



# ACCREDITATION REQUIREMENTS FOR ENVIRONMENTAL FIELD OF TESTING

## ‘WATER/ WASTEWATER ANALYSIS’

**DAC-REQ-03**

June 2008



## CONTENTS

Foreword	.....	3
1	Definitions.....	4
2	Scope.....	4
3	General Requirements.....	5
4	Specific Criteria of Competence.....	6
4.1	Requirements for Technical Competence of Staff.....	6
4.2	Test and Sampling Methods.....	6
4.3	Reporting Format.....	7
4.4	Internal Quality Control.....	7
4.5	Participation in External Quality Control Schemes.....	8
5	Accreditation Certificate.....	8
6	Surveillance.....	8
6.1	Planned announced Surveillance Visits.....	8
6.2	Planned unannounced Surveillance Visits.....	8
7	Accreditation Fees.....	8
8	Other Relevant Accreditation Requirements.....	9
9	Cancellation.....	9
10	References.....	9



## FOREWORD

Dubai is a rapidly expanding Emirate, and the Government places great emphasis on providing quality services. The main role of DM is to formulate the Emirate's urban strategic plans as well as the provision of essential infrastructure, environmental and health services for the continued development of Dubai as a modern, safe and dynamic Emirate. The DM, through its Dubai Accreditation Department (DAC) undertakes assessment and accreditation of various Conformity Assessment Bodies (CABs) according to International Standards, guidelines and best practices.

The requirements for accreditation of Laboratories are basically the ISO/ IEC 17025: 2005 as well as the criteria for performing testing according to the technical standards defined in the scope of accreditation by each CAB.

This document DAC-Req-03 describes the requirements for accreditation of Environmental Field of Testing under the accreditation program operated by Dubai Accreditation Department (DAC). This accreditation program is being implemented in order to provide a means of assessing and accrediting the competence of the laboratory to carry out testing for the requirements of the Environmental Protection and Safety Section (EPSS) under the Environment Department of DM.

DAC-Req-03 has been prepared by DAC in cooperation with the Environmental Testing Experts at Dubai Central Laboratory Department (DCLD).

This document should be read in conjunction with the International Standard ISO/ IEC 17025: 2005, *General Requirements for the competence of testing and calibration laboratories*, and DAC document DAC-Req-01, *Accreditation Requirements*.

While accreditation will normally be an indication of the quality of services offered by the Laboratories, it should not be regarded as a guarantee that the Laboratory will always maintain a particular level of performance. It shall not, in any way, diminish the contractual obligation between the Laboratory and its clients.

This document is subject to revision periodically when deemed necessary. It is the responsibility of the Accredited Laboratories to ensure that the latest version of this document is available for reference and implementation.

## 1 DEFINITIONS

The purpose of this section is to define the general and technical terminology that is used within the scope of this document.

### 1.1 Environmental Testing Laboratory

Any laboratory, which is performing chemical or microbiological testing on water and wastewater.

### 1.2 (Laboratory) Proficiency Testing Program:

Determination of laboratory testing performance by means of inter-laboratory comparisons [ISO/IEC Guide 2]

NOTE: For the purposes of this document, the term laboratory proficiency testing is taken in its widest sense and it may includes but not limited to:

- a) Qualitative schemes - for example where laboratories are required to identify a component of a test item.
- b) Data transformation exercises - for example where laboratories are furnished with sets of data and are required to manipulate the data to provide further information.
- c) Single item testing - where one item is sent to a number of laboratories sequentially and returned to the organizer at intervals.
- d) One-off exercises - where laboratories are provided with a test item on a single occasion.
- e) Continuous schemes - where laboratories are provided with test items at regular intervals on a continuing basis.
- f) Sampling - for example where individuals or organizations are required to take samples for subsequent analysis.

## 2. SCOPE

Initially the accreditation program shall cover the following tests carried out for:

### 1. Wastewater analysis:

#	Test Name	Test Method
1	pH	APHA-4500-H *
2	Total Suspended Solids	APHA-2540 D
3	Total Dissolved Solids	APHA-2540 C
4	Oil and Grease	APHA-5520 B
		APHA-5520 C
		APHA-5520 D
5	Biochemical Oxygen Demand (5 days Incubation @ 20 °C)	APHA-5210 B
		APHA-5210D
6	Chemical Oxygen Demand	APHA-5220 B
		APHA-5220 C
		APHA-5220 D

\* Standard Method for Examination of Water and Wastewater - APHA-AWWA-WEF 20<sup>th</sup> Edition 1998

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7	Metals (Cu,Cd,Pb,Ni,Zn,Cr,Co,Fe,Mn,Ag)	APHA-3030, (3111 / 3113 / 3120/3125)
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**2. Swimming Pools water:**

#	Test Name	Test Method
1	Coliforms & E.coli	APHA-9223 B/9221B/9222 B
2	HPC	APHA-9215 A&B
3	Ps. aeruginosa	BSI 6068: 1989 Sec: 4.7/ APHA 9213E
4	Fecal Streptococci	BSI 6068: 1989 Sec.: 4.4/ APHA 9230B

Scope may be extended for other parameters as per requirement.

