



Ministry of Water & Irrigation



Japan International Cooperation Agency

GENERAL INFORMATION

ON

WATER SUPPLY & SEWAGE

THE THIRD COUNTRY TRAINING PROGRAMME FOR IRAQ

JAPAN INTERNATIONAL COOPERATION AGENCY
AND
WATER AUTHORITY, JORDAN

28 NOVEMBER 2004 – 20 MARCH 2005

AMMAN, JORDAN



General Information On
THE THIRD COUNTRY TRAINING PROGRAMME FOR IRAQ
on
WATER SUPPLY AND SEWAGE

I. INTRODUCTION

Japan International Cooperation Agency - JICA and Water Authority Jordan - WAJ will cooperate with each other in organizing a training course in the field of Water Supply and Sewage for Iraq (hereinafter referred to as “the Course”) under JICA’s Third Country Training Programme.

Long lasting conflicts and successive economic sanctions caused water supply and sewage systems in Iraq to become obsolete and malfunctioned.

Compared to the situation before the Gulf War, unit water supply amount was declined by 30% in the urban area and half in the rural area. About 50,000 cubic meter of waste water per day is discharged directly to the river without due treatment. This affected a lot to the people around the region and caused to increase the mortality rate due to diarrhea by 20% for the children under five.

The Government of Japan has supported Iraq reconstruction in this field, i.e. provision of compact water treatment units, water tankers, special vehicles of garbage disposal and sewage cleaning and so forth.

In parallel with those assistances in facilities, it is important to assist institutional and human resources aspects. As revealed in relevant study reports, institutional capacities of water supply and sewage authorities have to be strengthened in line with facility rehabilitation and reconstruction. Among various institutional needs, policy and development planning, and operation & maintenance are the most urgent issues to be tackled with.

In this context, JICA, in cooperation with WAJ, will carry out the Course with the following two main purposes;

1. Capacity building in Operation and Maintenance for Water Supply
2. Capacity building and practice in Policy and Development Planning for Water Supply and Sewage



II. TRAINING OBJECTIVE

The overall goal of the Course is to facilitate smooth reconstruction and rehabilitation process in the sector, and build effective management and operation system in the City of Baghdad.

III. COURSE INFORMATION

The program is been carried out under the supervision and funding of Japan International Cooperation Agency (JICA), in coordination and support of the Water Authority-Ministry of Water & Irrigation of the Hashemite Kingdom of Jordan

Participants will receive several lectures which will be delivered by WAJ Staff and Japanese Experts in Water Supply & in Sewage Treatment



Title of the course:

The Course will be entitled “Water Supply and Sewage”. It consists of two sub-courses:

- (1) Operation and Maintenance for Water Supply (hereinafter referred to as “OMWS”)
- (2) Policy and Development Planning for Water Supply and Sewage (hereinafter referred to as “PPWS”)

Facilities & Institutions:

The Course shall be conducted in Amman and Water Authority’s different facilities & sites.

Duration:

The duration of the Course is about two weeks for OMWS and about four months for PPWS.

Venue:

Radisson SAS Hotel & Water Authority Training Center facilities.





Number of Iraqi participants:

The number of Iraqi participants from Baghdad Mayoralty shall be ten (10) for each sub-course, and twenty (20) in total.

IV. ACCOMMODATION

The Iraqi Officials Delegation will be accommodated at Radisson SAS Hotel, 3rd Circle, Amman.

Hotel accommodation will be covered by JICA on Bed and Breakfast basis only.



V. PER-DIEM

Iraqi officials' delegation will receive 17 Jordanian Dinars for each day of their stay in Jordan, including travel days.

VI. SITE VISITS



The participants will pay site visits arranged by Water Authority.

VII. HEALTH CARE

Life & insurance coverage for all participants shall be provided by JICA Headquarter.

VIII. TRANSPORTATION

Transportation related to the program will be provided by JICA for Airport pick-up & drop-off. During training days; transportation to & from training sites will be provided by WAJ till the end of the training hours only.



PHONE CALLS

The participants should pay for their private local and long distance phone calls.

IX. TERMINAL EVALUATION

An evaluation of the Course will be conducted jointly by the concerned parties in order to examine the level of achievement after the implementation of the Course.

JICA and WAJ shall discuss and might organize further training programmes based on the results of evaluations.

X. CONTACT PERSONS

JICA Jordan Office Iraq Unit: Tel: 5858921/3 Fax: 5858924

ANNEX I	Detailed description of Operation & Maintenance for Water Supply
ANNEX II	Detailed description of Policy and Development Planning for Water Supply and Sewage
ANNEX III	Training Schedule

“Operation and Maintenance for Water Supply (OMWS)”

1. Purpose

The purpose of the Course is to understand up-to-date operation and maintenance system on water supply, and develop action plan for effective operation and maintenance.

2. Objective

Objectives of the training program are as follows:

- (1) To introduce actual operation and maintenance works of water supply facility, its system and training programs in Jordan.
- (2) To increase the knowledge and awareness of water supply operation and maintenance work (O&M).
- (3) To transfer the knowledge for trainees to understand the current situation, to identify the problem, and to prepare the action plan for strengthening the water supply operation and maintenance system.

