1.5 Million Natural Gas Connections Project in 11 Governorates

Site-Specific Environmental and Social Impact Assessment

Executive Summary
Ramla & Miet El Attar/Qalubia Governorate
September 2016

Developed by

EcoConServ Environmental Solutions

Petrosafe
Petroleum Safety & Environmental Services Company
EXECUTIVE SUMMARY

1 Introduction

The Government of Egypt (GoE) has immediate priorities to increase household use of natural gas (NG) by connecting 1.2 million households/yr to the gas distribution network to replace the highly subsidized, largely imported Liquefied Petroleum Gas (LPG).

The GoE is implementing an expansion program for Domestic Natural Gas connections to an additional 1.5 Million households over the next 4 years. The project presented in this study is part of a program that involves extending the network and accompanying infrastructure to connect 1.5 million Households in 11 Governorates between 2016 and 2019 with the assistance of a World Bank Loan of up to US$500 Million and the Agence Française de Développement (French Agency for Development) financing of up to €70 Million. The program is estimated to cost US$850 Million.

The ESIA objectives are as follows:

- Describing project components and activities of relevance to the environmental and social impacts assessments
- Identifying and addressing relevant national and international legal requirements and guidelines
- Describing baseline environmental and social conditions
- Presenting project alternatives and no project alternative
- Assessing potential site-specific environmental and social impacts of the project
- Developing environmental & social management and monitoring plans in compliance with the relevant environmental laws
- Documenting and addressing environmental and social concerns raised by stakeholders and the Public in consultation events and activities

As the project involves components in various areas within the 11 governorates, the parties to the project agreed that Site-Specific Environmental and Social Impact Assessments (SSESIA) for each of the project sub-areas within the governorate will be prepared. Guided by the 2013 Environmental and Social Impact Assessment Framework (ESIAF) and Supplementary Social Impact Assessment Framework (SSIAF), this is the site specific ESIA for the connections network planned for the Ramla & Miet EL Attar in Qalubia Governorate. The project in Ramla & Miet EL Attar encompasses 4,000 household connections to be connected in year 1 of the 3-year project.

The local distribution company responsible for project implementation in Ramla & Miet EL Attar is Egypt Gas
2 Project Description

2.1 Background

Natural Gas is processed and injected into the high pressure lines of the national Grid (70 Bar) for transmission. Upon branching from the main lines to regional distribution networks, the pressure of the NG is lowered to 7 Bar at the Pressure Reduction Stations (PRS). An odorant is added to the NG at PRSs feeding distribution networks to residential areas\(^1\) in order to facilitate detection. Regulators are then used to further lower the pressure to 100 mbar in the local networks, before finally lowering the pressure to 20 mbar for domestic use within the households. In addition to excavation and pipe laying, key activities of the construction phase also include installation of pipes on buildings, internal connections in households, and conversion of appliance nozzles to accommodate the switch from LPG to NG.

2.2 Project Work Packages

2.2.1 Main feeding line/network “7 bar system – PE 100”

A gas distribution piping system that operates at a pressure higher than the standard service pressure delivered to the customer. In such a system, a service regulator is required to control the pressure delivered to the customer.

Main feeding lines are mainly constructed from polyethylene pipes (HDPE) with maximum operating pressure (MOP) below 7 bar.

2.2.2 Distributions network “Regulators, PE80 Networks”

A gas distribution piping system in which the gas pressure in the mains and service lines is substantially the same as that delivered to the customer’s Meters. In such a system, a service regulator is not required on the individual service lines.

Distribution networks are mainly constructed from polyethylene pipes (MDPE) with MOP below 100 millibar.

2.2.3 Installations (Steel Pipes)

A gas distribution piping system consist of steel pipes which is connected from individual service line to vertical service pipe in a multistory dwelling which may have laterals connected at appropriate floor levels; in addition to service pipe connected to a riser and supplying gas to a meter and gas appliances on one floor of a building.

Internal Installation consists of a pipe connecting the pressure reducing regulator/district Governor and meter Outlet (MOP 25 millibar) to appliances inside the customer’s premises.

\(^1\) Because natural gas is odorless, odorants facilitate leak detection for inhabitants of residential areas.
2.2.4 Conversions

Conversions involve increasing the diameter of the nozzle of the burner of an appliance to work with natural gas as a fuel gas rather LPG or others.

