CHAPTER 2:
PROJECT DESCRIPTION

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This chapter is based on information provided by OTGC and the appointed engineering consultants, Kantey and Templer Consulting Engineers. Please note that the information pertaining to the details of the project description is relatively conceptual at this stage as the design process is at a preliminary phase. Therefore, it is likely that the project details may change as the project design progresses.

2.1 Introduction

OTGC is proposing to construct and operate a Bulk Liquid Storage and Handling Facility in Zone 8 of the Coega IDZ, within the NMBM in the Eastern Cape Province. Overall, bulk liquids will be transported to the Port of Ngqura via ship and piped to a tank farm for storage, prior to supply to the Southern African market and/or exported. This is a greenfields development project on a portion of land measuring approximately 20 hectares within the area designated for bulk liquid storage in the Coega IDZ.

The project will include the following key components:

- The construction and operation of a tank farm, which includes the construction of storage tanks, road tanker loading gantries, possibly rail tanker loading gantries (for future development purposes), loading arms, and site offices;
- Construction of pipelines between the tank farm and Berth B100 in the Port of Ngqura, with a future likelihood of the utilisation of the A-series Berths; and
- Construction of marine loading arms and other related infrastructure at Berth B100 and potentially at the A-series Berths.

2.2 Project Conceptualization, Objectives and Site Selection

TNPA is a registered owner of certain land parcels in the Port of Ngqura. TNPA acknowledged that the demand for liquid fuels in South Africa is increasing, along with the importance of a dedicated fuel supply to the national economy. TNPA further recognised the opportunity that the Port of Ngqura presents in creating a facility within the port system that will secure the fuel supply and contribute to the economy of South Africa. In addition, the impending decommissioning of the existing tank farm at the Port Elizabeth Harbour created further motivation for the establishment of a tank farm at the Port of Ngqura. Based on this, in 2009, TNPA carried out an open tender process in line with Section 56 of the National Ports Act No. 12 of 2005 and invited appropriate service providers to submit proposals to plan, design, fund, construct and operate a new Bulk Liquid Storage

and Handling Facility on the designated tank farm site in the Port of Ngqura. As explained previously, this site was identified as the preferred location for the proposed activity, within the zone allocated for bulk liquid storage in the original EIA's for the Port of Ngqura and Coega IDZ.

After submitting a proposal to TNPA, OTGC was selected as the preferred bidder and was consequently appointed to undertake the proposed project. OTGC will be granted a 20 year lease to build, own and operate the facility. When the term draws to a close, the assets will be transferred from OTGC to TNPA. Under the terms of the agreement, OTGC will hand over a well maintained and fully functional facility to TNPA once the lease period ends.

As indicated above, the proposed Bulk Liquid Storage and Handling Facility will be located in Zone 8 of the IDZ. Zone 8 is situated in the southern extent of the IDZ and it is bordered by Zones 1, 5, 7, 9 and 10 of the IDZ. The Coega IDZ was selected as the preferred location for the establishment of the Bulk Liquid Storage and Handling Facility based on the following strategic criteria:

- It is an existing industrial zone which has been designated for activities such as tank farms and bulk fuel storage in line with the original EIAs conducted for the development of the Port of Ngqura and the IDZ.
- The proximity of the Port of Ngqura is favourable for such a development, as it negates the need for longer pipelines, which would inevitably create greater environmental disturbance and operational costs.
- Existing infrastructure in the IDZ to facilitate the establishment of the Bulk Liquid Storage and Handling Facility comprises:
    - a road network that provides access to and from the tank farm site and the existing bulk liquid Berth B100;
    - an existing common user berth;
    - marine services (pilotage, tug assistance, berthing services and maintenance dredging) that are required for vessels that enter and exit the Port of Ngqura to offload or load the bulk liquids; and
    - the proximity of the Port of Ngqura which facilitates the transportation of incoming bulk liquids to the tank farm, as well as the ability to export bulk liquids to international customers.
- Willingness of the landowner (TNPA) to accommodate a Bulk Liquid Storage and Handling Facility in the Port of Ngqura.
- The project will enable a significant capacity of bulk liquids in the Eastern Cape Province especially since the tank farm at the Port Elizabeth Harbour is planned to be decommissioned.
- Zone 8 of the Coega IDZ remains largely undeveloped, and the proposed project is classified as a greenfields development in the Port of Ngqura. The implementation

of the proposed project within Zone 8 of the IDZ will therefore not impact on any existing industrial and other land uses within the area.

2.3 Project Description:

As pointed out in the previous chapters, TNPA are planning the future construction of the A-series Berths on the eastern side of the Port of Ngqura. Once constructed, the new A-Berths will be well aligned with the tank farm, which creates the possibility for the infrastructure to be transferred from Berth B100 to the new A-series Berths. However, in order to construct the A-series Berths, TNPA will first need to carry out an EIA. This will take time and therefore, an overall phased approach has been proposed by OTGC for the construction phase of the project. This approach will most likely involve the initial construction of the inland components of the project such as the tank farm, followed by the construction of the remaining components in a seaward direction, such as the pipelines and berth infrastructure. Thus the berth infrastructure will probably be the final project component to be constructed. This will provide the opportunity and requisite timeframe for the completion by TNPA of the EIA and subsequent construction of the A-series Berths. If the construction of the A-series Berths is fast-tracked and OTGC have constructed the inland components of the project, and are now ready to commence with the installation of the infrastructure at the berth, it is planned that OTGC will proceed immediately with the usage of the A-series Berths. However, if for any reason the A-series Berths are not constructed or environmental authorisation is refused, the proposed project will proceed with the planned usage of Berth B100.

The construction activities within the tank farm area, including civil works and earthworks, will be completed in approximately 16 months. The pipelines are also planned to be prepared and assembled within the tank farm area and will thereafter be transported to the routing site and installed. Installation of the pipelines will be completed in approximately four months, whilst work on the berth will be completed in seven months. This way major works could be completed at the tank farm terminal prior to the pipeline installation being carried out.

The project components including the tank farm, pipelines and berth infrastructure are described within this section.

2.3.1 Bulk Liquid Storage and Handling Facility (Tank Farm)

2.3.1.1 Specifications

The tank farm will cover an area of approximately 20 hectares. As well as the overall phased approach highlighted above, the construction of the tank farm itself will also be

carried out in two phases. Phase 1 of the tank farm construction will accommodate the storage and handling of liquid hydrocarbon products currently being handled at the existing tank farm in the Port Elizabeth Harbour. Phase 1 will also include make and break-bulk operations, which will be explained further in this chapter. Phase 2 will include additional make and break-bulk operations, and possibly the ability to rail liquid products to storage facilities around South Africa, as well as to load product onto vessels calling at the berth. It is probable that Phase 2 construction will follow on immediately after the completion of Phase 1.