3. The Curriculum of the Course

Day	Date	Training Item	Person in charge	Training Contents
1	28 Nov. (Sun)	Orientation Introduction of existing water supply O&M management system in Amman	WAJ	Orientation (JICA Training program) General explanation by WAJ
2	29 Nov. (Mon)	Site visit-1: Zarka WTP, Machinery workshop of WAJ in Zarka	WAJ	Site visit on Zarqa water treatment plant, Machinery workshop of WAJ. Briefing on the entire facilities by WAJ
3	30 Nov. (Tue)	Lecture-1: Water network management by GIS Site visit-2: Water network management system through GIS(LEMA)	WAJ/LEMA	Introducing the GIS fundamental, facilitating GIS to water network management. Site visit on water network O&M of by GIS in LEMA office
4	1 Dec. (Wed)	Lecture-2: UFW Planning and its effort to reduce UFW Site visit:2 Pipe leakage and feed back system	WAJ/JICA Experts	UFW Planning and its effort to reduce UFW Site visit to see the pipe leakage and the feed back system
5	2 Dec. (Thu)	Lecture-3: Operation and Maintenance of Water treatment plant.	WAJ/ Training center	Basic understandings of Mechanical, Electrical, Pumps at WTP.
6	3 Dec. (Fri)	Off		
7	4 Dec. (Sat)	Lecture-4: Operation and Maintenance of Water pipes and water network.	WAJ/ Training center	Basic understandings of different types of pipes, welding of pipes, laying the pipes.
8	5 Dec. (Sun)	Lecture-5: Water standards and water quality	WAJ/Lab	Water Quality Standard(WHO), Water Quality Management

		management. Visiting the Laboratory facilities.		Chlorination and safe usage
9	6 Dec. (Mon)	Site visit:3 Operation and Maintenance of Compact Unit.	Local Expert	Site visit O&M of Compact Unit by local consultant in Jordan (Compact Unit owned by private company in Jordan Valley).
10	7 Dec. (Tue)	Lecture-6: Chlorination and safety	WAJ	
11	8 Dec. (Wed)	Workshop-1: *Presentation of the situation of Baghdad Water Sector *Understand the current situation and identify the problem of Water supply O&M system in Baghdad. *Analyze and discuss current situation and issues	Facilitator/W AJ/JICA	*Presentation by Iraqi Participants *Discussion and analysis on current situation and issues *Workshop (WS) facilitation by facilitator, WAJ advisors and JICA experts using PCM method
12	9 Dec. (Thu)	Workshop-2: Prepare the action plan for strengthening the water supply O&M system in Baghdad.	Facilitator/W AJ/JICA	*Develop cause and effect matrix and PDM through mutual discussion *Drafting an action plan (including capacity building plans) for O&M
13	10 Dec. (Fri)	Off		
14	11 Dec. (Sat)	Workshop-3: Presentation by Trainees about "Action plan for strengthening the water supply O&M system in Baghdad"	Facilitator/W AJ/JICA	*Drafting an action plan for O&M *Finalizing an action plan for O&M
15	12 Dec. (Sun)	Evaluation and Closing ceremony	WAJ	Questionnaire Training report preparation

4. Workshop on Water Supply and Sewage

A Workshop will be organized from 8, 9 and 11th of December:

Objectives

Through the OMWS workshop, JICA representatives and the Iraqi participants will be able to:

- ❖ Analyze the OMWS current situation in Baghdad Municipality.
- ❖ Identify the current issues/problems in the OMWS of the municipality.
- ❖ Analyze current issues/problems in the OMWS of the municipality.
- ❖ Identify possible technical cooperation programmes.
- ❖ Define the results (outputs) of the OMWS action plan.
- ❖ Formulate the Action Plan.

Workshop Schedule

Day	Time	Session Subject
8/12	08:00	Workshop opening, objectives and icebreaker
	08:30	Participation (stakeholders) analysis
	09:15	Situation analysis and Problem identification
	11:00	Coffee/Tea break
	11:30	Problem identification
	13:00	Lunch break
	14:00	Problem clustering
	15:00	Coffee/Tea break
	15:15	Problem Analysis (Two working groups)
	16:00	Concluding the 1 st day
9/12	09:00	Reviewing the work of the previous day
	09:15	Problem Analysis
	11:00	Coffee/Tea break
	11:30	Problem tree (Two working groups)
	13:00	Lunch break
	14:00	Objective tree (Two working groups)
	15:00	Coffee/Tea break
	15:15	Objective tree (continuation)
	16:00	Concluding the 2 nd day
11/12	09:00	Reviewing the work of the previous day
	09:15	Defining the development/action plan indicators
	11:00	Coffee/Tea Break
	11:30	Formulating the plan (Two working groups)
	13:00	Lunch break
	14:00	Formulating the plan (continuation)
	15:00	Coffee/Tea Break
	15:15	What is next
	15:45	Workshop evaluation
	16:00	Concluding the workshop

The Facilitators

The two Facilitators to be conducting the workshop are Husni Olama and Mutaz Al-Taher.

