Arab Republic of Egypt

EGYPT INFRASTRUCTURE IMPROVEMENTS PROJECT

SECONDARY CITIES

Environmental Assessment

Scoping Meeting

For

New Valley Governorate
El Mounira Village, Kharga Oasis,
Balat Village, Dakhla Oasis

National Organization for Potable Water and Sanitary Drainage (NOPWASD)

US Agency for International Development (USAID)
USAID Project No. 263-0236

CDM International Inc.

In association with

Dr. Ahmed Abdel-Warith Consulting Engineers

USAID FROM THE AMERICAN PEOPLE

April 2007

CONTENTS

Table of Contents

List of Tables

List of Figures

Acronyms and Abbreviations

AAW	Dr. Ahmed Abdel-Warith Consulting Engineers
CDM	CDM International Inc.
GOE	Government of Egypt
NOPWASD	National Organization for Potable Water and Sanitary Drainage
USAID	United States Agency for International Development
DI	Ductile Iron
EA	Environmental Assessment
ED/CM	Engineering Design and Construction Management
EIS	Environmental Impact Statement
FM	Force Main
HCC	House Connection Chamber
ID	Identification Number
HHS	Households
LE	Egyptian Pounds
MH	Manhole
PS	Pump Station
RCP	Reinforced Concrete Pipe
RR	Railroad
uPVC	Unplasticized Polyvinyl Chloride
VC	Virtified Clay
WTP	Water Treatment Plant
WWISP	Water and Wastewater Institutional Support Project
WWWTP	Wastewater Treatment Plant
$	United States Dollars

Weights and Measures

BOD_5	5-day biochemical oxygen demand
COD	Chemical Oxygen Demand
Feddan	A unit of area equal to 4,200m^2
Hectare	A unit of area equal to 10,000m^2
lpcd	Liters per capita per day
lps	Liters per second
m	Meter
m^3/hour	Cubic meters per hour
mg/L	Milligrams per liter
mm	Millimeters
m/s	Meter per second
NTU	Normal Turbidity Units
ºC	Temperature in degrees Celsius
ug/L	Micrograms per Liter
uS/cm	Microsiemens per centimeter – unit of measure of conductivity. Equal to micromhos/cm in U.S. system of measurements
km	Kilometer

EGYPT INFRASTRUCTURE IMPROVEMENTS PROJECT
ENVIRONMENTAL ASSESSMENT

NEW VALLEY GOVERNORATE

EL-MOUNIRA VILLAGE, KHARGA OASIS
BALAT VILLAGE, DAKHLA OASIS

ENVIRONMENTAL SCOPING STATEMENT

1 Introduction

The USAID-funded Egypt Infrastructure Improvements Project is preparing to implement recommendations to build or extend wastewater treatment facilities in El Mounir Village, El-Kharga Oasis and in Balat Village, Dakhla Oasis. These projects in the New Valley Governorate are to be implemented for the Government of Egypt (GOE) through the National Organization for Potable Water and Sanitary Drainage (NOPWASD) and the United States Agency for International Development (USAID). Location maps are included in Appendix J.

Background data and information for the proposed remedial activities were gathered and reported in the New Valley Feasibility Study prepared for USAID and NOPWASD (CDM, August, 2006). The New Valley Feasibility Study considered five (5) village locations to provide water and/or wastewater improvements. The five (5) villages are Balat, El Gedida and Tanidah in the Dakhla Oasis and El Mounira and Nasr El Thowra in the Kharga Oasis. This scoping statement is being presented for El Mounira and Balat Villages due to available construction funding although the scoping statement and the resultant environmental assessment report would be applicable to the other three (3) villages as well.

1.1 Background: Recent History of the New Valley

The Kharga and Dakhla Oases contain about 0.2% of Egypt's population, while the New Valley Governorate covers about 44% of Egypt's land. In planning for water supply and wastewater facilities for villages in the two oases, the forecast of the population to be served must take into account the number of people who may migrate from the crowded Nile areas.

Access to the area is primarily by road over the desert: 345 km from Luxor to Kharga, and 232 km from Kharga to Assiut. Service by train is limited to a weekly trip to Luxor. Air transport is in the beginning stages. Security concerns at present limit access to the two oases. In the longer term, the potential for developing tourism to see the available antiquities seems limited compared to elsewhere in Egypt. However, so long as the population remains relatively low, the tourism potential *per capita* may well be comparable to elsewhere in Egypt.

Construction and reclamation of the New Valley began in 1959. The governorate itself was established in 1961. Agriculture, the principal development activity, must rely on irrigation water provided from deep wells driven into the Nubian sandstone aquifer. More than 24,000 feddans (10,000 ha) of irrigated area have been developed in Dakhla Oasis, and 3000 feddans (1300 ha) in Kharga Oasis.

Differences in the economies and population characteristics among the several villages in the New Valley could cause differences in growth rate over the planning period. The increasing cost of water for irrigation (as groundwater levels fall) could either limit the population growth or require a reorientation of the economy away from farming and toward tourism or other sources of income.

The towns are connected by paved highways, and some side streets are paved in the project villages. The major towns of Kharga and Mout have urban amenities developed to a high standard, to the extent that four-lane highways and streetlights extend well beyond the presently-settled areas. Much of the housing consists of relatively new one-storey houses, with ancient mud-brick houses abandoned in place within many of the villages.

In 18 New Valley towns and villages there is a local ruling body, which oversees the town itself and smaller outlying villages.

1.2 New Valley hydrology and water use

The eastern Sahara is part of the most arid region in the world. Economic development there must rely on groundwater resources. The Nubian sandstone aquifer underlies a large part of Egypt and neighboring Sudan, Chad and Libya, covering about 1.65 million km^2. The aquifer is up to 4000 m thick, and extends downward to 2000 m below sea level in the Kharga Oasis, and to 500 – 1000 m below sea level in the Dakhla Oasis.

The groundwater from potable-supply wells in the New Valley generally meets all of the Egyptian water quality standards, except those for iron and manganese.

Recent groundwater modeling indicates that the aquifer contains about 135,000 billion m^3 of water, but that only a small portion can be exploited economically with presently available technologies.

As there is essentially no precipitation in the New Valley, there is no local groundwater recharge to the Nubian sandstone aquifer. Recharge elsewhere moves only very slowly toward the New Valley. Therefore economic and agricultural development of Kharga and Dakhla Oases must rely on mining of the groundwater, a practice considered sustainable for at least the next 100 years.

The effect of any large local drawdown of the aquifer would be to increase the pumping heads for irrigation water to an uneconomical level. However, per capita potable water demands are very moderate compared with irrigation demands. By shifting the type of work away from irrigated agriculture toward "dry" industries such as tourism, handicrafts, or manufacturing, the aquifer could sustain a population of several million for many generations.

Since the New Valley is a hydrologically closed basin it is important to prevent or at least mitigate water pollution, especially from wastewater as a major source.

1.3 The Infrastructure Improvements Project in the New Valley

Although many villages have legitimate need for wastewater collection systems, there are presently funds to build system for only two villages in the New Valley. It has been determined that the village of El Mounira in Kharga Oasis is to be provided with a wastewater collection and treatment system, and that Balat Village in Dakhla Oasis is to be furnished with an enlarged and improved wastewater treatment plant. Other villages will be provided wastewater systems in the future, should funds become available.

In such a remote area, wastewater treatment should employ low-cost, low maintenance technology to avoid many maintenance problems and thus risk of failure. The chosen technology is "stabilization ponds," a reliable treatment system of a type that is already in use in many locations in Egypt, including Luxor City. We anticipate that the effluent from the wastewater plant will be pumped (by others) to irrigate forest land.

2 The Environmental Assessment Process

For every USAID project there must be an Environmental Assessment (EA). The EA is a process used to identify and predict the environmental consequences of a newly planned activity and to assist in planning appropriate measures to reduce the adverse effects, and to maximize environmental benefits, before permitting the activity to proceed.

The EA is a practical and valuable means for guiding decision makers in charge of project implementation. It provides the decision makers with reasonably accurate information concerning existing environmental conditions, potentially significant environmental impacts

and possible mitigation measures, monitoring programs, opportunities for environmental enhancement and environmental management plans.

The fundamental steps in the Environmental Assessment of a project are the Scoping Session, the Scoping Statement, the Environmental Assessment Report, and environmental monitoring of the project

For a proposed project, "Scoping" is an EA activity which:

- Identifies those attributes of the environment for which there are concerns; and
- Provides a plan that enables the EA team to focus on those attributes.

Scoping is a shared responsibility where the proponent government agencies, the New Valley Governorate, NOPWASD, USAID, and the public, all have a role. The Scoping Session is part of this process.

The Scoping Session is a meeting of key individuals involved with the project, including representatives from:

- the funding agency (USAID),
- the implementing agency (NOPWASD)
- the funding agency's engineers,
- appropriate Egyptian national ministries (e.g. Housing, Agriculture),
- the Governorate,
- the Markaz,
- the Village,
- and interested local persons such as farmers, landowners, and businesspeople.

In the Scoping Session, usually held early in the project time schedule, the engineers tell what they intend to design and build, for whom, and where. The engineers also list the environmental impacts, good and bad, that can be anticipated, and to be dealt with properly. The other attendees are invited to add their own concerns and observations to the list, and so bring them to the attention of the government, the funding agency, and the engineers.

The **Environmental Scoping Statement** summarizes the proceedings of the Scoping Session (i.e. who was invited, who attended, and the environmental issues presented, raised, and discussed). The Scoping Statement sets the direction for the full EA report.

The Scoping Statement is formally reviewed by USAID. Once it is approved, engineering work on the project can begin, and the Environmental Assessment team can proceed to develop the full Environmental Assessment Report.

The **Environmental Assessment Report** shall describe this project, its beneficial and adverse impacts upon the local environment, and upon the health and well-being of the local residents. Based on the technical information gathered in past and present studies, and on the comments and questions raised in the Scoping Session, the Environmental Assessment Report is to:

- rate the environmental issues according to their importance,

- investigate further those issues deemed most important,
- recommend ways to minimize or at least mitigate the most significant of the foreseen adverse impacts,
- recommend ways to take advantage of the beneficial impacts, and
- outline a scope and schedule for environmental monitoring.

A proposed outline for the Environmental Assessment Report may be found in Appendix E.

Ongoing monitoring of the project shall follow a scope and schedule to be set out in the EA Report.

