

SEPP (Resilience and Hazards) Risk Screening Report

Project Name: **Pearl Narrabri Service Station**
Address: Peele Street, Narrabri, NSW, 2390.
Client: Brown Built Commercial Building
Project no: 1832

Prepared by: Mr Wayne Lamb

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Disclaimer

This report is based on information provided by the Client in terms of the types of dangerous goods and the quantities to be stored and handled on site. A facility management plan shall include the quantities of dangerous goods stored and any relevant information contained in this report so that users are aware of these requirements. This report assesses only the situations indicated and does not address all possible scenarios or catastrophic events which may be possible but have a very low likelihood of occurring. Assumptions have been made, as indicated and these need to be considered in management practices. The report outcomes do not totally eliminate the risks, but rather present a risk management approach intended to mitigate risks to as low as practicable to achieve compliance with the appropriate standards for the facility. If the activities or dangerous goods or quantities change then this assessment shall be updated to ensure compliance is maintained and safety is properly considered. Work Health and Safety risk assessments should be carried out in addition to this report.

Items not specifically mentioned in this report should not be regarded as having been assessed or inspected by WDE. Recommendations are not exhaustive, and where applicable, all recommended works are subject to approval and full compliance by the National, State and Local Authorities.

The author has worked within the Retail Petroleum Industry for more than 30 years (refer to Appendix H). The recommendations contained within this document are based on industry experience and on sound professional practice. Opinions and advice given by WDE in the following report represents WDE best judgement, but (to the permitted extent by law) WDE accepts no liability for claims or damages caused by its negligence (or that of its employees or agents) or otherwise. As such, the reader is invited to obtain any supporting information they feel is necessary before making any decisions.

The following report is confidential and not to be made available to other parties unless under the consent of the Client.

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1. Scope of this Report

An assessment of the proposed service station development has been carried out by WDE Fuel Industry Consulting. The purpose of this assessment is to report on the compliance of the Hazardous Chemical storage, and the fuel dispensing systems at this facility as required by current National and relevant State Acts, Regulations, Codes, and Australian Standards and Local Authority Approvals (refer to Appendix E).

Dangerous goods (DG) storage facilities where the proposed storages are above minor quantities require an assessment process to be followed to ascertain whether the proposed facility is suitable for that particular site or not. This procedure is set out in the NSW State Environmental Planning Policy (Resilience and Hazards) 2021, (incorporating the formally named State Environmental Planning Policy 33 also known as SEPP 33), hereafter referred to as SEPP(R&H). Any DG storage site should be considered as "potentially hazardous" until a detailed risk assessment can determine otherwise. The process flow chart is detailed in appendix A.

Guidelines are provided by the NSW Department of Planning for local government and developers to ensure potential safety and pollutant impacts of a proposal are assessed early in the development application process. NSW document "Applying SEPP 33" sets out a process to comply with the NSW SEPP(R&H). By following this document an assessment procedure links the permissibility of a proposal to its safety performance and in doing so, ensures that only those proposed facilities which are appropriately located, and can demonstrate that they can be constructed and operated with an adequate level of safety, can be built.

SEPP(R&H) states that a "hazardous industry" is one which poses a significant risk when all locational, technical, operational and organizational safeguards are included.

A "potentially hazardous industry" is one which, when all safeguards are operating, imposes a risk level which is significantly lower.

This report outlines the screening process as required by the "Applying SEPP 33" guidelines which determines whether or not a site is potentially hazardous. If found to be potentially hazardous, a Preliminary Hazard Analysis (PHA) is required.

It is possible that some activities may involve handling DG which, without proper controls, could create an off-site risk to people, property or the environment. These activities are defined as potentially hazardous or potentially offensive. This report, using the established State Environmental Planning Policies guidelines, assesses the proposal to determine whether it fits such a definition and if so, fall under the provisions of SEPP(R&H).

A PHA details possible risks and hazards associated with this site to assist the local authority reach an informed decision for the proposed development. It seeks to provide a better understanding of the risks and hazards associated with the site and to offer a reasonable basis for an informed judgment regarding the suitability of the proposed development.

As required by NSW state legislation, this report has been compiled by a suitably qualified person, experienced with the properties of the DG stored on site and their possible impacts on and off the site.

2. Description of Site

Address:	31-16-48-42 Peele Street, Narrabri, NSW, 2390
Site Area:	8096 sq.m (approx.)
Real Property Description:	Lots 171-172-173-18 on DP540858-2854
Local Authority:	Narrabri Shire Council

3. Description of the Proposed Development

3.1 Location and Surrounds.

The proposed development is located between Peele and Cooma Streets on the fringe of a mixed use zone in the central northeast of New South Wales. Vehicle access is proposed from Cooma Street (Newell Highway).

Aerial photographs show low density residential developments and parkland immediately surround the site with sporting fields and complexes beyond these. There is an existing service station immediately across Cooma Street. A motel and caravan park business is 200 metres northeast of the site.

Narrabri Lake is approximately 600 metres east of the proposed site and the Namoi River is some 800 metres to the east.