Policy & Development Planning For Water Supply & Sewerage System (PPWS)

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1. Introduction

1.1 Background of Programme

The population of 4.8 million of Baghdad Mayoralty (BM), and the neighboring areas are now producing the wastewater of approximately 1.2 million m³/day (2004 est.), much portion of which is being discharged to the Tigris River without treatment. Under the situation, public health and sanitary conditions in the BM are ever-deteriorating and the river water quality becomes worse without effective water pollution control measures. It is also necessary to secure safe and clean water to meet increasing water demand in BM.

In this respect, to improve the water supply and sanitary/environmental conditions, BM requested the Japan International Cooperation (JICA) for technical assistance. In response to the request, the JICA dispatched a team to Jordan, in order to identify the present deteriorated conditions of the water supply and wastewater system in Baghdad, and the need for an immediate water supply and sewerage improvement/rehabilitation programme.

Based upon the investigation results, JICA decided to dispatch the water supply and sewerage experts for technology transfer to Jordan to undertake a technology transfer/training programme to the participants from BM. The scope of work of the survey practice that will be conducted by the participants will be concluded between BM and JICA.

1.2 Purpose/Objectives of Programme

The purpose of this programme is to provide technology transfer/training to the selected personnel of the BM on the water supply and sewerage system improvement plan, and to prepare the bases for developing water supply and sewerage system Master Plan (M/P) and Feasibility Study (F/S) for Baghdad.

In the programme, the participants will study and analyzes the present conditions of the existing water supply and wastewater system and conduct further investigation on the major issues that would be included in the water supply and wastewater facilities improvement plan. More specifically, the major objectives of the programme are to:

- (1) Conduct a technology transfer to the Iraqi counterpart personnel in the course of the Programme;
- (2) Prepare an identification/pre-feasibility plan to formulate the M/P and F/S for the Baghdad water supply and sewerage system as part of the inter-mediate programme (2005-2007); and
- (3) Prepare a pre-feasibility plan to develop an immediate water supply and sewerage system facilities improvement/rehabilitation programme on high priority areas.

2. Contents of Technology Transfer Programme

The technology transfer programme consists of the following:

- (1) Steps, theories and necessity of the feasibility study (F/S);
- (2) Explain the donors/international lending agencies policies and evaluation standards for grants and loan procedures, with explanation of F/S preparation guidelines;
- (3) Identify and understand of the necessary items for undertaking the specific water supply

- and sewerage programmes; and
- (4) Plan an implementation programme for investigation and collection of the necessary data and information.

3. Programme Stages

In order to achieve the goal of the Programme, the Programme will be carried out in the three consecutive stages:

Stage-1: The preparatory work and technology transfer/training programme are scheduled to commence in late-November 2004 lasting about two weeks.

In principle, the work will include:

- (1) Discussions on the items to be investigated and theories relative to the M/P and F/S (Case study);
- (2) Extraction of problems involved in the Baghdad water supply and wastewater system, listing-up of the exact procedures for solving such problems;
- (3) Listing-up the necessary investigation/survey items for the selected programme; and
- (4) Site visits for the facilities and administrative system of Amman City water supply and wastewater systems;

Stage-2: This stage will take place from mid-January through early-March 2005. Throughout the period, the participants will stay in Baghdad, and carry out data collection and basic survey with regard to the project selected under Stage-1; based on the results of which, a draft report will be prepared.

During this stage, the trainees will be invited once to Amman to confirm the progress of such work, and discuss the results of investigation with the Consultants, so as to secure the accuracies of the investigation results.

While the Consultants are not present in Amman, exchange of discussions, enquiries, views, etc., may be made between the both parties via e-mails or other appropriate means.

Stage-3: About two weeks from the early March 2005. The Basic Investigation Report will be provided based on the collected data and results of investigations obtained during Stage-2.

4. General Approach

The Consultants will undertake the technology transfer/training programme consistent with those required by the Terms of Reference (TOR) by JICA.

