EXECUTIVE SUMMARY

1. Introduction

This ESIA and ESMP study is prepared for the extension of Akamat Hubaish to Anbian village which is (4.65 km long), main route and Jara Branch which is (2.925 km long) of the original sub-project.

The proposed sub-project “Akamat Hobaish – Anbian+ Jarah Branch” alignments will meet the future demand for better transportation and communication between many villages in the area and to Ta’iz City. In addition, keeping in view an anticipated overall development in the central region of the country; it will reduce travel time and reduce the cost for freight traffic engaged between the central region of the governorate and district areas of Al Mesrakh.

2. Sub-Project Description

The previous contract length of “Akamat Hubaish – Anbian, main route (7.6 km) + Talooq Branch (2.85 km) + Jarah Branch (2.925 km)” was 13.375 km. During the past contract, 2.95 km of main route and 2.85 km Talooq Branch were implemented. The remaining segment of this sub-project is (4.65 km main route and 2.925 km Jarah Branch). This sub-project is considered to be an important link in the Rural Road Network, serving very remote villages, sub-districts and district center and also is considered as a median road to many village accesses.

This sub-project is located in the north east of Al Mesrakh within Taiz Governorate. The sub-project is classified as intermediate rural road (secondary) as it connects Al Mesrakh District with Ta’iz Governorate, in addition to its vital role in alleviating poverty in the rural areas by improving access of local population to the basic services they need.

The main route starts from the asphalt road at Najed Qusaim to Anbian Village. The branch starts at station 3+800 from the main route to Jarah Village.

3. Sub-Project Objectives

The main objective of improving these sub-project alignments is to reduce isolation of villages which are living adjacent to alignments and to help them to contact with other regions of the country through roads network. Another objective is to alleviate poverty in the area by improving access to basic services such as schools, health centers and market areas.

Moreover, the importance of implementing the remaining segments of the sub-project of about (7.575 km) long is to serve directly about 483 settlements with a population of about 100,284 inhabitants in Al Mesrakh district within the sub-project area that will attract medium freight traffic with origins and destinations for the road corridor.
4. Environmental Legislation in Yemen

Environmental Impact Assessment (EIA) in Yemen is enabled by the Environment Protection Law No. 26 of 1995 (EPL). The provisions of this framework law are implemented through Executive Regulations (By-Law 148-2000), issued by a decree of the Council of Ministers. In addition, in October 2002, the Environmental Protection Authority (EPA) issued the “Environment & Sustainable Investment Program 2003-8” (ESIP), which constitutes the framework for the government’s environmental policy for the next years.

5. Baseline Conditions

Based on the field visit conducted from 4-6 Feb. 2013 for the purpose of assessing the existing environmental and social conditions, the following headings could be summarized:

5.1 Physical Conditions

The existing geographical alignments are classified as rolling to mountainous terrains with some stretches of steep grade (escarpment). Land use is mostly agricultural diverting from right to left of the excavated alignments. The design width has been achieved in most part of the two alignments except inside the villages of Anbian and Jarah because of many obstacles and facilities. Accordingly, no land acquisition is expected in these portions of alignments.

In addition, it was noticed that there is some excavated material left to the side of the two alignments at few locations which could be used as fill material for leveling existing surface and also some lose material sliding from unstable side slopes. It has been noticed that the locals are cutting stones at few locations for housing purposes.

5.2 Hydrology Conditions

During the field visit, it has been noticed that about 70% in the main route and about 50% in Jarah branch of the drainage culverts and retaining walls were implemented under the previous contact. The main route crosses a drainage flow at station 4+600 and Jarah branch alignment crosses two drainage flows at station 2+400 and at 2+600 where either Irish Crossings or big culverts will be implemented to accommodate the flow. Another water flow is running from Top Mountain in the escarpment portions of the two alignments, for example, from station 6+900 down to station 5+950 in the main route and from station 2+050 down to station 1+725 in Jarah branch and require consecutive spill ways to protect the side slopes from scouring effect. The design has incorporated all drainage measures to accommodate the natural flow in a way to distribute the water between villagers as agreed between farmers and to avoid social conflicts during construction stage.

