

**Sustainable Development of Drylands  
in Asia and the Middle East:  
Jordan Component**

**Jordan Visit Report**  
April 6, 2005 To April 13, 2005

**Report Number  
2005-002**

**Prepared**

**by**

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# I. Introduction

As a follow up to the Jordan component of the Sustainable Development of Dry Lands Project Dr. Tamimi traveled to Jordan during the period extending from April 6 to April 13, 2005.

Most of the objectives for the trip were met except for the work associated with the Wadi Mousa activities. As discussed in the report, the Wadi Mousa activities were on hold and USAID provided a go ahead via an email to continue working on the activities. However, it is felt that more discussions are needed between BRDC, the project Director: Mr. Freitas, and the involved technical assistance team members working on the activities.

This document is considered as the trip report submitted to The University of Arizona / International Arid Lands Consortium and can serve as the minutes of meetings held in Jordan and for documentation purposes.

# II. Objectives

The objectives of the trip are as follows:

- 1) Visit the US Agency for International Development (USAID) and discuss with them the following issues:
  - a. Rusaifah Site Remediation Project
  - b. Present Reports' CD
  - c. Present a copy of U of A Ag Experiment Station Research Report: Water Conserving Garden Article
  - d. Wadi Mousa Activities Status:
    - i) Landscape Master Plan
    - ii) Awareness Center
  - e. ASEZA Activities
    - i) Reclaimed Water Balance for Aqaba
    - ii) Irrigation System Design for WCG
    - iii) Irrigation System Design for City of Aqaba
  - f. Anaerobic Wastewater Treatment Workshop/Field Trip - Egypt
  - g. Recycled Water and Biosolids Conference at NCARTT
2. Visit NCARTT & CDM to accomplish the following:
  - a. Obtain Information about June Conference at NCARTT
3. Visit Dr. Bassam Hayek and his staff at Royal Scientific Society (RSS) to discuss the following:
  - a. Discuss Status of Met Station in Irbid
  - b. Visit Biosolids Application Experiment
  - c. Discuss Biosolids Characterization Papers – Bayan
  - d. Discuss current Characterization of Irbid's biosolids
4. Visit Dr. Ziad Ghazawi at Jordan University of Science and Technology (JUST) and:

- a. Finalize reimbursement of Pakistan Salinity Conference
  - b. Check on TEEAL Update and usage
5. Revisit the task of developing the Tender Documents for Wadi Mousa Awareness Center in relation with the following and discuss them with BRDC:
  - a. Work with BRDC and the Architect on plans
  - b. Work with BRDC on inviting Tenders for developing Tender Documents using Akrum's SOW developed earlier
  - c. Review previously developed procedure with BRDC for developing the Tender Documents and start implementing them.

### **III. Tasks and Visits**

In this section, the different objectives and visits are discussed in details.

#### **1) US Agency for International Development (USAID)**

A visit to USAID headquarters was scheduled for Thursday, April 7, 2005 between 9:00 a.m. and 11:00 a.m. Dr. Saad Al-Ayyash from BRDC, Dr. Akrum Tamimi from IALC and Mr. Jim Franckiewicz and Dr. Amal Hijazi from the USAID-Amman Mission were present during the meeting.

The following subjects were discussed in details.

##### **a. Rusaifah Site Remediation Project**

Dr. Tamimi stated that the Rusaifah project was presented to the Technical Assistance Team (TAT) for the Sustainable Development of Dry Lands Project in Tucson on March 11, 2005. All members of the team showed interest in working on the project.

Dr. Tamimi presented the capabilities available within The University of Arizona/IALC, the Jordanian partners and the technical assistance team that includes but not limited to the following:

- Dr. Janick Artiola from Department of Soil, Water and Environmental Sciences (SWES) at The University of Arizona who worked on similar project in the US and is a soil radiation specialist.
- Dr. Chuck Gerba from the SWES department who is a world renown microbiologist who would provide his expertise in the health side issues related to the project.
- Dr. Allen Matthias is an air modeling specialist from SWES department.
- Dr. Akrum Tamimi, Dr. Pete Waller, Dr. Don Slack and other faculty members from the department of Agricultural and Biosystems Engineering who are irrigation specialists and can assist in the re-vegetative aspect of the project including irrigation system designs.
- Dr. Margaret Livingston, a professor at the School of Landscape Architecture is a well-known professor in the area of landscape and xeroscape architecture.
- Faculty and staff members of Jordanian institutions partners.
- The GIS/Remote Sensing unit and its staff at the Office of Arid Lands Studies at The University of Arizona.
- The GIS unit available at the Safawi field office of the Badia Research and Development Center (BRDC) in Jordan.