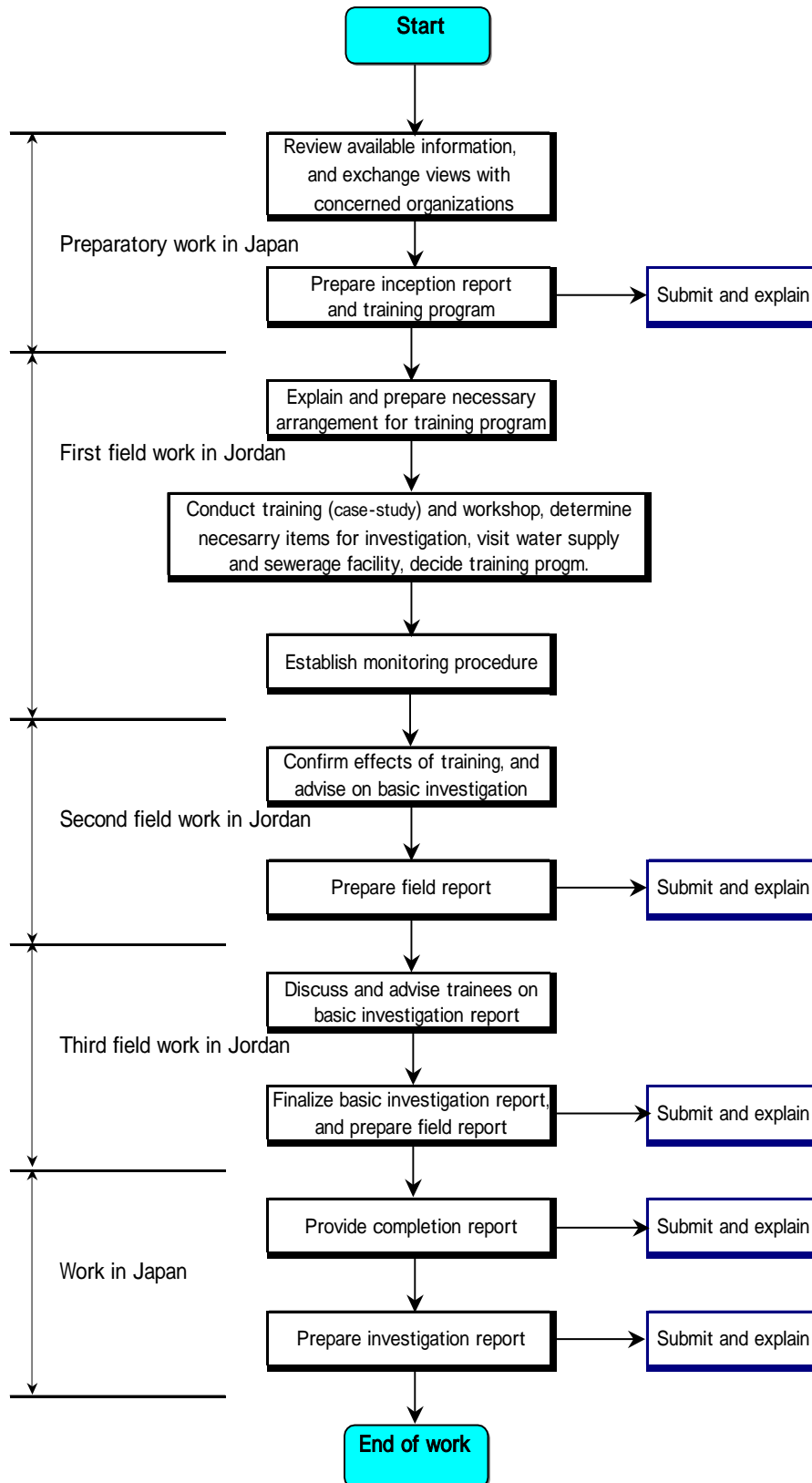
The Consultants will provide a necessary identification plan as the basis for developing the M/P and (F/S) on the Baghdad water supply and wastewater system; including an urgent improvement programme.

The scope of the Consultants' services is, therefore, to verify, clarify and summarize available existing information in a systematic manner and identify the main issues, which need to be addressed to improve the situation, but not to undertake substantial original data generation.

5. Study Schedule

The major study items and processes at each study stage are shown in the attached diagram:

Flow of Water Supply & Sewerage System Plan and Technology Transfer Programme



6. Schedule of Programme

Stage-1: Theory of Policy and Development Planning (Water Supply)

Day	Date	Training Item	Person in charge	Training Contents
1	28 Nov. (Sun)	Orientation Lecture-1 Overview of Master Plan Formulation	JICA Experts	Orientation Lecture on M/P (General)
2	29 Nov. (Mon)	Site Visit-1 Zarqa water treatment plant in Amman	WAJ	1) Site visit on Zarqa water treatment plant, 2) Briefing of the entire facilities by WAJ
3	30 Nov. (Tue)	Site Visit-2 Introduction of Existing water supply facilities in Amman Site visit on water management system through GIS (LEMA)	WAJ	1) General explanation by WAJ 2) Site investigation of LEMA system 3) Briefing of the water management system under LEMA
4	1 Dec. (Wed)	Lecture-2 Water Supply Plan / Water Quality / Water Resources	Experts	1) Type of water supply system 2) population / demand forecast 3) WHO water quality guideline 4) Quality control & disinfection technologies 5) type, cause, countermeasures on water contamination 6) selection of water sources 7) water sources development planning
5	2 Dec (Thu)	Lecture-3 Water Supply Facilities (1/2)	Experts	1) Intake/transmission facilities 2) Purification facilities 3) Disinfection facilities 4) Sludge treatment facilities 5) Desalination facilities 6) Membrane filtration facilities 7) Distribution facilities
6	3 Dec. (Fri)	Off		
7	4 Dec. (Sat)	Lecture-4 Water Supply Facilities (2/2)	Experts	1) Pump facilities 2) Electric facilities 3) Control / monitoring system 4) Water service equipment 5) Selection of optimum planning 6) Rehabilitation of water supply facilities
8	5 Dec (Sun)	Lecture-5 Feasibility Study	Experts	1) Design of water supply facilities 2) Cost estimation / financial plan 3) Financial analysis (B/C, NPV, FIRR) 4) Environmental assessment 5) Project evaluation
9	6 Dec. (Mon)	Lecture-6 Institutional Plan	Experts	1) Institutional planning 2) Water tariff planning 3) Organization planning
10	7 Dec. (Tue)	Case Study-1 Introduction of Example of Feasibility Study on water supply project	Experts	1) Introduction of example of feasibility study for the other country
11	8 Dec.	Workshop-1:	Facilitator/W	*Presentation by Iraqi Participants

