ENVIRONMENTAL SAFEGUARDS FRAMEWORK FOR ROAD NETWORK IMPROVEMENT PROGRAM IN THE NINGXIA PROVINCE IN CHINA

Introduction

Given the nature and small scale of the proposed civil works under the rural roads component of the project, a formal environmental assessment report was not considered necessary. However, as in most cases construction activities are going to be undertaken in rural areas there are likely to be some concerns relating to inconveniences or nuisances to surrounding areas during construction will require careful construction planning and management. Therefore, for the purpose of enhancing environment friendly measures and mitigating any adverse impacts caused by the construction activities, these Environmental Safeguard Framework (ESF) for the rehabilitation and upgrading of rural roads funded under this project have been prepared and shall be implemented by the concerned implementing agencies.

Project Description

The Improvement of Local Roads Component (Rural roads Component) would finance improvements to rural roads in the poorest counties of Ningxia. It would support the overall Local Roads Improvement Program (LRIP) of Ningxia to connect all “administrative villages” to all weather roads by 2015. The LRIP is comprised of 38 local roads with Class IV, in a total length of 523.8 km, serving 160,000 villagers. As part of this program, the Bank would finance nine roads with a total length of approximately 99.3 km and an estimated cost of USD 8 million.

Typology of Eligible Rural Roads and Planning Horizon

Only rural road upgrading or rehabilitation projects will be eligible for financing. Construction of new rural roads will not be eligible for financing. Projects must meet the following definitions:

Upgrading: Improving road specifications. Most of the work is carried out on the existing platform or right of way.
- Changing surface (gravel to pavement or asphalt)
- adding extra lanes in steep inclines
- improving curves
- strengthening bridges

Rehabilitation of Roads: It consists of bringing existing deteriorated roads to previous/original conditions. All of the work is done on the existing platform or right of way. No additional land acquisition is needed. The following works are carried out during rehabilitation of roads:
- improving drainage/slopes/embankments/other structures
- Rehabilitate pavements
- complete resurfacing/repaving
- recuperating civil works

In all, 38 roads and 3 portions of G211 have been identified for financing, of which 9 rural roads and 3 portions of G211 will be financed by the World Bank while the rest by counterpart funding. All roads
meet the definition of rehabilitation/upgrading. The characteristics of these projects and the year of implementation are presented in Annex 1.

Potential Subproject Impacts

As presented in Annex 1, all projects involve changing the road surface to either asphalt or concrete. The width of the road is not changed or expanded.

Perhaps the only environmental concern for this project would be the management of construction related impacts. Contractor practices can cause readily visible environmental and aesthetic impacts especially from the inadequate disposal of construction wastes and earth cuts. The proper management of excavation materials, river and drainage crossings, and the reduction of nuisances such as dust, noise, increased traffic, pedestrian safety concerns, and the presence of a large work force in or near small rural communities, will necessitate careful engineering planning, closed supervision, and a continuous and intense community information program.

Purpose of the Environmental Safeguards Framework (ESF)

The Environmental safeguard framework aims to establish some simple rules, procedures and institutional arrangements to be utilized under the Rural Road Component with regard to identification, monitoring and mitigation of possible adverse environmental impacts with respect to the rehabilitation and upgrading of rural roads. All subprojects to be financed under the Rural Roads Component must (i) meet World Bank safeguard policy requirements; it provides guidance in the screening of subprojects for eligibility to receive funds from the program, and identifies additional information that may be needed to ensure compliance with WB Safeguards; (ii) meet minimum environmental design standards; and (iii) are implemented without creating unnecessary impacts on the environment or nuisances to communities during the construction works.

The framework also describes the roles and responsibilities of the various institutions involved in meeting these requirements. The framework will be applied to all 38 rural roads under the program.

Ultimately, the ESF can be considered as a tool to promote better environmental practices in rural road design and construction in the Province of Ningxia (see annex 5).

Institutional Roles and Responsibilities

Main responsibilities for project implementation are as follows:

- The project executing agency is the NTD, the regional agency responsible for road management in Ningxia. The NTD has a Planning Division which is currently in charge of project preparation. Under the Planning Division, a special Project Management Office (PMO) has been set up to take charge of all preparation activities, including securing the required internal clearances. NTD has hired the Ningxia Highway Survey and Design Institute to carry out the engineering feasibility study. During implementation, the PMO would continue to provide overall coordination and project oversight.

- Project implementation would be the responsibility of the Ningxia Highway Construction and Administration Bureau (NHCAB) under the NTD, and transportation authorities in each city/county/district. Their responsibilities are defined as follows:
Assisted by the Supervision Engineer, the Local Road Division under NHCAB will be responsible for the and the 3 portions of G211 rural roads that are financed by the World Bank loan. Project city/county/district transportation authorities will be responsible for the rest 29 rural roads that are financed by domestic counterpart funding; and

Once built, all the roads will be handed over to city/county/district transportation authorities who will take over the responsibility of the operation and maintenance of these road network.

Other factors include:

- Domestic contractor: in charge of carrying out the rehabilitation and upgrading of the rural roads;
- World Bank, maintains an oversight role and may provide technical assistance and institutional strengthening in regard to implementation of subproject environmental and social commitments; and
- Design: design work will be undertaken by Yinchuan Highway Design Institute and other design firms.

Supervision: Ningxia Supervision Consulting Company. It is also possible to select other supervision engineering companies through bidding.

Roles and responsibilities in the Rural Roads Component as a whole and in the ESF are presented in Table 1.
Table 1: Subproject Roles and ESF Responsibilities

<table>
<thead>
<tr>
<th>Institution</th>
<th>Role in REDP</th>
<th>Responsibility in ESF</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMO</td>
<td>Coordination and oversight of rural roads component</td>
<td>Ensure ESF is applied and keep documentation for World Bank review</td>
</tr>
<tr>
<td>Local Road Division, NHCAB</td>
<td>Procurement, construction and contract management of the 9 rural roads and 3 portions of G211 financed by World Bank loan.</td>
<td>Ensure sub-projects meet environmental design criteria; ensure that environmental specifications are included in bidding documents and contracts</td>
</tr>
<tr>
<td>Transportation authority of project city/county/district</td>
<td>Procurement, construction and contract management of the 29 rural roads financed by domestic counterpart funding.</td>
<td>Ensure sub-projects meet environmental design criteria; ensure that environmental specifications are included in bidding documents and contracts</td>
</tr>
<tr>
<td>Transport authority of project city/county/district</td>
<td>Operation and maintenance of rural roads</td>
<td>Ensure maintenance of rehabilitated/upgraded roads</td>
</tr>
<tr>
<td>Contractors</td>
<td>Execute works, adhere to environmental specifications for construction</td>
<td>Execute works, adhere to environmental specifications for construction</td>
</tr>
<tr>
<td>World Bank (WB)</td>
<td>The WB will maintain an oversight role in the rural roads component and ensure compliance to environmental and social safeguards.</td>
<td>The World Bank will initially review the EMP of all subprojects implemented in 2010 to ensure compliance with ESF requirements. When satisfied that the document review and oversight process by the LRCD/Construction Bureaus is satisfactory, the World Bank will limit its reviews to a more modest level. However, if the World Bank feels implementation is not acceptable and does not see any improvements it will recommend institutional capacity building measures to the PMO/LRCD in order to correct any inadequacies.</td>
</tr>
</tbody>
</table>
Four-Step Procedures to be followed in ESF

The ESF comprises the following simple four-step procedures in undertaking any rural road under the Ningxia project. These four steps involve (i) conducting a site environmental screening to ensure that no sensitive issues regarding environmental and social impacts are not present in the road alignment; (ii) checking rural road design to ensure that minimum environmental components are properly addressed; (iii) applying environmental rules for rural road contractors to minimize impacts and nuisances to communities during construction; and (iv) providing training on rural road maintenance to municipalities and counties. They are described in more detail below.

