Project in Development and the Environment

PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

JORDAN TOURISM DEVELOPMENT PROJECT

U.S. AID PROJECT 278-0291

Project Component
Improvement of Sites and Related Services (Construction)

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EXECUTIVE SUMMARY

The findings of this assessment indicate that no significant adverse impacts are anticipated from 11 proposed categories of intervention that could receive funds from the Jordan Tourism Development Project. However, at this time insufficient information is available to make a finding of significance for two categories of proposed interventions (road improvements and improvement of the Siq at Petra). These two categories will require site-specific Environmental Reviews and/or Environmental Assessments (see Appendix B) before implementation. Furthermore, Jordan has no comprehensive and cohesive Environmental Law, and lacks in particular, an Environmental Impact Assessment Law. As a result, even though Jordan has professionals with expertise in every discipline required to conduct an environmental assessment, those individuals do not have experience needed to conduct an Environmental Review. Therefore, the consultant team recommends that the expertise present in Jordan be supplemented by technical assistance from USAID/Jordan to coordinate and assist in the preparation of the required Environmental Reviews.

The purpose of this document is to fulfill the requirements of 22 CFR Part 216, regarding the evaluation of environmental impacts of projects undertaken by USAID. The program which is the subject of this assessment is the series of proposed interventions in the Jordan Tourism Development Project, Component One: Improvements of Sites and Related Services, funded at $9 million. The discussion of the proposed interventions is presented in three parts: consideration of the environmental impacts of the proposed interventions, evaluation of the existing ability within Jordan to do Environmental Reviews and require mitigation measures, and program implementation and monitoring needs. This document also assesses the environmental impacts of the "no action" alternative.

The Improvement of Sites and Related Services component of the Jordan Tourism Development Project may fund interventions throughout Jordan at three levels:

LEVEL 1: Intensive Improvements
LEVEL 2: Intermediate Improvements
LEVEL 3: Limited Investment.

The individual interventions proposed for Levels 1 and 2 can be combined into 13 categories of activities:

- Archaeological excavation,
- Preservation and restoration of ancient and historic structures,
- Construction of shelters over ancient structures,
- Construction of tourist facilities (restrooms, rest houses, food services and a proposed small hotel),
- Provision of electrical and telephone services,
- Improvement of roads,
- Construction of parking areas,
- Construction of trails and stairs,
- Installation of explanatory panels and informational signs,

- Interior renovations of existing structures,
- Upgrade of the Siq entrance to Petra,
- Walking tour plan for Madaba, and
- Improvement of the "sound and light" show in Jerash.

All but one of these categories can create adverse environmental consequences. The one activity which does not have this potential is interior renovations of existing structures.

The PEA identifies mitigation measures for all but two of the categories (Section 4.2 and Table 4.1). If these mitigation measures are implemented, interventions in these categories will cause no significant impacts to the environment.

Two categories require further analysis to determine if they can be undertaken without significant environmental impacts: improvement of roads and the upgrade of the Siq entrance to Petra. Interventions in these categories require site-specific Environmental Reviews which should develop a reasonable set of alternatives and assess the environmental impacts of each alternative.

To ensure that the mitigation measures are implemented and the Environmental Reviews are prepared and approved, the PEA has identified an environmental review process and monitoring program. For site activities in the eleven categories for which mitigation measures have been identified, the project manager should be required to incorporate those measures into the design of site activities. The Mission Environmental Officer should review the plan for each site activity to ensure that the mitigation measures have been adequately addressed.

For the two categories of activities which require site-specific Environmental Reviews, the project manager should be responsible for preparing the Environmental Review as described in Appendix B of this PEA and incorporate the mitigation measures identified by the Environmental Review into the plan for the site activity. The Mission Environmental Officer should review the Environmental Review to ensure that it is adequate and advise the Mission Director, who has approval authority.

The project manager should be responsible for implementing the mitigation measures identified for each site activity during the environmental review process. The Mission Environmental Officer should monitor site activity implementation to ensure that the mitigation measures are implemented.

The only potential adverse environmental consequence of Level 3 interventions is degradation of visual aesthetics. The PEA identifies a mitigation measure for Level 3 interventions (Section 4.3). If this measure is implemented, Level 3 interventions will cause no significant impacts to the environment.

The "no action" alternative would either continue the current practice of limited and sporadic USAID/Jordan involvement in cultural tourism in Jordan or curtail all involvement. Either scenario would result in adverse environmental impacts at nearly all of the sites which may be included in the Improvement of Sites and Related Services component of the Jordan Tourism

Development Project. The "no action" alternative eliminates the potential for the site activities to address these environmental problems.

As mentioned in the first paragraph, adequate and abundant expertise exists in Jordan to field Environmental Review teams. The only requirement of the consultants is that USAID/Jordan provide technical assistance to the Jordanian teams in the design and preparation of the Environmental Reviews required by the PEA until sufficient local capacity is established.

All the mitigation measures listed in Section 4.2 and Table 4.1 and mitigation measures derived from the Environmental Reviews required in the PEA should be reviewed by the Mission Environmental Officer, and implemented by the Project Manager.

TABLE OF CONTENTS

Page

1.0 INTRODUCTION 1
1.1 PURPOSE OF THE PROGRAMMATIC ENVIRONMENTAL ASSESSMENT 1
1.2 REGULATORY BACKGROUND 1
1.3 ORGANIZATION OF THE DOCUMENT 2

2.0 DESCRIPTION OF JORDAN TOURISM DEVELOPMENT PROJECT COMPONENT ONE: IMPROVEMENT OF SITES AND RELATED SERVICES 3
2.1 PROGRAM DESCRIPTION 3
2.1.1 "No Action" Alternative 3
2.1.2 Level 1 Interventions 3
2.1.3 Level 2 Interventions 5
2.1.4 Level 3 Interventions 5
2.2 POTENTIAL ENVIRONMENTAL ISSUES AND CONCERNS 5
2.2.1 "No Action" Alternative 5
2.2.2 Levels 1 and 2 Interventions 5
2.2.3 Level 3 Interventions 9
2.3 SUMMARY OF PROPOSED INTERVENTIONS AND POTENTIAL ENVIRONMENTAL IMPACTS 9

3.0 ENVIRONMENTAL SETTING 13
3.1 GEOGRAPHY 13
3.2 GOVERNMENT 14
3.3 PRODUCTION 14
3.4 NATURAL RESOURCES 15
3.4.1 Soil 15
3.4.2 Natural Vegetation 15
3.4.3 Water 15
3.4.4 Marine and Coastal Resources 16
3.4.5 Mineral and Energy Resources 16
3.5 ARCHAEOLOGICAL AND HISTORIC RESOURCES 16
3.6 MAJOR ENVIRONMENTAL ISSUES 17

4.0 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES 19
4.1 POTENTIAL ENVIRONMENTAL CONSEQUENCES OF THE "NO ACTION" ALTERNATIVE 19
4.2 POTENTIAL ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES FOR LEVELS 1 AND 2 INTERVENTIONS . . 19

4.3 POTENTIAL ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES FOR LEVEL 3 INTERVENTIONS 26
4.4 SUMMARY OF ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES 27

5.0 ASSESSMENT OF ENVIRONMENTAL REVIEW CAPABILITIES 33
5.1 INSTITUTIONAL AND LEGAL FRAMEWORK OVERVIEW 33
5.1.1 Existing Institutional and Legal Framework 33
5.1.2 Future Institutional and Legal Framework 34
5.2 CAPACITY AND CAPABILITY OF JORDAN TO PERFORM ENVIRONMENTAL ASSESSMENT 36
5.2.1 Weaknesses 36
5.2.2 Strengths 36
5.2.3 Conclusion 37

6.0 PROGRAM IMPLEMENTATION AND MONITORING PLAN 39
6.1 ENVIRONMENTAL REVIEW PROCESS 39
6.2 PROGRAM MONITORING 39

7.0 CONCLUSIONS AND RECOMMENDATIONS 41
7.1 SUMMARY OF FINDINGS 41
7.2 RECOMMENDATIONS 41

8.0 INFORMATION SOURCES 43
8.1 REFERENCES 43
8.2 PERSONS CONTACTED 44
8.3 SITES VISITED 46

APPENDIX A ENVIRONMENTAL ISSUES ASSOCIATED WITH EACH INTERVENTION A-1
APPENDIX B DEFINITION OF ENVIRONMENTAL REVIEW B-1

ACRONYMS

CFR	United States Code of Federal Regulations
EA	Environmental Assessment
GDP	Gross Domestic Product
GOJ	Government of Jordan
IEE	Initial Environmental Examination
JTDP	Jordan Tourist Development Project (in this paper JTDP generally refers to the Improvement of Sites and Related Services component of the project)
PEA	Programmatic Environmental Assessment
PID	Project Identification Document
USAID	United States Agency for International Development (USAID/Jordan refers to the USAID Mission in Jordan)

GLOSSARY

Arroyo: Spanish word for a dry or intermittent stream or river bed.

"No Action" Alternative: An alternative in an Environmental Review, Environmental Assessment or Environmental Impact Statement which allows assessment of not taking any action.

Nonpoint Source Water Pollution: A source of water pollution which comes off of the land in a dispersed fashion as opposed to coming from one specific point.

Siq: Arabic word for deep narrow canyon.

Suq: Arabic word for a market.

Wadi: Arabic word for an arroyo.

1.0 INTRODUCTION

1.1 PURPOSE OF THE PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

The purpose of this document is to fulfill the requirements of Title 22 Code of Federal Regulations (CFR), Part 216, regarding the evaluation of environmental impacts of site activities undertaken by the U.S. Agency for International Development (USAID). The Jordan Tourism Development Project consists of a $5 million grant program to provide technical assistance, training, and marketing support to the Government of Jordan (GOJ) and a $9 million grant program to improve archaeological tourist sites over the next five years.

The scope of this programmatic environmental assessment is limited to the general consideration of potential environmental impacts of interventions at Level 1, Level 2, and Level 3 in the JTDP and an evaluation of the GOJ's or others' ability to conduct Environmental Reviews on a site-specific basis. The term "JTDP" throughout the remainder of this document refers exclusively to the Improvement of Sites and Related Services component of the project representing a $9 million grant portion of the project. Any deficiencies observed in the process or standards employed in environmental assessment by GOJ organizations or others are identified in this document.

1.2 REGULATORY BACKGROUND

As a prerequisite for funding assistance, USAID is required to comply with environmental review procedures as defined in 22 CFR Part 216. The purpose of these procedures is to identify, as early as possible in the planning and design of a project or program, potentially significant impacts on natural resources, social and economic parameters, and cultural resources. The intent is to avoid or minimize potential adverse environmental impacts of the project through the consideration of project alternatives, modification of project elements, or other mitigation measures.