In addition, Dr. Tamimi indicated that the Sustainable Development of Dry Lands Project is willing to provide technical assistance to the Rusaifah project through the current cooperative agreement. He indicated that the distinction between The University of Arizona/IALC and any contractor who would work on the Rusaifah project is the fact that The University of Arizona/IALC will work with the Jordanian partners and will not just do a contract job and leave as the case in many similar projects. The University of Arizona/IALC will provide an excellent service and will be there standing by what is committed for years to come.

Mr. Jim Franckiewicz indicated the following:

1. Due to the fact that the money that will be spent on the Rusaifah project will be coming from the environmental office within USAID – Amman Mission, the Jordan Government primary partner has to be the Ministry of Environment. A new environmental minister has been appointed with the name of Khalid Irani and has a very good reputation on working and delivering on environmental issues.
2. Other partners would include the following:
  - Ministry of Municipalities
  - The Mayor of the City of Rusaifah
  - Greater Amman Municipality
  - The Phosphate Company
3. The project will start with a one day kick off workshop in the fall of 2005 that will be held by the Ministry of Environment and the Ministry of Planning to fulfill the following objectives:
  - Make all concerned parties aware of the project. The parties that will be invited are: United Nations, European Union, the Japanese: JICA, all parties listed in item 2 above, Ministry of Planning, Ministry of Finance, a Royal representative to be determined by the Sustainable Development of Dry Lands Project primary Jordanian partner.
  - Encourage all participants to help in establishing an endowment to implement the plans that will be developed by The University of Arizona/IALC.
  - Get expressions of interest from the different bodies invited to the workshop.
  - Provide a big splashy event for public relations purposes.

It was suggested that the Sustainable Development of Dry Lands Project will present a design proposal that will show the current situation and the proposed activities that will take place.

4. It was also indicated by USAID that the Rusaifah project will be an add-on activity. A phased approach proposal would be developed starting June 2005 and will be ready by the end of the summer: August 15, 2005. The proposal will be used to develop the presentation in the previously mentioned one day kick off workshop.

5. Mr. Jim Franckiewicz indicated that the Amman Mission buy-in into the Sustainable Development of Dry Lands Project for year 2005/2006 will be a total of \$250K and the same amount will be provided for the year 2006/2007. This money will be spent solely on the Rusaifah project and will be the only money provided by the mission as a buy-in into the Sustainable Development of Dry Lands Project for the next two years.
6. Dr. Tamimi indicated that the understanding and the impression that he and Mr. Robert Freitas got during the January meeting with USAID – Mission in Amman is different. He explained that the Rusaifah project is thought about as an add-on activity that will be added to the other activities that are and will be taking place in the following years. And hence the money allocated to the Rusaifah project will be \$250K per year for two years plus the agreed upon mission buy-in of \$400K for the year 2005/2006 and \$500K for the year 2006/2007.
7. Dr. Tamimi also indicated that if this is the case that means that the Sustainable Development of Dry Lands project would likely have to stop all programmed activities for the next two years even though the project has committed itself to different activities providing technical assistance to the reuse of the recycled water implementation project in Jordan.
8. Dr. Amal Hijazi indicated that the other project activities can be funded from the \$390K core money allocated for Jordan. She showed the year 1 budget that broadcasted that much money to the Jordan component of the project which was never realized due to the lack of increase of the committed funds for the project from USAID - Washington. Dr. Tamimi indicated immediately that these funds were never allocated for the Sustainable Development of Dry Lands Project by Washington and what is allocated for Jordan now is in the neighborhood of \$270K.
9. Mr. Jim Franckiewicz indicated that the figures shown above are what he intended to say and he thought he made himself clear during the January meeting with Dr. Tamimi and Mr. Freitas. He also indicated that the mission is very stressed on funds and the supplemental money he gets from Washington will probably go directly to the ministry of finance without USAID mission even laying a hand on it.
10. Dr. Tamimi at this point indicated that this issue has to be discussed with Mr. Freitas.
11. Mr. Jim Franckiewicz requested that the issue be discussed further with Mr. Freitas and within IALC and different scenarios be presented to USAID for funding year 3 of 4 and year 4 of 4 years the life of the project. The scenarios should include the activities that will be funded from the core money and those that will be funded from the mission buy-in. The scenarios should be based on the following mission buy-in figures: \$250K dedicated to Rusaifah; \$400K dedicated to Rusaifah and other activities; and \$650K being \$400K for project activities + \$250K dedicated for Rusaifah.

12. Dr. Tamimi promised to discuss the issue with Mr. Freitas and then another meeting be set up between IALC and USAID. Project Director Freitas has subsequently indicated that he will be available to travel for a consultation with the USAID Mission in Amman on July 6<sup>th</sup>-7<sup>th</sup>.