	(Wed)	*Presentation of the situation of Baghdad Water Sector *Understand the current situation and identify the problem of water supply system in Baghdad.	AJ/JICA	*Learn PCM method *Discussion and analysis on current situation and issues *Workshop (WS) facilitation by facilitator, WAJ advisors and JICA experts
12	9 Dec. (Thu)	Workshop-2 Priority assessment to the identified issues and proposals on the countermeasures with time frame	Facilitator/W AJ/JICA	*Identify priority projects through discussion *Workshop (WS) facilitation by facilitator, WAJ advisors and JICA experts using PCM method
13	10 Dec. (Fri)	Off		
14	11 Dec. (Sat)	Workshop-3 *Identification of items on field investigation / data collection for Stage-2 for the specific project. *Identification of a contents of the final report	Facilitator/W AJ/JICA	*Develop TOR of field survey and finalizing it. *Determine contents draft for final report. *Prepare minutes of meeting for the field survey and other relevant issues.
15	12 Dec. (Sun)	Evaluation and Closing Ceremony	JICA/WAJ	*Evaluation and signing a minutes of understanding

Stage-1: Theory of Policy and Development Planning (Sewage)

Day	Date	Training Item	Person in charge	Training contents
1	28 Nov. (Sun)	Orientation Lecture-1 Overview of Master Plan Formulation	JICA Experts	Orientation Lecture on M/P (General)
2	29 Nov. (Mon)	Lecture-2 Sewerage Plan	Expert	1) Sewage Treatment system 2) Setting of target area 3) Population / demand forecast 4) Sewage volume, contamination degree planning 5) Sewage inflow planning 6) Sewage quality and treatment quality plan 7) Industrial wastewater treatment plan
3	30 Nov. (Tue)	Site Visit-3 Site visit on water management system through GIS (LEMA)	WAJ	1) General explanation by WAJ 2) Site investigation of LEMA system 3) Briefing of the water management system under LEMA
4	1 Dec. (Wed)	Lecture-3 Sewerage Facility Plan	Expert	1) Selection of Sewage Treatment type/method 2) Sewerage network plan 3) Pump facilities 4) Wastewater treatment plant (primary settling basin , aeration tank , final settling basin) 5) Sludge treatment facilities
5	2 Dec (Thu)	Lecture-4 Feasibility Study	Experts	1) Design of sewerage facilities 2) Cost estimation / financial plan 3) Construction schedule 4) Financial analysis(B/C, NPV, FIRR) 5) Socio-environmental assessment 6) Project evaluation
6	3 Dec.	Off		

	(Fri)			
7	4 Dec. (Sat)	Site Visit-1 *Introduction of Existing water supply facilities in Amman *Site Observation of Aqaba wastewater treatment plant	WAJ	1) Site investigation of existing wastewater treatment plant 2) Briefing by WAJ for the function of the existing facilities 3) <u>Stay at Aqaba</u>
8	5 Dec (Sun)	Site Visit-2 Site Observation of Aqaba wastewater treatment plant	WAJ	Same as Day 7 <u>Back to Amman</u>
9	6 Dec. (Mon)	Lecture-5 Institutional Plan	Experts	1) Operation and Management Plan, Human resources development plan 2) Sewerage tariff setting, tariff collecting system plan 3) Institutional plan
10	7 Dec. (Tue)	Case Study-1 Introduction of Example of Feasibility Study on wastewater treatment project	Experts	1) Introduction of example of feasibility study for the other country
11	8 Dec. (Wed)	Workshop-1 Identification of problems/issues on current sewerage system in Baghdad	Facilitator / Experts / Other guests	*Presentation by Iraqi Participants *Learn PCM method *Discussion and analysis on current situation and issues *Workshop (WS) facilitation by facilitator, WAJ advisors and JICA experts
12	9 Dec. (Thu)	Workshop-2 Priority assessment to the identified issues and proposals on the countermeasures with time frame	Facilitator / Experts / Other guest	*Identify priority projects through discussion *Workshop (WS) facilitation by facilitator, WAJ advisors and JICA experts using PCM method
13	10 Dec. (Fri)	Off		
14	11 Dec. (Sat)	Workshop-3 *Identification of items on field investigation / data collection for Stage-2 for the specific project. *Identification of a contents of the final report	Facilitator / Experts	*Develop TOR of field survey and finalizing it. *Determine contents draft for final report. *Prepare minutes of meeting for the field survey and other relevant issues.
15	12 Dec. (Sun)	Evaluation and Closing Ceremony	JICA/WAJ	*Evaluation and signing a minutes of understanding

Workshop Schedule

During the stage one, the three-day workshop will be held in order to present current status and identify priority needs in participatory manner.

Objectives:

Through the PPWS workshop, JICA representatives and the Iraqi participants will be able to:

- ❖ Analyze the PPWS (water supply and sewage) current situation in Baghdad Municipality.
- ❖ Identify the current issues/problems in the PPWS of the municipality.
- ❖ Analyze current issues/problems in the PPWS of the municipality.
- ❖ Identify priority projects to be tackled with in the survey.
- ❖ Define the results (outputs) of the OMWS development plan.
- ❖ Formulate outlines of a development plan and Terms of Reference for Baghdad work in the

- form of survey plan.
- ❖ Identify possible technical cooperation programmes.
 - ❖ Identify contents of the final report that will be issued at the end of the training.

