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**Analysis of Jordanian
Laws and Institutions**

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The opinions expressed in this paper are those of the author(s) and do not necessarily reflect the positions of the sponsoring agency or contractors.

PRIDE TECHNICAL REPORT #2

**Analysis of Jordanian
Laws and Institutions**

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LIST OF ACRONYMS

ACOR	American Center for Oriental Research
ARA	Aqaba Region Authority
DOA	Department of Agriculture
DOE	Department of Environment
DSS	Department of Standards and Specifications
EIA	environmental impact assessment
EIS	Environmental Impact Statement
GDP	Gross Domestic Product
GNP	Gross National Product
GOJ	Government of Jordan
HC	Higher Council
IUCN	International Union for the Conservation of Nature
JD	Jordanian Dinar
JSCEP	Jordanian Society for the Control of Pollution
JVA	Jordan Valley Authority
MIT	Ministry of Industry and Trade
MOI	Ministry of the Interior
MMRAE	Ministry of Municipal and Rural Affairs and the Environment
MOA	Ministry of Agriculture
MOH	Ministry of Health
MOU	Memorandum of Understanding
MWI	Ministry of Water and Irrigation
NES	National Environment Strategy
NRA	Natural Resources Authority
PPE	pollution prevention evaluation
RSCN	Royal Society for Conservation of Nature
RSS	Royal Scientific Society
UNDP	United Nations Development Programme
USAID	U.S. Agency for International Development
WAJ	Water Authority of Jordan
WRA	Water Resources Administration

EXECUTIVE SUMMARY

The Hashemite Kingdom of Jordan is taking ambitious strides to strengthen environmental protection, establishing itself as a leader in the Arab world. A National Environment Strategy for Jordan has been completed and was officially approved in May 1991. It reflects a profound understanding of the environmental challenges facing Jordan, including water shortages; overpumping of aquifers; population growth; desertification; agricultural land loss; air, surface water, marine, and groundwater pollution; and loss of critical cultural resources. The strategy provides important information and makes key recommendations to address these problems.

A major finding of the strategy is the need to strengthen institutions and consolidate a comprehensive legal framework for environmental protection in Jordan. The purpose of this report is advise the Government of Jordan through the Ministry of Municipal and Rural Affairs and the Environment (MMRAE) on possible statutory and institutional changes. To accomplish this, a review of existing laws and studies was conducted and numerous interviews were held with Jordanian environmental officials to understand current regulatory practices. In addition, a new draft environmental law was analyzed. Preliminary findings were presented to His Excellency the Minister of MMRAE, Razzaq Tubeishat, and His Excellency the Secretary General of MMRAE, Mohammed Bani Hani.

Major findings and recommendations contained in this report include the following:

- Population growth and economic development are causing stress to scarce Jordanian environmental resources, such as water, agricultural land, and wildlife.
- The Government of Jordan has studied many environmental problems and is aware of the principal concerns.
- Institutional responsibilities for environmental protection are spread over numerous government agencies. Duplication, poor coordination, and gaps in program administration occur.
- Environmental programs in water pollution and water supply are better developed than in other areas, such as air pollution or solid waste management.
- Resource management programs, such as forestry, mining, and water supply, appear to have better funding and clearer statutory mandates than pollution control programs.
- No single agency exercises comprehensive environmental protection functions. The Department of Environment (DOE) plays an advisory role across several areas but lacks substantive institutional responsibilities.

- Many agencies with environmental responsibilities lack clear and firm statutory directives for their actions. On an ad hoc or informal basis, these agencies have accomplished a great deal. The need for a comprehensive legal framework is clear.
- The proposed draft legislation provides a solid base for the creation of an expanded environmental law for Jordan. It adds needed provisions in ecosystem protection; soil, air, and marine pollution; solid and hazardous waste management; and spill control.
- This report suggests 22 substantive changes to the draft law as listed below:
 - Change the relative responsibilities of the Higher Council and DOE
 - Reorganize the statute in chapters to aid in comprehension
 - Create intergovernment provisions that more clearly allocate roles
 - Consolidate licensing provisions
 - Expand environmental impact assessment procedures to include pollution prevention
 - Create rights and procedures for public participation
 - Establish self-monitoring and reporting requirements
 - Establish a fee system
 - Strengthen enforcement provisions
 - Create a special court.
- The legal analysis suggests several environmental areas where additional protections may be desirable. These include land use planning, overpumping prohibitions, cultural preservation requirements, mine reclamation, pesticide controls, coastal zone management, and recycling.
- Comments are provided on 35 articles to improve their effectiveness. Suggestions include stiffening fines, simplifying causality requirements, and inserting clear prohibitions.
- The analysis considers alternative institutional roles for DOE and those envisioned in the National Environment Strategy (NES). The proposed law and the NES are compatible in the roles they envision for DOE.
- Institutional recommendations for DOE include the following:
 - Strengthen DOE's regulatory authority
 - Provide DOE leadership in all environmental program functions for planning, design, development, implementation, and enforcement for environmental protection

- **Leave implementation responsibilities for resource management programs (e.g., water, forestry, and mining) with resource management agencies with oversight by DOE**
- **Allow DOE to reside in MMRAE and to become an independent authority**
- **Expand DOE significantly in terms of staff, funding, resources, and equipment.**

PURPOSE AND APPROACH

The Government of Jordan (GOJ) recently completed a comprehensive environmental strategy. A major finding in the National Environmental Strategy (NES) was that laws and institutions are not adequate to ensure comprehensive and coordinated environmental protection in Jordan. There are gaps in the coverage of environmental laws, and confusion and overlap in the execution by institutions of administrative responsibilities. The NES' recommendations were that comprehensive environmental legislation be introduced, that an independent institutional framework for environmental affairs be created, and that advice be sought from other countries in framing and drafting appropriate environmental legislation.

The U.S. Agency for International Development (USAID) commissioned this analysis in response to these recommendations and a specific request from GOJ through the Ministry of Municipal and Rural Affairs and the Environment (MMRAE). The foci of the analysis include 1) consideration of the interrelationships and roles of various government ministries and agencies that are charged with protecting the environment; 2) review of all pertinent existing environmental laws and regulations; 3) evaluation of the effects of the NES on MMRAE's roles in environmental protection; 4) analysis of a new draft environmental law, which makes recommendations to empower MMRAE; and 5) definition of the optimal role for MMRAE in protecting the environment.

To complete this analysis, the author performed background research using materials listed in Appendix A. Key information resources included *The National Environmental Strategy for Jordan* (MMRAE 1991), *Jordan Environmental Profile: Status and Abatement* (Ahmad 1989), and the draft environmental legislation. A field trip to Amman, Jordan, was conducted during January 10 - February 6, 1992, to gather first-hand information. On this trip, the author worked with the Department of Environment (DOE), MMRAE. After a week's residence with DOE, interviews were conducted with major Jordanian ministries with environmental protection responsibilities, as well as with parastatal and nongovernmental organizations. Close coordination was maintained with the USAID mission. Formal briefings of preliminary and final results were presented to the Minister of MMRAE, the USAID mission, and the U.S. Ambassador.

This analysis is organized into four sections:

- General Background
- Review of Existing Jordanian Environmental Institutions, Laws, and Correct Regulatory Practices
- Recommendations for Improving Jordanian Environmental Laws
- Consideration of Alternative Institutional Roles for MMRAE.

This effort concentrated on providing recommendations to improve the new draft law as well as to enhance the institutional framework for its implementation. Given the fine work contained in Abdullah Ahmad's book and the NES of Jordan in documenting existing environmental problems, laws, and institutions, efforts with regard to existing environmental programs focused mainly on what was actually being done in practice rather than in theory in Jordan. This "real world" understanding was largely derived from more than 30 interviews with key Jordanian administrators. Their help and candor were critical to this presentation of current regulatory practices.

The author depended on translations for performance of the legal analyses. Frequently, no official translations existed and he relied on oral translations for the gist of laws and regulations. Formal translations should be used to ascertain specific legal rights and obligations.

CHAPTER I GENERAL BACKGROUND

Jordan is a small Middle Eastern nation with a land area of 91,880 square kilometers east of the Mediterranean Sea, bordered by the West Bank, Syria, Iraq, and Saudi Arabia. It is largely desert country in the east with elevations ranging from 700 to 1,000 meters and annual precipitation of less than 12 centimeters. The central region of the country contains the Jordanian Highlands (altitude 900 meters) with rainfall up to 30 centimeters in the north. Jordan's most dominant topographical feature is the presence of the great north-south rift manifesting itself in Lake Tiberias, the Jordan River Valley, and the Dead Sea (the lowest point on earth, which is more than 400 meters below sea level).

Jordan is landlocked except for a 27-kilometer coastline in the south on the Gulf of Aqaba, which provides access to the Red Sea. Jordan has three major rivers: the Jordan River and its two principal tributaries, the Yarmouk and the Az Zarqa Rivers. Given salinity and other water quality problems, surface water is used not for drinking water in Jordan but for irrigation. Drinking water is taken from underground aquifers.

The population of Jordan in 1988 was estimated at approximately 2.9 million persons (MMRAE 1991) although a recent influx of Palestinian returnees as a result of the Gulf War brings the total closer to 4 million. The National Environment Strategy (NES) places Jordan's population in 1991 at 3,571,000 (MMRAE 1991). More than 40 percent of Jordan's population resides in the Governate of Amman with the City of Amman having a population greater than 1.48 million people. No other city approaches Amman in size.

The Gross Domestic Product (GDP) of Jordan in 1987 (MMRAE 1991) was estimated at approximately \$5.5 billion. Major inputs to the Jordanian economy include phosphate mining, expatriate income, and the professional services sector. Manufacturing comprises only 14 percent of GDP, with the largest percentage in the potash, phosphate, petrochemical cement, and petroleum refining industries. Cottage or smaller industries exist, including food processing, tobacco, paper, furniture, textile, plastics, publishing, glass, and rubber manufacturing. Industries are concentrated in a corridor between Amman and Az Zarqa.

The Government of Jordan (GOJ) employs more than 40 percent of the labor force. In addition to the large industries mentioned above, the GOJ is involved in agriculture, water supply, electricity generation, forestry, and energy exploration among others.

Infrastructure in Jordan is well developed with a growing port in Aqaba, excellent north-south and east-west transportation corridors, and modern airports. Environmental infrastructure exists as well, with 14 wastewater treatment plants and 97 percent of citizenry being serviced by public water supplies. Plans are underway for development of a solid and hazardous waste landfill.

A. Overview of Environmental Issues in Jordan

The environmental issues confronting Jordan today are principally related to the population and economic growth that Jordan has experienced over the last four decades. In 1952, the population of Jordan was approximately 586,000 (MMRAE 1991); today, it is more than 3.5 million. Furthermore, more than 70 percent of the population lives in urban areas and 88 percent of the population is concentrated in the northwestern regions of Jordan (MMRAE 1991)

Predictably, this growth has taxed the fragile natural environment of Jordan. First on the list of Jordanian environmental problems is the availability of high quality water. This winter's snow and rain notwithstanding, Jordan faces dire water shortages. An official with the Ministry of Water and Irrigation estimated drinking water supply in Jordan in 1991 at 180 million cubic meters. Without the returnees, water demand was projected at 210 million cubic meters. With the returnees, demand grew to approximately 240 million cubic meters. In recent years, the country has over pumped aquifers due to increased water demand and still provides only intermittent service to others.

Perversely, the quality of Jordan's water supply is declining at the same time demand is rising. Overpumping is leading to salinization (e.g., the Dhulail aquifer in the 1970s). Industrial and municipal wastewaters as well as agricultural runoff are threatening the Zarqa River. Aquifers could be impaired by recharge from contaminated surface waters, a threat not currently being evaluated. Contaminant levels of boron and heavy metals in the King Talal Reservoir have been increasing steadily. While still below Food and Agricultural Organization standards for irrigation waters, this trend is of major concern to Jordanian officials.

Land resources have also been affected by population growth and related development pressures. Scarce arable land is being consumed by urbanization. This, in turn, causes other inappropriate land uses, such as use of agricultural land for orchards and use of marginal arid lands for grazing. Desertification, deforestation, and erosion are more prevalent as a result. Significant wetlands resources have been damaged in northern Jordan with attendant wildlife injuries.

Among Jordan's greatest treasures are its antiquities and cultural resources. These too have been affected negatively by growth. The Roman Nymphaeum in Amman is a simple example; this important historic monument has been consumed by the surrounding development. Antiquities are being lost or diminished in value by construction of nearby roads and buildings.

Similarly, growth continues to place acute pressures on coastal and marine resources. Reefs and fisheries in the Gulf of Aqaba appear stressed. While regional and national officials are working to plan future development, current degradation underscores the importance of these activities.

The construction boom in Jordan has led to an unusual environmental problem—the proliferation of abandoned quarries, generally in the midst of cities that have grown in more remote areas. Frequently, these quarries, which were not excavated according to sound engineering practices (bench cuts, terracing), are extremely dangerous to the public, aesthetically offensive, and very difficult to reclaim.

In addition, pollution is now a real concern for Jordanians. In Amman traffic alone is causing concern about air pollution. Industrial emissions in the Az Zarqa region have produced numerous citizen complaints. Dust pollution from mining operations and loading facilities has also been investigated.

Solid and hazardous wastes are beginning to draw attention also. For example, used tires are as daunting a problem in Jordan as in other jurisdictions. Public inquiry has also surfaced about pesticide applications in the Jordan Valley and in greenhouses throughout the country.

It is difficult to quantify the magnitude of environmental problems in Jordan. Environmental monitoring is not currently sufficient to establish baseline conditions on contaminant levels across media. Jordan has no large industrial sector that substantially pollutes ecosystems, although nonpoint loads from societal activity are clearly growing. The scarcity and fragility of Jordan's natural resources make environmental protection a critical need.

B. Overview of Jordanian Environmental Institutions

The ministries of Agriculture; Health; Energy and Mineral Resources; Industry and Trade; Municipal and Rural Affairs and the Environment; Tourism and Antiquities; and Water and Irrigation either play, or have the jurisdiction to assume, important roles in the development and implementation of environmental programs in Jordan. Within these ministries, several authorities and departments presently perform key functions related to the environment. These include the Natural Resources Authority, the Water Authority of Jordan, the Water Resources Administration, the Jordan Valley Authority, the Department of Antiquities, the Department of Forestries, the Department of Environmental Health, and the Department of Standards and Specifications. Municipalities are also active in implementing environmental controls and exercising police powers.

Also, nongovernmental organizations or quasi-governmental organizations closely aligned with the government in Jordan may receive government funding and play important administrative functions. Key examples in the Hashemite Kingdom are the Royal Scientific Society, which does environmental monitoring, and the Royal Society for the Conservation of Nature, which plays a critical role in wildlife protection.

Numerous problems arise with institutional roles and responsibilities for environmental protection in the Hashemite Kingdom. There is tremendous overlap in responsibilities, with numerous agencies performing components of the same job. At the same time, there is confusion as to who should take actions on other issues and, as a result,

gaps in environmental protection exist. Finally, some agencies with responsibilities are simply not performing key requirements under law due to lack of resources or commitment.

In the final analysis, no single agency has comprehensive authority for environmental protection in Jordan. While many agencies have a stake in environmental issues, these may be tangential to resource management, public health, or development responsibilities. The Department of Environment within the Ministry of Municipal and Rural Affairs and the Environment (MMRAE) is specifically dedicated to environmental protection but its small size and lack of statutory mandate have inhibited its authority to develop and enforce protection initiatives. The NES specifically called for strengthening the Department of Environment (DOE) and creating an independent institutional framework for managing environmental affairs.