A Programmatic Environmental Assessment (PEA) for the site activities of this project was requested in the Review of PID Cable sent in June 1993. A programmatic environmental assessment differs from a typical environmental assessment in that a PEA may cover multiple projects of a similar nature and similar potential environmental impacts, or programmatic activities that are not country-specific. A typical environmental assessment describes only one project, one set of project alternatives, and associated environmental impacts.

After a finding of positive threshold determination is made, based on an initial environmental examination (IEE), a PEA is required when multiple and similar project site interventions are contemplated. USAID/Jordan prepared an IEE for the JTDP in June 1993, resulting in a positive threshold decision for the Improvement of Sites and Related Services component of the project. The other project components were categorically excluded from environmental review in June 1993.

Within the PEA, potential environmental impacts that may result from interventions receiving JTDP grants are discussed. In addition, the ability of the government of Jordan or others organizations within Jordan to carry out an Environmental Review for specific sites is examined.

1.3 ORGANIZATION OF THE DOCUMENT

Following this introductory Chapter, Chapter 2.0 describes potential interventions at Level 1, Level 2 and Level 3, and their associated potential environmental issues. The general environmental setting is described in Chapter 3.0, and potential environmental impacts are discussed in Chapter 4.0. Chapter 5.0 focuses on the environmental impact assessment procedures established by the Hashemite Kingdom of Jordan. A discussion of strengths and weaknesses of the existing process and institutional capacity to conduct environmental impact assessment is included. Chapter 6.0 presents a program monitoring plan whereby USAID/Jordan can ensure that JTDP interventions are receiving adequate environmental review and appropriate mitigation measures. Conclusions and recommendations are presented in Chapter 7.0. Sources of information used in the preparation of this report are listed in Chapter 8.0, followed by appendices.

2.0 DESCRIPTION OF JORDAN TOURISM DEVELOPMENT PROJECT COMPONENT ONE: IMPROVEMENT OF SITES AND RELATED SERVICES

The Improvement of Sites and Related Services component of the Jordan Tourism Development Project proposes to ameliorate sites important to the tourism themes developed under the project. To this end, the project may fund construction of tourist facilities, the development of permanent presentation and interpretation displays, and limited archaeological excavation and consolidation. The interventions will occur at three levels:

> LEVEL 1: Intensive Improvements. Sites with multiple interventions, including archaeological excavation and consolidation, visitor service structures, and improved presentation.
>
> LEVEL 2: Intermediate Improvements. Sites with one or two smaller interventions, including restrooms, explanatory panels, and improved access.
>
> LEVEL 3: Limited Investment. Sites where interventions are limited to road-side historical markers and explanatory panels.

2.1 PROGRAM DESCRIPTION

2.1.1 "No Action" Alternative

The "no action" alternative could continue the current situation regarding USAID/Jordan involvement in cultural tourism in Jordan or terminate all USAID/Jordan activities in this sector. USAID/Jordan has been involved at archaeological sites in Jordan for many years, but its efforts have been limited and sporadic. Recently, USAID/Jordan has made a variety of investments in site development and conservation and service facilities, largely under the Technical Services and Feasibility Studies Projects (IV and V). Some USAID/Jordan involvement in similar activities would likely occur in the future without the Jordan Tourism Development Project, but the efforts would remain unfocused and many of the proposed interventions would not be accomplished.

2.1.2 Level 1 Interventions

Three sites have been identified for Level 1 interventions: the Amman Citadel, Petra and Madaba.

On the Amman Citadel, the project may:

- Support archaeological excavation in the 250 meter area between the Hercules Temple and the Byzantine structure.

- Clean up previous excavations in the vicinity of the Temple.
- Preserve and restore several Byzantine, Hellenistic and Umayyad structures as well as the Citadel walls.
- Construct a shelter over a presumed Byzantine public building.
- Fund a feasibility study for renovation of the existing museum and participate in the implementation of the renovations. The renovation could include improved exhibits and restrooms and development of a rest area and small cafe, which may require expanding the current building.
- Assist the GOJ in developing a new bus parking/turn around area.
- Develop and install on-site explanatory panels and informational signs.
- Develop a trail system.

At Petra, the project may:

- Fund archaeological excavation, preservation and conservation of the Byzantine church.
- Fund feasibility studies of alternative entrance and egress to the site, the provision of electricity and telephone service, and assist in the implementation of the interventions identified by the studies.
- Construct restrooms in the vicinity of the Roman Theatre.
- Upgrade the Visitor Center, including installing a site model, exhibits, a gift shop and rest area, and improving the restrooms.
- Develop and install on-site explanatory panels and informational signs.
- Provide two U.S. National Park Service officials for two years to work with the Jordanian Government to develop a trail system and interpretive program for the site.

At Madaba, the project may:

- Fund archaeological excavation in the existing archaeological park.
- Preserve and restore several structures containing in-situ Byzantine mosaics.
- Construct shelters over three Byzantine churches to protect the in-situ mosaics.
- Fund a feasibility study to identify opportunities and needs for incorporating the suq and surrounding neighborhoods into the tourist experience via a walking tour, and support implementation of the interventions identified by the study.
- Install restrooms and a snack bar in the area of the archaeological park.
- Assist the Department of Antiquities in improving the exhibits in the existing museum.

2.1.3 Level 2 Interventions

The project has identified 15 sites where Level 2 interventions may occur.[1] At most of the Level 2 sites the interventions would be limited to one or two of the following activities: construction of small rest houses, construction or improvement of restrooms, building renovations, and installation or improvement of site presentation. Improvements to access roads may be included at two sites (Ayn Mousa and Mukhayyat) and a proposed small hotel may be constructed at Umm Qeis. Protective shelters over antiquities may be constructed at three of the Level 2 sites.

2.1.4 Level 3 Interventions

Level 3 interventions are limited to roadside historic markers and on-site explanatory panels. Few specific sites have been identified for Level 3 interventions. The PID states that up to 500 sites could receive Level 3 interventions.

2.2 POTENTIAL ENVIRONMENTAL ISSUES AND CONCERNS

An Environmental Scoping Statement for this Programmatic Environmental Assessment was produced on September 6, 1993. The statement identifies 16 significant environmental issues for the Improvement of Sites and Related Services component of the Jordan Tourism Development Project (Figure 2.1 at the end of this Chapter). Not all of these issues, however, are significant for all the interventions. The purpose of this section of the report is to identify which issues are associated with each type of intervention.

2.2.1 "No Action" Alternative

Because the proposed project will intervene at sites that are already experiencing tourist impacts, the "no action" alternative raises all the environmental issues identified in Figure 1. These issues will remain a concern if the "no action" alternative is implemented.

2.2.2 Levels 1 and 2 Interventions

Most of the interventions proposed for Levels 1 and 2 fall into ten general categories:

- Archaeological excavation,
- Preservation and restoration of ancient and historic structures,
- Construction of shelters over ancient structures,
- Construction of tourist facilities (restrooms, rest houses, food services and a proposed small hotel),

[1]Umm Qeis, Pella, Ayn Mousa, Mukhayyat, Mount Nebo, Iraq El-Emir, Qsar Amra, Jerash, Abila, Umm Ar-Rasas, Wadi Rum, Umm Al-Jimal, Salt, Ma'an, and Qatraneh.

- Provision of electrical and telephone services,
- Improvement of roads,
- Construction of parking areas,
- Construction of trails and stairs,
- Installation of explanatory panels and informational signs, and
- Interior renovations of existing structures.

Three potential interventions, two at Level 1 and one at Level 2, do not fall into these general categories. The interventions are:

- Upgrade of the Siq entrance to Petra,
- Walking tour plan for Madaba, and
- Improvement of the "sound and light" show in Jerash.

Each of the ten general categories of interventions as well as the three specific interventions has its own set of potential environmental issues.

Archaeological Excavation

Archaeological excavation involves removing soil and changing the grade of the land, which can pose drainage and associated erosion problems. The soil which is removed from an excavation (spoils) has to be disposed. The removal, storage and disposal of spoils can also create dust problems that must be addressed during the life of the excavation and after the excavation if the spoils are discarded on site. All the archaeological excavations proposed in this project are to occur at active tourist attractions to enhance the tourist experience. Archaeological excavations often involve creating open pits with sheer drops that pose tourist safety issues. Finally, excavation and the disposal of spoils can impact archaeological resources.

Preservation and Restoration of Ancient and Historic Structures

Preservation and restoration of ancient and historic structures involves stabilizing in-situ components as well as reconstructing components which have deteriorated. Such activities can pose downstream and on-site drainage and associated erosion problems. By its very nature, preservation and restoration affects visual and cultural resources. *Because the preservation and renovation interventions in the Jordan Tourism Development Project will occur only in active tourist attractions, they also have the potential to impact tourist safety.*

Construction of Shelters Over Ancient Structures

Several archaeological structures that have been previously restored or will be restored by the project require shelters to protect them from inclement weather. Shelters are particularly needed to protect mosaic pavements. A shelter consists of a walled, roofed structure. Placing a roof over a previously exposed area alters the drainage pattern in the area. A shelter also changes the appearance of the site. Because a shelter is built over an ancient structure, the construction of the shelter has the potential to affect cultural resources.

Construction of Tourist Facilities

The project may construct four types of tourist facilities: restrooms, rest houses, food services and a small hotel. Each of these facilities will require a water supply and some means of wastewater treatment and disposal. Some interventions in this area may be upgrades of existing facilities. Other interventions may require construction of new facilities. The environmental issues associated with a facility vary depending upon whether it is an upgrade of an existing facility or construction of a new facility and on the size of the facility. To account for the variation, this activity has been further divided into three types of facilities: upgrades of existing facilities, construction of new facilities, and a proposed small hotel.

Upgrades of Existing Facilities

The project may alleviate problems with existing facilities by upgrading the facilities. Such upgrades will occur within the confines of the existing structures, requiring no new external construction. For these interventions, the only significant environmental issues are adequate water supply, wastewater treatment and disposal, and tourist congestion.

Construction of New Facilities

Some sites have no existing facilities. At these sites the project may construct new facilities. Construction of new facilities raises the same issues as upgrades of existing facilities—adequate water supply, wastewater treatment and disposal, and tourist congestion. In addition, it raises issues unique to construction and provision of new services. Construction requires changing the contour of the land which creates dust, raises issues about the preservation of cultural resources and, in combination with the erection of a roof, changes drainage patterns. Providing restrooms or food facilities generates additional solid waste at the site which raises issues about solid waste collection. A new building also changes the appearance of a site.

Proposed Small Hotel

The project may assist with funding for the construction of a proposed small hotel. A small hotel poses the same environmental issues as construction of a new facility with the addition of solid waste disposal and income/equity issues. A small hotel will generate more solid waste than a restroom, rest house or food service facility, thus posing the issue of solid waste disposal as well as collection. A small hotel will also generate more jobs than a rest house or food service facility, raising issues about income and equity.

