
Appendix J

Dangerous goods report



Dangerous Goods Compliance Report

Lot K, 200 Aldington Road, Kemps Creek

Stockland Fife Kemps Creek Pty Limited
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Dangerous Goods Compliance Report

Lot K, 200 Aldington Road, Kemps Creek

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Quality Management

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Executive Summary

Background

Stockland Fife Kemps Creek (SFKC) is developing a warehouse at Lot K, 200 Aldington Road, Kemps Creek. The site will require the storage of a Liquefied Petroleum Gas (LPG) tank in addition to a diesel tank. These chemicals are classified as Dangerous Goods (DGs). Hence, the site is subject to the NSW Work Health and Safety Regulation 2017 (Ref. [1]) which requires the risks associated with the storages to be assessed and minimised So Far As Is Reasonably Practicable (SFAIRP). Demonstrating the risks have been minimised may be achieved via compliance with an applicable design standard.

SFKC has commissioned Riskcon Engineering Pty Ltd (Riskcon) to prepare a DG assessment of the warehouse to list the items which are required to be included within the design of the warehouse to achieve compliance. This document represents the assessment of the DG storages at the proposed warehouses.

Conclusions

A review of the classes, quantities and locations of DGs stored at Lot K, 200 Aldington Road warehouse was conducted to assess the compliance with the WHS 2017 and the relevant Australia Standards for storage of DGs at the site.

The storage locations were assessed according to the standard applicable to the classes of DGs stored in a clause-by-clause fashion to identify any deficiencies in the design and make recommendation for inclusion in the design.

Based on this review, it is concluded that should the aforementioned design requirements be incorporated into the DG storages they will comply with the standards; hence, comply with the WHS Regulations.

Recommendations

The following recommendations have been made for the facility:

LPG Tank

- The LPG tank shall be protected by Armco guarding.

Diesel Tank

- The diesel tanks certification / documentation shall be reviewed and confirmed to be in accordance with Section 5.9.2 of AS 1940:2017.
- The diesel tanks shall be placarded in accordance with the WHS 2017.
- All materials of construction shall be compatible with diesel.
- All pipework shall be protected from vehicular damage.
- All pipework shall be well-supported and protected from potential traffic damage.
- The storage tank fill connection shall be of a liquid-tight connection.
- The diesel tanks fill point shall be protected by bollards to prevent accidental damage.
- Signage shall be provided above the diesel refuelling tank fill point identifying it as the diesel tank fill point.

- A spill kit shall be located adjacent to the diesel tanks fill point during tanker unloading.
- The normal fill level shall not exceed 95% of the tank capacity.
- The tank shall have a high-level alarm set at 97% of the tank capacity.
- A free vent or pressure-vacuum vent design diesel shall be provided.
- The diesel tanks shall be protected by bollards to prevent accidental vehicular damage.
- The vent discharge point shall be at least 4 m above ground.
- The vent pipe or overfill point shall be visible to the operator.
- The vent discharge point shall be protected to prevent foreign material entering.
- The tanks shall comply with AS 1692.
- A hose reel with foam making capabilities shall be provided with full coverage of both of the diesel tanks.

Generator Fuel Tank

- The diesel tanks certification / documentation shall be reviewed and confirmed to be in accordance with Section 5.9.2 of AS 1940:2017.
- The diesel tanks shall be placarded in accordance with the WHS 2017.
- All materials of construction shall be compatible with diesel.
- All pipework shall be protected from vehicular damage.
- All pipework transporting fuel from the tank to the generator shall be labelled or colour coded.
- All pipework shall be well-supported and protected from potential traffic damage.
- The storage tank fill connection shall be of a liquid-tight connection.
- The diesel tanks fill point shall be protected by bollards to prevent accidental damage.
- Signage shall be provided above the diesel refuelling tank fill point identifying it as the diesel tank fill point.
- A spill kit shall be located adjacent to the diesel tanks fill point during tanker unloading.
- A free vent or pressure-vacuum vent design diesel shall be provided.
- The diesel tanks shall be protected by bollards to prevent accidental vehicular damage.
- The vent discharge point shall be at least 4 m above ground.
- The vent pipe or overfill point shall be visible to the operator.
- The vent discharge point shall be protected to prevent foreign material entering.
- The tanks shall comply with AS 1692.
- A hose reel with foam making capabilities shall be provided with full coverage of both of the diesel tanks.

General Items

- A Dangerous Goods Register, indicating the type of chemical, any notations that may be required from the risk assessment and the Safety Data Sheet for the chemical.
- A DG Risk Assessment of the storage and handling area.
- A Placard Schedule.
- A Hazardous Area Classification (HAC).
- Hazardous Area Verification Dossier (HAVD).

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Abbreviations

| Abbreviation | Description |
|--------------|---|
| ADG | Australian Dangerous Goods Code |
| AQR | Aggregate Quantity Ratio |
| CBD | Central Business District |
| DGs | Dangerous Goods |
| HAC | Hazardous Area Classification |
| HAVD | Hazardous Area Verification Dossier |
| LPG | Liquefied Petroleum Gas |
| PCBU | Person Conducting a Business or Undertaking |
| SFAIRP | So Far As Is Reasonably Practicable |
| WHS | Work Health and Safety |

1.0 Introduction

1.1 Background

Stockland Fife Kemps Creek (SFKC) is developing a warehouse at Lot K, 200 Aldington Road, Kemps Creek. The site will require the storage of a Liquefied Petroleum Gas (LPG) tank in addition to a diesel tank. These chemicals are classified as Dangerous Goods (DGs). Hence, the site is subject to the NSW Work Health and Safety Regulation 2017 (Ref. [1]) which requires the risks associated with the storages to be assessed and minimised So Far As Is Reasonably Practicable (SFAIRP). Demonstrating the risks have been minimised may be achieved via compliance with an applicable design standard.

SFKC has commissioned Riskcon Engineering Pty Ltd (Riskcon) to prepare a DG assessment of the warehouse to list the items which are required to be included within the design of the warehouse to achieve compliance. This document represents the assessment of the DG storages at the proposed warehouses.

1.2 Objectives

The objectives of the study are to provide a design assessment document for the DG storages at the warehouse to determine whether the storages have been designed per the previously provided design guidance.

1.3 Scope of Services

The scope of work is to prepare a DG design document for the proposed warehouse to be located at Lot K, 200 Aldington Road, Kemps Creek.

2.0 Methodology

2.1 General Methodology

The following methodology was adopted for this study:

- Review the DG classes and quantities to be stored and the locations where they are to be stored within the warehouse.
- Review the relevant DG standards to identify the most applicable standard for the warehouse.
- Review the WHS Regulation 2017 (Ref. [1]) to identify the requirements for the warehouse based on the quantity of DGs stored.
- Prepare a report detailing the findings of the design assessment for submission to assist the project team design a compliant warehouse.

3.0 Site Description

3.1 Site Description

Lot K is located at 200 Aldington Road, Kemps Creek which is approximately 52 km west of the Sydney Central Business District (CBD). **Figure 3-1** shows the regional location of the site in relation to the Sydney CBD.



Figure 3-1: Site Location

3.2 Site Background

The proposed Lot K development is a bespoke warehouse and distribution centre which represents a contemporary and innovative response to the site operational needs and the logistical requirements for a major national business. The development is comprised of one main warehouse and distribution building with two main dock faces, ancillary offices, carparking, hardstand vehicle parking, a weighbridge and freestanding gate house, surrounded by perimeter landscaping and visual treatments to achieve pleasant micro-climates and desirable streetscapes.

The site is zoned IN1 General Industrial under the Chapter 2 of the State Environmental Planning Policy (Industry and Employment) 2021 (I&E SEPP). Industries (other than offensive or hazardous industries) are permitted with development consent within land zoned IN1. Development for the purpose of a warehouse or distribution centre is defined as a type of ‘general industry’ and therefore falls within the permissible development of ‘industries’.

The vision for Lot K, and other lots within the Kemps Creek Industrial Estate, is to create a world class facility for industrial businesses with an emphasis on design quality, sustainability, innovation and a complementary mix of estate occupants.

The warehouse and distribution centre is classified as SSD due to the estimated development cost which is greater than \$50 million, as prescribed under Section 12 of Schedule 1 to the State Environmental Planning Policy (Planning Systems) 2021.

3.3 Quantities of Dangerous Goods Stored and Handled

The quantities of DG stored and handled at the site have been summarised in **Table 3-1**. The site layout is shown in **Figure 3-2**.

Table 3-1: Quantities of DGs Stored and Handled

| Class | DG Description | UN | Shipping Name | PG | Quantity |
|-------|--------------------|------|-------------------------|-----|----------|
| 2.1 | Flammable gas | 1075 | Liquefied Petroleum Gas | n/a | 2.5 T |
| C1 | Diesel (Fuel) | - | Combustible liquid | n/a | 55,640 L |
| C1 | Diesel (Generator) | - | Combustible liquid | n/a | 3,000 L |

3.4 Major Hazard Facility Review

Where more than one class of dangerous goods are stored and handled at the site an AQR exists. This ratio is calculated using **Equation 3-1**:

$$AQR = \frac{q_x}{Q_x} + \frac{q_y}{Q_y} + [...] + \frac{q_n}{Q_n} \quad \text{Equation 3-1}$$

Where:

x,y [...] and n are the dangerous goods present

q_x, q_y, [...] and q_n is the total quantity of dangerous goods x, y, [...] and n present.

Q_x, Q_y, [...] and Q_n is the individual threshold quantity for each dangerous good of x, y, [...] and n

Where the ratio AQR exceeds a value of 1, the site would be considered a Major Hazard Warehouse (MHF). The threshold quantity for each class is taken from Schedule 15 of the WHS Regulation (Ref. [1]). These AQR assessment has been summarised in **Table 3-2**.

Table 3-2: Major Hazard Warehouse Thresholds

| Class | Packing Group | Quantity (Tonnes) | | Quantity Ratio |
|------------|---------------|-------------------|-----------|----------------|
| | | Storage | Threshold | |
| 2.1 | n/a | 2.5 | 200 | 0.013 |
| C1 | n/a | 46.91* | n/a | - |
| AQR | | | | 0.013 |

*Density of 800 kg/m³

The AQR is <1; hence, the warehouse would not be classified as an MHF.

