REPORT OF THE:

EXTERNAL COMPLIANCE MONITORING GROUP

CHAD EXPORT PROJECT

Site visit: October 2011
Cameroon - Chad

Prepared for
International Finance Corporation
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### FREQUENTLY USED ACRONYMS

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<th>Definition</th>
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<tbody>
<tr>
<td>AAQM</td>
<td>Ambient Air Quality Monitoring</td>
</tr>
<tr>
<td>BB</td>
<td>Bagyeli/Bakola</td>
</tr>
<tr>
<td>BP</td>
<td>Borrow pit</td>
</tr>
<tr>
<td>BBS</td>
<td>Basic Business School</td>
</tr>
<tr>
<td>BV</td>
<td>Block Valve</td>
</tr>
<tr>
<td>BWMF</td>
<td>Belabo Waste Management Facility</td>
</tr>
<tr>
<td>CCA</td>
<td>Credit Coordination Agreement</td>
</tr>
<tr>
<td>COTCO</td>
<td>Cameroon Oil Transportation Company</td>
</tr>
<tr>
<td>COTP</td>
<td>Crude Oil Topping Plant</td>
</tr>
<tr>
<td>CP(s)</td>
<td>Control Point(s)</td>
</tr>
<tr>
<td>CPSP</td>
<td>Pipeline Steering and Monitoring Committee</td>
</tr>
<tr>
<td>CRO</td>
<td>Community Relations Officer</td>
</tr>
<tr>
<td>CTF</td>
<td>Central Treatment Facility</td>
</tr>
<tr>
<td>DBST</td>
<td>Double Bitumen Surface Treatment</td>
</tr>
<tr>
<td>ECMG</td>
<td>External Compliance Monitoring Group</td>
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<tr>
<td>EEPCI</td>
<td>Esso Exploration and Production Chad Inc.</td>
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<tr>
<td>EDC</td>
<td>Electricity Development Corporation</td>
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<tr>
<td>EMP</td>
<td>Environmental Management Plan (PGE in French)</td>
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<tr>
<td>FEDEC</td>
<td>Foundation for Environment and Development in Cameroon</td>
</tr>
<tr>
<td>FSO</td>
<td>Floating Storage and Offloading</td>
</tr>
<tr>
<td>GER</td>
<td>GER Norwest enterprise</td>
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<tr>
<td>GPS</td>
<td>General Project Specification</td>
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<td>IA</td>
<td>Interface Agreement</td>
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<td>IAT</td>
<td>Improved Agriculture Training</td>
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<td>IFC</td>
<td>International Finance Corporation</td>
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<tr>
<td>KWMF</td>
<td>Komé Waste Management Facility</td>
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<td>LMM</td>
<td>The Land Management Manual</td>
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<tr>
<td>MA</td>
<td>Maintenance Area</td>
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<td>MINAS</td>
<td>Ministry of Social Affairs</td>
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<td>MINFOF</td>
<td>Ministry of Forestry and Fauna</td>
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<tr>
<td>MOC</td>
<td>Management of Change</td>
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<td>NCS</td>
<td>Non-Compliance Situation</td>
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<td>NGO</td>
<td>Non-Governmental Organization</td>
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<td>OFDA</td>
<td>Oil Field Development Area</td>
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<td>OSR</td>
<td>Oil Spill Response</td>
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<tr>
<td>OSRP</td>
<td>Oil Spill Response Plan</td>
</tr>
<tr>
<td>OWLS</td>
<td>Oil-Water Lift Station</td>
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<tr>
<td>OWS</td>
<td>Oil/Water Separator</td>
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<tr>
<td>PM\textsubscript{10}</td>
<td>Particulate Matter (&lt;10 μm)</td>
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<tr>
<td>PPE</td>
<td>Personal Protective Equipment</td>
</tr>
<tr>
<td>Abbreviation</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
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<tr>
<td>PMP</td>
<td>Pipeline Modification Project</td>
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<tr>
<td>PRS</td>
<td>Pressure Reduction Station</td>
</tr>
<tr>
<td>PS2</td>
<td>Pump Station No. 2</td>
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<tr>
<td>PS3</td>
<td>Pump Station No. 3</td>
</tr>
<tr>
<td>RAPID</td>
<td>Réseau d’Actions Participatives aux Initiatives de Développement</td>
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<tr>
<td>ROW</td>
<td>(pipeline) Right-of-Way</td>
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<tr>
<td>ROWIP</td>
<td>Right Of Way Integrity Plan</td>
</tr>
<tr>
<td>SEIA</td>
<td>Specific Environmental Impact Assessment</td>
</tr>
<tr>
<td>SSP</td>
<td>Site Specific Plan</td>
</tr>
<tr>
<td>STP</td>
<td>Sewage Treatment Plant</td>
</tr>
<tr>
<td>TPH</td>
<td>Total Petroleum Hydrocarbons</td>
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<tr>
<td>WCF</td>
<td>Wildlife Conservation Society</td>
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<tr>
<td>WHO</td>
<td>World Health Organization</td>
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<tr>
<td>WMP</td>
<td>Water Monitoring Program</td>
</tr>
<tr>
<td>WWF</td>
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EXTERNAL COMPLIANCE MONITORING GROUP (ECMG)
EIGHTH POST-PROJECT COMPLETION VISIT
OF THE D’APPOLONIA ECMG, OCTOBER 2011

1 INTRODUCTION

The present document reports the outcomes of the eighth Post-Project Completion field visit conducted by the External Compliance Monitoring Group (ECMG) between the 9th and the 21st October, 2011.

The visit was conducted in agreement with the relevant ECMG’s Terms of Reference in order to provide, on an annual basis, an independent review of the compliance by the Chad Cameroon Oil Development and Transportation Project (the Project) with the Environmental Management Plan (EMP) requirements.

Scope of the visit included the following:

- meet with the Cameroon Oil Transportation Company (COTCO) and the Exxon Exploration and Production Inc. (EEPCI) representatives to gather the required follow up information/data on the EMP monitoring activities conducted in the period between November 2010 (date of the last ECMG review) and October 2011;
- collection and review of all EMP monitoring records provided by COTCO and EEPCI EMP teams;
- visit of the Project Facilities in Chad and Cameroon;
- visit of some of the local communities affected by the Project in both countries and meeting with the Non-Governmental Organizations;
- review the current status of the Project offsets in Cameroon through dedicated meeting with the Foundation for Environment and Development (FEDEC) and the relevant implementing organizations; and
- conduct two separate close out meetings, one in Chad and one in Cameroon, to address the ECMG mission findings and to discuss preliminary recommendations provided or suggestions of improvement of the current EMP monitoring practice.

The close out meetings were held in N’Djamena, at EEPCI headquarter on October the 13th, 2011 and in Douala at COTCO headquarters on October the 20th, 2011.

In the following sections the findings of the field visit and desk review of the EMP related records are reported. For each biophysical and socioeconomic topic, a dedicated section is provided structured as follows:

- EMP requirements;
- Project update (EMP related activities and records relevant to the November 2010 – October 2011 period); and
- Observations, suggestions for improvement (according to best industry practice) and recommendations (to provide corrective actions to meet EMP requirements) made by the ECMG.

Review of EMP related topics is covered under separate sections for the two countries (Chad and Cameroon) in order to facilitate both the consultation and the implementation of the suggested or recommended mitigation measures. An additional dedicated section is provided for the review of the documentation submitted by COTCO within the final Consent Package for the Pipeline Modification Project (PMP) to be carried out in the Lom Pangar area.

Annex A of the report presents the daily activity agenda.

Annex B summarizes all the recommendations made by the ECMG under the present report to facilitate follow up on the closure of open issues under the next planned field visit in 2012.
2 EMP ORGANIZATION

Within the EMP compliance evaluation duties, the ECMG conducts on a yearly basis a review of the EMP team organization charts for both EEPCI and COTCO in order to evaluate the adequacy of the staff in place to conduct the planned EMP monitoring activities.

During the October 2011 mission, the ECMG was provided with the latest up to date EMP organization charts. Relevant observations are reported in the following sections.

2.1 EMP CHAD

Project Update

No major modification to the EMP Chad Organization chart has occurred in the last year. The team is still adequately structured to meet the EMP commitments and duties through the four different units focused respectively on:

- biophysical components (including waste, waste water, air quality and groundwater monitoring);
- socioeconomic components (including Local Communities Contacts);
- construction EMP related issues (with specific focus on land survey, acquisition and return issues); and
- implementation of the Land Use Mitigation Action Plan issued in 2007, to improve the execution of the resettlement and community compensation mitigation measures at the Land use at Oil Field Development Area (OFDA) in parallel to the ongoing drilling operations.

It should be noted that the EEPCI EMP team activities are regularly disclosed to the public through a semi-annual report issued, under article 18.1.2 of the Credit Coordination Agreement (CCA), for the whole Chad-Cameroon Development Project (e.g. including the activities carried out in Cameroon by COTCO EMP). Within this report, published through the Esso-Chad web site, dedicated sections are provided on Reportable EMP situations (e.g. including EMP Non-Compliance Situations (NCSs)), EMP Monitoring and Management Program, Safety, Compensation, Consultation, OFDA, Health and Local Employment.

Observations

During the October 2011 mission the ECMG had the opportunity to further verify the satisfactory EMP organization in place through joint field visits and review of the activities performed in the last year. All the EEPCI EMP team members met were found fully aware of the EMP requirements and monitoring duties.

In addition to the above, a joint data retrieval session was carried out at the Komé 5 EMP offices in order to evaluate the adequacy and prompt availability of the EMP related data in electronic format, as stored in the EEPCI servers. All requested data (mainly concerning monitoring of biophysical components) were readily provided, showing good management and filing of the monitoring data.

2.2 EMP CAMEROON

Project Update

The COTCO EMP team roaster has not faced any major change in the last year. The major updates concern:

- the introduction in the Public Affairs department of the new community relations coordinator in charge of interfacing with the EMP socio-economic team in identifying community level investments beyond the EMP compliance requirements;
- the reportedly planned (not yet implemented) re-organization of the Community Relations Officers (CROs) staff (switch of Maintenance Area [MA]2 and MA3 CROs); and
- recruitment of three (one per maintenance area), ROW surveyors dedicated to the permanent monitoring of the Right of Way Integrity Plan (ROWIP) patrolling and maintenance activities.

The COTCO EMP team releases quarterly EMP reports providing overview of NCSs raised, conducted environmental and social monitoring activities, safety records and communications with the Comité de Pilotage et de Suivi des Pipelines (CPSP – Pipeline Steering and Monitoring Committee) and the Government of Cameroon.
Observations

The COTCO EMP team appears, as also observed under past ECMG missions, well structured and fully aware of the EMP related duties. Support to the Douala EMP team is always provided by the resident personnel at Pump Stations, who assist EMP team representatives within the routine environmental monitoring duties.

However, while the Douala EMP staff is considered adequate to meet the EMP requirements, enforcement of the field EMP team representatives appears as necessary.

At the present time, COTCO employees a total of 6 CROs (2 per MA) and deploys, for each Right-of-Way (ROW) MA, two CROs in charge of handling the relationships with the local communities and bridging the same local communities with the Douala EMP team for any EMP related issue.

The newly implemented ROWIP and subsequent employment, by the appointed COTCO Contractors, of local communities members for the planned maintenance (grass cutting mainly) and surveillance (foot patrolling) of the ROW, is however requiring an increased need for the presence in the territory of COTCO EMP representatives to:

- ensure disclosure of the terms of employment within the new ROWIP;
- ensure and document that adequate training is provided;
- ensure and document that the foreseen maintenance and patrolling works are carried out in compliance with EMP standards;
- ensure (and document) that contractual requirements are met by employed contractors, with specific focus on health and safety measures and payment terms; and
- deal with all possible complaints by the employed local villagers with respect to the above.

As outlined in section 8.1.1, Project communication with communities is an ECMG concern, as apparent in the ROWIP implementation. ECMG recommends that the Project considers increasing the number of CROs and improving their briefing and monitoring. As suggested in section 8.1.1, ECMG also encourages COTCO to consider the hiring of specialized expertise to improve the communication tools, in particular for activities relating to specific communication campaigns such as the ROWIP or the asbestos issue clarification (see Waste Management Section for Cameroon).

Recommendation

1. While it is understood that COTCO is currently planning the contracting of three locally based monitors, it is however recommended that a more careful evaluation of the staff enforcement needed is made. In particular, the presence of two CROs and one ROW surveyor per MA may not be sufficient to ensure, at least in the starting implementation phase of the ROWIP, that all the activities to be conducted by the COTCO contractor and the employed local villagers are performed in agreement with the EMP and COTCO standards.
3 MANAGEMENT OF CHANGES (MOCS)

The Management of Change (MOC) is one of the tools foreseen by the Chad Export Project EMP and more specifically by Operations Integrity Management System (see volume 1, Ch.3 of EMP), in order to effectively manage changes that may be required to the EMP recommended practice or standards in order to better meet the operational issues encountered by the Project.

To this aim a formal MOC procedure is set by the EMP with the following steps.

**Box 1. Change of Management Process**

- Identification of an item/situation potentially requiring some type of change;
- Preparation of a change request document that:
  - outlines the nature of the item/situation requiring a change,
  - presents a justification for the change,
  - outlines impacts of the change (e.g., cost, schedule, safety, operability),
  - identifies potential biophysical, socioeconomic, or health concerns, and
  - estimates person power and financial requirements to effect the change;
- Quick evaluation by appropriate individual(s) to determine whether resources should be devoted to further progressing the change request (i.e., mechanism to filter out proposals of limited merit);
- Formal assessment and review of the change request;
- Documentation of the approval or rejection of the change request; and
- Implementation of an approved change, including communication.

According to the above procedure, any MOC proposed or implemented after approval by the Project is evaluated and monitored in its implementation by the ECMG within the EMP compliance evaluation duties.

3.1 MOC CHAD

**Project Update**

Only one MOC has been reportedly issued by EEPCI EMP team in 2011. This MOC concerns the amendment of the minimum requirement of 0.5 corde land availability per household member to qualify for eligibility to the Improved Agriculture Training (IAT) program. This change is expected to determine positive impacts on the program in terms of increased accessibility to the IAT by local communities, but also in terms of reduction of the EEPCI EMP effort in re-surveying potentially eligible subjects as the amount of land owned changes in time (see also Social Review sections for Chad).

The MOCs proposed and approved during the 2010 ECMG mission have been implemented as follows:

- **Borrow Pit Closure**: the new practice in place is aimed at avoiding the creation of water ponds at reclaimed pit through the creation of diversion ditches and low end drains. In 2011 three borrow pits (Maikeri BP, Komé BP6 ext 6&7 and Mamboe BP – see Section on Land Use) have been reclaimed. The ECMG visited this reclaimed pit without observing any standing water (despite the raining season still ongoing). Side berms have been put in place at this pit to avoid collection of surface stormwater runoff from adjacent areas;
- **Pad Remediation Design**: the layout of the reclaimed well pads has been slightly modified in shape in order to allow for access of maintenance vehicles, as needed, and maximize reclaimed portions. In addition, the use of compost has been introduced (see Sections on Waste Mgmt and Land Restoration) to enhance fertility of the reclaimed and returned land parcels;
- **PM_{10} Background Monitoring**: this MOC, which is aimed at changing the current practice on Particulate Matter less than 10 μm (PM_{10}) monitoring and at introducing blank samples to be collected in areas not impacted during sand storms period, has not yet been implemented as further technical evaluation from the EEPCI team is ongoing; and
- **Resettlement and Training Options**: four MOCs have been implemented since 2010 in order to better improve: 1) vulnerability assessment for marginal households; 2) process to select, train and monitor resettlement training graduates that have not restored livelihood (but would likely do with extra training and equipment); 3) current glossary of terms of Land Management Manual; and 4) formalization of the Basic Business Skill training prerequisites.

### 3.2 MOC CAMEROON

**Project Update**

Only one MOC has been issued in 2011 by COTCO and it concerns the Pipeline Modification Project (PMP). The scope and content of the document, along with the observations and comments by the ECMG, are presented in the section of this report dedicated to the PMP.

Concerning the proposed MOCs in 2010 or the already approved MOCs, the ECMG has the following comments:

- proposal for a new stack emission testing procedure has not been implemented by COTCO and, for the time being, it has been reportedly put on hold;
- approved MOC on MA2 access road to Oil Spill Response (OSR) Control Points (CPs), issued since 2008, is still pending approval by the Government of Cameroon;
- implementation of the ROWIP (approved under a dedicated MOC) has not determined yet the planned decrease of aerial surveys of the ROW, which is pending approval by the CPSP, however, planned ROW foot inspection and patrolling activities have successfully started (see following sections on ROWIP); and
- the approved MOC on new access roads to Block Valve (BV) 20 and 22 (access to OSR CPs at the Lom Pangar area pre-dam construction) is presently under implementation and the relevant Environmental Baseline Assessment conducted in 2011 has been provided for review during the mission.
4 WORKERS AND COMMUNITY HEALTH AND SAFETY

4.1 OCCUPATIONAL HEALTH AND SAFETY MEASURES (EEPCI AND COTCO PERSONNEL)

Project Update

The visits conducted at the OFDA and permanent facilities in Cameroon confirmed that the Health and Safety measures in place are in line with the current best industry practices and with the EMP requirements in force. No particular observation or suggestion for improvement was raised.

4.2 OCCUPATIONAL HEALTH AND SAFETY MEASURES (COTCO CONTRACTORS)

Project Update

As previously discussed, the newly issued ROWIP in Cameroon has required an increase of workforce from the local communities to conduct the periodical maintenance (grass cutting and erosion control) and inspection (foot patrolling) activities along the pipeline easement. Both activities have started in April 2011.

At the present time, COTCO has three contractors (one per maintenance area) in charge of the ROW maintenance, plus another three contractors in charge of performing the ROW inspection activities. These contractors are hiring the needed workforce at the villages located along the pipeline and the local workers are in charge of inspecting or maintaining the ROW sections pertinent to the relevant village (e.g., the ROW monitoring and maintenance work load is split based on the length of pipeline section falling within the territory of the each village). Further details on the ROWIP scope, content and implementation status are provided under a dedicated section in the present report.

Observations

During the ECMG mission, a sample of villages located in MA4, around the town of Yaoundé, and in MA3, around the Belabo area, have been visited (see Annex A for details) in order to gather some follow up from local representatives on the implementation of the ROWIP.

Based on the information provided by the local chiefs and interviewed workers, it appears that all of the appropriate Personnel Protective Equipment (PPE) was not provided to the workers during the campaigns conducted in 2011. Further discussion with COTCO EMP representatives has confirmed the concern raised during the villages visit and the need of further investigating, with the appointed Contractors, that adequate Health and Safety measures are put in place (including training and provision of PPE). In this sense the planned contracting of ROW surveyors (see previous section on EMP staffing) could help to provide more adequate follow up on the quality of the work performed by COTCO contractors.

Recommendation

2. COTCO shall ensure that all the required training and needed PPE (including coverall, boots, gloves, safety glasses, etc) are provided by the appointed contractors to the locally employed worker. In general, it is recommended that the monitoring of the COTCO contractors involved in the ROWIP is further enhanced through the existing CROs and through the planned new staff to be hired (ROW surveyors).

4.3 REPORTED THEFTS OF EQUIPMENT (CHAD)

Project Update

In the period between December 2010 and August 2011 (data set provided), EEPCI has recorded a total of 441 cases of thefts of equipment, mainly cables and transformer oil at well pads. Particular concern was raised by the Project regarding the increasing episodes of thefts of transformer oil (average of 23 cases per month since May 2011), which is causing the sudden shut downs of the wells and consequent loss of production during the time needed for maintenance and repair works.

Observations

This oil, which is a hydrotreated light naphthenic distillate, has known toxicological properties and can pose risk for human health through skin exposure, inhalation and ingestion (but also presents slow degradation when released to the environment). Based on the information provided, it is stolen for various purposes, including mixing with fuel and even use for cooking purposes.
At the present time EEPCI is further implementing awareness campaigns at the local villages to inform about the risks associated with the use of transformer oil.

It is also observed that, based on the visual inspection conducted at the well pads by the ECMG, hardening measures to protect authorized manipulation of the equipment are already in place, consistent with the overall hardening program implemented by the Project in the last two years. The measures in place can be considered adequate to prevent accidental contact with electrical cables and all the connected equipment but are useless to prevent deliberate theft episodes (which are occurring through intentional removal of sealing bolts, etc).

As a suggestion for improvement, the ECMG asked the Project to evaluate the opportunity of enhancing the current warning signs in place at the well pads, to indicate, also through intuitive images, the toxicity and risk for human health associated with the improper use of transformer oil.

In addition to the concerns related to the loss of production by EEPCI and the improper handling of the transformer oil by the local communities (where the stolen oil is likely being sold or in any case re-used), an additional problem is the possible consequences that the increase in theft events may have in terms of security enforcement in the area (see also Section on Consultation and Communication).

4.4 Minimum Distance Requirements of Well Pads from Villages or Settlements (Chad)

Observations

Within the regular external monitoring activities on EMP compliance, the ECMG has visited several newly constructed well pads at the OFDA to evaluate the compliance of the minimum distances between the constructed well and sensitive receptors (such as settlements, water wells and surface water bodies) and to verify the consistency of the Environmental Baseline Assessment documentation produced by the EEPCI EMP team.

Compared to the last ECMG visit in 2010, no particular observation in terms of access control or potential exposure of local communities was made during this visit.

All the checked Environmental Baseline Assessments were found to adequately reflect the site settings and conditions.

Requirements in place for minimum distances between newly constructed well pads and sensitive receptors are currently set by the Land Management Manual (LMM), Section 4.1.1 (Facility Siting).

4.5 Newly Constructed Well Pads (Chad)

Project Update

During the last three missions carried out by the ECMG, several concerns have been raised to the Project regarding the possible community safety issues due to the open pits that are constructed at new well pads awaiting to be drilled.

In normal operational conditions, these pits (used during drilling operation for mud and water storage) are left open and unattended for approximately ten days, till the drilling team is mobilized to the site (during drilling activities any unauthorized access is forbidden and prevented by guards).

A step forward in improving the security conditions at these pads was implemented by the Project in 2011 through the placement, at all newly constructed and not yet drilled pads, of warning signs to point out the risk of accidental falls. Use of any other device (such as warning tape or similar) has been reported by the Project as not feasible due to the recurring thefts (especially at night) of all kinds of valuable materials.

Observations

All the visited well pads by the ECMG in October 2011 were found, where needed, to be provided with warning signs. However, it was also observed that the warning signs are in the English and French languages only, while more intuitive drawings or pictures could have been used to facilitate understanding even in case of illiteracy.

In general, although it is recognized that the use of warning signs represents an improvement compared to the past, it is still believed that the current practice is not adequately aligned with the EMP requirements on open trenches and excavation works, as stated in the EMP General Project Specification (GPS) No. 008.
Recommendation

3. The Project shall identify and put in place further measures to ensure that adequate protection of the public is provided at excavated pits in the period elapsing between pad construction and drilling. The use of warning tape (eventually to be replaced when stolen) is recommended. Alternatively the use of concrete jerseys may be evaluated. Finally, it is underlined that, if no further measure is implementable due to reported theft of equipment, an MOC procedure has to be undertaken by the Project in order to soundly and justifiably modify the current EMP requirements, which at the present time, in ECMG opinion, are not met (repeated recommendation).
5 BIOPHYSICAL ENVIRONMENT AND ENVIRONMENTAL MANAGEMENT TOPICS – CHAD REVIEW

The present Section illustrates the main outcomes of the field visit conducted by the ECMG team in Chad from October the 10th to the 13th October, 2011 and presents the results of the documents desk review, with reference to the following different biophysical topics:

- water resource protection;
- wastewater management;
- waste management;
- oil spill prevention and response;
- air quality;
- land use and land resource protection; and
- erosion control and re-vegetation.

5.1 WATER RESOURCES PROTECTION

Project Update

Water resource protection is a key requirement for the entire Project, which has developed a Water Monitoring Program (WMP) consisting of six components as presented in the following box.

