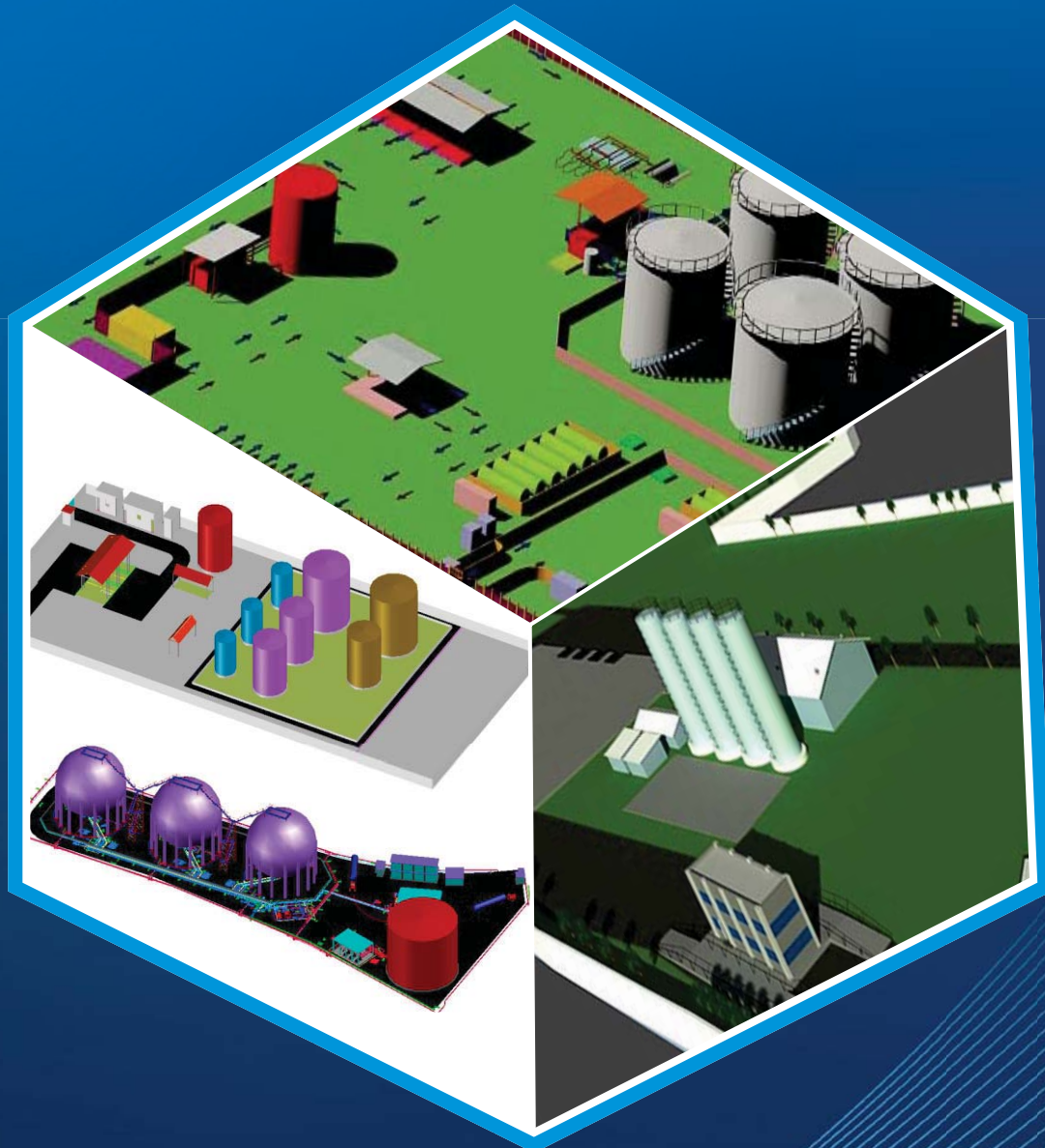


# DESIGN ENGINEERING

## CREDENTIALS



**SAGA Global Consultants**



# *Petroleum Terminal Credentials*

# CONSTRUCTION OF PETROLEUM STORAGE DEPOT AT MOINARBAND (SILCHAR), ASSAM

## PROJECT BRIEF :

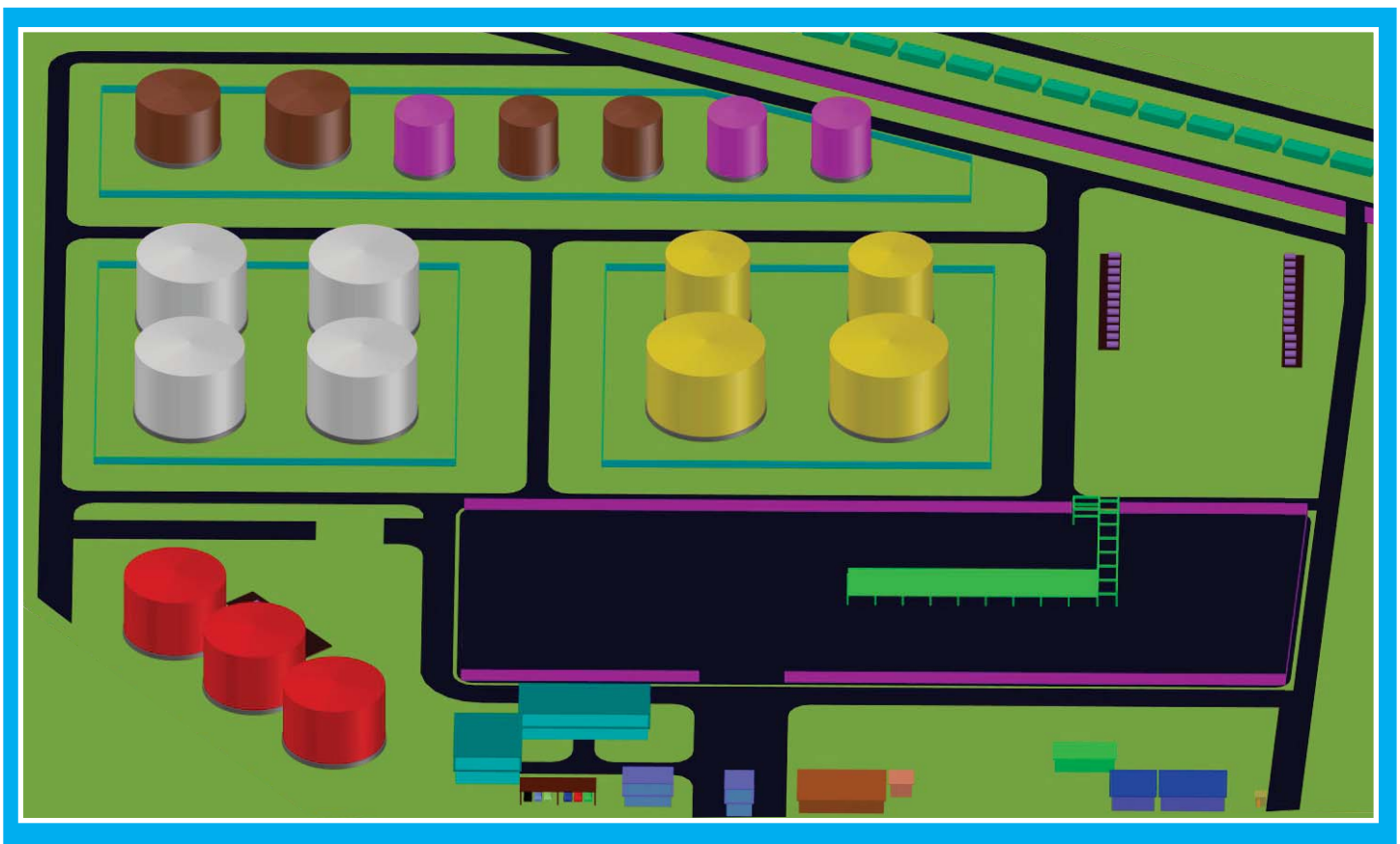
- In order to meet the requirement of petroleum products in north east region of the country, Indian Oil Corporation Limited is developing a Petroleum Storage Depot at Moinarband, Silchar, Dist. Cachar, Assam with proposed storage capacity totaling 30,000 KL in Phase - 1 with the provision for expansion by additional 41,620 KL in Phase - 2.

## SAGA's SCOPE :

- Layout
- Countour Survey
- Approval from Authorities
- Basic Engineering
- Detailed Engineering (Land Development, Plant/ Non-Plant Building, Tanks,
- Floating of Tenders
- Evaluation of Tenders
- Construction Supervision

## HIGHLIGHTS :

- Engineering has been completed
- Tender Evaluation in Progress



# SETTING-UP OF PETROLEUM DEPOT AT IBAFON

## PROJECT BRIEF :

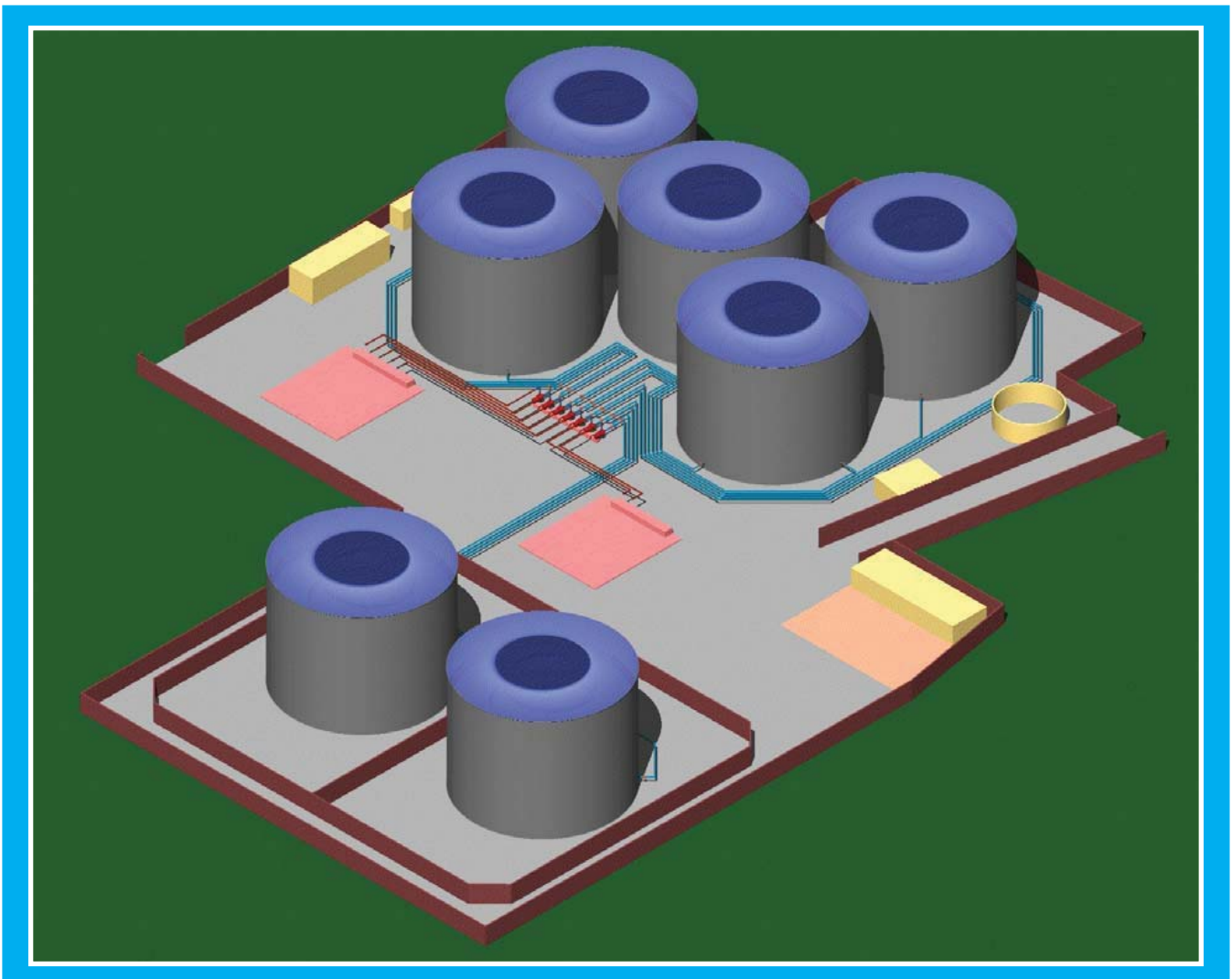
- Setting-up of Petroleum Terminal for storage of Finished Petroleum Products - PMS, DPK & ATK (JET-A1) at an estimated cost of US \$ 10 Million.
- Major equipment are : IFRT & CR tanks , Loading /unloading pumps & Loading arms and associated facilities.