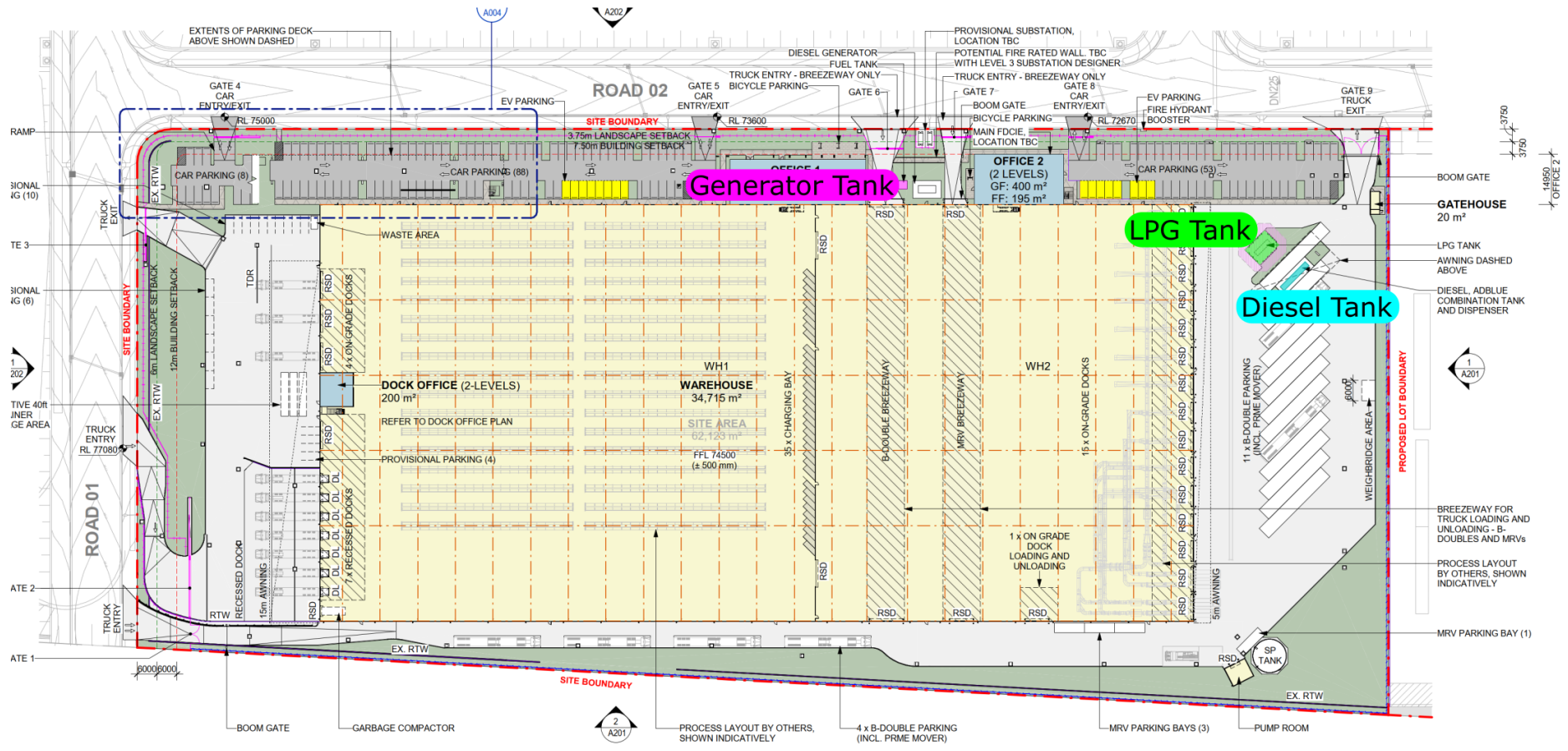


Figure 3-2: Site Plan of Including Proposed DG Storage and Use Locations

4.0 Assessment

4.1 Introduction

The facility has three main areas where materials classified as Dangerous Goods (DGs) are stored and handled:

- LPG Tank
- Diesel Tank
- Generator Fuel Tank

Each of these have been discussed / assessed in the following sections.

4.2 LPG Tank

The LPG tanks are located outside the warehouse main building as shown in **Figure 3-2**. **Table 4-1** provides a summary of the DGs stored in the LPG tank area.

Table 4-1: Quantities of LPG

| Class | Description | Packing Group | Material | Quantity (kL) | Total Quantity | |
|-------|---------------|---------------|----------|---------------|----------------|-----------|
| | | | | | Volume (kL) | Mass (kg) |
| 2.1 | Flammable gas | n/a | LPG | 1 x 4,330 | 4,330 | 2,500 |

A review of the standards determined that AS/NZS 1596:2014 (Ref. [2]) is the most applicable standard as it specifically caters for the storage of LPG. Based on the quantity proposed to be stored, the storage would be guided by Section 3 and 6 of the cited standard, which covers tank storage. The design points to be included have been summarised in **Table 4-2**.

Table 4-2: AS/NZS 1596:2014 Compliance Assessment

| Clause | Description | Assessment | Corrective Action/Comments | | | | | | | | |
|-------------------------|---|---|----------------------------|--------------|---------------|-----|-------------------------|---|-----------------|---|---------------------|
| 6.2.1 | <p>Above-ground storage tanks shall be located in accordance with the distances shown in Table 6.1, with the following qualifications:</p> <p>a) An above-ground tank shall not be installed within a building.</p> <p>b) Where the site is used primarily for LP Gas storage and handling, or where the LP Gas facility is within a petroleum terminal, the separation distance to buildings on the same site as the LP Gas storage may be halved, provided that in no case shall a tank having a total capacity exceeding 2.5 kL be located closer than 3 m to such a building.</p> <p>c) A tank exceeding 0.5 kL capacity shall be not less than 1 m from a boundary.</p> | <p>Separation required:</p> <table border="1" data-bbox="976 347 1574 564"> <thead> <tr> <th data-bbox="976 347 1274 403">Receptor</th> <th data-bbox="1274 347 1574 403">Distance (m)</th> </tr> </thead> <tbody> <tr> <td data-bbox="976 403 1274 459">Adjacent tank</td> <td data-bbox="1274 403 1574 459">1.2</td> </tr> <tr> <td data-bbox="976 459 1274 515">Public place or railway</td> <td data-bbox="1274 459 1574 515">5</td> </tr> <tr> <td data-bbox="976 515 1274 564">Protected place</td> <td data-bbox="1274 515 1574 564">8</td> </tr> </tbody> </table> <p>The tank is located such that the separation distances are complied with.</p> <p>a) The tank is not installed within the building.</p> <p>b) The tank is not located within the required separation to the building.</p> <p>c) The tank is >1 m from the site boundary.</p> <p>n/a – only one tank</p> | Receptor | Distance (m) | Adjacent tank | 1.2 | Public place or railway | 5 | Protected place | 8 | No action required. |
| Receptor | Distance (m) | | | | | | | | | | |
| Adjacent tank | 1.2 | | | | | | | | | | |
| Public place or railway | 5 | | | | | | | | | | |
| Protected place | 8 | | | | | | | | | | |
| 6.2.2 | <p>Tanks may be arranged in groups of up to six tanks, with each tank in the group separated in accordance with Table 6.1, Column 2. The following requirements and recommendations apply to tanks in groups:</p> <p>a) The distance from one such group to another tank or group shall be not less than 15 m except that, where no tank in either group exceeds 2 m diameter, the distance may be reduced to 10 m.</p> <p>b) Tanks shall not be stacked one above another.</p> <p>c) The longitudinal axes of tanks in a group should be parallel and should be directed away from any adjacent storages of hazardous, flammable or combustible liquids or gases. Where another arrangement is unavoidable, whereby a tank</p> | <p>a) There is only one tank.</p> <p>b) Tanks are not stacked.</p> <p>c) Only one tank present.</p> | No action required. | | | | | | | | |

| Clause | Description | Assessment | Corrective Action/Comments |
|--------|---|---|----------------------------|
| | <p>could be in line with the axis of another tank, the distance between the end of any tank and the end or shell of another tank shall be not less than 3 m or twice the diameter of the larger tank, whichever is the greater.</p> <p>NOTES:</p> <p>1 For interconnected tanks, see Clause 6.8.1.</p> <p>2 A tank that is less than 3 times the minimum separation distance from the tank (see Table 6.1) is considered 'adjacent'.</p> | | |
| 6.2.3 | <p>Hazardous area distances and electrical installation requirements relating to LP Gas installations shall be in accordance with AS/NZS 60079.10.1 and AS/NZS 60079.14 (as applicable).</p> | <p>A hazardous area classification has been prepared in RCE-25166_SFKC_HAC</p> | <p>No action required</p> |
| 6.2.4 | <p>The location of an above-ground LP Gas tank in relation to an above-ground storage of any other gas shall be as follows except where another relevant Standard or regulation requires a greater distance:</p> <p>a) Cryogenic liquids in tanks or vessels: Refer to AS 1894.</p> <p>b) Compressed gases in cylinders: Refer to AS 4332.</p> <p>c) Gases other than LP Gas or cryogenic liquids, in tanks: 6 m separation.</p> <p>d) Liquefied natural gas storage: Treat as flammable liquid (see Clause 6.2.5).</p> | <p>There are no other adjacent above ground tanks.</p> | <p>No action required.</p> |
| 6.2.5 | <p>LP Gas tanks shall be separated from other dangerous goods and flammable or combustible</p> | <p>a) The LPG tank is not near any package stores and is >10 m from the diesel tank refuelling area.</p> | <p>No action required.</p> |

| Clause | Description | Assessment | Corrective Action/Comments |
|--------|---|--|----------------------------|
| | <p>materials by at least the following distance or greater if required by the relevant Standards:</p> <ul style="list-style-type: none"> a) At least 6 m from any above-ground tank, package store or filling area for flammable or combustible liquid. b) At least 3 m from the top of the bund of a compound in which flammable or combustible liquids are stored. c) At least 2 m from any vent outlet of flammable liquids store (measured horizontally). d) At least 6 m from a store of any oxidating substance. e) At least 6 m to any combustible materials. | <ul style="list-style-type: none"> b) n/a – no adjacent tanks. c) n/a – no adjacent flammable liquid stores. d) n/a – no adjacent oxidising substance stores. e) n/a – no combustible material stores. | |
| 6.3.1 | <p>A tank shall not be installed in or above a significant ground depression where a spill or leak could lead to the accumulation of LP Gas. Any bunding shall permit spillage to flow away from the immediate vicinity of the tank.</p> | <p>The tank is installed on a concrete slab. No bunding is provided for the LPG tank and is not required.</p> | <p>No action required.</p> |
| 6.3.2 | <p>The location of the above-ground storage shall comply with the following requirements for ventilation and access:</p> <ul style="list-style-type: none"> a) Above-ground storage tanks shall be in the open air, outside buildings. b) Nearby construction, fences, walls, vapour barriers, or the like shall permit free access around and cross-ventilation for the tank. <p>The clearance distances illustrated in Figure 6.2 may be used as a guide. Where the adjacent structure provides visual screening only, is open to permit air</p> | <ul style="list-style-type: none"> a) The above ground tank is in the open and outside of the building. b) No obstructions are located within proximity of the LPG tank. | <p>No action required.</p> |