C. Summary of Current Initiatives

1. National Environment Strategy

Two major initiatives exist that will change the character of environmental protection in Jordan—preparation of the NES and development of a comprehensive national environmental law. Both efforts had their genesis in 1980 with the creation of DOE, which was specifically charged with planning activities to develop an environmental strategy. The strategy was prepared under the leadership of the Minister of MMRAE in collaboration with the International Union for the Conservation of Nature and Natural Resources. The U.S. Agency for International Development (USAID) funded this effort, and more than 180 Jordanian experts contributed technical information.

The NES was officially approved in May 1991 and published in August 1991. The strategy is both a comprehensive environmental plan and a detailed source book for information. The strategy assesses current issues, trends, and information and makes institutional, legal, and policy recommendations. In the environmental areas—agriculture and land, surface and groundwater, wildlife and habitat, coastal and marine, energy and mineral resources, population, housing and settlements, atmosphere and air quality, antiquities and cultural resources, and legal initiatives—the strategy is very thorough in identifying current and likely concerns and ambitious in delineating more than 400 specific recommendations. Major recommendations include:

- Pass an overall legal framework with a single comprehensive environmental policy, including formation of a Higher Council for Environmental Protection.
- Enact environmental management legislation giving DOE greater legal and enforcement authority.
- Create a national environmental impact assessment (EIA) process.
- Strengthen existing institutions working for environmental protection through improved funding, staffing, training, equipment, outreach, and legal authority.

- Create three new nature reserves in Wadi Rum, Dana, and Burqu; establish a national marine park at Aqaba; rehabilitate the Azraq Oasis.
- Expand management of other areas to include environmental and conservation elements.
- Expand public awareness, knowledge, support, and activism through programs in environmental and conservation education, development of an urban system of nature parks, involvement in the EIA process, and environmental health awareness.
- Give priority to water and population issues.

2. Comprehensive Environmental Law

Paralleling efforts on the NES, Jordanian officials have worked for the past 12 years to develop a new comprehensive environmental law. Draft laws were prepared in 1981, 1987, and 1989, but none has received sufficient cabinet support to be carried forward. As discussed previously, a principal recommendation for the NES is the passage of an overall environmental legal framework.

The Minister of MMRAE has commissioned a new draft law and a legal committee of advisors from the Ministries of Tourism, Energy and Natural Resources, MMRAE, and Health has prepared it. A lawyer from the municipality of Amman has also participated. The current draft is undergoing internal review. In addition, it has been evaluated as a part of this USAID-funded analysis in Chapter 3 of this report.

Major features of the present draft include the creation of a Higher Council for Environmental Protection as an environmental policymaking body and placement of more environmental rulemaking and enforcement activities within DOE. The draft law would consolidate environmental laws in one statute, which would supersede existing laws. New substantive authorities have been created in spill prevention and response, environmental impact assessment, and air pollution control, among others.

CHAPTER II

REVIEW OF JORDANIAN ENVIRONMENTAL INSTITUTIONS, LAWS, AND CURRENT REGULATORY PRACTICES

This chapter briefly reviews existing Jordanian environmental programs in terms of the key agencies involved, the focus of statutory mandates, and the status of actual program implementation. This review is an essential precursor to evaluation of the draft law in Chapter 3 and consideration of alternative institutional roles in Chapter 4.

This analysis focuses on the practical realities of environmental protection in Jordan. The principal source of information for this analysis was interviews with Jordanian officials responsible for administration of environmental programs. The knowledge and candor of these officials were crucial to developing an understanding of the strengths and weaknesses of existing environmental regulatory efforts. The official NES and a fine assessment by USAID's Abdullah Ahmad, entitled *Jordan Environmental Profile: Status and Abatement*, were also used. This discussion is organized into two functional program areas: environmental protection/regulation and resource management/conservation.

A. Environmental Protection/Regulation

Environmental protection activities have been introduced in Jordan within the last 10 years. In an international context, the most advanced national environmental programs have been in place for only about 20 years. The following section presents an overview of the initial efforts of Jordanian ministries to regulate environmental pollution.

1. Water Pollution Control

Water is a precious and scarce commodity in Jordan. The kingdom has three major rivers: the Jordan, the Zarqa, and the Yarmouk. Total average annual surface water flows are estimated at 755 Mm³ (MMRAE 1991). Jordan River water is saline and not suitable for drinking or irrigation purposes. The Zarqa River is currently receiving substantial municipal, industrial, and agricultural pollutant loads and the King Talal Reservoir on the Zarqa is showing elevated levels of metals and boron. The Yarmouk River is reported to be less stressed but it also receives municipal wastewater.

Renewable groundwater resources in Jordan, derived from 12 basins, were estimated at 280 Mm³ annually in 1989. The NES indicates that overextraction occurs in most fields, that one aquifer was seriously salinized in the Dhuleil area, and that depletion and contamination may be a concern for main basins in Amman-Zarqa and Azraq.

There are industrial, municipal, agricultural, and domestic sources of water pollution in Jordan. The most industrialized area in Jordan, the Amman-Zarqa region, is estimated to have more than 80 industrial and commercial facilities that discharge wastewaters either

directly or indirectly to surface waters (MWI and UNDP 1991). Other areas are certain to have some municipal, industrial, and commercial dischargers as well. Fourteen active sewage treatment plants serve 19 cities and approximately 60 percent of the urban population in Jordan. Capacity totals approximately 53 Mm³ per year (Ahmad 1989).

a. Institutional Responsibilities for Water Pollution Control

Several government agencies, including MMRAE, the Ministry of Water and Irrigation (MWI), Ministry of Health (MOH), and Ministry of Industry and Trade (MIT), perform administration and control of activities associated with water quality management. In addition, a parastatal organization, the Royal Scientific Society (RSS), provides critical monitoring and scientific research support. The roles and responsibilities of these agencies are not explicitly laid out in statutory mandate(s). Nor are there explicit coordinating mechanisms to ensure cooperation and avoid duplication. Moreover, administrative functions are changing in light of changes in government funding and perceptions of need.

In overview, the Ministry of Water and Irrigation is responsible for water supply, construction, and maintenance of wastewater treatment plants, and protection of surface water quality from industrial and municipal wastewater discharge by monitoring effluents and taking compliance actions. MOH is responsible for performing analyses for biological contaminants and monitoring water supplies to ensure their safety. It appears that MOH principally focuses on health issues associated with wells but it may also be involved in monitoring for health effects associated with wastewater treatment. In addition, MOH may close down industries violating health laws. MIT, through its Department of Standards and Specifications (DSS), which is responsible for development of all standards in Jordan, promulgated the wastewater limits in Regulation No. 202 and the drinking water quality regulations in Regulation No. 286. The Department of Environment within MMRAE responds to citizens' complaints or ministry inquiries about water pollution, monitors some water and wastewaters through grants to RSS, participates in licensing and regulatory development committees, and performs research and studies on water pollution. RSS performs water quality monitoring and conducts studies and special projects, such as the evaluation of bottled water quality in Jordan and examination of water quality contamination in the King Talal Reservoir.

In terms of resources, MWI is the largest with approximately 7,500 employees in 1991. MWI is subdivided into two authorities, the Jordan Valley Authority (JVA), responsible for all irrigation water issues in the Jordan Valley up to 500 meters in elevation, and the Water Authority of Jordan (WAJ), which bears responsibility for provision of all drinking water and public wastewater treatment in Jordan. The JVA has a staff of 2,000 and WAJ employs about 5,500 people. WAJ's operating budget in 1991 was approximately 60 million Jordanian Dinar (JD). The entities within WAJ with very direct water pollution responsibilities include the Water Resources Administration with 800 staff (responsible for drilling, water resources studies, laboratories) and the Operations and Maintenance Directorate with 200 staff (responsible for operation and maintenance of Jordanian wastewater treatment plants).

By comparison, the unit within MOH responsible for all environmental health responsibilities in Jordan has a staff of 67 with some doctors and sanitarians in each governorate and a central laboratory. The Department of Environment (DOE) within MMRAE has a total staff of 31 persons and its 1991 budget was less than 100,000 JD. DOE currently has no sampling equipment or laboratory capability. Its Water Protection Division comprises four persons.

b. Water Pollution Control Laws

Jordan presently has no comprehensive law to control water pollution. Rather, authorities are derived from several civil statutes and defense laws. The first, Military Ordinance Number 6 of 1980, required all industry to treat their wastewaters by January 1, 1981. Neither treatment technologies nor effluent limits were specified. Military Ordinance No. 2 of 1982 placed restrictions on the use of wastewaters to irrigate agricultural lands. This was reiterated and specified in more detailed provisions in Military Ordinance Letter Number 10-13-1-12133 of 1989 and a decree issued by the Ministers of Health, Agriculture, and Water and Irrigation on May 11, 1991 (MWI and UNDP 1991).

The most far-reaching Jordanian statute pertaining to water pollution is the Water Authority Law, Law Number 18, of 1988. Article 3 of this law created WAJ, and Article 5 provides full responsibility to MWI for all water and sewage systems and for establishing a water policy. Article 6 charges WAJ with the following responsibilities:

- Survey the different water resources, conserve them, determine ways, means and priorities for their implementation and use.
- Develop the potential water resources in the Kingdom, increase their capacity and improve their quality, protect them from pollution, supervise them . . .
- Regulate and advise on the construction of public and private wells; investigate ground water resources; drill exploratory, reconnaissance, and production wells; and license well-drilling rigs and drillers.
- Study, design, construct, operate, maintain, and administer water and public sewerage projects . . .
- Draw terms, specifications and special requirements in relation to the preservation of water and water basins, protect them from pollution . . .
- Carry out theoretical and applied research and studies regarding water and public sewage to achieve the WAJ's objectives including the preparation of approved water quality standards for different uses and publish the final findings and standards so as to generalize their application by all means available to WAJ.
- Issue permits to engineers and licensed professionals to perform public water and sewerage works; and participate in organizing special training courses to qualify

them in order to improve the standard of such works and to reduce water losses and pollution. All those involved in water and sewerage works are requested to adjust their practice in accordance with the provisions of this Article and to obtain the specified permit accordingly.

- Regulate the uses of water, prevent its waste, and conserve its consumption.

Article 27 prohibits carrying out any works related to water or sewerage without the written approval of the Minister of Water and Irrigation. Finally, Article 30 contains criminal penalties of not less than six months nor more than two years or fines ranging from 1,000 to 5,000 JD or both for anyone who damaged or destroyed a water resource or sewer or polluted any water resource or caused its pollution. Lesser penalties of one to six months and 100 to 1,000 JD are sanctioned for lesser deeds, including the illegal use of waters or carrying out works without obtaining licenses, permits, or approval.

Water Law Number 18 does not enumerate specific pollution limits or treatment requirements but does contain sufficiently broad authorities to support the development, implementation, and enforcement of water quality and wastewater standards. Notable gaps include any requirements pertaining to sludge disposal or management, guidelines relating to agricultural water pollution (pesticides and nutrient runoff), and provisions for wellhead or groundwater protection.

Finally, Public Health Law Number 21 of 1971, Sections 31 and 36, give MOH powerful authorities to close facilities and order the elimination of health nuisances within one week at the owner's expense, with a doctor's findings as sufficient evidence to support the nuisance findings.

c. Assessment of Current Water Pollution Control Efforts

The nature and extent of water pollution regulations in Jordan vary with different sources. Direct industrial discharges are regulated by Jordanian Standard Specification Number 202 issued in 1981 by DSS and revised in 1990. These standards cover up to 37 pollutant parameters (conventional and nonconventional pollutants and metals) setting the maximum allowable concentrations for discharges to streams/wadis, the sea, natural recharge, and irrigation. In addition, Standard 202 contains several narrative conditions to protect public health, aquatic life, worker health, and groundwater quality. Standard 202 is apparently self-implementing with no associated permitting. Industries are required to self-monitor once per week. WAJ guidelines specify compliance monitoring at industries twice per month. Industries may receive letters from WAJ, DOE, or MOH detailing noncompliance.

Indirect dischargers are subject to a different set of effluent limits imposed by WAJ under a regulation issued in September of 1988 (Official Gazette 3573). Concentration limits are established for 29 organic and chemical constituents and physical properties. General prohibitions are asserted for any discharge that would obstruct or interfere with plant operation. Interestingly, this regulation specifies a permitting process for industries to

connect and discharge to sewage treatment plants. Indications are that this permitting system has not been implemented (MWI and UNDP 1991).

Indirect dischargers must report process changes and allow WAJ to sample twice per month. It does not appear that they are required to self-monitor.

Publicly owned treatment works constructed and operated by WAJ are not subject to specific effluent limitations. No detailed standards regulate the disposal of sludge generated in the course of municipal or industrial wastewater treatment although health policies may be applied. Similarly, regulations do not exist to control illicit disposal to storm drains, underground injection, or marine dumping.

In the final analysis, water pollution control in Jordan is a cooperative effort by several agencies without a complete statutory underpinning or regulatory framework. Standards for some sources are considerable. Other standards are lacking, and neither the statutory mandate nor the institutional responsibility for the promulgation of missing standards is clear.

Each involved ministry performs monitoring but it is not clear that visits are coordinated or results shared. There does not appear to be a central repository of information on dischargers and compliance status. Nevertheless, strong enforcement action was taken in June of 1991 by MOH, MIT, MWI, and MMRAE to temporarily close 40 industrial and commercial facilities for long-term violations of effluent standards. Several aspects of this effort illustrate the need to improve the regulatory framework for water pollution. First, the Public Health Law was relied upon because of its preferred closure authority. Second, municipalities and governorates had to be relied upon for their police powers to actually bring about the closures, given the lack of authority in the environmental agencies. MMRAE was involved because its Minister was also the acting Minister of health. Apparently, WAJ did the technical work to support the closings, MOH's authority was used, and MMRAE initiated the actions.

The closings caused considerable controversy and a committee was formed with representatives from MOH, MWI, MIT, and MMRAE to hear each case. Representatives of each industry were heard, all were resampled and agreements to improve effluent quality were negotiated, enabling facilities to reopen. Simplifying and clarifying roles and responsibilities would streamline administrative burdens to protect water quality.

2. Air Pollution Control

Air pollution is a reasonably recent phenomenon in Jordan, and observable problems tend to be localized. The air is still pristine in most places in Jordan. Nevertheless, population growth, urbanization, and industrialization are contributing to air pollution, and public complaints are increasing. As with water pollution, the first air pollution priority, according to NES (MMRAE 1991), is in the Zarqa Basin where industries, including a refinery, chemical plant, power plant, and sewage treatment plant, are emitting SO₂, H₂S, and hydrocarbons. Dust is a major problem in Jordan both from prevailing winds

and from a cement factory, phosphate operation, and loading terminals in Aqaba. Ammar has air pollution episodes primarily from mobile sources; governmental concern has been expressed about hazardous air pollutants from a variety of sources, such as burning tires, landfills, and industrial operations. Jordanian officials have noted no increase in air pollution from the oil fires in Kuwait.

a. Institutional Responsibilities for Air Pollution Control

Currently, Jordan has no formal air pollution control program. No air pollution laws have been passed, and no formal regulatory programs are being implemented. Nevertheless, several government agencies are performing activities related to air quality management. DOE participates in industrial licensing/siting undertaken by MIT. As new industries propose to start up, DOE makes environmental assessments and recommendations on locations and emissions standards. Jordan has not promulgated its own air quality criteria and adapts World Health Organization standards for this purpose.

DOE receives complaints on odor and emissions involving existing facilities, conducts investigations, and negotiates for industries to install treatment technology. DOE also studies air pollution problems (e.g., burning tires and chlorofluorocarbons) and issues reports making recommendations. DOE has a staff of five who work on air pollution issues. DOE has a standing request to DSS for the joint development of Jordanian air quality criteria.

RSS conducts some sampling and analysis on behalf of DOE, as well as research studies on urban air pollution.

