



# DISI-MUDAWARRA TO AMMAN WATER CONVEYANCE SYSTEM

## **ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN (ESMP)**

May 2009

## **ABBREVIATIONS**

<b>ASEZ</b>	<i>Aqaba Special Economic Zone</i>
<b>ASEZA</b>	<i>Aqaba Special Economical Zone Authority</i>
<b>BPT</b>	<i>Break Pressure Tank</i>
<b>BRDC</b>	<i>Badia Research and Development Centre</i>
<b>CCD</b>	<i>Convention to Combat Desertification</i>
<b>CDMP</b>	<i>Centre of Drought Monitoring and Prediction</i>
<b>CEMG</b>	<i>Construction Environment Management Guidelines</i>
<b>CESMP</b>	<i>Construction Environment and Social Management Plan</i>
<b>CLO</b>	<i>Community Liaison Officer</i>
<b>CP</b>	<i>Compensation Plan</i>
<b>CRB</b>	<i>Compensation Review Board</i>
<b>CRM</b>	<i>Cultural Resources Management unit of DAJ.</i>
<b>CRMP</b>	<i>Cultural Resources Management Plan</i>
<b>DoAJ</b>	<i>Department of Antiquities Jordan</i>
<b>DH</b>	<i>Desert Highway</i>
<b>DIS</b>	<i>Desertification Information System</i>
<b>DIWACO</b>	<i>Disi Water Company (Project Company)</i>
<b>DOA</b>	<i>Department of Antiquities</i>
<b>DOS</b>	<i>Department of Statistics</i>
<b>DP</b>	<i>Disi Project</i>
<b>DPAC</b>	<i>Disi Project Advisory Committee</i>
<b>EC</b>	<i>Environment Committee</i>
<b>EHS</b>	<i>World Bank Environmental, Health, and Safety Guidelines</i>
<b>EIA</b>	<i>Environment Impact Assessment</i>
<b>EIS</b>	<i>Environmental Impact Statement</i>
<b>EM</b>	<i>Environmental Manager</i>
<b>EMP</b>	<i>Environmental Management Plan</i>
<b>EMS</b>	<i>Environment Management System</i>
<b>EPC</b>	<i>Engineering, Procurement and Construction</i>
<b>EPCC</b>	<i>Engineering, Procurement and Construction Contractor</i>
<b>EPCC EU</b>	<i>Engineering, Procurement and Construction Contractor Environmental Unit</i>
<b>EPL</b>	<i>Environment Protection Law</i>
<b>ESA</b>	<i>Environment and Social Assessment</i>
<b>ESIA</b>	<i>Environment and Social Impact Assessment</i>
<b>ESD</b>	<i>Environment and Social Department [of the PC]</i>
<b>ESMP</b>	<i>Environment and Social Management Plan</i>
<b>EU</b>	<i>Environmental Unit (Contractor to form)</i>
<b>GAM</b>	<i>Greater Amman Municipality</i>
<b>GIS</b>	<i>Geographical Information System</i>
<b>GOJ</b>	<i>Government of Jordan</i>
<b>HCST</b>	<i>Higher Council for Science and Technology</i>
<b>IBA</b>	<i>Important Bird Area</i>
<b>IFC</b>	<i>International Finance Corporation</i>
<b>ILO</b>	<i>International Labour Organisation</i>
<b>INCD</b>	<i>Intergovernmental Negotiating Committee of Desertification</i>
<b>JADIS</b>	<i>Jordanian Archaeological Data and Information System</i>
<b>JAZPP</b>	<i>Jordan Arid Zone Productivity Project</i>
<b>JMD</b>	<i>Jordan Meteorological Department</i>
<b>JOSCIS</b>	<i>Jordan Soil and Climate Information System</i>
<b>JS</b>	<i>Jordanian Standards</i>
<b>LAL</b>	<i>Land Acquisition Law</i>
<b>LUT</b>	<i>Land Utilization Types</i>
<b>MC</b>	<i>Main Contractor</i>
<b>MCM</b>	<i>Million Cubic Meters</i>
<b>MoA</b>	<i>Ministry of Agriculture</i>
<b>MoE</b>	<i>Ministry of Environment</i>
<b>MP</b>	<i>Monitoring Plan</i>
<b>MPWH</b>	<i>Ministry of Public Works and Housing</i>
<b>MSDS</b>	<i>Materials Safety Data Sheets</i>

## **ABBREVIATIONS**

<b>MWI</b>	<i>Ministry of Water and Irrigation</i>
<b>NAP</b>	<i>National Action Plan</i>
<b>NCARTT</b>	<i>National Centre for Agricultural Research and Technology Transfer, Jordan</i>
<b>NCB</b>	<i>National Coordinating Body</i>
<b>NDVI</b>	<i>Normalized Difference Vegetation Index</i>
<b>NEAP</b>	<i>National Environment Action Plan</i>
<b>NFCD</b>	<i>National Fund to Combat Desertification</i>
<b>NGO</b>	<i>Non-Governmental Organizations</i>
<b>NPP</b>	<i>Negative Performance Points</i>
<b>NRA</b>	<i>Natural Resources Authority</i>
<b>NSMLUP</b>	<i>National Soil Map and Land Use Project</i>
<b>OHL</b>	<i>Overhead Line</i>
<b>OPIC</b>	<i>Overseas Private Investment Corporation</i>
<b>PAP</b>	<i>Project Affected Person</i>
<b>PC</b>	<i>Project Company</i>
<b>PC ESD</b>	<i>Project Company Environmental and Social Department</i>
<b>PS</b>	<i>Pumping Station</i>
<b>RJGC</b>	<i>Royal Jordanian Geographic Centre</i>
<b>ROW</b>	<i>Right of Way</i>
<b>RSCN</b>	<i>Royal Society for the Conservation of Nature</i>
<b>SC</b>	<i>Supervising Consultant</i>
<b>SG</b>	<i>Stakeholder Group</i>
<b>TDS</b>	<i>Total Dissolved Solids</i>
<b>UNCCD</b>	<i>United Nation Convention to Combat Desertification</i>
<b>UNCED</b>	<i>United Nations Conference on Environment and Development</i>
<b>UNCOD</b>	<i>United Nations Conference on Desertification</i>
<b>UNDP</b>	<i>United Nations Development Programme</i>
<b>UNEP</b>	<i>United Nations Environment Programme</i>
<b>UNPACD</b>	<i>United Nations Plan of Action to Combat Desertification</i>
<b>VC</b>	<i>Valuation Committee</i>
<b>WAJ</b>	<i>Water Authority of Jordan</i>

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## **EXECUTIVE SUMMARY**

The Government of Jordan proposed the construction and operation of a development (the 'Disi Project') which consists of a wellfield in southern Jordan at Disi, and a conveyance pipeline (and associated infrastructure) through the Eastern Desert and along the Desert Highway into Amman.

The Disi Project Environmental and Social Management Plan (ESMP) comprises two parts the ESMP and ESMP Part 2. ESMP Part 2 (ESMP2) is specific to the responsibilities of the the Ministry of Water and Irrigation (MWI) and Water Authority of Jordan (WAJ) in connection with the sovereign loan agreements.

This document forms the first of the two parts of the Environmental and Social Management Plan for the Disi Project. It describes measures that will be taken to mitigate potential negative impacts of the project on the environment and on local communities.

The ESMP has been developed from the information contained and reported on in the following documents:

- Environmental and Social Assessment – Disi-Mudawarra to Amman Water Conveyance System, prepared by Consolidated Consultants for the Jordanian Ministry of Water and Irrigation, June 2004
- ESIA Addendum 1 – Disi-Mudawarra to Amman Water Conveyance System, prepared by Dar al-Handasah for Gama Enerji A.S., February, 2008.
- ESIA Addendum 2 – Disi-Mudawarra to Amman Water Conveyance System, prepared by Dar al-Handasah for Gama Enerji A.S., March, 2008. Added to IFC website April 16, 2008.

The ESIA has been prepared in compliance with Jordanian Environmental Impact Assessment Procedures, and in accordance with international standards, as reflected in the policies, performance standards, and EHS guidance of the International Finance Corporation (IFC).

## 1 INTRODUCTION

The objective of the ESMP is to set out the measures to be taken in addressing the potential adverse impacts of the project.

This ESMP has been prepared in response to the findings of the original ESIA, the findings of the studies prepared for the ESIA Addendum 2 March 2008, and to the adoption of a BOT approach to project implementation.

The ESMP sets out the mitigation, monitoring, and institutional measures to be taken during construction and operation of the project to eliminate, reduce or offset adverse environmental and social impacts.

This ESMP requires that the eventual operator of the Project must have in place a comprehensive EMS prior to initiation of operations. It is expected that this will ensure that the issues identified in the ESIA and the Addendum will be adequately addressed.

Therefore, the emphasis in this ESMP is on the management of impacts that may arise from the pre-construction and construction Phase of the Project.

The ESMP is structured as follows:

	<b>Section</b>	<b>Content</b>
2	<b>Project Background &amp; Impacts Summary</b>	Provides a summary of the project and identified impacts (at each project phase).
3	<b>Institutional Framework</b>	Describes the institutional structure proposed for future governance and implementation of this ESMP.
4	<b>Mitigation Plan</b>	Sets out the components of the mitigation plan as: <ol style="list-style-type: none"> <li>1. Design Review</li> <li>2. Compensation Plan</li> <li>3. Cultural Resources Management Plan</li> <li>4. Construction Environment Management Plan.</li> </ol> Details each of the components, providing tables on the specific actions to be taken, roles and responsibilities.
5	<b>Monitoring Plan</b>	Details baseline and construction environmental monitoring requirements. Sets out reporting responsibilities and frequencies.
6	<b>Communication Strategy</b>	Identifies communications objectives. Proposes the ongoing public communications programme with links to project stages.
7	<b>EMS outline</b>	Provides a brief outline of the expected content of the required operational EMS
8	<b>ESMP Implementation Responsibilities</b>	Outlines the roles and responsibilities for the implementation of separate phases and components of the project ESMP
9	<b>Mitigation Measures Summary Tables</b>	Contains eight summary tables detailing mitigation measures grouped by theme: <ol style="list-style-type: none"> <li>1. General</li> <li>2. Traffic and Access</li> <li>3. Borrow Sites</li> <li>4. Natural Environment</li> <li>5. Construction Camps</li> <li>6. Hazardous Materials</li> <li>7. Waste Management</li> <li>8. Cultural Resources</li> </ol>

## **2 PROJECT BACKGROUND & IMPACTS**

### **2.1 BACKGROUND**

The project objective is to construct and operate a bulk water extraction and conveyance system to supply the Greater Amman area with potable water. The project involves abstracting water from the fossil aquifer in southern Jordan and transferring it to Amman via a 325km pipeline to supply 100 million cubic meters per year of potable drinking water.

The WAJ and MWI originally devised the concept of conveying additional water to the Greater Amman Area from the Disi Aquifer to reliably meet urgent high quality water demand shortfalls while relieving the upland groundwater aquifers from over-abstraction.

At present water is rationed on a rotational basis that enables the majority of Amman households to receive water only one day per week. The Disi water will form the major portion of the extra water that is needed to partially replace the low quality groundwater currently consumed by domestic users in Amman, as well as to meet future demand from the influx of migrants from surrounding countries.

The Disi aquifer is a fossil aquifer and therefore a finite resource; however the project is to form part of the GOJ's larger regional framework of water management and development of new resources. In the long-term these will eventually include the desalination of seawater from the Red Sea in the South. Thus, the Disi conveyance system is designed to serve the long term water delivery needs for Jordan.

### **2.2 ENVIRONMENTAL AND SOCIAL ASSESSMENT**

In 2004 an ESIA was carried out for the Disi-Mudawarra to Amman water conveyance project.

The main components of the scheme are as follows;

- Construction of a wellfield,
- Construction of a submerged pipeline and associated infrastructure (i.e. pumping stations, break pressure tanks and control centre) from the wellfield to two reservoirs in Amman, and
- Construction of power supply infrastructure to the wellfield.

Further assessment was carried out in late 2007-08 when Dar Al-Handasah were commissioned by GAMA Enerji A.S. to undertake a review of the Project EIA to determine the extent to which the contents of the EIA had been superseded by design modifications and by changes to the legal, institutional and policy frameworks that have occurred since report preparation. This resulted in the production of an Addendum to the original ESIA and further modification to the ESMP.



Figure 2.1 Project components and layout

### 2.3 PROJECT IMPACTS

Significant project related impacts defined in the 2004 ESIA and in the Addendum are listed by time of impact within project implementation in Tables 2.1 A – C.

**Table 2.1 Impact summaries**

**A Pre-Construction Impacts Summary**

<b>Impact</b>	<b>Source</b>	<b>Receptors</b>
<b>Social Unease</b>	<i>Misinformation about project activities and impacts on communities. Poorly planned and executed consultation prior to and during compensation planning exercise No, or inadequate compensation for lost business and assets. Delayed payment of compensation. Project works going ahead without prior notification to communities.</i>	<i>Affected Communities in particular but effects may be felt in wider society if incorrect data is widely disseminated.</i>
<b>Project Delay</b>	<i>Non compliance with conditions imposed on the Project</i>	<i>All project stakeholders.</i>

**B Construction Impacts Summary**

<b>Impact</b>	<b>Source</b>	<b>Receptors</b>
<b>Noise</b>	<i>Site preparation Construction camps Construction corridor Traffic Blasting Excavation of undeveloped areas Excavation of existing road surfaces Well field drilling</i>	<ul style="list-style-type: none"> <li>- <i>Populations in close proximity to the construction corridor (residential areas close to Abu Alanda reservoir, residential neighbourhoods and "service/commercial" establishments located between Abu Alanda reservoir and Amman-Madaba Bridge, populations at Al Qatraneh, Al Hesa, and El Abiad mining village, from Airport bridge to Dabuk reservoir)</i></li> <li>- <i>Populations close to off site facilities i.e. waste treatment facilities, construction camps, storage areas.</i></li> <li>- <i>Populations close to diversion routes.</i></li> </ul>
<b>Dust</b>	<i>Excavation of trench Pipeline laying Vehicle movement Materials handling Crusher operation Blasting</i>	<ul style="list-style-type: none"> <li>- <i>Populations along construction route (worst affected are those within 200m of construction corridor – highest density along Abu Alanda route).</i></li> </ul>
<b>Liquid waste generation and disposal</b>	<i>Workforce (domestic liquid waste) expected to be between 9-18 m3/capita/year from project offices, camps and storage locations. Wastes from routine maintenance and servicing of vehicles and plant. Wastes from pipeline testing and disinfection</i>	<ul style="list-style-type: none"> <li>- <i>Wastewater treatment facilities (increase demand).</i></li> <li>- <i>Natural environment and drainage courses.</i></li> </ul>
<b>Solid waste Generation and disposal</b>	<i>Construction Wastes Sand and rock fragments in addition to metals, wooden and plastic fragments that will result from the different construction and installation activities. Domestic Waste Solid wastes generated from project workforce, estimated to be 0.5 kg/capita/day.</i>	<ul style="list-style-type: none"> <li>- <i>Waste treatment facilities</i></li> <li>- <i>Landscape (from littering and fly tipping)</i></li> <li>- <i>Fauna; larger carnivores and mammals attracted to refuse stores</i></li> </ul>
<b>Spills of hazmat</b>	<i>Hazmat stored, transported and handled on site. Waste materials stored, handled on site and transported off site.</i>	<ul style="list-style-type: none"> <li>- <i>Natural environment including water courses</i></li> <li>- <i>Groundwater</i></li> <li>- <i>Communities in immediate proximity to spill.</i></li> </ul>
<b>Access roads</b>	<i>Increase in HGV use of roads to transport construction equipment and</i>	<ul style="list-style-type: none"> <li>- <i>Users of affected Public Highways</i></li> </ul>

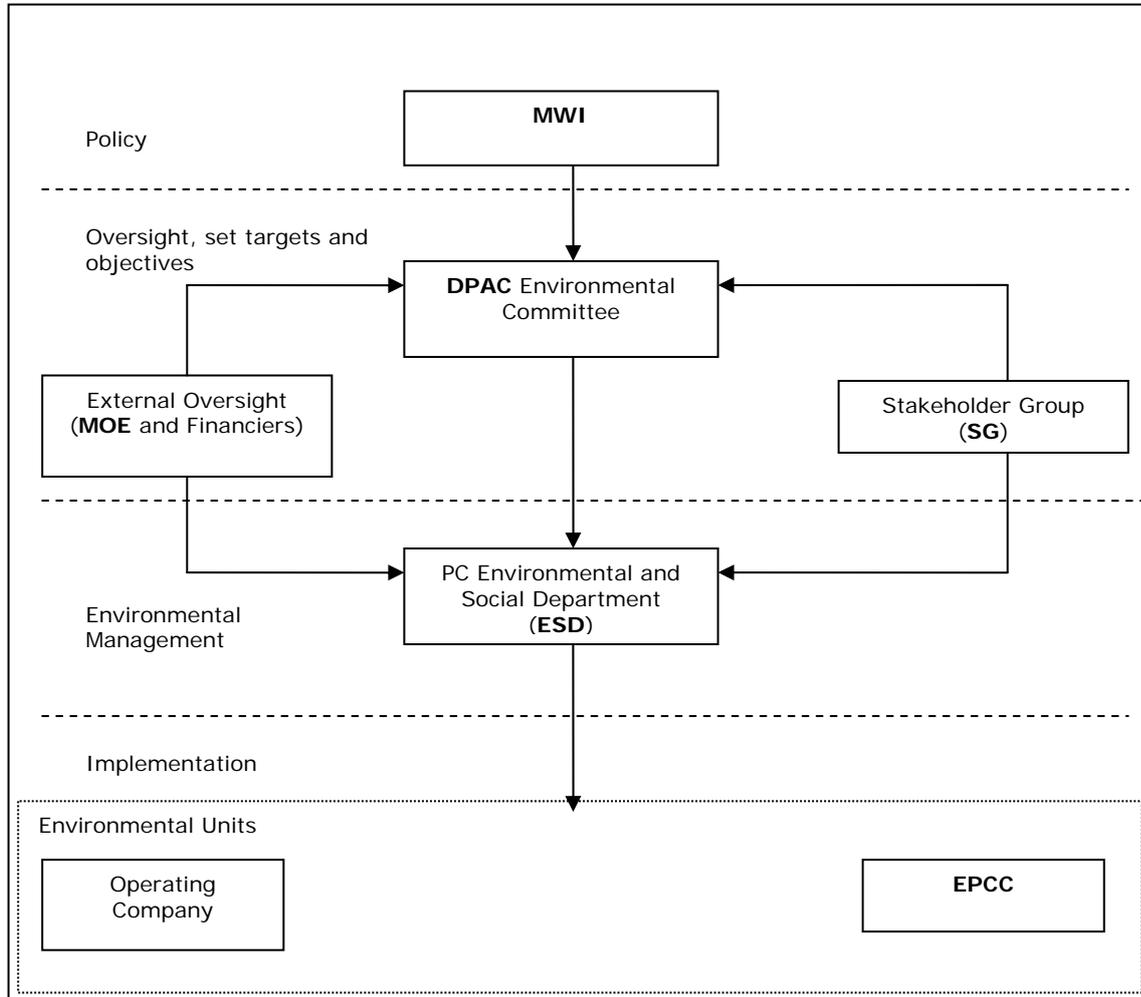
<b>Impact</b>	<b>Source</b>	<b>Receptors</b>
<b>and traffic</b>	<p>materials from the Aqaba port and raw materials sites.</p> <p>Partial and/or total closure of the local road systems, especially within the urban sections</p> <p>Partial or total loss of access to local rural road networks.</p> <p>Modification to rural road networks from creation of construction road network.</p>	<ul style="list-style-type: none"> <li>- Populated areas (termini branches most affected).</li> <li>- Natural environment</li> </ul>
<b>Visual impact</b>	<p>Visual impact from construction corridor and camps</p> <p>Visual impact of permanent structures in well field area</p> <p>Stockpiles</p>	<ul style="list-style-type: none"> <li>- Landscape of the construction site</li> <li>- Avifauna</li> </ul>
<b>Biodiversity</b>	<p>Loss of habitat at the southern zone (Eastern Plateaus, Sand Dune).</p> <p>Removal of vegetation cover and tree stands (mainly Tamarix and Acacia)</p> <p>Habitat disturbance and damage along construction corridor and access approaches.</p> <p>Disturbance to important bird areas</p> <p>Species introduction</p> <p>Illegal hunting</p> <p>Increased access to sensitive habitats</p> <p>Disturbance to fauna (noise, visual impact)</p>	<ul style="list-style-type: none"> <li>- Breeding and migratory bird species</li> <li>- Desert habitats</li> <li>- Downstream areas from wadis</li> <li>- Populations utilising natural resources of the region.</li> </ul>
<b>Socio-economic</b>	<p>Traffic disturbance,</p> <p>Disruption in water and power supplies.</p> <p>Loss of assets, including crops and trees.</p> <p>Loss of income from access restrictions</p> <p>Accidental property damage</p> <p>Reduction in agricultural production</p> <p>Reduction in sustainability of existing agriculture – loss of water resources.</p> <p>Positive</p> <p>Additional temporary customer base</p> <p>Loss of access to social infrastructure</p> <p>Labor demand for construction</p>	<ul style="list-style-type: none"> <li>- Populations in close proximity to the construction corridor</li> <li>- Populations close to off site facilities i.e. waste treatment facilities, construction camps, and storage areas.</li> <li>- Populations close to diversion routes</li> </ul>
<b>Public Health and Safety</b>	<p>Creation of hazards i.e. trenching</p> <p>Traffic hazards; vehicular-pedestrian conflicts</p> <p>Reduced air quality and visibility</p> <p>Increased accident risk from traffic diversions, and increase in HGV traffic volumes.</p> <p>Increased noise levels</p> <p>Reduced access and partial road closures</p> <p>Presence of venous/biting animals (i.e. snakes, scorpions)</p>	<ul style="list-style-type: none"> <li>- Populations in close proximity to the construction corridor</li> <li>- Populations close to off site facilities i.e. waste treatment facilities, construction camps, storage areas.</li> <li>- Populations close to diversion routes</li> <li>- Accidental spill risk to public and site staff.</li> <li>- Fauna (risk of trapping and killing)</li> </ul>
<b>Cultural heritage</b>	<p>Construction near known sites</p> <p>Excavation of chance finds</p> <p>Looting and damage to known sites</p> <p>Increased access to sites</p> <p>Pollution impacts from dust/emissions to known sites</p>	<ul style="list-style-type: none"> <li>- Mausoleum site along Dabuk branch</li> <li>- Other known sites within 300m of construction corridor and camps</li> <li>- Undiscovered sites</li> </ul>