5.3 Air Quality and Noise

Based on the field visit, air quality is clean since the area is un-developed and no air pollution because no manufacturing industries surrounding the area and the volume of traffic is low at present. Noise level is quite low because no heavy vehicles or big trucks driving in the area.
5.4 Flora and Fauna
Agricultural lands and terraces exist at different locations and diverting from left to right of the alignments. Some of the trees are productive and consumable and some are natural trees. No negative impact is expected on these trees because they are far from the right of way.

No wildlife or special species have been noticed during the field visit. Therefore, no negative impact is expected.

5.5 Socio-Economic and Historical Sites
The socio-economic condition of the area is considered poor because most of the local populations depend mostly on agricultural product during rainy seasons. Few small shops have been noticed selling basic food stuff. During the visit, one of the shop owners said that it cost so much to transfer goods from supply center to his shop because only four wheel drive vehicles can carry people.

No historical sites were found nearby the sub-project area. However, there are three old Religious found adjacent to alignments. One is in Talooq branch at station 1+325 and two in Anbian village at station 7+300 and at station 7+500. All Burials are protected and surrounded by stones. The one in Talooq branch was not affected during construction stage in the previous contract and the two in Anbian village will not be affected because it was agreed to have stone pavement and excavation or blasting will be conducted.

6. Environmental and Social Impacts
This sub-project is classified as category (B). This category is justified because the expected adverse environmental and social impacts will be limited in most cases temporary and for the most part reversible. As the alignments already exist, there will be no significant impacts associated with the land acquisition or resettlement.

The potential impacts were reviewed in the context of Physical Environment, Water Harvesting and Hydrology, Biological Resources and Socio-economic and Cultural Setup. Some of the identified impacts are positive in nature while few negative impacts have been noticed as well and could be mitigated properly during construction and maintenance phases.

The Environmental and Social Impact Assessment (ESIA) was carried out according to the guidelines set in the Sectored Environmental Assessment (SEA) and RAP Environmental and Social Processes.

The expected potential impacts of the extension of “Akamat Hubaish – Anbian” main route (4.65 km) and Jarah Branch (2.925 km) is summarized below:

6.1 Physical Environment:

The expected negative impacts during construction phase will be due to construction waste disposal especially to the side of the road and to unstable slopes where water flow cause excess material to fall to agricultural lands and terraces. Waste generation will be disposed to vacant lands according ESMP and SFA in agreement with beneficiaries.
Another concern is the obstacles inside Anbian Village (main route) from station 7+125 until 7+600 and inside Jarah Village from station 2+625 to station 2+925 end of alignment because the alignments are passing through narrow track between community houses. There are many obstacles such as sewage holes, electric and phone poles and agricultural lands causing narrow track and possible land acquisition. In addition, the road bed surface of the entrances of both alignments is rock and may require either Jack Hammer for drilling or minor blasting.

However, in order to avoid all obstacles inside both Anbian Village and Jarah Village, it was agreed with the General Director and the Technical Department of RAPCMO to use labor works and provide stone paving with the necessary drainage works and keep the existing width. By using stone pavement, the Environment will be safe and the local people will be served. Of course, all items related to stone paving have been added in the up-dated Bill of Quantities of the sub-project and reflected in the ESMP.

6.2 Hydrology and Water Harvesting

The alignments are crossing several water flows from Top Mountains in the two alignments. For example, the main route is crossing a consecutive flow from station 6+900 down to station 5+950 and Jarah branch is crossing water flow from 2+050 to 1+725. This effect is causing unstable side slopes, land sliding and scouring effect. The mitigation measures in this case is to protect the unstable slopes by implementing the right size of drainage culverts to accommodate the flow of rain water from the top mountains and to include consecutive spill ways to down flow water to side ditches below and to next culverts. Accordingly, slope stabilization will be fixed by retaining walls, mesh gabion works or planting. These flows will be discharged to adjacent agricultural lands and terraces as traditional water harvesting among all farmers in order to avoid social conflicts. The design has incorporated all drainage measures to accommodate the natural flow in a way to distribute the water between villagers as agreed between farmers and to avoid social conflicts during construction stage.