3 Legislative and Regulatory Framework

3.1 Applicable Environmental and Social Legislation in Egypt

- Law 217/1980 for Natural Gas
- Law 38/1967 for General Cleanliness
- Law 93/1962 for Wastewater
- Law 117/1983 for Protection of Antiquities
- Traffic planning and diversions
  - Law 140/1956 on the utilization and blockage of public roads
  - Law 84/1968 concerning public roads
- Work environment and operational health and safety
  - Articles 43 – 45 of Law 4/1994, air quality, noise, heat stress, and worker protection
  - Law 12/2003 on Labor and Workforce Safety
  - Book V on Occupational Safety and Health (OSH)
  - Minister of Labor Decree 55/1983.
  - Minister of Industry Decree 91/1985

3.2 World Bank Safeguard Policies

Three policies are triggered for the project as a whole: Environmental Assessment (OP/BP 4.01), Physical Cultural Resources (OP/BP 4.11), and Involuntary Resettlement (OP/BP 4.12). However, OP/BP 4.12 will not be applicable to Ramla & Miet El Attar as no land acquisition or resettlement is anticipated. Particularly, as the network will pass through the main urban roads/streets and side roads without causing any damage to private assets or lands.

In addition to the above mentioned safeguards policies, the Directive and Procedure on Access to Information\(^2\) will be followed by the Project.

4 Analysis of Alternatives

4.1 No Project Alternative

This Natural Gas Connections to Households Project is expected to yield many economic and social benefits in terms of providing a more stable energy source, achieving savings in LPG consumption and enhancing safety in utilizing energy.

The No-Project alternative is not favored as it simply deprives the Egyptian Public and Government of the social, economic, and environmental advantages.

4.2 Energy Alternatives

- **Maintain LPG Use**: Introduction of piped natural gas to replace LPG will help to remove subsidies and reduce imports. The proposed project would also improve the safety of gas utilization as appliance standards are strictly controlled and only qualified personnel carry out installations and respond to emergencies. In the case of LPG, installations are not carried out by trained personnel resulting in possible unsafe installations and unsafe use of LPG.

- **Convert to Electricity**: The second alternative is to convert all homes to use electricity for all energy supply applications. Additional power stations would be needed to cope with the additional demand created by utilization of electricity in homes, which most probably would operate also by natural gas. Power losses in transmission and distribution are also significantly higher than their natural gas equivalents which would add to the overall inefficiency.

- **Use Renewables**: the renewables market does not present feasible, practical, and affordable alternatives to connecting 1.5 million households at this point in time in Egypt. Biogas requires large amounts of agricultural and domestic waste, while solar panels and heaters remain in pilot phase.

Energy alternatives do not provide favorable options to the proposed NG networking

4.3 Installation costs

The average natural gas connection installation cost is about 5600 EGP and consumers contribute a part of 1700 LE because the connection is heavily subsidized by the Government. This payment can be made either upfront or in installments over a period of time. Installment schemes are available to all community people.

The government of Egypt is negotiating with the project’s financing organizations in order to secure additional subsidy to poor and marginalized groups. They also provide facilitation payments strategies through offering various installment schemes. The following are the main types of installments: 138 EGP/Month for 12 months, 74 EGP/Month for 24 months, 52 EGP/Month for 36 months, 42 EGP/Month for 48 months, 35 EGP/Month for 60 months, 31 EGP/Month for 72 months and 28 EGP/Month for 84 months.
5 Environmental and Social Impacts and Mitigations

The environmental and social advantages of switching household fuel from LPG cylinders to natural gas pipelines are diverse. On the residential level, the proposed project will lead to improved safety, reduced physical/social/financial hardships, and secure home fuel supply. On the national level, it promotes the utilization of Egyptian natural resources and reduces the subsidy and import burden. Even on the global level, the project involves cleaner fuel with reduced carbon footprint.

A thorough analysis of environmental and social impacts is important to detail an effective management and monitoring plan which will minimize negative impacts and maximize positives.

The assessment of impacts distinguishes between the construction phase and the operation phase.

5.1 Positive Impacts

5.1.1 During the construction phase

Provide direct job opportunities to skilled and semi-skilled laborers

- The project is expected to result in the creation of job opportunities, both directly and indirectly. Based on similar projects implemented recently by EGAS and the local distribution company, the daily average number of workers during the peak time will be about 50 workers.
- The total number of new short term job opportunities within the project area is estimated at 40-50 temporary jobs they are segregated as follows: up to 20% semi-skilled workers on a temporary basis, up to 30% local construction workers for water heater vent installations and up to 50% daily wage workers for street drilling
- In order to maximize employment opportunities in the local communities it is anticipated that training will be required for currently unskilled workers. On-the-job training will also supplement opportunities for the local workforce for both temporary construction roles and for long-term operation phase positions, where these are available.

