Dangerous Goods Report

Project Title: **Toll IPEC Freight Transport Facility**
Dangerous Goods

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Revision History

Date	Rev No.	No. of Pages	Issue or Description of Amendment	Checked By	Approved By	Date Approved
19/11/12	1	7	Dangerous Goods Review	S Branca	N Browne	19/11/12
26/11/12	2	7	Final Dangerous Goods Review	S Branca	N Browne	21/11/12

EXECUTIVE SUMMARY

The design for the new Toll IPEC Freight Transport Facility at Bungarribee Industrial Estate, Eastern Creek is proceeding in compliance with the requirements of New South Wales *Work Health & Safety Act 2011* and subordinate regulations, codes and guidelines.

The facility will store and handle Dangerous Goods including LPG, thus there are issues that need to be addressed to provide a facility in accordance with the relevant Australian Standard. Recommendations herein will enable the facility to meet these requirements, thereby supporting the facility's compliance with the WH&S Act.

Several recommendations have now been adopted and incorporated into the design, to ensure that the three bulk fuel tanks noted below are compliant with the provisions of the relevant Australian Standards.

1. Project Details and Scope

This report has been prepared as the result of a review of the initial project drawings and documentation for the Toll IPEC Freight Transport Facility at Eastern Creek in support of the Development Application. The project scope includes recommendations for chemicals including:

- LPG (liquefied petroleum gas)
- Diesel

The scope of this report does not extend to AS 3833 compliance. With respect to other classes of Dangerous Goods, Toll have represented that they are compliant with AS 3833:

The Toll Project Manager, Property stated the following:
- [Toll] do not hold DGs for an extended period; they tend to be delivered in and sent out on the same day, and Toll internally had confirmed that they comply with AS 3833.

The Toll IPEC National Infrastructure Manager stated the following:
- STORAGE & HANDLING OF DG's: We do not provide Dangerous Goods Storage Services. The DG's that we do provide Transport services for are in small quantities. I have received confirmation from Toll Group DG's Manager that we operate in accordance with AS 3833 – the small quantities of DG's are handled in the specified DG's area. He did further note that an emergency shower/eye wash facility should be nearby to that specified DG's handling area.

2. Legislative & Statutory Requirements

It is the responsibility of people involved in the design of a structure to comply with Section 22 of the Work Health and Safety Act 2011.

NSW Parliament has now enacted the *Work Health and Safety Act 2011* based upon the nationally harmonised Model WHS Act 2010. The new act was enacted from 01 January 2012. Section 22 of the new WHS Act 2011 states that "The designer must ensure, as far as is reasonably practicable, that the plant, substance or structure is designed to be without risks to the health and safety of persons". This report will provide advice consistent with the requirements of the Act and forms part of the trail of evidence in support of the requirements.

The design will also be reviewed for consistency with New South Wales Work Health & Safety Regulation 2011 and associated, relevant standards.

No physical testing of any plant or equipment was undertaken by us in the preparation of this report.

3. References

The following drawings and documents were reviewed as part of this report:

Drawing No.	Revision	
DA-01	C	Cover Sheet & Location Plan
DA-02	B	Masterplan
DA-03	E	Site Plan
DA-04	J	Warehouse Ground Floor Plan
DA-05	D	Warehouse Mezzanine Plan
DA-06	C	Warehouse Roof Plan
DA-07	D	Warehouse Elevations
DA-08	D	Warehouse Sections and Elevations
DA-09	C	Office Plans and Elevations
DA-10	E	Operations Office and Gatehouses
DA-11	B	Fleet Workshop and Drivers Rest Area

- Australian Standards
    - AS/NZS 1596:2008 The storage and handling of LP Gas
    - AS 1940-2004 The storage and handling of flammable and combustible liquids

4. Dangerous Goods types

The major dangerous goods to be stored and handled at the site include the following.

- **Flammable and Combustible materials** – LPG and diesel, as well as possible small quantities of welding gas e.g. acetylene, and possibly hydrogen from battery charging

It is noted that storage of small quantities of Dangerous Goods, as relevant to AS 3833, is addressed elsewhere and as such is not the focus of this report.

5. Issues and Recommendations

5.1 Chemical hazards – General Issues

Mixing different classes of dangerous goods requires appropriate management to reduce risk of reaction.

Many chemicals have specific requirements for storage due to their capacity to react with each other. Segregating chemicals according to DG Class alone may not always alleviate this risk. For example, some Class 8 chemicals are not compatible with each other despite being of the same DG Class.

Below are recommendations for safe operation of chemical storage.

Issue / Hazard	Reference	Recommendations
Gases	DG Class 2.2	Gases in cylinders should not be stored in this facility. If cylinder gas is required a separate store is to be provided. Gas cylinders should be stored outdoors, and should be secured e.g. by chains or straps to keep upright.
Chemical Incompatibility		Provide adequate storage allowing incompatible chemicals to be segregated to prevent mixing. NOTE: The size of the facility appears to provide ample space, but it may be necessary to have several separate stores for DGs, depending on quantities.
Acids/Alkali incompatibility		Do not store acids (e.g. hydrochloric acid) near alkalis (e.g. caustic soda). They require a separate bund or separate spill containment.
Caustic Soda incompatibility	UN No. 1823 and 1824	Caustic soda (sodium hydroxide) must not be stored on galvanised shelving or near galvanised fittings.
Foodstuffs		Store foodstuffs away from DG storage.
Liquids - General		Do not store liquids above powders/solids.
Combustible Liquids		Example: engine oil. If these are stored, apply the same recommendations as for Flammable Liquids.
Flammable Liquids	DG Class 3	If > 250 kg to be stored, do so as separate batches of up to 250 kg within the store, separated by at least 20 m.
Flammable liquids		Do not store flammable goods in individual packages greater than 20 litres. Example: methylated spirit in drums.
Flammable liquids		If 20 litre packages are stored, total flammable liquids volume should be kept below 200 litres.
Ventilation	NOHSC-1003	Provide natural or mechanical ventilation to maintain atmospheric contaminant levels below safe thresholds
Manifest		A dangerous goods manifest or inventory should be provided and maintained.