Step 1: Environmental Screening to Identify any Key Environmental Safeguard Issues

As a first step prior to construction/renovation, the LRCD complete a simple Road Site Checklist to determine possible environmental impacts/nuisances for every rural road included in the program. This checklist will identify any outstanding issues regarding environmental or social impacts and identify specific actions or mitigation measures to be included in the design or to be included as part of environmental specifications for contractors.

The Checklist is included in Annex 2. This checklist must be signed and kept in files for Bank review.

Step 2: Applying Checklist for Environmentally Design Criteria

The second step in the environmental safeguards procedures for the rural roads would involve completion of a checklist of some specific design criteria to be adopted in the process of construction and/or upgrading of rural roads. These design criteria involve certain environmentally friendly/enhancing elements that would avoid or minimize incidence of adverse environmental impacts. These design criteria include ensuring (i) appropriate lateral and cross drainage systems; (ii) adequate design of culverts and river/stream crossings; (iii) appropriate management of any erosion or instability problems along the road; (iv) inclusion of adequate signs along the road; and (v) greening and other landscaping measures are adequate. It is not expected that all of these design criteria would be adopted in each case, but the effort should be to adapt as many as possible in the engineering design of the proposed roads.

This checklist should be completed by the engineering design institution. A sample of the Checklist on Environmentally Friendly Design Criteria is provided in Annex 3.

Step 3: Preparation of Standardized Environmental Specifications for Contractors

After completing the site and environment-friendly design criteria screening using the checklists in annex 1 and 2, the third step in the ESF would be the development of a simple environmental specifications for construction.

As the small-scale construction activities envisaged might cause impacts and nuisance to nearby surroundings, they need to be avoided or mitigated through application of good engineering practices and strict environmental safeguards measures including waste management techniques especially for construction dust and debris, noise control, site management, traffic safety controls, provision of clean water and sanitation facilities etc.

Annex 4 presents a complete set of environmental specifications for contractors of rural road rehabilitation and upgrading in Ningxia. These specifications must be adapted and complemented according to the findings and recommendations of Steps 1 and 2 of the ESF. It is expected that all
Contractors working on civil works under the Rural Roads Component of the project will adhere to this as part of the bidding specifications and the Contractor's Work Plan.

All these measures should be included in bidding document and contractor's workplan as part of the specifications for construction that will be followed by contractors to address any potential environmental safeguard concerns during construction.

Step 4: training on Rural Road Maintenance for Municipalities and Counties

Once the rural road rehabilitation and upgrading is completed, and the project is handed over to local governments, LRCD will carry out training of local O&M staff on rural road maintenance. The training can be designed following the Technical Manual for Maintenance teams (in Chinese, see Attachment 1). This training will be part of the Institutional strengthening of the Ningxia project.

Institutional Arrangements
Ningxia Transportation Department World Bank Project Management Office (PMO), Ningxia Highway Construction Administrative Bureau (NHICAB), city/county/district transportation authorities, contractors, supervision engineers are main actors that participate in to the environmental work of the project. Local environmental protection bureaus (EPB) supervise the environmental performance of the project.

Overall Coordination: Ningxia Transportation Department World Bank Project Management Office (PMO)
- Provide overall guidance to the environmental protection of the project;
- Responsible for preparation and applying for review and approval of environmental assessment documents; and
- Coordination, supervision, training and follow-up during project implementation.

Project Owner: Ningxia Highway Construction Administrative Bureau (NHICAB) and city/county/district transportation authorities
- Ensure compliance with relevant environmental laws, regulations, policies and standards;
- Appoint dedicated staff who will be responsible for environmental protection of the rural roads project;
- Supervise implementation of environmental protection measures that are set forth in the environmental assessment documents;
- Supervise contractors and important construction fields in terms of implementation of environmental protection measures; and
- Report environmental management performance to relevant parties.

As noted above, the Local Road Division of NTD and city/county/district transportation authorities will ensure the application of the ESF and will report to the PMO. The ultimate responsibility for approvals and ensuring adherence to these ESF lies with the PMO. A summary of the institutional arrangements for following the above procedures is given below:

1. Application of Site Checklist: PMO will screen all rural road projects and will coordinate relevant procedures including final review and clearance.

2. Checklist for Environmental Design Criteria: The selected design institute will ensure the application of design standards identified in Annex 2. These design criteria should be reviewed and cleared with the PMO and should form part of the bidding documents and Contractor Work Plan.
3. Environmental specifications for Contractors: Local Road Division of NHCAB will be responsible for the 9 roads and 3 portions of G211 financed by World Bank loan; while city/county/district transportation bureaus for the rest 29 roads financed by domestic counterpart funding. Oversight and final clearance for the Environmental specifications for Contractors will be provided by the Local Road Division.

4. Training: the PMO will be responsible for the training under the project.

**Monitoring, Supervision and Reporting:** NTD will through hired GQE external environmental consultant to help project owners implement monitoring, supervision and reporting. In addition, PMO, project owners and will work together with local EPBs to supervise the whole implementation of project.
### Annex 1 Rural Roads Program