## SAGA's SCOPE :

- Civil Engineering Design
- Project Cost Estimation
- Preparation of Tender Packages

## HIGHLIGHTS :

- Detailed Engineering completed as per schedule with no cost overruns.



# SETTING-UP OF ADDITIONAL PETROLEUM TANKS AT TEMA, GHANA

## PROJECT BRIEF :

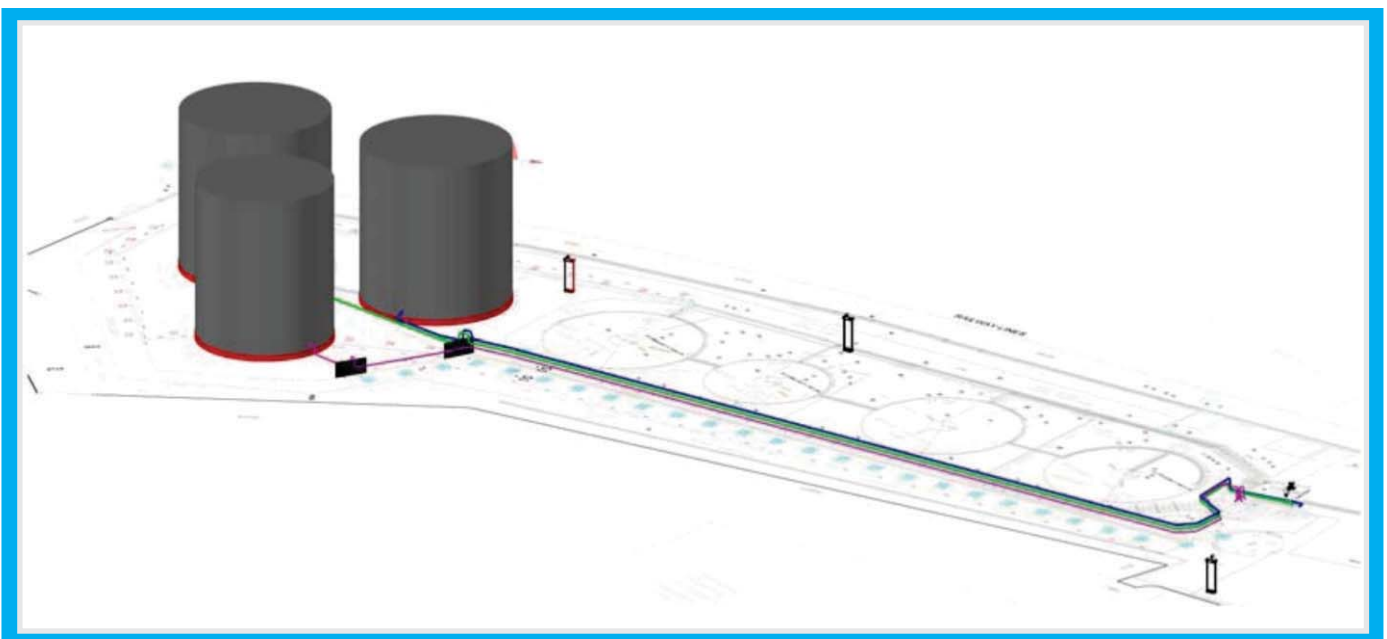
- Setting-up of Petroleum Terminal for Storage of Finished Petroleum Products - PMS (16,000 KL), ATK (JET-A1) (6,500 KL) at an estimated cost of US \$ 4.5 Million.
- Major equipment are: IFRT & CR tanks , Loading /unloading pumps & Loading arms and associated facilities.

## SAGA's SCOPE :

- Basic and Detailed Engineering in Process
- Civil Engineering Design
- Mechanical
- Electrical
- Instrumentation
- Project Cost Estimates
- Preparation of Tender Packages
- Project Management and Site Supervision

## HIGHLIGHTS :

- Project completed as per schedule with no cost overrun.



# SETTING-UP OF FUEL FARM FACILITY AT PAP, HAITI

## PROJECT BRIEF :

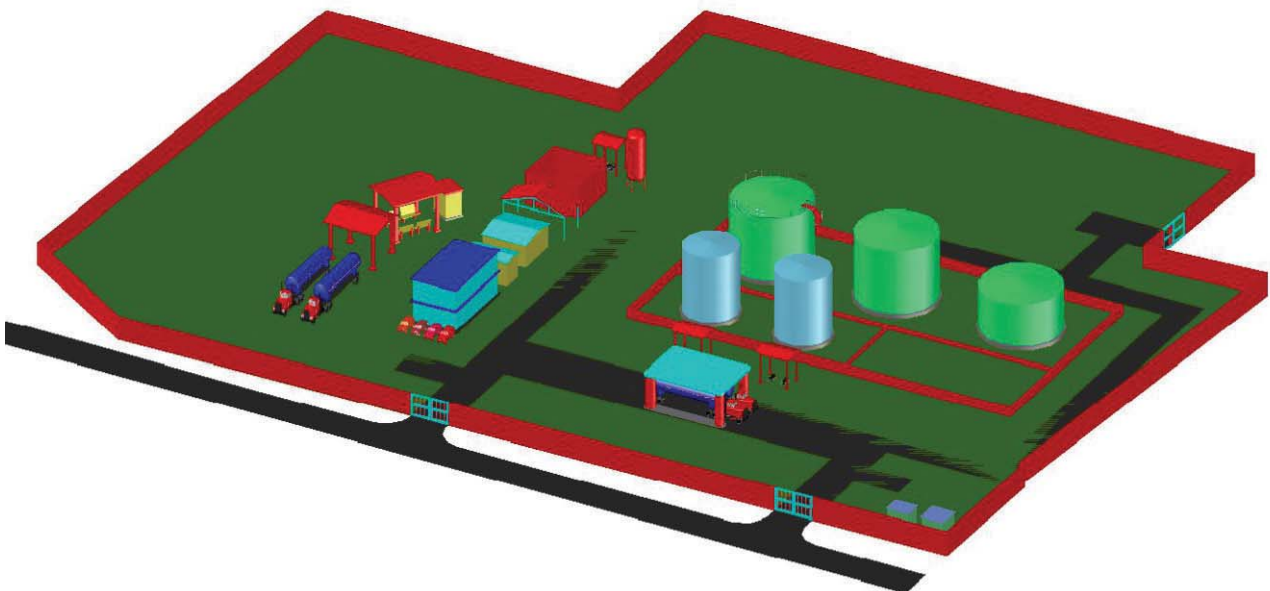
- Setting-up of Fuel Farm Facility (Diesel & Jet A1) at PAP, Haiti

## SAGA's SCOPE :

- Basic design & Engineering
- Finalization of Layout
- Equipment Specifications
- Project Management
- Site Supervision

## HIGHLIGHTS:

- Project made operational within seven months under difficult working environment.



# SETTING-UP OF OIL TERMINAL AT FREEPORT, LIBERIA

## PROJECT BRIEF :

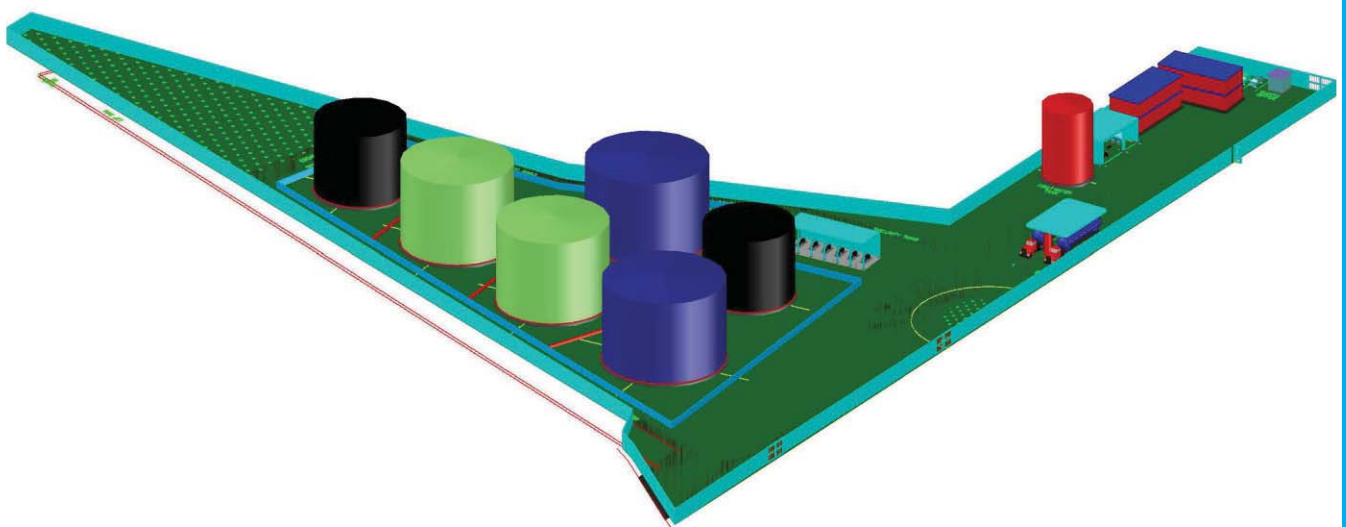
- Petroleum Terminal to store and distribute PMS, AGO and Jet A-1. The bulk product is received by ship and dispatched by Tank-trucks. The terminal is also capable of back-loading the bulk product to ship/ adjacent terminals.
- The terminal has state-of-art instrumentation systems.

