The DoE may request from an Entity making an application for a decision, any information or documentation it considers reasonable and necessary in the circumstances and the Entity must provide such information within the period specified by DoE.

7.4 Relaxation of Requirements

7.4.1 The DoE may, upon the written request of a relevant Entity, authorise a relaxation of certain requirements of these Regulations.

7.4.2 Subject to Clauses 7.4.3 and 7.4.4, the DoE may at any time modify or revoke an authorisation (whether or not the authorisation is expressly given for a specified period) pursuant to Clause 7.4.1 above.

7.4.3 The DoE shall not revoke or modify an authorisation without giving at least a 3-month notice but the DoE may revoke or modify an authorisation without notice if it appears to the DoE that the immediate revocation or modification of the authorisation is required for public health and interest.

7.4.4 A Licensee upon whose request an authorisation has been given under this Part shall notify the DoE as soon as the circumstances which gave rise to the request for the authorisation cease to exist, and, notwithstanding Clause 7.4.3 above, the DoE shall thereupon revoke the authorisation.

7.4.5 Any request for a relaxation under Clause 7.4.1 shall provide sufficient information and data to allow the DoE to assess the necessity and appropriateness of authorising a relaxation together with a risk assessment and mitigation plans. The requester shall also provide an impact assessment on any Supply Agreements in place as needed, and the views and/or acceptance of the impacted Entities. The DoE requires a minimum of 3 months to assess any request made under Clause 7.4.1.



7.4.6 The DoE may require an Entity who makes a request for a relaxation to pay a charge which reflects the expenses incurred or likely to be incurred by the DoE in connection with that request. In determining the amount of any charge, the DoE may adopt such methods and principles for its calculation as appear to it to be appropriate and notify the Entity of the relevant expenses.

7.5 DoE Decision

7.5.1 The DoE shall notify the Entity that made an application for review or relaxation of its final decision.

7.5.2 The DoE may:

- a) make any decision it sees fit in the circumstances; and/or
- b) issue directions as it sees fit to the Entity that made the application for review and to any third party.

7.5.3 Any decisions, relaxations, or directions issued by DoE are binding on the Entity that made the application for review or relaxation and any third party stated in these decisions, relaxations or directions. Failure to comply with decisions, relaxations or directions issued by DoE under Part 7, shall be considered as a failure to comply with these Regulations.



8. Failure to Comply with Regulations

8.1 Reporting Failure

8.1.1 Any failure to comply with these Regulations or any act that may be considered as a failure to comply with these Regulations must be reported to the DoE.

8.2 Enforcement Procedures

8.2.1 In case of failure to comply with these Regulations, the DoE may issue a written warning notice to the non-complying Entity.

8.2.2 The warning notice shall include:

- a) the name of the Entity;
- b) the Regulation which was been violated;
- c) a tolerance period to comply; and
- d) the enforcement procedures to be taken against the Entity in case it does not comply with the Regulations within the tolerance period.

8.2.3 Pursuant to Article 66 of Law No. (2), an Entity that fails to comply with these Regulations may be subject to a fine of not less than AED 250,000.

8.2.4 If an Entity fails to comply with these Regulations for a second time, the fine may be doubled.

8.2.5 Without prejudice to Clauses 8.2.3 and 8.2.4 and pursuant to Article (10) of Law No. (11) of 2018, an administrative fine of not more than (AED 10,000,000) ten million dirhams may be imposed by DoE on anyone who contravenes the provisions of these Regulations and/or any rules, policies, decisions, relaxations, plans, circulars, codes issued thereunder.

8.2.6 The DoE may rectify the violations of these Regulations at the expense of the violator if the latter does not rectify them within the period specified by DoE.

8.2.7 The DoE may take further administrative sanctions against violators in accordance with Article (11) of Law No. (11) of 2018.

8.2.8 Any grievance, appeal or reconciliation of fines and administrative sanctions issued by DoE under this Part shall be made to DoE in accordance with Articles (10) and (11) of Law No. (11) of 2018.



9. Governing Law

9.1 Governing Law

- 9.1.1 These Regulations and the rights and duties of any parties hereunder shall be governed by the Laws of the Emirate of Abu Dhabi and the federal Laws of the UAE as applied by the courts of the Emirate of Abu Dhabi.