3.2 On Site.

The following is a description of the facilities proposed on the site:

- The proposed development is a retail service station for the sale of flammable and combustible liquids for automotive use to the general public. It comprises a sales building, a light vehicle covered fuel dispensing area (FDA) and a heavy vehicle covered FDA.
- The light vehicle FDA includes 4x 8 hose multi-product fuel dispensers.
- The heavy vehicle FDA includes 4x dual ultra-high flow diesel fuel dispensers and a number of Adblue (non-dangerous goods) dispensing hoses.
- The Underground Petroleum Storage System (UPSS) consists of 2x 110kL double-contained fibreglass underground storage tanks (USTs) complying with AS 1692-2006.
- An inline, gravity flow, stormwater polishing and spill collection, containment and treatment device/or holding tank shall be installed to collect any potential contamination or spills to prevent hydrocarbons from entering the council stormwater system. This system shall have a minimum spill capacity of 2,500 litres in the event of a fuel tanker compartment rupture as required by AS 1940-2017.
- The UPSS remote fill points are contained within a spill safe fill box and located within the spill catchment area of the heavy vehicle FDA.
- Filling of the underground fuel tanks will be conducted by a tanker that will enter and depart in a forward direction onto the hardstand area and is wholly contained within the boundaries on the property during fuel discharging activities.

- Vapour Recovery Stage 1 is to be installed as part of the UPSS.
- Impervious concrete pavements will be installed on site.

3.3 Hazardous Materials.

The proposed facilities will store:

- 110,000 litres of class 3 PGII flammable liquids (motor spirit)
- 90,000 litres of combustible liquids (diesel fuel)
- 20,000 litres of diesel exhaust fluid (Adblue). Note – This is not classified as a DG under the Australian Dangerous Goods Code (ADGC) and can be ignored in this assessment.

No other bulk hazardous materials have been identified as being stored at the proposed facilities.

4. Site Assessment and Risk Screening

4.1 Fuel Storage.

Proposed Bulk Storage Volumes:

Product	Quantity (litres)	Tank No.	Class and Packages Group
motor spirit (all grades)	110,000	1	3 PG II
Diesel	90,000	2	C1
Ad Blue	20,000	2	n/a

Note: Diesel is a combustible liquid class C1 which is stored on site separately to the motor spirit. It is, therefore, not considered to be potentially hazardous and can be omitted from this assessment. As Adblue is not a DG but rather a water based product, it is not included in this assessment.

4.2 Calculations

SEPP 33 provides a screening method based on broad estimates of the possible off-site effects or consequences from hazardous materials present on site, when locational characteristics are taken into account. Using Figure 9 of "Applying SEPP 33" and measuring separation distances, it can be determined whether further hazard analysis is required. The distances to the site boundaries are measured for:

- The underground tank fill points and
- The fuel dispensers.

The heavy vehicle dispensers are for diesel and not motor spirit so only the separation distances for the dispensers in the light vehicle FDA will be considered.

If proposed separation distances for the calculated quantities of DG are greater than the screening threshold requires then no further analysis is warranted. Risk management relies on adherence to engineering codes and standards.

If the proposed separation distances are less than the screening threshold, further analysis of the hazards is necessary.

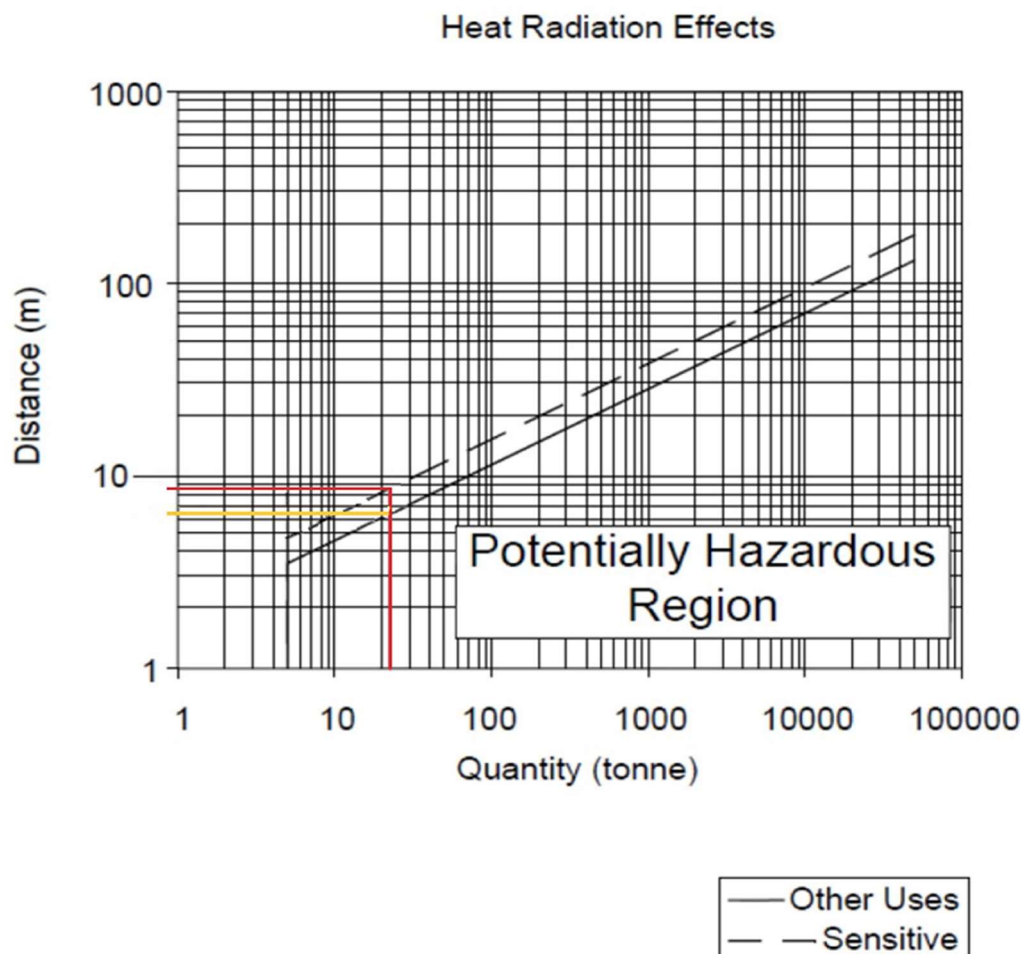
Boundary	Min Distance — Fill Points (metre)	Min Distance – Dispensers (metres)
Northeast	21	42
Southeast	57	84
Southwest	59	17
Northwest	41	15