TNPA will provide the associated infrastructure to the tank farm site, such as the access roads and electrical requirements, as stipulated in the Build, Own, Operate, Transfer (BOOT) agreement.

The tank farm will consist of a number of tanks designated for the storage of hydrocarbon and chemical products, such as petrol, diesel, jet fuel, fuel oil, carbon black feedstock, paraffin, Liquefied Petroleum Gas (LPG), biofuel, and petrol and diesel additives. Figure 2.1 (Page 2-8) is a conceptual layout of the tank farm, including the corresponding infrastructure. It is expected that during the detailed engineering design phase and on completion of additional technical studies (e.g. geotechnical investigations); some changes will be required. In relation, slight amendments have been made to the layout as a result of the requirements of potential customers of the tank farm, however the overall storage capacity of the tank farm (i.e. 790 000 m^3) has not been amended. It is important to note that the layout provided is indicative at this stage and more detailed information (such as the final number of tanks proposed) will be confirmed at a later stage of the design process and provided in subsequent EIA Reports.

The tank farm is anticipated to contain a total storage capacity of approximately 790 000 m^3 for both phases of the project. The proposed capacity of the tank farm has changed since the Background Information Document was released to the public as a result of the evolving design phase and confirmation of applicable standards for a facility of this nature. Three types of tanks have been proposed for usage at the tank farm based on the type of product, pressure and composition. These include:

- Bulk Liquid Tanks;
- LPG Tanks; and
- Additive Tanks.

The Bulk Liquid Tanks are classified as vertical tanks and will be constructed according to the American Petroleum Institute (API) 650 standard, which pertains to the construction of atmospheric steel tanks. Refer to Appendix B for the complete list of specifications and codes of practice that will be used during the construction and operational phases of the project for the development of such tanks.

The LPG tanks will meet the requirements of the South African National Standards (SANS) 10087, the American Society of Mechanical Engineers (ASME) IX BPVC Section VIII Division 1 or the British Code, and the National Fire Protection Association 58 LPG Code. The SANS 10087 pertains to the handling, storage, distribution and maintenance of LPG in domestic, commercial and industrial installations (Parts 1 to 10), and the ASME IX BPVC Section VIII Division 1 pertains to the construction of pressure vessels.

The additive tanks will store additives for petrol and diesel according to the requirements of the customers of the tank farm (i.e. petrol companies). These tanks are expected to contain the smallest capacities of product, ranging up to 9 m^3 maximum. The petrol additives will be stored above-ground, whilst the diesel additives might be installed underground. Diesel additives will only be stored underground if an exothermic cetane improver is potentially required by the customer. A cetane improver is a chemical that is required to improve the measure of the ignition quality of the stored diesel product. The term exothermic refers to a chemical reaction that produces heat.

The bulk liquid storage tanks will be constructed of steel, and will range from 14 m to 45 m in diameter, and 14 m to 18 m in height. The bulk liquid tanks will be designed to store product at atmospheric pressure, whilst the LPG vessels will be pressurized (at approximately 7 bar). In terms of the storage temperature, the tanks will be at ambient temperature, with the exception of the tanks containing black oils, which may be heated to a certain degree.

The LPG storage tanks will be semi-buried in order to reduce the impact of radiant heat on them. As mentioned above, only if there is a potential need for the exothermic cetane improver will the diesel additive be installed underground. The remaining tanks are expected to be constructed above-ground.

The storage tanks containing low-volatility products, such as gasoil, will be fitted with fixed roofs. However, the storage tanks containing volatile products such as petrol will consist of internal floating roofs in order to reduce vapour loss. An internal floating roof system has a roof that floats on the surface of the product within the tanks, together with a seal around the rim. The floating roof height fluctuates according to the level of the stored product, which reduces the potential of a gaseous zone occurring above the product and thereby reduces the probability of corrosion within the tanks themselves (Geo Pollution Technologies, 2008). In addition, the internal floating roof system controls the amount of vapour released into the atmosphere and achieves a 95% efficiency in terms of vapour loss. The diesel and paraffin storage tanks will be installed with free venting roofs as these liquids are not classified as highly volatile. The efficiencies that will be achieved are in line with internationally accepted standards, as well as the latest technology in the industry for tank farm installations of this nature.

The preliminary planning phase work indicates that the bulk storage tanks will be equipped with a high accuracy Radar Tank Gauging (RTG) system. This RTG system will

ensure that signals are generated in order to derive the low low, low, operating, high and high high levels in the tanks. Apart from the RTG system, the tanks will also be equipped with an independent High Level Alarm, in case the RTG system is not functioning. In addition, the RTG system will monitor the stock in each tank, and it will have the ability to derive the rate of change of the tank volume in order prevent tank overfilling during operation. Basically, the RTG system will accurately control the amount of liquid being stored in each tank.