<table>
<thead>
<tr>
<th>Box 2: Water Monitoring Program Components- Chad</th>
</tr>
</thead>
<tbody>
<tr>
<td>Water Monitoring Program Components</td>
</tr>
<tr>
<td>1. Surveying of local surface water and groundwater usage practices prior to the commencement of Project-related surface water and/or groundwater withdrawals;</td>
</tr>
<tr>
<td>2. Surface Water and Groundwater Withdrawals at OFDA (Chad);</td>
</tr>
<tr>
<td>3. Monitoring of Water for Human Consumption Obtained From Project-installed Groundwater Source Wells;</td>
</tr>
<tr>
<td>4. Regional Groundwater Monitoring Program;</td>
</tr>
<tr>
<td>5. Groundwater Monitoring at the Project’s Engineered Solid Waste Landfill Sites; and</td>
</tr>
<tr>
<td>6. Monitoring of liquid effluents discharged directly to onshore surface water bodies.</td>
</tr>
</tbody>
</table>

According to the records provided, EEPCI consistently implemented all the monitoring activities foreseen by WMP. In particular, during the site visit, the following data relevant to the implementation of the WMP were provided:

- records on water consumption at the OFDA relevant to 2010 and 2011 (records available until August 2011);
- complete weekly potable water test results at the OFDA for July, August and September 2011;
- detailed chemical quality monitoring data relevant to the ground water analysis at OFDA (4th Quarter 2010 and 2nd Quarter 2011);
- Total Petroleum Hydrocarbons (TPH) groundwater testing results for 4th Quarter 2010;
- the updated OFDA Groundwater monitoring map;
- the piezometer and village traditional wells water levels for 1st, 2nd and 3rd Quarter 2011; and
- the list of new installed piezometers and relevant scheme of installation.

The observations relevant to the performed WMP activities are summarized in the following sections, for each separate component.

5.1.1 Component # 2 of WMP – Surface Water and Groundwater Withdrawals at OFDA (Chad)

During the site visit the EGMG team was provided with the groundwater levels for all piezometers installed at OFDA in the period 2002 - 2011 (until September 2011). During the 3rd Quarter 2011 groundwater level
measurement campaign it was not possible to gather data from one well (KPZ-17) since it was reportedly damaged.

The provided data confirm what already reported under the previous two ECMG reports, namely an increasing trend of the water table level at OFDA during the period between 4th Quarter 2002 and 2nd Quarter 2011, as presented in the following figure.

![Image of groundwater levels at OFDA](image)

**Figure 5.1: Groundwater Levels at the OFDA**

As per 2009 ECMG recommendation, EEPCI started an in-house hydrogeological study to better understand the possible effects on groundwater monitoring due to the increased water level observed.

Scope of the study is to:

- primarily improve the current knowledge of the hydrogeological setting of the site (by identifying the nature of shallow aquifer monitored); and
- consequently understand if any modification to well installation scheme is needed (since most of the groundwater monitoring wells have been installed based on what is now obsolete ground water level measurement). Any change in the installation scheme would be aimed at ensuring detectability of floating hydrocarbons in the groundwater.

Based on the collected data, the same observations made during the past visit (November 2010) hold true and can be summarized as follows:

- increase of water levels occurred in two areas, where the surface soil tends to be more porous and near riparian areas where recharge from hydraulic gradient is significant;
- in other areas of the OFDA water levels remain about unchanged;
- there’s no evidence that oilfield activities could have affected the increase in water level (e.g., there is no specific correlation with the produced water injection given the difference in depths);
- the monitoring well installation schemes were reviewed since in some areas the ground water is actually shallower than the well screen; and
- sampling procedure was modified for those wells where the groundwater is shallower than the screen by increasing purging to insure pulling a cone of depression sufficient to get a complete sample that includes the top of the aquifer.

**Recommendations**

4. Replacement or repairing of the damaged groundwater well KPZ-17 should be carried out by the Project in order to reinstate the complete monitoring network.

5. The Project, as anticipated during 2010 ECMG mission, should provide a systematic comparison of water depth vs. depth of installed screen (according to the original installation
6. With reference to the discussion held in Komé with EEPC1 EMP on the monitoring well installation specifications, the Project shall ensure that any new piezometer to be installed (even at very shallow groundwater level areas) is constructed according to EMP Esso Chad Specification (ECS) 11-1-1, with particular reference to the seals installation requirements as follows:

- “To prevent groundwater contamination, at least two well seals shall be installed within the annulus: (1.) One just above the screen, and (2.) the other at the ground surface”

5.1.2 Component # 3 of WMP – Monitoring of Water for Human Consumption Obtained From Project-installed Groundwater Source Wells

During the field survey, the Komé 5 drinking water treatment plant was visited and found adequately managed. Water from two wells, used in alternance, is withdrawn at a depth of approximately 60 m and then sent to the plant to be processed.

Provided results of drinking water monitoring have been spot checked through the analysis of summary tables reporting weekly data collected in July, August, and September 2011 at OFDA. Water samples were collected and tested daily for pH, residual chlorine, turbidity and conductivity and weekly for coliforms and total dissolved solids. Data provided refer to the drinking water supplied at:

- the Komé 5 WTP station, clinic, kitchens, ice plant, TCL tanks and airport;
- Komé base WTP station and kitchen (until August 2011, then closed);
- Moundouli WTP station and kitchen (until August 2011, then closed); and
- Baker (starting from September with reduced frequency).

All the provided results confirmed that the water samples comply with applicable World Health Organization (WHO) standards for Drinking Water Quality except for free chlorine residual that was found exceeding the standard limits at Komé Base twice in 2011 due to the failure of the chlorinator pump.

As a suggestion for improvement of current practice, the Project should consider adding to the existing quality monitoring activities spot checks of potable water at taps inside camp facilities to identify possible deterioration of piping network.

5.1.3 Component # 4 of WMP – Regional Groundwater Monitoring Program

The data provided by the Project and relevant to the 2nd Quarter 2011 monitoring activities did not show any exceedances of the WHO reference limits, with the usual exception of pH and turbidity and, in few cases, iron, at traditional village wells. However, these exceedances are due to geological background effects given the presence of laterite in the area. Testing results have been reportedly provided to Chadian authorities in N’Djamena. No groundwater sample was collected from wells MPZ3, Meurmeouel II and Dodang 3, since they were reportedly damaged.

During 2010, the Project installed 15 additional monitoring wells (8 in Komé, 2 in Bolobo, 1 in Miandoum, 3 at the BV3 oil spill site, and 1 at K223). An updated map showing the overall locations of all groundwater monitoring point in the OFDA was provided. Overall, the coverage of the groundwater monitoring network at the OFDA is considered adequate for monitoring purposes.

Recommendation

7. The Project should replace or repair damaged wells MPZ3, Meurmeouel II and Dodang 3 in order to reinstate the full monitoring network.

5.1.4 Component # 5 – Groundwater Monitoring at the Project’s Engineered Solid Waste Landfill Sites

Groundwater monitoring at the Project’s engineered landfill is performed in parallel to the monitoring of Project-installed groundwater source wells and the regional groundwater monitoring program. Results did not show any exceedance of the reference limits.
5.2 WASTEWATER MANAGEMENT

Project Update

During the site visit, the ECMG team collected wastewater analytical results for the period July - September 2011 at Miandoum, Komé Five Camp (KFC), Komé Base and Moundouli facilities. All monitoring activities have been conducted according to EMP requirements. The relevant observations are reported in the following sections.

5.2.1 Component # 6 – Monitoring of Liquid Effluents Discharged Directly to Onshore Surface and Water Bodies

According to Component # 6 of WMP, a chemical characterization of non-continuously discharged effluents shall be performed prior to discharging water to surface water bodies, testing for a set of parameters listed in the WMP (pH, biochemical oxygen demand, chemical oxygen demand, oil and grease, metals, etc.).

However, none of the Project wastewater effluents at the OFDA is discharged directly to surface water bodies. The observations relevant to the performed monitoring activities of the quality of the effluents produced by the Oil Water Separator (OWS) and sewage treatment plants are discussed in the following sections.

5.2.2 Sewage Water

Sewage treatment units at permanent facilities consist mainly of a primary aerobic digestion unit. Treated effluent is disposed through leach fields or open lagoons for evaporation and transpiration (at Komé Base and Esso Drilling camps).

A sludge drying bed is also present at the Komé 5 sanitary waste plant. The dried sludge is collected and sent for disposal at the Project waste management facilities and in more recent times to the GER Norwest enterprise (GER) facility for composting, while wastewater collected below the filtering unit of the drying bed is pumped and recycled upstream of the treatment unit. Two leach fields are in place at the KFC facility collecting treated wastewater from sewage water treatment plant and wastewater from the KFC laundry, via a septic tank.

Results of the treated wastewater quality, conducted weekly in the 3rd Quarter 2011, were provided. No test is conducted on the KFC laundry effluents. Only two exceedances for the Oil and Grease parameter were detected in August 2011 at Komé Base due to a malfunctioning of the grease trap serving the camp Kitchen. However, as further discussed below, the camp is under decommissioning and therefore the grease trap does not represent an issue any longer.

Recommendations

8. A spot check of subsoil quality at the waste water outlet at the Komé Base lagoon should be carried out to ensure that the oil and grease exceedances detected did not result in a cross contamination of the receiving lagoon. This check could be included within the EMP related decommissioning activities indicated in Section 5.6.3.

9. The Project should re-evaluate the current wastewater monitoring practice by including the effluents testing at the KFC Laundry. According to the EMP (laundry wastewater is included among wastewater types, section 2.1.30 of WMP in the EMP, as shown in Figure 5.2) effluent tests are needed in case of surface discharge, which is actually occurring though the leach field downstream of the collecting septic tank. Based on the test results the Project shall evaluate if the septic tank treatment prior to discharge on soil is adequate, or if further treatment is needed.
5.2.3 Oil Water Separators

EEPCI is complying with the OWS Monitoring Plan requirements, providing the surveying and effluent monitoring criteria for all the OWS installed at the OFDA. However, despite the same requirements in place, the effluents produced by the OWSs operating in the OFDA are not discharged but are instead collected by vacuum truck and disposed of at K223 facility.

The only OWS connected with an offsite drainage ditch is the one serving the Central Treatment Facility (CTF) at Komé 5. The effluent of the OWS at the CTF is tested for oil and grease prior to each discharge and, in case of exceedances of the applicable oil and grease limit (20 mg/l) the effluent is collected by vacuum truck and disposed of at the K223 facility.

5.2.4 Produced Water

The Project is injecting the produced water (water recovered from crude oil treatment at the two Gathering Stations and CTF) through a high pressure water injection system at a depth of approximately 1,500 m below ground level. The injected water is used to maintain formation pressure and to assist oil production (secondary recovery) in the producing formations. The produced water recovered from the K223 Well Testing Mud Management Facility, after the oily mud collected from wells development has been dried, is also injected. The observations relevant to the K223 site are discussed under the Oil Contaminated Soil Management Section.

5.3 WASTE MANAGEMENT AT THE OFDA

During the site visit at the OFDA, the ECMG team collected data on amounts of waste produced and disposed of and relevant to the waste management system. Produced amounts of waste during 2011 (until August 2011) are summarized in Figure 5.3 below.
According to the information provided, during 2011 (through October) the total amount of waste produced at the OFDA is equal to 6,624 tons (with hazardous waste representing 20% of the total amount), of which 4,723 tons were processed/recycled/donated.

The waste production values are in line with the 2010 data, while sensible improvement in the amount of waste processed has been recorded. This improvement was achieved also thanks to the operating of the two non hazardous incinerators at the Komé Waste Management Facility (KWMF) and the newly established waste recycling programs.

Among these programs, a remarkable contribution to the amount of waste processed is given by the GER composting initiative, which is collecting exhausted and dried sewage treatment sludge, vegetation cuttings, cardboards, and food waste generated by the Project.

In addition, a contract was awarded to the Quincaillerie Djarabe Company, located in Moundou, to handle waste metal recycling. Quincaillerie will handle recycled metal by mostly sending it outside of Chad. It should be noted that this metal recycling program is not a donation initiative since the waste is sold, generating an income for the Project. During the field visit, the ECMG team suggested EEPCI to be provided by the appointed contractor with some documentation on the final destination and/or fate of the waste in order to adequately document its end-status.

Field visits were conducted at: the KWMF; the K223 reinjection facility; and the GER composting facility. All surveyed facilities have been found in good conditions and well managed.

### 5.3.1 Komé Waste Management Facility (KWMF)

The KWMF is the main Project central waste management facility operating at the OFDA. It consists of several units, including: a waste segregation area; a waste compaction area; two municipal waste incinerators, of which one is designed for mixed municipal-plastic waste incinerator; a hazardous waste incinerator; one non-hazardous and one hazardous waste disposal cells; two landfill leachate collection tanks; used oil storage tanks; and several unpaved temporary storage areas.

The hazardous waste cell was reportedly used for highly oil contaminated soil disposal (approx 1,000 m³ from K223). No leachate at the hazardous waste cell was produced during 2011 since it currently contains only dried sludge. Additionally, the ECMG team acknowledged that the hazardous waste incinerator has operated less than 10 days in 2011 due to several operational problems. It should be noted that during the ECMG site visit the incinerator was not operating due to a failure to the scrubber pumps and cooling tower pump. The graph in Figure 5.4 shows the operating days of each incinerator (Hazardous, Municipal and Penn ram incinerators) in the period between December 2010 and August 2011, while Figure 5.5 shows the amount of waste processed by the KWMF incineration during the same period.
5.3.2 External Waste Recycling Initiatives

5.3.2.1 GER

The GER Norwest (GER) is a commercial enterprise based in Mainani, which in the fall of 2009 started to process waste streams such as vegetation cuttings, food waste, cardboard and paper, sewage sludge and shredded wood for the production of compost. All waste streams treated are entirely provided by EEPCI. The GER facility was visited by the ECMG team and found in good condition. Health and safety measures are properly in place at the site and control of hygiene conditions is conducted by the GER management.

It should be noted that in 2011, EEPCI operated the Penn Ram incinerator, acquired by the Project in 2009 and capable of processing a mixed stream of cardboards and plastic materials (up to 40%) with emissions guaranteed within the most stringent United States Environmental Protection Agency standards, by feeding the minimum recommended quantities of plastic materials (e.g. up to 10%).

Finally, also thanks to the above mentioned recycling programs, less quantities of waste stored waiting for final treatment or disposal were observed at the site compared to past ECMG visits.
Particular care is devoted to prevent direct contact with sewage sludge, which has a potential high content in pathogens, and to the decontamination of work clothing. In addition, the Project is periodically visiting the facility to monitor its status and support the management in solving potential operational problems.

Up to now GER has hired 14 employees and approximately 170 m³ of compost were produced in 2011 before the rainy season. Plans are in place to hire 34 more employees in 2012 and bring the production to 1,000 m³ during the next dry season.

Improvement in the segregation of waste streams at the GER facility was observed compared to 2010 mission. Total plastic waste recovered in 2011 was reportedly close to 50 drums, plus some unsorted construction materials. Plastic waste and material not suitable for the composting process is properly segregated and returned to EEPCI for disposal at KWMF.

As a suggestion for improvement, the Project should consider to leave a copy of the outgoing waste manifest (e.g. for the waste streams returned to EEPCI) at the GER site in order to enhance traceability of waste streams. Furthermore, segregation of waste streams from building demolition debris was recognized as possible area of improvement given the presence of several mixed waste streams not usable for composting process. In this sense segregation of building demolition derived wastes should be carried out first by EEPCI at KWMF before delivery to GER.

Compost was already used in 2011 at 5 well pads: K640, K897, K623, K603, and K545. In total 150 m³ of compost were spread on 8,300 m² of reclaimed land. The compost was spread to an approximate thickness of 3.6 mm at each of the five well pads.

Five other well pads not treated with compost, located near the five treated pads, were selected as control sites for the pilot testing. However, the 5 compost treated and 5 control well pads were not planted by the same farmers at the same times or using the same species, and therefore a quality comparison between treated and non treated land parcels was not evaluated as significant.

Further observations and recommendation for compost re-use are reported in the section relevant to the Land Reclamation topic.

5.3.2.2 Bébédjiia Distribution Services

Within the waste recycling program, the Bébédjiia Distribution Services was appointed by EEPCI in 2008 to provide plastic and food waste recycling and composting services. The waste recycling facility is provided with a food waste collection and treatment unit, an area for vegetable waste food composting, and a plastic recycling area. The main objectives of this initiative were (in the plans) to produce and sell, on the local market, plastic pellets, compost and animal feed for chickens and pigs.

During the visit, the ECMG acknowledged that this contract is expected to be closed. ECMG is particularly concerned by the final disposal of the waste received and treated by the Bébédjiia facility. To this aim, it should be ensured that no EEPCI generated waste stream is abandoned or improperly disposed of after contract closure.

5.3.3 K223 Site

The K223 Well Testing Mud Management Facility collects the first surge oily sand and drilling mud from the OFDA wells. Once dried into the double lined concrete pit, the mud is collected in a new temporary accumulation pit also provided with a double liner and side berms. The oily water recovered is pumped and stored into several tanks before being pumped through the disposal well at a depth of approximately 1,600 m below ground surface.

In 2009, due to the limited capability by the Project of handling oil contaminated soil and the continuous production of impacted mud from the newly developed wells, the K223 facility was expanded by acquiring an adjacent area to host up to three additional drying/sedimentation basins.

Following ECMG recommendation, the Project has installed a new groundwater monitoring well to cover the front downstream of the facility expansion and included this well within the list of the periodically monitored points according to the Water Monitoring Plan.

In April 2011, 1,000 m³ of contaminated mud was reportedly moved to the hazardous waste cell at the KWMF. It should be noted that about 1,400 m³ are currently stored at this facility. By the first months of
During the ECMG visit, the facility was found in good status; the site is permanently guarded and under surveillance. No particular issue relevant to the drying sedimentation basin was observed.

5.3.4 Oil Contaminated Soil Management at the OFDA

The EMP requirements for the disposal/treatment of contaminated soil can be summarized as follows: 1) waste minimization options by using contaminated soil for road mix or berming (if non hazardous); 2) treatment through bioremediation; or 3) disposal through landfill (depending on the hazardous waste determination).

EEPCI is currently handling the following oily contaminated soil streams:

- oil contaminated soil derived from oil spills occurred at the OFDA (see section 5.4.2 for detailed record of oil spills occurred in 2011); and
- oily mud recovered at the K223 facility following separation and pumping the liquid to the reinjection well.

The two soil streams have different physical and chemical characteristics and therefore pose different problems in terms of management according to the EMP requirements. While the oil contaminated soil from oil spills is in general light contaminated soil (with concentrations of TPH often below the target level of 1% in weight) and is therefore suitable to be handled through simple waste minimization options, the K223 mud is a heavy contaminated material with TPH concentration well above 1%.

As reported under previous ECMG reports, in the past years the Project has struggled to find a suitable solution for the abatement of the TPH concentration within the EMP recommended target concentration. All attempts of conducting bioremediation, as recommended by EMP, have failed due to the presence of heavy petroleum compounds that are not suitable to be abated through simple bioremediation processes.

Heavy Contaminated Soil from K223

With reference to the high contaminated mud presently stored at the K223 site, during the visit the ECMG team acknowledged that the Project is presently evaluating the option to dispose it through the Bocom authorized hazardous waste facility located in Douala, Cameroon.

If this disposal option will be finally selected, careful evaluation of Chad and Cameroon regulatory requirements on transboundary transportation and disposal of waste is strongly recommended. Adequate documentation to be provided after disposal will have to include, among other:

- proof of compliance with applicable regulatory requirements;
- track of waste amount disposed of (generated, transported and received);
- description of Bocom incineration process and relevant permitting /authorization documents; and
- management of emergency in case of release of contaminated soil during transportation.

The alternative solution proposed during the 2010 visit, concerning the adoption of the engineering technique known as “Grind and Injection”, was reportedly abandoned since it was considered too expensive (expected costs for the “Grind and Injection” solution were reportedly four times higher than the ones foreseen for the Bocom disposal solution).

Light Contaminated Soil from Oil Spill

The lighter contaminated soil (approximately 356 m$^3$ in total), generated from past clean up operations conducted at oil spill sites as well as from the attempted land farming and bioremediation treatment, it is now temporarily stored at the Komé 5 batch plant site in a soil pile double lined on the bottom and covered with impermeable liners.

Following analytical verifications, showing an average concentration of TPH below the target concentration of 1%, approximately 5,000 m$^3$ contaminated oily soil coming from the BV4 and K984 old spill sites, and formerly stored at the Komé 5 batch plant area, were used, in agreement with EMP waste minimization options, for paving the road section running north of the KWMF up to the junction with the N’Djamena – Doba National Road (7.7 km long). A schematic cross section of the road paving design, where the light yellow sub base course is made of oil impacted soil, is shown in Figure 5.6.
Road paving through Double Bitumen Surface Treatment (DBST) has been extensively adopted by the Project as dust mitigation option along the main OFDA spine road. This section of road, paved with the use of oily soil and DBST (total length of DBST was 8.6 Km of which, 7.7 km included light contaminated soil) was visited by the ECMG team and no particular issue was observed, although the quality of the paved surface appeared slightly poorer compared to the normal use of DBST.

During the site visit, the ECMG team was also provided with the ExxonMobil Biosciences Inc. study. According to this study, and based on the assumption that soils containing less than 1% TPH typically does not pose a risk to human health or the environment, the BV4 and K984 soil (tested in 2008) was considered acceptable for beneficial reuse consistent with the EMP requirements. In 2010, additional soil samples were collected on oily soil from the Batch Plant. A risk assessment was then conducted to evaluate the potential risks that might be associated with the use of the combined soil as a component of road substructure. The conclusions of this study can be summarized as follows:

- oil-related constituents that were evaluated included TPH, benzene, toluene, ethylbenzene, xylenes (known as BTEX), polycyclic aromatic hydrocarbons, and metals;
- based on a review of the 2010 analytical data for the Batch Plant soil, the average TPH concentration in the soil material is less than 1% and can be used for beneficial reuse applications;
- the proposed use of the lightly oiled soil as part of the sub base layer of roads ways that is encapsulated with DBST will further reduce potential risks by precluding direct contact and minimizing potential leaching to ground water; and
- no potential human health ecological risks are expected with this proposed use.

Following the review of the study conducted by the ECMG, the following observations were made:

- risk based approach is acceptable for contaminated sites assessment (to evaluate onsite/insitu remedial needs) but it is not, from a general point of view, recommendable to be used to evaluate offsite disposal or reuse;
- however, if used, the reference methodology and threshold levels for acceptable carcinogenic and toxic risk should be better explicated;

Figure 5.6: Schematic Cross Section for the Re-Use of Light Oily Contaminated Soil for Road Paving

Road paving through Double Bitumen Surface Treatment (DBST) has been extensively adopted by the Project as dust mitigation option along the main OFDA spine road. This section of road, paved with the use of oily soil and DBST (total length of DBST was 8.6 Km of which, 7.7 km included light contaminated soil) was visited by the ECMG team and no particular issue was observed, although the quality of the paved surface appeared slightly poorer compared to the normal use of DBST.

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- risk based approach is acceptable for contaminated sites assessment (to evaluate onsite/insitu remedial needs) but it is not, from a general point of view, recommendable to be used to evaluate offsite disposal or reuse;
- however, if used, the reference methodology and threshold levels for acceptable carcinogenic and toxic risk should be better explicated;
assessment done concluded that light contaminated soil (from oil spill with TPH<1%) is, consistently with EMP requirements, re usable for road paving; however, the EMP also indicates the need of evaluating non hazardousness in alignment with standard waste classification practice; Laboratory results relevant to the samples collected from the oily soil reused for road paving have been provided to the ECMG in October 2011. These data confirm the following:

- TPH concentration is always below EMP target level (1%);
- TCLP (Toxicity Characteristics Leaching Procedure) tests on organic matter and metals are always below or slightly above detection limit (indicating absent or very limited leachability of the potential contaminants of concern and therefore the non hazardousness of the material).

Recommendation

10. At the present time, the use of contaminated soil according to the scheme provided still does not appear to be in strict compliance with EMP requirements, especially taking into account that the soil is not mixed but left as it is, although properly confined and encapsulated. Therefore, ECMG recommends to develop a dedicated MOC (completing the preliminary one issued in 2010) where the following items are covered:

- procedure for assessing hazardousness of waste material to be reused (attaching the relevant results of laboratory tests performed on the batch already employed),
- specifications for road paving to ensure the soil is properly encapsulated (construction schemes); and
- procedure in place for ordinary monitoring of road paving integrity.

5.4 OIL SPILL PREVENTION AND RESPONSE

5.4.1 Routine Drills Conducted

The Project provided the records relevant to the drills conducted at OFDA during 2011. The number and type of drills performed appeared to be adequate.

5.4.2 Reported Events and Mitigation Measures Adopted

According to the information provided, two reportable (> 1 barrel) spills occurred in 2011.

On July 13 2011 an oil spill occurred at the M154 site due to the presence of a stone underneath a fiber glass flow line pipe during the movement of heavy equipment over the pipe. A total of approximately 200 barrels of crude oil was reportedly spilled. Response actions adopted included:

- clean up of the spill site and excavation of 330 m³ of impacted soil (at present temporarily stored at the Komé 5 Batch Plant area);
- collection and testing of composite soil samples from the excavated soil and at the bottom of the excavation pit for verification of the clean up measure (concentrations of the tested samples ranged from 0 to 2,926 mg/kg); and
- monitoring of TPH from two downstream groundwater wells, one already existing (MPZ02) and one installed right after the spill event. Groundwater monitoring consisted in sampling groundwater monthly during the rainy season and quarterly during the dry season. Provided groundwater samples results indicated concentrations below laboratory detection limit of all analytes.

