Annex 2-3 :
Lecture Materials for Training

2.3.6 Data Management

Lecture 10: Data Management

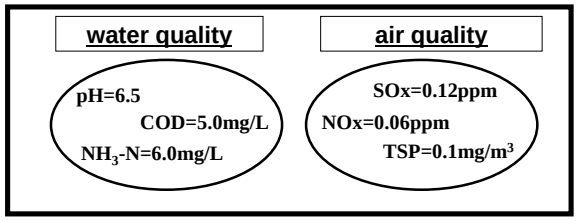
Data Management
- What, Why and How? -

June 2005

JICA Expert Team

What is "data"?

- "Data" : Figures with a specific unit in a specific form collected by the monitoring to indicate water/air quality.



What is "Data Management"?

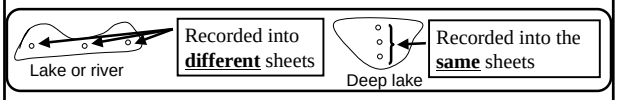
- Process the data into a "unified form"
  - ✓ **Unify the unit for each item**
  - ✓ **Unify the essential digit for each item (usually "two")**

unified unit	unified essential digit
ex)	ex)
NH_3-N → mg/L	NH_3-N → 6.0 or 6.04
COD → mg/L	COD → 5.0 or 5.04
SOx → μg/m³ or ppm	SOx → 0.12 or 0.123

→make it easier to accumulate data at DFEA and GCEA, and to process it further

Continue…(1)

- Record data in a Chronological order
- Record data of Horizontally and Vertically different points in a rational way
  - ✓ **Horizontally different points of the same water body**
  - ✓ **Vertically different points of the same horizontal points**



→identify changes over time
→practical laws/standards, and quick actions for emergency incidences (ex. spills or explosions)

Continue…(2)

- Accumulate data at regional and national centers

→enables to review past data in a easy way

- Issue environmental reports

→explain citizens about the degradation and improve environmental awareness

→encourage citizens to complain about environmental degradation

→strengthen the cooperation between citizens and authorities

Goal of Data Management

- to identify pollutants to deal with
- to take countermeasures
- to verify effects of the countermeasures
- to publish environmental reports

Data management from the view point of monitoring objectives

At Regional Level

1. characterize and identify changes or trends in water/air quality over time;
2. identify specific existing or emerging water/air quality problems;
3. punish violators of laws and effluent/emission standards;

Continue…

4. design laws and standards to prevent or remediate pollutions;
5. analyze effects of the laws and standards; and
6. evaluate the necessity of new laws and standards.

At National Level

Bridging Role between Regional monitoring objectives and National monitoring objectives

Procedures of Data Management

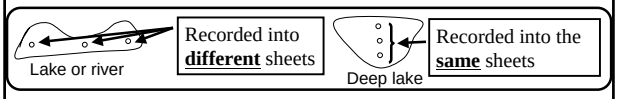
1. Prepare the unified recording format by a versatile software (i.e. excel) and use the same format among all DFEA

Key words: good and enough Directions for correct Form Entry, Unit, Method, Essential Digit

see "Example of Recording Format"

Procedures of Data Management

2. Form entry of monitoring data in a chronological order using excel sheets.



Key words: Chronological Order, Obedience to the Format

see"Example of Recording Format again"

Procedures of Data Management

3. Form entry of useful relevant data such as weather and monitoring site description.

Key words: Relevant Data, Weather, Site Description

see "Example of Recording Format again"

Procedures of Data Management

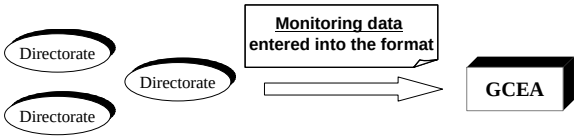
4. Analyze and evaluate the accumulated data at DFEA before sending to GCEA.

   Deal with citizens' complaints or punish violators based on the results.

Key words: Evaluation of Data at Regional Level (DFEA)

Procedures of Data Management

5. Send the data entered into the format from DFEA to GCEA and accumulate all data at GCEA



Procedures of Data Management

6. Analyze and evaluate the accumulated data at GCEA and confirm DFEA.

Key words: Communication between GCEA and DFEA

7. Evaluate whether the selection of monitoring sites is appropriate for monitoring of ambient water/air quality or pollution sources.

Key words: Evaluation of Monitoring Sites

Evaluation of monitoring sites

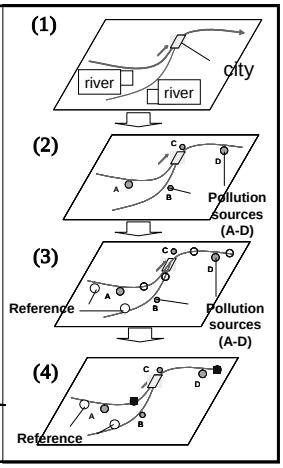
(2) Identify pollution sources

(3) Set reference sites and preliminary typical sites of surrounding env.

(4) Select representative sites of surrounding env.

Always consider points where complaints occurred

○Preliminary typical sites of surrounding env.
○Representative sites of surrounding env.



Procedures of Data Management

8. Continue monitoring at the same sites for a long time to identify trends and changes in water/air quality

Key words: Continuation

Procedures of Data Management

9. Formulate the environmental laws and standards to control pollution sources or to remedy existing pollutions

Key words: Formulation of Laws and Standards based on the Monitoring Results

Japanese Experience

- how to set standards on living environment -

- Too strict
  ⇒ **standards will lose substance**
- Too loose
  ⇒ **standards are meaningless**

Appropriate standards considering compliance conditions.

Procedures of Data Management

10. Issue an environmental report at national level periodically to open to the public

Key words: Publication of environmental reports

Summary of Procedures

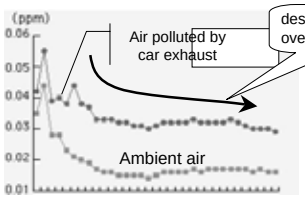
1. **Prepare the unified recording format**
2. **Form entry of monitoring data in a chronological order**
3. **Form entry of useful relevant data**
4. **Analyze and evaluate the data at DFEA**
5. **Send the data from DFEA to GCEA**
6. **Analyze and evaluate the accumulated data at GCEA**
7. **Evaluate the monitoring sites**
8. **Continue the monitoring at the same sites over time**
9. **Formulate or modify the environmental laws/regulations based on the monitoring results**
10. **Issue an environmental report periodically to open the monitoring results to the public**

Output of Data Management - environmental report -

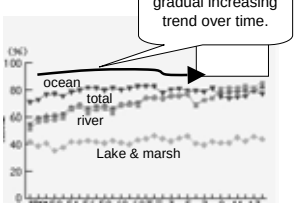
Environmental Report at national level

Environmental Report at regional level

Environmental Report - What the result shows (1) -

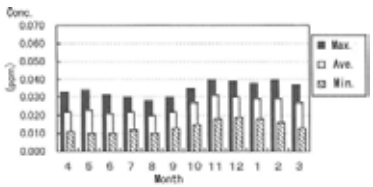


One year average NO2 concentration



Percentage of compliance with BOD/COD regulation

Environmental Report - What the result shows (2) -



Monthly Average NO_2 concentration

Weekly Average NO_2 concentration

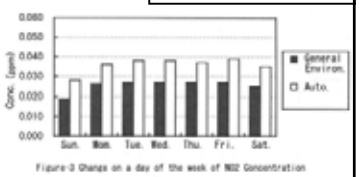
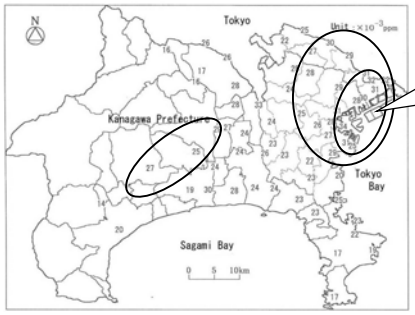


Figure-3 Change on a day of the week of NO2 Concentration

Environmental Report
- What the result shows (2) -



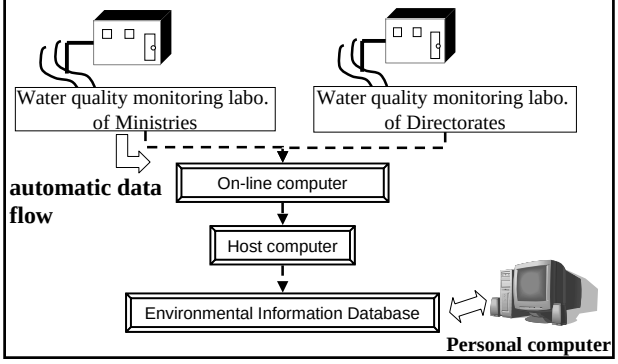
Plot of NO_2 Concentration in map (one year average)

Output of Data Management
- environmental report -

Environmental report for children

This picture painted by a child was selected by the contest

In the future, …
Data Management Network in Japan



Introduction of QA/QC for Laboratory Management

January 2006

Hanae Matumoto

JICA Expert Team

1

Concept of QA/QC

- **Quality Assurance (QA)**
  - **Part of quality management focused on providing confidence that quality requirements will be fulfilled [ISO9000].**
- **Quality Control (QC)**
  - **Part of quality management focused on fulfilling quality requirements [ISO9000].**

2

Quality Management

3

Importance of QA/QC in Syria

- Basis for future prediction and monitoring plan formulation
- Be prepared for data publication by official environment reports
- Be prepared for factory inspection and following lawsuits

⇨ **Demand of reliable monitoring data**

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Relevant Guidelines

- ILAC I & G series, are basis of ISO/IEC17025
- ISO/IEC 17025, is an international standard which presents general requirements for the competence of testing and calibration laboratories
- Good Laboratory Practice (GLP), was made by OECD

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Relevant Body

- ILAC (International Laboratory Accreditation Cooperation)
  - ILAC was formalized in 1996.
  - ILAC is an international cooperation between the various laboratory accreditation schemes operated throughout the world.
  - Laboratory accreditation (ex. ISO/IEC17025) provides **a means of determining the competence of laboratories** to perform specific types of testing, measurement and calibration.

Source: www.ilac.org

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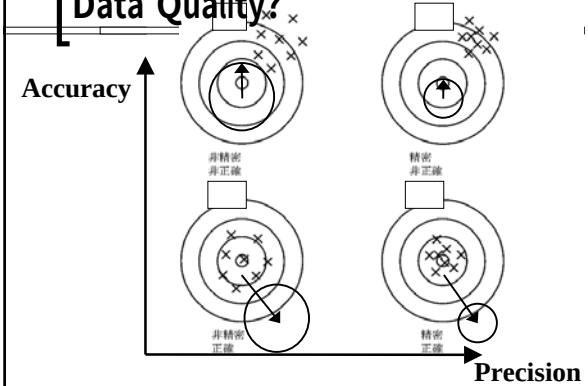
Data Quality?



Accuracy or Precision?

- An indication of uniformity or reproducibility of a result **Precision**
- The degree of conformity with the "truth" **Accuracy**

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Statistical Analysis of Data

- Minimum
- Maximum
- Mean (Average)

} Introduced in the "Recording Format"

- Standard Deviation (σ)
- Coefficient of Variation (CV)

} New Idea

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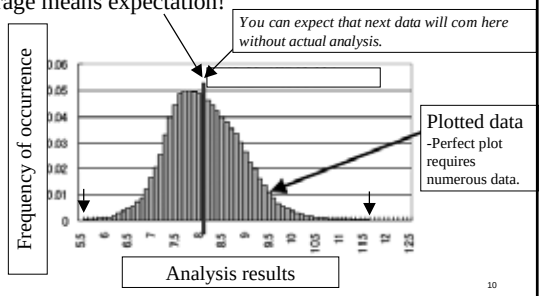
Review of min., max. and ave.

Average means expectation!



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σ and CV

- $\sigma = \sqrt{\frac{1}{n}\sum_{i=1}^{n}(x_i - \bar{x})^2}$

$\Rightarrow$ $\sqrt{\text{Average of (scale of difference from mean)}^2}$

- CV = $\frac{\sigma}{\bar{x}} \times 100$

n : the number of data

$\bar{x}$: mean of data

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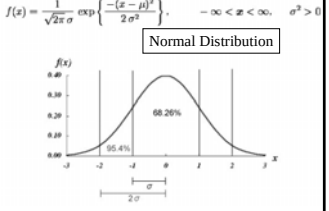
Meaning of σ and CV

- Most analysis results follow the normal distribution.
- Ninety five percent (95%) of analysis results should be in the range of mean $\pm 2\sigma$.



- CV should be less than 10% as for inorganic materials, and less than 20% as for organic materials.

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Cause of inaccurate results

Document control
- NOT to comply with SOP
- Lack of data recording
- Wrong data recording

Equipment/consumable
- Inappropriate storage of samples
- Deterioration of reagents
- Contamination or deterioration of glassware
- Ill maintenance of equipment
- Lack of calibration of equipment

Capacity
- Lack of skill and training
- Limitation of analytical methods

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Limitation of Analytical Methods

- Data got by "basic water quality analysis" has a limitation of reliability.

⇨ Details will be explained by JICA experts in a water quality training course.

- Can not be relied on too much especially for political matters.

⇨ Careful choice of data is needed on publication.

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Brief Introduction of ISO/IEC17025

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Table of Contents of ISO/IEC 17025

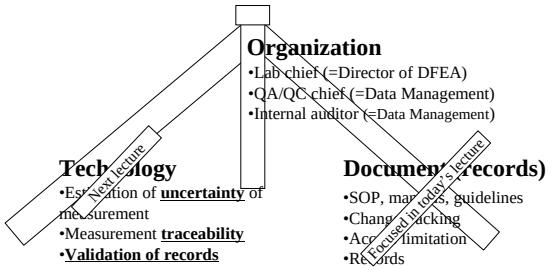
1. **Scope**
2. **Normative references**
3. **Terms and definitions**
4. **Management requirements**

4.1 Organization, **4.2** Quality system, **4.3** Document control,
4.4 Review of requests, tenders and contracts, **4.5** Subcontracting of tests and calibrations,
4.6 Purchasing services and supplies, **4.7** Service to the client, **4.8** Complaints,
4.9 Control of nonconforming testing and/or calibration work, **4.10** Corrective action,
4.11 Prevention action, **4.12** Control of records, **4.13** Internal audits,
4.14 Management review

5. **Technical requirements**

5.1 General, **5.2** Personnel, **5.3** Accommodation and environmental conditions,
5.4 Test and calibration methods and method validation, **5.5** Equipment,
5.6 Measurement traceability, **5.7** Sampling, **5.8** Handling of test and calibration items,
5.9 Assuring the quality of test and calibration results, **5.10** Reporting the results

Three Key Elements of QA/QC



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Roles of Data Management

- **To establish the laboratory's QA/QC system** (mainly related to "technical matters" and "document control") to keep and improve the competence of the laboratory
- **To report the situation** related to the laboratory's QA/QC **to the Director of DFEA**
- To request new and appropriate resources (ex. equipment, reagents) to the Director of DFEA when the budgetary plan is made or as need arises based on the record of consumables
- **Major roles of Data Management**
  - A) Record of analyzed data, received complaints, and quality and quantity of consumables stored in the laboratory (ex. reagents)
  - B) Control of above records
  - C) Check of nonconforming works to manuals (ex. SOP)
  - D) Taking corrective and preventive action to nonconforming works
  - E) Education and training of new personnel

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Procedures of Data Management explained in the basic lecture in June

1. Prepare the unified recording format ✓done
2. Form entry of monitoring data in a chronological order ✓continue
3. Form entry of useful relevant data ✓continue
4. Analyze and evaluate the data at Directorates ✓continue
5. Send the data from Directorates to GCEA
6. Analyze and evaluate the accumulated data at the GCEA
7. Evaluate the monitoring sites
8. Continue the monitoring at the same sites over time
9. Issue *an official environmental report* periodically to open the monitoring results to the public

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4.3 Document control (extract)

- Changes to documents shall be reviewed and approved …

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4.12 Control of records (extract)

- All records shall be held secure and in confidence.
- The laboratory shall have procedures to protect and back-up records stored electronically and to prevent unauthorized access to or amendment of these records.

5.10 Reporting the results (extract)

- The results of each test, calibration, or series of tests or calibration carried out by the laboratory shall be reported accurately, clearly, unambiguously and objectively, and in accordance with any specific instructions in the test or calibration methods.

Attention: Review the essential digits of recorded data on a computer!

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4.13 Internal audits (extract)

- The laboratory shall periodically… conduct internal audits of its activities to verify that its operation continue to comply with the requirements of the quality system …

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5.9 Assuring the quality of test and calibration results, **5.10** Reporting the results

4.8 Complaints (extract)

- The laboratory shall have a policy and procedure for the resolution of complaints received from clients and other parties. Records shall be maintained of all complaints and of the investigations and corrective actions taken by the laboratory.

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Simple Procedures of QA/QC

Procedures	*Requirements*
Personnel / Organization	Position – Qualification Duties of personnel
↓	
Purchasing services and supplies	Specification – Confirmation – Approval Record of suppliers and their evaluation
↓	
Sampling	Compliance with SOP Sampling checklist, field records
↓	
Analysis	Compliance with SOP Field analysis records, laboratory analysis records
↓	
Complaint Handling	Record of complaints
↓	
Correction Measures	

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Thank You for Your Attention!

