

Level 1, 1A Wirraway Street, Taminda NSW 2340 (PO Box 3104) West Tamworth, NSW, 2340 Phone: 02 67620177 Email: nathan@sixhillsgroup.com.au ABN: 43 152 207 479 ACN: 152 207 479

# **Statement of Environmental Effects**

Demolition of an Existing Highway Service Centre and Construction of a new Highway Service Centre (Class 6) -Two (2) Stage Development

> Lot 217, DP 41546 & Lot 7313, DP 1147165 11541 Newell Highway, Narrabri NSW 2390





Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

#### **Sixhills Group Pty Limited**

Level 1, 1A Wirraway Street, Taminda NSW 2340 PO Box 3104 WEST TAMWORTH NSW 2340 Phone: (02) 6762 0177 nathan@sixhillsgroup.com.au www.sixhillsgroup.com.au

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This Statement was prepared in order to demonstrate compliance with applicable environmental planning instruments as well as local plans and strategies.

Ref.: 18033C

Issue	Rev.	Date	Author	Approved	Issued To
Draft	1	4 March 2021	N Bartlett	S Hill	Elvin Robb, Project Director The Thistle Company of Australia P/L
Final	1	8 March 2021	N Bartlett	E Robb	Narrabri Shire Council



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

	Submission of a Statement of Environmental Effects (SoEE) Prenared under the Environmental Planning and Assessment Act 1979
SoEE Prepared by	
Name	Nathan Bartlett - Manager Town Planning
Qualifications	B. Urban and Regional Planning (UNE)
	Diploma Project Management (SYD)
	Certificate IV Frontline Management (TAFE NSW)
	Member Planning Institute Australia (MPIA)
Address	Sixhills Group Pty Limited
	PO Box 3104
In recreat of	Tamworth NSW 2340
in respect of	-
Proponent Name	The Thistle Company of Australia P/L
Land on which activity is to	11541 Newell Highway
be carried out	Narrabri NSW 2390
	Lot 217, DP 41546 & Lot 7313, DP 1147165
Proposed Development	Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (2 Stages)
Statement of Environmental	A SoEE is attached.
Effects	
	-
Certificate	I certify that I have prepared the contents of this Statement and to the
	best of my knowledge it is true in all material particulars and does not,
	by its presentation or omission of information, materially mislead.
Signature	
Nome	
Name	Nathan Bartlett
	Manager, Town Planning
	Sixiniis Group Pty Linnited
Date	8 March 2021
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Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

## **1 DEVELOPMENT APPLICATION OUTLINE**

Proposed	Development:	
Development:	Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)	
	Subject Land:	
	11541 Newell Highway, Narrabri NSW 2390	
	Lot 217, DP 41546	
	Lot 7313, DP 1147165	
Proponent:	Proponent:	
Proponent:	<b>Proponent:</b> The proponent for the development is The Thistle Company of Australia P/L.	
Proponent: Estimated	Proponent:The proponent for the development is The Thistle Company of Australia P/L.Stage 1: \$500,000.00Stage 2: \$4,500,000.00	

## 2 EXECUTIVE SUMMARY

## 2.1 Background

This Statement provides a description of the subject site and surrounds, the characteristics of the proposed development and an assessment of the perceived impacts of the proposal for those relevant matters contained within Section 4.15 of the *Environmental Planning and Assessment Act* 1979, as amended.

## 2.2 Proposal & Permissibility

This development application proposes two (2) stage development that is described as follows:-

#### Stage 1

This stage involves the demolition of an existing highway service centre on the subject land (refer Figure 1), and seeks development consent for the following works:

- Demolition of the existing buildings and structures;
- Removal of the existing fuel systems and infrastructure, completion of a soil contamination assessment and remediation of land (if required); and
- Removal of concrete pavements within the private property, including provision for stockpiling this material and/or on-site crushing.

A separate development application shall be lodged in the near future for the redevelopment of the existing highway service centre under existing use rights, to include a new facility comprising fuel sales and associated canopies, a shop, a restaurant, driver's amenities, truck parking, car parking and signage.



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#### Stage 2

Stage 2 of the proposal concerns the construction of a new 'highway service centre' on the subject land. Development consent was granted for the existing land use via Development Application IDO No. 6/1979, which approved the construction of a trucking station and restaurant on portion of travelling stock route 941 and 1223, Parish of Cooma, County of Whiee on 22 February 1980.

The subject allotment is zoned *RU1 Primary Production* pursuant to the provisions of the *Narrabri Local Environmental Plan* 2012. As a 'highway service centre' is prohibited in the RU1 zone, the development operates under existing use rights pursuant to the *Environmental Planning and Assessment Act 1979* and *Environmental Planning and Assessment Regulation 2000.* To this end, this application proposes the the construction of a new highway service centre pursuant to Clause 41 of the Regulation, to include a new facility comprising fuel sales and associated canopies, a shop, a restaurant, driver's amenities, truck parking, car parking and signage. This application also proposes the erection of a new pylon sign on Lot 7313, DP 1147165. As this property is classified as a Travelling Stock Route (TSR), landowners consent for lodgement of this development application has been provided by NSW Department of Industry – Land and Water. Existing access and egress locations will remain unaltered.

## **3** SUBJECT SITE AND LOCALITY

## 3.1 Land Titles

The development site is described as Lot 217, DP 41546 and is located at 11541 Newell Highway, Narrabri in proximity to the junction of the Newell and Kamilaroi Highways. The allotment has an area of approximately 2.23 hectares and derives access from the Newell Highway via Lot 7313, DP 1147165, which is listed as Crown Land. Owner's consent has been obtained from the Crown for this application for Lot 7313, DP 1147165, and is attached in **Appendix A**.

## 3.2 Existing Development & Land Use Context

Development consent was granted via Development Application IDO No. 6/1979 for the construction of a trucking station and restaurant on portion of travelling stock route 941 and 1223, Parish of Cooma, County of Whiee on 22 February 1980. The Deposited Plan identified as Lot 217, DP 41546 was created on 22 January 1981 and is attached in **Appendix B**.

Given the date of the development consent, it is anticipated that the existing land use was approved via an Interim Development Order. The earliest Local Environmental Plans that applied in the local government area of Narrabri are *Narrabri Local Environmental Plan No. 2*, gazetted on 6 June 1986 and *Narrabri Local Environmental Plan 1992*, gazetted on 24 December 1992.

The allotment is improved by the following:

- Fuel sales;
- Restaurant;
- Truck parking, rest area and amenities.

Existing development within the locality of the subject site includes the Narrabri Fire Control Centre (east), Woodham Petroleum Services Pty Limited (north east) and the Narrabri Sub-Depot (south east). The nearest residential receptor is approximately 200 metres north of the proposed demolition site and is separated by Kelvin Vickery Avenue and screening provided by existing vegetation.



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FIGURE 1 - AERIAL VIEW OF THE SUBJECT LAND, 2011

The subject allotment is landlocked and is completely surrounded by the TSR affecting Lot 7313, DP 1147165 (refer Survey Plan in **Appendix C**). Access to the subject land is derived from the Newell Highway A39 and traverses the TSR as demonstrated by the aerial and cadastral images included as Figures 2 and 3, overleaf:



FIGURE 2 - CADASTRAL IMAGE OF 11541 NEWELL HIGHWAY, NARRABRI NSW 2390 (LOT 217, DP 41546)



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FIGURE 3 - AERIAL IMAGE OF 11541 NEWELL HIGHWAY, NARRABRI NSW 2390 (LOT 217, DP 41546)

In accordance with the Maps accompanying the NLEP 2012, the subject site is classified as being prone to inundation by flooding and as such, this matter has formed a consideration during the preparation of the DA. The land is not improved with any items of environmental heritage and is not subject to any additional restrictions (including a floor space ratio and restrictions on building height). A land zoning map is included as Figure 4, to provide context of the surroundings:



FIGURE 4 - LAND ZONING MAP, NARRABRI LEP 2012



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## **3.3 Existing Use Rights**

The subject allotment is zoned *RU1 Primary Production* with a minimum lot size (MLS) of 100 hectares pursuant to the provisions of the *Narrabri Local Environmental Plan 2012* (NLEP 2012). Existing land uses can be satisfactorily classified as a 'highway service centre', which is defined in the dictionary of the NLEP 2012 as follows:

*highway service centre* means a building or place used to provide refreshments and vehicle services to highway users. It may include any one or more of the following:

- (a) a restaurant or cafe,
- (b) take away food and drink premises,
- (c) service stations and facilities for emergency vehicle towing and repairs,
- (d) parking for vehicles,
- (e) rest areas and public amenities.

It is considered that this definition also reflects the intent of the original approval, which permitted the erection of a 'trucking station' and 'restaurant'. It is noted that a 'highway service centre' is prohibited in the RU1 zone.

The *Environmental Planning and Assessment Act* 1979 (hereafter referred to as 'the Act') is the principal piece of legislation regulating the assessment and determination of development applications in NSW. Section 4.65 of the Act describes existing uses as lawfully commenced uses which are subsequently prohibited by an environmental planning instrument. The underlying purpose of defining existing uses is to control historical and now non-conforming uses, allowing such uses to continue regardless of alterations to zoning and / or land use tables.

An existing use is defined by Section 4.65 of the Act which provides:

In this Division, existing use means:

- (a) the use of a building, work or land for a lawful purpose immediately before the coming into force of an environmental planning instrument which would, but for Division 4 of this Part, have the effect of prohibiting that use, and
- (b) the use of a building, work or land:
  - *i.* for which development consent was granted before the commencement of a provision of an environmental planning instrument having the effect of prohibiting the use, and
  - *ii.* that has been carried out, within one year after the date on which that provision commenced, in accordance with the terms of the consent and to such an extent as to ensure (apart from that provision) that the development consent would not lapse.

As development consent was granted via Development Application IDO No. 6/1979, the proposed development complies with the definition of an 'existing use' as detailed by Section 4.65(b) of the Act.

Section 4.66 of the Act allows for the continuance of an existing use, although it does not authorise any alterations, extension, rebuilding or intensification of the use. However, Section 4.67 states that the *Environmental Planning and Assessment Regulation 2000* (hereafter referred to as 'the Regulation') may make provision for or with respect to an existing use, as follows:

- (a) the carrying out of alterations or extensions to or the rebuilding of a building or work being used for an existing use, and
- (b) the change of an existing use to another use, and
- (c) the enlargement or expansion or intensification of an existing use.
- (d) (Repealed).

Section 4.67 also states that the provisions of any environmental planning instrument (for example an LEP) that derogate from the existing use rights provisions have no force or effect whilst existing use rights remain.



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Part 5 of the Regulation relates to existing uses and aims to regulate their operation. Clause 41 states that an existing use may be enlarged, expanded or intensified, or be altered or extended, or be rebuilt (emphasis added):

#### 41 Certain development allowed

(cf clause 39 of EP&A Regulation 1994)

- 1) An existing use may, subject to this Division:
  - (a) be enlarged, expanded or intensified, or
  - (b) be altered or extended, or
  - (c) be rebuilt, or
  - (d) be changed to another use, but only if that other use is a use that may be carried out with or without development consent under the Act, or
  - (e) if it is a commercial use—be changed to another commercial use (including a commercial use that would otherwise be prohibited under the Act), or
  - (f) if it is a light industrial use—be changed to another light industrial use or a commercial use (including a light industrial use or commercial use that would otherwise be prohibited under the Act).
- 2) However, an existing use must not be changed under subclause (1) (e) or (f) unless that change:
  - (a) involves only alterations or additions that are minor in nature, and
  - (b) does not involve an increase of more than 10% in the floor space of the premises associated with the existing use, and
  - (c) does not involve the rebuilding of the premises associated with the existing use, and
  - (d) does not involve a significant intensification of that existing use.
  - (e) (Repealed)
- 3) In this clause:

commercial use means the use of a building, work or land for the purpose of office premises, business premises or retail premises (as those terms are defined in the Standard Instrument).

light industrial use means the use of a building, work or land for the purpose of light industry (within the meaning of the standard instrument set out in the Standard Instrument (Local Environmental Plans) Order 2006).

**NOTE**: The restrictions relating to an increase in floor space or intensification of an existing use referenced in Clause 41(2) of the Regulation are not considered to apply to the subject land, as a change in use is not sought in this instance. It is the intention of the landowner that the subject land continue to be utilised as a highway service centre.

Clause 42 of the Regulation requires that development consent be granted for any enlargement, expansion or intensification of an existing use, and that the enlargement, expansion or intensification:

- must be for the existing use and for no other use, and
- must be carried out only on the land on which the existing use was carried out immediately before the relevant date.

Clause 43 of the Regulation requires that development consent be granted for any alteration or extension of a building or work used for an existing use, and that the alteration or extension:

- must be for the existing use of the building or work and for no other use, and
- must be erected or carried out only on the land on which the building or work was erected or carried out immediately before the relevant date.

The NSW Land and Environmental Court has collated a list of non-statutory planning principles from relevant case law which relates to issues that frequently arise in merit-based assessments of development applications. The redevelopment of a site with existing use rights was considered by *Roseth SC in Fodor Investments v Hornsby Shire Council* [2005] NSWLEC 71 and states that provisions of planning instruments that derogate (i.e. detract) from Regulation 41(1) do not apply to the assessment of applications on sites



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with existing use rights. Therefore, the consequence of preserving existing use rights is that zone objectives and planning controls that limit the size of a proposal (i.e. floor space ratio, height and setback) have no application, and only general town planning principles apply to the assessment of a development application (pursuant to Section 4.15 of the Act).

*Roseth SC* found in *Fodor Investments v Hornsby Shire Council* [2005] NSWLEC 71 that four questions usually arise in the assessment of existing use rights development, namely:

- How do the bulk and scale (as expressed by height, floor space ratio and setbacks) of the proposal relate to what is permissible on surrounding sites?
- What is the relevance of the building in which the existing takes place?
- What are the impacts on adjoining land?
- What is the internal amenity?

As redevelopment of the subject land proposes the continuation of the existing highway service centre land use, the abovementioned planning principles shall be addressed by this Statement of Environmental Effects.

## 4 THE PROPOSAL

The subject allotment is zoned *RU1 Primary Production* pursuant to the provisions of the *Narrabri Local Environmental Plan 2012*. Stage 1 of the proposal seeks approval for demolition of existing development on the subject site. As a 'highway service centre' is prohibited in the RU1 zone, Stage 2 of the proposal operates under existing use rights (via Development Application IDO No. 6/1979) pursuant to the *Environmental Planning and Assessment Act 1979* and *Environmental Planning and Assessment Regulation 2000*. This component of the application comprises the construction of a new highway service centre pursuant to Clause 41 of the Regulation, to include a new facility comprising fuel sales and associated canopies, a shop, a restaurant, driver's amenities, truck parking, car parking and signage.

As discussed, the subject development application proposes two (2) stages involving Stage 1) the demolition of the existing highway service centre; and Stage 2) the construction of a new highway service centre on the subject land. Each stage of the proposed development is explained in further detail as follows:-

## 4.1 Proposed Stage 1 - Demolition

The proposed works for Stage 1 of the development include:

- Demolition of the existing buildings and structures;
- Removal of the existing fuel systems and infrastructure (including fuel tanks and fuel lines), completion of a soil contamination assessment and remediation of land (if required); and
- Removal of concrete pavements within the private property, including provision for stockpiling this material and/or on-site crushing.

There will be no changes to the current entry and exit driveways passing through the Crown Lands Reserve, and no additional clearing required.

#### 4.1.1 Stages of the Demolition

There are six (6) Stages of the proposed demolition and these are identified in three (3) groups as follows:-

- 1) Stage 1a Fuel System Removal.
- 2) Stage 1b Building Demolition.

Both these stages will likely involve occupation of the site for shorter periods (3-5 days) by specific plant/equipment.



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#### 3) Stages 1-4 - Concrete Pavement Removal

These four stages will see site establishment of the crushing unit, cutting rig and heavier plant for a period of 6-8 weeks.

Each of the 6 discretely identified stages are anticipated to take up to 2 weeks each to complete, with another week initially for site setup and a final extra week of site finishing, thus a total up to 14 weeks.

The fuel infrastructure decommissioning and removal will be undertaken by a specialist contractor with necessary authorisations. An accredited environmental consultant will undertake coincident inspections and soil sampling. This may mean specific actions as directed by the consultant at the time of inspection. Stockpiling of soil may be appropriate, as stated on drawing sheets 1 and 2, under existing canopy structures to protect from the weather and minimise any contamination risk.

#### Adopted Development Standards of the Proposal

During demolition works, the following standards will be satisfied:

- Demolition work shall be limited to the following hours in order to prevent unreasonable disturbance to the amenity of the area:
  - Monday Friday 7.00 am 5.00 pm;
  - Saturday 8.00 am 1.00 pm if audible at adjoining residential properties, otherwise 7.00 am 5.00 pm;
  - No work to be carried out on Sunday on public holidays if audible at adjoining residential properties.
- All demolition work shall be carried out in accordance with AS 2601-2001 The demolition of structures. There is no known asbestos in the building; however, special note will be given to this possibility during demolition works.
- Decommissioning of all Underground Petroleum Storage Systems (UPSS) will be undertaken in accordance with the Occupational Health and Safety (Dangerous Goods) Regulation 2017 and applicable SafeWork NSW requirements. The consultant engaged for the decommissioning process will ensure the site is investigated for contamination and a validation report will be prepared for the site for submission to Council in accordance with the requirements of clause 24 of the UPSS Regulation.
- Removal of all UPSS, including associated fuel lines, is to be undertaken by suitably qualified contractors. Following removal of the UPSS, the subject land will be tested to determine the extent of any contamination on site. Should contamination that requires remediation to ensure that it is suitable for its future intended use be detected, remediation works shall be completed.

All landscaping of the land will be undertaken at the future development stage of the project where a DA will be lodged for redevelopment of the site to establish a new highway service centre. In the interim the surface of the site will be re-graded to facilitate the shedding of water and to prevent ponding. That is, all excavation will be reinstated with sound compacted selected fill and the appropriate erosion mitigation measures will be undertaken during and upon completion of all earth works. A plan of the proposed demolition is attached as **Appendix D** for further information.



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## 4.2 Proposed Stage 2 - Construction

Stage 2 of the subject development application proposes the construction of a new highway service centre on the subject land, pursuant to Clause 41 of the Regulation. Development works of this stage include:-

- New travel centre with a shop, restaurant incorporating indoor and outdoor dining areas, gym and amenities (including showers);
- Outdoor bin and storage compound to the north of the travel centre building;
- Refuelling areas (with canopies and business identification signage) that will service light and heavy rigid vehicles;
- Installation of an oil / water / solid separator system under the canopy areas, which will remove free floating hydrocarbons like oil, diesel and hydraulic fluid as well as suspended solids from wastewater;
  - Truck and car parking and driveway hardstand areas, as follows:
    - 28 car parks, including a disabled car park and shared zone;
    - 25 truck parks;
    - 12 truck / bus parks; and
    - 9 caravan / mobile home parks;
- Site landscaping;
- Upgrading of the existing crossovers to Newell Highway;
- Erection of new illuminated pylon signage on Lot 7313 DP 1147165.

The development will provide greater access and parking for trucks (i.e. articulated, B-double & B-triple), buses and caravans / campervans. Operating hours of the highway service centre will remain unchanged from the original operation, being 24 hours per day, seven (7) days per week.

New fuel tanks and lines are proposed to be installed as part of development works. This infrastructure shall comply with AS4897 *The design, installation and operation of underground petroleum storage systems,* AS1940 *Storage and handling of flammable and combustible liquids* and NSW *Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019.* 

Plans of the proposed development (Stage 2) are attached as **Appendix E** and a comparison of the proposed development with the existing use is detailed below:

Matter	Existing Use	Proposed Development	
Land use	Highway service centre comprising restaurant, take-away food and drink premises, service station, parking, rest areas and amenities	Highway service centre comprising restaurant, take-away food and drink premises, service station, parking, rest areas and amenities	
Building footprint	Calculated gross floor area of approximately 475 square metres	Gross floor area of approximately 471.5 square metres	
Development details Public dining area – 20 seats Truck driver's area – 10 seats Take-away food and drink premises: Café service counter Convenience retail store		<ul> <li>Restaurant:</li> <li>Public dining area – 30 seats</li> <li>Truck driver's area – 16 seats</li> </ul> Take-away food and drink premises: <ul> <li>Café service counter</li> <li>Convenience retail store</li> </ul>	
	<ul> <li>Service station:</li> <li>4 motor spirit pumps</li> <li>4 diesel pumps</li> <li>5 underground steel fuel tanks (3 x 40kl &amp; 2 x 55kl) = 230,000 litres</li> </ul>	<ul> <li>Service station:</li> <li>3 motor spirit pumps</li> <li>5 diesel pumps</li> <li>3 underground fibreglass fuel tanks (1 x 55kl, 2 x 70kl) = 195,000 litres.</li> </ul>	



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	<ul> <li>Rest areas and amenities:</li> <li>Public female – 3 WCs</li> <li>Public male – 2 WCs, urinal</li> <li>Driver's female – 2 WCs, 1 shower</li> <li>Driver's male – 2 WCs, urinal, 3 showers</li> <li>Driver's lounge (currently not in use)</li> </ul>	<ul> <li>Rest areas and amenities:</li> <li>Public female – 3 WCs</li> <li>Public male – 2 WCs, 2 urinals</li> <li>Driver's unisex – 2 WCs, 1 shower</li> <li>Driver's male – 2 WCs, 2 urinals, 4 showers</li> <li>Driver's lounge (common area)</li> <li>Driver's laundry (wash and dry)</li> <li>Driver's gym (treadmill and bench)</li> </ul>
Car parking	<ul> <li>18 car spaces</li> <li>6 staff spaces</li> <li>8 car and towed caravan / trailer</li> <li>spaces</li> <li>26 truck spaces</li> </ul>	21 car spaces 3 staff spaces 12 car and towed caravan / trailer spaces 38 truck spaces
Traffic	Entry and exit driveway crossovers exist from the Newell Highway, passing through a TSR.	Existing entry and exit crossover locations will be retained, with some reconstruction of the pavement surface to occur as part of development works.
	The existing premises attracts passing vehicles from the Newell Highway.	The proposed development will continue to attract passing vehicles from the Newell Highway; however, site improvements are expected to result in an extended stay.
Environment	Property is undeveloped on the northern end, and contains a small number of maturing trees and saplings / scrub	The proposed development shall utilise the full extent of the subject land. Three (3) mature trees have been accommodated in the design of the proposal
	Stormwater drainage is discharged to the edge of the property, with overland flow through channels in an adjoining reserve.	Catchments are proposed to be established in pavements, draining via systems to points of discharge. Stormwater management design will control flows and address treatment to
	No stormwater discharge control or quality improvement management devices / systems are present on the subject land.	pavement runoff.
	2 pylon signs are located close to access driveways	One pylon sign shall replace the existing signage, to be located adjacent to the entry to the subject land.



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The Newell Highway is a state declared road and forms part of a National Highway Network. As such, Stage 2 of the subject application is required to be referred to the Roads and Maritime Service (RMS), and a Traffic Impact Assessment (attached as **Appendix F** to this Statement) has been submitted in order to address the RMS' requirements. The following matters are detailed in the Traffic Impact Assessment (TIA):-

- Car parking supply and design;
- Provision for access;
- Heavy vehicle access, circulation and parking; and
- Impacts on the Newell Highway.

Onsite activity noise emissions (i.e. vehicle activity, patron activity, deliveries, waste collection and mechanical plant) have the potential to impact upon the offsite noise sensitive receivers. The nearest noise sensitive receivers to the development include dwellings to the southeast across Newell Highway, to the southwest, to the northwest and to the northeast across Kelvin Vickery Avenue. To address this matter, an Environmental Noise Impact Report has been prepared in accordance with the NSW "Noise Policy for Industry" to ensure an acceptable level of acoustical amenity can be achieved. A copy of the Report is attached as **Appendix G** to this Statement.

The Environmental Noise Impact Report provides recommended acoustic treatments in order to ensure that the proposed development will generally operate within acceptable levels of the adopted criterion. The proponent intends to implement these recommendations, as follows:

- The facility will operate 24 hours per day, seven (7) days per week;
- Waste collection will be limited to the daytime period between 7am and 6pm;
- An acoustic barrier shall be constructed as detailed by the plans attached as **Appendix E** to this Statement;
- Refrigerated trucks shall be restricted to the "Noise Protection Zone" via the installation of internal signage. This matter shall also be managed by staff where required;
- The tyre pressure alarm will be visual (not audible) or set to a noise level less than 60 dB(A) at 1m;
- The finished treatment of driveway and car parking areas shall prevent tyre squeal;
- Drainage over trafficable areas will be suitably maintained throughout the operation of the development;
- Mechanical plant will be designed and installed to comply with Section 4 of the acoustic report.