<table>
<thead>
<tr>
<th>No.</th>
<th>City</th>
<th>Name of Road</th>
<th>Km</th>
<th>Existing surface Type &amp; Class</th>
<th>New surface Type &amp; Class</th>
<th>Current width (m)</th>
<th>New width (subgrade/pavement) (m)</th>
<th>Year Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Yinchuan</td>
<td>Sanzhacun-yongfengxun</td>
<td>12</td>
<td>sandgravel class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>2</td>
<td>Lingwu</td>
<td>Shabatou-Nongchang2</td>
<td>6</td>
<td>sandgravel class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>3</td>
<td>Majiatazhendayangqiu</td>
<td></td>
<td>11.3</td>
<td>sandgravel class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>4</td>
<td>Wuzhong</td>
<td>Maliang-Tianqiao</td>
<td>10</td>
<td>sandgravel class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>5</td>
<td>Yuanyichang-Yinxincun</td>
<td></td>
<td>9</td>
<td>sandgravel class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>6</td>
<td>Guojiaqiaxiang-Mawanunc</td>
<td></td>
<td>16</td>
<td>sandgravel or earthen class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>7</td>
<td>Xinjiebao-Baisitan</td>
<td></td>
<td>9</td>
<td>sandgravel class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>8</td>
<td>Hongsibao</td>
<td>Hongxing-Yangliu</td>
<td>12</td>
<td>earthen class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>9</td>
<td>Hongyang-Wushatang</td>
<td></td>
<td>16</td>
<td>earthen class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>10</td>
<td>Qingtongxia</td>
<td>Lixin-Dabadianchong</td>
<td>7</td>
<td>earthen class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>11</td>
<td>Daodunzi-Huangcaoling</td>
<td></td>
<td>16</td>
<td>earthen class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>12</td>
<td>Gaoxing-Xinsheng</td>
<td></td>
<td>7</td>
<td>earthen class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>13</td>
<td>Tongxin County</td>
<td>S203-Qiaojiawan</td>
<td>10</td>
<td>earthen class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>14</td>
<td>S101-Yujialiang</td>
<td></td>
<td>6</td>
<td>earthen class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>15</td>
<td>Xiaoshan-Wujiawan</td>
<td></td>
<td>8</td>
<td>earthen class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>16</td>
<td>Yaoshan-Yuejiaxuan</td>
<td></td>
<td>13.5</td>
<td>earthen class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>17</td>
<td>Yanchi County</td>
<td>Songjishui-Tianshuibao</td>
<td>30</td>
<td>earthen class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>18</td>
<td>Wanglejing-Niumaojing</td>
<td></td>
<td>20</td>
<td>earthen class IV</td>
<td>asphalt or cement class IV</td>
<td>6.5-7.0</td>
<td>6.5/6</td>
<td>2011</td>
</tr>
<tr>
<td>No.</td>
<td>Location</td>
<td>Code</td>
<td>Type</td>
<td>Class</td>
<td>Asphal or class</td>
<td>Gravel</td>
<td>Class</td>
<td>Strength</td>
</tr>
<tr>
<td>-----</td>
<td>--------------------------</td>
<td>------</td>
<td>----------</td>
<td>-------</td>
<td>----------------</td>
<td>--------</td>
<td>-------</td>
<td>----------</td>
</tr>
<tr>
<td>19</td>
<td>Nanliang-Lizhuangzi</td>
<td>11</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>20</td>
<td>Liuyangbao-Lijagou</td>
<td>10</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>21</td>
<td>Wanglejing-Houwa</td>
<td>27</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>22</td>
<td>Yuanxiong</td>
<td>15</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>23</td>
<td>Tanshan Gaotai</td>
<td>22</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>24</td>
<td>Xij County</td>
<td>17</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>25</td>
<td>Mengji-Hongzhuangzi</td>
<td>8</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>26</td>
<td>Gujagou-Youjagou</td>
<td>13</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>27</td>
<td>Tonghua-Zhangwan</td>
<td>12</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>28</td>
<td>Xinying-Zhangbaiwan</td>
<td>15</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>29</td>
<td>Chenjin-Zhongyue</td>
<td>17</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>30</td>
<td>Shimiao-Nitao</td>
<td>18</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>31</td>
<td>Yacian-Liuyuan</td>
<td>14</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>32</td>
<td>Honghe-Heuyuan</td>
<td>16</td>
<td>sandgravel or earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>33</td>
<td>G312-Xinghe</td>
<td>6</td>
<td>sandgravel</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>34</td>
<td>Shan County</td>
<td>5</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>35</td>
<td>Sikouzi-Beyankou</td>
<td>33</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>36</td>
<td>Xutao-Baltaozzi</td>
<td>20</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
<tr>
<td>37</td>
<td>Tangbao-Liaopo</td>
<td>10</td>
<td>earthen</td>
<td>class IV</td>
<td>asphalt or cement</td>
<td></td>
<td></td>
<td>6.5-7.0</td>
</tr>
</tbody>
</table>
Annex 2 Rural Road Screening Criteria Worksheet

This worksheet is designed to help project safeguard specialists assess potential environmental and social risks and impacts associated with project activities on a particular site. The findings can inform the EA Category determination, guide early project design, and contribute to the type and scale of EA work undertaken. This worksheet can also be provided as a tool for the consultant conducting the EA.

<table>
<thead>
<tr>
<th>Location</th>
<th>Yes/No</th>
<th>Description</th>
<th>Proposed Mitigations or Enhancements</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inside or close to a National Park (existing or planned), reserve, or area of high cultural value?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there vulnerable or endangered species (terrestrial or aquatic) in the area?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there natural habitats/ancient trees in the alignment?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>If there are natural habitats, are they fragile, unique, and limited in size?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there wetlands, areas of saturated soils, (permanent or temporary), or evidence of ponding (cracks, high clay content in soils, dead vegetation, water marks)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the site already degraded (low groundwater, poor soil quality)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there steep slopes?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do people live close to the right of way site?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there existing land uses (ranching, farming)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is there existing site access (roads)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Is the site vulnerable to natural hazards (in floodplain, seismic, wind)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there economic activities along the right of way (vendors)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there known archaeological, historical or other cultural property?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Do indigenous peoples live on or near the site?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Impacts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are large excavation works planned? Will a large volume of soil be taken from off-site (quarries and borrow pits)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will the project generate an increase in solid wastes or machine wastes (oil, etc)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Water Resource Impacts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Could it result in a modification of groundwater levels by altering flows, paving surfaces or increasing water extraction?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Criteria</td>
<td>Yes/No</td>
<td>Description</td>
<td>Proposed Mitigations or Enhancements</td>
</tr>
<tr>
<td>-------------------------------------------------------------------------</td>
<td>--------</td>
<td>-----------------------------------------------------------------------------</td>
<td>-------------------------------------</td>
</tr>
<tr>
<td>Could it affect groundwater quality?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Could it affect quality (through sediment, wastewater, storm discharge or solid waste) of nearby surface waters (lake, rivers, streams, irrigation canals)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will it affect water quantity in nearby water bodies (lake, river, and stream)?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there nearby potable water sources that need to be protected?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Ecosystem Impacts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Could it affect natural habitats or areas of high ecological value?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Could it affect natural characteristics of adjacent or nearby sites?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Could it affect wildlife or natural vegetation? Ancient trees?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Drainage Impacts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will storm water drainage affect existing drainage pattern?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will it cause standing water, which could cause public health risks?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will erosion result in sediment discharge to nearby water bodies?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will surface drainage patterns be affected in borrow pits and quarries?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will infiltration patterns be affected?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Socio-economic Impacts</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will the project entail resettlement of population?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will the project affect indigenous peoples?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will it limit access to natural resources to local population?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will it have an impact on land use?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cultivation patterns</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Are there any schools close to the right of way?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will it cause any health impacts?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Will it disturb nearby communities during construction?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Could cultural resources be affected?</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Could it affect nearby properties?</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Annex 3: Checklist 2: Sample of Format for Checklist on Environmentally Friendly Design Criteria