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Introduction of Technical Requirements

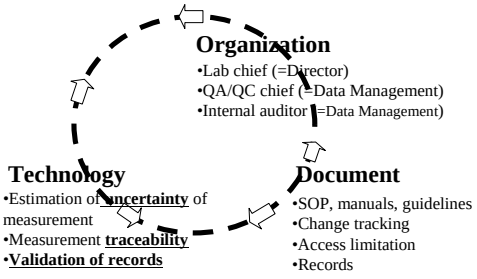
for the competence of laboratories

January 2006

Hanae Matumoto
JICA Expert Team

1

Three Key Elements of QA/QC



2

Technical requirement-1 Uncertainty of measurement

- When estimating the uncertainty of measurement, all uncertainty components which are of importance in the given situation shall be taken into account using appropriate methods of analysis. (ISO/IEC17025: 5.4.6.3)

3

Technical requirement-1 Introduction of Uncertainty in the Project

- 3 to 5 times analyses per sample depending on analytical equipment
  ⇨ Minimize uncertainty
- Calculation of coefficient of variation (CV%)

$$CV(\%) = \frac{\sigma}{x} \times 100$$ ⇨ Minimize uncertainty

- Confirmation of detection limit of analytical equipment

4

Technical requirement-2 Measurement traceability

- All equipment used for tests and/or calibrations, including equipment for subsidiary measurements having a significant effect on the accuracy or validity of the result of the test, calibration or sampling shall be calibrated before being put into service. (ISO/IEC17025: 5.6.1)
- Reference materials shall, where possible, be traceable to SI units of measurement, or to certified reference materials. (ISO/IEC17025: 5.6.3.2)

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Technical requirement-2 Introduction of Traceability in the Project (1)

source: SOP

- **Repeat the test on a replicate sample**
  - pH (portable pH meter), water temperature (colorimeter), EC&TDS (EC&TDS meter)
- **Calibration**
  - pH (Every day), EC&TDS (sometimes), DO (Every day), color (colorimeter), turbidity (turbidity meter)
- **Nothing**
  - SS (colorimeter), COD (colorimeter), BOD, NO_3^--N (colorimeter), PO_4^{3-} (colorimeter), Cl^- (digital titrator), NH_3-N (colorimeter)

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Technical requirement-2
Introduction of Traceability in the Project (2)

- Analysis of common samples
- Analysis of reference materials
- Interlaboratory calibration

Attention:
The JICA expert team is planning to distribute reference materials to all DFEAs, and compare the results. This can contribute to interlaboratory calibration.

7

Technical requirement-3
Validation of records

- Validation is the confirmation by examination and the provision of objective evidence that the particular requirements for a specific intended use are fulfilled. (ISO/IEC17025: 5.4.5.1)

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Technical requirement-3
Introduction of Validation in the Project

- To record every step from sampling to analysis
  - Sampling checklist
  - Field record (width, depth, velocity, etc.)
  - Field analysis record (got by portable colorimeter)
  - Sample entry record/ sample labeling
  - Laboratory analysis record
  - Recording format
  - Record of laboratory consumables
  - Record of complaints
- To validate records and reports
- To ensure the compliance with SOP
- To revise SOP as need arises (in the future)

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Necessity of Reference Laboratory

- Major roles of the reference laboratory
  - Strengthening of QA/QC in other laboratories
  - Interlaboratory calibration
  - Cross check among personnel
  - Validation of analysis results of other laboratories

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QA/QC Covers Everything….

Procedures	*Requirements*
Personnel / Organization	Position – Qualification Duties of personnel
↓	
Purchasing services and supplies	Specification – Confirmation – Approval Record of suppliers and their evaluation
↓	
Sampling	Compliance with SOP Sampling checklist, field records
↓	
Analysis	Compliance with SOP Field analysis records, laboratory analysis records
↓	
Complaint Handling	Record of complaints
↓	
Correction Measures	

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Thank You for Your Attention!

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Data Management
- Practical Lesson -

June 2006
Takahashi Keiichi
JICA Expert Team

Goal of Data Management

- Accumulate data at DFEAs
- Accumulate data at GCEA
- Issue environmental reports
- Identify pollutants to deal with
- Take countermeasures
- Verify effects of the countermeasures

Practical Data management

- Use Unified File Naming Rule
- Arrangement of the Data File on the Data Folder in PC
- Input Data in a Correct Way
- Print out the Record and Filing

File Naming Rule

- ○○○-△-# # #

  ○○○: Name of Governorate in 3 Character
  △:Type of Sample Water (water body)
  ### :Station Number (Sequential Number)

- Example: DAM-I-003
  ALP-R-005

○○○: Name of Governorate in 3 Character

Abbreviations for each DFEA

Name	Abbreviations (in 3 Character)
Damascus DFEA	**DAM**
Damascus Countryside DFEA	**DAC**
Aleppo DFEA	**ALP**
Homs DFEA	**HOM**
Hama DFEA	**HMA**
Lattakia DFEA	**LTK**
Deir ez Zor DFEA	**DEZ**
Idleb DFEA	**IDL**
Hasakeh DFEA	**HSK**
Rakka DFEA	**RAK**
Sweida DFEA	**SWD**
Dara'a DFEA	**DAR**
Tartous DFEA	**TAR**
Quneitra DFEA	**QNT**

△:Type of Sample Water (water body)

- I : Industrial waste water
- D: Domestic waste water (Sewage water)
- R: Rivers (including canal)
- L: Lakes (including Dam and reservoir)
- G: Under ground water
- S: Seas
- C: Complaints

:Station Number (Sequential Number)

- Sequential Number by Type of Sample Water
- Based on DFEA's Environmental Monitoring Plan
- Example: DAC-I-001 to DAC-I-046
  DAC-D-001
  DAC-R-001
  DAC-G-001 to DAC-G-003

Make Data Folder in PC

- Folder Name based on Type of Sample Water (water body)
  Industrial waste water
  Domestic waste water (Sewage water)
  Rivers (including canal)
  Lakes (including Dam and reservoir)
  Under ground water
  Seas
  Complaints

Input Data in a Correct Way

- Input Code: △-# # #

  △:Type of Sample Water (water body)
  ### :Station Number (Sequential Number)

  Example: I-005
  D-002
  R-002
  L-001
  G-002

- Input governorate, City, Town, (Village)
  المحافظة , المدينة, البلدة, القرية
- Input sampling time :(hh:mm)
- Input weather (الطقس):

  clear/sunny: ◎, overcast: ○, rain (gentle): △, rain (heavy): ▲
- Input Air Temp. (درجة حرارة الهواء)
- Input water width (عرض المياه)
- Input water depth (عمق المياه في نقطة الاعتيان)
- Input flow rate (نسبة الجريان)
- Input odor(الرائحة)

Input Data in a Correct Way

- Input Analysis Data (Result)
  pH, Water Temp., Color, TDS, DO, SS, COD, BOD_5, NO_3^-, PO_4^{3-}, Cl^-,NH_3-N, Electrical Conductivity, Turbidity
- Input Name of Person in charge of Data Management

Print out the Record and Filing

- Print out the Record
- Filing the Record in order


Thank You
For blue sky,
and
clean water

Lecture Training
For
Data management

2007 Jan. – Feb.

Takahashi Keiichi
The JICA Expert Team

Training for Data Management
(2007/1/21 – 2/8)
Goal of Data Management

- Accumulate data at DFEAs
- Accumulate data at GCEA (Data Transmission from DFEA to GCEA)
- Issue environmental reports
- Identify pollutants to deal with
- Take countermeasures
- Verify effects of the countermeasures

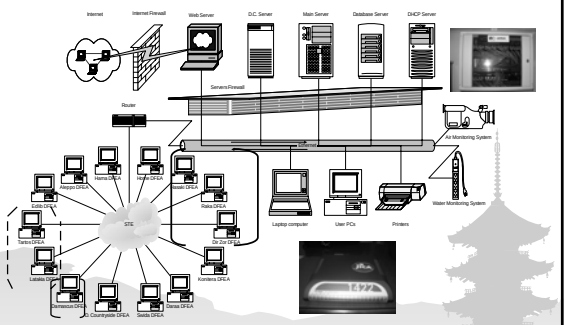
1.Networking between GCEA and DFEA Data transmission system and database

1) Objective
- **Accumulate data at GCEA (Data Transmission from DFEA to GCEA)**
- **Making National Environmental Report by GCEA**
- **Publishing environmental data to public**
- **Contributing to increasing environmental awareness**

2) Connection to GCEA: Intranet (GS-HDSL by STE)

3) Limitation
- **Hasakeh, Deir ez Zor, Rakka: Out of service area by STE**
- **Damascus DFEA: Jobar area is out of service area**

Diagram of Environmental Network



Example of data input

2. Annual Report

1) As follows desirably,

1) Title Page	
2) Executive Summary	**Contents, function of the report, findings etc.**
3) Introduction	**Objectives, area introduction, related monitoring activity etc.**
4) Details	**Details of factories, rivers, lakes, reservoirs, area (population etc.), location map of sampling station, analysis method, QA/QC etc.**
5) Results and Discussion	**Water quality assessment, major problems, etc. (tables and figures)**
6) Recommendations for Future Work	**Monitoring plan (station, parameter, frequency), water pollution control policy etc.**
7) Appendices	**Glossary, data tables and other detailed information etc.**

2) As follows at least,

1) Title Page

2) Introduction — Objectives, area introduction, related monitoring activity etc.

3) Results and Discussion — Data tables, major problems, etc.

4) Monitoring plan in 2007 — Monitoring plan (station, parameter, frequency), etc.

5) Appendices — Glossary and other detailed information etc.

3. Computer Virus

1) It is very important to protect your monitoring data from computer virus.

2) Keep using antivirus software (Norton Antivirus)

3) Antivirus software automatically detects and removes viruses, Trojan horses, and worms.

4) Cause of virus may be flash memory

5) It is important to update of protection file periodically

6) JICA team will assist updating, when coming to you.

7) Please prepare the budget for update right after Sep. 2007 (about S.P 1,500)

4. Backup of data

1) Hard disk in PC shall be broken in future surely.

2) Please make a backup of monitoring data (recording sheet).

3) Please prepare the budget to buy CD writer within a couple of year.

5. Confirmation of O &M record of reagents

Please confirm one year consumption

Table 2 Operation and Maintenance (O/M) Record of Reagents in _____DIEA (Maker of reagents: HACH; Supplier: MIMOSA)

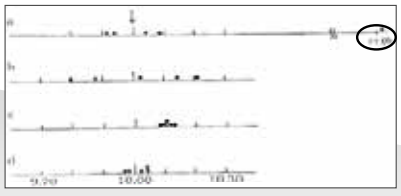
الجدول -2- سجل استخدام وحفظ الكواشف في مصرية

No.	Name of Reagent	Usage	Unit	Number	Purchased Date	Expiration date	Unknown of Turbidity	Order No.	Stored qty. on 31st end of Mar.	Stored qty. on 30th end of Jun.	Stored qty. on 30th end of Sep.	Stored qty. on 31st end of Dec.	Remarks (condition/cause)
	...WORD ref.	Wetlabel	Unit	Number	Purchased Date	Expiration date	Unknown of Turbidity	Order No.	Stored qty. on 31st end of Mar.	Stored qty. on 30th end of Jun.	Stored qty. on 30th end of Sep.	Stored qty. on 31st end of Dec.	Remarks (condition/cause)
1	pH standards, pH 4.01	pH calibration	500 ml	2	2005 Jun.		NO	HACH 2283149					
	pH standards, pH 7.00		500 ml	2				HACH 2283549					
	pH standards, pH 10.00		500 ml	2				HACH 2283649					
2	Conductivity standards, 100 µS/cm		500ml	1				HACH 27873.42					
	Conductivity standards, 1,000 µS/cm	Wet&TDS calibration	500ml	1	2005 Jun.		NO	HACH 14389.42					
	Conductivity standards, 10,000 µS/cm		500ml	1				HACH 27874.42					
3	Formazin Primary Standard, 4000 NTU Turbidity	Turbidity calibration	500 ml for each	1	2005 Jun.		NO	HACH 2659649					
	Dilute (4 L to 100, 000 NTU)												
4	Reagents (High range 0-1,500 mg/l) for COD_{Cr}	COD_{Cr}	25 tests/PK	22	2005 Jun.		Yes (Hg, Ag, Cr)	HACH 2125L25					
5	Reagents for NO_3 -N (High range, 0-30.0 mg/l)	NO_3 -N	100 tests/PK	8	2005 Jun.		Yes (Cd)	HACH 2106.69					
6	Reagents for PO_4^{3-} (High range, 0-30.00 mg/l)	PO_4^{3-}	100 tests/PK	8	2005 Jun.		NO	HACH 2350.52					
7	Reagents for Cl^-, (0-10,000 mg/l)	Cl^-	100 tests/set	8	2005 Jun.		Yes (Ag)	HACH 2307.69					
8	Reagents for SS, N (High range, 0-50 mg/l)	SS, N	25 tests/PK	11	2005 Jun.		Yes (CN)	HACH 2469649					
9	Disinfectant Inhibitor	BOD	100g	1	2005 Jun.		NO	HACH 2533.63					
10	BOD Inorganic Buffer Pillows,	BOD	100 millitests/PK	10	2005 Jun.		NO	HACH 2105.66					
11	BOD Seed Microbes	BOD	100 millitests/Bottle	10	2005 Jun.		NO	HACH 2106.66					
12	TOC/DOC	TOC	25 tests/PK	2	2005 Jun.		Yes (CN)	HACH 2449.25					
13	Reagents (Low range 0-150 mg/l) for COD_{Cr}	COD_{Cr}	25 tests/PK	2	2005 Jun.		Yes (Hg, Ag, Cr)	HACH 2125.25					
14	Reagents for NO_3 -N (Mid range, 0-15 mg/l)	NO_3 -N	25 tests/PK	1	2005 Jun.		Yes (Cd)	HACH 2106.25					
15	Reagents for PO_4^{3-}(Low range, 0-2.50 mg/l)	PO_4^{3-}	100 tests/PK	1	2005 Jun.		NO	HACH 2106.69					
16	Reagents for NH3-N (Low range, 0-2.50 mg/l)	NH3-N	25 tests/PK	1	2005 Jun.		Yes (CN)	HACH 2606.25					
17	Acid standard, 1000 mg/l	Check CEO	500 ml	1	2005 Jun.		NO	HACH 2106B.49					
18	CEO standard, 1000 mg/l	Check CEO	500 ml	1	2005 Jun.		NO	HACH 2105B.49					
19	NO_3 -N standard, 1.0 mg/l	Check NO_3 -N	500 ml	1	2005 Jun.		NO	HACH 2940.49					
20	NO_3 -N standard, 10.0 mg/l	Check NO_3 -N	500 ml	1	2005 Jun.		NO	HACH 307.49					
21	NO_3 -N standard, 100 mg/l	Check NO_3 -N	500 ml	1	2005 Jun.		NO	HACH 1947.49					
22	NO_3 standard, 50 mg/l	Check NO_3	500 ml	1	2005 Jun.		NO	HACH 171.49					
23	NO_3-N standard, 10 mg/l	Check NO_3 -N	500 ml	1	2005 Jun.		NO	HACH 153.49					
24	NH_3 -N standard, 95 mg/l	Check NH_3 -N	125ml/SL Volhard Graphite	1	2006 Jun.		NO	HACH 14791.30					
25	BOD standard, 300 mg/l	Check BOD	125ml/SL Volhard Graphite	1	2006 Jun.		NO	HACH 14869.30					
26	BOD standard, 3000 mg/l	Check BOD	125ml/SL Volhard Graphite	1	2006 Jun.		NO	HACH 14868.30					
27	Cl standard, 1000 mg/l	Check Cl	500 ml	1	2006 Jun.		NO	HACH 105.49					
28	Hexane Wate 50g/L	NO_3 interfering	50 ml,	1	2006 Jun.		NO	HACH 2151.69					
29	Phenol Solution	NO_3 interfering (NO_3 removal)	50 ml,	1	2006 Jun.		NO	HACH 2732.69					
30	Sulfamic acid	NO_3 interfering (Nitrite interfering	5 g	1	2006 Jun.		NO	HACH 2344.14					
31	Phosphate Prestotannate Powder Pillows	Turbidity and color interfering	100/pkg	1	2006 Jun.		NO	HACH 1.0301.99					
32	Ferrochelate Acid, ACS	pH adjusting (NO_3,Cl, PO_4 etc.)	500 ml,	1	2006 Jun.		NO	HACH 1.54.49					
33	Sulfide Inhibitor Powder Pillows	S interfering (CU interfering)	100/pkg	1	2006 Jun.		NO	HACH 2128.99					
34	Mercuric Sulfate	Cl interfering (COD)	50.5 g	1	2006 Jun.		Yes (Hg)	HACH 1953.99					
35	Hydrogen Peroxide, 30% ACS	Sulfur interfering NO_3 interfer	500 ml,	1	2006 Jun.		NO	HACH 164.53					

6. About error

1) Type of error

- *Assuming theoretical value (correct answer) is 10.00*
  - **Mistake error**
    ex.) 10.04, 9.94, 17.04, 10.08, 9.92
  - **Random error (poor precision)**
    ex.) 9.98, 1014, 10.02, 9.80, 10.21
  - **Systematic error (Bias: +0.1)**
    ex.) 10.08, 10.11, 10.09, 10.10, 10.12
  - **error is very small (Precise and low bias)**
    ex.) 10.04, 9.98, 10.02, 9.97, 10.04



2) Statistical Figure of Type of Error

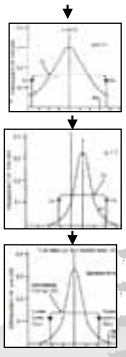
Correct answer

Example of Random Error:

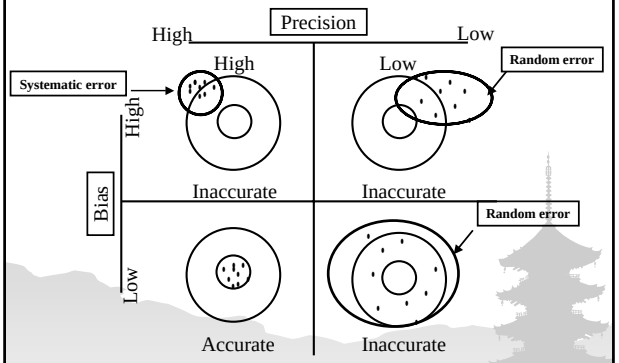
Example of Systematic Error:

Example of Small Error:

(Precise and low bias)



3) Data Quality and Error



6. Questions and Discussion

شكراً
جزيلاً

Lecture Training
For
Air Quality
and
(Chemical & Biological Water Quality 1,2)
Data management