| Clause | Description | Assessment | Corrective Action/Comments |
|--------|--|--|----------------------------|
| | <p>passage through not less than 30% of its area, and is completely open on at least one side except for any necessary security fencing, the minimum clearance in any direction shall be equal to the diameter of the tank.</p> | | |
| 6.4.1 | <p>The supporting structure and the foundations shall be designed in accordance with the vessel design Standard (such as AS 1210) and the following requirements:</p> <ul style="list-style-type: none"> a) The design load shall be the total mass when the tank is full of water. b) Where a tank is located in an area that is likely to be subject to flooding, the tank shall be anchored to prevent its floating. c) Seismic and wind loadings shall apply for foundations and supports (see Clauses 5.2.2(c) and 5.2.3). | <p>The tank is 4.33 kL and are installed on a reinforced concrete foundation which is expected to be sufficient to withstanding the load.</p> <p>The tank supports and structure will be installed by the tank supplier.</p> | No action required. |
| 6.4.2 | <p>Tank supports shall have an FRL/FRR of 120/120/120 except where—</p> <ul style="list-style-type: none"> a) the tank is a horizontal tank and has a capacity of 8 kL or less, and is prevented from subsiding more than 600 mm if the supports are weakened by fire; or b) the tank is a horizontal tank and has a capacity of more than 8 kL and is prevented from subsiding more than 300 mm if the supports are weakened by fire. <p>Piping shall be capable of withstanding any such movement without rupture.</p> | n/a - The tank is 4.33 kL. | No action required. |

| Clause | Description | Assessment | Corrective Action/Comments |
|--------|--|---|----------------------------|
| | <p>Where the support for a vertical tank comprises a continuous steel skirt having only one opening of 450 mm or less diameter, fire protection may be applied to the outside only of the skirt.</p> <p>NOTES:</p> <p>1 Where fire-protective cladding is applied to metal supports, care must be taken to prevent the ingress of moisture between the metal and the cladding.</p> <p>2 The ground, or a plinth or foundation of concrete, masonry, or similar fire-resistant material under a horizontal tank, would be considered as the limit to which a tank can subside.</p> | | |
| 6.10.2 | <p>The outdoor discharge from a vent terminal, gas-pressure-relief device or terminal of a vent line shall be—</p> <p>a) arranged to minimize the risk of vapour collecting in drains, gutters, and downpipes;</p> <p>b) not less than 1 m in any direction from any opening into a building; and</p> <p>c) not less than 2 m from any fixed source of ignition.</p> <p>The vent terminal shall have provision to exclude rain and insects.</p> <p>For design and installation purposes, vent discharge piping shall be treated as low-pressure-vapour piping. The venting requirements of AS/NZS 5601.1 shall be met.</p> | <p>a) Vapour release from tank is expected to dissipate before impacting drains, etc.</p> <p>b) Tank discharge is not located within 1 m of the building.</p> <p>c) The tank is not located in proximity to an ignition source.</p> | No action required. |
| 6.11.2 | <p>A pump or compressor intended for handling LP Gas shall be designed for, and suitable for use with, LP Gas.</p> | <p>Tank to be subject to hazardous area classification per previous recommendation.</p> | No additional action. |

| Clause | Description | Assessment | Corrective Action/Comments |
|--------|---|--|--|
| | A pump or compressor shall be located so that its surrounding hazardous area (as defined in AS/NZS 60079.10.1) does not impinge on a protected place, public place or ignition sources. | | |
| 6.12.1 | <p>Where a tank is accessible to the public, it shall be provided with a means to prevent tampering with any tank fitting that could lead to an escape of gas, and that is able to be locked. The provision shall be one of the following:</p> <p>a) A fully surrounding fence complying with Clause 6.12.2 or an equivalent security fence surrounding the whole of the property; or</p> <p>b) A fence complying with Clause 6.12.2 and surrounding only those components requiring protection; or</p> <p>c) A lockable enclosure complying with Clause 6.12.3, provided that the tank capacity is less than 8 kL and a tank of any size is not in a school, playground, or public place (e.g. a park or similar).</p> | n/a – tank is not accessible to the public. | No action required. |
| 6.12.2 | A security fence shall be at least a chain-wire fence of strong construction, not less than 1.8 m high and incorporating an outward opening, lockable gate not less than 1 m wide. In addition, a fully surrounding fence shall be not less than 1.5 m from the tank and shall be kept locked when not under supervision. | The tank is located within the site premises which is protected with a security fence. | No action required. |
| 6.12.4 | Where any tank or other part of the installation is located such that it is susceptible to impact from moving vehicles, it shall be protected from such impact. | Tank design still under development. | <ul style="list-style-type: none"> The LPG tank shall be protected by Armco guarding. |

| Clause | Description | Assessment | Corrective Action/Comments |
|-----------|--|---|----------------------------|
| 6.13.1 | An above-ground tank larger than 8 kL shall be provided with lightning protection if required by AS/NZS 1768. | n/a – tank is <8 kL. | No action required. |
| 6.13.2 | The filling or loading connection for a tank larger than 8 kL shall be provided with a facility for attaching the bond or static wire of a tanker in accordance with AS/NZS 1020. | n/a – tank is <8 kL. | No action required. |
| 6.15 | Where the gas has a lower odour level than that described in Clause 11.2.2, e.g. as for aerosol manufacture, a continuously operating gas leak detection system shall be installed (see also Clause 6.18). | n/a – odourised gas. | No action required. |
| 6.16 | A tank or tank storage area shall be provided with signs, markings and notices as set out in Appendix D. | Tank markings to be provided by tank supplier. | No action required. |
| 6.17 | Installations for which LP Gas transfer will occur at night shall be provided with lighting capable of providing illumination at a level of more than 50 lx at all valves, couplings, and gauges that might be involved in the transfer operation (see also the ADG Code). | n/a – no nighttime gas transfer. | No action required. |
| 13.5.1(b) | For a single tank of 8 kL or less, where there is a basic tap water supply for any adjacent structure that is capable of operating a garden hose, such a water facility supplied with a suitable hose will be taken to provide adequately for minor fire risks in the vicinity of the tank. Where there is no such structure, the installation will be deemed to be not effectively a fire risk. | The tank is 4.33 kL; hence, the provision of a garden hose is all that is required. The site is equipped with hydrants which exceed the flow rate of a garden hose. | No action required. |

4.3 Diesel Tank

Diesel will be stored at the site to provide refuelling facilities. Provided in **Table 4-3** is a summary of the diesel quantities that are stored in the tanks.

Table 4-3: Quantity of Diesel Stored

| Class | Packing Group | Description | Quantity (L) |
|-------|---------------|-------------|--------------|
| C1 | n/a | Diesel | 55,650 |

Diesel is a combustible liquid; hence, is subject to AS 1940:2017 (Ref. [3]). The diesel is stored in tanks and is therefore subject to Chapter 5 of the standard. A clause-by-clause assessment of the general warehouse has been conducted in Table 4-4.

Table 4-4: AS 1940:2017 Compliance Assessment – Diesel Tank

| Clause | Requirement | Assessment | Recommendations |
|----------|--|--|--|
| 5.2.1(a) | A static storage tank shall be designed and constructed to comply with AS 1692 or an equivalent Standard for the category of tank appropriate to the application. | The tank will be purchased from a reputable supplier that specialises in providing diesel tanks. It is assumed that the supplier has designed the tanks in accordance with AS 1940:2017. Procurement of the tanks will not occur until closer to practical completion and have thus not been procured at this stage. | <ul style="list-style-type: none"> The diesel tanks certification / documentation shall be reviewed and confirmed to be in accordance with Section 5.9.2 of AS 1940:2017. |
| 5.2.2(c) | All tanks shall be marked with the appropriate warning placard as required by relevant regulation | The tank shall have a combustible liquid placard on the side of the tank. Diesel tanks typically come with the combustible liquid placard affixed. | <ul style="list-style-type: none"> The diesel tanks shall be placarded in accordance with the WHS Regulation 2017. |
| 5.2.4(a) | Pipes and pipe joints shall be constructed from a material that is resistant to attack by, and is compatible with, the liquid under all service conditions | The tanks and associated pipework are constructed of metal which is compatible with the diesel | <ul style="list-style-type: none"> All materials of construction shall be compatible with diesel. |
| 5.2.4(b) | All pipes shall be adequately protected from physical damage. | All pipework will be protected from vehicular damage. | <ul style="list-style-type: none"> All pipework shall be protected from vehicular damage. |
| 5.2.4(c) | All above-ground pipes shall be colour-coded or labelled | n/a – self contained fuel bowser / tank unit. | No action required. |
| 5.2.4(d) | Pipework shall be well-supported and protected from potential traffic damage. | Pipework will be designed and installed by a competent contractor. Pipework will be supported and protected from traffic damage. | <ul style="list-style-type: none"> All pipework shall be well-supported and protected from potential traffic damage. |
| 5.2.4(e) | Flexible hoses shall not be used, except at transfer points. Where such hose is used, it shall be constructed of material that is resistant to attack by, and is compatible with, the liquid being transferred. The length of the hose shall be kept to a minimum. | Flexible hoses are only used for refuelling the tank. | No action required |
| 5.3.1 | The fill connection to a storage tank that is filled from a tank vehicle shall incorporate a liquid-tight connection | The hose coupling will be of a liquid tight design. | <ul style="list-style-type: none"> The storage tank fill connection shall be of a liquid-tight connection. |

| Clause | Requirement | Assessment | Recommendations |
|----------|---|--|---|
| | unless the filling method employs a hand-held trigger nozzle with a non-latching feature. A cap or cover shall be provided for the fill point | | |
| 5.3.2(a) | The fill point shall be readily accessible. | The fill point is on the hardstand is readily accessible. | No action required |
| 5.3.2(b) | The fill point shall be protected from accidental damage. | The fill point will be protected from accidental damage by bollards. | Notwithstanding this the following recommendation has been made: <ul style="list-style-type: none"> The diesel tanks fill point shall be protected by bollards to prevent accidental damage. |
| 5.3.2(c) | The fill point for any tank containing a flammable liquid shall be in open air and no ignition sources shall be located within the hazardous area defined in accordance with AS/NZS 60079.10.1. | The only flammable liquids stored at the site are in the warehouse. There are no external flammable liquid storages. | No action required |
| 5.3.2(e) | The fill point for a tank shall be located so that a tank vehicle is not required to enter the tank compound to make a delivery | n/a – the delivery tanker will not need to enter the compound. | No action required |
| 5.3.2(f) | For any tank containing a flammable liquid, the location shall be such that the tanker can stand wholly off any public road, except where allowed under the ADG Code. | The tanker is located wholly within the site boundaries away from public roads. | No action required |
| 5.3.2(g) | Each fill point shall be clearly identified. | The fill point will be clearly signed. | <ul style="list-style-type: none"> Signage shall be provided above the diesel tanks fill point identifying it as the diesel tank fill point. |
| 5.3.2(h) | The areas around the tank fill point and the vehicle hose connection point shall be impervious to the product. | The surrounding ground is concrete which is impervious to diesel. | <ul style="list-style-type: none"> A spill kit shall be located adjacent to the diesel tank fill point during tanker unloading. |
| 5.3.3(a) | The normal fill level shall not exceed 95% of tank capacity (overfill level) | It is assumed that the tank supplier has designed the tank with a 95% safe fill level. | <ul style="list-style-type: none"> The normal fill level shall not exceed 95% of the tank capacity. |