3 El-Mounira Village in Kharga Oasis

El Mounira, located about 25km north of El Kharga, has a brief history dating only from 1970. It has a population of about 2,300, with an additional 800 people in the suburban village of El Ktarah located about 1 km south of El Mounira. It also has a smaller suburban village, Ezbet El Taieb, which lies about 9km to the north and contains about 300 people. The population is projected to grow to 10,000 by the year 2030.

According to the 1996 census, 19 percent of the population is illiterate, 21 percent is literate, and the remaining 60 percent are in school.

Thirteen percent of the population is farmers; 14 percent are teachers, and 18 percent are in commerce. El-Mounira has relatively fewer people in farming, and more in commerce, than elsewhere in the New Valley.

El Mounira has a professional town manager and has undertaken an activist stance toward development in several respects: special computer education is provided for advanced students. An ethnographic museum has been developed showing traditional kitchen and farmyard implements. A handicrafts center is in operation, specialized in making and selling unglazed carved pottery and various types of carpets.

Known Antiquities. North of Kharga on the road to the village of El Mounira is the Temple of Hibis, a VIII Dynasty ruin and ancient settlement that prospered under the Persians (in the Sixth Century BC) and the Ptolemies; this temple is reported to be the best-preserved temple in the western desert of Egypt. The Bagawat Necropolis is also nearby, having 263 mud-brick chapels, that is among the oldest Christian cemeteries in Egypt. Mounira is also within 1 km of a fortress, Ed-Deir, which contains 12 towers, a gallery and rooms.

The potable water system contains a well and iron-removal treatment plant with a capacity of 200 m^3/hour operated up to 15 hours per day. Metered customers include 573 domestic, 112 commercial, and 27 governmental customers; an additional 360 customers are expected to be served within the next 3 years from houses where the house lots have been sold, and some houses are under construction.

Wastewater will be collected from the homes, shops, and other buildings by the pipe network as shown in the Scoping Session Agenda, Appendix J. The wastewater will flow to

a central pump station, from where it will be pumped to the wastewater treatment plant 2300 meters to the east of the village, as shown in the Scoping Session Agenda, Appendix J. The projected wastewater flow rate is 2000 m^3/day. The footprint area of the wastewater plant is about 4 ha.

More information about existing conditions and proposed facilities in El Mounira, excerpted from the New Valley Feasibility Study, may be found in Appendix F. Egyptian effluent water quality criteria are summarized in Appendix H, and some specifications for the process train and site layout for a stabilization point wastewater treatment system are given in Appendix I.

4 Balat Village in Dakhla Oasis

Balat is located about 30 km east of Mout, the principal town in the Dakhla Oasis. For planning purposes, the area of the village is divided into the main village and 8 small suburban or satellite villages, all of which are served by the water supply system, and all of which could potentially be served by the sewer system.

Balat's population was about 5100 in 1996, and about 6,500 in 2006. It is projected to grow to 10,000 by 2030. According to the 1996 census, 37 percent of the population is illiterate, 17 percent is literate, and the remaining 46 percent are in school. Thirty-four percent of the population is farmers; 18 percent are teachers, and 13 percent are in commerce.

Known antiquities. Balat contains modern developments which screen the older hilltop settlement of covered streets, and the governor's seat "Palace of the Lord" dating from the Old Kingdom. Balat prospered from trade with Nubia (or Kush). Five mud-brick mastabas (step pyramids) mark the tombs of governors from the VI Dynasty, one of which was discovered as recently as 1977.

Water supply. Balat has an extensive potable water network, containing 40 km of water mains. A water treatment plant for iron and manganese removal was built in 1997. Its rated capacity is 3,888 m^3/day, although the actual capacity is estimated at 2,592 m^3/day.

Wastewater. A sewer system and wastewater stabilization ponds were built in the late 1980s. The sewer system contains about 24 km of sewers and force main, and 5 small sewage pump stations. The sewer system serves an estimated 90% of the existing population. The estimated inflow rate to the ponds is 700 m^3/day; the estimated effluent rate is 600 m3/day. The discrepancy between influent and effluent flows can be attributed in part to evaporation from the water surface of the ponds, and in part to the visible overflows onto the ground near the anaerobic ponds, caused by a blockage or other restriction in the flows from the anaerobic ponds to the facultative ponds.

Visual inspection of the ponds indicated that the treatment being provided is inadequate, with anaerobic effluent (devoid of oxygen) being discharged from the facultative ponds and maturation ponds. The effluent is applied to irrigation of wood trees on 5 feddans of land.

The existing overloaded stabilization-pond wastewater plant is to be replaced by a new system of larger ponds, sized to accommodate flows from a future served population of about 10,000. Expanded demand is expected to be due to extension of sewerage in Balat (by

others), and to connection of other villages' wastewater systems (by others) to this treatment plant. The footprint area of the present set of ponds is about 4 hectacres; the footprint area of the set of new ponds is to be about 13 hectacres.

Possible expansion of the existing wastewater stabilization ponds is the only potential improvement under consideration in this feasibility study. As a result, details on housing, streets, and land-use planning within the village are not of direct concern to this study, since improvements to the sewer system and water system are not being considered.

More information about existing conditions and proposed facilities in Balat, excerpted from the New Valley Feasibility Study, may be found in Appendix G. Egyptian effluent water quality criteria are summarized in Appendix H, and some specifications for the process train and site layout for a stabilization point wastewater treatment system are given in Appendix I.

5 Scoping Activities for the Villages of El Mounira and Balat

5.1 Meetings with Governmental Agencies

The following government agencies were consulted by the team during this environmental process and/or during the feasibility study phase of the New Valley work:

- New Valley's Office of the Governor
- NOPWASD
- New Valley Village Mayors and their representatives
- New Valley Water and Wastewater Operating Entity
- Representative from the Ministry of Housing for Local Development
- National Research Institute
- Representatives of the respective Markaz

5.2 Scoping Session

5.2.1 Presentation of the Projects

The scoping session was held on 11 April 2007 at 8:30 pm in the Conference Room of the Governorate Building in Kharga City of Kharga Oasis. Copies of the Environmental Scoping Meeting agenda was prepared in English and Arabic (Appendix J) and distributed to participants at the meeting. The presentation was delivered predominately in Arabic and English presentations were translated into Arabic. The meeting was opened by CDM Project Manager, Rick Minkwitz, who described the Egypt Infrastructure Improvements Project and the purpose of the Environmental Assessment process. CDM/AAW Deputy Project Manager, Moustafa Tayeb, and EA Specialist, Dr Ashraf El-Sayed Ismail gave a powerpoint presentation describing the New Valley projects, the EA process and the potentially significant environmental issues. Comments, all verbal, were received following the

presentation and have been summarized herein. The Scoping Session meeting was closed by the New Valley Governorate's General Secretary, Saad Abu Elela.

5.2.2 Environmental Issues Mentioned in the Presentation

Potential environmental effects that have been identified, whether positive or negative, are listed below.

General

- There will be an improvement in public health.
- There will be a reduction in the cost and effort to dispose of wastewater: a positive socioeconomic impact on the villagers.
- Employment opportunities will be created for skilled, semiskilled and unskilled laborers during construction and operation & maintenance.
- The system will produce an effluent of adequately good quality to support the irrigation of trees and non-consumed crops.
- Consider the potential impact of construction activities on antiquities.
- Due to requirements for monitoring of wastewater influent and effluent, there will be increased demand for local laboratory services.

Construction of the new wastewater collection system, El Mounira

- There will be improvement in the form of a lowered water table within the residential area of El-Mounira.
- Consider public safety, traffic control and interruptions during construction including interruptions of water or electric utility services.
- Be aware of locations where the sewerage system may pass through deposits of expansive clays, which swell when wetted. In such locations, take measures to minimize the probability of leakage from the sewer into this soil, and replace such soil with sand to the extent necessary.
- If it happens that unsewered areas remain adjacent to sewered areas, provide manhole access in the sewers nearest such areas for the convenience of septage haulers who need to discharge their loads.
- Where new pump stations are to be located, the impacts on land use, energy consumption and traffic control must be assessed.
- Consider operation and maintenance activities at these new pump stations, e.g. problems of noise, odors and disposal of screenings.

Construction of Stabilization Pond Wastewater Treatment Systems, El Mounira and Balat

- Consider the location of the new stabilization pond sites, and problems of associated land acquisition.
- There will be improvement in the quality of effluent used for irrigation.
- Determine whether there are limitations to how much effluent can be accepted for irrigation, from season to season.
- Consider public safety, traffic control and interruptions during construction including interruptions of water or electric utility services.
- After several years of operation, it may be necessary to remove and dispose of sludge accumulated in stabilization ponds. If possible, adequate land should be acquired for drying and treating the sludge, and stockpiling it on site unless or until it can be taken away for appropriate agricultural use.

5.2.3 Comments Received

The following are comments received during the meeting. The comments reflect the interest of the representatives of the other villages in the Feasibility Study to have wastewater service as soon as possible as well as environmental impacts.

Location of WWTP at El Mounira villages

Comment
The location of the proposed Wastewater Treatment Plant (WWTP) should be sufficiently far from the present residential area and any further development.

Response
The proposed WWTP is located away from any future development by at least 1 km.

Nuisance from the proposed WWTP at El Mounira village

Comment
Operation of the WWTP should not cause any remarkable nuisances in terms of odor and noise to the village residents.

Response
The location of the WWTP of El Mounira is southeast of the residential area by 1.5 km and the treatment plant will have a minor mechanical works. In addition, the prevailing wind is from the northwest. The proposed WWTP will not cause significant odor problems. So, it's expected that there will be negligible odor and noise impacts to the village residents.

USAID support allocated to the New Valley Governorate

Comment

The USAID support allocated to the New Valley Governorate is relatively low and the community expects more support.

Response

The budget allocated this year can cover two villages. There is a possibility that the USAID would support the proposed activities for one or more villages of the five villages

Comment

What are the selection criteria for the two villages?

Response

It is one in Dakhla Oasis and one village in Kharaga Oasis. The remaining five villages will be handled in a new program with total fund of 20 Billion LE covering the rural area of Egypt.

Comment

The involvement of local community in running the projects is missing not like other programs such as the Swiss Fund.

Response
There are other programs run by USAID, such as the Small Enterprise Program, that allows for the involvement of the local community.

Comment

Do the funds allocated for the proposed project for the two villages cover all activities including the treatment works?

Response

USAID confirms that the funds will cover the construction of the whole proposed activities for the two villages including the WWTP.