## SAGA's SCOPE :

- Basic & Detail engineering services in Process (Line Hydraulics, P&IDs, tank and pump sizing)
- Mechanical (Piping GA & Equipment design)
- Civil Design
- Instrumentation systems
- Electrical
- Tender document preparation

## HIGHLIGHTS :

- Design Engineering has been completed.



# SETTING-UP OF OIL TERMINAL AT MONROVIA, LIBERIA

## PROJECT BRIEF :

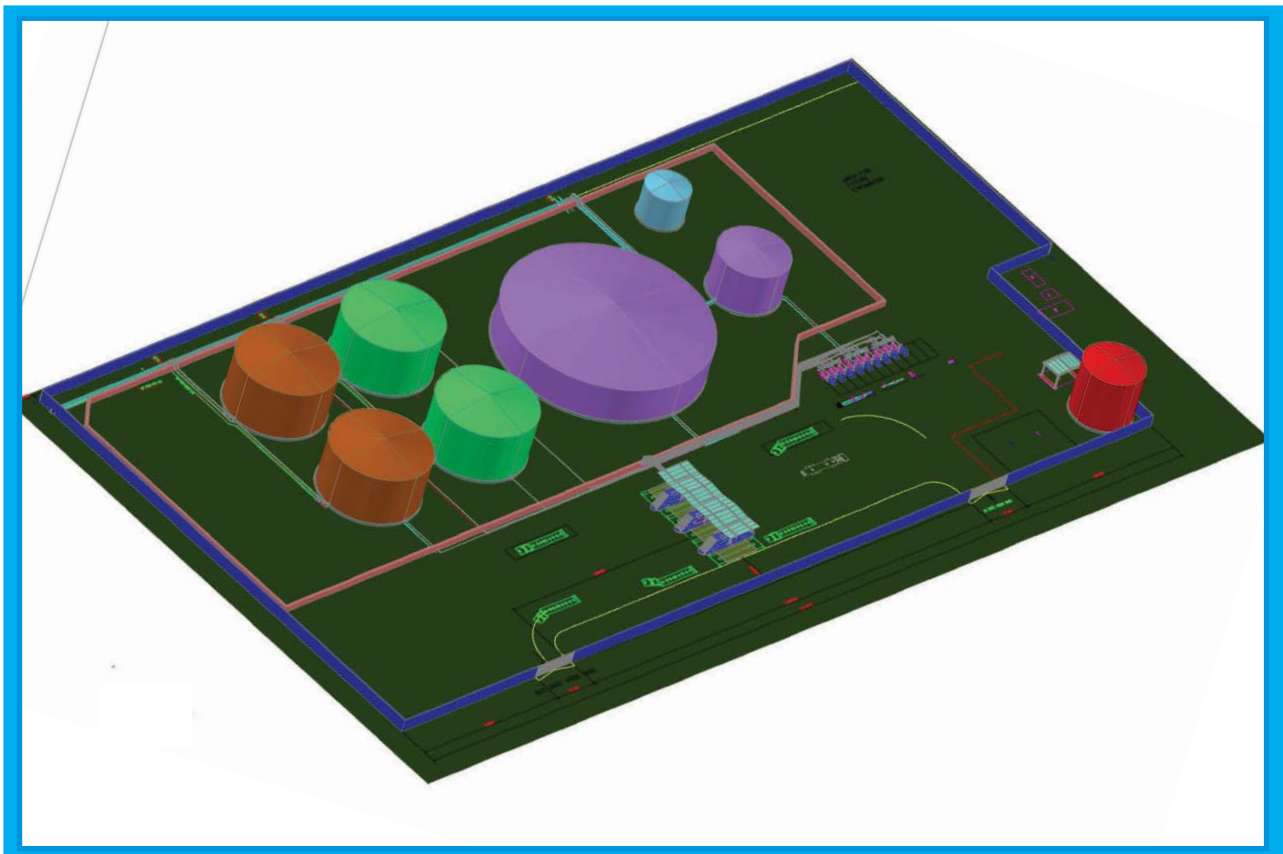
- Setting-up of Petroleum Terminal for storage & Distribution of Finished Petroleum Products - PMS, AGO.
- Major facilities are: IFRT & CR tanks , Loading /unloading pumps Gantry, Loading arms, associated civil, electrical, instrumentation and piping. The fire-fighting facilities were as per as NFPA Standards.

## SAGA's SCOPE :

- Basic & Detail engineering services (Process, Mechanical, Electrical, Civil, Instrumentation, Piping, Fire-Fighting)
- Estimation of project cost
- Preparation and Floating of Tenders
- Finalization of Tenders
- Contractor drawing approval
- Site Supervision
- Project Management

## HIGHLIGHTS :

- Project progressing as per schedule and estimated to be commissioned by August' 2014.