Provision of Electrical and Telephone Services

The project may provide electrical or telephone services to sites. The provision of these services could effect visitor safety by providing lighting and communication with emergency service providers. Some of the sites already have electrical generators which raise noise issues. As an alternative to generators, the project may bring electricity to the sites from the existing power grid. The project may also bring wired telephone service into sites. Bringing electrical or

telephone lines into a site introduces visual issues as well as the potential to impact cultural resources.

Improvement of Roads

The project may upgrade roads in sites or access roads to sites. This intervention may only require resurfacing, but could involve road bed improvement and realignment with associated cut and fill activities. Road improvements pose issues with dust during construction and drainage and associated erosion both during and after construction. Roads affect the appearance of a site. Road improvement may stimulate increased vehicle use which in turn creates noise, congestion and tourist safety issues.

Construction of Parking Areas

The project may create or upgrade parking areas at sites. Parking areas pose the same issues as road improvements.

Construction of Trails and Stairs

The project may assist in the design and construction of trails and stairs at some sites. In some instances the trails or stairs will provide access to sites. In other instances the trails and stairs will control circulation within sites.

Trails often cut across natural drainages raising issues about drainage and associated erosion. The presence of trails in a site changes the appearance of the site. Trails and stairs concentrate tourists in the trail corridors which also concentrates litter, raising the issue of solid waste collection. The concentration of tourists on trails and stairs also raises issues about congestion and tourist safety. The issue of cultural resources is associated with trails and stairs because their construction requires disturbance of the land surface.

Installation of Explanatory Panels and Informational Signs

USAID/Jordan may install explanatory panels and informational signs at several sites. The only environmental issue associated with the installation of panels and signs is visual impacts.

Interior Renovations of Existing Structures

Interior renovations of existing structures is limited to remodeling the insides of buildings and installing exhibits to explain the site. These activities raise no environmental issues. If the renovation includes construction or upgrade of restrooms or food service facilities, that component is covered under "Construction of Tourist Facilities."

Upgrade of the Siq Entrance to Petra

The project could undertake a feasibility study to upgrade the Siq entrance to Petra and fund implementation of the selected alternative. The GOJ has proposed to address the presence of

horses in the Siq, so the project will not deal with this issue. But it will look at the use of horses in other parts of Petra. Such a study will be complex, involving many affected parties and addressing several environmental issues:

- Drainage and erosion associated with the Siq and alternative routes,
- Nonpoint source water contamination from animal wastes,
- Dust from trail use by animals,
- Collection of solid wastes,
- Visual impacts of alternative routes,
- Odor from animal wastes,
- Impacts on cultural resources in the Siq and on alternative routes,
- Impacts on the incomes and traditional lifestyles of inhabitants,
- Tourist congestion, and
- Impacts on tourist safety.

Walking Tour Plan for Madaba

The purpose of this intervention will be to identify a walking tour route and make landscape improvements along the route. Development of a walking tour plan for Madaba raises several socioeconomic issues including income and equity, impacts on traditional lifestyles, tourist congestion and tourist safety. Because foreign tourists are used to having solid waste receptacles on streets, it also raises the issue of solid waste collection. Implementation of the interventions identified in the plan could affect landscapes and architecture, thus raising the issue of visual impacts.

Improvement of the "Sound and Light" Show in Jerash

Only two environmental issues are associated with improvement of the "sound and light" show in Jerash: visual and noise impacts.

2.2.3 Level 3 Interventions

USAID/Jordan plans to install roadside historic markers and on-site explanatory panels at several sites. The only environmental issue associated with the installation of panels and signs is the visual impact.

2.3 SUMMARY OF PROPOSED INTERVENTIONS AND POTENTIAL ENVIRONMENTAL IMPACTS

The Improvement of Sites and Related Services component of the Jordan Tourism Development Project may fund interventions throughout Jordan at three levels:

LEVEL 1: Intensive Improvements. Sites with multiple interventions, including archaeological excavation and consolidation, visitor service structures, and improved presentation.

LEVEL 2: Intermediate Improvements. Sites with one or two smaller interventions, including restrooms, explanatory panels, and improved access.

LEVEL 3: Limited Investment. Sites where interventions are limited to roadside historical markers and explanatory panels.

The individual interventions proposed for Levels 1 and 2 can be combined into 13 types of activities. All but one of these types of activities can be associated with one or more of the 16 environmental issues identified in the Environmental Scoping Statement for this PEA (Table 2.1). The one activity which raises no environmental issues is interior renovations of existing structures including rearrangement of walls and installation of exhibits, but not including upgrades of restrooms or food services, which is covered under "Construction of Tourist Facilities." A list of the environmental issues associated with each intervention identified as a potential activity as of September 1, 1993, is included in this PEA as Appendix A.

The only environmental issue associated with Level 3 activities is the visual impact on aesthetics.

The "no action" alternative would continue the current practice of limited and sporadic USAID/Jordan involvement in cultural tourism in Jordan. All the issues in Figure 2.1 are associated with the "no action" alternative.

FIGURE 2.1

SIGNIFICANT ISSUES FOR PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

I. Water

- A. Water supply
- B. Wastewater treatment and disposal
  1. Capacity
  2. Appropriate technology
  3. Operation and maintenance capabilities
- C. Drainage/Erosion (on-site and downstream)
- D. Nonpoint source contamination

II. Air

- A. Dust

III. Solid Wastes

- A. Waste collection (litter)
- B. Waste disposal
- C. Archaeological spoils disposal

IV. Aesthetics

- A. Visual impact
- B. Noise
- C. Odor

V. Cultural Resources (impacts on archaeological structures)

VI. Socioeconomic

- A. Impacts on income and equity (wage, profits, taxes, winners/losers, locals/tour operators)
- B. Traditional lifestyles
- C. Congestion
- D. Tourist safety

TABLE 2.1
ENVIRONMENTAL ISSUES ASSOCIATED WITH EACH TYPE OF INTERVENTION

DESCRIPTION OF ACTIVITY	ISSUES															
	Water				Air	Solid Waste			Aesthetics				Socioeconomic			
	Supply	Wastewater	Drain/Erosion	Nonpoint	Dust	Collection	Disposal	Archae Spoils	Visual	Noise	Odor	Cultural Res	Income/Equity	Trad Life	Congestion	Tour Safety
Archaeological Excavation			X		X			X				X				X
Preservation and Restoration			X						X			X				X
Shelters			X						X			X				
Tourist Facilities Upgrades of Existing Facilities	X	X													X	
Construction of New Facilities	X	X	X		X#	X			X			X			X	
Proposed small hotel	X	X	X		X#	X	X		X			X	X		X	
Electricity and Telephone Service									X	X		X				X
Improvement of Roads			X		X#				X	X		X			X	X
Parking Areas			X		X#				X	X		X			X	X
Trails and Stairs			X			X			X			X			X	X
Explanatory Panels and Informational Signs									X							
Interior Renovations																
Upgrade of Petra Siq Entrance			X	X	X	X			X		X	X	X	X	X	X
Walking Tour Plan for Madaba						X			X				X	X	X	X
Improvement of "Sound and Light" show at Jerash									X	X						

Environmental issues which will exist only during the construction phase.

3.0 ENVIRONMENTAL SETTING[2]

3.1 GEOGRAPHY

The territory of Jordan is about 91,000 square kilometers (35,000 square miles). Jordan is landlocked except for the 27 kilometer shoreline along the Gulf of Aqaba at its southern extremity, providing access to the Red Sea. Jordan shares borders with Israel and the West Bank in the west, Syria in the north, Iraq in the northeast, and Saudi Arabia in the east and southeast.

The population of Jordan is about 3.5 million and growing at an alarming 3.6 percent per year. The population comprises East Bankers and Palestinians and small communities of Circassians, Armenians, and Kurds. Seventy percent of the population is urban, located mainly in the midland and the north of the country, and 30 percent is rural.

The country is mainly a plateau rising between 700 to 1,000 meters above sea level, divided by deep gorges and valleys, and occasional summits reaching 1,200 meters in the north and 1,700 meters in the south. The highest peak is Jabal Ramm at 1,756 meters. A large portion of this plateau is located in the great Syrian Desert (North Arabian Desert). It supports little vegetation and comes to life only for a brief period after the winter rains. This is the least populated area of Jordan.

The western side of the plateau borders the eastern side of the north-south great rift, part of the great geographical African rift, which forms the depression of Lake Tiberias, the Jordan Valley, the Dead Sea, and continues down to the Gulf of Aqaba. It is the dominant geographical feature of the country. The wadis that drain the plateau are canyon-like and difficult to travel whether wet or dry.

The Jordan River is about 360 kilometers long, and drops from an altitude of 3,000 meters above sea level to 400 meters below sea level at the Dead Sea. The Jordan River forms Lake Tiberias before entering Jordan. The main tributaries of the Jordan River are the Yarmouk River, which forms the boundaries with Israel to the northwest, and Syria to the northeast, and the Zarqa River which empties entirely into the East Bank.

The length of the Great Rift in Jordan is about 380 kilometers. The part between the Yarmouk River and the Dead Sea is known as the Jordan Valley. The maximum width of the Valley between the eastern and western steep sides is about 22 kilometers.

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[2] This chapter was based on: "Jordan, A Country Study," Federal Research Division, Library of Congress, 1991; "National Environment Strategy for Jordan," Ministry of Municipal and Rural Affairs and the Environment, Department of Environment, IUCN, August 1991; "Jordan Environment Profile Status and Abatement," Abdullah A. Ahmad, Amman, 1989; and "Jordan Tourism Development Project, Technical Analysis," Site Development, C.J. Lenzen, USAID/Jordan, July 1993.

Jordan has a Mediterranean-style climate. Its rainy season lasts from November to April and its hot dry season for the rest of the year. Most of the plateau area receive less than 12 centimeters of rain a year. The highlands, east of the Jordan Valley, receive more than 30 centimeters of precipitation in the south and more than 50 centimeters in the north.

3.2 GOVERNMENT

Jordan's government is a constitutional monarchy with three branches: executive, legislative, and judicial. The chief of state, the head of the government, and the cabinet form the executive branch. The King is the chief of state. He nominates the prime minister who becomes the head of the government. The prime minister chooses ministers who form the Council of Ministers (cabinet). The legislative branch is composed of a bicameral legislature called the National Assembly. The 37 members of the Senate are appointed by the King. The House of Representatives is elected by the public. The legislative power of the National Assembly has been overshadowed by the executive branch. The judicial branch is composed of civil courts, religious courts (sharia courts for Muslims and ecclesiastical courts for Christians), and special courts (Land Settlement Court). The King nominates the judges.