Workshop Schedule

Each of the two workshops will run according to the suggested following schedule:

Day	Time	Session Subject
8/12	08:00	Workshop opening, objectives and icebreaker
	08:30	Participation (stakeholders) analysis
	09:15	Situation analysis and Problem identification
	11:00	Coffee/Tea break
	11:30	Problem identification
	13:00	Lunch break
	14:00	Problem clustering
	15:00	Coffee/Tea break
	15:15	Problem Analysis (Two working groups)
	16:00	Concluding the 1 st day
9/12	09:00	Reviewing the work of the previous day
	09:15	Problem Analysis
	11:00	Coffee/Tea break
	11:30	Problem tree (Two working groups)
	13:00	Lunch break
	14:00	Objective tree (Two working groups)
	15:00	Coffee/Tea break
	15:15	Objective tree (continuation)
	16:00	Concluding the 2 nd day
11/12	09:00	Reviewing the work of the previous day
	09:15	Defining the development/action plan indicators
	11:00	Coffee/Tea Break
	11:30	Formulating the plan (Two working groups)
	13:00	Lunch break
	14:00	Formulating the plan (continuation)
	15:00	Coffee/Tea Break
	15:15	What is next
	15:45	Workshop evaluation
	16:00	Concluding the workshop

Stage-2: Reporting and instruction of Field Survey (Water Supply/Sewerage Plan)

Day	Date	Training Item	Person in charge	Training contents
1	26 Jan. (Wed)	Orientation <u>Presentation and discussion on field survey</u>	Iraqi Participants and Japanese Experts	Orientation Presentation and discussion
2	27 Jan. (Thu)	<u>Presentation and discussion on field survey</u>	Iraqi Participants and Japanese Experts	Presentation and discussion
3	28 Jan. (Fri)	Off		
4	29 Jan. (Sat)	<u>Presentation and discussion on field survey</u>	Iraqi Participants and Japanese Experts	Presentation and discussion
5	30 Jan. (Sun)	<u>Instruction and revision of field survey plan</u>	Iraqi Participants and Japanese Experts	Discussion and instruction
6	31 Jan. (Mon)	<u>Finalize the field survey plan</u>	Iraqi Participants	Presentation and instructions

Stage-3: Examination and Discussion of the Survey Result (Water Supply/Sewerage Plan)

Day	Date	Training Item	Person in charge	Training Contents
1	6 Mar. (Sun)	Orientation	JICA	Explanation of overall schedule for Stage-3
2	7 Mar. (Mon)	<u>Lecture-1</u> Flow of feasibility study and items to be investigated.	Experts	Necessity and Theory of Feasibility Study
3	8 Mar. (Tue)	<u>Lecture-2</u> How to prepare the bankable report ?	Experts	Requirements / evaluation criteria of donor agencies for project finance
4	9 Mar. (Wed)	<u>Lecture-3</u> Socio-environmental issues to be clarified in the feasibility study	Experts	Explanation of EIA guideline of international donors
5	10 Mar. (Thu)	<u>Presentation-1</u> Presentation of the results of field investigation / data collection for specified water supply project	Trainee Experts	Presentation by Trainee Discussion
6	11 Mar. (Fri)	Off		
7	12 Mar. (Sat)	<u>Presentation-2</u> Presentation of the results of field investigation / data collection for specified sewerage treatment project	Trainee Experts	Presentation by Trainee Discussion
8	13 Mar. (Sun)	<u>Office work</u> Finalization of pre-feasibility study report of the specified project	Trainee / Experts	Finalization of pre-feasibility report (Implementation program for the specified project)

9	14 Mar. (Mon)	Ditto-2	ditto	ditto
10	15 Mar. (Tue)	Ditto-3	ditto	ditto
11	16 Mar. (Wed)	Ditto-4	ditto	ditto
12	17 Mar. (Thu)	Ditto-5	ditto	ditto
13	18 Mar. (Fri)	Off		
14	19 Mar. (Sat)	Office work Finalization of pre-feasibility study report of the specified project	Trainee / Experts	Finalization of pre-feasibility report (Implementation program for the specified project)
15	20 Mar. (Sun)	Closing Ceremony Action plan formulation for the project implementation	JICA / Experts / Trainee	1) Training report preparation 2) Presentation (15min.each) by trainees

7. Data/Information to be Collected

Some of the basic data and information on the Baghdad water supply and sewerage system have already been available: however, if any additional data and information are obtainable, the following data and information may be collected and analyzed for the forthcoming studies. Participants are requested to prepare a situation report containing following items about the BM:

