










2.3 million Natural Gas Connections Project in 20 Governorates

Environmental and Social Impact Assessment For El Kassasin-PRS

Ismailia Governorate

Final Report

June 2022

EGAS

Egyptian Natural Gas Holding Company

Developed by

"Petrosafe"

Petroleum Safety & Environmental Services Company

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
GBV	Gender-based violence
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
MOP	Maximum operating pressure
NG	Natural Gas
NGO	Non-Governmental Organizations
PAPs	Project affected persons
P&A	Property and Appliance Survey
PE	Poly Ethylene
PRMS	Pressure Reduction and measuring Station
PRS	Pressure Reduction Station
SDO	Social Development Officer
SEA	Sexual Exploitation and Abuse
SH	Sexual Harassment
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$ = 18.81 EGP as of June 2022

Exchange Rate: € = 19.86 EGP as of June 2022

Contents

Annexes

ANNEX 1:		CONTRIBUTORS TO THE ESIA
ANNEX 2:		PRS LAND DOCUMENT
ANNEX 3:		EGAS PROCEDURE FOR LAND ACQUISITION FOR PRS CONSTRUCTION
ANNEX 4:		QRA (QUANTITATIVE RISK ASSESSMENT STUDY) FOR EL KASSASIN PRS
ANNEX 5:		EGAS UPDATED HSE GUIDELINES
ANNEX 6:		NOISE AND AIR MEASUREMENTS
ANNEX 7:		CHANCE FIND PROCEDURE
ANNEX 8:		IMPACT ASSESSMENT
ANNEX	9-A:	EGYPTIAN MINISTRY OF PETROLEUM AND MINERAL RESOURCES COVID-19 EMERGENCY RESPONSE PLAN
	9-B:	WBG RESPONSE TO COVID-19 CONTINGENCY PLANNING FOR PROJECT SITES
ANNEX 10:		CODE OF CONDUCT
ANNEX 11:		GRIEVANCE AND REDRESS MECHANISM FORM
ANNEX 12:		EGAS EMERGENCY RESPONSE PLAN MAIN ELEMENTS & NOTIFICATION PROCEDURES SUMMARY
ANNEX 13:		LIST OF PARTICIPANTS OF CONSULTATION ACTIVITIES AT EL KASSASIN

List of Tables

List of Figures

0. Executive Summary

The objective of the proposed project is to construct a Pressure Reduction Station (PRS) in El Kassasin District, Ismailia governorate to install the NG in El Kassasin (2500 households) and Abu Sweir (2500 households) districts. It is worth mentioning that the Low-pressure network in El Kassasin and Abu Sweir districts were among other districts in Ismailia Governorate, that is financed by the project. The ESMP of Ismailia Governorate districts including the mentioned districts, was cleared by the Bank in May 2022. The PRS for El Kassasin will be designed to reduce an inlet pressure of 25-70 bar to an outlet pressure of 7 bar at a flow rate of 10,000 m3/h. The flow rate can be increased to 20,000 m3/h in the future according to demand increase. The new PRS will entail new land acquisition. The current land location was purchased on 17/06/2020 (after inspecting different land alternatives, according to the Willing buyer Willing seller approach applied by EGAS and Town Gas, (**Annex-2** land document). The objective of the current Environmental and Social Impacts Assessment (ESIA) is to assess and propose mitigation measures for the environmental and social impacts of El Kassasin PRS at Ismailia governorate. 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 a separate Environmental and Social Management Plan (ESMP) which cleared by WBG team on May 2022.

The off-take point will be located inside Gasco valve room which is about 40 meters from the PRS. A plot of land of 150 square meters was purchased after the acceptance of the road land owner to the bargain (LDC usually pay a higher price than the market price) to be used as a road between the off-take point and the PRS location Thus, the WB OP/BP 4.12, will not be applicable.

The local distribution company (LDC) responsible for project implementation in El Kassasin is Town Gas.

EGAS and LDCs follow a set of agreed-upon procedures for the process of permanent Land acquisition for the construction of PRSs **Annex-3**. The procedure covers cases of land acquisition of State-Owned Lands or privately-owned Lands on a willing Buyer Willing Seller basis.

Series of public consultations and consultation activities conducted throughout the project cycle, through the past 8 years from the early stages of the project, including the dissemination of project information and consultation with the Project affected persons.

The proposed PRS will be located in agricultural lands within El Kassasin district, Ismailia governorate, about 0.8 km West Abu Gerish village, 1 km North Ezbat Al Hawary, 1.5 Km East Al Mahsama village, 0.25 km West 30 June axis and about 1.1 km North Ismailia - El Zakazik road.

The nearest residential area is Abu Gerish village which is located approximately 0.8 km East of the proposed PRS location. The project will be regulated by both the World Bank Safeguards requirements and Egyptian environmental, social and occupational health and safety regulations. A list of laws is presented in chapter 3 of this report.

The average temperature for the year is (21.7 °C). The average amount of precipitation for the year is (35.6 mm). El Kassasin PRS is located about 76 km east of the Nile River. The surface water resources of the Ismailia Governorate are limited to the Nile River Branches (Rosetta and Damietta). The groundwater aquifers in Ismailia Governorate are the quaternary deposits that can be divided into two hydrological units Holocene semi-permeable layer and the Pleistocene main aquifer.

The air quality at the proposed site is exhibiting permissible limits of classic air pollutants the levels are way below the national and international guidelines.

Concerning the flora of significance, none were encountered in the proposed project area, where the PRS is planned to be constructed. The current PRS area is free of significant vegetation. The PRS offtake from the national grid does not come into contact with flora as it is located inside Gasco Valve room.

El Kassasin district is located in Ismailia governorate. Municipal solid waste is collected and then transferred to El Kassasin intermediate waste area and then to Abu Balah dumpsite.

El Kassasin PRS is located in a rural area in Ismailia governorate. The traffic surrounding El Kassasin PRS is relatively low density.

The total population of El Kassasin Markaz is 111,618 people representing about 15% of the estimated population in the Ismailia governorate in 2017.

According to CAPMAS data of 2017, almost all individuals at El Kassasin Markaz use electricity for lighting and other utilities are also available. The PRS is will be supplied by electricity from the national electricity grid.

The project will result in positive impacts on temporary job opportunities and potential supplies. However, it may result in some potentially negative impacts. The 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
Impacts due to COVID-19 pandemic	Medium
Labor Influx	Medium
Child labor	Minor -Medium

Potential Negative Impact	Impact significance
Sexual exploitation and abuse (SEA)/ sexual harassment (SH)	Negligible
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
Impacts due to COVID-19 pandemic	Minor
Hazardous material and waste management	Medium
Noise	Minor

Mitigation and monitoring measures are presented in this ESIA in chapter-7. The PRS-related consultation activities in El Kassasin were conducted with a wide range of stakeholders. This included 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 surrounding individuals/households expressed their eagerness to host the project, as the natural gas will reduce their agony with the LPG cylinders. It is worth mentioning that due to the current situation of the COVID-19 pandemic and the required precautionary measures, the research team has adopted a new methodology for consultation; 48 persons attended more than seven focus group discussions at El Kassasin. An additional consultation session was conducted on 8th February 2022 with the participation of 68 persons in Egypt Library Hall, Ismailia city. Where the public officials of the Governorate stressed expediting the implementation of the project in their districts. Taking into consideration that the consultation activities are a continuous process during all the project phases. There was no single comment raised about the safety of the PRS or its activities. The PRS did not raise any concerns among the community in the vicinity area.

1. Introduction

1.1 Project Objectives

The objective of the proposed project is to construct a Pressure Reduction Station (PRS) in El Kassasin District, Ismailia governorate to install the NG in El Kassasin (2500 households) and Abu Sweir (2500 households) districts. It is worth mentioning that the Low-pressure network in El Kassasin and Abu Sweir districts were among other districts in Ismailia Governorate, that is financed by the project. The ESMP of Ismailia Governorate districts including the mentioned districts, was cleared by the Bank in May 2022.

The PRS for El Kassasin will be designed to reduce an inlet pressure of 25-70 bar to an outlet pressure of 7 bar at a flow rate of 10,000 m3/h. The flow rate can be increased to 20,000 m3/h in the future according to demand increase.

1.2 Environmental and Social Impact Assessment (ESIA)

The ESIA is undertaken to assess and propose mitigation measures for environmental and social impacts of the PRS. Impacts of NG exploration, extraction, refining, and transmission are outside the scope of this ESIA. The impacts of distribution networks for different areas are addressed in separate Environmental and Social Management Programs (ESMPs). It is worth mentioning that in March 2014 an Environmental and Social Impact Assessment Framework (ESIAF) was developed for 11 of the project's Governorates[1] (including Ismailia Governorate), followed by an update of the ESIAF in January 2017 to cover the expansion of the project in 9 new Governorates[2]. In March 2018, a site-specific ESMP for Qantra Shark and Qantra Gharb was prepared[3], followed by ESIA for Qantra Shark PRS in November 2018[4], while ESIA for Qantra Gharb PRS was prepared in April 2019[5] (The aforementioned studies were cleared by the World Bank and disclosed on the EGAS website and the Bank website), moreover an ESMP for Nefisha, El Kassasin, Abu Sweir and New Ismailia districts[6] cleared by WBG team on May 2022

The ESIA objectives include:

- Describing project components and activities of relevance to the environmental and social impacts assessments.

1 https://www.egas.com.eg/sites/default/files/2019-06/ESIAF%20for%20NG%20connections%20project%20for%2011%20Governorates.pdf
2https://www.egas.com.eg/sites/default/files/2019-06/updated%20environmental%20and%20social%20impact%20assessment%20framework%20for%2020%20governorates.pdf
3 https://www.egas.com.eg/sites/default/files/2019-10/ISMAILIA%20ESMP%20.pdf
4 https://www.egas.com.eg/sites/default/files/201910/Executive%20summaryQantra%20Shark%20PRS%20ESIA%20Ismailia.pdf
5 https://www.egas.com.eg/sites/default/files/2019-10/Qantara%20Gharb%20PRS%20ESIA.PDF
6 https://www.egas.com.eg/ismailia-esmp-0

- 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, social, and OHS impacts of the project
- Developing environmental & social management and monitoring plans in compliance with the relevant applicable laws
- Documenting and addressing environmental and social concerns raised by stakeholders and the Public in consultation events and activities

The local distribution company (LDC) responsible for project implementation in El Kassasin district is Town Gas.

1.3 Contributors

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

Table 1-1: Shortlist of Main Contributors

Shortlist of Petrosafe main Team Members				
Project Manager (Senior ESIA Expert)	**Project Manager (Senior ESIA Expert)**	**Social consultant**	**Team leader**	**Quality Control**
Chem. Mohamed Saad Abdel Moein	**Chem. Mohamed Abdel Moniem Aly**	**Economist/ Osama Kamal**	**Geo. Mohamed El-Ghazaly**	**Dr. Zeinab Farghaly**

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[7] to facilitate detection in the event of leaks. In addition to excavation, key activities of the construction phase also include the 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:

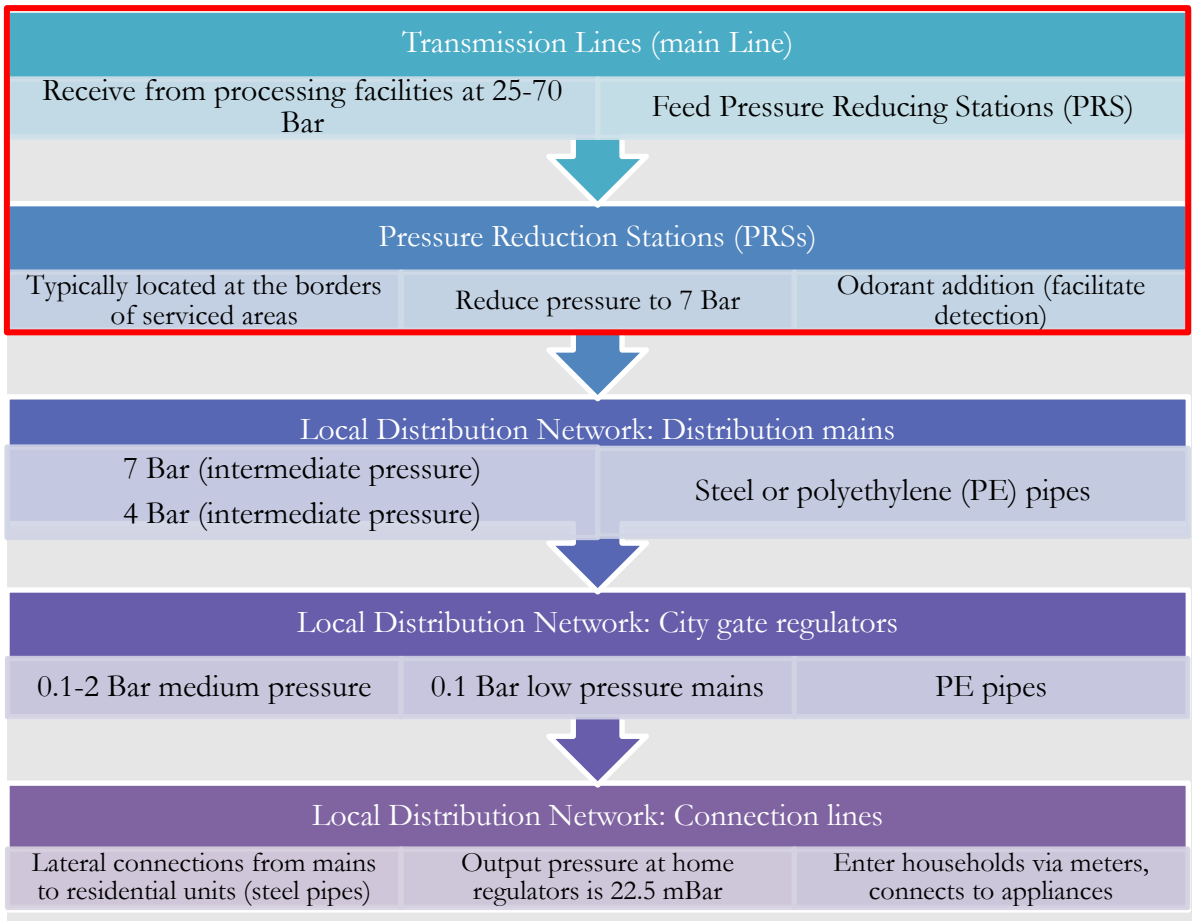


Figure 2-1: General components of the city's distribution network

[7] 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)

The 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, odorizing unit, and ventilation equipment as shown in **Figure 2-2**.

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

The proposed El Kassasin PRS will be designed to reduce the inlet pressure of 25-70 Bar to an outlet pressure of 7 Bar at a flow rate of 10,000 m3/h capacity to feed El Kassasin and Abu Sweir districts.

2.2.2 Offtake

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 Kassasin PRS, the related HP pipeline connection between offtake and the PRS is about 63 meters far from the PRS boundaries. At the offtake, there is a valve room/valve ditching to control the flow of the natural gas through the pipeline (branch).