Coordination between USAID and NOPWASD

Comment

There is a need to have full cooperation between USAID and NOPWASD to handle the rest of the proposed activities for the other three villages.

Response

There is coordination between USAID and NOPWASD for any upcoming projects.

Other villages subject to subsurface water problem

Comment
El Gedida and Tenidah Villages suffer from subsurface water problem and pooling stagnant water in the residential areas. So, there is a need to have wastewater collection system as soon as possible.

Response
The villages are among those that have a priority in the NOPWASD program for rural areas of Egypt.

Reuse effluents

Comment

The project should include reuse of treated effluents.

Response

NOPWASD in coordination with Ministry of Agriculture and Land Reclamation (MALR) manage the treated effluent. So, the effluent of the both proposed WWTPs will be reuse through scheme managed by MALR. Another possibility is that the New Valley Governorate would invite investors for better use of the treated effluents. The reuse scheme would include planting trees for wood production and landscaping.

Appreciation from the project area (proposed served villages of Balat and El Mounira)

The communities within the villages of the project area appreciate the proposed activities supported by USAID and NOPWASD.

5.2.4 Written Statements Received

All comments were provided verbally at the meeting and there were no written statements.

5.3 Significant Issues to be Addressed in the Environmental Assessment

The significant issues to be addressed in the Environmental Assessment include:

- In each of the villages, provisions need to be made for handling the treated effluent either by reuse or the provision of a treated effluent disposal area.

- Although sites where the work will proceed have been used by the respective villages for many years, consideration must be given to the potential for uncovering antiquities.
- Due to limited laboratory facilities within the New Valley, consideration needs to be given to providing for or determining that a reliable wastewater laboratory facility is either by constructed locally or by arranging for prompt transport of samples to an existing laboratory elsewhere.

5.4 Issues to be Eliminated from Further Consideration

Issues that can be eliminated from further consideration include:

- Economic benefits from employment during construction and operation/maintenance of facilities will have limited positive benefits as will the cost benefit for having a new wastewater system rather than individual onsite systems

- Sufficient land for the required WWTPs and pump stations is available for each location.

- Negligible impacts are expected from air quality, public safety, traffic issues and interruption of basic services during construction due to the rural nature of these villages.

5.5 Schedule for Preparing the Environmental Analysis

The Environmental Assessment process will commence with the issuance of this Scoping Statement. Considering the rural nature of each of these villages and the recently completed Feasibility Study sufficient information is available to provide an environmental analysis.

5.6 Proposed Approach to Address Significant Issues

Significant issues will be addressed as follows:

- Cooperation between the NOPWASD and Ministry of Agriculture will be implemented during the design phase to ensure that a coordinated process is established and implemented for handling the treated effluent. In the case of Balat, treated effluent is currently being used to irrigate a forest area.

- Provisions of the Antiquities Law will be incorporated into contract documents to ensure that antiquities if located during construction will be handled as required.

- Determine during design the available laboratories for wastewater sampling/testing within the New Valley. During the Feasibility Study, it was understood that provisions were being made at the new Kharga WWTP. If such a laboratory is unavailable, suitable provisions need to be considered during the design phase.

References

- **New Valley Feasibility Study Report**, prepared for the National Organization for Potable Water and Sanitary Drainage (NOPWASD) and the U.S. Agency for International Development, USAID PROJECT No. 263-0236, USAID Contract No. GHA-I-00-04-00006-00, Task Order No. 03. CDM International, Inc. in association with Dr. Ahmed Abdel-Warith, Consulting Engineers, August 2006.

APPENDIX A. List of government agencies consulted by the environmental team during scoping and/or the Feasibility Study

- New Valley's Office of the Governor
- NOPWASD
- New Valley Village Mayors and their representatives
- New Valley Water and Wastewater Operating Entity
- Representative from the Ministry of Housing for Local Development
- National Research Institute
- Representatives of the respective Markaz

APPENDIX B. Detailed Summary of comments received by the New Valley Scoping Session

The following are comments received during the meeting. The comments reflect the interest of the representatives of the other villages in the Feasibility Study to have wastewater service as soon as possible as well as environmental impacts.

Location of WWTP at El Mounira villages

Comment
The location of the proposed Wastewater Treatment Plant (WWTP) should be sufficiently far from the present residential area and any further development.

Response
The proposed WWTP is located away from any future development by at least 1 km.

Nuisance from the proposed WWTP at El Mounira village

Comment
Operation of the WWTP should not cause any remarkable nuisances in terms of odor and noise to the village residents.

Response
The location of the WWTP of El Mounira is southeast of the residential area by 1.5 km and the treatment plant will have a minor mechanical works. In addition, the prevailing wind is from the northwest. The proposed WWTP will not cause significant odor problems. So, it's expected that there will be negligible odor and noise impacts to the village residents.

USAID support allocated to the New Valley Governorate

Comment

The USAID support allocated to the New Valley Governorate is relatively low and the community expects more support.

Response

The budget allocated this year can cover two villages. There is a possibility that the USAID would support the proposed activities for one or more villages of the five villages

Comment

What are the selection criteria for the two villages?

Response

It is one in Dakhla Oasis and one village in Kharaga Oasis. The remaining five villages will be handled in a new program with total fund of 20 Billion LE covering the rural area of Egypt.

Comment

The involvement of local community in running the projects is missing not like other programs such as the Swiss Fund.

Response
There are other programs run by USAID, such as the Small Enterprise Program, that allows for the involvement of the local community.

Comment

Do the funds allocated for the proposed project for the two villages cover all activities including the treatment works?

Response

USAID confirms that the funds will cover the construction of the whole proposed activities for the two villages including the WWTP.

Coordination between USAID and NOPWASD

Comment

There is a need to have full cooperation between USAID and NOPWASD to handle the rest of the proposed activities for the other three villages.

Response

There is coordination between USAID and NOPWASD for any upcoming projects.

Other villages subject to subsurface water problem

Comment
El Gedida and Tenidah Villages suffer from subsurface water problem and pooling stagnant water in the residential areas. So, there is a need to have wastewater collection system as soon as possible.

Response
The villages are among those that have a priority in the NOPWASD program for rural areas of Egypt.

Reuse effluents

Comment

The project should include reuse of treated effluents.

Response

NOPWASD in coordination with Ministry of Agriculture and Land Reclamation (MALR) manage the treated effluent. So, the effluent of the both proposed WWTPs will be reuse through scheme managed by MALR. Another possibility is that the New Valley Governorate would invite investors for better use of the treated effluents. The reuse scheme would include planting trees for wood production and landscaping.

Appreciation from the project area (proposed served villages of Balat and El Mounira)

The communities within the villages of the project area appreciate the proposed activities supported by USAID and NOPWASD.

APPENDIX C. List of Invitees to Scoping Session

The Office of the Governor through the New Valley's General Secretary invited attendees via telephone calls to the various senior representatives who then passed along invitations to others within the organization or the community.

APPENDIX D. List of Participants at Scoping Session

Egypt Infrastructure Improvements

Environmental Assessment Scoping Session

Wednesday: 11 April 2007

Venue: New Valley

Meeting Attendance

Ser	Name	Organization	Telephone
1	Richard Minkwitz	CDM	010 1933030
2	Stephen Nielson	CDM	010 6694247
3	Ashraf Ismail	CDM/AAW	012 7835558
4	Moustafa Mohamed El Tayeb	CDM/AAW	010 1444609
5	Ashraf Abdullah Ata Allah	Local city Council for El-Kharga City and Markaz - Technical Surveyor	7923240
6	Sayed Mohamed Ahmed Younies	Urban Planning Department - at El Kharga Markaz -	012 7259577
7	Giehan Hosien Mohamed	Radio / Broadcasting - News reporter -	7933607
8	Naser Mohamed Omar Saied	Engineering Department- Mounira Village Local city Council	7960097
9	Yehia Abda Mohamed	Project Specialist in the Governorate	7933723
10	Hosni Sadek Gharsaa	Wastewater Technician at Kharga Markez	012 9372815
11	Mansour Abdalla Gabr	Wastewater Technician at Kharga Markez	7924432
12	Gharieb Ibrahim El Sawi	USAID	012 2176314
13	Amani Loka	USAID	012 6868797
14	Sabr Ahmed Mohamed Sakr	The Chief of Balat village & Dakhla Markez	012 7636337
15	Anwar Ahmed Kenawy	Head of Engineering Department of Balat Village	012 9451698
16	Khdr Abdalla Mohamed	Head of Development department - El Gedida Village Local Council	010 2871209
17	Mohamed Abdel Sayed Mohamed	Head of Engineering Department of El Gedida Village	7746351
18	Nabila Hasan Saied	Water Department Manager	010 5463351
19	Namat Ayied Saied	Water Treatment Plants Engineer	010 9469148
20	Omyma Ali Talab	Water Wells Maintenance Engineer	012 4424178
21	Mansour Mohamed Saied	Urban Planning Technician	012 9897623
22	Sayed M. Abdalla	Chief of of El Gedida Village Local Council	N/A
23	Yousef Hamouda Abdalla	Chief of El Mounira Village Local Public Council -	N/A
24	Mansour Mohamed Wahd	Chief of El Gedida Village Local Public Council	N/A
25	Ghdr Hosien Mohamed	Secretary of El Gedida Village Local Council	N/A
26	Mansour Mohamed Abdel Malek	Senior Technician of the Utility Department - Dakhla	N/A
27	Sayed Saad Ryad	Tecnation of the Utility Department - Dakhla	N/A
28	Anwar Ibrahim Hanaa	Utility Department Engineer - Dakhal	N/A
29	Mohamed Ali Abdel Kawi	Senior Technician -Water Supply Network - Kharga	N/A
30	Ahmed Hosien Ahmed	Senior Technician - W. T.P - Kharga -.	N/A
31	Ibrahim Mohamed Yknown	Senior Technician - W.T.P. Kharga	
32	Mahmoud Tartwsh Abdel Moniem	Senior Technician of the WW. Department - Kharga	

