

Port Bonython Fuel Storage and Processing Facility

Traffic Impact Assessment

Prepared for: **Port Bonython Fuels Pty Ltd**

Prepared by: **QED Pty Ltd**
309 Angas Street
Adelaide SA 5000
Telephone +61 8 8227 0188
Facsimile +61 8 8227 0271
Email: qed@qedecisions.com.au



21 May 2009

Contents

Page Number

1	Introduction	1
2	Existing Conditions	2
2.1	Existing Site	2
2.2	Santos Safety Procedure	3
2.3	Road Safety	3
3	Proposed Development	4
4	Parking Requirements	6
4.1	Car Parking Requirements	6
4.2	Car Parking Layout	6
4.3	Bicycle Parking Requirements	6
4.4	Heavy Vehicle Parking Requirements	6
4.5	Construction Parking Requirements	7
5	Property Access	8
5.1	Vehicles	8
5.2	Santos Exclusion Zone	8
5.3	Pedestrians and Cyclists	8
6	Traffic Assessment	9
6.1	Traffic Distribution	11
6.2	Traffic Impact	11
7	Conclusions	12

Figures

Figure 1	Overview of Port Bonython Fuels Site Layout	5
----------	---	---

Tables

Table 1	Traffic Generation	10
---------	--------------------	----

1 Introduction

The Port Bonython Fuels Storage and Processing Facility is a joint venture between Stuart Petroleum Limited and the Scott Group of Companies. Stuart Petroleum and the Scott Group of Companies have identified an opportunity to provide greater security to the State's diesel fuel supplies in the north of the State which over a number of years has been at a critical shortage level.

The project will be carried out in a number of stages to develop a tank farm and diesel distillation refinery at Port Bonython on the Lowly Peninsula, South Australia.

The importance of this infrastructure has been recognised by the State Government as it will alleviate the periods of fuel shortages which have been experienced on a regular occurrence over recent years and better utilise the Port Bonython facilities.

QED Pty Ltd has been engaged by Port Bonython Fuels Pty Ltd to undertake a Traffic Impact Assessment for the proposed Port Bonython Fuel Storage and Processing Facility development.

This report assesses the traffic impacts and requirements for the proposed development.

2 Existing Conditions

2.1 Existing Site

The facility is on the Point Lowly Peninsula, Upper Spencer Gulf, approximately thirty kilometres east northeast of Whyalla and approximately 250 kilometres north-west of Adelaide. The peninsula is currently home to the Point Lowly Lighthouse, the Santos' Port Bonython Fractionation Plant, the Clean Seas Kingfish Aquaculture Farm, and a small residential community of shacks/houses.

Santos currently completes some 30 ship loadings a year but during the peak production at the Moomba Gas fields the number of ships was as high as 50 per year.

The proposed site is located on Port Lowly Road immediately north west of the Santos' Port Bonython Fractionation Plant and the Port Bonython Jetty. The Santos' Port Bonython Fractionation Plant is located 500 metres west of the community of Point Lowly.

The proposed site comprises 137.20 hectares of Crown Land which has in the past been used as an army firing range operated by the Commonwealth Department of Defence.

2.2 Adjacent Road Network

The subject site is adjacent to Port Bonython Road. Port Bonython Road connects the township of Point Lowly to the Lincoln Highway and the City of Whyalla. Both the Lincoln Highway and Port Bonython Road are two lane two way single carriageway roads. The existing road network adjacent to the subject site operates below capacity, even at peak times.

The existing Lincoln Highway / Port Bonython Road intersection is a T-junction with Port Bonython Road being the terminating leg. Port Bonython Road is priority controlled and has the required sight distance to both legs of the Lincoln Highway.

Port Bonython Road is an undulating two lane two way road with unsealed shoulders. There is a railway crossing located on Port Bonython Road approximately 55 metres from the intersection with Lincoln Highway. This crossing is actively controlled but does not have boom gates. The speed limit along Port Bonython Road is 110 kph between Lincoln Highway and the Santos Plant. Immediately west of the Santos Plant the speed limit reduces to 80kph for eastbound drivers.