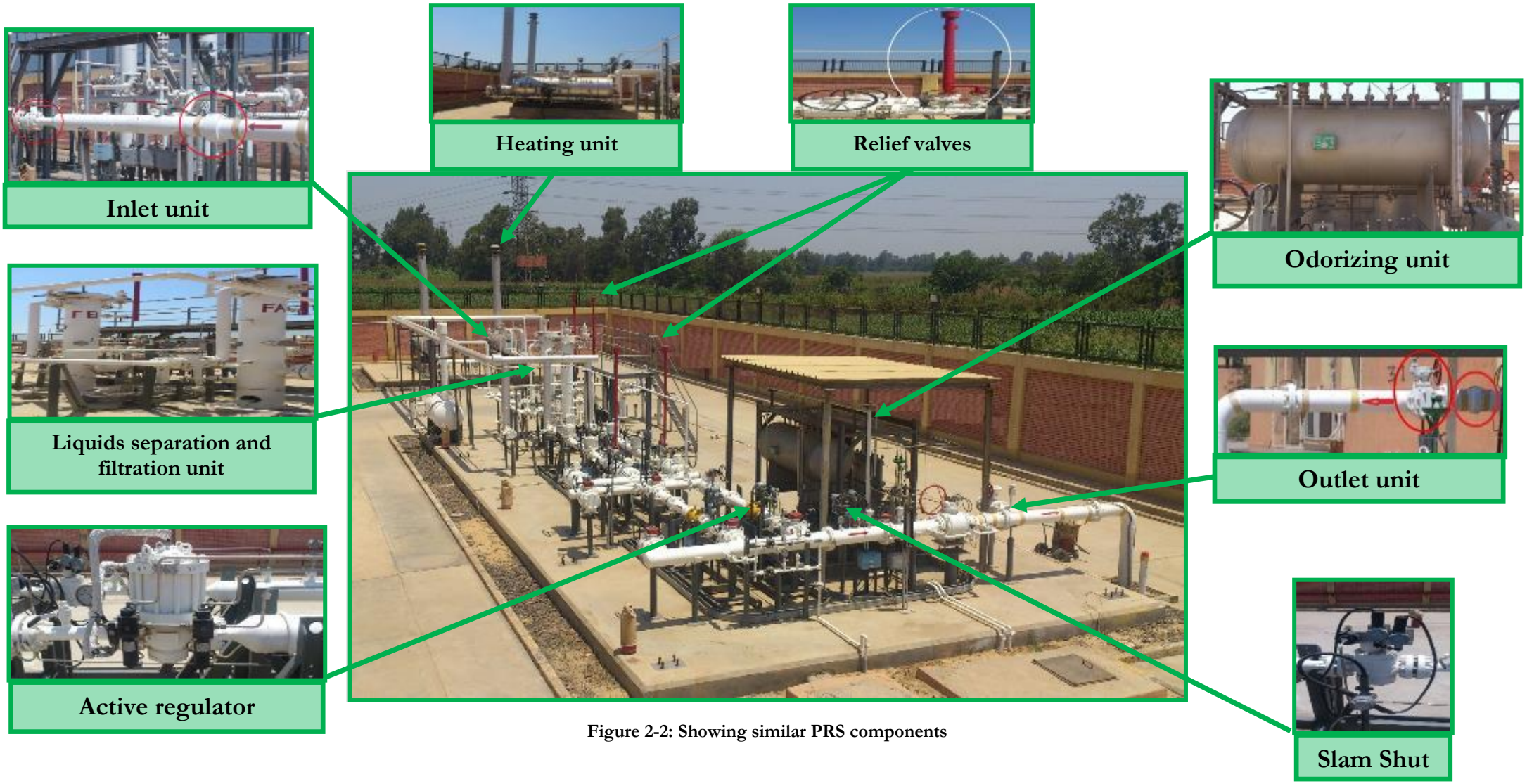


Figure 2-2: Showing similar PRS components

2.3 Project location

2.3.1 Pressure Reduction Station (PRS)

The proposed PRS will be located within El Kassasin district, Ismailia Governorate, on El Mazraa Road, about 0.8 km West Abu Gerish village, 1 km North Ezbat Al Hawary, 1.5 Km East Al Mahsama village, 0.25 km West 30 June axis and about 1.1 km North Ismailia - El Zakazik road. The geographical coordinates of the proposed PRS location are (latitude 30° 33' 41.64" N, longitude: 32° 3' 24.17" E). The nearest residential area (Abu Gerish village) is located approximately 0.8 km East of the PRS location as shown in **Figures 2-3, 2-4, and 2-5**

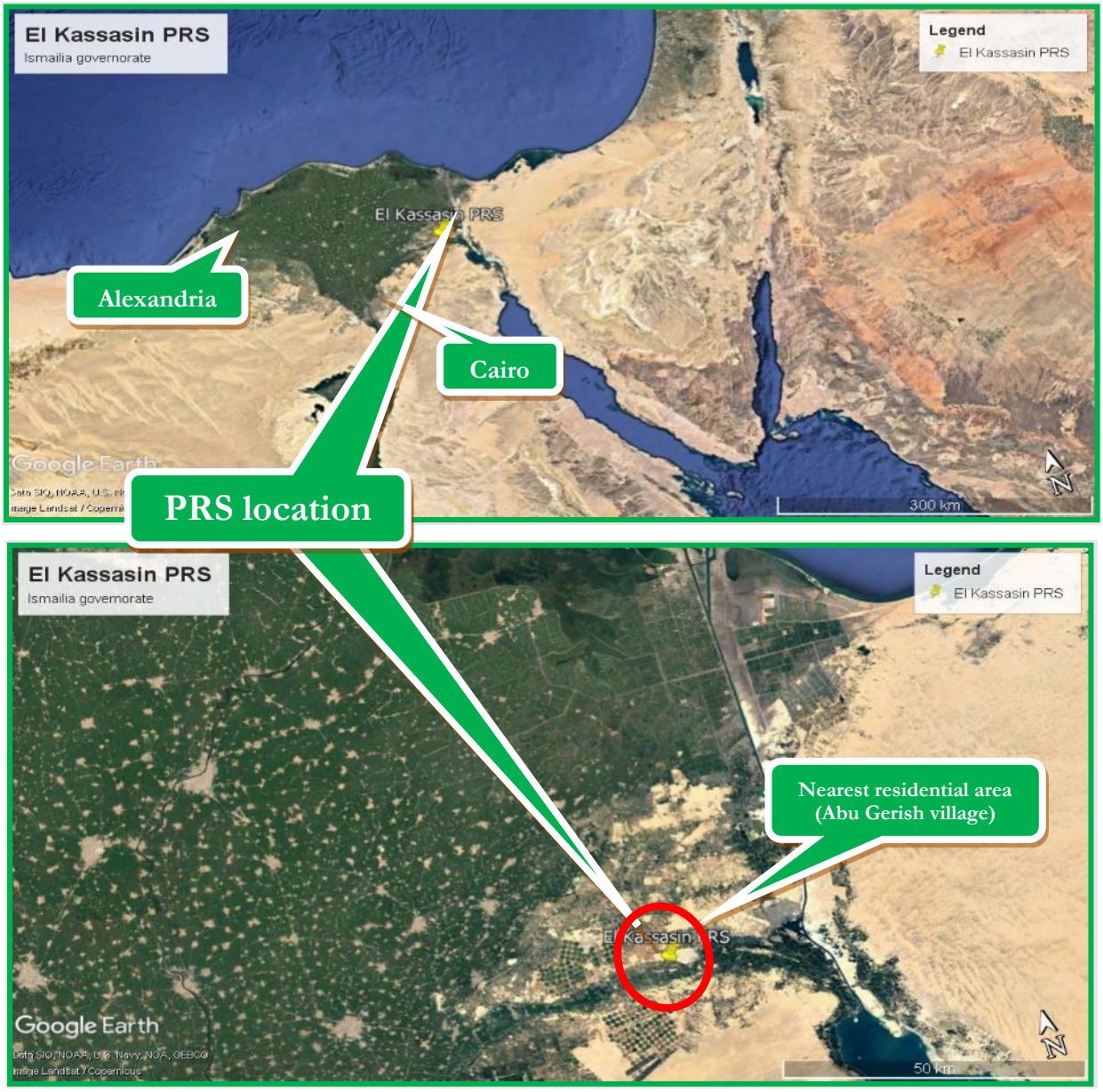


Figure 2-3: A satellite map showing the proposed location of El Kassasin's PRS and nearest residential areas.

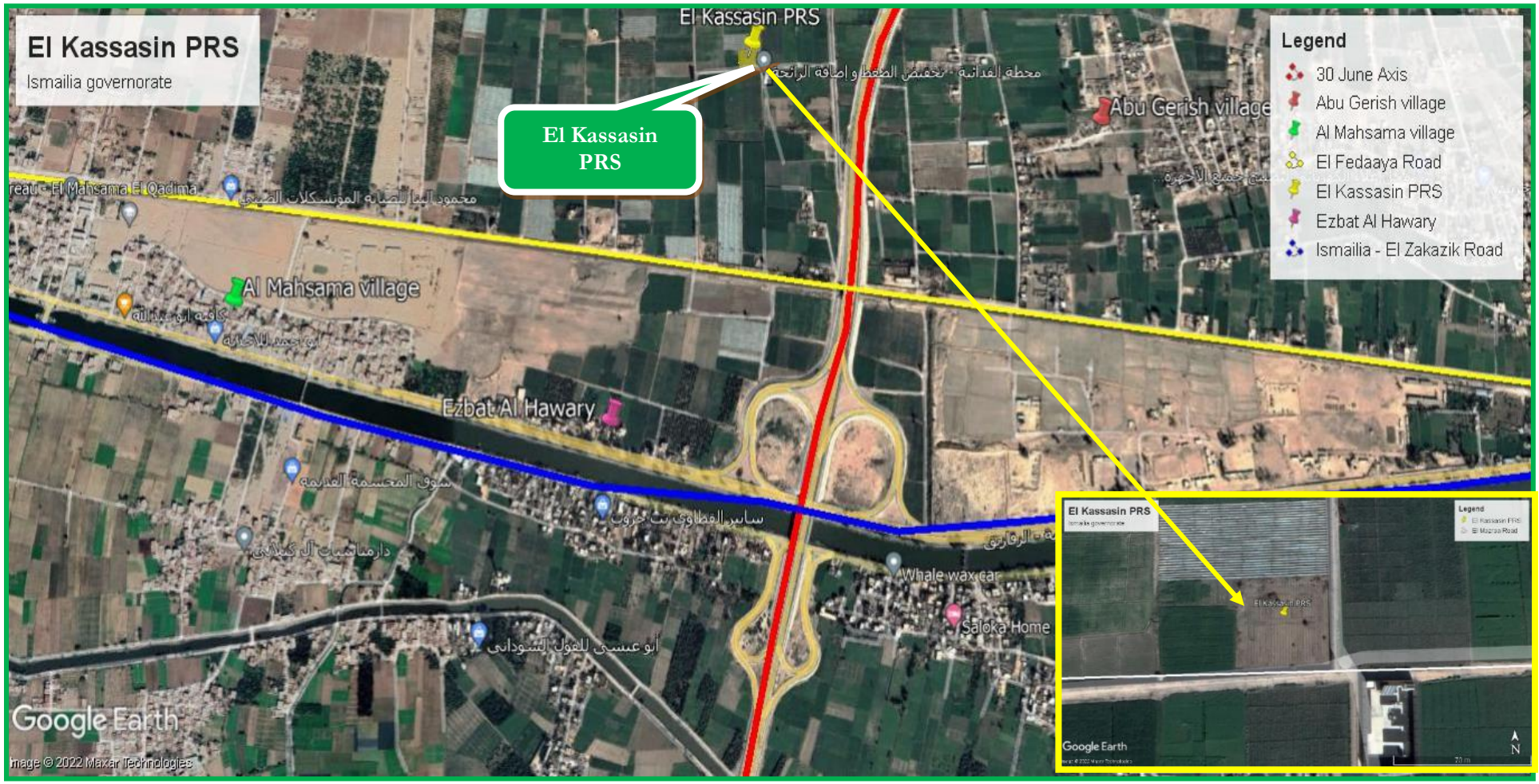


Figure 2-4: The proposed Location of El Kassasin PRS

Figure 2-5: Pictures showing the proposed PRS and its surroundings

2.3.2 Offtake Location

The Offtake point will be located inside Gasco valve room, which is located about 40 m south East the proposed PRS location. The geographical coordinates of the proposed offtake location are (latitude 30° 33' 40.30" N, longitude: 32° 3' 25.95" E). **Figure 2-6 and Figure 2-7**

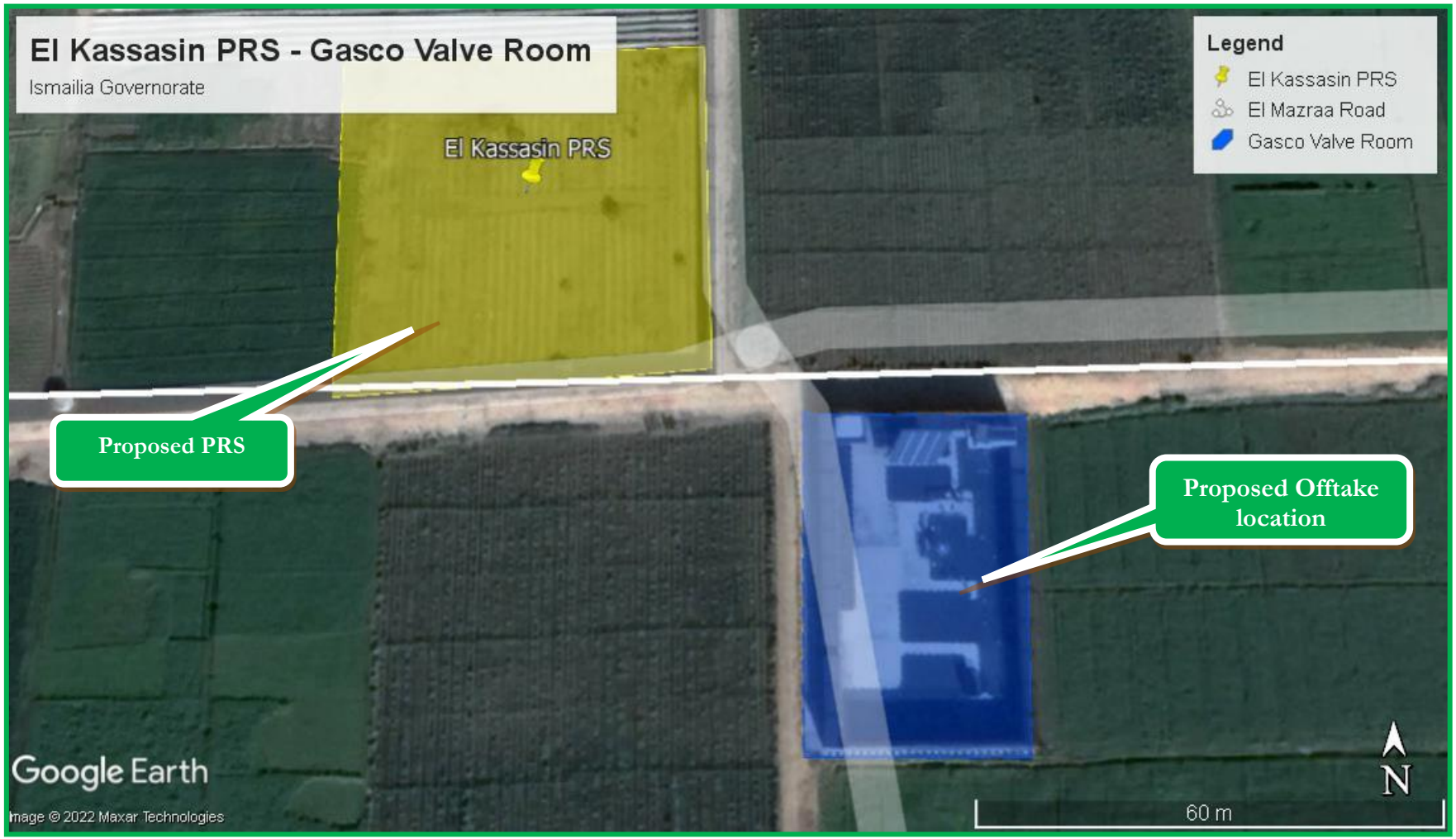


Figure 2-6: The proposed location of the proposed Offtake point, which will be located inside Gasco valve room

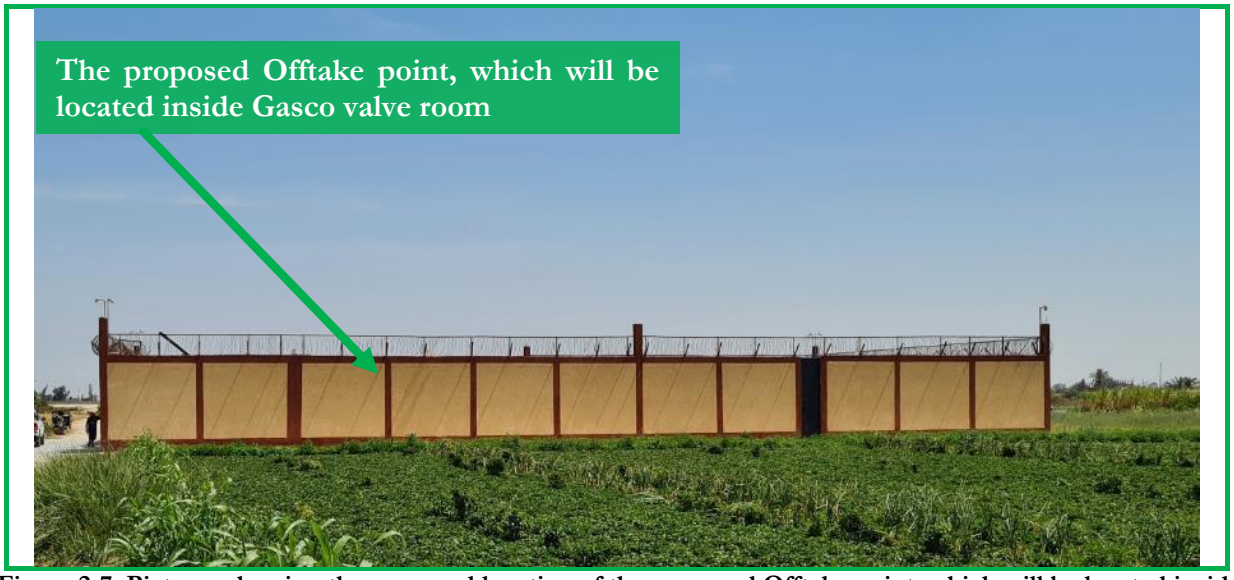


Figure 2-7: Pictures showing the proposed location of the proposed Offtake point, which will be located inside Gasco valve room

2.3.3 HP Pipeline Route

The total length of the proposed pipeline route is about 63 meters. The proposed pipeline route will start from the Proposed Offtake point, which will be located inside Gasco valve room then will extend to the west (through the purchased land) for about 63 meters to reach its destination inside the PRS at the geographical coordinates of (latitude 30° 33' 41.64" N, longitude: 32° 3' 24.17" E). **Figure 2-8**.