**General Information**

<table>
<thead>
<tr>
<th>Field</th>
<th>Information</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name of Project</td>
<td>Name of rural road</td>
</tr>
<tr>
<td>Name of engineer/ technical officer</td>
<td>Person(s) who conducted the studies</td>
</tr>
<tr>
<td>Date of Site Study Completed</td>
<td>The date on which the onsite studies were completed.</td>
</tr>
</tbody>
</table>

**Information Source**

<table>
<thead>
<tr>
<th>Information Source</th>
<th>Information Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Person(s) who conducted the studies</td>
<td>Name and contact of person(s) contacted</td>
</tr>
</tbody>
</table>

**Proposed Output**

<table>
<thead>
<tr>
<th>Proposed Output</th>
<th>Proposed Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Improvements to Design</td>
<td>Improvements to Design</td>
</tr>
</tbody>
</table>

**Design Criteria**

<table>
<thead>
<tr>
<th>Design Criteria</th>
<th>Yes</th>
<th>No</th>
<th>Unknown</th>
<th>Recommendations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Others (describe)**

**Summary of Overall Assessment:** Prepare a short summary of an overall assessment basing on the design criteria screening results above. What recommendation/suggestion is made to the project?

The above checklist should be provided to the institution in charge of project design.
Annex 4 Environmental Specifications for Contractors

The purpose of this document is to present a simplified EMP to be followed by Contractors in the upgrading, and rehabilitation of rural roads in Ningxia Province, People’s Republic of China.

The project will include specific language in the construction and engineering supervision contracts which will address the need to implement and enforce aspects such as:

(i) proper disposal of construction wastes and earth cuts in either landfills or sites approved by the environmental agency;
(ii) the collection and proper disposal of all spent oils and strict prohibitions regarding oil changes of machinery and equipment in the premises;
(iii) control of dust, noise and other nuisances during construction;
(iv) traffic safety during construction specially in the already overcrowded entrance to the Complex;
(v) the need to inform neighbors about construction schedules;
(vi) the need for adequate sanitary facilities for workers during the construction period and proper disposal of collected wastes in accordance with the sanitation authorities;
(vii) the need to ensure that all landscape items are finalized in accordance with design before final acceptance of the building; and
(viii) all landscape re-vegetation will be done with native species.

The Annex should be used as a guidance.

ROLES AND RESPONSABILITIES

The implementation of these specifications requires the involvement of several stakeholders, each with different roles and responsibilities to ensure sound environmental management during the upgrading, rehabilitation and maintenance of roads.

- Overall coordination: PMO under NTD. Be responsible for preparation and applying for review and approval of environmental assessment documents during project preparation. Coordination, supervision and follow-up during project implementation.
- Project owners: NHCAB and city/county/district transportation authorities. Be responsible for supervision and ensure compliance of mitigation measures set forth in environmental assessment documents. Regular reporting to NTD and PMO.
- Project supervision: local EPBs will supervise PMO, contractors and supervision engineers.

Construction supervisor

The Ningxia Supervision Consultation Company will be appointed the construction supervisor who will represent the Local Road Division and city/county/district transportation authorities in all matters related to the project and will be responsible for overall coordination of implementation of these specifications. The Supervisor will have extensive experience (at least five years experience) in environmental management, supervision and monitoring of road projects, and be familiar with The People’s Republic of China environmental legislative requirements.

The Supervisor will have the following responsibilities:

- Ensure that the specifications are implemented in compliance with relevant Chinese legislation;
- Assist the Contractor(s) in finding environmentally responsible solutions to problems;
• Review the implementation of mitigation and other environmental protection measures during upgrading, rehabilitation, including incorporation of environmental requirements into rehabilitation contracts, enforce other environmental management programs and conduct inspection of the upgrading/rehabilitation sites;

• Consult and/or communicate to the local communities, project affected people, regulatory agencies, and other stakeholders during the project to ensure them the full knowledge of the project progress, potential issues and mitigation actions, as well as to listen and respond to their concerns, suggestions and demands for environmental and community protection;

• Order the removal of personnel and/or equipment not complying with EMP specifications; and

• Issue fines for transgressions of site rules and penalties for contravention of these specifications.

The Contractor and Sub-Contractors

The Contractor, his sub-contractor and employees shall adhere to firstly try to minimize the impact that may result of the project activities and secondly, the mitigation measures set down in these specifications to prevent harm and nuisances on local communities and to minimize the negative impacts to the environment.

The duties of the Contractor and his Sub-Contractors include but not limited to:

• Compliance with relevant environmental legislative requirements;

• Work within the scope of contractual requirements and other tender conditions;

• Organize representatives of the upgrading/rehabilitation team to participate in the joint site inspections undertaken by the Supervisor;

• Carry out any corrective actions instructed by the Supervisor;

• Provide and update information to the Supervisor regarding works activities which may contribute, or be continuing to the generation of adverse environmental conditions;

• In case of non-compliances/discrepancies, carry out investigation and submit proposals on mitigation measures, and implement remedial measures to reduce environmental impact; and

• Stop upgrading/rehabilitation activities which generate adverse impacts upon receiving instructions from the Supervisor. Propose and carry out corrective actions and implement alternative rehabilitation method, if required, in order to minimize the environmental impacts;

UPGRADING/REHABILITATION ACTIVITIES

The following information is intended solely as broad guidance to be used in conjunction with local and national regulations. These specifications must be complemented with the results of the environmental screening and environmental design checklists of steps 1 and 2 of the ESF. They can be also be extended or simplified even further according to these findings. Before initiation of upgrading and rehabilitation activities, the Contractor shall present the Supervisor with an Upgrading/Rehabilitation Plan which explicitly states how he plans to abide by these specifications. After approval of such Plan by the Supervisor, rehabilitation activities can proceed.

Workforce and Site Installation

Workforce

There are potential of the local available labor from the villages along the road that could participate in the project implementation activities. Priority shall be set by the Contactor(s) and sub-Contractor(s) to hire the local labor for the works. The Contractor shall take the following steps to maximize to use of the local labor:
• Announcement for the position that local labor could participate in the works to every township and villages along the road and corresponding payment; and
• Provide work safety training to those local labors upon their hiring.

Code of Conduct

A Code of Conduct shall be established to outline the importance of appropriate behavior, alcohol abuse, and compliance with relevant laws and regulations. Each employee shall be informed of The Code of Conduct and bound by it while in the employment of the Client or its Contractors. The Code of Conduct shall be available to local communities at the project information centers or other place easily accessible to the communities.