Lincoln Highway and Port Bonython Road are both approved Double A Road Train and B Double routes. These approved routes also allow restricted access vehicles (Double A Road Train and B Double) to complete all turning movements at the intersection of Lincoln Highway and Port Bonython Road.

Traffic surveys undertaken by DTEI indicate that the existing traffic on Port Bonython Road has an estimated two way AADT of 400 with 10% commercial vehicles. This last survey was completed in 2001 but the traffic on Port Bonython Road should have remained relatively steady. The only increase would be due to the addition of the Clean Seas factory which would increase traffic by 20 to 30 vehicles per day. The survey also showed that the two way 24 hour traffic increased (520 vehicles a day) on Sunday. This is probably associated with the public boat mooring and launching facility at Point Lowly and weekend shack users.

2.3 Santos Safety Procedure

In the event that Santos has a LPG vapour escape emergency a section of Port Bonython Road is closed as part of the safety procedure. This is achieved with the use of a flashing light and signage assembly which states 'Stop When Lights Start Flashing No Vehicles Past This Point'. On the Point Lowly (eastern) side of the exclusion zone drivers are advised to detour onto an unsealed road but there is no detour set up on the western side of the exclusion zone. Whilst car drivers would be able to complete a u-turn there is no facility to allow larger vehicles to u-turn.

2.4 Road Safety

A review of crashes recorded in the five year period from January 2003 to January 2008 near the subject site shows that there were no crashes recorded on Port Bonython Road or at the intersection with Lincoln Highway.

3 Proposed Development

The proposed development will be built in at least two stages. Stage 1 will include building a trans-modal terminal comprising of the following components:

- A fuel storage terminal with 40-80 million litres of fuel storage capacity for the storage and distribution of diesel
- Workshop and office complex
- Marine loading and unloading facilities (connection from the storage tanks to the Port Bonython Jetty)
- A road tanker fuelling facility with stormwater retention pond
- An access and egress to Port Bonython Road capable of handling Triple Road Trains.

Subsequent stages will include the provision of:

- A modular diesel distillation still (micro refinery)
- Product Storage Area (gasoline / crude oil / fuel oil etc)

All of the storage facilities and the micro refinery will be surrounded by bunds to ensure spills are contained within the grounds of the development. These bunds will support 5 metre wide access roads. The road tanker filling facility will be located between the storage facility and the administration car park. The filling facility will be physically separated from the storage facility by the bund wall and from the administration area by a swale drain. The facility will have a low internal speed limit to minimise conflict between employees / truck drivers and heavy vehicles.

The Overview of Port Bonython Fuels Site Layout is shown in Figure 1 on the next page.