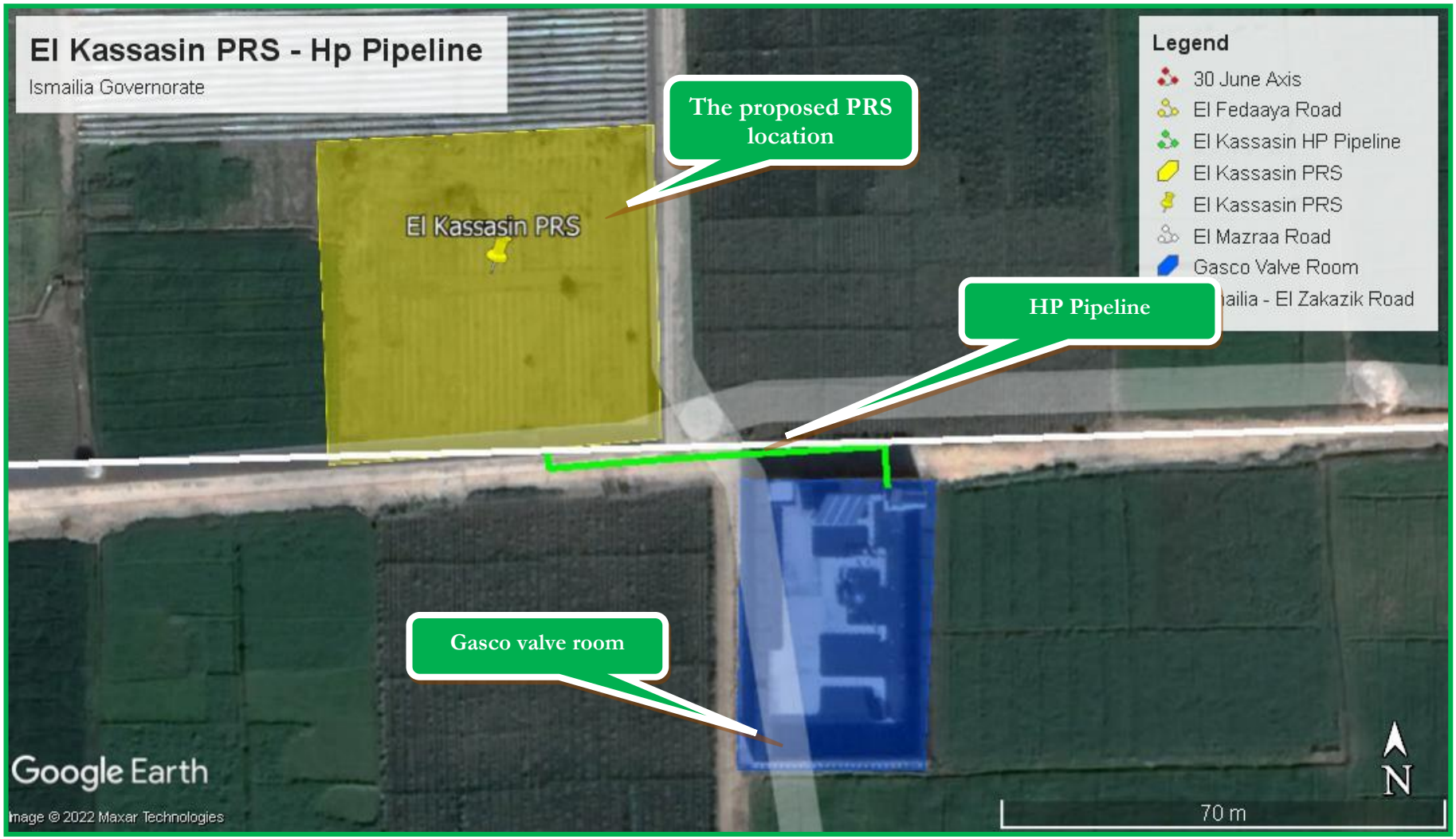


Figure 2-8: The proposed Pipeline Rout

2.4 Project Execution Methodology

2.4.1 General survey

- Identifying the availability of overhead and underground 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, and gas networks.
- Identifying the location of the new PRS location and new offtake location.
- Identify the route of inlet connection "25-70 Bar system"

2.4.2 Land acquisition for the Project Activities

The new PRS will entail two new land plots, one of the areas of 2500 square meters for installing the PRS while the other of 150 square meters to be used as a road to connect the valve room at Gasco with the PRS location. Both the two plots were purchased on 17/06/2020 after inspecting different land alternatives (**Annex-2** land document), according to the Willing buyer Willing seller approach applied by EGAS and Town Gas (For further elaboration on EGAS procedures for land acquisition see **Annex-3**).

The Off-take from the national network and high pressure (HP) pipeline "25-70 bar system" is about 40 meters from the PRS location (within GASCO Valve Room) and it will pass through the purchased road. The landowners expressed their satisfaction of selling their lands at such price, which is higher than the market prices. (Usually the petroleum sector pays more than the market price for the landowners, so the landowners are competing and struggling to sell their lands to the petroleum' projects all over the country).

Thus OP 4.12 does not apply to Kassasin 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

PRS 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 the noise impacts of the PRS reducers on the surrounding receptors). The nearest residential area is around 0.8 km (Abu Gerish village) East of the proposed PRS location **(Figure 2-5)**.

The PRS is to be accessible from El Mazraa road to ensure quick response in the event of repairs and/or emergencies.

Pressure Reduction Station Civil Works:

About a 2 months construction schedule is planned for El Kassasin Proposed PRS with site preparation expected to commence in the first half of 2022.

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 about 80 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:

El Kassasin PRS comprises two pressure streams, the upstream (inlet) high pressure 25-70 Bar and the downstream (outlet) low pressure 7 Bar. The PRS design as per 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 2-9)**

The proposed PRS will be equipped with valve and blind flange to the inlet and the outlet for the future upgrade.

In case of need for upgrade, the new facilities will be installed and connected to the system via the refereed valve to ensure the uniform supply for NG customers without any disruptions.

Testing:

Following mechanical completion, testing of the facility components will be performed under the applicable standards (e.g. IGE/TD/13, IGE/UP/1, IGEM/SR/16, IGE/SR/9,22,23,24,25,…etc).

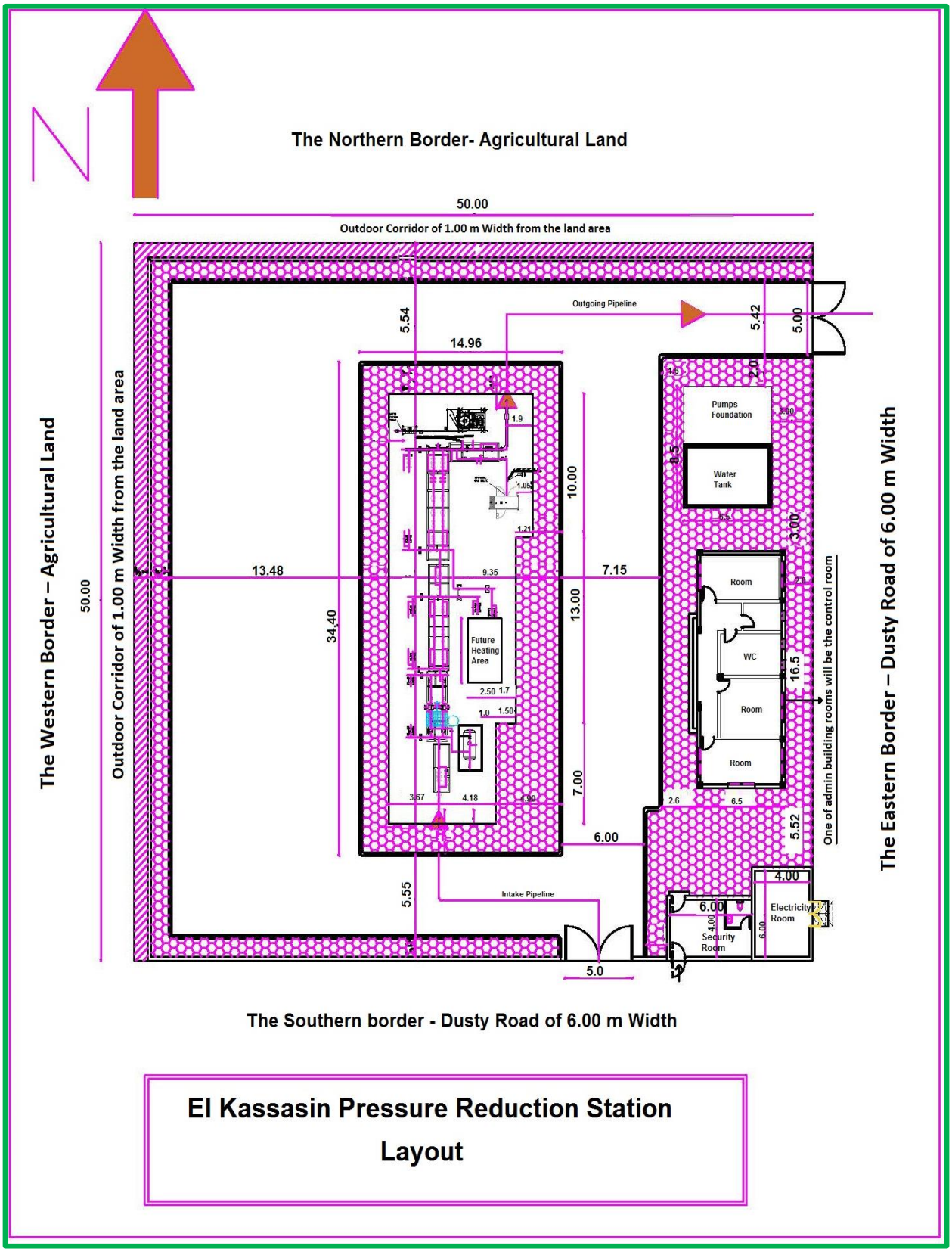


Figure 2-9: The proposed layout of El Kassasin PRS

2.4.5 Construction works for the Offtake and HP pipeline

The 63-meter HP pipeline will pass through an inner road (purchased land with no intrusion to any agricultural land) to connect the offtake with the proposed PRS. The offtake location will be inside Gasco Valve Room, away from any residential areas and close to a road.

Construction activities of the HP pipeline include excavation, pipeline placement, pipeline connection welding and then surfacing. The construction activities will be located within the purchased land for the proposed Pipeline route. The duration of the construction of the pipeline will be about 1 week.

All safety precautions will be applied as per the updated EGAS HSE guidelines (**Annex-5**) including:

- 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 PRS and the HP pipeline will temporarily involve using El Mazraa road 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 within the proposed El Kassasin PRS location; 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 within the proposed El Kassasin PRS 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, telecommunication lines and overhead utilities) 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 Kassasin 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 8 inches. 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 soil is used for backfilling. Small amounts of leftover soil and other waste materials during excavation are loaded onto trucks to minimize obstruction of road, 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, 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 after analysis 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 of 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 to avoid road settlements and subsequent cracks. Natural gas pipes are surrounded by sand 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 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. A 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 drain the line before NG is fed.

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

The operation of the PRS involves the 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 to, 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 a 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 filtration unit aims to remove dust, rust, solid contaminants, and liquid traces before entering 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 at a suitable temperature (the temperature of gas flow entering the station should be 15 °C; 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 pipelines passing 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 range between 35 °C and 45 °C.

The heating unit comprises the following components:

- Heater body/shell
- Process gas inlet/outlet
- Water Expansion tank
- Burner, Gas Train & BMS Panel
- Removable Firetube
- 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 an open protected area.

Active and Monitor Regulator

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

Slam Shut Valve

The purpose of Slam shut is to automatically, and rapidly cut off gas flow when the outlet pressure exceeds or drops below the set 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 concentrations before gas concentrations become hazardous. 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 the Water and Sanitation Company.

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 3.6 m^3/day
- Construction activities (61.2 m^3) including hydrostatic testing (2 m^3): about 63.2 m^3

Fuel:

Diesel fuel will be mainly used for:

- Diesel generators supply electricity for 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 its related 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 connected to the public water network.

Electricity

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

2.7 Waste Generation

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

2.7.1 During Construction

Solid wastes

The solid waste generated during the construction phase will be disposed by the contractor, it comprises from construction wastes and domestic wastes as follows:

- 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 30 workers per day over 2 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. which will be transferred to El Kassasin intermediate waste area and then to Abu Balah dumpsite.
- Excavated soil is used for backfilling. Small amounts of leftover soil may remain will be covered and are disposed of in legal dumpsites as per the contract between the Contractor and the supplier

Hazardous wastes

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

Liquid waste

Liquid waste will comprise mainly domestic wastewater, vehicle/equipment wash down water and hydrostatic test water. Domestic water is the only continuous source during construction. Workers during the construction phase will use the contractor's portacabin bathroom, the hydrostatic test water will be sampled and analyzed before selecting an appropriate disposal method, and if the results are 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

The 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 the local units.

Hazardous waste

Mainly empty odorant containers and filters will be treated on-site and 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 which is connected to the municipal sanitary network.

3. Legislative and Regulatory Framework

In this chapter, the applicable laws, regulations, and standards to which contractors are obligated will be presented.

Detailed discussion and comparison between National legislations and WB policies are presented in the updated Environmental and Social Impact Assessment Framework (ESIAF)[8] and Resettlement Policy Framework (RPF)[9].

3.1 Applicable Environmental and Social Legislation in Egypt

- Law 217/1980 for Natural Gas.
- Law 4 for the 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 the Year 1995 and the amended regulation No 1741 for the 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
- 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 Occupational health and safety
    - Articles 43 – 45 of Law 4/1994, air quality, noise, heat stress, and worker protection
    - Law 12/2003 on Labor including decrees 211, 126, and 134 for the year 2003
    - EGAS updated HSE guidelines, LDCs will comply with EGAS updated HSE guidelines which work as regulations on PRS construction and operation (provided in **Annex-5** from the report)

3.2 World Bank Safeguard Policies[10]

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). Environmental Assessment OP/BP 4.01 will apply to the current project. Physical Cultural Resources OP/BP4.11 will be applicable since Ismailia governorate is known for some archeological and cultural sites, although no cultural resources are located in the

[8] https://www.egas.com.eg/sites/default/files/2019-06/updated%20environmental%20and%20social%20impact%20assessment%20framework%20for%2020%20governorates.pdf

[9] https://www.egas.com.eg/sites/default/files/2019-06/updated%20Ressettlement%20policy%20framework%20for%20HH%20connection%20project%20in%2020%20governorate.pdf

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

project district (since this district has been excavated several times before for other public utilities). The chance finds procedures will be part of the contracts of the contractors. With regards to OP/BP 4.12, it will not be applicable Where the lands for the PRS and the required road have obtained on the 17th of June 2020 and were bought from a landowner as per the contract in **Annex-2**.

WBG' labor influx guideline (2016)[8] as well as the Good Practice Note on Addressing Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) in Investment Project Financing involving Major Civils Works[9]" were taken into consideration in addressing impacts of labor influx and SEA/SH.

In addition to the above-mentioned safeguards policies, the Directive and Procedure on Access to Information[10] will be followed by the Project.

3.2.1 World Bank Group General Environmental, Health, and Safety Guidelines[11] & WBG Environmental, Health and Safety Guidelines for Gas Distribution Systems[12]

The General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines, which guide 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.