2007 July

Takahashi Keiichi
The JICA Expert Team

Practical Data management for Air quality data

- Use Unified File Naming Rule
- Arrangement of the Data File on the Data Folder in PC
- Recording format of Air Quality Data (**New**)
- Input Data in a Correct Way
- Print out the Record and Filing
- Annual Report of Air Quality
- O/M Record of Reagent and Consumables
- Others (**New Recording Format** for Chemical & Biological Water Analysis and AAS Analysis)

1.File Naming Rule

- A-□□-○○○-△-# # #
  A：Air
  □□：Year
  ○○○: Name of Governorate in 3 Character.
  △:Type of Area Air Sample collected.
  ### :Station Number (Sequential Number)

  Example: A-07-DAM-I-002
  A-07-ALP-R-001
  A-07-HOM-B-001

○○○: Name of Governorate in 3 Character

Abbreviations for each DFEA

Name	Abbreviations (in 3 Character)
Damascus DFEA	**DAM**
Aleppo DFEA	**ALP**
Homs DFEA	**HOM**

△:Type of Area Air Sample collected

- B：Background
- I：Industrial
- C：Commercial
- V：Main Road (Vehicle Emission)
- R：Residential
- S：Complaints (الشكاوى Shaukaui)

:Station Number (Sequential Number)

- Sequential Number by Type of Area Air Sample collected
- Based on DFEA's Monitoring Plan
- Example: DAM-I-001 to DAC-I-002
  ALP- C-001
  HOM-V-001

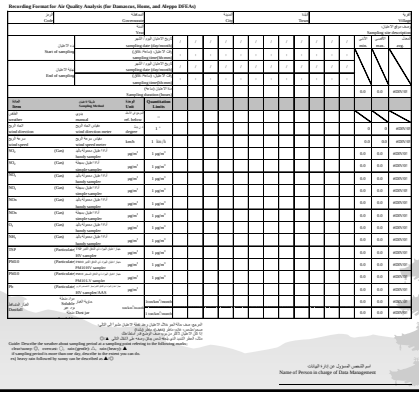
2.Make Data Folder in PC

- Folder Name based on Type of Area Air Sample collected.
  - Background
  - Industrial
  - Commercial
  - Main Road (Vehicle Emission)
  - Residential
  - Complaints (الشكاوى Shaukaui)

Data Folder in PC

Data Folder in PC

3.Recording Format of Air Quality



4.Input Data in a Correct Way

- Input Code: △-# # #

△:Type of Area Air Sample Collected

:Station Number (Sequential Number)

Example: I-002
C-001
R-002
V-001
G-002

5.Print out the Record and Filing

- Print out the Record
- Filing the Record in order

6. Annual Report

1) As follows desirably,

- **1) Title Page**
- **2) Executive Summary** — Contents, function of the report, findings etc.
- **3) Introduction** — Objectives, monitoring plan in this year, area introduction, related monitoring activity etc.
- **4) Details** — Details of industrial area, factories, traffic volume on the main road, residential area, population etc., location map of sampling station, analysis method, QA/QC etc.
- **5) Results and Discussion** — Air quality assessment, major problems, etc. (tables and figures)
- **6) Recommendations for Future Work** — **Monitoring plan in next year (station, parameter, frequency), etc.**
- **7) Appendices** — Glossary, data tables and other detailed information etc.

2) As follows at least,

- **1) Title Page**
- **2) Introduction** — Objectives, area introduction, monitoring plan in 2007, related monitoring activity etc.
- **3) Results and Discussion** — Data tables, major problems, etc.
- **4) Monitoring plan in 2008** — Monitoring plan (station, parameter, frequency), etc.
- **5) Appendices** — Glossary and other detailed information etc.

7. O &M record of Reagents and Consumables (Air)

Please confirm one year consumption

Operation and Maintenance (O/M) Record of Reagent and Consumables (1)

Check the residue quantity of the reagent four times a year.
The user must report to the management representative promptly when the residue quantity decreases.

Management No.	Name of Reagent	Specifications: Usage	Quality/ size	Unit	Number	Date of Delivery	Expiration date	Stored no. in the end of Mar.	Stored no. in the end of Jun.	Stored no. in the end of Sep.	Stored no. in the end of Dec.	One Year Consumption	Remarks (recorder's name)
1	Acetic acid (CH3COOH)	NO2	G	2.5 L	1	Aug. 6, 2006							
2	Sulfanilic acid (H2NC6H4SO3H)	NO2	G	100g	1								
3	[p-(1-Naphthyl) ethylenediamine dihydrochloride For NOx analysis (C10H7NHCH2CH2NH2)2.2HCl]	NO2	--	25g	1	Aug. 25, 2006							
4	Potassium permanganate For NOx analysis (KMnO4)	NO2	--	1 kg	1	Aug. 6, 2006							
5	Sulfuric acid (H2SO4)	NO2_F	G	2.5 L	1	July 2006							
6	Sodium nitrite (NaNO2)	NO2	G	500g	1	Aug. 6, 2006							
7	Chloroform, certified (CHCl3)	NO2	UGR	2.5 L	1								
8	Barium hydroxide octahydate (Ba(OH)2 * 8H2O)	NO2	G	500g	1								
9	Triethanol amine (NOC2H4OH)3	NO2	G	500ml	1								
10	Sodium azide (NaN3)	SO2	G	500g	1								
12	Pyrohochlic acid (HCl)	SO2	G	2.5 L	1								
13	Formaldehyde	SO2	G	2.5 L	1								
14	Sodium hydrogen sulfite 40% Solution (NaHSO3)	SO2	G	1.0L	1								
15	Sulfur (0.1 N)	SO2,Cls	--	500ml	1								
16	Sodium sulfate (Na2SO3)	SO2	G	500g	1	Aug. 6, 2006							
17	Mercury (II) chloride (HgCl2)	SO2	G	500g	1								
18	Sodium chloride (NaCl)	SO2	G	1 kg	1								
19	Glycerin (HOCH2CHOHCH2OH)	SO2,	G	1 L	2								
20	Starch, soluble (ไม่ทราบรายละเอียด)	SO2,Cls	1	1 kg	1								
21	Mercury (II) iodide, red (HgI2)	SO2	G	100g	1								
22	Sodium thiosulfate pentahydrate (Na2S2O3 * 5H2O)	SO2,Cls	Semi-G	1 kg	1								
23	Potassium iodate (KIO3)	SO2	G	100g	1								
24	Potassium iodide (KI)	SO2	G	1 kg	1								
25	Nessler's reagent	NH3	--	500ml	1	July 2006							
26	Methylene blue	H2S	G	100g	1								
27	Phosphoric Acid (H3PO4)	NO2	G	2.5 L	1								
28	Sulfanilamide	NO2	G	100g	1								
29	NO2 Measuring Filter	NO2	--	50 sheets	90	Aug.2005	3 year in the freezer						
30	NOx Measuring Filter	NOx	--	50 sheets	45								
31	SO2 Measuring Filter	SO2	--	50 sheets	90								
32	Glass fiber filter paper	PM	dia50	100	2	Jan. 2007							
33	Quartz fiber filter paper	PM	8" x 10"	100	2								
34	Glass fiber filter paper	PM	8" x 10"	100	2								
35	Membrane filter paper	FM/Mem	dia47	100	2	Aug.2006							
	Check person												

8. Computer Virus

1) Keep using antivirus software (Norton Antivirus)

2) Cause of virus may be flash memory

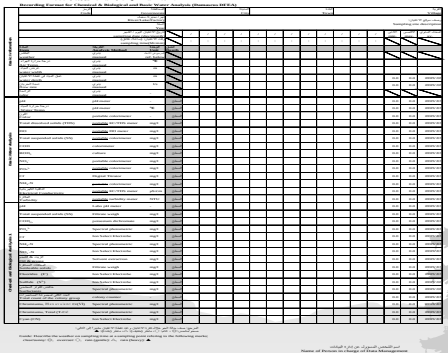
3) Keep Minimum use of flash memory

4) It is important to update of protection file periodically

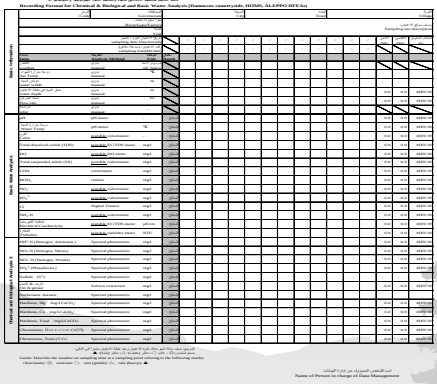
5) Please prepare the budget for update right after Sep. 2007 (about S.P 1,500)

9. New Recording Format

1) Chemical and Biological water Quality Analisis-1 (DAM)



2) Chemical and Biological water Quality Analisis-2 (DAC,ALP,HOM)



3) Water Quality (Metal) Analysis by AAS

شكل السجل لتحليل المياه (المعادن) في المديريات الـ 14

Recording Format for Water Analysis for Metals (for all 14 DFEAs)

الرمز Code: | المحافظة Governorate | المدينة City | البلدة Town | القرية Village

نهر/ بحيرة/ معمل River/Lake/Factory

وصف موقع الاعتيان: Sampling site description

2007 السنة Year

Basic Information	تاريخ الاعتيان اليوم / الشهر sampling date (day/month)				/	/	/	/	/	/	/	/	/	/	/	/	/	الأدنى min.	الأقصى max.	المعدل السنوي av.
	وقت الاعتيان: (ساعة/ دقائق) sampling time(hh:mm)				:	:	:	:	:	:	:	:	:	:	:	:	:			
	المادة Item	**الطريقة Analysis Method**	**الوحدة Unit**	**Quantitation**																
	الطقس weather	يدوي manual	المرجع في الأسفل ref. below																	
	درجة حرارة الهواء Air Temp.	يدوي manual	°C															0.0	0.0	#DIV/0!
	درجة حرارة المياه Water Temperature	يدوي manual	°C															0.0	0.0	#DIV/0!
	عرض المياه water width	يدوي manual	m															0.0	0.0	#DIV/0!
	عمق المياه في نقطة الاعتيان water depth	يدوي manual	m															0.0	0.0	#DIV/0!
	نسبة الجريان flow rate	يدوي manual	m/s															0.0	0.0	#DIV/0!
	الرائحة odor	يدوي manual	-																	
Metal Analysis	Ag	Pretreat(HNO3)-AAS	mg/l	0.002														0.0	0.0	#DIV/0!
	Al	Pretreat(HNO3)-AAS	mg/l	0.005														0.00	0.00	#DIV/0!
	As	Hydride Vapor-AAS	mg/l															0.0	0.0	#DIV/0!
	Ba	Pretreat(HNO3)-AAS	mg/l	0.5														0.0	0.0	#DIV/0!
	Cd	Pretreat(HNO3)-AAS	mg/l	0.0001														0.0	0.0	#DIV/0!
	Cr	Pretreat(HNO3)-AAS	mg/l	0.001														0.00	0.00	#DIV/0!
	Cu	Pretreat(HNO3)-AAS	mg/l	0.5														0.0	0.0	#DIV/0!
	Fe	Pretreat(HNO3)-AAS	mg/l	0.25														0.0	0.0	#DIV/0!
	Hg	Reduction Vapor-AAS	mg/l	0.0005														0.0	0.0	#DIV/0!
	Mn	Pretreat(HNO3)-AAS	mg/l	0.0005														0.00	0.00	#DIV/0!
	Ni	Pretreat(HNO3)-AAS	mg/l	0.002														0.0	0.0	#DIV/0!
	Pb	Pretreat(HNO3)-AAS	mg/l	0.005														0.0	0.0	#DIV/0!
	Sb	Pretreat(HNO3)-AAS	mg/l	0.005														0.0	0.0	#DIV/0!
	Zn	Pretreat(HNO3)-AAS	mg/l	0.1														0.00	0.00	#DIV/0!

المرجع: صف حالة الجو خلال فترة الاعتيان وعند نقطة الاعتيان مشيرا إلى التالي:
صحو/مشمس: ◎، غائم: ○، ماطر (خفيف): △، ماطر (بشدة): ▲

Reference: Describe the weather on sampling time at a sampling point refering to the following marks;
clear/sunny: ◎, overcast: ○, rain (gentle): △, rain (heavy): ▲

اسم الشخص المسؤول عن إدارة البيانات
Name of Person in charge of Data Management

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10. Questions and Discussion

شكراً جزيلاً

Lecture Training
For
Chemical & Biological Water Quality 1,2
Data management

2007 July

Takahashi Keiichi
The JICA Expert Team

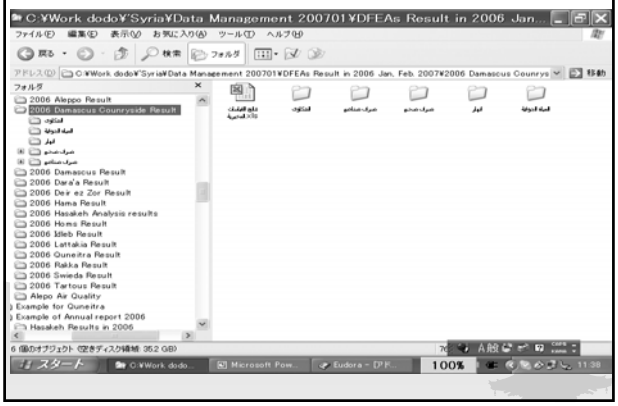
1.Same File Naming Rule and Same File as Basic water Quality

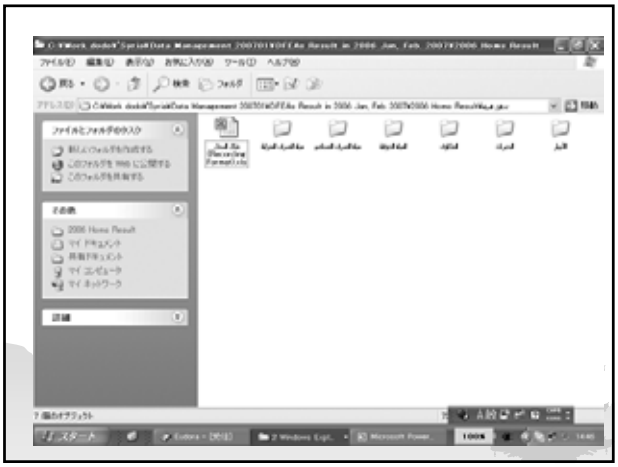
- ○○○-△-# # #

  ○○○: Name of Governorate in 3 Character
  △:Type of Sample Water (water body)
  ### :Station Number (Sequential Number)

- Example: DAM-I-003
  ALP-R-005

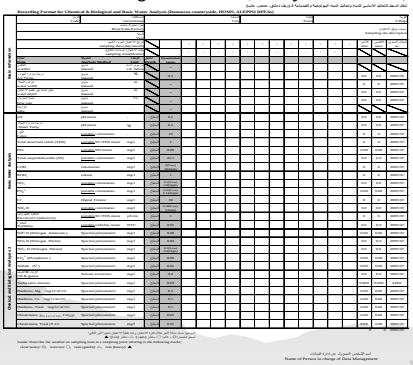
2.Same Data Folder as Basic water quality in PC



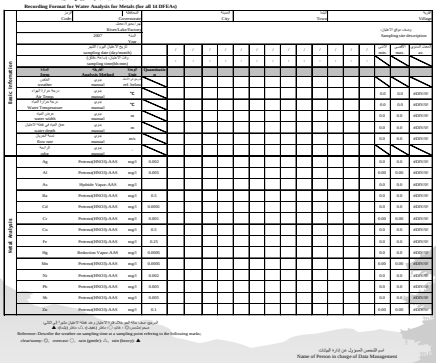


3. New Recording Format

1) Chemical and Biological water Quality Analisis-2 *(DAC,ALP,HOM)*

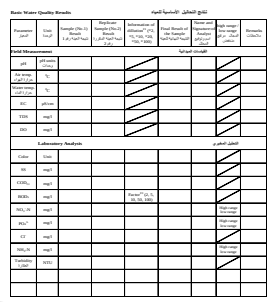


2) Water Quality (Metal) Analysis by AAS



4. New Analysis Record at Labo.

1) Basic water Quality Analysis



Basic Water Quality Results — نتائج التحليل الأساسية للمياه

Parameter المعيار	Unit الوحدة	Sample (No.1) Result نتيجة العينة رقم 1	Replicate Sample (No.2) Result نتيجة العينة رقم 2	Information of dilution* (*2, *5, *10, *20, *50, *100)	Final Result of the Sample النتيجة النهائية للعينة	Name and Signature of Analyst اسم ورقم المحلل	High range low range ارتفاع منخفض	Remarks ملاحظات
Field Measurement								
pH	pH unit							
Air temp. درجة الهواء	°C							
Water temp. درجة الماء	°C							
Water velocity (cm/s) السرعة	°C							
EC	μS/cm							
TDS	mg/l							
DO	mg/l							
Laboratory Analysis								
Color	Unit							
SS	mg/l							
CO_3^{2-}	mg/l							
HCO_3^-	mg/l							
NO_3 -N	mg/l			Dilution(*2, *5, *10, *20)			High range low range	
PO_4^{3-}	mg/l						High range low range	
Cl	mg/l							
NH_3-N	mg/l						High range low range	
Turbidity الكدرة	NTU_s							

Name of Sampling station اسم محطة الأخذ: _____ Type of Waterbody نوع مصدر المياه: _____ Date of Analysis التاريخ: / / _____

Signature of Laboratory Chief _____ توقيع رئيس المختبر _____

Note(#1- Put a number of dilution ratio: إكتب رقم من أرقام نسبة التخفيف
#2-Circle the correct temperature range: ضع دائرة حول درجة الحرارة الصحيحة
#3-Circle a number of below you choose: ضع دائرة حول أحد الخيارات التالية

2) Chemical and Biological water Quality Analisis-2 (DAC,ALP,HOM)

Chemical & Biological Water Quality Results 2 (Damascus Countryside, Homs, Aleppo)

نتائج نوعية المياه الكيميائية والبيولوجية (ريف دمشق، حمص، حلب)