Several ministries operate under the Prime Minister, each concerned with specific activities. Of notable interest for the present paper are the Ministry of Municipal, Rural Affairs and Environment where the Department of Environment (DOE) is located, and the Ministry of Tourism and Antiquities which is divided into the Department of Tourism and the Department of Antiquities.

Local governments are an extension of the central government under the Ministry of Municipal and Rural Affairs. There are eight governorates in Jordan, each subdivided into districts and subdistricts.

3.3 PRODUCTION

The GDP in 1992 was approximately 2.2 billion Jordan dinars.[3] Manufacturing, mining, agriculture, and construction accounted for 28 percent of the GDP; government services, 19.2 percent; finance banking, real estate transactions, insurance, and business services 17.9 percent; and retail and wholesale trade, the restaurants and hotels, only 3.3 percent. This sector, which includes part of income received from tourism, has not recovered its 1988 level. In 1992 this sector represented only 31 percent of the 1988 level (at constant prices). Electricity and water represented only 2.9 percent.

Jordan needs to increase its foreign exchange earnings. Its balance of payments runs a large deficit. International tourism, which is underdeveloped in Jordan, has a good potential to bring additional foreign exchange earnings complementing foreign exchange earnings from chemical products, raw phosphate, and potash exports.

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[3] Jordan National Bank, Gross National Product at constant 1985 prices.

3.4 NATURAL RESOURCES

3.4.1 Soil

Even if water were available, most of Jordan's soil is not arable. According to the latest estimate, only 11 percent of the land is arable. This is higher than previous estimates due mainly to the use of more sophisticated dry-land farming techniques. Of the 9.2 million hectares of Jordan, only 500,000 hectares (5.5 percent) were cultivated in 1989. Fewer than 40,000 hectares were irrigated, almost all in the Jordan Valley. Inappropriate use of land has significantly reduced the cultivable land area in Jordan.

In rain-fed northern and central areas with higher elevation, wheat, barley, tobacco, lentils, chickpeas, and olives are produced. However, because of limited areas and periodic drought, the rain-fed uplands are not sufficient for domestic demand. In the fertile Jordan Valley, irrigated fruit, vegetable, and citrus crops are produced in abundance.

3.4.2 Natural Vegetation

There are three distinct ecological regions in Jordan, separated by soil and rainfall. In the first region forests and shrubs grow on terra rosa, basalt, and sandy soils. The second is formed by steppe-like soil and loess in which dwarf shrubs and herbaceous plants are found. The last region is desert-like where dwarf shrubs and herbaceous plants grow on saline and sandy soil.

The highlands of Jordan were believed to be covered with forests in the past. Today, forests cover less than 0.8 percent of Jordan's total area. The total area of natural oak, juniper, pine, and wild olive forest covers about 36,500 hectares.

3.4.3 Water[4]

Surface water quantities are estimated at 755 million m^3; more than half of that is in the Yarmouk River Basin. Surface water is plentiful in the north and west and scarce in the south and east of Jordan.

Treated water from wastewater plants is about 32 million m^3 and is projected to reach 60 million m^3 in 1995. In 1989, 97 percent of the population was served by water networks, and 54 percent was served by sewerage treatment networks.

Total water consumption reached 874 million m^3 in 1990, of which 553 million m^3 came from groundwater sources. Jordan met part of the 321 million m^3 deficit by overdrafting the groundwater basins and using almost 200 million m^3 of irreplaceable groundwater.

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[4] Source for this section: "A Water Management Study for Jordan," August 1992, AID Project Number: 398-0365, submitted to USAID/Jordan and GOJ, submitted by PRIDE.

Total water consumption is forecasted at 1.75 billion m^3 in 2005. Total available water, is estimated at .8 billion m^3 in 2005.

3.4.4 Marine and Coastal Resources

The marine and coastal area of Jordan encompasses 27 kilometers of coast at Aqaba, and the coast of the Dead Sea.

Aqaba, the only sea access to Jordan, includes a very busy port, a tourist center, an industrial complex, and a small fishing industry. However, the available shore area for fishing is decreasing as industrial sites expand. Aqaba also possesses beautiful coral reefs that attract tourists and sustain a thriving diving industry. Unfortunately, the coral reefs are threatened by industrial pollution.

The surface water of the Dead Sea is estimated to be at 407 meters below sea level. The Dead Sea level has been dropping since 1920 and its surface area is shrinking. The main reason for the drying up of the Dead Sea is the diversion of water sources that flowed into it. It is estimated that to maintain its present level, the Dead Sea should receive around 1.3 billion m^3 of water; however, it receives only 450 million m^3. The Dead Sea is used as a reservoir to extract potash and other minerals.

3.4.5 Mineral and Energy Resources

Jordan is rich in phosphate and potash. It is estimated that its phosphate deposits will last hundreds of years at the present production rate. Jordan is a major exporter of phosphate on world markets. Phosphate is Jordan's primary natural resource and major source of export earnings. Potash, its other mining sector, is extracted at Al Aghwar al Janubiyah on the Dead Sea.

Oil and gas extraction are insignificant and Jordan remains entirely dependent on imported oil for its fuel needs. However, Jordan has a large oil shale resource (proven reserves are estimated at 40 billion tons). The quality of the shale is very good, but it is not yet commercially competitive for the production of electricity. Jordan does not take full advantage of nature's energy—solar and wind. Additional efforts are needed to harness more of this renewable and environmentally friendly energy.

3.5 ARCHAEOLOGICAL AND HISTORIC RESOURCES[5]

Jordan's wealth of archaeological remains is due to its geographical setting at the crossroads of culture and civilization since the Paleolithic period. A Neolithic culture introduced agriculture to the region in the eighth millennium B.C. Bayda on the East Bank and Jericho on the West

[5] Sources for this section: "Jordan, A Country Study," Federal Research Division, Library of Congress, 1991; JTDP, Technical Analysis, C.J. Lenzen, USAID/Jordan, August 1993.

Bank date from this period and may have been history's first "cities." Over the centuries this area has formed part of various empires: Assyrian, Achaemenid, Macedonian, Nabatean, Ptolemaic, Roman, Ghassanid, Egyptian, Muslim, Crusader, and Ottoman. Hellenistic, Roman, Byzantine, Islamic, and Ottoman remains are well documented throughout Jordan. Recently archaeological research has focused on indigenous kingdoms such as the Nabataean and the people living in desert regions (badiya).

Some sites are world renowned, such as Petra (a World Heritage Site), Madaba-Mt. Nebo, and Jerash. Others have national significance such as the Amman Citadel, the Umayyad, Crusader and Mamluk Castles, Pella, Gadara, and Umm Al Jimal. Still others are the focus of research—excavation and publication—by scholars. However, hundreds of additional sites are still waiting to be excavated whose significance cannot be assessed yet.

The majority of archaeological remains suffer from decay and destruction due to lack of protection against the elements and people (inhabitants and tourists alike). This is mainly an economic and cultural problem: lack of money for conservation and management, and the population's lack of awareness of the importance of cultural heritage.

3.6 MAJOR ENVIRONMENTAL ISSUES

The major issue underlying Jordan's present environmental challenges is the conflict between conservation of scarce natural resources and population growth.

Nationwide, the major environmental issues are:

- Depletion of rechargeable aquifers faster than the rate of recharge,
- Overload of wastewater treatment plants leading to pollution of surface water,
- Pollution of the Yarmouk river and the King Talal dam,
- Industrial pollution and pollution of the countryside,
- Overgrazing,
- Marine pollution in Aqaba, and
- Urban encroachment on historic, archeological, or culturally significant sites.

4.0 ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

This chapter of the PEA provides a general description of the environmental consequences of the "no action" alternative and each category of intervention which JTDP may fund. This chapter also identifies mitigation measures for each category.

The sites where interventions may occur under the JTDP are in both rural and urban settings throughout Jordan. Due to the dispersed nature of the sites and the great variety of the types of interventions that may occur, this PEA can provide only a general, non-quantitative description of environmental consequences and mitigation measures. These conditions also make it difficult for the PEA to accurately assess the cumulative impacts of all the interventions.

4.1 POTENTIAL ENVIRONMENTAL CONSEQUENCES OF THE "NO ACTION" ALTERNATIVE

The "no action" alternative could continue existing conditions. As noted in Chapter 2.0, all the environmental issues identified as potentially significant exist at the sites where the Jordan Tourism Development Project may intervene. The environmental consequences associated with the current situation include water shortages, drainage and erosion problems, nonpoint source contamination of wadis, water damage to sites, detraction from the visitor experience due to lack of facilities, nuisances to tourists from dust and odor, litter accumulations, noise pollution and damage to cultural resources.

Without action, the Jordan Tourism Development Project cannot incorporate mitigation measures to address these issues.

4.2 POTENTIAL ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES FOR LEVELS 1 AND 2 INTERVENTIONS

Archaeological Excavation

Drainage and associated erosion from archaeological excavations can cause downstream flooding and sedimentation. The excavation and treatment of spoils can cause a nuisance from dust for nearby residents as well as tourists and threaten cultural resources. The opening of below grade archaeological sites can create opportunities for tourist accidents.

All archaeological digs in Jordan require a permit from the Department of Antiquities. In granting a permit, the Department must ascertain that the licensee has the appropriate abilities and qualifications to undertake the excavation (Antiquities Law, No. 21, 1988). If USAID/Jordan ensures, through proper monitoring, that the excavations it funds adhere to the Antiquities Law, the potential impacts on cultural resources will be mitigated.

To mitigate the impacts from drainage and erosion, dust, spoil disposal and tourist safety, USAID/Jordan should require the preparation of drainage/erosion, dust control, spoil disposal and tourist safety plans before releasing funds for the site activity. The Mission Environmental Officer in consultation with a qualified archaeologist should review the plans.

Preservation and Restoration of Ancient and Historic Structures

Drainage and associated erosion from preservation and restoration of ancient and historic structures can cause downstream flooding and sedimentation. In addition, improper drainage can cause on-site problems as has happened with ponding of water in the below grade areas of Madaba and mosaic damage in the Byzantine church at Petra.

In Jordan it is common for archaeological sites to contain the remains of several cultures which successively occupied the site. Restoration of a structure from one civilization will protect the cultural resources represented by the structure, but pose risks to the cultural resources of another civilization.

Restoration of ancient and historic structures generally enhances the visual resources of a site and can correct safety problems for tourists by stabilizing unsafe conditions. But restoration can also raise the potential for tourist accidents if tourist safety is not considered during restoration.

The potential environmental consequences from preservation and restoration of ancient and historic structures can be mitigated by using several of the same measures identified for archaeological excavation: compliance with the Antiquities Law and preparation of drainage/erosion and tourist safety plans before releasing funds for the site activity. The plans should be reviewed by the Mission Environmental Officer in consultation with a qualified archaeologist.