"Gap analysis for key environmental and social issues concerns: Egyptian laws and WBG Policies was conducted in the ESIAF of the project and disclosed on EGAS website[13]" WBG' labor influx guideline (2016), as well as GBV, are included.

3.3 Permits Required

- Approval from the Ministry of Agriculture to construct the PRS on agricultural land under the presidential decree number 615 of the year 2016.
- Army forces permit for the construction of the PRS.
- Constructions permit to be obtained from the local Governmental unit (LGU) in El Kassasin – Ismailia 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 the construction phase)

[11] https://www.ifc.org/wps/wcm/connect/554e8d80488658e4b76af76a6515bb18/Final%2B-%2BGeneral%2BEHS%2BGuidelines.pdf?MOD=AJPERES
[12] https://www.ifc.org/wps/wcm/connect/9c6e3d0048855ade8754d76a6515bb18/Final%2B-%2BGas%2BDistribution%2BSystems.pdf?MOD=AJPERES&id=1323162128496
[13] https://www.egas.com.eg/natural-gas-connections-project-11-egyptian-governorates

4. Environmental and Social Baseline

4.1 Description of the Environment

El Kassasin PRS located in an agricultural land surrounded by two dusty roads from the South and East, agricultural lands from the West and North within El Mahsama village, El Kassasin Markaz about 0.8 km West of Abu Gerish village, 1 km North of Ezbat Al Hawary, 1.5 Km East Al Mahsama village, 0.25 km West 30 June axis and about 1.1 km North Ismailia - El Zakazik road.

The nearest residential area is Abu Gerish village which is located approximately 0.8 km East of the proposed PRS location. (**Figure 4-1**)

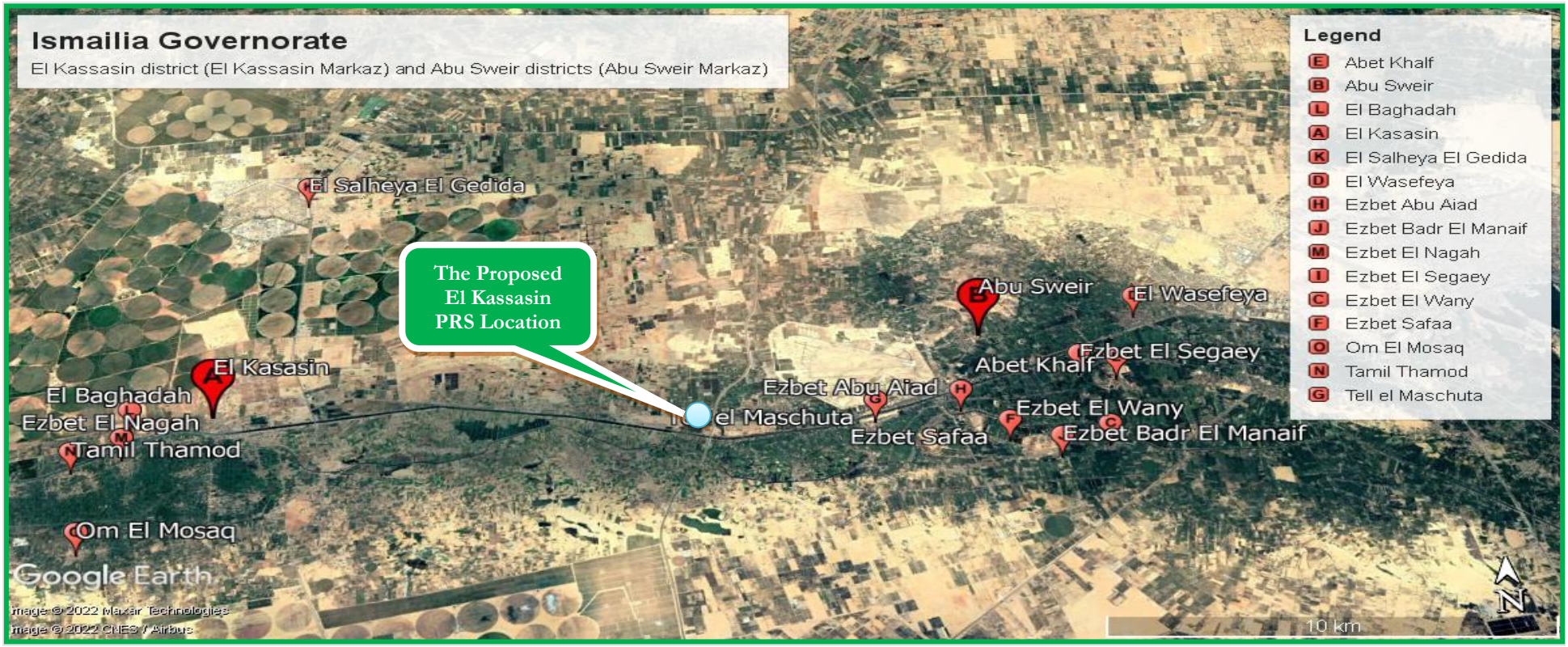


Figure 4-1: Satellite map showing El Kassasin PRS Proposed location and surrounding communities

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 to the PRS location, 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 the nearest road adjacent to the PRS location.

One-hour average results for 8 hours of 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 area 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., the exhaust is below permissible levels. Ambient concentrations of gaseous pollutants, NOx, SOx, and CO are unlikely to surpass permissible levels due to the operation of construction equipment. Management and mitigation plan for ambient air pollution is further addressed in chapters 6 and 7. During the construction phase, excavation and construction activities will likely cause dust levels to surpass permissible levels in 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 of continuous measurements were conducted for noise level measurements in the same location as the ambient air quality measurements.

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

Results of noise measurements

The noise measurements in the studied area 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 temperature for the year is (21.7°C). The warmest month, on average, is August with an average temperature of (28.9°C). The coolest month on average is January, with an average temperature of (13.9°C). The average amount of precipitation for the year is (35.6 mm). The month with the most precipitation on average is January with (10.2 mm) of precipitation. The month with the least precipitation on average is April with an average of (0 mm)

4.1.4 Water resources

Groundwater

Water-bearing formations of the eastern Nile delta consist mainly of Quaternary fluvial and local fluvio-marine sand deposits. Their lithologic characteristics and thickness are highly controlled by the prevailing geological and environmental conditions. The regional flow of groundwater is mainly directed from west to east via the Ismailia governorate. There are two types of water-bearing formations in the Ismailia governorate as follows:

- **The local fluvio-marine Holocene semi-permeable aquifer:** contained from shale and clay. Its thickness differs from one area to another and generally ranges between 5 – 20 m.
- **The main fluvial Pleistocene aquifer:** contained from sand, flint, and scattered spots from clay. Lies between the Holocene semi-permeable layer from upward and Pliocene clay from the downward. Its thickness ranges between 100 – 400 m. sourced from Damietta Nile branch and irrigation canals.

Surface water:

El Kassasin PRS is located about 76 km east of the Nile River. Ismailia fresh water canal is the main source of irrigation and drinking water in Ismailia governorate. There are two main lakes as follows:

1. **Temsah lake:** It forms a natural basin, size about 90 million m3 of salty water, its area about 1900 acres with average depth of 5 meters. Temsah lake forms 14 Km^2 of the total area of Ismailia governorate.
2. **Bitter Lakes:** Shores of Bitter Lakes extend for 50 Km from Defreswar in north of Ismailia till Kebreet in south. The area of Minor Bitter Lakes is 40 Km^2 (9525 acres) and the area of Major Bitter Lakes is 194 Km^2 (46190 acres).

There are 4 mains agricultural water drainages (Malaria and Mahsama drainages– Fayed, El Wady drainage - El Tal El Kabier, and the North Sinai drainage – El Rouda), part of their water is used for irrigation of agricultural lands and the rest is dumped in Temsah lake and Bitter Lakes

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 4-2 and 4-3**.

El Kassasin Proposed PRS Location

Figure 4-2: Shows an Overview of the proposed PRS location.

Overview of the PRS surrounding area

South Neighbor	East Neighbor

Figure 4-3: Shows an Overview of the PRS surrounding area

In conclusion, the project area is free from any flora or fauna of ecological importance, and it is not going to intervene with any green cover. In addition, the activities will take place away from any protected areas or areas of any ecological importance.

4.1.6 Waste Management:

Solid Waste:

The responsibility of service planning, delivery, and monitoring in El Kassasin district within the Ismailia governorate is delegated to the Cleansing and beatification Agency managed by the local governmental unit and transferred by trucks to El Kassasin intermediate waste area and then to Abu Balah dumpsite.

Liquid Waste:

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

Hazardous Waste:

There is no hazardous waste site within El Kassasin district. any hazardous waste generated within El Kassasin PRS will be temporarily stored in an isolated area inside the PRS borders and will be transported- by licensed hazardous waste handling vehicles and personnel to Town Gas Abu Rawash sit then transported for final disposal at a licensed hazardous waste facility (Nassreya or UNICO in Alexandria).

4.1.7 Traffic Profile

The traffic surrounding El Kassasin PRS is relatively moderate to low density with no rush hours, there are many types of vehicles including trucks, private cars, microbuses, and motorcycles. The main roads are El Mazraa Road, El Fedaaya Road, El Shahid Mohamed El Boghdady Road (Low density) and Ismailia - El Zakazik road (Moderate density).

Types of roads close to the PRS

Urban Roads

The main roads closest to the PRS area are El Mazraa Road and El Fedaaya Road.

Figure 4-4: Shows the main roads closest to the PRS area

4.2 Socioeconomic Baseline

Ismailia Governorate is one of the Canal Zone governorates of Egypt with a total population of 1,303,993. Located in the northeastern part of the country, its capital is the city of Ismailia. It is located between the other two Canal governorates; Port Said Governorate, in the Northern part of Egypt and Suez Governorate. The new PRS will be constructed at Markaz El Kassasin, Ismailia governorate

Depending on a combination of both primary data collected from the field and secondary resources reviewed including statistical data, this section will highlight the following: administrative division, urbanization trends, demographic characteristics, human development profile, access to basic services, roads and transport, poverty index, income and expenditure, fuel currently used in households, problems faced with the current household fuel, perception towards the project, and gender dimension of the current type of fuel.

4.2.1 Administrative division

Markaz El Kassasin is affiliated to Ismailia Governorate, with a total population of 190,703 representing about 15% of the total population in Ismailia

Table 4-1 Project District Areas[14]

Project district	Total area
Ismailia governorate	5066 km^2
Markaz El Kassasin	677 Km^2

4.2.2 Urbanization Trends

According to the site visit to El Kassasin district and the field observations, Markaz El Kassasin is classified as an urban to semi-urban area. The type of dwelling should be highlighted to identify the probability to install the NG in the houses there. Most of the buildings (90%) are constructed of concrete and red bricks. Almost all of the community members surveyed live in urban houses (apartments). The conditions and characteristics of urban houses are in compliance with the bases and preconditions for connecting NG. The majority of buildings at Markaz El Kassasin range between 3 to 6 stories high. Concerning the legal status of buildings, all buildings and neighborhoods are legal as reported by the LGU after the new Reconciliation Law. It is worth mentioning that there is no noticeable different between the buildings and streets conditions on El Kassasin areas (as an urban to semi-urban areas) as shown in the figures below.

[14] ***Source: Ismailia governorate Website.***

Figure 4-5: Pictures showing Building conditions at Markaz El Kassasin areas.

Regarding the condition of the streets in the project district, the average width of main streets ranges 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. According to the (LGU), the Governorate is giving high priority to the infrastructure upgrade, which included roads and streets, sanitary and sewage systems, and restoring main squares.

Figure 4-6: Pictures showing Streets Conditions at Markaz El Kassasin areas.

4.2.3 Demographic Characteristics

4.2.3.1 Total population and Characteristics:

The total population, the number of households, and the average family size are presented in the table below:

Table 4-2 Distribution of the population in project districts[15]

District	Population			No. of Households	Average Family size
	Male	Female	Total		
Ismailia governorate	673,431	630,562	1,303,993	321,708	4.1
Markaz El Kassasin	58114	53504	111,618	25646	4.4

Additionally, there are no ethnic, religious minorities or social conflict in the project area and all the workers are speaking the same language (Arabic).

4.2.3.2 Rate of natural increase and Household size:

The birth rate in Ismailia Governorate, according to CAPMAS Data 2017, is 30.8 births per 1000 persons, while the mortality rate is 6.1 per 1000 persons. That gives a natural growth rate of 24.7 per 1000 persons in the Ismailia Governorate. The average household size in Ismailia Governorate is about 4.1 persons while at Markaz El Kassasin is 4.4, as shown in **Table 4-2**.

4.2.4 Access to Basic Services[16]

According to the data collected from LGUs and statistical data, the basic services, water supply, sanitation, and electricity are available in the project district and the PRS will be supplied by all services. Nearly 100% of the households are using electricity, and public water networks, while the percentage of households having sanitation networks is about 85% in El Kassasin city.

4.2.5 Human development profile

Educational, health facilities, poverty index, income and expenditure, human activities, and work status should be highlighted to determine the current socioeconomic conditions of the target district in the Ismailia governorate.

4.2.5.1 Education:

Education is perceived as the first shell that can help the population to withstand poverty. The review of secondary data showed that the percentage of the illiterate rate at the governorate level is 21%. This percentage is higher at Markaz El Kassasin (28%). Additionally, the illiteracy rate for females in Ismailia Governorate and Markaz El Kassasin is 25% and 33%, respectively compared to 17.7% and 23% for males, respectively, as shown in the following table. Education status is an important indicator to choose suitable channels for sharing project information with the community.

[15] ***Source: CAPMAS, 2017 and LDC***

[16] ***Source: CAPMAS data 2017***

Table 4-3 Distribution of the project districts' population by educational status[17]

District	Percent illiterate			Percent University Education	Percent Intermediate Education
	Total	Females	Males		
Ismailia governorate	21.4%	25%	17.7%	11%	36%
Markaz El Kassasin	28 %	33 %	23 %	6 %	35%

4.2.5.2 Health Facilities

Providing health facilities is very important to save workers during accidents and emergency cases in the project districts. A new Health Insurance System adopted by the Egyptian Government is applicable now in the Ismailia governorate. Markaz El Kassasin has one public and central hospital; in addition to two medical units added to the health units for family and children. All health facilities are providing emergency medical services, and are easy to reach (within two to three kilometers distance). Many participants in the focus group discussions conducted during preparation of the ESIA and some Government officials reported that the new Health Insurance System would provide them with the required medical services. The LDC (Town Gas) is giving a high priority to protecting their workers. All contracts between LDC and contractors /subcontractors have a clause to guarantee that contractors /subcontractors will provide the necessary medical services to the workers.

4.2.5.3 Poverty index, Income, and Expenditure

According to CAPMAS's Income, Expenditure and Consumption Survey in 2017/2018, the percentage of poor people in the Ismailia Governorate is about 32.4%.[18] According to the data collected from LGUs of Markaz El Kassasin and focus group discussions, the data revealed that the average family monthly income is 3500 pounds.

4.2.5.4 Human activities in the project district

Agriculture is the main economic activity at Markaz El Kassasin, which absorbs about 50% of the labor force there. The most famous agricultural products are wheat, fruits, and vegetables. In addition to other activities in the governorate, include such as governmental positions, handicrafts, and commercial activities.

4.2.5.5 Unemployment and work status

Concerning the work status, the CAPMAS Annual Bulletin of Labor Force 2017 indicates that the unemployment rate in the Ismailia governorate is about 11.8%. The unemployment rate for females is about 28 %, which is higher than this rate for males (6%). According to the data provided by LGU, the unemployment rate at Markaz El Kassasin is 15%.

[17] ***Source: CAPMAS data 2017***

[18] no data was found about poverty in the mentioned districts

Table 4-4 Estimation of Labor Force, Employed, and Unemployment in Ismailia Governorate[19]

Labor Force (15 years and above)			Estimated Employed Persons			Unemployment Rate		
Male	Female	Total	Male	Female	Total	Male	Female	Total
302,000	106,300	408,300	283,900	76,200	360,100	6%	28 %	11.8 %

It is worth mentioning that the CAPMAS Annual Bulletin of Labor Force 2017, regarding the labor force, reflected that the age of starting work is 15 years old. 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 district where agriculture work and sales activities are in place, a big number of underage laborers were noticed. In the meantime, due to the technicality of the work in NG project, LDCs always seeks technical workers that are highly trained and experienced, so the risk of contracting children under 18 years is medium to a minor. In conclusion, the only risk is that the contractors might employ young people below 18 years old. **Therefore, rigid restrictions to employ this category must be added to the contractor's obligations**.