Injury	Provide safety shower and eye wash near chemical storage facilities.
Fire protection	Provide fire safety systems e.g. sprinklers, extinguishers.
Security	Secure the facility. Allow access only to authorised persons
Spill Containment Volume	Spill containment shall be provided for liquids, such as a bund or means of diverting a spill to a compound within the premises. Each compound should hold at least the volume of the largest container to be stored above. The mesh above the bund must be chemical resistant. If possible, bunds should be located apart rather than next to each other, as this reduces risk still further – otherwise a splash guard between each bund is recommended where chemicals are not compatible with each other.

5.2 Flammable and Combustible materials

The following recommendations need implementation to achieve compliance to relevant Australian Standards.
The relevant standards are:
For LPG, AS 1596
For diesel, AS 1940

It is expected that in terms of quantity, flammable and combustible materials will comprise the largest proportion of DGs stored on the Bungarribee site.

Diesel (a combustible material) and LPG (a flammable material) will be used on site.

It is noted that battery recharge areas, including those for forklifts, can involve lead-acid batteries which contain and generate dangerous chemicals. One such chemical is hydrogen, a highly flammable gas which is lighter than air.

LPG

The latest LPG location agreed upon is 14 metres from the edge of the building, which **satisfies the setback requirement of AS 1596**. Further, it allows a fuel tanker filling the LPG tank to drive "forwards in, forwards out" as stipulated in that Standard.
To maintain compliance, the intervening space between the LPG tank and the building must not be built out, in whole or in part.

Diesel

The diesel tank configuration **complies with the setback distance requirements of AS 1940** in terms of the fleet workshop.
The diesel tanks are marked as end to end. End to end configuration would not be acceptable for petrol, but can be accepted for diesel provided there are isolation valves between the fill point and the tanks themselves.
We still recommend making the tanks side by side if possible. This could be done without getting too close to the fleet workshop.

Issue / Hazard	Ref	Recommendations
Fill Points		Filling on-site bulk fuel tanks is a high risk. Fill points shall be: ▪ readily accessible ▪ protected from accidental damage This may be effected using bollards, for example. Both the LPG tank and the diesel tank shall have impact protection. It is strongly recommended that while filling the LPG tank from a delivery tanker, that the neighbouring docks are not used by trucks to load or unload at the warehouse.
Spill from hose couplings		For diesel, fill point shall be provided with spill containment having a minimum capacity of 15 L per fill point, to catch and contain any minor spill during product delivery to the tank.
When pumping from a vehicle, the tank could overflow		Provide a clear line of sight both to gauges and vents from driver filling position.
Confined Spaces		Any pits e.g. stormwater near any LPG tanks may be Confined Spaces (i.e. areas with a possibility of asphyxiating atmosphere).
Tank End Failure	DA-03_E	Bulk fuel tanks should be installed side by side rather than end to end, or where this is not practicable, protection such as a fire rated concrete wall should be provided between the tanks. NOTE: (1) This is especially important if there are bulk petrol or LPG tanks. (2) In practice it is usually more realistic to align the tanks side by side.
Separation Distance – Buildings on site		Bulk fuel tanks in general need to be kept distant from the proposed buildings.
Separation Distance – neighbouring site		Bulk fuel tanks should be kept distant from areas where *future* buildings could be constructed, even if these are on another site. The best way to manage this risk is to keep the separation distance from the boundary, or to install a fire rated wall.
Separation Distance – between tanks		If bulk LPG tanks are the same size and type, separate from each other by the tank diameter. Bulk diesel tanks should be separated by at least 600mm.
Systems Maintenance Area	DA-10_A	Do not have meeting rooms or offices attached to an active welding workshop. It is recommended they are removed, e.g. to the east, possibly attached to the Supervisors' area. If flammable materials are to be used in the Systems Maintenance area, the above recommendation stands, and appears to be achievable within the current building footprint. If **no** flammable materials are to be used in the Systems Maintenance area (for example, if there is only arc welding), the existing configuration is acceptable.
Kitchen		Ensure wet chemical fire extinguisher(s) are available.

5.3 Other DG issues

Separation - internal	DA-03_E	Dangerous Goods storage areas should not be against the walls of offices or other areas where people may gather (e.g. meeting rooms), or stringent fire rating may be required. Separation by distance can address this risk, particularly in a large facility if the core purpose is not DG storage.
Gas generation – Battery Charging	DA-09_C	If hydrogen is expected to be generated, even in small quantities, in recharge areas we recommend that the ceiling slope up slightly to a vent, to prevent dangerous accumulation of lighter-than-air flammable gas. Spark generating equipment should be kept clear of battery recharge areas.
Incompatible chemicals		Some batteries contain sulphuric acid which is corrosive and will react violently with some chemicals. It is recommended that no other chemicals be stored in, or used in, recharge areas where such batteries are charged.
Ignition Source – Battery Charging		Sealed concrete floors generate significant static charge. It is recommended that where bottle gas is stored, the floor be unsealed concrete.
Battery leakage		As batteries contain sulphuric acid, they can damage metals if they leak. It is recommended that batteries be placed on impervious, corrosion-resistant (e.g. plastic) materials such as trays to reduce the risk of damage to metal floors or racks.