Total storage capacity is 110,000 litres.

Because the bulk storage of the DG is underground, the storage can be considered less invasive under SEPP 33 so the total storage of flammable liquids to be divided by a factor of 5. This means the assessment can be based upon a volume of 110,000 divided by 5 = 22,000 litres of motor spirit.

Calculated assessable storage volume of hazardous material = 22,000 litres.

4.3 SEPP 33, Figure 9.



When 22,000 litres is plotted on Figure 9 above, we can see that the minimum boundary setback distance from the remote fill points and for the dispensers is:

- 6.5 metres for “Other Uses” and
- 8.6 metres for “Sensitive Uses” (eg. residential uses).

The proposed set back distances far exceed the minimum threshold distances required by SEPP 33. It is therefore appropriate to conclude that the proposed site is deemed to be non-hazardous and that a PHA for further analysis under SEPP 33 is not required.

5. Transport Screening Threshold

"Applying SEPP 33" screening requires an assessment of the frequency of deliveries to and/or from the proposed facility. Thresholds are listed in table 2 and this is replicated below for reference.

It has been advised that the facility's expected throughput of DG is 6 million litres per year. With a typical volume of 50,000 litres per delivery, it can be estimated that 120 deliveries per year will be transported to the site. This can be conservatively rounded to 3 deliveries per week.

Table 2: Transportation Screening Thresholds

Class	Vehicle Movements		Minimum quantity*	
	Cumulative Annual	Peak or Weekly	per load (tonne) Bulk	Packages
1	see note	see note	see note	
2.1	>500	>30	2	5
2.3	>100	>6	1	2
3PGI	>500	>30	1	1
3PGII	>750	>45	3	10
3PGIII	>1000	>60	10	no limit
4.1	>200	>12	1	2
4.2	>100	>3	2	5
4.3	>200	>12	5	10
5	>500	>30	2	5
6.1	all	all	1	3
6.2	see note	see note	see note	
7	see note	see note	see note	
8	>500	>30	2	5
9	>1000	>60	no limit	

Note: Where proposals include materials of class 1, 6.2 or 7, the Department of Planning should be contacted for advice. Classes used are those referred to in the Dangerous Goods Code and are explained in Appendix 7.

* If quantities are below this level, the potential risk is unlikely to be significant unless the number of traffic movements is high.

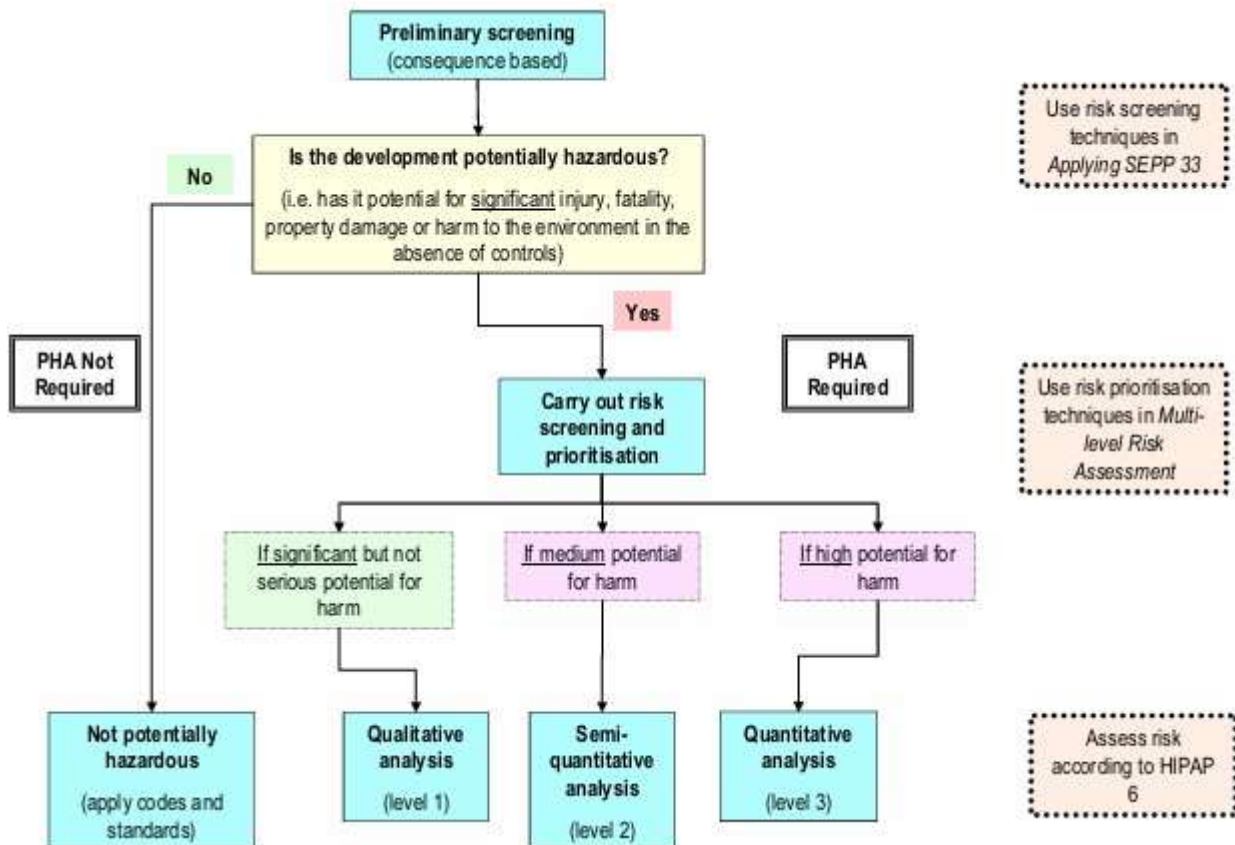
According to the "Transportation Screening Thresholds", up to 45 movements per week or 750 movements per year for fuel is an acceptable threshold before a site is considered to be potentially hazardous. It is clear that the proposed facility is well below the threshold and there is no need for further analysis or a PHA based on the transport screening thresholds.