MOH, pursuant to the Public Health Law, has the authority to close facilities that threaten health due to air pollution. MOH has been less active in monitoring air than water. The Meteorological Department performs long-term meteorological monitoring and records maintenance. Finally, the Ministry of the Interior enforces traffic laws and through the police may issue tickets to polluting vehicles. Cars must be inspected every two years, although no pollution control equipment is required. Incidentally, leaded gas is sold in Jordan.

b. Status of Air Pollution Control Laws

No direct laws control air pollution emissions in Jordan. Public Health Law Number 21 may be used to curtail environmental nuisances. Traffic Law Number 14 prohibits the driving of vehicles causing air pollution.

c. Current Regulatory Practices in Air Pollution

DOE influences industrial behavior to some extent through general licensing, which may effect changes when complaints are received. For example, the Jordan Phosphate Company and the refinery agreed to upgrade emissions control equipment on a voluntary basis. Comprehensive air quality monitoring is not occurring, and DOE has insufficient equipment or resources to perform monitoring. Obviously, permitting and

compliance programs do not exist. A core program to develop standards, oversee implementation, and perform monitoring is necessary in Jordan to preserve pristine resources and mitigate acute problems.

3. Solid/Hazardous Waste Management

Jordan has approximately 140 municipalities, cities, and villages. Twelve currently operate landfills, with seven serving more than one city (WEC 1988). Sanitary landfill technologies do not seem to be used in Jordan. Other municipalities allow open dumping or burning. The greater Amman area is projected to generate 1,200 tons per day of solid waste (WEC 1988).

No hazardous waste disposal facilities currently exist in Jordan, although a cooperative industry/government venture has been negotiated for which fundraising is under way.

a. Institutional Responsibilities for Solid/Hazardous Waste Management

At the national level, DOE may comment on siting of landfills and has promoted development of a hazardous waste management facility. MOH may act in response to health nuisances. Individual municipalities control collection and disposal practices.

b. Laws Pertaining to Solid/Hazardous Waste Management

No consolidated laws specifically call for regulation of solid or hazardous wastes. Management activities may be covered by water and health laws. The Prime Minister of Jordan established a Cleaning Committee in 1987 headed by the Chairman of the Royal Society for Conservation of Nature to develop a comprehensive waste management policy. This committee recommended creation of a central department responsible for solid waste management, construction of recycling facilities, a moratorium on plastic bags, and use of biodegradable materials. Passage of solid waste legislation was recommended .

c. Current Regulatory Practices

No regulatory activities are occurring at the national level. Presumably, waste management activities are the subject of municipal action.

4. Environmental Health Programs

In addition to the air and water quality programs discussed previously, several agencies undertake activities to protect environmental health in Jordan. These programs cover food purity, occupational safety, and pesticides control.

a. Institutions with Environmental Health Responsibility

The Environmental Health Department within MOH bears principal responsibility for ensuring public health related to water, wastewater, food, and occupational health. The department has 67 staff in Amman, plus it draws in senior medical officers and more than 180 sanitarians in the governorates and municipalities. MOH also operates a central laboratory in Amman with 110 personnel.

The Ministry of Agriculture certifies pesticides for use in Jordan and has a newly developed pesticide laboratory to test product purity and residue contamination levels. The Ministry of Industry and Trade is responsible for establishing food purity standards and has adopted 300 to date. It also operates a laboratory. All imported foods are inspected by a multiagency committee with representatives from Health, Agriculture, Industry and Trade, and Customs. The City of Amman also has a sizeable laboratory.

The Ministry of Labor-Directorate of Industrial Health and Safety supervises workplace safety by establishing standards and inspecting job sites. MOH also evaluates and inspects workplaces. Mine safety is regulated by the Natural Resources Administration within the Ministry of Energy and Mineral Resources.

b. Jordanian Laws Governing Environmental Health

As discussed previously, Public Health Law Number 21 of 1971 provides MOH with broad authority for protecting environmental health. The Ministry of Labor operates pursuant to Law Number 27 of 1986, which provides for the cleanliness of workplaces, as well as the adequacy of light, ventilation, and drinking water supply. It requires special precautions at dangerous operations and mandates first aid and fire protection.

Law No. 12 of 1968 establishes health precautions for mines. Precautions include worker training, safety equipment, ventilation requirements, explosives handling precautions, lighting, communication and rescue procedures, and passage requirements.

Agriculture Law No. 20 of 1973 contains pesticide management provisions, which give MOA authority to prohibit manufacturing, preparation, or sale of pesticides without a license. The minister may issue regulations about the type, allowed uses, and sampling and analysis requirements for pesticides.

c. Current Regulatory Practices in Environmental Health

Monitoring of food quality and purity is aggressively pursued in Jordan. Numerous inspections are made and thousands of samples are taken annually. These samples may be analyzed in MOH's central laboratories, the Amman Municipal Laboratory, the MIT laboratory, or the Ministry of Agriculture's (MOA's) pesticides laboratory. A panel of international experts found Jordan's efforts worthwhile but fragmented (USAID 1990). The panel recommended administrative consolidation, more

resources, additional training, and more rigorous sampling and analysis quality control, among other findings. This team suggested a certification and accreditation program for the laboratories and consolidation of laboratory resources under a single agency.

Jordan is also taking steps to register and monitor pesticides. However, authority and resources to control and inspect pesticide application and the ability to identify and withdraw foods with high levels of pesticide residual are limited. A critical need exists for extension services to teach farmers proper application and storage of pesticides.

Occupational safety regulations seem well-designed, although no explicit standards cover agricultural or construction workers (USAID 1990). The critical need in occupational safety is for program resources to inspect facilities, prioritize hazards, and develop standards.

B. Resource Management/Conservation

Many resource management programs in Jordan are more established than their environmental counterparts. Institutional responsibilities are clearer and narrower, and statutory mandates exist for program activities. In addition, government resource commitments are considerable.

1. Water Use

According to NES, the annual deficit of renewable groundwater is more than 90 Mm³ (MMRAE 1991). This shortage will probably increase due to population growth, industrialization, and degradation of existing aquifers. It is improbable that major new groundwater reserves will be discovered. Conservation, water harvesting, and desalinization are water supply options that will increase in importance.

Competition for scarce water is intense. As reported in NES, 20 percent is consumed for drinking water, 79 percent for irrigation, and 1 percent for industrial use (MMRAE 1991). Almost all drinking water in Jordan is derived from groundwater, while irrigation water largely comes from surface water sources. Approximately 80 working wells supply water to industries.

a. Institutional Responsibilities for Water Supply

Regardless of source, WAJ within MWI controls allocation of all waters outside the Jordan Valley. Unlike other nations where private parties may hold water rights, all water belongs to the Kingdom of Jordan. WAJ controls the drilling, extraction, and use of water in Jordan. WAJ has a staff of more than 5,500 people and an annual budget greater than 60 million JD to execute these responsibilities.

b. Legal Basis for Water Use Control

WAJ operates under an extensive statutory mandate contained in Water Law No. 18 of 1988. WAJ is required to develop a water policy and submit it to the

Council of Ministers. WAJ is charged with putting forth programs and plans to meet future water needs. In addition, it is tasked with regulating construction of public and private wells; investigating groundwater, drill exploratory, and production wells; and licensing rigs and drillers. WAJ is authorized to recommend tariffs for subscriptions, prices, rates, and fees for water. "All water resources available within the Kingdom, whether they are surface or groundwater, regional waters, rivers or internal seas, are considered State-owned property that shall not be used or transported except in compliance with this law" (Article 25). The penalties for noncompliance (e.g., drilling unauthorized wells or polluting resources) are severe—six months to two years in jail, a fine ranging from 1,000 to 5,000 JD, or both.

c. Current Water Use Program

Program implementation of WAJ's water use closely parallels its statutory mandate. WAJ, through the Water Resources Administration (WRA), performs water resources studies and exploration, drills, and ascertains water quality. While WAJ has a reasonably good idea where the water is, it is continuously refining data on factors such as basin size and recharge capacity.

A master plan for water use was last prepared in 1977. Currently, an ongoing project with support from Germany is expanding the water data base, and efforts are under way with USAID to do water planning.

WAJ controls all drilling. For public drinking water wells, WAJ drills, operates, and maintains wells and distributes the water throughout Jordan. Ninety-six percent of the population is connected to public water supplies. Some large industries have their own water wells. Currently, 80 working industrial wells exist in Jordan. Industries drill, maintain, and operate these wells under WAJ supervision. WAJ also licenses these withdrawals. In total, roughly 29 Mm³ are extracted annually in industrial wells.

Licensing is a two-part process. First, an applicant provides information on the proposed location of a new well. Provided that the spacing is suitable (not less than 1,000 meters from the nearest well) and drilling is not prohibited in the area, a one-year drilling license is issued. WAJ supervises drilling from a geological perspective and tests the well and the quality of the well water. Then an extraction license is issued specifying water use, water quality capacity of the well, and pumping rate. Extraction licenses must be renewed annually. Meters are installed on industrial wells, but WAJ officials concede that meters are not read and industries exceed their extraction limits. This is the reason for overdrafting of aquifers, although it is only a small part of water demand.

Interestingly, industries and agriculture are charged for neither water nor licensing or drilling fees. The public pays 280 fils per cubic meter (m³) of water (approximately 50 cents) while the cost of providing the same amount of water is 580 fils (approximately \$1.10). Water is expensive in Jordan because wells may be more than 300 meters deep and water may be transported hundreds of kilometers.

No user is guaranteed a water supply or a water right. Routinely, water service to Amman is restricted to two days a week in the summer. Some houses have storage tanks on their roofs where owners pump water when supplies are flowing. Use of rainwater cisterns is not prevalent.

Aquifers are sometimes overpumped because of population growth, political pressure to overdraft, and noncompliance with extraction licenses due to the failure to enforce license provisions. Officials feel that conservation practices and repairs to the distribution system may serve as a stop gap measure for water shortages but ultimately, population expansion and agriculture land uses may have to be curtailed. Comprehensive water planning should be undertaken and the safety yields of aquifers absolutely honored.

2. Land Use, Forestry, and Grazing

Arable land is another scarce resource in Jordan. Jordan has a land area of 9.25 million hectares, of which only 364,260 are considered tillable (Ahmad 1989). Agricultural land has declined dramatically in recent years due to urbanization, soil erosion, improper use of land for other purposes, and salinization due to improper irrigation practices.

Deforestation has also occurred in Jordan. Jordan presently has approximately 40,000 hectares of natural forests and 35,000 of manmade forests. Furthermore, desertification is a concern, resulting from overgrazing of fragile and arid lands. Proper land use management is critical to the future of Jordan.

a. Institutional Responsibilities for Land Use

No single agency is responsible for land use planning or management in Jordan. MMRAE has two departments that play a role in land use. DOE advises on industrial siting and exerts a policy to preserve agricultural land. They also respond to citizen complaints and undertake special projects, such as participation in forestation and coordination of efforts to restore the Azraq wetlands. The Department of Regional Planning conducts studies of land use and characteristics throughout the country. Its work is not currently used for zoning, planning, or licensing.

MOA is responsible for protection of national forests, forestation projects, and administration of rangelands. In addition, MOA registers pesticides and supervises their use, performs agricultural research, and trains farmers in agricultural practices. MOA is a large government agency with approximately 10,000 personnel, of whom 2,000 are permanent.

b. Legal Authority for Land Use Management

Currently, Jordan has no comprehensive land use planning authority. DOE land use studies and licensing policies are not conducted pursuant to any legislation.

MOA implements a very extensive statute, Agriculture Law No. 20 of 1973. This enactment contains chapters on plant protection, registration of crops, orchard and nursery regulation, fertilizer use, pesticide registration, forestry protection, soil conservation, and rangeland administration. None of its provisions conveys comprehensive authority to allocate land for priority uses.

Forestry provisions enable MOA to prohibit the cutting, transporting, burning, or storing of materials found on public or private forests without a license. MOA may also undertake forestation projects.

Grazing lands are defined by statute as those receiving rainfall less than 200 millimeters per year. The Minister of Agriculture has the right to issue regulations to develop and protect grazing lands, to specify the number and type of animals allowed to graze, and to protect the natural environment.

c. Current Land Use Initiatives

As suggested earlier, the Jordanian ministries lack the ability to control the misuse of lands or to check the urbanization of critical agricultural lands. MOA runs an extensive program to protect natural and manmade forests. The Forestry Directorate has approximately 400 people and a budget in 1991 of 1.25 million JD. Among other functions, it operates a network of rangers who protect forests from grazing, cutting, and fires. The directorate also owns land in most villages, which are designated as forest lands to be planted with trees. Foresters frequently catch illegal tree cutters and impose fines. An official estimated that approximately 2,000 cases per year result in fines of approximately 100,000 JD. Between 400 and 500 permits to cut trees are issued per year.

MOA has established 18 grazing reserves with a total area of approximately 100,000 dunums. Fencing and restrictions for grazing are critical to the viability of the reserves. According to officials, little has been done to implement rangeland provisions due to a lack of funding. Moreover, tribes are extremely opposed to any regulation of grazing. Vehicles are destroying grazing lands, and deserts are being plowed illegally.

Lands have been classified by soil type, and soil maps of Jordan are available. These classifications and maps allow for the allocation of land for priority uses. The loss of agricultural land must be curtailed, soil conservation must be emphasized, and desertification must be controlled. Jordan needs an explicit agricultural policy.

3. Mining Regulation

Mining plays a major role in the economy of Jordan. Potash is distilled from Dead Sea brine, and phosphates are mined extensively with deposits in several locations in the country. Respectively, these two minerals accounted for 29 million and 61 million JD in exports in 1987, constituting more than 6 percent of Jordan's GNP (Ahmad 1991). The Central Bank of Jordan estimated that mining and quarrying generated 179.2 million JD in 1990. In addition, Jordan has other mineral deposits, such as copper, manganese, and

bentonite, that may be exploited commercially. In addition, numerous quarries are mined to produce domestic construction materials.

a. Institutional Responsibilities for Mining

Administration and control of mining falls largely within the purview of the Ministry of Energy and Mineral Resources. This ministry consists of two independent authorities, the Jordan Electricity Authority and the Natural Resources Authority (NRA), who report to the Minister of Energy and Natural Resources. The latter agency is responsible for all issues affecting mining, petroleum, and gas exploration and extraction. The NRA employed approximately 1,300 employees in 1991 and its annual budget was approximately 12.5 million JD. In 1991, NRA was divided into 11 directorates covering management, laboratories, geophysics, geology, petroleum exploration, mining, finance, administration, workshops, followup, and transportation.

Within NRA, the Mining Directorate is fully responsible for controlling the discovery, leasing, and assaying of minerals and the licensing and operation of mines. The principal function of the Mining Directorate is to facilitate the exploitation of Jordanian mineral deposits. The Directorate works to define reserves and assesses commercial viability. This information is conveyed to MIT, which has the task of encouraging private investors and companies to undertake commercial mining.

There are presently two major mining companies within Jordan: the Jordan Phosphate Company and the Arab Potash Company. Each is a joint venture with GOJ, with majority ownership resting with the government. By contrast, there are approximately 230 quarries in Jordan.

b. Mining Laws

Mining is presently governed directly by the Organization of Natural Resources Affairs Law, Law No. 12 of 1968, and Mining Code No. 131 of 1966, and Quarries Regulation No. 8, issued in accordance with Law No. 12. Among other provisions, the law enables NRA to control the prospecting of deposits through issuance of prospecting licenses. These licenses are issued for a one-year period and grant the holder exclusive rights to excavate, take mineral specimens, build roads, and construct buildings, among other activities (Article 37).

Mining rights may be granted for up to 30 years and require the submittal of maps, mineral estimates, and financial statements (Article 42). The holder of a mining right must submit an annual report on tonnage, employees, and work plan; a financial report; and a mining plan before starting any cut (Article 45). According to Article 42 B, the vice president may cancel a mining right if the owner fails to comply with any conditions included in the right.