### C Operational Impacts

<b>Impact</b>	<b>Source</b>	<b>Receptors</b>
<b>Liquid waste</b>	<i>Washouts Waste chemicals Waste lubricating oils</i>	<i>Public Operational and maintenance staff</i>
<b>Supply interruption</b>	<i>Maintenance closures Loss of pressure due to leak</i>	<i>General public Manufacturers</i>
<b>Water Quality</b>	<i>Quality decline from micro-organisms/chemical residues Leaks allow changes in quality Poor raw water quality</i>	<i>General public</i>
<b>Noise</b>	<i>Permanent plant – pumping stations, regulating tanks, treatment facilities</i>	<i>General public Operational and maintenance staff</i>
<b>Public Health and Safety</b>	<i>Hazardous chemicals</i>	<i>General public Operational and maintenance staff</i>
<b>Health and safety</b>	<i>Hazardous chemicals Confined spaces</i>	<i>Operational and maintenance staff</i>

### 3 ESMP INSTITUTIONAL FRAMEWORK

This Section details (for guidance purposes) a ‘typical’ organisational structure that may be adopted for the effective implementation of the ESMP. The proposed organisational structure is shown in Figure 3.1. The principal roles of each of the parties defined in the Figure are discussed below.



**Figure 3.1 Proposed ESMP Implementation Structure**

#### 3.1 MWI

MWI represent the highest level of DP management. In terms of the ESMP the MWI will be responsible for establishing the environmental policy for DP and for reviewing, the Annual Environmental Report.

#### 3.2 DPAC COMMITTEE

The DPAC Environmental Committee will comprise the review unit for DP environmental performance. Its members will be drawn primarily from MWI and representatives from other stakeholders.

The Environmental Manager of the Project Company (PC) should be a member of the Committee and it will be chaired by a nominated representative of MWI. If appropriate, a member of MoE may be nominated to the Committee.

The responsibilities of the Committee are as follows:

- Assess the adequacy of the management of the ESMP through annual reviews to ensure its continuing suitability and effectiveness;
- Setting performance indicators and targets for DP environmental management and review performance against those targets;
- Recommend levels of resourcing necessary to implement the ESMP, including human resources, specialised skills, technology and financial provision; and,
- Approve an Annual Environmental Report for submission to MWI.

The suggested members of the DPAC committee are as follows:

### **1.) CONSTRUCTION PHASE**

MWI – Chairman

#### *Members*

PC

EPCC

RSCN

MOE

3 x Municipal / Community Leaders – Amman, Wadi Rum and Qatranah

DAJ

WAJ

### **2.) OPERATIONAL PHASE**

MWI – Chairman

#### *Members*

Operator

MOE

WAJ

RSCN

3 x Municipal / Community Leaders – Amman, Wadi Rum and Qatranah

### **3.3 PROJECT COMPANY (PC)**

The PC will be responsible for the overall implementation of the Project ESMP and will establish an Environmental and Social Department (ESD) for that purpose.

The ESD Department Head will report directly to the CEO of the Project Company, and will be supported by adequate numbers of experienced technical staff sufficient to undertake these responsibilities, as well as adequate financial resources. Roles, responsibilities, and authorities of staff will be defined, documented, and communicated to all staff and contractors involved in ESMP-related activities.

Specific principal roles for the ESD include:

- Supporting the EPCC in the Design Review process.
- Establishment of a Human Resource Policy and Occupational, Health and Safety Policies and Plans consistent with the Jordanian Labour Law and IFC PS2.
- Implementation of human resource and occupational health and safety policies.
- Preparation of the Construction Environmental and Social Management Plan
- Carrying out construction monitoring in accordance with the requirements of this ESMP
- Carrying out environmental monitoring and reporting as per the requirements of the ESMP

- Suggesting modifications to the CEMG as necessary to improve environmental performance.
- Review and revision of the ESMP as required over the project period.

Among the key duties of the ESD will be to ensure continuous and effective dialog with communities affected by construction, and to give special attention to the management of public safety in areas within populated residential neighbourhoods.

### **3.4 ENGINEERING PROCUREMENT CONTRACT CONTRACTOR (EPCC) ENVIRONMENTAL AND SOCIAL UNITS (EU)**

The EPCC will have primary responsibility for the execution of the ESMP and the achievement of any targets set by DPAC EC and/or contained within the ESMP. Therefore it is a requirement of this ESMP that EPCC establish an environmental unit(s) for that specific purpose.

Tasks to be undertaken by EU would include:

- Undertake, self inspections, audits and other compliance assessments as per CEMG requirements;
- Carrying out construction in accordance with mitigation guidelines (CEMG guidelines).
- Carrying out day to day environmental monitoring and reporting as per the requirements of the CEMG.
- Review and propose revisions to CESMP as required;
- Design and implement a Communications Strategy, including internal and external programmes of Environmental Awareness development and education;
- Environmental reporting including preparation of Annual Reports; and,
- Maintaining an up-to-date regulatory and policy framework for the ESMP.
- Preparing and implementing the Project Compensation Plan.

The EU is expected to comprise a small unit headed by an Environmental Manager (EM) who should be sufficiently senior within the EPCC management structure to sit on decision making management boards, committees or sub committees.

The EPCC will also be responsible for carrying out the Design Review in the form of both a desk study and site validation and submit the documents/reports on the dates as set out in Appendix 4.

### **3.5 STAKEHOLDER GROUP (SG)**

The importance of stakeholder consultation is recognised in this ESMP. However, if this is to be effective it must be structured. *Ad-hoc* processes can be effective in obtaining an understanding of stakeholder concerns but they tend to promote a reactive approach to environmental management that can be confrontational and inefficient.

Creating a formal structure in which information is passed between parties on a regular basis will allow for more effective stakeholder input into the implementation of the ESMP and equally importantly, its review and revision.

To this end a SG should be established to manage the day to day consultation process. The composition of this group can be determined at a later date but should include the following core members:

- Representatives from MWI.
- PC ESD Department Head ;

- PC and EPCC Operations managers (as required);
- NGOs;
- Representatives from MoE; and,
- Other stakeholders may be invited to attend meetings to discuss specific issues these might include representatives of PAPs, MoA, NRA, Police Department, Ministry of Agriculture.

This group should meet on a two monthly basis unless further meetings are deemed necessary and should operate within parameters set in the approved ESMP and agreed at the first meeting.

MWI will be responsible for the formation of the SG.

MoE (and other agencies) may also have specific responsibilities in respect of reviewing applications for the use of raw materials, location of certain project components such as camps and crusher sites (no objections certificates issued) and for approving measures taken to remedy breaches in environmental regulations and or spills of hazardous materials. These can be most easily coordinated through the SG.

### **3.6 EXTERNAL OVERSIGHT**

MoE as the nominated National Authority for environmental affairs will undertake their normal oversight function on behalf of the Government.

International financiers will undertake external oversight to ensure compliance with their guidelines and standards and any conditions they may have imposed on the project in their financing agreements.

### **3.7 OTHERS**

A number of 'other institutions' will need to be established to implement the ESMP. These comprise:

- Valuation committees; to determine compensation rates as required in the CP.
- Compensation Review Board (CRB). Required to hear and adjudicate on compensation appeals.

## 4 MITIGATION PLAN

The environmental and social impact assessment process is the driver for the elimination, reduction and management of project impacts. The hierarchy of mitigation embedded within the differing stages of project implementation and adopted for the Disi Project are set out below in Table 4.1 and discussed briefly below.

**Table 4.1 Mitigation Hierarchy**

Mitigation Hierarchy	Rationale	Impact management tool or measure	When in ESA process
<b>Avoid impact (eliminate)</b>	<i>Early identification of impacts and subsequent adjustment of design and timing where possible to avoid sensitive environments.</i>	<p><b>Design Review</b></p> <p><i>Initial design criteria and ESIA study review have led to revision and review of alignments for the Disi conveyance to avoid sensitive habitats, cultural sites, and non-government land.</i></p> <p><i>Additional review is required during the final design process to minimise impacts further.</i></p>	<p><i>Detailed Design Stage</i></p> <p><i>Site planning</i></p>
<b>Reduce impact severity</b>	<i>If adverse effects cannot be prevented, steps must be taken to reduce them by minimising the cause of impact at source and by abatement on site and abatement at the receptor</i>	<p><b>Application of Good Construction Practice</b></p> <p><i>Measures implemented and monitored through a Construction Environment Management Plan (CSEMP).</i></p> <p><i>Measures to reduce impacts include:</i>  <i>Use of abatement equipment at construction sites.</i>  <i>Provision of abatement equipment to receptors.</i>  <i>Use of alternative construction process.</i>  <i>Operational controls</i></p> <p><b>Application of Good Operational Practice</b></p>	<p><i>Measures to reduce impacts include:</i></p> <p><i>Use of abatement equipment at Pre-construction, Construction Operations</i></p>
<b>Remedy or offset impact</b>	<i>When significant effects remain that cannot be prevented they are offset by remedial or compensatory action.</i>	<p><b>Compensation Plan</b></p> <p><i>Financial compensation for lost assets</i>  <i>Compensation payments for financial loss/loss of land.</i></p> <p><i>Creation of compensation habitat and/or enhancement of habitat.</i>  <i>Relocation of assets i.e. trees, archaeological features, monuments, public art.</i></p>	<p><i>Detailed Design Stage</i></p>

### 4.1 DESIGN REVIEW

The Design Review has two objectives:

(i) To eliminate or minimise potentially adverse social and environmental impacts by subjecting the proposed design of the conveyor alignment and wellfield to multi disciplinary review on an iterative basis.

In this case specific objectives of the review process would be to:

- Minimise the overall footprint of the well field, wells roads, power lines and other facilities and infrastructure;
- Minimise the visual effects of the above on the landscape;
- Minimise potential adverse impacts of the well field and conveyor design on biological resources;
- Minimise potential adverse impacts on cultural resources. In this case, it is recommended that an archaeologist approved DAJ carry out walkover surveys of the proposed impact areas of design components;
- Review wadi crossings to minimise impact to natural environment (habitats, flow paths etc); and
- Minimise potential social and economic costs associated with construction of the conveyor. To include further consultations with affected communities.

(ii) To demonstrate that full coordination has been undertaken with the relevant utility authorities and with other ongoing and committed projects. This should serve to minimise adverse effects on local communities.

To provide evidence of the completion of a Design Review as specified, the ESMP requires that a Design Review Report is included in the final design documentation.

The Design Review would be carried out by the EPC design engineers and their environmental advisors and would include site visits as required. The DIWACO ESD will provide support to EPCC in preparing the design review if requested.

#### **4.2 COMPENSATION PLAN (CP)**

As indicated in Chapter 6 of the ESIA Addendum 2, compensation for land acquisition has been completed for all project works except the pumping station at the Madaba Highway interchange. It is understood from discussions with MWI that negotiations for the acquisition of these lands are ongoing and are expected to be completed shortly.

For the ESMP, it is further assumed that any compensation due to Government agencies resulting from Project requirements will be resolved by negotiation on an agency to agency basis.

If during execution of the Project EPC Contractor needs additional land other than defined in Project Agreement to be provided by MWI, EPC Contractor will , compensate land owners for temporary use of the land, as appropriate.

Therefore this Compensation Plan has been drawn up to:

- Establish the project's strategy for compensating individuals physically and/or economically displaced;
- Establish the projects strategy for livelihood restoration for temporary and/or permanent displacement;
- Provide a description of all types of asset ownership and/or user rights of the population likely to be affected by the project;
- Describe the process for consulting with the affected populations in the planning, implementation and monitoring of the compensation process ;and
- Detail the proposed Project grievance redress mechanism.

Compensation entitlements under this CP are outlined in the Entitlement Matrix provided in Table 4.2.

Implementation of the CP shall be the responsibility of MWI, PC and EPCC as per Project Agreement and EPC Contract respectively. The principal agent will be a Community Liaison Officer (CLO) operating from within PC ESD.

Boxes 4.1 to 4.5 (located at the end of this Section) provide a detailed programme of activities or tasks to be completed in undertaking the CP.

The principal elements of that programme are discussed briefly below.

**(i) Confirmation of Entitlements Matrix**

It is evident from the legal and policy review that no specific guideline is available to determine precisely what compensation is to be due to whom. In this regard, the guidelines of IFC , as meeting or exceeding the legal requirements of all parties, have been adopted for use in this ESMP. These provide a definition of the types of compensation that could be paid but they do not include triggers or indicators as to when such compensation might be paid.

Triggers are provided in Table 4.3 a-b but it will necessary for all parties involved in the implementation of the Project to agree on the final entitlements matrix and triggers to be applied.

**Table 4.2 Entitlements Matrix**  
**A. Private Lands Outside Public Highway Rights of Way**

Type of Loss or Disturbance	Definition of Entitled Person (EP)	Definition of Entitlement	Actions	Responsible Agency
<b>a. Land acquisition</b>				
Arable Land	Land owner	<p><i>Land</i> Cash sum compensation at full market value</p> <p><i>Crop</i> Market value plus 15% for loss. Market value = average of last three years price. Yield based on land capability and location within agroclimatological zones as assessed by Ministry of Agriculture.</p> <p><i>Built Assets</i> Cash compensation at replacement cost.</p> <p><i>Trees/Vines</i> Olive, Almond, Vines 20 yrs NPV discounted at 12% per dunum irrigated.</p> <p><i>Other</i> Lump sum to be negotiated</p>	<p>1. Creation of the Project Valuation Committee comprising:</p> <p>a) a representative of the MWI b) a member of the affected community c) a representative of the Ministry of Finance d) two professional valuers, one each from the private and public sector.</p> <p>2. Determination of market value for land, assets and crops.</p> <p>3. Confirmation of Land Ownership</p> <p>4. Grievance resolution relating to entitlements within project framework.</p> <p>5. Opening bank accounts in the name of PAPs.</p> <p>6. Prompt Payment by cheque within the stipulated period.</p> <p>7. Issuance of Certificate of compensation</p> <p>8. Public Notice of all awards to PAP</p> <p>9. Payment of all duties on the purchase of land not occupied by government.</p>	<p>1. MWI Department of Lands</p> <p>2. Valuation Committee</p> <p>3. Land Directorate</p> <p>4. Compensation Review Board</p> <p>5. MWI</p> <p>6. MWI</p> <p>7. Land Directorate</p> <p>8. MWI</p> <p>9. MWI</p>
Subdivided Land	Land Owner	<p><i>Land</i> Cash sum compensation at full market value.</p> <p><i>Assets</i> Cash compensation at replacement cost</p>		
Built lands	Land Owner	<p><i>Residential building</i> Cash compensation at full market value plus 15% for dislocation.</p> <p><i>Commercial</i> Cash compensation at full market value plus 15% for dislocation.</p>		
Other Assets (e.g. wall, infrastructure, etc).	Asset Owner	Cash compensation at full market value.	<p>1. Estimate payment.</p> <p><i>Tasks 4 to 7 from (a)</i></p>	<p>1. Valuation Committee</p> <p><i>Items 4 to 7 from (a)</i></p>
<b>b. Economic Losses</b>				
Loss of Business	Business Owner – if	<p><i>Re-establishment cost.</i> Acquisition of access to equivalent premises and moving</p>	1. Creation of Business Valuation Committee comprising:	1. MWI Department of Lands

Type of Loss or Disturbance	Definition of Entitled Person (EP)	Definition of Entitlement	Actions	Responsible Agency
	different from land and building owner.	costs including deposits down payments etc. Plus 25% for economic dislocation; for loss of income in move plus loss of customer base.	a) a representative of the MWI b) a member of the affected community c) a representative of the Ministry of Finance d) Two professional valuers, one each from the private and public sector.  2. Determination of business loss value  <i>Tasks 4 to 7 from (a).</i>	2.Valuation Committee  <i>Items 4 to 7 from (a)</i>
Loss of Employment	Employee	<i>Lost Income</i> Compensate demonstrable loss income for a given period as a result of project activities in accordance with Jordanian Labour Law. To apply to all employees irrespective of nationality.	1. Estimate payment in accordance with prevailing labour law.  2. Grievance resolution relating to entitlements within project framework.  3. Payment of cash to PAPs  4. Issuance of Certificate of compensation	1.Valuation Committee  2. Compensation Review Board  3. MWI  4. MWI
<b>c. Temporary Economic Losses</b>				
Temporary Loss of Business Income	Business Owner – all cases	<i>Lost Income</i> Negotiated payment equivalent to estimated loss of earnings plus 15% for dislocation and loss of customer base.	1. Estimation of losses  <i>Tasks 4 to 7 from (a)</i>	1. Business valuation committee.  <i>Items 4 to 7 from (a)</i>
Loss of wage /salary income	Employee	<i>Loss of Income</i> Pro-rata compensation to make up income to pre-project levels for duration of expected shortfall.	1. Estimate payment.  <i>Tasks 4 to 7 from (a)</i>	1.Valuation committee  <i>Items 4 to 7 from (a)</i>
<b>d. Loss of Residence</b>				
Loss of residence	Tenant	<i>Relocation cost.</i> Costs of obtaining rental of equivalent premises including moving costs, deposits, down payments, transport costs etc. Plus 15% dislocation fee.	1. Estimate payment  <i>Tasks 4 to 7 from (a)</i>	1.Valuation committee  <i>Items 4 to 7 from (a)</i>
<b>e. Nuisance Effects</b>				
	All affected land users	None – If affected person feels compensation is due they may seek redress through the courts.	Civil process. Parties to respond in accordance with their legal need.	Determined by court.