10. Schedules

- Schedule A. Parameters and Limits for Recycled Water
- Schedule B. Parameters and Limits for Biosolids
- Schedule C. Sampling Frequency for Recycled Water
- Schedule D. Sampling Frequency for Biosolids
- Schedule E. Initial Data Entries Forms



Schedule A: Parameters and Limits for Recycled Water

- A1 Recycled Water Standards
- A2 Discharge of Recycled Water to the Environment
- A3 Discharge of Recycled Water to Storm Water Networks



A1 Recycled Water Standards

- A1.1 The standards identified in Tables A1, A2, A3 and A4 define the minimum quality requirements for Recycled Water.
- A1.2 Recycled Water use falls under two categories as outlined in Clause 3.2.1:
- Unrestricted Reuse (referred to as P1 in Tables A1 & A2) such as the use of Recycled Water for irrigation in urban areas or toilet flushing; and
 - Restricted Reuse (referred to as P2 in Tables A1 & A2) such as irrigation of remote forestry areas.
- A1.3 P1 standard will require Treatment and Disposal Systems capable of delivering high quality tertiary Treatment and disinfection;
- A1.4 P2 standard will require Treatment and Disposal Systems capable of achieving good quality secondary Treatment and disinfection;
- A1.5 The DoE shall periodically review the quality standards for Recycled Water and Biosolids defined in Schedules A and B of these Regulations and may make amendments or additions as required.

Table A1 - Sanitary Parameters

Standard		P1	P2
Parameter	Unit	Unrestricted Reuse Prescribed Concentration	Restricted Reuse Prescribed Concentration
pH		6 to 8.5	6 to 8.5
BOD5 (ATU)	mg/l	10	10
Total Suspended Solids	mg/l	10	20
Turbidity	NTU	5	10
Residual Chlorine (total available)	mg/l	0.5 to 1	0.5 to 1
Dissolved Oxygen	mg/l	≥ 1	≥ 1

Notes:

- Total available residual chlorine is that residual chlorine being the sum of free and combined residuals.
- NTU = Nephelometric Turbidity Unit; mg/l = milligrams per litre.
- Although the ideal concentration for Residual Chlorine shall be between 0.5 to 1.0 mg/l, the Licensee may, subject to justification, increase the concentration to above 1.0 mg/l where the Licensee determines that it is necessary for the purpose of reducing bacteriological contamination.



Table A2 - Microbiological Parameters

Standard		P1		P2	
Parameter	Unit	Unrestricted Reuse		Restricted Reuse	
		Geometric Mean	Prescribed Concentration	Geometric Mean	Prescribed Concentration
Faecal Coliform or E. Coli	CFU or MPN/100ml	14	23	200	800
Intestinal Enterococci	CFU or MPN/100ml	11	24	35	104
Helminth Ova	Number/l	N/A	0	N/A	0
Legionella (in circulating water)	CFU or MPN/ml	N/A	100	N/A	N/A

Notes:

- i. CFU = Colony Forming Units; MPN = Most Probable Number
- ii. Follow up sampling is required whenever the Prescribed Concentrations for microbiological Parameters have been exceeded and must be performed within one working day of the result being known.
- iii. Two consecutive microbiological monitoring results that reach the Prescribed Concentrations of the Parameters shall be considered non-compliant.
- iv. Testing for Legionella will only be required if Recycled Water is used for chilled water cooling plants. The listed concentration is based on the following:
 - The Association of Water Technologies (<https://www.awt.org>) recommends a threshold level of legionella for triggering cleaning and/or biocide Treatment of the condenser system of 100 CFU or MPN per ml; and
 - The Cooling Technology Institute (<https://www.cti.org>) recommends a threshold level of legionella for triggering routine on-line disinfection of 100 CFU or MPN per ml.

