

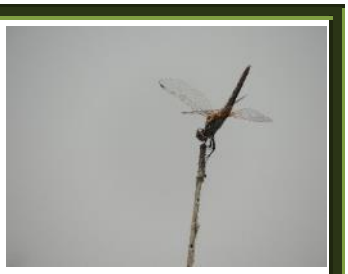








1.5 Million Natural Gas Connections Project in 11 Governorates

Environmental and Social Impact Assessment
El Badresheen-PRS and its High-Pressure Pipeline

Giza Governorate

Final Report

April 2020

EGAS
Egyptian Natural Gas Holding Company

Developed by

"Petrosafe"
Petroleum Safety & Environmental Services Company

EcoConServ Environmental Solutions

List of acronyms and abbreviations

AFD	Agence Française de Développement (French Agency for Development)
ALARP	Stands for "As Low As Reasonably Practicable", and is a term often used in the milieu of safety-critical and safety-involved systems. The ALARP principle is that the residual risk shall be as low as reasonably practicable.
CAPMAS	Central Agency for Public Mobilization and Statistics
CDA	Community Development Association
EEAA	Egyptian Environmental Affairs Agency
EGAS	Egyptian Natural Gas Holding Company
EIA	Environmental Impact Assessment
EMOP	Egyptian Ministry of Petroleum
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management framework
ESMP	Environmental and Social Management Plan
FGD	Focus Group Discussion
GPS	Global Positioning System
HH	Households
HP	High pressure
HSE	Health Safety and Environment
IFC	International Finance Corporation
LGU	Local Governmental Unit
LDC	Local Distribution Companies
LPG	Liquefied Petroleum Gas
mBar	milliBar
NG	Natural Gas
NGO	Non-Governmental Organizations
PAPs	Project affected persons
P&A	Property and Appliance Survey
PE	Poly Ethylene
PRS	Pressure Reduction Station
SDO	Social Development Officer
SIA	Social Impact Assessment
Town Gas	Town Gas (LDC)
WBG	The World Bank Group
WHO	World Health Organization
$	United States Dollars
€	Euros

Exchange Rate: US$ = 15.81 EGP as of April, 2020

Exchange Rate: € = 17.21 EGP as of April, 2020

Contents

Annexes

List of Tables

List of Figures

0. Executive Summary

The objective of the proposed project is to construct a Pressure Reduction Station (PRS and its related HP pipeline at El Badresheen district, Giza Governorate in order to install the NG to a wider segment of clients. The PRS for El Badresheen will be designed to reduce an inlet pressure of 15 Bar to an outlet pressure of 7 Bar at a flow rate of 35,000 m^3/h.

The ESIA is undertaken to assess and propose mitigations for environmental and social impacts of the PRS **and its HP pipeline**. Impacts of NG exploration, extraction, refining, and transmission are outside the scope of this ESIA. Impacts of distribution networks for different areas are addressed in separate Environmental and Social Management Programs (ESMPs). A new 300 m 15 Bar HP pipeline will connect the Pressure Reduction Station (PRS) to the offtake point inside Gasco valve room.

The local distribution company responsible for project implementation in El Badresheen is Town Gas

In order to install the PRS, there was a need to one plot of land of 2275 m^2 obtained in accordance to willing buyer willing seller approach, the sale contract of the land signed on 18/3/2017 with a total cost of 2,665,000 EGP.

EGAS and LDCs follow a set of agreed upon procedures for the process of permanent Land take for the construction of PRSs **Annex-2**. The procedure covers cases of land acquisition of State-Owned Lands or privately-owned Lands on willing Buyer Willing Seller basis. It is the priority of EGAS as an asset holder, to acquire State Owned Lands that are free of any uses (both formal and informal EGAS never resorts to the land expropriation decrees in PRSs selection, particularly because of the flexibility of the PRSs locations.

In cases of unavailability or in case the available land is technically unacceptable, private land is usually used as a second a resort. Land alternatives are examined and the optimum technical and socio-economic scenario of land is selected. Consultation activities are conducted through the project cycle including with the individuals who offer to sell their land, dissemination of project information at the early stages of the project during the frameworks preparation followed by consultation activities with the Project affected persons (e.g. cases of farmers whose land are temporary affected from the high pressure pipelines passing their land) and during land acquisition with land owners. **Annex-3** summarizes the land acquisition process of El Badresheen PRS Land

The PRS is located at El Badresheen about 20 m from Tarrad El Neel road, 450 m North El Marazeeq bridge, 1.1 km east Giza - Beni Suef agricultural road, 850 m north east Al Shobak Al Gharbi village, 2.3 km north east Abu Rajwan village.

A new HP pipeline "15 Bar system" with a length of 300 meter only, will be installed and pass through the main road (state owned lands) leading to the new PRS location. The nearest residential building is located approximately 850 m South west of the proposed PRS location.

The project will be regulated by both the World Bank and Egyptian regulations pertaining to environmental and occupational health and safety. Long list of laws was presented in chapter 3 of this report.

El Badresheen District is affiliated to Giza Governorate and it is very close to Cairo (about 21.6 Km to the south).

the average annual temperature in El Badresheen is 21.5 °C and the average annual rainfall is 1.9 mm.

El Badresheen PRS is located about 0.2 km West Nile River which represents the main freshwater stream, the Nile River extends northwards from Atfih for about 48 km to split into Rosetta and Damietta branches which extends about 236 km and 242 km respectively to boundary of the Nile Delta

The air quality at the proposed site of the proposed PRS is exhibiting permissible limits of classic air pollutants in fact the levels are way below the national and international guidelines. The project site relies upon two sources of water, namely, the Nile water carried to the Governorate by a pipeline and rain water that is harvested during winter season.

With respect to flora of significance, none were encountered in the proposed project area, where PRS and its HP pipeline site are constructed. The current PRS area is free of significant vegetation. Planned offtake from national grid to the gas route shall not come into contact with flora and the uncultivated vegetation cover as the HP pipeline located along the road.

El Badresheen district is a city located in Giza Governorate. Municipal solid waste collection points, used as open transfer systems, where waste is collected and then transferred to the Shoubramant controlled-landfill, located approximately 60 km from the PRS location.

The PRS in El Badresheen is located in an area characterized as agricultural land. El Badresheen district is one of the semi-urban areas in Giza Governorate. The district hosts many industrial activities. Consequently, the traffic tends to be dense.

The total population of El Badresheen district is estimated at 537133 people in 2017 with a total area of 111 km^2

According to CAPMAS data of 2017, almost all of individuals in El Badresheen district use electricity for lighting. The PRS will be supplied by electricity from the National electricity grid.

The project will result in various positive impacts pertaining to job opportunities and potential supplies. However, it may result some potential negative impacts. Following is a summary table listing the impacts of relevance to the project:

Table 0-1: Impacts of relevance to the project

Potential Negative Impact	Impact significance
During Construction:	
Deterioration of soil quality	Medium
Air emissions	Minor
Noise	Medium - Minor
Occupational Health and safety	Medium
Labor Influx	Medium
Child labor	Low -Medium
Waste generation	Medium
Traffic	Minor
Ground water contamination	Minor
Community health and safety	Minor
Impacts related to lands	Minor
During operation:	
Occupational Health and safety	Medium
Hazardous material and waste management	Medium
Noise	Minor

A long list of mitigation and monitoring measures was presented in this report in chapter-7. The PRS related consultation activities in El Badresheen district included wide range of concerned stakeholders. This included but not limited to individuals/households affected by the project activities, civil society organizations representing the interest of the community, and governmental bodies who will play a role in facilitating or regulating the implementation of site-specific project activities.

The project affected persons (PAPs) expressed their eagerness to host the project as the natural gas will reduce their agony with the LPG cylinders. Surprisingly, there was no single comment raised about the safety of the PRS. The land owner expressed his satisfaction with the value of PRS land. The PRS did not raise any concerns among the community in the vicinity areas.

1. Introduction

1.1 Project Objectives

The objective of the proposed project is to construct Pressure Reduction Station (PRS) and its related HP pipeline at El Badresheen district in order to install the NG to wider segment of clients. The PRS for El Badresheen will be designed to reduce an inlet pressure of 15 Bar to an outlet pressure of 7 Bar at a flow rate of 35,000 m^3/h.

1.2 Environmental and Social Impact Assessment (ESIA)

The ESIA is undertaken to assess and propose mitigations for environmental and social impacts of the PRS and its HP pipeline. Impacts of NG exploration, extraction, refining, and transmission are outside the scope of this ESIA. Impacts of distribution networks for different areas are addressed in separate Environmental and Social Management Programs (ESMPs). A 300 m HP pipeline connects the Offtake to the PRS. HP pipeline installation works will take place and will pass through a state-owned land. **The ESIA objectives includes:**

- Describing project components and activities of relevance to the environmental and social impacts assessments.
- Presenting project alternatives and the no project alternative.
- Identifying and addressing relevant national and international legal requirements and guidelines
- Describing baseline environmental and social conditions
- 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

The local distribution company responsible for project implementation in El Badresheen district is Town Gas.

1.3 Contributors

The ESIA prepared by Petrosafe (Petroleum Safety & Environmental Services Company) and Ecoconserv Environmental Solutions (Cairo, Egypt) with collaboration and facilitation from EGAS, Town Gas HSE and Engineering Departments. The names of the Petrosafe and Ecoconserv experts who have participated in the preparation of the ESIA study listed in Annex-1 attached to this report.

Table 1-1: List of Main Contributors

Team Member	
• Geo. Mohamed El-Ghazaly	• Dr. Khaled Gamal
• Dr. Zeinab Farghaly	• Chem. Mohamed Saad Abdel Moein
• Chem. Mohamed Abdel Moniem Aly	• Economist/ Osama Kamal

2. Project Description

2.1 Background

Natural Gas (NG) 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 PRS. An odorant is added to the NG at PRSs feeding distribution networks to residential areas[1] in order to facilitate detection in the event of leaks. In addition to excavation, key activities of the construction phase also include installation of mechanical equipment.

The diagram below **Figure (2-1)** presents the components of a city's distribution network. The component covered in this ESIA is lined in red. Other components are addressed in a separate ESMP:

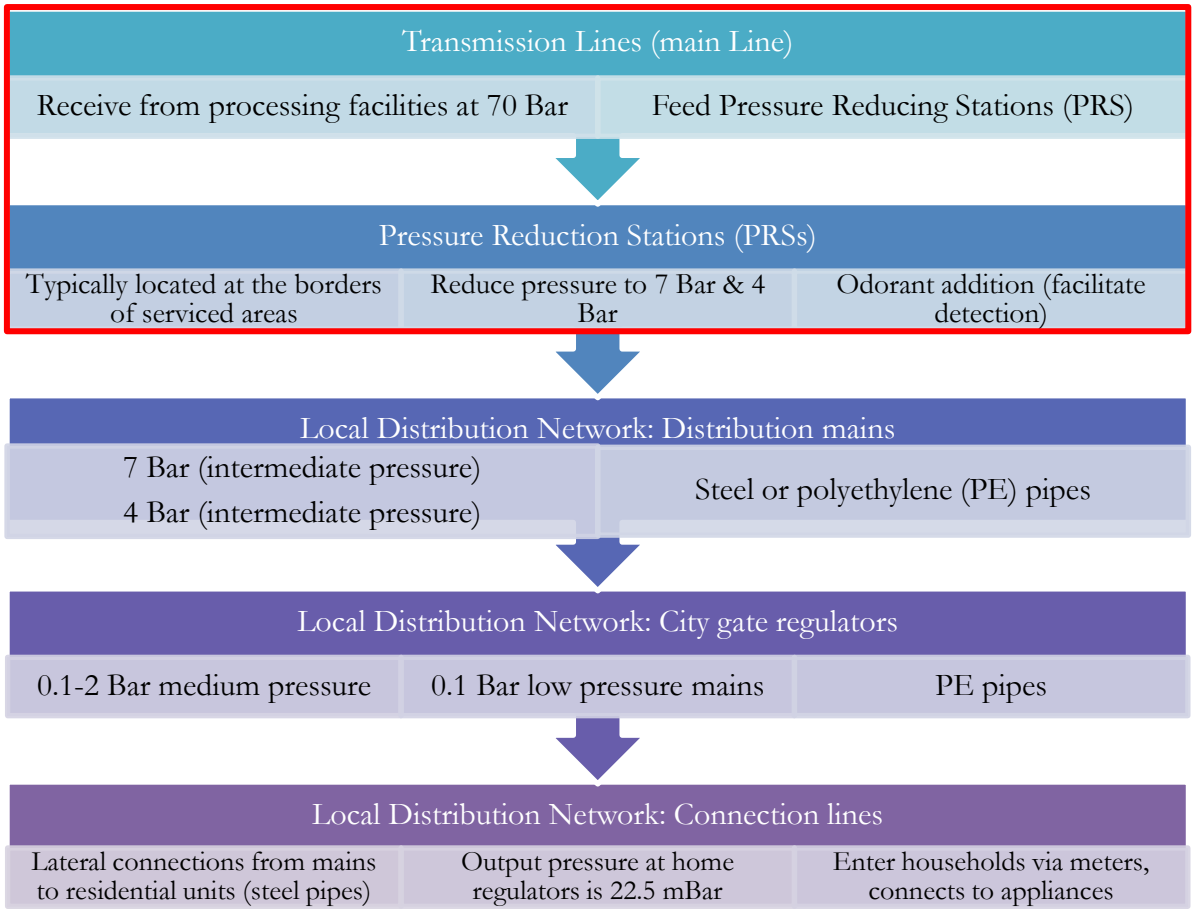

Figure 2-1: General components of the city's distribution network

[1] Because natural gas is odorless, odorants facilitate leak detection for inhabitants of residential areas.

2.2 Project Work Packages

2.2.1 Pressure Reduction Station (PRS)

A PRS consists of the following components: an inlet unit (isolated cathodic system), a liquid separation unit, a filtration unit and equipment for automatically reducing and regulating the pressure (active regulator and monitor regulator). In addition, auxiliary devices include safety valves (Slam Shut), relief valves, an odorizing unit and ventilation equipment as shown in **Figure 2-2**.

Utilities existing in a PRS include a control room, a firefighting system (firefighting water tank, firefighting valve), staff bathroom, a storage area and entrance room located adjacent to the entrance gate.

The PRS for El Badresheen will be designed to reduce an inlet pressure of 15 Bar to an outlet pressure of 7 Bar at a flow rate of 35,000 m^3/h. in order to feed El Badresheen area.

2.2.2 Offtake and HP pipeline

The national grid pipeline network has a MOP of 70 Bar. The offtake is the point on the HP national grid pipeline where a branch of the pipeline is constructed to connect the PRS to the national grid. In El Badresheen the high-pressure pipeline (HP) connection between offtake and PRS will have an approximate length of 300 m. At the offtake location (inside Gasco valve room), valve rooms/valve ditching is constructed so as to control the flow of the natural gas through the pipeline (branch).

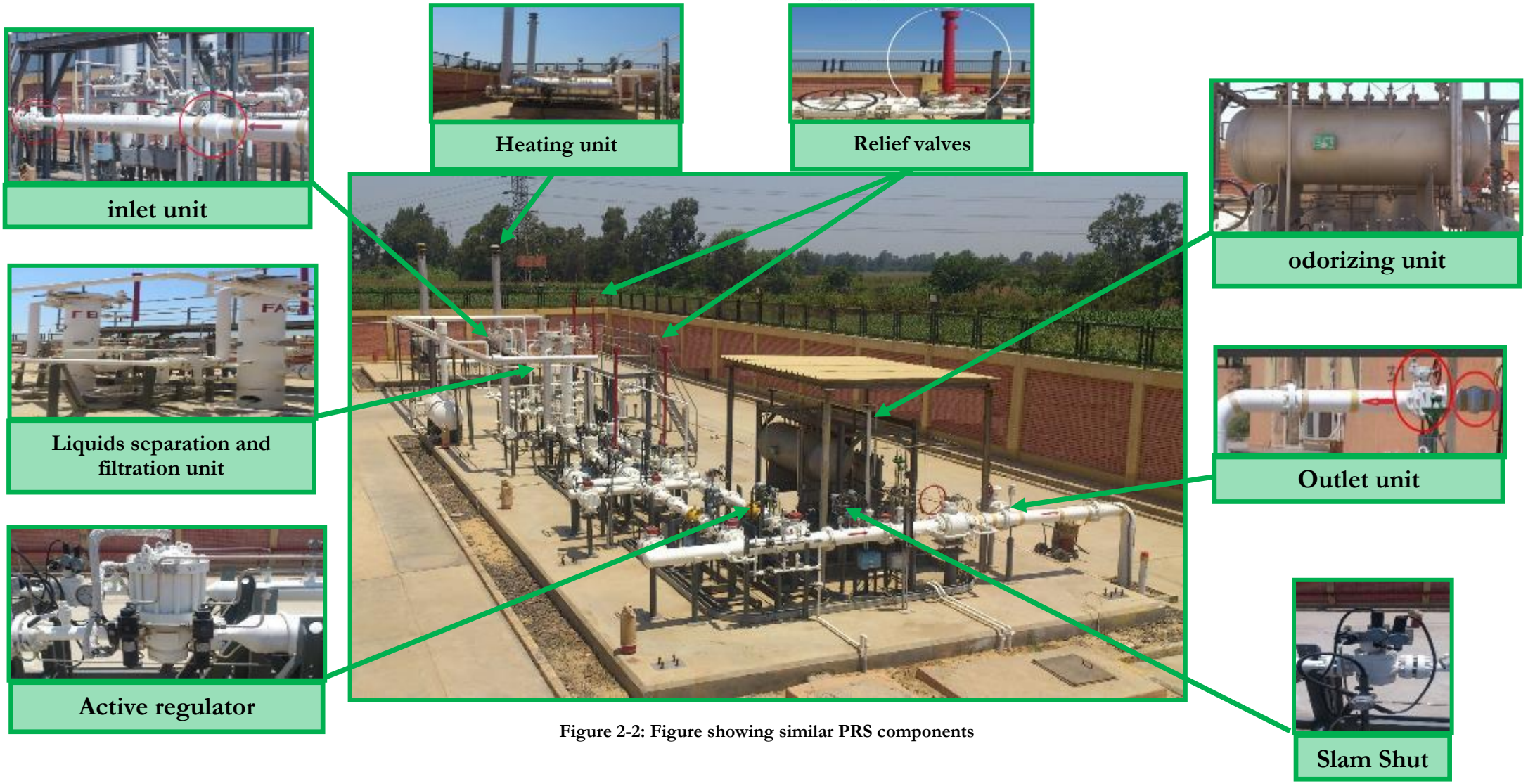

Figure 2-2: Figure showing similar PRS components

2.3 Project location

2.3.1 Pressure Reduction Station (PRS)

The proposed pressure reduction station (PRS) will be located within El Badresheen district, Giza Governorate. The proposed PRS will be located about 20 m from Tarrad El Neel road about 450 m North El Marazeeq bridge, 1.1 km east Giza - Beni Suef agricultural road, 850 m north east Al Shobak Al Gharbi village, 2.3 km north east Abu Rajwan village, 1.1 km east El Marazeeq village. The geographical coordinates of the proposed PRS location are (latitude 29° 47' 53.9" N, longitude: 31° 17' 25.4" E). The nearest residential building is located approximately 850 m South west of the Offtake site as shown in **Figure 2-3, Figure 2-4 and Figure 2-5**

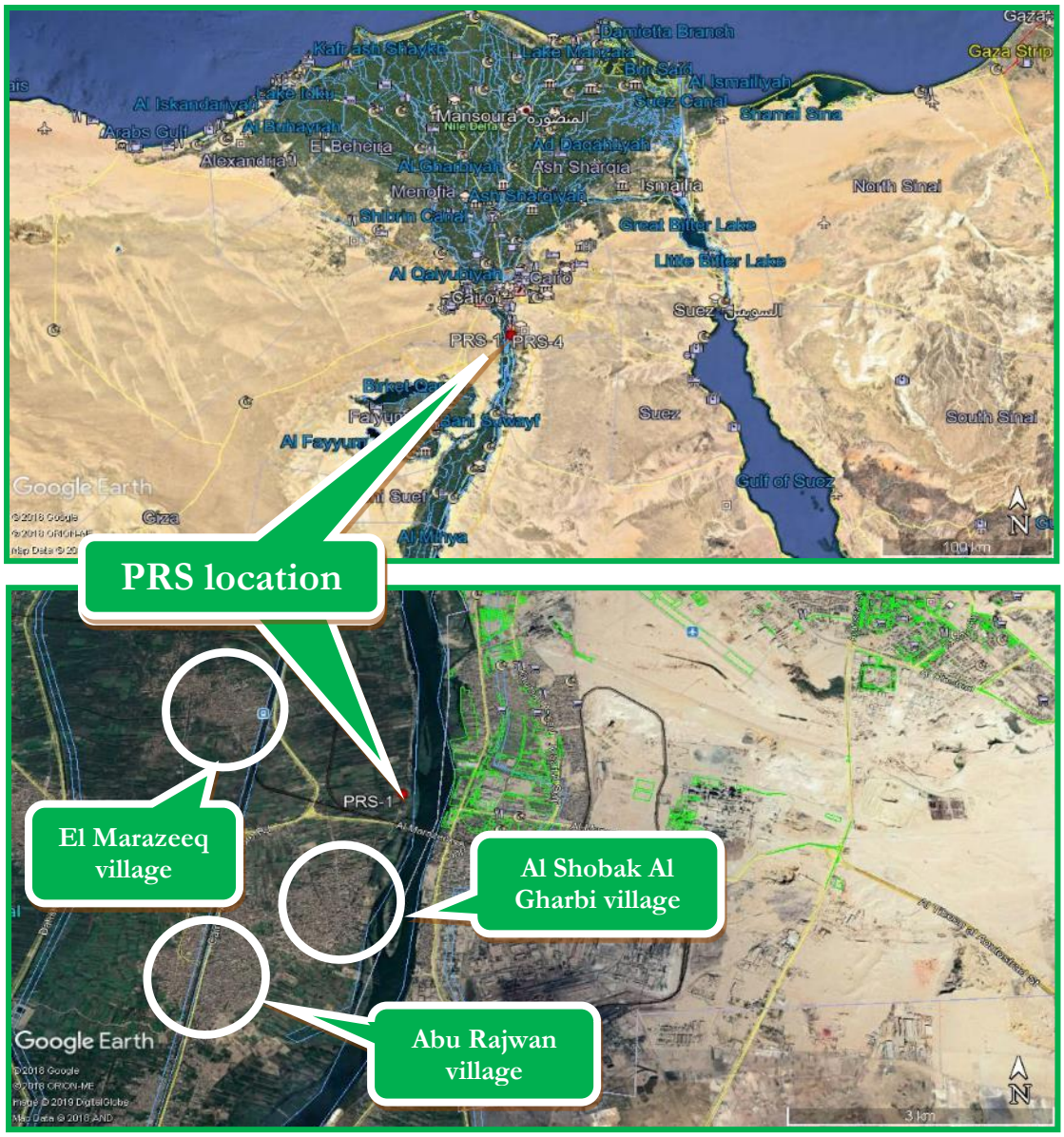

Figure 2-3: a satellite map showing the proposed Location of El Badresheen new PRS and nearest residential areas.