6.3 Air Quality and Noise

Information on air quality in Yemen is scarce. However, no significant impact is expected in the remaining segments of the two alignments during physical works because most of the excavation works is complete and as a result no air pollution. Noise would occur from Graders, Compactors and Trucks during working hours for the remaining activities. However, this impact is considered to be minor and short. Traffic and safety is not of a major concern because of low volume of traffic in the area.

6.4 Biological Resources

The sub-project does not traverse any known biodiversity or hotspot. Accordingly, no adverse impacts are anticipated in respect of sensitive habitat, wildlife or cultural heritage. Also, no adverse impact is expected on agricultural lands or terraces during construction period because the design width has been achieved during previous contract. Damage from dust during construction is also unlikely to be very significant.
6.5 Socio-Economic and Cultural

Significant beneficial impacts are anticipated to result from sub-project implementation. The most important of these are the major improvement in the social and socio-economic conditions of the population served by the road, arising through a major reduction in vehicle operating costs. This is expected to lead to reduced transport costs for both goods and passengers, both of which are high at present. Complete suppression of traffic-raised dust will result from the provision of a sealed surface and, together with much improved road drainage, which will improve the quality of life of those who live near the road and all road users. The improved road will improve accessibility to services (water, electricity, education and health) and local markets.

Based on the site visit and interviews, no cultural or historical sites are present near the sub-project area. Three old burials for religious people were found adjacent to alignments but are fenced and protected by stones. During construction stage, the burials will not be affected because there will be no excavation or blasting.

All potentially adverse impacts arising during construction can be mitigated satisfactorily, and residual impacts would be reduced to an acceptable level, through the inclusion of suitable environmental protection clauses in the construction contract.

7. Analysis of Alternatives

The sub-project alignments provide the only outlet for the affected villages to outside services and markets and implementing these roads will make a difference in the lives of these isolated people and villages.

From a pure environmental viewpoint, the “no-built” alternative is not preferable to sub-project implementation since it would leave the people living along the roads continue to have poor access to administrative and other services.

Therefore, the “no project” option is considered inappropriate in view of the long-term and widespread benefits of roads upgrading to the communities served by the roads in comparison with the short-term potential adverse impacts associated with the construction phase, most of which can be mitigated satisfactorily.

The positive impacts indicate that overall, beneficial impacts of this sub-project on physical and natural resources, safety, job creation and local economic development are expected to outweigh negative impacts.

8. Environmental and Social Mitigation Measures (ESMM)

This section will discuss the main mitigation tools during the preparation stage and the physical mitigation measures during execution stage. The Environmental and Social mitigation measures (ESMM) for the sub-project has three main components:

1. Mitigation Tools such as the Design Measures, Safety and Regulation Clauses and the Social Framework Agreement (SFA),
2. Mitigation Measures during Construction and Maintenance Phases, and
9. Monitoring Plan (MP)

During construction activities, the daily monitoring plan relies on the supervising consultant of all environmental and social impacts to determine contractor compliance or otherwise with the ESMP. The consultant will monitor the application of environmental and social mitigation measures and the result of monitoring activities shall be reflected on the monthly report.

The sub-project officer at RAPCMO shall conduct site inspections every 4-6 weeks to monitor the compliance of both the contractor and the supervising consultant with the applications of all mitigation measures for environmental and social impacts.

The Environmental and Social Unit (E&S U) within the Rural Access Program Central Management Office (RAPCMO) is responsible for overall monitoring of all sub-projects implemented under the program. The (E&S U) responsibility is to follow up and monitor the contractor, consultant, and the sub-project officer and review monthly reports on contractor compliance. The result of the monitoring will be archived in a dossier for each sub-project for WB Audit.