Construction of Shelters Over Ancient Structures

The construction of a shelter changes the drainage in an area which creates the potential for localized downstream flooding. A shelter creates a visual impact, which can be positive or negative, depending on the design of the shelter. Construction of a shelter can impact the cultural resources of the ancient structure as well as any cultural resources around the structure.

Drainage problems associated with a shelter can be mitigated by preparation of a drainage plan before release of construction funds. The Mission Environmental Officer should review the drainage plan.

Visual impacts can be mitigated during architectural design of the shelters. Shelters should be designed so that they blend into the setting and do not detract from the tourist experience or overwhelm the antiquities they are protecting. The environmental review process should ensure that the design addresses visual aesthetics.

Impacts to cultural resources can be mitigated by complying with the Antiquities Law and requiring the Mission Environmental Officer to review architectural and construction plans in consultation with a qualified archaeologist.

Construction of Tourist Facilities

The environmental consequences of construction of tourist facilities vary with the type of intervention.

Upgrades of Existing Facilities

Upgrading existing facilities can reduce congestion and improve the tourist experience by providing amenities which are currently inadequate or nonexistent. However, the upgrades will also increase demands for water and wastewater treatment and disposal. Increased water demand can cause local water supply shortages. If wastewater treatment and disposal facilities are inadequate, due to poor design or inadequate capacity, water contamination and public health problems can arise.

The potential adverse environmental consequences can be mitigated by preparation of water supply and wastewater management plans before release of funds for construction. The Mission Environmental Officer should review the plans.

Construction of New Facilities

As with upgrades of existing facilities, the construction of new facilities can reduce congestion and improve the tourist experience by providing amenities, but can also contribute to potential water supply shortages, degradation of water quality, and public health problems. In addition, the construction of facilities can:

- Create localized downstream flooding and sedimentation if drainage is not appropriate,
- Cause nuisance from dust for nearby residents and tourists during construction,
- Increase litter at the site, if solid waste receptacles are not provided or solid waste collection is inadequate,
- Degrade the visual aesthetics of the site, and
- Destroy cultural resources on the surface of the location of the facility or those underneath the location during construction of footings and wastewater disposal systems.

To mitigate the potential environmental consequences to water, air and land, USAID/Jordan should make construction funding contingent upon the preparation of water supply, wastewater management, drainage/erosion, dust control and solid waste collection plans. The Mission Environmental Officer should review the plans.

To mitigate the potential impact on visual aesthetics, the buildings should be designed to blend into, rather than distract from, the site. The environmental review process should ensure that the design addresses aesthetics.

To mitigate the potential impacts to cultural resources, USAID/Jordan should require that a qualified archaeologist survey the location for the building and supporting facilities before construction to ensure that cultural resources are not destroyed. If the location threatens a cultural resource, the building should be relocated. If relocation is impossible, or if the site is such that no location is available that has no cultural resources, the archaeologist should evaluate the resources to ensure salvage or preservation of any significant archaeological remains.

Proposed Small Hotel

A small hotel, like the construction of other tourist facilities, can improve the tourist experience and extend the period of a visit to a site, thereby reducing congestion. A small hotel can also have a positive impact on local income by creating jobs. If the owner/manager of the hotel, however, fills the new jobs with people from outside the local area, the construction of a hotel can create inequitable distribution of income.

A small hotel has the same potential adverse environmental consequences as construction of new facilities, but the impact is greater because the water supply and wastewater treatment needs are larger, as is the area of land disturbance. Also, because a small hotel may generate a significant quantity of solid waste, it may degrade the land associated with solid waste disposal.

The construction of a small hotel requires the same mitigation measures as construction of a new facility with the addition of the following:

- Preparation of a solid waste disposal plan prior to release of construction funding, and
- An assessment of the income generated by the hotel and its distribution to locals and non-locals.

The environmental review process should ensure that these activities are undertaken. The Mission Environmental Officer should review the solid waste disposal plan.

Provision of Electrical and Telephone Services

Some of the sites that may receive assistance from USAID/Jordan for upgrading their electrical services already have electrical generators. These generators create noise pollution. The provision of electricity and telephone service via wire can disturb cultural resources and degrade the aesthetics of a site. Even if the service is buried, it can impact the aesthetics if it is not appropriately covered. An example of such a situation is the buried electric line to the rest house at Pella, which created a vertical scar on the hill below the rest house visible from the lower ruins.

Noise pollution can be mitigated by bringing power into the site from the power grid, muffling or placing generators in sound resistant structures, or by providing solar generated electricity.

Each site activity proposal for the provision of electricity should evaluate these alternatives. If electricity is to be provided via generators, a noise abatement plan should be required prior to construction funding. The Mission Environmental Officer should review the plan.

Degradation of aesthetics can be mitigated by requiring that the use of non-wired power or telephone service be investigated (e.g., generators, solar systems, or wireless telephone service as used on the Desert Highway) and by requiring that wired service be located and designed to blend in with the surrounding terrain, or be properly buried. The environmental review process should ensure that the design addresses aesthetics.

To mitigate the potential impacts on cultural resources, USAID/Jordan should require that a qualified archaeologist survey the location of generators, transmitting equipment, and poles or trenches before construction to ensure that cultural resources are not destroyed. If the location threatens a cultural resource, the equipment, poles, or trenches should be relocated. If relocation is impossible, or if the site is such that all locations available have cultural resources, the archaeologist should evaluate the resources to ensure salvage or preservation of any significant archaeological remains.

Improvement of Roads

Drainage and associated erosion from road improvements can cause downstream flooding, sedimentation and slope failures. During construction, dust can be a nuisance to nearby residents and tourists, and cultural resources in the path of the road can be destroyed. The road and associated cut and fill can degrade the aesthetics of the site. If the road increases vehicular traffic, it will also increase both noise pollution from the vehicles and the potential for tourist accidents.

USAID regulations governing environmental procedures (22 CFR 216) identify "Penetration road building or road improvement projects" as one class of action normally requiring an Environmental Assessment (22 CFR 216.2(d)). To comply with these regulations, a site-specific Environmental Review should be prepared as part of planning and design for each road improvement intervention. The Environmental Review should develop a reasonable set of alternatives and assess the environmental impacts of each alternative. The issues addressed in the Environmental Review should be those identified in this PEA as well as any site-specific issues that the preparer of the Environmental Review may identify.

Construction of Parking Areas

Construction of parking areas has the same potential environmental consequences as road improvement, but their smaller size and less dispersed nature mean the impacts are less intense. Because the impacts are milder, the environmental consequences can be mitigated without a full assessment of alternatives.

To mitigate the impacts from dust, flooding, and sedimentation during construction and drainage and erosion, USAID/Jordan should require the preparation of dust control and drainage/erosion

plans before releasing funds for the project. The Mission Environmental Officer should review the plans.

To mitigate visual degradation, the parking area should be located and designed so that it is hidden or screened from the most visited areas at the site. The design and location should be selected so that noise from vehicles is minimized from the parking area to the most visited areas at the site. Screening with vegetation can mitigate both visual and noise impacts. The environmental review process should ensure that the design addresses aesthetics.

To mitigate the potential impacts to cultural resources, USAID/Jordan should require that a qualified archaeologist survey the location of the parking area before construction to ensure that cultural resources are not destroyed. If the location threatens a cultural resource, the parking area should be relocated. If relocation is impossible, or if the site is such that all locations have cultural resources, the archaeologist should evaluate the resources to ensure salvage or preservation of any significant archaeological remains.

The incidence of tourist accidents can be mitigated by designing walkways through the parking area and from the parking area to the site to minimize crossing of vehicle lanes. USAID/Jordan should require preparation of a tourist safety plan prior to releasing funds for the project. The Mission Environmental Officer should review the plan.

Construction of Trails and Stairs

Proper trail and stair design and construction can reduce tourist congestion, increase tourist safety, and enhance the tourist experience. They can also protect the cultural resources which the tourist has come to see.[6]

But trails and stairs also can have negative environmental impacts. If trails and stairs are not properly located and designed, they can create, rather than alleviate, congestion and safety hazards. Drainage and associated erosion from trail and stairs construction can cause localized downstream flooding and sedimentation. In addition, without proper installation of drainage controls on a trail, it can become a water channel, causing trail erosion and further downstream flooding and sedimentation.

If solid waste receptacles and proper collection are not provided on trails and stairs, litter can become concentrated, degrading the land. During construction, cultural resources in the paths of trails and stairs can be destroyed, and improper location can degrade the aesthetics of the site.

The potential adverse environmental consequences of trail and stairs construction can be mitigated by location and design that reduce congestion, protect tourist safety, and minimize visual impacts. Special attention should be given to width, surface material, the need for protective rails, and routing to minimize contact between groups of tourists. The environmental review process should ensure that these issues are adequately addressed in the design.

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[6]The United States National Park Service has found that 92 percent of the visitors to national parks remain on well-defined trails.

To mitigate the impacts from drainage and erosion, and litter, USAID/Jordan should require the preparation of drainage/erosion and solid waste collection plans before releasing funds for the project. The drainage/erosion plan should address on-trail drainage control as well as control at natural drainage crossings. The Mission Environmental Officer should review the plans.

To mitigate the potential impacts to cultural resources, USAID/Jordan should require that a qualified archaeologist survey the location of trails and stairs before construction to ensure that cultural resources are not destroyed. If the location threatens a cultural resource, a new location should be found. If relocation is impossible, or if the site is such that all locations available have cultural resources, the archaeologist should evaluate the resources to ensure salvage or preservation of any significant archaeological remains.

Installation of Explanatory Panels and Informational Signs

If explanatory panels and informational signs are incorrectly placed they can detract from the site they are intended to enhance. This potential adverse consequence can be mitigated by addressing the aesthetics of panel and sign placement for each site during the planning stage.

Interior Renovations of Existing Structures

Interior renovations have no significant environmental consequences and require no mitigation measures. (Renovations which include upgrades of restrooms or food service facilities are covered under "Construction of Tourist Facilities.")

Upgrade of the Siq Entrance to Petra

If the Siq entrance to Petra is upgraded, it could alleviate some of the current problems of dust, odor, tourist congestion, and tourist safety, and thereby improve the tourist experience. It could reduce the potential for nonpoint-source water contamination from animal wastes and create the opportunity to restore riparian vegetation and protect cultural resources in the Siq. It could also create employment opportunities for guides who lead tourists on horseback and allow them to maintain what has become a traditional source of income.

However, creating alternative entrances or exits from the site and opportunities for alternative horseback riding experiences can shift some of the current degradation to other areas. Drainage and associated erosion along with the presence of animal waste at the alternatives can cause localized downstream flooding, sedimentation, and water contamination. Alternative routes can degrade the aesthetics of the site, and alternative horse routes can create dust and odor problems for tourists and guides.