The Code of Conduct shall address the following measures (but not limited to them):

• All of the workforce shall abide by the laws and regulations of the People’s Republic of China;
• Illegal substances shall be prohibited;
• Pornographic material and gambling shall be prohibited;
• Fighting (physical or verbal) shall be prohibited;
• Creating nuisances and disturbances in or near communities shall be prohibited;
• Disrespecting local customs and traditions shall be prohibited;
• Smoking shall only be allowed in designated areas; and
• Maintenance of appropriate standards of dress and personal hygiene.

Failure to comply with the Code of Conduct, or the rules, regulations, and procedures implemented at the construction camp will result in disciplinary actions.

Prohibitions

The following activities shall be prohibited on or near the project site.

• Cutting of trees for any reason outside the approved upgrading/rehabilitation area;
• Hunting, fishing, wildlife capture, or plant collection;
• Buying of wild animals for food;
• Feeding of wild animals;
• Use of unapproved toxic materials, including lead-based paints, asbestos, etc.;
• Disturbance to anything with architectural or historical value;
• Building of fires;
• Use of alcohol by workers in office hours;
• Washing cars or machinery in streams or creeks;
• Doing maintenance (change of oils and filters) of cars and equipment outside authorized areas;
• Disposing trash in unauthorized places;
• Driving in an unsafe manner in local roads;
• Having caged wild animals (especially birds) in camps;
• Working without safety equipment (including boots and helmets);
• Creating nuisances and disturbances in or near communities;
• The use of rivers and streams for washing clothes;
• Indiscriminate disposal of rubbish or rehabilitation wastes or rubble;
• Littering the site;
• Spillage of potential pollutants, such as petroleum products;
Environmental Framework

- Collection of firewood;
- Poaching of any description;
- Explosive and chemical fishing;
- Latrine outside the designated facilities; and
- Burning of wastes and/or cleared vegetation.

Any upgrading/rehabilitation workers, office staff, Contractor's employees, the Client's employees or any other person related to the project found violating theses prohibitions will be subject to disciplinary actions that can range from a simple reprimand to termination of his/her employment depending on the seriousness of the violation.

Camp and Site Facilities (if proposed by Contractor)

The following general measures shall be considered for camp and site facilities:

- The construction, layout and extent of the construction site and its components, i.e. all offices, accommodation facilities, testing facilities / laboratories, batching areas, storage & stockpiling areas, workshops, vehicle washing areas and all other areas/facilities required for completion of the project shall be planned, designed and managed in such a manner that environmental impacts are minimized;
- The Contractor shall establish worker's camps, offices, workshops, testing facilities, stockpiling areas, staff accommodation etc. in a manner that does not adversely affect the environment;
- The construction area shall be kept to a minimum;
- Site offices, camps, depots, asphalt plants, mixing stations, and workshops shall be located in appropriate areas as agreed by local village and approved by the SUPERVISOR and not within 500 meters of existing residential settlements and not within 1,000 meters for asphalt plants;
- Site offices, camps, depots and particularly storage areas for diesel fuel and bitumen and asphalt plants shall not be located within 500 meters of watercourses, and be operated so that no pollutants enter watercourses, either overland or through groundwater seepage, especially during periods of rain. This will require lubricants to be recycled and a ditch to be constructed around the area with an approved settling pond/oil trap at the outlet;
- Areas for the storage of fuel or lubricants and for a maintenance workshop shall be fenced and have a compacted/impervious floor to prevent the escape of accidental spillage of fuel and or lubricants from the site. Surface water drainage from fenced areas shall be discharged through purpose designed and constructed oil traps. Empty fuel or oil drums may not be stored on site;
- Fuel wood shall not be used as a means of heating during the processing or preparation of any materials forming part of the Works;
- The Contractor shall restrict all his activities, materials, equipment and personnel to the areas specified. Entry into restricted areas by any person, vehicle or equipment without the Supervisor's permission can result in penalties;
- Potable water safe for human consumption shall be provided for at camps, site offices, and other working areas;
- Camp areas shall be located to allow effective natural drainage;
- A method shall be established for storing and disposing of all solid wastes generated by the labor camp and/or base camp. If applicable, kitchen wastes shall be disposed into soak pits;
- Solid wastes generated in the labor site shall be reused if recyclable or disposed off in land fill sites approved by local authorities;
- If water is stored on site, drinking water and multi-purposed water storage facilities shall be clearly distinguished and demarcated.
**First Aid Facilities**

- Medical and first aid facilities shall be provided at each camp area or at construction sites. First aid box shall be provided at every construction campsite and under the charge of a responsible person who shall always be readily available during working hours of the work place. He/she shall be adequately trained in administering first aid-treatment. Formal arrangement shall be prescribed to make motor transport available to carry injured person or person suddenly taken ill to the nearest hospital;

**Sanitary Facilities**

- In every camp/construction site separate and adequate lavatory facilities (toilets and washing areas) shall be provided for the use of male and female workers. Toilet facilities should also be provided with adequate supplies running water, soap, and toilet paper. Such facilities shall be conveniently accessible and shall be kept in clean and hygienic conditions; and
- A temporary septic tank system shall be installed for the disposal of domestic wastes and excreta without causing pollution of nearby watercourses. Wastewater should not be disposed into water bodies without treatment.

**Eating areas**

- If none is available, the Contractor shall provide adequate temporary shade within the upgrading/rehabilitation areas to ensure that site personnel do not move off site to eat; and
- The Contractor shall provide adequate refuse bins at all eating areas to the satisfaction of the Supervisor.

**Security**

Some security measures shall be put into place to ensure the safe and secure running of the site facilities and its residents. Some of these security measures include:

- Adequate, day-time night-time lighting shall be provided;
- A perimeter security fence constructed from appropriate materials; and
- Provision and installation in all buildings of firefighting equipment and portable fire extinguishers.

**Upgrading/Rehabilitation Impact Management Plan**

**Erosion and Sedimentation**

In order to minimize negative impacts in the project area, the following activities shall be carried out by the Contractor:

- The Contractor shall implement erosion and sedimentation control measures to the satisfaction of the Supervisor;
- The Contractor shall protect all areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking any other measures necessary to prevent storm water from concentrating in streams and scouring slopes, banks, etc.;
- Areas of the site not disturbed by rehabilitation activities shall be maintained in their existing conditions;
- Conserve topsoil with its leaf litter and organic matter, and reapply this material to local disturbed areas to promote the growth of local native vegetation;
• Apply local, native grass seed and mulch to barren erosive soil areas or closed construction surfaces;
• Apply erosion control measures before the rainy season begins preferably immediately following rehabilitation;
• Install sediment control structures where needed to slow or redirect runoff and trap sediment until vegetation is established. Sediment control structures include windrows of logging slash, rock berms, sediment catchment basins, straw bales, brush fences, and silt fences;
• In areas where upgrading/rehabilitation activities have been completed and where no further disturbance would take place, re-vegetation should commence as soon as possible;
• Spray water as needed on dirt roads, cuts, fill material and stockpiled soil to reduce wind-induced erosion; and
• Traffic and movement over stabilized areas shall be restricted and controlled, and damage to stabilized areas shall be repaired and maintained to the satisfaction of the Supervisor.