**B. Within Public Highway Rights of Way**

Type of Loss or Disturbance	Definition of Entitled Person (EP)	Definition of Entitlement	Actions	Responsible Agency
<b>a. Assets</b>				
All assets	Asset owner	<p><i>Fixed Structure</i> Cash compensation at replacement cost.</p> <p><i>Temporary Structure</i> Nil – owner advised of start of operations in advance of project works and may relocate.</p>	<p>1. Estimate payment</p> <p><i>Tasks 4 to 7 from (a)</i></p>	<p>1. Valuation committee</p> <p>Items 4 to 7 from (a)</p>
<b>b. Economic Losses</b>				
Loss of Business	Asset owner	<p><i>Lost Income</i> Negotiated payment for economic dislocation.</p>	<p>1. Estimation of losses</p> <p><i>Tasks 4 to 7 from (a)</i></p>	<p>1. Business valuation committee.</p> <p>Items 4 to 7 from (a)</p>
Loss of Business	Asset operator/user/tenant – if different from asset owner.	<p><i>Lost Income</i> Negotiated payment for economic dislocation.</p>	<p>1. Estimation of losses</p> <p><i>Tasks 4 to 7 from (a)</i></p>	<p>1. Business valuation committee.</p> <p>Items 4 to 7 from (a)</p>
Loss of Employment	Employee	<p><i>Lost Income</i> Negotiated payment</p>	<p>1. Estimate payment in accordance with prevailing labour law.</p> <p>2. Grievance resolution relating to entitlements within project framework.</p> <p>3. Payment of cash to PAPs</p> <p>4. Issuance of Certificate of compensation</p>	<p>1. Valuation Committee</p> <p>2. Compensation Review Board</p> <p>3. MWI</p> <p>4. MWI</p>
<b>c. Temporary Economic Losses</b>				
Temporary loss of Business Income	Owner – all cases	<p><i>Lost Income</i> Negotiated payment equivalent to estimated loss of earnings plus 15% for dislocation and loss of customer base.</p>	<p>1. Estimation of losses</p> <p><i>Tasks 4 to 7 from (a)</i></p>	<p>1. Business valuation committee.</p> <p><i>Items 4 to 7 from (a)</i></p>
Loss of wage /salary income	Employee	<p><i>Lost Income</i> Negotiated payment equivalent to estimated loss of earnings plus 15% for dislocation and loss of customer base.</p>	<p>1. Estimation of losses</p> <p><i>Tasks 4 to 7 from (a)</i></p>	<p>1. Business valuation committee.</p> <p><i>Items 4 to 7 from (a)</i></p>

**Table 4.3 Indicative Triggers for Application of Compensation****A. Private Lands Outside Public Highway Rights of Way**

Type of Loss or Disturbance	Entitled Person	Entitlement	Trigger
<b>a. Land acquisition</b>			
Arable Land	Land owner	Land Crop Built Assets Trees/Vines	Any land under production Any cropped area All assets All trees
Subdivided Land	Land Owner	Land Assets	All affected land up to 25% of plot at rate per m <sup>2</sup> Beyond 25% right to purchase entire plot. All assets
Built lands	Land Owner	Residential building Commercial Other	Any direct impact on structure – entire building. If structure would be left unsuitable for existing purpose (loss of access etc) entire structure.
<b>b. Economic Losses</b>			
Loss of Business	Business Owner – if different from land and building owner.	Re-establishment cost.	Any case of forced relocation
Loss of Employment	Employee	Lost Income	All employees made redundant
<b>c. Temporary Economic Losses</b>			
Temporary Loss of Business Income	Business Owner – all cases	Lost Income	Following implementation of design review mitigation and consultation. 1) Large business with planned daily delivery and out-shipment of goods. No interruption permissible without compensation. 2) Any business dependent on drive in access. No total loss of access during main business hours without compensation 3) Medium and small business > Compensation payable for closure of business due to loss of access. 4) Compensation for reduced access.
Loss of wage /salary income	Employee	Loss of Income	All cases when specified by business owner.
<b>d. Loss of Residence</b>			
	Tenant	Relocation cost	Any case of forced relocation.
<b>e. Nuisance Effects</b>			
Disturbance	All affected land users	None	None. Legal process to be applied.

**B. Within Public Highway Rights of Way**

Type of Loss or Disturbance	Entitled Person	Entitlement	Trigger
<b>a. Built assets</b>	Asset owner	Fixed Structure	Any constraint preventing continued operation at present level Removal of asset
<b>b. Economic Losses</b>			
Loss of Business	Asset owner	Lost Income	Inability to carry on trading as result of loss of all or part of structure.
Loss of Business	Non owner operator	Lost Income	
Loss of Employment	Employee	Lost Income	All cases when specified by business owner.
<b>c. Temporary Economic Losses</b>			
Temporary loss of Business Income	Owner – all cases	Lost Income	1) SME businesses Compensation payable for closure of business Compensation for reduced access to businesses 3) Shack/Kiosk – None. Structure can be easily relocated.
Loss of wage /salary income	Employee	Lost Income	All cases when specified by business owner.

**(ii) Compensation Inventory**

Once the entitlements matrix is defined and the Design Review complete, an inventory of potential affected properties and assets will be undertaken. Once these are defined, an affected persons census must be carried out to define individual entitlements. This will include:

- Asset owners,
- Building / site users,
- Persons employed by building owners or users.

Prior to the implementation of the inventory and notification process and irrespective of the consultation and survey process proposed therein, there is a need to undertake a consultation to advise the communities that the Project will be going ahead and that it will affect their community.

In particular the consultation will be used to explain the compensation process to the community and will emphasise the rights held by affected persons in respect of their entitlement to compensation and the right to appeal. A more detailed description of the proposed Consultation process is provided in Section 6.

The consultation will take the form of community meetings held in each affected community under the auspices of the relevant Municipality.

It should be noted that the inventory survey and subsequent CP activities will not necessarily be implemented as a single programme. In reality, given the physical length of the project works and the expected duration of construction, it is just as likely to be implemented over a number of years and on a when required basis, just ahead of the construction programme.

A scope of work for a census study is provided as Appendix 1.

**(iii) Notification**

Once the affected assets are defined affected individuals shall be notified of the expected project impact. Notifications will be placed in two National newspapers and at each affected Municipality.

**(iv) Valuation and Negotiation**

Once the affected persons and asset census has been completed it will be necessary to establish which potential impacts may be resolved fully or partly through solutions other than the payment of compensation.

The following provides a hierarchy of mitigation:

1. Micro level investigation of engineering options
2. Where design review can not eliminate impacts prepare appropriate traffic management plan – in consultation with Police and other authorities to minimise impacts.
3. Advance warning via community consultation to allow for adaptation where possible.
4. Modify construction process to shorten construction time in some sections.
5. Use affected businesses for supplies, maintenance contracts and or provide employment during construction.
6. Negotiate cash settlement for compensation.

Impacts that may be resolved by other solutions should be addressed in the design review and entitlements development process and should be based on discussions held with the affected parties.

Cash compensation will be considered only where it is clear that other solutions can not completely resolve the issue. Where such a need is defined, PAPs will be contacted again to be informed of the date for a valuation visit. PAPs will be offered the opportunity to attend (or delegate someone on their behalf to attend) the visit but if no response is received within 14 days of notification of the valuation visit, the valuation will take place in the absence of the PAP.

After the visit, the valuation will be prepared and a notification delivered to the PAP. This will specify the nature of any compensation to be paid, the level of compensation to be paid, and the timing of payment of that compensation.

To provide valuations, two valuation committees shall be established the Land Valuation Committee and the Business Valuation Committee. These shall be guided in their deliberations by a pre-established valuation framework developed for the project.

Once PAPs have been identified and notified and a valuation prepared and received, further discussions and negotiations with individual PAPs will be initiated. PAPs will have the right to appeal the valuation provided within a 28 day period from receipt of notification of the valuation.

A period of 60 complete days shall be available to all PAPs for negotiation after receipt of the initial valuation. Three cases may apply.

#### ***No Appeal***

If no intent to appeal is received by the end of the 28 day period the PAP will be visited by the CLO and requested to sign a document agreeing to the compensation offer. Once a final agreement is signed it will be forwarded for approval and subject to the completion process.

#### ***Appeal Lodged***

If an appeal is lodged the MWI with the help of the Municipality (if requested) may seek to negotiate with the PAP for the remaining element of the 60 day period to seek a compromise. If at the end of that period no agreement is reached and ratified (as above) the case will be referred to a Compensation Review Board (CRB).

However, if the PAP wishes to he may demand a hearing at CRB without further negotiation.

Though negotiations will be entered into on a case by case basis they will be framed by guidelines developed for the purpose and by an approvals process. They will seek to ensure that appropriate and fair redress is given at an acceptable cost. The process should not be accepted as a mechanism for the granting of wish lists, or as a pre-defined means of extracting additional compensation, but as a true negotiation. Negotiations will be carried out by MWI on behalf of the Project.

#### ***No Response***

If the PAP does not respond to the initial valuation and no further response is obtained within a 60 day period from the date of receipt of the initial valuation and provided it can be adequately demonstrated that reasonable effort has been made by the CLO to contact the PAP the case should be referred to the CRB for approval of the draft compensation offer. In this case letters of notification of approval of the compensation should be served if possible.

The funds allocated for this compensation should be placed in a bank account for a minimum period of 5 years from the date of issuance of the payment, to be claimed by the PAP on proof of eligibility.

**(v) Appeal Process**

Given that there is no specific legal basis in Jordanian law for the provision of any compensation defined in the entitlements matrix no formal appeals process exists outside of the civil courts. Therefore a project specific process must be developed.

Four possible appeals are envisaged. The timing of the appeals within the compensation process, and the appeals process are illustrated in Box 4.2 – 4.3 & 4.5 and described below.

**1. Appeal Against the Intent to Expropriate.**

Appeals may be lodged in writing by the PAP during the 15 day interval following publication in the newspapers of the intent to acquire land. Appeals are to be lodged with relevant municipalities. All appeals will be acknowledged in writing and considered by the relevant municipalities and the PC.

**2. Disputed Ownership.**

Disputes may arise over who is entitled to compensation. Lack of formal documentation over the status of a piece of land, asset or tenancy agreement may lead to such disputes, affecting the project implementation. In such cases the further verification of status of the entitlement by MWI/PC and other relevant parties will be necessary.

This may include consideration of a variety of documentation:

- Copies of land titles, mortgage deeds, revenue receipts or other legal tender showing ownership of tenancy;
- In the case of renters of farmed or rented land, documentary evidence of the understanding between the landowner and the renter, if available;
- In case of customary land use, verification and evidence of use for land, and
- For proof of residence, voters list or any other official record.

The municipality will attempt to facilitate an agreement within the project framework, failing which the case will be referred to the Valuation Committee for resolution.

Any PAP will have the right to appeal through court proceedings. In these cases the compensation process will proceed through to valuation irrespective of the status of the land. Compensations due will be assessed and funds held in a Bank Account until the conflict is resolved.

**3. Appeal against the Compensation Valuation.**

A single appeal against the Compensation Valuation is proposed. This will be heard by the CRB, an independent review body established for the purpose. The decision of the CRB will be final.

The CRB will review each case and come to one of three recommendations:

- (i). Reconfirm the original offer;
- (ii). Propose a revised offer at the hearing; or
- (iii). Establish new guidelines for the development of a revised offer to be developed under negotiation.

If agreement is still not reached under revised guidelines, the Municipality will confirm the details of the last offer in writing to the person concerned and refer the matter back to the Valuation Committee. In the event that the committee do not revise the offer, *either* party may refer the matter to the Courts.

**4. Appeal to the Courts.**

Article 10 of the Jordanian LAL states that failure to agree on levels of compensation at this stage will lead to the matter being referred to the Courts. Clearly, all citizens of Jordan have the right to take legal advice and to pursue compensation through the Civil

Courts. However, once a decision to use the civil courts has been made the compensation process is taken out of the hands of the project specific implementation structure.

The judgement of any civil court will be binding on all parties. However, if the asset to be acquired is not classed as directly affecting a residential unit (either by demolition or in making the property uninhabitable) the acquisition process will proceed on the basis of the last valuation made by the CRB. Any changes on that compensation ordered by the courts will be settled as required.

#### ***(vi) Completion***

Once an agreement is reached payments will be made to PAPs.

Past experience in Jordan is clear in establishing that cash is the preferred means of compensation, provided it was adequate and paid in time and in full. All monetary compensation in this Plan will be provided in the form of cheques. All cheques will be paid in to specially opened bank accounts. Copies of all records of payments will be attached together with a copy of the PAPs national identity document. Once the certificate of compensation is signed it will be placed in a personal file containing the documentary record of entire compensation process. The original file will be the property of the PAP. One copy will be retained by MWI, and a third will be lodged at the Municipality Offices for a period of 5 years.

Once compensation matters are completed, a Certificate of Compensation will be prepared. This will certify that the full cash compensation has been paid according to the agreed valuation.

#### ***(vii) Monitoring***

Three levels of CP monitoring are proposed:

- Internal Project Monitoring of the Performance of the CP with respect to the effectiveness of the processes established and ultimately therein, the disbursement of compensation.
- Independent Monitoring of the Processes and the Compensation.
- External Monitoring.

These are reviewed in more detail in Section 5.3.4. of this document.

#### ***(viii) Vulnerable Groups***

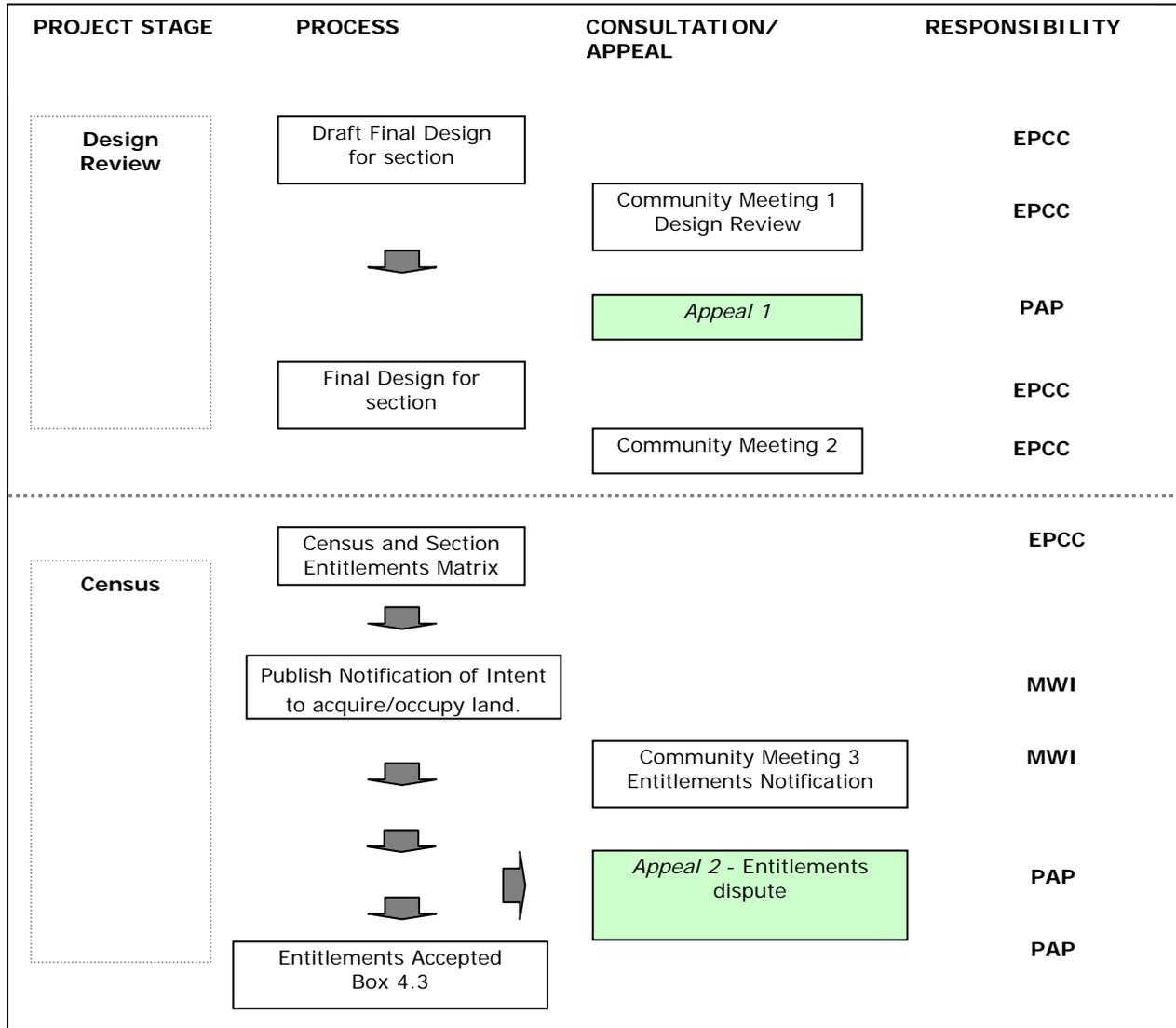
It is possible that a number of PAPs will be women that will be subject to pressure or harassment to sign over their rights or relinquish their entitlement under this CP.

This issue should be addressed in the Census process with women only meetings and consultations held if required. In these meetings women specialists will be employed to ensure that the PAPs are aware of their rights and entitlements and that they are also aware of the assistance that will be available to them to ensure that those rights are exercised.

Finally, no payment will be made for compensation to a female PAP to a bank account other than opened specifically for her (as the sole account holder) by the Project. Payment to pre-existing joint signatory, or new joint signatory accounts will not be permissible.