Ser.	Name	Organization	Telephone
33	Tallat Zaraa Hassan	Gen. Manager of Agriculture Department	N/A
34	Salah Abdel Hamied Mahmoud	Manager of Planting and Environmental - Agriculture Department	N/A
35	Ali Abdalla	The Chief of of Nasr El Thawra Village Local Council	N/A
36	Moustafa Khalil Masry	Nasr El Thawra Village Local Council	N/A
37	Abdel Hady Thabet	Nasr El Thawra Village Local Council	N/A
38	Mona Mohamed Ali Abdel Hamied	Manager of Urban Planning Department - Kharga	N/A
39	Mahmoud Gharieb Mohamed	New Valley Irrigation Department -	N/A
40	Salah El Dien Hananien	Production General Department	N/A
41	Ahmed Mohamed Ibrahim	Planning and Follow Up General Department	N/A
42	Abdel Aziz Abu El Hasan Hosien	NV. Governorate Urban Planning Department -	N/A
43	Vector Roshdy Shardien	General Manager of the Engineering Department - Kharga	N/A
44	Sayed Ahmed Abdel Sayed	Villages Development Authority	7923864
45	Mohamed Abdel All Abdel Aziz	Chief of the Wastewater Utility Department	N/A
46	Saied Hasan Mohamed	Manager of Land Fund Box	7922141
47	Hamad Frghaly Ahmed	Chief of El Mounira Village .	
48	Walied Hosien M. Abdalla	General Department of Groundwater	7935033
49	Saber Mohamed Ismail	EL Mounira Village Local Council - - Development responsible	7960070
50	Mohamed Modaa Abdalla	EL Mounira Village Local Council - Driver	7960439
51	Shokry Abdel Kalek Shaban	Planning and Follow Up General Department Office Manger	7925447
52	Adel Abdel Nabi	General Manager of the ARABESC Workshop - Village Urban Development Authority	7929835
53	Mohamed Soliman Ahmed	General Manager of the Housing Department-	7921148
54	Khaled Ismail Zaki	Desert Research Center	5103872
55	Fawkia Abdel Galil Khater	Kharga Local Council Markaz	79929707
56	Ahmed Abdel Rahman Ahmed	Manager of the Agriculture Advising	7920754
57	Salah El Din Sayed Hamad	General Manager of Production General Department	7925446
58	Ragab Yousef Mohamed	Land reclamation fund Box	7927234
59	Mawad Galal Mohamed	General Manager of Local Councils	220 7925446
60	Fatma Mohamed Mahfouz Ali	N.V. Governorate Information Center Gen. Manager	7924127
61	Mohamed El Tayeb Sayed Roha	Secretary of Balat Village Local Council.	7703013
62	Abu El Hasan Sayed Sakr	Chief of Balat Village Local Public Council	7703062
63	Abu Bakr Ibrahim Ali	Information Center	7920735
64	Aziza Hosien Othman	Manager of the Investment Sector	7920294
65	Adel Khdr Ibrahim	General Manager of Planning Department .	7925446
66	Ahmed Ali Abdel Kariem	Chief of the Governorate Media Office	7926926
67	El Saied Ahmed Abdel Rahman	Sn. Deputy of the El- Kharaga Markaze Chief	7821308
68	Zakria Hosien Mohamed Mansour	Secretary of Taneda Valley Local Council	7630001
69	Abdel Waha Abdel Salam Moaaz	Chief of Taneda Markz	7630001
70	Mohi EL Dein Ali Mohamed	Chief of Taneda Village Local Public Council	7630001
71	Ahmed Monier Saied	Engineer Department at Tanida Village Local Council-	7630073
72	Mohamed Ahmed Ali	Development Specialist - Tanida Village	7630185
73	Radwan Braka Mohamed	Advisor of Education Sector	3200077
74	Mahmoud Ali Mohamed El Asrawy	Governorate Legal Department General Manager	926175
75	Abdel Hakiem Gebali	General Manager of the Public Works	N/A

Ser.	Name	Organization	Telephone
76	Ibrahim Basheir	Chief of Kharga Water Utility Department	N/A
77	Ahmed Sayed Ghalil	Manager of Administration & Financial General Department in New Valley Governate	N/A
78	Khalaf Mhmoud Abdel Kariem	Farmer	N/A
79	Sad Abdel Kariem	Farmer	N/A
80	Saleh Ibrahim Saleh	Farmer	N/A
81	Ahmed Abu Rehab Maghy	Farmer	N/A
82	Abdel All El Sayed Ahmed	Farmer	N/A
83	Gharieb Mahmoud Srhan	Farmer	N/A
84	Abou El Ftoh Mahmoud Abdel Kader	Farmer	N/A
85	Sad Awad Godaa	Farmer	N/A
86	Aied Abdel Warth Khalil	Farmer	N/A
87	Ali Abdel Moiz Hamied	Farmer	N/A
88	Dawood Soliman Kandil	Deputy Chief of Kharga Local Council	N/A
89	General Maged	Chief of Kharga City & Markaz	N/A
90	Ahmed Hosien Marzouk	Manager of Follow Up at Kharga City & Markaz	
91	Amed Sayed Abdel Moula	New Valley Governorate	930755
92	Saad Ismail	New Valley Governorate Administration Manager	7921337
93	Assam Younis Mohamed	Governorate Public Relation	N/A
94	Salah Gabal	Governorate Public Relation	N/A
95	Abdel Kader Mohamed Abas	Governorate Public Relation	N/A
96	Mohamed Mahmoud Kasiem	Governorate Public Relation	N/A
97	Mahdy Saied	Governorate Public Relation	N/A
98	Gen. Sad Abu El Ola	N.V Governorate General Secretary - New Valley	N/A

مشـــروع تطوير البنيـــة التحتيـــة بمصـــر
ورشـــة عمل دراســـة التأثيرات البيئيـــة
أعمال الصرف الصحـــى بقـــرى الوادى الجديد

الأربعـــاء ١١ أبريل ٢٠٠٧

المكان : محافظة الوادى الجديد

كشـــف بأسمـــاء الســـادة الحضـــور

	الأســـم	جهـــةالعمل / الوظيفة	التيلفـــون
١	ريك مينلوتز	CDM	٠١٠١٩٢٢٠٧٠
٢	أسيف نيلسون	CDM	٠١٠٦٦٩٤٤٤٧
٣	اشرف اسماعيل	CDM/AAW	٠١٢٧٨٣٠٠٠٨
٤	مصطفى محمد الطيب	CDM/AAW	٠١٠١٤٤٤٦٠٩
٥	أشرف عبد الله عطا الله	الوحدة المحلية لمركز ومدينة الخارجة / فنى مساحة	٧٩٢٢٤٩٠
٦	سيد محمود احمد يونس	التخطيط العمرانى بالوحدة المحلية لمركز الخارجة	٠١٢٧٢٥٩٥٧٧
٧	جيهان حسين محمد	الإذاعة - محرر اخبار	٧٩٣٣٦٠٧
٨	[illegible]	مسئول [illegible] بالوحدة المحلية [illegible]	٧٩٦٠٠٩٧
٩	حسن عبده محمد	أخصائى حسابات [illegible]	٧٩٢٢٧٤٢
١٠	[illegible]	فنى صرف صحى مركز الخارجة	٠١٢٩٢٧٢٨١٥
١١	[illegible]	فنى صرف صحى مركز الخارجة	٧٩٤٤٤٢
١٢	غريب ابراهيم الصادق	USAID	012 2176314
١٣	أمانى رامى لوقا	USAID	0126868797
١٤	جابر [illegible]	رئيس المعمل [illegible]	٠127638337
١٥	أنور أحمد قناوى	مسئول الشئون الهندسية [illegible]	[illegible]
١٦	[illegible]	مسئول [illegible] بالوحدة المحلية لمركز الخارجة	٠١٠٢٨٧١٢٠٩
١٧	[illegible]	مسئول الشئون الهندسية بالوحدة [illegible]	٧٧٤٦٢٥١
١٨	[illegible]	مدير عام المياه	٠١٠/٥٤٦٣٣٥١
١٩	[illegible]	مهندس محطات المياه	٠١٠/٩٤٦٩١٤٨
٢٠	[illegible]	رئيس صيانة آبار المحطات	٠١٢٤٤٤٤١٧٨
٢١	[illegible]	فنى تخطيط عمرانى	٠١٢٩٨٩٧٦٣٢
٢٢	[illegible]	رئيس الوحدة [illegible]	
	يوسف جودة عطا الله	رئيس المجلس الشعبى بالمنيرة	

٢٤

مشـــروع تطوير البنيـــة التحتيـــة بمصـــر
ورشـــة عمل دراســـة التأثيرات البيئيـــة
أعمال الصرف الصحـــى بقـــرى الوادى الجديد

الأربعـــاء ١١ أبريل ٢٠٠٧

المكان : محافظة الوادى الجديد

كشـــف بأسمـــاء الســـادة الحضـــور

	الأســـم	جهـــةالعمل / الوظيفة	التيلفـــون
٢٣			
٢٤			
٢٥			
٢٦			
٢٧			
٢٨			
٢٩			
٣٠			
٣١			
٣٢			
٣٣			
٣٤			
٣٥			
٣٦			
٣٧			
٣٨			
٣٩			
٤٠			
٤١			
٤٢			
٤٣			
٤٤			

مشـــروع تطوير البنيـــة التحتيـــة بمصـــر
ورشـــة عمل دراســـة التأثيرات البيئيـــة
أعمال الصرف الصحـــى بقـــرى الوادى الجديد

الأربعـــاء ١١ أبريل ٢٠٠٧

المكان : محافظة الوادى الجديد

كشـــف بأسمـــاء الســـادة الحضـــور

	الأســـم	جهـــةالعمل / الوظيفة	التيلفـــون
٤٥			٧٩٢٢٤١٤١
٤٦			
٤٧			٧٩٣٠٠٢٢
٤٨			٧٩٦٠٠٧٠
٤٩			٧٩٩٠٤٢٩
٥٠			٧٩٢٠٤٤٧
٥١			٧٩٢٩٨٢٥
٥٢			٧٩٢١١٤٨
٥٣			٥١٠٢٨٧٢
٥٤			٧٩٩٢٩٧٠٧
٥٥			٧٩٢٠٧٠٤
٥٦			٧٩٢٠٤٤٦
٥٧			٧٩٢٧٢٢٤
٥٨			٧٩٢٠٥٤٦٦/٢٢٠
٥٩			٧٩٢٤١٢٧
٦٠			٧٧٠٣٠١٣
٦١			٧٧٠٢٠٩٢
٦٢			٧٩٢٠٧٢٥
٦٣			٧٩٢٠٢٩٤
٦٤			٧٩٢٠٥٤٦
٦٥			٧٩٢٦٩٢٦
٦٦			٠١٨٢٢٠٨

مشـــروع تطوير البنيـــة التحتيـــة بمصـــر
ورشـــة عمل دراســـة التأثيرات البيئيـــة
أعمال الصرف الصحـــى بقـــرى الوادى الجديد