Parameter المعيار	Unit الوحدة	Sample (No.1) Result نتيجة العينة رقم 1	Replicate Sample (No.2) Result نتيجة العينة رقم 2	Information of dilution* (*2, *5, *10, *20, *50, *100)	Final Result of the Sample النتيجة النهائية للعينة	Name and Signature of Analyst اسم ورقم المحلل	Remarks ملاحظات
Field Measurement							
Air temp. درجة الهواء	°C						
Water temp. درجة الماء	°C						
Laboratory Analysis							
NH_3-N	mg/l						
NO_2-N	mg/l						
NO_3-N	mg/l						
PO_4^{3-}	mg/l						
Sulfide (S^{2-})	mg/l						
Oil & grease	mg/l						
Surfactants Anionic	mg/l						
Hardness, Mg (mg/LCaCO3)	mg/l						
Hardness, Ca (mg/LCaCO3)	mg/l						
Hardness, Total (mg/LCaCO3)	mg/l						
Chromium, Hexavalent $Cr(VI)$	mg/l						
Chromium, Total (T-Cr)	mg/l						

Name of Sampling station اسم محطة الأخذ: _____ Type of Waterbody نوع مصدر المياه: _____ Date of Analysis التاريخ: / / _____

Signature of Laboratory Chief _____ توقيع رئيس المختبر _____

Note(#1- Put a number of dilution ratio: إكتب رقم من أرقام نسبة التخفيف

5. EDL and Recording Digit

EDL and Recording Digit for Chemical & Biological Water Analysis 2 (for Damascus Countryside, Homa and Aleppo) July 2007

No.	Parameter	Instrument	Unit	Measuring Range		EDL (Estimated Detection Limit)	Description in Recording <EDL	Description in Recording >EDL	Type of Digit (Decimal or Period)
1	Cr^{6+}	Spectrophotometer	mg/l	not diluted	0 to 0.70	0.01 mg/L Cr^{6+}	<0.01	0.01, 0.02, …, 0.68, 0.69, 0.70	#.##
2	T-Cr	Spectrophotometer	mg/l	not diluted	0 to 0.70	0.01 mg/L Cr	<0.01	0.01, 0.02, …, 0.68, 0.69, 0.70	#.##
3	Mg Hardness	Spectrophotometer	mg/l	not diluted	0 to 4.0 mg/L	0.1 mg/L $CaCO_3$	<0.1	0.1, 0.2, 0.3, …, 3.8, 3.9, 4.0	#.#
				diluted(×20)	2 to 80 mg/L	-	-	2, 3,4,5 6,7, 8 , ……, 78,79, 80	##~##
				diluted(×50)	5 to 200 mg/L	-	-	10,11,12,13,14, ……,198,199,200	###~###
				diluted(×100)	10 to 400 mg/L	-	-	101,102,103, ……,397,398,399,400	###~###
4	Ca Hardness	Spectrophotometer	mg/l	not diluted	0 to 4.0 mg/L	0.1 mg/L $CaCO_3$	<0.1	0.1, 0.2, 0.3, …, 3.8, 3.9, 4.0	#.#
				diluted(×20)	2 to 80 mg/L	-	-	2, 3,4,5 6,7, 8 , ……, 78,79, 80	##~##
				diluted(×50)	5 to 200 mg/L	-	-	10,11,12,13,14, ……,198,199,200	###~###
				diluted(×100)	10 to 400 mg/L	-	-	101,102,103, ……,397,398,399,400	###~###
5	Total Hardness	Spectrophotometer	mg/l	not diluted	0 to 4.0 mg/L	0.1 mg/L $CaCO_3$	<0.1	0.1, 0.2, 0.3, …, 3.8, 3.9, 4.0	#.#
				diluted(×20)	2 to 80 mg/L	-	-	2, 3,4,5 6,7, 8 , ……, 78,79, 80	##~##
				diluted(×50)	5 to 200 mg/L	-	-	10,11,12,13,14, ……,198,199,200	###~###
				diluted(×100)	10 to 400 mg/L	-	-	101,102,103, ……,397,398,399,400	###~###
6	NO_3 - N	Spectrophotometer	mg/l	Middle	0 to 5.0 mg/L	0.2 mg/L NO_3-N	<0.2	0.2, 0.3, …, 4.8, 4.9, 5.0	#.#
				High	0 to 30 mg/L	0.8 mg/L NO_3-N	<0.8	0.8, 0.9, 1.0 ……, 29, 30	##.#~##
				diluted(×10)	20 to 300 mg/L	-	-	20, 21, 22 ……,280, 290, 300	###
7	NO_2 - N	Spectrophotometer	mg/l	not diluted	0 to 0.30 mg/L	0.02 mg/L NO_2-N	<0.02	0.02, 0.03, ……,0.29, 0.30	#.##
				diluted(×10)	0.2 to 3.0 mg/L	-	-	0.3, 0.4, …,2.8, 2.9, 3.0	#.#
8	NH_3-N	Spectrophotometer	mg/l	not diluted	0 to 2.50 mg/L	0.08 mg/L NH_3-N	<0.08	0.08, 0.09, …,2.49, 2.50	#.##
				diluted(×10)	2.5 to 25 mg/L	-	-	2.5, 2.6,2.7…,24.8, 24.9, 25.0	#.#~##.#
				diluted(×100)	25 to 250 mg/L	-	-	25, 26,27…,248, 249,250	##~###
9	PO_4^{3-}	Spectrophotometer	mg/l	not diluted	0 to 2.50 mg/L	0.05 mg/L PO_4^{3-}	<0.05	0.05, 0.06, ……,2.49, 2.50	#.##
				diluted(×10)	2.5 to 25 mg/L	-	-	2.5, 2.6,2.7…24.8, 24.9, 25.0	#.#~##.#
				diluted(×100)	25 to 250 mg/L	-	-	25, 26,27…,248, 249,250	##~###
10	Sulfide (S^{2-})	Spectrophotometer	mg/l	not diluted	0 to 0.80 mg/L	0.01 mg/L PO_4^{3-}	<0.01	0.01, 0.02, ……,0.79, 0.80	#.##
				diluted(×10)	0.8 to 8.0 mg/L	-	-	0.8, 0.9, …,7.7 7.8, 8.0	#.#
11	Detergents, Anionic (Surfactants)	Spectrophotometer	mg/l	not diluted	0 to 0.275 mg/L	0.03 mg/L LAS	<0.03	0.003,0.004, …,0.274, 0.275	#.###
12	Oil & Grease	Oil Content Analyzer	mg/l	not diluted	0 to 200 mg/L	0.2 mg/L	<0.2	0.2, 0.3, ……,200	#.#~###
				diluted(×10)	200 to 2,000 mg/L	-	-	200,201, 202,…, 1,999, 2,000	###~####

6. O &M record of Reagents and Consumables (C&B2)

Please confirm one year consumption

Operation and Maintenance (O/M) Record of Reagents in Damascus Countryside, Homs and Aleppo DIWAs (Maker of reagents: HACH; Supplier: MIMOSA)

سجل استخدام ومخلفات المواد الكيميائية في مكاتب المياه في ريف دمشق و حمص و حلب

	Name of Reagent اسم الكاشف	Usage الوحدة	Unit الوحدة	Number العدد	Purchased Date تاريخ الشراء	Expiration date تاريخ انتهاء الصلاحية	Existence of Fumitis وجود عوث (نعم)	Order No.	Stored un. to the end of Mar. الكمية المخزنة حتى نهاية آذار	Stored un. in the end of Jun. الكمية المخزنة حتى نهاية حزيران	Stored un. in the end of Sep. الكمية المخزنة حتى نهاية أيلول	Stored un. in the end of Dec. الكمية المخزنة حتى نهاية كانون الأول	One Year Consumption الاستهلاك خلال العام	Remarks (remember's amount) ملاحظات (تذكير بالمبلغ المرصد)
1	Chromo Ver 3 Chromium Reagent Powder Pillows (for 5 Test, sample)	Cr	100pkg	2	2007 Jun.		Yes	22743-99						
2	Chromium, Hexavalent, Standards Solution, 50 mg/L Cr^{6+}	Cr^{6+}	500ml	1	2007 Jun.		Yes (Cr)	10A-639						
3	Chromium, Hexavalent, Standards Solution, 12.5 mg/L Cr^{6+} (Cont. Volume Sample)	Cr^{6+}	100pkg	1	2007 Jun.		Yes (Cr)	14250-10						
4	Chromate 1 Reagent Powder Pillows	Cr-1	100/pkg	2	2007 Jun.		Yes	21132-69						
5	Chromate 2 Reagent Powder Pillows	Cr-2	100/pkg	2	2007 Jun.		Yes	2610-99						
6	Chromium, Hexavalent Reagent Powder Pillows (for 10 Test, sample)	Cr-3	100/pkg	2	2007 Jun.		Yes	21066-99						
7	Acid Reagent Powder Pillows	Cr-3	100/pkg	2	2007 Jun.		Yes	2126-99						
8	Chromium, Hexavalent, Standards Solution, 50 mg/L Cr^{6+}	Cr^{6+}	500 ml	1	2007 Jun.		Yes (Cr)	14151-41						
9	Chromium, Hexavalent, Standards Solution, 12.5 mg/L Cr^{6+} (Cont. Volume Sample)	Cr^{6+}	100/pkg	1	2007 Jun.		Yes (Cr)	14197-10						
10	Sulfide Indicator Solution	Sulfide	100ml	1	2007 Jun.		Yes	2426-49						
11	Acid Stabilizer for Cadmium and Hydrazine Test	Sulfide	500 ml	1	2007 Jun.		Yes	22267-49						
12	EDTA Solution, 1N	Sulfide	50 ml	1	2007 Jun.		Yes	2426-20						
13	EDTA Solution	Sulfide	50 ml	1	2007 Jun.		Yes	21297-20						
14	Calcined Diatomite Standard Solution, 50 mg/L as $CaCO_3$	Sulfide	500 ml				Yes	22677-35						
15	Magnesium Standard Solution, 1000 mg/L as Mg	Sulfide	500 ml				Yes	14792-49						
16	Nitra Ver 3 Nitrate Reagent Powder Pillows (for 10 ml, sample)	NO_3 -N	100	2	2007 Jun.		Yes (Cr)	21061-69						
17	Nitrate Nitrogen Standard Solution, 100 mg/L NO_3 -N	NO_3 -N	500 ml				Yes	1947-49						
18	Nitra Ver 5 Nitrate Reagent Powder Pillows	NO_3 -N	100/pkg	1	2007 Jun.		Yes (Cr)	21071-69						
19	Nitrite Nitro. ACS	NO_2 -N	50 g	1	2007 Jun.		Yes	2631-01						
20	Ethanol Sulphite	SO_4 -N	50 ml	2	2007 Jun.		Yes	22702-29						
21	Isopropyl Alcohol Dispersing Agent	SO_4 -N	50 ml	2	2007 Jun.		Yes	22703-29						
22	Sulfa Ver 4 Sulfate	SO_4 -N	100/vel	2	2007 Jun.		Yes (Mg)	21702-99						
23	Nitrogen, Ammonia Solution, 1 mg/L NH_3 -N	NH_3 -N	500ml	1	2007 Jun.		Yes	2631-49						
24	Nitrogen, Ammonia Solution, 7.5 mg/L NH_4Cl (10 mL Volumetric Ampules)	NH_3 -N	100/pkg	1	2007 Jun.		Yes	24081-49						
25	Phos Ver 3 Phosphate Reagent Powder Pillows (for 10 mL sample)	PO_4^{3-}	100/pkg	2	2007 Jun.		Yes	21060-69						
26	Phosphate standard Solution, 7.5 mg/L as PO_4^{3-} (10 mL Volumetric Ampules)	Check PO_4^{3-}	100/vel	1	2007 Jun.		Yes	1171-10						
27	Sulfide 1 Reagent	Check	100/vel	2	2007 Jun.		Yes	2456-53						
28	Sulfide 2 Reagent	Check	100/vel	2	2007 Jun.		Yes	2456-53						
29	Kiffe Silicon, sulfite-free	Detergents, Anionic (Surfactants)	500 ml	1	2007 Jun.		Yes	2632-49						
30	Detergent Reagent Powder Pillows	Detergents, Anionic (Surfactants)	100/pkg	1	2007 Jun.		Yes	2608-68						
31	Benzo., ACS	Detergents, Anionic (Surfactants)	1 L	1	2007 Jun.		Yes (Benzen)	14440-17						
32	Detergent standard Solution, 50 mg/L LAS (10 mL Volume Ampules)	Detergents, Anionic (Surfactants)	10/pkg	1	2007 Jun.		Yes	2211-20						
33	Solvent 30 (Hex)	Oil and Grease	1	1	2007 Jun.		Yes	2632-32						
34	n-hexane	Oil and Grease	4 L	1	2007 Jun.		Yes	22648-17						
35	Activated Charcoal	Oil and Grease	100/pkg	1	2007 Jun.		Yes	14301-99						
36	Activated Aluminosilicate (Al_2O_3)	Oil and Grease	500 mL	1	2007 Jun.		Yes	1562-49						

6. Computer Virus

1) Keep using antivirus software (Norton Antivirus)

2) Cause of virus may be flash memory

3) Keep Minimum use of flash memory

4) It is important to update of protection file periodically

5) Please prepare the budget for update right after Sep. 2007 (about S.P 1,500)

7. Questions and Discussion

شكراً
جزيلاً

Lecture Training
For
Basic Water Quality Analysis
Data management

2007 July

Takahashi Keiichi
The JICA Expert Team

1.New File Naming Rule and Same File

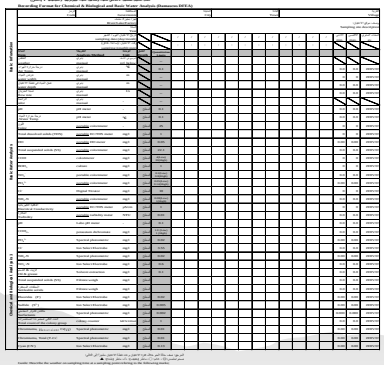
- □□-○○○-△-# # #
  □□：year
  ○○○: Name of Governorate in 3 Character
  △:Type of Sample Water (water body)
  ### :Station Number (Sequential Number)

- Example: 07-RAK-I-006
  07-RAK-R-003

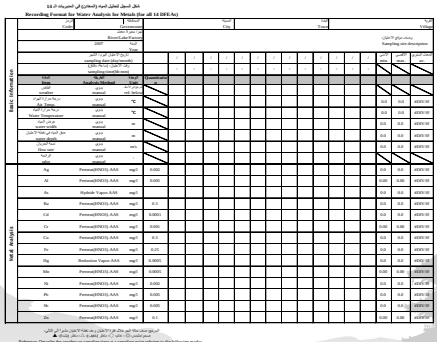
2.Same Data Folder in PC

3. New Recording Format

1) Basic and Chemical & Biological and Metal water Quality

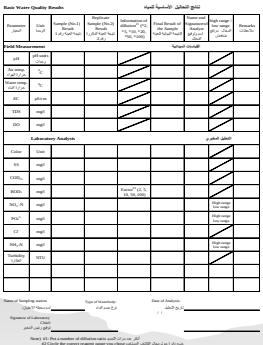


2) Water Quality (Metal) Analysis by AAS



4. New Analysis Record at Labo.

1) Basic water Quality Analysis



5. O &M record of Reagents and Consumables

Please confirm one year consumption

Operation and Maintenance (O/M) Record of Reagents in Damascus Countryside, Homs and Aleppo DFFAs (Maker of reagents: HACH; Supplier: MIMOSA)