Key provisions related to environmental protection include: Article 44, which disallows the appropriation of water without written permission from the vice president and

agreement of land owners; Article 32 , which prohibits exploration, prospecting, or mining in antiquity sites, forest areas, railway lands, and municipal areas without the approval of "concerned" authorities; and Article 46, which empowers the vice president to prohibit mining in any area with approval of the Council of Ministers.

NRA, which is authorized to inspect and investigate (Article 47), is currently working with the UN to expand its mining law and developing provisions to protect the environment and restore lands. A draft is not yet available.

Quarries are deemed mining operations under the mining law (Article 49) and are subject to the same controls and inspections. According to Regulation No. 8 of 1971, no one can operate a quarry without a license from NRA (Article 3a), and individuals must submit a site plan and certify that the site is not an archaeological or religious location, in addition to other requirements. Article 6(e) specifies that an owner must cover and level quarry sites after completing work, as well as plant trees.

c. Current Assessment of Mining Regulations

As has been discussed in other areas, initial licensing of mines and quarries is also the most important environmental activity that the NRA performs regarding regulation of mines and quarries. The antiquities protection provision is implemented rigorously, according to the NRA, and a licensing committee reviews all mining and quarry applications. Members of the licensing committee are drawn from the MOI, the Ministry of Water Irrigation, and the MOA. Interestingly, the licensing committee does not include permanent members from either the Department of Antiquities (Ministry of Tourism) or DOE (MWRRAE).

Presently, NRA does not monitor any mines or quarries, and the authorized mine inspection is not active. It was stated that environmental problems do not exist at the major mines for potash and phosphate, given their remote locations, absence of water resources, and nature of operation. Quarries, on the other hand, have presented persistent problems, according to one official. Jordan has approximately 230 quarries and many are now located within municipal boundaries because of urbanization. These quarries cause noise, dust, safety, and aesthetic problems. Some quarry operators are not making bench cuts as they remove materials and very little reclamation or restoration has occurred, leaving large holes in the landscape. The NRA has worked frequently to close quarries. Since the NRA lacks police powers under the mining law, they have often worked with mayors to close quarries and to confiscate equipment.

4. Wildlife Conservation

Jordan has a diverse mix of topography and climates. As a result, it has enjoyed considerable biodiversity in its flora and fauna. Once rich in wildlife, Jordan now has several endangered species of mammals, reptiles, and birds. Causes of habitat loss and species decline include deforestation, overpumping of aquifers, urbanization, destruction of wetlands, desertification, pesticides use, and mining.

a. Institutional Responsibility for Wildlife Conservation

DOA performs several functions that influence wildlife conservation. MOA is responsible for enforcing Jordanian hunting regulations, operating 18 grazing reserves, and protecting Jordanian forests. The Royal Society for Conservation of Nature (RSCN) plays a major role in wildlife conservation by supervising seven wildlife reserves in Jordan. RSCN is a private, voluntary society but has been delegated authority by the MOA to enforce hunting regulations. In addition, RSCN provides crucial training in wildlife management and conservation.

DOE plays an ad hoc role in nature protection by conducting studies, supporting wetlands reclamation, and advising on siting decisions.

b. Legal Framework for Wildlife Conservation

Agriculture Law No. 20 of 1973 contains several provisions regulating hunting activities in Jordan. Hunting of wildlife and birds without permission is prohibited. Birds may be listed, which protects them from being hunted. The minister may determine the times and places where hunting may occur. Fines are imposed according to species for illegal hunting. Regulation 113 of 1973 further enumerates hunting restrictions. All hunting is forbidden in the desert east of the Hijaz Railway line.

c. Current Initiatives in Wildlife Conservation

MOA operates 18 grazing reserves. RSCN operates seven nature reserves and has introduced species, such as the Arabian oryx and wild gazelle populations. Resources are inadequate, however. New reserves are needed. Training and environmental education are also lacking. Habitat loss may be more effectively limited with an increase of comprehensive land and water use planning.

5. Marine and Coastal Management

Jordan has a 27-kilometer coast in the extreme southwest corner of the country on the Gulf of Aqaba, adjacent to the Red Sea. This coastal area has tremendous strategic importance to Jordan. Development of the port of Aqaba is critical to the continued economic growth of the Hashemite Kingdom. In 1972, just over 1 million tons of cargo moved through Aqaba. In 1989, this figure was 20 million tons (MMRAE 1991). The population of Aqaba is presently 50,000; by the year 2000, it is projected to reach 119,000 (MMRAE 1991).

In addition to the coast's strategic economic value as a port, the Gulf of Aqaba is extremely rich in marine ecology, with lucid water and coral formations. Aqaba is an outstanding tourist resource, receiving thousands of visitors annually, mainly from the Arab world and Northern Europe. Conflicting uses are competing for Jordan's relatively small coastal zone. Development has brought oil pollution, thermal pollution, phosphate pollution, dust pollution, decline in fisheries resources, and some damage to aesthetic values.

a. Institutional Responsibility for Coastal Zone Management

The Aqaba Region Authority (ARA) is responsible for coastal zone management in Aqaba. ARA controls construction of coastal installations and prepares plans and environmental studies. DOE consults on licensing activities affecting the coastal zones and responds to citizen complaints. For example, DOE has participated in negotiations with the Jordan Phosphate Company to control dust emissions from its transport and loading facilities in Aqaba.

WAJ is responsible for enforcing effluent limits on discharges into the sea (see Section II.A.1), and MOA has jurisdiction for enforcing fishing regulations.

b. Legal Basis for Coastal Zone Management

There does not appear to be a centralized statutory basis for coastal zone management in Jordan, although several related statutes provide some authority to regulate coastal degradation. Laws exist that address certain aspects of pollution associated with shipping activities—Shipping Law No. 51 of 1961 and Aqaba Port Services Fee Law No. 49 of 1976, for example. Agriculture Law No. 10 of 1973 has some provisions restricting the means and location of fishing. Water Law No. 18 and Specification No. 202 allow the control of industrial discharges to marine waters.

c. Current Efforts for Coastal Zone Management

The Aqaba Region Commission prepared a coastal plan in 1985 delineating land uses and considering zoning. ARA, in conjunction with RSS, has initiated an environmental monitoring system project in the Aqaba Region to determine the impact of marine discharges. The Marine Sciences Station has conducted some long-term monitoring. In addition, ARA has planned a marine park and three marine reserves for several years.

All these efforts are important initiatives to rationalize and balance land use in Jordan's coastal zone. Degradation continues to occur and closure has not been accomplished on any of them, however. The park and reserves should be finalized before it is too late. A more comprehensive approach to marine pollution control may be necessary, covering coastal zone planning, oil spill control, and marine discharge elimination.

6. Cultural Preservation

Jordan is extraordinarily rich in antiquities and cultural heritage. Sites such as Mt. Nebo, Al-Jarasch, numerous towns in the West Bank, the Roman Amphitheater, and Petra are world-renowned. The Jordan Valley contains archaeological evidence dating back to the presence of paleolithic hunters (100,000 to 14,000 B.C.) and agricultural activity in 8000 B.C. Moreover, towns in the West Bank may be historic first cities (Library of Congress 1991). Archaeologists currently estimate that there are more than 15,000 antiquities sites in Jordan; only about 1,000 of these have been inventoried, and 1,500 are being catalogued.

Jordan also has more recent buildings and artifacts reflecting a diverse cultural and political background. Jordan's history includes Persian, Greek, Roman, Byzantine, Early Islamic, Crusader, Arabic, Mamluk, and Ottoman influences (Ahmad 1989). Not surprisingly, the Hashemite Kingdom has taken steps to preserve this remarkable legacy.

a. Jordan's Cultural Preservation Institutions

Responsibility for protection of antiquities resides within the Ministry of Tourism's Department of Antiquities. This agency currently comprises 200 staff (100 permanent and 100 contract). Its budget in 1991 was approximately 1.2 million JD. The department's responsibilities include cataloging sites, maintaining facilities, acquiring archaeological research, and guarding antiquities. The Department of Antiquities maintains 12 centers around the country staffed with inspectors to preserve archaeological sites.

b. Legal Authority for Cultural Preservation

The Department of Antiquities has a relatively strong and recent mandate in Antiquities Law No. 21 of 1988. The department is required to execute archaeological policy in Jordan, to evaluate the importance of antiquities, to protect and supervise antiquities, to excavate for antiquities, and to organize museums (Article 3). The Minister may establish the boundaries of sites and register them (Article 4). The government is the sole owner of immovable antiquities, and ownership of land does not give the owner property rights to any antiquities therein. Moreover, the government may expropriate or buy any land or antiquity (Article 5). The antiquities law prohibits the destruction, damage, disfigurement, or harming of any antiquity (Article 9). No construction project is permitted unless suitable distance is maintained (5 to 25 meters) (Article 13). Anyone finding an antiquity must notify the director of the Department of Antiquities within 10 days (Article 15). Only the department or specially permitted organizations may excavate for antiquities (Article 6). If these organizations violate the conditions for excavation, they can be stopped and the permit canceled (Article 19). Trading in antiquities is forbidden (Article 23) and anyone caught trading or excavating illegally may be subject to imprisonment for one to three years and to a penalty of 200 JD (Article 26). Destroying or forging antiquities can result in imprisonment of two months to two years and a penalty up to 200 JD. (Article 27). Rewards are given to persons who help confiscate improperly held antiquities.

c. Current Regulatory Practices for Cultural Preservation

A principal means of antiquities protection in Jordan is participation of the Department of Antiquities in all licensing decisions. Applicants for new construction or industrial activity must receive the department's consent before proceeding. When a case is referred to the department, an inspector may be assigned to investigate its impacts on antiquities. The department employs guards to protect sites but does not possess police powers. Working with the police, the department pursues individuals who have stolen or damaged antiquities. For example, a man was recently apprehended, fined, and jailed for stealing mosaics from a palace. Department officials believe that there is illegal trade in antiquities in Jordan.

The department has issued 42 excavation permits to scientific institutions. The government buys land and antiquities when they are found on private land. Funding for such acquisitions comes from the general budget. The department is currently collaborating with AID and the American Center for Oriental Research (ACOR) to computerize an inventory for Jordanian antiquities in the Jordan Antiquities Database and Information System. This system will help Jordan protect and manage its cultural resources.

Department officials feel that they have a successful and aggressive program for antiquities protection. They believe that penalty provisions are too low and that funding and staffing levels should be higher. The department is planning to revise the Antiquities Law to further strengthen its mandate.

The Department of Antiquities is collaborating with ACOR on a project to improve cultural resources management by assessing antiquities in an area prior to initiation of construction or development planning. Such a process allows earlier and better integration of protection efforts with development initiatives. Legal changes should be made to either integrate a comprehensive cultural resource assessment process into the environmental impact assessment process that may be proposed or to create an independent cultural resource assessment process. Licensing occurs too late in the process to marshal resources to study impacts. Additionally, all major private and public projects should be required to notify the Department of Antiquities in the planning stages of a project. The department should be given the authority to declare a development moratorium on areas where the concentration or importance of discovered or suspected antiquities is high.

CHAPTER III
RECOMMENDATIONS FOR IMPROVING
JORDANIAN ENVIRONMENTAL LAW

I. Background and Overview of Draft Legislation

Senior government officials have sensed the inadequacy of Jordanian environmental laws for some time. Concerns have surfaced regarding the lack of comprehensive environmental protection, gaps in the law, and confusion over administrative responsibilities. To address these concerns, concerted efforts have been made for 10 years to draft a comprehensive national environmental law. Draft laws were prepared in 1981, 1987, and 1989 and circulated among affected ministries. Comments were received and final proposals submitted to the Cabinet.

The Cabinet's Legislative Review Department has declined to forward these legislative proposals to the Prime Minister, and no comments on these decisions have been provided.

The present draft commissioned by the Minister of MMRAE has been prepared by a legal committee comprising legal advisors from the Ministries of Tourism, Energy and Natural Resources, and Health, with two advisors from MMRAE. (MMRAE has had four ministers during this revision.) Comments are once again being received from other ministries. Numerous interviews conducted for this report revealed that the draft is controversial and may need further work to build a consensus for its adoption.

The major institutional feature of the draft law is the proposed creation of the Higher Council for Environmental Protection (HC), chaired by the Minister of MMRAE and comprising the secretaries general of 11 ministries; 11 representatives from nongovernmental organizations, academia, and trade associations; and the director of the Department of Environment (DOE).

This council is designed to set policy and supervise executive and approval authority for much of DOE's work. The draft law strengthens DOE's role, authorizing it to exert some regulatory authority over environmental protection. While the draft law apparently is general in purpose, it creates permitting, monitoring, inspection, and enforcement authorities for DOE. Table III.1 summarizes the key roles designated for the HC and DOE in the draft law. The draft law adds new environmental provisions for ecosystem protection, soil pollution, solid and hazardous waste management, air pollution, marine pollution, and spill control, among other areas. It consolidates some environmental provisions from existing laws affecting forestry, hunting, desertification, water pollution, wildlife conservation, and grazing. Table III.2 summarizes the substantive prohibitions in the draft law. The draft law also contains a broad conflicts-of-law provision rescinding all existing laws with contravening provisions.

Table III-1. Key Responsibilities Under Draft Environmental Law

Higher Council	Department of Environment
	<ul style="list-style-type: none"> ● General Secretary for Council (Art. 10)
<ul style="list-style-type: none"> ● Making Environmental Policy (Art. 6A) ● Setting Specific Environmental Objectives (Art. 6B) 	<ul style="list-style-type: none"> ● Proposing and Implementing Policies (Art. 10A) ● Developing Basis and Framework for Plans (Art. 10B)
<ul style="list-style-type: none"> ● Specifying and Approving Environmental Plans (Art. 6C) 	<ul style="list-style-type: none"> ● Preparing Detailed Plans and Policies (Art. 10F)
<ul style="list-style-type: none"> ● Coordinating Environmental Needs with General Planning To Ensure Continuous Development (Art. 6D) 	<ul style="list-style-type: none"> ● Studying Development Project to Coordinate Environmental and Development Interests (Art. 10G)
<ul style="list-style-type: none"> ● Coordinating Cooperation Amongst Jordanian Agencies with Regional, Arab, and International Groups (Art. 6E) ● Representing Kingdom in Making Agreements with Above Groups (Art. 6F) 	<ul style="list-style-type: none"> ● Recruiting Help from Other Ministries (Art. 10C) ● Supervising and Controlling All Environmental Activities of Agencies and Private Establishments; Taking Measures for Violations (Art. 14)
<ul style="list-style-type: none"> ● Approving National Strategy (Art. 6G) ● Approving Budget for Council and Implementing (Art. 6H) ● Approving Department Plans and Programs (Art. 6I) 	<ul style="list-style-type: none"> ● Preparing National Strategy (Art. 10D)
<ul style="list-style-type: none"> ● Preparing Laws, Regulations, and Specifications (Art. 6J) ● Approving Standards or Criteria (Art. 6K) 	<ul style="list-style-type: none"> ● Developing Regulations and Procedures for Environmental Licensing (Art. 12A) ● Implementing All Regulations by Council (Art. 12)
<ul style="list-style-type: none"> ● Cancelling or Modifying Licenses (Art. 6C) ● Issuing Regulations for Enforcement (Art. 6M) 	<ul style="list-style-type: none"> ● Reviewing All License Applications and Transmitting to Special Committees with Opinion (Art. 13)
<ul style="list-style-type: none"> ● Performing Other Necessary Functions (Art. 6N) 	<ul style="list-style-type: none"> ● Conducting Studies and Research (Art. 10E)
<ul style="list-style-type: none"> ● Establishing Special Committees for Assistance (Art. 6O) 	<ul style="list-style-type: none"> ● Forming Technical and Consulting Committees (Art. 11)

Table III-2. Review of Substantive Prohibitions in Draft Legislation

Article	Subject	Substance of Prohibition	Procedure
15 & 22	Water	Prohibits disposal of any materials (solid, liquid, viscous, radioactive, or thermal) to any water sources that cause pollution or harm use.	<ul style="list-style-type: none"> • Exempts treated wastewater. • Exempts pesticides and herbicides within prescribed concentrations. • Wastes authorized in landfills. • Penalties: <ul style="list-style-type: none"> - min. 200 JD - max. 1,000 JD - 3 months imprisonment or both - 5 JD per day for continuous violation. • HC to establish water quality, industrial, and municipal wastewater criteria.
17-20	Air	Prohibits air pollution by industries or vehicles; requires treatment to reduce as governed by air criteria and standards; authorizes Council to set locations of industries causing air pollution.	<ul style="list-style-type: none"> • Council to establish ambient air criteria and standards. • Minister may take any steps necessary to prevent or treat air pollution. • Minister may order polluting activity stopped, removed, or transported by a decision from HC.
21	Noise	Prohibits persons, establishments, or owners of vehicles or equipment to produce noise louder than criteria.	<ul style="list-style-type: none"> • Council establishes noise criteria. • Penalties: <ul style="list-style-type: none"> - min. 200 JD - max. 1,000 JD - 15 days to 3 months imprisonment or both.
23	Solid, Hazardous, Toxic, and Liquid Wastes	None specified.	<ul style="list-style-type: none"> • Council to establish siting, as well as operational criteria for disposal of solid and liquid wastes, as well as hazardous and toxic wastes.
25	Soil Pollution	Prohibits activities that pollute the soil or affect natural characteristics, reducing productivity.	<ul style="list-style-type: none"> • Penalties: <ul style="list-style-type: none"> - min. 20 JD - max. 100 JD or 15 days to 3 months imprisonment - 10 JD per day for continuous violation plus costs of repairing damage.