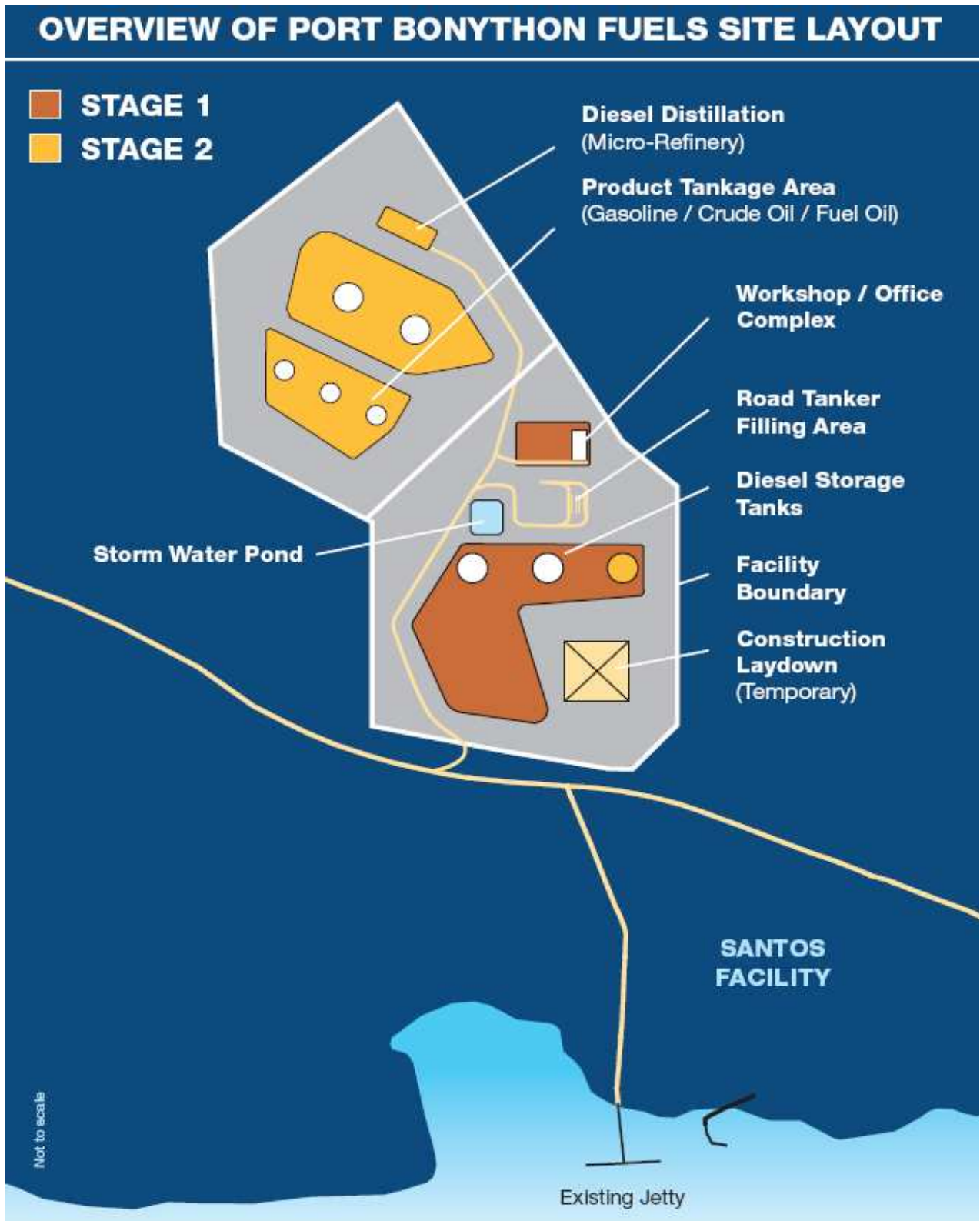


Figure 1 – Overview of Port Bonython Fuels Site Layout

4 Parking Requirements

Stage 1 of the facility will provide 4 full time jobs and 5 part time jobs, during tanker ship delivery (initially 10 which will increase to 20 deliveries a year over the next ten years). Stage 2 operations will employ 8 full time and 5 part time workers during tanker ship deliveries. The depot employees will be provided with a parking area near the workshop and administration office.

The construction of Stage 1 and 2 will peak at 35 workers on site. The construction employees will park adjacent to the site office (construction laydown area).

4.1 Car Parking Requirements

The City of Whyalla Development Plan specifies parking rates as follows:

Fuel depot – 1 car parking space for every 2 employees

Road transport terminal – 1 car parking space for every 2 employees

The administration car park should provide at least 7 car parking spaces for employees according to the Whyalla Council Development Plan. There is however no requirement for visitor parking. Given that this facility is located 30 kilometres from the likely source of employees (Whyalla) all employees (some car pooling can be expected) and visitors would be expected to drive to the facility. It is unlikely that 7 car parking spaces would meet requirements. For this reason the car parking requirement should provide at a minimum 13 car parking spaces (90% of employees drive, therefore 12 employees plus 1 visitor park). The proposed development has provided 16 car parking spaces adjacent to the offices.

4.2 Car Parking Layout

According to Australian Standard 2890.1:2004 – Off-Street Car Parking Facilities, car parks for employees should be built in accordance with Class 1. Parking dimensions for this class are 2.4 metres x 5.4 metres for 90 degree angle parking spaces.