سجل استخدام و حفظ الكواشف في مديريات البيئة في ريف دمشق و حمص و حلب

No.	Name of Reagent	Usage	Unit	Number	Purchased Date	Duplication date	Existence of Turn-in	Order No.	Stored no. in the end of Mar.	Stored no. in the end of Jun.	Stored no. in the end of Sep.	Stored no. in the end of Dec.	One Year's Consumption	Remarks (reason/who's name)
	ASSP no#	Vertilize	Unit		تاريخ الشراء	تاريخ انتهاء الصلاحية	Mrs Ger Abu		كمية المواد في نهاية آذار	كمية المواد في نهاية حزيران	كمية المواد في نهاية أيلول	كمية المواد في نهاية كانون الأول	كمية الاستهلاك لمدة سنة (Out-Put)	ملاحظات (من المسئول عن الإدارة)
1	Mercury Vio 3 Chromium Reagent Powder Pillows (for 0 - 10 mL sample)	Cr	100/pkg	2	2007 Jun.		No	8167-69						
2	Chromium, Hexavalent, Standards Solution, 10 mg/L Cr	Cr	500 ml	1	2007 Jun.		Yes (Cr)	8167-49						
3	Chromium, Hexavalent, Standards Solution, 15.5 mg/L Cr (Cr6 std. Solution Ampule)	Cr	20/pkg	1	2007 Jun.		Yes (Cr)	14250-10						
4	Chromium 1 Reagent Powder Pillows	Cr (1)	100/pkg	2	2007 Jun.		No	8028-68						
5	Chromium 2 Reagent Powder Pillows	Cr (2)	100/pkg	2	2007 Jun.		No	8029-68						
6	Mercury Vio 3 Chromium Reagent Powder Pillows (for 0 - 10 mL sample)	Cr (6)	100/pkg	2	2007 Jun.		No	12966-99						
7	Cyan Reagent Powder Pillows	Cyan	100/pkg	2	2007 Jun.		No	2126-99						
8	Chromium, Hexavalent, Standards Solution, 50 mg/L Cr	Cr (6)	100 ml	1	2007 Jun.		Yes (Cr)	14151-42						
9	Chromium, Hexavalent, Standards Solution, 15.5 mg/L Cr (Cr6 std. Solution Ampule)	Cr (6)	20/pkg	1	2007 Jun.		Yes (Cr)	14257-10						
10	Cyanide Standard Solution, 1000 mg/L CN	Cyanide	500 ml	1	2007 Jun.		No	2126-49						
11	Alkali Iodide for Cyanide and Ammonia Test	Cyanide	500 ml	1	2007 Jun.		No	8028-49						
12	EDTA Solution, 1M	Cyanide	50 ml	1	2007 Jun.		No	2419-26						
13	EDTA Solution	Cyanide	50 ml	1	2007 Jun.		No	2419-26						
14	Calcium Chloride Standard Solution, 10 mg/L as CaCO3	Hardness	500 ml	1	2007 Jun.		No	14127-49						
15	Magnesium Standard Solution, 1000 mg/L Mg	Hardness	500 ml	1	2007 Jun.		No	14779-49						
16	Nitra Ver 5 Nitrate Reagent Powder Pillows (for 10 mL sample)	NO_3-N	100/pkg	2	2007 Jun.		Yes (Cd)	21061-69						
17	Nitrate Nitrogen Standard Solution, 100 mg/L NO_3-N	NO_3-N	500 ml	1	2007 Jun.		No	3167-49						
18	Nitri Ver 3 Nitrite Reagent Powder Pillows	NO_2-N	100/pkg	1	2007 Jun.		Yes (Cd)	21077-69						
19	Sodium Nitrite, ACS	NO_2-N	25 G	1	2007 Jun.		No	2810-01						
20	Nitrate Standard	NO_3-N	500 ml	2	2007 Jun.		No	27810-49						
21	Nitrogen, Ammonia Reagent Set	NH_3-N	50 set	2	2007 Jun.		No	27670-45						
22	Nessler Reagent	NH_3-N	500 ml	2	2007 Jun.		Yes (Hg)	2170-53						
23	Nitrogen, Ammonia Solution, 1 mg/L NH_3-N	NH_3-N	500 ml	2	2007 Jun.		No	2105-49						
24	Nitrogen, Ammonia Solution, 75 mg/L NH_3-N (10 mL Voluette Ampule)	NH_3-N	20/pkg	1	2007 Jun.		No	14305-10						
25	Nitra Ver 4 Phosphate Reagent Powder Pillows (for 10 - 50 mL sample)	PO_4	100/pkg	2	2007 Jun.		No	21060-69						
26	Phosphate standard Solution, 75 mg/L as PO_4, 250 mL	Acid, PO_4	500 ml	1	2007 Jun.		No	8171-49						
27	Sulfide, Powder	Sulfide	100 ml	4	2007 Jun.		No	28191-26						
28	Sulfide, Powder	Sulfide	100 ml	4	2007 Jun.		No	28191-26						
29	Sulfer Solution, sulfide -Xyet	Detergents, Anionic (Surfactants)	500 ml	1	2007 Jun.		NO	436-01-49						
30	Detergent Reagent Powder Pillows	Detergents, Anionic (Surfactants)	100/pkg	1	2007 Jun.		No	1088-68						
31	Benzoic, ACS	Detergents, Anionic (Surfactants)	25 L	1	2007 Jun.		Yes (Benzene)	1444-07						
32	Detergent standard Solution, 105 mg/L LAS (10 mL Voluette Ampule)	Detergents, Anionic (Surfactants)	20/pkg	1	2007 Jun.		No	2211-20						
33	Iodine Cl- Test	Cl and Corrosi	Kit	1	2007 Jun.		No	2132-20						
34	Acetic acid	Cl and Corrosi	10 ml	1	2007 Jun.		No	2560-10						
35	Activated Charcoal	Cl and Corrosi	100/pkg	1	2007 Jun.		No	2302-99						
36	Calcium Carbonate(as CaCO3)	Cl and Corrosi	500 ml	1	2007 Jun.		No	2541-49						

6. *Computer Virus*

1) Keep using antivirus software (Norton Antivirus)

2) Cause of virus may be flash memory

3) Keep Minimum use of flash memory

4) It is important to update of protection file periodically

5) Please prepare the budget for update right after Sep. 2007 (about S.P 1,500)

7. Questions and Discussion

شكراً جزيلاً

EDL and Recording Digit for Basic Water Analysis (for all 14 DFEAs) rev.

							Description in Recording		
No.	Parameter	Instrument	Unit	Measuring Range		EDL Estimated Detection Limit	<EDL	>EDL	Type of Digit (Attention to Period)
1	pH	pH meter	-		0 to 14	-	-	0, 0.1, 0.2, …13.9, 14	#.#
2	درجة الحرارة Water temp.	pH meter	℃		-10.0 to 110.0	-	-	-10.0,-9.9,…, 109.9, 110.0	##.#
3	اللون Color	portable colorimeter	-	not diluted	0 to 500 units	25	<25	25, 26, …., 500	###
				diluted(×20)	500 to 10,000	-	-	500, 520,540,…10,000	###0
4	Total dissolved solids (TDS)	portable EC/TDS meter	mg/l	Low	0 to 2000 mg/L	1	-	1, 2, …., 2000	###
				High(g/L)	2000 to 50,000 mg/L	-	-	2000, 3000,4000,…50,000	#000
5	DO	portable DO meter	mg/l		0 to (10.5)	0.05	<0.05	0.06, 0.07… ,9.50,…	#.##
6	Total suspended solids (SS)	portable colorimeter	mg/l	not diluted	0 to 750 mg/L	22.1 mg/L	<22	22, 23, ….., 750	###
				diluted(×20)	760 to 15,000 mg/L	-	-	760, 780, …,15,000	###0
7	COD	colorimeter	mg/l	Low	0 to 150 mg/L	4 mg/L COD	<4	4, 5,……..150	##
				High	0 to 1,500 mg/L	30 mg/L COD	<30	30, 31, 32,…..1,500	###
				diluted(×20)	1,500 to 30,000mg/L	-	-	1520, 1540, ….,30,000	####0
8	BOD_5	culture	mg/l	not diluted	1 to 4,000 mg/L	1	<1	1, 2, 3, 4,…….4,000	## or #5 or #00
				diluted(×10)	4,000 to 40,000mg/L	-	-	4,000, 4,010,….40,000	####0
9	NO_3^-	portable colorimeter	mg/l	Low	0 to 5.0 mg/L	0.2 mg/L NO_3^--N	<0.2	0.2, 0.3, …..,5.0	#.#
				High	0 to 30 mg/L	0.8 mg/L NO_3^--N	<0.8	0.8, 0.9, 1.0 …29, 30	##.# / ##
				diluted(×10)	30 to 300 mg/L	-		30, 31, 31 …..,300	###
10	PO_4^{3-}	portable colorimeter	mg/l	Low	0 to 2.50 mg/L	0.05 mg/L PO_4^{3-}	<0.05	0.05, 0.06, …., 2.50	#.##
				High	0 to 30.0 mg/L	0.14 mg/L PO_4^{3-}	<0.14	0.14, 0.15,……, 30.0	##.## / ##.#
				diluted(×10)	30.0 to 300 mg/L	-	-	30.0, 31.0, …., 300	###
11	Cl^-	Digital Titrator	mg/l		10 to 10.000 mg/L	10 mg/L Cl^-	<10	10, 11, ….., 10,000	###
12	NH_3-N	portable colorimeter	mg/l	Low	0 to 2.50 mg/L	0.08 mg/L NH_3-N	<0.08	0.08, 0.09, ….., 2.50	#.##
				High	0 to 50 mg/L	1 mg/L NH_3-N	<1	1,2,3, 50	##
				diluted(×10)	50 to 500 mg/L	-	-	50, 60, 70 …., 500	##0
13	الناقلية الكهربائية Electrical Conductivity	portable EC/TDS meter	µS/cm		1 to 199,900 µS/cm	1µS/cm	<1	1, 2, …., 199,900	####
14	العكارة	portable turbidity meter	NTU	Low	0.00 to 9.99	0.01 NTU	-	0.01, 0.02, …,9.99	#.##
				Midium	10.0 to 99.9	0.1 NTU	-	0.1, 0.2, ….99.9	##.#
				High	100 to1000	1 NTU	-	100, 101, 1000	###
	Turbidity			diluted(×10)	1,000 to10,000	10 NTU	-	1000, 1010, , 10,000	###0

Effective digit after multiplication of BOD Factor

Result	Factor 2	Factor 5	Factor 10	Factor 20	Factor 50	Factor 100
	×2	×5	×10	×20	×50	×100
1	2	5	10	20	50	100
2	4	10	20	40	100	200
3	6	15	30	60	150	300
4	8	20	40	80	200	400
5	10	25	50	100	250	500
6	12	30	60	120	300	600
7	14	35	70	140	350	700
8	16	40	80	160	400	800
9	18	45	90	180	450	900
10	20	50	100	200	500	1000
11	22	55	110	220	550	1100
12	24	60	120	240	600	1200
13	26	65	130	260	650	1300
14	28	70	140	280	700	1400
15	30	75	150	300	750	1500
16	32	80	160	320	800	1600
17	34	85	170	340	850	1700
18	36	90	180	360	900	1800
19	38	95	190	380	950	1900
20	40	100	200	400	1000	2000
21	42	105	210	420	1050	2100
22	44	110	220	440	1100	2200
23	46	115	230	460	1150	2300
24	48	120	240	480	1200	2400
25	50	125	250	500	1250	2500
26	52	130	260	520	1300	2600
27	54	135	270	540	1350	2700
28	56	140	280	560	1400	2800
29	58	145	290	580	1450	2900
30	60	150	300	600	1500	3000
31	62	155	310	620	1550	3100
32	64	160	320	640	1600	3200
33	66	165	330	660	1650	3300
34	68	170	340	680	1700	3400
35	70	175	350	700	1750	3500
36	72	180	360	720	1800	3600
37	74	185	370	740	1850	3700
38	76	190	380	760	1900	3800
39	78	195	390	780	1950	3900
40	80	200	400	800	2000	4000
41	82	205	410	820	2050	4100
42	84	210	420	840	2100	4200
43	86	215	430	860	2150	4300
44	88	220	440	880	2200	4400
45	90	225	450	900	2250	4500
46	92	230	460	920	2300	4600
47	94	235	470	940	2350	4700
48	96	240	480	960	2400	4800
49	98	245	490	980	2450	4900

Example of Dilution (BOD)

10 times Dilution gives you the results such as,

410, 420, 430, 440, ……..., 4000

410×10=4,100

420×10=4,200

430×10=4,300

4000×10=40,000

5 times Dilution gives you the results such as,

820, 840, 860, 880, ……..., 4000

820×5=4,100

840×5=4,200

860×5=4,300

4000×5=20,000

Parameter	Instrument	Unit	Measuring Range		EDL	<EDL	>EDL	Type of Digit
BOD_5	culture	mg/l	not diluted	1 to 4,000 mg/L	1	<1	1, 2, …….4,000	## or #5 or #00
			diluted(×10)	4,000 to 40,000mg/L	-	-	4,100, 4,200,….40,000	##00
			diluted(×5)	4,000 to 20,000mg/L	-	-	4,100, 4,200,….20,000	##00

Example of Dilution (NO_3^-)

10 times Dilution gives you the results such as,

3.0, 3.1, 3.2, 3.3, ……., 30.0.

3.1×10=31

3.2×10=32

29.9×10=299

30.0×10=300

5 times Dilution gives you the results such as,

6.0, 6.1, 6.2, 6.3, ……., 30.0.

6.1×5=30.5

6.2×5=31.0

29.9×5=149.5

30.0×5=150.0

Parameter	Instrument	Unit	Measuring Range		EDL	<EDL	>EDL	Type of Digit
NO_3^-	portable colorimeter _	mg/l	Low	0 to 5.0 mg/L	0.2 mg/L NO_3^--N	<0.2	0.2, 0.3, ….., 4.9,5.0	#.#
			High	0 to 30.0 mg/L	0.8 mg/L NO_3^--N	<0.8	0.8, 0.9, …29.9, 30.0	##.#
			diluted(×10)	30 to 300 mg/L	-	-	31, 32, 33 .., 299,300	###
			diluted(×5)	30 to 150 mg/L	-	-	30.5, 31.0, 31.5 .., 149.5,150.0	###.5 or ###.0

Table 1 Operation and Maintenance (O/M) Record of Equipment in_____DFEA

الجدول -1- سجل تشغيل و صيانة التجهيزات لمديرية

2006/1/13

Name of Equipment		Usage	Number	Maker	Supplier	Purchased Date	Trouble Contents and Date	Repair Record (constants and date)	Remarks (recorder's name etc.)
اسم الجهاز :		استخدامه :	العدد	المصنع	المورّد	تاريخ الشراء	نوع المشكلة و تاريخها	سجل التصليح (التفاصيل و التاريخ)	ملاحظات (اسم المسجّل ..الخ)
1	Portable Colorimeter Kit (CEL/890)	SS, Color, NO_3^--N, PO_4^{3-}, NH_3-N,	1	HACH	MIMOSA	2005 Jun.	1)	1)	
2	Portable pH and Temp. Meter (sensION 1)	pH, Temp.	1	HACH	MIMOSA	2005 Jun.	1)	1)	
3	Portable EC and TDS Meter (sensION 5)	EC, TDS	1	HACH	MIMOSA	2005 Jun.	1)	1)	
4	Portable DO Meter (sensION 6)	DO	1	HACH	MIMOSA	2005 Jun.	1)	1)	
5	Portable Turbidity Meter (2100P)	Turbidity	1	HACH	MIMOSA	2005 Jun.	1)	1)	
6	COD Reactor (DRB 200-1)	COD_{Cr}	1	HACH	MIMOSA	2005 Jun.	1) Temperature can not reach 150 ^{0}C. (10th Dec. 2005) 2)	1) The reactor was sent to MIMOSA on 28th Dec. 2005., and heating system was changed. On 24 th Jan. 2006, DFEA receives the reparired reactor. 2)	Mr. …….
7	Digital Titrator (16900)	Cl^-	1	HACH	MIMOSA	2005 Jun.	1)	1)	
8	Stirring platform for BOD Analysis (OxiTop IS12)	BOD	2	WTW	MIMOSA	2005 Jun.	1)	1)	
9	BOD bottle with OxiTop measuring head	BOD	24	WTW	MIMOSA	2005 Jun.	1)	1)	
10	Incubator (TS 606/2i)	BOD	1	WTW	MIMOSA	2005 Jun.	1)	1)	
11	Analytical Balance (CP324S)	Reagents preparation	1	Sartorius	MIMOSA	2005 Jun.	1)	1)	
12	Table for Balance (YWT03)	For balance	1	Sartorius	MIMOSA	2005 Jun.	1)	1)	
13	Pure Water Unit (2001/4)	All of Parameters	1	GFL	MIMOSA	2005 Jun.	1)	1)	
14	Desktop Computer (for 14 DFEAs)	Data Analysis and Reporting etc.	1	Mall Tech	CMAX	2005 Jun.	1)	1)	
15	Printer	Reporting etc.	1	Hewlett-Packard	CMAX	2005 Jun.	1)	1)	
16	Digital Camera	Sampling Record and Reporting	1	Kodak CX7330	CMAX	2005 Jun.	1)	1)	

Table 2 Operation and Maintenance (O/M) Record of Reagents in_____DFEA (Maker of reagents: HACH; Supplier: MIMOSA)