2.3.1.2 Bunding

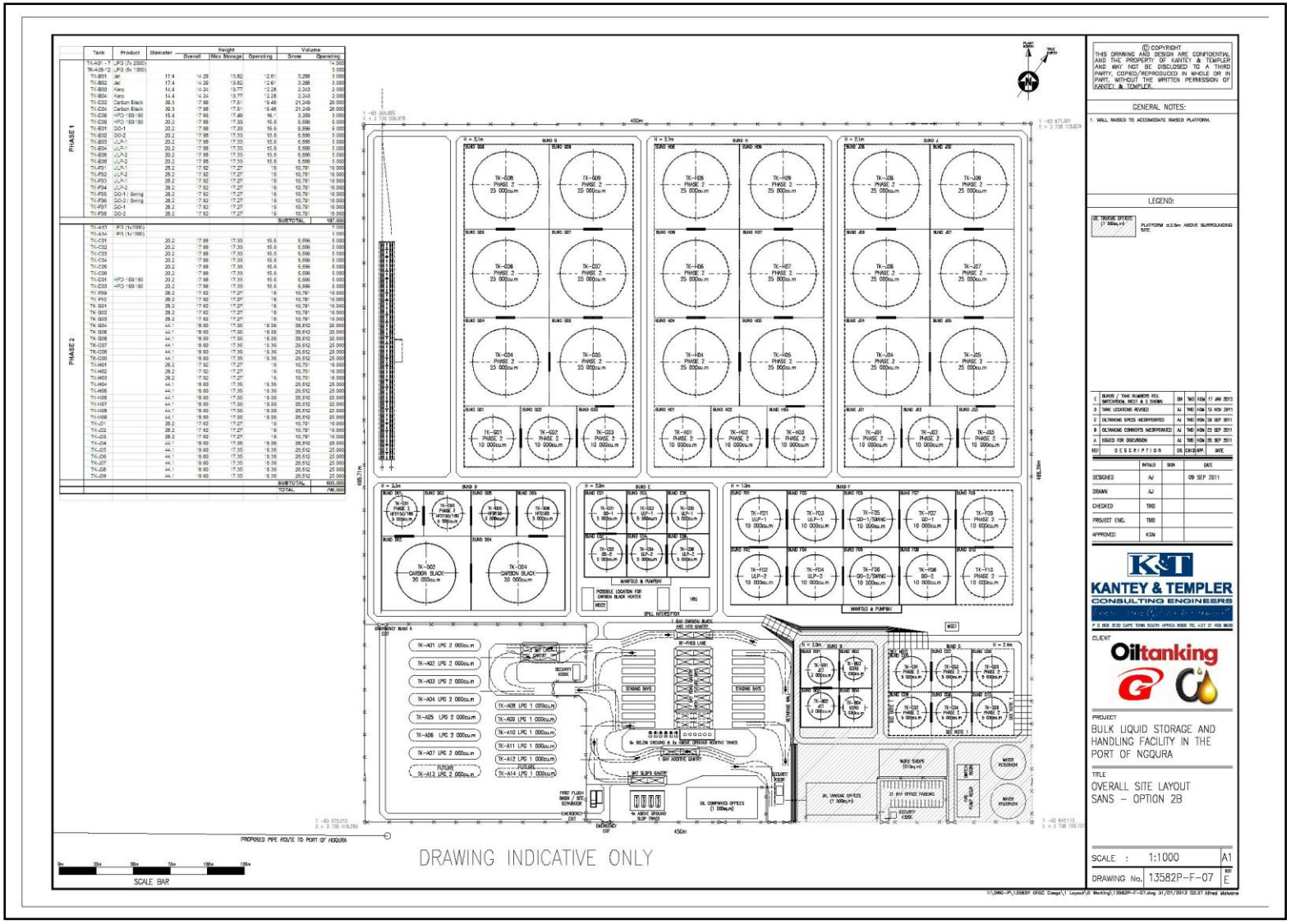
The bunding in the proposed tank farm has been designed to comply with or exceed the requirements of the most recent SANS specifications (particularly SANS 10089) with a view to minimizing any risks associated with product spills. Further to this, the Buncefield requirements will be taken into account where applicable. It is anticipated that the bund walls will be constructed of reinforced concrete. The bund wall capacity will be able to retain 100% of the largest tank capacity within the main bund area, as well as 100 mm of freeboard. The expansion joints within the bund walls will contain fire protected water-bars to ensure the integrity of the bunds during a fire. The floor of the bund will be constructed of concrete and sealed with an HDPE membrane ensuring that any leak inside the bund does not come in contact with the soil.

The drainage from the bund areas will be valved in order to assist in retaining the storm water, which will only be released once the quality has been tested and found to be within the relevant specifications.

Pipe penetrations through the bund walls will be kept to a minimum. However, pump suction lines will need to penetrate through bund walls, whilst pressure lines will mainly traverse over the bund walls. The pipe penetrations will be constructed such that the space between the concrete bund wall and the pipe itself is sealed and retained.

The tanks will be equipped with a leak detection pit adjacent to each tank. The leak detection pit is linked to the space between the tank floor and the foundation of the tanks. The leak detection system, which is the latest norm in the industry, will give an early warning in case a leak occurs in the floor of the tank.

Figure 2.1: Proposed Conceptual Layout of the Tank Farm (Indicative at this stage)



2.3.1.3 Road Tanker Loading Gantry

- ***General***

The construction of a road tanker loading gantry also forms part of the proposed project and will be located within the tank farm site (on TNPA land) adjacent to the tanks. Access to the tank farm site will be via the Hougham Park Interchange on the N2 to the east of the site, which will allow the road tankers to enter and exit the IDZ efficiently. The Emergency Response Action Plan (ERAP) will account for and address potential incidents within the tank farm site. The ERAP for the Port and IDZ will account for and address potential accidents in the Port and IDZ, respectively.

The road tanker loading gantry will initially contain up to seven loading bays, which may be expanded to nine loading bays at a later stage. A separate loading bay has been proposed to handle black oils. The gantry will serve as an area to assist the transfer of the bulk liquids from the storage tanks into the road tankers.

In order to facilitate this transfer, the white oil road tanker loading gantry will contain bottom loading arms and API dry break couplers with a loading flow rate of up to 2200 l/m per loading arm. The dry break couplers will be used to create a spill free connection of the loading arms to the road tankers. The gantry will be fitted with electronic presets to ensure that a pre-determined volume of the bulk liquids is transferred to a road tanker.

The road tanker loading gantry will be equipped with a truck grounding or earthing monitor system to ensure that the road tankers are suitably earthed and hence protected from the static created by the flow of the bulk liquids before the loading commences. This system will also ensure that the on-board overfill system is linked to the road tanker loading gantry control system.

Furthermore, in order to comply with the Listed Activities and Minimum Emission Standards indentified in terms of Section 21 of the National Environmental Management: Air Quality Act (Act No. 39 of 2004), a Vapour Recovery Unit will be installed within the road tanker loading gantry.

- ***Additives***

The road tanker loading gantry will also include a system to allow each oil company using the facility to inject additives for diesel and petrol. The electronic presets will control the additive volume based on the information stored in the Terminal Automation System (TAS).

- ***Spill Control and Tanker Access***

The road tanker loading gantry area will be fitted with spill control slabs as a contingency measure to ensure that any spillage is contained. Each loading bay will contain a central drain to collect the spills, which will then lead to a separator. This will ensure that all possible spills are contained and retained in a single loading bay, thereby preventing any movement between the loading bays. Furthermore, should any of the spilt material ignite; it will initially be contained in one bay.

The road tanker loading gantry will be covered with a fixed canopy to provide protection against the weather, thereby minimizing the volume of storm water entering the oily water drainage system. The gantry will also be equipped with mezzanine floors in order to store the gantry equipment and provide access to the top of the vehicles. Fall protection measures (to prevent personnel from falling when working at height) will be implemented to ensure the safety of all personnel during all phases of the project lifecycle.