Because the issues with this intervention are so complex and the potential negative and positive environmental consequences so numerous, a site-specific Environmental Review should be prepared as part of feasibility study. The Environmental Review should develop a reasonable set of alternatives and assess the environmental impacts of each alternative. The issues addressed in the Environmental Review should be those identified in this PEA as well as any site-specific issues which the preparer of the Environmental Review may identify.

USAID/Jordan should consider preparing one feasibility study and Environmental Review that would encompass all the potential interventions in Petra.

Walking Tour Plan for Madaba

A walking tour of Madaba could create additional jobs and income for the businesses along the tour route. The associated improvements to architecture and landscapes could improve the aesthetics of the affected portions of town. But the walking tour could also have negative environmental consequences.

Increasing tourist travel in the town could increase the need for solid waste collection. If this issue is not addressed, the route could experience an increase in litter. Encouraging more tourists to walk through the suq will also increase contacts with foreigners, which could cause some problems for residents and merchants on the route who live traditional lifestyles. If the route is not properly located, tourists may feel they are seeing more fellow tourists than locals. Increasing pedestrian traffic on roads that also carry vehicular traffic increases the potential for tourist accidents.

The feasibility study should address these adverse environmental consequences. The study should cover:

- The impacts of alternative routes on traditional lifestyles,
- Congestion and tourist safety,
- The need for solid waste receptacles and waste collection, and
- The potential for restricting vehicles from some roads to improve tourist safety and enhance the tourist experience.

The municipality of Madaba should be involved in the feasibility study. The study should, where necessary, identify specific mitigation measures to address these potential environmental consequences.

Improvement of the "Sound and Light" Show in Jerash

Degradation of aesthetics and noise pollution are the only environmental consequences associated with improving the "sound and light" show in Jerash. The environmental review process for this intervention should ensure that the design of the intervention addresses these potential environmental consequences.

4.3 POTENTIAL ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES FOR LEVEL 3 INTERVENTIONS

USAID/Jordan plans to install explanatory panels and informational signs at several sites. The only environmental issue associated with the installation of panels and signs is the visual impact, which can be mitigated by addressing the aesthetics of placement during site activity design.

4.4 SUMMARY OF ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

Table 4.1 summarizes the potential adverse environmental consequences of and mitigation measures for the "no action" alternative and the types of interventions proposed in the Improvement of Sites and Related Services component of the Jordan Tourism Development Project.

TABLE 4.1

SUMMARY OF POTENTIAL ADVERSE ENVIRONMENTAL CONSEQUENCES AND MITIGATION MEASURES

TYPE OF INTERVENTION	POTENTIAL ENVIRONMENTAL CONSEQUENCES	MITIGATION MEASURES
"No Action" Alternative	Continuation of existing water shortages; drainage, erosion and nonpoint source problems; water damage to sites; lack of adequate sanitary facilities; nuisances from dust and odor; litter accumulation; noise contamination; and damage to cultural resources.	None
Archaeological Excavation	Downstream flooding and sedimentation	Drainage/erosion plan Spoils disposal plan
	Nuisance from dust for nearby residents and tourists	Dust control plan Spoils disposal plan
	Risks to cultural resources	Compliance with the Jordanian Antiquities Law
	Tourist accidents	Tourist safety plans
Preservation and Restoration of Ancient and Historic Structures	Downstream flooding and sedimentation On-site water damage	Drainage/erosion plan
	Risks to cultural resources	Compliance with the Jordanian Antiquities Law
	Tourist accidents	Tourist safety plan
Construction of Shelters Over Ancient Structures	Localized downstream flooding	Drainage plan
	Degraded aesthetics	Shelter design to blend into the site
	Risks to cultural resources	Compliance with the Jordanian Antiquities Law Review of architectural and construction plans by a qualified archaeologist

TABLE 4.1, CONTINUED

TYPE OF INTERVENTION	POTENTIAL ENVIRONMENTAL CONSEQUENCES	MITIGATION MEASURES
Construction of Tourist Facilities		
Upgrades to Existing Facilities (restrooms, rest houses and food services)	Water availability and water quality	Water supply and wastewater management plan
Construction of New Facilities (restrooms, rest houses and food services)	Water availability and water quality	Water supply and wastewater management plan
	Localized downstream flooding and sedimentation	Drainage/erosion plan
	Nuisance from dust for nearby residents and tourists during construction	Dust control plan
	Land degradation from litter	Solid waste collection plan
	Degraded aesthetics	Design facilities to blend into the site
	Risks to cultural resources	Archaeological clearance by a qualified archaeologist
Small Hotel	Water availability and water quality	Water supply and wastewater management plan
	Downstream flooding and sedimentation	Drainage/ erosion plan
	Nuisance from dust for nearby residents and tourists during construction	Dust control plan
	Land degradation from litter and solid waste disposal	Solid waste collection and disposal plan
	Degraded aesthetics	Design facilities to blend into the site
	Risks to cultural resources	Archaeological clearance by a qualified archaeologist
	Redistribution of income	Assessment of economic impacts
Provision of Electrical and Telephone Services	Degradation of aesthetics	Align and design power and telephone lines so that they blend into the terrain, or bury them; or use unwired systems

TABLE 4.1, CONTINUED

TYPE OF INTERVENTION	POTENTIAL ENVIRONMENTAL CONSEQUENCES	MITIGATION MEASURES
	Noise pollution	Require noise abatement for generators
	Risks to cultural resources.	Archaeological clearance by a qualified archaeologist
Improvement of Roads	Downstream flooding, sedimentation and slope failure	Individual site Environmental Review with development of a reasonable set of alternatives and assessment of the impacts of each alternative on the environmental issues identified in this PEA
	Nuisance from dust for nearby residents and tourists during construction	
	Degraded aesthetics	
	Noise pollution	
	Risks to cultural resources	
	Tourist accidents if road is improperly designed or managed	
Construction of Parking Areas	Localized downstream flooding and sedimentation	Drainage/erosion plan
	Nuisance from dust for nearby residents and tourists during construction	Dust control plan
	Degraded aesthetics Noise pollution	Locate and design parking areas to reduce visual and noise impacts
	Risks to cultural resources	Archaeological clearance by a qualified archaeologist
	Tourist accidents if parking area is poorly located or designed	Locate and design parking areas to protect tourist safety
Construction of Trails and Stairs	Localized downstream flooding and sedimentation and trail erosion	Drainage/erosion plan, including appropriate trail or stair surface material and placement of water bars or other drainage devises on trails
	Land degradation from litter	Solid waste collection plan
	Degraded aesthetics	Locate and design trails and stairs to reduce visual impact
	Risks to cultural resources	Archaeological clearance by a qualified archaeologist

TABLE 4.1, CONTINUED

TYPE OF INTERVENTION	POTENTIAL ENVIRONMENTAL CONSEQUENCES	MITIGATION MEASURES
	Degraded tourist experience from trail or stair congestion	Design trails and stairs with the appropriate width for the expected capacity Route trails to minimize contacts between groups of tourists
	Tourist accidents if trails or stairs are poorly located or designed	Locate and design trails and stairs to protect tourist safety
Installation of Explanatory Panels and Informational Signs	Degradation of visual aesthetics	Address aesthetics of panel and sign placement in implementation plan for each site
Interior Renovations of Existing Structures	None	Not necessary
Upgrade of the Siq Entrance to Petra	Localized downstream flooding and sedimentation and trail erosion	Individual site Environmental Review with development of a reasonable set of alternatives and assessment of the impacts of each alternative on the environmental issues identified in this PEA
	Water contamination from animal waste	
	Nuisance from dust for tourists and workers	
	Land degradation from litter	
	Degraded visual aesthetics	
	Nuisance from animal waste odor to tourists and workers	
	Degraded tourist experience from trail or stair congestion	
	Tourist accidents if trails or stairs are poorly located or designed	

TABLE 4.1, CONTINUED

TYPE OF INTERVENTION	POTENTIAL ENVIRONMENTAL CONSEQUENCES	MITIGATION MEASURES
Walking Tour Plan for Madaba	Litter	Solid waste collection plan
	Impacts on traditional lifestyles	Assess impacts as part of environmental review and develop site specific mitigation measures as necessary
	Degraded tourist experience from congestion	Design tour route to minimize contacts between groups of tourists
	Tourist pedestrian/vehicle accidents	Locate tour route to protect tourist safety Assess, with the Town of Madaba, opportunities to reduce vehicle traffic in vicinity of route
Improvement of the "Sound and Light" Show in Jerash	Degraded visual aesthetics	Locate show equipment to reduce visual impact
	Noise pollution	Assess sound needs

5.0 ASSESSMENT OF ENVIRONMENTAL REVIEW CAPABILITIES

This chapter presents an overview of the existing and future environmental institutional and legal framework, and a survey of the capacity and capability within Jordan to perform environmental assessments for the Jordan Tourism Development Project.

5.1 INSTITUTIONAL AND LEGAL FRAMEWORK OVERVIEW

This section is divided between existing and future institutional and legal framework.

5.1.1 Existing Institutional and Legal Framework[7]

5.1.1.1 Environmental Protection and Regulation

Several ministries play important roles in the development and implementation of environmental law in Jordan, including the ministries of Agriculture, Health, Energy and Mineral Resources, Industry and Trade, Planning, Municipal and Rural Affairs and the Environment, Tourism and Antiquities, and Water and Irrigation. There is tremendous overlap in responsibilities and diffusion of power among these ministries, resulting in confusion as to who is in charge of what. In short, the need for a single agency with comprehensive authority for environmental issues in Jordan is thoroughly felt.

Jordan does not yet have a single and coherent environmental code. The existing body of Jordanian laws and regulations concerning the environment is scattered among various institutional texts, which have been promulgated over a long period of time.

The existing laws could be grouped as follows:

- Water Pollution Control Laws:
  - Industrial Wastewater Treatment (1980)
  - Industrial Discharge Standards (1981)
  - Wastewater Reuse in Irrigation (1982)
  - Water Authority Law No. 18 (1988)
  - Indirect Discharge Standards (1988)

- Jordanian Environmental Health Laws:
  - Law No. 12 (1968): Mining Safety
  - Law No. 21 (1971): Ministry of Health

[7] Sources for this section: "National Environmental Strategy for Jordan," IUCN, The World Conservation Union, 1991; "Analysis of Jordanian Environmental Laws and Institutions," Peter Trick, SAIC, 1992.

5.1.2.1 Future Institutional Framework

The Higher Council for Science and Technology is assessing a proposal to create a small agency—similar to the U.S. Environmental Protection Agency—either by expanding the Department of Environment, or attaching it to the office of the Prime Minister. The Council is assessing the feasibility of establishing a Monitoring Center to centralize and coordinate all environmental testing and monitoring in Jordan. Together, the small agency and the Monitoring Center could play the central role in the enforcement, monitoring, and regulation of environmental laws. The Higher Council, however, has no authority to establish either of these institutions. This authority lies with the parliament, which may consider environmental legislation after the November 1993 election.