## **5 DEVELOPMENT STANDARDS**

The preparation of this DA has been undertaken with consideration of the relevant criteria listed in Section 4.15 of the *Environmental Planning and Assessment Act 1979*, as amended. However, as detailed in Section 3.3 of this Statement, the subject land is afforded with existing use rights. The redevelopment of a site with existing use rights was considered by *Roseth SC in Fodor Investments v Hornsby Shire Council* [2005] NSWLEC 71 and states that provisions of planning instruments that derogate (i.e. detract) from Regulation 41(1) do not apply to the assessment of applications on sites with existing use rights. Instead, it was found that four questions usually arise in the assessment of existing use rights development, namely:

- How do the bulk and scale (as expressed by height, floor space ratio and setbacks) of the proposal relate to what is permissible on surrounding sites?
- What is the relevance of the building in which the existing takes place?
- What are the impacts on adjoining land?
- What is the internal amenity?

An assessment of the proposed development against these questions is detailed below.

How do the bulk and scale (as expressed by height, floor space ratio and setbacks) of the proposal relate to what is permissible on surrounding sites?

As demonstrated by Figure 4 in this Statement, the subject site, as well as land in the immediate vicinity, is zoned *RU1 Primary Production*. An industrial area (IN1) is located approximately 170 metres to the east of



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the allotment, and a residential zone (R1) is located approximately 120 metres to the north-west. The LEP does not provide restrictions in terms of building height or floor space ratio for any land zoned RU1, IN1 or R1. Building setbacks are detailed in the Development Control Plan – Building Line document, which states:

- Land zoned 1(a) General Rural [RU1 Primary Production] under a Local Environmental Plan applicable to the subject land Council recommends a minimum distance from a gravel/natural earth road of 200 metres.
- All other buildings are to be erected a minimum of 6m from the front boundary of an allotment.

As the proposed development derives access from a sealed road, it is expected that a 6 metre building setback applies to the subject land as well as surrounding allotments. The redeveloped highway service centre will comply with this building setback, thereby retaining consistency with the development standard.

#### What is the relevance of the building in which the existing takes place?

The existing highway service centre has been strategically located in proximity to junction of the Newell and Kamilaroi Highways. As detailed in Section 4 of this Statement, the new development is very similar in scale to the existing land use. However, current and future usage of the existing premises is influenced by the degraded condition and operation of the facility. In this regard, patrons may elect to use alternate facilities rather than use dated amenities, leaving under-utilised showers, toilets, etc. It is expected that the proposed development will restore the capability of the centre to the original level and provide additional heavy vehicle parking.

#### What are the impacts on adjoining land?

As detailed by this Statement and attached Appendices (including Traffic Impact Assessment, Environmental Noise Impact Report and Flood Impact Assessment), the proposed development has been designed in order to be cognisant of surrounding land uses. Potential impacts on adjoining land have been mitigated where possible.

It is anticipated that redevelopment of the subject land will result in improved outcomes for the safety of the surrounding road network. In this regard, trucks that currently park overnight on nearby road shoulders and verges will be able to be suitably accommodated on the subject land.

#### What is the internal amenity?

Approval of this development application and realisation of the proposal will restore the capacity of the existing site and is expected to result in an increase to internal amenity for clientele.

## 5.1 State Environmental Planning Policies (SEPPs)

#### 5.1.1 State Environmental Planning Policy No. 2020 – Koala Habitat Protection

This Policy applies in the Narrabri Shire Council local government area to land that is listed in Schedule 1 (i.e. Northwest Slopes) of the SEPP 2020, and land that has an area of more than 1 hectare. Therefore, the provisions of this Policy require consideration as part of the proposed development. This environmental planning instrument encourages the conservation and management of natural vegetation areas that provide habitat for koalas.

#### Stage 1 - Demolition

This development includes demolition of an existing built environment and <u>does not involve the clearing</u> <u>or removal of any native vegetation</u>. The mitigation measures proposed for the demolition are in accordance with the provisions of the SEPP 2020. The proposed development is expected to have low or no direct impacts on Koala's or their habitat. The SEPP 2020 outlines certain criteria for development requiring approval and is addressed in *Stage 2 Construction* of the development. The criteria and the site application for this stage are listed below.



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#### Stage 2 - Construction

Before a council may grant consent to a development application for consent to carry out the development on the subject land, the council must be satisfied as to whether or not the land is a potential koala habitat.

The proposed development does not involve the removal of any existing mature trees or native vegetation. The Biodiversity offset scheme clearing threshold for the site is 1 hectare. The impact area is expected to be approximately 0.94 ha metres and therefore does not trigger the Biodiversity Conservation Act as the total disturbance area is less than the clearing threshold of 1 hectare. The Koala Habitat Data Map 2019, provided by the *Department of Planning, Industry and Environment,* also confirms that no Koalas have been recorded over the subject land and is therefore identified as not having core koala habitat. Furthermore, the proposed development is not expected to impede Koala movements in the area.

Additionally, significant disturbance and modification of the natural environment has occurred on the subject land as a result of historic land uses. In this regard, the majority of the subject land has been previously cleared to accommodate the existing highway service centre, with only scattered vegetation (comprising a small number of maturing trees and saplings / scrub) remaining on the northern property boundary. The proposal accommodates the retention of three (3) mature trees. However, the preparation of the remainder of the site for reconstruction (e.g. demolition, excavation, site drainage, pavement sub-grading) will necessitate that all other minor saplings, shrubs, scrubby plants, etc. be removed.

Considering the nature of the vegetation on the subject land as well as the location of the allotment, the proposed development is expected to comply with the intent of the provisions of SEPP 2020.

#### 5.1.2 State Environmental Planning Policy No. 33 – Hazardous and Offensive Development

This Policy applies in the Narrabri Shire Council local government area and its purpose is to provide definitions for potentially hazardous industry and potentially offensive industry and to apply suitable planning provisions for such land uses. The proposal relates to two (2) stages - 1) the demolition of existing development and 2) the construction of a new highway service centre on the land.

#### 5.1.2.1 Stage 1 - Demolition

The impacts during the course of the demolition are negligible and short term. It is expected that timber, metal and concrete will generally be the materials to be removed from the premises. However, there is the potential for asbestos and fuel contaminates to be revealed during the course of demolition. The following information provides the appropriate measures to be implemented during demolition.

#### Asbestos

Should asbestos be identified as being present appropriate action will be undertaken in accordance with the provisions of the legislation (POEO Act 1997, WH&S Act 2011) and an asbestos management plan will be established and initiated.

#### Soil Contamination

In relation to the potential contamination of soil it is proposed that testing will occur upon the removal of the existing concrete slabs. This will expose the natural ground below, providing an opportunity for an invasive soil test for contaminates. At this time, a test will be coordinated prior to the removal of any soil. Council staff will be invited to review the preliminary investigation and soil on-site. If contaminates are found a comprehensive investigation and remediation plan will be pursued.

The removal of any contaminates relating to the underground storage tanks will be undertaken in accordance with the *Guidelines for Implementing the Protection of the Environment Operations* (Underground Petroleum Storage Systems) Regulation 2019 issued by NSW Department of Environment, Climate Change and Water (refer **Appendix H**). The demolition works carried out on the site are governed by the abovementioned legislative requirements. Therefore, the actions of all procedures which will follow



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the implemented guidelines are controlled to ensure the demolition will not become hazardous or offensive to the immediate or surrounding environment.

#### 5.1.2.2 Stage 2 - Construction of Highway Service Centre

An assessment of Stage 2 of the proposed development has been undertaken against the provisions of *State Environmental Planning Policy No. 33 – Hazardous and Offensive Development* (SEPP No. 33) and the *Hazardous and Offensive Development Application Guidelines: Applying SEPP 33* ('the Guidelines') published by the NSW Department of Planning. The following pertinent points are noted:

- Petrol flammable liquid 3PGII flammable liquid one underground compartmented storage tank 55kl maximum quantity;
- Diesel combustible liquids C1 PGIII (however 3 PGII as the diesel is stored in proximity to petrol) two underground compartmented storage tanks 140kl maximum quantity.

The total quantity of diesel and petrol is approximately 165 tonnes.

At the closest point, the underground tanks are located approximately 32.5 metres from the property boundary.

*Figure 9: Class 3PGII and 3PGIII Flammable Liquids* of the Guidelines specifies quantity and distance requirements for potentially hazardous development. Based on the data above, the proposed quantity of the petrol and diesel underground storage tanks (138 tonnes) and the distance to the boundary (32.5 metres), the proposed development is outside the potentially hazardous region. Therefore, based on storage amounts, the proposed development is not defined as potentially hazardous or a potentially hazardous industry.

Furthermore, the proposed transportation of the diesel and petrol Cl 3PGII Flammable Liquids does not exceed the thresholds specified in *Table 2: Transportation Screening* of the Guidelines, as detailed below:

Dangerous Goods	SEPP 33 Screening Threshold		Proposed	
Class	Annual cumulative	Peak weekly	Annual cumulative	Peak weekly
3PGII (Flammable	>750	>45	175	5
Liquid)				

In conclusion, the proposed development, being the construction of a highway service centre, is not considered to be potentially hazardous or a hazardous industry as the petrol and diesel proposed to be stored on the subject site falls below the both the thresholds for storage and transportation of Cl 3PGII Flammable Liquids, as specified within the Guidelines. In this regard, SEPP No. 33 does not apply to the proposed development and the preparation of a preliminary hazard analysis is not required in this instance.

#### 5.1.3 State Environmental Planning Policy No. 55 - Remediation of Land

This Policy requires consideration of whether land is suitable for a proposed use having regard to any known or potentially contaminating land use activities, as follows:-

Clause	Subject	Comments
7	Contamination and need for remediation to be considered in determining development applications	The subject land has historically been utilised as a 'Highway Service Centre'. The development site is not listed on the NSW Environment Protection Authority's online register of Records under Section 58 of the <i>Contaminated</i> <i>Land Management Act 1997</i> . The site is expected to be suitable in its existing state to accommodate the proposed demolition and future development. If any (at present unknown) contamination comes to light during demolition and development works, the



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appropriate actions shall be taken in accordance with SEPP No. 55, work
health and safety and environmental protocols in order to address any issues
relating to human health and environmental protection. Additionally, as
previously discussed in Section 5.1.2 of this report all procedures regarding
demolition will be undertaken in accordance with the Guidelines for
Implementing the Protection of the Environment Operations (Underground
Petroleum Storage Systems) Regulation 2019. These guidelines identify the
appropriate methods for investigating potential contamination and the
appropriate procedures for remediation. The proposed demolition will
comply with the specified requirements and a suitably qualified consultant
shall be engaged to investigate and report the outcomes of the subject land.

## 5.1.4 State Environmental Planning Policy (Infrastructure) 2007

The Application has been considered having regard to the relevant provisions of this SEPP:-

Clause Subject		Comments
101	Development with frontage to a classified road	The proposed development incorporates the use of an existing crossing onto the Newell Highway (A39). The scope of the proposed development involves demolition of existing structures. It is considered that impacts on the ongoing operation and function of the classified road are expected to be short term and negligible.
		The existing intersections to the Newell Highway on the entry and exit driveways are designed and currently function with a wide variety of heavy vehicles, including minimum length road-trains. The proposed demolition works, or future development will not introduce any vehicle type that does not already routinely enter and/or exit the premises.
		Stage 1
		Initially, thoroughfare can be maintained on the premises to deal with any vehicle movements from the highway. The proposed Stages 1a and 1b of demolition will be undertaken within areas segregated by the erection of temporary fencing. A traffic management scheme will need to be established with NSW RMS, including required highway signage and appropriate barriers to site entry, however it is recognised that this will be conditioned imposed in the notice of determination.
		Furthermore, the proposed on-site crushing of existing concrete pavements will minimise the truck movements off-site for handling the extensive areas of hardstand to be removed. The drawings in <b>Appendix E</b> detail the staging of the concrete removal works.
		Additionally, the proponent advises the peak daily vehicle movements through the premises are likely to be at the daily start and finish times, confirming 7-10 trucks/tankers and 5-7 light commercial vehicles (e.g. utes). One of the aims of the demolition on the property is to recycle as much material created by demolition activities as possible. Consequently, it is anticipated there will be maximum daily movements of 20-25 heavy vehicles and 15-20 light commercial fleet.



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		Given the above information it can be said that the demolition is not expected to have any significant impact on adjoining properties and existing vehicle movements as per Schedule 3 of this SEPP.
Clause 104 & Schedule 3	Traffic generating development	Stage 2 The proposed highway service centre development has been considered against the provisions of this Policy and is deemed to be 'traffic generating'. To address this matter, a Traffic Impact Assessment has been prepared and is attached as <b>Appendix F</b> to this Statement.

#### 5.1.5 State Environmental Planning Policy No. 64 - Advertising and Signage

This Policy is concerned with outdoor advertising and signage. This application includes the erection of a new pylon sign with a height of 12 metres and width of 3.2 metres, as demonstrated by the plans attached as part of **Appendix E** to this Statement. The display area will be greater than 20 m<sup>2</sup> and will be located within 250 metres of a classified road (the Newell Highway). Signage on the canopies above the refuelling areas will also be provided as part of development works.

Clause 6 of SEPP No. 64 outlines the signage to which this policy applies:

- (1) This Policy applies to all signage:
  - *a)* that, under another environmental planning instrument that applies to the signage, can be displayed with or without development consent, and
  - *b*) is visible from any public place or public reserve,

except as provided by this Policy.

A 'public place' is defined in the *Local Government Act* 1993 as:

- a) a public reserve, public bathing reserve, public baths or public swimming pool, or
- b) a public road, public bridge, public wharf or public road-ferry, or
- c) a Crown reserve comprising land reserved for future public requirements, or
- d) public land or Crown land that is not:
- e) a Crown reserve (other than a Crown reserve that is a public place because of paragraph (a), (b) or (c)), or
- f) a common, or
- g) land subject to the Trustees of Schools of Arts Enabling Act 1902, or
- h) land that has been sold or leased or lawfully contracted to be sold or leased, or
- *i) land that is declared by the regulations to be a public place for the purposes of this definition.*

As the proposed signage will be visible from a 'public place', specifically a public road, SEPP No. 64 is applicable to the proposed development. The consent authority must not grant consent for the proposed development unless it is satisfied that the signage is consistent with the objectives of SEPP No. 64, and that it satisfies the applicable provisions (in this instance, Clauses 17, 18 and 23) as well as the assessment criteria specified in Schedule 1.

- (1) This Policy aims:
  - a) to ensure that signage (including advertising):
    - *i. is compatible with the desired amenity and visual character of an area, and*

In relation to the pylon signage to be erected on Lot 7313, DP 1147165, this structure is consistent with existing signage that promotes the existing land use, although the existing two (2) sigs are proposed to be rationalised into one (1) proposed sign. It is noted that this sign is to be erected on a TSR, and landowners consent for lodgement of this development application has been provided by NSW Department of Industry – Land and Water. Compliance with the provisions of Clause 15(2)(b)(i) and 15(2)(b)(ii)(A), (C) and (D) is achieved in this instance.



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Signage on the proposed canopies is consistent with existing signage on the subject land. As such, the proposed development is not expected to have a detrimental impact on the amenity and visual character of the area.

#### *ii.* provides effective communication in suitable locations, and

It is considered that the proposed signage locations are suitable.

#### iii. is of high quality design and finish, and

It is expected that future signage will be of high quality design and finish.

<u>Clause 17 Advertisements with display area greater than 20 square metres or higher than 8 metres above</u> <u>ground</u>

This clause applies to the subject application, as the proposed pylon sign is higher than 8 metres above ground. It is noted that the display of an advertisement to which this clause applies is advertised development for the purposes of the Act.

In accordance with the requirements of this clause, an impact statement has been prepared as part of the Statement of Environmental Effects, addressing the assessment criteria in Schedule 1.

#### <u>Clause 18 Advertisements greater than 20 square metres and within 250 metres of, and visible from, a</u> <u>classified road</u>

This clause applies to the display of an advertisement to which clause 17 applies, that is within 250 metres of a classified road and that any part of which is visible from the classified road. It is noted that the consent authority must not grant development consent to the display of an advertisement to which this clause applies without the concurrence of the RMS.

#### Clause 23 Freestanding advertisements

The consent authority may grant consent to the display of a freestanding advertisement only if the advertising structure on which the advertisement is displayed does not protrude above the dominant skyline, including any buildings, structures or tree canopies, when viewed from ground level within a visual catchment of 1 kilometre. As detailed by the snapshots below, the proposed development complies with the provisions of this clause, as it will not protrude above tree canopies:



FIGURE 5 - NEWELL HIGHWAY (NORTH) APPROACH TO THE SUBJECT LAND – 140 METRES. EXISTING SIGNAGE IS TO BE REMOVED AS PART OF THE DEMOLITION (STAGE 1)



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FIGURE 6 - NEWELL HIGHWAY (NORTH) APPROACH TO THE SUBJECT LAND – 250 METRES. EXISTING SIGNAGE IS TO BE REMOVED AS PART OF THE DEMOLITION (STAGE 1)



FIGURE 7 - NEWELL HIGHWAY (SOUTH) APPROACH TO THE SUBJECT LAND - 200 METRES



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#### Schedule 1 Assessment Criteria:

#### 1 Character of the area

• Is the proposal compatible with the existing or desired future character of the area or locality in which it is proposed to be located?

The location of the proposed signage is considered compatible with the existing character of the area, which is in proximity to the junction of the Newell and Kamilaroi Highways.

• Is the proposal consistent with a particular theme for outdoor advertising in the area or locality?

There does not appear to be a particular theme for outdoor advertising in the area or locality.

#### 2 Special areas

• Does the proposal detract from the amenity or visual quality of any environmentally sensitive areas, heritage areas, natural or other conservation areas, open space areas, waterways, rural landscapes or residential areas?

There are no environmentally sensitive areas, heritage areas, natural or other conservation areas, open space areas, waterways or residential areas immediately surrounding the subject land. Although the allotment is located in a rural zoned area, the land is on the periphery of Narrabri and is therefore part of a streetscape that is urbanised. The proposed development is consistent with historic improvements on the subject land and is not expected to have a negative impact on the locality.

#### 3 Views and vistas

- Does the proposal obscure or compromise important views?
- Does the proposal dominate the skyline and reduce the quality of vistas?

As detailed by Figures 5 - 7 of this Statement, the proposed signage will not obscure or compromise important views nor will it dominate the skyline or reduce the quality of vistas.

• Does the proposal respect the viewing rights of other advertisers?

The proposed signage will not obscure any existing advertisements in the vicinity.

#### 4 Streetscape, setting or landscape

• Is the scale, proportion and form of the proposal appropriate for the streetscape, setting or landscape?

It is considered that the scale, proportion and form of the proposed signage is appropriate for the streetscape.

• Does the proposal contribute to the visual interest of the streetscape, setting or landscape?

The proposed signage will provide valuable information to passing travellers, and is not expected to detract from the setting or landscape.

• Does the proposal reduce clutter by rationalising and simplifying existing advertising?

All existing signage on the allotment shall be removed as part of development works.

• Does the proposal screen unsightliness?

It is considered that there is no unsightliness to screen in this instance.

• Does the proposal protrude above buildings, structures or tree canopies in the area or locality?

The proposed signage will not protrude above buildings, structures or tree canopies in the area.



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• Does the proposal require ongoing vegetation management?

The signage will not require ongoing vegetation management.

#### 5 Site and building

• Is the proposal compatible with the scale, proportion and other characteristics of the site or building, or both, on which the proposed signage is to be located?

The scale of the proposed signage is deemed to be compatible with the characteristics of the site, and the canopy signage is consistent with the design and proportion of the awnings to which it will be affixed.

- Does the proposal respect important features of the site or building, or both?
- Does the proposal show innovation and imagination in its relationship to the site or building, or both?

The proposed signage locations have been designed in conjunction with the subject building and as such the relationship between the two is considered to be compatible.

#### 6 Associated devices and logos with advertisements and advertising structures

• Have any safety devices, platforms, lighting devices or logos been designed as an integral part of the signage or structure on which it is to be displayed?

No.

#### 7 Illumination

- Would illumination result in unacceptable glare?
- Would illumination affect safety for pedestrians, vehicles or aircraft?
- Would illumination detract from the amenity of any residence or other form of accommodation?

The proposed signage will be illuminated; however, considering the setback from the Newell Highway, it is not expected to result in unacceptable glare to or affect the safety of vehicles. Due to the remote nature of the allotment, pedestrians are unlikely to be affected by the illumination of the sign.

Considering the separation distances, the signage is not expected to detract from the amenity of adjoining residences to the north of the subject land.

#### 8 Safety

- Would the proposal reduce the safety for any public road?
- Would the proposal reduce the safety for pedestrians or bicyclists?
- Would the proposal reduce the safety for pedestrians, particularly children, by obscuring sightlines from public areas?

The proposed signage is not expected to have an adverse impact on the safety of any public road or for pedestrians or bicyclists.

## 5.2 Biodiversity Conservation Act 2016

The NSW *Biodiversity Conservation Act 2016* (BC Act 2016) and *Biodiversity Conservation Regulation 2017* replaced the *Threatened Species Conservation Act 1995* (TSC Act) in August 2017. As of 25 February 2018, in most local government areas, any new application for development consent or modification to an approved development under Part 4 of the *Environmental Planning & Assessment Act 1979* (EP&A Act) (not including State Significant Development) is subject to the biodiversity assessment requirements of the *Biodiversity Conservation Act 2016*. The Local Government Area of Narrabri is subject to these requirements.

The proposal involves two stages; 1) short term minor demolition works of existing structures and 2) construction of a new highway service centre. Furthermore, the subject site is largely developed and contains minor vegetation. The surrounding locality is also considered to be significantly developed, with



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the exception of the crown land which adjoins the subject site. The subject site is also not identified to contain high biodiversity value (see Biodiversity Values Map in Figure 4 over the page). Additionally, the biodiversity offset scheme clearing threshold for the site is 1 hectare. The impact area for demolition is expected to be approximately 0.94 ha and therefore does not trigger the Biodiversity Conservation Act as the total disturbance area is less than the clearing threshold of 1 hectare. Given the above information it is considered the proposal will have negligible impact on endangered species.



FIGURE 8 – BIODIVERSITY VALUES MAP

## 5.3 Local Environmental Plans: Narrabri Local Environmental Plan 2012

*Narrabri Local Environmental Plan 2012* (NLEP 2012) applies to the subject site. In accordance with the Maps accompanying the LEP, the subject site is classified as being prone to inundation by flooding, which will form a consideration during the preparation of a future DA for construction works. The land is not improved with a heritage item and is not subject to any additional restrictions imposed by the LEP (including a floor space ratio and restrictions on building height).

Clause	Subject	Comments
1.2 (2)	Aims	The relevant aim of the NLEP 2012 considered in this Statement of Environmental Effects is as follows: (c) to facilitate development for a range of business enterprise and
		employment opportunities
		The proposed development is considered to be consistent with this aim, as approval of the application will facilitate future development on the subject site. Relevant issues have been considered and are addressed where appropriate in this Statement.

A review of the proposal against the relevant provisions of the NLEP 2012 is provided as follows:-



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2.1	Land use zones	The subject site is zoned <i>RU1 – Primary Production</i> .
2.3	Zone objectives	Ordinarily, the consent authority must have regard to the relevant zone objectives in determining a DA. However, as the subject land is afforded with existing use rights, these provisions are not applicable in this instance.
2.7	Demolition requires development consent	This clause provides that the demolition of a building or work may be carried out only with development consent. As consent has been sought in this instance, compliance with the provisions of this Part is achieved.
5.10	Heritage Conservation	It is noted that there are 3 items of aboriginal archaeological heritage significance within 50 metres from Lot 7313, DP 1147165 (lot used to access subject property). This lot spans for approximately 9 kilometres along the Newell Highway. However, the subject property (Lot 217, DP 41546) does not have any items of aboriginal archaeological significance located within 1 kilometre from the property. The proposed development involves demolition to existing structures on Lot 217, DP 41546 and will have negligible impact to the items of significance (refer AHIMS search in <b>Appendix I</b> ).
6.1	Earthworks	It is expected that the proposed demolition works will not have detrimental impacts on surrounding land or the environment. The proponent will have in place appropriate management parameters to ensure minimal impact from the demolition.
6.2	Flood Planning Area	It is understood that the subject land is affected by flooding. The proposal for Stage 1 involves the demolition and removal of existing buildings from the subject site to facilitate future commercial development. It is unlikely that the demolition works will have any impact on flooding as it is short term.
		However, stormwater drainage (including flood modelling) has been considered by WRM Water and Environment Pty Ltd for Stage 2 construction and an analysis is included as <b>Appendix J</b> to this Statement.
6.3	Essential Services	As previously discussed, the proposed demolition (Stage 1) will remove existing structures to facilitate development of a future Highway Service Centre (Stage 2).
		Development consent must not be granted unless the consent authority is satisfied that any of the following services that are essential for the development are available or that adequate arrangements have been made to make them available when required:
		(a) the supply of water,
		(b) the supply of electricity,
		(c) the disposal and management of sewage,
		(d) stormwater drainage or on-site conservation,
		(e) suitable vehicular access.
		The allotment has existing connections to town water, electrical services and reticulated sewer (via an on-site pump station). These existing services are capable of satisfactorily accommodating the proposed development without modification.



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Stormwater drainage (including flood modelling) has been considered by WRM Water and Environment Pty Ltd and an analysis is included as <b>Appendix J</b> to this Statement.
The location of the existing access crossings to the subject land will remain unaltered, although they will be upgraded as part of development works.