الأربعـــاء ١١ أبريل ٢٠٠٧

المكان : محافظة الوادى الجديد

كشـــف بأسمـــاء الســـادة الحضـــور

	الأســـــم	جهـــةالعمل / الوظيفة	التيلفـــون
٦٧	ذكريا حسين محمد منصور	سكرتير الوحدة المحلية لقرية [illegible]	٧٦٢٠٠٠١
٦٨	[illegible]	رئيس [illegible]	٧٦٢٠٠٠١
٦٩	محي [illegible]	رئيس مجلس محلي [illegible]	٧٦٢٠٠٠١
٧٠	محمد [illegible]	مسئول الشئون [illegible]	٧٦٢٠١٧٢٠
٧١	محمد احمد على	اخصائي البيئة بالوحدة المحلية لقرية [illegible]	٧٦٢٠٢٨٥
٧٢	رضوان زكي محمد	[illegible] التربية والتعليم / موجه أول	٢٢٠٠٧٧
٧٣	محمود محمد ابراهيم	[illegible]	٩٢٦ ١٧٥
٧٤	[illegible]	[illegible]	
٧٥	ابراهيم [illegible]	رئيس [illegible]	
٧٦	محمد حسين [illegible]	مدير الادارة العامة للمالية والادارية بالمحافظة	
٧٧	خلف محمد عبد الكريم	مزارع	
٧٨	محمد عبد الكريم	مزارع	
٧٩	صالح ابراهيم صالح	مزارع	
٨٠	احمد ابو رحاب ماضي	مزارع	
٨١	عبد العال السيد احمد	مزارع	
٨٢	غريب محمد [illegible]	مزارع	
٨٣	ابو الفتوح محمود عبد القادر	مزارع	
٨٤	محمد عوض جودة	مزارع	
٨٥	عيد عبد الوارث خليل	مزارع	
٨٦	علي عبد المعز حميد	مزارع	
٨٧	م/ داود سليمان قنديل	نائب رئيس الوحدة المحلية بالخارجة	
٨٨	العبد احمد	رئيس [illegible]	
٨٩	محمد حسين [illegible]	مدير [illegible]	

مشــروع تطوير البنيــة التحتيــة بمصــر
ورشـــة عمل دراســة التأثيرات البيئيــة
أعمال الصرف الصحــى بقــرى الوادى الجديد

الأربعـــاء ١١ أبريل ٢٠٠٧

المكان : محافظة الوادى الجديد

كشــف بأســمـاء الســادة الحضــور

التيلفـــون	جهـــةالعمل / الوظيفة	الأســـم	
		~~سعدون جودة~~	
٩٢٠٧٥٥	الديوان العام	احمد سيد حمول	٩٠
٧٩٤٢٢٤٢	[illegible]	[illegible]	٩١
	العلاقات العامة بالمحافظة	عصام يونس محمد	٩٢
	العلاقات العامة بالمحافظة	صلاح جبل	٩٣
	العلاقات العامة بالمحافظة	عبدالقادر محمد عياس	٩٤
	العلاقات العامة بالمحافظة	محمد محمود قاسم	٩٥
	العلاقات العامة بالمحافظة	مهدى سعيد	٩٦

APPENDIX E. Proposed Outline of the Environmental Assessment Report

ENVIRONMENTAL ASSESSMENT REPORT

Executive Summary (Arabic and English)

1. Introduction

1.1 Background
1.2 Proposed action
1.3 Environmental regulatory procedures
1.3.1 Egyptian environmental legislation
1.3.2 USAID environmental procedures

2. Project Description

2.1 Background
2.2 Layout and description of proposed facilities
2.3 Construction activities
2.4 Operation activities
3. Environmental Setting

3.1 Background
3.2 Physical environment
3.3 Socio-economic environment
3.4 Cultural and aesthetic environment

4. Environmental Effects

4.1. Background
4.2. Physical environment impacts
4.3. Cultural and aesthetic environmental impacts
4.4. No-action alternative

5. Mitigation, Monitoring and Management

5.1. Background
5.2. Physical environment
5.3. Socio-economic environment
5.4. Cultural and aesthetic environment

Appendices

List of EA preparers
Scoping Report
Public NGOs correspondence

APPENDIX F. Existing Conditions and Proposed Facilities in El-Mounira (from the New Valley Feasibility Study)

Information that is specific to the village of El Mounira is presented in this Appendix. It includes a brief evaluation of previous studies, followed by a description of the proposed facilities:

- a sewer network, sewage pump station and force main; and
- wastewater stabilization ponds.

Previous Studies and Designs. A detailed ground survey of El Mounira was developed under the feasibility study, including ground elevations and locations of streets, houses, barns and irrigated green areas. The results of the ground survey for El Mounira are included in Appendix C of the New Valley Feasibility Study (NVFS).

A geotechnical survey for El Mounira included 25 borings to 10m depth within the service area of the proposed sewer system, 1 boring near the proposed pump station, and 6 borings at the site of the proposed wastewater stabilization ponds. The geotechnical report for El Mounira is available as an annex to the NVFS. The borings indicate a general prevalence of sandy soil, with traces of silt and gravel. This soil is very suitable as a foundation for sewer pipe, and excavated material can be used to backfill the sewer trenches. Some locations in the southern portion of the village contain silty clay layers, which have a moderate swelling potential that can cause damage to sewers and manholes if moistened by sewage or irrigation drainage. This problem can be minimized by over-excavation of 0.5m to 1.0m, and replacement of the clay soil by clean sand. One of the six borings at the WWTP site also contains silty clay susceptible to swelling; such areas will require over-excavation and replacement of the clay soil with clean sandy soil. The previously-proposed sewage pump station is on a former dumpsite, and will require relocation or excavation of the trash to create a good foundation for the pump station.

Drawings dated 2004 show a proposed wastewater system for El Mounira. The drawings show three types of facilities: sewers, a pump station, and a force main. An approximate location and site boundaries were also identified for wastewater stabilization ponds.

Existing Utility Services. The water and electricity is provided throughout the village. The potable water supply network serves all the people, through a network of pipes ranging from 4-inch to 8-inch diameter, fed from a water treatment plant that receives water from a deep well.

Wastewater Collection System. The proposed sewer system for El Mounira is shown in Appendix J. About 13.2 km of gravity sewer will be required, of which 11.5km will be the minimum size of 200mm diameter. Flows will be by gravity to a single pump station located near the main highway. A 200mm force main, 2300m long, will carry the sewage to the wastewater stabilization ponds.

Wastewater Treatment Works. The sizes of stabilization ponds (anaerobic, facultative and maturation) for El Mounira have been selected based on the design discussed in Section 3.5

of the NVFS. The pond dimensions for the preliminary design are summarized in Table F-1. A layout of the ponds for the preliminary design is shown in Appendix J.

Effluent Disposal and Reuse. The NVFS estimate of cost of the stabilization ponds includes the costs for an effluent pump station and short length of force main. Effluent reuse to grow trees for wood has been assumed for this feasibility study, with none of the associated costs to be funded by USAID or NOPWASD. It was assumed that the villagers could provide the drainage ditches and seedlings required to absorb the effluent. Construction of an engineered disposal area (by evaporation and limited percolation into the soil) was considered to be a very costly option that would be undertaken only as a last resort.

Table F-1. Preliminary Design of Stabilization Ponds, El Mounira

Item	Anaerobic Ponds	Facultative Ponds	Maturation Ponds	Totals, Averages
Design Flow, m^3/day	2,000	2,000	2,000	2,000
Number of Ponds	3	4	3	10
Detention Time, days	3	15	15	33
Water Volume, m^3	6,000	30,000	30,000	66,000
Water Depth, m	4.0	1.5	1.5	1.59
WS Area at Mid-depth, m^2	1,500	20,000	20,000	41,500
Length/Width Ratio	1	2.50	3.00	
Length at Mid-Depth, m	22.4	111.8	141.4	
Width at Mid-Depth, m	22.4	44.7	47.1	
Side Slope, H:V	3.0	3.0	3.0	
Length at Full-Pond Depth, m	34.4	116.3	145.9	
Width at Full-Pond Depth, m	34.4	49.2	51.6	
Area at Full-Pond Depth, m^2	3,542	22,898	22,606	49,047
Freeboard, m	1	1	1	
Length at Top of Dike, m	**40.4**	**122.3**	**151.9**	
Width at Top of Dike, m	**40.4**	**55.2**	**57.6**	
Area at Top of Dike, m^2	4,887	27,015	26,270	58,172
Sludge Storage Depth, m	1.0	0.3	0.0	
Length at Pond Bottom, m	4.4	105.5	136.9	
Width at Pond Bottom, m	4.4	38.4	42.6	
Area at Pond Bottom, m^2	57	16,214	17,515	33,787

APPENDIX G. Existing Conditions and Proposed Facilities in Balat (from the New Valley Feasibility Study)

Information that is specific to the village of Balat is presented in this appendix. This includes a brief evaluation of previous studies, followed by a description of the proposed expansion of the existing wastewater treatment facilities serving Balat.

G.1 Previous Studies and Designs

A detailed ground survey of the Balat WWTP site, including ground elevations and locations of the existing stabilization ponds, is included in Appendix C of the New Valley Feasibility Study (NVFS). A geotechnical survey carried out at the Balat WWTP site included 8 borings (to depths of 8m to 15m) extending over the existing pond area and the adjacent land needed for the proposed expansion to the wastewater stabilization ponds. The Balat geotechnical report is available as an annex to the NVFS. All of the borings show silty clay having a moderate swelling potential that can cause damage to structures if moistened by sewage or irrigation drainage. This problem can be minimized by over-excavation of 0.5m to 1.0m, and replacement of the clay soil by clean sand. The additional cost for soil replacement has been included in the cost estimates.

Drawings were obtained that show the design for the existing stabilization ponds for Balat. The drawings are dated 1988, and show the general layout on two sheets. No engineering report has been provided showing the design population and wastewater flow, and no previous design is available for the wastewater stabilization ponds.

G.2 Proposed Wastewater Treatment Works

The sizes of stabilization ponds (anaerobic, facultative and maturation) for Balat have been selected based on the design discussed in Section 3.5 of the NVFS. The pond dimensions for the preliminary design are summarized in Table G -1, assuming that new ponds are built to treat all of the wastewater. A layout of the ponds for the preliminary design is shown in Appendix J, in which the existing ponds are shown within the same general site.