2.3.1.4 Rail Gantry

A rail tanker loading gantry may also be constructed as part of the scope of the proposed project. The inclusion of the rail tanker loading gantry in the scope of work is mainly to ensure that the necessary equipment is provided to facilitate rail loading should it become necessary in the future. Furthermore, the provision of the rail tanker loading gantry was stipulated by the landowner for future planning purposes. At this stage, the rail gantry is a possibility and the details of the location cannot be confirmed. The rail gantry will be constructed only if the demand arises. The rail gantry would initially contain up to 20 loading bays, which may be expanded up to 40 loading bays. The rail gantry would contain a concrete spill containment area that would direct any drainage to a separator. The spill containment area would contain a capacity that is sufficient to hold the full contents of one tank car. Furthermore, the rail gantry would be fitted with an emergency stop system to ensure that all the relevant pumps are shut down and the control valves are closed if warranted.

2.3.1.5 Fire Protection

The tank farm will be equipped with fire protection measures that have been designed according to the largest credible fire event, which serves as the basis for the maximum design water demand. Should a fire of this nature occur within a single bund sub-division in the tank farm, foam will be applied within, whilst the adjacent operating storage tanks will be cooled concurrently. Therefore, the tank farm will be equipped with foam generating and water facilities to assist during a fire. In addition, the construction will be guided by norms and updated regulations in terms of fire protection, including the requirements and recommendations of Buncefield, where applicable.

In line with the requirements of SANS 10089, it is anticipated that water will be supplied and replenished from a municipal supply, and a fluoro-protein foam concentrate will also be used. A water reservoir will be provided on site with a sufficient water storage capacity to ensure that municipal water will be utilized for replenishing purposes only. In addition, it is anticipated that Return Effluent from the IDZ may potentially be utilized for fire-fighting purposes.

As a fire protection measure, the tank farm will be equipped with several fire water pumps and foam pumps. Some of these pumps will be powered by diesel engines that will be capable of delivering the design flow rate at the required pressure without an external power supply.

The tank farm will be fitted with a water ring main in order to supply the water hydrants. It is anticipated that the pressure available at each water hydrant will be no less than 10 bars. The storage tank cooling facilities and the fixed cooling sprays within the road loading gantry for LPG will be connected to the water ring main. The link between the storage tank cooling facilities will be controlled by means of control valves.

A water/foam deluge system will be installed at both the road and rail loading gantries. It is expected that these deluge systems will be remotely activated.

As part of the project, OTGC will develop an ERAP prior to the commissioning of the Bulk Liquid Storage and Handling Facility which will tie into the ERAP for the Port of Ngqura to cover incidents in the port and within the tank farm. However, the possibility of covering incidents on the roads will be discussed with the relevant parties, such as the CDC and the South African National Roads Agency Limited (SANRAL), prior to the operational phase. It is expected that the road tankers belonging to the users and customers of the tank farm (i.e. the petrol companies) will have separate on-board spill contingency plans and fire-fighting equipment to account for potential spillages and accidents once it leaves the tank farm site to its destination. Once the road tankers, belonging to the tank farm users, exit the boundary of the tank farm and Port, the responsibility then shifts from OTGC to the tank farm users (i.e. petrol companies).

2.3.1.6 Handling of Storm Water and Oily Water

At this stage, it is anticipated that the storm water management system will be designed according to a 1:10 year rainfall pattern of 1 hour duration. Alternative rainfall patterns will be investigated at a later stage in the project design. With the operation of the separators, the oil will in all cases be separated from water. Each oily water system will link to a separator, and after passing through the separator the water will be monitored for quality prior to being released.

The bund floors will be sealed to ensure that the soil and groundwater are not contaminated in the event of a spillage of the stored substance. In addition, the bund floors will be sloped away from the storage tanks. The bund drainage channels will connect to the bund drainage outlet valve pits, which will be closed to ensure that the drainage is controlled. Contaminated storm water will be directed to the oily water system, and clean storm water will be released directly into the storm water system. Any spillage that occurs at the road or rail loading gantry will be directed to the oily water system. In this case the oily water system will be designed to contain at least two minutes flow of product at the proposed pumping rate (for a single pump) for the road gantry and one tank car capacity for the rail gantry. If the water from the effluent system meets the necessary standards and specifications, it will be discharged into the effluent water or it will be re-treated in the oily water system.

The storm water drained from potentially contaminated areas within the tank farm will initially be sent to a "first flush basin" for subsequent processing through a separator. In line with the South African Water Quality Guidelines published by the Department of Water Affairs in 1996, the storm water will be tested and if found to be of acceptable quality will be released into the storm water system.

2.3.2 Pipeline Routing between the Tank Farm and Berth(s)

Pipelines will be installed in order to initially transfer the bulk liquids from Berth B100 (or possibly the A-series Berth) to the tank farm, and vice versa. Figure 2.2 (Page 2-16) illustrates the indicative pipeline routing options that have been proposed from Berth B100 and the A-series Berths to the tank farm.

The pipeline routing option from the tank farm to Berth B100 traverses the Coega River. The exact position at which the pipeline may cross the Coega River will be finalised upon completion of further feasibility studies. The river crossing will be above-ground and achieved via means of a causeway that will be provided by TNPA. However, should a situation arise whereby the pipeline cannot be routed above-ground, culverts or trenches will then be utilized.

As mentioned in the previous chapter, a new series of A-Berths are planned to be constructed on the eastern side of the Port of Ngqura. Based on this, the possibility exists for the pipelines and associated land-side infrastructure to be transferred from Berth B100 to the new A-series Berths once they have been constructed. Relocating the pipelines to the new A-series Berths will avoid crossing the Coega River and will create a more direct and shorter link to the tank farm. As such, an additional pipeline routing option has been identified from the proposed A-series Berths to the tank farm.

As highlighted previously, if the new A-series Berths are not constructed or authorised by the time OTGC are ready to commence with the installation of infrastructure on the berth, then the project will proceed with the use of Berth B100, with the possibility of relocating to the A-series Berths once they have been constructed. If however, the A-series Berths have been authorised and completed expeditiously, the project will proceed with the usage of the A-series Berths.

It is important to note that the pipeline routing options to Berth B100 and the proposed A-series Berth presented in Figure 2.2 (Page 2-16) are indicative at this stage, and it therefore serves as a provisional layout. This is also applicable to the pipeline crossing for the routing option to Berth B100. The final pipeline routing to Berth B100 and the A-series Berths, as well as the final location at which the pipeline may cross the Coega River (for routing to Berth B100), will be determined upon completion of further feasibility studies (to be undertaken by TNPA). Please note that the specialist studies conducted during the EIA phase will assess the impacts of both pipeline corridor options.

It is proposed that separate pipelines will be installed for white products, black products and LPG. The term “black products” is used to refer to residual products such as fuel oil and carbon black feedstock. The term “white products” is used to refer to distillate products such as diesel and petrol. It is anticipated that about eight pipelines will be required for both phases of construction. At this stage of the design, it is evident that Phase 1 will contain four pipelines, whilst the number of pipelines proposed for Phase 2 is yet to be confirmed. However, it is expected that approximately four pipelines will be installed for Phase 2. The pipeline diameter is expected to vary between 12 inches and 28 inches. The flow rate of each pipeline is expected to reach up to 2000m^3/hour.