**Earthworks, Cut and Fill Slopes**

• All earthworks shall be properly controlled, especially during the rainy season;
• The Contractor shall maintain stable cut and fill slopes at all times and cause the least possible disturbance to areas outside the prescribed limits of the works;
• In order to protect any cut or fill slopes from erosion, in accordance with the drawings, cut off drains and toe-drains shall be provided at the top and bottom of slopes and be planted with grass or other plant cover. Cut off drains should be provided above high cuts to minimize water runoff and slope erosion;
• Any excavated cut or unsuitable material shall be disposed of in designated disposal areas as agreed to by the Supervisor;
• Disposal sites should not be located where they can cause future slides, interfere with agricultural land or any other properties, or cause soil from the dump to be washed into any watercourse. Drains may need to be dug within and around the tips, as directed by the Engineer.

**Stockpiles and Borrow Pits**

In general terms, the Contractor shall:

• Identify and demarcate locations for stockpiles and borrow pits, ensuring that they are 15 meters away from critical areas such as steep slopes, erosion-prone soils, cultivated lands, and areas that drain directly into sensitive water bodies (used for drinking water or aquaculture). Location of borrow pits shall be approved by the Supervisor;
• Limit extraction of material to approved and demarcated borrow pits;
• Stockpile topsoil when first opening the borrow pit. After all usable borrow has been removed, the previously stockpiled topsoil should be spread back over the borrow area and graded to a smooth, uniform surface, sloped to drain. On steep slopes, benches or terraces may have to be specified to help control erosion;
• Excess overburden should be stabilized and re-vegetated. Where appropriate, organic debris and overburden should be spread over the disturbed site to promote re-vegetation. Natural re-vegetation is preferred to the extent practicable;
• Existing drainage channels in areas affected by the operation should be kept free of overburden;
• The Contractor shall ensure that all borrow pits used are left in a trim and tidy condition with stable side slopes, re-establishment of vegetation, restoration of natural water courses, avoidance of flooding of the excavated areas wherever possible so no stagnant water bodies are created which could breed mosquitoes;
• When the borrow pits cannot be refilled or reasonably drained, the Contractor shall consult with the local community to determine their preference for reuse such as fish farming or other community purposes; and
• No foreign material generated or deposited during construction shall remain on site. Areas affected by stockpiling shall be reinstated to the satisfaction of the Supervisor.

**Disposal of Debris**

The Contractor shall carry out the following activities:

• Establish and enforce daily site clean-up procedures, including maintenance of adequate disposal facilities for debris;
• Debris generated due to the dismantling of existing structures shall be suitably reused, to the extent feasible, in the proposed rehabilitation program (e.g. as fill materials for embankments). The disposal of remaining debris shall be carried out only at sites identified and approved by the Supervisor. The contractor should ensure that these sites (a) are not located within designated forest or cultivated areas; (b) do not impact natural drainage courses; and (c) do not impact endangered/rare flora. Under no circumstances shall the contractor dispose of any material in environmentally sensitive areas;
• In the event any debris or silt from the sites is deposited on adjacent land, the Contractor shall immediately remove such, debris or silt and restore the affected area to its original state to the satisfaction of the Supervisor;
• Water courses shall be cleared of debris and drains and culverts checked for clear flow paths;
• Include provisions for incorporating the most appropriate stabilization techniques for each disposal site and determine that the selected spoil disposal sites do not cause unwanted surface drainage;
• Assess risk of any potential impact regarding leaching of spoil material on surface water; and
• Once the job is completed, all rehabilitation-generated debris should be removed from the site.

**Demolition of Existing Infrastructures**

The following measures shall be implemented in order to protect workers and the public from falling debris and flying objects:

• Set aside a designated and restricted waste drop or discharge zones, and/or a chute for safe movement of wastes from upper to lower levels;
• Conduct sawing, cutting, grinding, sanding, chipping or chiseling with proper guards and anchoring as applicable;
• Maintain clear traffic ways to avoid driving of heavy equipment over loose scrap; and
• Provide all workers with necessary safety equipments.

**Bridge demolition and construction**

• The Contractor shall submit a bridge demolition and construction method statement to the SUPERVISOR for approval, detailing the location of the temporary bypasses, spill prevention measures, and sedimentation control measures, surface water flow diversion, reinstatement, etc; and
• After bridge construction, the works area, stream diversion, settlement pond areas and temporary bypasses shall be reinstated to the satisfaction of the Supervisor.

**Dust Control**

• The Contractor shall ensure that the generation of dust is minimized and shall implement a dust control program to maintain a safe working environment, minimize nuisance for surrounding residential areas / dwellings and protect damage to natural vegetation, crops, etc.;
• Construction vehicles shall comply with speed limits and haul distances shall be minimized;
• Material loads shall be suitably covered and secured during transportation;
• Exposed soil and material stockpiles shall be protected against wind erosion and the location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors; and
• The Contractor shall implement dust suppression measures (e.g. water spray vehicles, covering of material stockpiles, etc.) if and when required.

**Noise Control**

• The Contractor shall be responsible for compliance with the relevant legislation with respect to noise;
• The Contractor shall try to keep noise generating activities to a minimum;
• The Contractor shall restrict all operations that result in undue noise disturbance to local communities and/or dwellings (e.g. blasting, crushing, etc.) to daylight hours on weekdays or as agreed with the Supervisor;
• The Contractor shall warn any local communities and/or residents that could be disturbed by noise generating activities such as blasting well in advance and shall keep such activities to a minimum;
• In sensitive areas (including residential neighborhoods, hospitals, rest homes, schools, etc.) more strict measures may need to be implemented to prevent undesirable noise levels;
• To the extent possible, nighttime operations shall be kept to a minimum and banned near sensitive receptors;
• No blasting shall be allowed during nighttime unless prior approval is obtained from the government authority and the Supervisor; and
• The Contractor shall maintain the construction equipment in its best operating conditions and lowest noise levels possible.

**Clearing and Re-Vegetation Management Plan**

**Vegetation Clearing**

• No vegetation clearing shall take place without written approval by the Supervisor. Vegetation shall not be disturbed in those areas not submitted for non objection;
• Before vegetation clearing takes place in any rehabilitation area, search and rescue and seed collection shall be undertaken;
• Before clearing of vegetation, the Contractor shall ensure that all litter and non-organic material is removed from the area to be cleared;
• Vegetation clearing shall take place in a phase manner in order to retain vegetation cover for as long as possible;
• All indigenous plant material removed from cleared areas shall be stockpiled for mulching. All remaining vegetation shall be removed and disposed of at an approved landfill site.
• The Contractor shall remove topsoil from all areas where topsoil will be impacted on by rehabilitation activities, including temporary activities such as storage and stockpiling, etc;
• Stripped topsoil shall be stockpiled in areas agreed with the Supervisor for later use in re-vegetation and shall be adequately protected;
• The application of chemicals for vegetation clearing shall be minimized. To the extent possible, non-residual chemicals shall be selected and with negligible adverse effects on human health; and
• Herbicides use in the project shall be shown to be effective against the target vegetation species, have minimum effect on the natural environment, and be demonstrated to be safe for inhabitants and domestic animals in the treated areas, as well for personnel applying them. The use of herbicides shall be approved by the Supervisor.