**Table A3 – Trace Elements Parameters**

Parameter	Unit	Prescribed Concentration
Aluminium (Al)	mg/l	5.0
Arsenic (As)	mg/l	0.1
Beryllium (Be)	mg/l	0.1
Cadmium (Cd)	mg/l	0.01
Chromium (Cr)	mg/l	0.1
Cobalt (Co)	mg/l	0.05
Copper (Cu)	mg/l	0.2
Fluoride (F ⁻)	mg/l	1.0
Iron (Fe)	mg/l	5.0
Lead (Pb)	mg/l	5.0
Lithium (Li)	mg/l	2.5
Manganese (Mn)	mg/l	0.2
Mercury (Hg)	mg/l	0.001
Molybdenum (Mo)	mg/l	0.01
Nickel (Ni)	mg/l	0.2
Selenium (Se)	mg/l	0.02
Vanadium (V)	mg/l	0.1
inc (Zn)	mg/l	2.0

Table A4 – Salinity Parameters

Parameter	Unit	Prescribed Concentration
Electrical conductivity	(dS/m @ 25 °C)	3.0
Total dissolved solids (TDS)	mg/l	2,000
Sodium Adsorption Ratio (SAR)		20
Sodium (Na ⁺)	meq/l	9
Chloride (Cl ⁻)	meq/l	10
Boron (B)	mg/l	3
Bicarbonate (HCO ₃ ⁻)	meq/l	8.5



A2 Discharge of Recycled Water to the Environment

A2.1 Discharge of Recycled Water to the environment is subject to the control of the Environment Agency Abu Dhabi or any other relevant Regulatory Authority.

A3 Discharge of Recycled Water to Storm Water Networks

A3.1 Discharge of Recycled Water to storm water networks is subject to the regulations and requirements of the municipalities and any other relevant Regulatory Authority.



Schedule B: Parameters and Limits for Biosolids

- B1 Biosolids Standards
- B2 Treatment Requirements for Biosolids
- B3 Biosolids Beyond the Point-of-Delivery
- B4 Biosolids to Landfill



B1 Biosolids Standards

- B2.1 The standards in Tables B1 and B2 define the minimum quality requirements for Biosolids.
- B1.2 Section B2 defines the minimum performance requirements for systems used to treat Biosolids.
- B1.3 Sections B3 and B4 define the requirements for Biosolids quality in specific Disposal activities.
- B1.4 The Reuse of Biosolids falls under two categories, B1 and B2, as outlined in Clause 3.2.1.
- B1.5 B1 standard may require a sludge disinfection process to support the sludge stabilisation requirements of Schedule B, Table B3; and
- B1.6 B2 will be achieved through a good stabilisation process that achieves the requirements of Schedule B, Table B3.

Table B1 – Microbiological Parameters

Standard		B1 Unrestricted Reuse	B2 Restricted Reuse
Parameter	Unit	Prescribed Concentration	Prescribed Concentration
E. Coli	CFU/g dm	<1000	<100,000
Salmonella	CFU/2g dm	<1	Not applicable
Helminth Ova	No./ 50g dm	<1	<10



Table B2 – Trace Elements Parameters

Standard		B1	B2
Parameter	Unit	Unrestricted Reuse Prescribed Concentration	Restricted Reuse Prescribed Concentration
Arsenic (As)	mg/kg	20	75
Cadmium (Cd)	mg/kg	1	20
Chromium (Cr)	mg/kg	400	1000
Copper (Cu)	mg/kg	150	1000
Lead (Pb)	mg/kg	300	750
Mercury (Hg)	mg/kg	1	10
Molybdenum (Mo)	mg/kg	20	75
Nickel (Ni)	mg/kg	60	300
Selenium (Se)	mg/kg	3	50
Zinc (Zn)	mg/kg	300	2500

Notes:

- i. mg / kg = milligrams per kilogram dry matter, dm = dry matter
- ii. CFU = Colony Forming Units,

B2 Treatment Requirements for Biosolids

- B2.1 Treatment Systems used to produce Biosolids must achieve one of the criteria defined in Table B3.
- B2.2 Analysis and sampling are to be carried out in accordance with the requirements outlined in Part 5 of the Regulations.