الجدول -2- سجل استخدام وحفظ الكواشف في مديرية

2006/6/17

	Name of Reagent اسم الكاشف	Usage استخدامه	Unit الوحدة	Number العدد	Purchased Date تاريخ الشراء	Expiration date تاريخ انتهاء الصلاحية	Existence of Toxicity وجود مواد سامة	Order No.	Stored no. in the end of Mar. الكمية المتبقية حتى نهاية شهر آذار	Stored no. in the end of Jun. الكمية المتبقية حتى نهاية شهر حزيران	Stored no. in the end of Sep. لكمية المتبقية حتى نهاية شهر أيلول	Stored no. in the end of Dec. الكمية المتبقية حتى نهاية شهر كانون الأول	Remarks (recorder's name) ملاحظات (اسم المسجّل ... الخ)
1	pH standards, pH 4.01	pH calibration	500 ml	2	2005 Jun.	APR -2009	NO	HACH 22834-49	2+1/2	2+1/2	2+1/4	2	وجد علبة اضافية أخرى عند استلام الاجهزة
	pH standards, pH 7.00		500 ml	2		APR -2007		HACH 22835-49	2+1/2	2+1/2	2+1/4	2	
	pH standards, pH 10.00		500 ml	2		EXPIRED		HACH 22836-49	2	2	-	-	
2	Conductivity standards, 180 µs/cm	EC&TDS calibration	100ml	1	2005 Jun.	APR -2010	NO	HACH 23075-42	1	1	3/4	1/2	
	Conductivity standards, 1,000 µs/cm		100ml	1		JAN -2010		HACH 14400-42	1	1	3/4	1/2	
	Conductivity standards, 18,000 µs/cm		100ml	1		SPT -2009		HACH 23074-42	1	1	3/4	1/2	
3	Turbidity Standards Kit for 2100 P Turbidity Meter (0.1, 20, 100, 800 NTU)	Turbidity calibration	500 ml for each	1	2005 Jun.	OCT -2006	NO	HACH 26594-00	1	1	1	1	
4	Reagents (High range 0-1,500 mg/l) for COD_{Cr}	COD_{Cr}	25 tests/PK	31	2005 Jun.	MAY-2010-	Yes (Hg, Ag, Cr)	HACH 21259-25	26	24+5/25	22+10/25	21	
5	Reagents for NO_3^--N (High range, 0-30.0 mg/l)	NO_3^--N	100 tests/PK	8	2005 Jun.	MAY -2008	Yes (Cd)	HACH 21061-69	7+30/100	6+94/100	6+80/100	6+50/100	
6	Reagents for PO_4^{3-}(High range, 0-30.00 mg/l)	PO_4^{3-}	100 ml	8	2005 Jun.	Molybdate FEB-2010	NO	HACH 2236-32	7+1/4	7	6+3/4	6	
						Amino Acid MAR-2007		HACH 1934-32	7+1/4	7			
7	Reagents for Cl^- (0-10,000 mg/l)	Cl^-	100 tests/set	8	2005 Jun.	Apr-10	Yes (Ag)	HACH 14397-01	6+1/2	6+1/4	6	5+1/2	
8	Reagents for NH_3-N (High range, 0-50 mg/l)	NH_3-N	50 tests/PK	15	2005 Jun.		Yes (CN^-)	HACH 26069-45	13+23/50	12+37/50	12+20/50	11+35/50	
9	Nitrification Inhibitor	BOD	500g	1	2005 Jun.	Mar-08	NO	HACH 2533-34	1	1	1	1	
10	BOD Nutrient Buffer Pillows	BOD	50 pillows/PK	15	2005 Jun.	APR -2010	NO	HACH 14160-66	13+32/50	12+46/50	12+13/50	11	
11	BOD Seed Inoculum	BOD	50 capsules/bottle	7	2005 Jun.	MAR -2006	NO	HACH 24712-00	6+43/50	6+17/50	6+1/50	5	
12	NaOH Pack	BOD	1000g/PK	1	2005 Jun.		NO	Bobel-Sweden	1	1	1	1	
13	Reagents (Low range 0-150 mg/l) for COD_{Cr}	COD_{Cr}	25 tests/PK	2	2006 Jun.		Yes (Hg, Ag, Cr)	HACH 21258-25			19/25	1	تم تسليم علبة واحدة ب 200629/11/
14	Reagents for NO_3^--N (Mid range, 0-5.0 mg/l)	NO_3^--N	100 tests/PK	1	2006 Jun.		Yes (Cd)	HACH 21061-69			75/100	50/100	
15	Reagents for PO_4^{3-}(Low range, 0-2.50 mg/l)	PO_4^{3-}	100 tests/PK	1	2006 Jun.		NO	HACH 21060-69			75/100	50/100	
16	Reagents for NH_3-N (low range, 0-2.50 mg/l)	NH_3-N	50 tests/PK	1	2006 Jun.		Yes (CN^-)	HACH 26045-45			18/50	0	
17	COD standard, 300 mg/l	Check COD	200 ml	1	2006 Jun.		NO	HACH 12186-29			170 ml	150 ml	
18	COD standard, 1000 mg/l	Check COD	200 ml	1	2006 Jun.		NO	HACH 22539-29			-	-	
19	NO_3^--N standard, 1.0 mg/l	Check NO_3-N	500 ml	1	2006 Jun.		NO	HACH 2046-49			-	-	
20	NO_3^--N standard, 10.0 mg/l	Check NO_3-N	500 ml	1	2006 Jun.		NO	HACH 307-49			470 ml	450 ml	
21	NO_3^--N standard, 100 mg/l	Check NO_3-N	500 ml	1	2006 Jun.		NO	HACH 1947-49			480 ml	460 ml	
22	PO_4^{3-}standard, 50 mg/l	Check PO_4^{3-}	500 ml	1	2006 Jun.		NO	HACH 171-49			470 ml	450 ml	
23	NH_3-N standard, 10 mg/l	Check NH_3-N	500 ml	1	2006 Jun.		NO	HACH 153-49			480 ml	460 ml	
24	NH_3-N standard, 50 mg/l	Check NH_3-N	10 ml/16 Voluette Amples	1	2006 Jun.		NO	HACH 14791-10			490 ml	475 ml	
25	BOD standard, 300 mg/l	Check BOD	10 ml/16 Voluette Amples	1	2006 Jun.		NO	HACH 14865-10			(15*10)/16	13/16	
26	BOD standard, 3000 mg/l	Check BOD	10 ml/16 Voluette Amples	1	2006 Jun.		NO	HACH 14866-10			(15*10)/16	13/16	
27	Cl^- standard, 1000 mg/l	Check Cl^-	500 ml	1	2006 Jun.		NO	HACH 183-49			490 ml	475 ml	
28	Bromine Water 30g/L	NO_2 interfering (NO_3 testing)	29 mL	1	2006 Jun.		NO	HACH 2211-20				1	
29	Phenol Solution	NO_2 interfering (NO_3 testing)	29 mL	1	2006 Jun.		NO	HACH 2112-20					
30	Sulfamic acid	Color interfering (PO_4 testing)	113 g	1	2006 Jun.		NO	HACH 2344-14					
31	Phosphate Pretreatment Powder Pillows	Turbidity and color interfering	100/pkg	1	2006 Jun.		NO	HACH 14501-99					
32	Hydrochloric Acid, ACS	pH adjusting (NH_3-N, PO_4 etc.)	500 mL	1	2006 Jun.		NO	HACH 134-49					
33	Sulfide Inhibitor Powder Pillows	S interfering (Cl^- testing)	100/pkg	1	2006 Jun.		NO	HACH 2418-99					
34	Mercuric Sulfate	Cl^- interfering (COD testing)	28.3 g	1	2006 Jun.		Yes (Hg)	HACH 1915-20					
35	Hydrogen Peroxide, 30% ACS	Sulfite interfering (Cl- testing)	500 mL	1	2006 Jun.		NO	HACH 144-11					

Table 3 Name List of The Staff in Charge of Laboratory Management

الجدول -3- قائمة بأسماء الكادر المسؤول عن إدارة المخبر

Item البند	Name of The Staff in Charge اسم الشخص المسؤول	TEL رقم الهاتف	Remarks ملاحظات
Laboratory Safety (Electricity, Fire Prevention, laboratory occupation Health and Safety سلامة المخبر (الكهرباء ,تجنب الحريق, الصحة و السلامة المهنية في المخبر)			
Management of Equipment and Spare Parts إدارة التجهيزات و قطع الغيار			
Management of Reagents and Glassware إدارة الكواشف و الزجاجيات			
Treatment of Liquid and Solid Wastes معاجة المخلفات الصلبة و السائلة			

Table 4 Suppliers List

الجدول -4- قائمة المورّد

Supplier		Name of The Staff in Charge	Address	TEL	FAX	E-mail	Remarks
المورّد		اسم الشخص المسؤول	العنوان	الهاتف	الفاكس	البريد الالكتروني	
MIMOSA	Agency of HACH equipment and reagents	Mr. Sami BAZ	Damascus - Abou Roummaneh Shakib Arslan St. - Masri Bldg. Next to Swedish Embassy, P.O.Box 5098	011-333-3276	011-333-2290	mimosa@net.sy	
ALBA Instruments & Chemicals	Supplier for glassware etc.	Eng. Antoun Doummar	Azbakieh, Damascus, P.O.Box 8345	011-442-6689	011-441-0305	antoundoummar@mail.sy	
CMAX	Desktop computer, printer and digital camera	Mr. Talal Al Habal		011-666-3955	011-666-3988		

EDL and Recording Digit for Chemical & Biological Water Analysis 2
(for Damascus Countryside, Homs and Aleppo) July 2007

No.	Parameter	Instrument	Unit	Measuring Range		EDL Estimated Detection Limit	Description in Recording		
							<EDL	>EDL	Type of Digit (Attention to Period)
1	Cr^{6+}	Spectrophotometer	mg/l	not diluted	0 to 0.70	0.01 mg/L Cr^{6+}	<0.01	0.01, 0.02, …0.68, 0.69, 0.70	#.##
2	T-Cr	Spectrophotometer	mg/l	not diluted	0 to 0.70	0.01 mg/L Cr	<0.01	0.01, 0.02, …0.68, 0.69, 0.70	#.##
3	Mg Hardness	Spectrophotometer	mg/l	not diluted	0 to 4.0 mg/L	0.1 mg/L $CaCO_3$	<0.1	0.1, 0.2, 0.3,….3.8, 3.9, 4.0	#.#
				diluted(×20)	2 to 80 mg/L	-	-	2, 3,4,5 6,7, 8 ……78,79, 80	#~##
				diluted(×50)	5 to 200 mg/L	-	-	10,11,12,13,14……198,199,200	##~###
				diluted(×100)	10 to 400 mg/L	-	-	101,102,103,…..397,398,399,400	##~###
4	Ca Hardness	Spectrophotometer	mg/l	not diluted	0 to 4.0 mg/L	0.1 mg/L $CaCO_3$	<0.1	0.1, 0.2, 0.3,….3.8, 3.9, 4.0	#.#
				diluted(×20)	2 to 80 mg/L	-	-	2, 3,4,5 6,7, 8 ……78,79, 80	#~##
				diluted(×50)	5 to 200 mg/L	-	-	10,11,12,13,14……198,199,200	##~###
				diluted(×100)	10 to 400 mg/L	-	-	101,102,103,…..397,398,399,400	##~###
5	Total Hardness	Spectrophotometer	mg/l	not diluted	0 to 4.0 mg/L	0.1 mg/L $CaCO_3$	<0.1	0.1, 0.2, 0.3,….3.8, 3.9, 4.0	#.#
				diluted(×20)	2 to 80 mg/L	-	-	2, 3,4,5 6,7, 8 ……78,79, 80	#~##
				diluted(×50)	5 to 200 mg/L	-	-	10,11,12,13,14……198,199,200	##~###
				diluted(×100)	10 to 400 mg/L	-	-	101,102,103,…..397,398,399,400	##~###
6	NO_3^--N	Spectrophotometer	mg/l	Middle	0 to 5.0 mg/L	0.2 mg/L NO_3^--N	<0.2	0.2, 0.3, ……4.8, 4.9, 5.0	#.#
				High	0 to 30 mg/L	0.8 mg/L NO_3^--N	<0.8	0.8, 0.9, 1.0 ……..29, 30	##.#~##
				diluted(×10)	30 to 300 mg/L	-	-	30, 31, 31 ….280, 290, 300	###
7	NO_2^--N	Spectrophotometer	mg/l	not diluted	0 to 0.30 mg/L	0.02 mg/L NO_2^--N	<0.02	0.02, 0.03,……0.29, 0.30	#.##
				diluted(×10)	0.3 to 3.0 mg/L	-	-	0.3, 0.4, …2.8, 2.9, 3.0	#.#
8	NH_3-N	Spectrophotometer	mg/l	not diluted	0 to 2.50 mg/L	0.08 mg/L NH_3-N	<0.08	0.08, 0.09, …..,2.49, 2.50	#.##
				diluted(×10)	2.5 to 25 mg/L	-	-	2.5, 2.6,2.7…24.8, 24.9, 25.0	#.#~##.#
				diluted(×100)	25 to 250 mg/L	-	-	25, 26,27…248, 249,250	##~###
9	PO_4^{3-}	Spectrophotometer	mg/l	not diluted	0 to 2.50 mg/L	0.05 mg/L PO_4^{3-}	<0.05	0.05, 0.06, …, 2.49, 2.50	#.##
				diluted(×10)	2.5 to 25 mg/L	-	-	2.5, 2.6,2.7…24.8, 24.9, 25.0	#.#~##.#
				diluted(×100)	25 to 250 mg/L	-	-	25, 26,27…248, 249,250	##~###
10	Sulfide (S^{2-})	Spectrophotometer	mg/l	not diluted	0 to 0.80 mg/L	0.01 mg/L PO_4^{3-}	<0.01	0.01, 0.02, …, 0.79, 0.80	#.##
				diluted(×10)	0.8 to 8.0 mg/L	-	-	0.8, 0.9, …7.7, 7.8, 8.0	#.#
11	Detergents, Anionic (Surfactans)	Spectrophotometer	mg/l	not diluted	0 to 0.275 mg/L	0.03 mg/L LAS	<0.03	0.003,0.004, …,0.274, 0.275	#.###
12	Oil & Grease	Oil Content Analyzer	mg/l	not diluted	0 to 200 mg/L	0.2 mg/L	<0.2	0.2, 0.3, ….., 200	#.#~###
				diluted(×10)	200 to 2,000 mg/L	-	-	200,201, 202,…1,999, 2,000	###~####

Example of Dilution (BOD)

10 times Dilution gives you the results such as,

410, 420, 430, 440, ……..., 4000

410×10=4,100

420×10=4,200

430×10=4,300

4000×10=40,000

5 times Dilution gives you the results such as,

820, 840, 860, 880, ……..., 4000

820×5=4,100

840×5=4,200

860×5=4,300

4000×5=20,000

Parameter	Instrument	Unit	Measuring Range		EDL	<EDL	>EDL	Type of Digit
BOD_5	culture	mg/l	not diluted	1 to 4,000 mg/L	1	<1	1, 2, …….4,000	## or #5 or #00
			diluted(×10)	4,000 to 40,000mg/L	-	-	4,100, 4,200,….40,000	##00
			diluted(×5)	4,000 to 20,000mg/L	-	-	4,100, 4,200,….20,000	##00

Example of Dilution (NO_3^-)

10 times Dilution gives you the results such as,

3.0, 3.1, 3.2, 3.3, ……., 30.0.

3.1×10=31

3.2×10=32

29.9×10=299

30.0×10=300

5 times Dilution gives you the results such as,

6.0, 6.1, 6.2, 6.3, ……., 30.0.

6.1×5=30.5

6.2×5=31.0

29.9×5=149.5

30.0×5=150.0

Parameter	Instrument	Unit	Measuring Range		EDL	<EDL	>EDL	Type of Digit
NO_3^-	portable colorimeter _	mg/l	Low	0 to 5.0 mg/L	0.2 mg/L NO_3^--N	<0.2	0.2, 0.3, ….., 4.9,5.0	#.#
			High	0 to 30.0 mg/L	0.8 mg/L NO_3^--N	<0.8	0.8, 0.9, …29.9, 30.0	##.#
			diluted(×10)	30 to 300 mg/L	-	-	31, 32, 33 .., 299,300	###
			diluted(×5)	30 to 150 mg/L	-	-	30.5, 31.0, 31.5 .., 149.5,150.0	###.5 or ###.0

Table 1 Operation and Maintenance (O/M) Record of Equipment in_____DFEA

الجدول -1- سجل تشغيل و صيانة التجهيزات لمديرية

2006/1/13

Name of Equipment		Usage	Number	Maker	Supplier	Purchased Date	Trouble Contents and Date	Repair Record (constants and date)	Remarks (recorder's name etc.)
اسم الجهاز :		استخدامه :	العدد	المصنع	المورّد	تاريخ الشراء	نوع المشكلة و تاريخها	سجل التصليح (التفاصيل و التاريخ)	ملاحظات (اسم المسجّل ..الخ)
1	Portable Colorimeter Kit (CEL/890)	SS, Color, NO_3^--N, PO_4^{3-}, NH_3-N,	1	HACH	MIMOSA	2005 Jun.	1)	1)	
2	Portable pH and Temp. Meter (sensION 1)	pH, Temp.	1	HACH	MIMOSA	2005 Jun.	1)	1)	
3	Portable EC and TDS Meter (sensION 5)	EC, TDS	1	HACH	MIMOSA	2005 Jun.	1)	1)	
4	Portable DO Meter (sensION 6)	DO	1	HACH	MIMOSA	2005 Jun.	1)	1)	
5	Portable Turbidity Meter (2100P)	Turbidity	1	HACH	MIMOSA	2005 Jun.	1)	1)	
6	COD Reactor (DRB 200-1)	COD_{Cr}	1	HACH	MIMOSA	2005 Jun.	1) Temperature can not reach 150 ^{0}C. (10th Dec. 2005) 2)	1) The reactor was sent to MIMOSA on 28th Dec. 2005., and heating system was changed. On 24 th Jan. 2006, DFEA receives the reparired reactor. 2)	Mr. …….
7	Digital Titrator (16900)	Cl^-	1	HACH	MIMOSA	2005 Jun.	1)	1)	
8	Stirring platform for BOD Analysis (OxiTop IS12)	BOD	2	WTW	MIMOSA	2005 Jun.	1)	1)	
9	BOD bottle with OxiTop measuring head	BOD	24	WTW	MIMOSA	2005 Jun.	1)	1)	
10	Incubator (TS 606/2i)	BOD	1	WTW	MIMOSA	2005 Jun.	1)	1)	
11	Analytical Balance (CP324S)	Reagents preparation	1	Sartorius	MIMOSA	2005 Jun.	1)	1)	
12	Table for Balance (YWT03)	For balance	1	Sartorius	MIMOSA	2005 Jun.	1)	1)	
13	Pure Water Unit (2001/4)	All of Parameters	1	GFL	MIMOSA	2005 Jun.	1)	1)	
14	Desktop Computer (for 14 DFEAs)	Data Analysis and Reporting etc.	1	Mall Tech	CMAX	2005 Jun.	1)	1)	
15	Printer	Reporting etc.	1	Hewlett-Packard	CMAX	2005 Jun.	1)	1)	
16	Digital Camera	Sampling Record and Reporting	1	Kodak CX7330	CMAX	2005 Jun.	1)	1)	

Table 2 Operation and Maintenance (O/M) Record of Reagents in_____DFEA (Maker of reagents: HACH; Supplier: MIMOSA)