Re-vegetation and site restoration

• Re-vegetation shall start at the earliest opportunity. Appropriate local native species of vegetation shall be selected for the compensatory planting and restoration of the natural landforms;
• Restoration of cleared areas such as borrow pits no longer in use, disposal areas, site facilities, stockpiles areas, working platforms and any areas temporarily occupied during construction of the project works shall be accomplished using landscaping, adequate drainage and re-vegetation;
• Spoil heaps and excavated slopes shall be re-profiled to stable batters, and grassed to prevent erosion;
• Restoration and re-vegetation shall be carried out timely for the exposed slopes/soils and finished areas shall be reinstated in order to achieve the stability of slopes and maintain soil integrity;
• All affected areas shall be landscaped and any necessary remedial works shall be undertaken without delay, including grassing and reforestation; and
• Soil contaminated with chemicals or hazardous substances shall be removed and transported and buried in waste disposal areas.

Waste Management Plan

Waste management on site shall be strictly controlled and monitored. Only approved waste disposal methods shall be allowed.

The Contractor shall ensure that all site personnel are instructed in the proper disposal of all waste.

Solid waste

• The Contractor shall submit a method statement detailing a solid waste control system (storage, provision of bins, site clean-up schedule, bin clean-out schedule, etc.) to the Supervisor for approval;
• The Contractor shall ensure that all facilities are maintained in a neat and tidy condition and the site shall be kept free of litter;
• Measures shall be taken to reduce the potential for litter and negligent behavior with regard to the disposal of all refuse. At all places of work, the Contractor shall provide litter bins, containers and refuse collection facilities for later disposal;
• Solid waste may be temporarily stored on site in a designated area approved by the Supervisor prior to collection and disposal through a licensed waste collector;
• Waste storage containers shall be covered, tip-proof, weatherproof and scavenger proof. The waste storage area shall be fenced off to prevent wind-blown litter;
• No burning, on-site burying or dumping of waste shall occur;
• All solid waste shall be disposed of offsite at an approved landfill site. The Contractor shall supply the Supervisor with certificates of disposal;
• Random disposal of solid waste in scenery areas shall be strictly prohibited;
• During rehabilitation, inert construction materials / excavated soil shall be reused on site as much as possible and minimize the volume requiring disposal;
• The Contractor shall identify and demarcate disposal areas clearly indicating the specific materials that can be deposited in each; and
• Recyclable materials such as wooden plates for trench works, steel, scaffolding material, site holding, packaging material, etc shall be collected and separated on-site from other waste sources. Collected recyclable material shall be re-used for other projects or sold to waste collector for recycling.

**Domestic waste**

• The Contractor shall provide refuse bins, all with lids, for all buildings and construction sites. Refuse shall be collected and removed from all facilities at least twice per week. Domestic waste shall be transported to the approved refuse disposal site in covered containers or trucks.

**Wastewater**

• The Contractor shall submit a method statement to the Supervisor detailing how wastewater would be collected from all wastewater generating areas, as well as storage and disposal methods. If the Contractor intends to carry out any on-site wastewater treatment, this should also be included;
• Water from kitchens, showers, laboratories, sinks etc. shall be discharged into a conservancy tank for removal from the site;
• Runoff from fuel depots/workshops/machinery washing areas and concrete batching areas shall be collected into a conservancy tank and disposed off at a site approved by the Supervisor;
• Domestic sewage from site office and toilets shall either be collected by a licensed waste collector or treated by on-site treatment facilities. Discharge of treated wastewater must comply with the discharge limit according to the legislation;
• Chemical toilets can be provided on site for construction workers. Domestic sewage collected from the site office and chemical toilets shall be cleaned up on regular basis. Only licensed waste collectors shall be employed for this disposal; and
• At completion of rehabilitation works, soak pits and septic tanks shall be covered and effectively sealed off.

**Hazardous and Chemical waste**

• All hazardous and chemical waste (including bitumen, etc.) shall be disposed of at an approved hazardous landfill site and in accordance with local legislative requirements. The Contractor shall provide disposal certificates to the Supervisor;
• The removal of asbestos-containing materials or other toxic substances shall be performed and disposed of by specially trained workers;
• Used oil and grease shall be removed from site and sold to an approved used oil recycling company;
• Under no circumstances shall the spoiling of tar or bituminous products be allowed on the site, over embankments, in borrow pits or any burying;
• Unused or rejected tar or bituminous products shall be returned to the supplier’s production plant;
• Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery shall be collected in holding tanks and sent back to the supplier or removed from site by a specialist oil recycling company for disposal at an approved hazardous waste site;
• Inform the SUPERVISOR of any accidental spill or incident;
• Initiate a remedial action following any spill or incident; and
• Provide a report explaining the reasons for the spill or incident, remedial action taken, consequences/damage from the spill, and proposed corrective actions.

Materials Handling, Use and Storage Management Plan

General

The Contractor shall submit a method statement detailing cement storage, concrete batching areas and methods, method of transport of cement and concrete, storage and disposal of used cement bags, etc. for each concrete batching operation.

Environmental considerations shall be taken into account in the location of any material storage areas.

Transportation

• The Contractor shall ensure that all suppliers and their delivery drivers are aware of procedures and restrictions (e.g. restricted areas);
• Material shall be appropriately secured to ensure safe passage between destinations during transportation;
• Loads shall have appropriate cover to prevent them spilling from the vehicle during transit; and
• The Contractor shall be responsible for any clean-up resulting from the failure by his employees or suppliers to properly secure transported materials.

Hazardous and Chemical Substances

The Contractor shall provide a method statement detailing the hazardous substances / material that are to be used during construction, as well as the storage, handling, and disposal procedures for each substance / material and emergency procedures in the event of misuse or spillage that might negatively affect people or the environment.

In general terms, the following activities shall be carried out:

• All hazardous material/substances (e.g. petrochemicals, oils, etc.) shall be stored on site only under controlled conditions;
• All hazardous material/substances shall be stored in a secured, appointed area that is fenced and has restricted entry. All storage shall take place using suitable containers to the approval of the SUPERVISOR;
• Hazard signs indicating the nature of the stored materials shall be displayed on the storage facility or containment structure; and
• Fuel shall be stored in a steel tank supplied and maintained by the fuel suppliers. The tank shall be located in a secure, demarcated area.
Environmental Framework 24

Surfacing Materials

- Over spray of bitumen products outside of the road surface and onto roadside vegetation shall be prevented using a method approved by the Supervisor;
- When heating of bitumen products, the Contractor shall take appropriate fire control measures; Stone chip/gravel excess shall not be left on road/paved area verges. This shall be swept/raked into piles and removed to an area approved by the Supervisor; and
- Water quality from runoff from any fresh bitumen surfaces shall be monitored by the Supervisor and remedial actions taken where necessary.