10. Environmental and Social Management Plan (ESMP)

The ESMP consists of three components; Mitigation Plan, Monitoring Program and Institutional Arrangements. The Mitigation Plan includes measures to mitigate potential negative sub-project impacts and enhance its positive impacts during initial physical works as well as the normal maintenance of the road. These mitigation measures are summarized in the comprehensive (ESMP) tables. These tables have been prepared for both Construction and Maintenance phases. The ESMP tables also identify the Officials/Organizations who are responsible for implementation and monitoring of ESMPs issues. The Monitoring Program will comprise site inspection designed to determine contractor compliance or otherwise with the ESMP and other applicable regulations and statutes. The Environmental and Social Unit (E&SU) of the Rural Access Program Central Management Office (RAPCMO) will be responsible for overall monitoring program of the environmental and social impacts in addition to Supervising Consultant and sub-project Officers within RAPCMO.

Implementation of Environmental and Social Management Plan would be the responsibility of contractor. The monitoring and reporting of environmental and social mitigation measures would be the responsibility of Supervising Consultant and reviewed by RAPCMO-E&SU.

11. Social Consultations

Thorough social consultations were conducted on 19 Dec. 2012 to the sub-project area at several locations with Local Council People, Beneficiary Committee (BC) members and Project Affected People (PAP). The consultations included distribution of Arabic translation of both the Executive Summary of ESIA and ESMP, and project objectives. Also, a sample questionnaire was adopted and an open discussion was used to get feedback from the affected locals and recorded their concerns and possible problems during construction. The findings of the consultations were concentrated on not to change the design, follow the existing tracks and to speed up the process of roads implementation. All attendees showed their willingness to provide all necessary means in order to finish the sub-project because they suffer very much of the tough terrain. At the end on the consultations, minutes of meetings were prepared, attendance sheets were signed by all attendees and photos of the consultations were taken. The minutes and attendance sheets were approved and stamped by local Council Office and the Governorate Office in Taiz.
It should be mentioned that a new Social Framework Agreement (SFA) was prepared and new Beneficiary Committee (BC) was formed by the Governor.

A scanned copy of the SFA, BC list, attendance sheets, questionnaire and translated minutes of main findings are attached to this ESIA report as annexes.

A separate women consultations report is prepared in Arabic language with an executive summary in English. The main concerns from women’s view are the safety near their daily activities such as water collection and fetching, the safety of students near schools and the safety of rising sheep. Their request included building speed bumps, warning sings, and barriers at certain locations.

12. Report Organization

The structure of the Environmental and Social Impact Assessment report is as follows:

SECTION 1: SUB-PROJECT OBJECTIVES AND DESCRIPTION
SECTION 2: ENVIRONMENTAL LEGISLATION IN YEMEN
SECTION 3: BASELINE CONDITIONS
SECTION 4: POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS
SECTION 5: SUB-PROJECT ANALYSIS OF ALTERNATIVES
SECTION 6: ENVIRONMENTAL AND SOCIAL MITIGATION MEASURES
SECTION 7: MONITORING PLAN
SECTION 8: ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN
SECTION 9: SOCIAL CONSULTATIONS
13. Table (1) Summary of ESMP during Construction Phase