الجدول -2- سجل استخدام وحفظ الكواشف في مديرية

2006/6/17

	Name of Reagent اسم الكاشف	Usage استخدامه	Unit الوحدة	Number العدد	Purchased Date تاريخ الشراء	Expiration date تاريخ انتهاء الصلاحية	Existence of Toxicity وجود مواد سامة	Order No.	Stored no. in the end of Mar. الكمية المتبقية حتى نهاية شهر آذار	Stored no. in the end of Jun. الكمية المتبقية حتى نهاية شهر حزيران	Stored no. in the end of Sep. لكمية المتبقية حتى نهاية شهر أيلول	Stored no. in the end of Dec. الكمية المتبقية حتى نهاية شهر كانون الأول	Remarks (recorder's name) ملاحظات (اسم المسجّل ... الخ)
1	pH standards, pH 4.01	pH calibration	500 ml	2	2005 Jun.	APR -2009	NO	HACH 22834-49	2+1/2	2+1/2	2+1/4	2	وجد علبة اضافية أخرى عند استلام الاجهزة
	pH standards, pH 7.00		500 ml	2		APR -2007		HACH 22835-49	2+1/2	2+1/2	2+1/4	2	
	pH standards, pH 10.00		500 ml	2		EXPIRED		HACH 22836-49	2	2	-	-	
2	Conductivity standards, 180 µs/cm	EC&TDS calibration	100ml	1	2005 Jun.	APR -2010	NO	HACH 23075-42	1	1	3/4	1/2	
	Conductivity standards, 1,000 µs/cm		100ml	1		JAN -2010		HACH 14400-42	1	1	3/4	1/2	
	Conductivity standards, 18,000 µs/cm		100ml	1		SPT -2009		HACH 23074-42	1	1	3/4	1/2	
3	Turbidity Standards Kit for 2100 P Turbidity Meter (0.1, 20, 100, 800 NTU)	Turbidity calibration	500 ml for each	1	2005 Jun.	OCT -2006	NO	HACH 26594-00	1	1	1	1	
4	Reagents (High range 0-1,500 mg/l) for COD_{Cr}	COD_{Cr}	25 tests/PK	31	2005 Jun.	MAY-2010-	Yes (Hg, Ag, Cr)	HACH 21259-25	26	24+5/25	22+10/25	21	
5	Reagents for NO_3^--N (High range, 0-30.0 mg/l)	NO_3^--N	100 tests/PK	8	2005 Jun.	MAY -2008	Yes (Cd)	HACH 21061-69	7+30/100	6+94/100	6+80/100	6+50/100	
6	Reagents for PO_4^{3-}(High range, 0-30.00 mg/l)	PO_4^{3-}	100 ml	8	2005 Jun.	Molybdate FEB-2010	NO	HACH 2236-32	7+1/4	7	6+3/4	6	
						Amino Acid MAR-2007		HACH 1934-32	7+1/4	7			
7	Reagents for Cl^- (0-10,000 mg/l)	Cl^-	100 tests/set	8	2005 Jun.	Apr-10	Yes (Ag)	HACH 14397-01	6+1/2	6+1/4	6	5+1/2	
8	Reagents for NH_3-N (High range, 0-50 mg/l)	NH_3-N	50 tests/PK	15	2005 Jun.		Yes (CN^-)	HACH 26069-45	13+23/50	12+37/50	12+20/50	11+35/50	
9	Nitrification Inhibitor	BOD	500g	1	2005 Jun.	Mar-08	NO	HACH 2533-34	1	1	1	1	
10	BOD Nutrient Buffer Pillows	BOD	50 pillows/PK	15	2005 Jun.	APR -2010	NO	HACH 14160-66	13+32/50	12+46/50	12+13/50	11	
11	BOD Seed Inoculum	BOD	50 capsules/bottle	7	2005 Jun.	MAR -2006	NO	HACH 24712-00	6+43/50	6+17/50	6+1/50	5	
12	NaOH Pack	BOD	1000g/PK	1	2005 Jun.		NO	Bobel-Sweden	1	1	1	1	
13	Reagents (Low range 0-150 mg/l) for COD_{Cr}	COD_{Cr}	25 tests/PK	2	2006 Jun.		Yes (Hg, Ag, Cr)	HACH 21258-25			19/25	1	تم تسليم علبة واحدة ب 200629/11/
14	Reagents for NO_3^--N (Mid range, 0-5.0 mg/l)	NO_3^--N	100 tests/PK	1	2006 Jun.		Yes (Cd)	HACH 21061-69			75/100	50/100	
15	Reagents for PO_4^{3-}(Low range, 0-2.50 mg/l)	PO_4^{3-}	100 tests/PK	1	2006 Jun.		NO	HACH 21060-69			75/100	50/100	
16	Reagents for NH_3-N (low range, 0-2.50 mg/l)	NH_3-N	50 tests/PK	1	2006 Jun.		Yes (CN^-)	HACH 26045-45			18/50	0	
17	COD standard, 300 mg/l	Check COD	200 ml	1	2006 Jun.		NO	HACH 12186-29			170 ml	150 ml	
18	COD standard, 1000 mg/l	Check COD	200 ml	1	2006 Jun.		NO	HACH 22539-29			-	-	
19	NO_3^--N standard, 1.0 mg/l	Check NO_3-N	500 ml	1	2006 Jun.		NO	HACH 2046-49			-	-	
20	NO_3^--N standard, 10.0 mg/l	Check NO_3-N	500 ml	1	2006 Jun.		NO	HACH 307-49			470 ml	450 ml	
21	NO_3^--N standard, 100 mg/l	Check NO_3-N	500 ml	1	2006 Jun.		NO	HACH 1947-49			480 ml	460 ml	
22	PO_4^{3-}standard, 50 mg/l	Check PO_4^{3-}	500 ml	1	2006 Jun.		NO	HACH 171-49			470 ml	450 ml	
23	NH_3-N standard, 10 mg/l	Check NH_3-N	500 ml	1	2006 Jun.		NO	HACH 153-49			480 ml	460 ml	
24	NH_3-N standard, 50 mg/l	Check NH_3-N	10 ml/16 Voluette Amples	1	2006 Jun.		NO	HACH 14791-10			490 ml	475 ml	
25	BOD standard, 300 mg/l	Check BOD	10 ml/16 Voluette Amples	1	2006 Jun.		NO	HACH 14865-10			(15*10)/16	13/16	
26	BOD standard, 3000 mg/l	Check BOD	10 ml/16 Voluette Amples	1	2006 Jun.		NO	HACH 14866-10			(15*10)/16	13/16	
27	Cl^- standard, 1000 mg/l	Check Cl^-	500 ml	1	2006 Jun.		NO	HACH 183-49			490 ml	475 ml	
28	Bromine Water 30g/L	NO_2 interfering (NO_3 testing)	29 mL	1	2006 Jun.		NO	HACH 2211-20				1	
29	Phenol Solution	NO_2 interfering (NO_3 testing)	29 mL	1	2006 Jun.		NO	HACH 2112-20					
30	Sulfamic acid	Color interfering (PO_4 testing)	113 g	1	2006 Jun.		NO	HACH 2344-14					
31	Phosphate Pretreatment Powder Pillows	Turbidity and color interfering	100/pkg	1	2006 Jun.		NO	HACH 14501-99					
32	Hydrochloric Acid, ACS	pH adjusting (NH_3-N, PO_4 etc.)	500 mL	1	2006 Jun.		NO	HACH 134-49					
33	Sulfide Inhibitor Powder Pillows	S interfering (Cl^- testing)	100/pkg	1	2006 Jun.		NO	HACH 2418-99					
34	Mercuric Sulfate	Cl^- interfering (COD testing)	28.3 g	1	2006 Jun.		Yes (Hg)	HACH 1915-20					
35	Hydrogen Peroxide, 30% ACS	Sulfite interfering (Cl- testing)	500 mL	1	2006 Jun.		NO	HACH 144-11					

Table 4 Suppliers List

الجدول -4- قائمة المورّد

Supplier		Name of The Staff in Charge	Address	TEL	FAX	E-mail	Remarks
المورّد		اسم الشخص المسؤول	العنوان	الهاتف	الفاكس	البريد الالكتروني	
MIMOSA	Agency of HACH equipment and reagents	Mr. Sami BAZ	Damascus - Abou Roummaneh Shakib Arslan St. - Masri Bldg. Next to Swedish Embassy, P.O.Box 5098	011-333-3276	011-333-2290	mimosa@net.sy	
ALBA Instruments & Chemicals	Supplier for glassware etc.	Eng. Antoun Doummar	Azbakieh, Damascus, P.O.Box 8345	011-442-6689	011-441-0305	antoundoummar@mail.sy	
CMAX	Desktop computer, printer and digital camera	Mr. Talal Al Habal		011-666-3955	011-666-3988		

Operation and Maintenance (O/M) Record of Reagents Chemical & Bioligical Analysis 2
in Damascus Countryside, Homs and Aleppo DFEAs (Maker of reagents: HACH; Supplier: MIMOSA)

سجل استخدام وحفظ الكواشف في مديريات البيئة في ريف دمشق و حمص و حلب

2007/7/22

	Name of Reagent اسم الكاشف	Usage استخدامه	Unit الوحدة	Number العدد	Purchased Date تاريخ الشراء	Expiration date تاريخ انتهاء الصلاحية	Existence of Toxicity وجود مواد سامة	Order No.	Stored no. in the end of Mar. الكمية المتبقية حتى نهاية شهر آذار	Stored no. in the end of Jun. الكمية المتبقية حتى نهاية شهر حزيران	Stored no. in the end of Sep. الكمية المتبقية حتى نهاية شهر أيلول	Stored no. in the end of Dec. الكمية المتبقية حتى نهاية شهر كانون الأول	One Year Consumption الإستهلاك خلال العام	Remarks (recorder's name) ملاحظات (اسم المسجّل ... الخ)
1	Chroma Ver 3 Chromium Reagent Powder Pillows (for 5 10 mL sample)	Cr^{6+}	100/pkg	2	2007 Jun.		NO	HACH 12710-99						
2	Chromium, Hexavalent, Standards Solution, 50-mg/L Cr^{6+}	Cr^{6+}	100 ml	1	2007 Jun.		Yes (Cr)	HACH 810-42H						
3	Chromium, Hexavalent, Standards Solution, 12.5-mg/L Cr^{6+} (10-mL Voluette Ampule)	Cr^{6+}	16/pkg	1	2007 Jun.		Yes (Cr)	HACH 14256-10						
4	Chromium 1 Reagent Powder Pillows	T-Cr	100/pkg	2	2007 Jun.		NO	HACH 2043-99						
5	Chromium 2 Reagent Powder Pillows	T-Cr	100/pkg	2	2007 Jun.		NO	HACH 2044-99						
6	Chroma Ver 3 Chromium Reagents Powder Pillows (for 25 mL sample)	T-Cr	100/pkg	2	2007 Jun.		NO	HACH 12066-99						
7	Acid Reagent Powder Pillows	T-Cr	100/pkg	2	2007 Jun.		NO	HACH 2126-99						
8	Chromium, Hexavalent, Standards Solution, 50-mg/L Cr^{3+}	T-Cr	100 ml	1	2007 Jun.		Yes (Cr)	HACH 14151-42						
9	Chromium, Hexavalent, Standards Solution, 12.5-mg/L Cr^{3+} (10-mL Voluette Ampule)	T-Cr	16/pkg	1	2007 Jun.		Yes (Cr)	HACH 14257-10						
10	Calcium and Magnesium Iindicator Solution	Hardness	100 ml	1	2007 Jun.		NO	HACH 22418-32						
11	Alkali Solution for Calcium and Magnesium Test	Hardness	100 ml	1	2007 Jun.		NO	HACH 22417-32						
12	EDTA Solution, 1M	Hardness	50 ml	1	2007 Jun.		NO	HACH 22419-26						
13	EGTA Solution	Hardness	50 ml	1	2007 Jun.		NO	HACH 22297-26						
14	Calcium Chloride Standard Solution, 50-mg/L as $CaCO_3$	Hardness	946 ml				NO	HACH 21277-16						
15	Magnesium Standard Solution, 1000-mg/L as Mg	Hardness	100 ml				NO	HACH 14794-42						
16	Nitra Ver 5 Nitrate Reagent Powder Pillows (for 10 mL sample)	NO_3^--N	100/pkg	2	2007 Jun.		Yes (Cd)	HACH 21061-69						
17	Nitrate Nitrogen Standard Solusion, 100-mg/L NO_3^--N	NO_3^--N	500 ml				NO	HACH 1947-49						
18	Nitri Ver 3 Nitrite Reagent Powder Pillows	NO_2^--N	100/pkg	1	2007 Jun.		Yes (Cd)	HACH 21071-69						
19	Sodium Nitrite, ACS	NO_2^--N	454 g	1	2007 Jun.		NO	HACH 2452-01						
20	Mineral Stabilizer	NH_3-N	50 ml	2	2007 Jun.		NO	HACH 23766-26						
21	Polyvinyl Alcohol Dispersing Agent	NH_3-N	50 ml	2	2007 Jun.		NO	HACH 23765-26						
22	Nessler Reagent	NH_3-N	500 ml	2	2007 Jun.		Yes (Hg)	HACH 21194-49						
23	Nitrogen, Ammonia Solusion, 1-mg/L NH_3-N	NH_3-N	500 ml	1	2007 Jun.		NO	HACH 1891-49						
24	Nitrogen, Ammonia Solusion, 50-mg/L NH_3-N (10-mL Voluette Ampule)	NH_3-N	16/pkg	1	2007 Jun.		NO	HACH 24065-49						
25	Phos Ver 3 Phosphate Reagent Powder Pillows (for 10 mL sample)	PO_4^{3-}	100/pkg	2	2007 Jun.		NO	HACH 21060-69						
26	Phosphate standard Solusion, 50-mg/L as PO_4^{3-} (10-mL Voluette Ampule)	Check PO_4^{3-}	500 ml	1	2007 Jun.		NO	HACH 171-10						
27	Sulfide 1 Reagent	Sulfide	100 ml	4	2007 Jun.		NO	HACH 1816-32						
28	Sulfide 2 Reagent	Sulfide	100 ml	4	2007 Jun.		NO	HACH 1817-32						
29	Buffer Solution, sulfate-type	Detergents, Anionic (Surfactants)	500 ml	1	2007 Jun.		NO	HACH 452-49						
30	Detergent Reagent Powder Pillows	Detergents, Anionic (Surfactants)	100/pkg	1	2007 Jun.		NO	HACH 1008-68						
31	Benzen, ACS	Detergents, Anionic (Surfactants)	4 L	1	2007 Jun.		Yes (Benzen)	HACH 14440-17						
32	Detergent standard Solusion, 60-mg/L LAS (10-mL Voluette Ampule)	Detergents, Anionic (Surfactants)	16/pkg	1	2007 Jun.		NO	HACH 2211-20						
33	Solvant (S-316)	0il and Grease	1L	1	2007 Jun.		NO	HACH 2112-20						
34	B-heavy oil	0il and Grease	10 mL	1	2007 Jun.		NO	HACH 2344-14						
35	Activated Charcoal	0il and Grease	100/pkg	1	2007 Jun.		NO	HACH 14501-99						
36	Activated Alminiumoxide (Al_2O_3)	0il and Grease	500 mL	1	2007 Jun.		NO	HACH 134-49						

Operation and Maintenance (O/M) Record of Reagents Chemical & Bioligical Analysis 2
in Damascus Countryside, Homs and Aleppo DFEAs (Maker of reagents: HACH; Supplier: MIMOSA)

سجل استخدام وحفظ الكواشف في مديريات البيئة في ريف دمشق و حمص و حلب

2007/7/22

	Name of Reagent اسم الكاشف	Usage استخدامه	Unit الوحدة	Number العدد	Purchased Date تاريخ الشراء	Expiration date تاريخ انتهاء الصلاحية	Existence of Toxicity وجود مواد سامة	Order No.	Stored no. in the end of Mar. الكمية المتبقية حتى نهاية شهر آذار	Stored no. in the end of Jun. الكمية المتبقية حتى نهاية شهر حزيران	Stored no. in the end of Sep. الكمية المتبقية حتى نهاية شهر أيلول	Stored no. in the end of Dec. الكمية المتبقية حتى نهاية شهر كانون الأول	One Year Consumption الإستهلاك خلال العام	Remarks (recorder's name) ملاحظات (اسم المسجّل ... الخ)
1	Chroma Ver 3 Chromium Reagent Powder Pillows (for 5 or 10 mL sample)	Cr^{6+}	100/pkg	2	2007 Jun.		NO	HACH 12710-99						
2	Chromium, Hexavalent, Standards Solution, 50-mg/L Cr^{6+}	Cr^{6+}	100 ml	1	2007 Jun.		Yes (Cr)	HACH 810-42H						
3	Chromium, Hexavalent, Standards Solution, 12.5-mg/L Cr^{6+} (10-mL Voluette Ampule)	Cr^{6+}	16/pkg	1	2007 Jun.		Yes (Cr)	HACH 14256-10						
4	Chromium 1 Reagent Powder Pillows	T-Cr	100/pkg	2	2007 Jun.		NO	HACH 2043-99						
5	Chromium 2 Reagent Powder Pillows	T-Cr	100/pkg	2	2007 Jun.		NO	HACH 2044-99						
6	Chroma Ver 3 Chromium Reagents Powder Pillows (for 25 mL sample)	T-Cr	100/pkg	2	2007 Jun.		NO	HACH 12066-99						
7	Acid Reagent Powder Pillows	T-Cr	100/pkg	2	2007 Jun.		NO	HACH 2126-99						
8	Chromium, Hexavalent, Standards Solution, 50-mg/L Cr^{3+}	T-Cr	100 ml	1	2007 Jun.		Yes (Cr)	HACH 14151-42						
9	Chromium, Hexavalent, Standards Solution, 12.5-mg/L Cr^{3+} (10-mL Voluette Ampule)	T-Cr	16/pkg	1	2007 Jun.		Yes (Cr)	HACH 14257-10						
10	Calcium and Magnesium Iindicator Solution	Hardness	100 ml	1	2007 Jun.		NO	HACH 22418-32						
11	Alkali Solution for Calcium and Magnesium Test	Hardness	100 ml	1	2007 Jun.		NO	HACH 22417-32						
12	EDTA Solution, 1M	Hardness	50 ml	1	2007 Jun.		NO	HACH 22419-26						
13	EGTA Solution	Hardness	50 ml	1	2007 Jun.		NO	HACH 22297-26						
14	Calcium Chloride Standard Solution, 50-mg/L as $CaCO_3$	Hardness	946 ml				NO	HACH 21277-16						
15	Magnesium Standard Solution, 1000-mg/L as Mg	Hardness	100 ml				NO	HACH 14794-42						
16	Nitra Ver 5 Nitrate Reagent Powder Pillows (for 10 mL sample)	NO_3^--N	100/pkg	2	2007 Jun.		Yes (Cd)	HACH 21061-69						
17	Nitrate Nitrogen Standard Solusion, 100-mg/L NO_3^--N	NO_3^--N	500 ml				NO	HACH 1947-49						
18	Nitri Ver 3 Nitrite Reagent Powder Pillows	NO_2^--N	100/pkg	1	2007 Jun.		Yes (Cd)	HACH 21071-69						
19	Sodium Nitrite, ACS	NO_2^--N	454 g	1	2007 Jun.		NO	HACH 2452-01						
20	Mineral Stabilizer	NH_3-N	50 ml	2	2007 Jun.		NO	HACH 23766-26						
21	Polyvinyl Alcohol Dispersing Agent	NH_3-N	50 ml	2	2007 Jun.		NO	HACH 23765-26						
22	Nessler Reagent	NH_3-N	500 ml	2	2007 Jun.		Yes (Hg)	HACH 21194-49						
23	Nitrogen, Ammonia Solusion, 1-mg/L NH_3-N	NH_3-N	500 ml	1	2007 Jun.		NO	HACH 1891-49						
24	Nitrogen, Ammonia Solusion, 50-mg/L NH_3-N (10-mL Voluette Ampule)	NH_3-N	16/pkg	1	2007 Jun.		NO	HACH 24065-49						
25	Phos Ver 3 Phosphate Reagent Powder Pillows (for 10 mL sample)	PO_4^{3-}	100/pkg	2	2007 Jun.		NO	HACH 21060-69						
26	Phosphate standard Solusion, 50-mg/L as PO_4^{3-} (10-mL Voluette Ampule)	Check PO_4^{3-}	500 ml	1	2007 Jun.		NO	HACH 171-10						
27	Sulfide 1 Reagent	Sulfide	100 ml	4	2007 Jun.		NO	HACH 1816-32						
28	Sulfide 2 Reagent	Sulfide	100 ml	4	2007 Jun.		NO	HACH 1817-32						
29	Buffer Solution, sulfate-type	Detergents, Anionic (Surfactants)	500 ml	1	2007 Jun.		NO	HACH 452-49						
30	Detergent Reagent Powder Pillows	Detergents, Anionic (Surfactants)	100/pkg	1	2007 Jun.		NO	HACH 1008-68						
31	Benzen, ACS	Detergents, Anionic (Surfactants)	4 L	1	2007 Jun.		Yes (Benzen)	HACH 14440-17						
32	Detergent standard Solusion, 60-mg/L LAS (10-mL Voluette Ampule)	Detergents, Anionic (Surfactants)	16/pkg	1	2007 Jun.		NO	HACH 2211-20						
33	Solvant (S-316)	0il and Grease	1L	1	2007 Jun.		NO	HACH 2112-20						
34	B-heavy oil	0il and Grease	10 mL	1	2007 Jun.		NO	HACH 2344-14						
35	Activated Charcoal	0il and Grease	100/pkg	1	2007 Jun.		NO	HACH 14501-99						
36	Activated Alminiumoxide (Al_2O_3)	0il and Grease	500 mL	1	2007 Jun.		NO	HACH 134-49						