4.2.6 Perception towards the project

Throughout the various consultation and focus group discussions, the team experienced and recorded remarkable and overwhelming public acceptance, even eagerness, by the community towards the proposed project. The burdens and financial hardships experienced by the community people (especially women) in obtaining LPG cylinders (the current household fuel) created an actual need to install NG.

The majority of the samples surveyed in the project districts have positive perceptions about the NG connections project. They reported that NG has many benefits:

- NG will save community people effort and money
- It is reliable, safe, and available.
- It will put a limitation on the different problems of LPG problems such as:
  - ✓ The high price of LPG cylinders.
  - ✓ The fluctuations of the informal LPG price, especially during winter.
  - ✓ Some LPG cylinders are invalid to be used due to poor maintenance.
  - ✓ The LPG bottle is not full. It is half-filled.
  - ✓ Sometimes it might leak.

[19] ***Source: CAPMAS data 2017***

- It will save electricity that is used in electric heaters and reduce the cost of electricity bills.

4.2.7 Physical cultural resources

The proposed PRS will be located in agricultural lands within El Kassasin district, Ismailia governorate and will require some excavation work. These areas have been excavated before for agricultural purposes or for installing other public utilities such as water, sanitary, sewage and electricity networks. For this reason, it is presumably less likely to chance to 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, that shall be affected by the new 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 (the 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 are presented in **Annex-8**. 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
- The 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, the 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 worksite 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 assessment results are presented in two tables in Annex-8.

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 El Kassasin PRS is 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 30 workers (hired from the surrounding areas), being 28 laborers and 2 supervisors. The workers can also include drivers, technicians, and welders.

  Indirect benefits

  Along the different stages of the project, indirect benefits are expected to be sensed in the targeted area due to the need for supportive services to the workers and contractors who will be working in the PRS location. This could include food supply, transport, trade, security, manufacturing… etc. For example, the transportation of workers to the PRS location will work for the benefit of car lease offices.

5.2.2 Negative Impacts

The process of environmental impact assessment during the construction phase indicates that some receptors have irrelevant impacts in El Kassasin; those receptors include surface water, Ecological (fauna or flora), vulnerable structures, and culturally 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 taking place. In addition, potential soil contamination may occur as a result of oil spills and leaks.

El Kassasin PRS project is located in an agricultural area and the duration of the impact is expected to be long-term, with its spatial extent being limited to the PRS boundaries (50 m x 50 m).

The HP pipeline will be extended along a dusty road at a short distance (63 m) for a short period of construction (1 week). The duration of the impact is expected to be short-term.

The impact on soil considered **Medium**

5.2.2.2 Air Emissions

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

- Fugitive dust emissions (PM10, PM 2.5)
- 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 Abu Gerish village which is about 0.8 km East of the PRS site. Therefore, it is expected that the dust impact will be moderate and slightly impact the surrounding area (agricultural land). The soil characteristic at the PRS site is mainly hard soil.

Emissions of CO2, CO, and PM will result from the operation of the construction machinery and road vehicles during the construction of the PRS. Air pollutants emitted from construction machinery are temporary (during the working activities). Winds may continue to create dust resulting in particulate matter even after working hours. 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 will require using various construction equipment, vehicles, 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 El Kassasin PRS are the following:

- Onsite workers
- Nearby farmers

It is worth mentioning that during the site visit few numbers of farmers are noticed within the surroundings of the PRS location the proposed PRS site and its related HP pipeline are located in an agricultural area (about 0.8 km from the nearest residential area which is Abu Gerish village), where the noise baseline is relatively moderate and 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 and its related HP pipeline construction are the operation of the construction equipment and machinery such as diggers, cranes, and loaders; farmers in the nearby agricultural land and worker are the main receptor.

Regarding the Construction of the new PRS and its new related HP pipeline, it is expected that the generated noise will mainly have an impact on workers and Neighbor farmers.

The impact of construction on workers is assessed as **Medium**
The impact of construction on the nearby farmers is assessed as **Minor**

5.2.2.4 Impact on worker health and safety

Potential health and safety impacts are expected to workers during the project activities, involving the use of large equipment, transportation of overweight, oversized materials, poor site management and lack of appropriate PPE may also result in accidents and injuries for workers. Also, includes the risks from working at heights, welding or other activities, risks from electricity, risks from testing and trials after setting up the equipment, and worker onsite amenities and facilities for workers and any camp that is required.

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

5.2.2.5 Impacts due to COVID-19 pandemic

Coronavirus Disease 2019 (COVID-19) is a respiratory disease caused by the SARS-CoV-2 virus. Depending on the severity of COVID-19's international impacts, outbreak conditions-including that rise to the level of a pandemic- can affect all aspects of daily life, including travel, trade, tourism, food supplies, and industrial and financial markets.

During the construction of El Kassasin PRS and its HP pipeline, the movement of staff inside and outside the project boundaries can increase the risk of transmission of COVID-19 to the workers and community.

Infection with COVID-19 can cause illnesses ranging from mild to severe and, in some cases, can be fatal. Symptoms typically include fever, cough, and shortness of breath. Some people infected with the virus have reported experiencing other non-respiratory symptoms. Other people, referred to as asymptomatic cases, have experienced no symptoms at all. Symptoms of COVID-19 may appear in as few as 2 days or as long as 14 days after exposure. All workers since 24-11-2021 will not be allowed to enter the PRS site without getting vaccinated.

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

5.2.2.6 Temporary Labor Influx

Generally speaking, having workers in small cities might result in unfavorable impacts on the available resources (e.g. pressure on food, health care, 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 a limited number of workers exist in the location during working hours, All workers will be hired from the surrounding areas (no accommodations or camps will be required) and 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**.

5.2.2.7 Child Labor

As mentioned in the baseline, child Labor is a common practice in the project communities in the project areas. Children below 18 work almost in all projects as they receive low salaries and they are less demanding. Due to the technicality of the work in NG projects, LDCs always seek technical workers that are highly trained and experienced, so the risk of contracting children under 18 years is medium to a minor. This risk should be carefully handled in the ESMP.

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

5.2.2.8 Sexual exploitation and abuse (SEA) / sexual harassment (SH)

Gender-based violence (GBV) is an umbrella term for any harmful act that is perpetrated against a person's will and that is based on socially ascribed (i.e., gender) differences between males and females. It includes acts that inflict physical, sexual, or mental harm or suffering, threats of such acts, coercion, and other deprivations of liberty. These acts can occur in public or in private. The SEA/SH[20] risk of the project is rated as negligible since the PRS location is in an isolated area.

SEA/SH risk is assessed as Negligible

[20] The second edition of WBG good practice note of Addressing Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) in Investment Project Financing involving Major Civil Works updated language changing Gender Based Violence (GBV) to SEA/SH where relevant; and additional information on third-party monitoring of SEA/SH. (https://pubdocs.worldbank.org/en/741681582580194727/ESF-Good-Practice-Note-on-GBV-in-Major-Civil-Works-v2.pdf)

5.2.2.9 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 are not disposed to adequate sites, it will lead to a negative environmental impact.

Solid hazardous waste generated is likely to include empty containers (of paints, solvents, lubricating oils..etc), spent welding materials, solvents, paints or adhesives, and other hazardous waste resulting from the operation, i.e. spent oils, spent lube, waste oil filters, batteries, etc. Among the hazardous wastes also are wasted or faulted materials. Maintenance of the equipment and vehicles will be carried out in specialized service workshops outside the construction site.

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

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

5.2.2.10 Traffic impact

The greatest potential traffic impacts that may occur arises during the short period when construction works peak (transportation of raw materials, and equipment including heavy equipment and foundation materials). During the PRS construction period, there will be a low number of trailers trips that will not have significant impacts on the road (El Mazraa Road) which has 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 trailers and the movement of one trip will not last more than 8 hours.

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

5.2.2.11 Impact on groundwater

Ground water may be impacted in case of improper disposal of sanitary wastewater (About 30 workers during the construction phase will use the contractor portacabin toilets), construction wastes, or debris (generated from activities like ditching, and excavation), Poor site management, inappropriate storage or disposal of construction related waste and accidental spills. The site will be well controlled by waste management plan and emergency response plan to deal with any spills that occur in real time so the risk of poor storage or spills is low. Generated sanitary wastewater, as well as water resulting from the HP pipeline hydrostatic test (if meet 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**

5.2.2.12 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 in an agricultural area and about 0.8 km from the nearest residential area (Abu Gerish village) and no residential building was noticed on the HP pipeline route which is planned to be along an existing road in the project area, we will find that the above-mentioned impacts will be greatly minimized

Therefore, the impact is assessed **Minor**

5.2.2.13 Land related impact

The new PRS will entail two new land plots, one of the areas of 2500 square meters for installing the PRS while the other of 150 square meters to be used as a road to connect the valve room at Gasco with the PRS location. Both the two plots were purchased on 17/06/2020 _after inspecting different land alternatives- according to the Willing buyer Willing seller approach applied by EGAS and Town Gas (**Annex-2** land document),

The landowners expressed their satisfaction of selling their lands at such price, which is higher than the market prices. (Usually the petroleum sector pays more than the market price for the landowners, so the landowners are competing and struggling to sell their lands to the petroleum' projects all over the country).

Thus OP 4.12 does not apply to EL Kassasin PRS. Hence, no RAPs will be required.

(For further elaboration on EGAS procedures for land acquisition see **Annex-3**).

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 will create extra job opportunities during the operation phase as the average number of the required workers is about 12 workers in two shifts (6 workers/ shift) from the permanent workers of the LDC; 4 technicians, 2 engineers, and 6 security staff could be from the surrounding areas.

5.3.2 Negative impacts

Various impacts are assessed following the impact assessment methodology. The project's 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 poor site management and lack of appropriate PPE may result in accidents and injuries for workers, health and safety issues, working around energized equipment, and possible contact with natural hazards. However, during the operation and maintenance phase, if there is any incident or emergency after applying all the control measures and safety precautions in the EGAS updated HSE guidelines (**Annex-5**), the impact may negatively endanger the surroundings.

Odorant handling is part of the operation of the PRS and is addressed in the Quantitative Risk Assessment "QRA" (**Annex-4**) as a separate study. An odorant is added to the NG to enable detection upon leakage. The odorant is classified as a hazardous substance.

An odorant leak can result from accidently improper handling of the odorant. In case of emergency, the risk resulting from the odorant release or gas leak will be managed by El. Kassasin's new PRS (updated)'s emergency response plan**(Annex-12)**.

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

5.3.2.2 Impacts due to COVID-19 pandemic

During the operation of El Kassasin PRS, the Movement of staff inside and outside the project borders may increase the risk of transmission of COVID-19 to the workers and community health. Given the fact that the average number of workers during the operation of El Kassasin PRS will be about 6 workers/ shift from the permanent workers (well trained and took awareness of COVID-19 precautions) of the LDC.

The Infection with COVID-19 between workers or from workers to the community is relatively minor (as all workers after 24-11-2021 will not be allowed to enter the PRS without getting vaccinated) but still more precautions can be applied.

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

5.3.2.3 Hazardous and non-hazardous waste management

During operation and maintenance of the PRS, hazardous (odorant containers), non-hazardous waste, and small quantities of domestic waste (solid and liquid waste) will be generated. 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 (as shown in **Table 7-2)**.

Therefore the impact is assessed as **Medium**

5.3.2.4 Noise impact

The pressure reducers normally cause noise generated from the reducers' pipes. The maximum noise level expected from the reducers is 80 dB. The generated noise is constant (not intermittent). Assuming ambient noise levels are complying with WB/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.

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

5.4 Impacts during Accidental Events (Operation Phase)

Regarding the Quantitative Risk Assessment Study (QRA), which demonstrates the following hazards:

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

And referring to the risk calculations determined in El Kassasin QRA study, the individual risk level to the exposed workers/public based on the risk tolerability criterion has been identified as Acceptable for workers and ALARP (Below the Upper Tolerability Limit)[21] for Public near the PRMS area. So, there are some points (Study Recommendations) that need to be considered to keep the risk tolerability, and this will be described under item (7.4) (for more details refer to the QRA Study under **Annex-4**)

[21] ***Below the Upper Tolerability Limit***

The risk is only tolerable if it is ALARP. This means that all practicable risk reduction measures must be identified and those that are reasonably practicable implemented. The term reasonably practicable indicates a narrower range than all physically possible risk reduction measures. If the cost of a risk reduction measure, whether in terms of money, time or trouble, can be demonstrated to be grossly disproportionate to the risk reduction gained from the measure, taking account of the likelihood and degree of harm presented by the hazard, then implementation of the measure may not be required.

Table 5-2 Impact Assessment

Detailed impact assessment results are presented in two tables in **Annex-8**.

Impact	Description	Type	Significance
During Construction			
Deterioration of soil quality	PRS construction and related HP pipeline 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) stipulate 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 cleaning and transportation operations - Exhaust from equipment and machinery containing SOx, NOx, CO, VOCs, etc. - Traffic congestions result from road closure or slowing down of traffic due to transportation of equipment. <u>Dust</u> The impact of dust generation (particulate matter) will be mostly limited to the working hours which lead to a temporary reduction of air quality, winds may continue to create dust resulting in particulate matter even after working hours, however, is unlikely to cause major air emissions impacts as the nearest receptors are around 1 km from the PRS location and no residential buildings was noticed on the HP pipeline route.	Negative	**Minor**
	<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**

Impact	Description	Type	Significance
Noise	Noise impact on workers 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**
	Noise impact on nearby farmers During the site visit a few numbers of farmers are noticed (within the surroundings of the PRS location), Some noise impacts are expected during the construction period (which is limited) of the PRS while they are working on the agricultural lands.	Negative	**Minor**
Risks on Occupational health and safety	Inhalation of air pollutants, high noise levels, injuries, and potential death as a result of operating heavy equipment, and handling hazardous materials, also poor site management and lack of appropriate PPE may result in accidents and injuries for workers. Also, includes the risks from working at heights, welding or other activities, risks from electricity, risks from testing and trials after setting up the equipment, and worker onsite amenities and facilities for workers and any camp that is required.	Negative	**Medium**
Impacts due to COVID-19 pandemic	During the construction of El Kassasin PRS and its related HP, the Movement of staff (All workers after 24-11-2021 will not be allowed to enter the PRS without getting vaccinated) inside and outside the project borders can increase the risk of transmission of COVID-19 to the workers and community health.	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 worksite).	Negative	**Medium**

Impact	Description	Type	Significance
Child Labor	As mentioned in the baseline, child Labor is a common practice in the project communities in the project areas. Children below 18 work almost in all projects as they receive low salaries and they are less demanding. Due to the technicality of the work in NG projects, LDCs always seek technical workers that are highly trained and experienced, so the risk of contracting children under 18 years is medium to a minor. This risk should be carefully handled in the ESMP.	Negative	**Medium - Minor**
Risk of SEA/SH	Gender-based violence (GBV) is an umbrella term for any harmful act that is perpetrated against a person's will and that is based on socially ascribed (i.e., gender) differences between males and females. It includes acts that inflict physical, sexual, or mental harm or suffering, threats of such acts, coercion, and other deprivations of liberty. These acts can occur in public or in private. The SEA/SH risk of the project is rated as negligible since the PRS location is in an isolated area	Negative	Negligible
Waste generation	Inappropriate waste disposal and improper management of construction waste materials could lead to spillages that will cause soil contamination. Improper disposal of such waste 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, and 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 will not have significant impacts on the road (El Mazraa Road) which has low traffic.	Negative	Minor

Impact	Description	Type	Significance
Groundwater pollution	Groundwater may be impacted in case of improper disposal of sanitary wastewater as well as water resulting from the HP pipeline hydrostatic test and dewatering activities. Generated sanitary wastewater, as well as water resulting from the HP pipeline hydrostatic test (if meet 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.	Negative	Minor
Risk to 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 were noticed on the HP pipeline route. Therefore, there are minor impacts related to community health and safety during construction.	Negative	**Minor**
Impacts related to lands	The proposed PRS and High pressure pipeline required two plots of land one of the area of 2500 m^2 to install the PRS while the other is the area of 150 m^2 to be used as a road to link the off-take point to the PRS location Both lands were obtained in accordance to willing buyer willing seller approach, (**Annex-2** land document).	Negative	**Minor**
Operation			
Risks on Occupational health and safety	At the PRS site, exposure to noise levels, injuries, 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 detail in the attached Quantitative Risk Assessment, which shows 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**

Impact	Description	Type	Significance
Impacts due to COVID-19 pandemic	During the operation of El Kassasin PRS, the Movement of staff inside and outside the project borders may increase the risk of transmission of COVID-19 to the workers and community health. Given the fact that the average number of workers during the operation of El Kassasin PRS will be about 6 workers/ shift from the permanent workers (well trained) of the LDC, COVID-19 vaccinated and maintain social distancing.	Negative	**Minor**
Hazardous material and waste	**Hazardous material** An 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 Kassasin QRA study, modeling the accidental vapor release will extend outside the PRS fence from the South side. **Hazardous waste** During the 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 the environment (soil, groundwater, visual, health, and safety).	Negative	**Medium**
Noise	The pressure reducers normally cause noise. The maximum noise level expected from the reducers is 80 dB/shift (12 hours per shift). 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 Kassasin District and other surrounding areas in the future. This Natural Gas Connections to Households Project is expected to yield many economic and social benefits in terms of providing a more stable, energy source, achieving savings in LPG consumption, and enhancing safety in utilizing energy.