Table B3 – Biosolids Stabilisation Standards

Option	Measure	Requirement
Treatment System to reduce volatile solids	% VS Reduction across process	> 38
Treatment System to dry raw sludge	% dm in final product	> 95
Treatment System to dry stabilised sludge	% dm in final product	>75
Treatment System to maintain pH	pH in final product	>11.5 for 24 hours

Note: The arithmetic mean of the samples taken in any month must comply with the standard



B3 Biosolids Reuse Beyond the Point-of-Delivery

B3.1 The Reuse of and quality of Biosolids beyond the Point-of-delivery are subject to control of the relevant Regulatory Authority.

B3.2 Where Biosolids are used for agricultural or landscaping purposes the Disposal Licensee must define the agronomic value by specifying, amongst other things, the typical range of:

(a) total and available nitrogen, phosphorus and potassium; and

(b) dry solids and volatile solids.

B4 Biosolids to Landfill

B4.1 The Disposal of and quality of Biosolids in landfills is subject to the regulation of the Environment Agency - Abu Dhabi and operation of Abu Dhabi Waste Management Center or any other relevant Regulatory Authority.



Schedule C: Sampling Frequency for Recycled Water

List of Tables:

Sampling Frequency Requirements at Point-of-transfer for Treatment Licensees

- Table C1.1 – Sampling frequency for Sanitary and Microbiological Parameters
- Table C1.2 – Sampling frequency for Trace Elements Parameters
- Table C1.3 – Sampling frequency for Salinity Parameters

Sampling Frequency Requirements at Point-of-delivery for Distribution and Supply Licensees

- Table C2.1 – Sampling frequency for Sanitary and Microbiological Parameters
- Table C2.2 – Sampling frequency for Trace Elements Parameters
- Table C2.3 – Sampling frequency for Salinity specific Parameters

Sampling Frequency Requirements at Point-of-use for Self-supply Schemes

- Table C3.1 – Sampling frequency for Sanitary and Microbiological Parameters
- Table C3.2 – Sampling frequency for Trace Elements Parameters

Look-up Table

- Table C4 – “Look-up” table (based on 95-Percentile Limit)



Sampling Frequency Requirements for Recycled Water

Regulated activity	Relevant sampling testing criteria	
	Schedule A (Parameters & limits)	Schedule C (Sampling frequency)
Treatment for Reuse	Table A1, A2, A3 & A4	Table C1.1, C1.2, C1.3
Distribution & Supply	Table A1, A2, A3 & A4	Table C2.1, C2.2, C2.3
Self-supply	Table A1, A2, A3 & A4	Table C3.1, C3.2



Sampling Frequency Requirements for Treatment Licensees

Table C1.1 - Sampling Frequency for Sanitary and Microbiological Parameters

STP Capacity M3/Day	Water Quality Sampling Frequency (number per annum)					
	Table A1 Sanitary			Table A2 Microbiological		
	Reduced	Standard	Increased	Reduced	Standard	Increased
5,000 & Less	24	48	96	12	24	48
5,001 – 50,000	48	96	192	24	48	96
Above 50,000	96	192	384	48	96	192
Helminth for all Capacities				6	12	24
Legionella for all Capacities				6	12	24

Table C1.2 - Sampling Frequency for Trace Elements Parameters

STP Capacity M3/Day	Water Quality Sampling Frequency (number per annum)		
	Reduced	Standard	Increased
5,000 & Less	3	6	12
5,001 – 50,000	6	12	24
Above 50,000	12	24	48

Table C1.3 - Sampling Frequency for Salinity Parameters

Parameter	STP Capacity M3/Day	Water Quality Sampling Frequency (number per annum)
Electrical Conductivity	Above 50,000	240
	Below 50,000	96
TDS & Chloride	Above 50,000	48
	Below 50,000	12
SAR, Sodium, Boron & Bicarbonate	For all capacities	12



Sampling Frequency Requirements for Distribution and Supply Licensees

Table C2.1 - Sampling Frequency for Sanitary and Microbiological Parameters

Volume delivered M3/Day	Water Quality Sampling Frequency (number per annum)					
	Table A1 Sanitary			Table A2 Microbiological		
	Reduced	Standard	Increased	Reduced	Standard	Increased
5,000 & Less	12	24	48	12	24	48
5,001 – 50,000	24	48	96	24	48	96
Above 50,000	48	96	192	48	96	192
Helminth for all volumes delivered				6	12	24
Legionella for all volumes delivered				6	12	24