4.3 Bicycle Parking Requirements

The Whyalla Council Development Plan does not specify bicycle parking. Most employees will live in Whyalla and it is unlikely that they will cycle 30 kilometres to work. Given the likelihood of employees driving and the low number of employees it is recommended initially that no bike racks are provided. There should however be space allocated for the possible installation of at least one bike rack in the future.

4.4 Heavy Vehicle Parking Requirements

The facility will provide a fuel tanker filling facility with a number of bays to allow for the filling of the heavy vehicle fuel tankers.

There will also be a holding area / bay to allow heavy vehicle to queue clear of the main carriageway when all loading bays are in use. This system will ensure that the filling facility operates effectively and does not queue out into the main carriageway.

The holding area will be provided between the security gate and the entrance to the filling facility. It will be actively controlled to ensure the number of vehicles inside the loading facility is restricted to avoid conflict. It is currently proposed that the holding area

(with merge and diverge tapers) will be approximately 400 metres long to cater for up to five Triple Road Trains.

4.5 Construction Parking Requirements

During construction of both Stage 1 and 2 the number of construction personnel will peak at 35 with a regular workforce of 15. The construction yard will provide adequate informal parking areas for personnel vehicles. This area should be separated from the deliveries unloading area and construction vehicle parking to minimise the risks within the construction yard. The separate areas within the yard for parking and unloading should be clearly defined to ensure visitor and personnel unfamiliar with the yard setup park in the appropriate locations. As some personnel are likely to arrive in the same vehicle and the regular workforce may be provided with a bus service an area capable of holding 70% of the peak workforce (25 vehicles) is considered sufficient.

5 Property Access

The facility will be provided with one access and egress point for all vehicles. The access and egress carriageways will be separated by a wide shoulder and verge area.

5.1 Vehicles

The facility proposes one access and egress point from Port Bonython Road.

The preliminary concept design for the traffic access junction was developed in consultation with DTEI.

The common access point will be designed to enable Restricted Access Vehicles (RAVs), including Triple Road Trains, and cars to enter the property via a designated slip lane. This slip lane will ensure that the vehicles do not queue back into Port Bonython Road. It will however need to be appropriately sign posted to ensure that the general public do not turn into the access slip lane. The intersection will also require the appropriate delineation and lighting to ensure that 24 hour use can be achieved. Visitors to the facility will be required to inform the administration office of their presence before being allowed into the complex. It may therefore be necessary for a small waiting area to be provided clear of the main carriageway thereby reducing the disruption to traffic movement into the site.

The egress has been design to accommodate RAVs (Triple Road Trains) turning right out of the egress. The RAVs will utilise an expanse of bitumen directly opposite the egress to complete the turn. The RAVs will complete the turn off the main carriageway and then drive back onto the westbound lane as they accelerate providing a potential conflict point as some westbound drivers will try to overtake the RAV whilst it is completing the turn to ensure they are not caught behind the slow moving vehicle. Consideration should be given in the detailed design to provide a longer acceleration lane to minimise the potential conflict and wear on the pavement and vehicle. The detailed design will be carried out in full consultation with DTEI and Whyalla Council.

5.2 Santos Exclusion Zone

The access / egress to the site will be located immediately outside of the Santos exclusion zone. This will allow the site the potential to continue operating during a Santos emergency. If however a queue of vehicle forms at the flashing signage assembly access to the facility could be compromised. The detailed design of the access will be subject to a full risk assessment which will take this issue into account, with the design objective that access and egress to the site will not be affect.

The existing situation does not provide a U-turn facility west or advanced warning to allow drivers to detour around the exclusion zone. DTEI should consider the provision of a U turn facility or an Advance Warning Device adjacent to the nearest detour route.

5.3 Pedestrians and Cyclists

Pedestrians will not be allowed to access the facility due to security and safety reasons. For this reason connection between the facility and Point Lowly is not considered appropriate. Within the site the interaction between vehicles and pedestrians will be minimised. The facility will also have a low internal speed limit. Provision of pedestrian facilities and walkways will be required to improve safety for staff undertaking work or maintenance within the loading bay and wash down area. These walkways minimise the conflict between pedestrian and RAVs.