Table III-2. Review of Substantive Prohibitions in Draft Legislation (continued)

Article	Subject	Substance of Prohibition	Procedure
27	Forestry	None specified.	<ul style="list-style-type: none"> • HC with Ministry of Agriculture to issue criteria to protect forests, and trees in municipal borders and along roads. • Criteria for cutting, destroying, and trimming; and reforesting land where cutting was permitted.
29	Trees	Prohibits negligence or violation in protecting trees.	<ul style="list-style-type: none"> • Penalty: – min. 50 JD per tree – if repeated, fine is doubled.
28	Desertification	Prohibits any activity 1) harming quantity or quality of plants in area leading to desertification, or 2) distorting appearance.	None specified.
30	Wildlife and Ecosystem Protection	In organizing area or conducting development project, precautions must be taken to protect wildlife from extinction. Ecosystem must not be affected.	None specified.
31	Grazing	Grazing should be regulated.	None specified.
32-47	Marine Pollution and Spill Control	<p>Prohibits vessels or other transport from dumping materials in regional waters or coastal areas; prohibits throwing, placing, or bringing pollutants in these areas.</p> <p>Requires immediate notification of leaks.</p> <p>Vessels must provide the equipment for disposing of, preventing, or reducing pollutants.</p> <p>Vessels in regional waters must maintain a pollution record logging all incidents involving transport or leakage of pollutants; the record must be submitted if requested.</p>	<ul style="list-style-type: none"> • Minister to issue regulations for eliminating pollution, including declaring materials pollutants; setting times for loading or transporting. • Penalty 1 for coastal waters. • Penalty 2 for failure to notify. • Penalty 3 for regional waters. • Minister to define cleanup measures and placement of equipment. • Minister may set and charge fees for using spill equipment. • Penalty 1 for failure to carry record. • Penalty 2 for false information.

Table III-2. Review of Substantive Prohibitions in Draft Legislation (continued)

Article	Subject	Substance of Prohibition	Procedure
32-47	Marine Pollution and Spill Control (continued)	<p>In the case of an accident, the vessel owner may be ordered to take specific immediate measures. Every vessel shall 1) follow directions for service, 2) not dump liquid or solid wastes in port, 3) not release dusts or vapors in port, and 4) not use sirens except when allowed</p> <p>Permit required before unloading any dangerous, banned, or polluted goods.</p> <p>Prohibits picking of coral or shells out of sea, damaging them, or selling or distributing them.</p>	<ul style="list-style-type: none"> • Minister may order specific measures; if not followed, Minister may take necessary steps, including destroying vessel if necessary. Also, Penalty 2 for failure to take measures. Supervisors, the Port Authority, and security personnel may enter and inspect vessels to ascertain compliance. • Penalty 3 for interference with supervisors. • Three penalty provisions: <ul style="list-style-type: none"> Penalty 1: – min. 200 JD – max. 1,000 JD or – 1-6 months imprisonment and costs Penalty 2: – min. 1,000 JD – min. 3 months imprisonment or both and costs. Penalty 1: – min. 5,000 JD – max. 15,000 JD or – max. imprisonment 2 years or both and costs. <p>For all the above, each incident separate.</p> <ul style="list-style-type: none"> • Environmental supervisor may temporarily sequester vessel until vessel deposits sufficient sum to cover fines and costs. • Failure to pay may lead to permanent sequestration and sale of vessel.

Table III-2. Review of Substantive Prohibitions in Draft Legislation (continued)

Article	Subject	Substance of Prohibition	Procedure
48-49	Natural Reserves and National Parks	Establish or amend the boundaries of reservations and national parks.	<ul style="list-style-type: none"> • Council and Minister nominate; Cabinet approves. • Law to be issued to specify conditions for establishing reservation or park and terms for operating and managing. • Minister with Council recommendation may define services to be provided in return for fees; Minister may set entrance fees. • Minister may define acts that are legal violations if carried out with reservations or parks and set fines.
50	Hunting	Prohibits carrying equipment that could be used for hunting in areas where hunting is banned.	<ul style="list-style-type: none"> • Penalty: – min. 50 JD or imprisonment for 1 month or both. • Minister on recommendation of Council may issue instructions on: <ul style="list-style-type: none"> – Bans on work that causes harm in reserves or parks – Protection measures – Entry conditions for all vehicles – Wild animal export conditions – Restrictions on entry of domestic animals – Plant protection measures – Prohibitions on low-flying aircraft – Controls on commercial work – Fire burning conditions – Prohibitions on killing, wounding, or harassing – Bans on trading of wildlife remains; licenses on embalming – Controls on imports/exports.

Table III-2. Review of Substantive Prohibitions in Draft Legislation (continued)

Article	Subject	Substance of Prohibition	Procedure
52-53	Ecosystem Protection	Protect wildlife, ecosystem, and natural balance through regulations.	<ul style="list-style-type: none"> • Minister approval required for building factory or other activity that may affect the ecology within a municipality; Minister may define restrictions.
54-55	Inspections and Monitoring	Search and control of establishments and locating where environmental activities occur to ensure permit compliance, health and safety, and environmental protection.	<ul style="list-style-type: none"> • Appointment of Environmental Supervisors by Secretary General with recommendations from Minister. • Regulations governing monitoring.
16	Construction	All construction projects must obtain consent (construction license) prior to building and starting.	<ul style="list-style-type: none"> • Reviewed by DOE. • Then referred to specialized committee. • HC may cancel or modify.
24	Licensing	Organizing authorities must comply with all environmental regulations and laws and must not issue or renew licenses related to environmental activity without Minister's consent.	<ul style="list-style-type: none"> • Minister's consent on all licenses affecting environmental activities issued by agencies. • Noncompliance subject to legal action.
26	Disturbing Natural Resources; Licensing	Prohibits initiation of any activity that adversely affects natural resources on or beneath land, in lakes, or in the sea.	<ul style="list-style-type: none"> • Activities licensed by Minister according to laws and rules of HC are exempt.
56	Cancellation of Licenses	Licenses may be cancelled if issued based on incorrect data, if owner is in violation of law, regulations, or instructions, or if the environment is harmed.	<ul style="list-style-type: none"> • Minister may suspend license after notice and opportunity to correct deficiencies.
57-58	Licensing	<p>No one may initiate any construction, operation, or administration with works related to environment without a license.</p> <p>No one may dispose of wastes totally or partially in locations not assigned for disposal purposes.</p>	<ul style="list-style-type: none"> • Minister may issue regulations on: <ul style="list-style-type: none"> - Licensing conditions - Banning or limiting import of materials - Specifying pollution control methods for industry, agriculture, and transportation - Protecting environment from research - Other issues related to the environment or pollutants.

Table III-2. Review of Substantive Prohibitions in Draft Legislation (continued)

Article	Subject	Substance of Prohibition	Procedure
59	Closure	Minister, with recommendation from special committee, may order closing of any construction. Establishment of a store is subject to judicial action for violating this law. Establishment may be ordered to stay closed if environment and health are endangered until violation is eliminated.	
62-63	Penalty		<ul style="list-style-type: none"> • If no specific penalty: fine of no less than 50 JD. • Imprisonment: <ul style="list-style-type: none"> - min. 1 month - max. 3 months - or both and repayment of damages.
62	Minimum Penalties		<ul style="list-style-type: none"> • Minimum penalties may not be lessened by court according to penal code.
63	Maximum Penalties		<ul style="list-style-type: none"> • Maximum penalty may not exceed 1,000 JD or imprisonment for over 6 months for each violation.
64	Delegation		<ul style="list-style-type: none"> • Council may give Minister some of its authorities.
65	Regulation Issuance		<ul style="list-style-type: none"> • Cabinet on recommendation of Council may issue implementing regulations.
66	Revocation	Any legislation contravening provisions of this law should be revoked.	

II. Enhancements to Draft Legislation

In the following subsections, fundamental recommendations and specific technical changes are presented for the draft environmental law (III.b.1 and III.b.2). The fundamental recommendations either go to the core of the proposed statutory scheme to provide environmental protection or make suggestions that span several proposed provisions. The specific changes focus on individual provisions, suggesting preferred legal or technical approaches to individual statutory objectives. General and specific recommendations usually do not overlap. Thus, each set of recommendations warrants consideration.

An important caveat should be placed on all these statutory recommendations. Comments are offered in somewhat abstract, objective terms on what constitutes effective environmental law. Aspects of the Jordanian legal system and political conditions may necessitate modification or rejection of some recommendations. Finally, comments are based on translation of the law from Arabic to English, which may affect some of the meanings.

A. Fundamental Recommendations to Enhance Draft Law for Protection of Environment

1. Change Roles and Responsibilities of the Higher Council, the DOE and the Minister

An initial observation is that the roles and responsibilities of the three major actors (HC, the Minister, and DOE) as proposed in the draft law are possibly ineffective and certainly confusing. Referring to Table III.1, HC has important policy-setting and coordinating functions such as those asserted in Articles 6A, B, E, F, and G. HC is also charged with concrete regulatory and administrative functions such as preparing laws and regulations (6J), canceling licenses (6C), and issuing enforcement regulations (6M). Last, HC is to play an approval function for environmental plans (6C and I), standards and criteria (6K), and budgets (6H).

Correspondingly, DOE is given the role of proposer, drafter, and recommender of plans, strategies, and regulations to the HC (Articles 10A, B, F, D; and 13) as well as some coordination and supervisory responsibilities. The merits of empowering an advisory council with 25 members and little staff to assume ministerial, administrative, and decision-making functions are questionable. Similarly, depriving the implementing agency, DOE, of active decisionmaking, licensing, and standard-setting authorities is likely to limit its effectiveness.

It is strongly recommended that HC be reduced in size, perhaps by restricting membership to ministries with major environmental responsibilities, such as Agriculture, Water and Irrigation, Municipal, Rural Affairs and the Environment, Tourism and Antiquities, Health, and Energy and Natural Resources. Including environmental NGOs such as the Royal Society for the Conservation of Nature, the Royal Scientific Society, and the Jordan Society for Control of Environmental Pollution would also bring expertise. A smaller group of secretaries general and senior Jordanian environmentalists may be a more

appropriate forum for strategizing about future directions, coordinating activities, and resolving conflicts in assigning environmental responsibilities.

In turn, responsibility for more complete regulatory authorities should be shifted to DOE with approvals required from the HC only for major initiatives such as standards setting, not for licensing and implementation activities. Chapter IV contains a more complete discussion of potential responsibilities for the DOE.

A second point to consider in evaluating the roles assigned in the draft law is the role of the Minister of MMRAE (where DOE is located presently). Table III.3 lists key responsibilities explicitly given to the Minister. The list is extensive and, in fact, constitutes a reasonable accumulation of authorities necessary to run a regulatory agency. Remember, however, that the Minister serves a dual capacity in the proposed law, as chairman of HC and Minister of MMRAE. With the active regulatory role that HC is to play, it is conceivable that the Minister might often face conflicts of interest in persuading the council to adopt regulations and standards that he has prepared.

In exploring this point, legal advisors suggested that the functions delegated to the Minister, shown in Table III.3, are in his capacity as chairman of HC. This interpretation seems compatible with the active model cast for HC in regulatory development, permitting, and other activities.

In any event, any confusion on this point might be clarified by simply referring to the Minister as "chairman" of HC, if that is intended. To make the law more effective, it would be appropriate to clarify that the Minister as head of DOE performs the responsibilities listed in Table III.3.

2. Narrow the Revocation or Rescission Provisions

A number of ministries have expressed concern over losing the authorities they are granted under existing laws if the revocation and rescission provisions of the proposed law are adopted. (See Article 66 revoking all contravening laws and Article 6, "powers despite other laws." These provisions are over broad in preempting useful existing laws and could not be implemented given their ambiguity (i. e., what constitutes "contravening"). A better provision might repeal all less stringent laws affecting environmental protection. Even better would be to include a specific table of the laws that are being superseded.

3. Expand the Detail Associated with Environmental Prohibitions

A corollary to the point about narrowing the rescission provision is that many of the substantive prohibitions are too general, giving no real indication of what conduct is prohibited. For example, the grazing provision states that "grazing should be regulated and protected to increase its capacity and ability to rejuvenate." Articles on forestry, desertification, solid waste, wildlife ecosystem protection, and natural resources, among others, are similarly ambiguous. If agencies are to know their responsibilities and

Table III-3. Key Responsibilities of Minister of MMRAE

Article	Responsibilities of Minister	Council Action
11A	Formation of Committees	
12A	Forms Licensing Regulations	
13	Accepts or Rejects Licenses	
16	Consent Required for Construction Projects	
20	Issues Orders to Stop Air Pollution	Council decision required
24	Organizational Authorities Must Get Minister's Consent for all Licenses	
34	Issues Marine Spill and Pollution Control Requirements	
37	Issues Regulations for Eliminating Pollution in Regional and Coastal Waters	
38	Takes Steps to Prevent Pollution in Accidents, Including Destroying Vessel	
48	Recommends Land for Natural Reserve	Council must also recommend
49a	Recommends Fees for Parks	Council must also recommend
49b	Establishes Violations in Parks	
51	Issues Park Rules and Regulations	Council recommendation required
53	Places Conditions on Building to Address Ecological Concerns	
54	Recommends to Secretary General Appointment of Environment Supervisors	
55	Issues Monitoring and Investigation Regulations	
56a	Cancels Licenses if Violation, Misinformation, or Harm to Environment	
56b	Suspends Licenses	
58a	Issues Licensing Regulations	
58b	Issues Product or Materials Bans	
58c	Issues Pollution Control Instructions	
59	Closes Establishments	
60	Sets Fees for Using Environmental Projects	
61	May Delegate Some of His Powers	

citizens are to understand their environmental obligations, greater specificity is needed. This, in turn, will ease the development of regulations. Recommendations to identify regulatory approaches are included in the specific recommendations section. To complete the grazing example, the provision should not only describe the goal but include information on the means, such as grazing permits, designation of lands suitable for grazing, and inspection by rangers of grazing practices.

4. Reorganize the Statutory Provisions in a Logical Framework

For the new law to be successful, all affected parties must understand the goal of greater specificity, the draft law must be substantially reorganized, and individual prohibitions written in parallel fashion.