Table C2.2 - Sampling frequency for Trace Elements Parameters

Volume delivered M3/Day	Water Quality Sampling Frequency (number per annum)		
	Reduced	Standard	Increased
5,000 & Less	1	3	6
5,001 – 50,000	3	6	12
Above 50,000	6	12	24

Table C2.3 - Sampling Frequency for Salinity Parameters

Parameter	STP Capacity M3/Day	Water Quality Sampling Frequency (number per annum)
Electrical Conductivity	Above 50,000	240
	Below 50,000	96
TDS & Chloride	Above 50,000	48
	Below 50,000	12
SAR, Sodium, Boron & Bicarbonate	For all capacities	12



Sampling Frequency Requirements for Self-supply Schemes

Table C3.1 - Sampling Frequency for Sanitary and Microbiological Parameters

STP Design Capacity M3/Day	Water Quality Sampling Frequency (number per annum)					
	Table A1 Sanitary			Table A2 Microbiological		
	Reduced	Standard	Increased	Reduced	Standard	Increased
All Capacities	6	12	24	6	12	24

Table C3.2 - Sampling Frequency for Trace Elements

STP Design Capacity M3/Day	Water Quality Sampling Frequency (number per annum)		
	Reduced	Standard	Increased
≤ 100	2	4	6
101 – 10,000	3	6	12



Table C4 – “Look-up” table (based on 95-Percentile Limit)

Number of samples (in any Year)	Permitted number of exceedances
4-7	1
8-16	2
17-28	3
29-40	4
41-53	5
54-67	6
68-81	7
82-95	8
96-110	9
111-125	10
126-140	11
141-155	12
156-171	13
172-187	14
188-203	15
204-219	16
220-235	17
236-251	18
252-268	19
269-284	20
285-300	21
301-317	22
318-334	23
335-350	24
351-365	25



Schedule D: Sampling Frequency for Biosolids

Table D1 - Sampling Frequency for Microbiological and Trace Elements Parameters

Quantity of Biosolids Tons per annum	Sampling Frequency (number per annum)		
	Reduced	Standard	Increased
Less than 290	1	1	2
290 to 1,500	2	4	8
1,501 to 15,000	3	6	12
Greater than 15,000	6	12	24

Note:

- i. Facilities must sample at the appropriate frequencies prescribed above, or as and when Biosolids are disposed of; whichever is less.



Schedule E: Initial Data Entries Forms

Form 1: Treatment Licensee

Form 2: Distribution & Supply Licensee

Form 3: Self-supply Scheme



Form 1 - Treatment Licensee

Licensee Name:		Site information		
Site Name				
Site Location				
Volume (m3/d)				
Year of Construction				
Region				
Annual frequency plan				
Sample location	STP capacity m3/d	Table		
		C1.1	C1.2	C1.3

Testing Method (according to the sampling testing criteria table)	
Test method No.	
Parameter	
Name of test method	
Method standard	
Description	
Internal or external lab (name of lab)	
Remarks	

Remarks: Please attach a schematic showing the flow diagram and Sampling Points locations



Form 2 – Distribution and Supply Licensee

Licensee Name:		Site information		
Site ID				
Site Description				
Site Location				
Volume (m3/d)				
Region ID				
Annual frequency plan				
Sample location	STP capacity m3/d	Table		
		C2.1	C2.2	C2.3

Testing Method (according to the sampling testing criteria table)	
Test method No.	
Parameter	
Name of test method	
Method standard	
Description	
Internal or external lab (name of lab)	
Remarks	



Form 3 – Self-supply Scheme

Licensee Name:	
Site information	
Site ID	
Site Description	
Site Location	
Volume (m3/d)	
Region ID	
Annual frequency plan	
Sample location	STP capacity m3/d
	Table
	C3.1
	C3.2

Testing Method (according to the sampling testing criteria table)	
Test method No.	
Parameter	
Name of test method	
Method standard	
Description	
Internal or external lab (name of lab)	
Remarks	



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