#### **b. Present Reports' CD**

During a previous meeting with USAID – Mission in Amman, Mr. Jim Franckiewicz requested better communication between the mission and the IALC project. Mr. Freitas promised that the IALC project will supply the USAID mission with complete reports from the previous year.

Dr. Tamimi was planning to deliver the CD but due to technical difficulties the CD was not ready. Dr. Tamimi indicated that the CD will be available and will be provided to USAID in the next meeting in a month or so. Dr. Tamimi is intending to add all the new reports to the CD and have it ready for the next visit to Jordan.

#### **c. Present a copy of U of A Ag Experiment Station Research Report: Water Conserving Garden Article**

Dr. Tamimi presented a copy of The University of Arizona Agricultural Experiment Station Research report to USAID. The magazine has a long article about the water conserving garden that has been designed for ASEZA. The article is the center piece of that report.

Mr. Jim Franckiewicz commented on the article and wished for it to be implemented in Aqaba. Dr. Tamimi indicated that he is planning to visit ASEZA and encourage them to budget for the implementation of the garden in next year's budget.

USAID were happy to see that the article acknowledged USAID funding.

#### **d. ASEZA Activities**

##### **i) Reclaimed Water Balance for Aqaba**

The reclaimed water balance for the City of Aqaba was discussed indicating that a first draft copy was turned in to ASEZA in January for comments. Unfortunately, ASEZA did not respond with any comments but instead passed it to the Aqaba Water Company. Dr. Amal Hijazi indicated that would have been OK as long as the document was labeled as a draft copy for review. Dr. Tamimi indicated that the study is ready but is lacking few maps for the city of Aqaba indicating the markings of the valves and the green areas.

Dr. Tamimi promised that he will obtain the necessary plans and maps when traveling to ASEZA during his Jordan trip and he will be sending draft number two of the study to USAID and ASEZA for comments before submitting the final copy within a month or so through BRDC.

##### **ii) Irrigation System Design for WCG**

A colored printed copy of the technical report for the design of the irrigation system for the Water Conserving Garden was handed to Mr. Jim Franckiewicz. Dr. Tamimi indicated that the copy represents the 2<sup>nd</sup> draft and IALC will be waiting for comments on the draft before finalizing it and sending it to USAID as a final product.

### **iii) Irrigation System Design for City of Aqaba**

Dr. Tamimi indicated to USAID that the inputs for the irrigation system design for the City of Aqaba have not been provided by ASEZA. He indicated that the subject will be discussed with Dr. Bilal Bashir during his next trip to Aqaba. For details on the inputs that are necessary for the irrigation system design please see Dr. Tamimi's Jordan visit report # 2004-005 dated November 21, 2004.

#### **e. Wadi Mousa Activities Status**

There are two activities that are on hold for Wadi Mousa: the Landscape Master Plan and the design and preparation of the tender documents for the Awareness Center. Dr. Tamimi indicated that the Sustainable Development of Dry Lands Project is committed to complete those two activities when three conditions are met:

- All necessary permits are obtained according to Jordan regulations from the designated agencies.
- A concrete commitment to implement them by means of allocating funds by USAID.
- A written note from USAID requesting that the Sustainable Development of Dry Lands Project complete and turn in the landscape master plan, the design and tender documents for the awareness center.

In addition, Dr. Tamimi indicated that CDM during one of the meetings indicated that the landscape master plan was not in CDM Scope of Work and funding was not allocated for it. Dr. Amal Hijazi indicated that the Scope of Work for CDM indicates that the landscaping is only around the Awareness Center. Dr. Hijazi indicated that \$150K has been allocated for both activities.

Dr. Tamimi stated that when CDM and USAID requested estimates for the Awareness Center and the Landscape design from the Sustainable Development of Dry Lands Project, the estimates were given - taking into consideration both a landscape master plan and an Awareness Center.

Mr. Jim Franckiewicz indicated that both the master plan and the awareness center will be implemented during CDM contract that goes on for another two years. He also indicated that the landscape master plan should be implemented around the visitor center and as much as can be done for the reuse site at Wadi Mousa. He requested that IALC work on both activities as soon as possible and have the designs ready for implementation.

Dr. Tamimi requested a memo be sent to IALC to indicate that the status of the Wadi Mousa activities should proceed and be changed from a hold status. Dr. Hijazi wrote such a memo and sent it by email for the Sustainable Development of Dry Lands Project to finish up the designs.

After discussing those two activities with the Sustainable Development of Dry Lands Project director and the Jordanian partners, Dr. Tamimi will set up a plan and a timeline for the two activities.