Given the unlikelihood of a cyclist riding to work or between Point Lowly and Whyalla the provision of bike lanes is considered unwarranted.

6 Traffic Assessment

The traffic generated by the facility will at different stages include construction employees, depot employees, visitors / inspectors, delivery vehicles and fuel transport operator (truck drivers). The site at full production will fill up to 51 fuel tankers a day and employ 13 staff when a tanker ship delivery is occurring.

Depot Employees

As there are no food outlets in Point Lowly and Whyalla is 30 kilometres away it is considered unlikely that employees will leave the site during their shift. For this reason the assumption has been made that employees complete 2 trips a day. The peak hour trips includes all employees' (one trip) and coincides with the change over from the night shift (1 employee) to the day time shift.

Fuel Tankers

Once Stage 1 is completed the facility will initially fill 4,000 fuel tankers a year. This equates to 11 a day. PBF plans to steadily increase the amount of fuel tankers serviced over a 10 year period until it reaches full production. At full production the facility will service between 15,000 (42 a day) and 18,500 (51 a day) fuel tankers a year.

The difference between the full production filling numbers is based on what type of vehicles will be serviced by the depot. 12,000 fuel tankers will be filled per year if Port Bonython Fuels is successful in an application to have the route from Port Augusta to The Facility approved as a Triple Road Train Route (L4 under PBS Scheme). If this is not the case the number of fuel tankers will increase to 18,500 a year due to the lower capacity of the fuel tankers (B Doubles and Double A Road Trains). The number of fuel tankers should remain constant throughout the week with slight peaks associated with the start and end of the working week.

Construction traffic

During both Stage 1 and 2 construction the number of personnel on site is expected to peak at 35. As this construction site will be located approximately 30 kilometres from Whyalla and some of the more specialised workers will not be local residents there will be an increased opportunity for multiple personnel to travel in one vehicle. For this reason it has been assumed that 70% of the construction workers will drive to the site with the other 30% arriving at work as passengers. It has been assumed that the construction workers will arrive during the peak hours but this will vary according to the time of the year when deliveries are made and the site manager. The existing peak times on Port Bonython Road are 7:30-8:30 am and 3:30-4:30 pm which coincide with the expected construction traffic peak time.

Deliveries to the construction site will occur during construction operating hours. The number of deliveries to the site per day will depend on the stage of construction, the personnel on site and the day of the week. It has been assumed that 6 deliveries will occur on peak days which include materials and water supply trucks.

Components	Quantity	Daily	Peak Rate
Construction Stage 1 (2010)			
Construction Employees	35	1.4trips/day =49	0.7 trips/peak hour =25
Deliveries	6	2 trips/day = 12	0.5 trips/peak hour = 3
Total		61	28
Stage 1 (2011)			
Employees	6	2 trips/day = 12	1 trips/peak hour = 6
Fuel Tankers	11	2 trips/day = 22 trips	0.15 trips/peak hour = 2 trips
Total		34	8
Stage 1 plus Construction (2015)			
Employees	6	2 trips/day = 12	1 trips/peak hour = 6
Fuel Tankers	23	2 trips/day = 46 trips	0.15 trips/peak hour = 5 trips
Construction Employees	35	1.6 trips/day = 49	1 trips/peak hour = 28
Deliveries	10	2 trips/day = 20	1 trips/peak hour = 5
Total		127	26
Stage 1 and 2 (2020 and 2025 running at full production)			
Employees	13	2 trips/day = 26	1 trips/peak hour = 13
Fuel Tankers	51 (35 if Triples)	2 trips/day = 102 trips	0.15 trips/peak hour = 8 trips
Total		128	21

Table 1: Traffic generation

Based on Table 1 above, the ultimate traffic generated by the proposed development is approximately 128 trips per day and 21 trips at peak hour. The current traffic volume generated by Santos and the Point Lowly community is approximately 380 trips per day and 45 trips per peak hour. The predicted traffic generated by this facility should lead to

a 34% increase in the daily traffic to 472 trips and a 47% increase in peak hour traffic to 66 trips.