Above-ground pipelines have been proposed for the project despite underground pipelines being considered feasible. Nevertheless, any underground pipelines will be housed in a culvert for ease of inspection and maintenance.

The above-ground pipelines will enable regular inspection and preventive maintenance to take place. The pipelines will be mounted on concrete sleepers above the ground and will be designed to have some spacing or clearance between the pipe and the ground in order to ensure unhindered movement of small fauna. In most cases, road crossings will be achieved by means of culverts under the roads to ensure inspection and maintenance of the pipes.

If for any reason, the pipelines need to be buried; these will be wrapped and adequately protected, and will include the provision of a leak detection system to monitor leakages. Furthermore, the pipes will be buried with at least 1 m of cover. In addition, isolating valves will be installed.

2.3.3 Berth(s)

At this stage of the design process, it is envisaged that Berth B100 will initially form the designated liquid fuels berth, with a possible relocation to the new A-series Berths which are planned to be constructed as part of the Port of Ngqura's expansion plans. More specifically, the proposed A-series Berths will be constructed on the eastern side of the Port of Ngqura, and moving up the Coega River channel. As such, it is anticipated that the pipelines and associated berth infrastructure (as described below) could possibly be relocated from the existing Berth B100 to the proposed A-series Berths once they have been constructed. It is estimated that this relocation will result in 15 days of "downtime". The need for the possible relocation from Berth B100 to the A-series Berths is pointed out below.

- Once the new A-series Berths are constructed, there will be a need to re-structure the port infrastructure in order to account for existing developments and make provision for future developments within the Port of Ngqura. As a result, the proposed A-series Berths have been earmarked to be the designated bulk liquid berths, whilst the existing Berth B100 is planned to be utilised for the handling of other materials.
- The proposed A-series Berths will be situated closer the tank farm and will offer a more direct and shorter pipeline link to the tank farm. Apart from reducing disruption to the banks of the Coega River, this option also creates lesser maintenance and operational costs for the pipelines.
- As highlighted above, the Coega River will not be traversed should the pipelines be routed from the A-series Berths to the tank farm. This minimises disturbance to the Coega River, and it has lesser technical, maintenance and cost implications.

As explained in the previous chapter, the construction of the A-series Berths will be undertaken by TNPA, and this construction will be subject to an independent and separate EIA process. However, the impacts associated with the potential relocation to the A-series Berths will be assessed as part of this EIA. As a precautionary measure, it cannot be assumed or guaranteed that TNPA will be granted Environmental Authorisation for the construction of the new A-series Berths. This therefore warrants the need to include both berth options (Berth B100 and A-series Berths) in the EIA for this project.

OTGC are planning to use marine loading arms eventually when located on the A-series Berths and are considering using hoses in the interim while on Berth B100. For Phase 1 of the project, it is proposed that the following infrastructure will be installed and constructed at the berth:

- Marine loading arms (or hoses as explained above): to link the pipelines to the vessels calling at the berth for discharge.
- Associated equipment such as valves and instrumentation from the loading arms to the designated pipelines, including a "pig launcher and receiver".

- An office which will be housed on the jetty to ensure that operators can monitor the discharge of vessels calling at the berth, which will also ensure that communication is maintained at all times with the vessel.

Phase 2 will include the construction of additional loading arms and pipelines, and it is envisaged that vessels will also be calling at the berth for loading purposes. As mentioned previously, a Vapour Recovery Unit will be installed in the road tanker loading gantry in the tank farm. The need to install a Vapour Recovery Unit at the berth is currently being investigated based on the fact that modern vessels usually have an on-board Vapour Recovery Unit. OTGC are currently evaluating alternative options of transferring the vapour from the berth to the tank farm to eliminate any vapour emissions at the berth. More information regarding this matter will be provided in the Draft EIA Report.

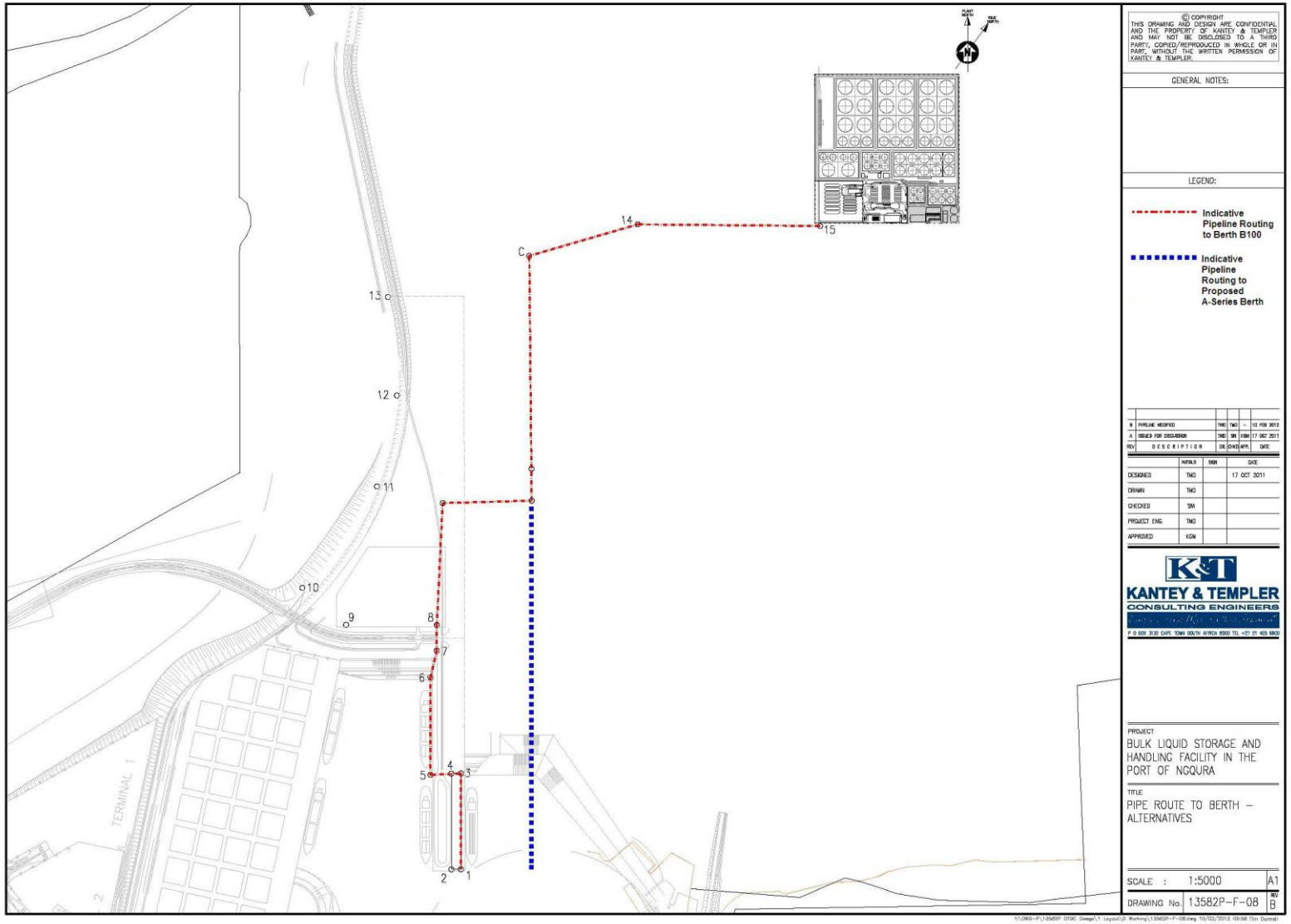
The berth will also be equipped with all necessary amenities for safety as required by the industry and in line with OTGC's own regulations in relation to emergency shutdown, fire fighting and pollution prevention.