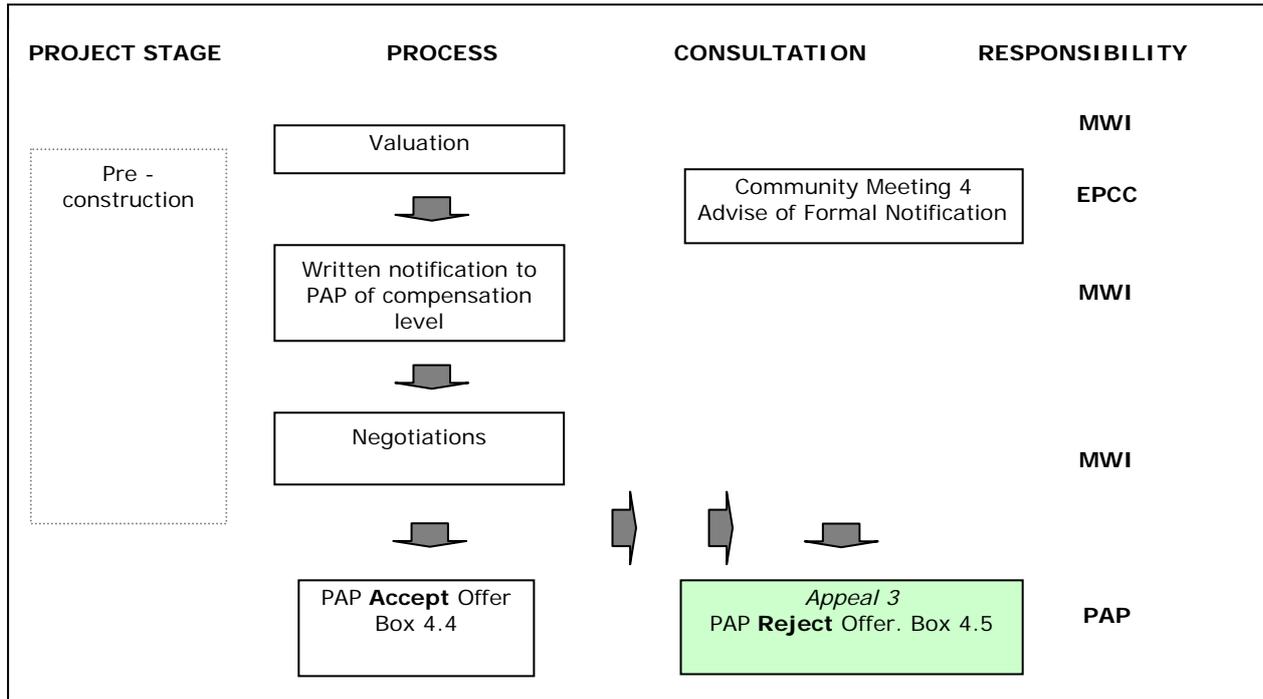
	<b>ACTION</b>	<b>RESPONSIBILITY</b>
Oct 2009	Establish environmental units within PC and EPCC	<b>PC/EPPC</b>
End 2009	Establish evaluation land and business evaluation committees.	<b>MWI</b>
	Finalise Grievance Resolution Process (GRP)	<b>MWI</b>
	Establish Compensation Review Board	<b>MWI</b>
End 2009	Establish negotiation and awards framework	<b>MWI</b>
	Confirmation of entitlements matrix	<b>MWI</b>

**Box 4.1 Required Preparatory Actions**

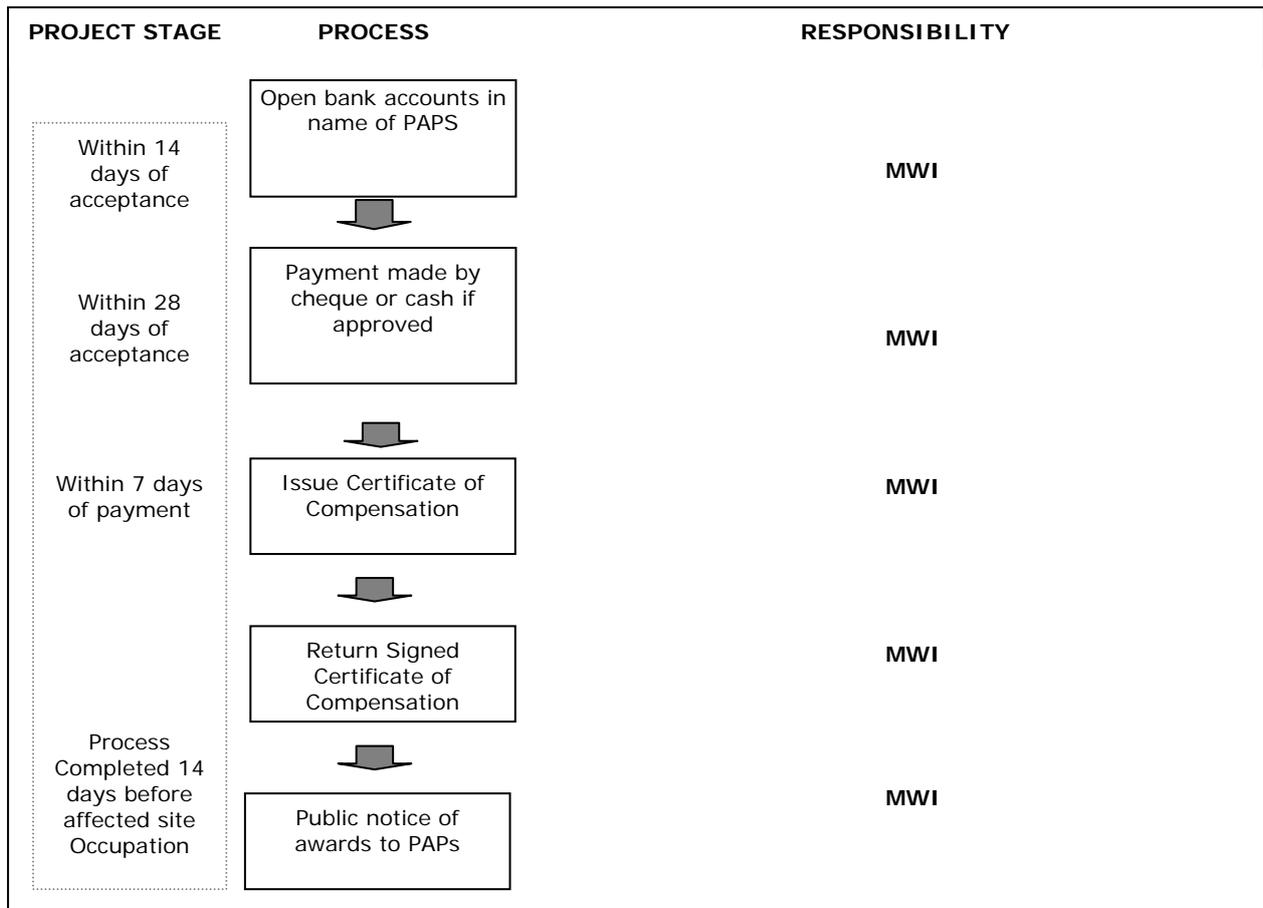


Box 4.2

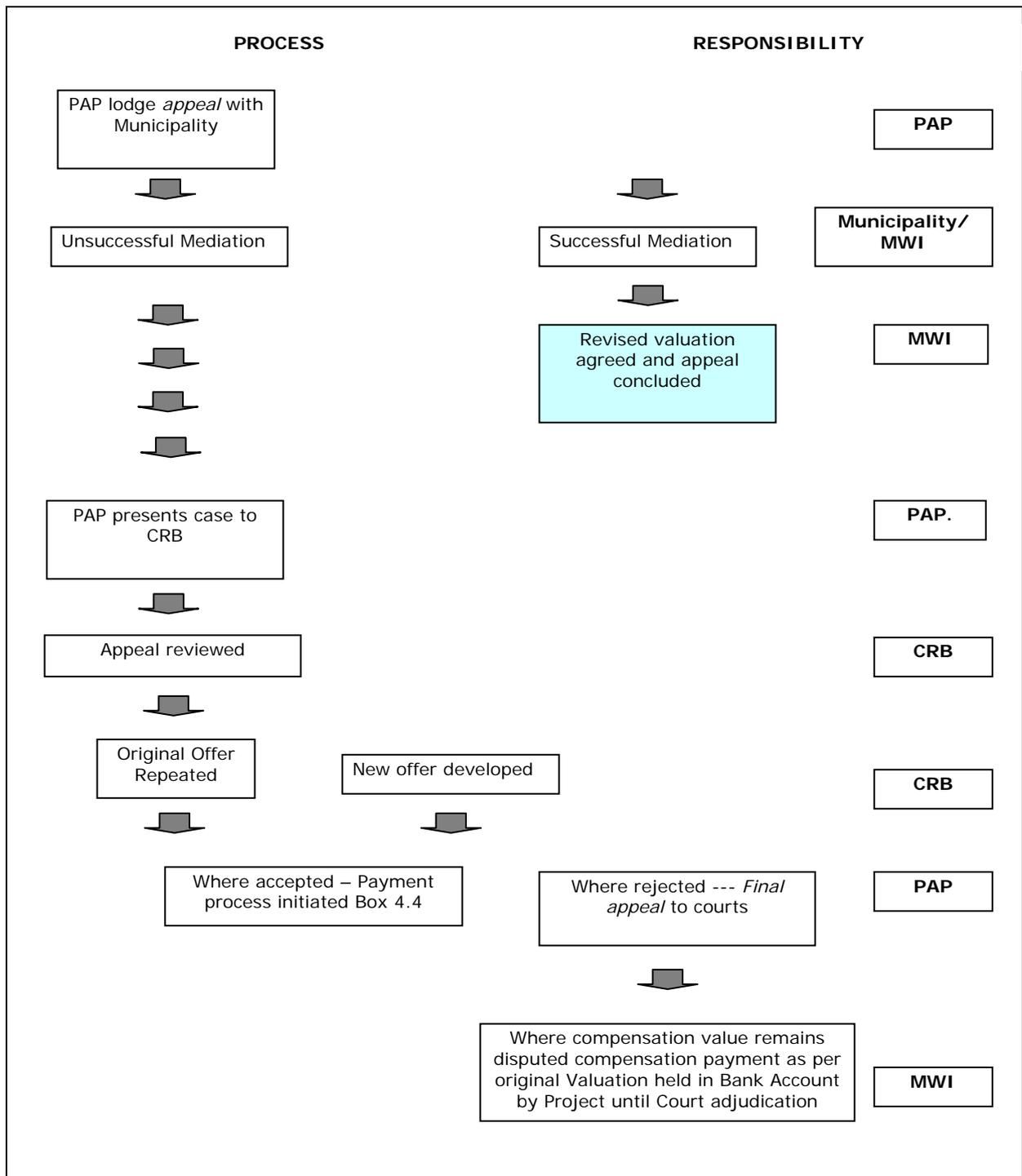
Design Review and Definition of Compensation Entitlement



**Box 4.3 Valuation Process**



**Box 4.4 Payment Process**



**Box 4.5 Grievance Resolution Process**

### **4.3 CULTURAL RESOURCES MANAGEMENT PLAN (CRMP)**

The CRMP will have three main components:

#### ***(1) Design Review***

Within the design review the following tasks will be completed.

- Final determination of risk to any identified sites; while there is no requirement for any known site a final assessment of the risk to identified sites should be undertaken in the preparation of the final design.
- Co-ordination with stakeholders; DAJ, Ministry of Awqaf and Islamic Affairs and Communities as required.
- Consideration of any indirect threats.

This review is intended to be interactive process between the design team and the Cultural Resources Management (CRM) unit of DAJ.

#### ***(2) A Construction Monitoring Programme***

Two forms of inspection will be required:

- i. Event Specific; These will be pre-programmed events such as the opening and demarcation of a borrow area, and the opening of any construction site in proximity to an identified site. In addition CRM will carry out a walkover survey of all proposed access roads with a view to approving (non objection) that alignment.

To facilitate these operations, the EPCC will provide sufficient advance notice to DAJ of the impending opening of borrow pits, quarries, access/detour roads, dumping areas, camps of storage facilities.

In order to avoid delays in the project and construction schedule, archaeological work will be conducted by DAJ in close co-ordination with the PC and EPCC.

Any additional monitoring that may arise from chance finds or additional excavations will be the subject of specific agreement between the PC and DAJ.

- ii. Random Inspections; additional site inspections should be carried out on a regular basis but not necessarily to a structured pattern. A minimum of 1 visit per quarter to contract sites is required.

All monitoring of contractor activities will be carried out by the CRM project team.

#### ***(3) Chance Find Procedures***

If during construction, sites are found that were not located during previous archaeological work, construction work must be stopped immediately and the DAJ regional office informed of the discovery. The importance of the remains found will be evaluated by a DAJ inspector.

#### **4.4 CONSTRUCTION ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (CESMP)**

The objective of CESMP is to ensure that all contractors performing work on the DP do so in accordance with regulatory environmental, social and health protection guidelines and that in doing so they:

- Formulate comprehensive work instructions to be adopted by contract personnel for the protection of the quality of the environment,
- Take action to eliminate or minimize risks of harm to local ecosystems,
- Assure the protection of the environment based on sustainable development principles,
- Develop a system for implementing the guidelines.

##### **4.4.1 CESMP Content**

The CESMP is the mechanism by which it is proposed potential construction impacts will be managed. At this time it is envisaged that the CESMP will comprise a Compliance Framework document supported by separate guidance notes as follows:

Guideline CEMG–01 General Guidelines  
Guideline CEMG–02 Waste Management  
Guideline CEMG–03 Hazardous Materials Management  
Guideline CEMG–04 Construction Camps  
Guideline CEMG–05 Access Management Plan  
Guideline CEMG–06 Borrow Sites  
Guideline CEMG–07 Ecology and Wildlife Management  
Guideline CEMG–08 Cultural Heritage

In each case the CEMG guidelines will be designed to meet the requirements of relevant National Environmental Standards.

In addition, specific contract provisions are required to mandate formal adoption by all 'Project Contractors' of a Community Relations, Security, Health, Environment, and Safety Policy, or equivalent, compatible with the requirements of Jordanian Labor Law and IFC PS2 (which is based on ILO Convention). This will provide information to employees regarding their rights under national labor law and employment terms, and will address compliance with legal requirements such as minimum wage, hours of work, overtime payments, health and safety conditions, contributions to health insurance and pension schedules, and other legally-mandated employment terms.

Draft Tables of Contents for the individual Compliance Framework Document and the CEMGs are provided in Appendix 2.

##### **4.4.2 Use of CESMP**

The CESMP requires that the EPCC makes reasonable efforts to conform to the specified CEMGs.

Persistent non-compliance with the requirements of the CEMGs shall incur negative performance points (NPPs) that will reflect the contractor's poor performance in meeting their environmental obligations. The Negative Performance Point scale shall be based on the nature and severity of the non-compliance events, and will be specified with respect to pre-defined inspection checklists made available to the EPCC.

The compliance status of the EPCC will be determined in quarterly reports prepared by PC following site inspections using the pre-prepared checklists.

**4.4.3 Compliance System**

An inspection and compliance reporting programme without an associated sanctioning or compliance recognition system will have no value. Similarly, a system that is designed only to react to inspections reports will have limited value.

For long term benefits to accrue, a compliance recognition system must have the wider objective of improving overall contractor performance. To do this it must:

- Ensure all project contractors understand that a clean environment is a critical element of the product delivered on completion of their contract.
- Ensure contractors are aware of their responsibilities and accountability in order that they become proactive in implementing the necessary environmental protection measures.
- Promote self identification of existing work practices that contaminate and otherwise damage the environment and promote adoption of suitable modifications.

A draft system programme of penalties, based on NPP system outlined is outlined below based on the intervention thresholds shown in Table 9.4. NPP will be defined and informed by PC to EPCC.

**Table 4.4 Intervention Thresholds for Non-Compliance with CESMP by Contractors**

Threshold Level	Intervention Action
1	<i>Advisory note of non-compliance requesting corrective action</i>
2	<i>Issue written warning and request schedule of corrective action</i>
3	<i>Written warning of threat of imposition of financial penalty – withholding of payment.</i>
4	<i>Issue withholding notice.</i>

A critical element of the CESMP is that it requires all contractors involved in the Project to certify that they will undertake their contractual obligations in compliance with the CESMP. No contractor shall be permitted to operate on Project sites unless they have duly signed the certificate. An example of a certificate of compliance is attached as Appendix 3.

**4.4.4 CESMP Preparation**

The CESMP will be prepared by EPC Contractor and certified as compliant with the requirements of this ESMP by the Project Company prior to work start.

**4.5 MITIGATION MANAGEMENT PROPOSALS**

Tables 1-8 located at the end of this document (Section 10) document specific mitigation measures to be undertaken during the preconstruction, construction and operational phases of the project. These measures are grouped under the following themes:

- General
- Traffic and Access
- Borrow Sites
- Natural Environment
- Construction Camps
- Hazardous Materials

- Waste Management
- Cultural Resources

The division of measures into these themes is intended to link into the CEMGs (as outlined above in section 4.5.1); with the specific measures within the summary tables managed through the CEMGs.

Overall responsibility for implementing the ESMP lies with PC. This will be achieved by the ESD working cooperatively with the EPCC Environmental Units and other government stakeholders to minimise project impacts and by direct monitoring of EPCCs compliance with the ESMP. In summary the majority of the ESMP mitigation actions are delegated to the EPC Contractor, with DIWACO (through their ESD) checking that the EPCC are fulfilling these requirements.

The PC ESMP implementation activity includes ensuring that governmental authorities are contacted when appropriate (such as obtaining no objection letters). These bodies include (but are not limited to)

1. DAJ in respect of cultural resource issues,
2. MoE in respect of compliance with environmental standards,
3. MoA with respect to the removal of crop or native tree species,
4. local municipalities with regard to traffic planning/street closures and
5. Public Utilities in respect of service interruptions.

## 5 MONITORING PLAN

### 5.1 PLAN COMPONENTS

The Monitoring Plan (MP) comprises five elements

- CRMP Monitoring
- CESMP Monitoring
- CP Monitoring
- Environmental Quality Monitoring
- External Monitoring

At the operational stage remaining impacts will be managed through a series of O&M Procedures developed under the framework of the proposed EMS for the operation of the Project. These are not reviewed further here.

### 5.2 CRMP

The monitoring component of the CRMP was outlined in Section 4.4 (ii) of this document and comprises two forms of inspection:

- *Event Specific:* These will be pre-programmed events such as the opening and demarcation of a borrow area, and the opening of any construction site in proximity to an identified site.
- *Random Inspections:* Additional site inspections should be carried out on a regular basis but not necessarily to a structured pattern. A minimum of 1 visit per quarter to contract sites is required.

All monitoring of contractor activities will be carried out by the CRM project team.

### 5.3 CESMP

Monitoring will be undertaken to verify and document that construction and commissioning activities associated with the construction of the pipeline and associated facilities (temporary and permanent) are conducted in compliance with the requirements of the CESMP. It will also ensure the feedback necessary to update and revise the CESMP is available.

The principal mechanism by which monitoring will be achieved will be a programme of site inspections and audits. However, it is also required in this ESMP that the EPCC has the capacity to undertake environmental quality monitoring in response to complaints from the community (discussed further in section 5.3.3).

#### 5.3.1 Site Inspections

##### **EPCC**

Primary responsibility for monitoring compliance with the CESMP will rest with the EPCC Environmental Monitoring Units<sup>1</sup> (EMU). Staff from the EMU will carry out regular site

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<sup>1</sup> Given the length of Project Pipeline it is expected that monitoring would be split between individual EMUs assigned to the management of Project Sections. Environmental monitoring reports for the various project Sections will then be collated by the EPCC Environmental Manager and submitted to PC.

inspections using pre-prepared checklists. Monthly inspection and compliance reports will be issued to PC and to the MoE.

These inspections are intended to provide the contractor with an internal record of his performance in respect of the CESMP and to indicate areas of non-compliance. To further facilitate effective implementation of the CESMP, weekly meetings will be held between EPCC Environmental Units, PC ESD and sub-contractors to discuss project issues and areas of concern to all parties.

### ***Project Company (PC)***

The application of NPPs as specified in the CESMP will be based on the findings of validation inspections carried out on a quarterly basis by PC using the same checklists used by the EPCC in their internal inspections.

With respect to the above, it should be noted that EPCC and PC inspections will be carried for all project facilities, and that EPCC will be responsible for all project sites including those that may be operated solely by sub-contractors.

This raises an important consideration for EPCC. Recent experience in Jordan indicates that the accrual of NPP during site inspections is most directly related to the performance of Sub-contractors, not that of the Main Contractor themselves. In this case, it may be in EPCC's interest to include in their selection criteria consideration of the likely performance of a sub contractor with respect to CESMP.

### **5.3.2 Audits**

Project Company will retain the capacity to undertake audits to monitor project construction sites and camps including sites beyond the construction corridor i.e. waste disposal sites.

Annual audits will be undertaken of all major facilities including the following:

- Main Construction Camps and Yards;
- Labour Camps;
- Main Non-Hazardous Material Storage Area;
- Hazardous Materials Storage and Use;
- Waste Disposal Sites,

Subsidiary and/or temporary camps, yards and storage area, small sites, and other sites outside the area of construction, for example, quarries and fabrication yards, may be subject to audit on a random basis.

### **5.3.3 Complaints Monitoring**

The CESMP requires that the EPCC retains the capability to undertake environmental quality monitoring in respect of water quality, air quality (dust) and noise in response to complaints received or at the request of PC. In all cases the decision to undertake such surveys will rest with PC.

The equipment required for this purpose should be purchased by the EPCC to specifications provided by PC. All EPCC EU staff shall be trained in the use of such equipment.