**3 GENERAL REQUIREMENTS**

- 3.1 The laboratory applying for accreditation as per this program must have a system, which includes the following as minimum:
  - 3.1.1. Proper Documentation System of its policies, procedures and operations starting from receiving the request for a test, performing contract review, performing preparatory work for testing, performing tests, recording results and up to the issuance of the final report/ certificate in accordance with the documentation requirements of ISO/ IEC 17025: 2005 “*General requirements for the competence of testing and calibration laboratories*” and any additional requirements set by DAC here within this document and other related documents.
  - 3.1.2. Facilities properly equipped with the equipment and instruments appropriate for the type and range of tests under accreditation as minimum.
  - 3.1.3. Employ the suitable and qualified technical and administrative staff in the testing laboratory (see 4.1 also).
- 3.2 The laboratory must be licensed to operate in Dubai under Local Order 52/1990 on licensing of laboratories operating in the Emirate of Dubai and must have passed the adequacy and compliance audits as per the requirements of the local order.
- 3.3 The Test Methods to be accredited must be included in the official list of tests submitted by the testing laboratory (Local Order 52/1990 DM Form 4).
- 3.4 The Laboratory shall operate in accordance with the requirements of ISO/ IEC 17025: 2005 and the relevant standard of test methods according to which it would be accredited as well as the DMS 11 & DMS 12.
- 3.5 The Laboratory shall prepare work program for its activities with a frequency suitable to its nature of work.

## 4 SPECIFIC CRITERIA OF COMPETENCE

### 4.1 Requirements for Technical Competence of Staff

- 4.1.1 The head of the environmental testing laboratory shall have appropriate educational background (preferably chemist), adequate experience, and training in the field of environmental testing. The technical staff of the laboratory shall, likewise, have appropriate qualification.
- 4.1.2 The laboratory shall maintain a list of staff authorized to carry out the tests to be accredited.
- 4.1.3 The laboratory shall maintain training records for all the technical staff involved in the environmental testing. The training records shall show evidence that they have carried out the tests and obtained satisfactory results in dummy runs and proficiency testing. Training records shall be reviewed and updated regularly at least once every year.

### 4.2 Test and sampling methods

- 4.2.1 The laboratory shall be responsible for taking the sample(s) from the client's premises. Sampling shall be carried out in accordance with:

- DMS 11: 2001 Sampling & sample handling of wastewater (rev. 0).
- DMS 12: 2001 Testing of wastewater for compliance with EPSS requirements (rev.0).

The analytical problem necessitating the sampling should be understood. Where a material is clearly in two or more physical phases it may be separated and treated as separate samples.

When there is considerable variation in solids, particle size distribution and setting, the samples should be homogenized before analysis except for total suspended solids.

NOTE: Sampling is not included in the initial assessment of the laboratory. Accreditation of sampling will be carried out after the procedure has been practiced for some time and found to be adequate.

#### 4.2.2 Test methods

The tests shall be carried out in accordance with the test methods mentioned in clause [2] above. The laboratory must demonstrate the ability to generate acceptable result.

Selection of Test method, Measuring equipment and parameters should be appropriate to provide results for the regulatory compliance limit.

The Laboratory shall have the test method documented, validated for the matrix effects and method performance data (raw data and supporting data) must be available for the assessment.

Laboratory must obtain a Quality Control Sample from a source different from the calibration standards used routinely and analyze as an independent check of system performance.

The laboratory shall, on an ongoing basis, demonstrate through calibration verification and analysis of the ongoing precision and recovery sample that the analysis system is in control and should maintain records to define the quality of data that is generated.

Matrix spike and matrix spike duplicate samples are required to demonstrate method accuracy and precision and to monitor matrix interferences.

#### Measurement Uncertainty

The Laboratory shall calculate the overall uncertainty and have the records available for each test method during assessment.

### 4.3 Reporting format

Reporting shall be in accordance with the format given in DMS 11: 2001 Sampling & sample handling of wastewater. Reporting detection limit must be the quantitation limit for the method.