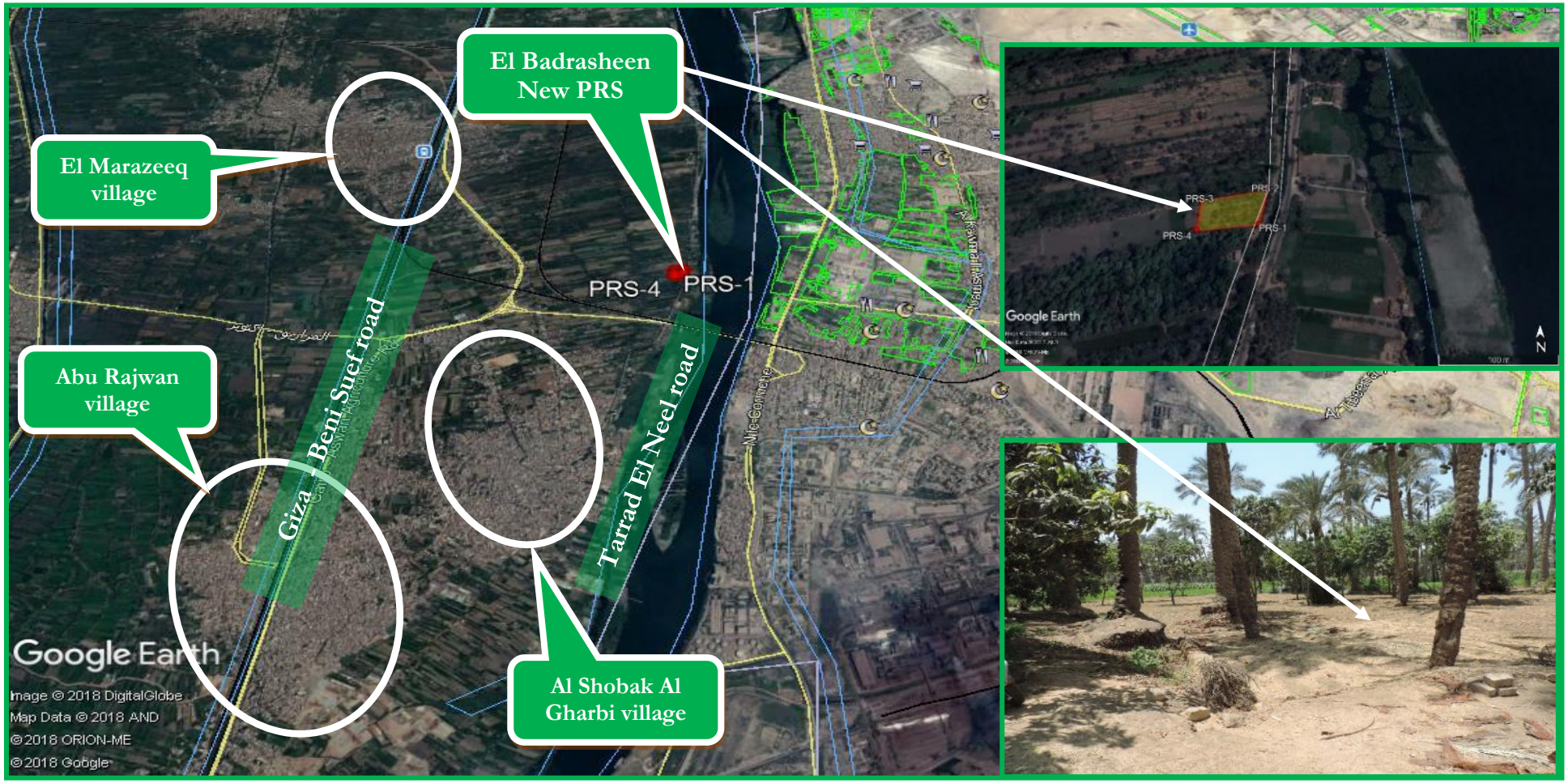

Figure 2-4: The proposed Location of El Badresheen new PRS feeding El Badresheen area

Figure 2-5: Pictures showing the proposed PRS surroundings

2.3.2 Offtake Location

The proposed Offtake point will be located inside Gasco valve room, which is located about 20 m from Tarrad El Neel road, 150 m North El Marazeeq bridge, 1.1 km east Giza - Beni Suef agricultural road, 650 m north east Al Shobak Al Gharbi village, 2 km north east Abu Rajwan village, 1.1 km east El Marazeeq village. The geographical coordinates of the proposed PRS location are (latitude 29° 47' 45.8" N, longitude: 31° 17' 25.4" E). **Figure 2-6 and Figure 2-7**

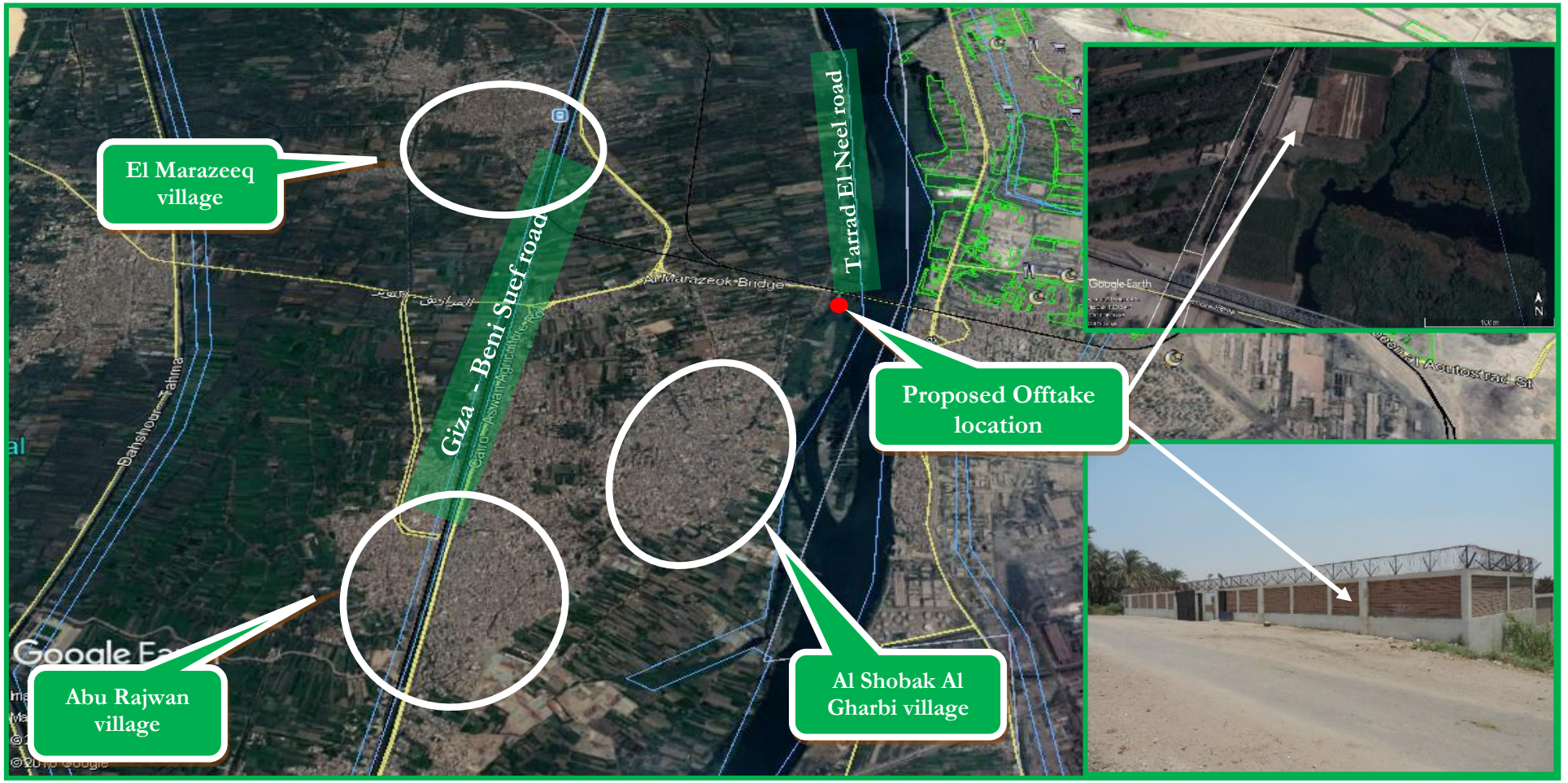

Figure 2-6: The proposed Location of the proposed Offtake point, which will be located inside Gasco valve room

Figure 2-7: Pictures showing the proposed Location of the proposed Offtake point, which will be located inside Gasco valve room

2.3.3 HP Pipeline Route

The total length of the proposed pipeline route is about 300 meters. The proposed pipeline route will start from the Proposed Offtake point, which located inside Gasco valve room, which is located about 20 m from Tarrad El Neel road, about 150 m North El Marazeeq bridge, 1.1 km east Giza - Beni Suef agricultural road, 650 m north east Al Shobak Al Gharbi village, 2 km north east Abu Rajwan village, 1.1 km east El Marazeeq village. The geographical coordinates of the proposed PRS location are (latitude 29° 47' 45.8" N, longitude: 31° 17' 25.4" E).

The proposed route will extend from the offtake point to the north along with Tarrad El Neel road for about 280 m to reach the point facing the proposed PRS location, which located on the other side of Tarrad El Neel road.

The proposed pipelined route will cut Tarrad El Neel road (asphalt road) and a dusty narrow road using open cut technique for about 20 m to reach the end point at the proposed PRS location at the geographical coordinates of (latitude 29° 47' 53.9" N, longitude: 31° 17' 25.4" E). **Figure 2-8 and Figure 2-9**.

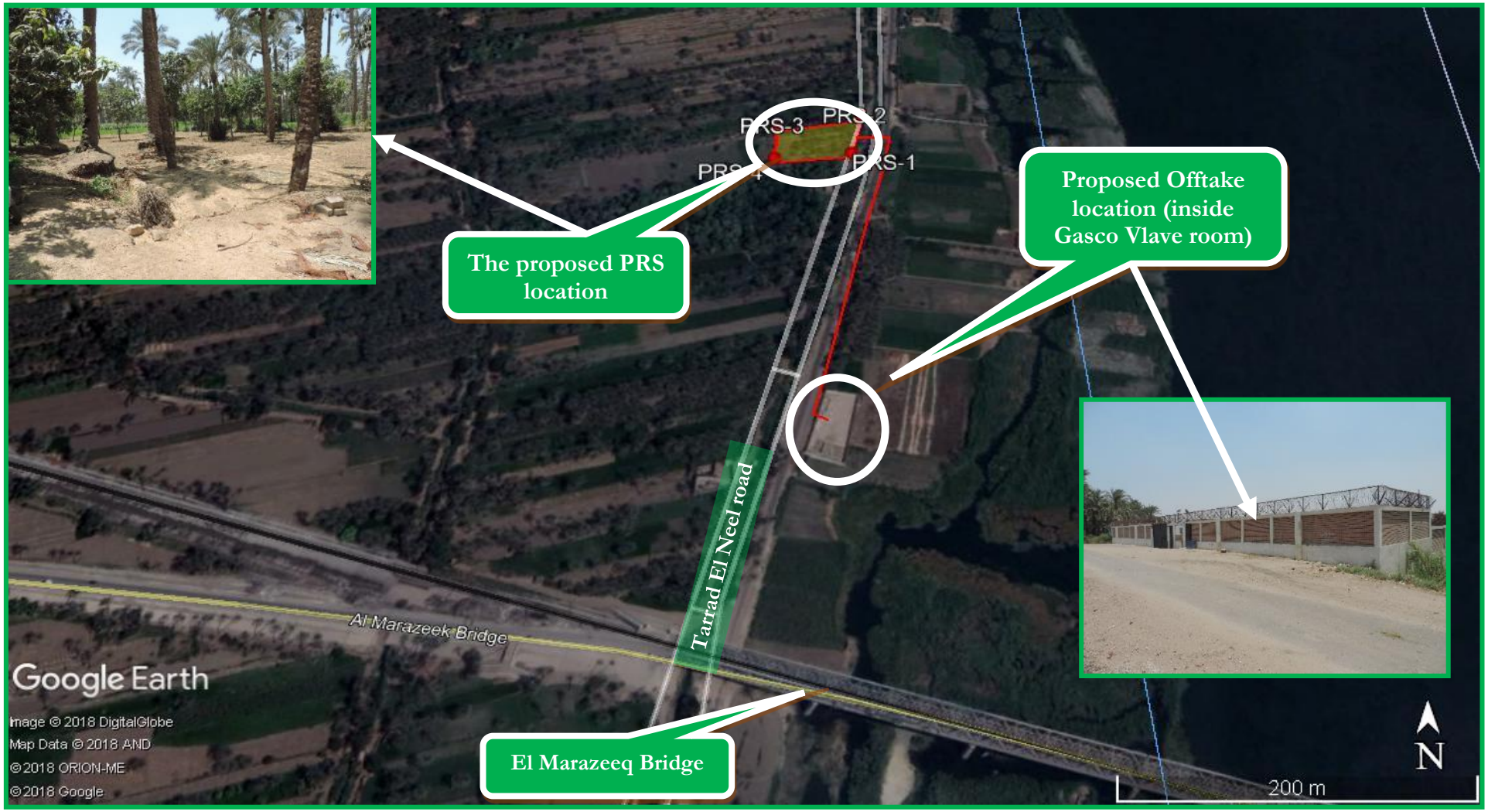

Figure 2-8: The proposed Pipeline Route

Figure 2-9: Pictures showing the proposed Pipeline route

2.4 Project Execution Methodology

2.4.1 General survey

- Identifying availability of utilities in the area and their conditions (electricity, water, telephone lines, and sanitary pipelines) through data and maps from the relevant authorities.
- Identifying the location of the nearest national grid pipelines, gas networks.
- Identifying the location of the new PRS location and new offtake location.
- Identify the route of inlet connection "15 Bar system"

2.4.2 Land acquisition for PRS

As a new PRS will be constructed in El Badresheen district, there was a necessity to select the technically and socially acceptable land with a total area of 2275 m^2 (approximately 13 Qirate). Selection process starts by searching for land nearest or closer to the offtake of the high-pressure pipeline (15 Bar pipeline).

Due to the unavailability of state-owned lands, Town Gas followed EGAS procedure for acquiring land for the construction of the PRS on Willing Buyer – Willing Seller basis and no involuntary land acquisition took place. (For further elaboration on EGAS procedures for land acquisition see **Annex-2**)

More than three alternatives of privately-owned lands were inspected. The agreed land was technically and socially acceptable, as it lies very close to the offtake of the high-pressure pipeline (15 Bar pipeline) owned by GASCO, and entails no further land acquisition compared to the other land alternatives.

The selected land is cultivated by its owners with no tenants and did not require payment to compensate tenants for crops. It was also mutually agreed that the land owners will be granted enough time to collect their crops before LDC (Town Gas) starts any construction works.

Consultation with the land owners were conducted during the Land Purchasing Committees visits also further consultation were conducted with the other neighboring land owners to determine the prevailing price (market price) of the land in the target area. Prevailing price ranged from 100 to 120 thousand EGP/Qirate, considering the current situation that the land is for agricultural purposes. Consultation meetings also reflected the future expectation of the land owners in this area that the land could be used in the near future for construction of buildings that is of more value than the current land status (agricultural).

Based on the cost estimation analysis carried out by the LDC, and after the negotiations with the land owners, the land was purchased on 18/3/2017 at a total cost of 2,665,000. EGP (approximately 205 thousand EGP/ Qirate) and a cheque was issued and received by the land owner. (For further

elaboration **Annex-3** is a summary of El Badresheen PRS land acquisition process). A new HP pipeline of 15 Bar with a length of 300 meter only, will be installed and passing through the main road (state owned lands) with no encroachment, Therefore, no lands will be needed. Thus OP 4.12 is not applicable to El Badresheen PRS, Hence, no RAPs will be required.

2.4.3 Design and material take-off (MTO) including procurement

Once the final location of project components is finalized, a final design of the Offtake and PRS is utilized to estimate the materials and equipment needed to implement the project. Procurement of the materials includes local and international components. The main international purchases may include critical components and PRSs, regulators, and metering stations.

2.4.4 Construction works

2.4.4.1 Construction works of PRS

Pressure Reduction Station area:

PRS siting was performed according to international best-practice and guided by minimizing the possible negative impacts on the project's surroundings; the safety of neighboring areas from possible gas release accidents; and noise associated with the operation of reducers. The PRS will be surrounded by a wall for safety and security purposes (including reducing noise impacts of the PRS reducers on the surrounding receptors). Currently, there are scattered buildings in the agricultural land surrounding the PRS. The closest buildings are around 850 m South west of the proposed PRS location, **(Figure 2-5).** In the event that buildings are constructed in the area surrounding the PRS, the Institute of Gas Engineers Safety Recommendations requires the following buffer zones:

- PRS should have free areas from each side to allow for emergency vehicle access.
- The nearest residential building to the proposed PRS is far about 850 m.

The PRS is to be accessible by an existing road (Tarrad El Neel road) to ensure quick response in event of repairs and/or emergencies.

Pressure Reduction Station Civil Works:

About a 9-month construction schedule is planned for the El Badresheen PRS with site preparation expected to commence in the first half of 2020.

The main construction activities will include:

- Site preparation, acceptance and placement of major fabricated equipment items, construction of buildings, testing and commissioning.
- Initial construction activities involve clearing and grading of the site, sediment fences and silt traps will be installed, as necessary, to control erosion and sediment transport during site preparation activities.

- Following site preparation, individual excavations will be made for fire-fighting tanks, domestic wastewater trenches, pipe racks, and a 6-m high wall (of cement) around the PRS.
- Concrete foundations for buildings and footings for mechanical equipment will be laid down;
- Facility piping (inlet, outlet and 4-inch firefighting line) both above and below ground, are installed.
- Construction of an 87.5 m^2 control room with a bathroom, an electrical unit's room, and a security room adjacent to the PRS.