### **5.3.3.1 CP Monitoring**

Three forms of Compensation Plan monitoring are proposed.

- Internal Project Monitoring of the Performance of the CP with respect to the effectiveness of the processes established and ultimately therein, the disbursement of compensation.
- Independent Monitoring of the Processes and the Compensation award.
- External Monitoring.

### **5.3.3.2 Internal Monitoring**

Internal monitoring will be a primary responsibility of PC. The programme will have a number of specific objectives:

- To provide early warning of CP related project difficulties and concerns.
- To monitor the progress of CP implementation against predetermined performance targets.
- To ensure that payments are made to the correct individual and as in the compensation agreement and that other entitlements are also made available as promised.
- To facilitate the work of the external and independent monitors through effective record keeping and the preparation of Project Progress Reports for each period the CP is operational.

The programme will be implemented through a fortnightly progress report prepared on the basis of documentation provided by the EPCC and obtained from weekly meetings between the EPCC, EMU and PC.

### **5.3.3.3 Independent Monitoring**

PC agrees independent monitoring of the implementation of the CP by the Lender's IE. The primary objectives of this monitoring are as follows:

- to review compensation negotiation processes to ensure that **all** PAPs are receiving adequate support and advice from the Project and that some are not being disadvantaged by poor CLO performance.
- to monitor the reaction of the PAP community to the processes and procedures adopted in the implementation of the CP programme and to document opportunities for the future improvement.
- to ensure that compensation is paid on a timely basis.
- to respond to complaints received over late or delayed payments or negotiation concerns, etc.
- to review the deliberations of the CRB (including observation of proceedings if felt necessary).

The monitor shall have the right to access all documentation held in a PAP file and to review any case he wishes. The monitor will report to the DPAC for information.

## 5.4 ENVIRONMENTAL QUALITY MONITORING

Three EQM programmes are proposed.

### 5.4.1 Water Quality

The water quality monitoring programme will comprise Baseline and monitoring surveys. In both cases, sampling and testing of water quality in compliance with JS 286/2008 Drinking Water Quality. Further water quality monitoring under the responsibility of MWI will also be undertaken as specified in ESMP Part 2.

#### **(i) Baseline**

The baseline parameters and frequency to be tested for new wells under this standard are as follows:

<i>Tested once every 3 months for the first year</i>	<i>Tested once every 6 months for the first year</i>
<ul style="list-style-type: none"> <li>- pH</li> <li>- TDS</li> <li>- Total Hardness</li> <li>- Ammonium</li> <li>- Aluminium</li> <li>- Manganese</li> <li>- Iron</li> <li>- Copper</li> <li>- Zinc</li> <li>- Sodium</li> <li>- Chloride</li> <li>- Sulphates</li> <li>- Colour</li> <li>- Turbidity</li> <li>- Nitrates</li> <li>- Nitrites</li> </ul>	<ul style="list-style-type: none"> <li>- Arsenic</li> <li>- Lead</li> <li>- Cyanide</li> <li>- Cadmium</li> <li>- Chrome</li> <li>- Barium</li> <li>- Selenium</li> <li>- Boron</li> <li>- Mercury</li> <li>- Silver</li> <li>- Nickel</li> <li>- Antimony</li> <li>- Fluoride</li> </ul>

For the Baseline study, water will be abstracted from three well sites selected by MWI to represent the well field. These samples shall be tested prior to operations as required and on completion of each testing programme a report will be prepared for submission to WAJ for information. On completion of the entire testing package a comprehensive report of the Baseline Programme will be prepared and submitted to WAJ to approve water from the Disi aquifer for use as a potable water source.

#### **(ii) Operations**

After the first year of well operation the frequency and parameters to be tested according to JS 286/2008 are as follows:

<i>Tested once every 3 months for the first year, then annually</i>	<i>Tested once every 6 months for the first year, then annually</i>
<ul style="list-style-type: none"> <li>- pH</li> <li>- TDS</li> <li>- Total Hardness</li> <li>- Ammonium</li> <li>- Aluminium</li> <li>- Manganese</li> <li>- Iron</li> <li>- Copper</li> <li>- Zinc</li> <li>- Sodium</li> <li>- Chloride</li> <li>- Sulphates</li> <li>- Colour</li> <li>- Turbidity</li> <li>- Nitrates</li> </ul>	<ul style="list-style-type: none"> <li>- Arsenic</li> <li>- Lead</li> <li>- Cyanide</li> <li>- Cadmium</li> <li>- Chrome</li> <li>- Barium</li> <li>- Selenium</li> <li>- Boron</li> <li>- Mercury</li> <li>- Silver</li> <li>- Nickel</li> <li>- Antimony</li> <li>- Fluoride</li> </ul>

<i>Tested once every 3 months for the first year, then annually</i>	<i>Tested once every 6 months for the first year, then annually</i>
- Nitrites	

Water quality shall be monitored during operations by the operator and monthly compliance reports (with respect to JS 286/2008) provided to DPAC, MoE and WAJ.

#### **5.4.2 Biodiversity**

During the design review Biodiversity assessments will be carried out by EPCC for the well field area and the alignment from the well field to the public highway. In the well field this will comprise of a review and a specific well sites and proposed alignments for local access roads and power lines. Outside the well field it will comprise of a further rapid appraisal of the final alignment. In each case the objective of the assessment will be to define baseline conditions and to identify sites at risk that may need to be the subject of specific design consideration and or construction planning and management.

After construction is completed further monitoring will be required over a period of 3 years to ascertain if possible changes to access patterns resulting from project construction and associated possible changes in resource use patterns have affected or could affect any identified significant resources.

This will take the form of discussions with traditional communities and site visits. Six visits are proposed for an ecologist for 3 years.

#### **5.4.3 Condition of Renewable Water Resources**

Disi Project documentation is explicit in determining that a principal benefit of the Disi project is that it will reduce the extraction pressure on the renewable aquifers that currently supply potable water to Amman and therefore will permit some recovery in the quality and quantity of water available from these resources in the future.

Accordingly, the project should seek to measure the extent to which these benefits actually accrue.

It is understood that most of these aquifers are regularly monitored by the authorities and that good existing trend data is available. In this case it is proposed that DPAC prepare a 2008 baseline report of the key aquifers indicating their present status and forecast their future status based on present trends.

This document should be reviewed and updated at the time of start of operation of the Disi Conveyor and every 5 years thereafter for at least 15 years.

### **5.5 ESMP REPORTING AND REVIEW PROCESS**

#### **5.5.1 Reporting**

Figure 5.2 provides a summary of the proposed Project Reporting Structure.

##### ***CESMP***

A structured program of Reporting will be required to support the CESMP.

##### ***Monthly Inspection Reports:***

Prepared by the EPCC and circulated for information purposes internally within EPCC and

for approval to PC ESD. These will comprise reports on the internal site inspection programme and will be intended to inform EPCC and the PC ESD of ongoing environmental performance. In particular, they will identify areas of contractor non-compliance with the CESMP and provide guiding remarks on remedial actions to be taken. The significance of the non-compliance will also be reported in respect of possible penalty imposition.

*Quarterly Inspection Reports:*

These will be prepared by the PC ESD and will be the primary source of information on ongoing project activities and environmental compliance. It will contain the statement of compliance or otherwise with the CEMG that determines whether withholding penalties will be applied and will be circulated widely among project stakeholders.

*Annual Report:*

Reporting on the ESMP as a whole shall be on an annual basis via Annual Reports prepared by the PC ESD and submitted to MWI for review by the end of October each year. The Annual Report should include the following:

- Review of environmental policy;
- Review of the defined environmental indicators, any changes introduced during the year to reflect new legislation and/or internationally-accepted best practice, and the impact of these changes on the level of environmental protection offered;
- Summary of the environmental monitoring programmes undertaken during the year, discussion of the results, and assessment of compliance;
- Discussion of any major environmental incidents, to include the causes and reasons for the lack of prevention, the impacts suffered, any special mitigation measures suffered, and any amendment to the ESMP and/or ESD procedures to prevent reoccurrence;

Forthcoming changes in Jordanian environmental legislation and/or regulations that will require amendment of the ESMP and/or ESD policy/procedures, details of the likely changes, and cost estimates for their implementation.

In addition to the above the ESMP requires ESD to submit a Design Review Report that documents the measures taken during the detailed design to limit or otherwise mitigate adverse project related environmental and social impacts.

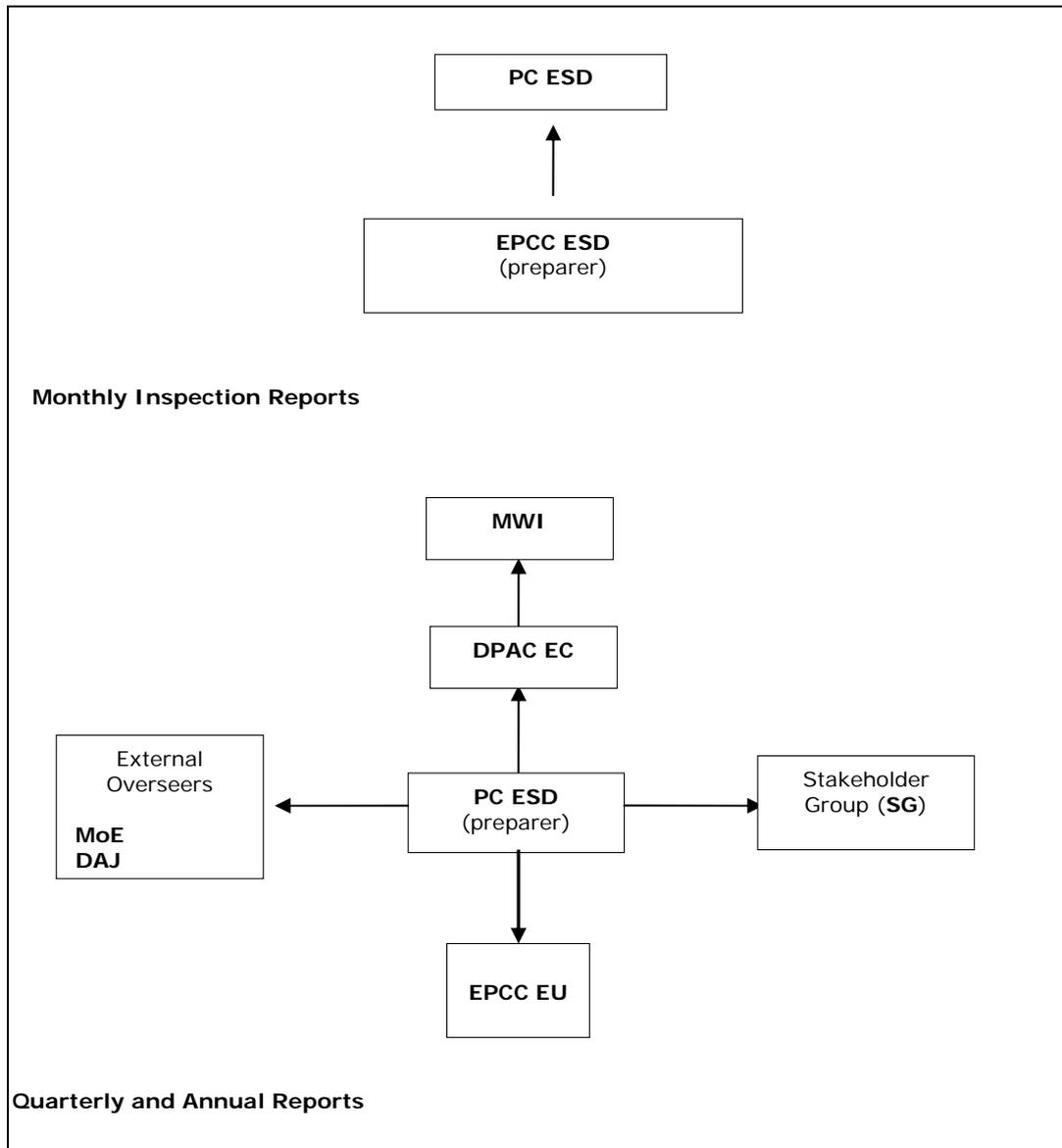
***Design Review Report***

The Design Review Report will detail the measures taken to avoid potential environmental and social impacts during the design review process. The Report will be prepared by the EPCC, with assistance from the ESD, and circulated to EPCC, DPAC committee and international financiers as required.

***Operational Compliance***

The O&M company will compile bi-annual environmental reports detailing compliance with operational guidelines and management plans.

Each of the operational guidelines and management plans should be reviewed in turn, with the indicators and monitoring results discussed. The rate of compliance should be presented, non-compliance detailed and proposals made for mitigating incidents of repeated non-compliance.



**Figure 5.2 Summary of CESMP Reporting Structure**

### 5.5.2 ESMP Review Process

Without routine management review and support, the ESMP will quickly cease to be a useful management tool. Therefore, the ESD will review the effectiveness of the ESMP at the mid-point of the construction schedule. This review will be undertaken by ESD and will include consultation with key stakeholders. All aspects of the Plan shall be open for review but it is expected that the focus will be on:

- The adequacy of the ESMP and related management programs to achieve the desired outcomes and to define any changes that might be necessary to ensure continued compliance with applicable Jordanian law and IFC's Performance Standards.
- Results of E&S monitoring undertaken during the past year and review of compliance with appropriate and relevant requirements; and
- Discussion of major incidents, including causes, impacts suffered, and changes needed to the ESMP and related operating procedures to prevent reoccurrence.

## **6 COMMUNICATIONS STRATEGY**

It is recommended that the Project establish a Communications Strategy. This will have 3 objectives:

- ensure relations with affected communities remain positive throughout project construction process and during operations,
- address the specific needs of components of the ESMP, and
- ensure that the project has in place a specific strategy and policy for dealing with other external parties.

The Communications Strategy will need to be developed by the PC with the support of MWI.

In the specific case of Consultation with affected communities it will be necessary during the design stage of the Project for the PC to undertake a programme of consultations with every major community affected. The objective of this programme would be to:

- Provide information about the project to communities; project purpose, nature of works, timing of works, etc.
- Receive comments from communities.
- Facilitate the design and implementation of the compensation process
- Establish strong project links with affected communities.

At this time the Consultation Programme shown in Table 6.1 is envisaged.

Community Liaison Officers (CLO) should be nominated to facilitate the consultation and act as a single point of contact for community complaints / information requests during the construction of the Project.

It is also desirable that Project offices are opened in affected communities. These offices may be manned on a part time basis but should be manned according to a fixed weekly schedule and would remain open throughout the Project Construction Period.

Table 6.1 sets out a programme for the consultation and appeals process.

**Table 6.1 Proposed Consultation and Appeals Programme**

<b>Project Stage</b>	<b>Consultation / Appeal</b>	<b>Objective</b>
<b>Draft Design</b>	Community Meeting 1	Project Update Introduce relevant CLO. Show project design and request comment Initial advisory on compensation process and appeals option.
<b>Census and Entitlements definition</b>	Appeal 1	Against the alignment. Request changes to avoid assets etc. Advisory that census is going to start and what that means. Explanation of entitlements. Explain appeal and review process and timings.
<b>Valuation</b>	Written notification Community Meeting 2	Project Update Public Notification Discussion of options and outline assistance available to PAP in the process.
	Appeal 2	Entitlement and ownership dispute.
	Appeal 3 Negotiation/completion of valuation process	Against valuation Individual negotiations with PAP.
<b>30 days before CS</b>	Community Meeting 3	Advise of start of works and measures proposed to minimise impacts on community Reconfirm complaints and grievance processes.
<b>90 days after CS</b>	Community Meeting 4	Status Update and response to comments
<b>360 days after CS</b>	Community Meeting 5	Status Update and response to comments
<b>720 days after CS</b>	Community Meeting 6	Post Project completion meeting 1
<b>1080 days after CS</b>	Community Meeting 7	Post Project completion meeting 2
<b>1460 days after CS</b>	Community Meeting 8	Post Project completion meeting 3

## **7 ENVIRONMENTAL MANAGEMENT SYSTEM (EMS)**

Under IFC guidelines, client will establish and maintain a Social and Environmental Management System appropriate to the nature and scale of the project and commensurate with the level of social and environmental risks and impacts.

For the purposes of this ESMP this is considered to require the Disi Pipeline Operator to establish an EMS and prior to the start of operations.

Accordingly, the Operator will be required to:

- Establish an Environmental Policy.
- Establish an Environmental Management Capability.
- Establish an Environmental Information System.

## 8 ESMP IMPLEMENTATION RESPONSIBILITIES

Table 8.1 outlines the roles and responsibilities for the implementation of separate phases and components of the project ESMP and ESMP Part 2.

**Table 8.1 Role of Project Parties in ESMP Implementation**

Action	Element in ESMP	RESPONSIBLE PARTY								
		MWI	DPAC EC	PC ESD	EPCC EU	Operator	SG	MoE	Municipalities	Other
<b>Preparatory Works</b>										
1	Obtain Approval for EIA and EIA Addendum from MoE	E								R
2	Establish PC ESD			E				N		
3	Establish DPAC Environmental Committee	E						N		
4	Establish SG	E						N		
5	Establish EPCC EU			N	E					
6	Develop and Implement External Communication strategy	S		N	E		N			N
7	Community Consultation	S		N	E		N	N	S	
8	Coordination with External Agencies – Permitting and Consultation	S		S	E		S			N
9	Establish Human Resources and Health and Safety Polices and Plans	N	N	E	N			N		
<b>Design Review</b>										
10	Desk study design review			S	E					
11	Site Validation		S		E				S	
12	Prepare Design Review Report	R	R	S	E					
<b>Compensation Plan</b>										
13	Develop Valuation Guidelines for Committees	E			E				S	S
14	Confirmation of Entitlements Matrix	E			E		N			
15	Compensation Inventory	E	N		E				S	
16	Notification	E	N	N					S	
17	Establish Valuation Committees and CRB	E		N					S	
18	Valuation and Negotiation	E	N	N					S	
19	Appeal Process	E	N	N					S	
20	Completion – Payment and certification	E	N	N	N				N	
<b>CEMG</b>										
21	Finalise CEMG for inclusion in EPC Contract Documents	N		E	N			N		
22	EPCC Certification of Willingness to Comply with CESMP		N	N	E		N	N		
23	Establish EPCC EU			N	E		R			
24	Identify and train relevant staff.		N	N	E			N		
25	Develop management plans		N	R	E			N		
26	Implement management plans			R	E					
27	Obtain approval for location of off site facilities		N	N	E		N/R	N	N/R	R
28	Maintain complaints register		N	N	E		N	N	N	
29	Prepare internal monitoring programme			N	E					
30	CESMP review and revision		N	E	N		N	N		
<b>Monitoring Plan</b>										
31	Undertake day to day monitoring			N	E					
32	Undertake Monthly Check Monitoring		N	N	E		N	N		
33	Undertake Facilities Audits		N	E	N		N	N		
34	Penalty Review Inspections	N	N	E	N		N	N		
35	External Reviews	N	N	N	N		N	N		E

Action	Element in ESMP	RESPONSIBLE PARTY								
		MWI	DPAC EC	PC ESD	EPCC EU	Operator	SG	MoE	Municipalities	Other
	<b>CP</b>									
36	Appoint external inspector	E		N	N					
37	Internal Monitoring			E	N					
38	Independent Monitoring		N	N						E
39	External Monitoring		N	N			N	N		E
	<b>Environmental Quality</b>									
40	Water Quality Baseline		N	N	E			N		N
41	Water Quality Monitoring	N	N	N	E	E		N		N
42	Biodiversity Baseline		N	N	E			N		N
43	Biodiversity Monitoring		N	N	E			N		N
	<b>ESMP(incl. CESMP) Reporting</b>									
44	Monthly			N	E					
45	Quarterly	N	N	E	E		N	N		
46	Annual	N	N	E	E		N	N		
	<b>Develop EMS</b>									
47	Develop Disi Project Operational EMS			N		E				
48	Implement EMS	N	N	N		E		N		
49	Review and Revise EMS	N	N	N		E		N		
50	Bi annual Operational Compliance Reporting	N				E		N		N