6. Conclusion

After an assessment of the proposed development under the NSW State Environmental Planning Policy (Resilience and Hazards) and the NSW "Applying SEPP 33" Guidelines, it is deemed that the site is "not potentially hazardous". All boundary setback distances to on-site hazards identified are well within the thresholds required and therefore the design of the facility is assessed to not impose a significant level of risk on the community.

There is no requirement for a Preliminary Hazard Analysis to be undertaken.

7. Appendix A: Multi-Level Risk Assessment Flowchart



8. Appendix B: Risk Assessment Methodology

Risks associated with the hazards identified in this report have been rated using a frequency/severity matrix illustrated below.

RISK LEVEL GUIDE:			FREQUENCY								
0-3 Low, risk level acceptable, no action required.	4-6 Medium, requires monitoring, may require minor remedial action.	7-10 High, requires action.	11 + Unacceptable, activity must stop, immediate action required.	SEVERITY	↓ V LOW EXTREME		V LOW		→	EXTREME	
						1	2	3	4	5	
						2	4	6	8	10	
						3	6	9	12	15	
						4	8	12	16	20	
						5	10	15	20	25	

Risks have been grouped into one or more of the following risk categories:

1. People - The risk is to any person who may be on site whether they are employees, maintenance personnel or the general public accessing the site.
2. Property - The risk is to assets of the owner, operator, supplier or any person accessing the site for any reason.
3. Environment - The risk poses potential harm to the environment including potentially harmful emissions to air, water or ground. Risks can be both catastrophic, and systemic.

The Risk Assessment process is designed to minimise risks to people, property, and the environment by the implementation of the following steps as outlined in AS/NZS ISO 31000 - Risk Management - Principles and guidelines.

- Identify all hazards
 - Assess all the risks with the use of the hierarchy of control measures of:
 - Elimination
 - Substitution
 - Engineering Controls
 - Administration Controls
 - Personal Protection Equipment
- Document, maintain and monitor the control measures implemented on a regular basis to ensure associated risks are kept to a minimum.

9. Appendix C: Site Manifest

Tank/ Storage No.	Type	Description	Capacity (litres)	Type or category of hazardous chemical	Equivalent Dangerous Goods Class/ Division/ Packaging Group	UN Number.	Hazchem
T1	Underground	Unleaded Petrol (91 Octane)	110,000	Flammable Liquids Category 2	3 PGII	UN 1203	3[Y]E
T2	Underground	Automotive Diesel	80,000	Flammable Liquids Category 4	C1	UN 1202	3Z
T2	Underground	Diesel Exhaust Fluid (Adblue)	20,000	n/a	n/a	n/a	n/a
P1	Exchange bottle cage (30 bottles)	Liquefied Petroleum Gas	200	Flammable Gases Category 1	2.1	UN 1075	2YE
other	Small Package Store	Miscellaneous Automotive Fluids	270	Flammable Liquids Category 4	C2	Varies	Varies

10. Appendix D: Hazard Identification and Risk Assessment

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
Section 1 - Operation							
1.1	Vehicle movements on site	Dispenser is struck	Dispenser requires repair or replacement. Spilt fuel is ignited causing injury or death and destruction of property. People in vehicle are injured. Vehicle is damaged. Product is spilt to the environment.	Level 8. People. Property. Environment.	Install bollards around dispensers to provide mechanical protection. Provide line marking and directional signage on the forecourt. Shear valves and flame arrestors are to be provided at the dispenser bases. Install an under canopy spill containment catchment area that drains to a treatment system where the spillage is contained and dealt with in line with specifically formulated emergency procedures.	Dispensers are physically protected. Intent for the correct use of site is made obvious through signage. Risk of spill and explosion is minimised by the installation of shear valves. Risk of fuel spill is minimised through collection of spills by the treatment system.	Level 2-3. People. Property. Environment.