Pressure Reduction Station Mechanical Works:

The El Badresheen PRS comprises of two pressures streams, the upstream (inlet) high pressure 15 Bar and the downstream (outlet) low pressure 7 Bar. The PRS design is in accordance with the Institute of Gas Engineers/ Safety Recommendations IGE/SR/9, 10, 16, 18, 22, 23, 24, 25; Institute of Gas Engineers/ Transmission Distribution IGE/TD/13; and National Fire Protection Association NFPA 15.

Following the construction of the foundation and fences, construction will continue with the installation of mechanical components. Mechanical components include the following:

- Inlet ball valve
- Solid filtration
- Liquid filtration
- Water bath heater
- Reduction regulator
- Active regulator
- Monitor regulator
- Slam shut /Safety valve
- Relief valve
- Measuring unit
- Odorizing unit
- Outlet unit

Please refer to **(Figure 2-2) and (Figure 2-10)**

Testing:

Following mechanical completion, testing of the facility components will be performed in accordance with applicable standards.

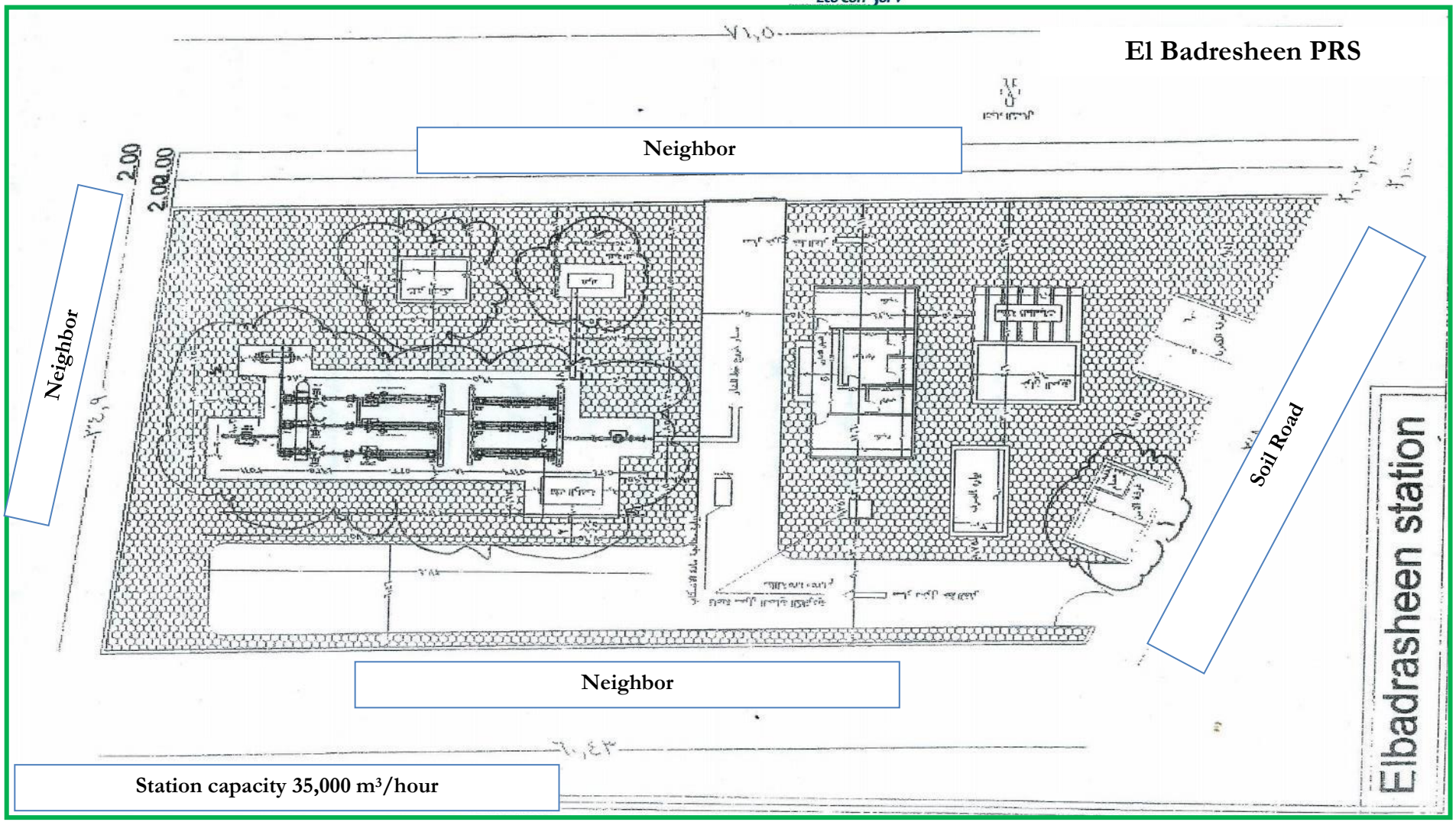

Figure 2-10: The proposed layout of El Badresheen new PRS.

2.4.5 Construction works for the Offtake and HP pipeline

The 300-meter High-Pressure pipeline will pass through a state-owned land to connect the offtake with the proposed PRS. The offtake location is remotely located, away from any residential areas. Therefore, no lands were needed for the access to high pressure pipeline. Thus OP 4.12 is not be applicable to El Badresheen HP pipeline. Hence, no RAPs are needed.

Construction activities of the HP pipeline include excavation, pipeline placement, pipeline connection welding and then surfacing. The construction activities will be located within the allocated site. The duration of the construction of the pipeline will be about 1 month. Other construction activities include:

- Clearing and grading activities and pipe transportation and storage
- Site preparation
- Excavation
- Pipe laying
- Welding
- Backfilling and road repair
- Leakage testing

The construction of the HP pipeline will temporarily involve roads. The main roads will be used on a temporary basis to transport personnel, equipment and material to the project site

Clearing and grading activities and pipe transportation and storage

The first step of construction includes flagging the locations of the approved access route of the pipeline; installing a temporary workshop for the crew; erecting fences surrounding the working areas: and land clearing. Grading is conducted where necessary to provide a reasonably leveled work surface. Additionally, equipment and piping will be transported to the site and stored at a temporary storage area along the pipeline route and will not left more than one day in the construction location. Quality control procedures during the transportation and handling of pipes should take place to ensure protection from any effects that may damage the pipes, and prevent any traffic accidents.

Site preparation

Before any excavation activities, Town Gas shall coordinate with the different authorities to determine the existing infrastructure in the project's area (e.g. water lines, sewage lines, electrical cables and telecommunication lines) so as to avoid any undue damage. In case of lacking sufficient information on the available infrastructure, inspections on the presence of underground utilities will be carried out by drilling exploratory drills and/or using utility detection devices. Pipeline routes are then identified and marked in the field.

Excavation

Pipe laying of the high-pressure line in El Badresheen will not involve main crossings (e.g., railways or water bodies), therefore, the excavation technique applied will be open cut. Trenches for steel high pressure pipes will be excavated at depths of 1.2 m. The diameter of the steel-HP pipelines is 12 inches. Manual excavation can only take place until 2-meter depth. The mechanical trencher also removes broken asphalt and the base stone layer. In case the jack hammer is used, road layers are then removed by an excavator.

The road base soil, underneath asphalt and stones, is then excavated either by a backhoe excavator or by manual excavation.

Excavated soils, broken asphalt and other waste materials during excavation are loaded onto trucks, which are transferred to disposal areas. Because of the limited available space on most Egyptian streets, loading waste trucks shall be done upon excavation, whenever possible, in order to avoid stockpiling waste on site.

Pipe laying

Before pipe laying, the bottom of the trench is cleaned of any rocks or solid objects which may damage the pipes. In some cases, where the ground water is shallow, the trench should be dewatered before pipe laying. Dewatering pumps typically discharge into a drain or sewer manhole, according to arrangements with local authorities. To conserve water, if dewatered water is free of perceivable pollution, it will be- to the extent possible- used on- or around the work site or discharged into the nearest canal to be used for irrigation.

Welding

Arc welding is used with HP steel pipes. Steel pipes are protected from corrosion by isolating coats, and by fixing an anode for cathodic protection. For long segments of the steel-HP pipelines, the impressed current protection system is employed with the aid of electrical components such as transformers. Once the trench is excavated and cleared, the pipe stretch shall be laid down.

Backfill and road repair:

After laying and welding works, the trench containing the HP pipe is backfilled with sand either by a front loader or manually. The trench will be backfilled immediately after the pipeline has been laid considering that the finished backfilling level will be the same as the road level. The initial backfill will be to a minimum height 20 cm of fine sieved sand either by a front loader or manually to protect the pipeline. The backfill will be then compacted by wet sand layers of 15 cm thickness in order to avoid

road settlements and subsequent cracks. Natural gas pipes are surrounded by sand in order to absorb loads from the road.

A yellow warning tape marked "Natural Gas" is placed on top of the sand layer.

In some cases, if the street width is not enough to fulfill the proximity required in standards for safety to sustain pressure, an inverted U-shaped reinforced concrete slab is constructed around the pipeline after laying in order to improve shock resistance.

Upon completing the backfilling works, the contractor will proceed to restore the road surface to its original status.

Hydrostatic leakage testing

Following construction activities, the piping will be tested to locate possible leaks using hydrostatic testing, which consists of filling pipes with water and then pressurizing to 1.5 times the operating pressure and measuring the pressure at different locations. Pressure drop indicates leakage. The water is then drained. This drainage takes place by the "pigging process", which includes forcing an object, the "pig", through the pipe by liquid or air pressure to totally drain the line before NG is fed.

In order to prevent deformation, dislocation, and rupture of the pipes, leakage testing through pressurization is performed after backfilling the excavation under (10 cm), around (10 cm), and above the pipes (20 cm, at least).

2.5 Operation phase

2.5.1 Operation of the PRS

Operation of the PRS involves operation of the various components outlined in the construction phase as shown in **(Figure 2-2)**. Risks associated with those activities are further addressed separately in a Quantitative Risk Assessment (QRA) **(Annex-4)** and all its outputs will be adhered, and the Emergency Response Plan (ERP) will be updated if necessary.

Inlet ball Valves

The inlet valve includes an insulation joint to completely isolate the PRS inlet from the cathodic system applied to the feeding steel. Insulation joints isolate the PRS as measure of protection during strikes and current.

Filtration unit

The filtration unit consists of two main stages, a liquid filtration stage and a solid filtration stage. The aim of the filtration unit is to remove dust, rust, solid contaminants and liquid traces before entering into the reduction stage. Two filters and two separators are installed in parallel; each filter-separator operates with the full capacity of the PRS to separate condensates and liquid traces. The solid filtration

unit is designed to separate particulate matter larger than 5 microns. Filter-separator lines are equipped with safety devices such as differential pressure gauges, relief valves, liquid indicators, etc.

Heating unit/Water Bath Heater

This unit ensures that inlet gas to the reduction unit enters with a suitable temperature (the temperature of gas flow entering the station should be 15 °C; and to avoid the formation of natural gas water hydrates in the line downstream of the choke or regulator (due to Joule Thompson effect). Temperature increases by heat exchange between gas pipeline pass through the heating unit filled with hot water. The unit was designed to be heated to 60 °C; while the heating temperatures for the outlet flow gas ranges between 35 °C and 45 °C.

The heating unit comprise of the following components:

- Heater body/shell
- Process gas inlet/outlet
- Water Expansion tank
- Burner, Gas Train & BMS Panel
- Removable Fire tube
- Exhaust stack
- Heating medium (Water Bath)

The PRS is equipped with two heaters in parallel (one of them being on standby in case of emergencies).

Reduction

The PRS includes two reduction lines in parallel (one of them being on standby in case of emergencies). The lines are equipped with safety gauges, indicators and transmitters to maintain safe operating conditions. According to the IGEM standards, the reduction unit should be installed in a well-ventilated closed area or, alternatively, in an open protected area.

Active and Monitor Regulator

The active regulator controls the outlet pressure while the monitor regulator assume control in the event of failure of the active device.

Slam Shut Valve

The purpose of Slam shut is to totally, automatically and rapidly cut off gas flow when the outlet pressure exceeds or drops below the setting pressure. The valve has to be installed to protect the system. The safety valve has to be sized for the maximum gas flow with the highest pressure that could be provided to the pressure reducing valve.

Measuring Unit

After adjusting the outlet pressure, gas flow and cumulative consumption are then measured to monitor NG consumption from the PRS and to adjust the dosing of the odorant indicated in the subsection below.

Odorizing Unit

Natural gas is generally odorless. The objective of odorizing is to enable the detection of gas leaks at low concentration, before gas concentrations become hazardous. The odorant is composed of Tertiobutylmercaptin (80%) and Methylsulphide (20%). The normal dosing rate of the odorant is 10-20 mg/cm^3. The odorant system consists of a stainless-steel storage tank, which receives the odorant from 200-liter drums, injection pumps, and associated safety devices.

Outlet unit

The outlet unit includes an outlet valve gauge, temperature indicators, pressure and temperature transmitters and non-return valves. The outlet pipes are also, like inlet pipes, isolated from the cathodic protection by an isolating joint. Please refer to **Figure 2-2**

2.5.2 Operation for the Offtake and HP pipeline

The main activities during the operation phase are the monitoring of the main offtake valve and the routine checking for the occurrence of gas leaks.

SCADA (Supervisory Control and Data Acquisition System):

GASCO is working with SCADA, a highly sophisticated integrated system used to control the national natural gas pipeline network. The SCADA system performs remote controlling of the valve rooms to adjust the operating pressure, and if necessary change the flow of natural gas by bypassing the main route. The SCADA system can also detect natural gas leakage if a pressure drop was observed in a certain pipeline. The SCADA system is connected to a fiber optics system installed in the pipelines.

2.6 Resources consumption

2.6.1 During Construction

Water:

Water is mainly used during the construction phase by the workers and engineers. There is a permanent source of water from Egyptian Holding Company for Drinking Water and Sanitation

Water is mainly used during the construction phase in concrete preparation and domestic uses by the workers and engineers. Water for construction is sourced from trucks. Bottled water will be used for drinking purposes. The expected amount of water to be used during the construction phase of this project is:

- Domestic uses by the workers and engineers: about 5 m^3/day
- Construction activities including hydrostatic testing: about 21.9 m^3

Fuel:

Diesel fuel will be mainly used for:

- Diesel generators that supplies electricity to the construction activities including welding.
- Trucks and excavators fuel
- The expected amount of diesel fuel to be used in the construction phase of the PRS, Offtake and HP pipeline is about 60 liters per day. The fuel will be delivered to the construction site via trucks when needed

2.6.2 During operation

Water:

Water is mainly used during the operation phase in the firefighting storage tank as well as for domestic use by workers in the PRS and drinking water.

The water source will be determined during the construction phase: either the PRS will be connected to the public water network or water will be delivered by trucks.

Electricity

Electricity consumption during the operation phase is expected to be minimal which will be mainly consumed at the control room. The PRS will be supplied by electricity from the National electricity grid network existing in the area.

2.7 Waste Generation

All solid wastes generating during the construction phase will be managed and disposed in accordance with applicable regulations and established best management practices. All generating wastes will be reused and/or recycled to the maximum extent possible **(Table 7-2).**

2.7.1 During construction

Solid wastes

Solid waste generated during the construction phase will comprise of construction wastes, domestic wastes as following:

- Construction waste will consist mainly of left-over piping materials such as polyethylene pipes and carbon steel. The amount of waste is approximately 2% of the total amount of materials, which is collected by the Contractor and resold as scrap.

- Domestic waste will be generated by approximately 24 workers per day over a period of 9 months during the project construction activities. Workers will utilize public facilities provided by the village or city and use public resources (bins) to dispose of food waste, packaging materials etc.
- Excavated soil is used for backfilling. Small amounts of leftover soil may remain and are disposed of in legal dumpsites as per contract between the Contractor and the supplier

Hazardous wastes

Some hazardous wastes will comprise of construction wastes as paint containers, batteries, chemicals containers (solvents, lubricants, etc..) and used oils.

Liquid waste

Liquid waste will comprise mainly of domestic wastewater, vehicle/equipment wash down water and the hydrostatic test water. Domestic water is the only continuous source during construction. Workers during the construction phase will use the nearest public washroom or the Mosque's bathrooms, the hydrostatic test water will be sampled and analysed before selecting appropriate disposal method, if the results within the limits it will be discharged into a drain or sewer manhole with arrangements with local authorities and if not meet with the limits it will be collected in tanks and transported via a certified contractor to the nearest wastewater treatment station..

2.7.2 During operation

Solid waste

Solid waste generated from the PRS is expected to be minimal and limited to domestic waste and it will be collected regularly by trucks belonging to El Badresheen local units.

Hazardous waste

Mainly empty odorant containers and filters- will be treated on-site, transported (using certified hazardous waste vehicles and personnel) to the Town Gas storage facility in Abu Rawash (Giza) for final disposal at the UNICO hazardous waste facility near Alexandria.

Wastewater

the only wastewater source is domestic wastewater. Wastewater will be collected in a septic tank. The septic tank will be emptied by trucks and disposed of at an authorized wastewater treatment facility. There is a possibility that the site be connected to the municipal sanitary network in the future.

3. Legislative and Regulatory Framework

3.1 Applicable Environmental and Social Legislation in Egypt

- Law 217/1980 for Natural Gas.
- Law 4 for Year 1994 for the environmental protection, amended by Law 9/2009 and law 105 for the year 2015 and its Executive Regulation(ER) No 338 for Year 1995 and the amended regulation No 1741 for Year 2005, amended with Prime Ministerial Decree No 1095/2011, prime ministerial decree No 710/2012, Prime Ministerial Decree No 964/2015, Prime Ministerial Decree No 26/2016 and Prime Ministerial Decree No 618 & 1963/2017
    - EEAA guidelines on ESIAs preparation
    - EGAS HSE guidelines, LDCs will comply with EGAS HSE Guidelines which work as regulation on PRS construction and operation (provided in **Annex-5** from the report)
- Law 38/1967 for General Cleanliness
- Law 93/1962 for Wastewater
- Traffic planning and diversions
    - Traffic Law 66/1973, amended by Law 121/2008 and Law 142/2014.
    - 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

3.2 World Bank Safeguard Policies[2]

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 4.11 will not be applicable to the land obtained in El Badresheen PRS as no cultural resources located in the project area. With regards to OP/BP 4.12, it will not be applicable to the land obtained in El Badresheen as the process of obtaining the land for the pressure reduction station was based on mutual consent between the seller and buyer with no encroachment (willing buyer willing seller approach).

[2] https://policies.worldbank.org/sites/ppf3/PPFDocuments/Forms/DispPage.aspx?docid=3694

3.2.1 World Bank Group General Environmental, Health, and Safety Guidelines[3] & WBG Environmental, Health and Safety Guidelines for Gas Distribution Systems[4]

The General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines, which provide guidance to users on EHS issues in specific industry sectors. Gaps between requirements outlined by WBG guidelines and the Egyptian Law 4/1994 for Environment protection and the LDCs EHS guidelines have been analyzed. There are no significant differences between the requirements outlined by the WBG EHS GUIDELINE on GAS DISTRIBUTION SYSTEMS and the management and monitoring actions outlined by the ESIA.

In addition to the above-mentioned safeguards policies, the Directive and Procedure on Access to Information[5] will be followed by the Project.