| Clause | Requirement | Assessment | Recommendations |
|-----------|---|--|---|
| 5.3.3(bi) | The provision of only a dipstick without an alarm is acceptable for liquid level monitoring of tanks up to 25,000 L capacity of flammable liquids. | The tank capacity will exceed 25,000 L; hence, the tank will have liquid level monitoring. | No action required |
| 5.3.3(c) | All other tanks shall have a suitable high-level alarm (LAH) set at a maximum of 97% of tank capacity. This alarm is the first stage overfilling protection and shall be set to warn when the normal fill level has been exceeded. It shall not be used to control filling | It is assumed that the tank supplier will have provided the appropriate level alarms. | <ul style="list-style-type: none"> The tank shall have a high-level alarm set at 97% of the tank capacity. |
| 5.3.3(d) | Any tank filled by gravity shall be fitted with an automatic flow limiting device which reduces the flow rate into the tank by 98% when the normal fill level of the tank has been attained. | n/a – not filled by gravity | No action required |
| 5.3.3(e) | <p>A contents gauge or monitoring device together with a LAH, remote from the tank shall be provided at the fill point, or where the tank filling operation is monitored and controlled (e.g. a control room), in the following circumstances:</p> <p>(i) Where the tank is located within a building or under a building and the dip point is more than 8 m from the entrance to the building or otherwise inaccessible.</p> <p>(ii) Where the tank is in a tank chamber and access to the dip point is prevented.</p> <p>(iii) Where the tank is out of direct sight of the attendant monitoring filling flow controls.</p> <p>(iv) Where Category 6 tanks are filled from ship to shore, from a refinery, or similar high volume transfers (e.g. 100 m³/h).</p> | n/a – none of these items apply. | No action required |
| 5.3.3(f) | In addition to the LAH, they shall incorporate a physically and electrically independent high-high level alarm | n/a – 5.3.3(e) did not apply. | No action required |

| Clause | Requirement | Assessment | Recommendations |
|----------|---|--|--|
| | (LAHH). It will warn of a failure of some element of a primary (process) control system. It shall be set at or below the tank rated capacity to allow adequate response time to terminate the transfer before loss of containment/damage occurs | | |
| 5.4.1(a) | A free vent or a pressure-vacuum (PV) vent designed for the type of liquid being stored. | It is assumed that the tank supplier will provide an appropriately sized vent. | <ul style="list-style-type: none"> A free vent or pressure-vacuum vent design diesel shall be provided. |
| 5.4.1(b) | An emergency vent when the conditions of Clause 5.5 apply. | Clause 5.5 does not apply | No action required |
| 5.4.1(c) | Vapours shall be safely discharged outdoors unless their recovery and treatment is otherwise required. | The tank is located outside and thus discharges outside. | No action required |
| 5.4.3(a) | The vent pipe shall fall consistently back to the tank at a slope of at least 1 in 100. | The vent pipe is vertical. | No action required |
| 5.4.3(b) | A vent pipe shall not pass through building foundations but may be embedded in concrete that is part of other building construction | The pipe does not pass through the foundations. | No action required |
| 5.4.3(d) | Where vent piping penetrates a fire-rated wall, it shall be installed so as to ensure that the fire resistance of the wall is maintained | The vent pipe does not penetrate a fire rated wall. | No action required |
| 5.4.3(e) | The vent pipe and terminal shall be located or protected so that they are not liable to damage resulting from normal activities. | The tank / vent pipe will be protected by bollards. | <p>Notwithstanding this, the following recommendation has been made:</p> <ul style="list-style-type: none"> The diesel tanks shall be protected by bollards to prevent accidental vehicular damage. |
| 5.4.3(g) | Where several tanks are interconnected by a common venting system and the vapours in the vapour are within the explosive range, measures shall be taken to prevent | n/a – common venting system not provided. | No action required |

| Clause | Requirement | Assessment | Recommendations |
|----------|--|---|---|
| | the possibility of flashback or flame propagation through the system from one tank to another, e.g. by the use of flashback arresters, barometric dampers, nitrogen inerting or ensuring that the vapour concentration is always above the explosive range. | | |
| 5.4.4(a) | The vent discharge point shall be located laterally at least 4 m for flammable liquids and 2 m for combustible liquids from any opening into a building, e.g. window, door, ventilator, air conditioner or a mechanical vent intake to reduce the possibility of the entry of nuisance vapour. The vent shall be located such that the opening into a building shall be outside the hazardous area to AS/NZS 60079.10.1. | The discharge point is outside and away from the building. Combustible liquids are not subject to hazardous area classification. | No action required |
| 5.4.4(b) | The vent discharge point shall be located at least 4 m above ground level except for direct-vented tanks of Categories 1 or 2. | It is assumed that the tank supplier will provide a discharge point >4 m above ground. | <ul style="list-style-type: none"> The vent discharge point shall be at least 4 m above ground. |
| 5.4.4(c) | Where the tank is to be filled by gravity flow from a tank vehicle, the vent discharge point for the tank shall be at least 4 m above ground level at the fill point and in all circumstances shall be higher than the tank vehicle. | n/a – not gravity filled. | No action required |
| 5.4.4(d) | Where a Category 1 to 5 tank is to be filled by pumping from a tank vehicle— (i) the vent pipe or overfill point shall terminate in view of the filling operator; or (ii) (ii) the tank shall be fitted with a high level alarm audible to the filling operator. | The vent pipe will be visible to the operator. | <ul style="list-style-type: none"> The vent pipe or overfill point shall be visible to the operator. |
| 5.4.5 | The discharge end of a vent shall be protected from the ingress of foreign material by means of a protective cage or fitting. Where a tank contains flammable liquid and | It is assumed that the vent discharge point will be protected to prevent foreign material from entering. | <ul style="list-style-type: none"> The vent discharge point shall be protected to prevent foreign material entering. |

| Clause | Requirement | Assessment | Recommendations | | | | | | | | | | |
|---|---|--------------------------------|--------------------|--------------------------------------|-----|---|-----|----------------|-----|-------------------------|-----|---|--------------------|
| | the vapour within the ullage space of the tank is within explosive limits, a flame arrester or similar device shall be fitted. Any such protective cage, flame arrester or other means shall not reduce the required effective vent area or create undue back-pressure within the tank. | | | | | | | | | | | | |
| 5.6.2(a) | Any tank that is located within the confines of a building and contains quantities of flammable liquid greater than minor storage shall be either— a double-walled tank below the lowest floor level, installed in accordance with Clause 5.12; or | n/a – tank is located outside. | No action required | | | | | | | | | | |
| 5.6.2(b) | a single-wall tank placed in a tank chamber or a sand-filled chamber, in accordance with Clause 5.13; or | | | | | | | | | | | | |
| 5.6.2(c) | a tank having integral secondary containment with an FRL of 240/240/240 and complying with Clause 5.9 | | | | | | | | | | | | |
| 5.7.2 | <p>A tank or tanks shall be located so that the following minimum separation distances are maintained:</p> <table border="1"> <thead> <tr> <th>Receptor</th> <th>Distance (m)</th> </tr> </thead> <tbody> <tr> <td>Fill points, platform, package store</td> <td>5.5</td> </tr> <tr> <td>Office buildings, warehouses, manufacturing and processing areas, workshops or amenities on blocks on the same premises</td> <td>4.4</td> </tr> <tr> <td>Security fence</td> <td>5.5</td> </tr> <tr> <td>Offsite protected place</td> <td>4.4</td> </tr> </tbody> </table> | Receptor | Distance (m) | Fill points, platform, package store | 5.5 | Office buildings, warehouses, manufacturing and processing areas, workshops or amenities on blocks on the same premises | 4.4 | Security fence | 5.5 | Offsite protected place | 4.4 | <p>Fill points for tanks are part of the unit. No other fill points for other DGs located within 6.6 m.</p> <p>Office buildings, warehouses, etc. located >4.4 m from the tanks.</p> <p>Security fences > 5.5 m from the tanks.</p> <p>Offsite protected places >4.4 m from the tanks.</p> | No action required |
| Receptor | Distance (m) | | | | | | | | | | | | |
| Fill points, platform, package store | 5.5 | | | | | | | | | | | | |
| Office buildings, warehouses, manufacturing and processing areas, workshops or amenities on blocks on the same premises | 4.4 | | | | | | | | | | | | |
| Security fence | 5.5 | | | | | | | | | | | | |
| Offsite protected place | 4.4 | | | | | | | | | | | | |

| Clause | Requirement | Assessment | Recommendations |
|--------|---|------------------------------------|--------------------|
| 5.7.3 | <p>The distance between any two adjacent vertical tanks that contain flammable liquids shall be as follows (except as otherwise provided in Clause 5.7.5):</p> <p>(a) If neither tank exceeds 6 m in diameter, the distance between them shall be at least either one-third of the diameter of the larger tank or 1 m, whichever is the greater.</p> <p>(b) If one of the tanks is more than 6 m but neither is more than 20 m in diameter, the distance between them shall be at least one-half of the diameter of the larger tank.</p> <p>(c) If one tank is more than 20 m in diameter, the distance between it and any other tank shall be at least 15 m.</p> | n/a – no flammable liquids stored. | No action required |
| 5.7.4 | <p>The distance between any two adjacent vertical tanks that contain combustible liquids shall be as follows:</p> <p>(a) For Class C1 liquids, at least either one-sixth of the sum of their diameters or 1 m, whichever is the greater, except as otherwise provided in Clause 5.7.5.</p> <p>(b) For Class C2 liquids, at least 1 m.</p> | n/a – tanks are not vertical. | No action required |
| 5.7.5 | <p>Vertical tanks having a diameter greater than 3 m but not exceeding 10 m may be grouped in a cluster with reduced tank-to-tank spacing, provided that—</p> <p>(a) the distance between any two tanks is at least 1 m;</p> <p>(b) the total cross-sectional area of all tanks in the cluster does not exceed 320 m²;</p> <p>(c) the distance separating any such cluster from any other above-ground tank or cluster of tanks is at least 15</p> | n/a – not a tank cluster. | No action required |