## 5.4 Section 4.15(1)(a)(ii) The provisions of any proposed environmental planning instrument

At the time of preparing this Statement (March 2021):

- There were no relevant proposed environmental planning instruments or amendments to environmental planning instruments detailed on the NSW Department of Planning, Industry and Environment website; and
- No relevant proposed planning instruments that had been the subject of public consultation were detailed on the Narrabri Shire Council website.

## 5.5 Section 4.15(1)(a)(iii) The provisions of any development control plan

The Narrabri Shire Council *Development Control Plans* (DCPs) provide guidelines regarding the types of development that may occur on specific sites and have been adopted by Council to control development throughout the Narrabri region, complementary to the provisions of the NLEP 2012. An assessment against the applicable DCPs has been undertaken as detailed within the following Table:

DCP	Comment	
Notification Policy	The Application will be required to be publicly exhibited, assessed and determined in accordance with the provisions of this Policy. Note: additional requirements relating to advertising of the Development Application apply under <i>State Environmental Planning Policy No. 64 – Advertising and Signage</i> as detailed previously in this Statement.	
Outdoor Advertising	There are no specific controls detailed in this Policy that require consideration as part of the proposed development. Compliance against the provisions of <i>State Environmental Planning Policy No. 64 – Advertising and Signage</i> is detailed in Section 5.1.1 of this Statement.	
Parking Code	In accordance with the provisions of this Policy, the proposed parking areas shall be constructed of hardstand materials and shall be clearly delineated. Suitable stormwater infrastructure shall be constructed as detailed previously within this Statement. Landscaping shall be provided as detailed on the plans attached as Appendix C.	
	As detailed in Section 4, onsite truck and car parking is proposed to be provided as follows:	
	<ul> <li>28 car parks, including a disabled car park and shared zone;</li> <li>25 truck parks;</li> <li>12 truck / bus parks; and</li> <li>9 caravan / mobile home parks.</li> </ul>	
	The number of car parks on the subject land exceeds the requirements of this Policy, which are:	
	<ul> <li>5 spaces per 100 square metres of convenience store; and</li> <li>15 spaces per 100 square metres of gross floor area of restaurant, or 1 space per 3 seats (whichever is the greater).</li> </ul>	



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It is noted that the abovementioned car parking rates are consistent with the RTA Guide to Traffic Generating Developments.
The proposed development is compliant with the applicable objective of the Parking Code DCP, which is:
To provide adequate parking for people using, and employed by, developments within the Shire.

## 5.6 Section 4.15(1)(a)(iiia) The provisions of any planning agreement

Not applicable.

## 5.7 Section 4.15(1)(a)(iv) The provisions of the regulations

The development is not listed in Schedule 3 of the *Environmental Planning and Assessment Regulation* 2000. Therefore, development is not deemed to require, with the exception of Narrabri Shire Council, development consent by any state agency or governing body.

Compliance with Part 5 of the Regulation, relating to existing uses, is detailed in Section 3.3 of this Statement.

## 5.8 The likely impacts of the development

#### 5.8.1 Impacts on the natural environment

Significant disturbance and modification of the natural environment has occurred on the subject land as a result of historic land uses. In this regard, the majority of the subject land has been previously cleared to accommodate the existing highway service centre, with only scattered vegetation (comprising a small number of maturing trees and saplings / scrub) remaining on the northern property boundary. There will be no further clearing undertaken in association with the demolition of the existing development. Stages 1 and 2 of the proposed development accommodates the retention of three (3) mature trees. However, the preparation of the remainder of the site for Stage 1 construction (e.g. excavation, site drainage, pavement sub-grading) will necessitate that all other saplings, shrubs, scrubby plants, etc. be removed.

The Biodiversity Values Map prepared by the Office of Environment and Heritage identifies land with high biodiversity value, as defined by the *Biodiversity Conservation Regulation 2017*. The subject land has not been mapped on the Biodiversity Values Map. Considering this, together with the urban fringe location of the subject land as well as historic land uses, it is expected that approval of the application will have a negligible impact on the natural environment.

#### 5.8.2 Impacts on the built environment

The proposed demolition of an existing highway service centre will accommodate the future construction of a new facility (highway service centre) that will be compatible with the quality of the built environment and urban design in this locality.

#### 5.8.3 Context and setting

Demolition of the existing development (comprising a dated facility) is expected to have a positive impact on the scenic qualities and features of the landscape.

The development of a new highway service centre is expected to have a minimal impact on the scenic qualities and features of the landscape, including views and vistas, and is compatible with the established character of the locality. Potential impacts (such as noise generation) have been mitigated by the design of the new development as detailed throughout this Statement.



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

### 5.8.4 Utility / infrastructure impacts

The allotment has existing connections to town water, electrical services and reticulated sewer (via an onsite pump station). These existing services shall be suitably capped prior to commencement of demolition works in preparation of Stage 2. These existing services are capable of satisfactorily accommodating the proposed development without modification.

Stormwater drainage (including flood modelling) for Stage 2 has been considered by WRM Water and Environment Pty Ltd and an analysis is included as **Appendix J** to this Statement.

The location of the existing access crossings to the subject land will remain unaltered, although they will be upgraded as part of development works.

#### 5.8.5 Crime Prevention Through Environmental Design (CPTED)

The proposed Stage 2 of the development has been designed in accordance with the principles of CPTED to minimise the opportunity for crime. This includes:

Surveillance

- A CCTV system shall be installed within the development, with approximately 30 cameras provided both inside and outside of the building.
- The cameras will monitor high risk areas, such as cash areas, fuel pumps and areas with poor natural surveillance.
- Monitors shall be installed so staff can monitor the cameras, particularly at night.

Lighting

• Lighting shall be provided across the property (including truck parking zones to minimise risk to assets) and will be designed to the Australian and New Zealand Standard.

#### Access control

- The number of points of entry into the proposed building has been minimised in order to provide increased security, and the rear door shall remain locked during night hours.
- 24-hour monitored duress alarms shall be included for the overnight staff member in their secure zone, which will call the police in an emergency.
- Amenities are fully contained within the building for controlled entry and safe usage, particularly for drivers out-of-hours.
- A night service drawer shall be installed for late transactions, which will allow for the purchase of fuel with staff located in secured building and customers/public remaining outside.

#### *Territorial reinforcement*

The proposed building perimeter has been designed to be a protected zone. In this regard, full
glass shopfronts have been avoided in order to decrease potential 'ram' targets, and 900-1000
mm high structural sills are proposed under shopfront glazing in external walls to public areas.
Furthermore, structural bollards shall be provided in front of the sliding glass entry door, and
masonry planter boxes used to shield the building façade.

#### Space management

• The proposed development will be well maintained and cared for in order to create a positive public space. Vandal-resistant exterior fittings shall be installed, and outdoor furniture shall be fixed.



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

#### 5.8.6 Traffic impacts

#### Stage 1 - Demolition

During the demolition stage all traffic will be notified by signage indicating the premises is closed for demolition. It will also be clearly sign posted and fenced to remove any confusion whether the premises are operating or closed.

The type and numbers of plant/equipment to be used during demolition are identifies as follows:-

- 2-3 x excavators;
- 2 x frontend loaders;
- 1 x large forklift;
- 1 x backhoe;
- 1 x concrete cutting rig;
- 1 x mobile crane (as required); and
- 1 x concrete crushing unit.

As previously confirmed, it is anticipated that Stages 1a Fuel System Removal and 1b Building Demolition will likely involve the shorter site occupation periods for specific plant/equipment (3-5 days). The 4 stages of concrete pavement removal will see site establishment of the crushing unit, cutting rig and heavier plant for 6-8 weeks.

Traffic associated with demolition of the existing development is expected to be satisfactorily accommodated within the existing road network, which is capable of serving large vehicles.

#### Stage 2 - Construction

A Traffic Impact Assessment is attached as **Appendix F** to this Statement. This Assessment concludes that the volume of traffic generated by the proposed development is not expected to have a significant effect on the current levels of service of all approach routes, as these carriageways have been operating satisfactorily to date and the expected traffic generated by the development will be similar to that of the existing land use. Furthermore, traffic generated by the proposed development is expected to have minimal effect on the operation of nearby intersections; and the design of the development permits vehicles to enter and exit the site in a forward direction to preserve the functioning of the surrounding road network.

On-site car parking is expected to be capable of accommodating the proposed development as detailed in Section 5.3 of this Statement.

#### 5.8.7 Construction impacts

It is anticipated that suitable conditions of development consent shall be included as part of the determination documentation in order to address relevant construction matters, including:

- Hours of building work (to be consistent with NSW State Guidelines);
- Construction waste storage and management;
- Noise and dust management and control of other potential pollutants;
- Continuity of public access to services; and
- Public Advisory Signage.

#### 5.8.8 Social / economic issues and impacts

The proposed development is expected to deliver a series of social benefits at local and regional levels by creating an opportunity for an improved range of services that can facilitate needs of the extended community. Furthermore, economic benefits will be realised through the demolition, construction and operation phases of the proposed development. In this regard, the proposal will generate a number of short-term (construction) and long-term employment opportunities.



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

#### 5.8.9 Cumulative impacts

The subject site is considered to be appropriately located for the proposed development and is compatible with surrounding land uses and development. The proposal is not expected to result in any unacceptable land use conflicts with surrounding properties or the environment. Issues such as noise, traffic and potential impacts on the locality have been discussed in previous sections of this Statement and are considered to be acceptable in this instance.

## 5.9 Section 4.15(1)(c) The suitability of the site for the development

The subject site is considered suited for the proposed development as outlined within this Statement. Known environmental hazards and / or constraints associated with the allotment (including flooding) have been addressed as part of the development application.

## 5.10 Section 4.15(1)(d) Any submissions made in accordance with the Act or the Regulations

This issue can only be fully considered after submission of this DA.

## 5.11 Section 4.15(1)(e) The public interest

Potential detrimental visual, social and environmental impacts have been thoroughly addressed in this Statement, and no detrimental economic impacts have been identified as a result of the proposed development. The proposal fits within the locality and site attributes are conducive to the development as proposed. In this regard, approval of the subject application is considered to be in the public interest.



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

## 6 CONCLUSION

The subject development application proposes two stages: - 1) the demolition of an existing 'highway service centre'; and 2) the construction of a new highway service centre on the subject land, described as Lot 217, DP 41546 and Lot 7313, DP 1147165 and located at 11541 Newell Highway, Narrabri.

Stage 1 demolition work shall be undertaken in accordance with applicable Australian Standards and will be completed by suitably qualified contractors. Following removal of the UPSS, the subject land will be tested to determine the extent of any contamination on site. Should contamination that requires remediation to ensure that it is suitable for its future intended use be detected, remediation works shall be completed.

Stage 2 of the proposed development application, involving the construction of a new highway service centre is submitted pursuant to Clause 41 of the *Environmental Planning and Assessment Regulation 2000*.

An assessment of the perceived impacts of this development has identified that:-

- Compliance is achieved with the provisions of Section 4.15 of the *Environmental Planning and Assessment Act 1979* as well as the planning principles established by Roseth SC in Fodor Investments v Hornsby Shire Council [2005] NSWLEC 71;
- Demolition of the existing degraded building and construction of a new development is expected to restore the capability of the centre to the original level and provide additional heavy vehicle parking. Thus, it is anticipated that the new facility will result in improved outcomes for the safety of the surrounding road network, as trucks that currently park overnight on nearby road shoulders and verges will be able to be suitably accommodated on the subject land;
- The site is not unsuitable for development by virtue of physical characteristics and impacts on the natural environment are expected to be negligible;
- Demolition of the existing highway service centre will accommodate the construction of a new facility that will be compatible with the quality of the built environment and urban design in this locality;
- The likely traffic generation characteristics of this proposal should be satisfactorily accommodated within the adjoining road network;
- The development will not significantly alter existing traffic movements and the impact to vehicles will be negligible;
- On-site traffic management (i.e. access, car parking, manoeuvrability, etc.) is suitable as detailed by the attached Traffic Impact Assessment;
- Potential emissions of dust, particulates, fumes, gases and pollutants are capable of complying with relevant legislation, monitored and enforced by the EPA; and
- Suitable measures shall be implemented to protect the amenity of adjoining residential receivers from noise emissions from the site.

The proposed development is for a use that is permissible with consent pursuant to the provisions of the *Environmental Planning and Assessment Act 1979, Environmental Planning and Assessment Regulation 2000* and the *Narrabri Local Environmental Plan 2012*. Furthermore, the proposal complies with other applicable statutory planning and related policy provisions, including those provided within the Narrabri Development Control Plans. The application is consistent with adopted planning provisions relating to existing use rights and represents an orderly and economic redevelopment of the land. On this basis development consent is now sought for the project as detailed within this Statement of Environmental Effects and attached Appendices.



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

## **APPENDIX A**

**OWNER'S CONSENT (CROWN LANDS)** 

#### Letter to Applicant (consent granted)



 File Ref:
 18/00568#01

 Account No:
 622920

Michelle Chittenden Phone: 02 6750 6409 Michelle.Chittenden@dpi.nsw.gov.au

The Thistle Company of Australia Pty Itd PO Box 10397 Adelaide Street BRISBANE QLD 4000

7 September 2020

Dear Sir/Madam

#### Landowner's Consent for Lodgement of Applications relating to development comprising: Access across Reserve 491 to enable demolition of existing structures (known as Highway Service Centre) on adjoining freehold Lot 217 DP 41546. on Crown land: Part: Lot 7313 DP 1147165 Parish Blake County White

Consent is granted by the Minister for Lands to the lodging a development application under the *Environmental Planning and Assessment Act 1979*, and other associated applications required under other legislation, for the development proposal described above.

This consent is subject to the following:

- (1) This consent is given without prejudice so that consideration of the proposed development may proceed under the *Environmental Planning and Assessment Act 1979* and any other relevant legislation.
- (2) This consent does not imply the concurrence of the Minister for Water, Property & Housing for the proposed development, or the issue of any necessary lease, licence or other required approval under the *Crown Lands Act 1989*; and does not prevent the Department of Planning, Industry & Environment Crown Lands (Department of Planning, Industry & Environment Crown Lands) from making any submission commenting on.
- (3) This consent will expire after a period of 12 months from the date of this letter if not acted on within that time. Extensions of this consent can be sought.
- (4) The Minister reserves the right to issue landowner's consent for the lodgement of applications for any other development proposals on the subject land concurrent with this landowner's consent.
- (5) Irrespective of any development consent or any approval given by other public authorities, any work or occupation of Crown land cannot commence without a current tenure from the Department of Planning, Industry & Environment Crown Lands authorising such work or occupation.

The consent is subject to the following Special Conditions:

a. Subdivision 24JA of the Native Title Act provides that future acts done under or in accordance with the reservation made on or before 23 December 1996 are valid provided the future act can be done in accordance with the reservation or has no greater impact on the native title than any act that can be done in accordance with reservation provided on that case the future act is done in good faith. For example, the access across the Reserve is considered a future act having no greater impact on native title that any act that can be done in accordance with the reservation with the reservation and is done in good faith.

- b. Access to the site will be via the existing driveways only. No new access routes are to be established across the Reserve.
- c. AHIMS search result revealed an Aboriginal heritage present 500m south from area under application on Newell Highway.

This letter should be submitted to the relevant consent or approval authority in conjunction with the development application and/or any other application.

It is advised that the Department of Planning, Industry & Environment - Crown Lands will inform Narrabri Shire Council of the issue of this landowner's consent and will request that Narrabri Shire Council notify the Department of Planning, Industry & Environment - Crown Lands of the subsequent development application, for potential comment, as part of any public notification procedure.

You are required to forward to Department of Planning, Industry & Environment - Crown Lands a copy of any development consent or other approval as soon as practical after that consent or approval is received.

If any modifications are made to the application (whether in the course of assessment, by conditions of consent, or otherwise), it is your responsibility to ensure the modified development remains consistent with this landowner's consent.

This landowner's consent relates to the following plans and other documents as stamped and retained by the Department of Planning, Industry & Environment - Crown Lands:

- Completed Landowners Consent Application 922920
- Completed Narrabri Shire Council Development Application for demolition of Highway Service Centre.

For further information, please contact Michelle Chittenden via the details given in the letter head.

Yours faithfully

marriel

Michelle Chittenden Senior Property Management Officer Department of Planning, Industry & Environment - Crown Lands



File Ref: 18/00568#01 Account No: 622920

Document Set ID: 1859142

#### Letter to Applicant (consent granted)

Michelle Chittenden Phone: 02 6750 6409 Michelle.Chittenden@dpi.nsw.gov.au


## STATEMENT OF ENVIRONMENTAL EFFECTS



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

# **APPENDIX B**

DEPOSITED PLAN (DP) 41546

## STATEMENT OF ENVIRONMENTAL EFFECTS



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

# **APPENDIX C**

**DETAILED SURVEY PLAN - EXISTING** 





/ERT 600mm W + 214.83C TO NARRABRI				
	<b>REFEREN</b> + 228.36A + 214.83C + 214.36INV	CE REDU REDU	CED LEVEL - APEX ROOF CED LEVEL - CONCRETE CED LEVEL - INVERT	
	+ 214.01SWP + 214.66N + 215.01D B GR LP	REDU REDU REDU BOWS GUAR LIGHT	CED LEVEL - INVERT CED LEVEL - STORMWATER P CED LEVEL - NATURAL SURFAC CED LEVEL - DRAIN SER CD RAIL POLE - CONCRETE BASE	IT CE
ETAIL SITE SURVEY - EXIS	STING		Date 23rd March 2018	Job No. 5002
DHOUSE, NEWELL HIGHWA LOT 217 IN DP 41546	Y, NARRAI	BRI	Drawing number <b>1 of 1</b> DRAWING SHEET SIZ	Issue A ZE = A1

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MGA

## STATEMENT OF ENVIRONMENTAL EFFECTS



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

# **APPENDIX D**

PLANS OF THE PROPOSED DEMOLITION (STAGE 1)



DATE IV2960 23/08/18 В 1 DOCUMENT No. DemDA1 PPROVED DATE APPROVAL . REG. No.: -DATUM: -



W TO WARREN					
A3 ORIGINAL	DRAWN ASD DESIGNED	DATE 23/08/18 DATE -	JOB No.: IV2960 DOCUMENT No.: DemDA1 STATUS:	ISSUE B	SHEET NO. 2 OF 8
9	APPROVED - DATUM: -	DATE -	APF REG. No.:	PROVAL	



W TO WARREN					
A3 ORIGINAL	DRAWN ASD DESIGNED - APPROVED - DATUM: -	DATE 23/08/18 DATE - DATE - -	JOB No.: IV2960 DOCUMENT No.: DemDA1 STATUS: APF REG. No.:	ISSUE B PROVAL	SHEET NO. OF 8

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TO NURRABER					
A3 ORIGINAL 30 40 50 1:1000 (A3)	DRAWN ASD DESIGNED - APPROVED - UDATUM: -	DATE 23/08/18 DATE - DATE - -	JOB No.: IV2960 DOCUMENT No.: DemDA1 STATUS: APF REG. No.:	ISSUE B PROVAL	SHEET NO. 4 OF 8

11



w TO WARRAGEN					
A3 ORIGINAL	DRAWN ASD	DATE 23/08/18	JOB No.: IV2960	ISSUE	SHEET No.
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g	DATUM: -			-	

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DATE IEET No IV2960 ASD 23/08/18 6 В DOCUMENT No. DemDA1 OF 8 PPROVED DATE APPROVAL . REG. No.: -DATUM: -



A3 ORIGINAL	DRAWN	DATE	JOB No.:	ISSUE	SHEET No.
	ASD	23/08/18	IV2960	P	7
30 40 50	DESIGNED	DATE	DOCUMENT No.:	D	1
	-	-	DemDA1		OF 8
1:1000 (A3)			STATUS:		
	APPROVED	DATE	APF	PROVAL	
	-	-	REC No.		
			REG. NO		
	DATUM: -			-	

## **EROSION CONTROL**

EROSION CONTROL DEVICES AND SILTATION TRAPS TO BE INSTALLED BEFORE SITE (OR PORTION OF SITE PROTECTED BY DEVICES) IS DISTURBED IN ACCORDANCE WITH N.S.W DEPARTMENT OF CONSERVATION AND LAND MANAGEMENT GUIDELINES AND APPROVED BY COUNCIL INSPECTOR.

ALL PERIMETER AND CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE 2 FIRST STEP IN EARTHWORKS AND/OR CLEARING.

SILT TO BE REMOVED FROM TEMPORARY SEDIMENT CONTROL BASINS AS DIRECTED 3. BY COUNCIL INSPECTOR OR DEPARTMENT OF LAND AND WATER CONSERVATION REPRESENTATIVE TO MAINTAIN SILTATION STORAGE CAPACITY IN TEMPORARY BASINS.

FILTRATION BUFFER ZONES ARE TO BE FENCED OFF AND ACCESS PROHIBITED TO ALL PLANT/MACHINERY.

STRAW BALE BARRIERS AND GEOFABRIC FENCES ARE TO BE CONSTRUCTED TO TOE 5 OF BATTER PRIOR TO COMMENCEMENT OF EARTHWORKS IMMEDIATELY AFTER CLEARING OF VEGETATION BEFORE REMOVAL OF TOPSOIL.

ALL TEMPORARY EARTH BERMS, DIVERSION AND SILT DAM EMBANKMENTS ARE TO BE MACHINE COMPACTED, SEEDED & MULCHED FOR TEMPORARY VEGETATION COVER AS SOON AS THEY HAVE BEEN FORMED.

CLEAN WATER IS TO BE DIVERTED AWAY FROM DISTURBED GROUND AND INTO DRAINAGE SYSTEM.

ALL SEDIMENT TRAPPING STRUCTURES AND DEVICES ARE TO BE INSPECTED AFTER 8. STORMS FOR STRUCTURAL DAMAGE OR CLOGGING. TRAPPED MATERIAL IS TO BE REMOVED TO A SAFE APPROVED LOCATION.

ALL TOPSOIL IS TO BE STOCKPILED ON SITE FOR RE-USE (AWAY FROM TREES AND DRAINAGE LINES). MEASURES SHALL BE APPLIED TO PREVENT EROSION OF THE STOCKPILES.

10 ALL FILLS ARE TO BE LEFT WITH A LIP AT THE TOP OF THE SLOPE AT THE END OF EACH DAYS EARTHWORKS. THE HEIGHT OF THE LIP SHALL BE A MINIMUM OF 200mm.

ALL CUT AND FILL SLOPES ARE TO BE SEEDED AND MULCHED WITHIN 10 DAYS OF 11 COMPLETION OF FORMATION.

UNDERSCRUBBING OF VEGETATION TO BE RESTRICTED TO SLASHING TO MINIMISE 12. SOIL DISTURBANCE.

UPON COMPLETION OF ALL EARTHWORKS OR AS DIRECTED BY COUNCIL, SOIL 13. CONSERVATION TREATMENTS SHALL BE APPLIED TO RENDER AREAS THAT HAVE BEEN DISTURBED, EROSION PROOF WITHIN 14 DAYS.

14. DENUDED AREAS TO BE HYDROMULCH SEEDED WITHIN 14 DAYS OF PRACTICAL COMPLETION OF EARTHWORKS, WITH A SEED MIX APPROVED BY DEPARTMENT OF LAND AND WATER CONSERVATION REPRESENTATIVE.

15. AREAS OVER ELECTRICITY, TELEPHONE AND GAS SUPPLY TRENCHES ARE TO BE SEEDED AND MULCHED BY THE RELEVANT AUTHORITY WITHIN 14 DAYS AFTER BACKFILL.

ALL BERMS AND BATTERS AND SITE REGRADING AREAS ARE TO BE TOPSOILED WITH 16. MINIMUM 75mm OF SELECTED SITE TOPSOIL AND GRASSED.

ALL FINAL EROSION PREVENTION MEASURES INCLUDING THE ESTABLISHMENT OF GRASSING ARE TO BE COMPLETED PRIOR TO THE FINAL INSPECTION. ALL EROSION DEVICES ARE TO BE MAINTAINED UNTIL THE END OF THE MAINTAINENCE PERIOD.

THIS DRAWING MAY BE USED BY THE CONTRACTOR AS A GUIDE, BUT ALL	
SEDIMENTATION & EROSION CONTROL MEASURES SHALL BE INSTALLED AND	
MAINTAINED IN ACCORDANCE WITH THE FOLLOWING PUBLICATIONS:	
*"LANDCOM: MANAGING URBAN STORMWATER: SOILS & CONSTRUCTION, VOL 4"	Pre-Construction
* AUSPEC D7: EROSION CONTROL & STORMWATER MANAGEMENT	
* C211 CONTROL OF EROSION & SEDIMENTATION	
AND SHALL REMAIN IN PLACE UNTIL VEGETATION IS ESTABLISHED.	During Construction
EXTRA MEASURES MAY BE REQUIRED IN ADDITION TO THOSE SHOWN ON THE	
DRAWINGS, AND ARE THE RESPONSIBILITY OF THE CONTRACTOR.	
	Finish of Construction
CONTRACTOR SHALL AMEND AND MODIFY AS APPROPRIATE TO THE STAGE AND	
SEQUENCING OF ACTUAL SITE WORKS	
	Post Construction

REFER TO THE FOLLOWING STANDARD DRAWINGS WHERE REFERED TO ON THESE PLANS, SOURCED FROM "LANDCOM" AS ABOVE. A SAMPLE SET HAS BEEN SUPPLIED TO THE CLIENT FOR INFORMATION BUT SOURCE DOCUMENT MUST BE REFERRED TO FOR FULL CONSTRUCTION NOTES AND METHODS.