Create indirect opportunities

As part of the construction stage, a lot of indirect benefits are expected to be sensed in the targeted areas due to the need for more supporting services to the workers and contractors who will be working in the various locations. This could include, but will not be limited to accommodation, food supply, transport, trade, security, manufacturing… etc.

5.1.2 During the operation phase
As indicated in the Baseline Chapter, women are key players in the current domestic activities related to handling LPG and managing its shortage. Being the party affected most from the shortfalls of the use of LPG, the NG project is expected to be of special and major benefits to women. This includes, but is not limited to, clean and continuous source of fuel that is safe and does not require any physical effort and is very reasonable in terms of consumption cost. Time saving is among the benefits to women. The use of a reliable source of energy will allow women to accomplish the domestic activities in less time and this will potentially open a space for better utilization of the saved time.

- Constantly available and reliable fuel for home use.
- Reduced expenditure on LPG importation and subsidies, as 4 thousand connections will be installed in the two areas. Each household consumes 1.5 LPG cylinders monthly. Accordingly, the total number of LPG cylinders consumed is about 6 thousand cylinders per month. The subsidy value is about 70 EGP per LPG cylinder. Consequently, the total saved monthly subsidy will be about 0.42 million EGP monthly. This will result in total annual savings of 5.04 million EGP.
- Significantly lower leakage and fire risk compared to LPG.
- Improved safety due to low pressure (20 mBar) compared to LPG cylinders.
- Beneficiaries to benefit from good customer service and emergency response by qualified personnel/technicians.
- Eliminate the hardships that special groups like the physically challenged, women, and the elderly had to face in handling LPG.
- Limiting possible child labor in LPG cylinder distribution

5.2 Anticipated Negative Impacts

5.2.1 Impact Assessment Methodology

To assess the impacts of the project activities on environmental and social receptors, a semi-quantitative approach based on the Leopold Impact Assessment Methodology with the Buroz Relevant Integrated Criteria was adopted.

The table below presents the classification of impact ratings and respective importance of impact values.

<table>
<thead>
<tr>
<th>Importance of Impact</th>
<th>Impact rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-25</td>
<td><strong>None</strong> or irrelevant (no impact)</td>
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<tr>
<td>26-50</td>
<td><strong>Minor</strong> severity (minimal impact; restricted to the work site and immediate surroundings)</td>
</tr>
<tr>
<td>51-75</td>
<td><strong>Medium</strong> severity (larger scale impacts: local or regional; appropriate mitigation measures readily available)</td>
</tr>
<tr>
<td>76-300</td>
<td><strong>Major</strong> severity (Severe/long-term local/regional/global impacts; for negative impacts mitigation significant)</td>
</tr>
</tbody>
</table>

The following tables summarize the impacts and the corresponding mitigation measures within the management plan, in addition to the monitoring plans proposed for implementation.
## 5.3 Environmental and Social Management Matrix during CONSTRUCTION