#### **f. Low Cost Energy Efficient Anaerobic Wastewater Treatment Workshop**

Dr. Tamimi indicated that the Sustainable Development of Dry Lands Project is planning to have a workshop/field trip for the Jordanian partners to be held in Egypt in cooperation with Wageningen University in Holland. The workshop will take place between November 13 and November 17, 2005. The main goal of the workshop is to convince decision makers in Jordan to consider UASB technology for domestic wastewater treatment and for rural communities. The workshop will include a site visit to the Sanhour City: Fayyoun, wastewater UASB treatment plant.

Dr. Tamimi requested that Mr. Jim Franckiewicz and Dr. Amal Hijazi participate in the workshop.

USAID showed positive reaction to the idea and indicated that probably Engr. Ramzi Sabella would participate on behalf of USAID. In addition, Dr. Hijazi indicated that she will be willing to help in getting the names of the most appropriate officials to invite to the workshop. Dr. Tamimi will work closely with Dr. Hijazi and BRDC to develop the list of the participants to be invited to the workshop.

#### **g. Recycled Water and Biosolids Conference at NCARTT**

Dr. Tamimi indicated that the Sustainable Development of Dry Lands Project technical assistance team at The University of Arizona is interested in presenting papers from the project at the conference.

## **2) Aqaba Special Economic Zone Authority**

Dr. Tamimi traveled to Aqaba to meet with Dr. Bilal Bashir, the commissioner of the Aqaba Special Economic Zone Authority (ASEZA). The meeting took place on April 10, 2005 and Dr. Saad Al-Ayyash from BRDC was present at the meeting. The topics presented below were discussed with Dr. Bashir.

#### **a. Water Conserving Garden**

Dr. Tamimi submitted a copy of the Water Conserving Garden, WCG, to Dr. Bilal Bashir. Dr. Bashir has never seen a copy of the design. Dr. Tamimi went over the design briefly with Dr. Bashir and explained the different aspects of the design.

Also, Dr. Tamimi presented a copy of The University of Arizona Agricultural Experiment Station Research report to USAID. The magazine has a long article about the water conserving garden that has been designed for ASEZA. The article is the center piece of that report.

Dr. Tamimi indicated to Dr. Bashir that the Sustainable Development of Dry Lands Project implemented by IALC is very disappointed in the fact that the design has been shelved and will not be implemented during the current year. Dr. Tamimi explained that the WCG design has excellent elements that can be used as models for the landscaping of Aqaba and Jordan and encouraged Dr. Bashir to allocate funds in the next year's implementation budget to implement the WCG design.

Dr. Bashir promised that he will budget for the Garden to be implemented next year and he will use some of the design in the landscaping of other parts of Aqaba.

### **b. Irrigation System Design for WCG**

Version number 2 of the technical report and plan for the design of the irrigation system for the WCG was submitted to Dr. Bashir for review and comments by ASEZA. Dr. Tamimi went over the report and explained the design and the management aspects of the technical report and he requested that ASEZA provide him with written reviews and comments on the technical report to serve as feed back by April 25, 2005. Dr. Bashir admitted that he does not have any body in his staff that will be able to review the design. Dr. Tamimi indicated that after the 25th of April, 2005 the Sustainable Development of Dry Lands Project will submit a final copy of the technical report to ASEZA via USAID to be considered as the completion of the activity. Dr. Bashir welcomed the assistance and the commitment of IALC to the different activities n Aqaba.

### **c. Reclaimed Water Balance for Aqaba**

Dr. Tamimi explained that a report has been submitted to ASEZA in January for comments and the IALC Sustainable Development of Dry Lands Project has not received any as of yet. Also, Dr. Tamimi indicated that there are inputs to the study that are needed from ASEZA in electronic format to be attached to the report and has not been delivered to IALC. Dr. Bashir indicated that Dr. Tamimi should meet with Mr. Ahmad Ashour, the head of the GIS department at ASEZA, and with Mr. Jihad Majali to get all information needed. Dr. Tamimi met with the above mentioned gentlemen as will be discussed later in section.

Dr. Bashir indicated that the consumption of the bird observatory at the Aqaba wastewater treatment plant should be included in the study. The bird consumption will also be discussed later in this section.

### **d. Irrigation System Design for City of Aqaba**

Dr. Tamimi indicated in the meeting with Dr. Bilal Bashir that the IALC Sustainable Development of Dry Lands Project will be interested in working with ASEZA to provide an irrigation system design for the city of Aqaba in parcels.

Dr. Tamimi explained that ASEZA would select an area within the City of Aqaba that is in need of in irrigation system; the IALC Sustainable Development of Dry Lands Project would design the irrigation system and would provide the plans and the technical report for the design; and then would wait for ASEZA to implement the design on the ground. After that is accomplished the process starts again and the IALC Sustainable Development of Dry Lands Project would perform another design for another selected land parcel of the City of Aqaba.