The second oil spill occurred on August 16, 2011 at the Mn40 site. A fiber glass pipe was damaged during an attempted theft of cable wire. The damage was not identified prior to the refilling of the trench and the damaged fiber glass pipe failed within one day from production start. A total of approximately 27 barrels of crude oil was reportedly spilled. Response actions adopted included:

- clean up of the spill site and excavation of 20 m³ of impacted soil (at present temporarily stored at the Komé 5 Batch Plant area);
ECMG

- collection and testing of composite soil samples from the excavated soil and at the bottom of the excavation pit for verification of the clean up measure (concentrations of the tested samples ranged from 0 to 1,826 mg/kg); and
- monitoring of TPH from three, already existing downstream groundwater wells (PZ01, PZ02 and PZ03). Groundwater monitoring consisted in sampling monthly during the rainy season and quarterly during the dry season; all samples tested were found below the relevant detection limit.

All the above implemented response measures were in line with the Oil Spill Response Plan (OSRP) and EMP requirements. Both oil spill sites were visited by the ECMG team and found in good conditions. EEPCI also provided the ECMG with both oil spill monitoring reports.

With respect to the documentation to be provided under EMP for oil spill sites, the following suggestions for improvement were proposed:

- better document (photos) all phases of the cleanup activities including excavation of trenches and purging of free product; and
- attachment of groundwater monitoring wells installation scheme and abstract of piezometric curves to the assessment report in order to provide adequate follow up on monitoring measures implemented.

The main observation concerned however the rationale adopted for soil sample collection and the lack of information available on sample collection below the leaking pipe.

In this respect, the Project should better document and demonstrate that composite samples are also collected from the bottom soil, below the leaking pipe, in order to ensure that the mostly contaminated area is targeted and that the environmental characterization is therefore carried out adequately.

5.4.3 Emulsion Release at CTF

An incident occurred in July 2010 at the CTF causing the release of almost 4,000 barrels of oil in water emulsion from one of the storage tanks into the tank’s secondary containment. The release occurred during an emulsion transfer operation due to the failure of the valve serving the piping system connecting the storage tanks.

Due to the large amount released, the liquid reportedly overflowed the tank’s primary containment but was contained within the secondary containment. Some of the liquid released reached the storm water drain and sewer. The Oil-Water Lift Station (OWLS)/OWS serving the process areas for the collection and treatment of storm water captured the released liquids. Reportedly none of the released liquids were discharged to the external drainage ditch (downstream the OWLS/OWS unit). However, as a precautionary measure, the quality of the water at the Loulé River, located downstream of the drainage outlet, was sampled and tested for TPH. No contamination was found in the water samples collected from the river.

During the previous ECMG visit cleanup operations were still ongoing and the Project was committed to prepare a detailed report on the incident, including presentation of emergency response and corrective actions implemented once all clean up operations and root causes investigative activities are completed.

During this visit, ECMG was provided with the CTF Emulsion Tank Incident Report including:

- chronology of events occurred on 31st July 2010;
- implemented response actions;
- description of the current status; and
- action plan (next steps).

The report and response measures put in place can be considered adequate and therefore no issue is raised.

5.5 AIR QUALITY PROTECTION

Air quality protection commitments, relevant to the permanent facilities in Chad, are provided by the EMP and by Schedule 17 of the CCA, which indicates the routine monitoring activities to be performed starting from the Project Physical Completion Date.

The main four datasets routinely checked during the ECMG field missions are:

- the records relevant to the ambient air quality monitoring;
The outcomes relevant to the conducted review of the records provided are presented in the following sections.

5.5.1 Ambient Air Quality Monitoring

In accordance with Schedule 17 of the CCA, continuous monitoring of ambient air concentrations of nitrogen oxides (as NO₂) is being performed in the immediate vicinity of the Chad Operations Center and the Miandoum Gathering Station. Also, a supplemental monitoring of the concentrations of sulfur dioxide (SO₂) and fine particulate matters (PM₁₀) is performed on a quarterly basis.

For the year 2011, the monitoring of Chad Ambient Air Quality (NO₂ and SO₂) was performed using PASS (Passives Air Sampling System) from January to April. Due to some administrative issues, the tests relevant to May and June 2011 were not performed.

Starting from July, the monitoring Ambient Air Quality restarted, using diffusion tubes purchased from GRADKO, a different vendor.

During the visit, EEPCI provided the ECMG with results on ambient air quality monitoring in the form of summaries tables for NOₓ, SO₂, and PM₁₀ collected during the 1st, 2nd and 3rd Quarters of 2011. The measured data complied with the limits set by the Schedule 17 of the CCA.

EEPCI EMP team is evaluating a modification to the current PM₁₀ monitoring procedure in order to better document incremental effects on PM₁₀ measurements during dust storms (Harmattan). According to the proposed rationale, blank samples will be collected at non impacted-blank areas during the Harmattan period and logged to document the background effects on measurements conducted in the OFDA.

5.5.2 Stack Emission Testing

Stack emission testing is required to be performed once every three years from Project completion date (28 October 2004) or at any time following a start up (including long term outages such as those occurred at the KWMF hazardous waste incinerator).

Monitoring of stack emission is done in agreement with Schedule 17 of CCA for the following parameters:

- at fired heaters, boilers and waste incinerators for Particulate Matter, Nitrogen Oxides as NO₂, Sulphur Dioxide, Volatile Organic Compounds (VOC), odour and Hydrogen Sulphide;
- at Power plant combustion turbines, for Particulate Matter and Sulphur Dioxide; and
- at combustion turbines, other than Power Plant, and reciprocating engines for Particulate Matter, Nitrogen Oxides as NO₂ and Sulphur Dioxide.

Stack emission testing was performed in January 2011 on three turbines and three incinerators. The following observations were made:

- only one measurement was performed on the hazardous waste incinerator due to a hot spot in the kiln limiting its operability;
- results of conducted tests at the Penn Ram incinerator with different plastic content (10, 20 and 40 %) were provided after completion of the ECMG field visit; provided data included only VOC testing results (always below threshold level set by the Schedule 17);
- stack emissions results did not show any exceedance of the relevant Schedule 17 limits at any of turbines monitored; and
- all the three incinerators showed instead exceedance of Schedule 17 limits for at least one parameter each.

Investigations on possible operational issues that may have led to the incinerators exceedances were still ongoing at the time of the ECMG visit.

Consistently with the requirements of the EMP and Schedule 17 of CCA, and due to the found exceedances, stack testing at the three incinerators will have now to be performed once every year, as already agreed and planned by EEPCI.
5.5.3 Updated Dispersion Models

As per EMP requirements, Dispersion Modeling Update shall be performed on a yearly basis after Project completion date (28 October 2004).

A copy of the air dispersion modeling results was delivered to the ECMG. Following the modeling results, the maximum predicted ground level concentrations (24-hr and annual averages) for Chad Operation Center were identified and mapped (see Figure 5.7).

The updated dispersion modeling outputs are consistently used by the Project to determine the location of the ambient air quality monitoring tools in use and conduct the routine ambient air quality measurements.

Figure 5.7: Updated Dispersion Model at the OFDA – Location of Maximum Predicted Ground Level Concentrations

5.5.4 Flaring Volumes

Updated data on the flaring volumes of natural gas associated with the produced crude oil in 2011 (period January - August) were provided. During this period the Project has always met the target level of 1.0 MCFD/day.

Figure 5.8: Daily Average Flaring Volumes at OFDA (2011)
5.5.5 Dust Control at the OFDA

EEPCI is continuing the DBST application program along the main OFDA roads.

An updated map on the dust control program was provided to the ECMG showing the DBST application completed up to December 2009 and the planned DBST program for 2010, which included the application of an additional 8.6 Km of DBST to complete the road paving from the OFDA up to the north junction with the National road between Bébédjia and Doba. As mentioned above, paving of this road section was completed in 2011 and most of the spine OFDA road is currently paved with DBST.

5.6 LAND RETURN AND DECOMMISSION OF CONSTRUCTION PHASE FACILITIES

The EMP requirements for land restoration are set within Volume 1, ECS 26-1-5 on Environmental Impact Mitigation and they can be summarized as follows.

**Box 3: EMP Key Requirements on Land Restoration**

- **Surface Restoration:** at ROW, Camps and Project Facilities (no longer needed during the Operational Phase of the Project) and borrow pits, it is required to conduct restoration according to the following criteria:
  - return of disturbed portion to natural contours,
  - re-contouring of natural lines and grade without disruption to adjacent undisturbed habitat,
  - minimize erosion or future settlement,
  - scarified compacted soil to loosen (for instance at camps under decommissioning),
  - restore or replace top soil originally present,
  - grade the site to ensure that it will not accumulate standing water or divert the flow of water courses that may engulf it (for instance at borrow pits to be reclaimed), and
  - slope the sides of the reclaimed areas (at borrow pits) to prevent injury to personnel, livestock and wild life, in addition to erosion prevention.

- **Site Reclamation:** All areas not under permanent facilities shall be restored to an equal or better soil condition than when disturbance occurred so that the pre-disturbance vegetation type can re-establish itself in a short period of time. In order to facilitate re-vegetation, mitigations that may apply for reclamation of portions of the Work Site include fertilizing and seeding, mulching, and surface texturing.

The above requirements apply to the following Project facilities to be restored and reclaimed:

- new flow lines, connecting newly installed wells;
- well pads: for the portion of the pad used during well drilling but no longer needed during production;
- borrow pits: for all pits no longer needed or productive; and
- construction phase camps or facilities, when no longer needed during the operational phase.

For reference purposes, the following Table provides the up to date (October 2011) balance between land taken and land returned by the Project for each type of facility at the OFDA.

**Table 5.1: Land Taken and Returned at OFDA (October 2011)**

<table>
<thead>
<tr>
<th>OFDA Facilities</th>
<th>Land taken to date (Ha)</th>
<th>Land returned to date (Ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>WEL Pads</td>
<td>1011</td>
<td>490</td>
</tr>
<tr>
<td>Roads</td>
<td>331</td>
<td>34</td>
</tr>
<tr>
<td>Borrow Pits</td>
<td>531</td>
<td>413</td>
</tr>
<tr>
<td>Field Pipelines</td>
<td>217</td>
<td>250</td>
</tr>
<tr>
<td>OIL</td>
<td>325</td>
<td>67</td>
</tr>
<tr>
<td>UG Cable</td>
<td>40</td>
<td>2</td>
</tr>
<tr>
<td>Camp and permanent facilities</td>
<td>306</td>
<td>0</td>
</tr>
<tr>
<td>Gathering station</td>
<td>59</td>
<td>23</td>
</tr>
<tr>
<td>Airstrip</td>
<td>163</td>
<td>62</td>
</tr>
<tr>
<td>Piezometer</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>4074</strong></td>
<td><strong>1331</strong></td>
</tr>
</tbody>
</table>
5.6.1 Borrow Pits Restoration

Project Update

In 2011 three borrow pits (Maikeri BP, Komé BP6 ext 6&7 and Mamboe BP) were reclaimed and returned to local communities by the Project. At the time of the ECMG visit the following borrow pits were still active and used by the Project:

- at Bolobo oil field: BBP11-EXT.5;
- at Miandoum oil field: Manboe BP-Ext.3; and
- at Komé oil field: KBP06 Ext 9 and 10 Rev.1, KBP 13 (new and not yet opened), KBP12 Ext. 1, 3, 11, and 13; KBP02 Ext 3, 4 and 5.

Observations

The ECMG team has conducted a site visit at the Maikeri and the KBP06 Extension reclaimed borrow pits to evaluate the status of the recent restoration activities conducted by the Project, but also to follow up on restoration activities carried out in the last years.

During the visit the following observations were made:

- recent reclamation activities conducted in agreement with the new procedures in place are giving very satisfactory results (see Figure 5.9 and Figure 5.10). In particular, at the Maikeri borrow pit no standing water was observed, while at both pits the newly reclaimed portions of the area (see left side of Figure 5.9) appeared to be successfully cultivated;
at some of the older (more than 2 - 3 years) reclaimed pits clear signs of erosion of top soil were observed (as also remarked during past ECMG missions). At these pits, especially at those where reclaimed land parcels have not been cultivated by local villagers, the erosion has determined an almost full deterioration of the top soil (making impossible to use the land, if needed, for agricultural purposes);

– it has to be underlined that the Project in the past years has extensively investigated the causes behind the missed use of reclaimed pits by locals and has identifying several issues. These include: issues with land restoration (which have been solved by greatly improving the restoration technique); issues related to the perception by local farmers (restored land was since the beginning, rich in laterite and therefore not regarded by locals as suitable for farming)\(^2\); and finally issues with the traditional rotation of cultures (according to which, after the first harvests, the land parcel is left abandoned for some years while awaiting to regain fertility); and

– some concerns were raised following the visit of the KBP06 extensions currently in use where, due to recent rainfall events, large amount of standing water was observed to accumulate at the pit bottom. The access to the pit is not controlled by the Project and potential risks associated with accidental falls in these large and deep ponds by cattle or locals villagers exist.

\(^2\) Also the recently conducted experiment on the cultivation of Mucuna has failed because of negative perception by local farmers on this new and unknown species (see 2010 ECMG report).
Figure 5.11: KBP06 Active Extension – Ponds with Rain Water

Following discussion with EEPCI EMP team on the last item, the ECMG has suggested to evaluate the implementation of the same community safety protection measures recommended for the open pits at newly constructed pads (see previous Sections) to ensure that adequate protection to the public is provided at least till the rain water accumulated is naturally drained or dries out.

5.6.2 Well Pads Restoration

Project Update

The ECMG visit in October 2011 was focused on well pad restoration conducted by the Project using the produced compost from the GER Composting Facility (see Section on waste management).

In June 2011 pilot tests application of compost (top 3.6 mm thin layer) have been carried out by the Project at five selected well pads for a total of approximately 8,300 m² reclaimed and using about 150 m³ of compost. The pilot tests have included the restoration of five additional well pads, located nearby, without the use of compost, for comparison purposes.

Post rainy season assessment has confirmed the success of the experiment at reclaimed pads. At all these pads the cob and fruit development appeared to be very satisfactory.

In response to Recommendation #20 of the 2010 ECMG report (request of evaluation of chemical quality of sludge used for composting and cultural constraints with respect to the use of compost), the Project has also provided the following updates:

− in depth analysis of the sewage collection system at the Komé 5 camp indicated that there is no upstream source of heavy metals potentially able to affect the quality of the treatment sludge;
− in addition, analyses conducted on the final product (raw data not provided to the ECMG) reportedly indicated concentrations of heavy metals below the thresholds established by the United States, 40 Code of Federal Regulation, part 503; and

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3 The sewage sludge is used together with grass cuttings and food waste to produce the compost.
where performed, the application of compost at well pads has been reportedly agreed with the beneficiary farmer. In this sense the compost has been applied only if explicit consent from the farmer was obtained. In some instances, the application of compost has been reportedly refused by the farmer and therefore the Project has only performed top soil restoration.

**Observations**

The ECMG has conducted a spot check of recently reclaimed well pads, visiting some pads with or without compost application.

Field observations confirmed, at least from a visual point of view, the success of this initiative in terms of productivity of the land treated.

It was however recognized, and confirmed by the Project, that comparison between treated and not treated land parcels was not really possible, due to the different timing in seeding and species used.

Nonetheless, the experiment conducted, which will become standard practice for the Project by the end of the next dry season, has been reportedly enthusiastically accepted by the farmers and it has demonstrated its feasibility and sustainability with respect to the initial plans, started in 2010, with the establishment of the GER composting facility.

**Recommendation**

11. While it is positively acknowledged the success of the compost application initiative, especially in terms of acceptability by local farmers, the ECMG still consider the re-use of compost as not adequately covered within the Project EMP and in particular within the Operations Waste Management Manual (e.g. composting is considered a suitable waste treatment option but no specific indication on compost re-use is provided). In this sense, the Project should issue a dedicated MOC within the OWMM, covering the following topics:

- composting process description, including reference methodology and recommended percentages of waste streams to be mixed,
- criteria for evaluation of the raw waste material and final product chemical quality (e.g., the initial tests done shall be attached to the MOC. In addition the MOC shall include a schedule for periodical - annual - check to be implemented in order to ensure that no variation in quality has occurred, also taking into account the possibly decreased efficiency of the Komé 5 sewage treatment units4), and
- requirements for formal logging of the agreement with the farmer beneficiary of the compost treatment (e.g. the acceptance of the use of compost must be clearly documented in the Quitus forms).

**5.6.3 Construction Camp Decommissioning**

**Project Update**

By April 2011, the Project has started the consolidation process of the Komé Base construction camp by moving all construction support activities, personnel and equipment to the Komé Five Camp.

The Komé Base former construction camp occupies an area of approximately 150,000 m² (plus 16,000 m² of lagoon for treated sewage effluent collection) and it is located adjacent to the operational Esso Drilling camp and in front of the Atan settlement. The camp has been in operation since the early construction phase and, during the operational phase, has hosted EEPCI construction personnel and equipment.

The camp was provided with several resident blocks, offices, a restaurant and all the process facilities needed, including non-hazardous waste incinerator, potable water units, sewage treatment units, fuel supply tanks, generators, etc.

At the time of the ECMG visit, all facilities have been vacated, sealed and left idled at the former camp while awaiting decommissioning.

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4 To this aim, a criteria for evaluating the need of additional tests could be the observation of decreased effluent quality at the sewage treatment system (which is already monitored within the standard EMP duties).
A field visit of the Komé Base former construction camp was conducted, observing the following:

- the area is still permanently guarded and a fire marshal is on site;
- all facilities, including dorms, kitchen, restaurant, offices, etc, are properly sealed to prevent unauthorized access;
- all the process equipment formerly used by the camp is still in place;
- no abandoned waste stream or material was observed in any of the former construction camp area; and
- the adjacent lagoon, used for evapo-transpiration of treated sewage effluents, is still fenced and guarded. However, despite the rainy season, the area was found completely dry during the visit.

**Figure 5.12. Komé Base Former Construction Camp**

Based on the discussion held with EEPCI EMP representatives, it is acknowledged that a final decision on the camp decommissioning has not been taken yet. However it is underlined that, as also recognized by the EMP team, that the timing represents a key factor for the identification of suitable recycling or donation options of the equipment still in place. As a matter of fact, as also observed in Cameroon at the former construction camps, deterioration of unused camp facilities occurs quite quickly and it can strongly compromise their potential for re-use.

**Recommendations**

12. By the time that a decision on camp decommissioning will be taken, the Project will have to produce a decommissioning plan for the Komé Base Construction camp. Consistent with EMP Volume 1, Section 7.10 (Decommissioning) and EMP Volume 2 – ECS 26-1-5, this plan will have to provide:

- a timeline for decommissioning implementation,
- the existing agreements with local Government on the camp land use,
- an inventory of recyclable items (and proposed beneficiaries),
- expected waste streams to be produced and disposal options,
- the required specifications for land restoration, and
- the recommended verifications, where needed, of subsoil quality before restoration and return (for example critical areas needing assessment may be represented by the former
waste storage and treatment areas, as well as areas interested by OWS and sewage unit outlets).

Since the Project EMP team in Cameroon has collected quite a long experience with construction camp decommissioning and related issues (which are not only limited to the disposal or recycling options for waste stream generated, but are also pertinent to the formal return process of the land parcel to the local Government), it is suggested to EEPCI EMP to coordinate with COTCO EMP when preparing the requested decommissioning plan in order to capture, as much as possible, all the lessons learned in the past years.

5.7 EROSION CONTROL AND REVEGETATION

The Project has consistently implemented the erosion control/revegetation management and monitoring measures in accordance with the Operations phase ROW Plan.

Monitoring and implementation of erosion mitigation measures appeared to be adequate. Particularly, according to the information provided by EEPCI, the following activities have been carried out:

- erosion identified at Kilometer Pipeline 101 site has reportedly been repaired with rip-rap and local material;
- erosion identified at Kilometer Pipeline 119 has reportedly been repaired with stones and cement; and
- erosion identified in Moundouli Well Pad 44 and Miandoum well pads 112 and 122 has reportedly been repaired by fixing borders with laterite mixed with cement filled in bags.
6 BIOPHYSICAL ENVIRONMENT AND ENVIRONMENTAL MANAGEMENT TOPICS – CAMEROON REVIEW

The present Section illustrates the main outcomes of the eighth Post-Project Completion field visit conducted in Cameroon from October the 14th to October the 20th, 2011 by the ECMG team and presents the results of the documents desk review, with reference to the following different biophysical media and site management aspects:

- water resource protection;
- wastewater management;
- waste management;
- oil spill prevention and response;
- air quality;
- land return and decommission of construction phase facilities;
- row integrity plan; and
- archeology.

6.1 WATER RESOURCES PROTECTION

Water resource protection is a key requirement for the entire Project, which has developed a WMP consisting of seven components as presented in the following box.

**Box 4: Water Monitoring Program Components - Cameroon**

<table>
<thead>
<tr>
<th>Water Monitoring Program Components:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Surveying of local surface water and groundwater usage practices prior to the commencement of Project-related surface water and/or groundwater withdrawals;</td>
</tr>
<tr>
<td>2. Monitoring of local surface water and groundwater resources while Project-related construction phase water withdrawals are occurring;</td>
</tr>
<tr>
<td>3. Monitoring of water for human consumption obtained from Project-installed groundwater source wells/boreholes;</td>
</tr>
<tr>
<td>4. Regional groundwater monitoring program at Permanent Facilities;</td>
</tr>
<tr>
<td>5. Groundwater monitoring at the Project’s engineered solid waste landfill sites (PS3 Landfill in Bélabo);</td>
</tr>
<tr>
<td>6. Monitoring of liquid effluents discharged directly to onshore surface water bodies; and</td>
</tr>
<tr>
<td>7. Monitoring of liquid effluents discharged directly from the Floating Storage and Offloading (FSO) vessel.</td>
</tr>
</tbody>
</table>

COTCO has consistently implemented the WMP in 2011. In particular, during the site visit, COTCO has provided the ECMG team with the following data relevant to the implementation of the plan:

- monthly groundwater consumption records at permanent facilities (November 2010 – September 2011);
- testing results of potable water analysis at Pump Station 2 (PS2) for June, July and August 2011 and Pump Station 3 (PS3) for June 2011, August and September 2011 and the Floating Storage and Offloading (FSO) for September 2011;
- monthly groundwater depth measurements at the piezometers located at the permanent facilities: PS2, PS3, Pressure Reduction Station (PRS) and Belabo Waste Management Facility (BWMF) in the period January 2004 - September 2011;
- summary tables of the groundwater chemical analyses results for piezometers at PS2, PS3 and PRS (period 2003 - 2010) and PS3 Waste Management Facility (period 2001-2010); and
- map of piezometers installed at PS2, PS3 and PRS facilities.

The observations relevant to the performed WMP activities are summarized in the following sections, for each separate component.
6.1.1 Component # 3 of WMP – Monitoring of Water for Human Consumption Obtained from Project-Installed Groundwater Source Wells at Permanent Project Facilities

Results of water monitoring used for drinking purpose have been spot checked through the analysis of summary tables reporting data collected in 2011 at PS2, PS3 and the FSO. According to component # 3 of WMP, at all the permanent facilities water samples were collected and tested twice per week for pH and residual chlorine and weekly for coliforms, turbidity and conductivity.

Data provided for the PS2 refer to the raw water and drinking water supplied at the kitchen and bathrooms for the period June - August 2011. All the provided results show no exceedances of the applicable WHO standards for Drinking Water quality.

Analytical results provided for the FSO refer to the drinking water of the Engine Room, Galley (A deck) and Nav Bridge Deck collected in August 2011. Relevant potable water monitoring results do not exceed WHO limits for drinking water.

At PS3 Facility, water is withdrawn from five wells and used for drinking purposes and to supply the fire fighting system. During the field visit, one well was out of service due to recorded low pH values.

Water used for potable purposes is processed and treated at the drinking water plant. Analytical results provided by COTCO for the PS3 facility refer to the raw water withdrawn from the four active wells, and to the drinking water supplied to the kitchen, changing room and bathroom for the period covering the months of June, August and September 2011. Analytical results of tap water samples collected at the Porta Camp were also provided. All the submitted results show that potable water consumed at the PS3 facility meet WHO limits for drinking water.

No drinking water data was provided for the PRS, since this facility only uses bottled water. The groundwater drawn from the only on-site well is used for vehicle and pig washing activities and for sanitary purposes.

