ANE 07-22 Iraq SO1 Baghdad Power PEA & SS – Mitigation Table

PROGRAMMATIC ENVIRONMENTAL ASSESSMENT

of

BAGHDAD POWER DISTRIBUTION SUBSTATIONS PROJECT

(JO-04-506-04)
in Cooperation with

MINISTRY OF ELECTRICITY
GOVERNMENT OF IRAQ

PREPARED BY:
United States Army Corps of Engineers
Mississippi Valley Division
New Orleans District
New Orleans, Louisiana

November 30, 2006

Table 4. Mitigation and Monitoring Measures Associated with Baghdad Power Distribution Substation Project Construction and Operation

Activity	Impact	Mitigation Measures	Monitoring Requirements
1. Planning and Design Phase			
Design and assessment of electric power distribution substation structures and installation of equipment by electrical engineering design consultants.	Environmental sensitivities may not be considered at this stage, but it is important to ensure that the adverse impact **mitigation and monitoring measures** are considered and budgeted for**.**	Ensure good collaboration with the ME so that project activities can be coordinated. Encourage understanding of the affected areas of ecological sensitivity, if any. Power distribution station rehabilitation and new construction may require having an "Environmental Checklist" for use by those assessing construction needs. . Costs of environmental protection and management become an explicit part of the BOQ.	Government of Iraq ME review completed checklist and verify that it has been adequately completed Possible field visit by MEO to substation construction sites to assess status of environmental parameters, and mitigation and monitoring plans.
	Human health and safety impacts during the ground preparation for rehabilitation and construction of substations caused by handling hazardous waste containing presence of PCBS and lead paint, and during field survey for removal of any live UXO before project construction. .	Ensure that project workers are provided with protective field equipment before removal of hazardous waste. Ensure that the personnel doing the field survey for removal of UXO are well trained and fully equipped for detection, removal, safe handling and storage, including proper storage for hazardous waste.	Carry out regular field checks to ensure that workers are provided with protective field equipment for removal of hazardous waste and live UXO, that the equipment is working well, and that the removed waste and live UXO are safely stored.

2. Construction Phase			
Soil surface disturbance from bush clearing, ground excavations and leveling for installation of power distribution structures and equipment, requiring transportation and operation of heavy construction machinery.	**Soil erosion impact** leading to soil displacement and sedimentation, and clogging of near by drains and watercourses or surface water bodies.	Plant grass or other ground cover using local plants and flowers around the power distribution structures. Cost of spreading and, or compaction of disturbed soil incorporated into BOQ. Ensure adequate maintenance of affected water drainage ways to prevent blockages and failure	Monitor sediment and debris buildup in nearby drains, ditches or culverts. Measure drainage flow, or local hydrology to increase the understanding of local conditions, and impact cause and effect.
	Air pollution impact due to generation of dust during ground surface excavations and leveling.	Ensure that the field crew has breathing equipment to prevent health hazards due inhalation of dust.	Check breathing equipment to ensure that it is working well.
	Noise pollution impact during the operation of heavy machinery.	Ensure that machinery operators have personal hearing protection equipment.	Ensure that the personal hearing protection equipment is working well.
	Historical and cultural resources impact, causing possible damage to the present resources.	Ensure that field surveys are carried out for detection of presence of any historical and cultural resources of importance before power distribution structure construction starts.	Carry out regular field checks to ensure that the necessary field surveys are done in every site before project construction activities are started.

Increased surface runoff due to roof catchments and construction of ground pavements in the power distribution station compounds.	**Hydrology and water resources pollution impact** due to transportation of PCB and lead paint pollutants to surface and underground water resources. **Human health and safety impacts** during the handling of hazardous PCB contaminated waste and removal of live UXO before the rehabilitation and construction of power substations.	Ensure that leakages of PCBs and lead paint residues are safely removed from power distribution substations to prevent their transportation by surface runoff when it rains. Ensure that project personnel involved in project construction are well trained and fully equipped for safe detection, removal, storage and disposal of hazardous waste and live UXO.	Carry out regular inspection of the power substations to ensure that all types of waste are completely removed and safely disposed off. Carry out regular checks to ensure that field equipment for removal of hazardous waste and live UXO is working well, and that the removed hazardous waste and live UXO are safely stored and disposed off.
Ground excavations and leveling for construction of power distribution structures.	**Biodiversity impacts** due to removal of plant material and other living organisms from the site, leading to possible loss of local flora and fauna species	Avoid areas sensitive for nature conservation when selecting new sites for power substations, especially those used for recreation in urban areas. Ensure that removed soil is well kept and used for environmental restoration and landscaping around the power distribution substations after the construction is completed.	Verify that environmental restoration and landscaping activities meet the mitigation standards. Verify natural plant regeneration on restored areas and if necessary, replant.

Generation of hazardous solid and liquid waste during the power distribution structure construction stage.	**Site pollution impact** due to accumulation of hazardous waste from garbage, fuel leaks or waste oil and other lubricants from motorized equipment.	Ensure project personnel training on specified site pollution safeguards. Provide equipment for storage of waste oil and other lubricants. Incorporate full field cleanup costs well into BOQ. Ensure that the field crew is well trained in safe handling and disposal of hazardous waste.	Ensure that the hazardous waste is properly removed stored and regularly disposed off in a safe manner. Ensure that training on safe handling of hazardous waste is regularly provided, including equipment for safe handling of waste.
Construction vehicle and traffic use of the road during the transportation of construction materials and power distribution equipment.	**Traffic obstruction impact** during movement of heavy construction machinery with heavy trucks along the roads, with a possibility of creating heavy traffic jams along the roads, especially in urban areas.	Transmit messages on affected roads through radio, TV and newspapers to warn members of the public to avoid affected roads during project construction periods. Arrange for regulation of traffic movement during project construction along affected roads. Install road signs to enforce speed limits and slow down traffic along affected roads during project construction periods. Arrange for road signals for alerting drivers to the dangers of passing on affected roads during project construction.	Ensure that traffic laws are enforced during the project construction period. Ensure that roads liaison officer maintains continuous log of community enquiries and complaints on road use inconveniences during project construction periods.

3. Operations Phase			
Operation of power distribution equipment in substations.	**Electro-magnetic fields impacts** due to high voltage equipment that could cause human health and safety considerations in residential areas.	Undertake measurements for changes in the fluctuation of electro-magnetic fields around the power distribution stations.	Monitoring changes in the fluctuation of electro-magnetic fields to ensure that they do not cause any significant health threats to nearby residents or business.
	Human health and safety impacts due to leakage of hazardous PCB during the operation of transformers.	Ensure that the ME staff technicians involved in the operation and maintenance of the power distribution substation equipment are well trained and fully equipped in safe handling and disposal of PCB contaminated hazardous waste.	Monitor the occurrence of PCB leaks from transformers, and safe removal of PCB contaminated hazardous waste.