SD 4-1	STOCKPILES	( SP	GENERAL NOTES SEDIMEN
SD 4-2	REPLACING TOPSOIL		1. DUST NUISANCE MUS
SD 5-4	ROCK CHECK DAM		
SD 5-5	EARTH BANK (LOW FLOW)		2. DIVERSION BANKS, SI CONSTRUCTED PRIOR TO R
SD 5-8	ENERGY DISSIPATER		3. SEDIMENT AND EROS
SD 6-3	EARTH SEDIMENT BASIN (DRY)		IN ACCORDANCE WITH DEP
SD 6-4	EARTH SEDIMENT BASIN (WET)		CONTROL" FOR DETAILS
SD 6-7	STRAW BALE FILTER		4. THE CONTRACTOR IS
SD 6-8	SEDIMENT FENCE	<u>`</u> , <u>`</u> , <u>`</u> , <u>`</u> , <u>`</u> , <u>`</u>	5. WHERE REQUIRED TO
SD 6-14	STABILISED SITE ACCESS		
SD 7-1	SEEDBED PREPARATION		6. SITE FILLED AREAS AN WITHIN FIFTEEN (15) DAYS (
SILT BA	IGS	$\otimes$	7. TEMPORARY DIVERSI
			2%* GRADE ON FILL AREAS
GENER	AL FALL OF NATURAL SURFACE		OR GEOFABRIC BARRIER AT
			8. SEDIMENT CONTROL
			FENCES) ARE TO BE MAINTA
			9. THE LOCATION OF SE

UNDERTAKEN

Image: Sector	CLIENT THISTLE CO PROJECT SHELL ROADHOUSE - NARRABRI NEWELL HIGHWAY, LOT 217 IN DP 41546 PROPOSED DEMOLITION - ESCP	SCALES A3 ORIGINAL   0 m 10 20 30 40 50   PLAN 1:1000 (A3) 1:1000 (A3) 1:1000 (A3) 1:1000 (A3)	DRAWN DATE ASD 23/08/18 DESIGNED DATE  APPROVED DATE 	JOB No.: IV2960 DOCUMENT NO.: DemDA1 STATUS: REG. NO.:	SHEET No. 8 OF 8
B MINOR AMENDMENTS - DA REVIEW AD 12/11/20 Email: john@legs.com.au Email: andrew@legs.com.au   ISSUE REVISION AUTH DATE DATE DATE DATE		FILE NAME: IV2960 CTL.dwg	DATUM: -	-	I

## CONSTRUCTION SEQUENCE

	Phase/implenent initial control measures, site shed setup, etc.
on	Install additional temporary control, measures, inspect and maintain all control measures
ion	Install permanent control measures, inspect and maintain all control measures
า	Install additional control measures, inspect and maintain all control measures until 70% of disturbed land is vegetated.

## **CONTROL**

T BE CONTROLLED BY REGULARLY WATERING CKS AND CONSTRUCTION AREAS

LT TRAPS AND SEDIMENT DRAINS ARE TO BE REMOVAL OF TOPSOIL

ION CONTROL FACILITIES ARE TO BE PROVIDED ARTMENT OF CONSERVATION AND LAND LICATION "URBAN EROSION AND SEDIMENT

TO MINIMISE THE AREA OF SOIL EXPOSURE DPSOIL IS TO BE STOCKPILED CLEAR OF WATER

RE TO BE TOPSOILED AND REVEGETATION OF FINAL SHAPING

ON DRAINS ARE TO BE PROVIDED AT APPROX. AT THE COMPLETION OF DAILY OPERATIONS. ID TO UNDISTURBED AREAS WITH STRAW BALES T THE DOWNSTREAM END

STRUCTURES (STRAW BALES OR SEDIMENT AINED AT ALL TIMES AND CLEANED AS REQUIRED

DIMENT CONTROL STRUCTURES ARE TO BE

## 10. SHOULD WORKS BE STOPPED FOR A PERIOD EXPECTED TO EXCEED TWO MONTHS, TEMPORARY REHABILITATION OF EXPOSED SOILS IS TO BE

## STATEMENT OF ENVIRONMENTAL EFFECTS



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

# **APPENDIX E**

PLANS OF THE PROPOSED HIGHWAY SERVICE CENTRE (STAGE 2)

Layout No:	Layout Name	Rev	Description	Date
0-00	COVER SHEET	В	PRELIMINARY	
SK-00.1	MASTER PLAN - EXISTING	В	PRELIMINARY	
SK-00.2	MASTER PLAN - PROPOSED	В	PRELIMINARY	
SK-00.3	SITE PLAN PROPOSED - EAST	В	PRELIMINARY	
SK-00.4	SITE PLAN PROPOSED - WEST	В	PRELIMINARY	
SK-00.5	TRAVEL CENTRE FLOOR PLAN	В	PRELIMINARY	
SK-00.6	TRAVEL CENTRE ROOF PLAN	В	PRELIMINARY	
SK-00.7	DETAIL FLOOR PLAN	В	PRELIMINARY	
SK-00.8	ELEVATIONS & SECTIONS	В	PRELIMINARY	
SK-00.9	PERSPECTIVES	В	PRELIMINARY	
SK-00.71	TRAVEL CENTRE AXO	В	PRELIMINARY	
SK-00.81	ELEVATIONS & SECTIONS	В	PRELIMINARY	
SK-00.91	PERSPECTIVES	В	PRELIMINARY	
SK-01.00	MOOD BOARD			

# **NARRABRI TRAVEL CENTRE** for THE THISTLE COMPANY PTY LTD at **NEWELL HIGHWAY NARRABRI QLD DA LODGEMENT**







Wednesday, 20 June 2018

# SITE DETAILS

Lot 217 on DP41546 22370 sqm

**#Site Custom** 









Version: 1, Version Date: 12/05/2021

Scale 1:1000 01 3 5 10 200 PRELIMINARY DA PLANS **MASTER PLAN** - EXISTING











Version: 1, Version Date: 12/05/2021



Scale 1:1000 0 1 3 5 10 20m PRELIMINARY DA PLANS MASTER PLAN - PROPOSED

Image: Sector Secto











Version: 1, Version Date: 12/05/2021



19x4m Single Articulated
36.5x4m B-triple
26x4m B-double
Various Lengths Vehicle & Caravan
12x4m Single unit Truck/bus
Dashed line denotes vehicle in transit
5.4x2.6m CarlVan











Version: 1, Version Date: 12/05/2021

D PRELIMINARY DA PLANS MASTER PLAN 1199 : SK-00.4 (B) SITE PLAN PROPOSED - WEST









Version: 1, Version Date: 12/05/2021











Version: 1, Version Date: 12/05/2021

## PRELIMINARY DA PLANS **MASTER PLAN** DETAIL FLOOR PLAN

20m





TRAVEL CENTRE AXO 2



HMA Vednesday, 20 June 2018

Version: 1, Version Date: 12/05/2021



THE THISTLE COMPANY PTY LTD NARRABRI TRAVEL CENTRE, NEWELL HIGHWAY NARRABRI QLD



PRELIMINARY DA PLANS MASTER PLAN TRAVEL CENTRE AXO















Version: 1, Version Date: 12/05/2021



## PRELIMINARY DA PLANS MASTER PLAN **ELEVATIONS & SECTIONS**





Version: 1, Version Date: 12/05/2021

HMA HOllindale Mainwaring ARCHITECTURE S: 969 Ann St, Fortitude Valley, Cld 4006 P: PCO Box 2716 Fortitude Valley BC, 40 06 CLD E: administrimarchitecture.com au. W: vsww.hmarchitecture.com au.



THE THISTLE COMPANY PTY LTDNARRABRI TRAVEL CENTRE,NEWELL HIGHWAY NARRABRI QLD119



## PRELIMINARY DA PLANS **MASTER PLAN** ELEVATIONS & SECTIONS













THE THISTLE COMPANY PTY LTD NARRABRI TRAVEL CENTRE, NEWELL HIGHWAY NARRABRI QLD

## PRELIMINARY DA PLANS MASTER PLAN PERSPECTIVES









Version: 1, Version Date: 12/05/2021





THE THISTLE COMPANY PTY LTDNARRABRI TRAVEL CENTRE,NEWELL HIGHWAY NARRABRI QLD1199 : SK-00.91 (B)

## PRELIMINARY DA PLANS MASTER PLAN PERSPECTIVES









BINS COMPOUND ............. GREAS 6.8 x 7.4 FREEZE 2.3 x 1.4 4.2 x 3.0 SHOP STORE KITCHEN 6.0 x 2.9m 5.9 x 4.5m FREEZER COOL ROOM 3.3 x 2.4m 6.5 x 2.4r Ô 4.8 x 11.8n 4.3 x 4.9n COFFEE 138x7

**CLIENT MEMORABILIA** 





PROJECT

NARRABRI TRAVEL CENTRE, NEWELL HIGHWAY, NARRABRI, QLD

Document Set ID: 1859142 Version: 1, Version Date: 12/05/2021



# THOROUGHFARE, "VERANDA" + FOOD COURT PADS







LANDSCAPING, OUTDOOR DINING





## STATEMENT OF ENVIRONMENTAL EFFECTS



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

# **APPENDIX F**

## **TRAFFIC IMPACT ASSESSMENT**





## **TRAFFIC IMPACT ASSESSMENT**

RE-DEVELOPMENT OF EXISTING SERVICE STATION NEWELL HIGHWAY, NARRABRI

Prepared for THE THISTLE COMPANY PTY LTD

27 JULY 2018



## DOCUMENT REGISTER

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### **Document History**

Version	Version date	Details	Reviewed and Authorised	
			Name / Position	Signature
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### COMPANY INFORMATION

CRG Traffic Pty Ltd as trustee for the Rytenskild CRG Trust trading as Rytenskild Traffic Group ABN 24 401 134 418 ACN 151 846 847 Director: Luke Rytenskild RPEQ 6293

Suite 8, Level 1 66 Appel Street ( PO Box 17 ) Surfers Paradise QLD 4217 Level 19 10 Eagle Street Brisbane QLD 4000 Level 26 44 Market Street Sydney NSW 2000

1300 220020
1300 087177
info@rytenskildtraffic.com
www.rytenskildtraffic.com



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## 1.0 INTRODUCTION

Rytenskild Traffic Engineering (RTE) has been engaged by The Thistle Company Pty Ltd to prepare a Traffic Impact Assessment of its proposal to redevelop an existing service station at Narrabri.

This report forms part of a Development Application to be lodged with the Narrabri Shire Council.

The following issues have been assessed during the study:

- Car parking supply and design;
- Provisions for access;
- Heavy vehicle access, circulation and parking;
- Impacts upon the Newell Highway.

The Newell Highway is a declared road and forms part of a National Highway Network, and therefore this application is to be referred to Roads and Maritime Services (RMS).

## 2.0 SUBJECT SITE

### 2.1 Site Location

As shown in Figure 2.1, the subject site is located on the northern side of the Newell Highway, just to ther west of the Kamilaroi Highway intersection. The site currently operates as a service station and gains access directly from the Newell Highway.

The layout of the existing service station and associated access arrangements is shown in Figure 2.2.



FIGURE 2.1 – LOCATION OF SUBJECT SITE





FIGURE 2.2 – LAYOUT OF EXISTING SERVICE STATION



### 2.2 Existing Road Network

The Newell Highway is freight link between Queensland and Victoria. Based on the 2012 traffic survey, provided on the Roads and Maritime Services (RMS) website, Newell Highway carried in the order of 2,924 daily vehicles (AADT), with a 40% heavy vehicle percentage between Narrabri to Moree.

Given the proximity of the site to the surveyed road section, it is expected that the roadway conditions along the frontage of the site would be like that shown in Figure 2.3 below.

Statistic	AADT	Northbound peak (11.00 am)		Southbound peak (2.00 pm)				
		Northbound	Opposing	Southbound	Opposing			
Traffic volume	2,924	127	106	109	118			
Total% Heavy vehicles (two-way)	40.5	32.5		35.7				

Table 6-24 Narrabri to Moree 2012 traffic volumes

Source: Newell Highway Corridor Strategy (Transport for NSW, 2015)

### FIGURE 2.3 – TRAFFIC SURVEY DATA (DAILY AND PEAK HOUR PERIODS – 2012)

The Newell Highway Corridor Strategy (Roads and Maritime Services (RMS), 2015) indicated that the annual daily traffic (AADT) and freight volumes on the Newell Highway would increase at a rate of 0.8% and 3.8% p.a. respectively, up to year 2031. Based this, it is estimated that the Newell Highway currently carries (in 2018) in the order of 3,067 vehicles (AADT), of which 1,557 are freight vehicles.



## 3.0 DEVELOPMENT PROPOSAL

The proposal is to demolish the existing service station buildings and associated infrastructure on the site. As shown in Figure 3.1, new service station buildings and refueuling areas for light and heavy vehicles will be constructed.

The existing access arrangements will be retained. The new service station will provide for B-Triple (36.5-metre-long) road trains.

The proposed service station, which will be known as the Narrabri Travel Centre, will comprise of the following facilities over the site:

- a new shop / food and drink outlets (250m<sup>2</sup>);
- new light vehicle fuelling area;
- new heavy vehicle fuelling area;
- extensive parking for heavy vehicles.

It is noted that a significant number of heavy vehicles park overnight on the opposite side of the Newell Highway. The proposed development is intended to address an apparent shortage of heavy vehicle parking in the local area

It is proposed that the new shop and food and drink outlets will have a combined GFA of 500m<sup>2</sup>. The proposed site plan is shown in Figure 3.1.





FIGURE 3.1 – PROPOSED SITE PLAN




FIGURE 3.2 – PROPOSED SHOP FLOOR PLAN



## 4.0 CAR PARKING

#### 4.1 Car Parking Supply

In accordance with the Narrabri Shire Council – DCP Parking Code, the following car parking rates are applicable to the proposed development:

#### Truck Stops:

1 truck parking space per motel unit plus 1 car space per 2 employees For restaurant facilities, the greater of: 15 spaces per 100m<sup>2</sup> GFA, or 1 space per 3 seats

#### Service Stations:

6 spaces per work bay 5 spaces per 100m<sup>2</sup> FAG of convenience store For restaurant facilities, the greater of: 15 spaces per 100m<sup>2</sup> GFA, or 1 space per 3 seats

Application of the above rate, the proposed development yields a minimum car parking requirement of 35 spaces as follows:

#### Table 4.1: Car Parking Requirement

Component	Minimum Car Parking Spaces Required
Shop (200m <sup>2</sup> )	30 spaces
Convenience Store (100 m <sup>2</sup> )	5 spaces
TOTAL	35 spaces

The proposed layout provides a total of 31 light vehicle and caravan parking spaces. An additional 41 truck parking spaces are proposed to be east of the building. The proposed parking supply therefore exceeds the minimum requirements specified in the Narrabri Shire Council DCP.



#### 4.2 Car Parking Design

The geometric layout of the proposed parking facilities has generally been designed to comply with the relevant requirements specified in the Transport Code and AS2890.1: 2004.

The indicative car parking plan, with each space color coded for specified vehicles are shown in Figure 4.1. The proposed car parking layout has the following dimensions:

Regular parking -	2.6 metres × 5.4 metres	[RED]
Caravan parking -	3.0 metres × 22 metres	[PINK]
Heavy rigid vehicle parking -	4.0 metres × 12.5 metres	[PURPLE]
Small Articulated Vehicle -	4.0 metres × 19 metres	[BROWN]
Large Articulated Vehicle -	4.0 metres × 26 metres	[YELLOW]
Road train parking -	4.0 metres × 36.5 metres	[BLUE]

A swept path analysis of the proposed light vehicle car park and service station are provided as Figures 4.2 and 4.3.

#### 4.3 Queuing Capacity

As shown in Figure 4.3, the proposed light vehicle service station provides queuing provision for three cars behind each pump. Such is generally provided for service stations of a similar scale and is considered to be satisfactory for the operational use of the site.





FIGURE 4.1 – PROPOSED CAR PARKING DESIGN





FIGURE 4.2 – SWEPT PATH OF 85<sup>TH</sup> PERCENTILE VEHICLES





FIGURE 4.3 – SWEPT PATH OF 99<sup>TH</sup> PERCENTILE VEHICLE + TRAILER



## 5.0 DEVELOPMENT TRAFFIC ESTIMATES

#### 5.1 Traffic Generation

Given the location of the subject site on a rural highway, traffic arriving to the site will generally drop in from the passing traffic flow. It is noted that the Newell Highway forms a key freight connection, and therefore a high percentage of heavy vehicles are expected to use the proposed centre.

Based on the traffic volumes specified in Section 2 of this report, the Narrabri Highway is estimated (year 2018) to carry in the order of 3,067 daily vehicles, with up of 40% of traffic defined as Austroads Class 3 and above, heavy vehicles.

It is typical to estimate the peak hour traffic to be approximately 10% of the daily volumes of the roadway. Such would result in an estimate of 307 vehicle trips along the frontage of the site, during the morning and afternoon peak hour periods. Given that visitors to the site will generally be from the passing traffic flow, a 10% drop in factor has been applied to estimate the traffic generated by the proposed development.

This would result in a peak hour traffic generation potential of 31 trips, with an even distribution of heavy to light vehicles, and eastbound to westbound travel direction along the Highway. It is noted that drop in trips assume that traffic travelling in the set direction (eastbound or westbound) would access the development and continue along their travel route once exiting the site.

The above traffic generation potential of 31 peak hour trips is considered to be reasonable for the use and scale of the proposed development.

#### 5.2 Traffic Impact

Intersection modelling of the existing access driveways has been carried out using SIDRA software, under the 2018 morning and afternoon peak hour periods. The results of the analysis indicate that the access intersection will operate within satisfactory criteria and will not cause queuing or significant delays along the Newell Highway.

The criterion for interpreting the SIDRA results and the detailed output of the analysis are presented in Appendix A and B respectively.



## 6.0 ACCESS ARRANGEMENTS

Access onto the development is proposed to be gained via the existing access arrangements off the Newell Highway. Given that the proposal will operate to a similar capacity to the current service station, the existing access arrangements are considered to be satisfactory to accommodate vehicles entering and exiting the site.

As shown in Figure 6.1. the existing driveways provides adequate width for the largest design vehicle to enter and exit the site satisfactorily. As shown, it is proposed that the driveways be restricted to allow enter movements via the eastern driveway and exist movement at the western. Such will improve on-site circulation and allow the truck stop to operate with minimal conflict with the light vehicle service station.

Given that the current service station already provides for B-Triple road trains, the existing turning provisions along the Newell Highway are considered to be satisfactory to accommodate trucks turning to the proposed development.





FIGURE 6.2 – PROPOSED ACCESS CROSSILE (B-TRIPLE PATHS – DETAIL)



#### 7.0 HEAVY VEHICLE ARRANGEMENTS

Provision has been made for vehicles up to a B-Triple Road Train to refuel at the service station and be able to park on site if required. In addition, provision has been made for trucks to circulate back to the fuelling area from the parking area.

As discussed in Section 4, the proposal provides parking for various sizes heavy vehicles, up to a B-Triple Road Train. The heavy vehicle parking spaces have been positioned throughout the site so that these vehicles can manoeuvre satisfactorily.

The proposed heavy vehicle fuelling area has been designed so that there is sufficient space for vehicles to queue without blocking access to the light vehicle area.

A swept path analysis of the proposed truck stop for each truck type is provided in Figures 7.1 - 7.5.





FIGURE 7.1 – SWEPT PATHS OF HEAVY RIGID VEHICLES (PARKING AREA)





FIGURE 7.2 – SWEPT PATHS OF ARTICULATED VEHICLES (19M)





FIGURE 7.3 – SWEPT PATHS OF B-DOUBLE VEHICLES





FIGURE 7.4 – SWEPT PATH OF B-TRIPLE VEHICLE (ENTRY TO FUELLING AREA)





FIGURE 7.5 – SWEPT PATH OF B-TRIPLE VEHICLE (MANOEUVRING THROUGH PARKING AREA)



## 8.0 SUMMARY OF CONCLUSIONS & RECOMMENDATIONS

- The subject site is located on the northern side of the Newell Highway, just to the west of the Kamilaroi Highway intersection. The site currently operates as a service station and gains access directly from the Newell Highway.
- The Newell Highway is a National Highway in New South Wales and forms an important freight link between Queensland and Victoria. Based on the background traffic growth rates specified in the Newell Highway Corridor Strategy (Roads and Maritime Services (RMS), 2015), it is estimated that Newell Highway in 2018, carries in the order of 3,067 daily vehicles (AADT), of which 1,557 are freight vehicles.
- The proposal is for the redevelopment of the existing service station and associated infrastructure on the site. It is proposed that the existing building will be demolished, and a new building constructed to provide for two separate fuelling areas, servicing light and heavy vehicles separately. The proposal will include a truck stop as well as restaurant / food and beverage tenancies. It is noted that a significant number of heavy vehicles park overnight on the opposite side of the Newell Highway. The proposed development is intended to address an apparent shortage of heavy vehicle parking in the local area
- In accordance with the Narrabri Shire Council DCP Parking Code, the proposal yields a car parking requirement of 35 spaces. The proposed plan of development provides a total of 72 spaces of which 31 have been provided for caravans and light vehicles. The proposal therefore exceeds Council's minimum car parking requirement.
- Given the location of the subject site on a rural highway, traffic arriving to the site will generally drop in from the passing traffic flow. It is noted that the Newell Highway forms a key freight connection, and therefore a high percentage of heavy vehicles are expected to use the proposed centre. As discussed in section 5, the proposal is expected to generate in the order of 31 trips during the morning and afternoon peak hour periods. Such is considered reasonable for the scale and use of the proposed development.
- Intersection modelling of the existing access driveways has been carried out using SIDRA software, under the 2018 morning and afternoon peak hour periods. The results of the analysis indicate that the access intersection will operate within satisfactory criteria and will not cause queuing or significant delays along the Newell Highway.
- Access onto the development is proposed to be gained via the existing access arrangements off the Newell Highway. Given that the proposal will still operate to the same capacity as the current service station, the existing access arrangements are considered to be satisfactory for the operational used of the site.
- Provision has been made for vehicles up to a B-Triple Road Train to refuel at the service station and be able to park on site if required. In addition, provision has been made for trucks to circulate back to the fuelling area from the parking area.



## 9.0 APPENDICES

APPENDIX A – CRITERIA FOR INTERPRETING SIDRA RESULTS APPENDIX B – DETAILED SIDRA OUTPUT (SITE ACCESS / NEWELL HIGHWAY INTERSECTION



L	evel of Service (LOS)	
LOS	Traffic Signals and Roundabouts	Give Way and Stop Signs
'A'		Good operation.
'B'	Good operation.	Acceptable delays and spare capacity.
	Good with acceptable delays and spare capacity.	
'C'	Satisfactory.	Satisfactory but accident study required.
'D'	Operating near capacity.	Near capacity and accident study required.
'E'	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.
'F'	Unsatisfactory and requires additional capacity.	Unsatisfactory and requires other control mode.

#### **APPENDIX A – CRITERIA FOR INTERPRETING SIDRA RESULTS**

#### 2. Average Vehicle Delay (AVD)

The AVD provides a measure of the operational performance of an intersection as indicated on the table below which relates AVD to LOS. The AVD's listed in the table should be taken as a guide only as longer delays could be tolerated in some locations (i.e. inner city conditions) and on some roads (i.e. minor side street intersecting with a major arterial route).

Level of Service	Average Delay per Vehicle (secs/veh)	Traffic Signals, Roundabout	Give Way and Stop Signs
А	less than 14	Good operation.	Good operation.
В	15 to 28	Good with acceptable delays and spare capacity.	Acceptable delays and spare capacity.
С	29 to 42	Satisfactory.	Satisfactory but accident study required.
D	43 to 56	Operating near capacity.	Near capacity and accident study required.
E	57 to 70	At capacity; at signals incidents will cause excessive delays. Roundabouts require other control mode.	At capacity and requires other control mode.

#### 3. Degree of Saturation (DS)

The DS is another measure of the operational performance of individual intersections.

For intersections controlled by **traffic signals**<sup>1</sup> both queue length and delay increase rapidly as DS approaches 1, and it is usual to attempt to keep DS to less than 0.9. Values of DS in the order of 0.7 generally represent satisfactory intersection operation. When DS exceeds 0.9 queues can be anticipated. For intersections controlled by a **roundabout or GIVE WAY or STOP signs**, satisfactory intersection operation is indicated by a DS of 0.8 or less.

<sup>&</sup>lt;sup>1</sup>The values of DS for intersections under traffic signal control are only valid for cycle length of 120 secs.



#### **APPENDIX B – DETAILED SIDRA OUTPUT (SITE ACCESS / NEWELL HIGHWAY INTERSECTION)**

## 2018 AM PEAK – WITH DEVELOPMENT 2018 PM PEAK 0 WITH DEVELOPMENT

It is noted that the site operates with separate entry and exit driveways. The below SIDRA results provide a conservative analysis for the operation of the intersection.