The draft should be organized by title so that like provisions are grouped together. For example, assemble all the standard-setting provisions under one title, the licensing provisions under a separate title, and other procedural provisions under separate titles. This would bring together permitting, siting, and environmental impact statement provisions so that anyone undertaking new construction could find all relevant procedural requirements in one place.

Similarly, all substantive provisions should be grouped together (e.g., the water provisions—fresh water, drinking water, marine spill control; land use provisions—agriculture, forestry, grazing).

For each substantive provision, an introductory section that explains the objectives of the title (as in the grazing example above) should be included. This will aid in establishing the underlying reasons for the specific prohibitions and in comprehension and subsequent regulatory drafting. Then, details on prohibited activities as well as on implementation methods and penalties should be provided. While this is done for some provisions (see, for example, the marine pollution control Articles 32 to 47), other provisions lack sufficient elaboration. The use of a standard format for each title will aid the regulator and those being regulated.

5. Include an Explicit Provision Governing Intergovernmental Roles and Responsibilities

A principal motivation for drafting new Jordanian legislation is to clarify roles and responsibilities for environmental protection. An excellent way to achieve this would be to devote a specific title to intergovernmental roles and responsibilities. These provisions could establish the specific tasks of individual agencies in environmental protection, responsibilities for oversight and monitoring, and sanctions in case a ministry fails to perform its job.

Such a provision is particularly desirable if responsibilities remain shared among agencies, as Chapter 4 suggests. For instance, a provision might be drafted stating that three ministries, Health, MMRAE, and MWI will share responsibility for wastewater monitoring.

Language could be written making MWI responsible for collecting samples and splitting them with the Health Ministry. MWI could be required to analyze samples for chemical parameters and MOH, to analyze for biological contaminants. The statute could specify the frequency of sampling required, as well as the parameters, and mandate that all data be given to MOE within a specified time. In this hypothetical example, each agency's requirements and expectations are known, thus facilitating coordination.

Provisions should be drafted defining the roles for every agency that will coordinate and cooperate (i.e., Industry and Trade, Health, Agriculture, MMRAE, Energy and Natural Resources, Tourism and Antiquities, Water and Irrigation, and Interior). The division of duties between each ministry and the DOE should be precisely defined. Every program function should be considered, including research, standard setting, data management, monitoring, inspecting, overseeing, and enforcing. The role of municipalities should be addressed extensively.

This title on intergovernmental responsibilities might be the most significant accomplishment of the act. It certainly would go far to relieve political tensions among ministries over program turf. It would also enhance the chances of passing this legislation if intra- and intergovernmental issues were resolved prior to review by the Prime Minister's office.

6. Establish Consolidated Licensing Provisions

The draft legislation establishes several licensing requirements but not the overall framework for licensing. As proposed earlier, a permitting title should lay out a comprehensive list of activities that require a permit. In addition, it would simplify matters to establish a consolidated permit program with permits or licenses required for initial siting (a one-time requirement) and a discrete permit for operation of industrial, municipal, or commercial activity causing environmental pollution (required every two to five years). This two-tiered permit system would allow separate decisions on the acceptability of an activity in terms of environmental impacts, siting, and land use planning, as well as the conditions that should be placed on the operation, maintenance, monitoring, and reporting at individual facilities. Issuance of the siting permit should be tied to preparation of an EIS for major activities as well as compliance with all siting restrictions (e.g., distance from antiquities, absence of aquifers) and conformance to any applicable land use plans.

It is suggested that the operating permit contain all the limits that would apply to a facility in terms of air emissions, wastewater discharges, water use, solid and hazardous waste management, soil conservation practices, and any other ongoing responsibilities regarding land use, antiquities, wildlife, etc. In addition, the permit should spell out monitoring, reporting, and record keeping provisions. This multi-media permit would ensure coordination of protection and procedural requirements.

7. Establish Comprehensive Assessment Procedures to Prevent Impacts

It is particularly important to establish in the statute new and proactive assessment tools to prevent deleterious impacts. Two specific approaches are recommended: an environmental impact assessment (EIA) process and a pollution prevention evaluation (PPE). It appears that an EIA process may have been intended in Articles 52 and 53 (ecosystem protection) and in Article 26 (licenses for disturbing natural resources). The strategy calls for establishment of an EIA process in Jordan. The draft should be amended to clarify what is required in an EIA process including the following basics:

- What projects need to prepare environmental impact statements (EISs)?
- When should the EIS be prepared (i.e., early in the planning process)?
- What analyses should be performed in preparing an EIS (e.g., evaluation of impacts on cultural, air, water, land, and wildlife resources; consideration of alternatives to the project; and ways to mitigate environmental impacts)?
- How will the EIS be evaluated and what criteria will determine a project's acceptability.

The numerous models for EIA programs in other countries should be considered. The basic component of a Jordanian system should be established in the draft, including the roles and responsibilities of the ministries. The HC may be an appropriate referee when agreement cannot be reached on government projects.

The PPE, which is an analogous tool, should also be established in the statute as a prerequisite to receiving a siting license or an operating permit. The facility or the Department of the Environment could conduct the PPE. Essentially, the facility is analyzed to determine what processes, operations, and materials are being used and what pollution is being caused.

Next the PPE evaluates whether raw materials, processes, or operations could be altered to prevent pollution in the first place. For example, changing the order of the rinse tanks of a jeweller who is plating gold may save him raw materials as well as prevent the discharge of heavy metals in wastewater. Similarly, chemical substitution, switching from chemical solvents to natural citrus-based cleansing agents, may reduce both air and water pollution.

The PPE can be used in one of two ways. Either the applicant demonstrates in his PPE that he has done everything possible to reduce pollution before he receives his permit or the DOE performs the PPE upon receiving the application and specifies any change before issuing the permit. In either case, the PPE is an excellent way to establish that no one has the right to pollute and that everything must be done up front to prevent it.

8. Establish the Rights of Public Participation

Another very important procedural change to consider is the establishment of public participation provisions in the statute. These would allow citizens to

comment when rules, regulations, and standards are being developed. Typically, the public is invited to submit comments when regulations are first proposed, which the responsible ministries evaluate and respond to as they finalize rules. In this way, controversies are resolved before they arise and participants feel that their wishes are considered. Any interested party may comment—environmentalists, trade associations, industries, and individuals. This ensures a balance between environmental and development interests as rules are prepared.

Other public participation tools that might be incorporated in a revised draft include public hearings on all major licensing decisions, and citizen suits that enable individuals or groups to initiate legal proceedings if environmental agencies have not acted. This has the benefit of expanding enforcement resources and encouraging agencies to fulfill their responsibilities. These tools tend to stimulate citizen involvement in environmental protection and expand political support.

9. Require Self-Monitoring, Industrial/Commercial Reporting, and Record Keeping

A key need for successful environmental protection is to perform sufficient monitoring to ensure compliance. The responsibility for monitoring need not be confined to the government. Industries and other facilities can be required to monitor themselves and report the results.

Furthermore, facilities should be required to maintain records for a specific period so that government inspectors can review records for consistency and accuracy.

Reliance on self-monitoring and reporting is an excellent way for regulatory agencies with limited resources to keep track of numerous parties. Facilities are on an honor system to accurately sample, analyze, and report. However, falsification of data or misreporting can be made a crime and DOE and other agencies can still perform random, periodic compliance monitoring to spot check data validity.

10. Create Fee Systems to Increase Self-sufficiency of Governmental Programs

It might be advisable to include broad statutory authorization for imposing a variety of environmental fees to subsidize environmental protection costs. Permitting, monitoring, and inspection fees should be collected on a graduated scheme reflecting the size of the firm, the magnitude of its pollutant load, and its ability to pay. These costs can be considerable and funding shortfalls may constrain critical activities. The draft statute mandates fees for national parks in Article 49. This proposal simply expands the concept of user fees to a larger universe.

At the same time, the legislation should specify that any penalties collected go to the budgets of the environmental agencies, rather than to the general treasury. Again, the goal is

to generate sufficient monies to tackle the resource-intensive demands of environmental management.

11. through 18. Create New Substantive Environmental Authorities

The draft legislation should spell out several additional areas of environmental protection. Some exist in other parts of Jordanian law and would simply expand existing law. Recommendations that would be entirely new are introduced below, including key regulatory components that the statute should include:

12. Comprehensive Land Use Planning

Several Jordanian environmental problems revolve around use of lands for the wrong purpose. Agricultural land is experiencing urbanization; forestry land is being used for orchards or agriculture; development is occurring too close to antiquities; population is expanding in areas where water is unavailable and, at times, next to industrial development; and grazing is occurring on lands that cannot support it. One obvious solution is to create a comprehensive land use planning system (planning is now occurring at the regional level). New provisions should:

- Establish the planning jurisdiction (e.g., the governorate);
- Require an inventory and classification of all lands;
- Allow public review of the plans;
- Require that all new activities conform to the plan or siting licenses will be denied.
- Establish an appeals process; and
- Establish penalties, including closure and confiscation, for any violation of the plan.

13. Restrictions on Overpumping Aquifers

Although it appears that the Water Authority of Jordan (WAJ) has sufficient authority to license well drilling and water withdrawals by industries, excessive water is being used and aquifers across Jordan are being overdrawn. Pumping groundwater beyond safe yields is extremely dangerous, leading to salinization and contamination of a scarce, invaluable commodity.

We strongly recommend that the draft legislation require WAJ to:

- Perform water planning;
- Publish on an annual basis the safe yield of each aquifer; and
- Ensure that public and private withdrawals do not exceed allocated amounts.

Legislation will reduce the political pressure on WAJ to continue excessive water use. Strong penalties (e.g., 10,000 JD or more) should be applied. DOE and the HC for Science and Technology should do independent reviews. Also, formal establishment of irrigation

water quality standards should be included. Such changes would strengthen Water Authority Law No. 18 of 1988.

14. Include Cultural Preservation in the Legislation and Expand Existing Authority

An excellent law was passed recently to protect Jordan's antiquities, which are one of the nation's richest environmental resources (Antiquities Law No. 21 of 1988). Antiquities provisions should be placed in the environmental protection legislation to emphasize the linkage between cultural and environmental protection and to strengthen specific features. Key improvements include:

- Mandatory preparation of a registry of antiquities, historic landscapes, and other cultural resources;
- Designation of cultural reserves where, in light of known or suspected cultural resources, no construction may occur;
- Mandatory submission of cultural resource impact assessments as part of the EIS process by all developers in the planning stages of major projects. Assessments should include plans, maps, and known artifacts;
- Review and evaluation of the cultural resource impact assessments by the Department of Antiquities with power to reject projects or order changes to protect antiquities;
- Modification of regulations to ensure larger buffer zones between antiquities and development to preserve "ancient landscapes"; and
- Stiffer penalties for violation of antiquities laws from the minimum fine of 1000 JD to a maximum of 10,000 JD, plus payment of cultural resource damage estimated by the Department of Antiquities.

15. Strengthen Environmental Controls on Mining

Jordan's ubiquitous quarries invariably present environmental problems. The strategic value of several minerals is increasing and may soon be mined. Jordan also has considerable phosphate and potash mining operations. Environmental controls should be established in this legislation to:

- Regulate safe and environmentally sound mining practices (e.g., bench cuts in quarries);
- Control air and noise emissions and groundwater and surface water impacts at mines;
- Require reclamation of quarries and mines to protect the public and to achieve aesthetic objectives;
- Provide regulators (i.e., the Natural Resources Authority and the DOE) with police powers so they can shut down violating quarries and mines;
- Set stiff fines for violation, at least 1000 JD.

16. Incorporate Pesticide and Herbicide Control Provisions in the Draft Legislation

Pesticide provisions from Agriculture Law No. 20 of 1973 plus additional powers should be included in the draft legislation. Specific requirements should cover:

- Approval prior to importation or use of any pesticide or herbicide;
- Application permits that dictate the type, amount, and rate of application of pesticides or herbicides, the crops they are applied to, and any monitoring conditions;
- Explicit bans on any products deemed dangerous;
- Limitations on pesticide residues in agricultural products; and
- Penalties for violating any of these prohibitions.

17. Place all Coastal Zone Management Provisions Under the Marine and Coastal Waters Articles

Protection of the scarce land and water resources in Aqaba is of paramount importance. This draft legislation should coordinate environmental interests with obvious development needs in the nation's only port. It should also designate two additional marine reserves.

Bans or quota authority should be established for stressed fisheries, and development of a fisheries conservation plan might be considered to revitalize Gulf resources. A comprehensive environmental monitoring program should be authorized for Aqaba.

18. Establish a Ban on Chlorofluorocarbons (CFC) in Jordan

Jordan is a signatory to the international treaty phasing out the manufacture and use of CFCs. Steps have already been taken with the Jordan Petroleum Refinery to ensure the local availability of alternative aerosols. The terms of the ban and any major restrictions should be continued in this legislation.

19. Eliminate Requirements to Show Causality in Several of the Draft Provisions

Several provisions in the draft law prohibit activities producing a specific result. For example, Article 20 authorizes the minister to stop any activity that pollutes the air if it has any adverse input on the environment.

This imposes a difficult burden of proof on the Minister and his staff because he theoretically must show that air pollution is occurring and having an adverse effect. A simpler approach is to declare that any emissions that exceed permit limits or air quality standards constitute air pollution and are prohibited. The Minister can then be authorized to

stop an activity or close a facility if the violation exceeds the limits by a certain percentage, if the violation is continuous, or if ambient air quality standards are exceeded.

This example is intended to demonstrate how to amend provisions on what constitutes a violation and lessen the burdens of proof for administrative agencies. Other provisions that need work include water (Article 15), desertification (Article 28), wildlife protection (Article 30), and grazing (Article 31).

20. Establish Recycling and Conservation Objectives in the Legislation

In addition to the many activities prohibited in the draft law, it would be desirable to establish that all citizens, industries, commercial activities, and other undertakings have a duty to meet recycling and conservation objectives established for five-year periods by the DOE and the HC. Objectives should be set for solid waste generation (paper, glass, aluminum, and plastics), water use, and energy use, among other activities. The publication of quantitative objectives, supported by public education campaigns, could help solve Jordan's mounting solid waste, water, and energy problems.

21. Strengthen All the Enforcement Provisions in the Draft Law

Each step in the compliance assurance process should be strengthened and clarified in the draft, from inspecting facilities to determining the size of fines. A provision should be drafted to give the DOE and other agencies the right of entry at any time, unannounced, to take samples, examine records, inspect the facility, or take any other action necessary to ascertain compliance with environmental provisions.

These changes would amend Article 55. The Minister and his agents should be given police authority to seize articles, confiscate records, and stop activities that endanger the environment.

In the statute, DOE should be specifically authorized to bring legal action. Currently, the draft establishes numerous fines and penalties but does not indicate who should prosecute violations. The penalty provisions for each article should be compared (see Table III.2) and articles should be reasonably consistent, accommodating any differences for the gravity of the offense, the magnitude of the damage, and the ease of restoration or remediation. The water and soil pollution penalties (Articles 15 and 25) seem too low and the noise pollution fines too high. When no penalty is specified, Articles 62 and 63 apply, which establish a 50 JD minimum and a 1000 JD maximum. These are far too low, given that they may govern hazardous waste offenses, desertification, and other important violations.

In addition, every type of offense, including air, water, soil, solid waste, antiquities, and pesticides, should have a set of fines, including imprisonment, payment for damages, suspension or closure of a facility, and termination of the pollution. Such consistency does not exist currently.

22. Consider Including a Provision to Create a Special Court for Environmental Protection and a Special Appeals Board to Resolve Interagency Controversies

Environmental disputes and litigation involve highly technical issues beyond the understanding of the existing judicial system. We suggest that a special court be formed to hear environmental cases and issue consistent, fair decisions based on this statute.