Dr. Bashir requested that the design for the entire city gets done and Dr. Tamimi indicated that IALC does not want to design systems that would be put on the shelves and not be implemented. Dr. Bashir agreed to that and requested that Dr. Tamimi meet Engr. Isam Jaradat to select an area with the highest priority for an irrigation system.

### **e. Meeting with Engr. Jihad Majali (Review of Reclaimed Water Demand for ASEZA)**

As indicated earlier, Dr. Bilal Bashir requested that Dr. Tamimi meet with Engr. Jihad Majali. Engr. Majali's contact information are:

Cell: +962-79-666-0024

Email: [jmajali@aseza.jo](mailto:jmajali@aseza.jo)

Engr. Majali works in the newly formed Water Resource Management Department within ASEZA. The department has a water demand management and a reuse sections. Two engineers are working with CDM on the ground water monitoring wells are part of this department. Dr. Bilal Bashir requested that Dr. Tamimi meet with the two engineers working with CDM but Dr. Tamimi was not able to do so during this trip due to time constraints. The engineers' names are: Engr. Mazen Rayan and Engr. Osam Heyajneh.

Engr. Jihad Majali indicated that Mr. Murad Zaatreh has left ASEZA and Moad is part of this department. Moad is the ASEZA staff member who participated in the biosolids study tour during May 2004.

For a review of the reclaimed water demand for the city of Aqaba, Engr. Jihad Majali gave the following summary of the demand:

1. The phosphate company has a contract to receive 6000 m<sup>3</sup>/day of the tertiary quality reclaimed water.
2. Al-Haq farm receives 2500 m<sup>3</sup>/day every day of the year from the existing treated wastewater. Dr. Bilal Bashir and Engr. Jihad based this information on a report provided by Dr. Abu Awad from CDM. Dr. Tamimi thinks this has to be recalculated and adjusted.
3. Irrigating the green areas of the city of Aqaba would consume 1400 m<sup>3</sup>/day during 2005 and will increase 20% per year for the following years.
4. The need of the birds' observatory at the Aqaba wastewater treatment plant needs to be calculated. The birds' observatory need has been requested to be included in the study since an NGO has signed a contract with ASEZA to build a bird observatory and has requested to leave enough water in the current wastewater treatment plant ponds for the migrating birds' use. This need really reflects the evaporation depth from the ponds. This amount has been estimated at 550 m<sup>3</sup>/day. However, the bird's demand has to be recalculated based on a 30 dunums area of ponds for the summer and winter months and included in the study.
5. For the RIAL demo site in Aqaba, CDM has requested 500 m<sup>3</sup>/day for irrigating the demo site for the months of July, August and September and about 200 m<sup>3</sup>/day for the other months.

### **f. Meeting with Mr. Ahmad Ashour**

A meeting was held at ASEZA that joined Mr. Ahmad Ashour, the head of the GIS department at ASEZA, Dr. Tamimi and Engr. Majali. Dr. Tamimi requested GIS maps of the pipe network

being implemented at Aqaba and of the green areas to be used in the analysis and the design of the irrigation systems and also to be use in the reclaimed water study.

GIS maps and AutoCAD files were provided to Dr. Tamimi. These inputs will be sent to Dr. Pete Waller to use in the irrigation designs and in the reclaimed water study.

### **g. Meeting with Engr. Issam Jaradat**

Based on Dr. Bashir's request, Dr. Tamimi met with Engr. Issam Jaradat, the head of the municipal services within ASEZA. Engr. Jaradat has the following contact information:

Tel: +962-3-20209-1068

Cell: +962-79-583-5233

Email: [ijaradat@aseza.jo](mailto:ijaradat@aseza.jo)

Dr. Tamimi requested that an area of the city be selected that is in need of an irrigation system. The area needed to be close to a turnout of the newly constructed pipes that will be conveying the reclaimed water to the city.

Engr. Jaradat showed many high priority areas that are in need of an irrigation system but lack a close-by turnout. These are mainly roads that have green areas as medians.

Engineer Jaradat suggested that the newly designated Town Park is the proper place to start. An irrigation system is needed for the park and a request from Engineer Jaradat was made and later in a second meeting with Dr. Bilal Bashir on the same day, Dr. Bilal requested that the IALC Sustainable Development of Dry Lands Project perform an irrigation system design for the Town Park. The Town Park is discussed in the following subsection.