18053 - Site Access / Newell Highway Site Category: (None) Giveway / Yield (Two-Way)



Newell Highway



## MOVEMENT SUMMARY

## $\nabla$ Site: 101 [2018 AM Peak - with development]

18053 - Site Access / Newell Highway Site Category: (None) Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Tum	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: I	Newell Hi	ghway										
5	T1	138	40.0	0.089	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	80.0
6	R2	7	50.0	0.008	7.3	LOSA	0.0	0.3	0.34	0.57	0.34	48.5
Approa	ach	145	40.5	0.089	0.4	NA	0.0	0.3	0.02	0.03	0.02	78.7
North:	Site Acce	ess										
7	L2	8	50.0	0.024	3.3	LOSA	0.1	0.9	0.41	0.54	0.41	46.2
9	R2	7	50.0	0.024	6.7	LOSA	0.1	0.9	0.41	0.54	0.41	46.2
Approa	ach	15	50.0	0.024	4.9	LOSA	0.1	0.9	0.41	0.54	0.41	46.2
West:	Newell H	ighway										
10	L2	8	50.0	0.006	6.1	LOSA	0.0	0.0	0.00	0.57	0.00	50.2
11	T1	169	40.0	0.109	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	60.0
Approa	ach	177	40.5	0.109	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.7
All Vel	nicles	337	40.9	0.109	0.5	NA	0.1	0.9	0.03	0.05	0.03	66.3

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



## **DEGREE OF SATURATION**

Ratio of Demand Volume to Capacity (v/c ratio)

# Site: 101 [2018 AM Peak - with development]

18053 - Site Access / Newell Highway Site Category: (None) Giveway / Yield (Two-Way)

	A	pproache	es	Intersection
	East	North	West	inter section
Degree of Saturation	0.09	0.02	0.11	0.11



Newell Highway

Colour code based on Degree of Saturation



## MOVEMENT SUMMARY

## Site: 101 [2018 PM Peak - with development]

18053 - Site Access / Newell Highway Site Category: (None) Giveway / Yield (Two-Way)

Movement Performance - Vehicles												
Mov ID	Turn	Demand Total veh/h	Flows HV %	Deg. Satn v/c	Average Delay sec	Level of Service	95% Back Vehicles veh	of Queue Distance m	Prop. Queued	Effective Stop Rate	Aver. No. Cycles	Average Speed km/h
East: I	Newell H	lighway										
5	T1	160	40.0	0.103	0.0	LOS A	0.0	0.0	0.00	0.00	0.00	80.0
6	R2	7	50.0	0.008	7.1	LOSA	0.0	0.3	0.32	0.56	0.32	48.6
Appro	ach	167	40.4	0.103	0.3	NA	0.0	0.3	0.01	0.02	0.01	78.8
North:	Site Acc	cess										
7	L2	8	50.0	0.024	3.1	LOSA	0.1	0.9	0.39	0.53	0.39	46.4
9	R2	7	50.0	0.024	6.6	LOSA	0.1	0.9	0.39	0.53	0.39	46.3
Appro	ach	15	50.0	0.024	4.8	LOSA	0.1	0.9	0.39	0.53	0.39	46.3
West:	Newell I	lighway										
10	L2	8	50.0	0.006	6.1	LOS A	0.0	0.0	0.00	0.57	0.00	50.2
11	T1	147	40.0	0.095	0.0	LOSA	0.0	0.0	0.00	0.00	0.00	60.0
Appro	ach	155	40.5	0.095	0.3	NA	0.0	0.0	0.00	0.03	0.00	59.7
All Vel	hicles	337	40.9	0.103	0.5	NA	0.1	0.9	0.02	0.05	0.02	67.5

Site Level of Service (LOS) Method: Delay (SIDRA). Site LOS Method is specified in the Parameter Settings dialog (Site tab). Vehicle movement LOS values are based on average delay per movement.

Minor Road Approach LOS values are based on average delay for all vehicle movements.

NA: Intersection LOS and Major Road Approach LOS values are Not Applicable for two-way sign control since the average delay is not a good LOS measure due to zero delays associated with major road movements.

SIDRA Standard Delay Model is used. Control Delay includes Geometric Delay.

Gap-Acceptance Capacity: SIDRA Standard (Akçelik M3D).

HV (%) values are calculated for All Movement Classes of All Heavy Vehicle Model Designation.



## **DEGREE OF SATURATION**

Ratio of Demand Volume to Capacity (v/c ratio)

# Site: 101 [2018 PM Peak - with development]

18053 - Site Access / Newell Highway Site Category: (None) Giveway / Yield (Two-Way)

ction
CUON
0
1

Colour code based on Degree of Saturation
[< 0.6 ] [0.6 - 0.7 ] [0.7 - 0.8 ] [0.8 - 0.9 ] [0.9 - 1.0 ] [> 1.0 ]

## STATEMENT OF ENVIRONMENTAL EFFECTS



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

# **APPENDIX G**

**ENVIRONMENTAL NOISE IMPACT REPORT** 

Suite 3, 2454 Gold Coast Highway Mermaid Beach Qld 4218

Postal PO Box 441 Mermaid Beach Qld 4218

Telephone 07 5527 7333 Facsimile 07 5527 7555 Email jay@crg.net.au www.crg.net.au

CRG Acoustics Pty Ltd ACN 151 847 255 ABN 11 708 556 182

# CRGACOUSTICS

Proposed Service Station Redevelopment 11553 Newell Highway, Narrabri NSW (Lot 217 on DP41546)

## ENVIRONMENTAL NOISE IMPACT REPORT

Prepared for

The Thistle Company of Australia Pty Ltd

## 20 June 2018

crgref: 18059 report rev.1

## **1.0 INTRODUCTION**

This report is in response to a request from The Thistle Company of Australia Pty Ltd for an environmental noise impact assessment of proposed service station redevelopment along Newell Highway, Narrabri.

In undertaking the above, noise modelling was undertaken to produce onsite activity noise impacts at the nearest offsite noise sensitive receivers. Based upon the predicted noise impact levels, recommendations regarding acoustic treatment have been provided.

## 2.0 DESCRIPTION OF THE DEVELOPMENT

The parcel of land is described Lot 217 on DP41546, No. 11553 Newell Highway. The site is currently occupied by Narrabri Truck Stop, which has heavy vehicle parking to the northern and eastern side of the building. The site is bounded by the Newell Highway to the southeast, with vacant land surrounding the remaining boundaries, with Kelvin Vickery Avenue to the northeast and privately-owned properties to the northwest and southwest. The topography of the site and surrounding land is generally flat. For site location refer to Figures 1 and 2 in Appendix A.

The proposal is to redevelop / upgrade the truck stop to provide greater access and parking for trucks (i.e. articulated, B-double & B-triple), buses and caravans / campervans. The redevelopment will include:

- New shop (travel centre) building towards the western end of the site. The building will comprise a shop, kitchen, food-servery, gym, office, separate trucker & public indoor & outdoor dining areas and toilet amenities.
- Outdoor bin and storage compound to the north of the travel centre building.
- Truck and car refuelling areas (with canopies) to the west (truck) and south (cars) of the travel centre building.
- Car & truck parking and driveway hardstand areas over the remainder of the site.
- Upgrading of the existing crossovers to Newell Highway.

For development plans refer to Appendix B.

The service station intends to continue operating 24 hours per day, seven days per week.

Onsite activity noise emissions (i.e. vehicle activity, patron activity, deliveries, waste collection and mechanical plant) have the potential to impact upon the offsite noise sensitive receivers and has been assessed in accordance with the NSW "*Noise Policy for Industry*" to ensure an acceptable level of acoustical amenity can be achieved.

The nearest noise sensitive receivers to the development include dwellings to the southeast across Newell Highway, to the southwest, to the northwest and to the northeast across Kelvin Vickery Avenue.

It is noted that given the service station would primarily only service traffic along Newell Highway the development is not anticipated to generate additional new traffic; therefore, we have not assessed development generated traffic noise in accordance with the NSW *"Road Noise Policy"*.

## 3.0 AMBIENT NOISE SURVEY

#### 3.1 Instrumentation

The following equipment was used to record ambient noise levels at the subject site locale.

- Rion NC 73 Calibrator; and
- Rion NL 21 Environmental Noise Logger.

All instrumentation used in this assessment hold current calibration certificate from a certified NATA calibration laboratory.

#### 3.2 Unattended Background Noise Monitoring Methodology

A logger was located along the south-eastern boundary of the subject site. The microphone was in a free-field location, approximately 1.2m above ground. Refer to Figure 2 in Appendix A for the logger location.

The logger was set to record noise statistics in 15 minute blocks continually between Tuesday 29/05/2018 and Tuesday 5/06/2018.

All measurements were conducted generally in accordance with Australian Standard AS 1055:1997 – "*Acoustics-Description and measurement of environmental noise*". The operation of the sound level logging equipment was field calibrated before and after the measurement session with no significant drift from the reference signal recorded.

Daily weather observations were obtained from the Bureau of Meteorology Narrabri weather station. Weather conditions during the assessed monitoring period were fine; with a temperature range between approximately -2 and  $24^{\circ}$ C and relative humidity between 25 and 75%.

## 3.3 Unattended Background Noise Monitoring Results

Table 1 presents the measured noise levels at the logger location. Graphical presentation of the measured levels is in Appendix C. Rating Background Levels (RBLs) were calculated using the method provided in Appendix B of the "*NSW Industrial Noise Policy*".

	Measured Level L <sub>A90</sub> dB(A)						
Background Noise	Daytime (7am to 6pm)	Evening (6pm to 10pm)	Night-time (10pm to 7am)				
Friday 24/03/17	-	42	-				
Saturday 25/03/17	45	43	42				
Sunday 26/03/17	46	41	41				
Monday 27/03/17	44	41	37				
Tuesday 28/03/17	43	39	46				
Wednesday 29/03/17	45	36	36				
Thursday 30/03/17	44	45	36				
Friday 31/03/17	-	_	-				
RBLs	44	41	39				

**Table 1:** Measured ambient noise levels at the logger location.

## 4.0 NOISE ASSESSMENT CRITERION

Noise associated with the commercial premises is regulated by the NSW *"Noise Policy for Industry"*. The assessment procedure has the following components to determine the project noise trigger levels:

• Intrusiveness Noise Level (LAeq, 15 min): the limit criteria for this assessment is as follows:

 $L_{Aeq, 15 \text{ min}} \leq \text{rating background level}^1 + 5 \text{ dB}; \text{ and}$ 

• Amenity Noise Level (L<sub>Aeq</sub>, period): this is achieved by ensuring that the proposed development complies with the noise limit criteria set in Table 2.2 of the Policy. If we assume that the area is within an Rural Area (as defined in Table 2.3 of the Policy), the following limits apply:

Receiver	Noise amenity	Time of day	Laeg. dB(A)
	area	,	
(see Table 2.3 to dete category applies)	ermine which reside	ential receiver	Recommended amenity noise level
Residential	Rural	Day	50
		Evening	45
		Night	40
-	Suburban	Day	55
		Evening	45
		Night	40
	Urban	Day	60
		Evening	50
		Night	45

Table 2.2: Amenity noise levels.

Table 2: Amenity Criterion Prescribed in the NSW "Noise Policy for Industry".

Given that the service station is an existing use and no other similar industries are present or likely to be introduced in the area the amenity noise levels are adopted as the project amenity noise levels rather than the amenity noise level minus (-) 5 dB (refer to Page 11 of the Noise Policy for Industry).

By considering the measured background noise levels at the subject site (refer to Table 1) and the Rural Amenity noise limits we recommend the following project noise trigger levels:

Dowind	Project Noise Trigger Levels Leq, 15min dB(A)					
renou	Intrusiveness Noise Level	Project Amenity Noise Level				
Daytime	<b>49</b> (Est. L <sub>90</sub> 44 + 5)	53 (50 + 3*)				
Evening	<b>46</b> (Est. L <sub>90</sub> 41 + 5)	48 (45 + 3*)				
Night-time	44 (Est. L <sub>90</sub> 39 + 5)	<b>43</b> (40 + 3*)				

\*The policy assumes that the  $L_{Aeq, 15min}$  will be taken to be equal to the  $L_{Aeq, period} + 3$  decibels (dB).

**Table 3:** Determined Project Noise Trigger Levels.

<sup>&</sup>lt;sup>1</sup> The rating background level is the overall single figure background level representing each assessment period (day/evening/night over the whole monitoring period.

## 5.0 PREDICTED NOISE IMPACTS

All noise source levels used in the assessment have been collected from similar previous investigations. All noise levels have been corrected for impulsiveness or tonality as per Australian Standard AS 1055:1997 – "Acoustics-Description and measurement of environmental noise".

Measured  $L_{Aeq}$  levels have been converted to  $L_{Aeq\,15min}$  levels by estimating a likely worst-case number of events / duration for which each activity occurs during any 15-minute period (refer to Appendix C for calculations).

Noise levels associated with mechanical plant are purely illustrative and should be reviewed upon determination of types of plant. Additional acoustic assessment/s should be undertaken once plant selections are finalised, and testing conducted prior to Commencement of Use and be conditioned within the Development Approval.

The following activities and associated noise source levels are typical of a service station facility and have been assessed within this report:

Activity / Noise Source	Distance (m)	Measured L <sub>eq Event</sub> Adjusted dB(A)
Fluctuating Noise Source		
Car / truck door closures	1m	80**
Car bypass	1m	72
Tyre pressure beeper	1m	75
Truck bypass	1m	87
Patrons at outdoor dining / seating	1m	75
Truck airbrakes	1m	97**
Goods delivery	1m	75
Waste collection	1m	102**
Continuous Noise Source (mechanical plan	t assumed to be lo	cated at the service station building)
A/C unit (rooftop)	3m	62
Refrigeration compressor (rooftop)	3m	64
Restaurant kitchen exhaust unit (rooftop)	3m	57
Electric air compressor (external wall)	2m	65
Truck refrigeration unit	1m	85

\* Denotes + 5 dB(A) correction due to tonality as per AS1055 - 1997 ; \*\* Denotes + 5 dB(A) correction due to impulsiveness as per AS1055 - 1997

Table 4: Typical noise source levels associated with the proposed service station facility.

Based upon the location of the proposed onsite activities in relation to surrounding offsite noise sensitive properties (i.e. at the nearest building façades), we predict the following noise impact levels as presented in Table 5.

The predicted levels assume that the recommended treatments detailed in Section 6 are incorporated into the development. For point source calculations refer to Appendix C.

Daytime Noise source	Predicted Noise Impact, SPL L <sub>eq 15min</sub> dB(A)
R1: Dwellings to the southeast	Nearest Façade / Outdoor Rec. to Onsite Activity
Nearest car door closures	< 15
Nearest truck door closures	< 15
Bowser car door closures	< 15
Bowser truck door closures	< 15
Car bypass	18
Tyre pressure beeper	< 15
Truck bypass	33
Patrons at outdoor dining / seating	21
Truck airbrakes	30
Goods delivery	21
Waste collection	41
A/C unit	18
Refrigeration compressor	20
Restaurant kitchen exhaust unit	< 15
Electric air compressor	< 15
Truck refrigeration unit x 6	41
Combined impacts (does not include delivery or waste	42
collection activities as typically infrequent occurrences)	
R2: Dwellings to the southwest	Nearest Façade / Outdoor Rec. to Onsite Activity
Nearest car door closures	< 15
Nearest truck door closures	< 15
Bowser car door closures	< 15
Bowser truck door closures	< 15
Car bypass	19
Tyre pressure beeper	< 15
Truck bypass	29
Patrons at outdoor dining / seating	17
Truck airbrakes	26
Goods delivery	18
Waste collection	38
A/C unit	<15
Refrigeration compressor	16
Restaurant kitchen exhaust unit	< 15
Electric air compressor	<15
Truck refrigeration unit x 6	35
Combined impacts (does not include delivery or waste collection activities as typically infrequent occurrences)	37
R3: Dwellings to the northwest	Nearest Facade / Outdoor Rec. to Onsite Activity
Nearest car door closures	
Nearest truck door closures	< 15
Bowser car door closures	< 15
Bowser truck door closures	< 15
Car hypass	18
Tyre pressure beeper	< 15
Truck bypass	33
Patrons at outdoor dining / seating	22
Truck airbrakes	30
Goods delivery	22
Waste collection	42
A/C unit	18
Refrigeration compressor	20
Restaurant kitchen exhaust unit	<15
Electric air compressor	< 15
Truck refrigeration unit x 6	40
Combined impacts (does not include delivery or waste	41
collection activities as typically infrequent occurrences)	41
Daytime Criterion	49

 Table 5: Predicted onsite activity noise impacts at the surrounding noise sensitive properties.

Daytime Noise source	Predicted Noise Impact, SPL L <sub>eq 15min</sub> dB(A)
R4: Dwellings to the northeast	Nearest Façade / Outdoor Rec. to Onsite Activity
Nearest car door closures	22
Nearest truck door closures	24
Bowser car door closures	18
Bowser truck door closures	18
Car bypass	29
Tyre pressure beeper	15
Truck bypass	42
Patrons at outdoor dining / seating	29
Truck airbrakes	42
Goods delivery	29
Waste collection	49
A/C unit	26
Refrigeration compressor	30
Restaurant kitchen exhaust unit	21
Electric air compressor	21
Truck refrigeration unit x 6	37
Combined impacts (does not include delivery or waste	46
collection activities as typically infrequent occurrences)	
Daytime Criterion	49

Evening Noise source	Predicted Noise Impact, SPL L <sub>eq 15min</sub> dB(A)
R1: Dwellings to the southeast	Nearest Façade / Outdoor Rec. to Onsite Activity
Nearest car door closures	< 15
Nearest truck door closures	< 15
Bowser car door closures	< 15
Bowser truck door closures	< 15
Car bypass	16
Tyre pressure beeper	< 15
Truck bypass	31
Patrons at outdoor dining / seating	21
Truck airbrakes	28
Goods delivery	21
A/C unit	15
Refrigeration compressor	20
Restaurant kitchen exhaust unit	< 15
Electric air compressor	< 15
Truck refrigeration unit x 6	41
Combined impacts (does not include delivery or waste	41
collection activities as typically infrequent occurrences)	41
<b>R2:</b> Dwellings to the southwest	Nearest Façade / Outdoor Rec. to Onsite Activity
Nearest car door closures	< 15
Nearest car door closures Nearest truck door closures	<15 <15
Nearest car door closures Nearest truck door closures Bowser car door closures	<15 <15 <15
Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures	<15 <15 <15 <15 <15
Nearest car door closures Nearest truck door closures Bowser car door closures Bowser truck door closures Car bypass	<15 <15 <15 <15 <15 <15
Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper	<15 <15 <15 <15 <15 <15 <15 <15
Nearest car door closures         Nearest truck door closures         Bowser car door closures         Car bypass         Tyre pressure beeper         Truck bypass	<15 <15 <15 <15 <15 <15 <15 <27
Nearest car door closures         Nearest truck door closures         Bowser car door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating	<15 <15 <15 <15 <15 <15 <15 <15 27 17
Nearest car door closures         Nearest truck door closures         Bowser car door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes	<15 <15 <15 <15 <15 <15 <15 27 17 24
Nearest car door closures         Nearest truck door closures         Bowser car door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery	<15 <15 <15 <15 <15 <15 <27 17 24 18
Nearest car door closures         Nearest truck door closures         Bowser car door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit	<15 <15 <15 <15 <15 <15 27 17 24 18 <15
Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit         Refrigeration compressor	<15 <15 <15 <15 <15 <15 27 17 24 18 <15 16
Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit         Refrigeration compressor         Restaurant kitchen exhaust unit	<15 <15 <15 <15 <15 <25 27 17 24 18 <15 16 <15
Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit         Refrigeration compressor         Restaurant kitchen exhaust unit         Electric air compressor	<15 <15 <15 <15 <15 <15 27 17 24 18 <15 16 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15 <15
Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit         Refrigeration compressor         Restaurant kitchen exhaust unit         Electric air compressor         Truck refrigeration unit x 6	<15 <15 <15 <15 <15 <27 17 24 18 <15 16 <15 <15 <15 <15 <27 17 24 18 <15 <15 16 <15 <15 <27 17 24 18 <15 35 <15 <27 16 <27 17 24 18 <15 35 <27 16 <27 17 24 18 <27 16 <27 17 24 18 <25 15 35 <27 16 <27 16 <27 17 24 18 <215 16 <215 35 <27 16 <27 27 17 24 18 <215 35 <27 16 <25 35 35
Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit         Refrigeration compressor         Restaurant kitchen exhaust unit         Electric air compressor         Truck refrigeration unit x 6         Combined impacts (does not include delivery or waste	<15 <15 <15 <15 <15 <15 27 17 24 18 <15 16 <15 <15 35 36
Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit         Refrigeration compressor         Restaurant kitchen exhaust unit         Electric air compressor         Truck refrigeration unit x 6         Combined impacts (does not include delivery or waste collection activities as typically infrequent occurrences)	<15 <15 <15 <15 <15 <15 27 17 24 18 <15 16 <15 16 <15 35 36

Table 5 (Cont.): Predicted onsite activity noise impacts at the surrounding noise sensitive properties.

Evening Noise source	Predicted Noise Impact, SPL Leq 15min dB(A)
R3: Dwellings to the northwest	Nearest Façade / Outdoor Rec. to Onsite Activity
Nearest car door closures	< 15
Nearest truck door closures	< 15
Bowser car door closures	< 15
Bowser truck door closures	< 15
Car bypass	16
Tyre pressure beeper	< 15
Truck bypass	31
Patrons at outdoor dining / seating	22
Truck airbrakes	28
Goods delivery	22
A/C unit	15
Refrigeration compressor	20
Restaurant kitchen exhaust unit	< 15
Electric air compressor	< 15
Truck refrigeration unit x 6	40
Combined impacts (does not include delivery or waste	41
collection activities as typically infrequent occurrences)	41
R4: Dwellings to the northeast	Nearest Façade / Outdoor Rec. to Onsite Activity
R4: Dwellings to the northeast Nearest car door closures	Nearest Façade / Outdoor Rec. to Onsite Activity 20
R4: Dwellings to the northeast Nearest car door closures Nearest truck door closures	Nearest Façade / Outdoor Rec. to Onsite Activity 20 22
R4: Dwellings to the northeast Nearest car door closures Nearest truck door closures Bowser car door closures	Nearest Façade / Outdoor Rec. to Onsite Activity 20 22 16
R4: Dwellings to the northeast         Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Bowser truck door closures	Nearest Façade / Outdoor Rec. to Onsite Activity 20 22 16 16 16
R4: Dwellings to the northeast         Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass	Nearest Façade / Outdoor Rec. to Onsite Activity 20 22 16 16 28
R4: Dwellings to the northeast         Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper	Nearest Façade / Outdoor Rec. to Onsite Activity 20 22 16 16 28 15
R4: Dwellings to the northeast         Nearest car door closures         Bowser truck door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass	Nearest Façade / Outdoor Rec. to Onsite Activity           20           22           16           28           15           40
R4: Dwellings to the northeast         Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating	Nearest Façade / Outdoor Rec. to Onsite Activity           20           22           16           28           15           40           29
R4: Dwellings to the northeast         Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes	Nearest Façade / Outdoor Rec. to Onsite Activity           20           22           16           28           15           40           29           40
R4: Dwellings to the northeast         Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery	Nearest Façade / Outdoor Rec. to Onsite Activity           20           22           16           28           15           40           29           40           29           40           29
R4: Dwellings to the northeast         Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit	Nearest Façade / Outdoor Rec. to Onsite Activity           20           22           16           28           15           40           29           40           29           23
R4: Dwellings to the northeast         Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit         Refrigeration compressor	Nearest Façade / Outdoor Rec. to Onsite Activity           20           22           16           28           15           40           29           40           29           23           27
R4: Dwellings to the northeast         Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit         Refrigeration compressor         Restaurant kitchen exhaust unit	Nearest Façade / Outdoor Rec. to Onsite Activity           20           22           16           28           15           40           29           23           27           21
R4: Dwellings to the northeast         Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit         Refrigeration compressor         Restaurant kitchen exhaust unit         Electric air compressor	Nearest Façade / Outdoor Rec. to Onsite Activity           20           22           16           28           15           40           29           23           27           21
R4: Dwellings to the northeast         Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit         Refrigeration compressor         Restaurant kitchen exhaust unit         Electric air compressor         Truck refrigeration unit x 6	Nearest Façade / Outdoor Rec. to Onsite Activity           20           22           16           28           15           40           29           23           27           21           21           41
R4: Dwellings to the northeast         Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit         Refrigeration compressor         Restaurant kitchen exhaust unit         Electric air compressor         Truck refrigeration unit x 6         Combined impacts (does not include delivery or waste	Nearest Façade / Outdoor Rec. to Onsite Activity           20           22           16           16           28           15           40           29           40           29           21           21           41
R4: Dwellings to the northeast         Nearest car door closures         Nearest truck door closures         Bowser car door closures         Bowser truck door closures         Car bypass         Tyre pressure beeper         Truck bypass         Patrons at outdoor dining / seating         Truck airbrakes         Goods delivery         A/C unit         Refrigeration compressor         Restaurant kitchen exhaust unit         Electric air compressor         Truck refrigeration unit x 6         Combined impacts (does not include delivery or waste collection activities as typically infrequent occurrences)	Nearest Façade / Outdoor Rec. to Onsite Activity           20           22           16           28           15           40           29           40           29           21           21           41           46

Night-time Noise source	Predicted Noise Impact, SPL L <sub>eq 15min</sub> dB(A)
R1: Dwellings to the southeast	Nearest Façade / Outdoor Rec. to Onsite Activity
Nearest car door closures	< 15
Nearest truck door closures	< 15
Bowser car door closures	< 15
Bowser truck door closures	< 15
Car bypass	< 15
Tyre pressure beeper	< 15
Truck bypass	28
Patrons at outdoor dining / seating	21
Truck airbrakes	25
A/C unit	< 15
Refrigeration compressor	20
Restaurant kitchen exhaust unit	< 15
Electric air compressor	< 15
Truck refrigeration unit x 6	41
Combined impacts (does not include delivery or waste collection activities as typically infrequent occurrences)	41
Night-time Criterion	43

Table 5 (Cont.): Predicted onsite activity noise impacts at the surrounding noise sensitive properties.