**Key:** R= Review/clear    E= Execute    S= Support    N= Notified

## 9 MITIGATION ACTIONS SUMMARY TABLES

Table 9.1 Mitigation actions summary tables (1-8)

1 GENERAL						
PHASE	ASPECT	Action no.	MITIGATION MEASURES/ACTIONS	Location	Action Responsibility	Approver
PRE - CONSTR <sup>M</sup>	EM Plan – CEMGs	G1	<p>The PC must set up the Environmental and Social Department (ESD) to produce CEMGs, establish HR policies, H&amp;S policies, and carrying out monitoring. The following CEMGs should be prepared:</p> <ul style="list-style-type: none"> <li>▪ General</li> <li>▪ Site Waste</li> <li>▪ Traffic &amp; Access</li> <li>▪ Hazardous Materials (including explosives use and storage)</li> <li>▪ Cultural Resources</li> <li>▪ Natural Environment</li> <li>▪ Borrow sites</li> <li>▪ Construction Camps</li> </ul>	-	PC	
	EM Administration	G2	The ESD must appoint an Environmental Protection Officer (EPO) who must monitor the contractor's compliance with the Environmental Management Plan (EMP).		ESD	
		G3	<p>The EPC must set up the Environmental Unit(s) to a level that ensures all active project sections have sufficient capacity to implement CESMP. The unit will:</p> <ul style="list-style-type: none"> <li>- Complete the CESMP,</li> <li>- Carry out the design review,</li> <li>- Complete management plans as required by the CEMGs</li> <li>- Commence compliance monitoring following start of construction</li> </ul>	Throughout project	EPCC	
	Land acquisition	G4	The final alignment demarcation and assessment should be completed for the specific construction section of the Site	Site	Contractor	
		G5	Final compensation plans for each major construction section of the Site are to be completed	Site	MWI	
	EMP plans	G6	The contractor is to prepare spill response plans	All worksites	Contractor's EU	ESD
		G7	The contractor is to prepare Hazardous Materials Management Plan in accordance with the relevant CEMG	Camps / staging areas/construction sites	Contractor's EU	ESD
		G8	The contractor is required to produce a Site Waste Management Plan in accordance with the CEMG guidelines.	Throughout project	Contractor's EU	ESD
		G9	Traffic Management Plans are to be developed in consultation with local police and communities. The CEMG Traffic & Access Management should be followed. Each should be 2 weeks before construction of section.	Throughout project	Contractor's EU	Police / Civil Defence / ESD

1 GENERAL						
PHASE	ASPECT	Action no.	MITIGATION MEASURES/ACTIONS	Location	Action Responsibility	Approver
		<b>G10</b>	Project section Cultural Resource Management Plans (CRM) are to be finalised and to cover all sensitive areas (temporary camps, staging areas, temporary access roads, permanent roads).	-	Contractor's EU	ESD / Dept Antiquities
		<b>G11</b>	All workers at site should be provided with information in their own language regarding: The place of employment. <ul style="list-style-type: none"> <li>- Compensation for the employment.</li> <li>- A description of employment activities.</li> <li>- The period of employment.</li> <li>- Transportation, housing and any other employee benefit to be provided and any costs to be charged for each benefit.</li> <li>- The existence of any labor organizing efforts, including but not limited to alternative means for workers to express grievances regarding working conditions and terms of employment.</li> <li>- Any education or training to be provided or made available, including the nature and cost of such training, who will pay such costs and whether the training is a condition of employment, continued employment, or future employment.</li> <li>- Protections for non-Jordanian workers under Jordanian labour laws.</li> </ul>	For all contracts	PC / Contractor	
<b>CONSTRUCTION</b>	<b>Protection of air quality</b>	<b>G12</b>	Dust abatement devices should be fitted to machinery if required in the urban areas	In urban areas	Contractor	
		<b>G13</b>	Stockpiles of soil/excavated material prone to the release of dust will be sheeted or sprayed with water whenever conditions exist for the generation of excessive levels of dust in the urban areas	Populated stockpile areas	Contractor	
		<b>G14</b>	Transported materials should be sheeted to prevent dust generation in the urban areas.	Populated areas	Contractor	
		<b>G15</b>	There should be no excessive vehicle idling.	Throughout project	Contractor	
		<b>G17</b>	Vehicles should use designated tracks only.	Throughout project	Contractor	
		<b>G18</b>	Construction machinery to comply with emissions regulations.	Throughout project	Contractor	
		<b>G19</b>	Construction machinery to be regularly maintained.	Throughout project	Contractor	
	<b>Noise &amp; vibration</b>	<b>G20</b>	Work must be undertaken in the agreed working hours	Throughout project	Contractor	
		<b>G21</b>	Affected residents to be notified in advance should there be a change in the agreed timing of construction activities.	All populated areas	Contractor's CLO	
		<b>G22</b>	Conduct noise level monitoring program once a month for a specific construction area only during the construction phase, and each time should be 24 hours. The major parameters to be measured include but are not limited to: <ul style="list-style-type: none"> <li>- Noise (Equivalent Sound Pressure Level, Laeq)</li> </ul>	Throughout route at a specific construction area	EU	

1 GENERAL						
PHASE	ASPECT	Action no.	MITIGATION MEASURES/ACTIONS	Location	Action Responsibility	Approver
			- Vibration (Weighted Root Mean Squared acceleration, RMS or other appropriate measure)			
		G23	Any noise complaints received will be subject to a complaints management system that provides for the assessment and management of the complaint.	Populated areas	Contractor's CLO	
		G24	All noise complaints shall be recorded and forwarded to the EPO / CLO so that remedial action can be undertaken.	Throughout route – populated areas	EU/ ESD	
		G25	Vibrations must be minimised at any neighbouring premises. Residents of neighbouring premises must be warned in advance of possible vibrations prior to the commencing the activity	Throughout route – populated areas	Contractor	
		G26	Construction activity will be staged to minimise interruptions to surrounding stakeholders (e.g. noise, air emissions, traffic congestion) and reduce the potential for environmental impacts.	Throughout alignment	Contractor	
		G27	The Jordanian regulations for ambient noise levels should be followed.	Throughout alignment	Contractor	
		G28	Conducting suitable and effective staff training and awareness activities to ensure the project employees understanding, appreciation and adherence to the suggested environmental and social management requirements.	Throughout alignment	Contractor	
	EH&S good practice	G29	Appropriate hazard warning signs should be in place	Throughout alignment	Contractor	
		G30	Information boards should include out of hours emergency contact details for Project Company, Contractor, and Community Liaison Officer (CLO).	Each route section / camp / staging area	Contractor	
		G31	Appropriate PPE should be provided for the workforce	Throughout alignment	Contractor	
		G32	Accident records should be maintained and control measures put in place/altered in response to incidents.	All sites	Contractor	
		G33	Use appropriate techniques for trenching and shoring	Throughout pipeline	Contractor	
		G34	Special procedures should be put in place for installation near roadsides: - Establishment of work zones so as to separate workers from traffic and from equipment as much as possible. - Reduction of allowed vehicle speeds in work zones. - Use of high-visibility safety apparel for workers in the vicinity of traffic. - For night work, provision of proper illumination for the work space, while controlling glare so as not to affect vision of workers and passing motorists	Throughout alignment	Contractor	
		G35	Workforce to be penalised for failure to follow H&S procedures	Throughout alignment	Contractor	
G36	Penalties for Contractor (including sub-contractor) non-compliance with H&S	Throughout alignment	EU			

1 GENERAL						
PHASE	ASPECT	Action no.	MITIGATION MEASURES/ACTIONS	Location	Action Responsibility	Approver
GENERAL	Monitoring		plan/regulations			
		G37	Mobile plant and light vehicles shall be equipped with appropriate fire extinguishing equipment	Throughout alignment	Contractor	
		G38	The Contractor should maintain an incident (pollution, health and safety, complaints) register.	Throughout alignment	Contractor	
	Training	G39	An air quality-monitoring program should be applied to monitor the dust levels at least four times per year at selected sites along the project layout. The major parameter to be measured is PM10.	Throughout alignment	Contractor	
		G40	Training is to be provided in site health and safety and response plans at the start of each construction section.	Throughout alignment	Contractor	
	Public utilities	G41	Training refreshers to be held every 6 months.	Throughout alignment	Contractor	
		G42	Locate and document position of utilities infrastructure within construction corridor.	Throughout alignment	Contractor	
		G43	Consult utilities departments to establish operational procedures for management of temporary (planned) service disruptions.	Throughout alignment	Contractor	
		G44	Damage to documented infrastructure to be repaired at Contractor expense.	Throughout alignment	Contractor	
	OPERATION	Environment Management	G45	The Operator (Borrower) must appoint suitably qualified and experienced environmental management person(s) to form the operational phase Environmental Unit. This unit will set up and implement the EMS for the operational phase of the project and should incorporate the actions set out within the ESMP.		O&M Company
Noise abatement		G46	Maintenance and deliveries should be outside peak hours in sensitive locations.	Populated areas	O&M Company	
Public utilities		G47	Consult utilities departments to establish operational procedures for management of temporary (planned) service disruptions.	All permanent buildings containing noisy operational machinery	O&M Company	
Public H&S		G48	Lockable valves should be fitted on all storage tanks, fences should be secure, and doors and gates kept locked.	All permanent facilities	O&M Company	
		G49	A specific management plan for chlorine storage use and handling should be completed	To cover all locations where chlorine is stored / used	O&M Company	ESD
		G50	Regular water quality testing at Influent and/or delivery points (Dabuk and Abu Alanda reservoirs) as per national drinking water regulations.	Delivery points and/or influent points	O&M Company	
Water quality		G51	Appropriate spill kits or absorbent materials are held at strategic locations along the route; staff trained on when and how to use kits.	Key locations along transfer route	O&M Company	

1 GENERAL						
PHASE	ASPECT	Action no.	MITIGATION MEASURES/ACTIONS	Location	Action Responsibility	Approver
	<b>Pollution prevention &amp; control</b>	<b>G52</b>	Follow standard O&M guidelines to be prepared in line with WAJ standard monitoring procedures.	Throughout project	O&M Company	
	<b>Maintenance</b>	<b>G53</b>	Minimize erosion during flushing e.g. by avoiding discharge areas that are susceptible to erosion and spreading the flow to reduce flow velocities.	Washout areas	O&M Company	

2 TRAFFIC & ACCESS						
PHASE	ASPECT	Action no.	MITIGATION MEASURES	Location	Action Responsibility	Approver
<b>PRE - CONST<sup>N</sup></b>	<b>Finalise traffic &amp; access CEMG</b>	<b>T1</b>	PC must finalise the Traffic & Access Management Plan guidelines and provide these to the Contractor. See General table point G1	-	PC / ESD	
<b>CONSTRUCTION</b>	<b>Notification</b>	<b>T2</b>	Advanced warning of main road closures/ detours should be a minimum of 48 hours beforehand. Duration of closure should be indicated.	All project affected areas	Contractor's EU	Municipality / Local Police
	<b>Signage</b>	<b>T3</b>	Adequate signage should be provided to indicate diversionary routes	All affected routes	Contractor	
		<b>T4</b>	Provide appropriate public safety and traffic warning signs of activities. See General table point G29	All affected routes	Contractor	
	<b>Business access</b>	<b>T5</b>	Ensure safe pedestrian access to businesses/ facilities affected by the pipeline route. Temporary protected pedestrian crossing to be installed. See General table points G34 & T9	Populated areas	Contractor	
		<b>T6</b>	Temporary access routes should be identified in consultation with the affected community.	All project areas	Contractor's CLO	
	<b>Closure</b>	<b>T7</b>	For main road crossings, take all measures to reduce closure time.	Main road crossings / densely populated areas	Contractor	
	<b>H&amp;S</b>	<b>T8</b>	Speed limits shall be enforced for project vehicles	All project areas, access routes	Contractor	
		<b>T9</b>	Barriers should be put in place for deep excavations in populated areas.	Populated areas	Contractor	
		<b>T10</b>	Ensure safe access routes for pastoralists.	Central and southern route sections	Contractor	
<b>Inspections</b>	<b>T11</b>	Provide free passage and access to all parts of the project and at all times to authorized representatives from the MOE, ESD MWI and Municipalities.	All project areas	Contractor		

2 TRAFFIC & ACCESS						
PHASE	ASPECT	Action no.	MITIGATION MEASURES	Location	Action Responsibility	Approver
<b>OPERATION</b>	<b>Project site access</b>	<b>T12</b>	Access to key sites is to be controlled by the use of barriers.	Active construction sections, camps, yards, staging areas, borrow sites.	Contractor	
		<b>T13</b>	Ensure work area is clearly defined and off limits to the public.	All project areas	Contractor	
	<b>Routes</b>	<b>T14</b>	Identify preferred route for construction traffic across the site, and clearly mark this route (routes to avoid sensitive locations i.e. schools, mosques).	All project areas	Contractor	
		<b>T15</b>	Additional speed controls must be considered for urban areas.	Densely populated areas	Contractor	
		<b>T16</b>	Points of ingress and egress onto public roads must be regularly cleared of accumulated soil /debris.	All affected routes	Contractor	
		<b>T27</b>	Delivery of abnormal loads should be outside peak hours (slow moving or wide vehicles).	All affected routes	Contractor	
		<b>T17</b>	Maintain condition of public roads to satisfactory safety levels.	All affected routes	Contractor	
		<b>T18</b>	Ensure that all loads are covered and secured, preventing soil and other contaminants being released to the road.	All project areas / all vehicle movements	Contractor	
		<b>T19</b>	All complaints involving vehicle movements relating to construction activity will be logged and responded to as soon as practicable	All project areas	Contractor's CLO	
	<b>Dust</b>	<b>T20</b>	Vehicle speeds on unsealed roads will be restricted to minimise dust generation.	All route	O&M Company	
	<b>Environment / H&amp;S</b>	<b>T21</b>	Remaining access roads should be controlled to prevent access to sensitive sites/operation infrastructure by the public.	Wellfield, Eastern desert	O&M Company	

3 BORROW SITES						
PHASE	ASPECT	Action no.	MITIGATION MEASURES	Location	Action Responsibility	Approver

3 BORROW SITES						
PHASE	ASPECT	Action no.	MITIGATION MEASURES	Location	Action Responsibility	Approver
CONSTRUCTION	Site selection	B1	Borrow sites and quarry locations must be assessed before use	All borrow areas	Contractor	Land owner, NRA, MoE
		B2	The locations of borrow areas and quarry sites selected by the Contractor should be approved by the Department of Antiquities (DOA) to prevent antiquities being damaged by quarrying or borrow excavation.		Contractor	Dept Antiquities
		B3	The Contractor should demonstrate how environmental impacts will be mitigated, including erosion prevention and after-use restoration.		Contractor's EU	
		B4	CRM plan should be enacted if any cultural remains are discovered		Contractor's EU	ESD
		B5	Where possible, borrow pits and quarries shall not be located in areas where their presence would impact on surface drainage patterns		Contractor's EU	
	Storage	B6	Control of stockpile height, basal extent and shape to prevent movement, wind erosion.		Contractor	
	Material transport	B7	In transportation from the site, trucks shall be fitted to prevent material spillage		Contractor	
	Access	B8	Access to borrow pits and quarries will be from a single track only.		Contractor	
	Drainage / erosion	B9	Drainage and erosion control structures will be developed around the pit to control the impact of substantial rainfall events		Contractor	
	H&S	B10	All health, safety and environmental protection measures within General Table should be applied where relevant.		Contractor	
	Site restoration	B11	Borrow pits and quarries shall be rehabilitated as soon as possible after use, and where appropriate shall be landscaped to best fit into the existing environment.		Contractor	

4 NATURAL ENVIRONMENT						
PHASE	ASPECT	Action no.	MITIGATION MEASURES / ACTIONS	Location	Action Responsibility	Approver
CONSTRUCTION	Conserve natural habitats	NE1	Define project corridor with signage system, and limit construction width.	Throughout alignment	Contractor	
		NE2	Vegetation disturbance and/or removal must be restricted to nominated areas	Throughout alignment	Contractor	

4 NATURAL ENVIRONMENT						
PHASE	ASPECT	Action no.	MITIGATION MEASURES / ACTIONS	Location	Action Responsibility	Approver
	Maintain habitat integrity	NE3	There shall be no ground clearance or regrading beyond defined project areas	Throughout alignment	Contractor	
		NE4	No non native species / crops to be planted by Project workforce	All project areas	Contractor	
		NE5	Imported machinery should be free from soil / vegetation debris to prevent unintentional introduction of non-native species	All project areas	Contractor	
		NE6	Provide signage to indicate prohibited activities – hunting, collecting, trapping	All camp areas / notice boards	Contractor	
		NE7	All excavations / pits should be filled to grade	Borrow sites, other excavated areas	Contractor	
	Protection of fauna	NE8	Hunting and trapping of animals and birds is strictly forbidden (Also refer to The Agriculture Law No. 44 of the year 2002 regulations governing wildlife hunting in Jordan, note that all areas to the east of the railway are designated no hunting areas therefore hunting here would also be a criminal offence).	All project areas	Contractor	
		NE9	Limit night time lighting levels to reduce disturbance to wildlife for non-working time	Wellfield, eastern desert	Contractor	
		NE10	Reduce night time working to reduce wildlife disturbance	Wellfield, eastern desert	Contractor	
		NE11	Workforce should not have pets as these may pose a threat to native species	All project areas	Contractor	
	Protection of flora	NE12	Collection / harvesting of wild plants is strictly forbidden	All project areas	Contractor	
		NE13	Fires are strictly forbidden	All project areas	Contractor	
		NE14	Translocation of trees in coordination with related authorities including the Ministry of Agriculture and the Royal Society for the Conservation of Nature	Throughout route	Contractor	MoA /RSCN
		NE15	Mature trees (if any) will be supported as necessary by excavation shields or the like during the works.	Throughout route	Contractor	
		NE16	As much as possible native species to be used for planting	Throughout route	Contractor	
		NE17	No tree stands are to be felled outside project areas	Throughout route	Contractor	
	Management of Wellfield area	NE18	A site specific management plan for the Wellfield area is required	Wellfield construction zone	Contractor EU	ESD /RSCN/MoE
		NE19	Drilling activities within close proximity to sensitive receptors must be carefully carried out		Contractor	
		NE20	If and where threatened species are specifically identified as breeding within close proximity of engineering operations, construction activities should be curtailed within 150m of the breeding sites. This may include the periods from May to August for the sooty falcon and the from March to May for the houbara bustard.		Contractor	RSCN / MOE

4 NATURAL ENVIRONMENT							
PHASE	ASPECT	Action no.	MITIGATION MEASURES / ACTIONS	Location	Action Responsibility	Approver	
			The RSCN should be consulted with regards to the breeding and migration seasons of other species				
		NE21	A register of significant fauna that may periodically be encountered within the development site will be maintained. Construction staff will be notified of the importance of recording such fauna in the register.				Contractor's EU
		NE22	On completion of pipe laying and backfilling, any trees removed will be replaced with similar species.				Contractor
	Management of desert habitat	NE23	A register of significant fauna that may periodically be encountered within the development site will be maintained. Construction staff will be notified of the importance of recording such fauna in the register.	From collector tank to Highway RoW	Contractor's EU		
		NE24	Construction widths should be minimised to prevent habitat fragmentation	Eastern desert	Contractor		
		NE25	Drainage patterns within the Jafr Basin / Wadi Abu Tarfa area should not be adversely affected	Eastern desert	Contractor		
	Wadis	NE26	Wadi crossing construction should avoid the rainy season	Wadis	Contractor		
		NE27	No excavated material is to be stored within the wadi channels	Wadis	Contractor		
		NE28	Following construction the wadi bed should be reinstated at grade to avoid creating nick-points.	Wadis	Contractor		
		NE29	Crossings are to be designed to accommodate design floods without undue backwater and scour.	Wadis	Contractor		
		NE30	Wadi banks should be reinstated to pre-excavation morphology to ensure effective channelling of flood flows.	Wadis	Contractor		
		NE31	Silt trapping should be put in place at discharge points	All locations	Contractor		
		NE32	Spill response measures implemented for pollution incident as per General Table (G5)	All locations	Contractor		
	Soil protection	NE33	Vehicle movements are restricted to access routes only if defined and signature	All locations	Contractor		
		NE34	The Contractor will be responsible for the costs of remediating and soil/land contamination originating from Project activities.	All locations	Contractor		
NE35		Access routes planned to avoid wadi crossing and unstable areas	All locations	Contractor			