| Clause | Requirement | Assessment | Recommendations |
|--------|--|---|--|
| | <p>m for flammable liquids or at least 7.5 m for combustible liquids;</p> <p>(d) where the total cross-sectional area of the tanks in any such cluster exceeds 30 m², and one or more tanks contain flammable liquid, all tanks in the cluster are provided with foam fire protection in accordance with Clauses 11.13.1 and 11.13.2; and</p> <p>(e) when the required compound capacity and clearances from other structures is being calculated, such a cluster is regarded as being one tank of aggregated volume containing liquid of the lowest flash point present.</p> | | |
| 5.7.6 | <p>The following requirements apply to the storage of liquids in horizontal tanks:</p> <p>(a) Horizontal tanks shall comply with AS 1692 and the requirements of this Standard.</p> <p>(b) The distance between horizontal tanks shall be at least 600 mm. Where horizontal tanks are adjacent to vertical tanks, the distance requirements for vertical tanks shall apply.</p> <p>(c) Tanks shall not be arranged end-to-end unless the potential for end failure and the resulting exposure hazard has been taken into account when determining the tank's location.</p> <p>NOTE: Tanks may be arranged in parallel (side-by-side) in a row.</p> | <p>a) Assumed tank supplier has designed the tanks according to 1692.</p> <p>b) n/a - solitary tank</p> <p>c) n/a – solitary tank</p> | <ul style="list-style-type: none"> The tanks shall comply with AS 1692. |
| 5.7.7 | <p>Where liquids of differing flash point are stored, the following requirements shall apply:</p> | <p>n/a – mixed products not stored.</p> | <p>No action required</p> |

| Clause | Requirement | Assessment | Recommendations |
|--------|---|--|--|
| | <p>(a) Where stored within the same compound, the separation distance between tanks applicable to the liquid of the lowest flash point present shall apply to each tank within that compound.</p> <p>(b) Where two compounds are separated by a bund, each tank in each compound shall be considered separately in its relationship to each tank in the adjacent compound. In each case, the separation distance shall be that applicable to the liquid of the lower flash point actually present in either of the tanks under consideration.</p> | | |
| 5.8.2 | Bundling clauses | n/a - tanks are integrally banded tanks. Refer to Clause 5.9 assessment. | No action required |
| 5.9.1 | <p>A tank complying with this Clause (5.9) shall be one of the following:</p> <p>(a) A double-walled tank.</p> <p>(b) A tank having secondary containment and an external, fire-rated covering.</p> <p>(c) A tank with an attached or integrated spillage compound.</p> | Integrally banded tanks to be supplied. | No action required |
| 5.9.2 | <p>The following requirements apply to tanks with integral secondary containment:</p> <p>(a) The tank shall not be used for the storage of PG I flammable liquids.</p> <p>(b) The capacity of the tank shall not exceed—</p> <p>(i) 55 000 L for PG II liquids;</p> <p>(ii) 110 000 L for PG III liquids; or</p> <p>(iii) 110 000 L for combustible liquids.</p> | <p>a) n/a – combustible liquids stored</p> <p>b) The maximum capacity of the tank is 55,650 L.</p> <p>c) it is assumed that the tank supplier has designed the tanks to AS 1692.</p> <p>d) It is assumed that the tank supplier will provide secondary containment to contain the entire contents of the primary tank.</p> | <ul style="list-style-type: none"> The diesel tanks certification / documentation shall be reviewed and confirmed to be in accordance with Section 5.9.2 of AS 1940:2017. |

| Clause | Requirement | Assessment | Recommendations |
|--------|---|--|-----------------|
| | <p>NOTE: For mine sites regulated by state, territory, or commonwealth legislation, a maximum of 200 000 L may be used.</p> <p>(c) The primary (inner) tank shall be constructed to AS 1692 or equivalent Standard.</p> <p>(d) The secondary containment shall be adequately designed and constructed, to contain the entire contents of the primary tank.</p> <p>(e) Means shall be provided to establish and monitor the integrity of the primary tank.</p> <p>(f) The tank shall be installed in accordance with Clause 5.11 or 5.12.6 as appropriate. Where flammable liquid or vapour could escape from the interstitial space of a tank, the tank shall be separated by at least 3 m from any ignition source, including vehicles being refuelled.</p> <p>(h) Spacing between adjacent tanks shall be at least 600 mm.</p> <p>(i) The tank shall be protected from damage caused by an impact.</p> <p>(j) Means shall be provided to prevent release of liquid by siphon flow from the tank.</p> <p>(k) The tank shall be fitted with a means of determining the level of its contents. Such means shall be available to the delivery operator.</p> <p>(l) All piping connections to the tank shall be above the normal maximum fill level.</p> <p>(m) Tanks shall not be manifolded unless provisions are made to prevent their being overfilled.</p> <p>(n) Overfill protection shall be provided by a suitable alarm with the flow of liquid being stopped, before the</p> | <p>e) It is assumed that the tank supplier has provided a method for monitoring the integrity of the primary tank.</p> <p>f) Refer to 5.11 and 5.12.6. Flammable liquids not stored.</p> <p>h) n/a - only one tank.</p> <p>i) Tanks will be protected by bollards as previously recommended.</p> <p>j) It is assumed that the tank supplier will design the tanks such that siphon flow from the tank does not occur.</p> <p>k) Tanks are fitted with a method of determining volume / level.</p> <p>l) Integrally banded tanks designed with all piping above normal maximum fill level.</p> <p>m) Tanks are not manifolded.</p> <p>n) assumed that the tank will be designed to comply as it is being sourced from a supplier.</p> <p>o) Fill points of integrally banded tanks are within an enclosure on the tank structure with the required containment.</p> <p>p) Separation is based on total tank volume.</p> <p>q) Assumed compliant venting as the tank is sourced from a supplier.</p> <p>r) Assumed venting of interstitial space is provided.</p> <p>s) Assumed access of the valve is provided.</p> | |

| Clause | Requirement | Assessment | Recommendations |
|---------|--|--|--|
| | <p>tank overflows. If the tank is designed to contain overflow, such an alarm is the minimum provision necessary to achieve this objective. If the overflow is to be discharged outside the secondary containment, an automatic shut-off shall be provided. These provisions shall not restrict or interfere with the proper functioning of the normal vent or the emergency vent.</p> <p>(o) Each fill point shall be provided with spill containment having a minimum capacity of 15 L per fill point. Such a device shall be fitted to a tank in order to catch and contain any minor spill during product delivery to the tank.</p> <p>(p) Where a tank having multiple compartments is installed, the separation distance to protected places shall be based on the aggregate volume of the compartments and the lowest flash point of the liquid in any tank compartment.</p> <p>(q) Venting shall comply with Clause 5.4. Venting of compartments of a multiple-compartment tank shall be based on the lowest flash point product in any of the compartments.</p> <p>(r) Where the interstitial space is enclosed, it shall be provided with venting in accordance with this Standard or with a UL approved method.</p> <p>(s) Means shall be provided to physically test the correct functioning of any internal valve without the need to remove the valve.</p> | | |
| 11.11.3 | Where Class C1 liquid is stored without flammable liquid, but with or without Class C2 liquid, at least one powder-type extinguisher shall be provided if a single- | <p>Hose reels to be provided per the recommendation.</p> <p>The site is protected by hydrant supply.</p> | <ul style="list-style-type: none"> • A hose reel with foam making capabilities shall be provided with |

| Clause | Requirement | Assessment | Recommendations |
|--------|--|------------|---|
| | tank installation, otherwise two powder-type extinguishers shall be provided. 10 L/s of hydrant supply. | | full coverage of both of the diesel refuelling tanks. |

4.4 Generator Fuel Tank

Diesel will be stored in a generator fuel tank at the site to supply a back-up generator. Provided in **Table 4-5** is a summary of the diesel quantities that are stored in the tanks.

Table 4-5: Quantity of Diesel Stored in Generator Fuel Tank

| Class | Packing Group | Description | Quantity (L) |
|-------|---------------|-------------|--------------|
| C1 | n/a | Diesel | 3,000 |

Diesel is a combustible liquid; hence, is subject to AS 1940:2017 (Ref. [3]). The diesel is stored in tanks and is therefore subject to Chapter 5 of the standard. A clause-by-clause assessment of the general warehouse has been conducted in **Table 4-6**.

It is noted that the fuel in the generator itself is not subject to assessment per Clause 328(4b) which excludes hazardous chemicals used directly in plant, equipment, appliances, etc. from being subject to the Part 7 of the WHS Regulation.

Table 4-6: AS 1940:2017 Compliance Assessment – Generator Fuel Tank

| Clause | Requirement | Assessment | Recommendations |
|----------|--|--|--|
| 5.2.1(a) | A static storage tank shall be designed and constructed to comply with AS 1692 or an equivalent Standard for the category of tank appropriate to the application. | The tank will be purchased from a reputable supplier that specialises in providing diesel tanks. It is assumed that the supplier has designed the tanks in accordance with AS 1940:2017. Procurement of the tanks will not occur until closer to practical completion and have thus not been procured at this stage. | <ul style="list-style-type: none"> The diesel tanks certification / documentation shall be reviewed and confirmed to be in accordance with Section 5.9.2 of AS 1940:2017. |
| 5.2.2(c) | All tanks shall be marked with the appropriate warning placard as required by relevant regulation | The tank shall have a combustible liquid placard on the side of the tank. Diesel tanks typically come with the combustible liquid placard affixed. | <ul style="list-style-type: none"> The diesel tanks shall be placarded in accordance with the WHS Regulation 2017. |
| 5.2.4(a) | Pipes and pipe joints shall be constructed from a material that is resistant to attack by, and is compatible with, the liquid under all service conditions | The tanks and associated pipework are constructed of metal which is compatible with the diesel | <ul style="list-style-type: none"> All materials of construction shall be compatible with diesel. |
| 5.2.4(b) | All pipes shall be adequately protected from physical damage. | All pipework will be protected from vehicular damage. | <ul style="list-style-type: none"> All pipework shall be protected from vehicular damage. |
| 5.2.4(c) | All above-ground pipes shall be colour-coded or labelled | Pipework will connect the tank and generator. | <ul style="list-style-type: none"> All pipework transporting fuel from the tank to the generator shall be labelled or colour coded. |
| 5.2.4(d) | Pipework shall be well-supported and protected from potential traffic damage. | Pipework will be designed and installed by a competent contractor. Pipework will be supported and protected from traffic damage. | <ul style="list-style-type: none"> All pipework shall be well-supported and protected from potential traffic damage. |
| 5.2.4(e) | Flexible hoses shall not be used, except at transfer points. Where such hose is used, it shall be constructed of material that is resistant to attack by, and is compatible with, the liquid being transferred. The length of the hose shall be kept to a minimum. | n/a – flexible hoses not required for genset. | No action required |