Monthly water consumption records at COTCO facilities (PS2, PS3, PRS and FSO) have been provided for the months of November and December 2010 and for the year 2011 (January – September).

6.1.2 Component # 4 of WMP – Regional Groundwater Monitoring Program at Permanent Project Facilities

A total of 13 active monitoring wells are installed in the immediate vicinities of Permanent Facilities (PS2, PS3 and PRS) for the monitoring of local groundwater:

- five monitoring wells surrounding PS3;
- four monitoring wells at PRS; and
- four monitoring wells surrounding PS2.

One piezometer, located at the PS3 facility, is reportedly not being monitored since April 2011 since it appears to have collapsed.

During the site visit COTCO provided the ECMG team with the groundwater chemical analyses results for all piezometers installed at PS2, PS3 and PRS for the period from 2003 to 2010. No result relevant to the 2011 groundwater monitoring campaign was provided since the annually sampling campaign is scheduled for December 2011.

According to component # 4 of WMP, at all the permanent facilities (PS2, PS3 and PRS) groundwater samples were collected once a year and tested for Extended TerrAttes analytes suite, TPH and PAH. Overall, the results provided (2003-2010) confirm the good quality of the water samples tested with respect to applicable WHO standards for Drinking Water quality and baseline data (showing for instance an overall low pH due to high laterite content in the soil), as documented in past reports.

Additionally, monthly groundwater depth results of piezometers at COTCO facilities (PS2, PS3, PRS, and four additional wells at BWMF) were provided for the period January 2004 - September 2011. Recorded groundwater depths for the year 2010 show seasonal changes in terms of groundwater levels following to the natural cycle of rainy and dry seasons.
Recommendations:

13. Replacement or repairing of the damaged groundwater well at PS3 should be carried out by the Project within the planned maintenance program for 2012 in order to reinstate the complete monitoring network.

6.1.3 Component #5 of WMP – Groundwater Monitoring at the Project’s engineered Solid waste Landfill Sites

According to this component of the WMP, a total of 4 monitoring wells were installed for groundwater monitoring at the Project’s Engineered Solid Waste Landfill Site of Belabo near the PS3 facility. The 2011 monitoring campaign at BWMF is yet to be performed (scheduled in December 2011). However, COTCO provided EGMG with baseline analyses recorded during the period 2001 - 2010 at BWMF. The results provided confirmed compliance with WHO standards for Drinking Water quality, with the exception of pH and inorganic contamination that can be attributed to geological background effects, as documented in past reports.

No well is in place for the monitoring of groundwater quality at the PS2 innocuous solid waste landfill. Following the ECMG recommendation made in the 2010 report, COTCO has reportedly planned the installation of a new monitoring well at the PS2 non-hazardous waste facility in 2012.

6.2 WASTEWATER MANAGEMENT

Project Update:

During the site visit, COTCO has provided the ECMG team with the following data relevant to the implementation of the waste water monitoring programs:

- wastewater effluent analysis results at PS2 (June, July and August 2011) and PS3 (June, August and September 2011) and FSO (July, August and September 2011);
- dried sludge analysis results at PS2 and PS3 wastewater treatment plant (2004 – 2010);
- results of leachate analysis for the BWMF (2010);
- TPH analysis of OWS effluent samples (December 2010 and July 2011) at PS2, PS3 and PRS; and
- TPH analysis of soil along oil water separator effluent routes at PS2, PS3 and PRS (December 2010).

Relevant observations are provided in the following sections.

6.2.1 Component #6 of WMP – Monitoring of liquid Effluents Discharged directly to Onshore Surface Water Bodies

The Project liquid effluents produced by Sewage Treatment Plants (STPs) and storm water runoff collection systems and OWSs, are discharged using leach field systems or open drainage ditches not directly connected with surface water bodies. The observations relevant to the performed monitoring activities of the quality of the effluents produced by the OWS and STPs are discussed below.

6.2.2 Sewage Water

Sewage treatment units at permanent facilities consist mainly of primary aerobic digestion units with treated effluent disposed through leach fields. Drying beds are used for the exhausted sludge derived from the wastewater treatment process, which is then collected after drying and sent for disposal in non-hazardous waste cells. Wastewater collected below the filtering unit of the drying bed is pumped and sent back to the STP.

According to field observations, the STP at PS3 is adequately managed and monitored. No STP is in place at the PRS facility where sanitary wastewater is collected in a septic-holding tank that is periodically emptied.

Wastewater analysis results have been provided by COTCO for the STPs at the PS2 (June, July and August 2011), PS3 (June, August and September 2011) and FSO (July, August and September 2011). According to component # 8 of the WMP, wastewatter effluent testing was conducted twice a week for pH and residual chlorine and monthly for fecal coliforms. Analytical results show compliance with EMP standards.
The dried sludge is reportedly being analyzed once every two years. Analytical results provided by COTCO refer to the toxicity characteristic leaching procedure analyses of sludge collected at PS2-Dompta and PS3-Belabo from 2004 to 2010. The results over the last six years show that the concentration of heavy metals, organic halogens and PAH in the sludge were below the recommended US EPA limits. In addition, a general decrease in concentration of zinc, nickel and copper was observed.

6.2.3 Oil Water Separators

During the site mission, the ECMG team visited the PS3 and PRS facilities, observing that all the installed OWSs are in a good status and well maintained.

A total of 4 OWSs are currently in place at the PS3. Stormwater runoff is collected by two different drainage systems (open channels), located at the process and the base camp areas respectively, and then treated through two different OWSs. After being treated, the two flows are conveyed into a single collector and discharged on the ground. Two monitoring wells are located downstream of the outlet point.

One OWS is located at the Porta Camp area that is currently under decommissioning. The OWS collects potential spills from the gasoline tank serving the non hazardous waste incinerator and discharges into the subsoil through a leachfield.

The fourth OWS at the PS3 facility collects stormwater runoff and potential spills from two different paved and unroofed areas that store used and new oil drums respectively, and wastewater from the nearby car washing pad. The OWS then discharges into a leachfield located outside the fenced area. A new shelter is under construction in the proximity of this OWS to reduce stormwater collection and is planned to store chemical products and new oil drums.

The PRS facility is provided with four OWSs. Stormwater runoff from the facility paved areas is collected by two drainage systems (open channels), conveyed into two different OWSs that then discharge on surficial soil. No monitoring well is located downstream of the outlet point. Another OWS collects and treats wastewater from the vehicle washing pad and effluents are periodically emptied by vacuum truck. The last OWS collects wastewater from the pig washing pad, stormwater runoff from the chemical products storage area (which is paved, partially roofed and provided with a safety valve that is kept closed), and potential spills from the waste segregation and temporary waste storage facility, which is also paved and roofed. Treated water is then discharged into the existing drainage system.

6.2.4 Oil Water Separator Monitoring Plan Update

During the site visit, COTCO has provided the ECMG team with the latest revision of the OWS Monitoring Plan (dated September 2011): this plan is providing the surveying and effluent monitoring criteria for all the OWS installed at the Project facilities as summarized in the following box.

**Box 5: OWS Monitoring Plan Requirements**

<table>
<thead>
<tr>
<th>Requirements</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Routine inspection: to be performed on a daily basis;</td>
</tr>
<tr>
<td>2. Documented inspection: to be performed on a weekly basis;</td>
</tr>
<tr>
<td>3. Effluent analysis for Heavy Metals, Phenolic Compounds, Mercury, Cadmium, TPH and pH (EEPCI analysis): to be performed twice a year for all the OWS (once during rainy and once in dry seasons) and once a month during the rainy season (July to September) for two main OWS per station;</td>
</tr>
<tr>
<td>4. Soil analysis for Heavy Metals, Phenolic Compounds, Mercury Cadmium, TPH and pH (EEPCI analysis): to be performed once every two years; and</td>
</tr>
<tr>
<td>5. Effluent analysis for Heavy Metals, Phenolic Compounds, Mercury, Cadmium, TPH and pH (certified Laboratory): to be performed once every two years.</td>
</tr>
</tbody>
</table>

According to interviews of the PSs personnel, regular inspections are performed daily and weekly to check the proper functioning of the equipment.

ECMG positively acknowledged the increased OWS monitoring frequency (twice a year for all the OWS and once a month during the rainy season for the two main OWS per station).
Nevertheless, as underlined during discussions held on site and during the close out meeting in Douala, the current procedure should be further improved by providing specifications on the sampling procedure to be adopted.

According to best industrial practice (see also ECMG 2010 report) this operation shall be implemented in order to target the effluent resulting from first rainfall event occurring after significant dry periods. These stormwaters are likely to be the most potentially impacted by oil cross contamination or other chemical residues that have accumulated over the paved drained areas.

Additionally, the OWS effluent should be tested for Oil and Grease prior to each planned discharge and, in case of exceedances of the applicable Oil and Grease limit (20 mg/l), the effluent should be collected by a vacuum truck and properly disposed of. It is underlined that this procedure, already present in the previous revision of the OWS Monitoring Plan, was removed from the new plan.

In terms of analytical results of the sampling campaigns conducted in December 2010 and July 2011 at PS3, PS2 and PSR, the relevant data have been provided to ECMG for review. No exceedance of the limit set in the OWS Monitoring Plan was recorded in the 2010 sampling events while the July 2011 analytical results showed exceedances in all collected samples for all the analyzed parameters. However, since the associated quality control trip blank also showed exceedances of all parameters, the samples, were considered not reliable and the analyses were repeated. The new data were not yet available at the time of the ECMG visit.

According to the OWS Monitoring Plan developed by COTCO, soil samples were also collected along each OWS discharge effluent route and analyzed for TPH. This sampling is performed once every two years. Results provided by COTCO refer to the samples collected in December 2010 along the entire OWS effluent route at PS2 - Dompta, PS3 - Belabo and PRS - Kribi. Composite soil samples were collected every 20 meters downstream of each OWS effluent point for a total distance of 100 meters. Analytical results showed compliance with limits set by the OWS Monitoring Plan.

**Recommendations**

14. Based on the observations reported above, the Project should consider to modify the current OWS monitoring practice as follows:
   - OWS effluent sample should be collected prior to each planned discharge to evaluate compliance with Oil and Grease standard (as already foreseen in the previous version of the OWS Monitoring Plan),
   - if the effluent sampling is instead conducted on a periodical basis to evaluate the performance of each OWS, this activity should be conducted in order to target the first flush effluent resulting from each rainfall event following a significant dry or no-rain period. This should be done in order to evaluate the treatment efficiency when in presence of the mostly impacted effluent, and
   - field or laboratory effluent testing equipment should be made available at all the permanent facilities in order to promptly evaluate compliance at the discharge points (before opening the outlet valve). Laboratory analyses should be instead performed on a periodical basis to confirm data collected on the field and to evaluate the performance of the OWSs.

15. Together with the new OWS effluent sampling results, conducted to substitute the data collected during the July 2011 event that was rejected, the Project should provide a laboratory quality report, officially documenting the occurred cross contamination of all samples collected during the transportation, and the quality assurance procedures (validation of data) that led to the rejection of the results.

16. The Project should evaluate the possible need of an additional monitoring well to be installed at the PRS wastewater discharge outlet in order to improve the current groundwater monitoring network, as done to at the PS3.
6.2.5 Component # 7 – Monitoring of Liquid effluents Discharged directly from the Floating Storage and Offloading (FSO) Vessel

The system in place at the FSO consists of an automatic oil in water detection unit (oil detector monitoring equipment) connected with the main control room of the FSO.

The unit is continuously measuring the TPH content in the treated effluent water and it is connected with an emergency shutdown valve to be closed in case of detected concentrations higher than Marine Pollution Convention (MARPOL) reference limits. At the same time, after effluent discharge, the FSO personnel collect grab water samples for offsite laboratory analyses aimed at counter-verifying the correct functioning of the oil detector equipment.

No oily water was reportedly discharged during 2011 from the FSO. In addition, no produced water was reportedly discharged in 2010 and 2011 (records available until September 2011) from the FSO.

6.3 WASTE MANAGEMENT

Project Update

During the site visit, the team was provided with a table summarizing updated data related to waste management during 2011 (till October). Moreover, the ECMG team visited the waste management facilities at PS3 and PRS.

In the following table a summary of the non-restricted and restricted waste quantities produced and disposed of or temporarily stored by COTCO in 2011 is reported (period January to August 2011).

<table>
<thead>
<tr>
<th>Table 6.1: Produced Waste Quantities in 2011 (Jan-Aug) in Cameroon</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-Restricted Waste</td>
</tr>
<tr>
<td>Domestic Garbage Incinerated on Site</td>
</tr>
<tr>
<td>Innocuous Solid Waste Buried On site</td>
</tr>
<tr>
<td>Recycled / Re-used by Local Communities</td>
</tr>
<tr>
<td>Sent to Approved Third Party Facilities for Disposal (Hysacam)</td>
</tr>
<tr>
<td>Restricted Waste</td>
</tr>
<tr>
<td>Restricted waste generated in 2010</td>
</tr>
<tr>
<td>Restricted waste disposed by BOCOM</td>
</tr>
<tr>
<td>Restricted waste remaining in storage</td>
</tr>
<tr>
<td>Restricted waste disposed at BWMF</td>
</tr>
</tbody>
</table>

According to the data provided, no restricted waste has been land filled in the hazardous waste cell at PS3 in 2011 and only approximately 15% of the restricted wastes, to be disposed of, have been incinerated at Bocom in 2011 while the balance is currently stored in dedicated drums and containers.

During the first quarter of 2011 a remarkable increase of non-restricted solid waste buried on site, mainly generated from the Porta Camp decommissioning activities, was recorded (see details in Section 6.6.2).

Approximately 8.5 tons of wastes, (e. g. wood, plastic, containers, reusable items, etc) were recycled through local communities in 2011.

During the site visit, the ECMG team visited the BWMF at PS3 and the waste accumulation area at PRS finding both facilities well maintained and managed. No EMP related issue was observed. In the following sections the findings of the conducted site surveys at the waste management facilities are presented in details.

6.3.1 Belabo Waste Management Facility (Pumping Station PS3)

Belabo Landfill receives waste generated by Project activities from the FSO, PRS, PS2, PS3 and the Lima Base (Douala) facilities. A spot check was also conducted for the relevant waste tracking documentation (waste manifests).
The ash generated at the Bocom facility by the incineration of hazardous waste from the Belabo Landfill is periodically sent back to the BWMF and stored in dedicated drums.

The BWMF hazardous waste cell is provided with two pumps used to extract leachate to a holding tank. The leachate is treated through a mixed bed resin before being stored in a second holding tank. Analyses of the treated leachate from the BWMF for 2010 have been provided. Tested parameters are below the Project adopted limits allowing disposal of collected leachate through the wastewater treatment facility at PS3.

The BWMF hazardous waste cell at PS3 has not been reopened since 2007. Reportedly, COTCO is planning to re-open the hazardous waste cell in 2012 for disposal of hazardous wastes including oily soil from 2010 spill events (currently stored at the PS3 waste management facility). According to the information provided this will be done in coordination with CPSP.

During the close out meeting held in Douala, it was mutually agreed with the EMP representatives on the need of adequately documenting the re-opening operations of the BWMF hazardous cell planned for 2012. In particular, given the recent experience on Asbestos waste disposal (see following sections), it was outlined the importance for COTCO of collecting and filing all the necessary documentation regarding: 1) quantity and amount of wastes disposed off; 2) operational procedures adopted for cell opening, waste dumping and cell closure; 3) record of the communications exchanged between CPSP and Government representatives; and 4) any other permitting document needed in agreement with local regulatory requirements.

6.3.2 PRS Waste Accumulation Area

At the PRS Facility, the only non hazardous waste produced is paper that is burned at the on-site incinerator.

The hazardous waste generated at the site is first segregated and stored in drums in a roofed and paved area provided with containment and then temporarily stored in containers at the waste accumulation area before being sent to the Belabo Landfill (PS3). Hazardous wastes are sent by trucks on a regular basis depending on the amount of produced waste. Used oil is re-injected in the pipeline.

6.3.3 Oil Contaminated Soil Management - Proposed Waste Minimization Option

Oil contaminated soil is generated by subsoil cleanup activities carried out at oil spills sites located along the flowlines or at the valves.

In 2011, the Project did not record any reportable oil spill (greater than 1 barrel) in Cameroon, while the latest significant oil spill event that resulted in the recovery of oil contaminated soil, occurred at blocking valve BV32 in 2009.

EMP requirements for oil contaminated soil are set in Volume 2 –Waste Management Plan –Section 2.1.9 and are summarized in the following box.

**Box 6: Oil contaminated Soil Management**

<table>
<thead>
<tr>
<th>Waste management requirements – Contaminated soil by hydrocarbons:</th>
</tr>
</thead>
<tbody>
<tr>
<td>• interim storage by means of containers (drums) or by on bulk pad or plastic sheeting;</td>
</tr>
<tr>
<td>• prioritization of waste minimization option such as use for berm or road mix (if non-hazardous);</td>
</tr>
<tr>
<td>• use of applicable off-site remedial technologies according to waste management plan: a) bioremediation; b) composting; and c) disposal at non-hazardous or hazardous landfill (whose design and construction requirements are defined by the project specification included in the EMP) depending on hazardousness of the contaminants of concern; and</td>
</tr>
<tr>
<td>• optimum TPH remediation goal 10,000 ppm (1% in weight).</td>
</tr>
</tbody>
</table>

At the present time, the oil contaminated soil collected from the BV32 spill event was placed in lined wooden boxes and stored at the BWMF.

It is underlined that the soil collected showed average concentrations below the target level of 1% in weight immediately after the excavation and therefore did not required, according to the EMP, any further
treatment. The current plans from COTCO EMP are to dispose of the contaminated soil in the hazardous landfill cell after its reopening foreseen in the 2012.

While visiting the PS3 waste management facility, the ECMG had the opportunity to visually confirm the good status of preservation of the storage boxes.

6.3.4 Asbestos Waste Disposal (follow up)

Project Update

In 2007 the Project has disposed at the PS3 Hazardous Waste Landfill approximately 2,100 Kg of asbestos containing wastes derived from the FSO cleanup activities. As outlined under past ECMG reports, despite compliance with the EMP requirements (Volume 5, Topic 2.136) and best industry practice, the Project has faced a number of complaints and public concerns from the local population resident in the Belabo area (where the PS3 landfill is located) and Non-Governmental Organizations (NGOs).

In response to these concerns, and to CPSP request, in 2010 COTCO has appointed the local University of Yaoundé I to conduct an independent evaluation of the adequateness of the clean up, transport of the asbestos containing waste and its disposal measures at the PS3 landfill.

The study was completed in July 2011 and presented to the government authorities, including the CPSP, the Ministry of Public Health and the Ministry of the Environment. To date, no disclosure to the public (local communities and NGO) has been reportedly conducted.

The ECMG has been provided with a copy of the study where the main findings can be summarized as follows:

- the PS3 Belabo Hazardous Waste Landfill is a class 1 cell constructed in agreement with EMP standards and best industry practice, able to receive asbestos containing wastes;
- clean up, packaging, transportation and landfilling has been conducted by appointed specialized contractors in agreement with best international practices and EMP requirements;
- no risk for exposure of local population to the buried wastes exist\(^5\); and
- COTCO is required to continue the environmental monitor of the landfill till final decommissioning.

Recommendation

17. Taking into account past and recent complaints, raised both by local communities (back in 2008) and by NGOs (more recently), concerning the potential health risks associated with the asbestos disposal operation and, more in general, with the operation of the Hazardous Waste Landfill in Belabo, the ECMG strongly recommends that the conducted study is disclosed to the public and NGOs. In particular, disclosure shall be focused on the following topics:

- asbestos exposure mechanisms (according to best international literature),
- documented clean up, segregation and transportation measures adopted (vs. international standards), and
- documented containment measures at the landfill cell (e.g. engineered characteristics of the landfill with respect to the potential exposure mechanisms and versus international construction standards).

In particular, with reference to the engineering and operational features of the landfill, it is recommended that the ongoing monitoring activities by the EMP team are correctly addressed to reinforce the concept of a well managed and monitored facility but also without providing misleading information on potential exposure mechanisms to asbestos fibers (for example with respect to the routine groundwater monitoring actions in place).

6.4 OIL SPILL PREVENTION AND RESPONSE

During the site visit, the ECMG team has been provided with a table summarizing the oil spill response drills and training conducted during 2011 (till September). Moreover, the ECMG team visited the PS3, the

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\(^5\) Asbestos exposure occurs only through inhalation of fibers which is prevented both by the packaging of the wastes and by the cover and containment of the hazardous waste cell.
PRS and sections of the ROW in MA3 and MA4. The main findings of the conducted site survey and the gathered data are described in the following sections.

6.4.1 Routine Drills Conducted

Routine emergency drills are conducted at Project’s sites on a regular basis. During the site visit COTCO provided the ECMG with the overall records relevant to the drills (167) and training (103) conducted in 2011 at all permanent facilities. The number and type of performed drills are considered adequate by the ECMG. Also, the oil spill response equipment storage areas at PS3 and PRS were visited and found very well maintained.

During the field visit of the ROW in proximity of the Bikobo village, the emergency contact telephone number showed on the warning signs at a Blocking Valve was found to be not up to date (shown number is not in use any more). Reportedly the same issue applies to all warning signs displaced along the ROW.

Recommendation

18. COTCO, within the planned BVs inspection and maintenance activities, shall provide the warning signs with stickers replacing the old emergency contact phone number to be called in case of spill or any emergency.

6.4.2 Reported Events and Mitigation Measures Adopted

No oil spill event occurred between December 2010 and September 2011.

With respect to the spill event occurred at the FSO in 2010, COTCO has confirmed that, as a mitigation measure to the event occurred⁶, the Project has adopted a new weather forecast service for the FSO.

6.5 AIR QUALITY PROTECTION

Air quality protection requirements relevant to the permanent facilities in Cameroon are provided by the EMP and Schedule 17 of the CCA, which indicate the following routine monitoring activities to be performed starting from the Project Physical Completion Date (fixed at the 28th of October 2004).

Box 7: Schedule 17 Air Quality Monitoring Requirements

The schedule 17 of the Credit Coordination Agreement defines the following routine air quality monitoring activities to be performed by the project:

- stack emission monitoring campaign for sulfur dioxide, nitrogen oxides and particulates once every third year;
- update of the air dispersion modeling of emissions;
- quarterly monitoring program of ambient air quality for sulfur dioxide and particulates by the mobile ambient air quality monitoring units available in Cameroon; and
- continuous monitoring program of ambient air quality for nitrogen oxides by the mobile ambient air quality monitoring units.

The ECMG team reviewed the data provided on ambient air quality monitoring. The relevant observations are presented in the following sections.

6.5.1 Ambient Air Quality Monitoring

Ambient Air Quality Monitoring (AAQM) was carried out according to the required time schedule in 2011 by using the PM₁₀ monitoring equipment and Passive Air Sampling System (PASS) for SO₂ and NO₂. The PM₁₀ and PASS were placed at different locations as following the results of the dispersion model. PM₁₀ was monitored for five continuous days at PS2 and PS3 facilities; while the PASS were exposed for one continuous month at both pump station facilities.

Summary tables were provided showing no exceedance during the 1st, 2nd and 3rd Quarters 2011 at PS2 and PS3. No AAQM was conducted at the PRS.

⁶ The event, as reported in 2010 ECMG report, occurred due to exceptionally adverse and unforecasted weather conditions, during loading of an export tanker. Given the sudden change in weather conditions, the two mooring lines securing the FSO and the export tanker parted, causing the release of some of the oil into the sea.
COTCO is also consistently taking pictures during the Harmattan period, when sand dust storms are occurring, in order to provide evidence that potential PM$_{10}$ exceedances are caused by natural factors. In addition to the collection of pictures during the Harmattan period, COTCO should coordinate with EEPCI on the planned, but not yet implemented, monitoring of PM$_{10}$ at blank locations to be carried out during sand storms in order to better document the background PM$_{10}$ values in case exceedances are found during these events.

**Recommendation**

19. The Project shall re-evaluate, within the next planned campaign, the need of conducting AAQM at the PRS, in compliance with Schedule 17 of the CCA and given the presence of stacks at the same facility.

### 6.5.2 Stack Emission Testing

Stack emission testing was conducted in December 2010 in accordance to Schedule 17 requirements, which set the stack emission testing frequency at once every three years. All continuous emissions sources (Crude Oil Topping Plant [COTP] heaters, generators and turbines) at all permanent facilities (PS2, PS3 and PRS) were tested with the exception of Turbine B, at Dompta, and Turbine A, at Belabo, which were under maintenance during the 2010 testing campaign.

Stack emissions results were provided and did not show any exceedance of the relevant Schedule17 limits at any of the stacks monitored.