4 NATURAL ENVIRONMENT						
PHASE	ASPECT	Action no.	MITIGATION MEASURES / ACTIONS	Location	Action Responsibility	Approver
		NE36	Spill response measures implemented for pollution incident as per General Table (G5)	All locations	Contractor	
		NE37	Erosion abatement measures to be implemented at discharge points ( i.e. hydrotest points)	All locations	Contractor	
	Groundwater protection	NE38	Spill response measures implemented for pollution incident as per General Table (G5)	All locations	Contractor	
		NE39	Contractor to follow spill response plan and adhere to points for in Construction Camps.	All locations	Contractor	
		NE40	Contractor required to follow waste management plan and hazardous materials management plans.	All locations	Contractor	
	Monitoring actions	NE41	Conduct site inspection to monitor construction activities according to the prepared construction schedule from an environmental point of view.	Active project sections	EU	
		NE42	For the biological environment, the frequency of monitoring is mostly periodical (every three months) combined with follow up on annual auditing. The following indicators should be monitored: - Maintained pre-project land utilization and access. - Maintained Runoff Habitat. - Natural vegetation cover is maintained. - Hunting is banned. - Accidental kills are kept at a minimum. - Breeding seasons are undisturbed. - Migration seasons are avoided.	Wellfield, eastern desert worksites, other sites to be determined following initial assessment of biological significance.	EU	
	Education	NE43	Training should include an environmental awareness element for the Project workforce	All new contracts / construction sections	EU	
OPERATION	Wadi crossings	NE44	Minimize erosion during flushing, for example by avoiding discharge areas that are susceptible to erosion and spreading the flow to reduce flow velocities.	Wadi crossings	O&M Company	
		NE45	Periodic surveys (annual) of crossings should be carried out to check for erosion.	Wadi crossings	O&M Company	
	Groundwater	NE46	Aquifer Water Management Plan to monitor the water level to assess and confirm Disi aquifer depletion rates.	Disi aquifer	O&M Company	
		NE47	Operator to provide annual report on Disi aquifer quality and levels.	Disi aquifer	O&M Company	
	Maintenance	NE48	Specific O&M guidance should include measures to minimise damage / disturbance	Wellfield	O&M Company	

4 NATURAL ENVIRONMENT						
PHASE	ASPECT	Action no.	MITIGATION MEASURES / ACTIONS	Location	Action Responsibility	Approver
			to the wellfield area during maintenance operations			
		NE49	Faunal observation log should be maintained for wellfield area	Wellfield	O&M Company	

5 CONSTRUCTION CAMPS							
PHASE	ASPECT	Action no.	MITIGATION MEASURES	Location	Action Responsibility	Approver	
CONSTRUCTION	Siting	C1	Select the site near permanent construction facilities to reduce environmental disturbance	For all camps	Contractor		
		C2	Camps should be located away from populated areas (schools, PoW, housing) if possible	-	Contractor		
		C3	Camps should be located away from ecologically sensitive sites (acacia stands, wadis, sand dunes, mudflats)	-	Contractor		
		C4	Camps should be located at least 500m away from known archaeological sites where practicable.	-	Contractor		
		C5	Camps should be located close to existing access routes as appropriate.	-	Contractor		
	Buildings	C7	Limit visual impact of temporary buildings	Wellfield, eastern desert, urban areas	Contractor		
		C8	Contractor to get site approval from PC, and Municipality prior to construction	For all camps	Contractor	PC, Municipality	
		C9	PC and Contractor must ensure that services (e.g. drinking water and sanitation) are provided on-site.	For all camps	Contractor		
	Site operations	C10	There should be a short direct location to main access routes where possible	For all camps	Contractor		
		C11	Food must be provided to workers in remote areas. Charges for food must not be at a rate greater than the prevailing market rate.	Construction camps	Contractor		
		C12	There should be regular briefings to staff on camp regulations / codes of conduct	At all camps	EPO/Contractor's CLO		
		C13	Appropriate storage of hazardous materials in accordance with Contractors Hazardous Materials Management Plan	Throughout alignment	Contractor		
		C14	Camps should be operated in accordance to: - U.S. Law - from the Department of Labor standards on temporary labor camps (29 CFR 1910.142) - EU Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work - EU Council Directive 92/57/EEC on the implementation of minimum safety and		For all camps		
						Contractor	

5 CONSTRUCTION CAMPS						
PHASE	ASPECT	Action no.	MITIGATION MEASURES	Location	Action Responsibility	Approver
			health requirements at temporary or mobile construction sites			
	Decommissioning	C15	On decommissioning of a work area, non-permanent structures and facilities will be removed and disposed of appropriately and sites restored to original condition.	Throughout alignment	Contractor	

6 HAZARDOUS MATERIALS						
PHASE	ASPECT	Action no.	MITIGATION MEASURES / ACTIONS	Location	Action Responsibility	Approver
CONSTRUCTION	Storage of fuel / oils	HM1	Spill kits to be located near to fuel storage area	Fuel storage areas	Contractor	
		HM2	All storage of fuels/ oils or other hazardous chemicals must occur within bunded areas	Camps, staging areas, construction sites	Contractor	
		HM3	Oil spill kits to be located near to oil storage area	Oil storage areas	Contractor	
	Storage of hazardous substances	HM4	All storage areas should be equipped with an appropriate spill kit and Material Safety Data Sheet (MSDS).	All Haz Mat storage areas	Contractor	
		HM5	Storage containers will be appropriately labelled	All Haz Mat storage areas	Contractor	
		HM6	Explosives are to be stored in a secure, fenced area. Use of explosives is by certified explosives personnel. Review Jordanian Law of Explosive Materials (No 13 dated 17/1/1953, Paper 1131), dealing with the security of movement of explosives and storage of explosives.	All explosives storage areas	Contractor	Gov't committee
		HM7	Appropriate hazard warning signs are to be placed in key locations	Camps, staging areas, construction sites, Haz Mat storage areas	Contractor	
		HM8	All dangerous goods will be stored in a bunded area and separated and sign posted as required by the relevant Codes and Standards	All Haz Mat storage areas	Contractor	
		HM9	The site manager/EPO should submit a list of chemicals and other potentially hazardous materials to the local fire services prior delivery.	All Haz Mat storage areas	Contractor	Civil Guard / Local fire brigade
		HM10	Staff using hazardous materials should be appropriately trained regarding safe handling practices and emergency response procedures in respect of such materials. Refresher training to be provided at regular intervals	All construction sites and camps	Contractor's CLO / EPO	

6 HAZARDOUS MATERIALS						
PHASE	ASPECT	Action no.	MITIGATION MEASURES / ACTIONS	Location	Action Responsibility	Approver
		HM11	Work force should be provided with appropriate PPE to protect against harmful effects of hazardous materials.	All areas	Contractor	
		HM12	Sealant, coatings, adhesives and glazings can be toxic to plants and animals if released in to the environment. The contractor should select, store and use these materials carefully to save resources and protect the environment. Sealant and glazing compounds containing asbestos should not be used.		Contractor	
	Pollution incidents	HM13	All spills of hazardous material are to be reported to the EPO / Site manager.		Contractor	
		HM14	The Contractor will keep appropriate absorbents, neutralising chemicals and protective equipment and clothing at any work site where dangerous goods are stored.		Contractor	
		HM15	Chemical Lists and Emergency Response Procedures will be placed in all relevant locations on site		Contractor	
OPERATIONAL	Health & Safety	HM16	O&M Company to prepare Management Plan for the storage and use of chlorine	All operational areas	O&M Company	
		HM17	A training program is required for operators who work with chlorine regarding safe handling practices and emergency response procedures. Refresher training at regular intervals	All operational areas	O&M Company	
	Reduce environmental risk	HM18	All dangerous goods will be stored in a bunded area and separated and sign posted as required by the relevant Codes and Standards	All operational areas	O&M Company	
	Maintenance	HM19	Chemical Lists and Emergency Response Procedures will be placed in all relevant locations on operational sites.	All operational areas	O&M Company	

7 WASTE MANAGEMENT						
PHASE	ASPECT	Action no.	MITIGATION MEASURES / ACTIONS	Location	Action Responsibility	Approver
PRE-CONSTRUCTION	General	W1	Waste generation, where practicable, will be minimised through the adoption of efficient designs, reduction of materials required, construction method selections and reuse and recycling where practicable.	All project areas	Contractor	
		W2	The Contractor is required to produce a Site Waste Management Plan in accordance with the ESD CEMG guidelines (COVERED IN GENERAL TABLE). This plan should	All active construction sections	Contractor's EU	EDS

7 WASTE MANAGEMENT						
PHASE	ASPECT	Action no.	MITIGATION MEASURES / ACTIONS	Location	Action Responsibility	Approver
			include a recording system for the amount of wastes generated, recycled and disposed (including the disposal sites).			
		W3	Excavated material is to be reused as far as practicable for other Project components.	All sections	Contractor	
		W4	Where possible the Contractor should sort construction & demolition debris and excavated materials to recover reusable/ recyclable portions (ie soil, broken concrete, metal, etc.)	All sections	Contractor	
		W5	The contractor should plan and stock construction materials carefully to minimize amount of waste generated and avoid unnecessary generation of waste.	All sections	Contractor	
		W6	Impermeable temporary waste liquid storage containers should be constructed to collect liquid wastewater for the main project camps and worksites.	All camps	Contractor	
	Waste collection & storage	W7	The contractor is to provide appropriate containers for the collection of waste oils.	All camps, staging areas, crusher sites	Contractor	
		W8	Storage of waste (including temporary) shall not be permitted in non-approved areas (i.e. wadis, drainage channels, mudflats, vegetated areas, public areas, farms, sand dunes)	Throughout alignment	Contractor	
		W9	Appropriately sized, lidded garbage containers will be provided on site for domestic waste.	All camps, staging areas, crusher sites	Contractor	
		W10	Domestic waste is to be collected regularly and disposed in accordance with Municipalities' instructions.	Throughout alignment	Contractor	
		W11	Provide a bunded area with an impermeable base for the storage of waste oils.	All vehicle / plant maintenance areas	Contractor	
		W12	All solid wastes will be placed in appropriately designed storage areas.	All camps, staging areas, crusher sites	Contractor	
		W13	Littering shall be prohibited.	Throughout alignment	Contractor	
		W14	Waste shall be secured against wind blown litter and animal foraging.	All sites	Contractor	
		Waste disposal	W15	Where absorbents, (e.g. sand, oil pads or booms) have been used to absorb a leak or contain a spill, the contaminated waste absorbent is to be disposed of as hazardous waste.	All sites	Contractor
	W16		Waste will not be stored or disposed of outside designated areas.	Throughout alignment	Contractor	
	W17		The burning of solid and liquid wastes is strictly prohibited.	All sites	Contractor	
	W18		Any used oils will be collected and delivered to recycling agents.	All vehicle/ plant maintenance sites	Contractor	

7 WASTE MANAGEMENT						
PHASE	ASPECT	Action no.	MITIGATION MEASURES / ACTIONS	Location	Action Responsibility	Approver
		<b>W19</b>	Documentation of regulated waste removal will be kept on file (waste type, quantity, destination).	All main sections	Contractor EU	
	<b>Waste monitoring</b>	<b>W20</b>	Solid waste management operations should be regularly monitored and cover the following: - Solid waste generation, including quality and quantity. - Collection and transportation efficiency. - Suitability of final disposal sites. - Solid waste accumulation within the project corridor in terms of volumes and frequency of removal.	All main sections	Contractor EU	
<b>OPERATIONAL</b>	<b>Waste reduction</b>	<b>W21</b>	The O&M operating procedures are to include waste management measures	All operational facilities	O&M Company	
	<b>Waste collection</b>	<b>W22</b>	All project generated waste is to be collected by approved waste carriers	All operational facilities	O&M Company	
	<b>Waste storage</b>	<b>W23</b>	All project generated waste is to be stored in appropriate containers which are correctly labelled. Waste segregation should be encouraged if regional recycling initiatives are implemented in the future.	All operational facilities	O&M Company	
	<b>Waste disposal</b>	<b>W24</b>	All project waste should be appropriately disposed of at licensed facilities	All operational facilities	O&M Company	

8 CULTURAL RESOURCES						
PHASE	ASPECT	Action no.	MITIGATION MEASURES	Location	Action Responsibility	Approver
<b>PRE-CONSTRUCTION</b>	<b>Formulate Cultural Resources CEMG</b>	<b>CR1</b>	As part of carrying out G1.		ESD	

8 CULTURAL RESOURCES						
PHASE	ASPECT	Action no.	MITIGATION MEASURES	Location	Action Responsibility	Approver
	<b>Finalise CRM Plan</b>	<b>CR2</b>	Complete general CRM plan in discussion with DoA		EU	Dept Antiquities / ESD
<b>CONSTRUCTION</b>	<b>Known sites</b>	<b>CR3</b>	Contractors are required to adopt special protection procedures for known sites. These include fencing, and implementing signage system to the site.	Known sites within 500m of Project areas.	Contractor	
	<b>Site selection</b>	<b>CR4</b>	Once the final alignment has been fixed and the extent of any earthworks and borrow pits is known, sites that remain classified as not threatened should be revisited and fully documented for record purposes.	Throughout alignment	Contractor	
		<b>CR5</b>	The locations of borrow areas, quarry sites and temporary facility sites selected by the Contractor should be approved by the Department of Antiquities (DOA) to prevent antiquities being damaged by occupation, quarrying or borrow excavation.	All borrow sites, temporary sites	Contractor	
	<b>Chance finds</b>	<b>CR6</b>	If any archaeological site or remains found during construction the Contractor EU should directly contact the Department of Antiquities.	Throughout alignment	EU	
		<b>CR7</b>	If any site found during construction and will be damaged by construction activities, the Department of Antiquities will assess the discovered remains and will carry out an emergency salvage excavation.	Throughout alignment	Contractor	
	<b>Salvage</b>	<b>CR8</b>	The Contractor should seek the written approval of the Department of Antiquities before the removal of any chance find building, foundation, structure, fence and other obstruction over 50 years old, any portion of which is in the R.O.W. all designated salvageable material shall be removed, without causing unnecessary damage, and in sections or pieces.	Throughout alignment	Contractor	
	<b>Approvals</b>	<b>CR9</b>	A set of final engineering drawings, on which archaeological sites within or immediately adjacent to the construction area are defined, should be addressed by the Contractor to the Department of Antiquities (DOA) prior to starting work.	For all project sites	Contractor	
<b>Surveys / watching brief</b>	<b>CR10</b>	In areas where the Department of Antiquities knows or suspects the existence of remains under the surface, but where there is insufficient time for archaeological excavation (or the importance of the site does not warrant full scale investigation prior to construction), a representative of DOA should be present during the opening of any excavation or borrow pit to identify and record any archaeological remains found.	Sites to be confirmed during site selection process	Contractor		

<b>8 CULTURAL RESOURCES</b>						
<b>PHASE</b>	<b>ASPECT</b>	<b>Action no.</b>	<b>MITIGATION MEASURES</b>	<b>Location</b>	<b>Action Responsibility</b>	<b>Approver</b>
		<b>CR11</b>	Implement the Cultural Resources Management (CRM) program in coordination with CRM monitoring groups including the Department of Antiquities / Ministry of Tourism.	For all project sites	Contractor	
		<b>CR12</b>	Apply penalties for non-compliance with CRM Plan.	For all project sites	EU	
<b>OPERATIONAL</b>	<b>Protection of cultural resources</b>	<b>CR13</b>	New access roads (for maintenance) and construction routes should be controlled as far as practicable to prevent access to known sites, including any discovered during construction.	All operational areas	O&M Company	

## **10 REFERENCES**

Environmental and Social Assessment - Disi-Mudawarra to Amman Water Conveyance System, prepared by Consolidated Consultants for the Jordanian Ministry of Water and Irrigation, June 2004

ESIA Addendum 1 - Disi-Mudawarra to Amman Water Conveyance System, prepared by Dar al-Handasah for Gama Enerji A.S., February, 2008.

ESIA Addendum 2 - Disi-Mudawarra to Amman Water Conveyance System, prepared by Dar al-Handasah for Gama Enerji A.S., March, 2008. Added to IFC website April 16, 2008.

**APPENDIX 1: PROJECT AFFECTED PERSONS' CENSUS AND SOCIO-ECONOMIC SURVEY TERMS OF REFERENCE**

**JORDAN  
DISI CONVEYOR PROJECT  
PROJECT AFFECTED PERSONS CENSUS  
AND SOCIO-ECONOMIC SURVEY  
SCOPE OF WORK**

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**12. OVERVIEW**

- (a) **Introduction** MWI seeks the services of a Consultant to prepare a Project Affected Persons Census and Socio-Economic Survey for the Disi Project. This would include a Consultation Process and the development of a Data Base. These complementary activities would support the integration of the provisions of IFC PS 1 and PS 5 into the project design, implementation and monitoring process for the proposed Project.
- (b) **Public Meetings to Support Census, Socio-Economic Survey and Consultation Process.** In order to facilitate the work of the Consultant, the MWI will formally notify local governments of its plan to undertake the census, socio-economic survey and consultation process and request that they support the Consultant by arranging a series of public meetings. These meetings would provide an opportunity to explain the purpose of these activities to local leaders, residents and non-governmental organisations (NGOs). These meetings may also encourage owners, tenants, works and other parties to come forward and register as a Project Affected Persons (PAPs) giving details for where and how they can be contacted.

**13. PROJECT AFFECTED PERSONS CENSUS**

- **Objective.** A census is to be undertaken of all the PAPs within the Desert Highway ROW for the Section to be occupied by the DP. This will also include an inventory of all assets on the site and details of their use. The objectives of the census are:

- (a) **Parties Entitled to Compensation.** Establish who will be affected by the Project in terms of loss of assets including land and structures, or loss of livelihoods. The losses should cover owners of assets, as well as those with established use-rights; and
- (b) **Asset Base.** Establish the asset base of those affected including the type of asset being lost and its current use (land use, tenancy rights, etc.) and determine the extent of project related impact in those assets and on the mode of its utilisation.

It is recognised that initially the PAPs would be identified as "potential" PAPs until the final decision on the alignment of the pipeline and supporting infrastructure would be made MWI following review and approval of the final designs. To support this process the MWI would re-establish a surveyed centreline along the anticipated alignment which would facilitate the Consultant in the identification of affected assets and PAPs.

- **Outputs.** The outputs from the study will be:

- E. **Computerised Database.** A computerised database containing unique files for each PAP and each structure affected. This will contain sufficient information to determine the significance of asset take and disruption to livelihood with regard to the ability to PAPs to maintain their existing standard of living;
- F. **Hard Copy of the Database.** A hard copy version of the computerised data base will also be prepared in English and Arabic provided in ten (10) copies (each) to the MWI;
- G. **Maps.** Maps will be prepared for show the location of each asset.
- H. **Affected Assets.** A description of all assets affected by the proposed Project would be prepared and integrated into the computerised database.

Information prepared under items (c) and (d) would be subject to review and finalisation by the Project Compensation Committee.

- **Registration Census.** The Consultant will undertake an initial review of the use and ownership of the affected assets.

It is recognised that in some cases, due to modifications of the pipeline alignment or siting of Project related infrastructure, there may be some change in the number and location of PAPs. These changes will be reflected in the Data Base described below and additional census, socio-economic survey and consultation activities would be undertaken to address the needs of these PAPs.