A comparison of the dimensions and area of the existing ponds, with the total area of new ponds required, is shown in Table G-2. It can be seen that the design forecasts adopted in this study will require new ponds with substantially more capacity than the existing ponds, by a factor of 6 to 12 times as much capacity. The existing ponds could be incorporated into the design of an expanded system, but given the insignificant size of the existing ponds, a completely new set of ponds is proposed as the preferable solution. This conclusion is based on the following factors:

- Modification of the existing ponds would require taking them out of service, which may not be permitted and which may lead to geotechnical problems in trying to modify the existing embankments and piping arrangements;

- The existing ponds have hydraulic restrictions, such that the anaerobic ponds overflow whenever the sewage pump station is operated for too long a duration; finding and correcting such restrictions may prove difficult;

- Obtaining a good hydraulic design, to assure the desired split in flow between existing and new ponds, would be quite difficult; the existing ponds are designed without any head loss elements built in between the successive ponds, and intermediate pumping or raising the embankments around the existing ponds might prove necessary;

- Long lengths of pipe would be necessary to interconnect the existing and new ponds at four transitions between successive processes: influent/anaerobic; anaerobic/facultative; facultative/maturation; and maturation/effluent. A different flow split between the existing and new ponds is required at each of these transitions;

- Any potential savings on civil-works cost from incorporating the existing ponds would be offset by the much higher costs for piping, valves, and other mechanical/electrical equipment.

- There is no apparent restriction on the amount of land available at the treatment plant site, and hence emphasis can be given to ease of design, construction, and operation of the pond system, rather than to fitting the ponds into a restricted site.

Table G-1. Preliminary Design of New Wastewater Stabilization Ponds, Balat

Item	Anaerobic Ponds	Facultative Ponds	Maturation Ponds	Totals, Averages
Design Flow, m^3/day	2,700	2,700	2,700	2,700
Number of Ponds	3	4	3	10
Detention Time, days	3	15	15	33
Water Volume, m^3	8,100	40,500	40,500	89,100
Water Depth, m	4.0	1.5	1.5	1.59
WS Area at Mid-depth, m^2	2,025	27,000	27,000	56,025
Length/Width Ratio	1	2.50	3.00	
Length at Mid-Depth, m	26.0	129.9	164.3	
Width at Mid-Depth, m	26.0	52.0	54.8	
Side Slope, H:V	3.0	3.0	3.0	
Length at Full-Pond Depth, m	38.0	134.4	168.8	
Width at Full-Pond Depth, m	38.0	56.5	59.3	
Area at Full-Pond Depth, m^2	4,328	30,355	30,018	64,701
Freeboard, m	1	1	1	
Length at Top of Dike, m	**44.0**	**140.4**	**174.8**	
Width at Top of Dike, m	**44.0**	**62.5**	**65.3**	
Area at Top of Dike, m^2	5,803	35,079	34,232	75,114
Sludge Storage Depth, m	1.0	0.3	0.0	
Length at Pond Bottom, m	8.0	123.6	159.8	
Width at Pond Bottom, m	8.0	45.7	50.3	
Area at Pond Bottom, m^2	191	22,576	24,103	46,870

Table G-2. Comparison of Existing and Proposed New Stabilization Ponds, Balat

Item	Existing Ponds				Proposed, New Ponds				Area Ratio %
	Length m	Width m	No.	Area m^2	Length m	Width m	No.	Area m^2	
Anaerobic Ponds	33	15	2	1,003	44.0	44.0	3	5,808	579%
Facultative Ponds	89	33	1	2,946	140	63	4	35,000	1188%
Maturation Ponds	70	39	2	5,389	175	65	3	34,243	635%
Totals			5	9,338			10	75,051	804%

G.3 Effluent Disposal and Reuse

Cost estimates for the stabilization ponds include an effluent pump station and short length of force main. Effluent reuse to grow trees for wood (as at present at Balat) has been assumed for this feasibility study, with none of the associated costs to be funded by USAID or NOPWASD. It is felt that the villagers could provide the drainage ditches and seedlings required to absorb the effluent. Construction of an engineered disposal area (by evaporation and limited percolation into the soil) is considered to be a very costly option that would be undertaken only as a last resort.

APPENDIX H. Effluent Quality Criteria

Table H-1: Wastewater Effluent Standards for Discharge to Non-Potable Waters

Parameter	Units	Stated Discharge Limit
5-day BOD	mg/L	60
Total Suspended Solids	mg/L	50
Total Dissolved Solids	mg/L	2000
Nitrate as N	mg/L	50
Coliforms	MPN/100ml	5,000
Dissolved Oxygen	mg/L	4

Note: from Ministerial Decree No. 8 of 1983; regulations for application of Law 48

Table H-2. Guidelines on Effluent Standards by Ministry of Housing and Utilities

Parameter	Units	Primary Treatment	Secondary Treatment	Tertiary Treatment
5-day BOD	mg/L	300	40	20
COD	mg/L	600	80	40
Total Suspended Solids	mg/L	350	40	20
Intestinal Nematodes	MPN/100ml	5	1	1
Fecal Coliforms	MPN/100ml	N/A	1000	100
Total Dissolved Solids	mg/L	2500	2000	2000

Note: from Ministry of Housing and Utilities; excerpted from SCP 1996 Design Criteria Report

Table H-3. Guidelines on Crops, Precautions, and Soils for Irrigation Reuse

Wastewater Treatment	Crops	Precautions	Irrigation Method	Type of Soil
None	Wood trees, palms	Fencing, no direct contact, no cattle, health precautions	Furrow	Light consistency
Primary	Cotton, flax, flowers	Same as above	Furrow, drip with filters	Light consistency
Secondary	Fodder, dry seeds, grass, most fruits, cooked vegetables	Cattle for meat not milk; cook crops before eating	Furrow, drip	Light or medium consistency
Tertiary	Raw vegetables	None	All except sprinkler	All types

Note: from Ministry of Housing and Utilities; excerpted from the SCP 1996 Design Criteria Report

APPENDIX I. Process Train and Site Layout for Stabilization Ponds

Process train

The treatment system will consist of preliminary treatment, anaerobic ponds, facultative ponds, and maturation ponds, followed by effluent reuse and/or disposal.

All the ponds will contain a membrane liner, protected by a layer of soil or gravel, and a layer of riprap near the water surface to protect against wind-driven waves. The liner is to prevent excessive leakage of water needed for irrigation reuse, and to prevent movement of nutrients from the ponds into the groundwater aquifer.

Preliminary treatment will consist of flow measurement and manually-cleaned screens.

The **anaerobic ponds** remove a substantial portion of the TSS (total suspended solids) and the settleable portion of the BOD by sedimentation, and trap most of the floating oils and scum in the wastewater. Anaerobic ponds are devoid of oxygen and provide slow anaerobic digestion of the sludge in the bottom of the ponds. An individual pond can accumulate sludge for 3 to 5 years before sludge removal is required. At that point, a pond must be taken out of service for about 1 year, during which the liquid is removed, and the sludge allowed to drain and dewater prior to removal. As a result, 3 anaerobic ponds are needed in a pond system, to allow for 1 of the 3 ponds to be out of service continuously. A loading rate of 250 grams/m^3/day is proposed for sizing of the 2 ponds in service, and a minimum hydraulic detention time (HRT) of 2 days. A nominal water depth of 4m has also been adopted (plus an allowance of 1.0m for sludge storage). The BOD removal efficiency is estimated at 40% under these design conditions.

Facultative ponds remove BOD by a combination of two processes: aerobic digestion near the water surface, with the oxygen supplied primarily by algae and to a lesser extent by atmospheric re-aeration; and anaerobic digestion and settling of solids in the bottom of the pond. A detention time of 15 days is considered to be sufficient to obtain an adequate BOD removal. Other design parameters selected for the facultative ponds, in addition to detention time, include an allowance of 0.3m in depth for sludge accumulation, and a design effluent BOD concentration of 50 mg/L. Two trains of facultative ponds are proposed, so that one train can be taken out of service for sludge removal or maintenance. Within each train, two ponds of equal size are proposed, to promote the removal of faecal coliforms (as an indicator of water-borne disease-causing bacteria).

Maturation Ponds. Three ponds in series, each with a detention time of 5 days, are proposed to assure coliform removal. The objective is to achieve an effluent fecal coliform concentration of 300 MPN per 100ml, which would allow application of the effluent to essentially all types of irrigated crops. The maturation ponds would have a depth of 1.5m to allow good light penetration for disinfection, as well as polishing of the effluent by further removal of organics.

Effluent Reuse and/or Disposal. In the long term, the treated effluent from the stabilization ponds will be used for irrigation and other beneficial purposes. An effluent pump station and force main will be provided to support effluent reuse. Based on experience on the Secondary Cities Project in other areas of Egypt, it is considered unlikely that irrigation reuse facilities

could be developed (under the aegis of the Ministry of Agriculture) in time to use all of the effluent in the early years of pond operation. The villages and Ministry of Housing officials have indicated a willingness to use the effluent, at least temporarily, to water trees grown only for wood. If this cannot be accommodated, disposal of the treated effluent by application to a dedicated disposal area may be found necessary. Within the disposal area, evaporation and percolation into the soil, rather than irrigation of crops, would be used for effluent disposal.

The effluent disposal area would be divided into six equal parcels, and the effluent would be applied to each parcel every six days. This would allow time for drying of the soil between applications, to avoid problems (ponding, mosquitoes, weeds, swampy conditions) that might occur with continuous application over the disposal area.

During several winter months, percolation into the ground will be used for disposal of a portion of effluent, in order to reduce the total size of the disposal area. A maximum infiltration rate of about 3 mm/day has been assumed. Under these assumptions, the disposal area required would have an area of 18 ha (180,000 m^2).

Site Development

The WWTP facilities will include a manual head works structure for screening and measuring flow, the process ponds, an administration/operations building, an effluent pump station, force main site lighting, standby generator, a protected potable water system for use in the administration building and as required for wash down.

The site layout design for the WWTPs and Pump Stations will include roadways, parking, site grading, and landscaping. One access will be provided to the sites. The WWTP sites will have a roadway system on the berms of the stabilization ponds for inspection and servicing the ponds. The Pump Station sites will be provided with sufficient access to service all mechanical equipment and depending on the land area decreed parking will be included.
The pump station site will be protected by a perimeter security fence constructed of sand brick within a concrete frame matching the materials of the pump station structures.

The necessity of a costly perimeter security fence at the WWTP will be reviewed by all parties during design.