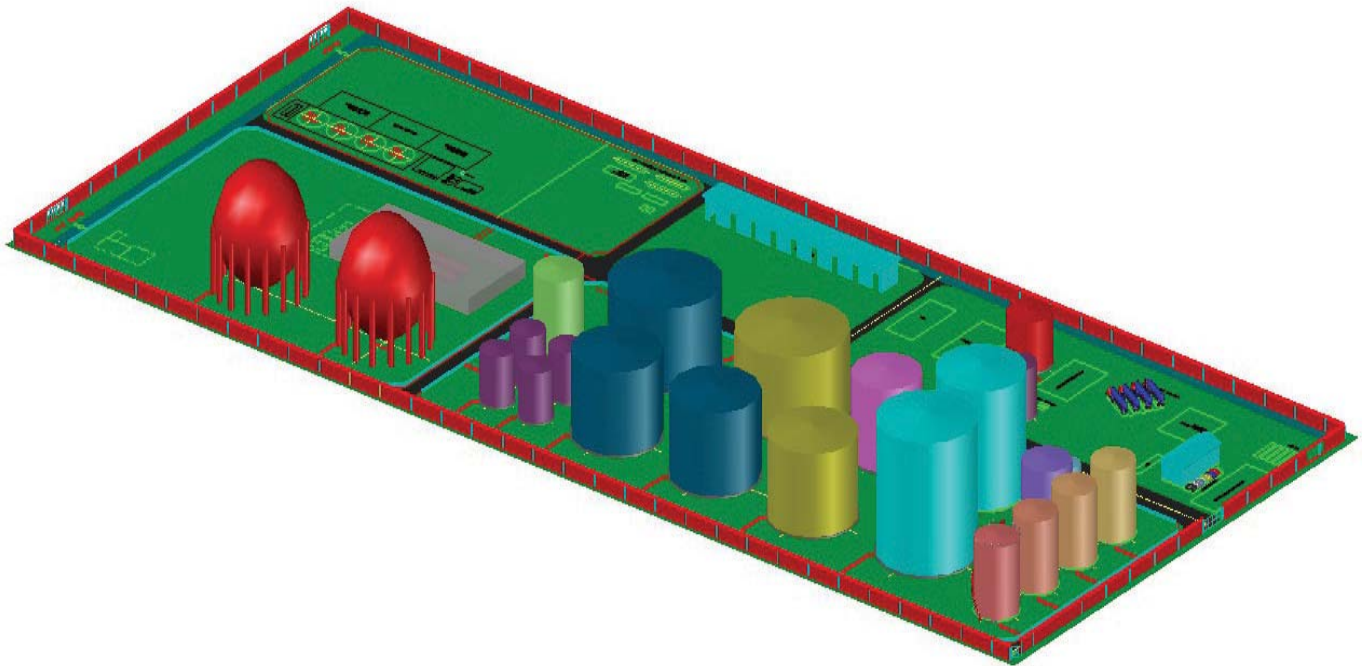
# FEASIBILITY REPORT FOR PROPOSED TERMINAL AT FUJAIRAH

## SAGA's SCOPE :

- Feasibility Study
- Concept Design
- Freezing of design parameters

## HIGHLIGHTS :

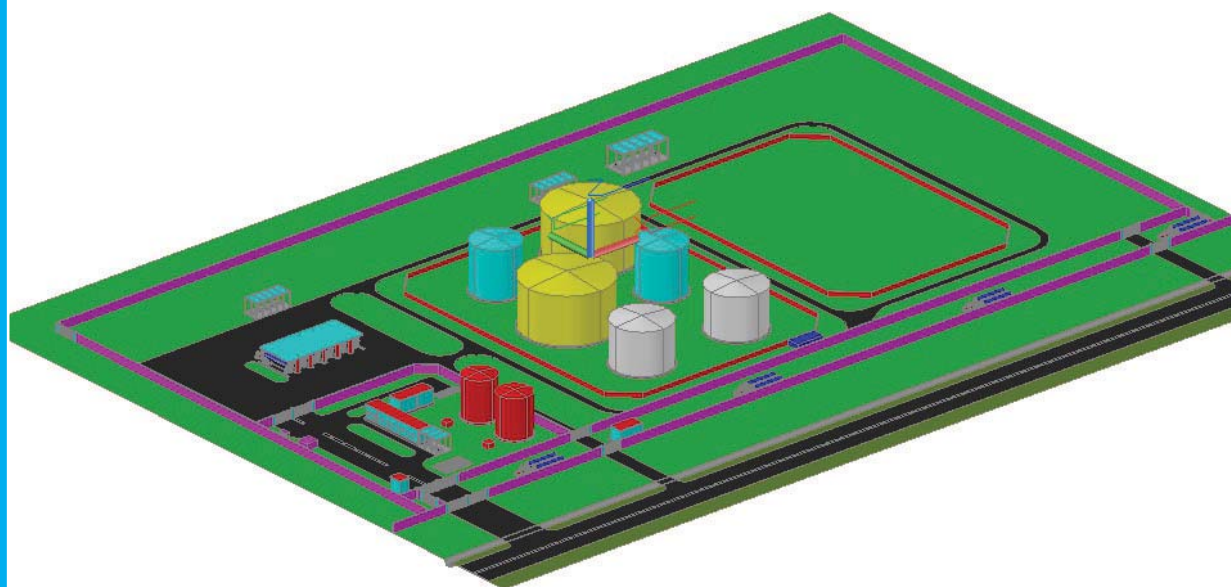
- Design Engineering has been completed



# FEASIBILITY REPORT AND PROJECT PRELIMINARIES FOR PROPOSED TERMINAL AT BEIRA

## SAGA's SCOPE :

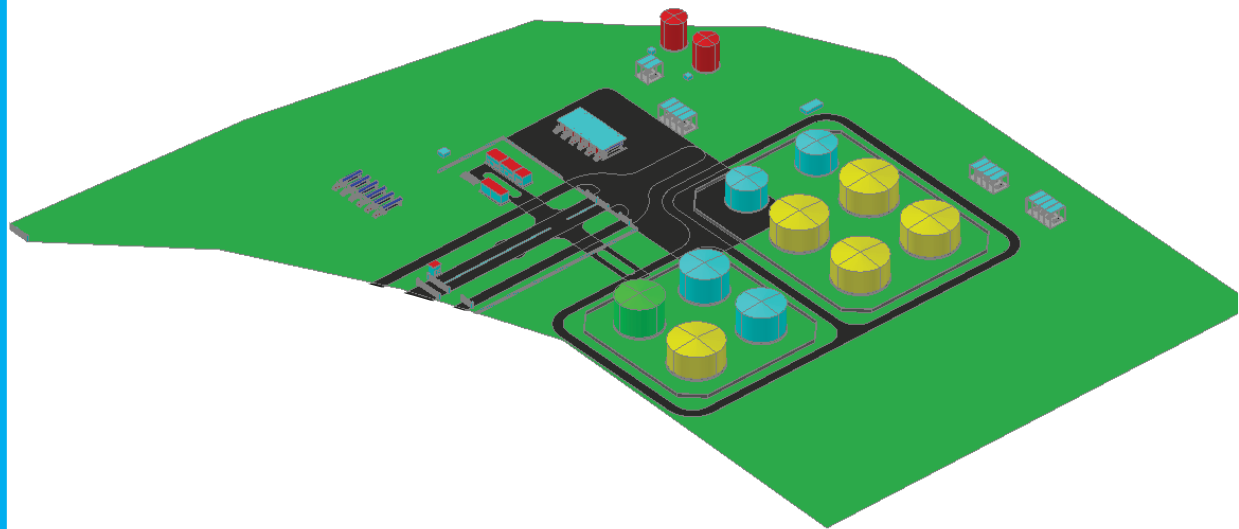
- Feasibility Study
- Concept Design
- Design Basis
- Contour Survey
- Soil Investigation



# FEASIBILITY REPORT AND PROJECT PRELIMINARIES FOR PROPOSED TERMINAL AT MATOLA

## SAGA's SCOPE :

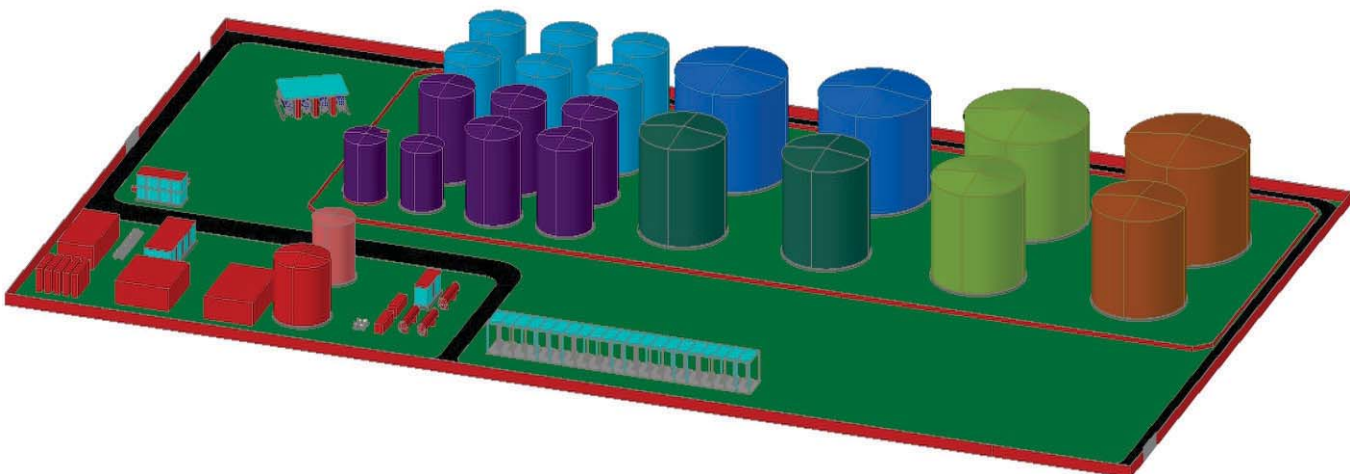
- Feasibility Report
- Detailed Project Report
- Signing of MOU with CFM
- Allocation of Land
- Contour Survey
- Soil Investigation
- Environment Impact Assessment
- Concept Design
- Design Basis
- Presentation to prospective investors
- Finalization of Tankage sizes

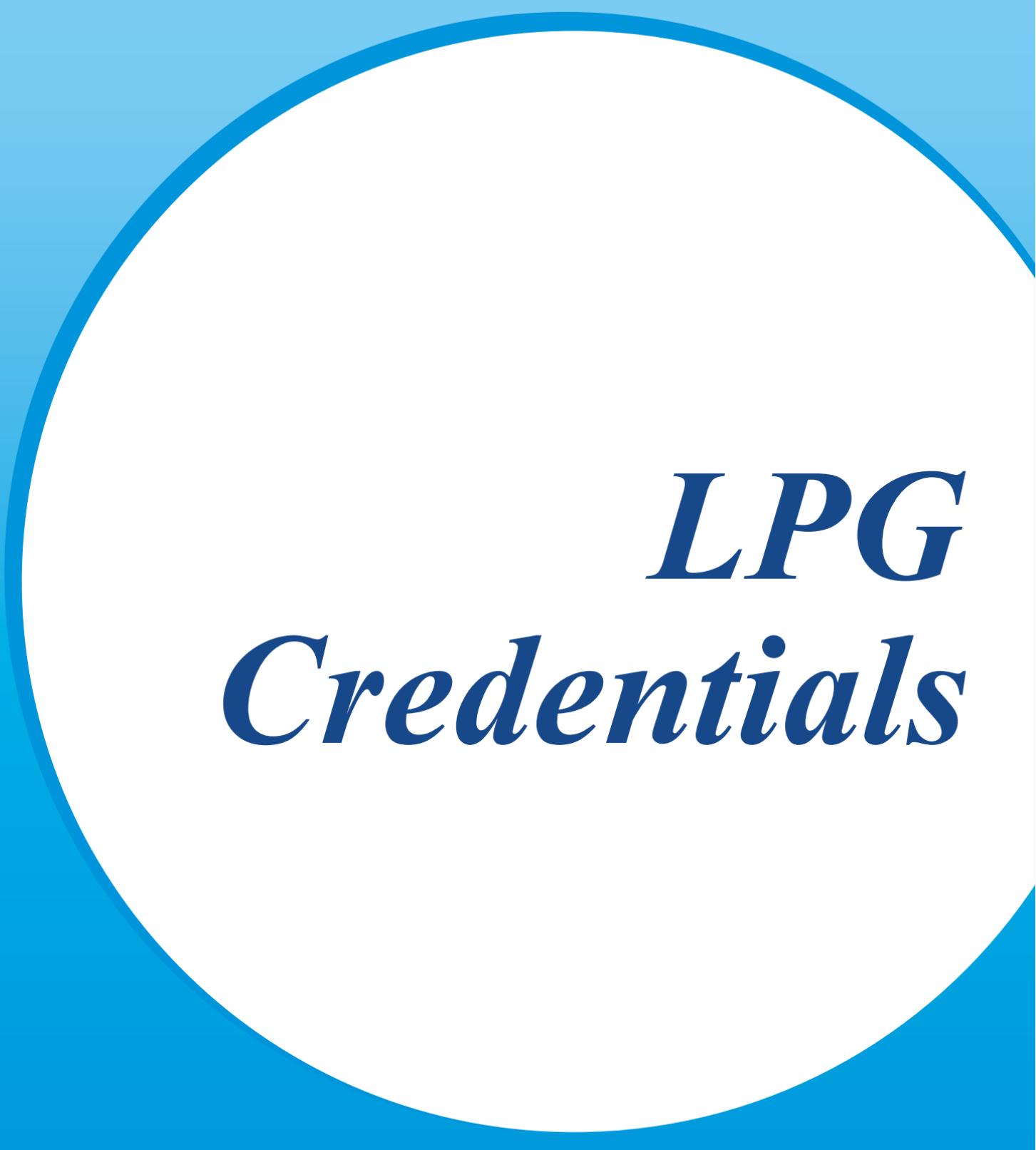


# FEASIBILITY REPORT FOR PROPOSED TERMINAL AT FUJAIRAH

## SAGA's SCOPE :

- Feasibility Study
- Concept Design
- Freezing of design parameters
- Allocation of Land