Cement and Concrete Batching

- Concrete mixing directly on the ground shall not be allowed and shall take place on impermeable surfaces to the satisfaction of the Supervisor;
- All runoff from batching areas shall be strictly controlled, and cement-contaminated water shall be collected, stored and disposed of at a site approved by the Supervisor;
- Unused cement bags shall be stored out of the rain where runoff won’t affect it;
- Used (empty) cement bags shall be collected and stored in weatherproof containers to prevent windblown cement dust and water contamination. Used cement bags shall not be used for any other purpose and shall be disposed of on a regular basis via the solid waste management system (see Waste Management Plan); and
- All excess concrete shall be removed from site on completion of concrete works and disposed of. Washing of the excess into the ground is not allowed. All excess aggregate shall also be removed.

Ecological Considerations

Protection of Natural Vegetation

- The Contractor shall be responsible for informing all employees about the need to prevent any harmful effects on natural vegetation on or around the rehabilitation site as a result of their activities;
- Clearing of natural vegetation shall be kept to a minimum;
- The removal, damage and disturbance of natural vegetation without the written approval of the Supervisor are prohibited;
- The use of herbicides shall be approved by the Supervisor;
- Regularly check the work site boundaries to ensure that they are not exceeded and that no damage occurs to surrounding areas;
- Prohibit and prevent open fires during upgrading/rehabilitation and provide temporary firefighting equipment in the work areas, particularly close to forest areas; and
- Ancient trees are protected by Chinese legislation and may not be cut, disturbed, damaged, destroyed and their products may not be possessed, collected, removed, transported, exported, donated, purchased or sold except under license granted a delegated authority.

Protection of Fauna

- The Contractor shall ensure that no hunting, trapping, shooting, poisoning or otherwise disturbance of any fauna takes place;
- The feeding of any wild animals shall be prohibited;
• The use of pesticides shall be approved by the SUPERVISOR; and
• No domestic pets or livestock shall be permitted on site.

Safety during Construction

Construction Site Safety

The Contractor’s responsibilities include the protection of every person and nearby property from construction accidents. The Contractor shall be responsible for complying with all national and local safety requirements and any other measures necessary to avoid accidents, including the following:

• Provide necessary personal protective equipment and clothing for construction workers and enforce their use;
• During heavy rains or emergencies of any kind, suspend all work;
• Brace electrical and mechanical equipment to withstand seismic events during the construction;
• Present details regarding maximum permissible vehicular speed on each section of road;
• Establish safe sight distance in both construction areas and construction camp sites; and
• Place signs around the rehabilitation areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warning. All signs shall be constructed according to Chinese specifications.

Measures on blasting

• The Contractor shall take necessary precautions to prevent damage to special features and the general environment;
• Environmental damage caused by blasting / drilling shall be repaired at the Contractor’s expense to the satisfaction of the Supervisor;
• The Contractor shall notify any occupants / owners of surrounding land at least one week prior to blasting and shall address any concerns that they may have to the satisfaction of the Supervisor; and
• For the transportation, storage, process, package on site, connect, blasting and the disposal of the blasting, the procedure shall be in accordance with the Blasting Safety Regulations of the (GB6722-1986).

Fire Control

• The Contractor shall submit a fire control and fire emergency method statement to the Supervisor for approval. The method statement shall detail the procedures to be followed in the event of fire;
• The contractor shall take all reasonable steps to avoid increasing the risk of fire through activities on site;
• The contractor shall ensure that basic fire-fighting equipment is available at all camp areas and facilities;
• The contractor shall appoint a fire officer who shall be responsible for ensuring immediate and appropriate action in the event of a fire;
• The contractor shall ensure that all site personnel are aware of the procedure to be followed in the event of a fire; and
• Any work that requires the use of fire may only take place at a designated area approved by the Supervisor and must be supervised at all times. Fire-fighting equipment shall be available.
Traffic Management

- Estimate maximum concentration of traffic (number of vehicles/hour);
- Use selected routes to the project site, as agreed with the Supervisor, and appropriately sized vehicles suitable to the class of roads in the area, and restrict loads to prevent damage to local roads and bridges used for transportation purposes;
- Maintain adequate traffic control measures throughout the duration of the Contract and such measures shall be subject to prior approval of the Supervisor;
- Carefully and clearly mark pedestrian-safe access routes;
- If school children are in the vicinity, include traffic safety personnel to direct traffic during school hours;
- Maintain a supply for traffic signs (including paint, easel, sign material, etc.), road marking, and guard rails to maintain pedestrian safety during construction;

Environmental Emergency Procedures

- The possibility exists for environmental emergencies of an unforeseen nature to occur during the course of the construction and operational phases of the project;
- By definition, the nature of such emergencies cannot be known. Therefore, the Contractor shall respond on a case-by-case basis to such emergencies and shall initiate event-specific measures in terms of notifications and reactions; and
- The Contractor shall prepare a report on the incident detailing the accident, clean-up actions taken, any pollution problems and suggested measures to prevent similar accidents from happening again in future. The incident report shall then be submitted to the Supervisor for review and keep in the records.

Protection of Heritage and Cultural Property

- If any archaeological or paleontological artifacts or remains are uncovered during upgrading/rehabilitation activities, work in the vicinity of the find shall cease immediately. The Contractor shall immediately notify the SUPERVISOR who shall contact the Autonomous Region Culture Department;
- The Contractor will be required to abide by the specifications as set out by the authorities or the heritage specialist appointed to investigate the find; and
- The Contractor may not, without a permit issues by the relevant heritage resources authority, destroy, damage, excavate, alter, deface or otherwise disturb archaeological material.
### Annex 5: Good Practices and Problems in Rural Roads

<table>
<thead>
<tr>
<th>Good quality of construction: borders and road surface</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lateral drains are well designed and constructed</td>
</tr>
<tr>
<td>Cutting of trees along the right of way was minimized and controlled during construction</td>
</tr>
<tr>
<td>Cutting of slopes was carefully carried out. No dumping of earth cuts on down side of slope was not allowed</td>
</tr>
<tr>
<td>Good signs were placed along this rural road.</td>
</tr>
<tr>
<td>Inappropriate design of cross drain in this field. Pipe placement is causing erosion of fill and will affect stability of entire platform. Pipe should have been placed at the bottom of the fill.</td>
</tr>
<tr>
<td>Lack of energy dissipation at delivery of drain is causing erosion and has cracked the concrete side of the drain. Some rip-rap would have solved the problem.</td>
</tr>
</tbody>
</table>
Inadequate minor landslide control is affecting traffic flow. A minor retaining wall should have been built.