Structural design will conform with UBC and local Egyptian requirements for wind and seismic loads. The AASHTO Specifications will be used in the development of vehicular loadings, impact, and lateral surcharges. Conditions for design of liquid containing structures will include cells full, empty or in any combination, with or without backfill.

Electrical Design. The New Valley Electrical Distribution Company (NVEDC) will supply electrical power to the facilities. Sufficient fuel storage will be provided to allow for a minimum of 48 continuous hours of generator operations.

APPENDIX J. Scoping Session Meeting Agenda – English/Arabic

Arab Republic of Egypt

EGYPT INFRASTRUCTURE IMPROVEMENTS PROJECT

SECONDARY CITIES

Environmental Assessment

Scoping Statement

For

New Valley Governorate
El Mounira Village, Kharga Oasis,
Balat Village, Dakhla Oasis

National Organization for Potable Water and Sanitary Drainage (NOPWASD)

US Agency for International Development (USAID)
USAID Project No. 263-0236

CDM International Inc.

In association with

Dr. Ahmed Abdel-Warith Consulting Engineers

USAID FROM THE AMERICAN PEOPLE

April 2007

EGYPT INFRASTRUCTURE IMPROVEMENTS PROJECT
ENVIRONMENTAL ASSESSMENT

NEW VALLEY GOVERNORATE

EL-MOUNIRA VILLAGE, KHARGA OASIS
BALAT VILLAGE, DAKHLA OASIS

ENVIRONMENTAL SCOPING MEETING

1. Introduction

This paper and this meeting are to describe the wastewater control measures we propose to construct in the New Valley Governorate. The projects are undertaken for the Government of Egypt (GOE) through the National Organization for Potable Water and Sanitary Drainage (NOPWASD) and the United States Agency for International Development (USAID).

Background data and information for the proposed remedial activities were gathered and reported in the New Valley Feasibility Study, prepared by CDM for USAID in August, 2006.

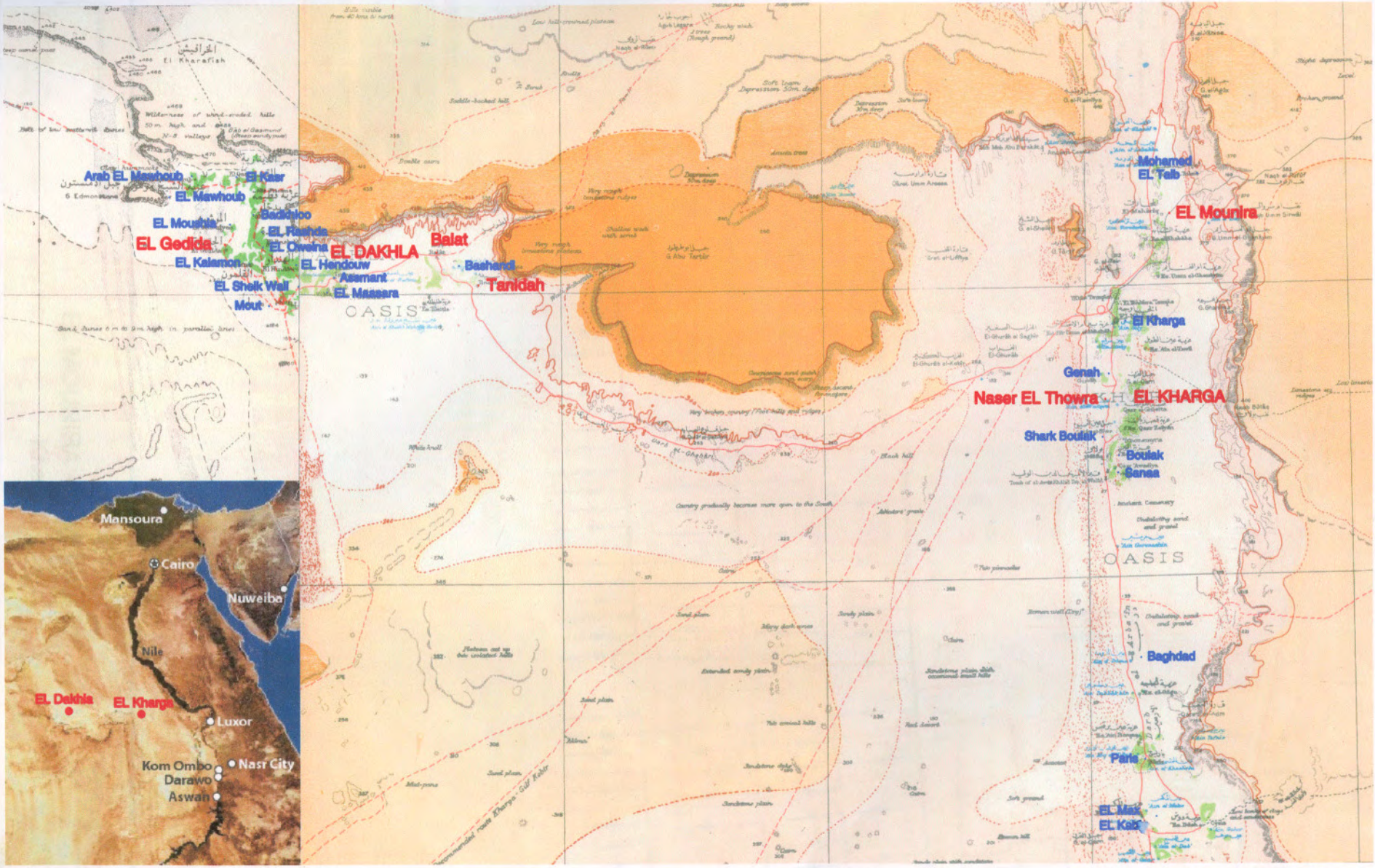
We have learned that many villages need wastewater collection systems. The wastewater, once collected, must be piped to a treatment plant. The treated effluent must be discharged and used in a manner that is beneficial, not harmful.

Hydrologically, New Valley is a closed basin. There is therefore a priority to prevent and mitigate water pollution especially from wastewater as a major source.

Although many villages have legitimate need for wastewater collection systems, there are presently funds to build a system for only two villages in the New Valley. It has been determined that the village of El Mounira in Kharga Oasis is to be provided with a wastewater collection and treatment system, and Balat Village in Dakhla Oasis will be furnished with an enlarged and improved wastewater treatment plant. Other villages will be furnished wastewater systems in the future, should funds become available.

2. Project Descriptions

Figure 1 identifies the location of the New Valley Oases of El-Kharga and El-Dakhla. In **El Mounira,** wastewater will be collected from the homes, shops, and other buildings by the pipe network shown in Figure 2. The wastewater will flow to a central pump station, from where it will be pumped to the wastewater treatment plant 2300 meters to the east of the village, as shown in Figure 2.



CDM International Inc.
consulting engineering construction operations

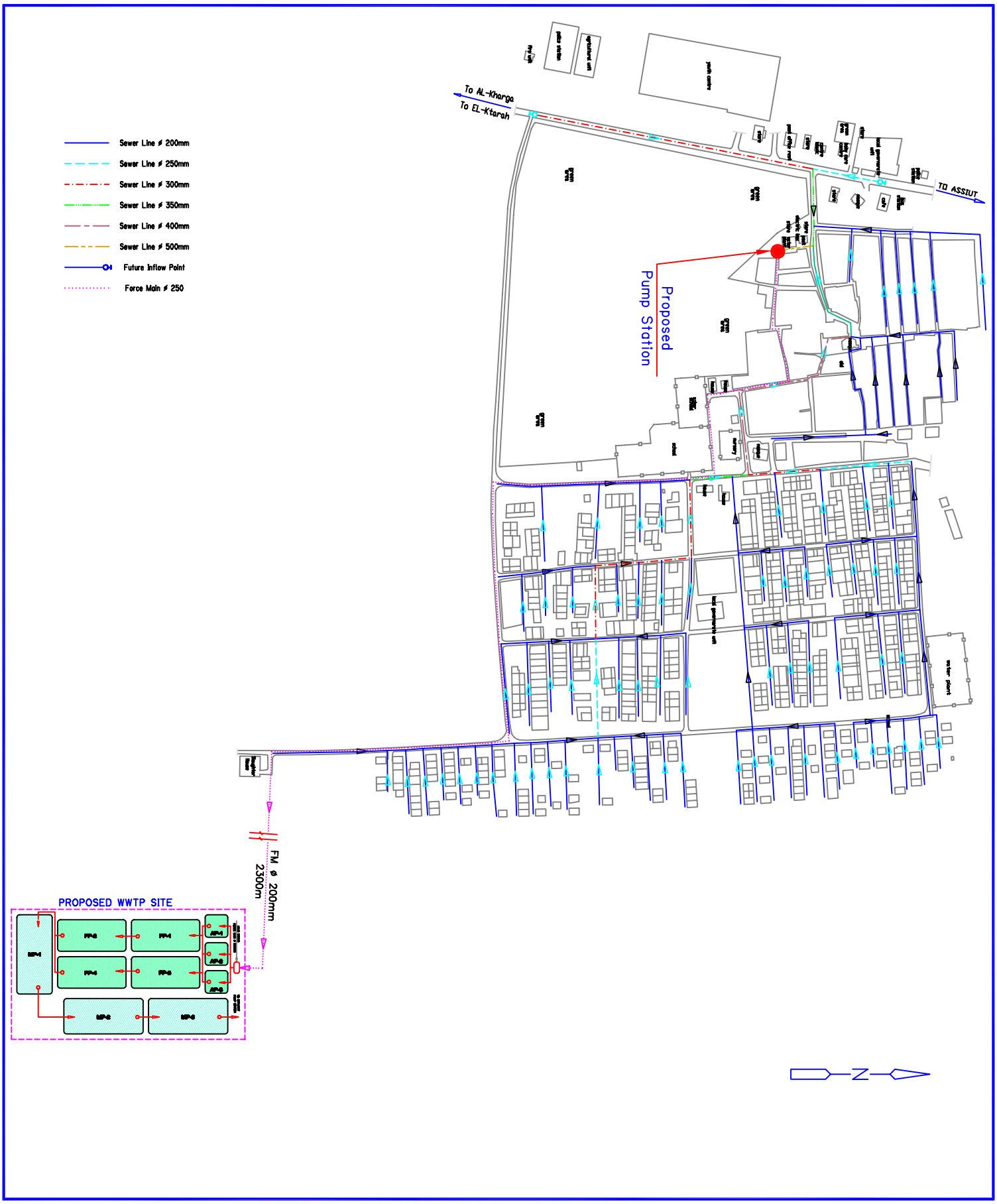
in association with
Dr. Ahmed Abdel-Warith
Consulting Engineers

New Valley Location Map

USAID
FROM THE AMERICAN PEOPLE

Contract No. 263-C-00-07-00010-10
Egypt Infrastructure Improvements Project

FIGURE 1



CDM International Inc.
consulting engineering construction operations
in association with
Dr. Ahmed Abdel-Warith
Consulting Engineers

EL MOUNIRA - NEW VALLEY
Kharga

USAID
FROM THE AMERICAN PEOPLE
Contract No. 263-C-00-07-00010-10
Egypt Infrastructure Improvements Project

FIGURE 2

In such a remote area, the wastewater treatment should employ low-cost, low maintenance technology to avoid many maintenance problems and thus risk of failure.