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

6.2 Technology Alternatives

6.2.1 Outlet Pressure

The PRS will reduce the Natural Gas pressure from 25-70 Bar in the HP pipeline to 7 Bar to be suitable for distribution or use in domestic or industrial applications.

El Kassasin's PRS will produce 7 Bar outlet pressure for the local distribution network (intermediate pressure). The LDC choose to produce 7 Bars instead of 4 Bars due to the high consumption rate expected in El Kassasin and Abu Sweir cities. It is designed to accommodate future expansion to feed other cities and/or villages surrounding El Kassasin and Abu Sweir districts.

Outlet pressure 7 bar is the best alternative for accommodate future expansions to provide NG to other concerned districts.

6.2.2 Odorant Handling

Environmental and safety control considerations and measures are integrated into the selected technology design. For example, 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 the complete remote operation of the units.

The selected technology design for odorant handling is the best alternative for Environmental and Safety considerations

6.3 Location Alternative

As mentioned in item 2.4 (Project Execution Methodology) and item 5.2.2.12 (land related impact), the main criteria for PRS siting are:

- Proximity to High-pressure gas main lines to minimize Off-take 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
- The proposed PRS required two plots of land one of the area of 2500 m^2 to install the PRS while the other is the area of 150 m^2 to be used as a road to link the off-take point with the PRS location. Both lands were obtained in accordance to willing buyer willing seller approach, after inspecting all land alternatives (**Annex-2**).

6.4 Conclusion through analyzing the alternatives

Through analyzing the above alternatives, it could be concluded that implementing the project is recommended as long as its impacts are identified, analyzed and their mitigation measures are determined and executed (accordingly to the study recommendations), and its social, economic, and environmental advantages to the Egyptian Public and Government.

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 the implementation of the project to avoid, reduce, mitigate, 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 estimated 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 the field. Additionally, EGAS has mobilized a supervision-consulting firm (Petrosafe company) to strengthen EGAS's supervision capacity to make sure that all mitigation measures are applicable. During the operation phase, the PRS shall have at least one permanent staff member for health, environmental, and safety.

Overall, the following Environmental and Social measures are complementary to and do not substitute compliance with the detailed HSE guidelines, procedures, and actions adopted by EGAS and its subsidiary LDCs. **Annex-5** is 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 waste	Minor	Contractor	LDC –HSE department	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		
	Air emission	- Monitoring of wind speed and direction to manage dust-generating activities during undesirable conditions. - Management of the number of vehicles and equipment on 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 to minimize dust blow. - Ensure material and waste containers are always stacked and sealed properly and secured from tipping /falling /damage /direct sunlight during transportation and storage - Avoided dust generating activities during high wind periods.	Negligible	Contractor	LDC –HSE department	Contractual clauses + Field supervision (audits)	- Contractor costs - LDC management costs

	Noise	**Workers** Application of the normal precautions normally taken by construction workers as follows: - All machines and vehicles should be shut off when not used - Choosing vehicles, equipment of good technical specifications, and status - Good maintenance of this equipment to reduce the resulting noise - Effective scheduling of installation activities to avoid the overlap of noise sources - All machinery is to be fitted with effective exhaust silencers - Air compressors should be of the type, which is sound reduced with properly, lined, and sealed acoustic cover and to be operated with the covers closed - All machines and vehicles should be shut off when not used - Provide Earmuffs, earplugs, certified noise PPE for workers - Noise exposure periods should be minimized for workers so as not to exceed the safe limits mentioned in the environmental laws in addition to the occupational health and safety standards **Nearby farmers:** - Notification to the surrounding farmers before the construction phase. - Time management and construction schedule according to the WBG regulation provided by the contractor before the construction phase	Minor - Negligible	- LDC - Excavation Contractor	LDC–HSE department	Contractual clauses + Field supervision (audits) Field supervision Complaints receipt from the 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 of the PRS project are to be collected and sent	Minor	- LDC - Excavation Contractor	LDC HSE department	Field supervision and review of certified waste	- Indicative cost items included in contractor

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
		back to the 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 presents more details about waste management**				handling, transportation, and disposal chain of custody	bid: - 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

Social receptor (health and safety)	Occupational health and safety	- The project will hire a qualified contractor/sub-contractor with 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. - Standard protection by placing clear project signs. - Time management for vehicles movement; especially avoiding the peak hours - Regular inspection to the compelling worker to use their PPE - Training and licensing industrial vehicle operators of specialized vehicles. - The contractor also will be obliged to maintain daily attendance sheets as well as keep records of ID cards of workers to verify the attendance of workers to ensure first, that workers below 18 years old are not included on-site, and second, in case of accidents, the injured persons will be provided with proper health requirements according to the health insurance supported by contractor/subcontractor. - Health insurance should apply to the contractor workers and workers contracted by a sub-contractor - Full compliance with 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 updated HSE guidelines (**Annex-5**) That may include all required actions for worker safety such as working at heights, in confined spaces, with electricity, welding etc. - Ensure the provision of the appropriate personal protective equipment and other equipment needed to ensure compliance with HSE manuals - The new contracts with contractors/subcontractors will include an annex with mitigation measures to address all related OHS issues, labor-management issues through having in place relevant procedures. The annex will include all the social requirements in the worker's contract such as: - The right of workers to report their thoughts.	Minor	- LDC - Excavation Contractor	LDC HSE Department	Field supervision inspection 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		
			- The right of the worker to know all the terms and conditions of his contract. (Salary, business hours, insurance, etc... - Ensuring that there are adequate facilities for workers (cafeteria, health care facilities, toilet) - Worker GRM, allows the worker to submit his complaint. - Ensure that first aid and an emergency protocol in place in case of an accident - Ensure that incident and accident report log system in place. - Regular training and safety drills in case of emergency for all workers to ensure identified protocols and equipment is used properly					

	Impacts due to COVID-19 pandemic	**Assessing Workforce Characteristics** - Minimize contact and keep a distance not less than 1 meter with community people **Entry/Exit to the Work Site and Checks on Commencement of Work** - Confirm that workers are COVID-19 vaccinated - Confirm that workers are fit for work - Check and record temperatures of workers - Update daily personnel count log (in/out) in each area/ working site - Provide briefings to workers before commencing work, focusing on COVID-19 specific considerations, and reminding workers to self-monitor for possible symptoms and to report to their supervisor or the COVID-19 focal point if they have symptoms or are feeling unwell - Prevent a worker from an affected area or who has been in contact with an infected person from returning to the site for 14 days (paid by LDC) or isolating such worker for 14 days. - Prevent sick workers from entering the site, referring them to local health **General Hygiene** - Train workers and staff on-site on the signs and symptoms of COVID-19, how it is spread, how to protect themselves (including regular hand washing and social distancing), and what to do if they or other people have symptoms - Place informative, illustrative posters and signs around the site, - Ensure handwashing facilities supplied with soap, disposable paper towels, and closed waste bins exist at key places throughout the site, if such facilities aren't available then Alcohol-based sanitizers should be supplied **Cleaning and Waste Disposal** - Provide adequate cleaning equipment, materials, and appropriate PPE (face masks, gloves….) as necessary	Minor	- LDC	-LDC Patrolling committees EGAS HSE department	Field supervision and review of HSE report+ Field supervision (audits)	- Contractor costs - LDC management costs

		- Train on appropriate cleaning procedures and appropriate frequency in high use or high-risk areas - Train on proper hygiene, how to use PPE, and waste control **Adjusting Work Practices** - Adapting work processes to enable social distancing and training workers on these processes - Continuing with usual safety training includes the use of PPE, adding COVID-19 specific considerations - Review overall work schedule and assess whether adjustments are needed, considering Government advice and instructions **Project Medical Services** **Local Medical and Other Services** - Any suspected case should leave the site immediately and referred to the nearest hospital / local medical facility for medical examination - any suspected cases should be self-quarantined for 14 days **Instances or Spread of the Virus** - If a worker has symptoms of COVID-19, the worker should be removed immediately from work activities - The worker should be referred to the local health facilities to be tested. - Implement sanitization practices in affected sites - Inform fellow workers of possible exposure to the virus if a worker is confirmed to have COVID-19 infection but maintain confidentiality **Training and Communication with Workers** - Workers are made aware of the procedures that have been put in place by the project, and their responsibilities in implementing them - Training is conducted regularly, providing workers with a clear understanding of how they are expected to behave and carry out their work duties - **in addition to EMOP and WBG Guidelines related to COVID-19 infection (Annex-9).**					

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 high health and safety standards. - Rigid obligations and penalties will be added to the contractor ToR to warrantee no child Labor occurs in the project - The ToR also will oblige the contractor to keep a copy of the IDs of Laborers to monitor the hired staff below 18 years old The contractor also will be obliged to maintain daily attendance sheets to verify the attendance of workers to ensure first, that workers below 18 years old are not included on-site, and second, in case of accidents the injured persons will be provided with proper health requirements according to the health insurance supported by contractor/subcontractor.	Minor	- LDC - Excavation Contractor/subcontractor	- LDC– HSE department	- Field supervision and review of HSE report+ Field supervision (audits)	- Contractor costs - LDC management costs

	Risk of Labor Influx	To minimize the impacts of labor influx the following should be thoroughly implemented: - Preparation of an appropriate code of conduct that stipulates the different commitments of labor towards community groups and the different behavior that should be avoided (please see **Annex-10** 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 newcomers 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 like The National Council for Women's Rights (15115) which is a public channel for receiving women complaints. - Raising awareness of the local populations about the project's 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 the construction site and the exit gate. - Coordination with traffic department (ministry of interior) for vehicles route and movement and road open-cut crossing. - Vehicle speed restrictions should be applied across the project site, - Flagman will be considered whenever needed. - Safety precautions taken during night driving will be according to EGAS updated HSE guidelines (**Annex-5**)	Negligible	Contractors	LDC + Traffic department	The contractor has a valid conditional permit + Field supervision	- Contractor costs - LDC management costs
	Land related impact	- The lands was obtained in full compliance with the willing buyer willing seller approach after inspecting all land alternatives. The landowners expressed their satisfaction with the selling price, which is higher than the market price. - No tenants, encroachers, residential laborers, or others with customary claims or other land use, where the lands are cultivated with their owners. - Enable grievance mechanism and disclose it to the community	Negligible	LDC HSE department	EGAS SDO	Field Supervision	- LDC - EGAS management costs

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
	Concerns of Community	- The detailed grievance mechanism (GRM) presented in Annex-11 attached to this ESIA and will 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 before 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. - Informing neighboring farmers through posters about the project details, location signing up to the network and receiving the service, project-level GRM	Negligible	Contractors LDC –HSE department	- LDC – HSE department EGAS SDO	Contractual clauses + Field supervision Field supervision	- Contractor costs - LDC management costs - LDC management costs
	community health and safety	- Ensure that first aid and an emergency protocol in place in case of an accident on community - Notification to the surrounding farmers before the construction phase. - Time management and construction schedule according to the WBG regulation provided by the contractor before the construction phase	Negligible	Contractors LDC –HSE department	- LDC – HSE department	Field supervision	- LDC management costs

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 Abu Balah dumpsite
Domestic Waste (food waste, packing,)		
Wood – Scrap	Non-Hazardous	- Temporarily stored in an 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 an 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 hazardous waste facility (Nassreya and / UNICO).
Batteries		
Chemicals (solvent, lubricants,…) containers	Hazardous	
Used Oils	Hazardous	- Temporarily stored in an isolated area on-site, then transported to Abu Rawash storage site. The 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	- Produce Hazardous Area Classification drawings - Provide fixed firefighting systems (pumps, hoses, tanks, etc.) and portable firefighting devices distributed in different sizes, trip distance considered according to its type. - Preventive maintenance policy and station manual - Provision of self-contained breathing apparatus (2 pieces for each station) for handling odorant leaks - Install an elevated wind sock and provision portable gas detectors - The design should fully comply with IGE TD/3 code requirements - Ensure that first aid and an emergency protocol in place in case of an accident - Ensure that incident and accident report log system in place. - Regular training and safety drills in case of emergency for all workers to ensure identified protocols and equipment is used properly (Annex 12)	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

	Impacts due to COVID-19 pandemic	**Assessing Workforce Characteristics** - minimize contact and keep a distance not less than 1 meter with community people **Entry/Exit to the Work Site and Checks on Commencement of Work** - Confirm that workers are COVID-19 vaccinated - Confirm that workers are fit for work - Check and record temperatures of workers - Update daily personnel count log(in/out) in each area/ working site - Provide briefings to workers before commencing work, focusing on COVID-19 specific considerations, and reminding workers to self-monitor for possible symptoms and to report to their supervisor or the COVID-19 focal point if they have symptoms or are feeling unwell - Prevent a worker from an affected area or who has been in contact with an infected person from returning to the site for 14 days or isolating such worker for 14 days. - Prevent sick workers from entering the site, referring them to local health **General Hygiene** - Train workers and staff on-site on the signs and symptoms of COVID-19, how it is spread, how to protect themselves (including regular hand washing and social distancing) and what to do if they or other people have symptoms - Place informative, illustrative posters and signs around the site, - Ensure hand washing facilities supplied with soap, disposable paper towels and closed waste bins exist at key places throughout the site, if such facilities aren't available then Alcohol-based sanitizers should be supplied **Cleaning and Waste Disposal** - Provide adequate cleaning equipment, materials, and appropriate PPE (face masks, gloves,….) as necessary - Train on appropriate cleaning procedures and appropriate	Negligible	- LDC	- LDC Patrolling committees - EGAS HSE department	- Field supervision and review of HSE report+ Field supervision (audits)	- Contractor costs - LDC management costs

		frequency in high use or high-risk areas - Train on proper hygiene, how to use PPE and waste control **Adjusting Work Practices** - Adapting work processes to enable social distancing and training workers on these processes - Continuing with usual safety training includes the use of PPE, adding COVID-19 specific considerations **Project Medical Services** **Local Medical and Other Services** - Any suspected case should leave the site immediately and referred to the nearest hospital / local medical facility for medical examination - any suspected cases should self-quarantine for 14 days **Instances or Spread of the Virus** - If a worker has symptoms of COVID-19, the worker should be removed immediately from work activities - The worker should be referred to the local health facilities to be tested. - Implement sanitization practices in affected sites - Inform fellow workers of possible exposure to the virus if a worker is confirmed to have COVID-19 infection but maintain confidentiality **Training and Communication with Workers** - Workers are made aware of the procedures that have been put in place by the project, and their responsibilities in implementing them - Training is conducted regularly, providing workers with a clear understanding of how they are expected to behave and carry out their work duties - **In addition to EMOP and WBG Guidelines related to COVID-19 infection (Annex-9).**					

Receptor	Impact	Mitigation measures	Residual impact	Institutional Responsibility for Implementation		Means of Supervision	Estimated Cost of mitigation / supervision
				Mitigation	Supervision		
Physical receptor	waste generation	**Hazardous waste:** - 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 (e.g., lubricating oils, odorant containers, chemical containers) to a certified hazardous waste facility via company depot using certified handling and transportation contractors - Ensure full and empty (treated) lubricating oils, odorant containers, chemical containers are 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) - NEVER use empty odorant containers for any other purpose - Others measures as per item 7.4: Toukh Quantitative Risk Assessment study recommendations. **Hazardous material** 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	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		
		(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 - 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