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
		Tanker parked on site is struck	Rupture of tanker compartment causing major spill. Spilt fuel is ignited causing injury or death and destruction of property. Damage to tanker trailer requiring repair. People in vehicle are injured or killed.	Level 10. People. Property. Environment.	Lower speed limit on site to 10km/hour. Implement strict tanker unloading operation controls. Fuel tanker driver to place traffic cones 8m from fill point area and tanker. Place signage at crossovers warning entering traffic of the presence of the tanker. Close off any refuelling positions within 8m of the fuel tanker unloading position. Locate fill point within the under canopy catchment area that drains to a treatment system where the spillage is contained and dealt with in line with specifically formulated emergency procedures.	Low speed of traffic on site allows collisions to be avoided, allows people time to get out of the way of moving vehicles and minimises the effects of collisions. Entering traffic has plenty of warning that there is a tanker on site. Visual cues are in place directing traffic away from the tanker location. The physical presence of the tanker vehicle also provides a deterrent to irresponsible vehicle operation on site. Appropriate procedures and physical controls are in place to enable major spills to be managed as safely as possible. Risk of fuel spill is minimised through collection of spills by the treatment system.	Level 4. People. Property.
		Tanker driver is struck	Tanker driver is injured or killed.	Level 10. People.	Lower speed limit on site to 10km/hour. Provide suitable driver training as to traffic awareness and unloading procedures. Provide tanker drivers with high visibility clothing.	Low speed of traffic on site allows collisions to be avoided, allows people time to get out of the way of moving vehicles and minimises the effects of collisions. Driver is visible and traffic is aware of driver's presence.	Level 5. People.

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
		Tanker transfer hose is struck	Transfer hose is ruptured causing major spill. Spilt fuel is ignited causing injury or death and destruction of property. Transfer hose is damaged requiring repair or replacement.	Level 8. People. Property. Environment.	Implement strict tanker unloading operation controls. Fuel tanker driver to place traffic cones from fill point area and tanker. Place signage at crossovers warning entering traffic of the presence of the tanker. Close off any refuelling positions within of the fuel tanker unloading position. Tanker driver to stand by to monitor fuel transfer operation. Locate fill point within the under canopy catchment area that drains to a treatment system where the spillage is contained and dealt with in line with specifically formulated emergency procedures.	Entering traffic has plenty of warning that there is a tanker on site. Visual cues are in place directing traffic away from the tanker location. The physical presence of the tanker vehicle also provides a deterrent to irresponsible vehicle operation on site. Tanker driver is positioned such that he is protected and can direct traffic away from unloading area. Appropriate procedures and physical controls are in place to enable major spills to be managed as safely as possible. Risk of fuel spill is minimised through collection of spills by the treatment system.	Level 4. People. Property. Environment.
		Person using the site or their vehicle is struck.	Person is injured or killed. Damage to private property on site.	Level 10. People. Property.	Limit speed on site to 10km/h.	Low speed of traffic on site allows collisions to be avoided, allows people time to get out of the way of moving vehicles and minimises the effects of collisions.	Level 2-3. People. Property

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
1.2	Use of dispensers	Smoking at dispenser	Vapour ignites causing injury or death and damage to property.	Level 12. People. Property.	Provide statutory signage at dispensers forbidding smoking on site. Console operator to shut down dispenser if someone is smoking at dispenser.	People are made aware of the danger regarding smoking on site. The situation is able to be controlled by the console operator by shutting down the dispenser. The refuelling area is able to be monitored by console operator from their console. Risk eliminated if there is no smoking on site.	Level 1. People. Property.
		Use of mobile phone or potential source of flame at dispenser	Vapour ignites causing injury or death and damage to property. User is distracted from the task of fuelling.	Level 8. People. Property.	Provide statutory signage/highly visible signage at dispensers forbidding use of mobile phones or other potential source of flame such as pilot lights, gas refrigerators and other electrical device at dispensers. Console operator to shut down dispenser if someone is using a mobile phone or other electronic device at dispenser.	People are made aware of the danger regarding the use of mobile phones and other electronic devices at dispenser. The situation is able to be controlled by the console operator by shutting down the dispenser. The refuelling area is able to be monitored by console operator from their console. Risk eliminated if there is no use of mobile phones and other electronic devices on site.	Level 1. People. Property.
		Filling of non-compliant container(s)	Hydrocarbons may dissolve container causing spillage and releasing vapour. Hydrocarbons may react with container causing fire.	Level 6. People. Property.	Provide statutory signage at dispensers forbidding the filling of non-compliant containers. Console operator to shut down dispenser if someone is attempting to fill non-compliant containers.	People are made aware of the danger regarding the filling of non-compliant container(s). The situation is able to be controlled by the console operator.	Level 3. People. Property.

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
		Misuse of nozzle or leaving dispenser unsupervised while discharging fuel	Spillage of fuel onto forecourt or people causing fire hazard and risk of injury. Damage to nozzle requiring repair or replacement. Release of vapour leading to fire hazard and risk of injury and damage to property. Hydrocarbons could find their way into waterways causing environmental harm.	Level 9. People. Property. Environment.	Provide highly visible warning signage and instructions at the dispenser. Console operator to monitor forecourt and shut down dispenser if the dispenser is not used appropriately. Install nozzles with safety cut out attitude valve Remove latching mechanism from nozzle. Provide signage stating that the latch is not to be locked open and left unattended. Provide readily accessible spill kit on site.	The situation is able to be controlled by the console operator. Risk of fuel spill is minimised through collection of spills by the treatment system. Appropriate procedures and physical controls are in place to enable major spills to be managed as safely as possible.	Level 4. People. Property.