It will be in a series of "stabilization ponds," a reliable treatment system of a type that is already in use in many locations in Egypt, including Luxor City. We anticipate that the effluent from the wastewater plant will be pumped to irrigate forest land (by others), as indicated in Figure 2.

El Mounira Village has a population of about 10,000. The projected wastewater flow rate is 2000 m^3/day. The footprint area of the wastewater plant is about 10 ha.

In **Balat,** the existing stabilization-pond wastewater plant (Figure 3) is overloaded, and is to be upgraded/replaced by a new system of larger ponds, sized to accommodate flows from a future served population of about 10,000. Expanded demand is expected to be due to extension of sewerage in Balat (by others), and to connection of other villages' wastewater systems (by others) to this treatment plant. The footprint area of the present set of ponds is about 2-5 ha; the footprint area of the set of new ponds is to be about 13 ha (Figure 4).

3. Environmental Considerations and Key Issues

The USAID-funded Project is conducting an Environmental Assessment (EA) of the proposed remedial activities for the El Mounir Village, El-Kharga Oasis and Balat Village, Dakhla Oasis. An EA is a process used to identify and predict the environmental consequences of a newly planned activity and to assist in planning appropriate measures to reduce the adverse effects and maximize environmental benefits before such activities are allowed to go ahead. It is a practical and valuable means for aiding decision makers as regards to project implementation.

The EA provides the decision makers with reasonably accurate information concerning existing environmental conditions, potentially significant environmental impacts and possible mitigation measures, monitoring programs, opportunities for environmental enhancement and environmental management plans.

"Scoping" is an EA activity which:

- Identifies those attributes of the environment for which there are concerns; and
- Provides a plan that enables the EA team to be focused on those attributes.

Scoping is a shared responsibility where the proponent government agencies, the New Valley Governorate and USAID, and the public, all have a role. The Scoping Meeting is part of this process.

Anaerobic and Facultative Ponds at Balat WWTP

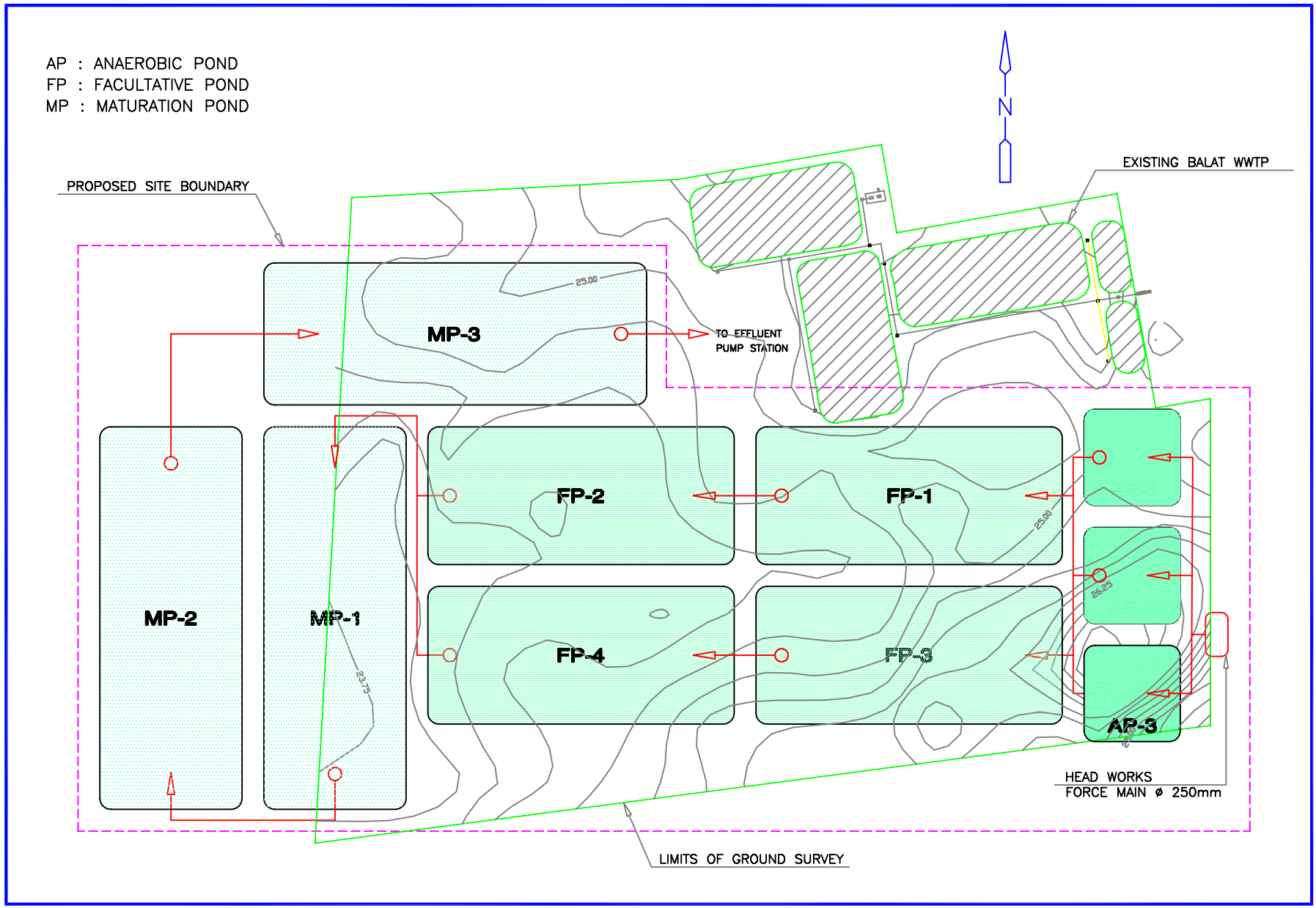
Maturation Pond at WWTP

Effluent From Maturation Pond

Weir on Effluent and Pump Suction

Balat's Existing Wastewater Tretment Plant

Figure 3



CDM International Inc.
in association with
Dr. Ahmed Abdel-Warith
Consulting Engineers

BALAT - NEW VALLEY
Dakhla

USAID
FROM THE AMERICAN PEOPLE
Contract No. 263-C-00-07-00010-10
Egypt Infrastructure
Improvements Project

FIGURE 4

Potential effects that have been identified, whether positive or negative, are listed below.

General

- There will be an improvement in public health.
- There will be a reduction in the cost and effort to dispose of wastewater: a positive socioeconomic impact on the villagers.
- Employment opportunities will be created for skilled, semiskilled and unskilled laborers during construction and operation & maintenance.
- The system will produce an effluent of adequately good quality to support the irrigation of trees and non-consumed crops.
- Consider the potential impact of construction activities on antiquities.
- Due to requirements for monitoring of wastewater influent and effluent, there will be increased demand for local laboratory services.

Construction of the new wastewater collection system, El Mounira

- There will be improvement in the form of a lowered water table within the residential area of El-Mounira.
- Consider public safety, traffic control and interruptions during construction including interruptions of water or electric utility services.
- Be aware of locations where the sewerage system may pass through deposits of expansive clays, which swell when wetted. In such locations, take measures to minimize the probability of leakage from the sewer into this soil, and replace such soil with sand to the extent necessary.
- If it happens that unsewered areas remain adjacent to sewered areas, provide manhole access in the sewers nearest such areas for the convenience of septage haulers who need to discharge their loads.
- Where new pump stations are to be located, the impacts on land use, energy consumption and traffic control must be assessed.
- Consider operation and maintenance activities at these new pump stations, e.g. problems of noise, odors and disposal of screenings.

Construction of Stabilization Pond Wastewater Treatment Systems, El Mounira and Balat

- Consider the location of the new stabilization pond sites, and problems of associated land acquisition.

- There will be improvement in the quality of effluent used for irrigation.

- Determine whether there are limitations to how much effluent can be accepted for irrigation, from season to season.

- Consider public safety, traffic control and interruptions during construction including interruptions of water or electric utility services.

- After several years of operation, it may be necessary to remove and dispose of sludge accumulated in stabilization ponds. If possible, adequate land should be acquired for drying and treating the sludge, and stockpiling it on site unless or until it can be taken away for appropriate agricultural use.

4. Outline of the Environmental Assessment Report

In the next few months we plan to prepare an "Environmental Assessment Report" describing this project, its beneficial and adverse impacts upon the local environment, and upon the health and well-being of the people who live here.

The Environmental Assessment will be based on the technical information we have gathered so far, and the comments and questions that you bring to this meeting, the Environmental Scoping Session. In this meeting, we will tell you what we plan to do and how we plan to do it. We also must listen to your ideas and information.

The Environmental Assessment Report will be arranged according to the outline shown on the next page.

(PROPOSED OUTLINE)
ENVIRONMENTAL ASSESSMENT REPORT

Executive Summary (Arabic and English)

1. Introduction

1.1 Background
1.2 Proposed action
1.3 Environmental regulatory procedures
1.3.1 Egyptian environmental legislation
1.3.2 USAID environmental procedures

2. Project Description

2.1 Background
2.2 Layout and description of proposed facilities
2.3 Construction activities
2.4 Operation activities
3. Environmental Setting

3.1 Background
3.2 Physical environment
3.3 Socio-economic environment
3.4 Cultural and aesthetic environment

4. Environmental Effects

4.1. Background
4.2. Physical environment impacts
4.3. Cultural and aesthetic environmental impacts
4.4. No-action alternative

5. Mitigation, Monitoring and Management

5.1. Background
5.2. Physical environment
5.3. Socio-economic environment
5.4. Cultural and aesthetic environment

Appendices

List of EA preparers
Scoping Report
Public NGOs correspondence