### **h. Aqaba Town Park**

The Town Park has been designated within the city of Aqaba to serve as a public park. The park was inaugurated by his Majesty the King in January of 2005. A turnout from the reclaimed water network is close by the Park. Dr. Bilal Bashir requested that this would be a suitable site that the IALC Sustainable Development of Dry Lands Project could provide ASEZA with a design of the irrigation system.

The concept for the Town Park was inspired by the landform of the desert and indigenous climate and landscape of the region, and provides a new destination for the local community of Aqaba. Figure A1 in Appendix A shows the site location within the City of Aqaba while Figure A2 shows photos of the existing conditions of the park. Figure A3 shows the Town Park layout as a landscape concept.

An AutoCAD file of the park and the surrounding perimeter is available with Dr. Tamimi for future use. This file can be requested directly from Dr. Tamimi.

### **3) NCARTT & CDM**

Dr. Tamimi requested information about the conference from Dr. Abdul Nabi Fardous, the NCART director back in March. The information did not come by and Dr. Tamimi requested a meeting with Dr. Fardous but a meeting was not confirmed or taken place during this visit.

John Pasch from CDM notified Dr. Tamimi that the conference may be postponed. Mr. Pasch also indicated that the information about the conference has been posted to the Ministry of Water and Irrigation web site. When this web site was visited, there was nothing about the conference.

### **4) Royal Scientific Society, RSS**

A meeting with Engr. Wael Suleiman and Engr. Bayan Athamneh from RSS; Dr. Tamimi from IALC and Dr. Saad Al-Ayyash from BRDC took place on April 11, 2005 at 1:30pm at RSS. The topics discussed are shown below.

#### **a. Meteorological Station at Wadi Hassan**

The metrological station at Wadi Hassan still has no modem for remote access to the data. It seemed that the technology development of treatment of biosolids does not have a high priority on RSS list due to lack of funding in this area. It was requested by Engr. Wael Suleiman that the IALC Sustainable Development of Dry Lands Project allocates some funding from next year's budget to fund gathering of data and maintaining the met station.

Collecting data and biosolids samples for characterization is scheduled to start on April 20, 2005. This is when the spring cycle of gathering data of drying biosolids will start by RSS.

#### **b. Biosolids Application Experiment and Met Station**

Dr. Tamimi accompanied by Engr. Wael Suleiman and Engr. Bayan Athamneh met with Dr. Saad Al-Ayyash on Tuesday April 12, 2005 in Irbid to visit the biosolids application experiment at the NCARTT experimental Station and the metrological station at Wadi Hassan wastewater treatment plant.

The barley grown at the biosolids application experiment shows variation of growth based on the rate of application of biosolids. The barley will be harvested the first week of May. Engr. Wael Suleiman asked if RSS needs to resubmit a proposal for year 2 of the biosolids application experiment. Dr. Tamimi indicated that a technical report for year 1 accompanied by an action plan for year 2 would suffice. But the Sustainable Development of Dry Lands Project director will confirm this.

#### **c. Biosolids Characterization Papers**

The biosolids characterization papers were discussed with RSS. It was agreed that the first paper should be the characterization of biosolids at Wadi Mousa wastewater treatment plant. Dr. Tamimi requested that the sampling procedure be explained better and sent to Dr. Tamimi to include in the paper. Engr. Bayan stated that will be completed and sent to Dr. Tamimi by April 20, 2005. In addition, background information about biosolids quantities in Jordan is needed to serve as background materials for the paper. Engr. Wael Suleiman indicated that this

information will be sent to Dr. Tamimi by April 20, 2005. Dr. Tamimi is supposed to have a first draft of the paper before the end of April 2005.

#### **d. Characterization of Irbid's Biosolids**

Royal Scientific Society, RSS, is taking bimonthly samples from the Irbid's Wastewater Treatment plant and characterizing them as was done at Wadi Mousa last year. A report will be due from RSS by the end of the season.

### **5) JUST**

On Tuesday April 12, 2005, Dr. Tamimi and Dr. Al-Ayyash met with Dr. Ziad Ghazawi from Jordan University of Science and Technology. The meeting was scheduled to start at 11:15am but due to unannounced visitors from Yemen, Dr. Ghazawi was delayed and the meeting started around 12:45pm.

#### **a. Reimbursement of Pakistan Salinity Conference**

The reimbursement contract and papers for the support of the Sustainable Development of Dry Lands Project to partially finance two JUST faculty were completed. BRDC will be requesting a reimbursement of the partial support for the travel cost of the two staff members of JUST. A copy of the proceedings from that conference was given to Dr. Tamimi by Dr. Ghazawi. This copy is available by requesting it from Dr. Tamimi.

#### **b. TEEAL Update and Usage**

IT confirmed that JUST received the TEEAL update CDs for the year ending 2003. It was requested that JUST supply Dr. Tamimi with logs to show the use of the TEEAL library to justify the updating of the library by the Sustainable Development of Dry Lands Project. Dr. Ziad Ghazawi promised to do so as soon as possible.