| Clause | Requirement | Assessment | Recommendations |
|----------|--|--|---|
| 5.3.1 | The fill connection to a storage tank that is filled from a tank vehicle shall incorporate a liquid-tight connection unless the filling method employs a hand-held trigger nozzle with a non-latching feature. A cap or cover shall be provided for the fill point | The hose coupling will be of a liquid tight design. | <ul style="list-style-type: none"> The storage tank fill connection shall be of a liquid-tight connection. |
| 5.3.2(a) | The fill point shall be readily accessible. | The fill point is on the hardstand is readily accessible. | No action required |
| 5.3.2(b) | The fill point shall be protected from accidental damage. | The fill point will be protected from accidental damage by bollards. | <p>Notwithstanding this the following recommendation has been made:</p> <ul style="list-style-type: none"> The diesel tank fill point shall be protected by bollards to prevent accidental damage. |
| 5.3.2(c) | The fill point for any tank containing a flammable liquid shall be in open air and no ignition sources shall be located within the hazardous area defined in accordance with AS/NZS 60079.10.1. | The only flammable liquids stored at the site are in the warehouse. There are no external flammable liquid storages. | No action required |
| 5.3.2(e) | The fill point for a tank shall be located so that a tank vehicle is not required to enter the tank compound to make a delivery | n/a – the delivery tanker will not need to enter the compound. | No action required |
| 5.3.2(f) | For any tank containing a flammable liquid, the location shall be such that the tanker can stand wholly off any public road, except where allowed under the ADG Code. | The tanker is located wholly within the site boundaries away from public roads. | No action required |
| 5.3.2(g) | Each fill point shall be clearly identified. | The fill point will be clearly signed. | <ul style="list-style-type: none"> Signage shall be provided above the diesel tanks fill point identifying it as the diesel tank fill point. |
| 5.3.2(h) | The areas around the tank fill point and the vehicle hose connection point shall be impervious to the product. | The surrounding ground is concrete which is impervious to diesel. | <ul style="list-style-type: none"> A spill kit shall be located adjacent to the diesel tank fill point during tanker unloading. |

| Clause | Requirement | Assessment | Recommendations |
|-----------|---|--|--|
| 5.3.3(a) | The normal fill level shall not exceed 95% of tank capacity (overflow level) | It is assumed that the tank supplier has designed the tank with a 95% safe fill level. | <ul style="list-style-type: none"> The normal fill level shall not exceed 95% of the tank capacity. |
| 5.3.3(bi) | The provision of only a dipstick without an alarm is acceptable for liquid level monitoring of tanks up to 25,000 L capacity of flammable liquids. | n/a – the tank is only 3,000 L and can be fill tested with dipstick. | No action required |
| 5.3.3(c) | All other tanks shall have a suitable high-level alarm (LAH) set at a maximum of 97% of tank capacity. This alarm is the first stage overflowing protection and shall be set to warn when the normal fill level has been exceeded. It shall not be used to control filling | n/a – 3,000 L tank | No action required. |
| 5.3.3(d) | Any tank filled by gravity shall be fitted with an automatic flow limiting device which reduces the flow rate into the tank by 98% when the normal fill level of the tank has been attained. | n/a – not filled by gravity | No action required |
| 5.3.3(e) | <p>A contents gauge or monitoring device together with a LAH, remote from the tank shall be provided at the fill point, or where the tank filling operation is monitored and controlled (e.g. a control room), in the following circumstances:</p> <p>(i) Where the tank is located within a building or under a building and the dip point is more than 8 m from the entrance to the building or otherwise inaccessible.</p> <p>(ii) Where the tank is in a tank chamber and access to the dip point is prevented.</p> <p>(iii) Where the tank is out of direct sight of the attendant monitoring filling flow controls.</p> | n/a – none of these items apply. | No action required |

| Clause | Requirement | Assessment | Recommendations |
|----------|--|--|--|
| | (iv) Where Category 6 tanks are filled from ship to shore, from a refinery, or similar high volume transfers (e.g. 100 m ³ /h). | | |
| 5.3.3(f) | In addition to the LAH, they shall incorporate a physically and electrically independent high-high level alarm (LAHH). It will warn of a failure of some element of a primary (process) control system. It shall be set at or below the tank rated capacity to allow adequate response time to terminate the transfer before loss of containment/damage occurs | n/a – 5.3.3(e) did not apply. | No action required |
| 5.4.1(a) | A free vent or a pressure-vacuum (PV) vent designed for the type of liquid being stored. | It is assumed that the tank supplier will provide an appropriately sized vent. | <ul style="list-style-type: none"> A free vent or pressure-vacuum vent design diesel shall be provided. |
| 5.4.1(b) | An emergency vent when the conditions of Clause 5.5 apply. | Clause 5.5 does not apply | No action required |
| 5.4.1(c) | Vapours shall be safely discharged outdoors unless their recovery and treatment is otherwise required. | The tank is located outside and thus discharges outside. | No action required |
| 5.4.3(a) | The vent pipe shall fall consistently back to the tank at a slope of at least 1 in 100. | The vent pipe is vertical. | No action required |
| 5.4.3(b) | A vent pipe shall not pass through building foundations but may be embedded in concrete that is part of other building construction | The pipe does not pass through the foundations. | No action required |
| 5.4.3(d) | Where vent piping penetrates a fire-rated wall, it shall be installed so as to ensure that the fire resistance of the wall is maintained | The vent pipe does not penetrate a fire rated wall. | No action required |
| 5.4.3(e) | The vent pipe and terminal shall be located or protected so that they are not liable to damage resulting from normal activities. | The tank / vent pipe will be protected by bollards. | Notwithstanding this, the following recommendation has been made: |

| Clause | Requirement | Assessment | Recommendations |
|----------|--|---|---|
| | | | <ul style="list-style-type: none"> The diesel tanks shall be protected by bollards to prevent accidental vehicular damage. |
| 5.4.3(g) | Where several tanks are interconnected by a common venting system and the vapours in the vapour are within the explosive range, measures shall be taken to prevent the possibility of flashback or flame propagation through the system from one tank to another, e.g. by the use of flashback arresters, barometric dampers, nitrogen inerting or ensuring that the vapour concentration is always above the explosive range. | n/a – common venting system not provided. | No action required |
| 5.4.4(a) | The vent discharge point shall be located laterally at least 4 m for flammable liquids and 2 m for combustible liquids from any opening into a building, e.g. window, door, ventilator, air conditioner or a mechanical vent intake to reduce the possibility of the entry of nuisance vapour. The vent shall be located such that the opening into a building shall be outside the hazardous area to AS/NZS 60079.10.1. | The discharge point is outside and away from the building. Combustible liquids are not subject to hazardous area classification. | No action required |
| 5.4.4(b) | The vent discharge point shall be located at least 4 m above ground level except for direct-vented tanks of Categories 1 or 2. | It is assumed that the tank supplier will provide a discharge point >4 m above ground. | <ul style="list-style-type: none"> The vent discharge point shall be at least 4 m above ground. |
| 5.4.4(c) | Where the tank is to be filled by gravity flow from a tank vehicle, the vent discharge point for the tank shall be at least 4 m above ground level at the fill point and in all circumstances shall be higher than the tank vehicle. | n/a – not gravity filled. | No action required |
| 5.4.4(d) | Where a Category 1 to 5 tank is to be filled by pumping from a tank vehicle— | The vent pipe will be visible to the operator. | <ul style="list-style-type: none"> The vent pipe or overfill point shall be visible to the operator. |

| Clause | Requirement | Assessment | Recommendations | | | | | | |
|--|--|--|---|--------------------------------------|---|--|-----|---|--------------------|
| | (iii) the vent pipe or overfill point shall terminate in view of the filling operator; or (iv) (ii) the tank shall be fitted with a high level alarm audible to the filling operator. | | | | | | | | |
| 5.4.5 | The discharge end of a vent shall be protected from the ingress of foreign material by means of a protective cage or fitting. Where a tank contains flammable liquid and the vapour within the ullage space of the tank is within explosive limits, a flame arrester or similar device shall be fitted. Any such protective cage, flame arrester or other means shall not reduce the required effective vent area or create undue back-pressure within the tank. | It is assumed that the vent discharge point will be protected to prevent foreign material from entering. | <ul style="list-style-type: none"> The vent discharge point shall be protected to prevent foreign material entering. | | | | | | |
| 5.6.2(a) | Any tank that is located within the confines of a building and contains quantities of flammable liquid greater than minor storage shall be either— a double-walled tank below the lowest floor level, installed in accordance with Clause 5.12; or | n/a – tank is located outside. | No action required | | | | | | |
| 5.6.2(b) | a single-wall tank placed in a tank chamber or a sand-filled chamber, in accordance with Clause 5.13; or | | | | | | | | |
| 5.6.2(c) | a tank having integral secondary containment with an FRL of 240/240/240 and complying with Clause 5.9 | | | | | | | | |
| 5.7.2 | <p>A tank or tanks shall be located so that the following minimum separation distances are maintained:</p> <table border="1" data-bbox="315 1161 922 1383"> <thead> <tr> <th>Receptor</th> <th>Distance (m)</th> </tr> </thead> <tbody> <tr> <td>Fill points, platform, package store</td> <td>3</td> </tr> <tr> <td>Office buildings, warehouses, manufacturing and processing</td> <td>0.2</td> </tr> </tbody> </table> | Receptor | Distance (m) | Fill points, platform, package store | 3 | Office buildings, warehouses, manufacturing and processing | 0.2 | <p>Fill points for tanks are part of the unit. No other fill points for other DGs located within 3 m.</p> <p>Office buildings, warehouses, etc. located >0.2 m from the tanks (interpolated).</p> <p>Security fences > 3 m from the tanks.</p> <p>Offsite protected places >0.2 m from the tanks (interpolated).</p> | No action required |
| Receptor | Distance (m) | | | | | | | | |
| Fill points, platform, package store | 3 | | | | | | | | |
| Office buildings, warehouses, manufacturing and processing | 0.2 | | | | | | | | |