### Table 1: Environmental and Social Management Matrix during CONSTRUCTION

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Impact</th>
<th>Mitigation measures</th>
<th>Implemented by</th>
<th>Direct supervision</th>
<th>Means of supervision</th>
<th>Estimated Cost of mitigation / supervision</th>
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</thead>
<tbody>
<tr>
<td><strong>Local traffic and accessibility</strong></td>
<td><strong>Traffic congestion</strong> (and associated noise/air emissions)</td>
<td>Excavation during off-peak periods&lt;br&gt;Time limited excavation permits granted by local&lt;br&gt;unit &amp; traffic department</td>
<td>Excavation contractors</td>
<td>– LDC + Traffic department</td>
<td>Contractor has valid conditional permit + Field supervision</td>
<td>Contractor costs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Announcements + Signage indicating location/duration of works prior to commencement</td>
<td>– LDC&lt;br&gt;– Excavation contractors</td>
<td>– LDC HSE&lt;br&gt;– Local Unit&lt;br&gt;– Traffic department</td>
<td>Ensure inclusion in contract + Field supervision</td>
<td>LDC management costs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Apply Horizontal Directional Drilling under critical intersections whenever possible to avoid heavy traffic delays</td>
<td>Contractor</td>
<td>LDC HSE</td>
<td>Field supervision</td>
<td></td>
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<td></td>
<td></td>
<td>Traffic detours and diversion</td>
<td>Traffic Department</td>
<td>Traffic Department</td>
<td>Field supervision for detouring efficiency Complaints received from traffic department</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Road restructuring and closing of lanes</td>
<td>Traffic Department</td>
<td>Traffic Department</td>
<td>Fluidity of traffic flow</td>
<td>Additional budget not required</td>
</tr>
<tr>
<td>Receptor</td>
<td>Impact</td>
<td>Mitigation measures</td>
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<td>Means of supervision</td>
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<tr>
<td>Ambient air quality</td>
<td>Increased emissions of dust and gaseous pollutants</td>
<td>Controlled wetting and compaction of excavation/backfilling surrounding area</td>
<td>Excavation Contractor</td>
<td>LDC HSE</td>
<td>Contractual clauses + Field supervision</td>
<td>-</td>
</tr>
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<td></td>
<td></td>
<td>Isolation, covering, transportation and disposal of stockpiles</td>
<td></td>
<td></td>
<td>Contractual clauses + Field supervision</td>
<td>Contractor costs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Compliance to legal limits of air emissions from all relevant equipment</td>
<td></td>
<td></td>
<td>Measure and document emissions of machinery by regular audits request emission measurements</td>
<td>LDC management costs</td>
</tr>
<tr>
<td>Ambient noise levels</td>
<td>Increased noise levels beyond WB/National permissible levels</td>
<td>Ear muffs, ear plugs, certified noise PPE for workers</td>
<td></td>
<td></td>
<td>Contractual clauses + Field supervision (audits)</td>
<td>-</td>
</tr>
<tr>
<td>Local community</td>
<td></td>
<td>Avoid noisy works at night whenever possible</td>
<td></td>
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<td>Field supervision</td>
<td>-</td>
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<tr>
<td>Workers</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Complaints receipt from local administration</td>
<td>-</td>
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<tr>
<td>Receptor</td>
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</table>
| Ground utilities' integrity | Damage to underground utilities resulting in water & wastewater leaks, telecommunication and electricity interruptions | Coordination with departments of potable water, wastewater, electricity, and telecom authorities to obtain maps/data on depth and alignment of underground utilities, whenever available.  
If maps/data are unavailable: Perform limited trial pits or boreholes to explore and identify underground utility lines using non-intrusive radio-cable and pipe locators.  
Preparation and analysis of accidental damage reports.  
Repair and rehabilitation of damaged components. | Excavation Contractor | LDC HSE  
LDC HSE Supervisor | Official coordination proceedings signed by representatives of utility authorities  
– Examination of site-specific reports and records  
– Field supervision | Contractor management costs  
LDC management costs |
<table>
<thead>
<tr>
<th>Receptor</th>
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<th>Estimated Cost of mitigation / supervision</th>
</tr>
</thead>
</table>
| Streets (physical status) | Hazardous waste | - Temporary storage in areas with impervious floor  
- Safe handling using PPE and safety precautions  
- Transfer to LDC depots for temporary storage  
- Disposal at licensed Alexandria hazardous waste facilities (Nasreya or UNICO)  
- Hand-over selected oils and lubricants and their containers to Petrotrade for recycling | - LDC Excavation Contractor | LDC HSE | Field supervision and review of certified waste handling, transportation, and disposal chain of custody | Indicative cost items included in contractor bid:  
- Chemical analysis of hazardous waste  
- Trucks from licensed handler  
- Pre-treatment (if needed)  
- Disposal cost at Nasreya  
Approximate cost of the above (to be revised upon project execution): 8,000-10,000 LE per ton |
| - Adequate management of asbestos and any possible hazardous waste | | | | | |
| - Minimize fueling, lubricating and any activity onsite | | | | | |
| Local community and workers (health and safety) | | | | | |
## Executive Summary

### Site-specific ESIA - NG Connection 1.5 Million HHs - Qalyubeya Governorate/ Ramla & Miet El Attar

**September 2016**

### Receptor Impact Mitigation measures Implemented by Direct supervision Means of supervision Estimated Cost of mitigation / supervision