### **6) Wadi Mousa Awareness Center**

Due to the fact that the guidelines agreed upon by the different Jordanian organizations were not finalized by Petra Regional Authority; it was decided to wait for these guidelines before starting the development of tender documents.

In addition, feedback from the director of the Sustainable Development of Dry Lands Project is needed to actually restart the activities in Wadi Mousa before working on these activities. Therefore, the following tasks will be delayed until the proper discussion among The University of Arizona / IALC and Jordanian partners is completed.

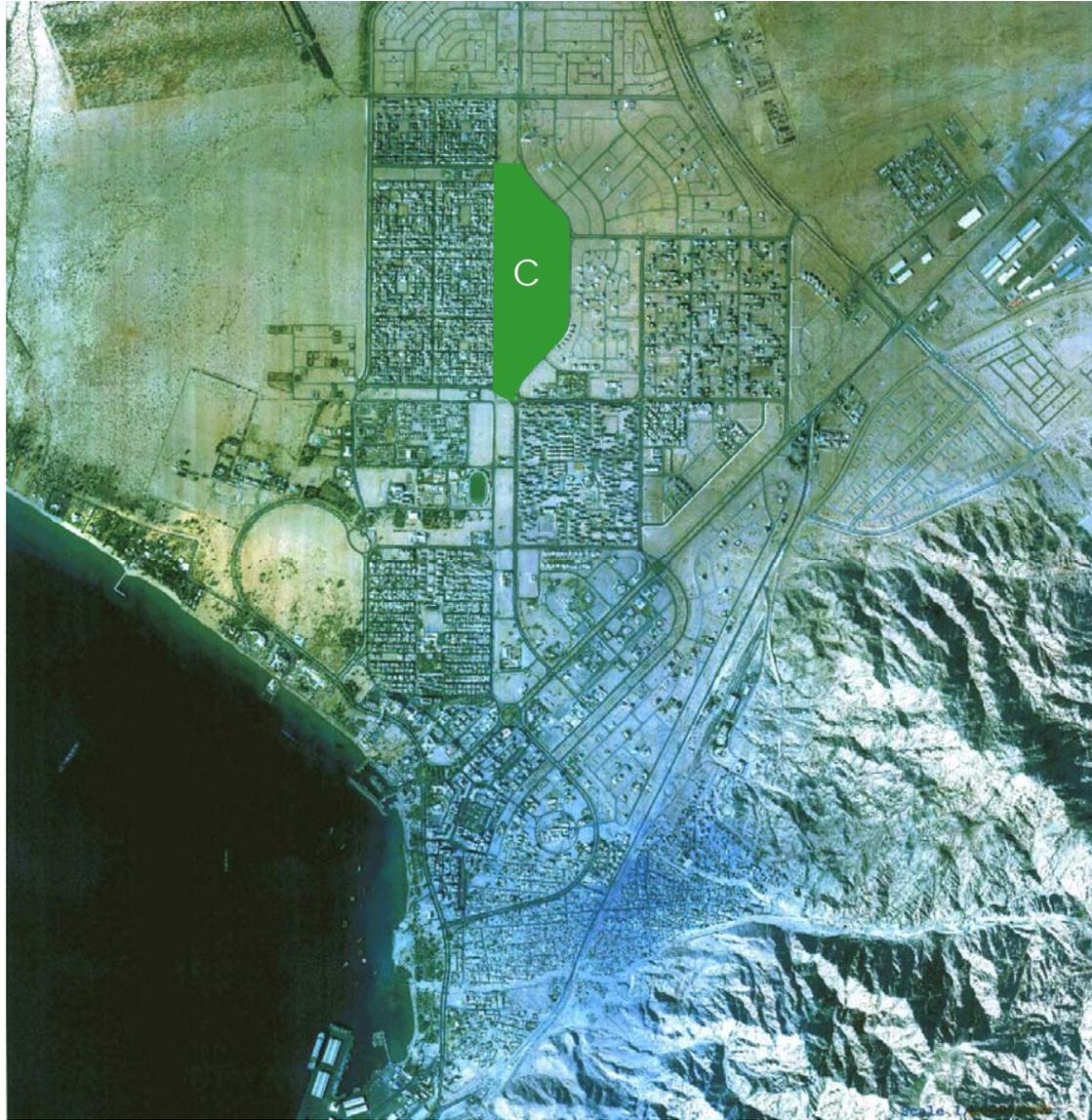
- a. The Architectural Plans**
- b. Tendering the Development of Tender Documents**
- c. Development of an Action Plan and Timeline**

## **IV. Conclusion and Recommendations**

During his visit to Jordan between April 6 and April 13, 2005, Dr. Tamimi accomplished most of the objectives of his trip except for the restarting of the Wadi Mousa activities. The activities at Wadi Mousa need to be discussed among the Jordanian Partners and IALC following the new information surfaced in regard to the permits and the guidelines. The principal concern at this point is sustaining the activities which are showing success and which have received considerable Jordanian support from the partnering institutions. Should the next project year's Mission buy-in funding decrease from expected levels, considerable disruption to these activities would likely result.