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
		Product spill onto forecourt	Slip hazard leading to risk of injury. Release of vapour leading to fire hazard and risk of injury and damage to property. Hydrocarbons could find their way into waterways causing environmental harm.	Level 9. People. Property. Environment.	Console operator to monitor forecourt activity and immediately clean up any minor spill using the spill kit readily accessible from the dispenser. If a major spill occurs, operator to shut down site and follow emergency procedures. Install an under canopy catchment area that drains to a treatment system where the spillage is contained and dealt with in line with specifically formulated emergency procedures. Provide highly visible warning signage and instructions at the dispenser.	Any minor spills are contained and removed quickly. Risk of fuel spill is minimised through collection of spills by the treatment system. Appropriate procedures and physical controls are in place to enable major spills to be managed as safely as possible.	Level 6. People. Property. Environment.
		Drive-off fuel theft	Loss of income.	Level 8. Property.	Console operator to monitor forecourt/pontoon activity for 'drive offs'. Installation of CCTV monitoring of refuelling positions to capture 'drive offs'/theft.	If a 'drive off' occurs the number plate of the vehicle is recorded and is likely to be witnessed. Incident is recorded and offenders are identified.	Level 4. Property.

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
1.3	Tanker unloading	Minor fuel spill (up to 20l.)	Vapour from spill could ignite causing injury or damage to property. Hydrocarbons could find their way into stormwater system and waterways causing environmental harm.	Level 6. People. Property. Environment.	Provide an emergency spill kit on site that is readily accessible from the dispensers/pumps/fill point. Provide training on its use to site staff and tanker drivers. Fill points are to be located within a spill safe fill box draining back into the fuel system.	Appropriate procedures and physical controls are in place to enable minor spills to be managed as safely as possible.	Level 3. People. Property. Environment.
		Major fuel spill (over 20l.)	Vapour from spill could ignite causing injury or damage to property. Hydrocarbons could find their way into stormwater system causing a potential explosive atmosphere within pipework. Hydrocarbons could find their way into waterways causing environmental harm.	Level 10. People. Property. Environment.	Provide an emergency plan and ensure training of workers in its use. Console operator to shut down site and proceed with emergency plan, evacuate if necessary. Ensure all fill points are installed in the under canopy catchment area that drains to a treatment system. Spillage is contained and dealt with in line with specifically formulated emergency procedures.	Appropriate procedures and physical controls are in place to enable major spills to be managed as safely as possible.	Level 5. People. Property. Environment.

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
		Incorrect product introduced into storage tank	Possible damage to private property caused by use of incorrect fuel.	Level 6. Property.	Ensure tanker drivers are trained in site-specific conditions. Fill points are clearly marked to Australian Standards. Provide tanker driver with correct, up to date fill point sketch. Any discrepancy between the fill point markers and the fill point sketch to be notified and fuel transfer is not to proceed.	Tanker driver can clearly see the product arrangement and has the ability to cross check the fill point arrangement.	Level 3. Property
		Storage tank is overfilled	Potential fuel spillage causing risk of ignition or harm to the environment. Lack of ullage space may cause storage tank to rupture due to thermal expansion of hydrocarbon.	Level 9. Property. Environment.	Ensure product reconciliation is performed daily. Provide accurately calibrated tank dips or auto tank gauging. Tanker driver to confirm product volumes prior to performing a fuel transfer. Provide overfill protection within the tanks.	Overfilling of the tanks becomes very difficult.	Level 3. Property. Environment.
1.4	Console operation	Robbery	Physical and psychological harm to the console operator. Loss of income.	Level 12. People. Property.	Provide jump barriers at counter. Provide CCTV monitoring of the console area. Provide safe haven behind counter for physical protection. Provide duress button behind counter and within safe haven. Provide training to console operators to help recognise suspicious behaviour.	Console operator has the means to protect their self. Level of security has a deterrent effect.	Level 8. People. Property.

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
		Operator is incapacitated during lone shift	Operator may be unable to access emergency medical help. Potential for theft if there is no one visibly on duty.	Level 8. People. Property.	Provide "dead man" system at console.	In the case of incapacitation, emergency services are notified automatically, although the time lapse still represents a risk.	Level 4. People. Property.
1.5	Maintenance access to dispensers/pumps	Maintenance person being struck by vehicle	Maintenance person could be injured or killed.	Level 12. People.	Ensure maintenance personnel use traffic cones and signage to barricade off dispenser. Ensure maintenance personnel use high visibility clothing while on site. Ensure an appropriately qualified observer is present with appropriate training in emergency response. Ensure appropriate work permits are obtained.	The work area and personnel are highly visible to any traffic on site.	Level 4. People.
		Electrocution	Maintenance person could be injured or killed. Equipment is damaged.	Level 12. People. Property.	Ensure any electrical work done on dispensers/pumps is performed by maintenance personnel with suitable qualifications and training. Ensure appropriate work permits are obtained.	Risks to maintenance personnel and equipment are minimised through the use of correctly trained personnel and safe work procedures.	Level 3. People. Property.