The Project will also reportedly integrate, within the next planned event, the Stack Emission Testing campaign by including Turbine B at PS2 and Turbine A at PS3, not tested in December 2010 due to the ongoing maintenance works.

### 6.5.3 Updated Dispersion Models

The Project updates the dispersion model every year based on the latest stack emission tests and meteorological data in order to identify the maximum predicted fall out concentrations at the ground level. The results of the model will, in turn, determine the placement of the AAQM monitoring devices.

The update of the dispersion model, relevant to the 2010 activities, is currently being carried out with the support of the EEPCI Chad team and simulation results were not available at the time of the ECMG visit. However, it is underlined that the AAQM locations were consistently selected in agreement with the latest model simulations available.

### 6.6 LAND RETURN AND DECOMMISSION OF CONSTRUCTION PHASE FACILITIES

EMP requirements for decommissioning of construction phase facilities and for land restoration are provided under Section 5.6 of the present report.

In the following section an update on the subject topic for the Cameroon portion of the Project is provided.

Key issues in Cameroon are represented by:

- the formalization of the return process of the state and national domains to the local Government; and
- the ongoing decommissioning of the porta-Kamps at the pumping stations.

### 6.6.1 Properties of the State and National Domains

**Project Update**

According to the information provided during the visit, no progress on this topic has been achieved by the Project compared to what reported in the last three ECMG missions.

Despite the long time elapsed and while some of these areas are reportedly already being used by the Government of Cameroon, COTCO has still not obtained the signature of the relevant protocols of agreement, for the Private Properties of the State, or the decrees for the National Domains. The following table summarizes the up to date status of the temporary facilities return.
Table 6.2: Follow up Table on Temporary Facilities Return

<table>
<thead>
<tr>
<th>Type of facility and property (not returned)</th>
<th>Status in February 2007</th>
<th>Status in June 2008</th>
<th>Status in May 2009</th>
<th>Status in December 2010</th>
<th>Status in October 2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>State Property – Storage Yards (9 sites in total)</td>
<td>6 Dis-allocation decrees signed</td>
<td>Dec 2007: additional 2 dis-allocation decrees signed (08 Dis-allocation Decrees in total)</td>
<td>N/a</td>
<td>N/a</td>
<td>N/a</td>
</tr>
<tr>
<td>Legal Process</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>State Property – Storage Yards (9 sites in total)</td>
<td>Draft Protocol Agreement prepared</td>
<td>April 2008: Meeting to review and agree on the draft Protocol Agreement for the transfer of buildings to the Republic of Cameroon. May 2008: Inspection visit to the sites with buildings to be transferred to the Rep of Cameroon. June 2008: Finalization of the draft Protocol Agreement for the transfer of buildings</td>
<td>Meetings with CPSP and MINDAF on the pending signing of Protocol Agreement COTCO-CPSP Coordination meetings – Topic on agenda</td>
<td>Many trips to the Administration and CPSP Protocol Agreement still pending</td>
<td>#2 COTCO-CPSP Coordination meetings – Topic on agenda Letters and many trips to the Administration and CPSP Protocol Agreement still pending</td>
</tr>
<tr>
<td>Protocol Agreement Process</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>National Domain - Camps/Roads/Airstrips (6 sites in total)</td>
<td>Draft Incorporation decrees prepared after lengthy process of incorporation involving Departmental &amp; National verification and valuation Committees Feb 2007: Review and finalization of draft Incorporation Decrees. (Draft decree has an article stipulating COTCO’s donation and</td>
<td>Draft incorporation Decrees sent to the PM office for signature. Draft incorporation Decrees rejected and re-sent to the PM office for signature. Meetings with CPSP and MINDAF on the pending Decrees</td>
<td>Draft incorporation Decrees re-sent to the Prime Minister office for signature. One Incorporation Decree since 2008 for Djerem (i.e. Ngaoundal) signed Nov 2009 Ad-hoc committee worked on the Decrees</td>
<td>Decrees re-sent to the Prime Minister office for signature Many trips to the Administration and CPSP by COTCO #3 Incorporation Decrees still pending</td>
<td>#3 decrees at the PM office for signature Many trips to the Administration and CPSP by COTCO August 2011: First pages of draft decrees Sent to the CPSP for follow up. #3 Incorporation Decrees still pending</td>
</tr>
<tr>
<td>Type of facility and property (not returned)</td>
<td>Status in February 2007</td>
<td>Status in June 2008</td>
<td>Status in May 2009</td>
<td>Status in December 2010</td>
<td>Status in October 2011</td>
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</tr>
<tr>
<td></td>
<td>once signed, transfer of infrastructure is complete</td>
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</tr>
<tr>
<td></td>
<td><strong>June 2007:</strong> Draft incorporation Decrees sent to the PM office for signature.</td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

**Observations**

During the kick off and close out meetings in Douala, the ECMG has raised, once again, the concern regarding the potential liabilities for the Project with respect to the areas that are already being used by third parties but which are still missing the signature of the corresponding decree/protocol of agreement. To this end the following recommendations have been made.

**Recommendations**

20. The Project shall expedite the signature process of the pending decrees and protocols of agreement (repeated recommendation over the last four ECMG reports); and

21. The Project should investigate the legal and EMP framework and produce a clarification note (to be shared with CPSP) to the Lenders on the possible responsibilities and liabilities pending on COTCO with respect to the use of former COTCO facilities by third parties (where the relevant signature is still missing).

### 6.6.2 Porta-Kamp at PS3

**Project Update**

Consistently with the plans presented to the ECMG in 2010, the Project has started in September 2011 the decommissioning of the *porta-Kamp* located inside the PS3 land easement and used at the time of the construction phase.

The decommissioning of this camp has been implemented according to the following criteria:

- identify reusable and valuable items (such as air conditioners, mattresses, cables) and remove them from the *porta-Kamp*;
- coordinate with Custom for disposal plan approval;
- identify items suitable for recycling/donation to local communities (coordinated by local CRO in agreement with existing donation protocols); and
- disposal of non-recyclable items by crushing and burying on site.

At the time of the ECMG visit at PS3, the camp demolition was ongoing and a new pit, located alongside the former camp location, for disposal of crushed, non-recyclable materials was already open and in-use.

**Observations**

The ECMG has been provided with a copy of the *porta-Kamp* decommissioning plan. However, this document appeared to be more general and schematic than a detailed plan as required by the EMP.

In particular, the following topics were found not covered within the documentation provided:

- the detailed inventory of waste streams produced, amounts and relevant disposal option (consistent with EMP Volume 5 - Section 2.1 – Waste Specific Guidance);
ECMG

- the permitting process for the opening and use of the new innocuous waste dump pit, with respect to the EMP (Volume 5, Section 3, if considered as a non-hazardous landfill, or, Volume 5, Section 4, topic 4.0.2, if considered just a burial pit7), and the local regulatory requirements (to be evaluated with CPSP);
- the site selection criteria and construction specifications adopted for the burial pit;
- the evaluation of environmental monitoring requirements for the new dump pit (for instance with respect to the groundwater quality downstream the pit); and
- the evaluation of additional community compensation, also taking into account the already existing BWMF, used by the Project, and target of several concerns raised by local communities in the recent past (see previous section).

In general, although it is recognized that some of the waste streams generated from porta-Kamp demolition are allowed, according to the EMP, for disposal at innocuous waste landfill or dump pits, the ECMG believes that the camp decommissioning and opening of this new cell has not been processed in strict adherence with EMP requirements. In addition, the Project should have given consideration of the existence of an engineered non-hazardous cell at the nearby BWMF.

With respect to the lack of EMP related documents, the following recommendation is raised:

Recommendation

22. While porta-Kamp decommissioning is ongoing, the Project shall proceed, as soon as practicable and before the conclusion of the decommissioning operations, with the preparation and disclosure of the following EMP related documentation:

- the detailed inventory of waste streams generated from the porta-Kamp demolition and the relevant disposal option (each type of waste stream must be explicaded),
- the permitting documentation, if required, for the opening of the cell (to be evaluated in coordination with CPSP),
- the site selection criteria and construction specification of the new innocuous waste pit,
- the proposed environmental monitoring actions (including groundwater quality and subsidence) to be implemented at the new dumping pit; and
- the evaluation of additional community compensations measures to be provided to the Belabo community.

6.7 ROW INTEGRITY PLAN- BIOPHYSICAL

Project Update

Starting in 2010, the Project has developed a ROW Integrity Plan to incorporate all EMP monitoring requirements with respect to the following topics:

1. ROW land easement maintenance (e.g. grass cutting to allow for visual inspection both through ground and aerial surveys);
2. ROW surveying and patrolling to identify unauthorized activities over the pipeline land easement and unauthorized accesses at Induced Access Management Areas; and
3. ROW surveying and patrolling for erosion control, river crossing inspection and monitor of re-vegetation (at eroded areas).

ROW Inspections

Since April 2011, ROW monthly inspections have started at all three Maintenance Areas. The following features were outlined by the Project:

- approximately 200 local workers hired by the three COTCO contractors are currently involved;
- as of September 2011, approximately 31 erosion cases have been reported (mostly in MA2), among which 10 requiring repair; and

7 Use of non hazardous landfill or dumping pits depends on the type of waste buried. The Project needs to provide full inventory of waste stream generated and demonstrate compliance with EMP requirements on waste disposal.
two out of the 10 erosion cases were already repaired at the time of the ECMG visit while the remaining eight were planned to be repaired during the dry season.

In addition, to the above ROW inspections, 9 areal patrols of the ROW (once per month) have been carried out by the Project while awaiting approval by CPSP of the proposed reduction of the areal patrol frequency in agreement with the new ROWIP.

Copy of the ROW inspection (erosion punch list) and aerial survey logs have been provided to the ECMG.

In addition, a copy of the training manual to be used by local inspector has been made available.

**Grass Cutting Campaigns**

The first 2011 grass cutting campaign was conducted at MA3 and MA4 between April and August 2011. A new campaign is planned for the dry season starting October 2011.

Based on the data provided by the Project, a total of approximately 1,500 local workers have been employed through the three COTCO contractors.

**Observations**

As also indicated in the past 2010 report, the ECMG positively acknowledged the integration of all ROW monitoring components in one single plan and the increased employment opportunities for local communities.

The main recommendation concerned the need by COTCO to enforce the monitoring of local contractors and communities involved (conducted by two CROs for each MA) in order to ensure that the Project employment and health and safety standards are met.

In terms of biophysical EMP requirements, the review of the records provided and the discussion held with COTCO EMP representatives, indicate that this initiative has been, so far, very successful.

The foot patrolling surveys are reportedly more efficient and effective that the aerial surveys, and allows for a more accurate identification of all issues needing mitigation measures.

During the visits of the communities located along the ROW around Yaoundé (MA4) and Belabo (MA3), the ECMG had the opportunity to interview several villagers employed for grass cutting and ROW inspection activities and to discuss about the following topics:

- required duties and responsibilities;
- transparency within the employment and payment process;
- provision of training and equipment; and
- respect of payment terms.

The main findings of these interviews, and the relevant recommendations, fall under the Occupational Health & Safety and Community Engagement topics, and therefore are covered within Sections 4 and Section 8.1 of the present report.

### 6.8 ARCHEOLOGY - MITIGATION OF RELATED LEVEL III NON-COMPLIANCES IN CAMEROON

**Background**

Following the two archaeology-related Level III non-compliance issued by the World Bank Group in mid-2003, COTCO was requested to develop and implement a mitigation program.

Identified mitigation measures were the followings:

- refurbish and equip an old building in Yaoundé to serve as an archeological curation facility for project’s archeological artifacts;
- establish two scholarships to be sponsored by the COTCO Fellowship;
- preparation and publication of an Archeological report by local and international experts, focused on preventive archeology, the lesson learned during the Chad-Cameroon Pipeline construction and opportunities for future archeological research in the regions transverse by the pipeline; and
organization of an International Archeological conference in Cameroon to discuss various aspects of the Project’s archaeology program with the Cameroonian archaeology community.

Project Update

In May 2011 the Project organized and held, jointly with CPSP, a three days international Conference on Archeology in Yaoundé. The Conference was attended by the Cameroon Minister of Culture and by approximately 200 participants from Cameroon and abroad.

The conference was articulated through seventeen presentations by professors and researchers focused on preventive archeology within the construction of oil pipelines and with specific reference to the experience gathered during the construction of the Chad – Cameroon Pipeline.

An exhibition of artifacts collected during the pipeline construction was also organized for the viewing of the participants.

In parallel to the conference, the Archeological book (two volumes), prepared under COTCO sponsorship, was presented and distributed to the participants. Copies of the book have been provided to International Finance Corporation (IFC) and the ECMG.

Finally, in September 2011, one of the two sponsored Cameroonian students, selected by the Ministry of Culture and studying at the Université Libre de Bruxelles, has completed his studies by presenting the final thesis, while the second one is completing the preparation of the graduation thesis.

Based on the above information and activities, at the time of the ECMG assessment, all mitigation measures concerning the Level III NCS have been implemented.
Drilling in the OFDA continues as planned (810 wells in operation and 36 pads in construction or waiting the rigs as detailed in the following Table).

Table 7.1. Well Balance at OFDA (October 2011)

<table>
<thead>
<tr>
<th>Type of well</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producer</td>
<td>732</td>
</tr>
<tr>
<td>Gas Wells</td>
<td>11</td>
</tr>
<tr>
<td>Injector</td>
<td>67</td>
</tr>
<tr>
<td>Observation</td>
<td>6</td>
</tr>
<tr>
<td>Waiting the drill</td>
<td>19</td>
</tr>
<tr>
<td>Under construction</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>852</strong></td>
</tr>
</tbody>
</table>

Overall, the footprint amounts to 2,697 hectares with the footprint increase being moderated by the land returned. Totally, land returned to date amounts to 34% of total acquired land and 52% of the temporary land (see also Table 1 in section 5.6). Another reason for the moderate increase of land take is that most of the drilling is carried out in areas already drilled where the new pads sometimes fall on existing roads or flow lines right of way. In these cases, if the land has not been returned yet (but has been compensated as part of the acquisition for the initial facility) it is re-used for the infill without requiring much additional land acquisition.

Out of the 32 affected villages in the OFDA, 12 were categorized as more affected than others by ongoing Project land needs. Till June 2011, 70% of the OFDA population has received a form of compensation. As the same areas continue to have the majority of land take due to infill drilling, the same affected people are likely to be compensated (and affected) again. The land impact is concentrated in few villages and some of them can be affected by a significant land take.

In order to improve the follow-up of the impact of land acquisition on communities and households beyond the impact analysis carried out in the 2008-09 EIA for the infill project, which was based on the number of a total 650 wells, the Project has recently developed a new process built on the Land Use Management Action Plan system that take also into consideration the concerns expressed ECMG in the 2010 report. In the frame of the LUMAP system, the Project has been conducting land and socioeconomic surveys in 16 villages within the oilfield area, linking the socio-economic information to a map database enhanced using satellite imagery and Geographic Information System (GPS)-based ground verification of field boundaries. All the information is consolidated in an information system (EMP-IS). For most impacted villages, a site specific plan (SSP) is prepared to mitigate impacts. The new process is based on the integration of the following monitoring activities:

---

8. Within the OFDA, land acquisition for production facilities has affected 47 official villages according to 2008 administrative categorization, 32 if the geographic rather than administrative units are counted, 61 if all the unofficial quartiers are included. Here, is the geographic unit that is considered since the aim is to remediate impacts on the geographical area of the village and its inhabitants.

9. “Focused Environmental and Social Assessment – Incremental Impacts of the Infill Drilling Program for the Komé and Bolobo Oil Fields”, ENVIRON February 2010
Village Land Use Surveys (cadastral survey): The VLUS serves as a baseline for the 16 villages where it has been completed in terms of land use patterns, and socio-economic information such as gender of the household head, number of dependents and other basic information. As it completely covers the territory of the village, the land survey gives a clear vision of the community composed by these households and it will serve as the basis to establish the original land holding status, i.e. whether the household is to be considered non viable\textsuperscript{10}, marginal\textsuperscript{11}, comfortable/wealthy\textsuperscript{12} from the point of view of land availability:

- Impact Surveys: as the Project continues to take land via the land acquisition compensation process, the compensated household-heads will be resurveyed (if the previous survey is more than a year old) in order to establish the impact that the Project has had or will potentially have on them in view of their present situation. Their present land holding will be established, accounting for any changes in land holdings (in and out), purchases or sales since the VLUS. In addition, all of the social information previously collected will also be updated (changes in family situation such as death, births, adoptions, addition of additional wives, etc.).

- Land Return Survey: this process is targeted specifically at facilities or parts of facilities that are reclaimed and returned to communities. In this case the aim is to identify the individuals/households that will eventually gain access to the parcels of land return and to establish to what use they are being put (crop, fallow or abandoned). A further objective is to establish whether the returned land has made it possible to remediate the situation of a household which had been previously impacted or that had previously been deemed to be non-viable. Overall both the impact surveys and the land return surveys will ensure that the EMP-IS is up-kept and remains relevant over time: and

- Livelihood Restoration Monitoring survey: over the years, the Project has been monitoring trained eligible\textsuperscript{13} individuals in a relatively continuous but not formalized fashion. In 2011 a formal monitoring process was launched. The monitoring survey takes place one full year after graduating from their training program. The main objective of this survey is to establish whether the graduate restores his/her livelihood using the training and its associated grant equipment and livestock. The goal of this survey is to look at the level of recovery through a number of indicators suggested by Barclay and Koppert in 2006 (see also section 7.2). Each individual will be associated to either of three situations: (i) recovered to a level equivalent or superior to that which existed prior to being impacted by the Project; (ii) demonstrating some progress but requiring some reinforcement (in terms of training or equipment); or (iii) no progress nor potential to recover. If this is the case despite the graduate’s best efforts, he/she will be oriented towards the land replacement options. According to Project team, in the future the process will be done in a more structured fashion whereby at-risk or non-viable producers who have received training will be systematically visited 1 year, 2 years and 5 years after completing their two-year training program.

Using this new process integrated by information originating from other EEPCI teams, it will be possible to generate village level portraits and update the communities’ situation in a recurring fashion. According to Project team, such an integrated overview may become a form of streamlined SSP or SSP update. To date, analysis was conducted on impact surveys performed in 2010 for 5 villages, namely: Madjo, Dildo, Dokaïdïlti, Danmadja, and Mbanga. In order to give an example of the new approach in SSP, the Project team presented the analysis conducted according to the new approach in the Madjo and Begada villages, highlighting the impact on changes in households’ landholding status (wealthy, comfortable, marginal, non-viable) and the evolution in status of a household taken as an example. The presentation included other relevant information on the Project impact on the village, such as water quality, and a section on Community Relations comprising of job creation, consultations and claim management.

New SSP have been prepared for new high impact villages (Maikeri and Poutougem).

An analysis of land fragmentation has been carried out on a sample of fragmented parcels in the Ngalaba village area. Results of the survey demonstrate that in 70\% of cases the parcels are not in use or are left in fallow. These parcels are not cultivated because: there is the presence of laterite brought to the surface

\textsuperscript{10} Non viable: An Individual or Household with less than 2/3 corde (3327 m\textsuperscript{2}) per capita

\textsuperscript{11} Marginal: An Individual or a Household with between 2/3 and 1 corde (3327 to 5041 m\textsuperscript{2}) per capita

\textsuperscript{12} Comfortable/Wealthy: More than 1 corde per capita

\textsuperscript{13} Eligibles: affected people eligible for resettlement/livelihood restoration measures, that is non-viable or marginal.
during the trenching process, and not completely corrected by the rehabilitation process; they are surrounded by numerous facilities, which make access difficult; or they are very small and at excessive distance from villages to make travelling to cultivate them not worthwhile.

The Land Management Manual (LMM) has been revised in February 2011 (revision 7). Two MoCs have been proposed:

1. Land Management Manual Revision 7 - Page 58, section 4.5.3.3 Improved Agriculture Training: last sentence to be removed, which allows the individual who possesses less than 0.5 corde per capita for household members to qualify for Improved Agriculture Training.

2. Land Management Manual Revision 7 - Update three (3) Quitus Forms in Appendix 16 removing the Sous Prefect signature block. The Sous Prefect's signature is not required for land return (Quitus documentation). An additional form is being added to Appendix 16 to provide a specific Quitus form for returning right of way land under Over Head Lines (high voltage). The existing forms do not adequately describe the special restrictions required for using land in the Over Head Lines RoW.

Observations

ECMG acknowledges that the monitoring activities described above and in course of implementation represent an update and a review of the tools developed in the frame of LUMAP and an improvement of the impact analysis of the continuing drilling activities in the OFDA, that have substantially increased Project impact in relation to what was expected to be mitigated by the initial EMP (1999), addressed in the Environ report in 2009, to the present day situation in 2011. The integration and analysis of the large amount of information collected during the surveys is also allowing the Project to better identify and address some of the direct and indirect effects of the drilling at the village level that represented issues of concern during past ECMG missions. Specifically ECMG commends:

- the establishment of the land-holding status (non viable, marginal, comfortable/wealthy) and the follow-up of the change in status over time and through the land taken/land restitution process;
- the connection of the land-holding status with additional socio-economic information on changes in the households' living conditions, that is, not limiting the vulnerability status to land, but including other factors;
- the follow-up of the land return process and of the use of the returned land;
- the systematic follow-up of the livelihood restoration for trained eligible affected people;
- the analysis of the fragmentation issue;
- the Community Relations section included in the SSP, which is a step forward to give a more integrated and complete picture of the impact at village level.

As for the fragmentation issues, the results of the analysis confirmed that fragmentation can be a problem in some cases. Therefore, the Project should consider which mitigating measures can be taken, such as including these parcels in the compensation that is paid to the individuals losing access to that land. This issue should also be highlighted, as relevant, in the SSPs and other reports.

The Community Relations section of the SSP should be enhanced by integrating not only the list of the community concerns and claims, but also how these have been (or will be) addressed, and generally, the perception and feedback from communities. ECMG noticed that this has been done in the Maikeri SSP, as an outcome of the ECMG/EEPCI/CPPL visit at Maikeri during the last ECMG mission. This type of interactions should be ongoing in the Project consultation process and be reflected in the updated SSP and the other reports.

ECMG encourages the Project streamlining the SSP process, as already recommended after the last ECMG visit, and including all villages affected by the ongoing activities, updating the Plans as the activity continues over time.

ECMG approved the MoCs presented by the Project. Please see also following section on the discussion over the qualification for training.

Finally, ECMG has participated in a discussions with the Project and IFC team concerning the opportunity for the Project to hire an independent consultant to complete an independent Project impact evaluation at the end of the construction phase (2014) as according to industry best practices. The objective of the
in the last year the Project equipment. CEDIFOP and APROFODEL staff received a 10 days training on Micro, to monitor DEL, gaining an 25% (90) were eligible. In February, the consultant recommended that they might use to monitor micro-

7.2 LIVELIHOOD RESTORATION

Update

Since last ECMG visit (November 2010), 56 members of the 2010 promotion completed their dry season training in Improved Agriculture and have all received their equipment and livestock grants. In April, the NGO providing the Improved Agriculture Training program, APROFODEL, established 36.5 hectares of demonstration parcels for the rainy season training and distributed rainy season grant equipment and livestock to all participants. Grant equipment includes: one carry-all cart (push-pull); one pair of oxen; one wagon (ox cart); one plow; one harrow; and one peanut sheller. Since the quality of the equipment and livestock procured before 2010 are still identified as a major source of concern, in the last year the Project established the following:

- precise technical description of each piece of equipment required was prepared providing detailed specifications;
- a review and monitoring process of the manufacture and procurement was introduced in order to ensure that the selected supplier does not deviate from the required standards;
- the supplier is required to offer a 1 year warranty on assembly and parts and on any equipment supplied to EEPCI;
- users will be given some training (through the Improved Agriculture Training (IAT) program) in the proper use and maintenance of the equipment. Basically this means that the warranty will not apply in cases where the equipment has been abused or misused;
- producers are given the opportunity to select the color and breed of the livestock they are to receive;
- all animals supplied will be vaccinated and provided with a 3 month warranty covering infectious diseases and/or chronic disabilities;
- a veterinarian will be retained to vaccinate all livestock and review any declared cases of diseases;
- each large ruminant granted will be tagged in order to ensure proper identification; and
- as was outlined for the equipment, eligibles will be trained in the proper care and husbandry of their livestock and will be required to do so in order to validate their warranty.

The 2011 Class includes 90 eligible household heads, including 18 women, who chose to be trained in cattle and small ruminant husbandry and vegetable production. They have completed the rainy season portion of their training.

In order to qualify for the two year IAT, the eligibles must follow and succeed in the Basic Business School (BBS), implemented by CEDIFOP. The BBS includes courses of reading, writing, arithmetic, management, family economics and integrated development. A number of additional topics were added in order to deal with specific issue like: hygiene, basic health, alcoholism prevention and other subjects associated with entrepreneurship.