*LPG*  
*Credentials*

# SETTING-UP OF LPG FACILITIES AT ZAMBIA

## PROJECT BRIEF :

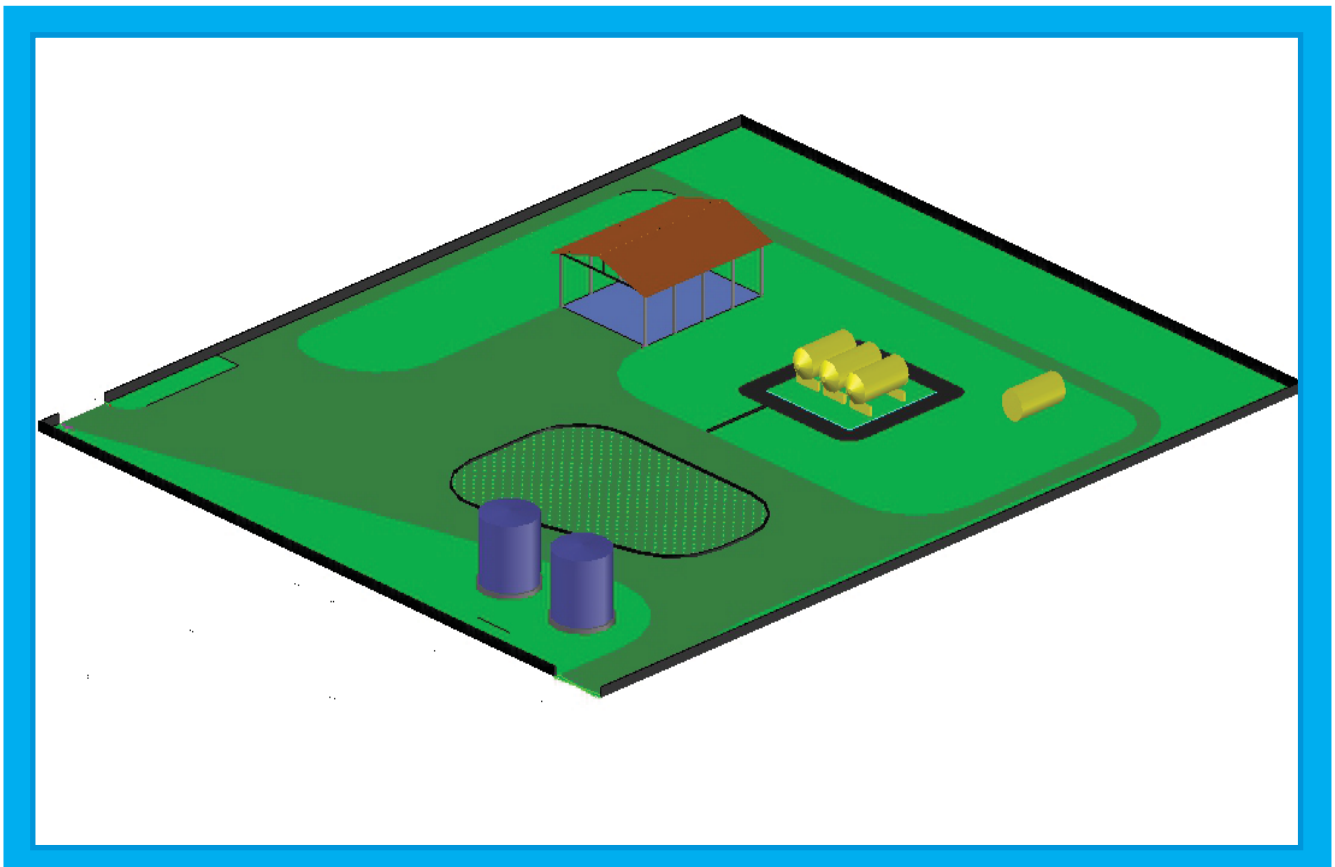
- LPG was taken via tank-trucks from Indeni Refinery, Zambia and stored in bullets. The same were bottled in cylinders and dispatched.
- Major equipment are : Over-ground Bullet, Loading/unloading pumps & compressors, LPG cylinder filling machine.

## SAGA's SCOPE :

- Complete Design Engineering packages were finalized including Civil, Mechanical, Electrical, Instrumentation, Piping.
- Procurement Assistance
- Inspection

## HIGHLIGHTS :

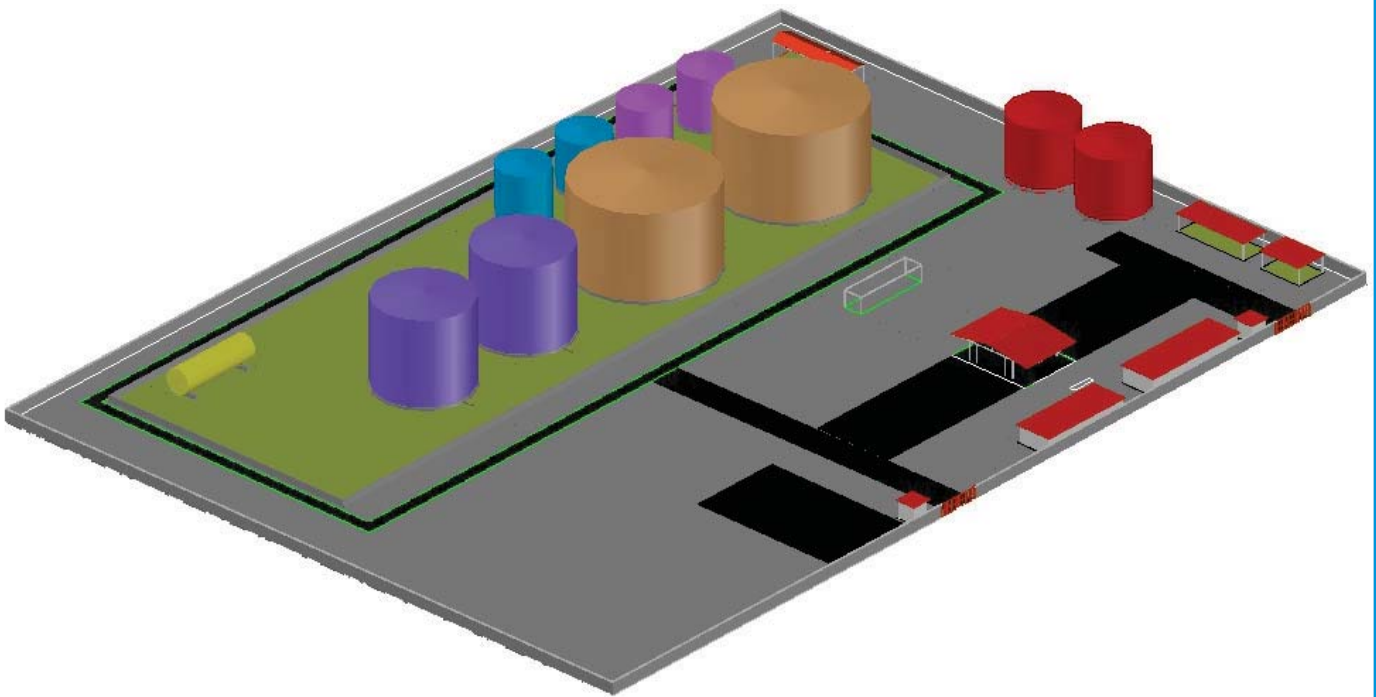
- The engineering for the project has been completed on time.



# SETTING-UP OF LPG IMPORT FACILITIES (ZANZIBAR)

## SAGA's SCOPE :

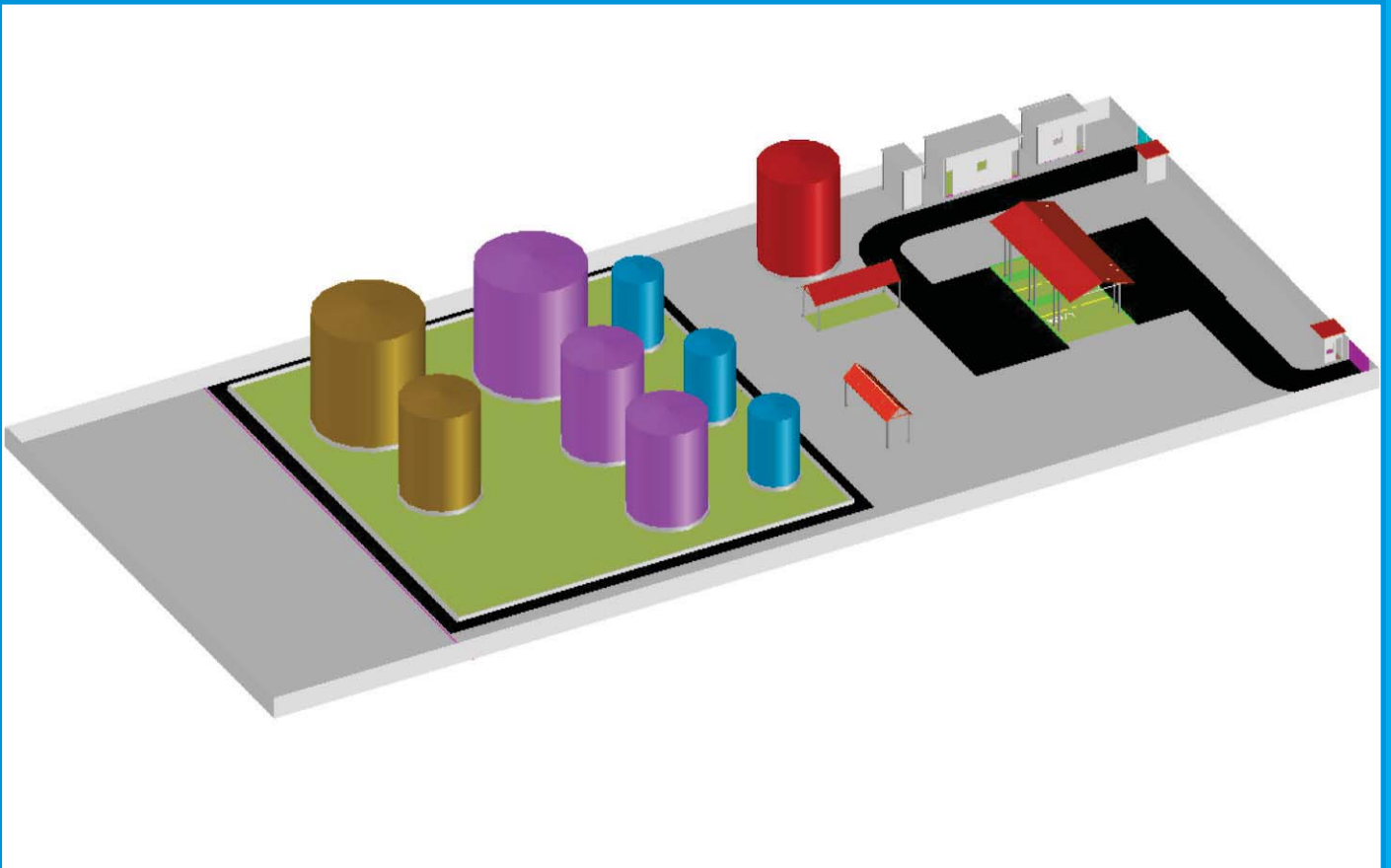
- Site Selection
- Finalization of Design parameters
- Strategy for demolition of existing structure at newly acquired land
- Contour Survey
- Soil Investigation