(1) General Information

- Climate; average, maximum, minimum temperature;
- Annual, daily and hourly precipitations;
- Land-use conditions;
- Area of forest;
- Population (current data and tendency of past 10 years);
- Annual quantity of fresh water intake; total quantity, ratio of total annual qty. to total qty. of water resources (%);
- Current data and tendency of past 10 years on water supply qty. per person/ per day, average and maximum water supply qty. per day., and accounted and unaccounted for water;
- Ratio of population having access to safe water and sewerage system;
- Supplying sector (households, factories, farmers...) and water use purposes (Drinking, cooking, bathing, toilet flush, etc.);
- Water distribution ability and wastewater treatment capacity, per-day and per-person;
- Available chlorine concentration;
- Water quality (drinking and wastewater);
- Quantity of wastewater production (peak, max. daily, average daily);
- Influent wastewater quality to sewerage;
- Treated effluent wastewater quality;
- Infiltration/inflow rate to sewerage;
- Industrial wastewater productions;
- Wastewater discharge quality standards;
- The latest existing topographical maps and geological data will be collected to conduct the field reconnaissance and use them for planning of sewer mains routes, pumping station

location, candidate sites of wastewater treatment plant, etc.;

- Actual hygienic status such as incidence rate of water-borne diseases in the past and at the present in the study area, outbreak areas, health conditions of residents and countermeasures for preventing water borne diseases.

(2) Existing institutional system, facilities and development plans for water supply and sewerage system.

- Institutions, regulations, law and organizational structures;
- Facility (reservoirs, water treatment plants, distribution systems, water quality control facilities, laboratories, pump systems, sewage treatment plants and other related facilities) maps and data;
- Operation, maintenance (O&M) and management systems and plans;
- Tariff, metering and charging system;
- Annual reports of water supply and sewage for last 5 years at least;
- Development master plans or relevant plans;
- Unit costs for construction of treatment plant, distribution pipes and other auxiliaries;
- Solid wastes disposal information for the present status and future plan of collection of solid waste in the city.

(3) Issues and countermeasures

- Present issues and topics to be tackled;
- Priority projects (institutional issues and facility issues) countermeasures and future plans

8. Approach to M/P and F/S Formulation

To improve the present deteriorated water supply and sanitary/environmental conditions and to alleviate the river water pollution, the existing M/P may need to be revised and updated. Such plan will call for the following activities:

Water Supply

- Development plan of water supply facilities to meet future water demand;
- Reduction programme of UFW (Unaccounted-for water) for sound operation of Baghdad water supply;
- Plan of metering for effective operation of the system and for saving water;
- Implementation an immediate programme of rehabilitation and development of the water supply system.

Sewerage

- Pollutant loads reduction plan necessary to meet the target river water quality;
- Plans for sewerage development, together with industrial wastewater treatment, necessary to achieve the pollution load reduction;
- River water quality management plan needed to promote the above sewerage development, and to sustain the target river quality; and
- Implementation an immediate programme of rehabilitation of the sewerage system.

9. Field Study Report

An English report will be drawn up at the end of Stage-III of the programme.

The reports will cover, inter alia, outline of data and information collected and analyses made thereon; and results of investigations made on the water supply and sewerage system improvement projects.

TENTATIVE SCHEDULE FOR WATER SUPPLY AND SEWAGE TRAINING

date	training schedule	day	month/year	date	schedule	day	month/year	date	schedule	day	month/year	date	schedule	day	month/year
1-Nov		Mon		1-Dec	Wed	4		11-Jan	Sat			1-Feb	Tue	Departure for Baghdad	10
2-Nov		Tue		2-Dec	Thu	5		12-Jan	Sun			2-Feb	Wed		
3-Nov		Wed		3-Dec	Fri	6		13-Jan	Mon			3-Feb	Thu		
4-Nov		Thu		4-Dec	Sat	7		14-Jan	Tue			4-Feb	Fri		
5-Nov		Fri		5-Dec	Sun	8		15-Jan	Wed			5-Feb	Sat		
6-Nov		Sat		6-Dec	Mon	9		16-Jan	Thu			6-Feb	Sun		
7-Nov		Sun		7-Dec	Tue	10		17-Jan	Fri			7-Feb	Mon		
8-Nov		Mon		8-Dec	Wed	11		18-Jan	Sat			8-Feb	Tue		
9-Nov		Tue		9-Dec	Thu	12		19-Jan	Sun			9-Feb	Wed		
10-Nov		Wed		10-Dec	Fri	13		20-Jan	Mon			10-Feb	Thu		
11-Nov		Thu		11-Dec	Sat	14		21-Jan	Tue			11-Feb	Fri		
12-Nov		Fri		12-Dec	Sun	15		22-Jan	Wed			12-Feb	Sat		
13-Nov		Sat		13-Dec	Mon	16		23-Jan	Thu			13-Feb	Sun		
14-Nov		Sun		14-Dec	Tue	17		24-Jan	Fri			14-Feb	Mon		
15-Nov		Mon		15-Dec	Wed	18		25-Jan	Sat			15-Feb	Tue		
16-Nov		Tue		16-Dec	Thu	19		26-Jan	Sun			16-Feb	Wed		
17-Nov		Wed		17-Dec	Fri	20		27-Jan	Mon			17-Feb	Thu		
18-Nov		Thu		18-Dec	Sat	21		28-Jan	Tue			18-Feb	Fri		
19-Nov		Fri		19-Dec	Sun	22		29-Jan	Wed			19-Feb	Sat		
20-Nov		Sat		20-Dec	Mon	23		30-Jan	Thu			20-Feb	Sun		
21-Nov		Sun		21-Dec	Tue	24		31-Jan	Fri			21-Feb	Mon		
22-Nov		Mon		22-Dec	Wed	25		1-Feb	Tue			22-Feb	Tue		
23-Nov		Tue		23-Dec	Thu	26		2-Feb	Wed			23-Feb	Wed		
24-Nov		Wed		24-Dec	Fri	27		3-Feb	Thu			24-Feb	Thu		
25-Nov		Thu		25-Dec	Sat	28		4-Feb	Fri			25-Feb	Fri		
26-Nov		Fri		26-Dec	Sun	29		5-Feb	Sat			26-Feb	Sat		
27-Nov	Departure from Baghdad			27-Dec	Mon	30		6-Feb	Sun			27-Feb	Sun		
28-Nov	Opening ceremony and introduction	1		28-Dec	Tue	31		7-Feb	Mon			28-Feb	Mon		
29-Nov	Technical Training	2		29-Dec	Wed			8-Feb	Tue			29-Feb	Tue		
30-Nov		3		30-Dec	Thu			9-Feb	Wed			30-Feb	Wed		
				31-Dec	Fri			10-Feb	Thu			31-Feb	Thu		
								11-Feb	Fri						
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								31-Feb	Thu						
								1-Mar	Fri						
								2-Mar	Sat						
								3-Mar	Sun						
								4-Mar	Mon						
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								29-Mar	Fri						
								30-Mar	Sat						
								31-Mar	Sun						