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

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

EGAS also conducts supervisory visits through an external consultant 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 twice 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 neighbors	LDC HSE	Weekly during construction.	Construction site	Documentation in HSE monthly reports	LDC management costs
Physical receptor (soil, groundwater, visual)	Waste generation	Observation of accumulated waste piles	LDC HSE	During construction. Monthly reports	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
		Observation of water accumulations resulting from dewatering (if encountered)	LDC HSE	During construction. Weekly reports	Around construction site	Observation and documentation	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		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
	Occupational Health and safety	- Total number of complaints raised by workers - Periodic Health report - Periodic safety inspection report - Incident register - Insurance policy and Attendees lists with workers' IDs - The insurance expiry dates	LDC HSE	Two times per year for the PRS (at least once during the construction phase)	Construction site	The safety supervisor should follow the 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
	COVID-19 pandemic	- Number of Suspected or confirmed COVID-19 cases, their location, condition, and all related actions taken - Periodic Health	LDC COVID-19 Patrolling committee EGAS HSE	Daily	Construction site	As per the instructions of the Ministry of Petroleum (MoP), Patrolling committees have been formed across all LDCs to ensure that mitigation	LDC management costs

Receptor	Impact	Monitoring indicators	Responsibility of monitoring	Frequency of monitoring	Location of monitoring	Methods of monitoring	Estimated Cost of monitoring
		report - Using of facemasks				measures are being implemented on all construction sites, these committees report to EGAS on daily basis whereas EGAS report to EMoP weekly	
	Child Labor	Attendees lists with workers' IDs Complaints and accidents reports	LDC HSE	monthly for PRS	Construction site	The safety supervisor observes the Laborers Random checkup for Laborers IDs	LDC management costs
	Risk of labor influx	- Code of conduct is in place - A list of workers who have attended the training on code of conduct (with dates). - Number of complaints were 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 the 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 the 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 licensed landfill	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
		training and safety drills in case of emergency					
		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 includes dealing with the odorant according to the SDS for it, with respect to 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 the 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 manufacturer's 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 operations are according to the standard operating procedure for the PRS	LDC Operation Dpt.	Daily for operation	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
		operations and training programs in-place for operators.		Yearly for training			
		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 the logbook	LDC management costs
	COVID-19 pandemic	- Number of Suspected or confirmed COVID-19 cases, their location, condition, and all related actions taken - Periodic Health report - Using of Face Masks	LDC COVID-19 Patrolling committee EGAS HSE	Daily	Construction site	As per the instructions of the Ministry of Petroleum (MoP), Patrolling committees have been formed across all LDCs to ensure that mitigation measures are being implemented on all construction sites, these committees report to EGAS on daily basis whereas EGAS report to EMoP weekly	LDC management costs

7.4 El Kassasin Quantitative Risk Assessment Study Recommendations

Regarding to the modeling scenarios and risk calculations to workers / public which find that the risk to Workers is in the **Acceptable region**, While the risk to Public was found to be in the **ALARP region**, therefore there are some points need to be considered to maintain the risk tolerability in its region and this will be described in the following recommendations:

Recommendation	Timeline Phases	Town Gas Remarks
• **Ensure that**		
- All PRMS facilities specifications referred to the national and international codes and standards	Design	
- Inspection and maintenance plans and programs are according to the manufacturers guidelines to keep all facility parts in a good condition.	Operation	
- All operations are according to standard operating procedures for the PRMS operations and training programs in-place for operators.	Operation	
- Emergency shutdown detailed procedure including emergency gas isolation points at the PRMS and Off-Take Point in place.	Operation	
- Surface drainage system is suitable for containment any odorant spillage.	Design	
• Considering that all electrical equipment, facilities and connections are according to the hazardous area classification for natural gas facilities.	Design	
• Updating the emergency response plan for the PRS to include all scenarios in this study and other needs like:	Operation	
- Firefighting brigades, mutual aids, emergency communications and fire detection / protection systems.	Operation	
- Dealing with the external road in case of major fires.	Operation	
- Safe exits in building according to the modeling in this study, and to the PRS from other side beside the designed exit in layout.	Design	
• Provide the site with SCBA "Self-Contained Breathing Apparatus (at least two sets) and arrange training programs for operators.	Operation	
• Cooperation should be done with the concerned parties before planning for housing projects around the PRMS area.	Operation / Design / Construction	

7.5 Reporting of Mitigation and Monitoring Activities

During construction and operation, environmental performance against targets is reviewed by management monthly 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 monthly 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 incidents and complaints from the surrounding establishments and residents near the construction site.
- Unusual traffic delays or accidents 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
- The monthly report should include any incidents of high dust emissions or smoke during construction works including the natural dust that might be encountered.
- The number of near misses and the number of incidents including injuries.
- There should be a form prepared by LDC's HSE department for the contractor to keep records of quantities, types of waste received, and the location where it has been received from.
- The monthly report of the HSE supervisor from LDC should report the evaluation of the contractor's compliance with 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 monthly of the accident or the worker's obedience.
- Reporting monthly, the total number, and the type of heavy equipment used during the construction phase.

- Monthly report on health and safety performance. This report will include any incident and complaint regarding health and safety measures performed by the contractor.
- A monthly report on supervision sites visits (environmental, social and safety), by Petrosafe Company to EGAS including all non-compliances and an action plan to correct the situation by LDC.
- Reporting on the implementation of the labor management procedures on the ground, including child labor, worker GRM, disturbance to communities due to labor influx, insurance coverage.
- Reporting on the activities related to dissemination of information
- As per the GRM manual reporting will include as a minimum number of grievances received, type of grievance received, number of grievances solved and closed / unsolved (reasons for not solving them), timeframe to solve a complaint, and number of complains due to labor influx (community disturbance). Data to be disaggregated by gender and channels for receiving the complaints. All complaints to be registered in an online-unified system (for example Excel Sheet).
- Daily report to be prepared on construction work of the pressure reduction station.
- Daily report in a logbook to consider any outside construction works around the PRS location that is related to public or industrial buildings.

7.5.2 Reporting of severe incidents

- According to Decree 126- 2003, 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 the Project Management at EGAS.
- EGAS will report the major accident to the World Bank within 24 hours at the latest.
- The report will include 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 procedures included in the EMMP are to be recorded in the Environmental Register so that they can be communicated effectively and clearly. It will include (a monitoring plan, solid waste management plan, and 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 generated waste and its 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 developed an Emergency Response Plan (ERP) which relates to its operations for the PRS and 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. The said ERP will be in line with EGAS's Emergency Response Plan. For full details about the emergency plan, kindly refer to **Annex-12** attached to this report.

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

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 the 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 a 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
- The 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 the fire, rescue, deal with hazardous materials, and 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. To make sure that all mitigation measures are in place, EGAS has assigned a new consulting firm to implement the supervision tasks and strengthen EGAS's supervision capacity. Below is the management structure of Town Gas.

Being the implementing body of the natural gas network in the project area, Town Gas has direct involvement with the environmental management and monitoring of the natural gas network. Town Gas has a 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 E&S clauses; as identified in the construction mitigation plan, are included in the contractor's contract, along with non-compliance penalties, aslo ensure that the Environmental and Social Management Plan of the project is implemented in all the phases of the Project. Town Gas has assigned two social development officers at the Head Quarter in addition to a social officer in El Kassasin. The main tasks of the social development officers are:

- SDOs are responsible for the implementation of the Land Acquisition procedure during the process of land selection for the construction of the Pressure Reducing Station.
- Carry out social screening to determine whether the project components will result in any resettlement impact and accordingly SDOs from EGAS and LDCs will decide the need for the preparation of a resettlement action plan or an abbreviated Resettlement Action Plan.
- SDOs will address all grievances raised by community members, particularly the ones related to resettlement activities (more information will be addressed in the GRM section).

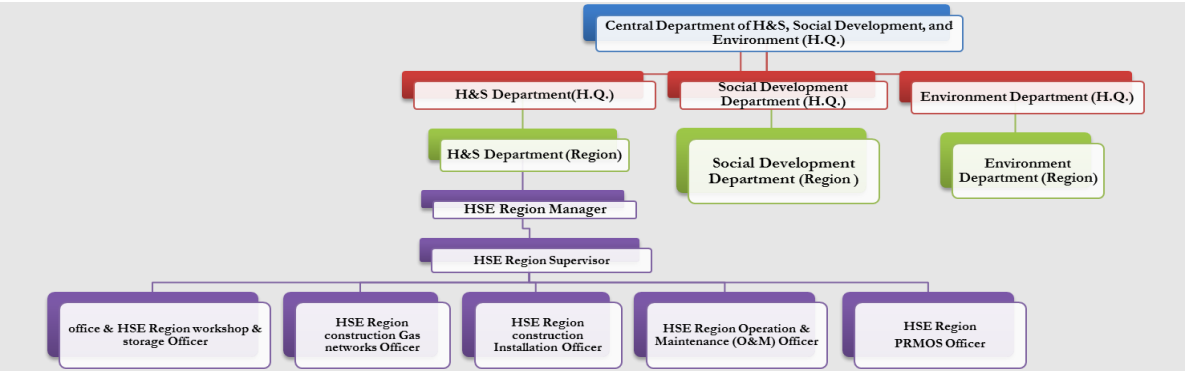


Figure 7-1: Town Gas ESMP organogram.

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 updated HSE manuals and ESIA 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 waste is issued from the 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 the preparation of monthly summary reports. **Annex-5**

The monthly reports will send to the HSE officer at Town Gas head office for compilation into quarterly reports to EGAS. EGAS in return will supervise the OHS, Environmental and social implementation through audits which will be executed by an independent entity. For that purpose, a new contract was signed by EGAS with PETROSAFE company (as an independent entity) to conduct the supervision, and monitoring visits on behalf of EGAS 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. Petrosafe conducts at least one / two supervision visits each month according to the EGAS plan.

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 the implementation of the ESMP
3- Specifically, Town Gas should take steps to develop the capacity of site engineers and HSE officers with specific courses focusing on the implementation of the ESMP detailed in this ESIA.

7.7.3 Management of grievances (Grievance Redress Mechanism)

EGAS and the LDCs aim to be recognized as responsible operators 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). 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. Also, the Egyptian worker

law No. 12 for the year 2003 provides for the Formal Grievance Procedure in case a worker, has been laid-off, discharged, dismissed, removed, or otherwise terminated from employment. The LDC has an internal division responsible for receiving, recording, and tracking the resolution of grievances.

Effective grievance management helps to:

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

GRM details will be shared with the community beneficiaries before and during construction works as well as during the contracting period. SEA/SH and GBV issues will be disseminated to encourage women to submit their complaints to the different project GRM channels (if they have any complaints) or to other channels like The National Council for Women's Rights (15115) where this channel is a public channel for receiving women complaints. Posters will be prepared and made available to the beneficiaries in the contracting office, in the neighboring area, other publicly accessible venues, and the customer services offices. It is worth mentioning that the customer's services offices are the main channel to receive complaints of Town Gas clients all over the country, while the hotline is the main channel to receive complaints in emergency cases. On the other hand, the GRM system for the current project has been tailored to handle the complaints of the project beneficiaries in a professional manner. All GRM activities should be conducted as per EGAS GRM Manual. Following are the various stages for handling project-level 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

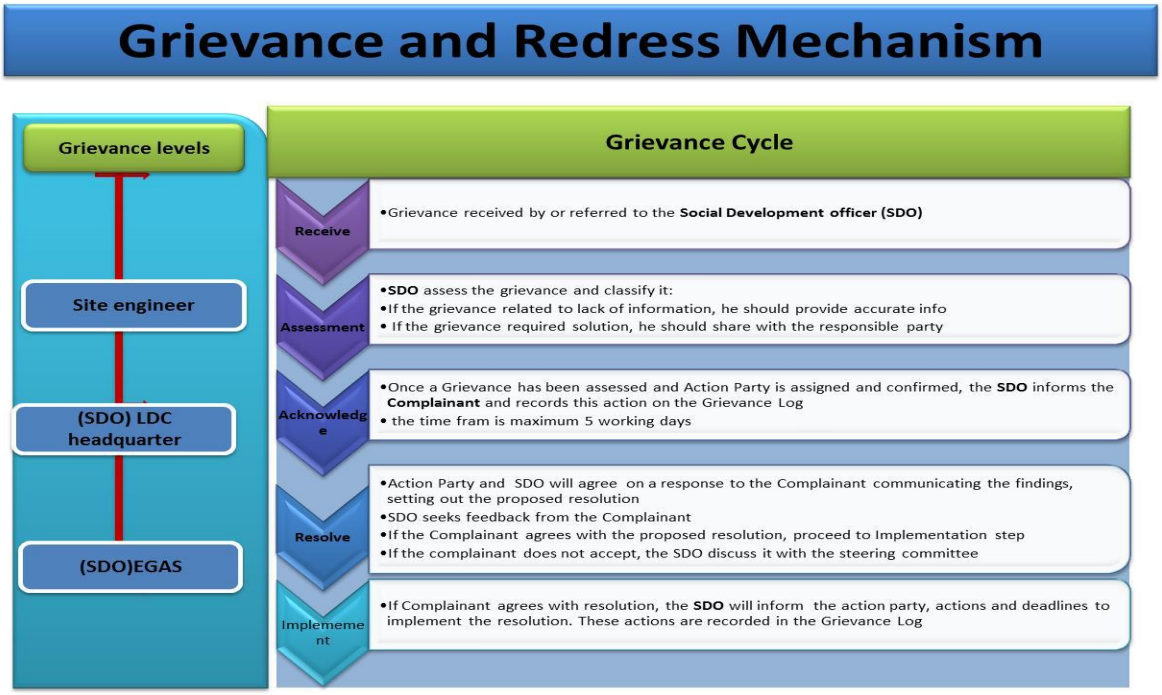


Figure 7-2 Proposed Grievance and Redress Mechanism

7.7.3.1 The first tier of grievances

To ensure a 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 at 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 10 business days and the complainant should know that he/she should receive a response by then. (a complaint form is attached see **Annex-11**)

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,

In the regional department of Town Gas in Ismailia 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 the level of responsiveness, providing feedback, and the documentation of the complaints need 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. The complaint form is attached in **Annex-11**. SDO, where they should provide a resolution within 10 business 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 10 business 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 a resolution within 10 business 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 10 business 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 petitioner's 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 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.
- Phone numbers of site engineer and SDO.
- The SDO within the LDC and EGAS
- Trustworthy people, community leaders, and NGOs/CDAs will be an appropriate channel to guide petitioners about the various tiers of grievances, particularly, in rural areas.

7.7.3.5 Response to grievances

Response to the grievance will be through the following channels:

- The response to grievances should be through an officially 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 promptly 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 a record of complaints and results. However, an anonymous complaint can receive a code and should be investigated appropriately and treated courteously. The correction action should be published on the LDC website.
- Apply the full requirements related to operating the grievance mechanism as per the GRM Manual, including possibility of receiving anonymous complaints.

7.7.3.6 Worker Grievances

The Egyptian Labor Law No. 12 for the year 2003 provides for the Formal Grievance Procedure in case a worker, who has been laid-off, discharged, dismissed, removed, or otherwise terminated from employment. The Project Management Unit (PMU) will require the Contractor/subcontractors to develop and implement a Grievance Redress Mechanism (GRM) for their workforce before the start of civil works. The GRM must be well circulated and written in a language understood by all. The new contracts with contractors/subcontractors will include an annex with mitigation measures to address labor-management issues, by having in place the labor-management procedures. One of the main items that will be included in the annex is the Worker GRM, which allows the worker to submit his complaint

The worker's GRM will include:

- Channels to receive grievances such as comment/complaint form, suggestion boxes, email, a telephone number and hotline, and anonymous complaints, including reaching out to the LDC
- Stipulated timeframes to respond to grievances;
- A register to record and track the timely resolution of grievances;
- A responsible section/committee to receive, record, and track the resolution of grievances.

7.7.3.7 Monitoring of grievances

All grievances activities should be monitored to verify the process. The monitoring process should be implemented at 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	o Number of grievances received monthly (Channel, gender, age, basic economic status of the complainants should be mentioned) o Type of grievance received (according to the topic of the complaint o Documentation efficiency
Efficiency of responses and corrective procedures	o Number of grievances solved and closed o Feedback offered to the grievances o Number of unsolved grievances and the reasons behind not solving them o Time consumed to solve the problem
Efficiency of information sharing about GRM	o Dissemination activities undertaken o Total number of brochures distributed (if any) o Total number of awareness meetings conducted (if any)

7.7.3.8 Institutional Responsibility for the Grievances

The entity responsible for handling grievances will mainly be the Environmental Affairs Department within the implementing agency (EGAS). The Social Development Officer (SDO) working within EGAS in cooperation with 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, as per the GRM Manual
- 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

This 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 household connections in the project sites are supplementary to the current existing natural gas connection network in Ismailia Governorate. In March 2014 an Environmental and Social Impact Assessment Framework (ESIAF) was developed for 11 of the project's Governorates[22] followed by an update of the ESIAF in January 2017 to cover the expansion of the project in 9 new Governorates[23]. In March 2018, a site-specific ESMP for Qantra Shark and Qantra Gharb was prepared[24], followed by ESIA for Qantra Shark PRS in November 2018[25], while ESIA for Qantra Gharb PRS was prepared in April 2019[26] (The aforementioned studies were cleared by the World Bank and disclosed on the EGAS website and the Bank website), moreover an ESMP for Nefisha, El Kassasin, Abu Sweir and New Ismailia districts[27] which cleared by WBG team on May 2022..