# SETTING-UP OF LPG IMPORT FACILITIES (JESUS BULK OIL COMPANY)

## SAGA's SCOPE :

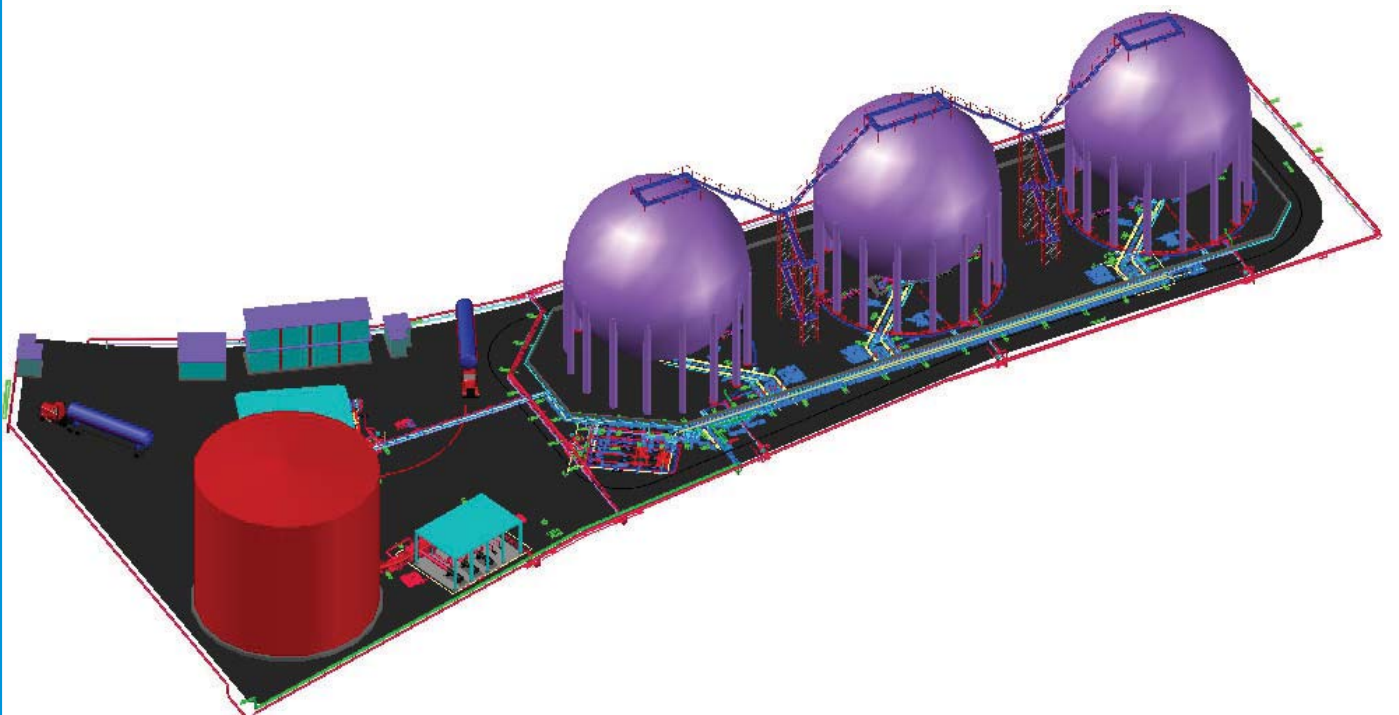
- Site Selection
- Finalization of Design parameters
- Strategy for demolition of existing structure at newly acquired land
- Contour Survey
- Soil Investigation
- Detailed Engineering Design (Process, Mechanical, Piping, Electrical, Instrumentation, Civil)
- HAZOP Study with statutory agencies
- Project Cost Estimation



# SETTING-UP OF LPG IMPORT FACILITIES (WEST AFRICA)

## SAGA's SCOPE :

- Finalization of Design parameters
- Basic Engineering Design
- Detailed Engineering Design (Process, Mechanical, Piping, Electrical, Instrumentation, Civil)
- MTO List
- HAZOP Study
- Project Cost Estimation
- Project Execution Plan
- EPC Tender



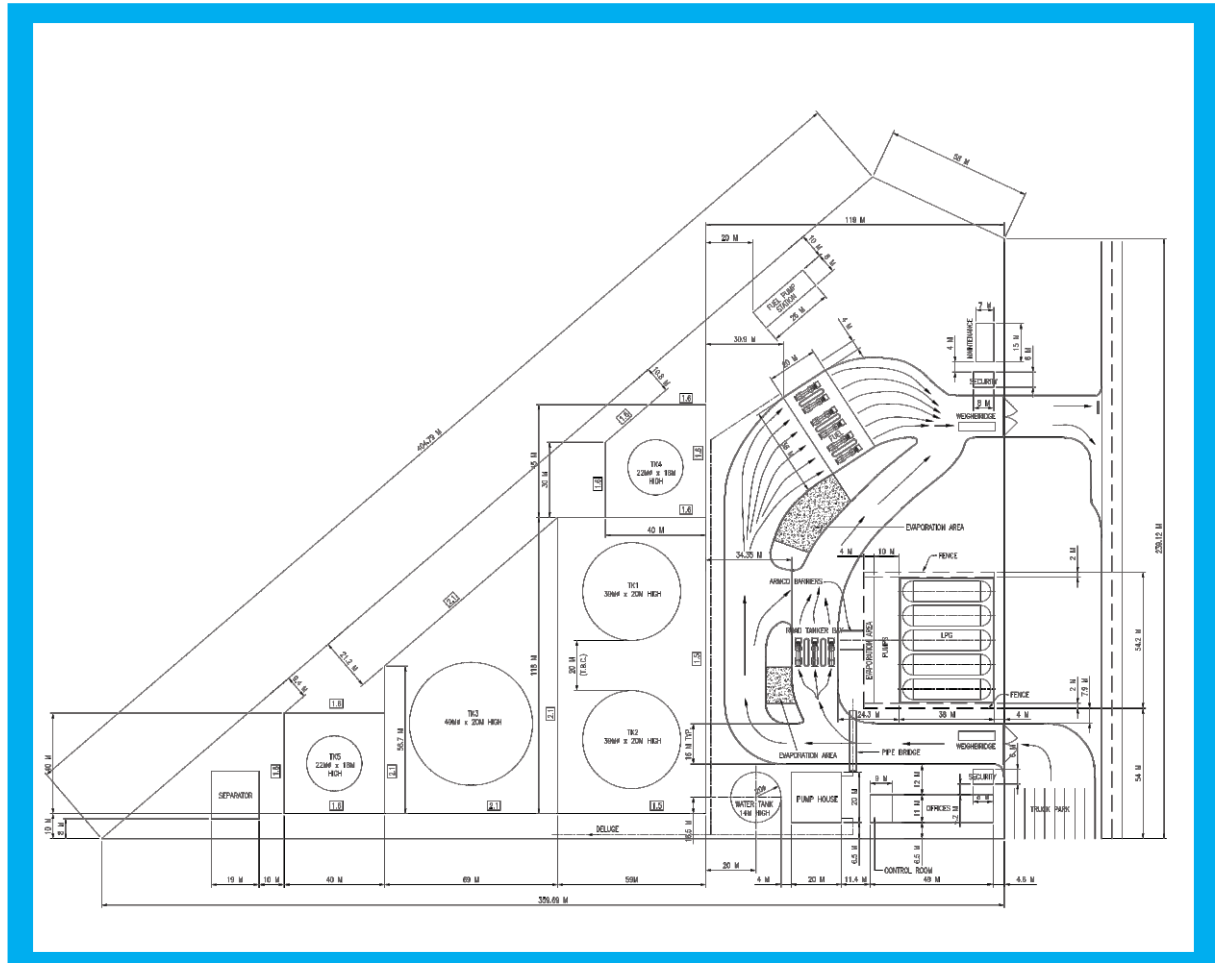
# SETTING-UP OF BULK LPG TERMINAL AT TEMA, GHANA

## SAGA's SCOPE :

- Concept Study considering space availability
- Risk Analysis
- Finalization of layout as per safety standards

## HIGHLIGHTS :

- Base on the concept study, the facility is being constructed by a LSTK Contractor.
- The facility is likely to be commissioned in December' 2014



# SETTING-UP OF LPG FACILITIES AT TANZANIA

## PROJECTS BRIEF :

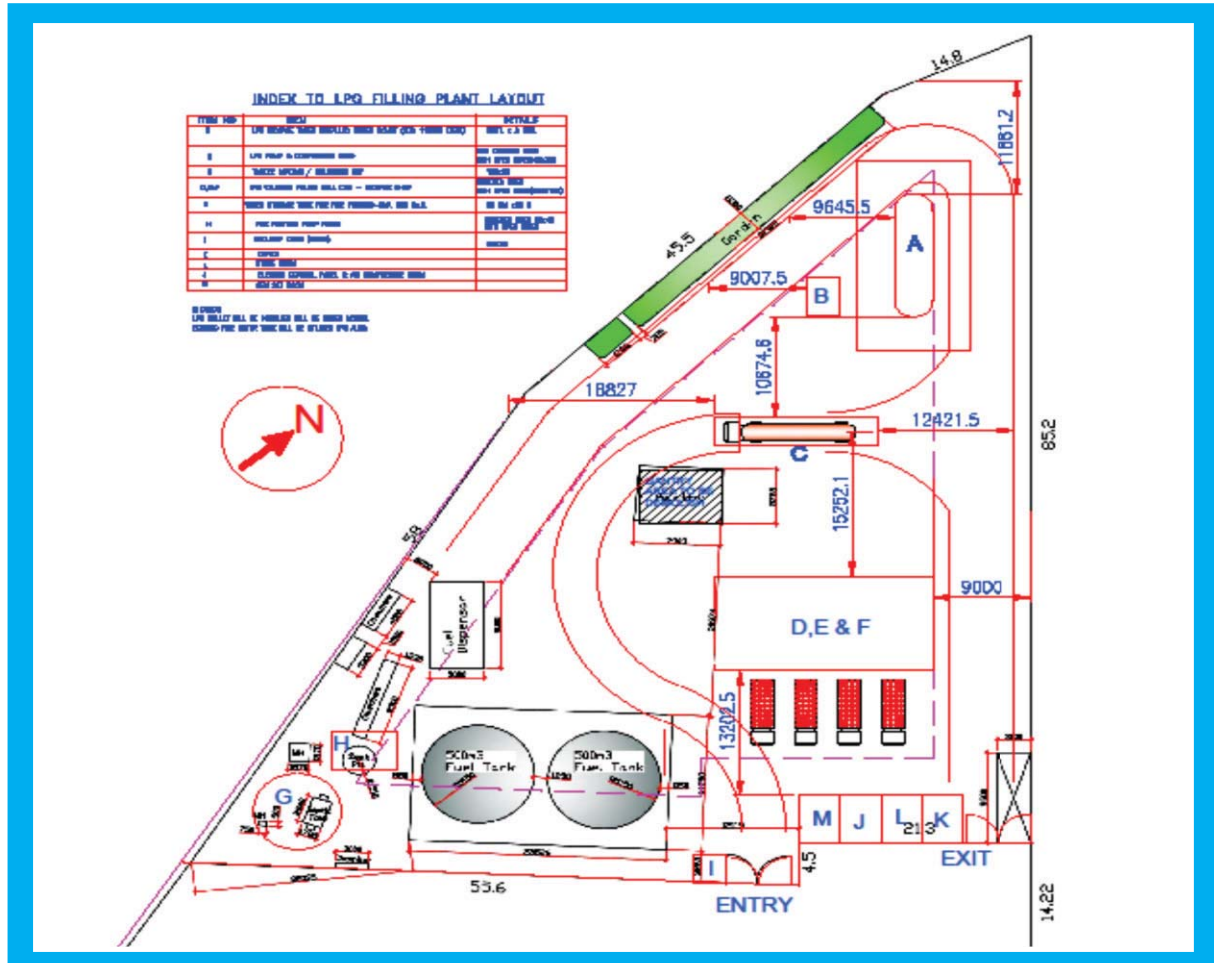
- Setting-up of Bulk LPG receipt facility, storage and dispatch by road tankers.