Oil and Grease must be reported separately as Emulsified oil and Free Oil. Where the Laboratory has not been responsible for sampling stage, it may be appropriate to state in the report and comment on any consequent limitations imposed on the results.

The accredited laboratory is entitled to use DAC Accreditation Symbol as a demonstration of the recognition of the laboratory's competence to perform the tasks defined in the scope of accreditation in accordance with the document DAC-Req-05 '*Accreditation requirements of Conditions for use of Accreditation symbol*'.

### 4.4 Internal quality control

4.4.1 The laboratory shall carry out internal quality control (IQC) testing in accordance with an IQC plan. The IQC result acceptability criteria should be clearly defined.

4.4.2 The IQC may be in one or more, or a combination of the following for the precision and accuracy to ensure that the quality of the results is under control:-

- Use of certified reference materials,
- Use of internal or external check samples,
- Replicate testing using the same or different method,
- Re-testing of retained items,
- Spike and recovery experiments,
- Use of control charts.

The concentration ranges adopted should be demonstrably sufficient to ensure the validity of the results. Internal QC should not be less than 5% of the sample throughput i.e. 1 in every 20 samples analyzed should be a QC sample. For analysis

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performed infrequently, a full system validation should be performed on each occasion involving the use of reference material containing certified or Known concentration and spiked sample.

#### **4.5 Participation in External Quality Control Schemes**

##### **4.5.1 Proficiency Testing Programs (PTP)**

The laboratory shall participate in inter-laboratory proficiency testing program (PTP) regularly organized by DAC or by competent PTP provider recognized by DAC and shall provide evidence that their results are within the acceptance criteria of the PTP organizer for all the parameters.

#### **5. ACCREDITATION CERTIFICATE**

The Accreditation Certificate shall be valid for a period of three years. The certificate shall be accompanied by a Scope of Accreditation giving details of the tests for which the laboratory has been granted accreditation.

#### **6. SURVEILLANCE**

##### **6.1 Planned Announced Surveillance Visits**

The accredited testing lab shall be subject to planned surveillance visits that will be carried out at least once per year. The purpose of the surveillance visits is to ensure that the testing lab is continuing to comply with the accreditation program requirements. Accredited testing labs will be exempted from the regular surveillance visits done as per Local Order 52/ 1990 on-licensed testing labs. However, compliance with the requirements of Local Order 52 will be verified during the planned accreditation surveillance visits.

##### **6.2 Planned Unannounced Surveillance Visits**

Additional planned special surveillance visits may be carried out at the discretion of DAC and as the need arises without giving prior notifications to the accredited testing lab. Such visits are planned and carried out as per DAC document DAC-G2-07 *Code of Conduct of the Unannounced Surveillance Visits*.

#### **7. ACCREDITATION FEES**

The accreditation fees shall be charged in accordance with DAC document DAC-G2-03 *Accreditation Fee Structure*.

## 8. OTHER RELEVANT ACCREDITATION REQUIREMENTS

The relevant provisions of the 'Accreditation Requirement DAC-Req-01' shall apply to the accredited laboratories unless otherwise superseded by the provisions of this document.

## 9. CANCELLATION

This document cancels and replaces the 'Guidance for the Accreditation for Environmental Field of testing (Waste water Analysis) issue 1, rev. 2 issued on July 2006.

## 10. REFERENCES

- 10.1 Local Order 52/ 1990, on conditions required for licensing laboratories operating in the emirate of Dubai
- 10.2 Local Order 61/1991, on Environment protection regulation in the Emirate of Dubai
- 10.3 ISO/ IEC 17025: 2005 'General requirements for the competence of testing and calibration laboratories',
- 10.4 ISO/ IEC Guide 43 –1:1997 'Proficiency testing by interlaboratory comparisons'
- 10.5 DMS 11: 2001 Sampling & sample handling of wastewater (rev. 0).
- 10.6 DMS 12: 2001 Testing of wastewater for compliance with EPSS requirements (rev.0).
- 10.7 DAC-Req-01 'Accreditation Requirements'
- 10.8 DAC-Req-05 'Accreditation requirements of Conditions for use of Accreditation symbol'
- 10.9 DAC-G2-03 'Accreditation Fee Structure'
- 10.10 DAC-G2-04 'Traceability on Measurement and Calibration of Instruments'
- 10.11 DAC- G2-07 'Code of Conduct of the Unannounced Surveillance Visits'
- 10.12 DAC-52-01 'External Quality Checks' DAC internal quality procedure