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Impact</th>
<th>Mitigation measures</th>
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<th>Estimated Cost of mitigation / supervision</th>
</tr>
</thead>
</table>
| Local community | Non-hazardous waste accumulation | 1. Designate adequate areas on-site for temporary storage of backfill and non-hazardous waste  
2. Segregate waste streams to the extent possible to facilitate re-use/recycling, if applicable  
3. Reuse non-hazardous waste to the extent possible  
4. Estimate size of fleet required to transport wastes.  
5. **Transfer waste to Abu Zaabal disposal facility South East of Ramla & Miet El Attar** | LDC  
Excavation Contractor | LDC HSE | - Contractual clauses  
- Monitoring of waste management plan  
- Field supervision | Contractor costs  
LDC management costs |
| Local community | Destruction of streets and pavement | - Arrange Restoration and re-pavement with local unit  
- Communication with local community on excavation and restoration schedules. | LDC in cooperation with the LGU | EGAS | - Field supervision  
- Coordination with LGU as needed | Included in re-pavement budget agreed by LDC with local units or Roads and Bridges Directorate |
<table>
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<tr>
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</tr>
</thead>
</table>
| Occupational health and safety                | Health and safety                           | 1. Full compliance to EGAS and LDC HSE requirements, manuals, and actions as per detailed manuals developed by Egypt Gas  
2. Ensure the provision of the appropriate personal protective Equipment and other equipment needed to ensure compliance to HSE manuals | Excavation Contractor   | LDC HSE and EGAS SDO  | Field supervision  | Contractor costs  
LDC management costs |
| Local communities and businesses              | Lack of accessibility to businesses due to delay in street rehabilitation | Compliance with the Environmental management plan concerning timely implementation of the construction schedule to minimize impact on local business  
• Follow up the procedure of Grievance Redress Mechanism  
• Ensure transparent information sharing | During digging process  
LDC  
The sub-contractors | LDC and EGAS SDO  |  
Ensure the implementation of GRM  
Supervision on Contractors performance | No cost |
## Receptor

### Impact

- **Threat to Safety of users and houses (due to limited level of awareness and misconceptions)**

### Mitigation measures

- Prepare Citizen engagement and stakeholder plan
- Awareness raising campaigns should be tailored in cooperation with the community-based organizations

### Implemented by

- During the construction
- LDC
- EGAS SDO

### Direct supervision

#### Means of supervision

- List of awareness activities applied
- Lists of participants
- Documentation with photos
- Awareness reports

#### Estimated Cost of mitigation / supervision

- 2250 $ per awareness raising campaign
- 2250 $ for brochure and leaflets to be distributed (material available by EGAS-$ spent)
### Table 2: Environmental and Social Monitoring Matrix during CONSTRUCTION