| Clause | Requirement | Assessment | Recommendations | | | | | | |
|--|---|--|--------------------|----------------|---|-------------------------|-----|--|--|
| | <table border="1"> <tr> <td data-bbox="320 245 734 331">areas, workshops or amenities on blocks on the same premises</td> <td data-bbox="734 245 978 331"></td> </tr> <tr> <td data-bbox="320 331 734 384">Security fence</td> <td data-bbox="734 331 978 384">3</td> </tr> <tr> <td data-bbox="320 384 734 440">Offsite protected place</td> <td data-bbox="734 384 978 440">0.2</td> </tr> </table> | areas, workshops or amenities on blocks on the same premises | | Security fence | 3 | Offsite protected place | 0.2 | | |
| areas, workshops or amenities on blocks on the same premises | | | | | | | | | |
| Security fence | 3 | | | | | | | | |
| Offsite protected place | 0.2 | | | | | | | | |
| 5.7.3 | <p>The distance between any two adjacent vertical tanks that contain flammable liquids shall be as follows (except as otherwise provided in Clause 5.7.5):</p> <p>(a) If neither tank exceeds 6 m in diameter, the distance between them shall be at least either one-third of the diameter of the larger tank or 1 m, whichever is the greater.</p> <p>(b) If one of the tanks is more than 6 m but neither is more than 20 m in diameter, the distance between them shall be at least one-half of the diameter of the larger tank.</p> <p>(c) If one tank is more than 20 m in diameter, the distance between it and any other tank shall be at least 15 m.</p> | n/a – no flammable liquids stored. | No action required | | | | | | |
| 5.7.4 | <p>The distance between any two adjacent vertical tanks that contain combustible liquids shall be as follows:</p> <p>(a) For Class C1 liquids, at least either one-sixth of the sum of their diameters or 1 m, whichever is the greater, except as otherwise provided in Clause 5.7.5.</p> <p>(b) For Class C2 liquids, at least 1 m.</p> | n/a – tanks are not vertical. | No action required | | | | | | |
| 5.7.5 | <p>Vertical tanks having a diameter greater than 3 m but not exceeding 10 m may be grouped in a cluster with reduced tank-to-tank spacing, provided that—</p> <p>(a) the distance between any two tanks is at least 1 m;</p> | n/a – not a tank cluster. | No action required | | | | | | |

| Clause | Requirement | Assessment | Recommendations |
|--------|--|---|--|
| | <p>(b) the total cross-sectional area of all tanks in the cluster does not exceed 320 m²;</p> <p>(c) the distance separating any such cluster from any other above-ground tank or cluster of tanks is at least 15 m for flammable liquids or at least 7.5 m for combustible liquids;</p> <p>(d) where the total cross-sectional area of the tanks in any such cluster exceeds 30 m², and one or more tanks contain flammable liquid, all tanks in the cluster are provided with foam fire protection in accordance with Clauses 11.13.1 and 11.13.2; and</p> <p>(e) when the required compound capacity and clearances from other structures is being calculated, such a cluster is regarded as being one tank of aggregated volume containing liquid of the lowest flash point present.</p> | | |
| 5.7.6 | <p>The following requirements apply to the storage of liquids in horizontal tanks:</p> <p>(a) Horizontal tanks shall comply with AS 1692 and the requirements of this Standard.</p> <p>(b) The distance between horizontal tanks shall be at least 600 mm. Where horizontal tanks are adjacent to vertical tanks, the distance requirements for vertical tanks shall apply.</p> <p>(c) Tanks shall not be arranged end-to-end unless the potential for end failure and the resulting exposure hazard has been taken into account when determining the tank's location.</p> <p>NOTE: Tanks may be arranged in parallel (side-by-side) in a row.</p> | <p>a) Assumed tank supplier has designed the tanks according to 1692.</p> <p>b) n/a – solitary tank</p> <p>c) n/a – solitary tank</p> | <ul style="list-style-type: none"> • The tanks shall comply with AS 1692. |

| Clause | Requirement | Assessment | Recommendations |
|--------|---|---|--|
| 5.7.7 | <p>Where liquids of differing flash point are stored, the following requirements shall apply:</p> <p>(a) Where stored within the same compound, the separation distance between tanks applicable to the liquid of the lowest flash point present shall apply to each tank within that compound.</p> <p>(b) Where two compounds are separated by a bund, each tank in each compound shall be considered separately in its relationship to each tank in the adjacent compound. In each case, the separation distance shall be that applicable to the liquid of the lower flash point actually present in either of the tanks under consideration.</p> | n/a – mixed products not stored. | No action required |
| 5.8.2 | Bunding clauses | n/a - tanks are integrally banded tanks. Refer to Clause 5.9 assessment. | No action required |
| 5.9.1 | <p>A tank complying with this Clause (5.9) shall be one of the following:</p> <p>(a) A double-walled tank.</p> <p>(b) A tank having secondary containment and an external, fire-rated covering.</p> <p>(c) A tank with an attached or integrated spillage compound.</p> | Integrally banded tanks to be supplied. | No action required |
| 5.9.2 | <p>The following requirements apply to tanks with integral secondary containment:</p> <p>(a) The tank shall not be used for the storage of PG I flammable liquids.</p> <p>(b) The capacity of the tank shall not exceed—</p> <p>(i) 55 000 L for PG II liquids;</p> | <p>a) n/a – combustible liquids stored</p> <p>b) The maximum capacity of the tank is 3,000 L.</p> <p>c) it is assumed that the tank supplier has designed the tanks to AS 1692.</p> | <ul style="list-style-type: none"> The diesel tanks certification / documentation shall be reviewed and confirmed to be in accordance with Section 5.9.2 of AS 1940:2017. |

| Clause | Requirement | Assessment | Recommendations |
|--------|--|--|-----------------|
| | <p>(ii) 110 000 L for PG III liquids; or (iii) 110 000 L for combustible liquids. NOTE: For mine sites regulated by state, territory, or commonwealth legislation, a maximum of 200 000 L may be used.</p> <p>(c) The primary (inner) tank shall be constructed to AS 1692 or equivalent Standard.</p> <p>(d) The secondary containment shall be adequately designed and constructed, to contain the entire contents of the primary tank.</p> <p>(e) Means shall be provided to establish and monitor the integrity of the primary tank.</p> <p>(f) The tank shall be installed in accordance with Clause 5.11 or 5.12.6 as appropriate. Where flammable liquid or vapour could escape from the interstitial space of a tank, the tank shall be separated by at least 3 m from any ignition source, including vehicles being refuelled.</p> <p>(h) Spacing between adjacent tanks shall be at least 600 mm.</p> <p>(i) The tank shall be protected from damage caused by an impact.</p> <p>(j) Means shall be provided to prevent release of liquid by siphon flow from the tank.</p> <p>(k) The tank shall be fitted with a means of determining the level of its contents. Such means shall be available to the delivery operator.</p> <p>(l) All piping connections to the tank shall be above the normal maximum fill level.</p> | <p>d) It is assumed that the tank supplier will provide secondary containment to contain the entire contents of the primary tank.</p> <p>e) It is assumed that the tank supplier has provided a method for monitoring the integrity of the primary tank.</p> <p>f) Refer to 5.11 and 5.12.6. Flammable liquids not stored.</p> <p>h) n/a - only one tank.</p> <p>i) Tanks will be protected by bollards as previously recommended.</p> <p>j) It is assumed that the tank supplier will design the tanks such that siphon flow from the tank does not occur.</p> <p>k) n/a – tank <25,000 L</p> <p>l) Integrally banded tanks designed with all piping above normal maximum fill level.</p> <p>m) Tanks are not manifolded.</p> <p>n) assumed that the tank will be designed to comply as it is being sourced from a supplier.</p> <p>o) Fill points of integrally banded tanks are within an enclosure on the tank structure with the required containment.</p> <p>p) Separation is based on total tank volume.</p> <p>q) Assumed compliant venting as the tank is sourced from a supplier.</p> <p>r) Assumed venting of interstitial space is provided.</p> <p>s) Assumed access of the valve is provided.</p> | |

| Clause | Requirement | Assessment | Recommendations |
|--------|---|------------|-----------------|
| | <p>(m) Tanks shall not be manifolded unless provisions are made to prevent their being overfilled.</p> <p>(n) Overfill protection shall be provided by a suitable alarm with the flow of liquid being stopped, before the tank overflows. If the tank is designed to contain overflow, such an alarm is the minimum provision necessary to achieve this objective. If the overflow is to be discharged outside the secondary containment, an automatic shut-off shall be provided. These provisions shall not restrict or interfere with the proper functioning of the normal vent or the emergency vent.</p> <p>(o) Each fill point shall be provided with spill containment having a minimum capacity of 15 L per fill point. Such a device shall be fitted to a tank in order to catch and contain any minor spill during product delivery to the tank.</p> <p>(p) Where a tank having multiple compartments is installed, the separation distance to protected places shall be based on the aggregate volume of the compartments and the lowest flash point of the liquid in any tank compartment.</p> <p>(q) Venting shall comply with Clause 5.4. Venting of compartments of a multiple-compartment tank shall be based on the lowest flash point product in any of the compartments.</p> <p>(r) Where the interstitial space is enclosed, it shall be provided with venting in accordance with this Standard or with a UL approved method.</p> | | |

| Clause | Requirement | Assessment | Recommendations |
|---------|---|---|--|
| | (s) Means shall be provided to physically test the correct functioning of any internal valve without the need to remove the valve. | | |
| 11.11.3 | Where Class C1 liquid is stored without flammable liquid, but with or without Class C2 liquid, at least one powder-type extinguisher shall be provided if a single-tank installation, otherwise two powder-type extinguishers shall be provided. 10 L/s of hydrant supply. | Hose reels to be provided per the recommendation. The site is protected by hydrant supply. | <ul style="list-style-type: none"> • A hose reel with foam making capabilities shall be provided with full coverage of both of the diesel refuelling tanks. |

5.0 Work Health and Safety Regulation 2017

5.1 Introduction

In addition to the requirements of the relevant standards, a Person Conducting a Business or Undertaking (PCBU) must also satisfy several obligations outlined in the Work Health and Safety Regulation 2017 (Ref. [1]). The relevant requirements are dependent on the quantities of DGs stored on site. The assessment has been conducted on the maximum possible DG storage quantities for conservatism.

The DG quantities and the placard and manifest thresholds are outlined in **Table 5-1**. As a number of the DG storages exceed the placard thresholds, the site would be classified as a placard site.

Table 5-1: WHS Placard and Manifest Threshold Quantities

| Class | PG | Stored Qty (L) | Threshold Qty (kg or L) | | Outcome |
|-------|-----|----------------|-------------------------|----------|---------|
| | | | Placard | Manifest | |
| 2.1 | n/a | 4,330 | 200 | 5,000 | Placard |
| C1 | n/a | 58,650 | 10,000 | 100,000 | Placard |

5.2 Applicable WHS Clauses

The applicable clauses for a Manifest site are outlined in **Table 5-2**.