3.3 Permits Required

- Approval from the ministry of Agriculture to construct the PRS on agriculture land in accordance with the presidential decree number 615 of year 2016.
- Army forces permit to construct the PRS.
- Constructions permit to be obtained from the local Governmental unit in El Badresheen – Giza Governorate.
- Environmental permit: according to Egyptian Law for the Environment, Law 4/1994 amended by Law 9/2009. EEAA approval on ESIA is considered the environmental permit.
- Utility installation permission to the PRS (after construction phase)

[3] https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES

[4] https://www.ifc.org/wps/wcm/connect/9c6e3d0048855ade8754d76a6515bb18/Final%2B-%2BGas%2BDistribution%2BSystems.pdf?MOD=AJPERES&id=1323162128496

[5] https://policies.worldbank.org/sites/ppf3/PPFDocuments/Forms/DispPage.aspx?docid=3694

4. Environmental and Social Baseline

4.1 Description of the Environment

El Badresheen city is located in El Badresheen Markaz and affiliated to Giza Governorate, which is located south the Nile delta in Egypt, about 21.6 km from Cairo, bordered from north by El_Hawamdeya city and from north west by Azizia village and from west by Meet Rahina district and from south by Al Maraziq district and from south east by Tarfaya district. (**Figure 4-1**)

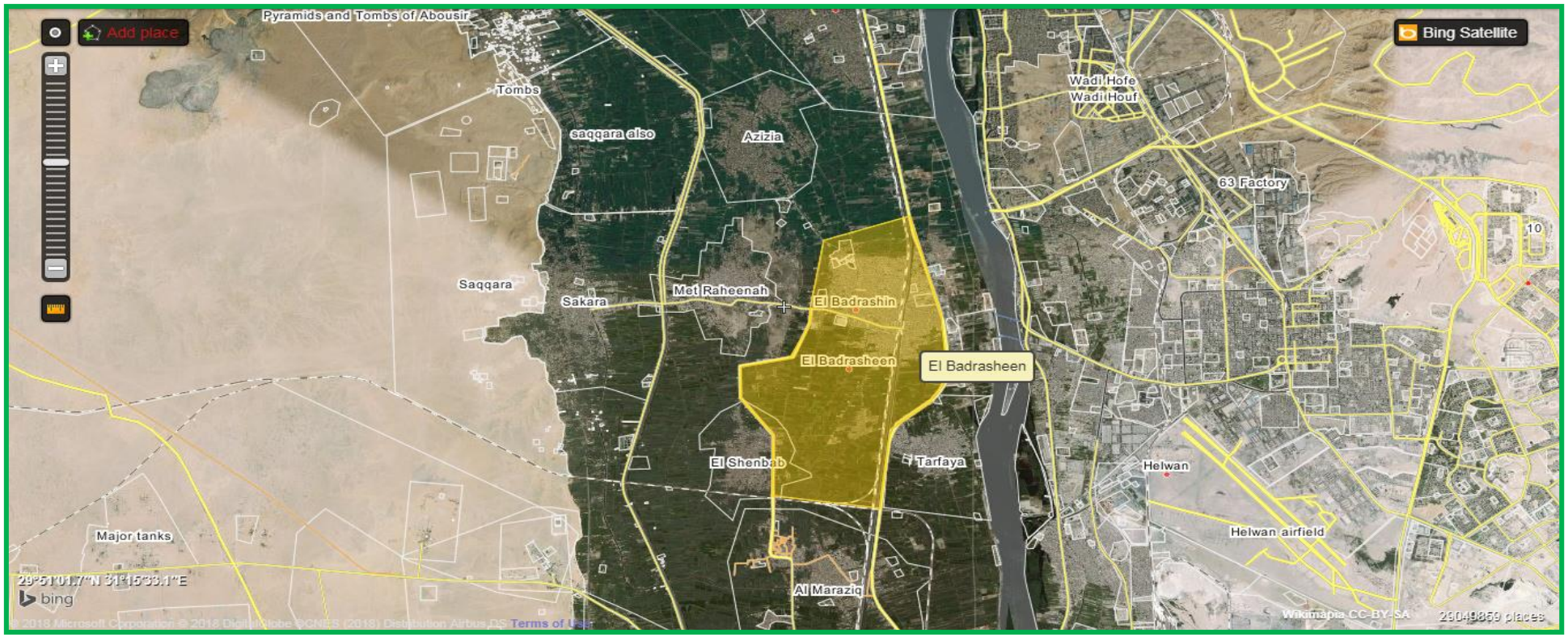

Figure 4-1: Distribution of cities in Giza governorate

The proposed project aiming to construct PRS in El Badresheen district (Markaz El Badresheen) within Giza Governorate.

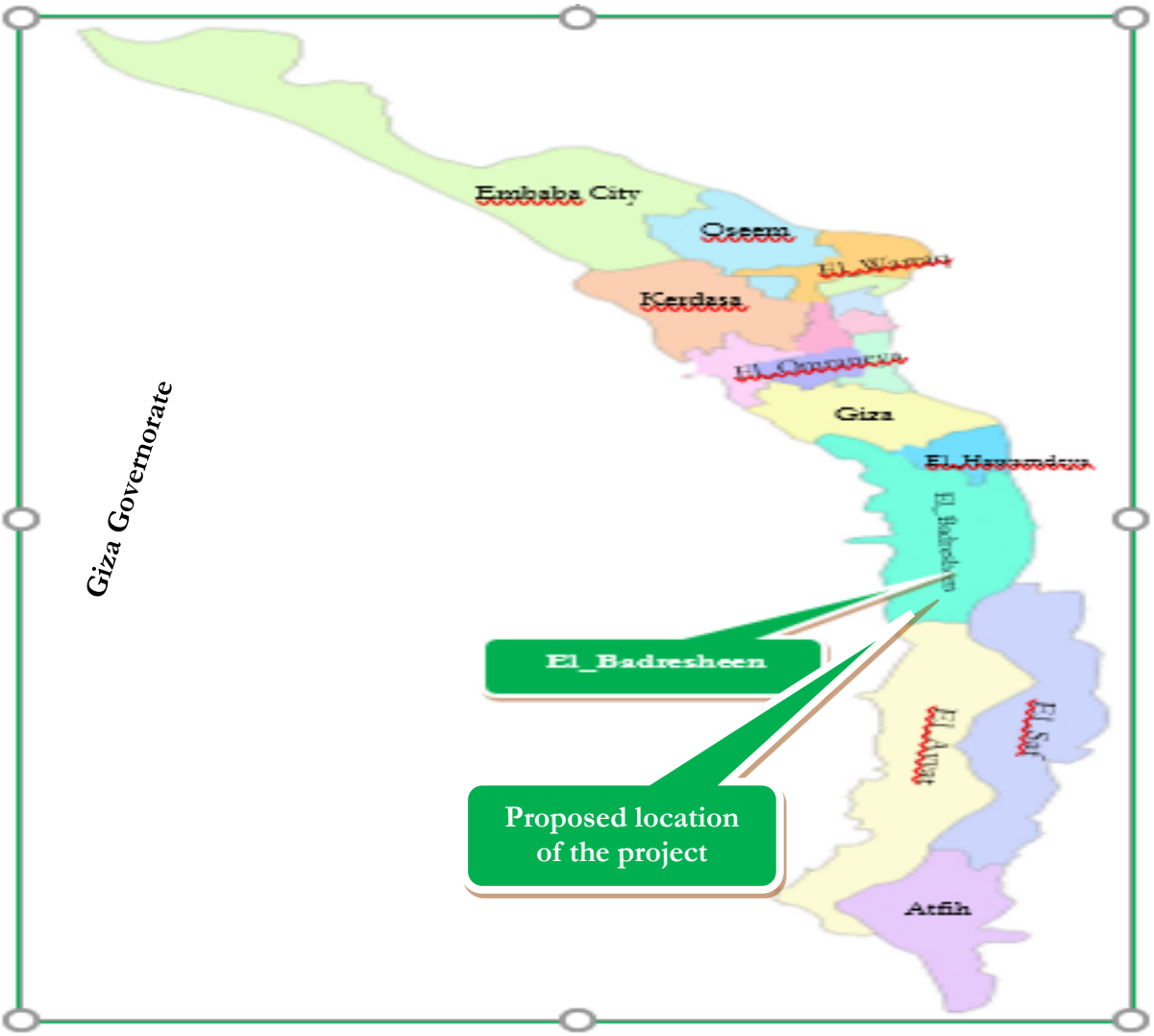

Figure 4-2: A layout showing the location of El Badresheen PRS.

4.1.1 Air Quality

4.1.1.1 Site Specific Ambient Air Quality:

The selection of the active air measurement location is based on the nature of the surrounding activities, the location of the nearest receptors with respect to the project plots, prevailing wind direction, site topography and the future layout of the proposed project components. Moreover, the selection is based on the guidelines stated in the American Society for Testing Materials (ASTM) reference method.

The measurement location was chosen on the basis that it is beside a main road and close to the PRS location.

One-hour average results for 8 hours' continuous measurements were conducted for pollutants of primary concerns, namely, carbon monoxide (CO), nitrogen oxides (NO_x), sulfur dioxide (SO_2), Total Suspended Particulates (T.S.P) and particulate matter (PM10).

Methodology, instrumentation and results of Ambient Air Quality are detailed in Annex-6 attached to this report

Results of ambient air quality measurements:

The concentrations of measured air pollutants in the studied areas are below national and WBG guidelines. All the measurements for the gaseous pollutants are complying with the maximum allowable limits according to law 4/1994 for Environment protection and its amendments by law No.9/2009 and the executive regulation issued in 1995 and its amendments no. 710 in 2012 and 618 in April 2017". Accordingly, the ambient air quality in the project areas is one of the tolerable areas in Egypt in terms of ambient air quality, which can be attributed to the absence of any major industrial sources.

Construction engines are certified, i.e., exhaust is below permissible levels. Ambient concentrations of gaseous pollutants, NOx, SOx and CO are unlikely to surpass permissible levels due to operation of construction equipment. Management and mitigation plans for ambient air pollution are further addressed in chapters 6 and 7. During the construction phase, excavation and construction activities will likely cause dust levels to surpass permissible levels at the construction areas. The duration of permissible levels being surpassed will be intermittent for the duration of the workday i.e., 8-10 hours. Management and mitigation plans for dust concentration beyond permissible levels are further addressed in chapter 7.

4.1.2 Noise

4.1.2.1 Site specific noise measurements

One-hour average results for 8 hours continuous measurements were conducted for noise level measurements in the same location of the ambient air quality measurements.

Methodology, instrumentation and results of Noise measurements detailed in Annex-6

Results of noise measurements

The noise measurements in the studied areas are below national and WBG guidelines. They are complying with the maximum allowable limits according to law 4/1994 for Environment protection and its amendments. The excavation and construction activities may cause noise levels to surpass permissible levels at the site. The duration of permissible levels being surpassed will be intermittent for the duration of the workday i.e., 8-10 hours Management and mitigation plans for noise levels beyond permissible levels are further addressed in chapter 7.

4.1.3 Climate

The average annual temperature is 21.5 °C and the average annual rainfall is 1.9 mm

4.1.4 Water resources

Groundwater

No Groundwater is anticipated in the project proposed location.

Surface water:

El Badresheen PRS is located about 0.2 km West Nile River which represents the main freshwater stream, the Nile River extends northwards from El Badresheen for about 48 km to split into Rosetta and Damietta branches which extends about 236 km and 242 km respectively to boundary of the Nile Delta.

There are six fresh water canals starting from the boundary of Atfih Markaz in the south to Monshaat Al Qanater Markaz in the north by total length of 123 km, as follows:

1. Giza canal supply about 498.8 million cubic meter/year
2. Al Ibrahimeya canal supply about 43.9 million cubic meter/year
3. Al Korayemat irrigation Station supply about 198.92 million cubic meter/year
4. Al Lithy irrigation Station supply about 151.89 million cubic meter/year
5. Al Rayah El Bahary canal supply about 56 million cubic meter/year
6. Al Rayah Al Nasery canal supply about 28 million cubic meter/year

4.1.5 Terrestrial Biological Environment:

The current land use for the location of the PRS is for agricultural purposes. Therefore, it is a modified habitat and has no ecological importance, the project area is eventually free from any endangered species as shown in **Figures 4-4 and 4-5**.

Flora

There had not been flora recorded in the studied areas except some cultivated species such as Dates palms (Phoenix dactylifera) and Mango trees (Mangifcra indica).

Dates palms *(Phoenix dactylifera)*	**Mango trees** *(Mangifcra indica)*
	

Figure 4-3: Shows flora at Study area.

Fauna

Dragonfly (*Anisoptera*)	Cattle Egret (*Bubulcus ibis*)
	

Figure 4-4: Shows fauna at study area

In conclusion, the project area is eventually free from any endangered species.

4.1.6 Waste Management:

Solid Waste:

The responsibility of service planning, delivery and monitoring in Al Giza Governorate is delegated to Cleansing and Beatification Agency managed by Presidency of the City Council.

In most cases, the proportion of waste collected in a transfer station by small trucks then transferred to dump site (Shoubramant dumpsite).

Figure 4-5: Shows Shoubramant dumpsite.

Liquid Waste:

The project location within El Badresheen district is well covered by public sanitation network which take all the municipal sewage to be treated in El Badresheen sewage treatment plant.

People in the streets can use available public sanitary facilities which can be located within the existing mosques, restaurants or any public coffee shops.

Hazardous Waste:

There are no hazardous wastes site within El Badresheen district, any hazardous Waste generated within El Badresheen will be Temporarily stored in isolated area (in the generated site) and will be transported- by licensed hazardous waste handling vehicles and personnel for final disposal at a licensed hazardous waste facility (Nassreya or UNICO in Alexandria).

4.1.7 Traffic Profile

El Badresheen congested with pickup truck, TukTuk, carriage pulled by donkeys, bicycles, motorcycles are the most used of transport. TukTuks made traffic conditions in the village worse as they pass in small alleys and in narrow streets. The traffic is congested between 8 a.m. – 11 a.m. and 2 p.m. – 6 p.m. (during winter season). The traffic around the PRS and along the HP pipeline route is relatively low.

Types of roads close to PRS

Urban Road

The main road closest to the PRS area Tarrad EL Neel road.

Figure 4-6: Shows Tarrad EL Neel road

4.2 Socioeconomic Baseline

The Social Impact Assessment (SIA) study is carried out through a combination of desktop and field survey in order to fully describe the social baseline of the Project area. The main methodology for the SIA is semi-quantitative assessment to convey accurate and relevant information for the project area. There has been substantial data gathering on socioeconomic conditions in the area. A number of visits to the project site were conducted during November 2018. SIA tools were employed during the field trip including observation and interviews with local officials, community leaders, local administrative units, LPG warehouse, local health units, and NGOs. El Badresheen district is located in Giza Governorate and it is very near to Cairo (about 21.6 Km to the south). The total area El Badresheen is 111 km^2 with a total population of 537133 people.

4.2.1 Administrative affiliation

El Badresheen District is administratively affiliated to Giza governorate. According to the local Information Center of El Badresheen district, it is subdivided into six main Local Governmental Units serving 18 villages, in addition to El Badresheen City.

4.2.2 Urbanization Trends

El Badresheen district is considered as a semi-urbanized area. According to the LGU in El Badresheen, the percentage of individuals living in apartments and modern houses is nearly 98%, while individuals living in rural houses represent only 2%. There are few villages surrounding the City, according to the findings of the field research team.

4.2.3 Demographic Characteristics

- **Total Population**

According to the (CAPMAS) data 2017, the total population number of El Badresheen district and its villages is 537.1 thousand people; the majority of residents in El Badresheen district live in rural areas representing about 84% of the total population, as opposed to 16% live in urban areas (El Badresheen city).

Table 4-3 shows the total population in El Badresheen district and its villages. The population average annual growth rate is 2%. The total female represents about 48% of the total population number living in El Badresheen.

Table 4-2: Population of El Badresheen District[6]

City/Village	Male	Female	Total	Percentage of Female (%)
El Badresheen City (urban area)	43804	42141	85945	49
El Badresheen villages (rural areas)	235145	216043	451188	48
Total	278949	258184	537133	48%

4.2.4 Living Condition

- **Household Size and Density**

A household is defined as "Family (and non-family) members who share residence and livelihood, and operate as one social and economic unit". The average family size in El Badresheen district is about 4.1 individuals, according to the recent figures of CAPMAS, 2017, while the average size of households in Giza Governorate stands around 4 individuals on average.

- **Dwelling characteristics**

The predominant majority of the people of El Badresheen district live in modern houses (apartments). The conditions and characteristics of urban houses are in compliance with the bases and preconditions for connecting NG. Almost all of urban houses are built with concrete and red bricks. The majority of buildings in El Badresheen district is ranged between 2 to 6 stories high. With regard to the legal status of buildings; all buildings and neighborhoods are mostly legal, and some illegal or unplanned neighborhoods were documented by the research team. Regarding the condition of the streets in El Badresheen district, the average width of main streets range between (2 to 3) lanes wide, and side streets range between (1 to 2) lanes wide. Despite the modest conditions and maintenance of the asphalt, they are mostly paved out and convenient for NG installations. Figure 4-8: Picture showing Building and Streets Condition in El_Badresheen District

[6] Source: CAPMAS Data, 2017.

4.2.5 Access to the Basic Services

- **Access to Electricity**

Accessibility to Electricity network is widespread in El Badresheen district and its villages, as nearly 100% of individuals have access to the public electricity network, according to the (LGU) in El Badresheen district

- **Access to potable water and sanitary system**

Accessibility to water network is widespread in El Badresheen and its villages, as 100% of individuals have access to the public water network, and have also tap water inside their houses. However, the coverage of the public sanitation network is very poor. Only 13% of the houses in El Badresheen and its villages has public sanitation network. This percentage is quite high in El Badresheen city (nearly 70% of the households have access to the public sanitation network. So connecting NG to El Badresheen city will be possible at the current stage.

4.2.6 Human development profile

Educational, human activities, poverty index, and income & expenditure should be highlighted in order to determine the current socioeconomic conditions of El Badresheen district.

- **Education**

According to the (CAPMAS) data 2017, the level of education is not very high in El Badresheen. The percentage of individuals who having university degrees is only about 6%, and the percentage of individuals who finalized their intermediate education is 21%. The illiteracy rate tends to be high in El Badresheen (37.7 %). There is a significant gap between the illiteracy rate of males and females, as females' illiteracy rate is very high (45 %) while it is only 31% between males. The education level -especially the percentage of illiterate- is very important to choose the suitable channels to share the information with the community.

- **Human activities in the Project Areas**

According to the data supported by the LGU in El Badresheen district, El Badresheen city is considered as a main commercial and industrial area. It has many industries such as furniture, carpets, oil & soap and clothes industries. In addition to the agriculture activities (which absorb a high percentage of the labor force). According to focus group discussions, most of the work forces of the surrounding villages come to El Badresheen city to work in the commercial business. So Connecting NG to the city will help so much for achieving the social and economic development plans, and participate strongly to raise the standard of living for the people.

- **Poverty, Income and Expenditure**

According to the CAPMAS Poverty Mapping, 2013, the percentage of poor people in El Badresheen is relatively high (53%), and the percentage of female-headed households is nearly 35%.

According to the Focus group discussions revealed that the average family expenditures range between 2500 to 3000 EGP per month. Most of the families are suffering of the high price of energy bills (both of electricity and LPG).

Male and female participants of the focus group discussions grumbled about the recent bulge in electricity bills which range between 150 to 250 EGP. More importantly, the cost of their consumption of LPG cylinders has increased after latest jump of the LPG price last July, 2018. The current formal price of LPG is 50 EGP, and the average LPG consumption is (1-3) cylinder/month for each household.

4.2.7 Unemployment Rate

In El Badresheen, the percentage of manpower that joined labor force at the age of 15 years old and above is 28%. The unemployment rate stands at about 12%. In the same respect, female employment figures show female unemployment rate at 24 %. The percentage of female workers who joined labor force at the age of 15 years old and above is 25%.

The formal Statistics obtained from the CAPMAS regarding manpower reflected that the age of starting work is 15 years old.7 Both the Child Law and the Labor Law state that children shall not be employed before they complete 14 years old, nor shall they be provided with training before they reach 12 years old; however children between 12 and 14 years old are permitted to work as trainees. Furthermore, the governor concerned in each governorate, in agreement with the Minister of Education may permit the employment of minors aged 12-14 years in seasonal work which is not harmful to their health and growth, and which does not conflict with regular school attendance. Consequently, there is always a high probability to detect child labor in most of the projects implemented in Egypt. In the project areas where agriculture work and sales activities are in place, there is a big number of underage laborers were noticed. As a conclusion, there is a high risk that the contractors might employ young people below 18 years old. Therefore, rigid restrictions to employ this category must be added to the contractor obligations.

4.2.8 Health Facilities

El Badresheen district has one public and central hospital, also there are several medical and health units at the surrounding villages, in addition to the private clinics. In addition to two family and child care medical units. Many participants of the focus group discussions and a number of government officials reported that the level of medical services, provided in El Badresheen, is poor in terms of quality and the availability of medication. Providing health facilities is very important

[7] Based on Labor law number 12 of year 2003 and The Child Law (No. 12, 1996). There are certain critical obligations to recruit children below 15 years old. Article 98-103 of Labor law put limitations related to age, type of occupation, hazards work…etc

to save the workers during accidents and emergency cases. All contractors are obliged (according to the signed agreements with LDC) to provide the necessary medical services to the workers. Also, Town Gas in the emergency cases provides the worker with all the required medical services.