5.1.2.2 Future Legal Framework

The draft laws not only add new laws but also consolidate existing laws. The new environmental draft laws cover:

- Air pollution,
- Noise pollution,
- Soil pollution,
- Marine pollution, and spill control
- Ecosystem protection,
- Solid, hazardous, and toxic waste management,
- Inspection and monitoring.

The laws which are being consolidated are as follows:

- Water pollution,
- Wildlife protection,
- Desertification control,
- Grazing control,
- Hunting control,
- Natural reserves and national parks.

The Higher Council for Science and Technology is studying the development of an Environmental Impact Assessment for Jordan to serve as a guideline for all environmental assessment in the country. This guideline will be the basis for conducting and evaluating EA studies.

Enactment of these draft laws would group all the environmental laws in a single, comprehensive, cohesive legal document: the National Environmental Law for protecting Jordan's environment.

5.2 CAPACITY AND CAPABILITY OF JORDAN TO PERFORM ENVIRONMENTAL ASSESSMENT

As stated in the preceding section, no law governs environmental impact assessments in Jordan. Nevertheless, this section will examine the weaknesses and strengths of the potential para-governmental, and private organizations that might be able to perform environmental assessment of the interventions proposed by the Jordan Tourism Development Project. The last section will propose solutions to remedy the weaknesses and enhance the strengths.

5.2.1 Weaknesses

The major weakness, as mentioned above, is the lack of a coherent body of environmental laws, specifically of Environmental Assessment Law and regulations. Second, among the five organizations interviewed none had conducted an EA. These organizations are:

- The Royal Society for the Conservation of Nature,
- The Water and Environment Research and Study Center of the University of Jordan,
- The Higher Council for Science and Technology,
- Environmental Resources Management Consultants, and
- Energy Management Services.

5.2.2 Strengths

Jordan has enough expertise in every discipline—watershed hydrology, road construction, erosion control, wastewater disposal, archaeology, and socioeconomic analysis—to field an environmental impact assessment team able to perform the Environmental Reviews for the proposed interventions of the Jordan Tourism Development Project.

All five organizations, listed above, seem to possess or have access to expertise to supplement their own staff. It does not seem, however, that all of them want to enter the business of doing environmental assessments.

The primary goal of the Royal Society for the Conservation of Nature is the conservation of nature and natural resources. It is a private, voluntary organization with public service status established in 1966. It has a small permanent staff and would have difficulty dedicating several employees full-time to an Environmental Review.

The first mission of the Water and Environment Research and Study Center of the University of Jordan is to conduct research on developing and managing water resources and protecting the environment from pollution and degradation. Its second mission is to provide services to the public and private sectors in areas including environmental impact assessment. The center will have no trouble fielding an EA team chosen among the university professors and the professionals linked to the center.

The broad objective of the Higher Council for Science and Technology is to stimulate and promote science and technology in Jordan. The Council also has ten sub-objectives, including protecting the environment. As seen in section 5.1.2 above, the Higher Council plays an active role in proposing and developing the future environmental and institutional legal framework of Jordan. The Higher Council does not seem interested in actually participating in an environmental assessment, but is willing to play the role of facilitator in fielding a team of experts for that purpose.

Environmental Resources Management Consultants is a young, private company established in 1993 whose business is to seek consultancy contracts in areas including environmental engineering, irrigation, hydrogeology, financial and economic analysis, environmental impact assessment, resource management, monitoring and evaluation programs, and decision support for public policy. This company has four professionals trained in environmental and civil engineering, water resources systems, wastewater disposal, chemistry, economics, and project management. They could easily supplement their staff with outside experts.

Energy Management Services is a private company established in 1991 and operational since 1992. This company specializes in the management and conservation of Jordan's water and energy resources. Energy Management Services proposes to its clients "a performance consultancy and contracting agreement." The company then conducts environmental and energy audits of the client's building or factory. It supplies, finances, and installs the necessary equipment identified by the audits. In return, it shares in the client's financial savings from its improvements in process throughout the agreement. Thereafter, the client owns the equipment and enjoys all the savings. The company provides multi-disciplinary professional services. It has seven electrical, mechanical, and chemical engineers on its permanent staff and access to part-time consultants in other fields. They could also put an Environmental Review team together easily.

5.2.3 Conclusion

As seen above, Jordan has plenty of adequate expertise to field an Environmental Review team. Even though there is no environmental assessment law, the only problem is that no one has ever participated in an environmental assessment study. The obvious short-term solution is to provide technical assistance to whatever team is selected to do Environmental Reviews. The technical assistant should guide the team in designing and performing an Environmental Review. The participants will then learn how to conduct an Environmental Review and could in the future conduct and provide training for an environmental impact assessment.

The long-term solution is to establish a nine to ten week part-time environmental assessment/review class, taught in the Water and Environmental Research and Study Center of the University of Jordan, and open to students and professionals.[8] The Water and Environment

[8] This idea of a part-time environmental assessment class comes from the discussion that the consultant had with several organizations interviewed. It is suggested that this class should be taught in the afternoon to minimize the time that the staff will be away from their duties.

Research and Study Center is proposing two new MAs scheduled to begin in 1994: Environmental Management and Water Resources. Both offer an environmental impact assessment class. It would be efficient to have only one class taught for both these MAs and open to professionals. The University of Jordan could draw on Washington State University, with which it already has a relationship through the USAID-supported university linkage program, to receive assistance on environmental issues.

6.0 PROGRAM IMPLEMENTATION AND MONITORING PLAN

USAID/Jordan must ensure that the environmental impacts of proposed interventions in each site of the Jordan Tourism Development Project are minimized throughout the length of the project. This chapter of the PEA identifies the environmental review process which should be used for site activities and the necessary monitoring to ensure that impacts are minimized.

6.1 ENVIRONMENTAL REVIEW PROCESS

Two categories of activities will require site-specific Environmental Reviews (improvement of roads, and upgrade of the Siq entrance to Petra). The project manager should be responsible for preparing the Environmental Review as described in Appendix B of this PEA. The project manager should also incorporate the mitigation measures identified by the Environmental Review (ER) into the plan for the site activity. The Mission Environmental Officer should review the ER to ensure that it is adequate and advise the Mission Director, who has approval authority.

For the other eleven categories of activities which may be undertaken by the JTDP, this PEA has identified mitigation measures which, if implemented, will minimize the potential impacts of the site activities. For site activities in these categories[9] the environmental review process will be less formal and should consist of incorporating the mitigation measures into the design of site activities. The project manager should be required to incorporate the mitigation measures into the plan for each site activity. The Mission Environmental Officer should review the plan for each site activity to ensure that the mitigation measures have been adequately addressed.

6.2 PROGRAM MONITORING

Mitigation measures are effective only if they are implemented. The project manager should be responsible for implementing the mitigation measures identified for each site activity during the environmental review process. The Mission Environmental Officer should monitor site activity implementation to ensure that the mitigation measures are implemented.

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[9]Archaeological excavation, preservation and restoration of ancient and historic structures, construction of shelters over ancient structures, construction of tourist facilities, provision of electrical and telephone services, construction of parking areas, construction of trails and stairs, installation of explanatory panels and informational signs, walking tour plan for Madaba, and improvement of the sound and light show in Jerash.

7.0 CONCLUSIONS AND RECOMMENDATIONS

7.1 SUMMARY OF FINDINGS

The findings of this assessment indicate that no significant adverse impacts are anticipated from eleven proposed categories of intervention that could receive funds from the Jordan Tourism Development Project. However, at this time sufficient information is not available to make a finding of significance for two categories of proposed interventions (road improvements and improvement of the Siq at Petra). These two categories will require site-specific Environmental Reviews and/or Environmental Assessments (see Appendix B, Definition of Environmental Review) before implementation. Furthermore, Jordan does not have a comprehensive and cohesive Environmental Law, and lacks in particular, an Environmental Assessment Law. As a result, even though the country has professionals with expertise in every discipline required to conduct an environmental assessment, they have no experience in preparing assessments.

7.2 RECOMMENDATIONS

1. The mitigation measures identified in Section 4.2 and Table 4.1 should be required for all interventions in the following categories:

   - Archaeological excavation,
   - Preservation and restoration of ancient historic structures,
   - Construction of shelters over ancient structures,
   - Construction of tourist facilities,
   - Provision of electrical and telephone services,
   - Construction of parking areas,
   - Construction of trails and stairs,
   - Installation of explanatory panels and informational signs,
   - Walking tour plan for Madaba, and
   - Improvement of the "sound and light" show in Jerash.

2. Individual site Environmental Reviews, prior to full EAs, with the development of reasonable sets of alternatives and the assessment of the environmental impacts of each alternative should be prepared for each road improvement intervention and for the upgrade of the Siq entrance to Petra. These Environmental Reviews should address the environmental issues identified in this PEA (Section 2.2.2).

3. For Petra, installation of restrooms in the site, development of a trail system, the feasibility studies (upgrade of the Siq entrance, egress, and telephone and electricity service) and the Environmental Reviews for the road and the Siq upgrade should be combined into one feasibility study/Environmental Review so that interrelated issues can be addressed at one time.

4. **USAID/Jordan should provide technical assistance on the design and preparation of Environmental Reviews to Jordanian entities, to develop local capacity for these reviews.**

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8.2 PERSONS CONTACTED

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Other

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The Mayor, Municipality of Wadi Musa
The Mayor, Municipality of Madaba
Husain Zaky Said, Municipality of Amman
Pierre Bikai, The American Center of Oriental Research
Talal Akasheh, The Higher Council of Science and Technology

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Abdullah Ahamad, USAID/Jordan
Cherie Lenzen, USAID/Jordan

8.3 SITES VISITED

The Amman Citadel
Petra
Madaba
Mt. Nebo
Umm Qeis
Pella
Kharana Castle
Amra Castle
Azraq Castle
Hammam es-Sarah Bath
Hallabat Castle
Wadi Rum
Karak Castle
Jerash
Ajlun
Umm al-Jimal

APPENDIX A
ENVIRONMENTAL ISSUES ASSOCIATED WITH EACH INTERVENTION

DESCRIPTION OF ACTIVITY	ISSUES															
	Water				Air	Solid Waste			Aesthetics				Socio-Economic			
	Supply	Wastewater	Drain/Erosion	Nonpoint	Dust	Collection	Disposal	Archae Spoils	Visual	Noise	Odor	Cultural Res	Income/Equity	Trad Life	Congestion	Tour Safety
LEVEL 1 DEVELOPMENT SITES																
AMMAN CITADEL Excavation			X		X			X				X				X
Preservation and restoration			X						X			X				X+
Shelter for Byzantine structure			X						X			X				
Interior work on museum*																
Restrooms and cafe in museum*	X	X				X	X								X	
Exterior expansion of museum*			X		X#				X			X				X#
Bus parking/turn around			X		X#				X	X		X			X	X
Explanatory panels and informational signs									X							
Trails			X			X			X			X			X	X
PETRA Excavation			X		X			X				X				X
Preservation and restoration			X						X			X				X

X Environmental issues which should be addressed during subproject design.