Separate marine loading arms will be fitted at the berth for white products, black products and LPG. Adequate portable facilities will be provided to drain the marine loading arms, and any resulting remnants will be returned to the tank farm.

TNPA will supply the lighting and fire fighting facilities at the berth itself. In addition, an emergency stop system will be established at the berth, which will cause the ship-loading pumps to shut down and close the control valves at the berth when it is engaged.

Several precautionary measures will be implemented during the loading and pumping process. In order to reduce the possibility of spillages and to control the pumping process, the operators will be in constant radio contact with the ship when bulk liquids are being received or loaded. It is important to mention that OTGC will operate the bulk liquid berth for operations relating to the OTGC Bulk Liquid Storage and Handling Facility only.

Figure 2.2: Proposed Indicative Routing of the Pipelines from the Berth(s) to the Tank Farm.



2.3.4 Overview of Project Development Cycle

- ***Detailed Planning and Design***

Various aspects of the planning and design phase of the project still need to be finalised. Most notably, the siting of the pipelines needs to be confirmed, as well as the details pertaining to capacity and number of tanks for each phase of the proposed project. Further to this, the actual layout of the tank farm will require inputs from the actual customers that will utilise the tank farm, which will most likely play an influencing role and result in slight modifications at a later stage.

- ***Construction Phase***

It is anticipated that Phase 1 will include activities such as site clearance, leveling and earthworks. During this contract, specific provision will be made to ensure compliance with the Port of Ngqura Storm Water Management Plan compiled by TNPA. During the construction phase, a temporary construction area will be located within the site boundary. Effluent generated during this period will be managed by chemical toilets or by use of conservancy tanks. Upon completion of the earthworks, further contracts will be assigned to suitable contractors for tankage, Civil, Mechanical, Electrical and Instrumentation construction. All efforts will be made to ensure that all construction work will be undertaken in compliance with local legislation, local and international best practice, as well as the Environmental Management Plan (EMP), which will be compiled during the EIA Phase. During the construction phase it is expected that both skilled and unskilled temporary employment opportunities will be created. It is difficult to specify the actual number of employment opportunities that will be created at this stage; however it is anticipated that between approximately 400 and 1600 employment opportunities will be created during the construction phase. OTGC will however, comply with the CDC Zone Labour Agreement requirements in terms of training and appointments.

- ***Operations Phase***

The projected operations are proposed to provide several services and added economic spin offs towards the shipping, trading and trucking industries. These services are illustrated in Figure 2.3 (Page 2-18).

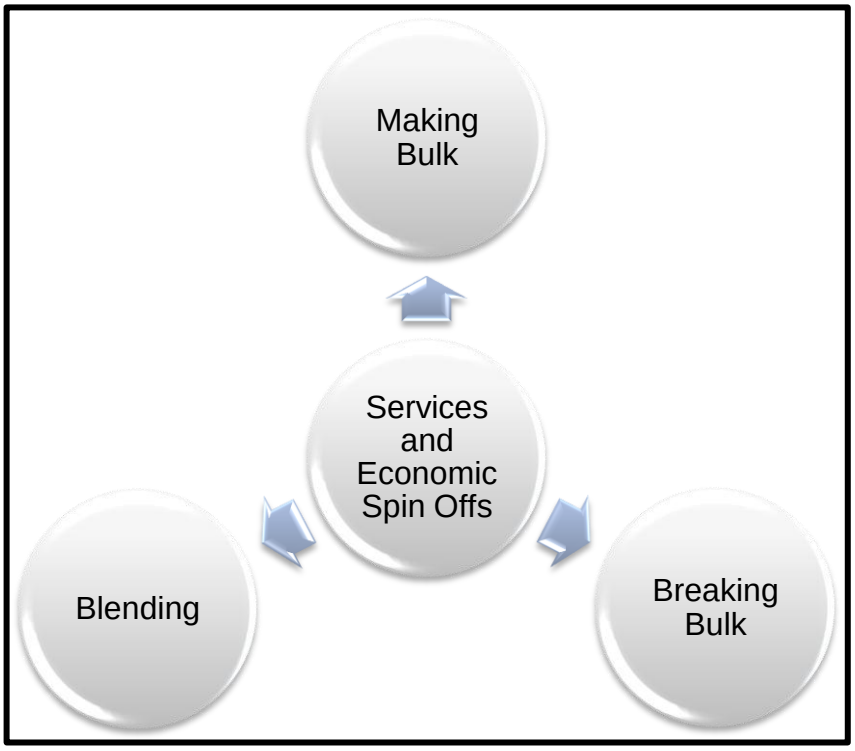


Figure 2.3: Proposed Services and Economic Spin-offs that the Bulk Liquid Storage and Handling Facility will generate.

As illustrated in Figure 2.3 above, Making Bulk involves consolidating smaller parcels into larger cargoes. This generally occurs due to draft restrictions or limited availability at the port in which loading of the product takes place. It also occurs as a result of the target market being at geographic distance that justifies large parcels capturing economies of scale in freight rates.

Breaking Bulk involves sourcing larger parcels to benefit from economies of scale in freight rates and then serving target markets that require smaller parcels because of their limited demand or draft restrictions.

Blending is a process whereby products of the same specifications are blended in order to obtain a homogenous product. The products are blended in order to negate product mismatch caused by different product specifications between the source region and consumption region. This may additionally involve sourcing products economically and turning them into a higher value product via blending.