<table>
<thead>
<tr>
<th>Impact</th>
<th>Mitigation Measures</th>
<th>Contract Clauses and Social Framework Agreement (SFA)</th>
<th>Monitoring</th>
<th>Implementation</th>
<th>Quantity</th>
<th>Cost ($)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.1 Land Resources</td>
<td>Stabilize upslope in mountainous areas; design measures to minimize adverse downstream impacts. Such measures are to build retaining walls, protection barriers or gabion mesh works. Or to plant side slope with grass and natural shrubs.</td>
<td>General Regulations: I. Safety, Health &amp; Environmental Regulations Clauses 6.1, 6.4, II. Other Regulations and Requirements Clauses 17.3, 17.4, 17.5.</td>
<td>Consultant, E&amp;S unit</td>
<td>Contractor</td>
<td>4,000 Cu.m Stone</td>
<td>260,465</td>
</tr>
<tr>
<td>A.2 Hydrology and Water Resources</td>
<td>Appropriate sourcing of water and prior arrangements with communities. Gaining water is the responsibility of the contractor; he can buy from water pump station at 2-800 or from the bottom of the wadi below the alignment.</td>
<td>Appropriate sourcing of water; provision of irrigation services; use of irrigation pipes; improvement of channel performance by riprap work.</td>
<td>Consultant, E&amp;S unit</td>
<td>Contractor</td>
<td>40 Cu.m</td>
<td>1,786</td>
</tr>
<tr>
<td>A.3 Air Quality and Noise</td>
<td>Incorporate current water harvesting practices into design; use of irrigation pipes; improvement of channel performance by riprap work.</td>
<td>Incorporate current water harvesting practices into design; use of irrigation pipes; improvement of channel performance by riprap work.</td>
<td>Consultant, E&amp;S unit</td>
<td>Contractor</td>
<td>600 Cu.m Stone works</td>
<td>38,511</td>
</tr>
<tr>
<td>A.4 Socio-Economic and Cultural Resources</td>
<td>Noise control devices (such as silencers) on compressors, percussion tools; avoid equipment use after working hours.</td>
<td>Noise control devices (such as silencers) on compressors, percussion tools; avoid equipment use after working hours.</td>
<td>Consultant, E&amp;S unit</td>
<td>Contractor</td>
<td>500 Cu.m Stone works</td>
<td>32,093</td>
</tr>
<tr>
<td>A.5 Tribal Tensions</td>
<td>Issues identified during screening; agreements and commitments expressed in SFA.</td>
<td>Issues identified during screening; agreements and commitments expressed in SFA.</td>
<td>Consultant, E&amp;S unit</td>
<td>Contractor</td>
<td>4475 Sq.m</td>
<td>124,884</td>
</tr>
</tbody>
</table>

Executive Summary 8 Akamat Hubaish – Anbian + Jarah Branch
<table>
<thead>
<tr>
<th>Impact</th>
<th>Mitigation Measures</th>
<th>Mitigations</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.5.3 Destruction or relocation of utility services (electricity and water pipes). (Figures 7-12, main route and 7-10Jarah branch).</td>
<td>Design avoidance measures through the use of stone pavement with necessary drainage. Also, relocation of utility as a pay item included in the sub-project cost.</td>
<td>General Regulations: Safety, Health &amp; Environmental Regulations Clause 16.2.4. Issues identified during screening, measures in Contract Data, contract drawings and SFA.</td>
<td>Consultant, E&amp;S unit</td>
</tr>
<tr>
<td>A.5.4 Public health and safety at construction site -Safety and health for the construction workers. -Public safety at the site and interaction between the workers and the public.</td>
<td>Safety rules for work maintenance, such as equipment maintenance procedures, protective hard hats, shoes and clothing for workers; first aid and medical kits and procedures; health and safety regulations clearly displayed in English and Arabic. Public health and safety measures, such as barriers and warning signs to borrow areas or other dangerous zones; Information campaigns on health practices and communicable diseases.</td>
<td>General Regulations: I. Safety, Health &amp; Environmental Regulations Clauses 4, 5 &amp; 6. Community precautions defined in SFA.</td>
<td>Consultant, E&amp;S unit</td>
</tr>
<tr>
<td>A.5.5 Graveyards and burials (Figures 7-12, main route and 7-10Jarah branch).</td>
<td>Avoid disturbance through the use of stone pavement to safe burials; and avoid drainage flooding and use barriers during construction.</td>
<td>General Regulations: I. Safety, Health &amp; Environmental Regulations Clause 7.5. Issues identified during screening, design measures in Contract Data and SFA.</td>
<td>Consultant, E&amp;S unit</td>
</tr>
<tr>
<td>A.5.6 Chance finds of Cultural Resources or other socio-economics resources</td>
<td>Application of Chance Find Procedures to assess requirements and implement mitigation.</td>
<td>Chance Find Procedures specified in Annex 2 of Cultural Resources Policy Framework; agreements and commitments carried out within the SFA framework.</td>
<td>Consultant, E&amp;S unit</td>
</tr>
<tr>
<td>A.5.7 Gender considerations</td>
<td>Women’s consultations and incorporate concerns into EMP. Most of the concerns were to implement humps near crossings to schools or daily women activities, install warning signs and some protection barriers.</td>
<td>Issues identified during screening, design measures in Contract Data and SFA.</td>
<td>Consultant, E&amp;S unit</td>
</tr>
<tr>
<td>A.5.8 Employment</td>
<td>Mechanisms to maximize local employment benefits explored during consultations.</td>
<td>General Regulations: I. Safety, Health &amp; Environmental Regulations Clause 4.11.</td>
<td>Consultant, E&amp;S unit</td>
</tr>
</tbody>
</table>
## 14. Table (2) Summary of ESMP during Maintenance Phase