A special governmental panel to resolve disputes between ministries may also be desirable. While this may be the purpose of the HC, its location within MMRAE may suggest bias and create distrust. The panel's purpose would be to avoid the situation in every major dispute in which a ministry appeals to the Prime Minister. Such an appeals panel would develop precedents and experience in appeals and resolve controversies more logically and less politically.

B. Specific Recommendations Addressing Individual Articles in the Draft Legislation

The following subsection presents recommendations on individual articles in the draft legislation. Shortcomings are highlighted and suggestions for enhancing provisions are presented. Some of the deficiencies were considered in general terms in the previous subsection but are reiterated in their specific contexts here.

Article 2: Some terms used in the law are not defined in the definitions section including, *regional waters*, *coastal waters*, *hazardous wastes*, and *toxic wastes*. Examine each article to ensure that all operative words are defined.

Article 5: Reduce the number of ministries participating in HC to the following Health, Agriculture, Water and Irrigation, Energy and Natural Resources, Industry and Trade, MMRAE, Tourism and Antiquities, plus representatives from Amman, Aqaba, RSS, RSCN, and JSEPC.

Article 6: Soften regulatory responsibilities of HC. Eliminate 6j (preparing laws) and 6k (approving criteria).

Article 10: Give DOE more regulatory authority. Strengthen its power to develop regulations, criteria, and standards, issue or reject licenses, monitor, supervise, and enforce.

Article 12: Mention two-tiered permitting system here—siting and operating permits. Establish permitting EIS requirements as laid out in recommendations 6 and 7.

Article 13: Give DOE the authority to approve or disapprove permits without referral to committee or the Minister. This amendment would strengthen DOE.

Article 14: This provision confers upon DOE supervision and control of all environmental activities of agencies and establishments. In light of general recommendation

5, amend this provision to acknowledge how environmental responsibilities might be shared and coordinated. The duties of each ministry should be restated here.

Article 15: Mention drinking water reservoirs. Eliminate causality requirement. ". . . which might cause water pollution or harm to humans." Replace language (e.g., "which exceeds drinking water, surface water, wastewater or water quality standards as established by DOE").

15 (a) Raise penalties, especially the 5 JD penalty for continuous violations. Establish ability to shut down or close facilities that violate standards. In this way, DOE will not have to rely on the health law.

Article 16: Change provision to give DOE consent. Combine this provision with the licensing provision (Article 12).

Article 17: Change provision to establish general air quality objectives. Then spell out tools to be used to attain objectives, describing ambient air quality standards as well as limits on technology-based emissions established in permits.

Article 18: Eliminate article. All siting should be covered earlier in the permitting Articles 12 and 13.

Article 19: Prohibition only applies to industries and vehicles. Expand to cover mines, sewage treatment plants, and "any other source or activity that causes pollutants to be emitted to the air." Prohibition should be against emissions that exceed limits established in operating permits.

Article 21: Prohibition is well-phrased, but reduce penalties (which now seem excessive). Also, DOE, not this council, should develop noise criteria.

Article 22: Incorporate this into Article 15 or place it before 15. Expand it to mention standards for drinking water, mineral water, and irrigation water.

Article 23: The first part states that the Council shall establish solid, hazardous, and toxic waste disposal criteria. First, define these wastes. This is a very controversial topic (for example, are mining wastes a solid or a hazardous waste? What about used oil, types, etc.). USEPA has been working to resolve these issues recently and their definitions should be consulted. Second, have the department establish the criteria. Third, establish affirmative duties (e.g., "anyone owning or operating a facility to dispose of solid or hazardous waste must comply with operating and disposal conditions established in his or her permits").

Article 24: In light of recommendations 6 and 7, eliminate this provision and include the roles and responsibilities of municipalities and organizational authorities in Article 14.

Article 25: Consider narrowing this provision. As it is written, digging might constitute soil pollution. Penalty provision differs from the others. Violators may get a civil

fine or imprisonment. All other provisions provide for one or the other, or both. Also, the fine for continuous violation is 10 JD; for water pollution, it is 5 JD. The penalty for both should be higher.

Article 26: Make this one of the introductory objectives to the provision establishing an environmental impact statement process.

Article 27: As with Article 23, this provision does not proscribe any behavior. The solution is to prohibit explicitly any tree cutting unless it complies with criteria established by the Ministry of Agriculture and DOE. Resource management agencies should initiate resource management criteria. This should be established in a revised Article 14.

Article 28: This is another provision that establishes a worthwhile objective, prevention of desertification, but does not give any specific prohibitions, such as restrictions on disturbing or plowing soil, grazing, or removing plants.

Article 29: The penalty for harming trees is apparently less stringent than under existing agricultural law in which the Forestry Department can assess the value of damaged trees and a judge is bound by this valuation.

Article 30: The wildlife protection provision also contains no specific prohibitions or implementation mechanisms. Include the following provisions: 1) listing of endangered species, 2) incorporation of hunting restrictions, 3) prohibitions against injuring any wildlife in wetland or park reserves, 4) authority to establish wildlife reserves, 5) penalties, and 6) authority to establish wildlife protection regulations among others.

Article 31: Grazing prohibitions similarly lack detail. Consider including the following program components: 1) designation of grazing land, 2) issuance of grazing permits to tribes designating areas and size of herds, 3) incentives for use of designated lands (e.g., provision of water supplies, fuel), and 4) penalties for violations.

Article 34: Require vessel operators to have plans on board their ships for emergency steps to take in case of a spill. The initial hours in an oil spill are critical to its containment.

Article 42: The fines are too low. Raise the maximum to at least 10,000 JD.

Article 51: Include endangered species protection.

Article 52: Include the objective for wildlife protection before the prohibitions, as suggested in recommendation 4.

Article 53: This provision seems redundant with Articles 12 and 13 relating to industrial licensing. What is being added here?

Article 54: Strongly establish for DOE right of entry and inspection authority, as proposed in recommendation 20.

Article 55: Authorize self-monitoring and reporting requirements here. DOE should be mandated to require industries or other polluting activities to monitor themselves for parameters at established frequencies. Industries and others should be obliged to submit monitoring results at frequencies specified by DOE and to report any known violations of applicable standards. In addition, facilities should be required to retain environmental records for 10 years.

Article 57: Merge this provision with Articles 12 and 13, as it seems redundant.

Article 58: This is an excellent provision that enables the Minister to issue a wide range of standards and instructions. Slightly expand it to explain the different types of analyses that may serve as the basis for issuing criteria. Environmental standards may be risk-based, set to protect a specified level of human and environmental health (e.g. incidence of cancer). Standards may also be technology-based, set at levels which may be attained through use of reasonably available treatment technology. Standards may be environmentally based, set to reduce pollutants in the ambient environment to levels believed to be protective. Standards may also be absolute, banning the use of products or requiring zero discharge of pollutants. Last, standards may be economically based, specifying a level of pollution control which facilities can reasonably afford to undertake. Given the number of criteria and standards that will be issued in Jordan, it is advisable to have a legal basis for all conceivable standards.

Article 62: The minimum penalty is too low. Raise it to at least 100 JD.

Article 63: The maximum penalty is too low. Raise it to at least 15,000 JD and five years of imprisonment.

Article 66: Narrow the revocation provision as discussed in recommendation 2, either specifically listing laws that are repealed or setting a benchmark for when to eliminate an existing law (e.g., any law that provides for less stringent environmental protection).

Summary

The foregoing recommendations and suggestions notwithstanding, the draft law adds important new authorities for environmental protection in Jordan and is a key step in beginning to clarify institutional roles and responsibilities. Many of the recommendations strengthen authorities further by spelling out regulatory approaches. If it is decided to preserve a more general law to aid in its passage, these recommendations should be reconsidered during the development of criteria and standards.

Many of the approaches embodied in these recommendations cost very little, if anything, and strengthen social cooperation to achieve environmental objectives (for example, inviting public participation in rulemaking and establishing recycling and conservation

objectives). Others are more oriented to compliance and planning, but can also be achieved in more cooperative, administrative ways, if desired. For example, rather than issuing a permit or a license or requiring compliance with a plan, citizens and affected facilities can be informed of desirable environmental protection measures and educated to employ them. As an example, it may be more appropriate to educate small farmers in safe pesticide application than to require them to obtain an application permit. Thus, the regulatory approaches proposed above may be modified if resources or practicalities dictate a different course.

CHAPTER IV CONSIDERATION OF ALTERNATIVE INSTITUTIONAL ROLES FOR MMRAE

This chapter considers alternative institutional roles in environmental protection for the Ministry of Municipal and Rural Affairs and the Environment (MMRAE), in which DOE is located. The main reason to explore changes to MMRAE administrative responsibilities is to enhance environmental protection in Jordan.

As Chapter 2 demonstrated, administrative responsibilities for the many functions associated with environmental protection in Jordan are spread among various agencies. The ministries of Agriculture, Health, Energy and Mineral Resources, Industry and Trade, Tourism and Antiquities, and Water and Irrigation all either play or have the jurisdiction to assume important roles in the development and implementation of environmental programs in Jordan. Within these ministries, several authorities and departments perform key functions related to the environment. These include the Natural Resources Authority, the Water Authority of Jordan, the Water Resources Administration, the Jordan Valley Authority, the Department of Antiquities, the Department of Forestries, the Department of Environmental Health, and the Department of Standards and Specifications.

Another interesting institutional feature in Jordan is the existence of several higher councils that provide leadership and policy direction and are critical to establishing political authority for administrative undertakings. Most are subsumed within ministries (for example, the Higher Council of Agriculture and the proposed Higher Council for Environmental Protection), although there are other more independent higher councils such as the Higher Council for Science and Technology .

Also, nongovernmental or quasi-governmental organizations closely aligned with the government in Jordan, although independent, may receive government funding and perform important administrative functions. Key examples in the Hashemite Kingdom are the Royal Scientific Society, which does environmental monitoring, and the Royal Society for the Conservation of Nature, which plays a critical role in wildlife protection.

There are numerous problems with institutional roles and responsibilities for environmental protection in the Hashemite Kingdom. There is tremendous overlap in responsibilities, with numerous agencies performing components of the same job. For example, four discrete agencies may sample and analyze wastewater. At the same time, responsibility for actions on other issues is not clearcut, so gaps in environmental protection exist. Finally, some agencies are simply not performing key requirements under law due to lack of resources or commitment.

This chapter considers alternative institutional arrangements involving all Jordanian institutions and recommends a basic institutional framework for environmental protection in the kingdom. Special attention will be focused on the duties of MMRAE, with analysis of its current role as manifested by DOE and its role as proposed in the draft legislation and the National Environmental Strategy. Other alternatives are briefly evaluated and final recommendations given.

A. Current Role of Department of Environment

As indicated in Chapter 2, DOE is the 31-person department in MMRAE responsible for setting policy and supervising environmental protection across Jordan. Its budget for 1991 was estimated at approximately 100,000 JD (roughly \$150,000) exclusive of 80,000 JD (\$120,000) paid to the Royal Scientific Society for environmental monitoring in 1991 (this monitoring is not planned for 1992). The department is organized into five divisions covering land protection, air protection, water protection, wildlife protection, strategies, and public information.

The DOE was established in 1980 and its stated responsibilities are to:

- Formulate the basis for environmental organization
- Prepare a national strategy for the environment
- Conduct studies and research about pollution control
- Study all development projects
- Develop all environmental quality standards
- Supervise environmental protection directly
- Prepare projects required by laws and regulations concerning the environment and its protection

DOE's major focus for the past 10 years has been making and coordinating policy (the first four responsibilities) and its single largest effort has been producing the National Environmental Strategy for Jordan. Ongoing activities include: 1) review of license requests, 2) response to citizen complaints about pollution problems, 3) study of pollution issues in Jordan and participation in negotiated solutions (e.g., dust at Jordan Phosphate Company), 4) participation in international conferences, and 5) public outreach.

DOE did support the closing of the industries exceeding wastewater discharge standards in 1990. DOE paid for monitoring by RSS, which was used to demonstrate the violations. However, the actual closing was done by the acting Minister of Health (who incidentally happened to be the Minister of MMRAE).

DOE does not possess sampling equipment or a laboratory and DOE staff do not perform periodic routine inspections. Individuals may perform site investigations in response to public complaints about pollution. In fact, it was recounted that during one episode an industry complained that investigation teams from five different ministries paid visits on the same day.

DOE also has participated on multi-agency committees to develop environmental criteria, but has not played a true leadership role. For example, the Department of Standards and Specifications in the Ministry of Industry and Trade amended the wastewater quality standards recently with input from DOE and others.

DOE is presently in charge of implementing the NES and been chairing the legal committee that drafted the new environmental legal proposal.

B. MMRAE's Role As Envisioned Under the Draft Law and the Strategy

As indicated in Chapter 3, the draft law would strengthen DOE and MMRAE's role as the central environmental authority, enabling it to take on the responsibilities posted presently at DOE. Table 4.1 summarizes the key responsibilities in the draft law for both the Higher Council and DOE. Table 4.3 describes duties specified in the proposal. The Minister leads MMRAE, chairs the Higher Council (an approval and review board subsumed under MMRAE), and directs the DOE to draft and implement requirements. Taken together, they define the full scope of MMRAE's proposed role in environmental protection.

Essentially, MMRAE is tasked to be policymaker, planner, strategist, budgeter, coordinator, representative licensor, supervisor, investigator, legal draftsman, and enforcer of environmental protection in Jordan. The program areas specifically cited in the draft statute are water; air; noise; forestry; desertification; wildlife; grazing; marine spill control; solid, hazardous, and toxic waste; soil pollution; construction; ecosystem protection; natural reserves; and hunting. The only major environmental areas missing are mining reclamation energy use, pesticide control, and antiquities protection, although broad functional authorities in the licensing provisions and supervision of environmental protection would probably enable MMRAE to perform in this area if they chose to do so. (Chapter 3 recommended these gaps be recommended to be filled.)

Functionally, the proposed law gives MMRAE a mandate that ranges from research and program design to program evaluation. Key stages authorized include research, planning, criteria development, licensing, investigations, enforcement, and supervision and control of all other agencies or activities affecting the environment.

Underscoring MMRAE's proposed institutional supremacy in environmental matters, the draft law would rescind all existing contravening laws. Clearly, the draft legislation undertakes to establish a strong central agency to control and coordinate environmental protection.

The draft law precisely fulfills institutional objectives established in the National Environmental Strategy. The NES was finished prior to this latest legal draft. In fact, legislation drafting was the first implementation step called for in the strategy. Therefore, it is not surprising that the institutional specifications in the strategy and the draft law are well aligned.

In the Executive Brief to the NES, finding number 2 calls for institutional strengthening of DOE, emphasizing its role in regulating and enforcing (p. XIV). Chapter 2 (Agriculture and Lands) calls for assigning one agency the responsibility for defining land use. Chapter 3 (Surface Water and Groundwater) calls for study of the organizational structure of agencies in water and monitoring to define them better. Chapter 5 (Coastal and Marine) articulates the responsibilities of an independent environmental authority to formulate policy, supervise implementation, study pollution, develop cooperation among workers, require EIAs, form committees, and perform regular inspections (p. 99 of NES).

It goes on to recommend formation of an Environmental Protection Council to approve plans and policies, cancel licenses, establish coordination between environmental and development needs, follow up on cases referred to it, draw up a strategy for environmental education and information, and improve the budget for the environmental authority. The similarity between these functions and those in the draft law is strong.

Chapter 6 (Energy and Mineral Resources) again endorses establishment of a Higher Council while emphasizing a training role for DOE. In discussing housing issues in Chapter 8, the NES again recommends the Higher Council as policymaker and DOE as implementer. Continuing this theme in the health area, Chapter 9 calls for a strengthening of DOE, with passage of a law, more funding, more technical staff, and greater independence. These are repeated in the air and antiquities chapters.

The NES closes with the overall recommendation that Jordan pass a law creating an independent central environmental authority and seek outside legal advice to help formulate this legislation. MMRAE has made serious progress on both counts.