Operations at the terminal will be carried out by competent personnel trained to OTGC standards. Listed below, and illustrated in Figure 2.4 (Page 2-20) are the tasks associated with the daily operation of the Bulk Liquid Storage and Handling Facility:

- ***Discharge of vessels:*** Vessels arriving at the Bulk Liquid Berth to discharge their cargo into the storage tanks on shore.
- Once the received product is ascertained in terms of both quality and quantity, the following operations are likely to take place:
  - ***Domestic Distribution***: The bulk liquids will be loaded from the storage tanks to road tankers (tank trucks) or rail wagons for distribution to the domestic market. At this point, the injection of additive(s) can take place either in the tank prior to loading or in line during loading.
  - ***Loading of Vessels***: The bulk liquids from the storage tanks will be loaded onto ocean going tankers alongside the Liquid Bulk Berth. The loaded product may form part of a blend from more than one tank.
  - ***Inter Tank Transfer***: Should issues arise in terms of the quality of the product or for ullage purposes, the customers of the Bulk Liquid Storage and Handling Facility may require tank to tank transfer and eventual blending.

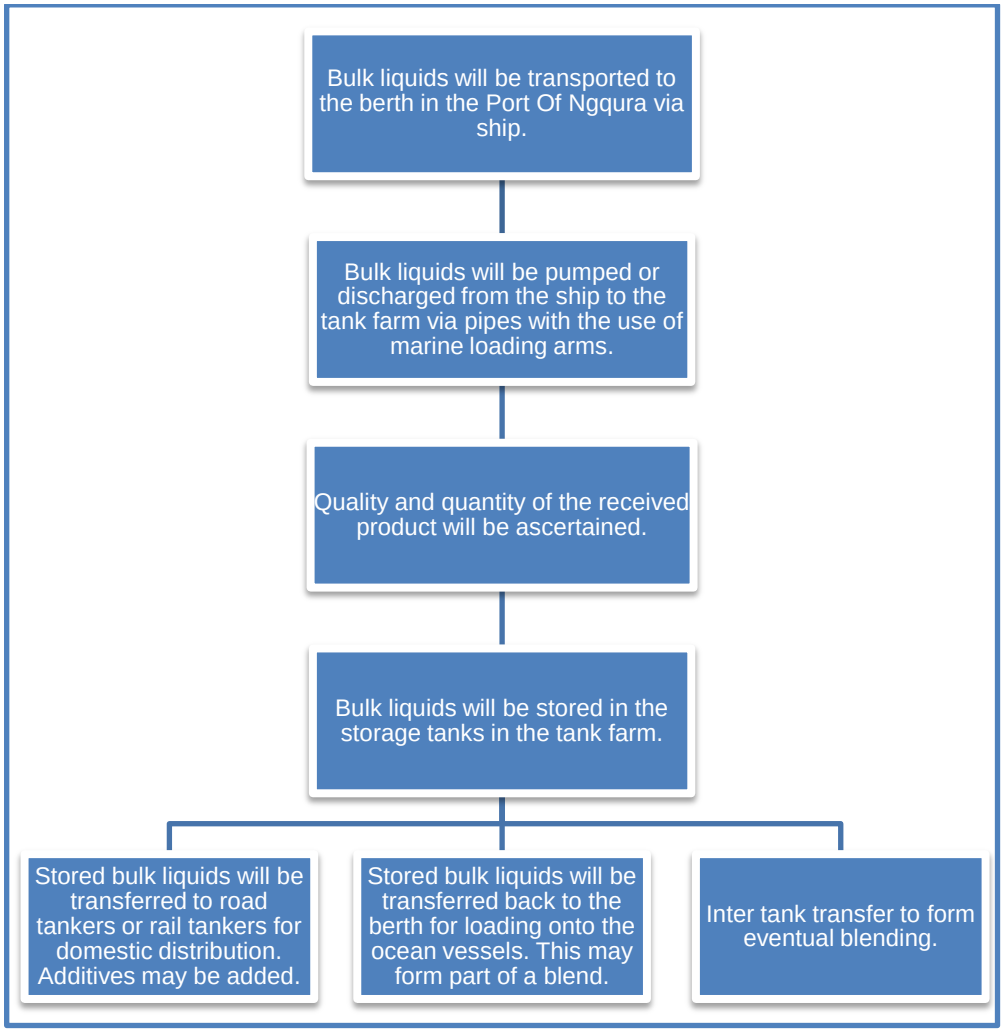


Figure 2.4: Flow diagram illustrating the proposed activities that will take place during the operations phase.

The maintenance of plant and equipment will be carried out on a routine basis in order to ensure the reliability of the equipment and the integrity of the assets. As part of the lease agreement signed with TNPA, OTGC is required to provide TNPA with a maintenance programme for the tank farm. This stringent maintenance programme will include and specify the methods adopted to keep the tank farm and concomitant infrastructure fully functional and operational, and safe. Furthermore, in line with OTGC's standards, Environment, Health, Safety and Security will be made an integral part of the daily operations at the Bulk Liquid Storage and Handling Facility.

The operational phase of the project is expected to create skilled employment opportunities. Potentially some of the employees from the Port Elizabeth Harbour tank farm (subsequent to its decommissioning) will be transferred directly to the Port of Ngqura for Phase 1 of the proposed project. Therefore, it is expected that not many additional skilled employment opportunities will be created. However, other opportunities may arise for unskilled labour to be integrated into the ancillary activities. The exact number of employment opportunities will be specified at a later stage.

One of OTGC's main objectives is to recruit locally to fill most of the positions of the proposed new facility in the Port of Ngqura. However, it is expected that initially, expatriate staff may be used to fill the position of Managing Director and Commercial Manager. All other key management positions and all operations staff shall be recruited locally to ensure that this terminal development maximizes the local employment opportunities for the proposed project. Figure 2.5 below illustrates the organization chart and key management positions planned for the proposed project.