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Impact</th>
<th>Monitoring indicators</th>
<th>Responsibility of monitoring</th>
<th>Frequency of monitoring</th>
<th>Location of monitoring</th>
<th>Methods of monitoring</th>
<th>Estimated Cost of monitoring</th>
</tr>
</thead>
<tbody>
<tr>
<td>Local traffic and accessibility</td>
<td>Reduction of traffic flow and accessibility to local community</td>
<td>Comments and notifications from Traffic Department</td>
<td>LDC HSE</td>
<td>Monthly during construction.</td>
<td>Construction site</td>
<td>Documentation in HSE monthly reports Complaints log</td>
<td>LDC management costs</td>
</tr>
<tr>
<td>Ambient air quality</td>
<td>Increased air emissions</td>
<td>HC, CO% and opacity</td>
<td>LDC HSE</td>
<td>Once before construction + once every six months for each vehicle</td>
<td>Vehicles licensing Department</td>
<td>Measurements and reporting of exhaust emissions of construction activities machinery Complaints log</td>
<td>LDC management costs</td>
</tr>
<tr>
<td>Ambient noise levels</td>
<td>Increased noise levels</td>
<td>Noise intensity, exposure durations and noise impacts</td>
<td>LDC HSE</td>
<td>Regularly during site inspections and once during the night in every residential area or near sensitive receptors such as hospitals</td>
<td>Construction site</td>
<td>Measurements of noise levels Complaints log</td>
<td>LDC management costs</td>
</tr>
<tr>
<td>Receptor</td>
<td>Impact</td>
<td>Monitoring indicators</td>
<td>Responsibility of monitoring</td>
<td>Frequency of monitoring</td>
<td>Location of monitoring</td>
<td>Methods of monitoring</td>
<td>Estimated Cost of monitoring</td>
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</tr>
<tr>
<td>Underground utilities</td>
<td>Damages to underground utilities and infrastructure</td>
<td>Official coordination reports with relevant authorities</td>
<td>LDC HSE</td>
<td>Monthly during construction.</td>
<td>Construction site</td>
<td>Documentation in HSE monthly reports</td>
<td>LDC management costs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Accidents documentation</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Physical state of street</td>
<td>Waste generation</td>
<td>Observation of accumulated waste piles</td>
<td>LDC HSE</td>
<td>During construction.</td>
<td>Construction site</td>
<td>Observation and documentation</td>
<td>LDC management costs</td>
</tr>
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<td>Monthly reports</td>
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<tr>
<td></td>
<td></td>
<td>Observation of water accumulations resulting from dewatering (if encountered)</td>
<td>LDC HSE</td>
<td>During construction.</td>
<td>Around construction site</td>
<td>Observation and documentation</td>
<td>LDC management costs</td>
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<td></td>
<td></td>
<td>Monthly reports</td>
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<tr>
<td></td>
<td></td>
<td>Chain-of-custody and implementation of waste management plans</td>
<td>LDC HSE</td>
<td>Zonal reports</td>
<td>Construction site and document examination</td>
<td>Site inspection and document inspection</td>
<td>LDC management costs</td>
</tr>
<tr>
<td>Local community</td>
<td>Damaging to the streets</td>
<td>Streets quality after finishing digging</td>
<td>LDC, EGAS</td>
<td>Four times per year, each three months</td>
<td>Site and Desk work</td>
<td>Checklists and complaints log</td>
<td>No cost</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Number of complaints due to street damage</td>
<td></td>
<td></td>
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<tr>
<td>Receptor</td>
<td>Impact</td>
<td>Monitoring indicators</td>
<td>Responsibility of monitoring</td>
<td>Frequency of monitoring</td>
<td>Location of monitoring</td>
<td>Methods of monitoring</td>
<td>Estimated Cost of monitoring</td>
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</tr>
<tr>
<td>Local community</td>
<td>Threat to Safety of users and houses (due to limited level of awareness and misconceptions)</td>
<td>Number of awareness raising implemented Number of participants in information dissemination</td>
<td>LDC, EGAS</td>
<td>Quarterly monitoring</td>
<td>Office</td>
<td>Reports Photos Lists of participants</td>
<td>No cost</td>
</tr>
</tbody>
</table>
### 5.5 Environmental and Social Management Matrix during OPERATION

#### Table 3: Environmental and Social Management Matrix during OPERATION

<table>
<thead>
<tr>
<th>Receptor</th>
<th>Impact</th>
<th>Mitigation measures</th>
<th>Responsibility of mitigation</th>
<th>Responsibility of direct supervision</th>
<th>Means of supervision</th>
<th>Estimated Cost of mitigation / supervision</th>
</tr>
</thead>
</table>
| - Ambient air quality  
- Community health and safety | Network integrity | - Detailed review of the geotechnical and geological history of the project area  
- Development of a full emergency response plan in case of rare events which exhibit multiple simultaneous impacts  
- Random inspections and communication/awareness actions to ensure that NG piping and components (both inside the household and outside) are not be altered, violated, or intruded upon in any way without written approval from, or implementation of the alteration by, the LDC. | LDC | LDC HSE. | - Map and local geotechnical report review  
- Site inspections  
- Awareness actions  
- Periodical trainings and drills | LDC management costs |
| - Ambient air quality  
- Community health and safety | Repairs and maintenance (network and households) | As with construction phase activities | LDC | LDC HSE | As relevant from construction phase | LDC management costs |
<table>
<thead>
<tr>
<th>Receptor</th>
<th>Impact</th>
<th>Mitigation measures</th>
<th>Responsibility of mitigation</th>
<th>Responsibility of direct supervision</th>
<th>Means of supervision</th>
<th>Estimated Cost of mitigation / supervision</th>
</tr>
</thead>
</table>
| Economically disadvantaged Community members | Financial burden on economically disadvantaged due to the installments | - Petro Trade should collect the installment immediately after the installation of NG  
- The installments should be collected on monthly basis in order not to add burden to the poor, as it will be easier for them to pay on monthly basis  
- The installment should not be high | Petro trade (Company responsible for collecting the consumption fees and the installments) | EGAS | Banks loans log  
Complaints raised by poor people due to the frequency of collecting the installments | No cost |
| Informal LPG distributors | Loss of revenue for LPG distributors | - LPG distributors should be informed about the NG potential areas in order to enable them to find alternative areas  
- They should be informed about the GRM in order to enable them to voice any hardship | Butagasco | EGAS | Information sharing activities with the LPG vendors  
Grievances received from them | No cost |
| Community health and safety | Possibility of Gas leakage | - Information should be provided to people in order to be fully aware about safety procedures  
- The hotline should be operating appropriately  
- People should be informed of the Emergency Numbers | LDC | LDC | Complaints raised due to Gas leakage | No cost |
### 5.6 Environmental and Social Monitoring Matrix during OPERATION