4.2.9 Physical cultural Resources

The proposed PRS will be located within El Badresheen district, which characterized as agricultural land. These areas have been excavated before for agricultural purpose or installing other public utilities such as water, sanitary, sewage and electricity networks. For this reason, it is presumably less likely to chance find any artifacts or antiquities in the construction areas. Additionally, there are no identified archeological sites or sites with cultural or historical value, located within the project area, shall be affected by the PRS construction works, , however in case of any unanticipated archeological discoveries within the project areas; **Annex-7**, entitled 'Chance Find Procedure,' details the set of measures and procedures to be followed in such cases

5. Environmental and Social Impacts

The environmental and social impact assessment (ESIA) is a process used to identify and evaluate the significance of potential impacts on various environmental and social receptors as a result of planned activities during (construction and operation) phases of the Project. Furthermore, the 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 evaluation of the potential impacts on various receptors is based on a significance ranking process described in the following subsection. Details presented in **Annex-7**. attached to this report

5.1 Impact Assessment Methodology

To determine and assess the impacts of the project phases on environmental and social receptors, a semi-quantitative approach based on Leopold was first adopted. The impact of each activity on each receptor was assessed according to magnitude on a scale of -10 to 10, where negative values indicate a negative influence on the receptor, and importance on a scale of 0 to 10, which encompasses the probability of occurrence, frequency of the impact etc. The numbering system is used as a relative measure, where more negative numbers correspond to impacts having a higher negative magnitude. Susceptible receptors and corresponding activity are deduced and addressed if both magnitude and importance are of minor severity. The impact assessment methodology adopted for this ESIA is a "cause-effect" matrix modified from Leopold; and Buroz´s Relevant Integrated Criteria to evaluate the impacts. The environmental impact assessment methodology encompasses a semi-quantitative assessment that considers the following:

- Probability of the impacts
- Spatial and temporal scale
- Intensity of the impacts (which also considers the sensitivity of receptors, and the reversibility nature of the impact)

Each impact was identified considering:

- Type of impact: The negative or positive influence on the receptor.
- Magnitude: The extent of the impact within a scale (0-10)
- Significance: That includes the probability of occurrence, frequency, intensity of the impact, etc., within a scale (0-10)

The "cause-effect" matrix identifies the impacts during the mentioned phases, considering the elements of the environment and social context (receptor of the impact).

Table 5-1 Impact Assessment Methodology

Importance of Impact	Impact Rating	Color Code
0-25	**None** or irrelevant (no impact);	
26-50	**Minor** severity (minimal impact; restricted to the work site and immediate surroundings);	
51-75	**Medium** severity (larger scale impacts: local or regional; appropriate mitigation measures readily available);	
76-300	**Major** severity (Severe/long-term local/regional/global impacts; for negative impacts mitigation significant).	

Detailed impact assessments results presented in two tables in Annex-7.

5.2 Impacts during Construction

5.2.1 Positive impacts

5.2.1.1 Impacts related to employment

The project will result in positive impacts through the provision of job opportunities.

- **Provide direct job opportunities to skilled and semi-skilled laborers**

  The construction of the El Badresheen PRS and its HP pipeline expected to result in the creation of job opportunities, both directly and indirectly. Based on similar projects implemented recently by EGAS and Town Gas, the daily average number of workers during the peak time will be about 16 workers, being 14 Laborers and 2 supervisors. The workers can also include drivers, digging staff, technicians and welders. About half of them can be recruited from the local community.

- **Indirect benefits**

  As part of the construction stage, many indirect benefits 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. For example, the transportation of workers from Giza districts to El Badresheen will work for the benefit of car lease offices.

5.2.2 Negative Impacts

The process of environmental impact assessment during construction phase indicate that some receptors have irrelevant impacts in El Badresheen; those receptors include surface water, Ecological (fauna or flora), vulnerable structures and cultural vulnerable sites. The receptors which might be affected during the construction phase will be as follows:

5.2.2.1 Deterioration of soil quality

The excavation activities will result in the disturbance of soil characteristics and cause soil erosion and soil compaction as a result of heavy equipment take place. In addition, potential soil contamination may occur as a result of oil spills and leaks.

The PRS is located in a relatively small agriculture area (2275 m²) and its related HP pipeline will be extended along with the main roads in a relatively short distance (300 m).

The duration of the impact is expected to be short-term, with its spatial extent being limited to the boundaries of the Project site.

The impact on soil considered **Medium.**

5.2.2.2 Air Emissions

Construction of the PRS and the HP pipeline will include several activities such as excavation, concrete foundations, transportation of construction material and equipment, burial of cables and pipes, etc. Those activities in consequence are expected to emit air pollutants to the ambient air, however it will be conducted for short periods of time. The following air pollutants are foreseeable for most of the construction activities:

- Fugitive dust emissions (PM10, PM2.5)
- Exhaust from excavation equipment and heavy machinery (excavators, loaders, trucks) containing SOx, NOx, CO, VOCs, etc.

Dust emissions will slightly negatively impact ambient air quality, particularly during the initial phases of construction. The nearest residential area is about 840 m south west of the PRS site and no residential building was noticed on the HP pipeline route. Therefore, it is expected that the dust impact will be moderate slightly impact the surrounding area (agriculture land). Soil characteristic at PRS site is mainly hard soil. In addition, Tarrad El Neel road (20 m away) already paved.

Emissions of CO2, CO and PM will result from the operation of the construction machinery and road vehicles during construction of the PRS and the HP pipeline. Air pollutants emitted from construction machinery are generally temporary (during the working activities). The intensity of work activities and the number of vehicles traveling onsite would be relatively low for all tasks. The emissions will be mostly limited to the construction phase and therefore are temporary.

Therefore the impact is assessed as **Minor**

5.2.2.3 Noise

Construction of the PRS and the installation of the high-pressure pipeline will require using various construction equipment, vehicle, etc. in addition to the other activities that generate noise. These tools signify potential major sources of noise emissions that will have an impact on receptors.

The potential people groups who are susceptible to the construction noise during the construction of the El Badresheen PRS are the following:

- Onsite workers and neighbor farmers
- The residences

It is worth mentioning that the proposed PRS site and the HP pipeline located about 850 m from Al-Shobak Al-Gharbi village (the nearest residential area), about 20 m from Tarrad El Neel road, where the noise baseline is relatively high but does not exceed the national and international standards. Construction activities may increase the already existing baseline ambient noise. However, increased noise emissions are anticipated to be for a short duration of time.

The main sources of noise and vibration during the PRS construction are the operation of the construction equipment and machinery such as diggers, cranes, loaders; farmers in the nearby agriculture land and worker are the main receptor.

Regarding the Construction of the PRS and the installation of the high-pressure pipeline it is expected that the generated noise will mainly have an impact on workers and Neighbor farmers.

The impact of construction on workers and neighbor farmers is assessed as **Medium**
The impact of construction on the residences is assessed as **Minor**

5.2.2.4 Impact on worker health and safety

Potential health and safety impacts are expected to workers during construction of the El Badresheen PRS and its HP pipeline, in general, are the same as those associated with any construction project involving earthmoving, use of large equipment, transportation of overweight and oversized materials, working in trenches, and construction and installation of facilities, in addition to exposure to infectious diseases (e.g.: COVID-19 infection).

The occupational health and safety impacts is assessed as **Medium**

5.2.2.5 Temporary Labor Influx

Generally speaking, having workers in small cities might result in unfavorable impacts on the available resources (e.g. pressure on accommodation, food, health care and medication and potable source of water). It may also result in inconvenience to the local communities, particularly in the areas where communities are conservative or not accustomed to having outsiders. Given the fact that only limited number of workers exist in each of the location during working hours, portion of those workers are local workers and that the LDCs are imposing rules and code of conduct on the contractors to ensure good behaviors and limit any potential conflict with the communities.

The impacts related to Labor Influx will be **Medium**.

5.2.2.6 Child Labor

As mentioned in the baseline, child Labor is a common practice in the project communities in the project areas. Children below 18 works almost in all projects as they receive low salaries and they are less demanding. This risk should be carefully handled in the ESMP and strict obligations and monitoring should be applied in the contractor obligations.

Child Labor risk is assessed as **Low -Medium**

5.2.2.7 Inappropriate waste management

Normal construction non-hazardous solid wastes include scrap concrete, steel, bricks, packaging waste, used drums, wood, scrap metal, welding belt, building rubble and HP pipeline hydrostatic test water will be generated. Domestic wastes by construction Labors, including sewage and garbage collected from the Labors onsite will be also generated. if those wastes not disposed to adequate sites, it will lead to a negative environmental impact.

Solid hazardous waste generated is likely to include empty containers, spent welding materials, solvents, paints or adhesives, and other hazardous waste resulting from operation and maintenance of the equipment and vehicles, i.e. spent oils, spent lube, waste oil filters, batteries, etc. Among the hazardous wastes also are the wasted or faulted materials.

Adverse impacts on the environment from the possible improper disposal of the solid wastes and hazardous waste.

Therefore, impact is assessed **Medium**

5.2.2.8 Traffic impact

The greatest potential for traffic impacts to occur arises during the short period where construction works peak (transportation of raw materials, equipment, and foundation materials). The traffic flow that will be created during the construction period will to some extent depend on which type and number of trips to and from the proposed site. Additional activities, such as entering and exiting the site will not have significant impacts on the road (Tarrad El Neel road) which has a low traffic. Based on observation during the site visits, it is predicted that during transportation of the equipment and raw materials, only one lane will be used by the trolleys and the movement of one trip will not last more than 8 hours (during the midnight – morning).

Therefore, impact on traffic in the project site is assessed **Minor**

5.2.2.9 Impact on ground water

Ground water may be impacted in case of improper disposal of sanitary wastewater, construction wastes or debris (generated from activities like ditching, and excavation). Generated sanitary wastewater, as well as water resulting from the HP pipeline hydrostatic test (if not meet with the limits to be discharged into a drain or sewer manhole) or dewatering activities (if existing) during

excavation, will be collected in tanks, analyzed and transported via a certified contractor to the nearest wastewater treatment station.

Therefore, the impact is assessed **Minor**

5.2.2.10 Community health and safety

Impacts on community health and safety can result from emissions of gaseous pollutants, dust, increased background noise levels, uncontrolled dumping of construction waste, accidental falls in temporary excavated trenches and accidental contact with equipment etc.

Taking into consideration that the PRS planned to be located about 850 meters of the nearest residential area (Al-Shobak Al-Gharbi village) and no residential building was noticed on the HP pipeline route which is planned to be along existing roads in the project area, we will find that the above-mentioned impacts will be greatly minimized.

Therefore, the impact is assessed **Minor**

5.2.2.11 Land related impact

The PRS needed a plot of 2275 m^2 (approximately 13 Qirats). The plot of land obtained in accordance to a willing buyer willing seller approach as mentioned in (2.4.2 land acquisition for PRS). EGAS procedures for land acquisition was adopted to choose one plot of all alternatives lands. A survey for market price was conducted by LDC and EGAS social officers. The average price ranged between 100 – 120 thousand EGP/Qirate in the surrounding area. Consultation meetings also reflected the future expectation of the land owners in this area that the land could be used in the near future for construction of buildings that is of more value than the current land status (agricultural).

Based on the cost estimation analysis carried out by the LDC, and after the negotiations with the land owners, the land was purchased at a total cost of 2,665,000 EGP (approximately 205 Thousand EGP/ Qirate). (For further elaboration **Annex-3** is a summary of El Badresheen PRS land acquisition process) also land related documents are attached in **Annex-8** to this report.

HP pipeline with a total length of 300 meter only will passing through the main road (state owned lands) with no encroachment. Therefore, no lands will be needed for access to the HP pipeline.

Therefore, the impact is assessed **Minor**

5.3 Impacts during Operation

5.3.1 Positive impacts

5.3.1.1 Impacts related to employment

The project may result in the creation of job opportunities during the operation phase.

Provide direct job opportunities to skilled and semi-skilled laborers

The operation of El Badresheen PRS and HP pipeline expected to result in the creation of job opportunities, the average number of workers during operation of the El Badresheen PRS will be about 12 workers in two shifts (6 workers/ shift) from the permanent workers of the LDC; 4 technicians, 2 engineers and 6 security staff. In addition to that, 4 police staff will be security permanently to guard the PRS. With regards to health and safety, one person will be assigned from the staff of Town Gas.

5.3.2 Negative impacts

Various impacts assessed in accordance to the impact assessment methodology. The project relevant impacts will be as follows:

5.3.2.1 Impact on worker health and safety

Possible impacts to health and safety during operations include exposures odorant release, gas leak, fire, noise and accidental injury to workers. In addition; health and safety issues include exposures to infectious diseases (e.g.: COVID-19 infection), working around energized equipment, and possible contact with natural hazards. However, during the operation and maintenance phase, if there is any incident or emergency situation, the impact will negatively endanger the surrounding community and establishment.

Odorant handling is part of the operation of the PRS. An odorant is added to the NG in order to enable detection upon leakage. The odorant containing Tertiobutylmercaptin (80%) and Methylehylsulphide (20%) is classified as a hazardous substance.

Odorant leak can result from improper handling of the odorant includes: Storage in unsafe conditions, in terms of occupational health and safety. In case of emergency, the risk resulting from odorant release or gas leak will be managed by El Badresheen PRS's emergency response plan.

Therefore the impact is assessed as **Medium**

5.3.2.2 Hazardous and non- hazardous waste management

During operation and maintenance of the PRS, besides industrial hazardous (odorant containers) and non-hazardous waste, small quantities of domestic waste (solid and liquid waste) will be generated. Industrial hazardous waste is likely to be generated during routine operations (e.g., lubricating oils, odorant containers, chemical containers). These wastes are typically stored temporarily, and transported by a licensed contractor to an appropriate permitted off-site disposal facility as a standard practice, according to EEAA regulations for hazardous waste management.

Therefore the impact is assessed as **Medium**

5.3.2.3 Noise impact

The pressure reducers normally cause noise generated from the reducers' pipes. Maximum noise level expected from the reducers is 80 db. The generated noise is constant (not intermittent). Assuming ambient noise levels are complying with WBG/IFC requirements and Law 4/1994-

9/2009- 105/2015 standards for low noise residential areas, a 20-meter buffer distance kept between the reducers and the PRS fences should lead to minimal impact outside the PRS borders. Additionally, the PRS is located 20 m far from the main road.

Therefore, the impact is assessed as **Minor**

5.4 Impacts during Accidental Events (Operation Phase)

Regarding to the Quantitative Risk Assessment Study (QRA), which demonstrate on the following hazards:

- Gas Release
- Fires (Heat Radiation)
- Explosion (Overpressure Waves)
- Suffocation (Odorant Leak)

And referring to the risk calculations determined in El Badresheen QRA study, the individual risk level to the exposed workers / public based on the risk tolerability criterion have been identified in Acceptable region (Lower Tolerability Limit[8]) region. So there are some points (Study Recommendations) need to be considered to keep the risk tolerability, and this will be describe under item (7.4) (for more details refer to the QRA Study under **Annex-4**)

[8] ***Lower Tolerability Limit***

Which the risks are broadly tolerable to society and comparable to everyday risks faced by the public. If the overall risk is below the Lower Tolerability Limit, the ALARP Assessment is likely to be straightforward and limited to ensuring compliance with Good Practice. Below the Lower Tolerability Limit, the principal risk management concern is the maintenance of existing risk reduction measures to avoid degradation.

Table 5-2 Impact Assessment

Detailed impact assessments results are presented in two tables in **Annex-7**.

Impact	Description	Type	Significance
	During Construction		
Deterioration of soil quality	PRS and HP pipeline construction will lead to degradation of soil quality, Excavation and movement of heavy machinery on unpaved surface soils during site preparation and foundation-laying could cause a physical breakdown of soil particles potentially causing destabilization of the soil structure.	Negative	**Medium**
Air emissions	WBG requirements and Law 4/1994 (modified by laws 9/2009 & 105/2015) stipulates strict air quality standards. Air emissions (gases and particulates) during construction (from transportation and machine operation) shall arise from: - Particulate matter and suspended solids from excavation/backfilling operations - Possible dispersion from stockpiles of waste or sand used for filling excavations. - Exhaust from excavation equipment and heavy machinery (excavators, trenchers, loaders, trucks) containing SOx, NOx, CO, VOCs, etc. - Traffic congestions resulting from road closure or slowing down of traffic due to excavation works.	Negative	**Minor**
	<u>Dust</u> The impact of dust generation (particulate matter) will be limited to the working hours as excavation and other construction activities. Which lead to temporary reduction of air quality, however is unlikely to cause major air emissions impacts as the nearest receptors are around 850 m from the PRS construction site and no residential buildings was noticed on the HP pipeline route.		
	<u>Gaseous pollutants emissions</u> Provided machinery used during construction is certified and maintained as per guidelines, the increase in emissions stemming from the exhaust of machinery is unlikely to increase ambient levels beyond national and WBG permissible levels.	Negative	**Minor**
Noise	<u>Noise impact on worker</u> Noise impacts on construction workers, technicians and engineers in direct vicinity of the excavation works and heavy machinery are considered more significant than those on residents.	Negative	**Medium**
	<u>Noise impact on nearby farmers</u> Noise impacts on farmers in nearby agriculture land will be affected by the increased noise levels during the construction phase.	Negative	**Medium**
	No major noise impacts on the nearest receptors expected during construction of the PRS and HP pipeline as they are about 850 m away and the construction period is limited.	Negative	**Minor**

Impact	Description	Type	Significance
Risks on Occupational health and safety	Inhalation of air pollutants, high noise levels, exposure to infectious diseases (e.g.: COVID-19 infection), injuries and potential death as a result of operating heavy equipment, and handling hazardous materials.	Negative	**Medium**
Impacts related to Labor Influx	If not properly managed, there is a risk that labor inappropriate behaviors or misconduct might pose negative impacts on the community groups, particularly on women, children and other vulnerable groups (including inconvenience and impacts on the work site).	Negative impact	**Medium**
Child Labor	As mentioned in the baseline, child Labor is a common practice in the project communities in the project areas. Children below 18 works almost in all projects as they receive low salaries and they are less demanding. This risk should be carefully handled in the ESMP and restrict obligations and monitoring should be applied in the contractor obligations	Negative	**Low -Medium**
Waste generation	Inappropriate waste disposal and improper management of construction waste materials which could lead to spillages that will cause soil contamination. Excavated soil and concrete/bricks waste are inert materials. Improper disposal of such wastes will only have aesthetic effects on the disposal site. The legal standards of Law 4/1994-9/2009-105/2015 for the Environment and Law 38/1967 stipulate that these wastes should be disposed of in licensed sites by the local authority, which minimizes any aesthetic effects of such waste. Hazardous and non-hazardous materials available onsite during construction activities are likely to include fuel, engine oil, paints, Poor handling of those materials and their inappropriate storage may result in poor containment of induced leaks.	Negative	**Medium**
Reduction of Traffic Flow	The traffic flow that will be created during the construction period will to some extent depend on which type and number of trips to and from the proposed site. Additional activities, such as entering and exiting the site will not have significant impacts on the road (Tarrad EL Neel road) which has a low traffic.	Negative	**Minor**
Ground water pollution	Ground water that might exist in area may be affected by inappropriate liquid and hazardous waste during construction.	Negative	**Minor**
Risk on Community health and safety	Negligent workers may cause accidents harmful to the community members, particularly children and old people, especially close to the digging site. Impacts associated with Community Health and Safety are limited to the inside the fence of the PRS and no residential buildings was noticed on the HP pipeline route. Therefore, there are minor impacts related to community health and safety during construction.	Negative	**Minor**

Impact	Description	Type	Significance
Impacts related to lands	The proposed PRS required a plot of 2275 m^2. Plot of land obtained in accordance to willing buyer willing seller approach. A new HP pipeline 15 Bar with a length of 300 m will pass through the main road (a state-owned land) with no encroachment.	Negative	**Minor**
Operation			
Risks on Occupational health and safety	At PRS site, inhalation of air pollutants (odorant or natural gas leak), exposure to noise levels, infectious diseases (e.g.: COVID-19 infection), injuries and potential death as a result of operating equipment with high pressure tools and equipment and handling hazardous materials. In case of emergency / accidents, resultant risks are studied in details in the attached Quantitative Risk Assessment, that show that the required mitigation measures are already in place and no further measures are needed. In cases, where further mitigation measures are required, action plans are set for implementation and follow up by the concerned departments	Negative	**Medium**
Hazardous material and waste	**Hazardous material** Odorant handling will be according to Odorant Material Safety Data Sheet (MSDS) and Town Gas procedures. Odorant leak can result from improper handling of the odorant and storage in unsafe conditions, in terms of occupational health and safety. According to El Badresheen QRA study, modeling the vapor release will be limited inside the PRMS boundary, and Town Gas El Badresheen PRS ERP will cover this point. **Hazardous waste** During operation and maintenance of the PRS, industrial hazardous wastes will be generated (e.g., lubricating oils, odorant containers, chemical containers). Poor waste management practices may have a significant impact on environment (soil, ground water, visual, and health and safety).	Negative	**Medium**
Noise	The pressure reducers normally cause noise. Maximum noise level expected from the reducers is 80 db. The generated noise is constant (not intermittent).	Negative	**Minor**

6. Analysis of Alternatives

6.1 No Project Alternative

The main target of the proposed project is to supply natural gas to households in El Badresheen District and other surrounding areas in the future. This Natural Gas Connections to Households Project expected to yield many economic and social benefits in terms of providing a more stable, energy source, achieve 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.