Table 5-2: Relevant WHS Clauses and Requirements

| Clause | WHS Requirement |
|-----------|--|
| 346 | <p>A Hazardous Chemicals [<i>Dangerous Goods</i>] register shall be prepared which must include;</p> <ul style="list-style-type: none"> • A list of hazardous chemicals stored, used or handled • The current Safety Data Sheet (SDS) for DGs stored, used or handled, unless the hazardous chemical is a consumer product (e.g. hand sanitiser). <p>The register must be readily accessible to workers involved in handling or storing the chemicals, and anyone who is likely to be affected by the chemicals.</p> |
| 349 & 350 | <p>PCBU shall ensure placards are displayed for all chemicals which exceed placard quantity of Schedule 11, and that placards comply with Schedule 13, as shown in Figure 5-1 and Figure 5-2. A Placard Schedule shall be prepared to indicate the placard requirements.</p> <p>A PCBU shall ensure an outer warning placard shall be prominently displayed at the site. The placard is to show the words "HAZCHEM" in red lettering on white or silver background and shall have minimum dimensions 120 mm x 600 mm, in compliance with Schedule 13, as shown in Figure 5-2.</p> |
| 351 & 354 | <p>A PCBU must manage the risk to health and safety associated with using and storing a hazardous chemical [<i>Dangerous Good</i>] and have regard of the following:</p> <ul style="list-style-type: none"> • Hazardous properties of the chemical • Reactions between chemicals (physical) or between the chemical and other substances/materials; • The nature of the work to be carried out with the hazardous chemical; |

| Clause | WHS Requirement |
|--------|---|
| | <ul style="list-style-type: none"> Any structure, plant or system of work used in the handling, generation or storage of the hazardous chemical [Dangerous Good] or that could react with the hazardous chemical [Dangerous Good] at the workplace. <p>In order to comply with this requirement, it is necessary to conduct a risk assessment and to identify those hazards and risks associated with the storage and handling of the hazardous chemicals [Dangerous Goods]. The following recommendation has been made:</p> <ul style="list-style-type: none"> A risk assessment of the hazardous chemical [Dangerous Good] storage areas be conducted, including the use of the chemicals in the manufacturing areas; |
| 353 | <p>A PCBU must display safety signs required to control an identified risk in relation to using, handling or storing hazardous chemicals. The safety signs must warn of a particular hazard associated with the hazardous chemical, and be located next to hazard, clearly visible to a person approaching the hazard.</p> |
| 355 | <p>A PCBU must ensure ignition sources are not introduced to areas which where there is a possibility of fire or explosion in a hazardous area. In the flammable liquids containers, there is potential for vapours to accumulate and ignite. Therefore, the following recommendation has been made:</p> <ul style="list-style-type: none"> A Hazardous Area Classification (HAC) report and associated drawings should be prepared for flammable liquid in accordance with AS/NZS 60079.10.1:2022 (Ref. [4]). A Hazardous Area Dossier shall be prepared prior to occupation in accordance with AS/NZS 3000:2018 (Ref. [5]). |
| 357 | <p>A PCBU must ensure, SFAIRP, that where there is a risk from a spill or leak of a hazardous chemical, a spill containment system contains the resulting effluent within the workplace.</p> <ul style="list-style-type: none"> The containment system must not create a hazard by bringing together incompatible chemicals. <p>The containment system must provide for the clean-up and disposal of hazardous chemicals.</p> |
| 358 | <p>A PCBU must ensure containers of hazardous chemicals are protected against impact damage and damage from excessive load.</p> |
| 359 | <p>A PCBU shall ensure that a workplace is provided with fire protection and firefighting equipment that is designed and built for the types of hazardous chemicals at the workplace.</p> <ul style="list-style-type: none"> The PCBU shall have regard to the fire load of the hazardous chemicals and from other sources, and the compatibility of the hazardous chemicals with other substances on site. The equipment shall be compatible with firefighting equipment used by Local Fire Brigades <p>Fire protection and firefighting equipment shall be properly installed, tested and maintained, and a dated record shall be kept of the latest testing results.</p> |
| 364 | <p>A PCBU must ensure that containers in which hazardous chemicals are used, handled, or stored in bulk shall have stable foundations and supports, and be secured to the foundations and supports to prevent movement and subsequent damage to the container.</p> |

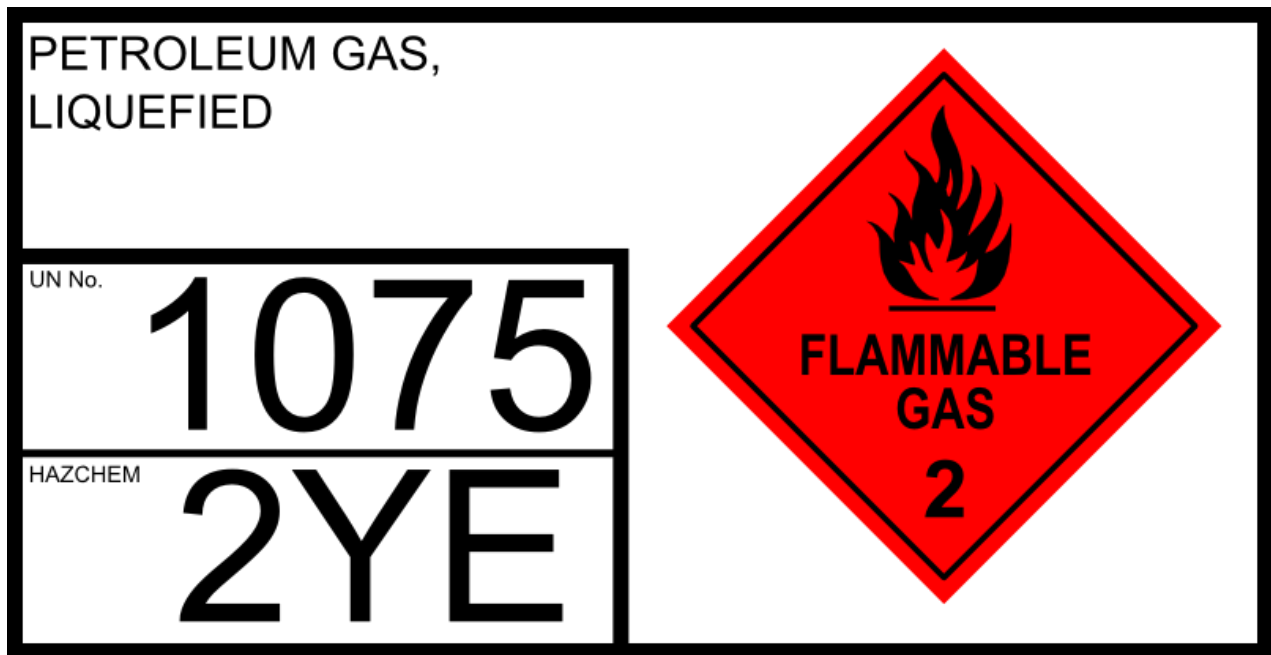


Figure 5-1: DG Placards



Figure 5-2: HAZCHEM Placard

5.3 Summary of Requirements

In summary, the site will require the following:

- A Dangerous Goods Register, indicating the type of chemical, any notations that may be required from the risk assessment and the Safety Data Sheet for the chemical.
- A DG Risk Assessment of the storage and handling area.
- A Placard Schedule.
- A Hazardous Area Classification (HAC).
- Hazardous Area Verification Dossier (HAVD).

6.0 Conclusion and Recommendations

6.1 Conclusions

A review of the classes, quantities and locations of DGs stored at Lot K, 200 Aldington Road warehouse was conducted to assess the compliance with the WHS 2017 and the relevant Australia Standards for storage of DGs at the site.

The storage locations were assessed according to the standard applicable to the classes of DGs stored in a clause-by-clause fashion to identify any deficiencies in the design and make recommendation for inclusion in the design.

Based on this review, it is concluded that should the aforementioned design requirements be incorporated into the DG storages they will comply with the standards; hence, comply with the WHS Regulations.

6.2 Recommendations

The following recommendations have been made for the facility:

LPG Tank

- The LPG tank shall be protected by Armco guarding.

Diesel Tank

- The diesel tanks certification / documentation shall be reviewed and confirmed to be in accordance with Section 5.9.2 of AS 1940:2017.
- The diesel tanks shall be placarded in accordance with the WHS 2017.
- All materials of construction shall be compatible with diesel.
- All pipework shall be protected from vehicular damage.
- All pipework shall be well-supported and protected from potential traffic damage.
- The storage tank fill connection shall be of a liquid-tight connection.
- The diesel tanks fill point shall be protected by bollards to prevent accidental damage.
- Signage shall be provided above the diesel refuelling tank fill point identifying it as the diesel tank fill point.
- A spill kit shall be located adjacent to the diesel tanks fill point during tanker unloading.
- The normal fill level shall not exceed 95% of the tank capacity.
- The tank shall have a high-level alarm set at 97% of the tank capacity.
- A free vent or pressure-vacuum vent design diesel shall be provided.
- The diesel tanks shall be protected by bollards to prevent accidental vehicular damage.
- The vent discharge point shall be at least 4 m above ground.
- The vent pipe or overflow point shall be visible to the operator.
- The vent discharge point shall be protected to prevent foreign material entering.

- The tanks shall comply with AS 1692.
- A hose reel with foam making capabilities shall be provided with full coverage of both of the diesel tanks.

Generator Fuel Tank

- The diesel tanks certification / documentation shall be reviewed and confirmed to be in accordance with Section 5.9.2 of AS 1940:2017.
- The diesel tanks shall be placarded in accordance with the WHS 2017.
- All materials of construction shall be compatible with diesel.
- All pipework shall be protected from vehicular damage.
- All pipework transporting fuel from the tank to the generator shall be labelled or colour coded.
- All pipework shall be well-supported and protected from potential traffic damage.
- The storage tank fill connection shall be of a liquid-tight connection.
- The diesel tanks fill point shall be protected by bollards to prevent accidental damage.
- Signage shall be provided above the diesel refuelling tank fill point identifying it as the diesel tank fill point.
- A spill kit shall be located adjacent to the diesel tanks fill point during tanker unloading.
- A free vent or pressure-vacuum vent design diesel shall be provided.
- The diesel tanks shall be protected by bollards to prevent accidental vehicular damage.
- The vent discharge point shall be at least 4 m above ground.
- The vent pipe or overfill point shall be visible to the operator.
- The vent discharge point shall be protected to prevent foreign material entering.
- The tanks shall comply with AS 1692.
- A hose reel with foam making capabilities shall be provided with full coverage of both of the diesel tanks.

General Items

- A Dangerous Goods Register, indicating the type of chemical, any notations that may be required from the risk assessment and the Safety Data Sheet for the chemical.
- A DG Risk Assessment of the storage and handling area.
- A Placard Schedule.
- A Hazardous Area Classification (HAC).
- Hazardous Area Verification Dossier (HAVD).

7.0 References

- [1] SafeWork NSW, "Work Health and Safety Regulation," SafeWork NSW, Lisarow, 2017.
- [2] Standards Australia, "AS/NZS 1596:2014 The storage and handling of LP gas," Standards Australia, Sydney, 2014.
- [3] Standards Australia, AS 1940:2017 - Storage and Handling of Flammable and Combustible Liquids, Sydney: Standards Australia, 2017.
- [4] Standards Australia, AS/NZS 60079.10.1:2022 - Explosive Atmospheres Part 10.1: Classification of Areas, Explosive Gas Atmospheres, Sydney: Standards Association of Australia, 2022.
- [5] Standards Australia, "AS/NZS 3000:2018 - Wiring Rules," Standards Australia, Sydney, 2018.