BBS training took place with communities of the Béro, Komé and Miandoum Cantons. Of the 433 who participated in the BBS program, less than 25% (90) were eligibles, while 343 other participants were spouses of eligibles and other people from the villages that were interested in the training. It must be noted that spouses and auditors who participate receive no advantage of any kind in addition to the simple fact of gaining a new skill set. Overall this program has managed to touch over 1,000 persons over the last three years of which only about 30% were actual eligibles and members of a given year’s resettlement class promotion.

In February, CEDIFOP and APROFODEL staff received a 10 days training on Micro-Enterprise Management Tools and Skills by an international consultant. The consultant recommended that they establish a monitoring program and suggested a list of indicators they might use to monitor micro-enterprises.
ISM Consult, the consulting firm hired in 2010 to manage the Livelihood Restoration program, carried out the Livelihood Restoration Monitoring survey of 257 trained people, corresponding to the marginal and non-viable trained people still alive and residing in the OFDA (see also section 7.1). To evaluate whether the graduate restores his/her livelihood using the training and its associated grant equipment and livestock, the Project team considers the following:

- assessment of the economic situation of the household, considering the standard of living (value of the housing, including well, shower and animal shelter, if any) and income;
- diagnostic on the effectiveness of the training program (income from learned activity; quality of the equipment; learnt skills, etc.); and
- evaluation of the reason for failing, if applicable (lack of involvement, defective equipment, sold equipment, no skill learned).

According to the survey, the results showed that:

- housing value among graduates is high: on average it is around 1.9 million FCFA and 57% have a house which is worth more than 800,000 FCFA;
- 75% of the graduates are succeeding using the resettlement training skills;
- the training program was found to be ineffective or very ineffective in less than 20% of cases, and very effective in almost 40% of cases (based on the level of retention and use of the concepts learned); and
- 73% of surveyed eligible’s declared the Improved Agriculture training program to be good, while none (0%) rated it as bad.

ISM Consult stressed the need to complete the analysis of data, incorporating livestock and equipment into the asset pool and, through a more open ended surveying process, to identify those who could benefit from further support and the customized solution more likely to enhance their livelihood.

In April, AfricaRice submitted a final report on the Generate New Farm Lands from Riverine Lowlands Project implemented in 2010 as a pilot project to test the possibility of promoting improved rice cultivation in lowlands as an alternative option for livelihood restoration and as a community compensation for some village (see also section 7.3). According to AfricaRice and the Project team, the pilot has been successful from a technical point of view and showed the great agricultural potential of the Southern region of Chad, in general, and for upland, lowland and irrigated rice in particular. However, notwithstanding the participation of farmers in the project, some serious issues were highlighted by the Project team concerning the availability of land (i.e. willingness to share lowlands users’ rights with eligibles) and the willingness of farmers of grouping and organizing themselves.

**Observations**

ECMG commends the ongoing effort to improve the IAT program, in particular concerning the quality and timely availability of the equipment and livestock. According to ECMG interviews in the field, the IAT is the most appreciated livelihood restoration program and also the one that is more feasible considering the socio-economic situation in the area. According to the Livelihood Restoration Monitoring data, the application of the training makes the crops yield increase from between 25-30% (poorest performance) up to 300% (best cases).

These results pushed the Project team to modify the rule that excluded from the IAT those eligibles left with less than 0.5 corde per household member (see MOC mentioned in section 7.1). This modification allows more eligible people to access the program: 122 of the 145 with less that 0.5 corde/household-member, although 23 land owners in the 16 villages would still find it a challenge to implement what they learn because of not having enough land. According to the Project’s Chad Resettlement and Compensation Plan, these people should be oriented towards the other “resettlement options”, basically consisting of the land for land option (including physical resettlement, rainy season resettlement and third party compensation). However, as recognized by the Project team and discussed in the ECMG report (December 2009), the land for land option has never been an effective solution. In fact, it has worked in only one recorded case: a single mother who chose this option in order to return to her village of origin.

In addition, some cases are recorded of people selling their grant equipment, livestock and/or seed. According to the Project’s Land Management Manual (version 7, section 4.5.1.2), these people will be released from the resettlement program and their file will be closed out with the appropriate documentation.
In the event that these individuals experience future land take, they will not be allowed to enter into the training options but will be automatically enrolled on the land replacement option list.

ECMG reminds that the livelihood restoration of impacted people is a Project commitment and appropriate measures should be taken with particular attention to vulnerable and highly impacted households. According to EMP/Chad Resettlement and Compensation Plan, all non-viable individuals/households should be given resettlement/livelihood restoration options in a timely manner. Therefore, the Project should ensure to document the non vulnerability of people released from the training program, if this is the case, or find alternative options for those who do not succeed in the training program.

In this respect, ECMG commends the monitoring process set up to establish the effectiveness of the livelihood restoration measures and supports the work plan outlined in the presentation, with a focus on identifying households who need further support and customized solutions. The ECMG appreciates the inclusion of the standard of living criteria in the livelihood restoration monitoring; however, the team suggests introducing more qualitative assessment in the cases of training failure, also considering that over the years graduates received different type of training and equipment as the Project’s approaches and programs evolved over time. Moreover, the Project team should consider the following:

- following ECMG interviews with trained people, on-farm training appears to be widely appreciated and it is usually applied. However, in some cases the training is implemented in a limited manner because of the need for further training and/or further investment (for example, the case of a woman who does not have a cart to carry the compost she learnt to make). This applies in particular to graduates from the past years, when different grant procedures were implemented;\(^ {14} \)
- in the monitoring process, it should be preferable to highlight whether a skill is applied rather than whether it has been learnt; and
- the monitoring exercise should also collect some feedback on the perception of the affected people.

ECMG acknowledged some complaints from communities who have been involved in the Rice Project and do not have any information on the follow-up. The Project should document the results and conclusions of the pilot experience and potential development, also on the basis of Africare recommendations. In any case, the farmers and communities involved in the pilot project should be involved in the reflection process and properly informed and consulted (see also section 7.4).

**Recommendation**

23. The Project should monitor and appropriately document the cases of eligible people who, for any reason, cannot follow, or do not succeed, in the livelihood restoration training option. If these people are non-viable and vulnerable, the Project should present an alternative plan to restore their livelihood in a timely manner.

## 7.3 Community Compensation

**Update**

In the last year, the Project implemented a new shortened procedure for the selection of community compensation (referred to as the mini-MARP). The procedure allows for a more rapid implementation of the compensation but, according to Project team, respected the participatory approach by involving different groups of community members (men, women, young people, and technical services of the State) and then prioritizing in a general assembly the different options. Other new features to improve the program are establishing specifications for the investment and ensuring a one year warranty.

The process involved some of the villages most impacted by the recent infill drilling. In total 7 projects were chosen by the communities: 5 flour mills and 2 three-classroom schools. Of these, at the time of the ECMG mission, five were already completed and in use, while 2 were under construction.

The Project team stressed that most of the work force involved in the construction of the school at Poutougem came from within the community. In addition to the money they earned, some of these workers

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\(^ {14} \) According to Project team, these cases happen when some households opted to receive the equivalent value in money in order to purchase the equipment that was most suitable to their needs. Nonetheless, following completion of the monitoring process, the Project will give the type of reinforcement best suited to the individual situation to those households who have made efforts and are found to have remained at risk.
were able to improve their skills as brick layers and masons. In Bekia 2 and Bekia 3, extensive discussions took place as to the location of the flour mills they both selected in order to avoid excessive competition between the two villages and to ensure they have a sufficient client base to both operate in a viable fashion.

ISM Consult conducted a random sample survey on 36 Management Committees that showed a reassuring rate of functionality of the investments:

- 91% of Management Committees are still operational;
- 88% of the Committees have a formal accounting process in place;
- 30% of the projects get their revenues from the sale of services (flour mills); in the case of schools, income is mainly originating from voluntary contributions from parents and community stakeholders;
- 52% of Committees have a maintenance management program in place;
- in 94% of cases decisions are taken in a participative fashion; and
- in 80% of cases the population has taken ownership of the infrastructure.

The survey highlighted some shortcomings and points to be strengthened, as follows:

- representation of women and young people on the committees could be enhanced;
- literacy level of committee members is generally not optimal, particularly in regards to accounting and financial management;
- a number of Management Committees operate without a formal charter; and
- about 48% of Management Committees do not have a formal equipment management program.

The Project team is developing some measures to address these issues such as: providing basic small business management training to Management Committee Members; providing training on the maintenance and operation of the equipment to Members of Management Committees or some of their staff; and proposing a pro forma charter to assist Management Committees in establishing an appropriate operating structure.

**Observations**

ECMG was able to visit some of the infrastructures realized according to this approach and could discuss with some community members (chief and other notables, women, people using or managing the infrastructure) and received an overall positive feedback. Visited communities expressed satisfaction for the celerity of the new process (mini-MARP) and the quality of investments. The two flour mills visited gave evidence of intensive use and of responding to actual needs both of the community at large and of women in particular. The mills technical staff has been trained by the enterprise supplying the mill, while the Management Committee Members were not yet trained.

In Maikeri, where the community complained on the lack of a proper school during the last ECMG visit, a new three-classroom school has been built. In addition, the community received additional support by a gift of a well from the Esso women staff. However, the water of the well is not used as drinking water because of its colour (reddish) likely due to the high subsoil (laterite) iron content.

The one year warranty on the mills is good; however, the Project team should study, with the community and the enterprises, how to improve or facilitate access to petty maintenance and repairs during the warranty year. In the case of one of the mills, petty repairs have been carried out without waiting for the enterprise warranty team and the expenses should be reimbursed to the Management Committee by the enterprise.

During the ECMG visit to the communities, some complaints were collected concerning older community compensations investments. Dildo villagers expressed disappointment for the cost of the investment and expressed their regret of not being involved enough in the realization of the investment (a school). In other villages, it was found that the communities were not informed of the cost of the investment. According to the Project team experience, informing communities about the budget resulted in numerous disputes regarding cost or realization and use of residual amount. However, ECMG encourages EEPCI to explain reasons and criteria in selecting the type and cost/quality of investment.
EIGHTH POST-PROJECT COMPLETION VISIT OF THE D’APPOLONIA ECMG, OCTOBER 2011

In Dokaidilti the difficulties encountered in the rice project have caused frustration to the communities who selected the pilot project as community compensation. As addressed in section 7.2, the Project should include the villagers to the analysis of reasons of failure (if this is the case) and find a shared solution.

ECMG encourages the Project to consider the ongoing impact of its construction activities on the affected communities as outlined in the LMM (Revision 7, February 2011), Appendix 29:

a) The loss of use of land from the community land pool: This pool is made up of all land currently in cultivation, in fallow, and bush. Although an individual may currently control an area of fields and fallow, his/her relatives have residual rights over this land. The community as a whole also has residual rights which revert to the holders of these rights. Hence all land within community bounds belongs to the community and the entire community suffers from the loss of land resources;

b) Construction and operations activities may interfere with a community’s on-going every-day activities. This interference constitutes a nuisance for the community;

c) Project occupation of land may lead individuals, households or groups of people to leave one area in search of land elsewhere. This causes a loss of their manpower and skills for their community as well as a decrease in tax base;

d) The arrival of individuals or households in another community because of Project land use creates an impact on the host community, its land and social infrastructure, and its social relationships.

In addition to direct land impact during construction, communities in the OFDA experience continuous impact (positive and negative) because of the presence of the Project, including security and safety. For this reason, it is ECMG opinion that the Project could consider widening the scope of the community compensation program, and establishing criteria for supplying on-going support to community development in the affected area. Criteria for giving support should be based on severity of impact but should also include the community performance in managing the first compensation, absence of conflicts, large benefit, synergy to increase impact of other investments, and youth employment.

7.4 CONSULTATION AND COMMUNICATIONS

Consultations with communities are ongoing through the EMP Socioeconomics Local Community Contacts, Socioeconomics Monitors and Supervisors, as well as the contractors and subcontractors implementing the livelihood restoration activities. Between the end of 2010 and August 2011 the Project held 126 meetings with communities, 36 meetings with NGOs/contractors, and 6 meetings with the authorities for a total of 6,742 attendees. During these meetings, the Project team addressed issues such as road safety; mosquito nets distribution; DBST road project near the village of Bero (see also relevant section within the biophysical review section and below); sensitization against thefts, acts of sabotage and vandalism; community compensation (mini MARPs, etc); and resettlement options. The most frequent issues raised by communities according to Project’s team were: abuses by gendarmerie; expectations of local employment; and crop damages.

The communication campaign for security and safety touched 27 villages and 1,957 people and focused on the thefts of Project's properties and on the honey gathering using fire under electrical poles. The Project team stressed the dangers of these actions. Other specific campaigns have been carried out on the sabotage acts on piezometers; on the potential effects of flaring; and on the use of slightly contaminated soil for road sub grading near Bero (DBST project). According to the meetings’ minutes, the main responses and issues raised by the communities were:

- questions on the actual danger of using the transformer oil for human consumption; on the potential danger of using the contaminated soil for the road; on the impact of flaring on crops; on the quality of water (allegedly oily in some villages);
- complaints on the quality of land restoration over the underground lines and on the missed restoration of village paths;
- expectations of being hired for the road works;
- requests to be more involved in the security system, so to better prevent thefts and avoid being suspected and abused by gendarmerie; and
ECMG

- requests to be regularly informed of the results of piezometric controls.

With reference to the community expectations for local employment, a total of 273 people have been recruited from OFDA villages in 2011, representing around 5% of national workforce, of which 28 locals are employed in the security system (COP guards).

In March 2011, the number of open grievances cases had reached 300 pending cases. EEPCI strived to reduce the backlog down to a manageable level through routine review and to decrease the number of days for settling grievances by assigning responsibility for cases as soon as EEPCI receives them. Existing grievances were settled and the backlog was reduced, at the time of ECMG mission, to 67 open grievances, of which 16 are to be paid, 19 were not founded, and 32 are still to be investigate. The average number of days to settle a (founded) grievance has been reduced from 60 (2010) to 25 (2011). The time to settle an unfounded grievance is 45 days. Four cases are pending decision of the court.

In order to reduce the number (and reasons) of grievances, EEPCI analyzed the current and historical grievances, identified the common causes of the grievances (tree damage and field damage), and worked with those responsible for causing the damage to reduce the incidents of grievances.

The Project team pointed out that no grievance was received in relation to the compensation and resettlement programs, with the majority of grievances being the responsibility of the EEPCI Construction since they most often refer to damages to trees and crop fields (167 cases). Reportedly, EEPCI Operations also do damages crop fields from time to time when they do not use the EEPCI roads driving from facility to facility.

Observations

ECMG team had a joint visit with NGOs, EMP managers, and a coordination of NGOs monitoring the Project (Commission Permanente Pétrole N’djamena, CPPN and NGO local office) in the villages of Dildo and Dokaidilli. During the meetings, communities raised again complaints on alleged abuses by local gendarmerie against local people. These abuses are considered by the population connected with the Project presence and more specifically with the thefts of Project material. As already discussed in section 4.3, the Project has had 441 thefts in the period from December 2010 to August 2011.

During ECMG visit to the villages, the EMP team demonstrated engagement with the communities and NGOs, taking commitments of discussing with relevant authorities the issue of security. The Project team stressed to communities and to the ECMG team its limited or no control over the gendarmerie's behavior. However the Project management informed ECMG that they have already started a process to form a committee, at the regional level, headed by the archbishop and including all relevant stakeholders (authorities, but also other projects), to discuss this and other general issues and to work to find solutions.

ECMG commends the initiative, but also suggests increasing the involvement of the communities in the security system. ECMG acknowledges that the Project has been creating a number of jobs for local people, and particularly young people, in the course of the years, such as within the framework of the recent compost program, and encourages the Project to develop more programs for income generating activities for young people. In addition, the Project should record local employment disaggregated by gender.

Sample of minutes of the consultation meetings reviewed by ECMG shows the participation of the communities, good attendance (including in some cases local authorities), and the free expression of attendees' point of view. The social team made sensible recommendations and in one case used visual tools (photos). However, ECMG would like to bring to the attention of the Project the following:

- according to the minutes of the meeting supplied by the Project team, the social team leading the meeting does not appear always properly briefed on important matters. For example, on one question regarding the danger of using the transformer oil for human consumption, the staff answered he did not know (Bendoh 18/06/11)\(^{15}\); they were also unable to answer the question on the possible effects of flaring on crops (Ngalaba 28/07/11); and on the color of water from Maikeri well (29/07/11)\(^{16}\);
- there is no information in minutes on the next step/follow-up actions as agreed with the attendees; and;

\(^{15}\) Programme de la campagne de sensibilisation relatif à la sécurité électrique et le vol d’huile de transformeur dans l’OFDA, Poudouguem, Maikeri et Nya- Moundouli

\(^{16}\) Compte rendu de la campagne d’information et de sensibilisation à Ngalaba et Maikeri
generally, the Project seems to act more on a reactive rather than on a proactive approach, addressing the issues after they are raised by the communities (and/or NGOS/ECMG).

After the joint meetings, EMP management agreed to intensify and improve its communication strategy in order to give timely feedback to stakeholders (including local NGOs) on issues of common interest. As showed by the community's positive response to the explicatory meetings on piezometers, the Project should have a more proactive approach in regularly informing communities on the ongoing environmental monitoring activities. To do so, ECMG suggests that the Project develop adapted tools to communicate results of environmental monitoring to affected communities, hiring specialized expertise. More use of visual aids and printed material (leaflets, drawings and photographs, Powerpoint presentation) is also suggested, as it helps community officers to better explain issues, it ensures consistency and increases credibility (as it is seen as not the opinion of the field agent, but rather something written by the Project's management and/or experts).

Recommendation

24. The Project should improve its communication strategy and ensure adequately briefing the communication team, including the presence of technicians as relevant, and developing adapted communication tools to ensure a full and complete explanation with all the accurate information.
8 COMMUNITY ENGAGEMENT

8.1 ROW Integrity Plan- Social

Update

As discussed in section 6.7 of this report, the implementation of the ROW Integrity Plan (ROWIP) started this year. Since April 2011, ROW monthly inspections have started at all three Maintenance Areas and the first 2011 grass cutting campaign has been conducted in MA3 and MA4 until August. A new grass cutting campaign is planned for the dry season starting October 2011. Based on the data provided by the Project, approximately 200 local workers were hired by the three COTCO contractors for ROW inspections and approximately 1,500 local workers have been employed for grass cutting. In terms of biophysical EMP requirements, this initiative has been so far, very successful as the foot patrolling surveys are reportedly very efficient and effective.

The ROWIP works have been preceded by a communication campaign started in 2010 and described in the November 2010 ECMG report. During 2011, approximately 550 public consultation and community awareness meetings were held in various localities along the pipeline ROW with the participation of about 7,441 people. In the frame of the ROWIP, COTCO decided to harmonize wages throughout the pipeline corridor. According to COTCO, all workers received proper PPE and were informed on their wages prior to the starting of work.

Another sensitization campaign started in October 2011 and is ongoing on the field. The campaign is focused on safety during ROW monthly inspection, especially in wetlands and at rivers crossing, as well as assessing risks associated with sensitive areas.

During 2010 ECMG visit, some issues and concerns were raised by the communities met, and reported by ECMG, regarding the ROW maintenance works, as follows:

- low wages;
- delays in payment up to three months; and
- lack of provision of proper safety equipment.

In June, following COTCO monitoring, a level 2 Non Compliance Situation (repeated level 1) was issued by COTCO to a contractor for late payment of wages in some villages at the MA2.

Observations

As stated in the 2010 ECMG report, from a social point of view the ROWIP represents an improvement in the measure as it enhances communities' involvement in ROW maintenance, increases local employment opportunities, and clarifies rules on wages.

In the discussions with communities met by ECMG around Yaoundé (MA4) and Belabo (MA3), communities generally were positive on the resumption of the ROW maintenance activities (and of their working opportunities) that was suspended for more than a year. Wages have been paid in all visited villages, though with some delays but shorter than in the past. However, the villagers also raised a number of complaints around the following issues:

- wages and respect of payment terms;
- provision of training and equipment;
- work monitoring requirements; and
- in general, level of information on ROWIP received by communities.

COTCO’s communication campaign on ROWIP appears to have been focused on prohibited activities on the ROW, which were also recalled in the T-shirts distributed and in posters. Much less emphasis was put in explaining the new wage policy and the workers’ right to PPE. Incidentally, at the time of ECMG visit, COTCO posters were all still displayed in villages and did not contain information on wages and PPE. The villagers appear not to have retained this information, while they could recall very well the “do’s” and “don’ts” regarding the activities allowed and prohibited on the pipeline. Not one of the villagers and workers met by ECMG in MA4 seemed to know that the wages are now the same along the entire ROW and that no negotiation is allowed.
ECMG

Lack of information was apparent in the case of a villager in Nkometou 1, who participated to the ROW inspection training but said he was not informed on the outcome, was not recruited and was waiting in frustration.

As discussed in section 2.2 of this report, according to Project consultation records, the agenda of the CROs appears to be overloaded, with up to 11 villages visited in one day to sensitize on the ROWIP. ECMG opinion is that the Project should consider increasing the number of CROs and improving their briefing and monitoring (see also section 2.2 and recommendation n. 1).

ECMG interviews in villages indicate that there are cases where contractors do not yet comply with ROWIP (and EMP), particularly concerning the supply of PPE and timely payment of workers hired for grass cutting. Delays of payment have generally decreased but in two villages they still took over two weeks. According to the villagers, partial or no PPE was supplied to grass cutters, and they do not have clear information on what PPE is needed for and why. During the works, according to MA4 villagers, the presence of a nurse and safety coordinator, as required by the ROWIP, has not occurred and they have never shown up. One of the local ROW inspectors met by ECMG in Mvoundoumbe did not receive boots.

In some villages in MA4, workers were unable to say the name of the contractors and only MA3 villagers could produce a copy of a contract for the works. Generally, the workers seemed unaware of the possibility of contacting COTCO if unsatisfied of the contractor, because they fear the loss of employment opportunities in favor of other people from outside. The communication line for all issues passes through the chief and/or a telephone number in Douala displayed on the poster but some of the chiefs met did not have the number of the local CRO.

In two villages (MA3 and MA4), an issue on the length of the pipeline section in the village territory was raised. The length on official COTCO documents did not coincide with villagers' measurement and this influenced the total wage envelope awarded to the village for maintenance. Apparently, in these cases COTCO relies on contractor’s measurement, together with the villagers, to establish the actual length of the pipeline section on the basis of which the payment is calculated.

ECMG encourages COTCO to improve the implementation of the ROWIP, strengthen monitoring on contractors, and suggests the following measures:

- improve the briefing and training of contractors and their staff on ROWIP and EMP compliance; investigate further contractors not meeting contractual and EMP requirements and adapt corrective measures as relevant;
- verify that the wages established are commensurate to the effort and workforce needed, aligned with Cameroonian labor regulations, and that they are effectively and timely paid, establishing a clear deadline;
- streamline a “ROWIP contract form” to be filed in three copies (and kept at COTCO, village/worker’s representative and contractor level) including:
  - name of the contractor and contact number,
  - name and visits of the supervisor, nurse and Safety, Health and Environment coordinator,
  - scope of the work (length and width),
  - total wage envelope,
  - number and list of names of local workers, to be signed after payment, with date of payment, and equipment supplied and returned;
- expedite the contracting of the three, locally-based ROW surveyors who monitor the contractors.

ECMG is also concerned by the insufficient communication with communities, particularly regarding the ROWIP implementation, and suggests the following:

- adding information on safety and PPE also in visual form (for example, preparing posters and leaflets with the drawing/photo of a worker perfectly equipped for the different tasks);
- posting fixed wage in villages;
- promoting a clarification campaign on ROWIP concepts such as:
  - wages,
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- maximum timeline for payment; and
- employment in turns for local inspectors.

- simplifying the communication procedure for labour-related complaints to COTCO, ensuring that the village chief and at least two other representatives of the village, including at least one woman, have at least two mobile telephone numbers to contact local COTCO CRO/monitor and the contractor; and

- once again, ECMG encourages COTCO to consider hiring external expertise to improve its communication tools and materials and adapt them to the targeted public. This recommendation is also connected with the need to launch a campaign to clarify the question on asbestos management (see section 6.3.5).

With reference to the issue of the length of the pipeline section affected to each village, this is something that should be officially and once and for all clarified and registered in a consensual manner. ECMG suggests appointing a multi-party measuring commission including COTCO, the relevant villages and local authorities if needed, with the results signed and posted in each village.