#### Table 4: Environmental and Social Monitoring Matrix during OPERATION

<table>
<thead>
<tr>
<th>Impact</th>
<th>Monitoring indicators</th>
<th>Responsibility of monitoring</th>
<th>Monitoring Frequency</th>
<th>Location of monitoring</th>
<th>Methods of monitoring</th>
<th>Monitoring Estimated Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Network integrity</strong></td>
<td>- Earthquakes or geotechnical settlements&lt;br&gt;- Emergency response time and corrective actions during emergency drills&lt;br&gt;- Reports of alteration or tampering with ANY gas components</td>
<td>LDC HSE</td>
<td>Bi-annual inspections and annual emergency response drills</td>
<td>Along the network and inside and outside households</td>
<td>- Inspection, leakage detection, running the drills</td>
<td>LDC management costs</td>
</tr>
<tr>
<td><strong>Financial burden on economically disadvantaged due to the installments</strong></td>
<td>- Number of economically disadvantaged people who complained&lt;br&gt;- Number of those who can't pay the installment</td>
<td>LDC and Petro Trade, EGAS</td>
<td>Quarterly</td>
<td>Desk work</td>
<td>- Complaints log&lt;br&gt;- Bank reports&lt;br&gt;- Petro trade reports</td>
<td>No cost</td>
</tr>
<tr>
<td><strong>Impact on the informal LPG distributors</strong></td>
<td>- Grievance received from the informal LPG distributors&lt;br&gt;- Information shared with them</td>
<td>EGAS, LDC</td>
<td>Quarterly</td>
<td>Desk work</td>
<td>- Complaints log</td>
<td>No cost</td>
</tr>
<tr>
<td><strong>Possibility of Gas leakage</strong></td>
<td>- Complaints raised by the community people&lt;br&gt;- Number of leakage accidents reported/raised</td>
<td>LDC, EGAS</td>
<td>Four times per year, each three months</td>
<td>Site and Desk work</td>
<td>Complaints log&lt;br&gt;LDC</td>
<td>No cost</td>
</tr>
</tbody>
</table>
6 Stakeholder Engagement and Public Consultation

The public consultation chapter aims to highlight the key consultation and community engagement activities that took place as part of the preparation of the ESIs and their outcomes. Following are the main groups consulted during the SSESIA and the engagement tools used.

Table 5: Summary of consultation activities in Miet El Attar and Ramla City

<table>
<thead>
<tr>
<th>Participants</th>
<th>Number</th>
<th>Methods</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>During the site specific study</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community people Ramla</td>
<td>Male</td>
<td>Female</td>
<td>FGD</td>
</tr>
<tr>
<td>Community people Miet El Attar</td>
<td>10</td>
<td>10</td>
<td>September-December 2015</td>
</tr>
<tr>
<td>Community people Ramla</td>
<td>21</td>
<td>29</td>
<td>Structured questionnaire</td>
</tr>
<tr>
<td>Community people Miet El Attar</td>
<td>29</td>
<td>21</td>
<td></td>
</tr>
<tr>
<td>Public hearing for the ESIA of the governorate level. Potential beneficiaries, government officials, NGO representatives, (20 people have attended from Miet El Attar and Ramla)</td>
<td>89</td>
<td>33</td>
<td>Public consultation 14th of February 2016</td>
</tr>
<tr>
<td>Total</td>
<td>159</td>
<td>103</td>
<td></td>
</tr>
</tbody>
</table>

6.1 Main Results of Consultation during the Data Collection Phase

The majority of the sample surveyed expressed their willingness to be connected to the NG regardless of the amount of money they can afford to pay. This trend is attributed to the fluctuation of the LPG prices.

Following are the main issues raised during data collection and scoping phase.