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
		Exposure to explosive atmosphere within dispenser housing	Maintenance person could be injured or killed. Possible damage to property.	Level 16. People. Property.	Ensure area around the dispensers/pumps is adequately ventilated and that there are no vehicles parked close by during maintenance. Ensure all potential ignition sources are excluded from the area. Ensure appropriate work permits are obtained.	Vapours are being dispersed. The potential for ignition is greatly reduced.	Level 6. People. Property.
1.6	Maintenance entry into tanks	Exposure to explosive atmosphere	Maintenance person could be injured or killed. Possible damage to property.	Level 10. People. Property.	Only appropriately qualified personnel to access confined spaces. Ensure appropriate entry and work permits are obtained. Ensure all safety clothing and breathing apparatus are used. Ensure an appropriately qualified observer is present with appropriate training in emergency response.	Risks to personnel are minimised through the use of correctly trained personnel and safe work procedures.	Level 4. People. Property.
		Inhalation of vapour	Could result in various health problems relating to respiration and central nervous system, potential for fatality.	Level 10. People.	Ensure breathing apparatus is used. Ensure an appropriately qualified observer is present with appropriate training in emergency response.	Risks to personnel are minimised through the use of appropriate safety equipment and safe work practices.	Level 4. People.

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
		Maintenance person being struck by vehicle	Maintenance person could be injured or killed.	Level 12. People.	Ensure maintenance personnel use traffic cones and signage to barricade off dispenser. Ensure maintenance personnel use high visibility clothing while on site. Ensure an appropriately qualified observer is present with appropriate training in emergency response. Ensure appropriate work permits are obtained.	The work area and personnel are highly visible to any traffic on site.	Level 4. People.
1.7	Customer safety	Customer being struck by tanker or other vehicle	Customer could be injured or killed.	Level 12. People.	Clearly identify entry to shop with pedestrian line marking. Limit speed on site to 10km/h. Keep area clear of trip hazards and unnecessary items. Provide first aid and CPR training to staff. Provide CCTV monitoring at forecourt.	Customer is visible and traffic is aware. Low speed of traffic on site allows collisions to be avoided, allows people time to get out of the way of moving vehicles and minimises the effects of collisions. Activity at the forecourt is monitored and the console operator is made aware of potential danger.	Level 5. People.
		Debris and dust from construction site being blown across to the operating site	Customer could be temporarily distracted causing potential fuel spillage causing risk of ignition or harm to the environment. Customer could be injured or killed.	Level 8. People. Property. Environment.	Dust from construction should be kept to a minimum by wetting of the construction site. Provide protection on the fence to reduce the amount of debris and dust being blown across site. Construction site to implement safe work methods.	Risk of debris and dust travelling across to the operating site causing personal injury, damage to property and harm to the environment is minimised.	Level 3. People. Property. Environment.

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
		Electrocution	Employee could be injured or killed. Equipment is damaged.	Level 12. People. Property.	Circuit RCD protected. Equipment is serviced every six months. Safety training to employees on how to operate electrical equipment. Minimise water where electrical connections are by means of safety procedures	Risks to maintenance personnel and equipment are minimised through the use of correctly trained personnel and safe work procedures.	Level 3. People. Property
Section 2 – The Installation							
2.1	Concrete forecourt/hardstand and compound	Slippery surfaces due to spillage	Possible slip and fall causing injury. Vehicle accessing the site could lose control causing possible injury to persons on site or damage to property.	Level 8. People. Property.	Spill kits are provided on site and are readily accessible from the dispensers/pumps. Ensure all staff is trained in spill response. Forecourt/hardstand surfaces to be designed to be slip resistant.	The time between a spill and clean-up is minimised. Surface provides as much grip as possible.	Level 4. People. Property.
		Trip hazard at kerbs	Possible trip and fall causing injury.	Level 8. People.	Kerbs in paths of travel to be painted in high visibility colour (yellow). Install indicators to Australian Standards. Minimise use of kerbs in areas commonly used by pedestrians.	Trip hazards are visible and their number is minimised.	Level 3. People.

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
2.2	Underground fuel tanks and pipework	Structural failure of tanks and/or pipework	Possibility of hydrocarbon being spilt to ground causing environmental harm.	Level 8. Property. Environment.	The liquid fuel tanks are made from non-corrosive materials. Auto tank gauging and line leak detection is to be provided to tanks and pipework. Provide product reconciliation procedures (auto tank gauging, manual dip). Check tank excavation observation wells regularly. Fuel supply pressure pipework is double.	Should failure occur checks are in place for product reconciliation, leak detections, and the surrounding area is being monitored to minimise harm.	Level 3. Property. Environment.
2.3	Fire extinguishers	Misuse of equipment	May cause extinguisher to fail or run out during emergency. Fire extinguisher discharge would require clean up. Fire extinguisher would require recharging.	Level 6. Property.	Fire extinguishers are visible from the console or security camera. Fire extinguishers are installed in a well-lit area.	Fire extinguishers can be monitored. Location in well-lit area acts as a deterrent to potential misuse. Location where visible increases likelihood of any misuse being witnessed.	Level 4. Property.
		Theft of equipment	Firefighting equipment may be unavailable during an emergency. Cost of replacing fire extinguisher.	Level 6. Property.	Fire extinguishers are visible from the console or security camera. Fire extinguishers are installed in a well-lit area.	Fire extinguishers can be monitored. Location in well-lit area acts as a deterrent to potential theft. Location where visible increases likelihood of any theft being witnessed.	Level 3. Property.
		Failure of equipment	Personnel unable to respond to a fire emergency causing damage to property and possible injury or death.	Level 8. People. Property.	Ensure firefighting equipment is tested regularly to Australian Standards.	If fire extinguishers are required their correct operation is ensured.	Level 2. Property.