<table>
<thead>
<tr>
<th>Impact</th>
<th>Mitigation</th>
<th>Contract Clauses and Social Framework Agreement (SFA)</th>
<th>Responsibility</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mitigation Measures</td>
<td>Monitoring</td>
<td>Implementation</td>
</tr>
<tr>
<td><strong>B.1 Land Resources</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B.1.1 Slope stabilization</td>
<td>Regular maintenance of stabilization measures; protection works. These areas shall be regularly maintained and monitored as part of maintenance.</td>
<td>Maintenance measures defined in contract data.</td>
<td>Consultant, E&amp;S Unit</td>
</tr>
<tr>
<td>B.1.2 Maintenance contractor site compounds, materials and equipment storage</td>
<td>Provision of adequate living and sanitation facilities; adequate materials management and safety plan; limitation of construction site.</td>
<td>General Regulations: I. Safety, Health &amp; Environmental Regulations Clauses 6.1, 6.4; II. Other Regulations and Requirements Clauses 17.3, 17.4, 17.5.</td>
<td>Consultant, E&amp;S Unit</td>
</tr>
<tr>
<td><strong>B.2 Hydrology and Water Resources</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B.2.1 Water harvesting</td>
<td>Regular maintenance of water harvesting structures.</td>
<td>Maintenance measures defined in contract data and SFA.</td>
<td>Consultant, E&amp;S Unit</td>
</tr>
<tr>
<td>B.2.2 Blockage of cross Drains/culverts Uncontrolled discharge</td>
<td>Regular maintenance of drainage structures; avoid uncontrolled community discharges.</td>
<td>Maintenance measures carried by the beneficiaries defined in SFA.</td>
<td>Consultant, E&amp;S Unit</td>
</tr>
<tr>
<td><strong>B.3 Air Quality and Noise</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B.3.1 Air pollution from increased traffic</td>
<td>Vehicle maintenance; enforcement of emission controls; lead free fuels.</td>
<td>Not applicable.</td>
<td>Consultant, E&amp;S Unit</td>
</tr>
<tr>
<td>B.3.2 Noise Nuisance</td>
<td>Speed controls in populated areas; signs and warnings in sensitive areas; driver information/education campaigns.</td>
<td>General Regulations: I. Safety, Health &amp; Environmental Reg. Clause 6.5.</td>
<td>Consultant, E&amp;S Unit</td>
</tr>
<tr>
<td><strong>B.4 Socio-Economic and Cultural Resources</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B.4.1 Road accidents</td>
<td>Maintenance of speed reduction measures, signs and warnings; Information campaigns to drivers and at villages.</td>
<td>Local maintenance and actions defined in SFA.</td>
<td>Consultant, E&amp;S Unit</td>
</tr>
<tr>
<td>B.4.2 Socio Economic Benefits</td>
<td>Monitoring of benefits.</td>
<td></td>
<td>Consultant, E&amp;S Unit</td>
</tr>
<tr>
<td>B.4.3 Chance finds of Cultural Resources or other socio-economics resources</td>
<td>Application of Chance Find Procedures to assess requirements and implement mitigation.</td>
<td></td>
<td>Consultant, E&amp;S Unit</td>
</tr>
</tbody>
</table>