\+ On the Amman Citadel, preservation and restoration includes cleaning archaeological trenches which would be safe for public access and fencing those which would not be safe.

* The project will fund feasibility studies prior to implementation of these activities.

\# Environmental issues which will exist only during the construction phase.

APPENDIX A, CONTINUED

DESCRIPTION OF ACTIVITY	ISSUES															
	Water				Air	Solid Waste			Aesthetics				Socio-Economic			
	Supply	Wastewater	Drain/Erosion	Nonpoint	Dust	Collection	Disposal	Archaeo Spoils	Visual	Noise	Odor	Cultural Res	Income/Equity	Trad Life	Congestion	Tour Safety
PETRA, CONTINUED																
Upgrade entrance via Siq*			X	X	X	X			X		X		X	X	X	X
Egress alternatives to Siq*			X		X#				X	X		X	X	X	X	X
Telephone and electricity service within site*									X	X		X				X
Restrooms within site	X	X				X	X		X		X	X			X	
Upgrade visitor center	X	X				X	X						X		X	
Explanatory panels and informational signs									X							
Trails			X			X			X			X			X	X
MADABA																
Excavation			X		X			X				X				X
Preservation and restoration			X						X			X				X
Shelters			X						X			X				
Walking tour plan*						X							X	X	X	X
Restrooms and snack bar in archaeological park area	X	X				X	X								X	
Upgrade existing DOA museum																

X Environmental issues which should be addressed during subproject design.

* The project will fund feasibility studies prior to implementation of these activities.

\# Environmental issues which will exist only during the construction phase.

48

APPENDIX A, CONTINUED

DESCRIPTION OF ACTIVITY	ISSUES															
	Water				Air	Solid Waste			Aesthetics			Cultural Res	Socio-Economic			
	Supply	Wastewater	Drain/Erosion	Nonpoint	Dust	Collection	Disposal	Archae Spoils	Visual	Noise	Odor		Income/Equity	Trad Life	Congestion	Tour Safety
LEVEL 2 DEVELOPMENT SITES																
UMM QEIS -- Small hotel	X	X	X		X#	X	X		X			X	X		X	
PELLA Visitor access to site			X		X#	X	X		X			X			X	X
Explanatory panels									X							
Site model in rest house																
JERASH/GERASA -- Improve "sound and light" show									X	X						
Shelters			X						X			X				
IRAQ EL-EMIR -- Explanatory panels									X							
QSAR AMRA -- Small rest house	X	X	X		X#		X		X			X				
AYN MOUSA -- Upgrade road			X		X#				X			X			X	X
MUKHAYYAT Upgrade access road			X		X#				X			X			X	X
Upgrade explanatory panel									X							
MOUNT NEBO -- Water and electricity for rest house	X	X							X	X						
AYN MOUSA Shelter over mosaic			X						X			X				
Explanatory panel									X							

X Environmental issues which should be addressed during subproject design.

Environmental issues which will exist only during the construction phase.

APPENDIX A, CONTINUED

DESCRIPTION OF ACTIVITY	ISSUES															
	Water				Air	Solid Waste			Aesthetics				Socio-Economic			
	Supply	Wastewater	Drain/Erosion	Nonpoint	Dust	Collection	Disposal	Archae Spoils	Visual	Noise	Odor	Cultural Res	Income/Equity	Trad Life	Congestion	Tour Safety
WADI QWEILEBEH/ABILA Small rest house	X	X	X		X#	X	X		X			X			X	
Explanatory panels									X							
UMM AR-RASAS -- Shelter			X						X			X				
WADI RUM -- Nabataean exhibits									X							
UMM AL-JIMAL Preservation and restoration			X						X			X				
Temporary shelter			X						X			X				
SALT -- Restore facades along Hamman Street and Khader Street									X			X				
Restore stairs between streets			X						X			X				
MA'AN -- Renovation of house			X						X			X				
QATRANEH -- Restrooms	X	X	X		X#	X	X		X			X				

X Environmental issues which should be addressed during subproject design.

Environmental issues which will exist only during the construction phase.

50

APPENDIX B

DEFINITION OF ENVIRONMENTAL REVIEW

On June 9, 1993, USAID/Jordan received a cable from USAID/Washington which delegated authority to the Mission Director to approve the project paper and project authorization. The cable also detailed agreements about key issues including guidance on environmental review (Issue 6). This guidance included the following language:

"-- THE PROJECT PAPER WILL IDENTIFY ACTIONS THAT THE GOVERNMENT OF JORDAN OR GRANTEE SUCH AS ACOR MUST CARRY OUT IN ORDER TO BRING THEIR ENVIRONMENTAL REVIEW PROCEDURES TO A STANDARD ACCEPTABLE TO THE BEC. THE PROJECT PAPER WILL ALSO INCLUDE A TECHNICAL ASSISTANCE PLAN TO ENHANCE GOJ'S OR GRANTEE'S ENVIRONMENTAL MONITORING CAPACITY, IF NEEDED.

-- WHEN SPECIFIC LOCATIONS OF EACH SITE TO BE DEVELOPED UNDER THE PROJECT HAVE BEEN SELECTED, THE GOJ OR GRANTEE WILL PREPARE AN ENVIRONMENTAL REVIEW AND THIS WILL BE APPROVED BY THE MISSION DIRECTOR ON ADVICE OF MISSION ENVIRONMENTAL OFFICER. THE REGIONAL LEGAL ADVISOR SHOULD BE CONSULTED FOR ESTABLISHING THE MANNER IN WHICH CONDITION PRECEDENT TO DISBURSEMENT WILL AVOID AN IRREVERSIBLE COMMITMENT OF RESOURCES BEFORE ENVIRONMENTAL REVIEW IS COMPLETED AND APPROVED. DURING IMPLEMENTATION, CHANGES IN THE ENVIRONMENT, EITHER POSITIVE OR NEGATIVE, SHOULD BE MONITORED. COPIES OF ENVIRONMENTAL REVIEWS AND MONITORING REPORTS SHOULD BE SUBMITTED TO THE BEC FOR INFORMATION AND TRACKING."

On September 1, 1993, the consultants sent a fax to the Environmental Office of the Near East Bureau seeking clarification on the definition of "Environmental Review." They received the following guidance.

"<u>Level 1 Interventions</u>

Should these, in the opinion of the Mission MEO, require further assessment per 22 CFR 216 (i.e., because the action is delineated, per 22 CFR 216 (d), as a class of action normally having a significant effect on the environment), then an Environmental Assessment (EA) is called for.

However, if the action only marginally might cause negative impact(s) to the environment, then the MEO can require an "environmental review," which is covered under the PEA.

So, to respond to your specific questions:

1. The "environmental review" does require the development of a reasonable range of alternatives and an assessment (a level lower than required in an EA) of impacts per alternative.

2. The Mission MEO can review and approve an "environmental review."

(Fax from J.P.E. des Rosiers, September 1, 1993)

From this guidance, it would seem that an "Environmental Review" is similar to an Environmental Assessment, except that the analysis is at a lower level than that required in an Environmental Assessment, and it can be approved by the Mission Director on the advice of the MEO instead of the BEC. But if 22CFR216(d) is applicable, and full EA is called ro.

Environmental Review should be integral to the site activity planning process. If a feasibility study is undertaken for an activity, the person or persons conducting the Environmental Review should be part of the feasibility study team to ensure integration of the Review into the planning process.

The purpose of an Environmental Review is to improve decisions. The output of an Environmental Review would be a statement with the following general outline:

Summary: Summary of the findings (including a finding of no significant impact for the proposed site activity) and identification of the proposed alternative and associated mitigation measures.

Purpose: Purpose and need for the proposed site activity.

Issues: Identification of the potentially significant environmental issues which will be addressed in the review.

Alternatives: Identification of a reasonable range of alternative actions which could achieve the purpose of the site activity, as well as the "no action" alternative.

Affected Environment: A brief description of the environment which may be affected by the project, limited to only that information which is necessary for comparing the impacts of the alternatives.

Environmental Impacts and Mitigation Measures: Identification of environmental impacts (positive and negative) and mitigation measures for each alternative, and comparison of the alternatives.

A generic scope of work for an Environmental Review would be as follows:

1. Objective: to ensure that the site activity is environmentally sound and to provide decision makers in USAID/Jordan and the GOJ with information on the potential environmental impacts of the proposed activity.

2. Specific Tasks:

A. Review relevant documents on the proposed site activity including the Project Paper and the PEA for the JTDP. Review documents on the specific environment at the site.

B. Visit the site of the proposed activity.

C. Review the list of potentially significant environmental issues identified for the site activity or category of activity in the PEA. In consultation with USAID/Jordan, the project manager, GOJ and potentially affected parties, update the list so that all potentially significant issues are identified.

D. Prepare a draft outline and workplan for the Environmental Review statement.

E. In consultation with USAID/Jordan and the project manager, develop two or more action alternatives and describe them in sufficient detail to allow an assessment of their environmental impacts.

F. Assess the environmental impacts (positive and negative) for each alternative, including the "no action" alternative, for each of the issues identified as being potentially significant. The assessment may require a field trip to the site for data collection. The assessment should be conducted in a manner which allows for direct comparison of the impacts across alternatives.

G. Identify necessary mitigation measures for each alternative.

H. Prepare and present a briefing to USAID/Jordan and the project manager on the alternatives, environmental impact assessment and mitigation measures in a manner which will allow them to select an alternative which has no significant impact on the environment. (Note: if no such alternative can be identified, then JTDP will either have to select the "no action" alternative (i.e., abandon the site activity) or go through the Environmental Assessment or Environmental Impact Statement process required in 22 CFR 216).

I. Prepare the Environmental Review statement.

3. Staffing:

The number of staff and their qualifications will depend on the size and complexity of the proposed site activity and the administrative arrangement for preparation of the Environmental Review. An interdisciplinary team composed of professionals with training in each of the issue areas is ideal, but may not always be practical.

If the Environmental Review is prepared as an integral part of a feasibility study, the study team should be composed of experts as appropriate including an environmental impact assessment expert.

4. Deliverables:

A. Draft outline and workplan for the Environmental Review.

B. Briefing for USAID/Jordan and the project manager on the alternatives, environmental impact assessment and mitigation measures.

C. Environmental Review statement.