6.2 Technology Alternatives

6.2.1 Outlet Pressure

The Pressure Reducing Station (PRS) will reduce the Natural Gas pressure from 15 Bar in the HP pipeline to 7 Bar to be suitable for distribution or use in domestic or industrial applications.

El Badresheen PRS will produce 7 Bar outlet pressure for the local distribution network (intermediate pressure). The LDC choose to produce 7 Bars instead of 4 Bar due to high consumption rate expected in El Badresheen city. It is designed to accommodate future extensions in order to feed other cities and/or villages surrounding El Badresheen district.

6.2.2 Odorant Handling

Environmental and safety control considerations and measures are integrated into the selected technology design. For example, in order to reduce emissions from the odorant unit, the odorant will be automatically added or by using a plunger pump. Automatic and sophisticated unit management systems ensure safe and easy operation and can encompass complete remote operation of the units.

6.3 Location Alternative

As mentioned in item 5.2.2.11 (Land related impact), the main criteria for PRS siting are:

- Proximity to High-pressure gas main lines to minimize Offtake length
- Availability of space with adequate dimensions and affordability of the land for PRS construction and possible expansion
- Presence of standard buffer zones between PRS and nearest buildings or receptors
- According to EGAS/LDC land acquisition procedure, it is the priority of EGAS as an asset holder, to acquire State Owned Lands that are free of any uses (both formal and informal. EGAS never resorts to the land expropriation decrees in PRSs selection. In cases of unavailability or in case the available land is technically unacceptable, private land is usually used as a second a resort and willing Buyer Willing Seller basis will be applied. Due to the unavailability of state-owned lands, EGAS/Town Gas followed EGAS procedure for acquiring land for the construction of the PRS on Willing Buyer – Willing Seller basis and no involuntary land acquisition took place.
- More than three alternatives of privately-owned lands were inspected. The agreed land was technically and socially acceptable.as it is very close of the HP pipeline and entails no further land acquisition compared to the other alternatives.
- Consultation with the land owners were conducted during the committees visits also further consultation were conducted with the other neighboring land owners to determine the prevailing price (market price) of the land in the targeted area. Prevailing price ranged from 100 to 120 Thousand EGP/Qirate, considering the current situation that the land is for agricultural purposes. Consultation meetings also reflected the future expectation of the land owners in this area that the land could be used in the near future for construction of buildings that is of more value than the current land status (agricultural). Based on the cost estimation analysis carried out by the LDC, and after the negotiations with the land owners, the land was purchased on 18/3/2018 at a total cost of 2,665,000 EGP (approximately 205 Thousand EGP/ Qirate). and a cheque was issued and received by the land owner.
- HP pipeline with a total length of 300 meter only will passing through the main road (state owned lands) with no encroachment. Therefore, no lands will be needed for access to the HP pipeline.

7. Environmental and Social Management & Monitoring Plan

7.1 ESMMP Objectives

The Environmental and Social Management and Monitoring Plan (ESMMP) consists of a set of mitigation, management and monitoring measures to be taken during implementation of the project to avoid, reduce, mitigate, or compensate or offset any adverse social and environmental impacts analyzed in the previous chapter. The ESMMP distinguishes between mitigation measures and monitoring that should be implemented during the construction and operation of the project.

The ESMMP identifies certain roles and responsibilities for different stakeholders for implementing, supervising and monitoring the environmental and social performance of the project as well as some of their estimate costs during its life cycle. Roles and responsibilities for implementing the ESMMP during the construction and operation phases have been proposed. During construction EGAS/LDC will assign supervision staff who will undertake supervision over the contractor to make sure that the mitigation measures specified in the design/tender document are implemented on field. During the operation phase, the PRS shall have at least one permanent staff member for health, environment and safety.

Overall, the following Environmental and Social measures are complementary to and do not substitute compliance to the detailed HSE guidelines, procedures, and actions adopted by EGAS and its subsidiary LDCs. **Annex-5** attached to this report

In the following Management and monitoring measures, the term Local Distribution Company (**LDC**) refers to the gas company in charge of project implementation: **Town Gas.**

7.2 Environmental and Social Management Measures

Table 7-1: Environmental and Social Management Matrix during CONSTRUCTION

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
Physical receptor	Impact on soil	- Decrease erosion by minimizing disturbances and scarification of the surface - Best practices for soil management should be followed - Good housekeeping to minimize spills/leaks - Proper handling and management of wastes	Minor	Contractor	LDC –HSE department	Field supervision (audits)	- Contractor costs - LDC management costs
	Air emission	- Monitoring of wind speed and direction to manage dust-generating activities during undesirable conditions. - Management of number of vehicles and equipment in the site. - Appropriate maintenance, engine tuning and servicing of construction equipment to minimize exhaust emissions - Minimize unnecessary journeys or equipment use - Adopt a policy of switching off machinery and equipment when not in use (idle mode). - Minimizing drop heights for material transfer activities such as unloading of friable materials. - Transportation of construction waste by a licensed contractor. - Sheeting of Lorries transporting friable construction materials. - Appropriate sitting and covering of stockpiles of friable materials with adequate cover in addition to regular water spraying so as to minimize dust blow.	Negligible	Contractor	LDC –HSE department	Contractual clauses + Field supervision (audits)	- Contractor costs - LDC management costs

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
	Noise	**Worker and nearby farmers** - Application of the normal precautions normally taken by construction workers. **Residence** - Notification to the surrounding establishment prior to the construction phase. - Time management and construction schedule according to the WBG regulation provided by the contractor prior to the construction phase	Minor - Negligible	- LDC - Excavation Contractor	LDC–HSE department	Contractual clauses + Field supervision (audits) Field supervision Complaints receipt from local administration	- Contractor costs - LDC management costs
Physical receptor	waste generation	- Temporary storage in areas with impervious floor - Safe handling using PPE and safety precautions - Empty cans of oil-based paint resulting from painting the steel connection pipes to households are to be collected and sent back to nearest LDC depots (Abo Rawash) for temporary storage until disposal at a hazardous waste facility (Nassreya or UNICO in Alexandria). - If hazardous waste quantities generated are too small for isolated transport to the Nassreya landfill, a temporary storage site can be created. Coordination with waste authority will be imperative to secure a location and implement adequate procedures for storage depending on quantities and type of wastes until collection and shipping to Nassreya landfill. - Hand-over selected oils and lubricants and their containers to Petrotrade Co. for recycling **Table 7-2 present more details about waste management**	Minor	- LDC Excavation Contractor	LDC HSE department	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 Nassreya - Approximate cost of the above (to be revised upon project execution): 8000 EGP -10000 EGP per ton

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
Social receptor (health and safety)	Occupational health and safety	- The project will hire a qualified contractor/sub-contractor with the high health and safety standards. In addition, the ToR for the contractor and the ESMP will provide the provision of the health, safety and precaution of the environmental impacts and its mitigation measures to be followed during construction, in addition to EMOP and WBG Guidelines related to COVID-19 infection **(Annex-12)**. - Standard protection by placing clear project signs. - Time management for vehicles movement; especially avoiding the peak hours - Standard protection for the workers especially working at elevated heights or trench. - Regular inspection to compelling worker to used their PPE - Training and licensing industrial vehicle operators of specialized vehicles. - The contractor also should keep attendance worksheet and Laborers ID in order to verify the age of workers - Health insurance should be applicable to the contractor workers and workers contracted by a sub-contractor - Full compliance to EGAS and LDC HSE requirements, manuals, and actions as per detailed manuals adopted by EGAS - The safety work Permits in general will be issued before each activity on site by the LDC safety team according to the EGAS HSE guidelines (**Annex-5**) - Ensure the provision of the appropriate personal protective Equipment and other equipment needed to ensure compliance to HSE manuals	Minor	- LDC - Excavation Contractor	LDC HSE Department	Field supervision and review of HSE report+ Field supervision (audits)	- Contractor costs - LDC management costs

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
	Child Labor	- The project will hire a qualified contractor/sub-contractor with the high health and safety standards. In addition, the ToR for the contractor and the ESIA will provide the provision of the health, safety and precaution of the environmental impacts and its mitigation measures to be followed during construction. - Rigid obligations and penalties will be added to the contractor ToR in order to warrantee no child Labor is occurred in the project - The ToR also will oblige the contractor to keep a copy of IDs of Laborers in order to monitor the hired staff below 18 years old The contractor also will be obliged to maintain daily attendance sheets in order to verify the attendance of workers to ensure first, that workers below 18 years old are not included on site, second, in case of accidents the injured persons will be provided with proper health insurance.	Minor - Negligible	- LDC - Excavation Contractor/subcontractor	- LDC– HSE department	- Field supervision and review of HSE report+ Field supervision (audits)	- Contractor costs - LDC management costs

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
	Disturbance to Community due to Labor Influx	In order to minimize impacts pertaining to labor influx the following should be thoroughly implemented: - Preparation of appropriate code of conduct that stipulates the different commitment of labor towards community groups and the different behavior that should be avoided (please see **Annex-9** of this report). - All workers should be trained on the Code of Conduct. - Code of conduct to be signed by sub-contractor. - Code of conduct induction to be done every 2 weeks for the recurrent workers and the new comers before starting work. - According to availability, try to rent all apartments in the same building. - Apply the full requirements related to operating the grievance mechanism including anonymous channels - Raising awareness of the local populations about the project commitment towards communities' and the measures taken for that through public consultation and focus group discussions - Apply Penalties to workers violating the code of conduct.	Minor	Contractors and subcontractors	LDC HSE for guidance super vision	-Field supervision by LDC and EGAS. Received grievances	_Contractor costs _ LDC management costs

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
Community	Traffic	- Time management for transporting the materials, equipment, debris, etc. - Clear sign surrounding construction site and the exit gate. - Coordination with traffic department (ministry of interior) for vehicles route and movement. - Vehicle speed restrictions should be applied across the project site, - Flag man will be considered whenever needed. - Safety precautions taken during night driving will be according to EGAS HSE guidelines (**Annex-5**)	Negligible	Contractors	LDC + Traffic department	Contractor has valid conditional permit + Field supervision	- Contractor costs - LDC management costs
	Land related impact	- Land was obtained in full compliance with willing buyer willing seller approach. - No tenants, encroachers, residential laborers or other with customary claims or other of land use. - Enable grievance mechanism and disclose it to community	Negligible	LDC HSE department	EGAS SDO	Field Supervision	- LDC - EGAS management costs
	Concerns of Community	- The detailed grievance mechanism (GRM) is presented in **Annex-10** attached to this report is to be shared with the community beneficiaries. Posters will be prepared and made available to the beneficiaries in the contracting office9. Additionally, they will be availed in the customer services office. Thus, sufficient and appropriate information about the GRM will be disseminated to the communities prior to the construction phase. Information dissemination about the GRM should be shared with the beneficiaries during the process of contracting and disclosed in the contracting office and other publicly accessible venues.	Negligible	Contractors	- LDC – HSE department	Contractual clauses + Field supervision	- Contractor costs - LDC management costs

[9] Falls under the budget of the LDCs

Table 7-2: Waste management During Construction Phase

Waste Type	Hazardous/ Non-Hazardous	Treatment and Disposal
Cement and Concrete Wastes (Including Cement Contaminated Soil)	Non-Hazardous	- Will be sent to Shoubramant Dumping site
Domestic Waste (food waste, packing,)		
Wood – Scrap	Non-Hazardous	- Temporarily stored in isolated area on-site, then transported to Abu Rawash storage site (Town Gas facility) to be sold as scrap.
Tires		
Cardboards		
Containers		
Paints containers	Hazardous	- Temporarily stored in isolated area on-site, then transported to Abu Rawash storage site. final Disposal will be UNICO.
Batteries		
Chemicals (solvent, lubricants,…) containers	Hazardous	- Temporarily stored in isolated area of the site, the transported- by licensed hazardous waste handling vehicles and personnel- to Abu Rawash storage site (Town Gas facility) for final disposal at Nassreya hazardous waste facility.
Used Oils	Hazardous	- Temporarily stored in isolated area on-site, then transported to Abu Rawash storage site. Final disposal will be by Petrotrade Co.

Table 7-3: Environmental and Social Management Matrix during Operation

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
Social –Health	Occupational health and safety	- ESMP will provide the provision of the health, safety and precaution of the environmental impacts and its mitigation measures to be followed during operation, in addition to EMOP and WBG Guidelines related to COVID-19 infection **(Annex-12)** - Remote actuation of isolation and slam-shut valves by LDC for PRS and pipelines - Produce Hazardous Area Classification drawings - Control room exit design. - Preventive maintenance policy and station manual - Provision of self-contained breathing apparatus (2 pieces for each station) for handling odorant leaks - Apply jet fire rated passive fire protection system to all critical safety shutdown valves ESDVs or Solenoid valves (As applicable) - Place signs in Arabic and English "Do Not Dig" and "High Pressure Pipeline Underneath" - Install an elevated wind sock and provision of portable gas detectors The design should fully comply with IGE TD/3 code requirements	Minor	- LDC project Department Designer	- LDC project department - Engineering dep. - HSE dept. EGAS	- Drawing and design Document Review - Policy and manual review - Inspection by operators Signage inspection and site visits	- Project cost LDC management costs
Physical receptor	waste generation	- Strict use of chemical-resistant suits and PPE when handling odorant barrels, tanks, or spills - Evacuation of odorant from barrels into holding tank with utmost care and full PPE - Covering possible odorant spills immediately with sand and treatment with sodium hypochlorite as per EGAS and LDC practices - On-site treatment of empty containers with sodium hypochlorite and detergent as Per EGAS and LDC practice - Ship empty containers to a certified hazardous waste facility via company depot using certified handling and transportation contractors - Ensure full and empty (treated) odorant containers are	Minor	PRS staff	LDC HSE Dpt.	Quaternary auditing	- Project cost LDC management costs

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
		accompanied by a trained HSE specialist during transportation to and from the depot and to/from the hazardous waste disposal facility (UNICO and/or Nassreya) - Others measures as per item 7.4: El Badresheen quantitative risk assessment study recommendations. In order to minimize risk of spillage of hazardous odorant, the following general precautions should be taken: - Pre-Plan the anticipated amounts of odorants to be used in order to minimize leftovers and residuals. - Handle with extreme care and always perform visual checks on the integrity of the odorant container - Avoid rough handling rolling or dropping of odorant containers - Avoid exposure to direct sunlight during storage or transportation - Ensure odorant containers are always sealed properly and secured from tipping/falling/damage during transportation and storage (temporary and long-term) - Always have sufficient amounts of sand, sodium hypochlorite and detergent on standby during usage of odorant - ALWAYS handle containers or spills with care and full PPE compliance - Never release or empty residual odorant from its container to any receptor or for any reason other than filling the odorant tank at the PRS - NEVER use empty odorant containers for any other purpose - In case of odorant spillage: - avoid inhalation and sources of ignition - immediately cover and mix with sufficient amounts of sand and sodium hypochlorite using necessary PPE and tools - collect contaminated sand in clearly marked secure containers/bags - Add sand to inventory of hazardous waste					

7.3 Monitoring and Review

Procedures to monitor and measure the effectiveness of the management program, as well as compliance with any related legal and/or contractual obligations and regulatory requirements will be established. In addition to recording information to track performance and establishing relevant operational controls, dynamic mechanisms, such as internal inspections and audits, where relevant, to verify compliance and progress toward the desired outcomes will be utilized.

Monitoring will normally include recording information to track performance and comparing this against requirements in the management program. The monitoring results shall be documented and the necessary corrective and preventive actions in the amended management program and plans shall be identified consequently.

7.3.1 Monitoring procedures

In order to fulfil the monitoring requirements and to ensure that any non-compliances are corrected, the following tasks should be followed:

- LDC HSE staff is responsible to carry out periodic audits to follow up on ESMP implementation.
- Any observed non-compliance is recorded and corrective actions requested.
- LDC report these non-compliances and the corrective actions taken to EGAS in their monthly reports.

EGAS also conduct supervisory visits to ensure that all mitigation measures are appropriately adhered to, non-compliances are reported to the LDC and an action plan to correct the situation is requested and followed within the LDC monthly reports to EGAS.

Table 7-4: Environmental and Social Monitoring Matrix during CONSTRUCTION

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Ambient air quality	Increased air emissions and dust	- Inspection of vehicle and machinery maintenance schedule - Inspection of the construction activities - Exhaust emissions concentrations from diesel generators	LDC HSE	Monthly during construction + before construction and each three month for machines	Vehicles licensing Department	Measurements and reporting of exhaust emissions of construction activities machinery Complaints log	LDC management costs
Ambient noise levels	Increased noise levels	- Noise intensity, exposure durations and noise impacts - Use of earmuffs by Construction workers	LDC HSE	Regularly during site inspections	Construction site	Measurements of noise levels Complaints log	LDC management costs
		Complaints from Farmers	LDC HSE	Weekly during construction.	Construction site	Documentation in HSE monthly reports	LDC management costs
Physical receptor (soil, ground water, visual)	Waste generation	Observation of accumulated waste piles	LDC HSE	During construction. Monthly reports	Construction site	Observation and documentation	LDC management costs
		Observation of water accumulations resulting from dewatering (if encountered)	LDC HSE	During construction. Weekly reports	Around construction site	Observation and documentation	LDC management costs
		Chain-of-custody and implementation of waste management plans	LDC HSE	Area reports	Construction site and document examination	Site inspection and document inspection	LDC management costs
		Chain-of-custody and implementation of domestic wastewater (sewage) management	LDC HSE	During construction. Monthly reports	Construction site	Site inspection and document inspection	LDC management costs

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
Labor conditions	Occupational Health and safety	Total number of complaints raised by workers Periodic Health report Periodic safety inspection report Incident register	LDC HSE	Two times per year for the PRS	Construction site	Safety supervisor should follow commitment of workers to use the protective equipment -Inspection & recording of the performance -Reports about the workers and complaints	LDC management costs
		Provide a suitable tool for wind direction (Windsock) to be installed in a suitable place to determine the wind direction.	LDC HSE and Projects Dpt.	Daily during construction	Construction site	Supervision & reporting	LDC management costs
		Cooperation should be done with the concerned parties before planning for housing projects around the PRS area.	LDC Projects Dpt.	Daily during construction	Construction site	Supervision & reporting	LDC management costs
	Child Labor	Attendees lists with workers IDs Complaints and accidents reports	LDC HSE	Biannual for PRS	Construction site	Safety supervisor observe the Laborers Random checkup for Laborers IDs	LDC management costs
	Disturbance to local community due to labor influx	- Complaints raised by the local community GRM. - Conduct spot checks/audits on the worker's behaviors during field visits.	LDC HSE	When reported and during field visits	Construction sites	Supervision & reporting	Contractor Cost
Local traffic and accessibility	Reduction of traffic flow and accessibility to local community	Comments and notifications from Traffic Department	LDC HSE	Weekly during construction.	Construction site	Documentation in HSE monthly reports Complaints log	LDC management costs

Table 7-5: Environmental and Social Monitoring Matrix during Operation

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Monitoring Frequency	Location of monitoring	Methods of monitoring	Monitoring Estimated Cost
Ambient air quality	Improper management of odorant during operation	- Log of spillage incidents - Number of treated containers - Odorant delivery forms	LDC HSE	Quarterly for each PRS	- PRSs	Compare Environmental Register with odorant delivery forms, observation of site	LDC management costs
Ambient noise levels	Noise of PRS operation	- Noise intensity	LDC HSE	Quarterly for each PRS	- PRSs	- Noise meter	LDC management costs
Physical receptor (soil, ground water, visual)	Waste generation	- Best practice of handling and intermediate storage - Disposal to appropriate and license land field	LDC HSE	Quarterly for each PRS	- PRSs	- Hazardous waste Register	LDC management costs
Labor conditions	Occupational Health& safety	- Total number of complaints raised by workers - Periodic Health report - Periodic safety inspection report	LDC, EGAS	Four times per year, each three months	- Safety supervisor should follow the commitment of workers to use the protective equipment - Inspection and recording of the performance - Reports about the workers& complaints	Complaints log LDC	No cost
		Review the emergency response plan and update the plan to include all scenarios in this study **and other needs including:**	LDC HSE (ERP document)	Yearly (ERP doc.)	PRS location	HSE annual audit	LDC management costs