Date	Day	<u>Operation and Maintenance for Water Supply</u> 10 Iraqis	<u>Theory of Policy and Development Planning (Water Supply Plan)</u> 5 Iraqis	<u>Theory of Policy and Development Planning (Sewage Treatment Plan)</u> 5 Iraqis
27-Nov	Sat	Departure from Baghdad & Arrival in Amman		
28-Nov	Sun	Opening Ceremony & Orientation		
		Introduction of existing water supply O&M management system in Amman	Lecture-1 Overview of Master Plan Formulation	Lecture-1: Overview of Master Plan Formulation
29-Nov	Mon	Site visit-1: Zarka WTP, Machinery workshop of WAJ in Zarka	Site Visit-1 Zarqa water treatment plant in Amman	Lecture-2: Sewerage Plan
30-Nov	Tue	Lecture-1: Water network management by GIS Site visit-2: Water network management system through GIS(LEMA)	Site Visit-2 Introduction of Existing water supply facilities in Amman - Site visit on water management system through GIS (LEMA)	Site Visit-3: Site visit on water management system through GIS (LEMA)
1-Dec	Wed	Lecture-2: UFW Planning and its effort to reduce UFW Site visit:2 Pipe leakage and feed back system	Lecture-2 Water Supply Plan / Water Quality / Water Resources	Lecture-3: Sewerage Facility Plan
2-Dec	Thu	Lecture-3: Operation and Maintenance of Water treatment plant.	Lecture-3 Water Supply Facilities (1/2)	Lecture-4: Feasibility Study
3-Dec	Fri	Off	Off	Off
4-Dec	Sat	Lecture-4: Operation and Maintenance of Water pipes and water network.	Lecture-4: Water Supply Facilities (2/2)	Site Visit-1: *Introduction of Existing water supply facilities in Amman *Site Observation of Aqaba wastewater treatment plant
5-Dec	Sun	Lecture-5: Water standards and water quality management. Visiting the Laboratory facilities.	Lecture-5 Feasibility Study	Site Visit-2: Site Observation of Aqaba wastewater treatment plant
6-Dec	Mon	Site visit:3: Operation and Maintenance of Compact Unit.	Lecture-6 Institutional Plan	Lecture-5: Institutional Plan
7-Dec	Tue	Lecture-6: Chlorination and safety	Case Study-1: Introduction of Example of Feasibility Study on water supply project	Case Study-1: Introduction of Example of Feasibility Study on wastewater treatment project
		Workshop		
8-Dec	Wed	Workshop-1: *Presentation of the situation of Baghdad Water Sector *Understand the current situation and identify the problem of Water supply O&M system in Baghdad. *Analyze and discuss current situation and issues	Workshop-1: *Presentation of the situation of Baghdad Water Sector *Understand the current situation and identify the problem of water supply system in Baghdad.	Workshop-1: Identification of problems/issues on current sewerage system in Baghdad
9-Dec	Thu	Workshop-2: Prepare the action plan for strengthening the water supply O&M system in Baghdad.	Workshop-2: Priority assessment to the identified issues and proposals on the countermeasures with time frame	Workshop-2: Priority assessment to the identified issues and proposals on the countermeasures with time frame
10-Dec	Fri	Off	Off	Off
11-Dec	Sat	Workshop-3: Presentation by Trainees about "Action plan for strengthening the water supply O&M system in Baghdad"	Workshop-3: *Identification of items on field investigation / data collection for Stage-2 for the specific project. *Identification of a contents of the final report	Workshop-3: *Identification of items on field investigation / data collection for Stage-2 for the specific project. *Identification of a contents of the final report
12-Dec	Sun	Evaluation and Closing ceremony		
13-Dec	Mon	Departure from Amman & Arrival in Baghdad		