Recommendations

25. COTCO should improve the briefing and training of contractors and their staff on ROWIP and EMP compliance; investigate further contractors not meeting contractual and EMP requirements and adapt corrective measures as relevant.

26. COTCO should verify and document that the wages established by ROWIP are commensurate to the effort and workforce needed, aligned with Cameroonian labor regulations, properly communicated to workers, and effectively and timely paid establishing a clear deadline.

27. COTCO should ensure that each affected village chief and at least two other representatives of the village, including at least one woman, have at least two mobile telephone numbers to contact local COTCO CRO/monitor and the contractor.

8.1.2 Social Platform

Update

The tripartite (CPSP/COTCO/NGOs) social platform was established in 2008 as a common framework for the Project, the Government of Cameroon (through the CPSP, Pipelines Steering and Monitoring Committee) and civil society (through NGOs' associations monitoring the Project). The platform scope was to review the status of grievances received from impacted communities and persons and generally to address social issues relative to the Project activities. The platform carries out regular joint field visits to investigate grievances and discuss with concerned parties.

From February to October 2010, the NGOs participating to the social platform suspended their participation arguing the following: COTCO refuses to share information on compensated people and compensations they received; COTCO has a general distrust of communities; delays in closing the issues are excessively long; and there are cases of COTCO negotiating directly with local authorities and communities bypassing the platform.

In November 2010, COTCO and the NGOs met and found an agreement to re-launch the collaboration. COTCO accepted to share more information on compensated people but only on a case by case basis (when a grievance is received), in order to respect affected people's privacy. In addition, COTCO committed to write a letter of receipt as soon as any letter of grievance is received and to share all documentation of grievances received and closed in the period between platform meetings.

In the course of 2011, three social platform meetings were held in February, May and August. At the February meeting, three NGOs were present, while subsequently three of the four monitoring NGOs (RELUFA, CARFAD and CED) suspended again their participation claiming lack of trust on the part of COTCO. However, the social platform has continued its work of managing and closing grievances with the participation of CPSP and the NGO, FOCARFE, which continues to attend the social platform and gives regular feedback on its activities to the absentees.

According to Project records, eight grievances are still pending: four filed in 2011; six related to the construction phase; two waiting for the Prime Minister indemnification decree; and three to be investigated.
in October 2011. Tripartite (CPSP/COTCO/NGOs) field visits were conducted in two villages (Talla and Mvile).

During the August meeting, COTCO has proposed to widen the scope of the social platform so to include identification and monitoring of potential community investments done in the framework of the External Affairs Donation and Contribution Program, funded by COTCO and other partners. This program is an annual program centered on Health, Education, the Infrastructures, Sport and Culture. The NGO FOCARFE welcomes the proposal and will discuss it with the other social platform NGOs in the following months.

**Observations**

According to ECMG commitment and recommendation expressed in the 2010 report, ECMG selected some communities, flagged by the social platform NGOs in the past as cases of non-satisfactory closure of grievances, to monitor the process of grievances closure. One of the visits was carried out together with FOCARFE.

The villagers met generally expressed their satisfaction with the outcome of the grievance process and the community investments received. Issues that arose during the meetings with ECMG apparently pertained more to internal conflicts or frustration on further expectations not addressed. Management committees are reportedly established for all investments. A school and a grounding machine seen by ECMG were operational.

In the villages of Ossoué-Bikobo and Mbaki (among others) community compensation is still blocked because their request for a rural electrification project cannot be realized for lack of matching funds. ECMG acknowledges the efforts done by COTCO that regularly meets with the chiefs and proposes alternatives that however, are not accepted. More meetings are planned in November 2011, and ECMG recommends the efforts to find a rapid solution to this issue.

In consideration of the possible disagreement among villages that pooled the money for the electrification project, and of the internal conflicts that seem to affect some of the villages, ECMG suggests to invite to the meetings not only the chiefs, but also one or two other representatives, possibly including a woman representative. In addition, ECMG suggests that the meeting be organize at the local village level and not in Yaoundé (where some of these chiefs actually live).

ECMG supports COTCO willingness of further community investment in project affected areas. The corporate social responsibility approach appears adequate to the ongoing impact that the Project has, and will be having, on affected communities and is aligned with industry best practice. In this respect, ECMG has the following suggestions:

- COTCO staff responsible for managing the program should be trained in project management and monitoring and evaluation;
- specific expertise should be hired to properly plan and monitor investments. In connection with this, ECMG repeats the recommendation of considering the hiring of specialized assistance (NGO or consultant) to conduct participatory planning exercises and assist communities in (i) identifying priorities for community compensations and (ii) monitoring the investments;
- capacity building should be implemented for investments' management committees; and
- the criteria of severity of impacts, good management, equity, broad impact, and community ownership should be considered in selecting locations and type of initiative.

In consideration of this program, ECMG's suggestion is to consider complementing the community compensation in the most affected villages (mainly villages around pump stations), and wherever compensation measures were not found to be carried out in an effective manner. In particular, a supplemental compensation for the village of Belabo is required, also taking into account the already existing BWMF, used by the Project, and the subject of several concerns raised by local communities in the recent past (see also section 6.6.2 and recommendation n. 23).

**Recommendation**

28. High priority should be given to the finalization of the pending community compensations. COTCO, according to the EMP Compensation Plan, should strive to implement the compensation agreed with the affected community. In case the agreed compensation is not
8.2 FOUNDATION FOR ENVIRONMENT DEVELOPMENT IN CAMEROON (FEDEC)

The structural problem concerning the Foundation's financial situation and institutional role is not yet solved; nevertheless, the activity has continued and some important steps have been taken.

In 2011, COTCO extra funding to FEDEC has allowed the continuation of the support to implementing organizations' activities, i.e. the three offsets put in place as an environmental compensation of the pipeline project, in compliance to World Bank's Operational Policies related to Natural Habitats (OP 4.04) and Indigenous Peoples (OP 4.20):

- the Campo Ma’an National Park, which is managed by World Wildlife Fund (WWF). Funds coming from FEDEC represent around 10% of overall budget and are mainly employed in anti-poaching activities;
- the Mbam and Djerem National Park managed by Wildlife Conservation Society (WCS). FEDEC funds around 30% of activities; and
- the Indigenous People Plan for the Bagyeli/Bakola Pygmies in the Atlantic Littoral forest between Lolodorf and Kribi, which is implemented by the Réseau d’Actions Participatives aux Initiatives de Développement (RAPID) with funds from FEDEC covering the totality (100%) of the activities.

During the period, the joint inspections of Implementing Organization activities by FEDEC/COTCO/Government of Cameroon have being continued:

- January 2011: Mission to Mbam & Djerem Park (WCS) with FEDEC’s Board of Directors President and Ministry of Forestry and Faune (MINOF) representative;
- February 2011: Mission to Kribi and Lolodorf area (RAPID for Indigenous People Plan) with FEDEC’s Board of Directors President and Ministry of Social Affairs (MINAS) representative;
- April 2011: Mission to Campo Ma’an Park (WWF) alongside with FEDEC’s Board of Directors President and MINOF representatives; and
- June 2011: Inspection Mission of FEDEC Board to visit the Indigenous People Program activities.

The monitoring missions have been appreciated by the implementing organizations. The WCS reported to ECMG that the visits of the funding agencies increase the credibility of the Project but also the communities' expectations. Generally, the implementing organizations representatives met by the ECMG team agreed that the relations with FEDEC have improved, and suggested more opportunities of exchange of experiences between the three programs.

During the term, FEDEC board (the president and the secretary) benefitted by a three-week training program in project design, monitoring and evaluation held in Swaziland and funded by the National Hydrocarbons Society.

In August, an agreement was reached between IFC and COTCO for the funding of the Action Plan, proposed by IFC in 2008, and consisting of studies intended to strengthen the Foundation managing and fundraising capacities, develop a Long Term Organizational Effectiveness Master Plan for FEDEC, and a long-term Community Investment Strategy for the Bagyeli/Bakola (BB) Pygmies. The kick-off is scheduled in November 2011 and the study is expected to last from six to nine months for the two components, depending on the hiring of the consultant.

FEDEC has been invited to participate to an Electricity Development Corporation (EDC) workshop on the fight against poaching and other illegal activities in the Deng Deng National Park, in the framework of the Lom Pangar Dam Project.

A controversial interpretation of the PRECESSE funds for indigenous people has not been solved with MINAS/World Bank yet. PRECESSE is a Government program of the MINAS, jointly funded by the World Bank. A part of the PRECESSE funds is earmarked for Indigenous People that, according to FEDEC, should complement FEDEC Indigenous People Plan program, and, according to PRECESSE management, to carry out activity in other Pygmies' areas. However, MINAS committed PRECESSE funds for the reparation of the Pygmies/Bantu boarding school in Ngoyang (see also section 8.2.1), which is in the RAPID/FEDEC operating area.
Both parks supported by FEDEC continue to be short of funds, in particular for vehicles and other equipment. WWF and WCS are promoting stakeholders platforms to mitigate the intense infrastructure construction and legal or illegal natural resources exploitation activities around the parks (dams, roads, timber exploitation, poaching, touristic hunting, and agri-business). COTCO and FEDEC teams highlight how a number of projects (infrastructures, forestry concession, touristic hunting) have conducted (or were supposed to conduct) environmental and social assessment according to national regulation and are committed to a number of mitigation and compensation plans that are not respected. The lack of monitoring and sanctions hinders the full engagement of these actors and the functioning of the platforms, since only a minority of these projects participate and give their economic contribution. As discussed in the last ECMG reports (2010), COTCO, the implementing organizations and IFC support the idea that FEDEC could, in principle, play a role in pooling resources given as environmental compensations/offsets for these investments that pose a high environmental risk.

With regard to this, a Memorandum of Understanding with the MINOF about the MINOF for the parks has been drafted in accordance with the MINOF, which commits to: (i) promote FEDEC’s role; (ii) support FEDEC in accessing public and private funding; and (iii) strengthening MINOF financial, logistical and administrative support to FEDEC for the management of the parks. The Memorandum of Understanding is pending the signature of the Minister.

**Observation**

Once again ECMG commends the initiative of FEDEC, the continued support to FEDEC by COTCO, and the on-going intense activities carried out by implementing organizations notwithstanding financial limits.

ECMG acknowledges that the problem of FEDEC funding and institutional role is not solved yet, but that some important steps towards a solution have been taken.

**Recommendation**

29. ECMG recommends that COTCO ensures and documents that all volunteers working in the Ngoyang boarding school (and in any other COTCO/FEDEC funded initiative) work in the frame of the Cameroonian labour regulation.

### 8.2.1 Indigenous People Plan

**Update**

The Indigenous People Plan for the Bagyeli/Bakola (BB) Pygmies started in 2002 in 26 settlements situated within 2 km at each side of the Lolodorf-Bipindi-Kribi pipeline corridor and includes the following components:

- Education: facilitation and support to schooling for BB children in 12 schools, sensitization of parents and children, monitoring of children health, construction of toilets in schools and supply of equipment and uniforms. It should be noted that most of the support to schools benefits both the BB and Bantu children;
- Health: provision of free-of-charge health care, emergency transport and drugs, follow-up of sick people, training of young BB as health focal points and training of midwives, preventive medicine, and sensitization for the vaccination campaigns;
- Agriculture: supply of tools, trees and seeds through a network of BB focal points, seeds production, bee-keeping, chicken raising, technical assistance and follow up; and
- Citizenship: sensitization, census survey, sensitization concerning the birth certificates. In 2010 FEDEC recommended RAPID to discontinue the distribution of identity cards because it overlapped with other similar program. Consequently the project focused on sensitization on citizenship rights and duties.

The Ngoyang boarding school for Pygmy and Bantu children re-opened for the 2010-2011 school year with 31 enrolled children of which 25 have completed the year. For the year 2011 - 2012, 37 children are enrolled. A management committee has been established and three volunteers from local Bantu and Pygmie communities work in the boarding school. The boarding school has already received COTCO and other donors’ donations in the form of equipment. The lack of lighting has still to be resolved and in that respect the project will evaluate a budget for solar lighting. MINAS will fund repairs of the building and a well. An official ceremony for the re-opening of the school is scheduled in November 2011 and all organizations active in the support of Pygmies have been invited to the event.
According to RAPID team, the project’s strict monitoring of BB children's schooling has generally increased the parents’ awareness on the importance of children’s education and has diminished the number of children withdrawn from school because of family obligations such as ceremonies and wild fruit gathering. School uniforms and equipment have been distributed during the year. Of the 244 enrolled children (119 girls), 209 (102 girls) participated in the evaluation and 139 (63 girls) passed to the following class. 10 Pygmy children (4 girls) received the primary school certification (CEP) this year, bringing the total to 22 since 2008. For the year 2011 - 2012, 272 children have been enrolled of which 10 BB students (1 girl) are following the secondary school curricula.

The program has signed a collaboration agreement with the Ngovayang hospital and the health centers of Bidjouka and Bandévouiri, to include vaccination and training for mid-wives and community health focal points (health practitioners). A vaccination campaign has been carried out in 11 camp sites while 3 health relays and 10 mid-wives have been trained. According to RAPID team, Pygmies are generally more willing to go to the hospital now, but usually only when the sickness has worsened, due to the distance to the medical facility. In that regards, funds are allocated by the program through the focal points for the transportation from villages. Malaria remains the most widespread disease among BB and, to that extent, COTCO has donated 350 bed nets to BB camp sites.

For the agriculture program, RAPID carried out a census of BB farmers and fields (147 farmers in 25 camp sites for a total farming area of 72 ha), has conducted farmers training and sensitization activities, subsidized small equipment, and has organized seeds distribution. Notwithstanding the timely distribution of seeds, some farmers have used seeds for consumption because the rains were late. The competition with hunting activities has also affected the results. According to RAPID report, the success of tree plantation remains weak, while chicken raising is improving.

FEDEC promoted a census of BB educated young people in order to provide assistance to employment (40 young people counted). Other planned activities concern young women training in tailoring.

As mentioned in section 8.2, IFC and COCTO are funding a project that will review the existing programs/interventions in support of the indigenous people in the Project area carried out either by FEDEC or other stakeholders and through a participatory engagement process will develop a long term Community Investment Strategy for the Bakola/Bagyeli Indigenous People.

8.2.2 Mbam And Djerem National Park

The WCS has been implementing the Mbam and Djerem National Park management support project since 2003. A Master Plan was validated by MINFOF in March 2008. According to the Plan, the budget for the park has been calculated between 700 million FCFA per year (best option) and 200 million FCFA (minimum option), while actually the park management is implemented with 160 million FCFA per year, one third from FEDEC, one third from MINFOF and one third from WCS. The project is implemented around four axes, as follows:

- protection and public sensitization, which include park boundaries demarcation, anti-poaching activities and eco-guards mobilization;
- research and ecological monitoring;
- natural resources co-management with local population, which includes the support of fishing and bee-keeping activities (with co-funding of the British High Commission and USFWS17); and
- coordination and capacity building.

According to WCS mid-year report for 2011, fauna monitoring has continued and a decrease in the human presence index (from 50 in 2009 to 31 in 2011) and an important increase in the presence of elephants (from 29 to 249) have been registered. In June, the regular meeting of the monitoring committee on anti-poaching activities composed by the park, MINFOF and the economic actors around the park was held.

In the first half of 2011, besides regular mobile patrols and fixed control points, 8 special anti-poachers operation were organized, of which two were in the forestry concessions around the park with the collaboration of commercial operators. Eventually, two of the poachers were sanctioned with imprisonment and a fine, which can contribute to discouraging the activity. The prosecution and punishment of the poachers has been a matter of concern because of administrative obstacles and a lack of

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17 United States Fish and Wildlife Service
training of the guards. On the positive side, the temporary eco-guards salaries have been ensured by the Special Fund for Fauna.

Awareness raising meetings have been held in about 20 villages around the park focusing on illegal human activities in the park. In four cases, workers of the timber enterprises participated. The regional councils of traditional authorities set up by WCS were also involved. The platform involving the other economic stakeholders in the area (forest concessions) lacks funds because only two concessions out of seven pay their fees, and the private hunting enterprises do not participate at all. School equipment and sensitization material has been distributed to neighboring schools; two environmental school clubs have been established; and support has been given to schoolchildren of the marginalized herd group (Bororo).

Five research teams have carried out research activities in the park focusing on park flora, non-timber forestry products, chimpanzees, and impact of human activities on vegetation. Some students carried out university research activities in the park with the support of park’s staff.

In the frame of the co-management program, consisting in giving economic opportunities to communities around the park in order to diminish their activities in it, the project established GICs (community associations) active in cattle rearing, bee-keeping and fisheries. Three sessions of training for bee-keepers have been carried out, after the distribution, in 2010, of equipment offered by USFWS. The activity is reportedly very popular, particularly on the northern border, and, according to a WCS report, already 123 farmers have established improved beehives (more than 3,000), while 2,600 traditional beehives have been censed. The production is about 3,600 liters, amounting to a total of 3 million francs CFA. WCS also support the commercialization of locally produced honey in Yaoundé. According to WCS, these figures are probably underestimated, as farmers are reluctant to give information on their production and income.

Two more GIC (Groupe d’Intérêt Communautaire) made by herders have been promoted by the project, totaling 17. Support to herders is also given through the distribution of improved fodder seeds and the construction of a water point for livestock.

In the period April - June 2011 the first fishing campaign has been implemented involving 22 fishermen and catches have been of 2,272.5 Kg of fish, which was commercialized fresh and smoked. The total income is over 2 million francs CFA and a part of the total (46,500 FCA) is kept for the common fishermen’s fund. However, WCS acknowledges that the monitoring of fishing activities has been insufficient and figures can underestimate catches and income. It should be noted that, according to project report, 80% of fishermen use the allowed equipment.

Beside the promotion of these income generating activities, the park gives short term employment opportunities to villagers with salaries up to 1,500,000 FCFA.

In their reports, WCS identify a number of problems in managing the park:

- need to clarify the precarious status of local temporary guards;
- difficulties in controlling the South-Eastern border of the park, where another road has been opened;
- insufficient participation of commercial entities operating around the park to participate in the collaboration platform;
- insufficient equipment, including very old vehicles;
- the prosecution and punishment of the poachers meet administrative obstacles; and
- lack of monitoring of hunting permits and no payment of hunting taxes to the communities by the private operators operating around the park.

8.2.3 Campo Ma’an National Park

The WWF has been managing the Campo Ma’an National Park since 2003 and a five-year Management Plan was approved by MINFOF in April 2006. Main funding to the park comes from the Dutch Government, the European Commission and WWF. FEDEC’s contribution represents 10% of the overall park’s budget.

FEDEC funds are allocated to one of the four components of the WWF program in Campo Ma’an: the biodiversity conservation program. The other three components are community forestry, livelihood development, and research on the great apes. According to the Management Plan, the cost of the
biodiversity conservation activities financed by FEDEC was calculated at 160 million FCFA per year, while FEDEC's funding amount at 50 million FCFA per year. The bio-diversity conservation program includes the following activities:

- protection: anti-poaching activities, eco-guards mobilization, park boundaries demarcation, sensitization;
- co-management: developing a collaboration platform with authorities, private sector, local communities and indigenous people, BB Pygmies living within the park;
- ecological monitoring; and
- developing a collaboration platform with the Rio Campo National Park in Equatorial Guinea.

This year, FEDEC has also funded some health activity in favor of the Pygmy communities residing in the park in collaboration with RAPID.

According to the project's report on the marking of park's boundaries (July 2011), 9 meetings have been organized with local authorities, traditional chiefs, administration and local population to increase awareness on the park boundaries and to hire local people for the physical boundaries marking (500 young people have been hired). The works have allowed monitoring of the human and animal presence and activities at the border of the park and the number and placement of tracks and paths. The results confirmed the pressure on parks resources by local population and several commercial entities. The main findings for each park sector were the following:

- Sector of Nieté: Notwithstanding the agreement signed in 2010 with the enterprise Hevecam, potential conflicts are likely to occur with the local population and the enterprise, which has taken over large surfaces of land in the area and given employment to 3,000 workers accommodated in 17 camp sites. A socio-economic study has estimated the total population of these camps at 26,000 people. Most of these people have migrated from other part of the country and their presence has impacted the availability of local resources for indigenous groups, including Bantu and Pygmies. As a consequence, local people are generally not supportive of the park that is seen as another competitor for land;
- Sector of Akom 2: Discussions with local population have been held regarding the limits of the park with community forests; and
- Sector of Campo: The park boundaries are in conflict with the boundaries of a private forestry concession.

In consideration of these findings, the project has planned a number of actions, including: (i) developing a communication strategy towards the local population; (ii) setting up a multi-party commission including all relevant ministries to carry out a field recognition on the natural resources exploitation in the area; (iii) creation of collaboration platform with major enterprises in the region and specially HEVECAM; and (iv) creation of Pygmies' hunting zones.
9 LOM PANGAR PIPELINE MODIFICATION PROJECT

9.1 PROJECT BACKGROUND

The Lom Pangar PMP consists in the planned substitution by COTCO of two pipeline sections, each 13.3 Km long, located in the Lom Pangar area where the Government of Cameroon, through the EDC, is planning to create a new water reservoir for hydroelectric power production.

Scope of the PMP will be therefore to replace the two pipeline sections to be flooded in order to operate under water. Key phases of the Project execution for COTCO will be the following:

- EPC Contractor mobilization and site preparation, which will include the construction of the COTCO camp;
- new pipeline sections installation (along the existing ROW land easement and parallel to the already existing pipeline) and connection through a hot-tapping tie-in technique;
- diversion of oil flow through the new pipeline sections and decommissioning of old sections (clean up and abandonment);
- construction of new OSR access roads to the selected OSR points;
- decommissioning of all construction related facilities; and
- implementation of the OSR monitoring actions, including mobilization of OSR equipment at the dam site.

Consistently with existing environmental and social monitoring commitments, the Project will carry out all the above activities in compliance with the main Chad Export Project EMP requirements and the additional PMP specific mitigation measures, as identified within the Specific Environmental Impact Assessment (SEIA) prepared for the Project.

9.2 CURRENT SET PROJECT SCHEDULE

Based on the latest Project Schedule provided, the current foreseen key milestones for the PMP are the following:

- obtaining the statement of non-objection by the Project Lenders (to allow COTCO to receive pre financing funds by the Government of Cameroon) by November 2011;
- pre financing funds deposit to be made available by January 2012;
- EPC contract bidding and award: first quarter of 2012;
- detailed engineering: to be completed by December 2012;
- procurement: to be carried out between June 2012 and October 2013;
- mobilization to the site by November 2012; and
- pipeline installation: to be started by August 2013 and completed by April 2014 (9 months in total).

9.3 UPDATE FROM LAST ECMG VISIT

In the last two years, the ECMG has been involved in the review of all environmental related document prepared by the Project, with specific focus on the PMP SEIA and the identified mitigation measures in addition to the existing set of measures outlined in the main Chad Export Project EMP.

Key recommendations made under the 2010 ECMG report concerned the following:

- updating of SEIA package to reflect latest project settings (completed by the Project in May 2011 through the emission of a final revised SEIA);
- sorting of all the identified PMP specific mitigation measures, in addition to the already existing general EMP requirements, in order to facilitate their application (completed by the Project through the addition of a dedicated annex to the SEIA);
- finalization of the Interface Agreement (IA) between EDC and COTCO to formalize, between the two companies that will operate in the same area, the respective environmental and social commitments and requirements to be met; and
strengthening the monitoring of the local villages affected by the future Dam Project, to anticipate possible issues or critical areas related with the overlap and interaction with EDC in the area (implemented by COTCO through the local CRO).

In 2011, the Project has proceeded with the finalization of the Consent Package for the Lenders, implementing the above recommendations, and which includes the following EMP related documentation:

- the MOC for the PMP;
- the OSRP related documentation;
- the PMP SEIA (and the relevant ECMG reviewing documents); and
- the draft final (not yet signed) IA between COTCO and EDC.

During the October 2011 mission conducted in Cameroon, the ECMG team has been provided with the latest version of the Consent package concerning the Lom Pangar PMP.

As part of the EMP compliance reviewing duties, the provided package has been reviewed with respect to the main Chad Export Project EMP requirements, the specific PMP Social and Environmental Management Plan requirements and the comments provided to the May 2011 version of the same package.

In the following, the ECMG observations and recommendations for the finalization of the package, as shared with IFC and COTCO representatives during the Close out meeting held in Douala on the 20th of October 2011, are reported.

9.4 REVIEW OF FINAL CONSENT PACKAGE

9.4.1 MOC

Project update

A first draft MOC version has been prepared by the Project in May 2011 and revised in September 2011 following the discussion held with the Lenders and technical and environmental advisers carried out in the last months.

The MOC document is structured as follows:

a) Technical description of the change, including cost estimate;

b) Environmental mitigation measures related to the change;

c) Financing terms;

d) Project execution; and

e) External interfaces (with EDC and Ministry of Forest).