## SAGA's SCOPE :

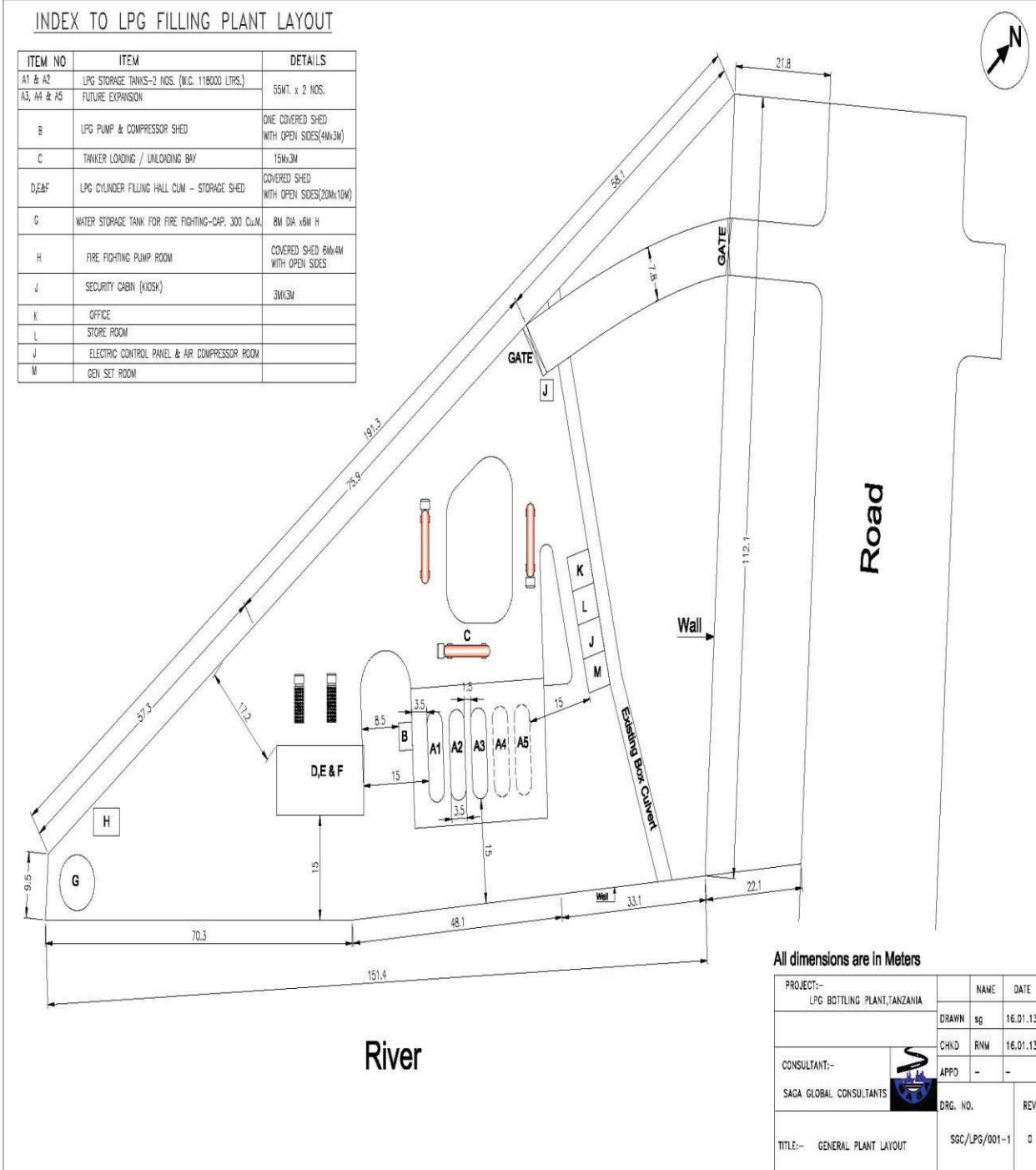
- Basic and Detail engineering
- Preparation of tender packages
- Design/selection of major equipment-Ship loading, unloading arm, horton sphere, mounded bullets, loading/unloading pumps, compressor and fire-protection system.

## HIGHLIGHTS :

- The engineering was done on time. The contractors are being finalized by owner.



## SETTING-UP OF LPG FACILITIES AT TANZANIA



# SETTING-UP OF LPG FACILITIES AT ZAMBIA

## PROJECT BRIEF :

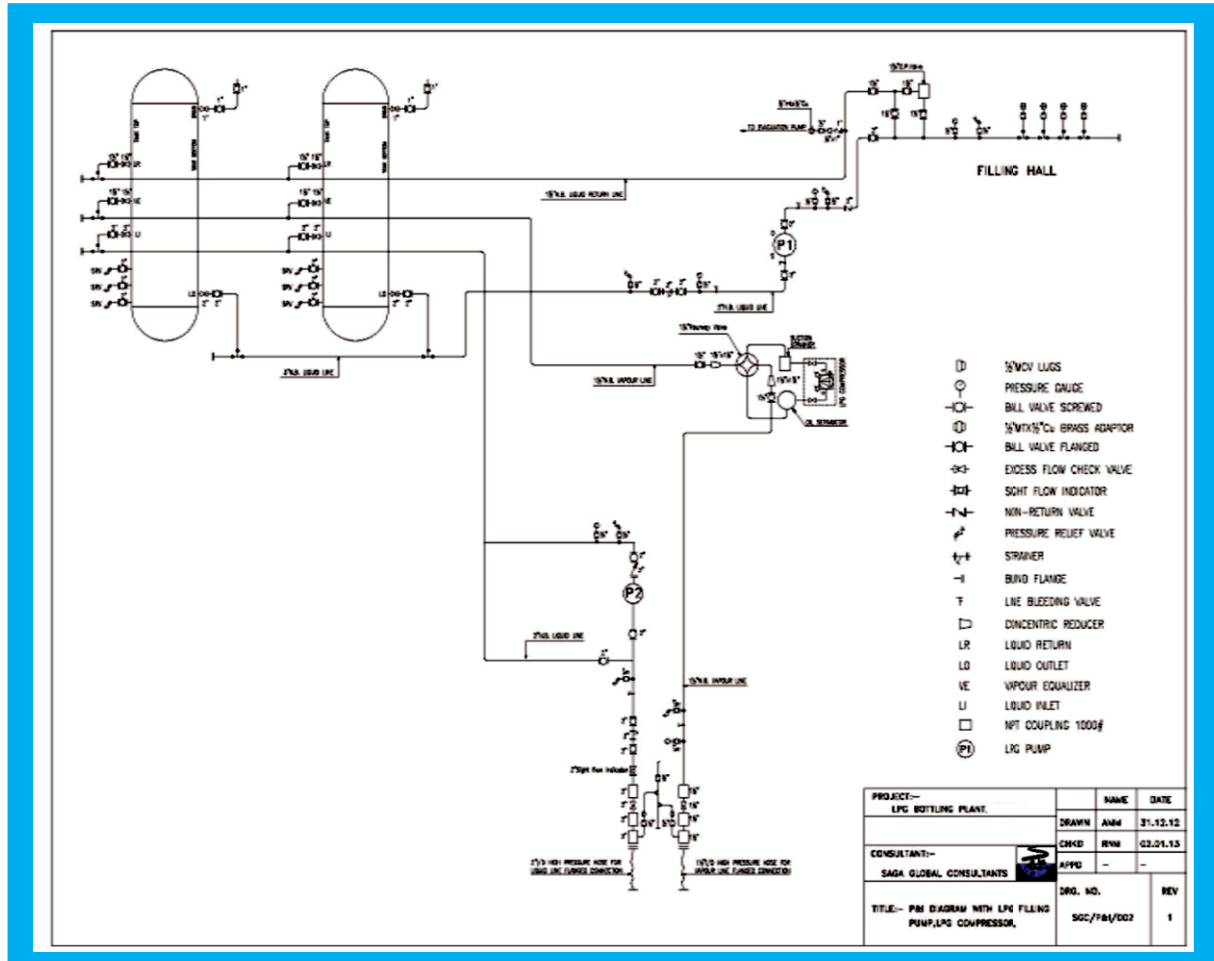
- LPG was taken via tank-trucks from Indeni Refinery, Zambia and stored in bullets. The same were bottled in cylinders and dispatched.
- Major equipment are : Over-ground Bullet, Loading/unloading pumps & compressors, LPG cylinder filling machine.

## SAGA's SCOPE :

- Complete Design Engineering packages were finalized including Civil, Mechanical, Electrical, Instrumentation, Piping.
- Procurement Assistance
- Inspection

## HIGHLIGHTS :

- The engineering for the project has been completed on time.