Table 6: Sample of the main issues raised during data collection and scoping phase in Ramla and Miet El Attar

<table>
<thead>
<tr>
<th>Subject</th>
<th>Questions and comments</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Technical specifications required to install the NG</td>
<td>In El Ramla the NG has been installed to lots of houses. However, many buildings were left behind due to not being technically eligible. The main problem is that streets are narrow.</td>
<td>Technical specification is adopted for your safety. The limitation of street width will not enable the workers to install NG pipes</td>
</tr>
</tbody>
</table>
### Executive Summary

**Site-specific ESIA - NG Connection 1.5 Million HHs - Qalyubeya Governorate/ Ramla & Miet**  
**El Attar September 2016**

<table>
<thead>
<tr>
<th>Subject</th>
<th>Questions and comments</th>
<th>Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>LPG problems</strong></td>
<td>Residents have got the impression that no one cares about the area. The LPG is a problem especially during winter and no one cares. Its price increases to be 50-60 EGP. The community here in El Ramla can’t afford paying 100 EGP to get 2 LPGs. Baking using traditional oven costs us a lot. In the absence of the LPG the residents can’t do cooking. Therefore, they have to buy food which cost also a lot. Frankly the NG will save our money</td>
<td></td>
</tr>
</tbody>
</table>
| **NG benefits and drawbacks**                | The NG is of lower cost than the LPG. It is reliable and safe. However, it might affect the vulnerable structures  
The project also will put limitation to the quarrels and fights occur to obtain an LPG.  
The bullies will not take advantage of LPG shortage | The LDCs adopt an avoidance mechanism that enables them not to affect the vulnerable structures. Additionally vulnerable buildings are not technically accepted to have the NG installed in.                                                                                                                                                                                       |
| **Installation cost**                        | It is very expensive to pay 1700 EGP at once. It is strongly recommended to have installment mechanism. The residents can pay from 250-750 EGP as advance payment. Thereafter, they pay few amount of money as installment | There will be installment schemes that is in consistent with the proposed payment mechanism                                                                                                                                                                                                                                                                                                                      |
| **Daily wage workers and poor people**       | It is strongly recommended to have the NG installed to the daily wage workers and the poor people free of charge after conducting a social survey about their economic conditions | The state provides subsidy to all beneficiaries through reducing the installation cost from 5600 to only 1700 EGP.                                                                                                                                                                                                                                          |
| **Role of NGOs**                             | Misr El Kheir and Ressala can pay for the installation of the NG to poor households                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                   |
| **Sewage system problem**                    | At the entrance of the street there is a septic tank. The NG companies managed to install the NG to the first building of the street. However, the remaining buildings were left behind. | As the septic tank banning the installation team from working, it will not be an easy process to install the NG to the households. It is technical requirement                                                                                                                                                                                                       |
| **Monitoring of the NG**                     | The NG companies should assign a vehicle to pass around the pipelines in the whole village to monitor the pipes | It is obvious that monitoring is crucial to the project                                                                                                                                                                                                                                                                                                           |

On the 10\textsuperscript{th} of February 2016 a public consultation was conducted in Banha City to which all areas of relevance to the project in Qalubia Governorate were invited. The head of Banha city, the head of the environmental department in Banha, as well as the head of
the educational sector and health authority in Banha and some members of the community attended the consultation event. The results and documentation of the public consultation can be found in the El Khosous City SSIESIA.

6.2 Summary of consultation outcomes

Site specific consultation activities, as mentioned in details above, included wide range of concerned stakeholders. This included but was not limited to, persons/households affected by the project activities, civil society organizations representing the interest of the community, or regulatory and governmental bodies who will play a role in facilitating or regulating the implementation of site-specific project activities.

The key concerns raised in Ramla and Miet El Attar areas were related to the daily wage workers and poor people who might not be able to afford the installation. They were informed about installment mechanisms. The second main concern raised is the sewage problem encountered in some streets which will limit access to some buildings which do not meet the technical specifications. The third concern is the NG installation requirements as the majority of buildings have been built with no legal permits. The NGOs were keen also to work as information desk to the project.

While WB safeguards and regulations state that a minimum of two large-scale, well-publicized public consultation sessions are a must for projects classified as category ‘A’ projects like the one at hand, additional consultation activities (for example through focus group discussions, in-depth meetings, and interviews) were implemented to reach the most vulnerable and difficult to reach community members. Additionally, in order to obtain larger scale and more quantifiable information, the consultant has conducted surveys in the different sites.

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3 Clause 14 of OP 4.01 states that: “For Category A projects, the borrower consults these groups at least twice: (a) shortly after environmental screening and before the terms of reference for the EA are finalized; and (b) once a draft EA report is prepared. In addition, the borrower consults with such groups throughout project implementation as necessary to address EA-related issues that affect them.”