Night-time Noise source	Predicted Noise Impact, SPL L <sub>eq 15min</sub> dB(A)
R2: Dwellings to the southwest	Nearest Façade / Outdoor Rec. to Onsite Activity
Nearest car door closures	< 15
Nearest truck door closures	< 15
Bowser car door closures	< 15
Bowser truck door closures	< 15
Car bypass	< 15
Tyre pressure beeper	< 15
Truck bypass	24
Patrons at outdoor dining / seating	16
Truck airbrakes	21
A/C unit	< 15
Refrigeration compressor	16
Restaurant kitchen exhaust unit	< 15
Electric air compressor	< 15
Truck refrigeration unit x 6	35
Combined impacts (does not include delivery or waste	26
collection activities as typically infrequent occurrences)	36
R3: Dwellings to the northwest	Nearest Façade / Outdoor Rec. to Onsite Activity
Nearest car door closures	< 15
Nearest truck door closures	< 15
Bowser car door closures	< 15
Bowser truck door closures	< 15
Car bypass	< 15
Tyre pressure beeper	< 15
Truck bypass	28
Patrons at outdoor dining / seating	21
Truck airbrakes	25
A/C unit	< 15
Refrigeration compressor	20
Restaurant kitchen exhaust unit	< 15
Electric air compressor	< 15
Truck refrigeration unit x 6	40
Combined impacts (does not include delivery or waste	41
collection activities as typically infrequent occurrences)	
K4: Dwellings to the northeast	Nearest Façade / Outdoor Rec. to Unsite Activity
Nearest car door closures	17
Nearest truck door closures	19
Bowser car door closures	<15
Bowser truck door closures	<15
Car bypass	25
Tyre pressure beeper	<15
Truck bypass	37
Patrons at outdoor dining / seating	28
Truck airbrakes	37
A/C unit	21
Refrigeration compressor	26
Restaurant kitchen exhaust unit	21
Electric air compressor	20
Iruck retrigeration unit x 6	41
combined impacts (does not include delivery or waste collection activities as typically infrequent occurrences)	44
Night-time Criterion	43

Table 5 (Cont.): Predicted onsite activity noise impacts at the surrounding noise sensitive properties.

## 6.0 RECOMMENDED ACOUSTIC TREATMENTS

Based upon the adopted noise source levels, the following acoustic treatments and management principles are recommended to mitigate onsite activity noise emissions:

- The facility operate 24 hours, seven days per week.
- Waste collection be limited to the daytime period between 7am and 6pm.
- Construction of the acoustic barrier as detailed in Sketch No. 1 of Appendix A. Typical materials include earth berms, 19mm lapped timber fence (40% overlap), 9mm FC sheet, toughened glass, Perspex, masonry, or a combination of the above (a minimum surface mass of 11kg/m<sup>2</sup> is required).
- Trucks parking overnight with refrigeration motors be required to park within the "Noise Protection Zone" as marked on Sketch No. 1 of Appendix A
- The service station tyre pressure alarm should be a visual type not audible, or set to a noise level less than 60 dB(A) at 1m.
- Driveway and car parking areas be finished with surface coatings which prevent tyre squeal (an uncoated rough concrete or bitumen surface is acceptable)
- Drainage grating over trafficable areas be well secured to prevent rattling.
- Mechanical plant be designed and installed to comply with the noise criterion presented in Section 4. As final plant selection has not been completed, additional acoustic assessment/s should be undertaken once plant selections are finalised. Such assessments should be undertaken prior to Building Approval; and be conditioned within the Development Approval.

## 7.0 DISCUSSION and CONCLUSIONS

This report is in response to a request from The Thistle Company of Australia Pty Ltd for an environmental noise impact assessment of proposed service station redevelopment along Newell Highway, Narrabri.

The proposal is to redevelop / upgrade the truck stop to provide greater access and parking for trucks, buses and caravans / campervans. The service station intends to continue operating 24 hours per day, seven days per week.

Onsite activity noise emissions have the potential to impact upon the offsite noise sensitive receivers and has been assessed in accordance with the NSW "*Noise Policy for Industry*" to ensure an acceptable level of acoustical amenity can be achieved. The nearest noise sensitive receivers to the development include dwellings to the southeast across Newell Highway, to the southwest, to the northwest and to the northeast across Kelvin Vickery Avenue.

Based upon the recommended acoustic treatments and management controls, predicted service station activity noise impacts at the nearest receivers are at or below the adopted noise criterion, with the exception of a 1 dB exceedance at Receiver R4 for all activity combined at night. All other combined impacts (excluding delivery and waste collection) are also predicted within the noise criterion. As noted earlier, the predicted combined impacts do not include waste collection and delivery activities as they are typically infrequent occurrences and of short duration such activities and are unlikely to cause annoyance. Also, as the site is currently used as a service station the proposed delivery and waste collection activities would be similar to those currently occurring.

To minimise noise annoyance, we have recommended that waste collection activities be limited to the daytime period between 7am and 6pm.

We have also provided an indication of potential noise impacts and likely acoustical treatment requirements for onsite mechanical plant; although the levels are merely a guide as no plant selections have yet been completed. For this reason, additional more detailed assessment/s should be conducted upon determination of plant. Such assessments should be undertaken prior to Building Approval; and be conditioned within the Development Approval.

Overall, the proposed development will generally be within acceptable levels of the adopted criterion, subject to the acoustic treatments recommended in Section 6 being integrated into the design, construction and operation of the service station development.

Report Reviewed By:

JAY CARTER BSc Director

Report Compiled by:

Have

Matthew Lopez BEng Consultant

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## APPENDIX A

Subject Site, Offsite Receiver and Noise Monitoring Locations
CRGACOUSTICS

A39 Narrabri West Public School IOR Petroleum 😲 A39 Subject Site 851 Google \$

Figure No. 1: Subject Site Location (Google Maps).

Map data ©2018 Google Australia Terms Send feedback 100 m L\_\_\_\_\_





Figure No. 2: Subject Site, Logger Location and Surrounding Environs (Google Earth with the NSW Globe aerial overlay).



Sketch No. 1: Service Station Layout and Recommended Acoustic Treatments (Not to Scale).

#### ACOUSTIC TREATMENT LEGEND

Recommended 3.7m high acoustic barrier constructed above the finished (i.e. adjacent hardstand areas) or existing ground level, whichever is higher and be free of gaps and holes.

The barriers could be constructed of a combination of materials. Typical materials include earth berms, 19mm lapped timber fence (40% overlap), 9mm FC sheet, toughened glass, Perspex, masonry, or a combination of the above (a minimum surface mass of  $11 \text{kg/m}^2$  is required).

Noise protection zone for parking trucks with refrigeration motors running



#### **APPENDIX B**

Development Plans







Thistle. HMA





Scale 1:1000 PRELIMINARY DA PLANS THE THISTLE COMPANY PTY LTDPRELIMINARY DA PLANSNARRABRI TRAVEL CENTRE,MASTER PLANNEWELL HIGHWAY NARRABRI QLD1199 : SK-00.2 (A)MASTER PLAN - PROPOSED





Thistle.

NEWELL HIGHWAY NARRABRI QLD 1199 : SK-00.6 (A) TRAVEL CENTRE ROOF PLAN











THE THISTLE COMPANY PTY LTDNARRABRI TRAVEL CENTRE,NEWELL HIGHWAY NARRABRI QLD1199 : SK-00.71 (A)





#### APPENDIX C

Measurement Results and Model Calculations / Predictions

















DAYTIME						
Leq ONSITE SERVICE STATION AC	TIVITIES I	MPACTING:				
R1: Dwellings to the southeast				R2: Dwellings to the southwest		
Nearest car door closures	80	dB(A) @ 1m	#	Nearest car door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	15	events		Number of events in 15 minutes	15	events
Worst case duration in 15 minutes	0.375	minutes		Worst case duration in 15 minutes	0.375	minutes
15 minute Leq	64.0	dB(A) @ 1m		15 minute Leq	64.0	dB(A) @ 1m
Distance to receiver	314	m		Distance to receiver	590	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-49.9	dB(A)		Distance attenuation	-55.4	dB(A)
Facade reflection	2.5	dB(A)		Facade reflection	2.5	dB(A)
Impact at Facade	12	dB(A)	#	Impact at Facade	6	dB(A)
Int in a state				Furt at a sum		
Nearest truck door closures	80	dB(A) @ 1m	#	Nearest truck door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	15	events		Number of events in 15 minutes	15	events
Worst case duration in 15 minutes	0 375	minutes		Worst case duration in 15 minutes	0 375	minutes
15 minute Leg	64.0	dB(A) @ 1m		15 minute Lea	64.0	dB(A) @ 1m
Distance to receiver	314	m		Distance to receiver	590	m
Ground absorption correction	514	dB(A)	-	Ground absorption correction	570	dB(A)
Distance etternation	-5		-	Distance esternuestion	55 4	
	-49.9	dD(A)	-	Distance attenuation	-55.4	dD(A)
	2.5	dB(A)	-		2.3	dB(A)
Impact at Façade	12	dB(A)	#	Impact at Façade	6	dB(A)
Contract the second	80	1D(A) @ 1	#	Construction of home		1D(A) @ 1
Car door closure at bowser	1.5	db(A) @ Im	#	Car door closure at bowser	1.5	
Single event duration	1.5	seconds	-	Single event duration	1.5	seconds
Number of events in 15 minutes	15	events	_	Number of events in 15 minutes	15	events
Worst case duration in 15 minutes	0.375	minutes	_	Worst case duration in 15 minutes	0.375	minutes
15 minute Leq	64.0	dB(A) @ 1m	_	15 minute Leq	64.0	dB(A) @ 1m
Distance to receiver	329	m	_	Distance to receiver	580	m
Ground absorption correction	-5	dB(A)	_	Ground absorption correction	-5	dB(A)
Distance attenuation	-50.3	dB(A)		Distance attenuation	-55.3	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
				Impact at Façade		
Impact at Façade	11	dB(A)	#		6	dB(A)
Impact at Façade	11	dB(A)	#		6	dB(A)
Impact at Façade Truck door closures at bowser	80	dB(A) dB(A) @ 1m	#	Truck door closures at bowser	6 80	dB(A) dB(A) @ 1m
Impact at Façade Truck door closures at bowser Single event duration	80 1.5	dB(A) dB(A) @ 1m seconds	#	Truck door closures at bowser Single event duration	6 80 1.5	dB(A) dB(A) @ 1m seconds
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes	80 1.5 15	dB(A) @ 1m seconds events	#	Truck door closures at bowser Single event duration Number of events in 15 minutes	6 80 1.5 15	dB(A) @ 1m seconds events
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes	11 80 1.5 15 0.375	dB(A) @ 1m dB(A) @ 1m seconds events minutes	#	Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes	6 80 1.5 15 0.375	dB(A) @ 1m seconds events minutes
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq	11 80 1.5 15 0.375 64.0	dB(A) dB(A) @ 1m seconds events minutes dB(A) @ 1m	#	Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq	6 80 1.5 15 0.375 64.0	dB(A) @ 1m dB(A) @ 1m seconds events minutes dB(A) @ 1m
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver	11 80 1.5 15 0.375 64.0 365	dB(A) @ 1m seconds events minutes dB(A) @ 1m m	#	Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver	6 80 1.5 15 0.375 64.0 525	dB(A) dB(A) @ 1m seconds events minutes dB(A) @ 1m m
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction	80 1.5 15 0.375 64.0 365 -5	dB(A) @ 1m dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A)	#	Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction	6 80 1.5 15 0.375 64.0 525 -5	dB(A) dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A)
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation	80 1.5 15 0.375 64.0 365 -5 -51.2	dB(A) @ 1m dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A)	#	Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation	6 80 1.5 0.375 64.0 525 -5 -54.4	dB(A) dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A)
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection	111 80 1.5 15 0.375 64.0 365 -5 -51.2 2.5	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A)	#	Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection	6 80 1.5 0.375 64.0 525 -5 -54.4 2.5	dB(A) @ 1m dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A)
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade	111 80 1.5 15 0.375 64.0 365 -5 -5 1.2 2.5 10	dB(A) @ 1m dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A) dB(A)	#	Truck door closures at bowser         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction         Distance attenuation         Façade reflection         Impact at Façade	6 80 1.5 525 64.0 525 -5 -5 4.4 2.5 7	dB(A) dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A) dB(A) dB(A)
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade	111 80 1.5 15 0.375 64.0 365 -5 -5 1.2 2.5 10	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A) dB(A)	#	Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade	6 80 1.5 525 64.0 525 -5 -5 4.4 2.5 7	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A) dB(A)
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade Combined door closure impacts	111 80 1.5 15 0.375 64.0 365 -5 -51.2 2.5 10 10 17	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A)	# #	Truck door closures at bowser         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction         Distance attenuation         Façade reflection         Impact at Façade         Combined door closure impacts	6 80 1.5 525 64.0 525 -5 -5 4.4 2.5 7 7 12	dB(A) dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A) dB(A) dB(A)
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade Combined door closure impacts	111 80 1.5 15 0.375 64.0 365 -5 -51.2 2.5 10 10 17	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A) dB(A) dB(A)	# #	Truck door closures at bowser         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction         Distance attenuation         Façade reflection         Impact at Façade         Combined door closure impacts	6 80 1.5 525 -5 -5 -5 4.0 525 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -7 -7 -12	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A)
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade Combined door closure impacts Car bypass	111 80 1.5 15 0.375 64.0 365 -5 -51.2 2.5 10 10 17 72	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A)	#	Truck door closures at bowser         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction         Distance attenuation         Façade reflection         Impact at Façade         Combined door closure impacts         Car bypass	6 80 1.5 525 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5 -5	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A)
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade Combined door closure impacts Car bypass Single event duration	11           80           1.5           0.375           64.0           365           -5           -51.2           2.5           10           72           20	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A)	# # 4 4 4 4 4 4 4 4 4	Truck door closures at bowser         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction         Distance attenuation         Façade reflection         Impact at Façade         Combined door closure impacts         Car bypass         Single event duration	6           80           1.5           0.375           64.0           525           -54.4           2.5           7           12           72           20	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A)
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade Combined door closure impacts Car bypass Single event duration Number of events in 15 minutes	11           80           1.5           0.375           64.0           365           -5           -51.2           2.5           10           72           20           30	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A)	# # 4 4 4 4 4 4 4 4 4 4 4 4	Truck door closures at bowser         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction         Distance attenuation         Façade reflection         Impact at Façade         Combined door closure impacts         Car bypass         Single event duration         Number of events in 15 minutes	6 80 1.5 525 -5 -54.4 2.5 7 7 12 72 20 30	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) events
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade Combined door closure impacts Car bypass Single event duration Number of events in 15 minutes Worst case duration in 15 minutes	11           80           1.5           0.375           64.0           365           -5           -51.2           2.5           10           72           20           30           10	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A)	# # 4 4 4 4 4 4 4 4 4 4 4 4 4	Truck door closures at bowser         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction         Distance attenuation         Façade reflection         Impact at Façade         Combined door closure impacts         Car bypass         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes	6           80           1.5           0.375           64.0           525           -54.4           2.5           7           12           72           20           30           10	dB(A) dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m dB(A) dB(A) dB(A) dB(A) dB(A) events minutes
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade Combined door closure impacts Car bypass Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq	11           80           1.5           0.375           64.0           365           -5           -51.2           2.5           10           72           20           30           10           70.2	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m dB(A) dB(A) dB(A) dB(A) dB(A) events minutes dB(A) @ 1m	# # 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Truck door closures at bowser         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction         Distance attenuation         Façade reflection         Impact at Façade         Combined door closure impacts         Car bypass         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes         15 minute Leq	6           80           1.5           0.375           64.0           525           -54.4           2.5           7           12           72           200           300           10           70.2	dB(A) dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) events minutes dB(A) @ 1m
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade Combined door closure impacts Car bypass Single event duration Number of events in 15 minutes User the second se	11           80           1.5           0.375           64.0           365           -5           -51.2           2.5           10           72           20           30           10           70.2           303	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) events minutes dB(A) @ 1m m	# # 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Truck door closures at bowser         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction         Distance attenuation         Façade reflection         Impact at Façade         Car bypass         Single event duration         Number of events in 15 minutes         User to receiver         Distance to receiver	6           80           1.5           0.375           64.0           525           -54.4           2.5           7           12           72           200           300           100           70.2           503	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) events minutes dB(A) @ 1m seconds events minutes
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade Combined door closure impacts Car bypass Single event duration Number of events in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction	11           80           1.5           0.375           64.0           365           -51.2           2.5           10           72           20           30           10           72.5           64.0           303           -5	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) m minutes dB(A) @ 1m m dB(A) @ 1m	# # 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4 4	Truck door closures at bowser         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction         Distance attenuation         Façade reflection         Impact at Façade         Combined door closure impacts         Car bypass         Single event duration         Number of events in 15 minutes         Vorst case duration in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction	6           80           1.5           0.375           64.0           525           -54.4           2.5           7           12           72           200           300           100           70.2           503           -5	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) events minutes dB(A) @ 1m m m dB(A) @ 1m
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade Combined door closure impacts Car bypass Single event duration Number of events in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation	11           80           1.5           0.375           64.0           365           -51.2           2.5           10           72           20           300           10           70.2           303           -5           -49.6	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m dB(A) dB(A) dB(A) dB(A) dB(A) minutes dB(A) @ 1m minutes dB(A) @ 1m m motheres dB(A) @ 1m	# # # # #	Truck door closures at bowser         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction         Distance attenuation         Façade reflection         Impact at Façade         Combined door closure impacts         Car bypass         Single event duration         Number of events in 15 minutes         Ustance to receiver         Ground absorption correction         Distance attenuation	6           80           1.5           0.375           64.0           525           -54.4           2.5           7           12           72           200           300           100           70.2           503           -54.0	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m dB(A) dB(A) dB(A) dB(A) dB(A) dB(A) events minutes dB(A) @ 1m m dB(A) @ 1m m dB(A) @ 1m
Impact at Façade Truck door closures at bowser Single event duration Number of events in 15 minutes Worst case duration in 15 minutes 15 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection Impact at Façade Combined door closure impacts Car bypass Single event duration Number of events in 15 minutes Users case duration in 15 minutes I5 minute Leq Distance to receiver Ground absorption correction Distance attenuation Façade reflection	11           80           1.5           0.375           64.0           365           -5           -51.2           2.5           10           72           20           300           10           70.2           303           -5           -49.6           2.5	dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m dB(A) dB(A) dB(A) dB(A) dB(A) minutes dB(A) @ 1m minutes dB(A) @ 1m m mlates dB(A) @ 1m m	<pre># # # # # # # # # # # # # # # # # # #</pre>	Truck door closures at bowser         Single event duration         Number of events in 15 minutes         Worst case duration in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction         Distance attenuation         Façade reflection         Impact at Façade         Combined door closure impacts         Single event duration         Number of events in 15 minutes         Vorst case duration in 15 minutes         15 minute Leq         Distance attenuation         Ground absorption correction         Distance of events in 15 minutes         15 minute Leq         Distance to receiver         Ground absorption correction         Distance to receiver         Ground absorption correction         Distance attenuation         Façade reflection	6           80           1.5           0.375           64.0           525           -54.4           2.5           7           12           72           200           300           100           70.2           503           -54.0           2.5	dB(A) dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m dB(A) dB(A) dB(A) dB(A) dB(A) @ 1m seconds events minutes dB(A) @ 1m m dB(A) @ 1m

DAYTIME						
Leq ONSITE SERVICE STATION ACT	VITIES 1	MPACTING:				
R1: Dwellings to the southeast				R2: Dwellings to the southwest		
Tyre pressure beeper	75	dB(A) @ 1m	#	Tyre pressure beeper	75	dB(A) @ 1m
Single event duration	3	seconds		Single event duration	3	seconds
Number of events in 15 minutes	12	events		Number of events in 15 minutes	12	events
Worst case duration in 15 minutes	0.6	minutes		Worst case duration in 15 minutes	0.6	minutes
15 minute Leq	61.0	dB(A) @ 1m		15 minute Leq	61.0	dB(A) @ 1m
Distance to receiver	345	m		Distance to receiver	600	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-50.8	dB(A)		Distance attenuation	-55.6	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	8	dB(A)	6	Impact at Façade	3	dB(A)
Truck bypass	87	dB(A) @ 1m	#	Truck bypass	87	dB(A) @ 1m
Single event duration	20	seconds		Single event duration	20	seconds
Number of events in 15 minutes	30	events		Number of events in 15 minutes	30	events
Worst case duration in 15 minutes	10	minutes		Worst case duration in 15 minutes	10	minutes
15 minute Leq	85.2	dB(A) @ 1m		15 minute Leq	85.2	dB(A) @ 1m
Distance to receiver	303	m		Distance to receiver	503	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-49.6	dB(A)		Distance attenuation	-54.0	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	33	dB(A)	#	Impact at Façade	29	dB(A)
Patrons outdoor dining	75	dB(A) @ 1m	#	Patrons outdoor dining	75	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	75.0	dB(A) @ 1m		15 minute Leq	75.0	dB(A) @ 1m
Distance to receiver	355	m		Distance to receiver	570	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-51.0	dB(A)		Distance attenuation	-55.1	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	21	dB(A)	#	Impact at Façade	17	dB(A)
Truck airbrakes	97	dB(A) @ 1m	#	Truck airbrakes	97	dB(A) @ 1m
Single event duration	1	seconds		Single event duration	1	seconds
Number of events in 15 minutes	30	events		Number of events in 15 minutes	30	events
Worst case duration in 15 minutes	0.5	minutes		Worst case duration in 15 minutes	0.5	minutes
15 minute Leq	82.2	dB(A) @ 1m		15 minute Leq	82.2	dB(A) @ 1m
Distance to receiver	303	m		Distance to receiver	503	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-49.6	dB(A)		Distance attenuation	-54.0	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	30	dB(A)	#	Impact at Façade	26	dB(A)
Goods delivery	75	dB(A) @ 1m	#	Goods delivery	75	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	75.0	dB(A) @ 1m		15 minute Leq	75.0	dB(A) @ 1m
Distance to receiver	365	m		Distance to receiver	555	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-51.2	dB(A)		Distance attenuation	-54.9	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	21	dB(A)	#	Impact at Façade	18	dB(A)