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Monitoring Frequency	Location of monitoring	Methods of monitoring	Monitoring Estimated Cost
		Firefighting brigades, mutual aids, emergency communications and fire detection / protection systems.	LDC HSE (ERP document) LDC HSE and Operation Dpt. for facilities.	Yearly (ERP doc.) Weekly	Area head office / PRS location PRS location	HSE annual audit Inspection checklist	LDC management costs
		Dealing with the external road in case of major fires.	LDC HSE (ERP document)	Yearly (ERP doc.)	PRS location	HSE annual audit	LDC management costs
		First aid including dealing with the odorant according to the MSDS for it, with respect of means of water supply for emergency showers, eye washers and cleaning.	LDC HSE (ERP document) LDC HSE and Operation Dpt. for facilities.	Yearly (ERP doc.) Weekly	Area head office / PRS location PRS location	HSE annual audit Inspection checklist	LDC management costs
		Safe exits in building according to the modeling in this study.	LDC HSE (ERP document) LDC HSE and Operation Dpt.	Yearly (ERP doc.) Daily	Area head office / PRS location PRS location	HSE annual audit Inspection checklist	LDC management costs
		Inspection and maintenance plans and programs are according to the manufacturers guidelines to keep all facility parts in a good condition.	LDC Operation and maintenance Dpt.	Periodic maintenance plan according to manufacturers	Area head office / PRS location	HSE annual audit	LDC management costs
		All operation is according to standard operating procedure for the PRS operations and training programs in-place for operators.	LDC Operation Dpt.	Daily for operation Yearly for training	Area head office / PRS location	HSE annual audit	LDC management costs

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Monitoring Frequency	Location of monitoring	Methods of monitoring	Monitoring Estimated Cost
		Provide the site with SCBA "Self-Contained Breathing Apparatus" (at least two sets) and arrange training programs for operators.	LDC HSE and Operation Dpt.	Daily	PRS location	Inspection checklist	LDC management costs
		Cooperation should be done with the concerned parties before planning for housing projects around the PRS area.	LDC Security Dpt.	Daily	Around PRS location	Patrolling and recorded in logbook	LDC management costs

7.4 El Badresheen Quantitative Risk Assessment Study Recommendations

Regarding to the risk calculations to workers / public which found in Acceptable region, therefore there are some points need to be considered to maintain the risk tolerability in its region and this will be describe in the following recommendations:

Recommendation	Timeline Phases
All facility specifications referred to the national and international codes and standards.	Design Phase
Emergency shutdown detailed procedure including emergency gas isolation points at the PRMS and GASCO valves room (Offtake Point) in place.	Design Phase
Surface drainage system is suitable for containment any odorant spillage.	Design Phase
Considering that all electrical equipment, facilities and connections are according to the hazardous area classification for natural gas facilities.	Design Phase
Provide a suitable tool for wind direction (Windsock) to be installed in a suitable place to determine the wind direction.	Construction Phase
Review the emergency response plan and update the plan to include all scenarios in this study and other needs including:	Operation Phase
• Firefighting brigades, mutual aids, emergency communications and fire detection / protection systems.	Operation Phase
• Dealing with the external road in case of major fires.	Operation Phase
• First aid including dealing with the odorant according to the MSDS for it, with respect of means of water supply for emergency showers, eye washers and cleaning.	Operation Phase
• Safe exits in building according to the modeling in this study, and to the PRS from other side beside the designed exit in layout provided.	Operation Phase
• Inspection and maintenance plans and programs are according to the manufacturers guidelines to keep all facility parts in a good condition.	Operation Phase
• All operations are according to standard operating procedures for the PRMS operations and training programs in-place for operators.	Operation Phase
Provide the site with SCBA "Self-Contained Breathing Apparatus" (at least two sets) and arrange training programs for operators.	Operation Phase
Cooperation should be done with the concerned parties before planning for housing projects around the PRS area.	The Three Phases

7.5 Reporting of Mitigation and Monitoring Activities

During construction and operation, environmental performance against targets is reviewed by management on a monthly basis and reported to the contractor and LDC. The plan is designed to record incidents and to ensure investigation, root cause analysis, corrective action and follow up. Records are kept of all incidents, investigations and actions.

Regulatory and HSE reporting systems will be brought together on a monthly basis to be collated and input into the LDC' s (Town Gas) reporting system to be submitted to EGAS' Environment Department during the construction phase.

During operation, the reporting of any occurrence and /or the result will take the following path:

- recording of the nature and scale of the occurrence;
- reporting to the necessary competent/ responsible persons; and
- Internal reporting and external regulatory notification.

7.5.1 During the Construction phase reports should include as a minimum

- Monthly report for the implementation of the ESMMP submitted by the contractor to LDC HSE staff.
- Monthly report on incident and complaint from the surrounding establishments and residents nearby the construction site.
- Unusual traffic delays or accident caused during construction or any complaints received should be reported in the monthly report prepared by the construction contractor supervisor. And /or permits and any comments or recommendations by Traffic Department
- Monthly report should include any incidents of high dust emissions or smoke during construction works including the natural dust that might be encountered.
- There should be a form prepared by LDC' s HSE department for the contractor to keep records of quantities, types of wastes received and the location where it has been received from.
- The monthly report of HSE supervisor from LDC should an evaluation of the contractor's compliance to mitigation measures and any comments noticed by the HSE site supervisor about mismanagement of construction waste during the month.
- The HSE team from LDC observer should report on the monthly basis of the accident or the worker's obedience.
- Reporting on the monthly basis, the total number and the type of heavy equipment use during the construction phase.

- Monthly report on health and safety performance. This report will include any incident and complaint regarding health and safety measures perform by the contractor.
- Daily report to be prepared on construction work of the pressure reduction station and HP pipeline construction works.
- Daily report in a logbook to consider any outside construction works around the PRS location that related to public or industrial buildings.

7.5.2 Reporting of severe incidents

- In case of worker/community work-related severe accidents or fatalities, immediate reporting should take place by the LDC to the relevant regulatory authorities and to the Project Management at EGAS.
- EGAS will report the major accident to the World Bank within 24 hours at the latest.
- The report will be including all actions taken by LDC to investigate the root cause of the accident and the plan to prevent the occurrence of future accidents will be included in the final investigation report

7.5.3 During the operation phase reports should include as a minimum

According to law 4/94 amended by law 9/2009 and its executive regulation, each facility should prepare an environmental register. Components of the environmental register are presented in annex three of the executive regulation. All environmental procedure included in the EMMP are to be recorded in the Environmental Register so that they can be communicated effectively and clearly. It will include (monitoring plan, solid waste management plan, emergency response plan,).

Environmental Register shall contain:

- Any complaint related to the noise generated from the PRS
- Regular noise and air measurement reports.
- Record keeping of the admitted waste and their quantity and management (bills of waste transportation).
- Summary of the HSE monthly report.

According to Article 29-32 from law 9/2009 and its executive regulation, the PRS shall prepare a hazardous material and waste register containing the handling and storage of hazardous material and waste in the facility (types, quantities, material safety data sheets, type of storage and means of transportation). Additionally, the register should contain a contract and /or bills of hazardous waste disposal at UNICO and /or Nassreya.

7.6 Emergency Response Plan

Town Gas (تاون جاس) developed an Emergency Response Plan (ERP) which relates to its operations for the PRS and for its intermediate and low-pressure distribution network. The purpose of this document is to outline emergency responsibilities, organizational arrangements and responses and procedures to be followed by personnel based in the field in the event of an emergency. For full details about the emergency plan, kindly refer to **Annex-11** attached to this report.

Emergency Levels are classified as Levels (Level 1, Level 2 and Level 3) as following:

The first level of Emergency:

- Potential hazards to life, safety, property and the environment are limited, and do not exceed the emergency zone or the boundaries of the public site or facility.
- The personnel of the enterprise or the site possess adequate training, capacity, personal protection equipment and necessary tools to manage and control the situation, and there is no need for external assistance.
- Alarm bells are not required to warn those outside the site or facility.
- The situation does not require evacuation of the emergency zone.
- There is no possibility of losing control or escalating the situation.
- The accident management team is not used.

The Second level of Emergency:

- There is a serious risk to life, safety, property and the environment and may exceed the limits of the emergency zone, but do not exceed the limits of the public site or facility.
- There is a need to use the assistance of external parties to manage the emergency, or at least the presence of stand-by team in the presence of a potential escalation of the situation, but the situation does not extend its influence outside the facility or site.
- Members of the facility or site do not have sufficient capacity or resources to deal with the incident
- Requires evacuation and / or warnings to warn those outside the emergency zone
- Security breach or situation leading to constant threat to life and safety
- Accident management team intervenes

The Third level of Emergency:

- There is a serious risk to life, safety, property and the environment and may exceed the limits of the emergency zone and the possibility of exceeding the limits of the public site or facility.
- There is a need to use the help of external parties to fight fire, rescue, dealing with hazardous materials, large number of injuries and deaths.

- Measures must be taken to protect units, nearby areas and / or communities and the environment beyond the boundaries of the public site or facility
- There is a potential risk that the reputation of the company, its business or its revenues will be affected
- Any incident involving the exit of the operating system beyond the limits of safe operation with the possibility of escalation
- There is a danger to the public
- There is a possibility to start or run the communication system for emergency reporting
- The accident management team is used.

7.6.1 Hotline

A 24-7 Hotline (129) is available for customers and the public to report leaks, damage, emergencies, and/or incidents related to gas connections, components, infrastructure, and activities (inside or outside households) and to request repairs/emergency response/assistance.

7.7 Institutional Framework for ESMMP Implementation

7.7.1 Environmental Management Structures

EGAS is the supervisory body. Town Gas is the implementing body. Below is the management structure of Town Gas.

Being the implementing body of the natural gas network in project areas, Town Gas has a direct involvement with the environmental management and monitoring of the natural gas network. Town Gas has good environment, occupational health and safety and social background.

One of the standard tasks of the HSE Departments of Town Gas, supervised by EGAS, is to ensure that the Environmental and Social Management Plan of the project is implemented in all the phases of the Project.

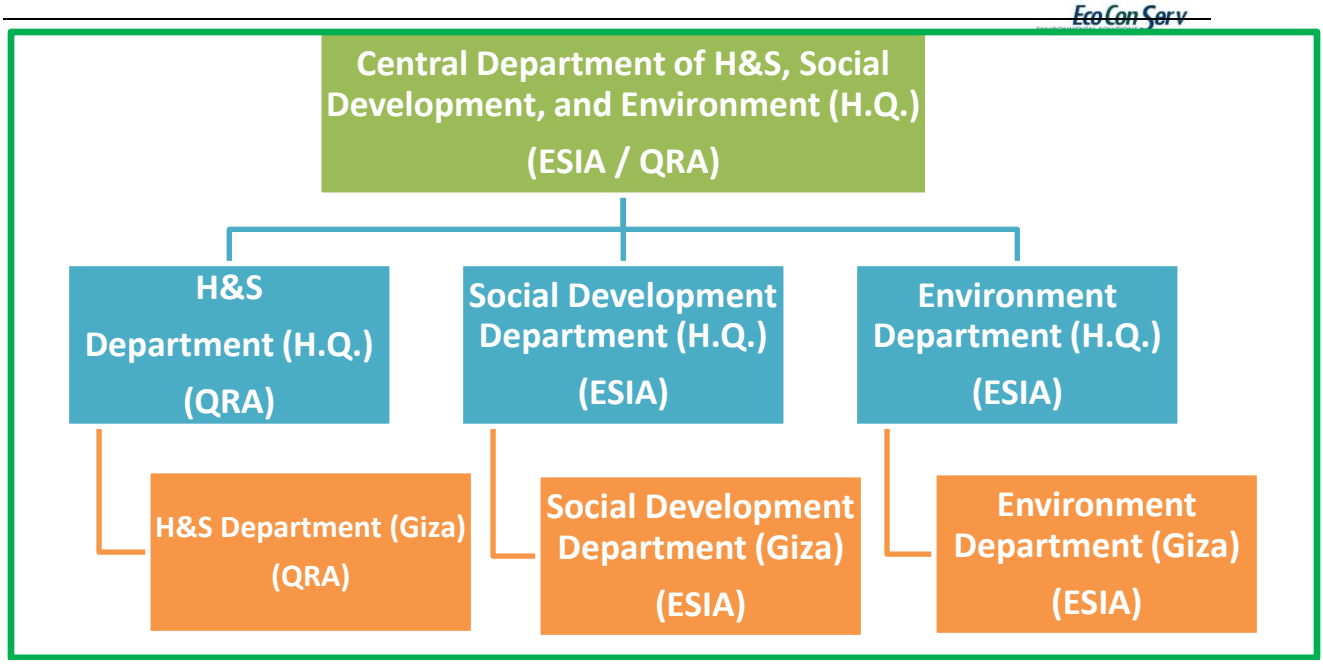

Figure 7-1: Town Gas ESMP organogram.

In the structure above, designated site engineers perform daily implementation, monitoring and reporting of activities as per the ESMMP with special attention to:

- Worker and contractor compliance to EGAS HSE manuals and procedures
- Occurrence of HSE incidents and suggestions for incident avoidance (Refer to Item 7.4)
- Management of broken asphalt (if any), unused backfill, solid waste, metal scrap
- Management of paint cans, refueling & lubrication, soil contamination
- Management of liquid waste such as leaked condensate hydrocarbons (if any) or chemicals used in heaters; and
- Checking that handling of hazardous waste is done according to the requirements of the Environmental Law, where a permit for handling hazardous material and Hazardous wastes is issued from EGAS Environment Department
- Using analyzers to measure noise, SO2, CO, CH4 and NO2 in ambient air, and detect possible natural gas leaks
- Ensure and log compliant handling of odorant/odorant containers, odorant-contaminated-soils (in case of spillage)
- Measure noise at different locations of the PRS
- Other tasks as outlined in ESM & MP

Daily reports are to be compiled and sent to the regional HSE officer for preparation of monthly summary reports.

Monthly reports are sent to HSE officer at Town Gas head office for compilation into quarterly reports to EGAS.

7.7.2 Required Actions

1- Involvement of environmental and social officers during the design, costing, tendering, and construction phases would be advantageous.
2- An updated and detailed assessment of Town Gas EHS institutional capacity and available resources for implementation of the ESMP
3- Specifically, Town Gas should take steps to develop capacity of site engineers and HSE officers with specific courses focused on implementation of the ESMP detailed in this ESIA.

7.7.3 Management of grievances (E&S Grievance Redress Mechanism)

EGAS and the LDCs aim to be recognized as a responsible operator exemplary in the management of the impacts of its activities. As such, EGAS and the LDCs are committed to preventing, limiting and, if necessary, remedying any adverse impacts caused by its activities on local populations and their social and physical environment.

Identifying, preventing and managing unanticipated impacts are facilitated by a grievance redress mechanism (GRM). As the World Bank's governance and anticorruption (GAC) agenda moves forward, grievance redress mechanisms (GRMs) are likely to play an increasingly prominent role in Bank-supported projects. Well-designed and implemented GRMs can help project management significantly enhance operational efficiency in a variety of ways, including generating public awareness about the project and its objectives; deterring fraud and corruption; mitigating risk; providing project staff with practical suggestions/feedback that allows them to be more accountable, transparent, and responsive to beneficiaries; assessing the effectiveness of internal organizational processes; and increasing stakeholder involvement in the project. For task teams more specifically, an effective GRM can help catch problems before they become more serious or widespread, thereby preserving the project's funds and its reputation.

Effective grievance management helps to:

- Build trust through having a dialogue with stakeholders.
- Detect weak signal and propose solution.
- Reduce risk of conflict between the affiliate and local communities.
- Reduce risk of litigation by seeking fair solutions through mediation in the event of an established impact.
- Identify and manage unanticipated impacts of operation.
- Avoid delays to operations and additional costs.
- Avoid future impacts through analysis of weak signals.

The detailed grievance mechanism (GRM) below is to be shared with the community beneficiaries. Posters will be prepared and made available to the beneficiaries in the contracting office.

Additionally, they will be availed in the customer services office. Thus, sufficient and appropriate information about the GRM will be disseminated to the communities prior to the construction phase. Information dissemination about the GRM should be shared with the beneficiaries during the process of contracting and disclosed in the contracting office and other publicly accessible venues. Following are the various stages of grievances. The proposed mechanism is built on three tiers of grievances:

1. The level of site engineer of Town Gas in the project area.
2. On the level of LDC headquarter
3. On the level of EGAS

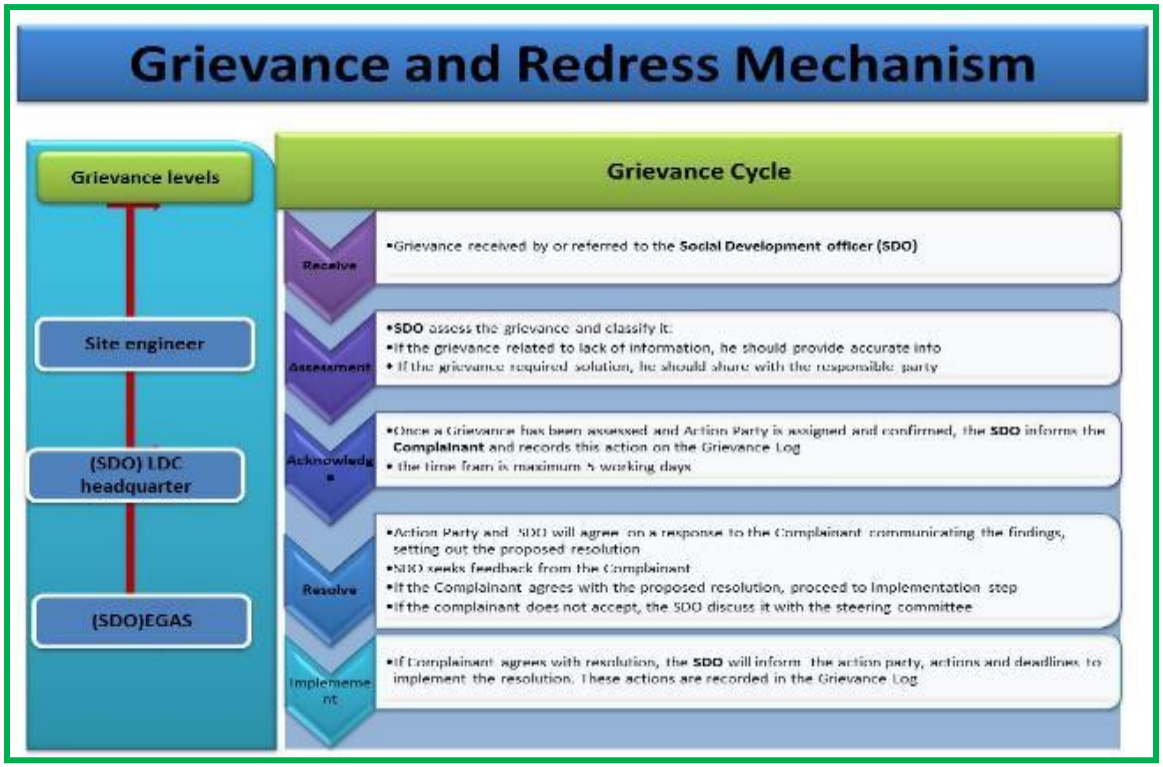

Figure 7-2 Proposed Grievance and Redress Mechanism

7.7.3.1 First tier of grievances

In order to ensure high level of responsiveness to the local communities, it is essential to ensure that a local grievance mechanism is functioning and that the communities are aware of it. Town Gas has assigned a Social Development Officer (SDO) (can be more than one) who will be working closely with the assigned SDO of EGAS. It is the responsibility of Town Gas SDO to ensure that the GRM system is widely known and well explained on the local level. Moreover, s/he will follow up on the complaint until a solution is reached. The turnaround time for the

response/resolution should be 15 calendar days and the complainant should know that he/she should receive response by then. (a complain form is attached see **Annex-10**)

The grievances should be presented to the following:

- The foreman working on the ground in the study area,
- The project manager in the study area,

The regional department of Town Gas in Giza Governorate, it is worth noting that most of the previous experience of EGAS is suggesting that complaints are usually handled efficiently and resolved on the local level. However, the management of the complaints including level of responsiveness, providing feedback and the documentation of the complaints needs to be significantly strengthened. In case the problem is not solved, the complainant may reach out to the second level of grievance

7.7.3.2 Second tier of grievances:

If the aggrieved person is not satisfied with the decision of the first tier, they can present the case to Town Gas headquarters. Complaint form is attached in **Annex-10**. SDO where they should provide resolution within 15 calendar days, following is the second level of grievances:

- The Social Development Officer in Town Gas headquarters will handle technical, environmental and land acquisition complaints. Town Gas headquarters SDO should receive the unsolved problems. Thereafter, the SDO gets in contact with the petitioner for more information and forwards the complaint to the implementing entities for a solution.
- The SDO should follow the complaints and document how they were solved within 15 calendar days.