Stakeholder engagement and public consultation activities were held during the preparation of this ESIA and the ESMF for Nefisha, El Kassasin, Abu Sweir and New Ismailia districts. Stakeholder Engagement activities and a series of public consultations were conducted all through the past 8 years from the early stages of the project in December 2013 until recently. Stakeholders were identified, a work plan was developed, and information was adequately disclosed, using 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. Due to the current situation of the COVID-19 pandemic and the required precaution, and measures, limited consultation activities were held at Markaz El Kassasin on 28th April 2021. Consultation activities showed an overwhelming acceptance of the consulted participants to host the NG. With 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 of paying in installments. This high level of enthusiasm from the local communities towards the project is attributed to the high level of awareness of the benefits of natural gas and the current hardships that the households are facing to secure LPG provision and usage.

22 https://www.egas.com.eg/sites/default/files/2019-06/ESIAF%20for%20NG%20connections%20project%20for%2011%20Governorates.pdf
23https://www.egas.com.eg/sites/default/files/2019-06/updated%20environmental%20and%20social%20impact%20assessment%20framework%20for%2020%20governorates.pdf
24 https://www.egas.com.eg/sites/default/files/2019-10/ISMAILIA%20ESMP%20.pdf
25 https://www.egas.com.eg/sites/default/files/201910/Executive%20summaryQantra%20Shark%20PRS%20ESIA%20Ismailia.pdf
26 https://www.egas.com.eg/sites/default/files/2019-10/Qantara%20Gharb%20PRS%20ESIA.PDF
27 https://www.egas.com.eg/ismailia-esmp-0

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 2.3 million household NG connections project in compliance with the following legislation:

- WBG policies related to disclosure and public consultation, namely,
  - World Bank Operational Policy (OP 4.01).
  - Directive and Procedure on Access to Information
- Law 4/1994 modified by Law 9/2009 and its amendments
- Egyptian regulations related to the public consultation

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, the NG project in Ismailia Governorate has witnessed several phases of consultation activities during the preparation of ESIA and ESMPs as well mentioned below. Due to the precaution measures to prevent the spread of the COVID-19 pandemic, a new methodology has been adopted by the study team for a consultation. Focus group discussions, in-depth meetings, and interviews) were implemented to reach the most vulnerable and difficult to reach community members.

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;
- Avoid 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 to:

- 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

To ensure an inclusive and meaningful consultation process, a stakeholder analysis was conducted to get a better understanding of the various groups and their roles, interests, and influence on the project. For this site-specific ESIA, a focused stakeholders' identification shown in Table 8-1, was developed 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. Local communities involving both men and women of project beneficiaries, as well as the PAPs, local NGOs/CDAs, contractors, and suppliers were among the key stakeholders on the local level.

Table 8-1: Stakeholders identified in Ismailia governorate

Stakeholder Category	Stakeholder Group	Relevance/Importance of the Stakeholder to the Project
Communities in the project sites	Residents of communities within the project Districts: • Ismailia governorate • Markaz El Kassasin	Residents of these communities are more likely to be adversely affected by environmental and social impacts; for example, traffic during construction and other impacts relating to community health and safety. Residents of local communities will also potentially benefit from job opportunities or other positive economic outcomes, particularly; if they will have access to natural gas. Additionally, they will benefit from the savings of the LPG cylinder result due to the project implementation.
	Vulnerable groups within the local communities	Vulnerable groups will positively be affected by the Project especially Women, special needs and old people as they will not have to get LPG cylinders in their homes after they will be connected with the NG.
	Small business owners	Local businesses have the potential to benefit economically from the Project. However, as residents, this group also has the potential to be impacted by any social and environmental risks and impacts (positive and/or negative). For example, the effects of excavation work.
Businesses outside of the Area of Influence	Suppliers and contractors	They will benefit from any supplies available for the project.
Project Workforce (both direct and through subcontractors)	Project workers	Workers will benefit from available job opportunities in the project. The workforce is fundamental to the Project and a sound worker-management relationship is key to the sustainability of a company.
Health care providers	Community health care providers • Health institutions	The Project will secure health facilities for the workers by contracting health facilities at El Kassasin to provide the required service

Stakeholder Category	Stakeholder Group	Relevance/Importance of the Stakeholder to the Project
	• Health services providers	
NGOs and civil society	El Shoban El Moslemein, Social & women development	NGOs might share information about the project: terms of contracting and safety measures of the NG
National government stakeholders	Egyptian Environmental Affairs Agency	Responsible for reviewing and approving ESIAs/ESMPs, and monitoring implementation of the Environmental Management Plan
	Information Centers on the governorate level	Provide NG companies with underground utilities and infrastructure maps.
	Security Department	Secure the construction sites and prevent people from in- flushing into it
	Ministry of Transportation	This Ministry may have interest in issues relating to transportation and traffic planning related to the Project.
	General Authority for Roads, Bridges and Land Transport	Responsible for permitting related to any road work for the Project (e.g., road cutting)
Local/provincial government stakeholders	Ismailia governorate Authority	They are cooperating with the project in terms of facilitating permissions and coordinating with other local governmental units
	Local Governmental units (District authorities and village authorities)	Rehabilitation of roads, which is one of the major issues raised by the community, will be performed by the LGU. Provision of solid waste management facility
Media	Television and radio representatives Newspaper Websites	Inform the community about the project and its impacts and support dissemination of the main results of the ESIAs/ESMPs studies
Universities and Educational institutes	Faculty of Engineering	Review and enrich the ESMP 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
Natural Gas companies	EGAS	Implementing agency overseeing activities of the Environmental and Social Management Plan
	Town Gas	Local distribution company (LDC) that will implement, operate, and manage the ESMP
	Butagasco	It is the firm responsible for the LPG distribution. They will benefit from the project in terms of reducing the demand for LPG cylinders
	Petro trade	They are the responsible entity for collecting the consumption fees and the bank installment

The abovementioned stakeholders were consulted using various tools (i.e. individual interviews, group meetings, and public consultation). However, some of them were interviewed on their premises to enable them to spell out their concerns and worries freely.

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 regarding the project during various implementation phases. It is worth mentioning that the consultation activities have covered both the PRS and all the Low pressures pipelines networks activities. Surprisingly, there was no single comment raised about the safety of the PRS or its activities. All questions raised during the consultation activities were related to the connection process (Low pressures pipeline networks), where most of the people are not familiar with 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.

Due to the current situation of the COVID-19 pandemic and the required precautions, and measures, the research team has adopted a new methodology for consultation; 48 persons attended more than seven group meetings on 8th April 2021 at the project area. (Including the farmers who are cultivating plots surrounding PRS site). In addition, a consultation session was conducted on 8th February 2022 with the participation of 68 persons in Egypt Library Hall, Ismailia city. Where the public officials of the Governorate stressed expediting the implementation of the project in their districts. **(See lists of participants Annex-13)**

Following are the methodology and the main consultation activities adopted by the research team for all project phases:

1. The study team visited the project districts to define various stakeholders.
2. The study team divided the various engagement activities of the project to:
    - Scoping phase,
    - Data collection phase,
    - Consultation activities.
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 potentially affected people.
    - Conducting different scoping meetings with different groups.

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

- Phase I: In **March 2014** an Environmental and Social Impact Assessment Framework (ESIAF) was developed for 11 of the project's Governorates. **Annex-13**.
- Phase II: Consultation activities in February and March 2017. And Public consultation in April 2017, during the preparation of Site-Specific ESIAs for Qantra Shark and Qantra Gharb, and a site-specific for LP pipelines for both two cities in Ismailia governorate. **Annex-13-1**
- Phase III: Consultation activities in April 2021 in El Kassasin and New Ismailia districts, and consultation session for the project districts in Ismailia governorate (Egypt Library Hall) in February 2022. **Annex-13-1**.

Information about the project has been shared through:

- During the site visits for the P&A survey at the early stage of project planning.
- Consultation activities during the preparation of ESIAs and ESMPs for a different phase of the project.
- Site engineers and Contracting offices

All activities conducted were documented with photos and lists of participants to warrantee an appropriate level of transparency as follows:

Table 8-2: Summary of Consultation Activities during the project Phases in Ismailia Governorate (2013-2022)

Participants:	**Number**		**Methods**	**Date**
	Male	**Female**		
During the framework (ESIAF)				
Potential beneficiaries and governmental bodies	16	8	FGD	December 2013
Potential beneficiaries	53	71	Structured questionnaire	
Potential beneficiaries, government officials, NGO representatives,	31	48	Public consultation	
Total	100	127		
During Site-Specific and ESIAs (Qantra Gharb and Qantra Shark)				

Participants:		Number		Methods	Date
		Male	Female		
During data collection and scoping meetings					
Potential beneficiaries	Qantra Gharb	5	6	FGD	February and March 2017
	Qantra Shark	6	6		
Government/public officials	Qantra Gharb	6	0	In-depth interview	
	Qantra Shark	4	1		
NGOs/CDAs representatives	Qantra Gharb	1	0	In-depth interviews	
	Qantra Shark	0	1		
Head of municipalities and the deputy general secretary	Ismailia Governorate	11	1	Meeting	12th of February 2017
Total		**33**	**15**		
During the final public consultation					
Various stakeholders		39	18	Public consultation	10th of April 2017

Consultation activities during the preparation of an ESMP and ESIAs in April 2021, and February 2022 at El Kassasine and New Ismailia

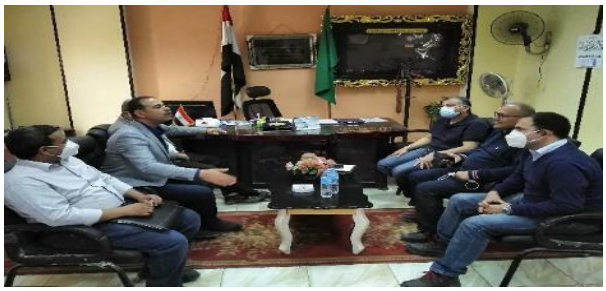
Participants		Number		Methods	Date
		(Male)	(Female)		
Governmental Representatives	El Kassasin,	**5**		FGD and Individual interview	April 2021
	New Ismailia	**5**		FGD and **Individual interview**	
Members of The Parliament	El Kassasin,	**3**		FGD and Individual interview	
	New Ismailia	**-**			April 2021
NGOs	El Kassasin,		**1**	Individual interview	
	New Ismailia	**3**		FGD and Individual interview	April 2021
Community people	El Kassasin,	**26**		FGD and **Individual interview**	

Potential Beneficiaries	New Ismailia	9	5	FGD and Individual interview	April 2021
	El Kassasin,	3		**Individual interview**	
	New Ismailia	1		**Individual interview**	
University and Information Centers	El Kassasin,	1	1	Individual interview	April 2021
	New Ismailia		1	**Individual interview**	
LPG vendors	El Kassasin,	3		Individual interview	April 2021
	New Ismailia				
Town Gas Representatives		5		FGD and **Individual interview**	
Modern Gas Representatives		4	1	FGD and **Individual interview**	
Total		68	9		

Consultation Session in Egypt Library Hall, Ismailia city for Ismailia districts, on 8th February 2022

Participants:	Number		Methods	Date
	Male	Female		
Governmental representatives	10	2	Consultation Session	8th February, 2022
Community people	23	16		
NGO representatives,	2	1		
Environmental Representatives	6	2		
University and Information Centers	0	3		
Town Gas Representatives	3	0		
Total	44	24		

Consultation meeting at LGU, El Kassasin district



FGD with the Governmental representatives LGU El Kassasin District

Figure 8-1: Shows Consultation session at Markaz El Kassasin, April 2021

FGD **with Local Community members at PRS location Markaz El Kassasin**

FGD with Local Community members at PRS location Markaz El Kassasin

FGD with PAP at El Kassasin

Consultation meeting at LGU, El Kassasin district

Figure 8-2: Consultation Activities at Markaz El Kassasin.

8.5 Summary of consultation activities

The field research team engaged in several social activities. These activities include in-depth discussions with government officials, individual interviews with potential beneficiaries; and with potentially affected people (LPG vendors), representatives of civil society, and community leaders. Consultation meetings were held at the Local Governmental Center in El Kassasin district, where the public officials of the Governorate stressed expediting the implementation of the project in all El Kassasin districts.

Throughout the discussions (which included some beneficiaries who have already connected with natural gas at their homes), interviewees were asked about the following main points:

- The type of fuels currently in use, and their associated problems.
- The high cost of LPG cylinders.
- Some LPG cylinders are not suitable to be used, due to poor maintenance.
- The criteria of areas to be connected to natural gas.
- The upsides and downsides of NG, compared to other types of fuels.

- The effects of the project during construction and operations.
- The cost of NG installation to households.
- The future positive/negative impact of the NG connections project.
- Citizens (who already have natural gas services) are suffering from the delay in collecting the gas monthly bills, hence the accumulation of NG consumption.

It was notable that the reactions and attitudes of the local communities towards the project are in favor of the project. The field research team noted strong public support and eagerness toward the project. Besides some legitimate concerns expressed by the public, the field research team recorded the general view that NG is a far better substitute for the type of fuel currently in use.

The following table illustrates the different subjects, questions, comments, and responses that were discussed throughout the different consultation activities in Ismailia Governorate. Most of them are addressed in Ismailia ESMPs studies. Such as the cost of NG installation, Criteria for Natural Gas connection, Coordination between governmental organizations during connecting different public facilities, Street rehabilitation & land refill, etc. As mentioned before there was no single comment raised about the safety of the PRS or its activities. All comments were generality about the project as a whole.

Table 8-3: Key comments and concerns raised during the consultation activities, and the way they were addressed in the current ESIA study

Subject	Questions& comments	Responses	Addressed in the ESIA Study
Job opportunities	Can the project permanently employ our sons	The project Provides different job opportunities to skilled and unskilled laborers, and creates indirect job opportunities, in terms of supporting services to the workers and contractors who will be working in the various locations.	**Section 5**
Information sharing about NG	Shouldn't the gas company distribute flyers or brochures with clear information about the project?	The LDC adopts multi-level information sharing. The first level is during the P& A survey where technicians share information about the project with households. At the second level through contracting offices, Posters are installed there to share information about the NG and contracting procedures. Additionally, there is a hotline that can share information with any of the targeted beneficiaries	**Section 7. Section 8**

Subject	Questions& comments	Responses	Addressed in the ESIA Study
Complaint system	What if we have any complaints about the project, where we can raise our complaints? Why do some complaints take too much time to respond to?	The project is adhering to a grievance mechanism. This enables anyone to submit a complaint and respond to it in 10 working days and the different channels to support his complaint.	**Section 7.**
LPG problems	LPG is not always full and is in a bad condition	Some private companies are working on fueling LPG bottles, and need more control and monitoring from the government.	**Section 4.**

8.6 Summary of Consultation Results

The consultation outcomes revealed the following:

- The Natural Gas connection project is achieving great success during the last eight years, and community people have eagerness towards the project.
- The Ministry of Petroleum is giving a high priority to the NG connection project and facilitates all the procedures to encourage more people to be connected by NG by offering the following:
  - ✓ Paying the cost in installments for 6 years at a zero-interest rate (30 EGP/ month).
  - ✓ A grant for poor people from AFD in cooperation with the European Union (1500 EGP/household) representing more than 50% of the NG connection cost according to specific criteria, and the principles which have been adopted by the Ministry of the Social Solidarity to determine the poor people.
- Community people asked for more information dissemination about the project and NG security and safety, especially in the rural areas.
- The majority of the community people are in favor of the Ministry of Petroleum's initiative to pay NG installation costs in installments (30 EGP/month).
- The community people are asking for speeding up NG connection to their homes, which will help them to overcome the problems related to LPG cylinders.
- The community people are in favor of installing the pre-payment meters to overcome the problem of delay in collecting NG consumption bills.

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

8.7 ESIA disclosure

A final report 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 made available in the customer service office. 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.