- **Potentially Vulnerable Groups.** The Consultant would give special attention in their work to evaluation of some PAPs which may be more significantly affected, or particularly vulnerable to hardship unless special protections are included. These special categories may include: (a) persons dependent on common lands, (b) persons losing income or employment because of impacts upon firms.

- **Contacting PAPs.** All PAPs shall be contacted in person wherever practicable.

(a) **PAPs Resident in Project Area.** If necessary, repeat visits at appropriate intervals and times will be required by the Consultant to contact PAPs resident in the Project area. The date and times of these visits will be documented. A minimum of three attempts is required. These visits will include meetings with PAPs who are land owners, tenants, workers and informal users.

## C. SOCIO-ECONOMIC SURVEY

(a) **Socio-Economic Survey.** A socio-economic survey will be undertaken to establish the baseline date of PAPs. This analysis will form the basis of the compensation estimation process. In addition, to describing standard household characteristics, consistent with IFC procedures the surveys would describe:

(a) **Duration.** The duration of the impact.

(b) **Resource Base.** Information on the full resource base of the population including income derived from informal sector and non-farm activities.

- (c) **Loss of Assets.** The extent to which PAPs will experience total or partial loss of assets;
- (d) **Services Affected.** Public infrastructure and social services that will be affected;

#### D. PROJECT AFFECTED PERSONS CONSULTATION PROCESS

- (b) **Consultation.** Associated with the Census will be a Potentially Affected Parties Consultation Process which is intended to:
  - (a) **Project Status.** Outline the status of the project and the works proposed in the near future;
  - (b) **Compensation for Other Property.** Explain how compensation will be paid for assets and crops;
  - (c) **Indirect Damages.** Explain how compensation will be paid by the Government and/or the Contractor for indirect damage to crops or assets from the construction process;
  - (d) **Compensation for Renters, Tenants and Employees.** Explain how compensation would be paid to renters, tenants and employees who would be adversely affected by the proposed project; and
  - (e) **Available Assistance.** Advise them on the assistance that will be available throughout the process from the Project Compensation Committee and/or other parties.

#### 1 DATABASE AND DATA MANAGEMENT

- (c) **Structure of the Database.** The data obtained from the census will be recorded as both a manual and computerised database.
- (d) **Elements of the Database.** The database will include:
  - 1 **Plot Ownership.** Each PAP shall be referenced to a unit defined as the lowest known level of plot ownership record available for each square metre of land to be acquired.
  - 2 **Comprehensive Coverage.** The database will include all PAPs; asset owners, tenants and employees, each of whom will be referenced to an asset.
  - 3 **Physical Data.** Data on assets shall be recorded as follows:
    - 11 No. and size of structures
    - 12 Structure condition
    - 13 Other assets.
  - 4 **Socio-Economic Data.** Data on PAP shall be established at the Household level and linked to an asset by use status.
    - 14 No. of households.
    - 15 No. of persons.
    - 16 Economic activities on site.

While a project specific referencing system may be adopted for asset numbers and PAPs the database should also include the asset reference number.

**(e) Compensation Information.** This database should also be developed in such a way that it may be expanded to accommodate further details. Specifically for each PAP:

- **Compensation.** To include estimated and then final and agreed details of:
  - 17 Compensation entitlement;
  - 18 Compensation sum;
  - 19 The nature of the compensation to be provided; and
- **Total Cost.** Total cost for each compensation item.
- **Implementation Programme.** Information on the implementation programme and disbursement for compensation.
- **Monitoring.** Implementation Monitoring Record (including references to all communications concerning plot acquisition).

## 2 REPORTS

**(f) Reports.** The Consultant would provide the following Report:

e) **Project Compensation Report.** The Report will include:

- 20 A definitive list of PAPs;
- 21 A statement of the assets that will be affected by the Project;
- 22 A statement concerning issues and actions related to loss of livelihood;
- 23 Summary details of the characteristics of the PAPs;
- 24 An overview of the processes undertaken to contact each affected PAP.
- 25 A summary statement of incomplete or conflicting data as of April 30<sup>th</sup>.
- 26 A detailed list of specific outstanding issues, including their reason, location and magnitude; which would require resolution as final design details in some areas are reached in the future; and
- 27 A comprehensive cost estimate for the compensation programme and a recommended schedule for payment linked to directly to the overall Project implementation plan.

This report would be provided in 10 copies in both Arabic and English.

## 3 SCHEDULE

**(g) Proposed Schedule.** The Consultant would provide a detailed schedule as part of their proposal which would outline how they would accomplish the activities in this TOR by April 30<sup>th</sup> 2008.

## 4 CONTACT PERSONS

**(h) Contact Persons.** The following individuals, or their designated representatives, will serve as the contact persons for the activities included under this TOR:

e) **Government of Jordan**

Name  
Position  
Address  
Telephone:  
Email:

f) **GAMA**

Name  
Position  
Address  
Telephone:  
Email:

g) **OPIC**

Name  
Position  
Address  
Telephone:  
Email:

h) **EIB**

Name  
Position  
Address  
Telephone:  
Email:

i) **PROPARCO**

Name  
Position  
Address  
Telephone:  
Email:

**APPENDIX 2: INDICATIVE TABLES OF CONTENTS FOR PROPOSED  
CEMG**

## **COMPLIANCE FRAMEWORK DOCUMENT**

1. Objectives
  - o Introduction
  - o Commitment to the Environment
  - o Guideline Objectives and Goals
  - o Compliance with Other Complementary Policies and Guidelines
- 1.5 Definitions
  
2. Legislative Framework
  - 2.1 Jordanian Legislation
  - 2.2 Applicable Guidelines
  - 2.3 International Legislation
  
- 3 Responsibilities
  - 3.1 Main Contractor
  - 3.2 Project Company
  - 3.3 EPC Contractor
  - 3.4 Authorities
  - 3.5 Nominated Contacts
  
4. Environmental Compliance System
  - 4.1 Purpose and Objectives
  - 4.2 Compliance Procedures
  - 4.3 Performance Recognition System
    - 4.3.1 Negative Performance Points
    - 4.3.2 Positive Performance Points
    - 4.3.3 Improving Performance Recognition
    - 4.3.4 Performance Points Scale
  
5. Contractors Declaration

## **CEMG – 01 General Guidelines**

1. General
  - 1.1 Purpose of Document
  - 1.2 Responsibilities
  - 1.3 Contents
  
2. General Guidelines
  - 2.1 Guidance and Training of Personnel
  - 2.2 Use of Environmentally Friendly and Safe Materials
  - 2.3 Construction Activities
  - 2.4 Construction Equipment
  - 2.5 Pollution
    - 2.5.1 *Prevention of Water Pollution*
    - 2.5.2 *Prevention of Soil Pollution*
    - 2.5.3 *Remediation*
  - 2.6 Site Boundary
  - 2.7 Public Services and Utilities
  - 2.8 Water Supply and Use
  - 2.9 Public Hygiene and Sanitary Facilities
  - 2.10 Waste Management
  - 2.11 Construction Traffic
  - 2.12 Non Hazardous Materials Storage
  - 2.13 Hazardous Materials Storage and Use
  - 2.14 Noise Control
  - 2.15 Air Quality
    - 2.15.1 Dust Abatement
    - 2.15.2 Other Atmospheric Pollution
  - 2.16 Hydrology- Prevention of Erosion and Increased Sedimentation
    - 2.16.1 Water Discharge from Site
    - 2.16.2 Dewatering
  - 2.17 Operations in Unstable Areas
  - 2.18 Cultural Resources
  - 2.19 Ecosystems and Wildlife
  - 2.20 Transport of Construction Workforce
  
3. Off site Works
  - 3.1 General
  - 3.2 Construction Camps and Yards
  - 3.3 Raw Materials Extraction Points
  - 3.4 Materials Processing Sites
    - 3.4.1 General
    - 3.4.2 Wastewaters
    - 3.4.3 Atmospheric Pollution
    - 3.4.4 Noise
  
4. Post Contract Activities and Demobilisation

## **CEMG – 02 Waste Management**

1. General
  - 1.1 Purpose of Document
  - 1.2 Regulations
    - 1.2.1 Guidance on Waste and Legislation
      - 1.2.1.1 What is waste?
      - 1.2.1.2 Legislation and Guidelines
    - 1.2.2 Waste Classification
    - 1.2.3 Prohibited Waste Disposal Practices
  - 1.3 Responsibilities
    - 1.3.1 Project Company
    - 1.3.2 EPCC
  - 1.4 Contents
2. Guide to Formulating a Waste Management Plan
3. Disposal Options
  - 3.1 Inert Waste and Domestic or Municipal Waste (Category A and B Waste)
  - 3.2 Non- Hazardous Industrial Waste
    - 3.2.1 Construction and Demolition Waste
    - 3.2.2 Unusable / Excess Fill Material
  - 3.3 Hazardous Wastes
  - 3.4 Discharge of Wastewater
    - 3.4.1 Discharge to a Sewer
      - 3.4.1.1 Sewer Discharge Permits
      - 3.4.2 Monitoring Requirements
      - 3.4.3 Kitchen Waste
    - 3.4.2 Discharge to an Internal System
4. Duty of Care- Company Responsibilities
  - 4.1 Definition
  - 4.2 Transfer Notes
5. Best Waste Management Practice
  - 5.1 Identify a Waste Manager
  - 5.2 Developing a Waste Prevention Program
  - 5.3 Good Housekeeping Practices
  - 5.4 Guide to Best Practice and Training Materials
  - 5.5 Nominated Representatives
  - 5.6 Reporting

## **CEMG - 03 Hazardous Materials Management**

1. General
  - 1.1 Purpose of Document
  - 1.2 Regulations
  - 1.3 Responsibilities
    - 1.3.1 PC
    - 1.3.2 EPCC
  - 1.4 Contents
  
2. Definition and Hazmat Responsibilities
  - 2.1 Definition
  - 2.2 Hazmat Responsibilities
    - 2.2.1 General
    - 2.2.2 HAZMAT Inventory
    - 2.2.3 Emergency Response Plan
  
3. Best Practice Guidelines
  - 3.1 General
  - 3.2 Fuel Storage and Use
    - 3.2.1 Storage
    - 3.2.2 Spills
  - 3.3 Bitumen
    - 3.3.1 Storage and Handling
      - 3.3.1.1 Handling
      - 3.3.1.2 Storage - Safety Considerations for Tankage
      - 3.3.1.3 Loading, Transportation and Discharge - Cold Form
    - 3.3.2 Use of Bitumen
  - 3.4 Chlorine
    - 3.4.1 Storage and Handling
      - 3.4.1.1 Handling
      - 3.4.1.2 Storage - Safety Considerations
      - 3.4.1.3 Loading, Transportation and Discharge
    - 3.3.2 Use of Chlorine
  - 3.5 Hazmat Waste Collection and Disposal
  
4. Development of Emergency Response Procedures for Accidents Involving Dangerous Goods
  - 4.1 General
  - 4.2 Progress of an Incident
  - 4.3 Planning
    - 4.3.1 Risk Assessment and Mitigation
    - 4.3.2 Subsequent Site Safety Auditing
    - 4.3.3 MSDS and HAZMAT Inventories
    - 4.3.4 The Incident Plan Management System
  - 4.4 Further Advice

## **CEMG – 04 Construction Camps and Yards**

1. General
  - 1.1 Purpose of Document
  - 1.2 Regulatory Framework
  - 1.3 Responsibilities
  - 1.4 Contents
  
- 2 Determining Site Location
  - 2.1 Main Camps and Yards
  - 2.2 Secondary Facilities
  
- 3 Preparation of Site Plan
  - 3.1 Required Information
    - 3.1.1 General
    - 3.1.2 Site Plan Content
    - 3.1.3 Modification of Approved Site Plans
  
- 4 Special Measures
  - 4.1 General
  - 4.2 Security
  - 4.3 Accommodation
    - 4.3.1 Facilities
    - 4.3.2 Housekeeping and Maintenance
    - 4.3.3 Conduct
    - 4.3.4 Complaints from Local Communities
  - 4.4 Parking
  - 4.5 Cultural Resources
  - 4.5 Drainage
  - 4.6 Waste Supply and Use
  - 4.7 Other Public Services and Utilities
  - 4.8 Waste Management
  - 4.9 General Hygiene
  - 4.10 Workshops and Repair Areas
    - 4.10.1 Workshop Activities
    - 4.10.2 Material Storage and Handling
  - 4.11 Hazardous Materials
  - 4.12 Air Quality
  - 4.13 Noise

## **CEMG – 05 Access Management**

1. General
  - 1.1 Purpose of Document
  - 1.2 Regulatory Framework
  - 1.3 Responsibilities
    - 1.3.1 PC
    - 1.3.2 EPCC
    - 1.3.3 Civil Defence and Police
  - 1.4 Contents
2. Conditions on the Use of the Public Rights of Way
  - 2.1 General
  - 2.2 Guidelines in Preparing the PMP
  - 2.3 Public Notification
  - 2.4 Damage to Public Highways and Utilities
3. Guidelines for Development of Site Access
  - 3.1 General
  - 3.2 Water Course Crossing
  - 3.3 Definition of Construction Access Routes
4. Management of Construction Traffic Operations
5. Maintenance of Existing Local Network and Property Access

## **CEMG – 06 Quarries and Borrow Areas**

1. General
  - 1.1 Purpose of Document
  - 1.2 Regulations
  - 1.3 Responsibilities
    - 1.3.1 PC
    - 1.3.2 EPCC
    - 1.3.3 NRA
  - 1.4 Contents
  
2. Guidelines for Borrow Pits
  - 2.1 General
  - 2.2 EIA Requirements
  - 2.3 Borrow Site Planning and Design
  - 2.4 Borrow Site Operations
  - 2.5 Pit Restoration
  
3. Guidelines for Quarries
  - 3.1 General
  - 3.2 EIA Requirements
  - 3.3 Quarry Site Planning and Design
  - 3.4 Quarry Site Operations
  - 3.5 Blasting
  - 3.6 Site Restoration

## **CEMG – 07 ECOLOGY AND WILDLIFE MANAGEMENT**

1. General
  - 1.1 Purpose of Document
  - 1.2 Regulations
  - 1.3 Responsibilities
    - 1.3.1 PC
    - 1.3.2 EPCC
    - 1.3.3 RSCN
  - 1.4 Contents
2. Guidelines for Operation in Sensitive Areas
  - 2.1 General
  - 2.2 Operational Plan Requirements
  - 2.3 Ground Restoration
3. Guidelines for Staff
  - 3.1 General
  - 3.2 Training
  - 3.3 Code of Conduct
  - 3.4 Penalties

## **CEMG – 08 CULTURAL RESOURCES**

1. General
  - 1.1 Purpose of Document
  - 1.2 Regulations
  - 1.3 Responsibilities
    - 1.3.1 PC
    - 1.3.2 EPCC
    - 1.3.3 DAJ
  - 1.4 Contents
2. Application of Chance Find Procedures
  - 2.1 General
  - 2.2 Training
3. Operations in Sensitive Areas.
  - 3.1 General
  - 3.2 Training
  - 3.3 Site Demarcation
  - 3.4 Blasting and other potential damaging actions
  - 3.5 Code of Conduct

**APPENDIX 3: EXAMPLE OF CERTIFICATE OF COMPLIANCE**

**CERTIFICATE OF ENVIRONMENTAL COMMITMENT**

Name of Contractor			
Construction Project Name			
Construction Ref. No		Commencement Date	

**1. Application of Environmental Management Guidelines, Site Assessment and Inspection**

The following should be read by all persons involved in the Construction of the Project.

- a) In operating their sites the Main Contractor agrees to abide by the requirements outlined in the Construction Environmental Management Guidelines and the Compliance Framework Document.
- b) The Main Contractor agrees to a pre-construction assessment of affected sites prior to construction to determine their environmental condition. These assessments would be undertaken jointly between MWI and/or MWI nominated personnel, GAMA Personnel and nominated Main Contractor personnel.
- c) The Main Contractor agrees to have MWI and GAMA staff, or nominated representatives, conduct Inspections of all contract sites throughout the Construction period. No advance notification of inspection will be required.
- d) GAMA will provide the Main Contractor with copies of all Compliance Inspection Reports.
- e) The Main Contractor shall maintain a log of all Inspection Reports in a Project File. The Project File shall be maintained on site and be made available to permitting authorities on request. The contents of the Project File are attached as Annex 1 to this document.
- f) Prior to hand over of a site at the end of the Contract the Main Contractor agrees to a post-construction assessment to determine its post-contract environmental condition. This would be undertaken jointly between MWI and/or MWI nominated personnel, GAMA Personnel and nominated Main Contractor personnel.

**2. Contractors Declaration**

I the undersigned, the legal representative of the Main Contractor having read the conditions above confirm that \_\_\_\_\_ (Main Contractor) undertake to fulfil the obligations outlined.

Signed

Position

Date

**APPENDIX 4: LIST OF SUBMISSION DATES**

<b>Description</b>	<b>Due Date</b>
<p>Details of the Project Company’s Environmental and Social Department (ESD) and/or E&amp;S Advisor, including:</p> <ul style="list-style-type: none"> <li>- Name, category (example: senior environmental advisors, superintendents and community liaison officers), and responsibilities of staff</li> <li>- Team locations</li> </ul>	<p>45 days prior to commencement of construction Works</p>
<p>Detailed topographic plan based on the Contractor’s detailed topographic survey and rational mapping as appropriate, of the following items, taking into account measures to minimize the impact on valuable habitats, breeding species and archaeological remains and identifying known points of concern:</p> <ul style="list-style-type: none"> <li>- Construction corridor for proposed pipelines</li> <li>- Construction corridor for proposed overhead transmission lines</li> <li>- Construction corridor for permanent and temporary roads</li> <li>- Location of borrow-pits or quarries</li> <li>- Location of spoil disposal sites</li> <li>- Location of proposed infrastructure within the well field</li> <li>- Location of EPCC construction camps</li> </ul>	<p>75 days after the Effective Date</p> <p>45 days prior to respective Date of Access of each section of the Site</p> <p>75 days after the Effective Date</p> <p>45 days prior to respective Date of Access of each section of the Site</p> <p>45 days prior to respective Date of Access of each section of the Site</p> <p>45 days prior to respective Date of Access of each section of the Site</p> <p>75 days after the Effective Date</p>
<p>Detailed ornithological survey to identify the presence of the following bird types and identification of mitigation measures required to avoid their disturbance as well as the disturbance of any vegetation which may serve as food or nesting shelter:</p> <ul style="list-style-type: none"> <li>- Rare breeders – including but not limited to Verreaux’s eagle, short toed eagle, sooty falcon and houbara bustard.</li> <li>- Passage migrants – including but not limited to eagles, vultures and corncrake.</li> <li>- Common ground nesting desert species – including but</li> </ul>	<p>45 days prior to respective Date of Access of each section of the Site</p>

<b>Description</b>	<b>Due Date</b>
not limited to desert lark, hoopoe lark, wheatear, stone-curlew, cream coloured courser and sand partridge.	
Updated and detailed Ecological Review and Assessment (section 4 of Addendum 2, April 2008), with specific focus on species and habitats along each section of the Site.	45 days prior to respective Date of Access of each section of the Site
Updated and detailed Archaeological Review and Assessment (section 5 of Addendum 2, April 2008) along each section of the Site.	45 days prior to respective Date of Access of each section of the Site
Completion of the Cultural Resources Management Plan (CRMP) along each section of the Site.	45 days prior to respective Date of Access of each section of the Site
Submission of final versions of the following documents by the EPC Contractor:	
- Human Resource Policy and Occupational, Health and Safety Policies and Plan	120 days after the Effective Date
- Project Compensation Plan	120 days after the Effective Date
- Construction Environmental and Social Management Plan	120 days after the Effective Date
- Communication Strategy (EPCC)	120 days after the Effective Date