7.7.3.3 Third tier of grievances:

If the aggrieved person is not satisfied with the decision of the SDOs of Town Gas at Stage 2, they can present the case to EGAS SDO where they should provide resolution within 15 calendar days. The following section presents the third level of grievances:

- The Social Development Officer in EGAS will handle technical, environmental and land acquisition complaints. He should receive the unsolved problems. Thereafter, they get in contact with the petitioner for more information and forward the complaint to the implementing entities for a solution.
- The SDO should follow the complaints and document how they were solved within 15 calendar days.
- The SDO should update the complainant on the outcome of his/her complaint.

7.7.3.4 Grievance channels

Due to the diversity of the context in different governorates and the socioeconomic characteristics of the beneficiaries, the communication channels to receive grievances were locally tailored to address all petitioners concerns and complaints. The following are the main channels through which grievances will be received:

- Foremen act as the main channel for complaints. They are always available on the construction sites. However, complaints raised to him/her are mostly verbal. Thus, s/he should document all received grievances in writing form using a fixed serial number that the complainant should be informed about to be able to follow up on the complaint
- Hotline: 129 is the hotline for Town Gas.
- The SDO within the LDC and EGAS
- Trustworthy people, community leaders and NGOs/CDAs will be an appropriate channel to guide petitioner about the various tiers of grievances, particularly, in rural areas.

7.7.3.5 Response to grievances

Response to grievance will be through the following channels:

- The response to grievances should be through an official recognized form to ensure proper delivery to the complainant. It is the responsibility of the SDOs to ensure that complainants were informed about the results of handling their complaints.
- Response to grievances should be handled in timely manner as mentioned above, thereby conveying a genuine interest in and understanding of the worries put forward by the community.
- EGAS and Town Gas should maintain record of complaints and results.

7.7.3.6 Monitoring of grievances

All grievances activities should be monitored in order to verify the process. The monitoring process should be implemented on the level of EGAS and the LDC. The following indicators will be monitored.

Table 7-6 Means of verification and indicators

Monitoring dimensions	Means of verification and indicators
GRM is fully operational	○ Number of received grievances monthly (Channel, gender, age, basic economic status of the complainants should be mentioned) ○ Type of grievance received (according to the topic of the complaint ○ Documentation efficiency
Efficiency of responses and corrective procedures	○ Number of grievances solved and closed ○ Feedback offered to the grievances ○ Number of unsolved grievances and the reasons behind not solving them ○ Time consumed to solve the problem
Efficiency of information sharing about GRM	○ Dissemination activities undertaken ○ Total number of brochures distributed (if any) ○ Total number of awareness meetings conducted (if any)

7.7.3.7 Institutional Responsibility for the Grievances

The entity responsible for handling grievances will mainly be the Environmental Affair Department within the implementing agency (EGAS). The Social Development Officer (SDO) working within EGAS in cooperation with the Town Gas will address all grievances raised by community members. The main tasks related to grievances of the SDOs on the various levels are:

- Raise awareness about channels and procedures of grievance redress mechanisms
- Collect the grievances received through different communication channels
- Document all received grievances
- Transfer the grievance to the responsible entity
- Follow up on how the problem was addressed and solved
- Document, report and disseminate the outcome of received grievances
- Ensure that each legitimate complaint and grievance is satisfactorily resolved by the responsible entity
- Identify specific community leaders, organizations and citizen groups required to enhance the dialogue and communication through a public liaison office to avoid or limit friction and respond effectively to general concerns of the community
- Monitoring grievance redress activities

8. Stakeholder Engagement and Public Consultation

The public consultation section aims to highlight the key consultation and community engagement activities that took place as part of the preparation of the ESIAs, ESMPs and their outcomes. The new house connections in the project sites are extension to the current existing natural gas connection network in Giza Governorate. ESMPs for other areas were prepared, stakeholder engagement and public consultation activities were held, and studies were cleared by the Bank and disclosed on EGAS website. It is worth to mention that the consultation activities have covered both the PRS and all the Low pressures pipelines networks activities. All questions raised during the public consultation were related to the connection activities (Low pressures pipelines networks), where most of the people are not familiar of the PRS activities. Stakeholder Engagement activities and a series of public consultations were conducted all through the past 6 years since the early stages of the project in December 2013 until recent. Consultation meeting session was conducted in November 2018 at El Badresheen district during the current study. Stakeholders were identified, a work plan was developed, information adequately disclosed, used different engagement instruments. Fair gender-based participation and engagement of the different stakeholders and documentation of all conducted events were made. Public concerns were responded to and addressed in the ESIAF /ESIAs/ESMPs of the project.

Consultation activities showed an overwhelming acceptance of the consulted participants to host the NG. Their willingness to be connected to the NG, some potential beneficiaries expressed their willingness to pay the installation cost in cash, while others were much in favor to pay in installment. This high level of enthusiasm from the local communities towards the project is attributed to the high level of awareness of the benefits of the natural gas and the current hardships that the households are facing to secure LPG provision and usage.

8.1 Legal Framework for Consultation

The consultation activities used multiple tools and mechanisms (scoping, interviews, focus group discussions, public hearings/consultations) with various stakeholders and community people in the host communities were held for the proposed 1.5 million household NG connections project in compliance with the following legislations:

- WBG policies and directives related to disclosure and public consultation, namely,
- Directive and Procedure on Access to Information
- World Bank Operational Policy (OP 4.01)
- Egyptian regulations related to the public consultation
- Environmental law No 4/1994 modified by Law 9/2009 and 105/2015 and its executive regulation until the last amendment by ministerial decrees no. 1963/2017
- While WBG 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 efforts were implemented to reach the most difficult to reach community members. Additionally, in order to obtain larger scale and more quantifiable information, the consultant should assess conducting surveys in the different sites.

8.2 Consultation objectives

The objective of the Stakeholder Engagement is to ensure safe and successful Project delivery by:

- Informing stakeholders, including persons or groups who are directly or indirectly affected by a project, as well as those who may have interests in a project and/or the ability to influence its outcome, either positively or negatively;
- listening to their comments, ideas and concerns and recording the same for follow up;
- Avoiding conflict by addressing impacts and issues raised by stakeholders promptly; particularly with the communities that will not be served by the project
- Ensuring that fears and anxieties about the nature, scale and impact of the operation have been properly considered in the development and management of the Project
- Accessing and making good use of existing local knowledge of the area;
- Communicating and implementing a viable community feedback mechanism.

The consultation outcomes will be used in:

- Define potential project stakeholders and suggest their possible project roles
- Identify the most effective outreach channels that support continuous dialogue with the community

Thereafter the results will provide proper documentation of stakeholder feedback and enhance the ESIA accordingly.

8.3 Defining the stakeholder

In order to ensure an inclusive and meaningful consultation process, a stakeholder's analysis was conducted to get better understanding of the various groups and their roles, interests and influence on the project.

For the purpose of this site specific ESIA, a focused stakeholders' identification was conducted to identify the key groups of relevance to the project in this specific location. The main identified groups are very similar to those identified on the governorate level but on a smaller scale, (elaborated details on that are include in the Governorate level ESMP). In the meantime, local communities of both men and women of projects beneficiaries, local NGOs/CDAs were among

the key stakeholders on the local level. The following table includes a list of key stakeholders of both men and women within the project areas.

Table 8-1: A list of key stakeholders of both men and women within the project areas.

Stakeholder	Role/ concern
1. Local Governmental entities	
Governorates	The main role of the governorates is the provision of support to the project through mobilizing people to gain information about the project.
Local Governmental units (District authorities and village authorities)	Permissions for PRS construction should be prepared by the governorate and approved by the LGU. Rehabilitation of roads, will be performed by the LGU.
2. Other governmental entities	
Information Centers on the governorate level	Provide NG companies with underground utilities and infrastructure maps.
Governmental Authorities	Various authorities in the governorate will support the project through permissions for excavation works, maintenance, health related issues, etc.
Egyptian Environmental Affair Agency (HQ and RBOs)	Responsible for reviewing and approving ESIAs, and monitoring implementation of the Environmental Management Plan
Security Department	Secure the construction sites and prevent people from in- flushing into it
Ministry of Health	Providing health facilities to the project workers
Ministry of Antiquities	Very important to issue permissions for excavations and accompany the working teams,
Ministry of Transportation	This Ministry may have interest in issues relating to transportation and traffic planning related to the Project.
3. Media	
Television and radio representatives	Inform the community about the project and its impacts and support dissemination of ESIA studies
Press people	
Websites editors	
4. NGOs working on environmental and social related aspects	
NGOs on the central level	Play an active role in any awareness-raising related to the project
5. Universities and Educational institutes	
Faculty of Engineering	Review and enrich the ESIA study with feedback
Secondary vocational schools	Propose needed capacity building for their students to potentially find employment with the project
Researchers/consultants	Review results of the study and provide feedback
6. Other	
Private companies	Mainly potential tenderers for construction works
Traders	Provide workers with food and amenities.

Stakeholder	Role/ concern
Contractors	From the project adjacent areas, may be affected.
	7. Community people
Community leaders	Main cornerstone in mobilizing the communities.
Potential beneficiaries	Potentially benefit from the project
Potential Project Affected Persons (PAPs)	Farmers whose lands may be traversed by project components. LPG distributors (formal and informal), LPG storage workers.
Vulnerable groups within the local communities	Vulnerable groups may be likely to be adversely affected by environmental and social impacts, while also being least likely to benefit from the Project. Women, disabled, old people and children might get injured if they crossed the excavated areas in main streets and allies. Children also may fall down in the excavated areas
	8. Natural Gas companies
EGAS	Implementing agency overseeing activities of the Environmental and Social Management Plan
Town Gas	Local distribution company (LDC) who will implement, operate, and manage the ESMP
Butagasco	May be affected due to the installation of the NG
Petro trade	They are the responsible entity for collecting the consumption fees and the bank installment

8.4 Consultation Methodology and Activities

The research team for this study has adopted multi-dimensional consultation activities that enable the marginalized, voiceless, youth and women to gain information about the project. As well as, gaining information about their concerns and worries that regarding the project during various implementation phases. It is worth to mention that the consultation activities have covered both the PRS and all the Low pressures pipelines networks activities. All questions raised during the public consultation were related to the connection activities (Low pressures pipelines networks), where most of the people are not familiar of the PRS activities. So all questions, comments and responses were concentrated on the NG connection activities and have been addressed in the ESMP studies for the Low pressure network.
Following are the methodology and the main consultation activities adopted by the research team:

1. The study team visited the project area in order to define various stakeholders.
2. The study team divided the various engagement activities of the project to:
   - Scoping phase,
   - Data collection phase,
   - Consultation activities and final public consultation.
3. The study team has adopted many tools during the consultation process such as:
   - Conducting Focus Group Discussions (FGDs) with the local communities.
   - Conducting panel meetings with the governmental officials and potential affected people.
   - Public consultation sessions.

- Various NGOs participated actively in the preparation of the FGDs and providing data collectors to assist the team in collecting the data.

4. Consultation activities have been developed for the different communities through the following phases:

- **Phase I:** Scoping phase session in Giza Governorate on 24th Nov. 2013, during the preparation of the framework study
- **Phase II:** Public consultation session was conducted on 23rd Dec. 2013 during the preparation of the framework study.
- **Phase III:** Consultation activities January and February 2017, during the preparation of ESMP study for 10 districts in Giza Governorate.
- **Phase IV:** Public consultation session was conducted on 30th April 2017 in Giza Governorate.
- **Phase VI:** Consultation meeting session was conducted in November 2018 at El Badresheen district during the current study.

All activities conducted were documented with photos and lists of participants in order to warrantee appropriate level of transparency.

The following table summarizes all the consultation activities in Giza Governorate, since November, 2013 till now.

Table 8-2: Summary of Consultation Activities in Giza Governorate (Nov. – Dec. 2013)

Participants	Number		Methods	Date
	Males	Females		
During the preparation of framework				
Various stakeholders	68	21	Scoping Session	November 2013
	73	26	Public consultation	December, 2013
Community residents	257	299	Structured questionnaire	December 2013
Potential beneficiaries and governmental entities	18	17	FGD	
Governmental entities& NGOs	11	1	In-depth interview	
Total	**427**	**364**		

Table 8-3: Summary of Consultation Activities During the preparation of ESMP study for 10 districts in Giza Governorate (February 2017).

Participants	Location	Number		Methods	Date
		Male	Female		
Potential beneficiaries	Jazirat Mohamed	3	2	FGD In depth	February 2017
	El-Kom El-Ahmar	2	1		
	Tanash	3	2		
	Suqayl	2	2		
	Ausim	3	1		
	Saft Al-Laban	4	3		
	Hadayek El-Ahram	2	1		
	Al-Munib	3	2		

Participants	Location	Number		Methods	Date
		Male	Female		
	Nazlet El-Semman and Kafr El-Gabal	5	3		
LPG vendors	Jazirat Mohamed	2	-	Structured questionnaire	February 2017
	El-Kom El-Ahmar	1	-		
	Tanash	2	-		
	Suqayl	1	-		
	Ausim	2	-		
	Saft Al-Laban	3	-		
	Hadayek El-Ahram	2	-		
	Al-Munib	2	-		
	Nazlet El-Semman and Kafr El-Gabal	**3**	**-**		
Governmental and NGOs	Jazirat Mohamed	2	1	In depth	February 2017
	El-Kom El-Ahmar	3	4		
	Tanash	2	2		
	Suqayl	3	2		
	Ausim	2	1		
	Saft Al-Laban	5	4		
	Hadayek El-Ahram	2	2		
	Al-Munib	2	4		
	Nazlet El-Semman and Kafr El-Gabal	3	2		
Community people	Jazirat Mohamed	3	2	FGD Structured questionnaire	February 2017
	El-Kom El-Ahmar	4	1		
	Tanash	2	1		
	Suqayl	4	2		
	Ausim	2	1		
	Saft Al-Laban	2	3		
	Hadayek El-Ahram	2	1		
	Al-Munib	3	1		
	Nazlet El-Semman and Kafr El-Gabal	2	1		
Sub TOTAL		93	52		
Representatives from Town Gas		4	-	in–depth	February 2017

Participants	Location	Number		Methods	Date
		Male	Female		
Various stakeholders		45	11	Public consultation	April 2017
TOTAL		**142**	**63**		

Table 8-4: Summary of Consultation Activities at El_Badresheen District (Nov. 2018)

Participants (During the site-specific study)	Number		Methods	Date
	Male	Female		
Government officials	6	4	In-depth discussion	
NGOs	5	3	In-depth meetings	
Community people	16	8	FGD	November, 2018
Potential affected people	7		FGD	
Total	**34**	**15**		
Town Gas Representatives	**5**		In–depth Meetings	

A panel discussion with affected people

Consultation meeting with NGOs representatives

Meeting with potential affected people at El_Badresheen (LPG vendors)

FGD with governmental representatives At El_Badresheen

Figure 8-1: pictures showing the Consultation meetings.

The following table summarizes all the questions and comments raised during the consultation activities for both the ESMP and ESIA studies in Giza Governorate, since November 2013 until now. None of the comments received are related to the ESIA and they are all related to and addressed in the ESMP study.

Table 8-5: Key comments and concerns raised during the different public consultation activities, and the way they were addressed in the GIZA ESMP study

Subject	Questions& comments	Responses	Addressed in the ESMP Study[10]
Criteria for natural Gas connection	Why all the households and villages are not included in the NG connection plan	Connection to villages is depend on the availability of other public utilities (water, sewage, and electricity) Additionally, the village should be close to the national NG grid. The Government is giving a high priority to connect NG to all households.	Section 2.
Street rehabilitation & land refill	-Who is responsible to rehabilitate the street and land refill after the end of construction works?	Town Gas responded to this question, as they will be the implementing agency responsible for street rehabilitation in terms of budget. However, the LGU will implement the streets rehabilitation according to their plans for streets rehabilitation in each area.	Section 7.
Information sharing about NG	The people should be informed about NG. Group meetings will be useful	The NG project team provide information to the communities as follow: - During the site visits for P&A survey - During the preparation of the ESIAs and ESMPs - During contracting process - Through the hotline 129	Section 7. Section 8.
Complaint system	What if we have any complaints about the project, where we can raise our complaints	The project is adhering to a grievance mechanism. This enable anyone to submit a complaint and respond to in 15 calendar days	Section 7.
Loses of income for LPG Vendors	The NG connection project will affect the source of income for LPG vendors and the distributers	NG is not going to cover all areas, the LGU will give new license in another areas.	Section 7.
Coordination	During the Construction phase many underground public utilities (electricity cables, water pipelines ...etc. may be expose to the damage.	The LDC is keen to coordinate with the LGU, to obtain all available underground public utilities maps and information to avoid any damage. In case of damage the contractor is obliged to repair the damage at once.	See Section 7

[10] Link: https://www.egas.com.eg/sites/default/files/2019-10/Giza%20ESMP.pdf

Subject	Questions& comments	Responses	Addressed in the ESMP Study[10]
Cost of installing NG to households and options for payments	How much is the cost of NG installation, can you inform us if there is a system of monthly installments to settle the installation fee?	The cost of the installation fees is expensive but the Government of Egypt provides a huge subsidy to enable all citizens' benefit from the NG. - There is an agreement with the Egyptian Banks to finance the cost of connection to the client, and he can pay the cost in installment. - AFD in cooperation with EU provide a grant of 1500 EGP for poor people according to illegibility criteria. - Also the Ministry of Petroleum has adopted a new initiative to reduce the burden of the cost by paying the installation cost with zero interest rate (30 EGP/month for six years).	Section 4. Section 7
Role of NGOs	NGOs can help the poor people by paying the NG installation cost or alternatively, can pay the advance payment. So, the burden of the installment could be easier for them.	No one can enforce NGOs to pay the installation cost for poor. NGOs can play a vital role as a communication channel between LDC and the local community especially for information sharing and solving complaints.	Section 4

8.5 Summary of Consultation Results

The consultation outcomes revealed that:

- The interviews with the implemented companies revealed that, they are fully aware about security and safety procedures in accordance with the nature of the region.
- The AFD in cooperation with the European Union will provide the poor with a kind of grant to be able to install the NG (nearly 50% of the NG connection cost according to specific criteria). This initiative has been approved and will be applied to all project areas.
- The Ministry of Petroleum Initiative to encourage more people to connect NG by paying the cost in installment for 6 years at zero-interest rate.
- The study recommended the participation of the community people in sharing information about NG project with the other people especially the illiterate groups. (the recommendation is not obligated for the project)
- There are many problems related to LPG cylinders such as: (high cost, price fluctuations, unavailable, the exerted effort to hold and install the cylinder, and the risks related to the existence of LPG cylinder within the household)

- The interviews and the focus group discussions revealed some concerns raised by the community regarding the NG connection such as:
    - Actual need to provide clear information about the project and some concerns about NG security and safety.
    - The majority of the community people cannot afford to pay NG installation costs in one installment, they strongly recommended to pay in installments.
    - Some concerns about LPG security and safety.
    - Actual need to response to grievances in timely manner

The key message from the consultation events carried out for this project is that: The acceptance and the support of governmental officials and the local community for the project are very strong.

8.6 ESIA disclosure

As soon as the ESIA gets clearance from the World Bank and approval from EEAA, a final report in English language will be published on the WBG, EGAS and Town Gas websites. A copy of the ESIA report in English and a Summary in Arabic will be available in the customer service offices. Additionally, an Arabic summary will be made available in the contracting offices. An A3 poster will be installed in the contracting office informing about the results of the ESIA and the website link for the full ESIA study.