Table 3 Name List of The Staff in Charge of Laboratory Management

الجدول -3- قائمة بأسماء الكادر المسؤول عن إدارة المخبر

Item	Name of The Staff in Charge	TEL	Remarks
البند	اسم الشخص المسؤول	رقم الهاتف	ملاحظات
Laboratory Safety (Electricity, Fire Prevention, laboratory occupation Health and Safety سلامة المخبر (الكهرباء ,تجنب الحريق, الصحة و السلامة المهنية في المخبر)			
Management of Equipment and Spare Parts إدارة التجهيزات و قطع الغيار			
Management of Reagents and Glassware إدارة الكواشف و الزجاجيات			
Treatment of Liquid and Solid Wastes معاجة المخلفات الصلبة و السائلة			

Table 4 Suppliers List

الجدول -4- قائمة المورّد

Supplier		Name of The Staff in Charge	Address	TEL	FAX	E-mail	Remarks
المورّد		اسم الشخص المسؤول	العنوان	الهاتف	الفاكس	البريد الالكتروني	
MIMOSA	Agency of HACH equipment and reagents	Mr. Sami BAZ	Damascus - Abou Roummaneh Shakib Arslan St. - Masri Bldg. Next to Swedish Embassy, P.O.Box 5098	011-333-3276	011-333-2290	mimosa@net.sy	
ALBA Instruments & Chemicals	Supplier for glassware etc.	Eng. Antoun Doummar	Azbakieh, Damascus, P.O.Box 8345	011-442-6689	011-441-0305	antoundoummar@mail.sy	
CMAX	Desktop computer, printer and digital camera	Mr. Talal Al Habal		011-666-3955	011-666-3988		

Operation and Maintenance (O/M) Record of Reagent and Consumables (1)

Check the residue quantity of the reagent four times a year.

The user must report to the management representative promptly when the residue quantity decreases. [Person in charge:

Management No.	Name of Reagent	Specifications			Number	Date of Delivery	Expiration date	Stored no. in the end of Mar.	Stored no. in the end of Jun.	Stored no. in the end of Sep.	Stored no. in the end of Dec.	One Year Consumption	Remarks (recorder's name)
		Usage	Quality/ size	Unit									
	اسم الكاشف	استخدامه	لنوعية أو القياسات	الوحدة	العدد	تاريخ الاستلام	تاريخ انتهاء الصلاحية	الكمية المتبقية حتى نهاية شهر آذار	الكمية المتبقية حتى نهاية شهر حزيران	الكمية المتبقية حتى نهاية شهر أيلول	الكمية المتبقية حتى نهاية شهر كانون الأول	الاستهلاك خلال العام	ملاحظات (اسم المسجّل ... الخ)
1	Acetic acid (CH_3COOH)	NO2	G	2.5 L	1	Aug. 6, 2006							
2	Sulfanilic acid ($H_2NC_5H_4SO_3H$)	NO2	G	100g	1								
3	*N*-(1-Naphthyl) ethylenediamine dihydrochloride For NOx analysis (C10H7NHCH2CH2NH2·2H2O)	NO2	—	25g	1	Aug. 23, 2006							
4	Potassium permanganate For NOx analysis ($KMnO_4$)	NO2	—	1 kg	1	Aug. 6, 2006							
5	Sulfuric acid (H_2SO_4)	NO2, F	G	2.5 L	1	July 2006							
6	Sodium nitrite ($NaNO_2$)	NO2	G	500g	1	Aug. 6, 2006							
7	Chloroform, certified ($CHCl_3$)	NO2	UGR	2.5 L	1								
8	Barium hydroxide octahydrat ($Ba(OH)_2 \cdot 8H_2O$)	NO2	G	500g	1								
9	Triethanol amine ($N(CH_2CH_2OH)_3$)	NO2	G	500ml	1								
10	Sodium azide (NaN_3)	SO2	G	100g	1	Aug. 6, 2006							
12	Hydroclolic acid (HCL)	SO2	G	2.5 L	1								
13	Formaldehyde	SO2	G	2.5 L	1								
14	Sodium hydrogen sulfite 40% Solution (NaHSO3)	SO2	G	1.0L	1								
15	Iodine (0.1 N)	SO2,Ox	—	500ml	1								
16	Sodium sulfate (Na_2SO_4)	SO2	G	500g	1								
17	Mercury (II) chloride ($HgCL_2$)	SO2	G	500g	1								
18	Sodium chloride (NaCL)	SO2	G	1 kg	1								
19	Glycerin ($HOCH_2CHOHCH_2OH$)	SO2	G	1 L	2								
20	Starch, soluble ($(C_6H_{10}O_5)n$)	SO2,Ox	-	1 kg	1								
21	Mercury (II) iodide, red (HgI_2)	SO2	G	100g	1								
22	Sodium thiosulfate pentahydrate ($Na_2S_2O_3 \cdot 5H_2O$)	SO2,Ox	Semi-G	1 kg	1								
23	Potassium iodate (KIO_3)	SO2	G	100g	1	July 2006							
24	Potassium iodide (KI)	SO2	G	1 kg	1								
25	Hydrochloric acid (1 N) (1N-HCL)	SO2	G	1 L	1	Aug. 6, 2006							
26	Sodium fluorid (NaF)	F	G	500g	1								
27	Lanthanum nitrate hexahydrate (La(NO3)3·6H2O)	F	Semi-G	25g	1								
28	Alizarin complexone dihidrate, indicator grade (C19H15 NO8·2H2O)	F	—	1g	1	Aug. 23, 2006							
29	Silicon dioxide (SiO2)	F	G	500g	1	Aug. 6, 2006							
30	Fhosphoric acid (H3PO4)	F	G	2.5L	1								
31	Phenolphthalein (C20H14O4)	F	G	100g	1								
32	Perchloric acid (HCLO4)	F	G	1 L	1	July 2006							
33	Sodium hydroxide, pellets (NaOH)	F	G	1 kg	1								
	Check person												

Operation and Maintenance (O/M) Record of Reagent and Consumables (2)

Check the residue quantity of the reagent four times a year.

The user must report to the management representative promptly when the residue quantity decreases.

[Person in charge:

Management No.	**Name of Reagent**	**Specifications**			Number	Date of Delivery	Expiration date	**Stored no. in the end of Mar.**	**Stored no. in the end of Jun.**	**Stored no. in the end of Sep.**	**Stored no. in the end of Dec.**	**One Year Consumption**	**Remarks (recorder's name)**
		Usage	Quality/ size	Unit									
	اسم الكاشف	استخدامه	لنوعية أو القياسات	الوحدة	العدد	تاريخ الاستلام	تاريخ انتهاء الصلاحية	الكمية المتبقية حتى نهاية شهر آذار	الكمية المتبقية حتى نهاية شهر حزيران	الكمية المتبقية حتى نهاية شهر أيلول	الكمية المتبقية حتى نهاية شهر كانون الأول	الاستهلاك خلال العام	ملاحظات (اسم المسجّل ... الخ)
34	Ammonia solution, 25% (NH4OH)	F	G	2.5 L	1	Aug. 6, 2006							
35	Ammonium acetate, >98% (CH3COONH4)	F	Semi-G	500g	1								
36	Sodium acetate, trihydrate	F	G	500g	1								
37	Acetone (CH3COCH3)	F	G	2.5 L	2								
38	Potassium dihydrogenephosphat (KH2PO4)	Ox	—	500g	1								
39	Disodium hydrogen phosphate-12water (Na2HPO4･12H2O)	Ox	G	1 kg	1								
40	Potassium iodide (KI)	Ox	G	1 kg	1	July 2006							
41	Iodine (I)	Ox, SO2	G	500g	1	Aug. 6, 2006							
42	Nessler's reagent	NH3	-	500ml	1								
43	Methylene blue	H2S	G	100g	1								
44	Phosphoric Acid (H3PO4)	NO2	G	2.5 L	1								
45	Sulfanilamide (H2NC6H4SO2NH2)	NO2	G	500g	1								
46	NO2 Measuring Filter	NO2		20 sheets	90	Aug.2005	1 year in the freezer						
47	NOx Measuring Filter	NOx		20 sheets	45								
48	SO2 Measureing Filter	SO2		20 sheets	90								
49	Glass fiber filter paper	PM	Φ50	100	2	Jan. 2007	-						
50	Quartz fiber filter paper	PM	8'×10'	25	1		-						
51	Glass fiber filter paper	PM	8'×10'	100	2		-						
52	Membrane filter paper	PM/Metal	Φ47	100	2	Aug.2006	-						
Check person													

Operation and Maintenance (O/M) Record of Reagent and Consumables (1)

Check the residue quantity of the reagent four times a year.
The user must report to the management representative promptly when the residue quantity decreases.

[Person in charge:

Management No.	Name of Reagent	Specifications			Number	Date of Delivery	Expiration date	Stored no. in the end of Mar.	Stored no. in the end of Jun.	Stored no. in the end of Sep.	Stored no. in the end of Dec.	One Year Consumption	Remarks (recorder's name)
		Usage	Quality/ size	Unit									
	اسم الكاشف	استخدامه	النوعية أو القياسات	الوحدة	العدد	تاريخ الاستلام	تاريخ انتهاء الصلاحية	الكمية المتبقية حتى نهاية شهر آذار	الكمية المتبقية حتى نهاية شهر حزيران	الكمية المتبقية حتى نهاية شهر أيلول	الكمية المتبقية حتى نهاية شهر كانون الأول	الاستهلاك خلال العام	ملاحظات (اسم المسجّل ... الخ)
1	Acetic acid (CH_3COOH)	NO2	G	2.5 L	1	Aug. 6, 2006							
2	Sulfanilic acid ($H_2NC_5H_4SO_3H$)	NO2	G	100g	1								
3	*N*-(1-Naphthyl) ethylenediamine dihydrochloride For NOx analysis (C10H7NHCH2CH2NH2·2H2O)	NO2	—	25g	1	Aug. 23, 2006							
4	Potassium permanganate For NOx analysis ($KMnO_4$)	NO2	—	1 kg	1	Aug. 6, 2006							
5	Sulfuric acid (H_2SO_4)	NO2, F	G	2.5 L	1	July 2006							
6	Sodium nitrite ($NaNO_2$)	NO2	G	500g	1	Aug. 6, 2006							
7	Chloroform, certified ($CHCl_3$)	NO2	UGR	2.5 L	1								
8	Barium hydroxide octahydrat ($Ba(OH)_2 \cdot 8H_2O$)	NO2	G	500g	1								
9	Triethanol amine ($N(CH_2CH_2OH)_3$)	NO2	G	500ml	1								
10	Sodium azide (NaN_3)	SO2	G	100g	1	Aug. 6, 2006							
12	Hydroclolic acid (HCL)	SO2	G	2.5 L	1								
13	Formaldehyde	SO2	G	2.5 L	1								
14	Sodium hydrogen sulfite 40% Solution (NaHSO3)	SO2	G	1.0L	1								
15	Iodine (0.1 N)	SO2,Ox	—	500ml	1								
16	Sodium sulfate (Na_2SO_4)	SO2	G	500g	1								
17	Mercury (II) chloride ($HgCL_2$)	SO2	G	500g	1								
18	Sodium chloride (NaCL)	SO2	G	1 kg	1								
19	Glycerin ($HOCH_2CHOHCH_2OH$)	SO2	G	1 L	2								
20	Starch, soluble ($((C_6H_{10}O_5)n)$)	SO2,Ox	-	1 kg	1								
21	Mercury (II) iodide, red (HgI_2)	SO2	G	100g	1								
22	Sodium thiosulfate pentahydrate ($Na_2S_2O_3 \cdot 5H_2O$)	SO2,Ox	Semi-G	1 kg	1								
23	Potassium iodate (KIO_3)	SO2	G	100g	1	July 2006							
24	Potassium iodide (KI)	SO2	G	1 kg	1								
25	Nessler's reagent	NH3	-	500ml	1								
26	Methylene blue	H2S	G	100g	1								
27	Phosphoric Acid (H3PO4)	NO2	G	2.5 L	1								
28	Sulfanilamide	NO2	G	500g	1								
29	NO2 Measuring Filter	NO2		20 sheets	90	Aug.2005	1 year in the freezer						
30	NOx Measuring Filter	NOx		20 sheets	45								
31	SO2 Measureing Filter	SO2		20 sheets	90								
32	Glass fiber filter paper	PM	ϕ50	100	2	Jan. 2007	-						
33	Quartz fiber filter paper	PM	8'×10'	25	1		-						
34	Glass fiber filter paper	PM	8'×10'	100	2		-						
35	Membrane filter paper	PM/Metal	ϕ47	100	2	Aug.2006	-						
Check person													

Operation and Maintenance (O/M) Record of Reagent and Consumables (1)

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Management No.	Name of Reagent	Specifications			Number	Date of Delivery	Expiration date	Stored no. in the end of Mar.	Stored no. in the end of Jun.	Stored no. in the end of Sep.	Stored no. in the end of Dec.	One Year Consumption	Remarks (recorder's name)
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3	*N*-(1-Naphthyl) ethylenediamine dihydrochloride For NOx analysis (C10H7NHCH2CH2NH2·2H2O)	NO2	—	25g	1	Aug. 23, 2006							
4	Potassium permanganate For NOx analysis ($KMnO_4$)	NO2	—	1 kg	1	Aug. 6, 2006							
5	Sulfuric acid (H_2SO_4)	NO2, F	G	2.5 L	1	July 2006							
6	Sodium nitrite ($NaNO_2$)	NO2	G	500g	1	Aug. 6, 2006							
7	Chloroform, certified ($CHCl_3$)	NO2	UGR	2.5 L	1								
8	Barium hydroxide octahydrat ($Ba(OH)_2 \cdot 8H_2O$)	NO2	G	500g	1								
9	Triethanol amine ($N(CH_2CH_2OH)_3$)	NO2	G	500ml	1								
10	Sodium azide (NaN_3)	SO2	G	100g	1	Aug. 6, 2006							
12	Hydroclolic acid (HCL)	SO2	G	2.5 L	1								
13	Formaldehyde	SO2	G	2.5 L	1								
14	Sodium hydrogen sulfite 40% Solution (NaHSO3)	SO2	G	1.0L	1								
15	Iodine (0.1 N)	SO2,Ox	—	500ml	1								
16	Sodium sulfate (Na_2SO_4)	SO2	G	500g	1								
17	Mercury (II) chloride ($HgCL_2$)	SO2	G	500g	1								
18	Sodium chloride (NaCL)	SO2	G	1 kg	1								
19	Glycerin ($HOCH_2CHOHCH_2OH$)	SO2	G	1 L	2								
20	Starch, soluble ($(C_6H_{10}O_5)n$)	SO2,Ox	-	1 kg	1								
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23	Potassium iodate (KIO_3)	SO2	G	100g	1	July 2006							
24	Potassium iodide (KI)	SO2	G	1 kg	1								
25	Hydrochloric acid (1 N) (1N-HCL)	SO2	G	1 L	1	Aug. 6, 2006							
26	Sodium fluorid (NaF)	F	G	500g	1								
27	Lanthanum nitrate hexahydrate (La(NO3)3·6H2O)	F	Semi-G	25g	1								
28	Alizarin complexone dihidrate, indicator grade (C19H15 NO8·2H2O)	F	—	1g	1	Aug. 23, 2006							
29	Silicon dioxide (SiO2)	F	G	500g	1	Aug. 6, 2006							
30	Fhosphoric acid (H3PO4)	F	G	2.5L	1								
31	Phenolphthalein (C20H14O4)	F	G	100g	1								
32	Perchloric acid (HCLO4)	F	G	1 L	1	July 2006							
33	Sodium hydroxide, pellets (NaOH)	F	G	1 kg	1								
Check person													

Operation and Maintenance (O/M) Record of Reagent and Consumables (2)

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38	Potassium dihydrogenephosphat (KH2PO4)	Ox	—	500g	1								
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52	Membrane filter paper	PM/Metal	φ47	100	2	Aug.2006	-						
Check person													