DAYTIME Leq ONSITE SERVICE STATION AC	TIVITIES	MPACTING:				
R1: Dwellings to the southeast			-	<b>R2:</b> Dwellings to the southwest		
Waste collection	102	dB(A) @ 1m	#	Waste collection	102	dB(A) @ 1m
Single event duration	180	seconds		Single event duration	180	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	3	minutes		Worst case duration in 15 minutes	3	minutes
15 minute Leq	95.0	dB(A) @ 1m		15 minute Leq	95.0	dB(A) @ 1m
Distance to receiver	365	m		Distance to receiver	555	m
Ground absorption correction	-5	dB(A)	_	Ground absorption correction	-5	dB(A)
Distance attenuation	-51.2	dB(A)		Distance attenuation	-54.9	dB(A)
Façade reflection	2.5	dB(A)	#	Façade reflection	2.5	dB(A)
Impact at Façade	41	dD(A)	#	Impact at raçade	58	dB(A)
A/C plant	62	dB(A) @ 3m	#	A/C plant	62	dB(A) @ 3m
Single event duration	420	seconds		Single event duration	420	seconds
Number of events in 15 minutes	2	events		Number of events in 15 minutes	2	events
Worst case duration in 15 minutes	14	minutes		Worst case duration in 15 minutes	14	minutes
15 minute Leq	61.7	dB(A) @ 3m		15 minute Leq	61.7	dB(A) @ 3m
Distance to receiver	355	m	Τ	Distance to receiver	565	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-41.5	dB(A)		Distance attenuation	-45.5	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	18	dB(A)	#	Impact at Façade	14	dB(A)
Refrigeration plant	64	dB(A) @ 3m	#	Refrigeration plant	64	dB(A) @ 3m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	64.0	dB(A) @ 3m		15 minute Leq	64.0	dB(A) @ 3m
Distance to receiver	355	m		Distance to receiver	565	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-41.5	dB(A)		Distance attenuation	-45.5	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	20	dB(A)	#	Impact at Façade	16	dB(A)
Kitahan ay haust unit	57	$d\mathbf{P}(\mathbf{A}) \otimes 2\mathbf{m}$	#	Kitahan ayhayst ynit	57	$d\mathbf{P}(\mathbf{A}) \otimes \mathbf{2m}$
Single event duration	900	uB(A) @ 5111	- #	Single event duration	900	econds
Number of events in 15 minutes	300	events		Number of events in 15 minutes	300	events
Worst case duration in 15 minutes	15	minutes	_	Worst case duration in 15 minutes	15	minutes
15 minute Lea	57.0	dB(A) @ 3m		15 minute Lea	57.0	dB(A) @ 3m
Distance to receiver	355	m		Distance to receiver	565	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-41.5	dB(A)		Distance attenuation	-45.5	dB(A)
Facade reflection	2.5	dB(A)		Facade reflection	2.5	dB(A)
Impact at Façade	13	dB(A)	#	Impact at Façade	9	dB(A)
· · · · · · · · · · · · · · · · · · ·						
Air compressor	65	dB(A) @ 2m	#	Air compressor	65	dB(A) @ 2m
Single event duration	180	seconds		Single event duration	180	seconds
Number of events in 15 minutes	2	events		Number of events in 15 minutes	2	events
Worst case duration in 15 minutes	6	minutes		Worst case duration in 15 minutes	6	minutes
15 minute Leq	61.0	dB(A) @ 2m		15 minute Leq	61.0	dB(A) @ 2m
Distance to receiver	355	m		Distance to receiver	565	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-45.0	dB(A)		Distance attenuation	-49.0	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	14	dB(A)	#	Impact at Façade	10	dB(A)
		TRAN C :				mun c :
1 ruck retrigeration units x 6	93	dB(A) @ 1m	#	I ruck retrigeration unit	93	dB(A) @ 1m
Single event duration	900	seconds	+	Single event duration	900	seconds
Number of events in 15 minutes	1	events	-	Number of events in 15 minutes	1	events
worst case duration in 15 minutes	15		+	15 minute Leg	15	
Distance to receiver	93.0	uB(A) @ 1m		Distance to receiver	93.0	ub(A) @ Im
Ground absorption correction	514		1	Ground absorption correction	590	dB(A)
Distance attenuation	-5	dB(A)	1	Distance attenuation	-5	$dB(\Lambda)$
Encode reflection	-49.9	dP(A)	+	Encode reflection	-55.4	dP(A)
raçaue reflection	2.5	dB(A)	#	raçade reflection	2.5	dB(A)
mpart at raçdur	41	ഡ(റ)	#	impact at raçaue		w)(A)
			+			
Combined daytime facade impact	42	dB(A)		Combined daytime facade impact	37	dB(A)

DAYTIME						
Leq ONSITE SERVICE STATION ACT	VITIES 1	MPACTING:				
R3: Dwellings to the northwest				R4: Dwellings to the northeast		
Nearest car door closures	80	dB(A) @ 1m	#	Nearest car door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	15	events		Number of events in 15 minutes	15	events
Worst case duration in 15 minutes	0.375	minutes		Worst case duration in 15 minutes	0.375	minutes
15 minute Leq	64.0	dB(A) @ 1m		15 minute Leq	64.0	dB(A) @ 1m
Distance to receiver	325	m		Distance to receiver	173	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-50.2	dB(A)		Distance attenuation	-44.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	11	dB(A)	#	Impact at Façade	22	dB(A)
Nearest truck door closures	80	dB(A) @ 1m	#	Nearest truck door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	15	events		Number of events in 15 minutes	15	events
Worst case duration in 15 minutes	0.375	minutes		Worst case duration in 15 minutes	0.375	minutes
15 minute Leq	64.0	dB(A) @ 1m		15 minute Leq	64.0	dB(A) @ 1m
Distance to receiver	330	m		Distance to receiver	138	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-50.4	dB(A)		Distance attenuation	-42.8	dB(A)
Facade reflection	2.5	dB(A)		Facade reflection	2.5	dB(A)
Impact at Facade	11	dB(A)	#	Impact at Facade	24	dB(A)
Car door closure at bowser	80	dB(A) @ 1m	#	Car door closure at bowser	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	15	events		Number of events in 15 minutes	15	events
Worst case duration in 15 minutes	0.375	minutes		Worst case duration in 15 minutes	0.375	minutes
15 minute Leq	64.0	dB(A) @ 1m		15 minute Leq	64.0	dB(A) @ 1m
Distance to receiver	355	m		Distance to receiver	260	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-51.0	dB(A)		Distance attenuation	-48.3	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	10	dB(A)	#	Impact at Façade	18	dB(A)
Truck door closures at bowser	80	dB(A) @ 1m	#	Truck door closures at bowser	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	15	events		Number of events in 15 minutes	15	events
Worst case duration in 15 minutes	0.375	minutes		Worst case duration in 15 minutes	0.375	minutes
15 minute Leq	64.0	dB(A) @ 1m		15 minute Leq	64.0	dB(A) @ 1m
Distance to receiver	335	m		Distance to receiver	275	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-50.5	dB(A)		Distance attenuation	-48.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	11	dB(A)	#	Impact at Façade	18	dB(A)
Combined door closure impacts	17	dB(A)	#	Combined door closure impacts	27	dB(A)
		<b>B</b> (1) 0 1	<u> </u>			<b>B</b> (1) 0 1
Car bypass	72	dB(A) @ 1m	Ħ	Car bypass	72	dB(A) @ 1m
Single event duration	20	seconds		Single event duration	20	seconds
Went and herein 15 minutes	30	events		We not and dwatter in 15 minutes	30	events
worst case duration in 15 minutes	70.2	dP(A) @ 1		worst case duration in 15 minutes	70.2	dP(A) @ 1
Distance to real.	/0.2	uB(A) @ 1m	-	15 minute Leq	/0.2	uB(A) @ 1m
Distance to receiver	312	m ID(A)		Distance to receiver	148	m ID(A)
Ground absorption correction	-5	aB(A)		Barrier screening	0	aB(A)
Distance attenuation	-49.9	aB(A)	-	Distance attenuation	-43.4	aB(A)
Façade reflection	2.5	aB(A)	μ	Façade reflection	2.5	aB(A)
Impact at Façade	18	aB(A)	∣#	Impact at Façade	29	aB(A)

DAYTIME						
Leq ONSITE SERVICE STATION ACT	VITIES I	MPACTING:				
R3: Dwellings to the northwest				R4: Dwellings to the northeast		
Tyre pressure beeper	75	dB(A) @ 1m	#	T yre pressure beeper	75	dB(A) @ 1m
Single event duration	3	seconds		Single event duration	3	seconds
Number of events in 15 minutes	12	events		Number of events in 15 minutes	12	events
Worst case duration in 15 minutes	0.6	minutes		Worst case duration in 15 minutes	0.6	minutes
15 minute Leq	61.0	dB(A) @ 1m		15 minute Leq	61.0	dB(A) @ 1m
Distance to receiver	358	m		Distance to receiver	252	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-51.1	dB(A)		Distance attenuation	-48.0	dB(A)
Facade reflection	2.5	dB(A)		Facade reflection	2.5	dB(A)
Impact at Facade	7	dB(A)	6	Impact at Facade	15	dB(A)
1				1		<u> </u>
Truck bypass	87	dB(A) @ 1m	#	Truck bypass	87	dB(A) @ 1m
Single event duration	20	seconds		Single event duration	20	seconds
Number of events in 15 minutes	30	events		Number of events in 15 minutes	30	events
Worst case duration in 15 minutes	10	minutes		Worst case duration in 15 minutes	10	minutes
15 minute Lea	85.2	dB(A) @ 1m		15 minute Lea	85.2	dB(A) @ 1m
Distance to receiver	312	m		Distance to receiver	138	m
Ground absorption correction	-5	$d\mathbf{B}(\mathbf{A})$		Barrier screening	-3	$d\mathbf{B}(\mathbf{A})$
Distance attenuation	_10.0	dB(A)		Distance attenuation	_12.8	dB(A)
Eacode reflection	-49.9	$d\mathbf{B}(\mathbf{A})$		Encode reflection	-42.8	$d\mathbf{B}(\mathbf{A})$
Impact at Eacode	2.3	$d\mathbf{P}(\mathbf{A})$	#	Impact at Eacoda	2.3	dD(A)
Impact at Façade		dD(A)	#	Impact at raçade	42	uD(A)
Detrons outdoor dining	75	$d\mathbf{P}(\mathbf{A}) \otimes 1_{\mathbf{m}}$	#	Patrons outdoor dining	75	$d\mathbf{P}(\mathbf{A}) \otimes 1_{\mathbf{m}}$
Fattons outdoor dinnig	7.5	ub(A) @ IIII	#	Fattons outdoor dining	7.5	ub(A) @ Till
Single event duration	900	seconds		Single event duration	900	seconds
Wanter of events in 15 minutes	15	events		Worst asso dynation in 15 minutes	15	events
worst case duration in 15 minutes	75.0	Initiates		worst case duration in 13 minutes	75.0	Initiates
Distance to provide the	/5.0	dB(A) @ 1m		15 minute Leq	75.0	dB(A) @ 1m
Distance to receiver	530	m ID(A)		Distance to receiver	255	m m(A)
Ground absorption correction	-5	dB(A)		Barrier screening	40.1	dB(A)
	-50.4	dB(A)			-48.1	dB(A)
Façade reflection	2.5	dB(A)	щ	Façade reflection	2.5	dB(A)
Impact at Façade	22	dB(A)	#	Impact at Façade	29	dB(A)
	07	<b>B</b> (1) 0 1	щ		07	<b>B</b> (1) 0 1
1 ruck airbrakes	97	dB(A) @ 1m	#	1 ruck airbrakes	97	dB(A) @ 1m
Single event duration	1	seconds		Single event duration	1	seconds
Number of events in 15 minutes	30	events		Number of events in 15 minutes	30	events
Worst case duration in 15 minutes	0.5	minutes	_	Worst case duration in 15 minutes	0.5	minutes
15 minute Leq	82.2	dB(A) @ 1m		15 minute Leq	82.2	dB(A) @ 1m
Distance to receiver	312	m		Distance to receiver	138	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-49.9	dB(A)		Distance attenuation	-42.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	30	dB(A)	#	Impact at Façade	42	dB(A)
Goods delivery	75	dB(A) @ 1m	#	Goods delivery	75	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	75.0	dB(A) @ 1m		15 minute Leq	75.0	dB(A) @ 1m
Distance to receiver	330	m		Distance to receiver	255	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-50.4	dB(A)		Distance attenuation	-48.1	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	22	dB(A)	#	Impact at Façade	29	dB(A)

DAYTIME						
Leq ONSITE SERVICE STATION ACT	VITIES I	MPACTING:				
R3: Dwellings to the northwest				R4: Dwellings to the northeast		
Waste collection	102	dB(A) @ 1m	#	Waste collection	102	dB(A) @ 1m
Single event duration	180	seconds	_	Single event duration	180	seconds
Number of events in 15 minutes	1	events	_	Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	3	minutes	-	Worst case duration in 15 minutes	3	minutes
Distance to receiver	95.0	dB(A) @ 1m	-	Distance to receiver	95.0	dB(A) @ Im
Ground absorption correction	-5	dB(A)		Barrier screening	233	dB(A)
Distance attenuation	-50.4	dB(A)		Distance attenuation	-48.1	dB(A)
Facade reflection	2.5	dB(A)	-	Facade reflection	2.5	dB(A)
Impact at Facade	42	dB(A)	#	Impact at Facade	49	dB(A)
,						
A/C plant	62	dB(A) @ 3m	#	A/C plant	62	dB(A) @ 3m
Single event duration	420	seconds		Single event duration	420	seconds
Number of events in 15 minutes	2	events		Number of events in 15 minutes	2	events
Worst case duration in 15 minutes	14	minutes		Worst case duration in 15 minutes	14	minutes
15 minute Leq	61.7	dB(A) @ 3m		15 minute Leq	61.7	dB(A) @ 3m
Distance to receiver	340	m		Distance to receiver	255	m
Ground absorption correction	-5	dB(A)		Plant enclosure	0	dB(A)
Distance attenuation	-41.1	dB(A)		Distance attenuation	-38.6	dB(A)
Façade reflection	2.5	dB(A)	.,	Façade reflection	2.5	dB(A)
Impact at Façade	18	dB(A)	#	Impact at Façade	26	dB(A)
		17 (1) G B	щ			<b>B</b> (1) <b>G A</b>
Refrigeration plant	64	dB(A) @ 3m	#	Retrigeration plant	64	dB(A) @ 3m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes	-	Worst case duration in 15 minutes	15	minutes
Distance to maximum	04.0	dB(A) @ 5m	-	15 minute Leq	04.0	dB(A) @ 5m
Crown d absorption correction	540		-	Distance to receiver	255	
Distance attenuation	-41.1	dB(A)	-	Distance attenuation	-38.6	dB(A)
Eacade reflection	-41.1	dB(A)	-	Eacade reflection	-30.0	dB(A)
Impact at Facade	2.5	dB(A)	#	Impact at Facade	2.5	dB(A)
	20		"		20	
Kitchen exhaust unit	57	dB(A) @ 3m	#	Kitchen exhaust unit	57	dB(A) @ 3m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leg	57.0	dB(A) @ 3m		15 minute Leg	57.0	dB(A) @ 3m
Distance to receiver	340	m		Distance to receiver	255	m
Ground absorption correction	-5	dB(A)		Attenuator	0	dB(A)
Distance attenuation	-41.1	dB(A)		Distance attenuation	-38.6	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	13	dB(A)	#	Impact at Façade	21	dB(A)
Air compressor	65	dB(A) @ 2m	#	Air compressor	65	dB(A) @ 2m
Single event duration	180	seconds		Single event duration	180	seconds
Number of events in 15 minutes	2	events		Number of events in 15 minutes	2	events
Worst case duration in 15 minutes	6	minutes		Worst case duration in 15 minutes	6	minutes
15 minute Leq	61.0	dB(A) @ 2m		15 minute Leq	61.0	dB(A) @ 2m
Distance to receiver	340	m		Distance to receiver	255	m
Ground absorption correction	-5	dB(A)		Plant enclosure	0	dB(A)
Distance attenuation	-44.6	dB(A)	_	Distance attenuation	-42.1	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	14	dB(A)	#	Impact at Façade	21	dB(A)
		17 (1) O (	ш			<b>B</b> (1) <b>G</b> (
Truck refrigeration unit	93	dB(A) @ 1m	#	Truck retrigeration unit	93	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Worst appointer in 15 minutes	17	events minutes	-	Worst once duration in 15 minutes	17	events minutes
15 minute Lea	02.0	dP(A) @ 1 m	⊢	15 minute Lee	02.0	dP(A) @ 1 m
Distance to receiver	93.0	mu(A) ⊎ Im	1	Distance to receiver	93.0	m (A) @ IM
Ground absorption correction	550	dB(A)		Barrier screening	215	dB(A)
Distance attenuation	-50 4	dB(A)	1	Distance attenuation	-12	dB(A)
Eacade reflection	-50.4	dB(A)	1	Eacade reflection	-+0.0	dB(A)
Impact at Facade	2.5	dB(A)	#	Impact at Facade	2.3	dB(A)
Impuet ut i uçude	+0	(1)	<i>a</i>	impart at 1 açadı	51	(11)
			-			
Combined daytime facade impact	41	dB(A)	t	Combined daytime facade impact	46.0	dB(A)
	1					

EVENING						
Leq ONSITE SERVICE STATION ACTIV	VITIES 1	MPACTING:				
R1: Dwellings to the southeast				R2: Dwellings to the southwest		
Nearest car door closures	80	dB(A) @ 1m	#	Nearest car door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	0.25	minutes		Worst case duration in 15 minutes	0.25	minutes
15 minute Leq	62.2	dB(A) @ 1m		15 minute Leq	62.2	dB(A) @ 1m
Distance to receiver	314	m		Distance to receiver	590	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-49.9	dB(A)		Distance attenuation	-55.4	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	10	dB(A)	#	Impact at Façade	4	dB(A)
Nearest truck door closures	80	dB(A) @ 1m	#	Nearest truck door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	0.25	minutes		Worst case duration in 15 minutes	0.25	minutes
15 minute Leq	62.2	dB(A) @ 1m		15 minute Leq	62.2	dB(A) @ 1m
Distance to receiver	314	m		Distance to receiver	590	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-49.9	dB(A)		Distance attenuation	-55.4	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	10	dB(A)	#	Impact at Façade	4	dB(A)
Car door closure at bowser	80	dB(A) @ 1m	#	Car door closure at bowser	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	0.25	minutes		Worst case duration in 15 minutes	0.25	minutes
15 minute Leq	62.2	dB(A) @ 1m		15 minute Leq	62.2	dB(A) @ 1m
Crown d absorption connection	529	m dD(A)		Distance to receiver	580	m dD(A)
Distance attenuation	-50.2	dB(A)		Distance attenuation	-5	dB(A)
Eacade reflection	-50.5	dB(A)		Eacade reflection	-35.5	dB(A)
Impact at Facade	2.5	dB(A)	q	Impact at Facade	2.3	dB(A)
			Ŭ			ub(II)
Truck door closures at bowser	80	dB(A) @ 1m	#	Truck door closures at bowser	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	0.25	minutes		Worst case duration in 15 minutes	0.25	minutes
15 minute Leq	62.2	dB(A) @ 1m		15 minute Leq	62.2	dB(A) @ 1m
Distance to receiver	365	m		Distance to receiver	525	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-51.2	dB(A)		Distance attenuation	-54.4	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	8	dB(A)	7	Impact at Façade	5	dB(A)
Combined door closure impacts	15	dB(A)	#	Combined door closure impacts	11	dB(A)
Car bypass	72	dB(A) @ 1m	#	Car bypass	72	dB(A) @ 1m
Single event duration	20	seconds		Single event duration	20	seconds
Number of events in 15 minutes	20	events		Number of events in 15 minutes	20	events
Worst case duration in 15 minutes	6.667	minutes		Worst case duration in 15 minutes	6.667	minutes
15 minute Leq	68.5	ав(A) @ Im		15 minute Leq	68.5	ав(A) @ Im
Cround absorption correction	303			Cround absorption correction	503	
Distance attenuation	-5	dP(A)		Distance ettenuation	-5	dD(A)
Eacade reflection	-49.0	dB(A)		Eacade reflection	-54.0	dB(A)
Impact at Eacade	2.5	$dB(\Lambda)$	#	Impact at Facade	12	dB(A)
impact at raçade	10	uD(A)	π	impact at l'açade	12	uu(n)

EVENING						
Leq ONSITE SERVICE STATION ACT	IIVITIES I	MPACTING:				
R1: Dwellings to the southeast				R2: Dwellings to the southwest		
Tyre pressure beeper	75	dB(A) @ 1m	#	Tyre pressure beeper	75	dB(A) @ 1m
Single event duration	3	seconds		Single event duration	3	seconds
Number of events in 15 minutes	12	events		Number of events in 15 minutes	12	events
Worst case duration in 15 minutes	0.6	minutes		Worst case duration in 15 minutes	0.6	minutes
15 minute Leq	61.0	dB(A) @ 1m		15 minute Leq	61.0	dB(A) @ 1m
Distance to receiver	345	m		Distance to receiver	600	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-50.8	dB(A)		Distance attenuation	-55.6	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	8	dB(A)	6	Impact at Façade	3	dB(A)
Truck bypass	87	dB(A) @ 1m	#	Truck bypass	87	dB(A) @ 1m
Single event duration	20	seconds		Single event duration	20	seconds
Number of events in 15 minutes	20	events		Number of events in 15 minutes	20	events
Worst case duration in 15 minutes	6.667	minutes		Worst case duration in 15 minutes	6.667	minutes
15 minute Leq	83.5	dB(A) @ 1m		15 minute Leq	83.5	dB(A) @ 1m
Distance to receiver	303	m		Distance to receiver	503	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-49.6	dB(A)		Distance attenuation	-54.0	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	31	dB(A)	#	Impact at Façade	27	dB(A)
Patrons outdoor dining	75	dB(A) @ 1m	#	Patrons outdoor dining	75	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	75.0	dB(A) @ 1m		15 minute Leq	75.0	dB(A) @ 1m
Distance to receiver	355	m		Distance to receiver	570	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-51.0	dB(A)		Distance attenuation	-55.1	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	21	dB(A)	#	Impact at Façade	17	dB(A)
Truck airbrakes	97	dB(A) @ 1m	#	Truck airbrakes	97	dB(A) @ 1m
Single event duration	1	seconds		Single event duration	1	seconds
Number of events in 15 minutes	20	events		Number of events in 15 minutes	20	events
Worst case duration in 15 minutes	0.333	minutes		Worst case duration in 15 minutes	0.333	minutes
15 minute Leq	80.5	dB(A) @ 1m		15 minute Leq	80.5	dB(A) @ 1m
Distance to receiver	303	m		Distance to receiver	503	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-49.6	dB(A)		Distance attenuation	-54.0	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	28	dB(A)	#	Impact at Façade	24	dB(A)
Goods delivery	75	dB(A) @ 1m	#	Goods delivery	75	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	75.0	dB(A) @ 1m		15 minute Leq	75.0	dB(A) @ 1m
Distance to receiver	365	m		Distance to receiver	555	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-51.2	dB(A)		Distance attenuation	-54.9	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	21	dB(A)	#	Impact at Façade	18	dB(A)

EVENING						
Leq ONSITE SERVICE STATION AC	TIVITIES I	MPACTING:				
R1: Dwellings to the southeast				R2: Dwellings to the southwest		
A/C plant	62	dB(A) @ 3m	#	A/C plant	62	dB(A) @ 3m
Single event duration	420	seconds		Single event duration	420	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	7	minutes		Worst case duration in 15 minutes	7	minutes
15 minute Leq	58.7	dB(A) @ 3m		15 minute Leq	58.7	dB(A) @ 3m
Distance to receiver	355	m		Distance to receiver	565	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-41.5	dB(A)		Distance attenuation	-45.5	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	15	dB(A)	#	Impact at Façade	11	dB(A)
Refrigeration plant	64	dB(A) @ 3m	#	Refrigeration plant	64	dB(A) @ 3m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	64.0	dB(A) @ 3m		15 minute Leq	64.0	dB(A) @ 3m
Distance to receiver	355	m	1	Distance to receiver	565	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-41.5	dB(A)		Distance attenuation	-45.5	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	20	dB(A)	#	Impact at Façade	16	dB(A)
Kitchen exhaust unit	57	dB(A) @ 3m	#	Kitchen exhaust unit	57	dB(A) @ 3m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	57.0	dB(A) @ 3m		15 minute Leq	57.0	dB(A) @ 3m
Distance to receiver	355	m		Distance to receiver	565	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-41.5	dB(A)		Distance attenuation	-45.5	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	13	dB(A)	#	Impact at Façade	9	dB(A)
Air compressor	65	dB(A) @ 2m	#	Air compressor	65	dB(A) @ 2m
Single event duration	180	seconds		Single event duration	180	seconds
Number of events in 15 minutes	2	events		Number of events in 15 minutes	2	events
Worst case duration in 15 minutes	6	minutes		Worst case duration in 15 minutes	6	minutes
15 minute Leq	61.0	dB(A) @ 2m		15 minute Leq	61.0	dB(A) @ 2m
Distance to receiver	355	m		Distance to receiver	565	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-45.0	dB(A)		Distance attenuation	-49.0	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	14	dB(A)	#	Impact at Façade	10	dB(A)
Truck refrigeration units x 6	93	dB(A) @ 1m	#	Truck refrigeration unit	93	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes	1	Worst case duration in 15 minutes	15	minutes
15 minute Leq	93.0	dB(A) @ 1m		15 minute Leq	93.0	dB(A) @ 1m
Distance to receiver	314	m		Distance to receiver	590	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-49.9	dB(A)		Distance attenuation	-55.4	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	41	dB(A)	#	Impact at Façade	35	dB(A)
Combined daytime façade impact	41	dB(A)		Combined daytime façade impact	36	dB(A)