**Appendix A**

**Pictures and Layout of Aqaba's  
Town Park**



**Figure A1: City Park shown as Area C**



Figure A2: Existing Conditions of Town Park

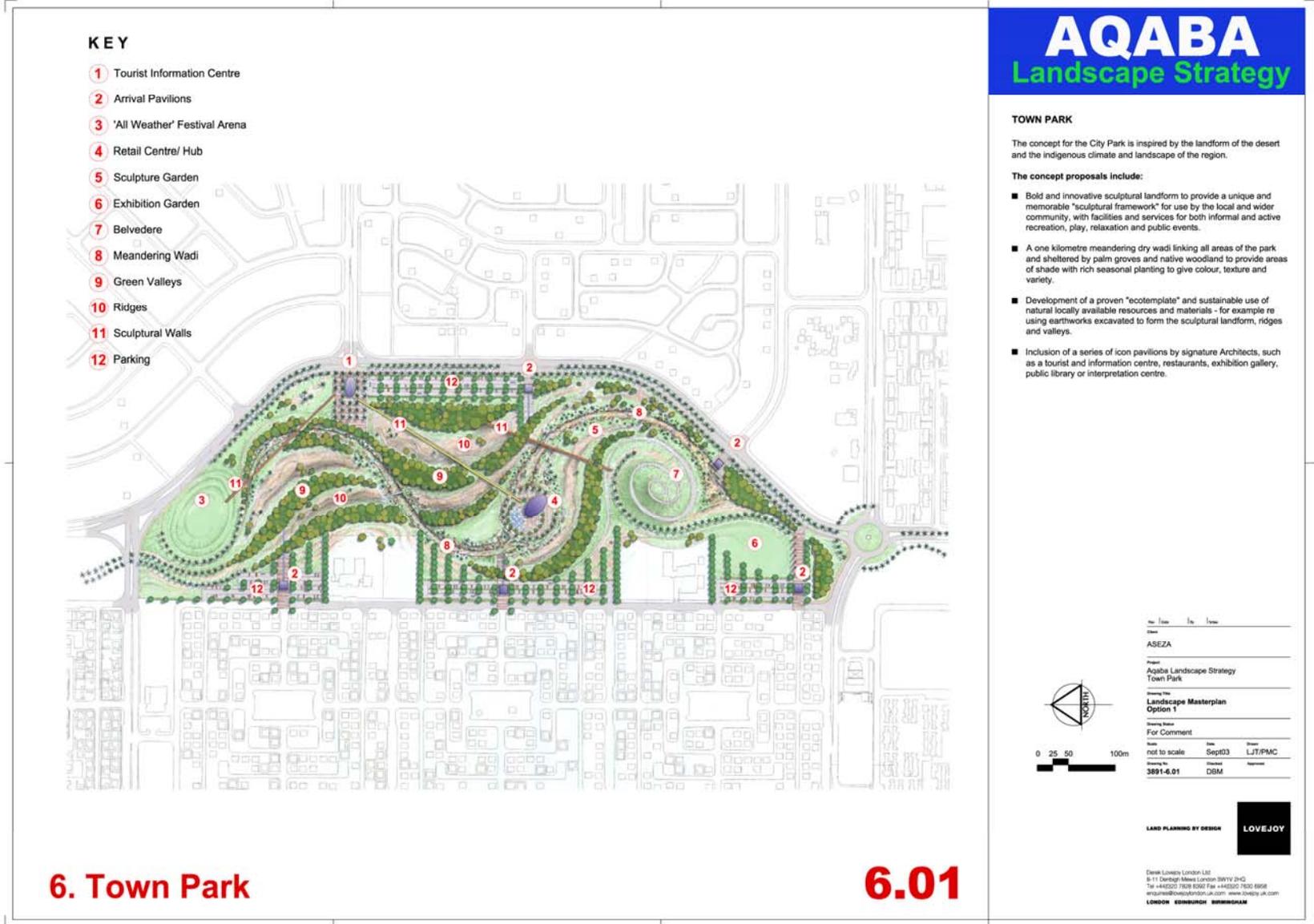


Figure A3: Layout of Town Park