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
		Vandalism	Fire extinguisher could fail during emergency.	Level 6. Property.	Fire extinguishers are visible from the console or security camera. Fire extinguishers are installed in a well-lit area.	Fire extinguishers can be monitored. Location in well-lit area acts as a deterrent to potential vandals. Location where visible increases likelihood of any vandalism being witnessed.	Level 3. Property.
2.4	Tank vents	Vents being struck by vehicle	Could result in injury and damage to property.	Level 6. People. Property.	Vents are installed in a protected area away from vehicles in a landscaping area of the site. Install bollards around vents to provide mechanical protection.	It is very unlikely that the vents will be struck.	Level 2. Property.
		Vapour igniting	Could result in injury and damage to property.	Level 8. People. Property.	Vents are installed away from any potential ignition source. Vents are installed to appropriate Australian Standards. Provide signage near the vents forbidding smoking on site.	Risk of ignition is minimal.	Level 2. Property.
		Inhalation of vapour	Vapour inhalation can result in headaches, dizziness, weakness, nausea, blurred vision, shortness of breath and effects to central nervous system.	Level 10. People.	Vents are installed to appropriate Australian Standards. Vents are installed in a well-ventilated location.	The likelihood of vapour inhalation is minimal.	Level 2. People.
2.5	Site Manifest	An emergency situation could occur requiring information of site specific hazards.	Emergency services unable to access site specific information for the hazardous chemical storage in the event of an emergency.	Level 8. People. Property.	Locate the red weatherproof manifest box immediately adjacent the entry to the site from the direction of approach of the emergency vehicles. Ensure the manifest for the site is reviewed at regular intervals.	The manifest is easy to find and accessible. The manifest is up to date with product types and volumes stored on site.	Level 3. People. Property.

No	Hazard	Risks	Consequences	Risk Level and Type	Action	Re-assessment of Consequences	Revised Risk Level
2.6	Emergency Plan	An emergency situation could occur requiring a site specific response.	Workers are unaware of emergency response procedures.	Level 8. People. Property.	Ensure the Emergency Plan for the site is reviewed at regular intervals. Ensure workers on site are trained in the Emergency Plan and records of this training are maintained on site.	In the event of an incident, workers know what procedures are in place and how to respond to minimise the effects of the incident.	Level 3. People. Property.
Section 3 – Demolition and Construction Works in Stage 2							
3.1	Customer safety	Debris and dust from construction site being blown across to the operating site	Customer could be temporarily distracted causing potential fuel spillage causing risk of ignition or harm to the environment. Customer could be injured or killed.	Level 8. People. Property. Environment.	Dust from construction should be kept to a minimum by wetting of the construction site. Provide protection on the fence to reduce the amount of debris and dust being blown across site. Construction site to implement safe work methods.	Risk of debris and dust travelling across to the operating site causing personal injury, damage to property and harm to the environment is minimised.	Level 3. People. Property. Environment.

11. Appendix E: Reference Documents

The design, construction, operation and supply of Hazardous Materials to service stations in NSW shall comply with, but not be limited to, the latest edition of the following policies, regulations, standards and codes.

- NSW State Environmental Planning Policy (Resilience and Hazards) 2021.
- NSW State Environmental Planning Policy 33 Hazardous & Offensive Development Guidelines.
- NSW Protection of the Environment Operations (Clean Air) regulation 2022
- NSW Work Health and Safety Regulation 2017
- NSW EPA Environmental Action for Service Stations
- Protection of the Environment Operations (UPSS) Regulation 2019 (NSW)
- NTC Australian Dangerous Goods Code 7th edition.
- National Construction Code.
- AS1692-2006 Tanks for flammable and combustible liquids.
- AS1940-2017 The storage and handling of flammable and combustible liquids.
- AS4897-2008 Design Installation and Operation of Underground Petroleum Storage Systems.
- AS4977-2008 Petroleum Products - Pipeline, road tanker compartment and underground tank identification.
- AS/NZS60079.10.1-2022 Explosive atmospheres, Classification of areas.
- AS/NZS1841.5-2007 Portable fire extinguishers - Specific requirements for powder type extinguishers.
- AS2444-2001 Portable Fire Extinguishers and fire blankets - Selection and location.
- NSW Code of Practice 2005 for Storage & Handling of Dangerous Goods.

13. Appendix G: Safety Data Sheets

Refer to Mobil Fuels Australian website.

14. Appendix H: About the Author

Mr Wayne Lamb

- 40 years' experience in building design – engineering and architectural
- 35 years as a Fuel Industry Consultant in service station and fuel system design on projects across all Australian states.
- Designed of over 1000 fuel industry projects to date.
- Bachelor of Technology (Civil Engineering)
- Certificate in Identification of Hazardous Areas
- Past member of the Building Designers' Association, Queensland (BDAQ)
- Member of Australian Institute of Dangerous Goods Consultants (AIDGC)
- Past Vice President of the Australian Petroleum Industry Contractors and Suppliers Association, Australia (APICSA)
- Past President of the Petroleum Industry Contractors Association, Queensland (PICA, QLD)
- Active with Australian Convenience and Petroleum Marketing Association (ACAPMA)
- Guest presenter and keynote speaker at numerous State and National Industry conferences.
- Retained as an Expert Witness in NSW, Vic and Qld in relation to service station and fuel system design matters.