6.1 Traffic Distribution

Due to the location of the facility most traffic will turn left into the site and right turn out. This means 100% of the traffic generated by the site will use Port Bonython Road to access Lincoln Highway.

Drivers on Port Bonython Road will either turn left (south) towards Whyalla or right (north) towards Port Augusta. The majority of Port Bonython Fuels customers (95%) are located north of Port Augusta so the majority of fuel tankers should be expected to right turn out and left turn into Port Bonython Road. Most of the employees are expected to live in Whyalla (35 kilometres south) meaning that most of these drivers will right turn in and left turn out of Port Bonython Road.

Therefore ultimately 30 vehicle trips (25% of traffic generated) will be added to the southern leg and 100 vehicle trips (75% of traffic generated) to the northern leg of Lincoln Highway per day.

6.2 Traffic Impact

The Port Bonython Road existing traffic volume is quite low and the predicted increase volume will not exceed the capacity of the road. The locals will be familiar with the heavy vehicles and whilst their increase will be noticeable it should not affect the amenity of the Point Lowly community as the vehicle route does not travel through the settlement. DTEI should consider reducing the speed limit along Port Bonython Road from 110 kph to 80 kph by extending the existing 80kph speed zone west of the access. This will help to mitigate traffic conflict at the access point associated with turning RAVs and decelerating vehicles.

Lincoln Highway has a traffic volume of 1800 vehicle trips per day which is quite low. The predicted future traffic volume should increase to 1900 vehicle trips per day (north of Port Bonython Road) and approximately 200 vehicle trips per peak hour will only slightly increase the overall traffic volume on the Lincoln Highway. The traffic volume on Lincoln Highway is quite low and the increase in volume will not exceed the capacity of the road. An analysis of intersection capacity indicates that the intersection will have a level of service of B and a mean delay of 22 seconds. This indicates that the intersection and road should have enough capacity to cope with this increase in traffic volume. The 95 percentile queue is only 1 vehicle meaning the queue should not extend over the railway line.

Lincoln Highway and Port Bonython Road are both approved Double A Road Train and B Double routes. Therefore whilst there is an increase in demand for Restricted Access Vehicles' (RAVs) the existing intersection should meet appropriate standards. There have however been changes in the requirements for RAVs which mean the right turn and left turn slip lanes into Port Bonython Road do not meet the current standards. Upgrading the intersection to meet current standards should be considered by DTEI. DTEI should also consider the intersection with respect to Triple Road Trains movement.

Stage 1 will continue to maintain full operations during the construction of subsequent stages so that construction vehicles and fuel tankers have minimal interaction.

7 Conclusions

The traffic impact assessment of the proposed Port Bonython Fuels Storage and Processing Facility has found the following:

- the proposed facility will be constructed in at least two stages; initially filling 4000 fuel tankers a year increasing to a maximum of 18,500 tankers over ten years.
- the proposed facility provides sufficient car parking spaces.
- the holding bay should ensure that the filling facility does not get congested and allow the fuel tankers to queue off of the main carriageway.
- the predicted ultimate traffic generated by the facility is around 130 trips/day and 21 trips/peak hour.
- the road network should have sufficient capacity for the increase in traffic flow.
- pedestrian walkways within the filling facility area should be well defined but pedestrian access to the site will not be provided.
- the slip lane access will ensure that vehicles queue off the main carriageway of Port Bonython Road thereby reducing the risk of crashes associated with the facility.
- detailed design of the access / egress should be completed in consultation with DTEI and subject to the risk assessment process.
- DTEI should give consideration to reducing the speed limit along Port Bonython Road from 110 kph to 80 kph by extending the existing 80kph speed zone west of the access, to enhance the safety of the access.
- DTEI should consider the intersection of Port Bonython Road / Lincoln Highway with respect to standards for Restricted Access Vehicles (Triple Road Trains).

Based on the assessment result above, the proposed development is supported on traffic engineering grounds.