# ENGINEERING STUDY FOR ZUEITTINA LPG STORAGE & CYLINDERS FILLING PLANT (Brega Petroleum Marketing Company)

## PROJECT BRIEF:

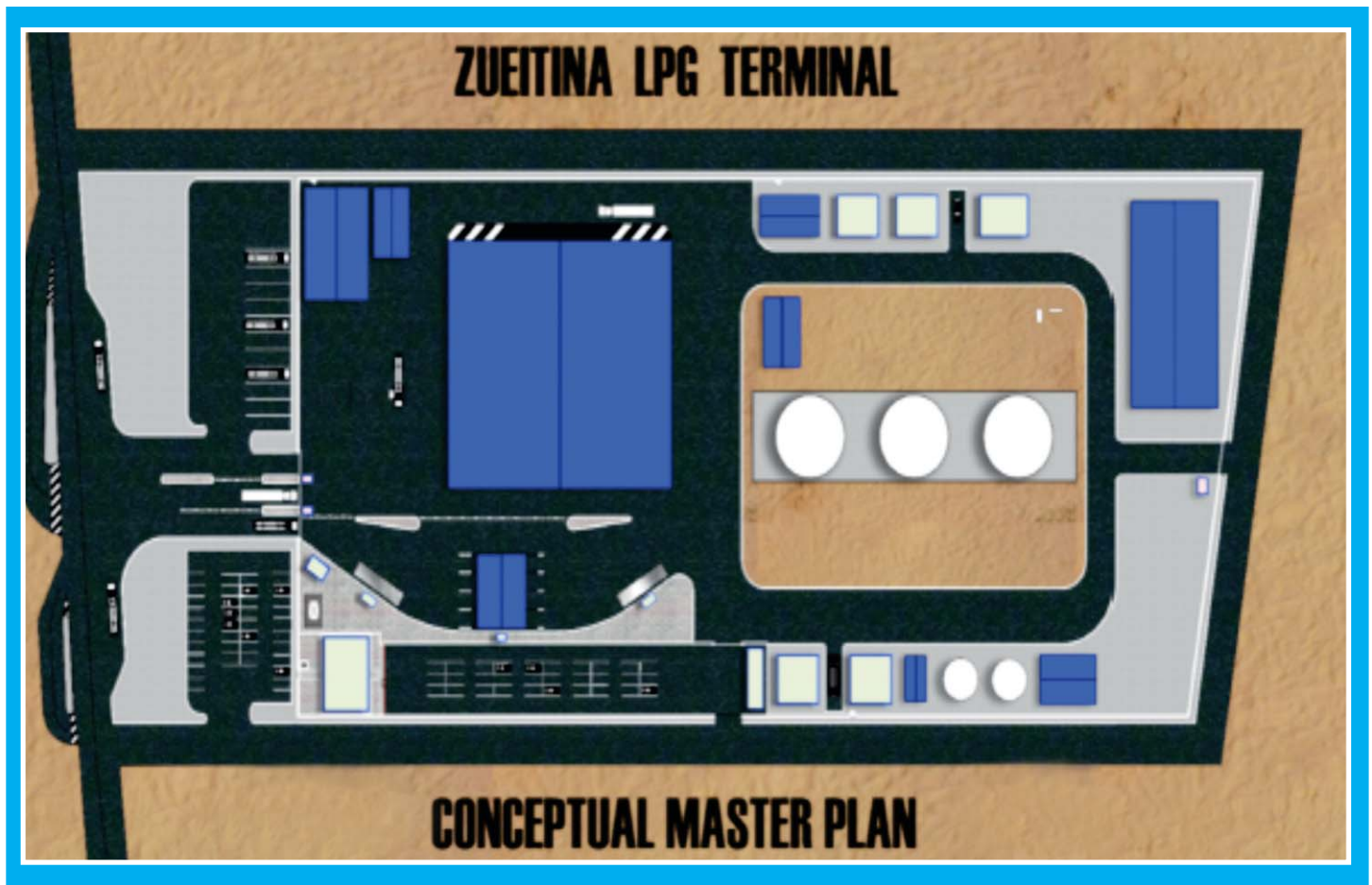
- The terminal shall include an LPG bottling unit in addition to LPG storage and tanker trucks loading and unloading facilities.
- The design of a Liquid Petroleum Gas (LPG) storage, distribution and bottling terminal involves diversity of technical concepts and is a complex process system.

## SAGA's SCOPE :

- Concept Design
- Freezing of Parameters
- Design Basis
- Cost Estimates

## HIGHLIGHTS :

- The project is under evaluation and is likely to be tendered to LSTK Contractor in third quarter of 2016



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# *Aviation Credentials*

# SETTING-UP OF AVIATION TERMINAL AT ACCRA, GHANA

## PROJECT BRIEF :

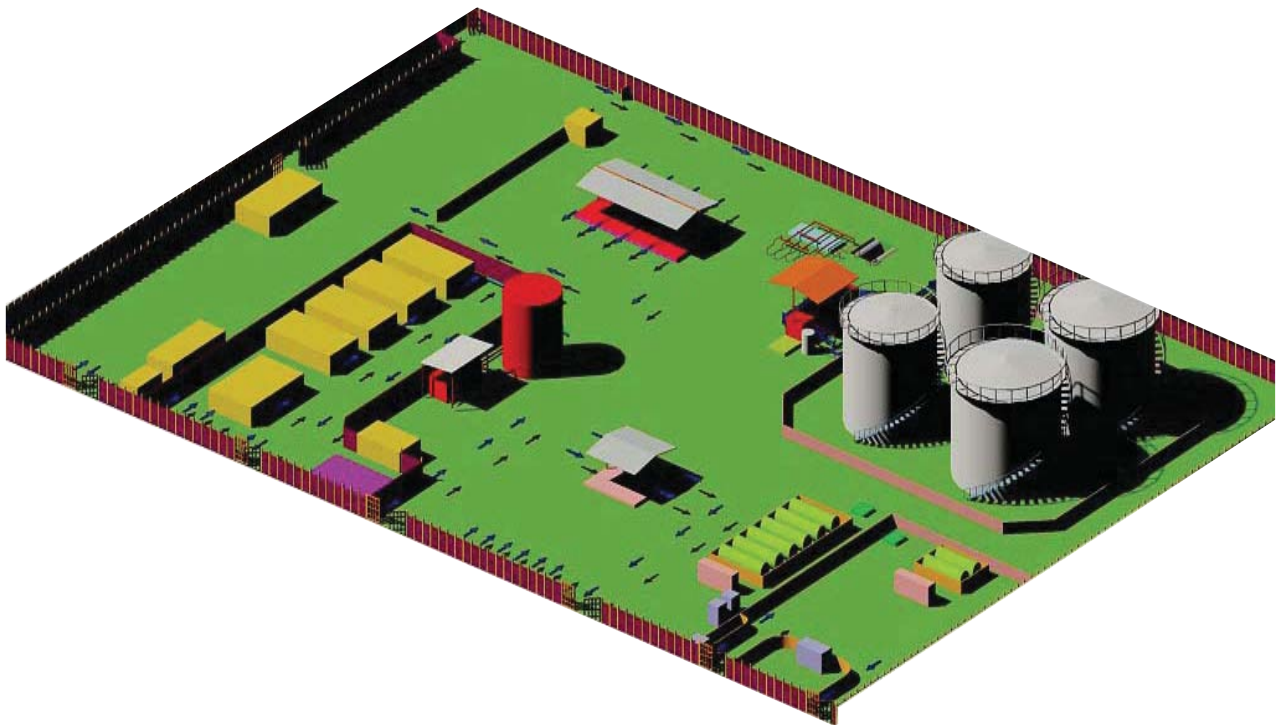
- Setting-up of 16,000 KL Aviation Fuel Farm at Accra International Airport, Ghana for storage of ATK (JET-A1) to deliver to aircraft.

## SAGA's SCOPE :

- Basic Design and detailed engineering of tank-farm, unloading gantry, refueller gantry, fire protection system.
- Hydrant System for Airforce Fuelling Ramp with four pits.

## HIGHLIGHTS :

- Detailed Engineering of the project completed on time. The project is currently under execution.





# SETTING-UP OF AVIATION TERMINAL FOR GHANA AIR FORCE BASE (NEAR KOTOKA INTERNATIONAL AIRPORT)

## PROJECT BRIEF :

- Conceptual design of Aviation Terminal for Ghana Air Force Base.
- The facility consists of 45KL x 2 and 55KL X 6 Horizontal Tanks.

## SAGA's SCOPE :

- SAGA Services include : Design/ Engineering of Horizontal tanks, Specification of Loading/ Unloading Skid.
- Approvals from Air Force.

## HIGHLIGHTS :

- Project completed from concept to commissioning in six months with no cost over-run.
- Received appreciation from Ghana Air Force for speed of execution.



# SETTING-UP OF AVIATION FUELLING FACILITY AT SONGWE AIRPORT (MBEYA), TANZANIA.

## PROJECT BRIEF :

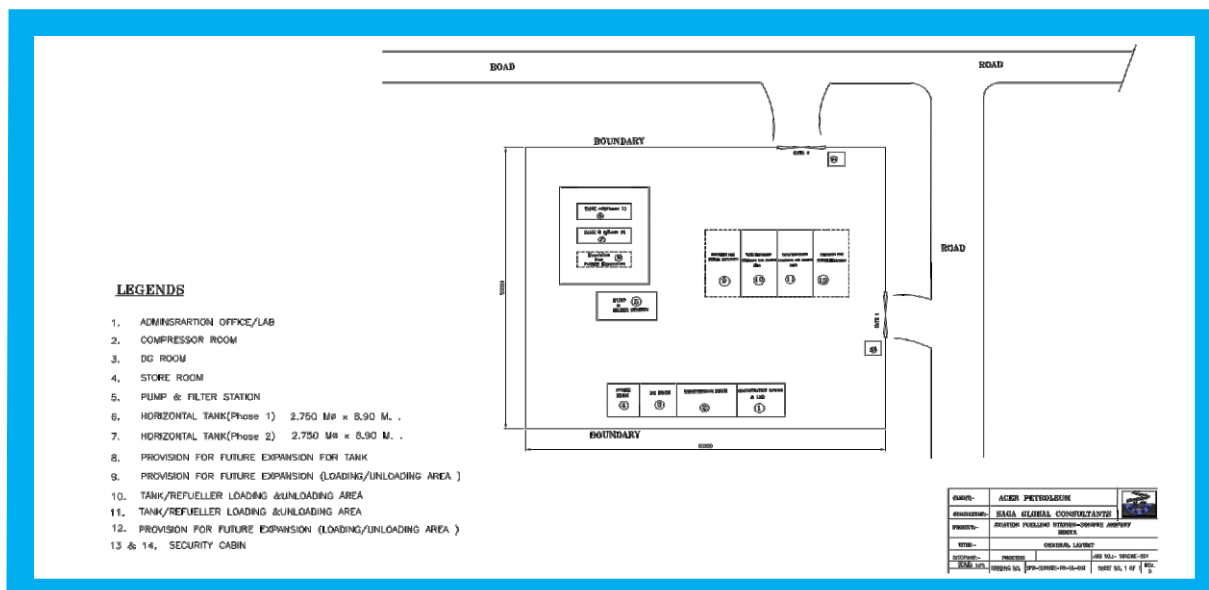
Setting-up of Aviation Fuelling Facility at Songwe Airport (Mbeya), Tanzania.

## SAGA's SCOPE :

- Concept Design
- Business Plan Preparation
- Basic Design
- Documentation for Sub-concessionaire Agreement
- Finalization of Layout

## HIGHLIGHTS :

- Besides the design and detailed engineering, drafted the business plan and proposal for sub-concessionaire for the client.



# SETTING-UP OF BITUMEN DRUM FILLING FACILITY

## PROJECT BRIEF:

The Bitumen Drum Filling Facility consists of:

- Bitumen Storage tank of 1000 MT for two grades of bitumen (VG 10; VG 30).
- Unloading Pumps, Bitumen Filling Pumps
- Filling Machines
- Associated Facilities
- The objective of the facility is to carry out all activities from receiving the bulk bitumen delivered and packing the same in drums.

## SAGA's SCOPE :

- Design and Detailed Engineering (Process, Civil/Structural, Mechanical, Electrical, Instrumentation, Piping, Technical Safety/ QHSE)
- Preparation of Tenders, Floating of Tenders, Finalization of Orders.

## HIGHLIGHTS :

- Project completed as per schedule in a record time of five months.





# **SAGA Global Consultants**

**The Think-Tank for the Oil & Gas Industry**

B-608, Western Edge II, Western Express Highway, Borivali (East), Mumbai - 400066. INDIA

Tel: +91-22-4028 6100 • Fax: +91-22-4028 6106

E-mail : [info@sagaconsultants.com](mailto:info@sagaconsultants.com) • Web : [www.sagaconsultants.com](http://www.sagaconsultants.com)