With particular reference to item b), the MOC outlines the following environmental and social PMP related issues and relevant proposed mitigation measures:

- induced Access Management Areas: proposed access control measures to be put in place along the roads to the OSR control points including the location of the post guards (two) for access control in the area to be installed by COTCO (in addition to the three post guards to be constructed by EDC)\(^{18}\);

- land needs: limited to the 1) access roads to the construction area\(^{19}\); 2) access roads to OSR points; 3) construction camp; 4) laterite borrow pits and 5) new blocking valves to be installed\(^{20}\);

- identified settlements in the area and compensation measures (at the present time no settlement has been identified in the PMP areas during the conducted surveys; however, with particular reference to the OSR access roads to be constructed, the baseline assessment and compensation measures will be implemented in compliance with EMP as needed);

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\(^{18}\) It is noted that the PMP is located in a IAMA area for the Project subjects to the access control provisions as defined by the EMP – Volume 1 Chapter 7.1 Induced Access Management Plan.

\(^{19}\) With the exclusion of the main road and bridge to access the construction camp, which will be opened and managed by the Government of Cameroon within the dam project.

\(^{20}\) It is noted that the new pipeline sections will be installed along the already existing land easement for the COTCO ROW.
Identified Security issues in the area (at the present time limited to the expected migration in the area following the opening of the dam project construction phase); 
- Pipeline sections decommissioning procedures (purge clean up and abandonment); and

Concerning the External interfaces with EDC and the Ministry of Forest, the MOC is provided with the latest version of the IA between EDC and COTCO, and the MOU initialed between COTCO and MINFOF on biodiversity protection and prevention of unauthorized logging and poaching in the area.

Observations
The MOC, as presented, appears to be adequately structured to manage the change and properly addresses all the reference documents (such as the Royal Haskoning SEIA, the IA and the EMP, providing the PMP specific Environmental and Social standards) to be adopted during both the pipeline adaptation works, and in the subsequent operational phase.

During the close out held in Douala on the 20th of October, the following observations and recommendations were made for its finalization:
- preliminary layout of the proposed access roads to the OSR CPs to be counterchecked to evaluate consistency with the information provided in the document;
- the OSR CPs maps to be checked for consistency with the Emergency Response Plan Quick Reference Guide;
- clarification needed on the proposed OSR access road layouts, which are at the present time preliminary and will be subject to a dedicated baseline assessment to be conducted and approved under separate cover. In this sense it is underlined by the ECMG that the approval of the MOC includes the “concept” and the proposed solutions for OSR Control Points, but it does not cover the final layout and design of access roads, which will be subjected to a dedicated environmental baseline assessment to define the final path and needed mitigation actions, if any, such as compensation for land taken;
- need of a clear statement of compliance for any additional compensation measure requested for land use (temporary and permanent) with the main Project EMP and PMP specific ESMP (not limited to permanent access roads); and
- need of clear statement of compliance with the main Project EMP and the PMP ESMP for any public consultation activity to be carried out.

Finally, concerning the EMP requirements on decommissioning and land restoration, it was observed that the MOC did not clearly address the planned camp decommissioning and temporary acquired land return, including land restoration.

The above observations were integrated in a new version of the MOC document submitted to the ECMG and IFC on the 18th of October 2011.

9.4.2 Oil Spill
As previously indicated, the Consent Package is provided with a number of reference studies on Oil Spill Response at the Lom Pangar reservoir, including:
- the Plan National de Lutte Contre Les Déversements Accidentels d’Hydrocarbures au Cameroun;
- the Royal Haskoning PMP SEIA and relevant D’Appolonia reviews;
- the Oréade- Brèche Etude Des Risques Associes A Un Déversement D’hydrocarbures Dans La Retenue De Lom Pangar; and
- the newly issued Lom Pangar Emergency Response Plan Quick Reference Guide by COTCO, which is reporting the response measures and procedures to be put in place for OSR at the reservoir.

All the above documents produced or used as a reference for the identification of the oil spill response measures to be adopted, will be merged together in the operational MA3 OSRP (which will represent the
ECMG

operational Oil Spill Response Plan in use by COTCO for the Maintenance Area No. 3, e.g. the ROW section intersected by the PMP and the Lom Pangar Hydro-electrical Projects).

During the kick off presentation held by COTCO EMP team in Douala, the following additional information has been provided to the ECMG team:

- the oil spill scenarios analyzed\(^{21}\);
- the OSR mitigation measures during pipeline adaptation works\(^{22}\);
- the post construction OSR mitigation measures\(^{23}\);
- the COTCO duties and responsibilities in implementing the OSR measures; and
- the equipment to be made available both at PS3 and at the dam site.

**Observations**

With respect to the documents provided, the following observations and recommendations were made during the close out meeting held in Douala:

- final review of the updated MA3 OSRP will be carried out by the ECMG once available; however, the documentation provided appeared complete and in line with EMP requirements and best industry practice;
- the Draft Emergency Response Plan Quick Reference Guide (QRP) required some in depth review and editing, especially with respect to the use of in situ burning and dispersant OSR techniques, still indicated as suitable OSR options (while it is understood that the mechanical recovery was evaluated as the best applicable technique); and
- similarly, some of the technical information provided to the ECMG during the October 2011 mission, as presented above, were not yet clearly stated in the documents. Among others: the identified OSRP measures to be adopted and the equipment to be made available during the tie-in operations; how to handle the possibly generated oil/water wastes recovered; and the periodic inspections to be carried out during the newly installed pipeline section lifetime.

Finally, with reference to the periodic inspection to be carried out, the ECMG has preliminarily discussed with COTCO and IFC the opportunity of involving the local communities, currently already employed within the ROW Integrity Plan monitoring and patrolling activities, as an additional mean of ROW surveying for oil spill prompt identification purposes. Further discussion on this topic is planned for the next ECMG mission, also based on the follow up on the ROWIP implementation related issues presented under the present report.

The above observations have been discussed with COTCO and integrated in a new version of the OSR QRP submitted to the ECMG and IFC on the 18\(^{th}\) of October, 2011.

**9.4.3 Interface Agreement**

**Observations**

The ECGM has revised the provided draft final IA to be signed between EDC and COTCO. As a reminder, it is highlighted that the IA has been indicated, since the initial ECMG review of the RH SEIA, as a key element needed to ensure that the Project EMP and the PMP SEMP standards will be met, and that any possible misalignment between EDC and COTCO standards will be properly bridged, wherever applicable and needed.

The provided IA is, in ECMG opinion, a well structured agreement. In particular, positive acknowledgments gathered from its review concerned the following:

\(^{21}\) Including: A) non-automatic detected leak; B) instantaneous rupture (estimated in 600 bbls in 7 minutes as sum of detection limit and shutdown time); and C) oil spill during adaptation process.

\(^{22}\) COTCO provided an overview of the measures identified which include: the selected tie-in technology (hot tapping), the location of earth berms with liners downstream of tie-in locations, the pipeline recommended flow rate during tie-in operations, the diameters of bypass, the pressure between PS2 and PS3 below maximum allowable surge pressure and the doubling of the valves to reduce potential spill volume.

\(^{23}\) Including: surface surveying, sensitization of local populations in reporting spills, creation of access road to strategic OSR control Points, oil spill recovery technique (mechanical), location of OSR equipment at the dam site.
– accessibility to the area by COTCO (and COTCO lenders, consultants and contractors) granted by EDC;
– clear statement of compliance with COTCO EMP requirements for COTCO Camp construction and management;
– financing of post guards of Deng Deng forest by EDC and COTCO (also addressed in the MOU between MINFOF, COTCO and EDC);
– confidentiality agreement, allowing disclosure to COTCO consultants and Lenders of all needed project related documentation;
– common commitment to hire local workforce; and
– site coordination meetings and communities consultations planned jointly between EDC and COTCO.

Some clarifications were indicated as necessary by the ECMG, during the close out meeting held in Douala, concerning the proposed approval process of the ESMP to be provided by COTCO contractors (which will be required to meet both the Main Chad Export Project EMP and the PMP SEMP requirements).

The current IA version indicates that approval will be subject to submittal of the relevant documents to EDC, but the role of EDC in the process (and the possible comments provided by EDC following their review) has to be further clarified.

In addition to the above, the following improvements for the final version of the IA were recommended during the close out meeting in Douala:

– while it is understood that COTCO will minimize, or possibly avoid completely, the shared use with EDC of any facility and/or utility (in order to avoid overlap and possible disputes over misaligned EMP standards), some further clarifications should be provided on the foreseen mechanism. In particular, on finding a solution between EDC and COTCO in cases where not aligned with EMP standards could affect COTCO operations and commitments to meet EMP requirements. Possibly this could be achieved within the foreseen coordination meetings between EDC and COTCO already included in the IA; and

– similarly, while both EDC and COTCO commit to conduct compensation according to their SEMP principles in force, it should be clarified how the compensation for the land taken for common facilities will be handled (for example in case of a laterite quarry used by both parties).
ANNEX A

DAILY ACTIVITY SUMMARY
# ANNEX A

## DAILY ACTIVITY SUMMARY

<table>
<thead>
<tr>
<th>DAY</th>
<th>ACTIVITY</th>
</tr>
</thead>
</table>
| 10 October| Kick off meeting in Komé (Chad) with EEPIC EMP: Presentation of EMP related activities in 2011 and follow up on ECMG recommendations dated November 2010.  
BIOPHYSICAL REVIEW: Field visit of K223 and Komé Waste Management Facility (KWMF). |
| 11 October| SOCIAL REVIEW: Visit of local villages and interviews with villages representatives (Dildo and Dokaili with EEPIC EMP and local NGO and Begada with EEPIC EMP).  
BIOPHYSICAL REVIEW: Visit of Komé 5 Batching Plant, Maikeri Borrow pit, selection of well pads, M40 and M154 spill sites and Komé 5 Waste water treatment plan. |
| 12 October| SOCIAL REVIEW: Visit of local villages and interviews with villages representatives (Maikeri and Bekia 2).  
BIOPHYSICAL REVIEW: Visit of GER Composting facility, Komé Base Construction camp (under decommissioning); selection of well pads , KBP6 and Ext borrow pit. |
| 13 October| Close out in N’Djamena (Chad).                                           |
| 14 October| Kick off meeting in Douala (Cameroon): review of EMP related activities by COTCO EMP. |
| 15 October| Lom Pangar Pipeline Modification Project progress status meeting in Douala. |
| 16 October| BIOSPHYSICAL REVIEW: visit of Pressure Reducing Station in Kribi  
SOCIAL REVIEW: Visit of local villages and interviews with villages representatives (Ossoué-Bikobo, Nkongzok I in the Yaoundé area.) |
| 17 October| BIOSPHYSICAL REVIEW: visit of Pump Station #3 in Belabo.  
SOCIAL REVIEW: meeting with FOCAFE (NGO Platform) and joint visit of Mvoundoumba and Nkometou I villages in the Yaoundé area. |
| 18 October| BIOSPHYSICAL REVIEW: visit of Lom Pangar area, visit of PS3 Belabo Waste Management Facility.  
SOCIAL REVIEW: meeting with FEDEC and implementing NGOs for Project Offsets (RAPID, WCS and WWF). |
| 19 October| SOCIAL REVIEW: visit of Ebaka village.                                  |
| 20 October| Close out meeting in Douala (Cameroon).                                 |
ANNEX B

ECMG RECOMMENDATIONS FOLLOW UP TABLE
### ANNEX B

### ECMG RECOMMENDATIONS FOLLOW UP TABLE

<table>
<thead>
<tr>
<th>#</th>
<th>EMP Topic</th>
<th>Recommendation</th>
<th>Status (New/Pending/Closed)</th>
<th>Date open</th>
<th>Section in Report</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>EMP team organization and staff – Cameroon (COTCO)</td>
<td>Evaluation of the EMP/Monitor staff enforcement needed, with respect to the starting implementation phase of the ROWIP. The Project shall ensure, though the EMP staff and field monitors, that all the activities carried out by COTCO contractors and local villagers employed are performed in agreement with the EMP standards (see also Recommendation #2)</td>
<td>New</td>
<td>October 2011</td>
<td>Section 2</td>
</tr>
<tr>
<td>2</td>
<td>Occupational Health and Safety Measures – Cameroon (COTCO)</td>
<td>The Project shall ensure provision of all the required training and PPE to the locally employed workers (by COTCO contractors) within the ROWIP. This activity should be conducted through the existing CROs and through the planned new staff to be contracted (ROW surveyors) within the ROWIP.</td>
<td>Pending</td>
<td>November 2010</td>
<td>Section 4</td>
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<tr>
<td></td>
<td></td>
<td>Note: first observation made under 2010 ECMG report. It is however underlined that, by that time, the ROWIP was not yet implemented but only in the early development phase.</td>
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<tr>
<td>3</td>
<td>Community safety – Chad (EEPIC)</td>
<td>With respect to the EMP requirements on open trenches and excavation works, (General Project Specification No. 008), further evaluation of safety measures to be put in place at excavated pits (at newly constructed well pads) is requested. Improvement of current practice could consist in the use of more visually intuitive warning signs. Additional measures could encompass the use of warning tape or the use of concrete jerseys. If no further measure is implementable, an MOC procedure has to be undertaken by the Project in order to soundly and justifiably modify the current EMP requirement.</td>
<td>Pending</td>
<td>November 2010</td>
<td>Section 4</td>
</tr>
<tr>
<td>4</td>
<td>Component # 2 of WMP – Surface Water and Groundwater Withdrawals at OFDA – Chad (EEPIC)</td>
<td>Damage KPZ-17 monitoring well is to be replaced or repaired to reinstate the groundwater monitoring network</td>
<td>New</td>
<td>October 2011</td>
<td>Section 5.1.1</td>
</tr>
<tr>
<td>#</td>
<td>EMP Topic</td>
<td>Recommendation</td>
<td>Status (New/Pending/Closed)</td>
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<tr>
<td>5</td>
<td>Same as previous</td>
<td>Due to the reported increase of groundwater level at some areas of the OFDA, the Project should carry out a systematic comparison of the actual water depth vs. the depth of installation of the well screen (water depths ideally to be reported on the installation schemes) to ensure that proper detection of floating product is achieved.</td>
<td>New</td>
<td>October 2011</td>
<td>Section 5.1.1</td>
</tr>
<tr>
<td>6</td>
<td>Same as previous</td>
<td>With reference to the discussion held in Komé with EEPCI EMP on the piezometer installation specification (driven by ECS 11-1-1 of the EMP), it is recommended to proceed with construction of newly built wells even at very shallow groundwater level areas is conducted including the installation of impermeable seals on top and below the well screen</td>
<td>New</td>
<td>October 2011</td>
<td>Section 5.1.1</td>
</tr>
<tr>
<td>7</td>
<td>Component # 4 of WMP – Regional Groundwater Monitoring Program – Chad (EEPCI)</td>
<td>Repairing or replacement of damage groundwater wells MPZ3, Meurmeouel II and Dodang 3 shall be carried out by the Project to reinstate the monitoring network</td>
<td>New</td>
<td>October 2011</td>
<td>Section 5.1.3</td>
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<tr>
<td>8</td>
<td>Treated Sewage Water Monitoring – Chad (EEPCI)</td>
<td>Following exceedances detected at treated sewage outlet at Komé Base construction camp (now under decommissioning) lagoon, a spot check on subsoil quality should be carried out in order to evaluate possible cross contamination effects of the receiving soil.</td>
<td>New</td>
<td>October 2011</td>
<td>Section 5.2.2</td>
</tr>
<tr>
<td>9</td>
<td>Treated Sewage Water Monitoring – Chad (EEPCI)</td>
<td>Given the existence of discharge to a leach field (downstream the septic tank) of the treated effluent coming from the Komé 5 Laundry, the Project should include the effluent monitoring at the septic tank outlet within the routine monitoring actions to be implemented</td>
<td>New</td>
<td>October 2011</td>
<td>Section 5.2.2</td>
</tr>
<tr>
<td>10</td>
<td>Same as previous</td>
<td>A new and dedicated MOC for the reuse of oily soil for road paving should be issued by the Project reflecting the practice currently put already in place at a portion of the OFDA roads. MOC shall include the process for assessing the hazardousness of the material (required by EMP for the waste minimization process), the specifications for road paving and encapsulation of oily soil and the procedure for ordinary monitoring of road paving integrity</td>
<td>New</td>
<td>October 2011</td>
<td>Same as previous</td>
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<tr>
<td>#</td>
<td>EMP Topic</td>
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<td>11</td>
<td>Land Restoration at Well Pads – Chad (EEPCI)</td>
<td>The issuing of a dedicated MOC (completing the preliminary one produced in 2010) on the use of compost for land reclamation is requested to the Project in order to fulfill the current EMP gaps on the compost re-use. The MOC shall be aimed at formalizing the composting process adopted, the practice in place for its use within the land restoration and the logging of the agreements with the farmers beneficiary of the compost treatment.</td>
<td>New</td>
<td>October 2011</td>
<td>Section 5.6.2</td>
</tr>
<tr>
<td>12</td>
<td>Decommissioning of Construction phase facilities – Chad (EEPCI)</td>
<td>Following the camp consolidation process started in 2011 at the OFDA, and by the time a decision on camp decommissioning will be taken, the Project will be requested to develop, consistently with the EMP requirements, a decommissioning plan for the recently abandoned Komé Base Construction Camp.</td>
<td>New</td>
<td>October 2011</td>
<td>Section 5.6.3</td>
</tr>
<tr>
<td>13</td>
<td>Component # 4 of Water Monitoring Program – Regional Groundwater Monitoring Program at Permanent Project Facilities – Cameroon (COTCO)</td>
<td>In order to reinstate the GW monitoring network in place at the PS3, the replacement or repairing of the currently damaged (and not usable for EMP monitoring purposes) well BEL-MW4 is required.</td>
<td>New</td>
<td>October 2011</td>
<td>Section 6.1.2</td>
</tr>
<tr>
<td>14</td>
<td>Waste water effluent monitoring – Oil Water Separator Monitoring Plan – Cameroon (COTCO)</td>
<td>With respect to the current OWS monitoring practice in place, some recommendations for improvement were made in order to ensure that effluent samples at OWS are collected (and readily tested at the site) before any discharge to the subsoil to check compliance with effluent limits. To this aim, field testing equipment should be made available at permanent facilities and the use of laboratory analysis should be adopted for periodical counter verification and check of performance of OWS only.</td>
<td>New</td>
<td>October 2011</td>
<td>Section 6.2.4</td>
</tr>
<tr>
<td>15</td>
<td>Same as previous</td>
<td>Following rejection of July 2011 OWS monitoring dataset due to occurred cross contamination of samples collected (confirmed by contaminated trip blanks), the Project should provide a quality assurance laboratory report officially certifying the cross contamination occurred.</td>
<td>New</td>
<td>October 2011</td>
<td>Same as previous</td>
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<td>#</td>
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<td>Recommendation</td>
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<td>16</td>
<td>Same as previous</td>
<td>Evaluation of additional ground water monitoring at the PRS treated wastewater discharge outlet needed. Similarly to the configuration in place at PS3, the Project should consider the installation of one additional groundwater well to enhance the network already in place.</td>
<td>New</td>
<td>October 2011</td>
<td>Same as previous</td>
</tr>
<tr>
<td>17</td>
<td>Waste Management – Cameroon (COTCO)</td>
<td>Following the completion of the study by the Yaoundé I University on the Asbestos containing wastes disposal at BWMI (conducted in 2008 by the Project), the relevant outcomes, which are confirming the adequacy of the removal, segregation, transportation and disposal measures adopted, should be adequately disclosed to the local communities and NGOs, also taking into account the concerns raised in the past years.</td>
<td>New</td>
<td>October 2011</td>
<td>Section 6.3.4</td>
</tr>
<tr>
<td>18</td>
<td>Oil Spill Prevention and Response – Cameroon (COTCO)</td>
<td>Update of the emergency contact phone numbers marked at the Blocking Valves is needed. The reported numbers are no longer up to date and the Project should replace them within the planned maintenance activities.</td>
<td>New</td>
<td>October 2011</td>
<td>Section 6.4.1</td>
</tr>
<tr>
<td>19</td>
<td>Ambient air quality monitoring – Cameroon (COTCO)</td>
<td>AAQM within the next planning campaign shall include the Pressure Reducing Station (PRS) given the presence of stacks at the same facility (two generators)</td>
<td>New</td>
<td>October 2011</td>
<td>Section 6.5.1</td>
</tr>
<tr>
<td>20</td>
<td>Land Return – Properties of the State and National Domains – Cameroon (COTCO)</td>
<td>With reference to the long and stalled process of formalizing the return of 9 storage yards (state property) and 6 national domain areas belonging to the construction phase, the Project was further requested to expedite the signature process of the pending decrees and protocols of agreement</td>
<td>Pending since year 2007. Progress status provided in the Report</td>
<td>February 2007</td>
<td>Section 6.6.1</td>
</tr>
<tr>
<td>21</td>
<td>Land Return – Properties of the State and National Domains – Cameroon (COTCO)</td>
<td>With respect to issue of the formalization of the land return process, the Project should investigate the legal and EMP framework and produce a clarification note on the possible responsibilities and liabilities pending on COTCO with respect to the use of former COTCO facilities by third parties (where the relevant signature is still missing).</td>
<td>New</td>
<td>October 2011</td>
<td>Section 6.6.1</td>
</tr>
<tr>
<td>22</td>
<td>Decommissioning of construction phase facilities –</td>
<td>While decommissioning of Porta Kamp at PS3 has started in September 2011, the Project shall as soon as practicable complete the preparation of all EMP related documentation (full)</td>
<td>New</td>
<td>October 2011</td>
<td>Section 6.6.2</td>
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<td><strong>Cameroon (COTCO)</strong></td>
<td>decommisioning plan), including inventory of waste streams generated and disposal option, permitting documentation (if required) for new dump cell opened, site selection and construction criteria for the cell, proposed environmental monitoring actions and evaluation of additional compensation measures to the Belabo community.</td>
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<td>23</td>
<td>Livelihood Restoration – Chad (EEPCI)</td>
<td>The project should monitor and appropriately document the cases of eligible people who, for any reason, cannot follow or do not succeed in the livelihood restoration training option. If these people are non-viable and vulnerable, the Project should present an alternative plan to restore their livelihood in a timely manner.</td>
<td>New</td>
<td>October 2011</td>
<td>Section 7.2</td>
</tr>
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<td>24</td>
<td>Consultation and Communication - Chad (EEPCI)</td>
<td>The Project should improve its communication strategy and ensure to brief adequately the communication team, including technicians as relevant and developing communication tools so to ensure to give an adequate, proper and complete information</td>
<td>New</td>
<td>October 2011</td>
<td>Section 7.3</td>
</tr>
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<td>25</td>
<td>Community Engagement - ROW Integrity Plan – Social - Cameroon (COTCO)</td>
<td>COTCO should improve the briefing and training of contractors and their staff on ROWIP and EMP compliance; investigate further contractors not meeting contractual &amp; EMP requirements and adapt corrective measures as relevant.</td>
<td>New</td>
<td>October 2011</td>
<td>Section 8.1.1</td>
</tr>
<tr>
<td>26</td>
<td>Same as previous</td>
<td>COTCO should verify and document that the wages established by ROWIP are commensurate to the effort and workforce needed, aligned with Cameroonian labor regulations, properly communicated to workers and effectively and timely paid, establishing a clear deadline.</td>
<td>New</td>
<td>October 2011</td>
<td>Same as previous</td>
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<td>27</td>
<td>Same as previous</td>
<td>COTCO should ensure that each affected village chief and at least two other representatives of the village, including at least one woman, have at least two mobile telephone numbers to contact local COTCO CRO/monitor and the contractor.</td>
<td>New</td>
<td>October 2011</td>
<td>Same as previous</td>
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<td>28</td>
<td>Social Platform – Cameroon (COTCO)</td>
<td>High priority should be given to the finalization of the pending community compensations. COTCO should strive to implement the compensation agreed with the affected community, according to the EMP Compensation Plan. In case the agreed compensation is not feasible, COTCO should justify the reason why, document the</td>
<td>New</td>
<td>October 2011</td>
<td>Section 8.1.2</td>
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<td>29</td>
<td><strong>Foundation For Environment Development In Cameroon (Fedec) – Cameroon (COTCO)</strong></td>
<td>efforts made and do its best to find another option acceptable to the community.</td>
<td>New</td>
<td>October 2011</td>
<td>Section 8.2</td>
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<td><strong>ECMG recommends that COTCO ensures and documents that all volunteers working in the Ngoyang boarding school (and in any other COTCO/FEDEC funded initiative) work in the frame of the Cameroonian labour regulation.</strong></td>
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