What differences exist between NES recommendations and provisions of the draft law? The following six recommendations established in the NES have no specific counterparts in the draft law:

- Strengthen the capabilities of the Royal Society for Conservation of Nature in planning, training, EIAs, library resources, data bases, and photo reconnaissance (p. XIV).
- Establish special courts to handle land use problems (p. 13).
- Create a special framework in the Ministry of Water and Irrigation to develop water plans and policies (p. 35).
- Activate the role of national scientific agencies to carry out research into issues relating to water (p. 35).
- Create an environmental division within the Ministry of Energy and Mineral Resources to coordinate with DOE, initiate and oversee EIAs at mine sites, recommend control measures, receive approval from DOE for industrial projects, support planning activities, and conduct studies (p. 134).

- Create a National Air Quality Center to perform monitoring, create data bases, develop criteria, conduct studies, and train technical staff.

All the above recommendations could be carried out within the current scope of the legislation but are not presently mentioned, given the general nature of the law. None challenge the fundamental premise of the legislation, institutional supremacy for MMRAE, the Higher Council, and its implementing agency, DOE, in making environmental decisions.

C. Alternative Roles for MMRAE

Consideration of alternative roles for MMRAE (or any environmental protection agency) in Jordan revolve around answering the following six questions:

- What functions should MMRAE perform?
- In what capacity shall MMRAE fulfill environmental functions?
- In what programs should MMRAE be involved?
- Where should environmental management be centered in the Jordanian government?
- How should environmental administration be overseen within the government of Jordan?
- What should be the capabilities of the environmental protection agency?

Options for each of these issues are considered below along with major advantages and disadvantages. Then, in the final section of this report, recommendations are provided in each area.

1. What Functions Should the MMRAE Agency Perform?

Comprehensive environmental management entails work to: 1) conduct research on pollution, 2) study problems, 3) develop general approaches to address problems, 4) develop specific techniques to solve problems (e.g., development of criteria and standards and limits), 5) inform the public of obligations to use control techniques, 6) educate and train citizens on problems and responsibilities, 7) coordinate among internal and external agencies to attain environmental goals, 8) monitor and supervise environmental compliance, 9) enforce laws and regulations, 10) evaluate program effectiveness, and 11) plan new program directions. These functions may be viewed as a continuum or cycle that is undertaken in all environmental program efforts. In simple terms, it translates into program design, implementation, enforcement, and evaluation.

Which of these fundamental functions or combinations of them dictates MMRAE's basic personality as an environmental protection agency? Presently, DOE has a moderate role in program design as confirmed by its work on the NES and the draft law, although it is weak in standards development. It has a slight role in program implementation with its public information work, participation in licensing decisions, and response to public complaints. Its role in program oversight and evaluation has been negligible.

Advantages in performing all functions follow naturally from involvement in the full life cycle of a program. An agency better understands the problems and solutions needed if it is involved in all facets. Coordination between elements is improved. Individual activities may be linked to master plans and to long-term strategies. Ability to monitor compliance and progress is greatly improved and adjustments may be more easily made. Ultimate accountability is greatly enhanced.

One disadvantage of centralizing all or most program functions is that it concentrates power and may make an agency less cooperative. It also requires extensive commitment of resources across diverse technical functions.

As mentioned, MMRAE principally plays a program design function. The draft law would have DOE/MMRAE perform all functions listed above. Suggestions presented in Chapter 3 would further strengthen MMRAE's role in each programmatic function.

One alternative that has surfaced in discussing the draft law with other agencies is the maintenance of principal program implementation responsibilities within existing institutions. In other words, DOE might design criteria and standards on water pollution, for example, but WAJ would be responsible for writing permits and overseeing compliance.

The advantage, as expressed by its proponents, is that implementing agencies such as the ministries of Agriculture, Water and Irrigation, and Energy and Mineral Resources, as well as municipalities, know the regulated community better, have more resources, and will do a better job. One disadvantage of segregating program implementation is a decline in program coordination, depriving the planners and criteria developers from seeing the real world, for example. In addition, the potential for conflict of interest between resource development and environmental protection responsibilities exists. As one official stated, "How can I be both the victim and the judge?" Another commentator pointed out that existing agencies have currently had implementation responsibilities under several statutes and very little has been done.

One additional option in allocating environmental program functions came up in reviewing Jordanian institutions. Currently, the Department of Specifications and Standards (within the Ministry of Industry and Trade) has a lead role in developing environmental standards in Jordan. Thought has been given to further strengthening the role of DSS, even making it an independent authority, akin to the National Bureau of Standards. The advantage asserted is that this would further professionalize the standard-setting process in Jordan. The disadvantages are that it would deprive DOE of a very fundamental authority, and DSS has had very little expertise in environmental protection.

2. In What Capacity Should MMRAE Fulfill Environmental Functions?

For every function described above (i.e., program design, implementation, enforcement, and evaluation), DOE may serve in a support, participatory, coordinative, or leadership capacity. These are distinguished in ascending order by the degree of control asserted. Currently, DOE plays a coordinating role in program design, a support or

participatory role in program implementation, and no role in other functions. In the strategy and law, MMRAE/DOE would play a leadership role in program design, and a coordinating or leadership role in program implementation and program evaluation. With other agencies implementing programs, DOE's role might be scaled back to coordinative or participatory, and, for example, include review of licensing decisions. With DSS as a standard-setter, DOE again may be characterized as a participant.

Options leading to a lesser role for DOE than its current role as supporter, participant, or coordinator have no rational basis. Thus any alternatives probably center around MMRAE as coordinator versus MMRAE as leader. With MMRAE as coordinator, the strengths and political support of other ministries may be better accessed for environmental protection, with some accompanying loss of efficiency and clarity of direction. With MMRAE acting in a leadership capacity, commitment to environmental protection and effective direction setting should be enhanced, but with potential loss of resource support from participating agencies.

3. In What Programs Should MMRAE Be Involved?

Environmental protection efforts in Jordan include abatement of air pollution; wastewater control; drinking water protection; solid, hazardous and toxic waste management; forestry management; prevention of desertification; marine spill control; wildlife protection; mining reclamation; noise pollution control; and antiquities protection.

Another fundamental question is for which program will MMRAE perform administrative roles? One alternative includes involving DOE in only traditional pollution control programs such as air, water, noise, and waste management and keeping it out of resource development and management programs. Benefits include allowing DOE to concentrate on a smaller set of issues and generating less resistance from other agencies. Disadvantages include lack of coverage of environmental problems and potential inconsistency across programs.

Another approach might be to conduct a detailed assessment of existing environmental programs in health, agriculture, energy, water, wildlife, and antiquities to determine DOE's involvement based on the strengths and needs of existing efforts. The advantages that attend a less intrusive tack are more cooperation and focus on efforts where problems exist. The disadvantages are inconsistency, lack of centralization and efficiency, and the reasonable certainty that no existing programs would be found satisfactory anyway.

4. Where Should Environmental Management Be Centered in Jordanian Government?

Should environmental management be contained within the mandate of MMRAE or does it fit better in another ministry? Alternatives include Agriculture, Water and Irrigation, Interior, and Industry and Trade. The benefit of aligning DOE with another ministry is that many of them have better labs, staff, and budgets than MMRAE does. The disadvantage of shifting to another institution is that each has a specialized mission that does

not naturally encompass the full range of environmental issues. Moreover, all have potential conflicts of interest.

5. How Should Environmental Administration Be Overseen?

The main issue here is how DOE should be overseen. Should it be supervised by the MMRAE and the Higher Council, should it be its own authority like the Water Authority of Jordan or the Natural Resources Authority, or should it be its own ministry? The advantages and disadvantages of oversight alternatives have to do with independence and political strength, as well as resources. Theoretically, the more independent environmental functions are under DOE, the more resolute and focused environment protection can be. For a small, weak agency, however, independence may hinder its effectiveness in accessing resources and attaining objectives.

6. What Capabilities Should MMRAE Possess?

Having considered functions, capacities, programs, location, and oversight options for MMRAE, questions remain about the services and capabilities it should maintain. Should it be a full service agency with monitoring equipment, a laboratory, a library, computerized data bases, field offices, and agents? Or should it be a smaller agency with scientists, policy analysts, strategists, and enforcement specialists that delegates field, laboratory, and information management capabilities to other agencies and private and non-profit institutions?

The advantage of the full service option is that DOE would be more self-sufficient and better versed in all facets of environmental protection. The down side is the difficulty of accumulating the resources necessary to acquire this self-sufficiency. The advantage of greater delegation is flexibility in acquiring and applying resources as needed. The disadvantage is a loss of direct control and greater dependence on other agencies.

The foregoing six questions served to lay out key variables and major alternatives for institutional roles in environmental management in Jordan. Clearly, the resolution of individual issues cannot occur in a vacuum; a decision on one affects all the others.

D. Recommendations

Recommendations are provided below on MMRAE's roles for environmental protection in the Hashemite Kingdom. These suggestions are based on an analysis of environmental problems in Jordan, a review of existing laws and institutions, analysis of the draft law and the new strategy, conversations with officials at each major ministry currently involved in environmental protection, advice from His Excellency the Minister of MMRAE and His Excellency the Secretary General of MMRAE, detailed discussions at DOE, and knowledge of institutional arrangements for environmental protection in other countries.

1. Recommendation: MMRAE/DOE Should Perform the Complete Range of Environmental Functions

The strategy, the draft law, and individuals at each ministry all recognize the need for one agency to perform central and comprehensive environmental authority. Jordan has been plagued by piecemeal efforts, gaps, redundancies, and confusion. This is best solved by giving MMRAE/DOE comprehensive responsibilities in program design, implementation, enforcement, and evaluation as established by the draft law and further strengthened in the legal recommendations included herein.

Particularly important at this stage is that DOE become much more forceful in the promulgation of new criteria and standards in areas such as air pollution, hazardous waste management, and irrigation water quality where presently no environmental benchmarks exist to guide protection efforts. To this end, we advise that DSS play no leadership role in standard-setting and that DOE direct this activity. DSS has a heavy work load and has not been able to produce air criteria for several years now. Program implementation is another matter.

It is possible that existing agencies such as the Ministry of Agriculture and Ministry of Water and Irrigation, as well as municipalities, are best positioned to be the first points of contact in regulating farms, private forests, industrial water users, and industrial and municipal wastewater dischargers, for example. Such delegations are not intended as an abrogation of DOE responsibilities or authorities, but rather as a prudent use of resources and existing administrative networks to issue permits and educate citizens on environmental duties.

The draft law should generally spell out delegation of program implementation responsibilities such as licensing review, training, and routine monitoring (Article 13 Intergovernmental Provision). For example, the law might recognize that the Ministry of Health (MOH) will be responsible for all biological monitoring of drinking and irrigation waters. Then, in implementing the law, DOE should negotiate an explicit Memorandum of Understanding (MOU) with MOH spelling out what activities will be done, at what frequency, with what resources, on what timetable, with what reports submitted to the DOE, and with what provisions if MOH fails to fulfill responsibilities. Areas of general cooperation should be established for each program area and agency in the law and separate MOUs should be negotiated. DOE would retain ultimate responsibility, and if a municipality or cooperating agency failed to fulfill its duties, implementation would revert to DOE. DOE could set conditions for such delegation in regulations as well as in MOUs to reiterate administrative requirements.

DOE's oversight and evaluation roles cannot be delegated. To ensure steady, consistent, and objective assessments of environmental compliance and program progress, the central environmental authority must perform these functions.

2. Recommendation: MMRAE Should Play the Leadership Role in All Environmental Functions

On the scale of involvement from support to leadership, DOE is being given responsibility and should assert leadership for all aspects of environmental program evolution. Jordanian problems warrant focused and persistent efforts. Water supply and water quality issues are extremely urgent. For less urgent issues, early efforts that prevent pollution will obviate the need for more costly remediation. If DOE/MMRAE can develop cohesive policy to guide environmental initiatives, coordination and cooperation with other ministries will be enhanced.

In environmental affairs the tendency is to form committees to accomplish all decisions and drafts. More than one observer suggested that the way to avoid concrete action in Jordan is to form a committee. With this in mind we recommend that DOE serve in a leadership role.

3. Recommendation: DOE Should Play an Active Role in All Environmental Programs

Although MMRAE's function may vary, there is no reason that it should not conduct policymaking, planning, implementation, compliance, and oversight for every substantive area of environmental protection in Jordan. At a minimum, it must evaluate the effectiveness of all programs as a part of its policy and planning mandate. As the central environmental authority, it must act as the final guardian of public resources against pollution and damage. Other agencies may naturally contribute the means and direction for environmental problem-solving, but typically this will be ancillary to other missions such as economic development and effective resources management and allocation.

DOE should certainly prioritize those programs where total deficits exist (for example air pollution). Risk-based planning singles out urgent priorities, such as the overdrafting of wells, continued decline of the marine environment near Aqaba, and water pollution in the Zaiqa River Basin.

4. Recommendation: DOE Should Be A Unit Within MMRAE

MMRAE is the most logical organization in which to house DOE. Not only has this arrangement existed for 10 years, but MMRAE also has other missions, responsibilities, and authorities that may support DOE. For example, its supervision of municipalities and its responsibilities for regional planning mesh well with DOE's environmental mandate. No other ministry has a broad enough mission to house DOE.

The Ministry of Health might be a second choice, but the relationship of desertification and wildlife protection to environmental health is indirect at best. Programs could be divided up among ministries, but that would mimic the status quo with all its shortcomings.

5. Recommendation: DOE Should Evolve into An Independent Authority or Ministry in the Midterm

MMRAE has several critical functions, only one of which is environmental protection. Jordan's economic and social future depends on the protection of scarce resources such as water, land, and antiquities. Ultimately, the bureaucracy of environmental protection should be accorded the status of the issues themselves. This would also improve the political equity DOE might have in supervising and guiding other ministries.

Making this change precipitously, without sufficient time to acquire resources and staff, develop procedure, and build infrastructure, would postpone progress. Phased evolution of DOE from Environmental Protection Authority to its own ministry might be appropriate, allowing for mid-course correction and re-evaluation. Over time, it may also make sense to create a special court to hear environmental claims and to render expert opinions.

6. Recommendation: MMRAE/DOE Should Possess the Full Range of Skills and Services In-House, which Will Require Extensive Expansion of Existing Capabilities

DOE must have sufficient monitoring equipment, laboratory capacity, computer equipment, and, most importantly, qualified staff to fill the challenging roles that are being set for it. DOE now possesses no monitoring equipment, has been able to use RSS only sporadically, and has few computers of the kind necessary to develop standards or maintain central environmental data bases. While it is unnecessary for DOE to possess total capability, it needs a base capability to conduct compliance monitoring.

Many of DOE's small staff of only 31 are qualified, but there is an acute shortage of trained lawyers, scientists, and engineers to develop standards, issue regulations, review licenses, perform inspections, and bring enforcement actions. A tripling of staff in the immediate term is likely, with even greater expansion necessary in the short term.

Concomitant with passage of comprehensive environmental legislation in Jordan should be vigorous government funding. This commitment of resources would make meaningful implementation possible.

LIST OF REFERENCES

Ahmad, Abdullah A. 1989. *Jordan: Environmental Profile: Status and Abatement.*

Library of Congress (LOC). 1991. *Jordan: A Country Study.*

Ministry of Municipal and Rural Affairs and the Environment (MMRAE) and the International Union for the Conservation of Nature. 1991. *National Environment Strategy for Jordan.*

Ministry of Water and Irrigation and the United Nations Development Programme (MWI and UNDP). 1991. *Regulation of Industrial Wastewater Discharge in Jordan.*

U.S. Agency for International Development (USAID). 1990. *Regulation of Food, Pharmaceuticals, Drinking Water, and Occupational Safety and Health in Jordan: An Assessment.*

World Environment Center (WEC). 1988. *Kingdom of Jordan: An Environmental Assessment of Solid Waste Management.*

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