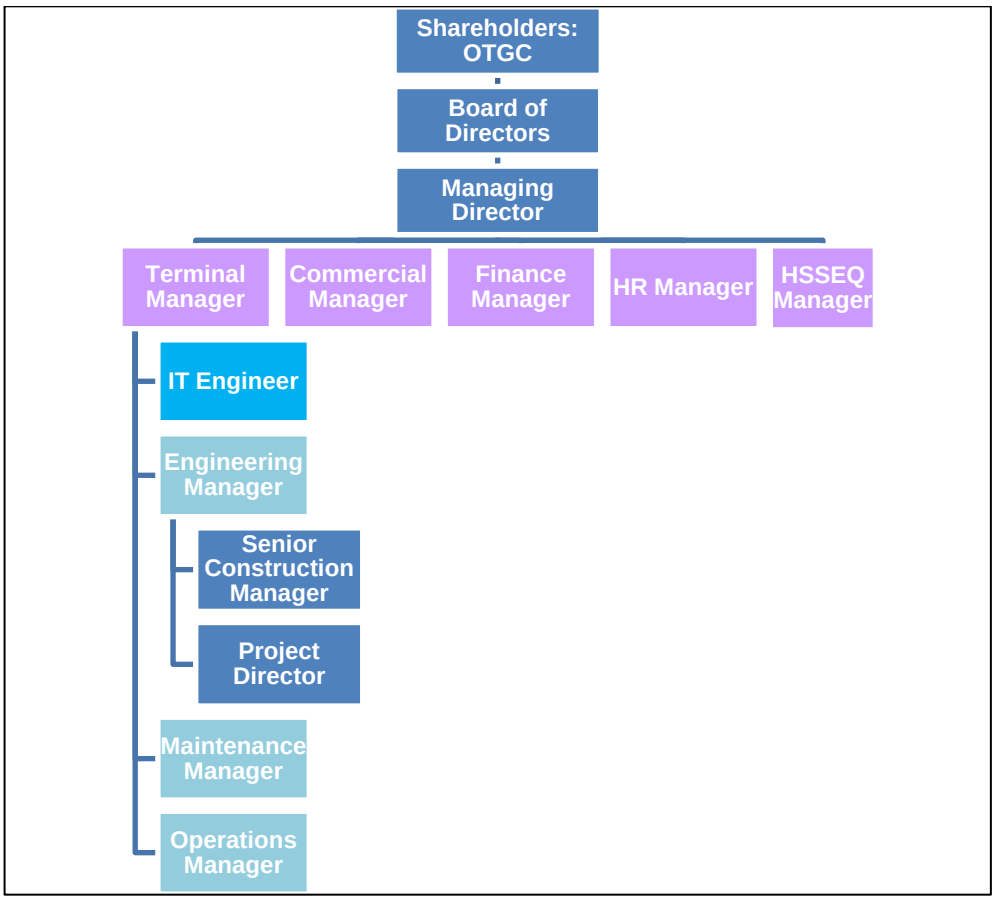


Figure 2.5: Organogram illustrating the key management positions proposed for the project.

OTGC will adopt an employment equity policy promoting equal opportunity and fair treatment in employment through the elimination of any discriminatory practices and prejudices. An environment shall be created in which every employee has the opportunity for advancement. OTGC will be committed to the development of all its employees and to this end supports initiatives aimed at promoting training, education and development. OTGC are bound to comply with the CDC's Zone Labour Agreement.

The operations at the Bulk Liquid Storage and Handling Facility can be broadly grouped into two categories, namely, core operations and support operations. Core operations include amongst others, truck/road tanker loading, tank farm operations and berth operations. These operations are repetitive, performed throughout the day, and are typically undertaken by direct employees. Support operations include amongst others, Security, some of the Maintenance jobs, Catering, Office Housekeeping and Office Services. These operations support the core operations and will be generally outsourced.

The operation phase is expected to create employment opportunities for operators for truck loading, daily supervision, assistant supervisors, tank farm operations, control room operations, jetty monitoring and maintenance support. As depicted in Figure 2.5 (Page 2-21), the terminal or Bulk Liquid Storage and Handling Facility will be divided into several management departments. The entire operations team will report to the Terminal Manager. The Operations Manager will be appointed to ensure that the company's policies and procedures are adhered to.

The operation phase of the development is also expected to create external support or temporary employment opportunities, as well as indirect employment opportunities. Temporary employment opportunities are likely to include the following:

- security services,
- annual maintenance,
- building housekeeping,
- catering contracts for the supply of food and consumables to the office,
- local workshop will be identified for specialized activities such as welding and valve lapping to take place,
- tank cleaning,
- supplier for general consumables and supplies such as lube oils, greases, tools, gaskets, uniforms and paints etc.,
- in-house contractors for undertaking regular modifications to the tank farm,
- waste management services, and
- suppliers of utilities such as potable water, electricity and nitrogen.

It is anticipated that the proposed project will generate indirect employment opportunities for the following potential activities:

- bunker suppliers,
- ship handlers,
- surveying companies,

- tank cleaners,
- financial services,
- shipping agencies,
- trucking companies,
- maintenance companies, and
- local suppliers of general goods and services.

- ***Decommissioning Phase***

Once the 20-year lease period ends, OTGC is expected to hand over a fully functional facility that has been maintained in good working order to TNPA. TNPA will then decide on utilization of the facility. However, should the need for decommissioning arise within the lease period, the following procedures will be undertaken. It is important to mention that the BOOT agreement signed with TNPA is clear and stringent, and OTGC will comply with the necessary decommissioning if required. The main aim of decommissioning is to return the land to its original, pre-construction condition. The closure and subsequent decommissioning of the tank farm and all associated infrastructure will be treated with the same care and attention as operating and maintenance works. The work concerning the closing and decommissioning of the tank farm and associated facilities requires proper planning, control and reporting.

It is expected that during the decommissioning phase, all written terminal safe work practices will be followed. The work carried out during this phase will comply with the API standards as a minimum, and will also ensure that the local laws and regulations are adhered to. In addition, all subcontractors' employees will be inducted on the procedures to be followed during this phase. A risk assessment will be carried out during the planning stage of the decommissioning phase in order to identify any possible additional hazards that the actual decommissioning may cause. All applied methods and the complete approach and procedures to be followed will be clearly described in advance to avoid mishandling.

It will be stressed that all personnel working during the decommissioning phase are covered by insurance. Further to this, it is anticipated that all necessary operational clearances and permits will be obtained prior to the commencement of the decommissioning phase.

Ongoing tests will be performed in enclosed spaces for hydrocarbon gases, and ground water monitoring will be continuous throughout the decommissioning phase. The material stored in the tanks and pipelines will be carefully removed to an alternate bulk liquid storage terminal or disposed at a licensed disposal facility capable of handling products of that nature. All equipment will be removed, and positively isolated and de-energized from all active equipment and connecting facilities, piping or wiring. All tanks and pipelines will need to be certified as gas free, which may be achieved by a third party inspector.

A full time qualified site safety supervisor who is experienced in demolition work within the oil and chemical industry will be employed prior to the planning phase. It is expected that prior to any demolition being carried out, a full and detailed method statement will be prepared by the contractors. The supervisor will be responsible for the work permits, compliance and method statements. The supervisor will also have the authority and ability to give instructions to contractors, particularly with regards to halting work in case of non-compliance.