EVENING						
Leq ONSITE SERVICE STATION ACT	VITIES I	MPACTING:				
R3: Dwellings to the northwest				R4: Dwellings to the northeast		
Nearest car door closures	80	dB(A) @ 1m	#	Nearest car door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	0.25	minutes		Worst case duration in 15 minutes	0.25	minutes
15 minute Leq	62.2	dB(A) @ 1m		15 minute Leq	62.2	dB(A) @ 1m
Distance to receiver	325	m		Distance to receiver	173	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-50.2	dB(A)		Distance attenuation	-44.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	9	dB(A)	9	Impact at Façade	20	dB(A)
Nearest truck door closures	80	dB(A) @ 1m	#	Nearest truck door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	0.25	minutes		Worst case duration in 15 minutes	0.25	minutes
15 minute Leq	62.2	dB(A) @ 1m		15 minute Leq	62.2	dB(A) @ 1m
Distance to receiver	330	m		Distance to receiver	138	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-50.4	dB(A)		Distance attenuation	-42.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	9	dB(A)	9	Impact at Façade	22	dB(A)
Car door closure at bowser	80	dB(A) @ 1m	#	Car door closure at bowser	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	0.25	minutes		Worst case duration in 15 minutes	0.25	minutes
15 minute Leq	62.2	dB(A) @ 1m		15 minute Leq	62.2	dB(A) @ 1m
Distance to receiver	355	m		Distance to receiver	260	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-51.0	dB(A)		Distance attenuation	-48.3	dB(A)
Façade reflection	2.5	dB(A)	-	Façade reflection	2.5	dB(A)
Impact at Façade	9	dB(A)	1	Impact at Façade	16	dB(A)
		m(1) 0 4				<b>B</b> (1) <b>B</b> (1)
Truck door closures at bowser	80	dB(A) @ 1m	Ŧ	Truck door closures at bowser	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	0.25	minutes		Worst case duration in 15 minutes	0.25	minutes
15 minute Leq	62.2	dB(A) @ 1m		15 minute Leq	62.2	dB(A) @ 1m
Distance to receiver	335	m ID(A)		Distance to receiver	275	m ID(A)
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-50.5	aB(A)		Distance attenuation	-48.8	dB(A)
Façade reflection	2.5	aB(A)	0	Façade reflection	2.5	aB(A)
Impact at Façade	9	dB(A)	Ø	Impact at Façade	16	dB(A)
	1.7		#		<u>.</u>	
Combined door closure impacts	15	ав(А)	#	Combined door closure impacts	24	ав(A)

EVENING						
Leq ONSITE SERVICE STATION ACT	VITIES 1	MPACTING:				
R3: Dwellings to the northwest				R4: Dwellings to the northeast		
T yre pressure beeper	75	dB(A) @ 1m	#	Tyre pressure beeper	75	dB(A) @ 1m
Single event duration	3	seconds		Single event duration	3	seconds
Number of events in 15 minutes	12	events		Number of events in 15 minutes	12	events
Worst case duration in 15 minutes	0.6	minutes		Worst case duration in 15 minutes	0.6	minutes
15 minute Leq	61.0	dB(A) @ 1m		15 minute Leq	61.0	dB(A) @ 1m
Distance to receiver	358	m		Distance to receiver	252	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-51.1	dB(A)		Distance attenuation	-48.0	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	7	dB(A)	6	Impact at Façade	15	dB(A)
Truck bypass	87	dB(A) @ 1m	#	Truck bypass	87	dB(A) @ 1m
Single event duration	20	seconds		Single event duration	20	seconds
Number of events in 15 minutes	20	events		Number of events in 15 minutes	20	events
Worst case duration in 15 minutes	6.667	minutes		Worst case duration in 15 minutes	6.667	minutes
15 minute Leq	83.5	dB(A) @ 1m		15 minute Leq	83.5	dB(A) @ 1m
Distance to receiver	312	m		Distance to receiver	138	m
Ground absorption correction	-5	dB(A)		Barrier screening	-3	dB(A)
Distance attenuation	-49.9	dB(A)		Distance attenuation	-42.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	31	dB(A)	#	Impact at Façade	40	dB(A)
Patrons outdoor dining	75	dB(A) @ 1m	#	Patrons outdoor dining	75	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	75.0	dB(A) @ 1m		15 minute Leq	75.0	dB(A) @ 1m
Distance to receiver	330	m		Distance to receiver	255	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-50.4	dB(A)		Distance attenuation	-48.1	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	22	dB(A)	#	Impact at Façade	29	dB(A)
Truck airbrakes	97	dB(A) @ 1m	#	Truck airbrakes	97	dB(A) @ 1m
Single event duration	1	seconds	_	Single event duration	1	seconds
Number of events in 15 minutes	20	events	_	Number of events in 15 minutes	20	events
Worst case duration in 15 minutes	0.333	minutes		Worst case duration in 15 minutes	0.333	minutes
15 minute Leq	80.5	dB(A) @ 1m		15 minute Leq	80.5	dB(A) @ 1m
Distance to receiver	312	m	_	Distance to receiver	138	m
Ground absorption correction	-5	dB(A)	_	Barrier screening	0	dB(A)
Distance attenuation	-49.9	dB(A)	_	Distance attenuation	-42.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	28	dB(A)	#	Impact at Façade	40	dB(A)
		<b>B</b> (1) 0 1	ш			TRAN O I
Goods delivery	- 75	dB(A) @ Im	#	Goods delivery	75	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1.7	events		We not soon dwarf on in 15 minutes	17	events
worst case duration in 15 minutes	15	minutes	-	worst case duration in 15 minutes	15	minutes
15 minute Leq	/5.0	dB(A) @ 1m		15 minute Leq	/5.0	dB(A) @ 1m
Distance to receiver	- 330			Distance to receiver	255	
Ground absorption correction	-5	aB(A)		Barrier screening	0	
Distance attenuation	-50.4	dB(A)		Distance attenuation	-48.1	dB(A)
Façade reflection	2.5	aB(A)	<u>بر</u>	Façade reflection	2.5	aB(A)
Impact at Façade	22	dB(A)	#	Impact at Façade	29	dB(A)

EVENING						
Leq ONSITE SERVICE STATION AC	TIVITIES I	MPACTING:				
R3: Dwellings to the northwest			_	R4: Dwellings to the northeast		
A/C plant	62	dB(A) @ 3m	#	A/C plant	62	dB(A) @ 3m
Single event duration	420	seconds		Single event duration	420	seconds
Number of events in 15 minutes	1	events	_	Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	7	minutes		Worst case duration in 15 minutes	7	minutes
15 minute Leq	58.7	dB(A) @ 3m		15 minute Leq	58.7	dB(A) @ 3m
Distance to receiver	340	m		Distance to receiver	255	m
Ground absorption correction	-5	dB(A)		Plant enclosure	0	dB(A)
Distance attenuation	-41.1	dB(A)		Distance attenuation	-38.6	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	15	dB(A)	#	Impact at Façade	23	dB(A)
Refrigeration plant	64	dB(A) @ 3m	#	Refrigeration plant	64	dB(A) @ 3m
Single event duration	900	seconds	_	Single event duration	900	seconds
Number of events in 15 minutes	1	events	_	Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes	_	Worst case duration in 15 minutes	15	minutes
15 minute Leq	64.0	dB(A) @ 3m	_	15 minute Leq	64.0	dB(A) @ 3m
Distance to receiver	340	m		Distance to receiver	255	m
Ground absorption correction	-5	dB(A)		Plant enclosure	0	dB(A)
Distance attenuation	-41.1	dB(A)		Distance attenuation	-38.6	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	20	dB(A)	#	Impact at Façade	28	dB(A)
Kitchen exhaust unit	57	dB(A) @ 3m	#	Kitchen exhaust unit	57	dB(A) @ 3m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	57.0	dB(A) @ 3m		15 minute Leq	57.0	dB(A) @ 3m
Distance to receiver	340	m		Distance to receiver	255	m
Ground absorption correction	-5	dB(A)		Attenuator	0	dB(A)
Distance attenuation	-41.1	dB(A)		Distance attenuation	-38.6	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	13	dB(A)	#	Impact at Façade	21	dB(A)
			_			
Air compressor	65	dB(A) @ 2m	#	Air compressor	65	dB(A) @ 2m
Single event duration	180	seconds		Single event duration	180	seconds
Number of events in 15 minutes	2	events		Number of events in 15 minutes	2	events
Worst case duration in 15 minutes	6	minutes		Worst case duration in 15 minutes	6	minutes
15 minute Leq	61.0	dB(A) @ 2m		15 minute Leq	61.0	dB(A) @ 2m
Distance to receiver	340	m		Distance to receiver	255	m
Ground absorption correction	-5	dB(A)		Plant enclosure	0	dB(A)
Distance attenuation	-44.6	dB(A)		Distance attenuation	-42.1	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	14	dB(A)	#	Impact at Façade	21	dB(A)
Truck refrigeration unit	93	dB(A) @ 1m	#	Truck refrigeration unit	93	dB(A) @ 1m
Single event duration	900	seconds	_	Single event duration	900	seconds
Number of events in 15 minutes	1	events	_	Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes	_	Worst case duration in 15 minutes	15	minutes
15 minute Leq	93.0	dB(A) @ 1m		15 minute Leq	93.0	dB(A) @ 1m
Distance to receiver	330	m		Distance to receiver	138	m
Ground absorption correction	-5	dB(A)		Barrier screening	-12	dB(A)
Distance attenuation	-50.4	dB(A)		Distance attenuation	-42.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	40	dB(A)	#	Impact at Façade	41	dB(A)
			_			
Combined daytime façade impact	41	dB(A)		Combined daytime façade impact	45.5	dB(A)

NIGHT						
Leq ONSITE SERVICE STATION ACTIV	VITIES 1	MPACTING:				
R1: Dwellings to the southeast				R2: Dwellings to the southwest		
Nearest car door closures	80	dB(A) @ 1m	#	Nearest car door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	5	events		Number of events in 15 minutes	5	events
Worst case duration in 15 minutes	0.125	minutes		Worst case duration in 15 minutes	0.125	minutes
15 minute Leq	59.2	dB(A) @ 1m		15 minute Leq	59.2	dB(A) @ 1m
Distance to receiver	314	m		Distance to receiver	590	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-49.9	dB(A)		Distance attenuation	-55.4	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	7	dB(A)	5	Impact at Façade	1	dB(A)
Nearest truck door closures	80	dB(A) @ 1m	#	Nearest truck door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	5	events		Number of events in 15 minutes	5	events
Worst case duration in 15 minutes	0.125	minutes		Worst case duration in 15 minutes	0.125	minutes
15 minute Leq	59.2	dB(A) @ 1m		15 minute Leq	59.2	dB(A) @ 1m
Distance to receiver	314	m		Distance to receiver	590	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-49.9	dB(A)		Distance attenuation	-55.4	dB(A)
Façade reflection	2.5	dB(A)	_	Façade reflection	2.5	dB(A)
Impact at Façade	7	dB(A)	5	Impact at Façade	1	dB(A)
Car door closure at bowser	80	dB(A) @ 1m	#	Car door closure at bowser	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	5	events		Number of events in 15 minutes	5	events
Worst case duration in 15 minutes	0.125	minutes	_	Worst case duration in 15 minutes	0.125	minutes
15 minute Leq	59.2	dB(A) @ 1m		15 minute Leq	59.2	dB(A) @ 1m
Distance to receiver	329	m		Distance to receiver	580	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-50.3	dB(A)		Distance attenuation	-55.3	dB(A)
Façade reflection	2.5	dB(A)	4	Façade reflection	2.5	dB(A)
Impact at Façade	0	dB(A)	4	Impact at Façade	1	dB(A)
Truck door closures at bouser	80	$d\mathbf{B}(\mathbf{A}) \otimes 1\mathbf{m}$	#	Truck door closures at bouser	80	$d\mathbf{B}(\mathbf{A}) \otimes 1\mathbf{m}$
Single event duration	1.5	caconde	π	Single event duration	1.5	caconds
Number of events in 15 minutes	1.5	avants		Number of events in 15 minutes	1.5	avants
Worst case duration in 15 minutes	0.125	minutes		Worst case duration in 15 minutes	0.125	minutes
15 minute Lea	59.2	dB(A) @ 1m		15 minute Lea	59.2	dB(A) @ 1m
Distance to receiver	365	m		Distance to receiver	525	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-51.2	dB(A)		Distance attenuation	-54.4	dB(A)
Eacade reflection	2.5	dB(A)		Facade reflection	2 5	dB(A)
Impact at Facade	2.5	dB(A)	4	Impact at Facade	2.3	dB(A)
Impuer ur rușude				impuor ur i uşudo		
Combined door closure impacts	12	dB(A)	#	Combined door closure impacts	8	dB(A)
I I I I I I I I I I I I I I I I I I I						<u> </u>
Car bypass	72	dB(A) @ 1m	#	Car bypass	72	dB(A) @ 1m
Single event duration	20	seconds		Single event duration	20	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	3.333	minutes		Worst case duration in 15 minutes	3.333	minutes
15 minute Leq	65.5	dB(A) @ 1m		15 minute Leq	65.5	dB(A) @ 1m
Distance to receiver	303	m		Distance to receiver	503	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-49.6	dB(A)		Distance attenuation	-54.0	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	13	dB(A)	#	Impact at Façade	9	dB(A)

NIGHT						
Leq ONSITE SERVICE STATION ACTIV	VITIES I	MPACTING:				
R1: Dwellings to the southeast				R2: Dwellings to the southwest		
Tyre pressure beeper	75	dB(A) @ 1m	#	Tyre pressure beeper	75	dB(A) @ 1m
Single event duration	3	seconds		Single event duration	3	seconds
Number of events in 15 minutes	4	events		Number of events in 15 minutes	4	events
Worst case duration in 15 minutes	0.2	minutes		Worst case duration in 15 minutes	0.2	minutes
15 minute Leq	56.2	dB(A) @ 1m		15 minute Leq	56.2	dB(A) @ 1m
Distance to receiver	345	m		Distance to receiver	600	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-50.8	dB(A)		Distance attenuation	-55.6	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	3	dB(A)	2	Impact at Façade	-2	dB(A)
Truck bypass	87	dB(A) @ 1m	#	Truck bypass	87	dB(A) @ 1m
Single event duration	20	seconds		Single event duration	20	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	3.333	minutes		Worst case duration in 15 minutes	3.333	minutes
15 minute Leq	80.5	dB(A) @ 1m		15 minute Leq	80.5	dB(A) @ 1m
Distance to receiver	303	m		Distance to receiver	503	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-49.6	dB(A)		Distance attenuation	-54.0	dB(A)
Facade reflection	2.5	dB(A)		Facade reflection	2.5	dB(A)
Impact at Facade	28	dB(A)	#	Impact at Facade	24	dB(A)
Patrons outdoor dining	75	dB(A) @ 1m	#	Patrons outdoor dining	75	dB(A) @ 1m
Single event duration	720	seconds	"	Single event duration	720	esconde
Number of events in 15 minutes	120	seconds		Number of events in 15 minutes	120	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	12	minutes		Worst case duration in 15 minutes	12	minutes
15 minute Leq	74.0	dB(A) @ 1m		15 minute Leq	74.0	dB(A) @ 1m
Distance to receiver	355	m		Distance to receiver	570	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-51.0	dB(A)		Distance attenuation	-55.1	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	21	dB(A)	#	Impact at Façade	16	dB(A)
Truck airbrakes	97	dB(A) @ 1m	#	Truck airbrakes	97	dB(A) @ 1m
Single event duration	1	seconds		Single event duration	1	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	0.167	minutes		Worst case duration in 15 minutes	0.167	minutes
15 minute Leq	77.5	dB(A) @ 1m		15 minute Leq	77.5	dB(A) @ 1m
Distance to receiver	303	m		Distance to receiver	503	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-49.6	dB(A)		Distance attenuation	-54.0	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	25	dB(A)	#	Impact at Façade	21	dB(A)
A/C plant	62	dB(A) @ 3m	#	A/C plant	62	dB(A) @ 3m
Single event duration	300	seconds		Single event duration	300	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	5	minutes		Worst case duration in 15 minutes	5	minutes
15 minute Leq	57.2	dB(A) @ 3m		15 minute Leq	57.2	dB(A) @ 3m
Distance to receiver	355	m		Distance to receiver	565	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-41.5	dB(A)		Distance attenuation	-45.5	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	13	dB(A)	#	Impact at Façade	9	dB(A)

NIGHT						
Leq ONSITE SERVICE STATION AC	TIVITIES I	MPACTING:				
R1: Dwellings to the southeast				R2: Dwellings to the southwest		
Refrigeration plant	64	dB(A) @ 3m	#	Refrigeration plant	64	dB(A) @ 3m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	64.0	dB(A) @ 3m		15 minute Leq	64.0	dB(A) @ 3m
Distance to receiver	355	m		Distance to receiver	565	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-41.5	dB(A)		Distance attenuation	-45.5	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	20	dB(A)	#	Impact at Façade	16	dB(A)
Kitchen exhaust unit	57	dB(A) @ 3m	#	Kitchen exhaust unit	57	dB(A) @ 3m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leg	57.0	dB(A) @ 3m		15 minute Leg	57.0	dB(A) @ 3m
Distance to receiver	355	m		Distance to receiver	565	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-41.5	dB(A)		Distance attenuation	-45.5	dB(A)
Facade reflection	2.5	dB(A)		Facade reflection	2.5	dB(A)
Impact at Facade	13	dB(A)	#	Impact at Facade	9	dB(A)
Air compressor	65	dB(A) @ 2m	#	Air compressor	65	dB(A) @ 2m
Single event duration	120	seconds		Single event duration	120	seconds
Number of events in 15 minutes	2	events		Number of events in 15 minutes	2	events
Worst case duration in 15 minutes	4	minutes		Worst case duration in 15 minutes	4	minutes
15 minute Leq	59.3	dB(A) @ 2m		15 minute Leq	59.3	dB(A) @ 2m
Distance to receiver	355	m		Distance to receiver	565	m
Ground absorption correction	-5	dB(A)		Ground absorption correction	-5	dB(A)
Distance attenuation	-45.0	dB(A)		Distance attenuation	-49.0	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	12	dB(A)	#	Impact at Façade	8	dB(A)
Truck refrigeration units x 6	93	dB(A) @ 1m	#	Truck refrigeration unit	93	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	93.0	dB(A) @ 1m		15 minute Leq	93.0	dB(A) @ 1m
Distance to receiver	314	m		Distance to receiver	590	m
Distance attenuation	-5	dB(A)		Distance attenuation	-5	dB(A)
Distance attenuation	-49.9	dB(A)		Distance attenuation	-55.4	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Facade	41	dB(A)	#	Impact at Facade	35	dB(A)
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Combined evening facade impact	41	dB(A)	1	Combined evening facade impact	36	dB(A)

NIGHT						
Leq ONSITE SERVICE STATION ACT	VITIES I	MPACTING:				
R3: Dwellings to the northwest				R4: Dwellings to the northeast		
Nearest car door closures	80	dB(A) @ 1m	#	Nearest car door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	5	events		Number of events in 15 minutes	5	events
Worst case duration in 15 minutes	0.125	minutes		Worst case duration in 15 minutes	0.125	minutes
15 minute Leq	59.2	dB(A) @ 1m		15 minute Leq	59.2	dB(A) @ 1m
Distance to receiver	325	m		Distance to receiver	173	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-50.2	dB(A)		Distance attenuation	-44.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	6	dB(A)	4	Impact at Façade	17	dB(A)
		<b>B</b> (1) <b>G</b> (1	ш			IR (I) O I
Nearest truck door closures	80	dB(A) @ Im	#	Nearest truck door closures	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	5	events		Number of events in 15 minutes	5	events
Worst case duration in 15 minutes	0.125	minutes		Worst case duration in 15 minutes	0.125	minutes
15 minute Leq	59.2	dB(A) @ 1m		15 minute Leq	59.2	dB(A) @ 1m
Distance to receiver	330	m	_	Distance to receiver	138	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-50.4	dB(A)		Distance attenuation	-42.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	6	dB(A)	4	Impact at Façade	19	dB(A)
Car door closure at bowser	80	dB(A) @ 1m	#	Car door closure at bowser	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	5	events		Number of events in 15 minutes	5	events
Worst case duration in 15 minutes	0.125	minutes		Worst case duration in 15 minutes	0.125	minutes
15 minute Leq	59.2	dB(A) @ 1m		15 minute Leq	59.2	dB(A) @ 1m
Distance to receiver	355	m		Distance to receiver	260	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-51.0	dB(A)		Distance attenuation	-48.3	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	6	dB(A)	4	Impact at Façade	13	dB(A)
Truck door closures at bowser	80	dB(A) @ 1m	#	Truck door closures at bowser	80	dB(A) @ 1m
Single event duration	1.5	seconds		Single event duration	1.5	seconds
Number of events in 15 minutes	5	events		Number of events in 15 minutes	5	events
Worst case duration in 15 minutes	0.125	minutes		Worst case duration in 15 minutes	0.125	minutes
15 minute Leq	59.2	dB(A) @ 1m		15 minute Leq	59.2	dB(A) @ 1m
Distance to receiver	335	m		Distance to receiver	275	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-50.5	dB(A)		Distance attenuation	-48.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	6	dB(A)	4	Impact at Façade	13	dB(A)
Combined door closure impacts	12	dB(A)	#	Combined door closure impacts	21	dB(A)
			-			
	70	ID(A) O 1	ш		70	ID(4) 0 1
Car bypass	72	dB(A) @ Im	#	Car bypass	72	dB(A) @ 1m
Single event duration	20	seconds		Single event duration	20	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	3.333	minutes		Worst case duration in 15 minutes	3.333	minutes
15 minute Leq	65.5	dB(A) @ 1m		15 minute Leq	65.5	dB(A) @ 1m
Distance to receiver	312	m		Distance to receiver	148	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-49.9	dB(A)	_	Distance attenuation	-43.4	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	13	dB(A)	#	Impact at Façade	25	dB(A)

NIGHT						
Leq ONSITE SERVICE STATION ACT	VITIES I	MPACTING:				
R3: Dwellings to the northwest				R4: Dwellings to the northeast		
Tyre pressure beeper	75	dB(A) @ 1m	#	Tyre pressure beeper	75	dB(A) @ 1m
Single event duration	3	seconds		Single event duration	3	seconds
Number of events in 15 minutes	4	events		Number of events in 15 minutes	4	events
Worst case duration in 15 minutes	0.2	minutes		Worst case duration in 15 minutes	0.2	minutes
15 minute Leq	56.2	dB(A) @ 1m		15 minute Leq	56.2	dB(A) @ 1m
Distance to receiver	358	m		Distance to receiver	252	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-51.1	dB(A)		Distance attenuation	-48.0	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	3	dB(A)	2	Impact at Façade	11	dB(A)
Truck bypass	87	dB(A) @ 1m	#	Truck bypass	87	dB(A) @ 1m
Single event duration	20	seconds		Single event duration	20	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	3.333	minutes		Worst case duration in 15 minutes	3.333	minutes
15 minute Leq	80.5	dB(A) @ 1m		15 minute Leq	80.5	dB(A) @ 1m
Distance to receiver	312	m		Distance to receiver	138	m
Ground absorption correction	-5	dB(A)		Barrier screening	-3	dB(A)
Distance attenuation	-49.9	dB(A)		Distance attenuation	-42.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	28	dB(A)	#	Impact at Façade	37	dB(A)
Patrons outdoor dining	75	dB(A) @ 1m	#	Patrons outdoor dining	75	dB(A) @ 1m
Single event duration	720	seconds		Single event duration	720	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	12	minutes		Worst case duration in 15 minutes	12	minutes
15 minute Log	74.0	$d\mathbf{P}(\mathbf{A}) \otimes 1\mathbf{m}$		15 minute Lea	74.0	$d\mathbf{R}(\mathbf{A}) \otimes 1\mathbf{m}$
Distance to receiver	220	ub(A) @ IIII	-	Distance to receiver	255	ub(A) @ III
	330			Distance to receiver	233	III ID(A)
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-50.4	dB(A)		Distance attenuation	-48.1	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	21	dB(A)	#	Impact at Façade	28	dB(A)
Truck airbrakes	97	dB(A) @ 1m	#	Truck airbrakes	97	dB(A) @ 1m
Single event duration	1	seconds		Single event duration	1	seconds
Number of events in 15 minutes	10	events		Number of events in 15 minutes	10	events
Worst case duration in 15 minutes	0.167	minutes		Worst case duration in 15 minutes	0.167	minutes
15 minute Leq	77.5	dB(A) @ 1m		15 minute Leq	77.5	dB(A) @ 1m
Distance to receiver	312	m		Distance to receiver	138	m
Ground absorption correction	-5	dB(A)		Barrier screening	0	dB(A)
Distance attenuation	-49.9	dB(A)		Distance attenuation	-42.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	25	dB(A)	#	Impact at Façade	37	dB(A)
A/C plant	62	dB(A) @ 3m	#	A/C plant	62	dB(A) @ 3m
Single event duration	300	seconds		Single event duration	300	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	5	minutes		Worst case duration in 15 minutes	5	minutes
15 minute Leq	57.2	dB(A) @ 3m		15 minute Leq	57.2	dB(A) @ 3m
Distance to receiver	340	m		Distance to receiver	255	m
Ground absorption correction	-5	dB(A)		Plant enclosure	0	dB(A)
Distance attenuation	-41.1	dB(A)		Distance attenuation	-38.6	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	14	dB(A)	#	Impact at Façade	21	dB(A)

NIGHT						
Leq ONSITE SERVICE STATION ACT	VITIES I	MPACTING:				
R3: Dwellings to the northwest				R4: Dwellings to the northeast		
Refrigeration plant	64	dB(A) @ 3m	#	Refrigeration plant	64	dB(A) @ 3m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	64.0	dB(A) @ 3m		15 minute Leq	64.0	dB(A) @ 3m
Distance to receiver	340	m		Distance to receiver	255	m
Ground absorption correction	-5	dB(A)		Plant enclosure	0	dB(A)
Distance attenuation	-41.1	dB(A)		Distance attenuation	-38.6	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	20	dB(A)	#	Impact at Façade	28	dB(A)
Kitchen exhaust unit	57	dB(A) @ 3m	#	Kitchen exhaust unit	57	dB(A) @ 3m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	57.0	dB(A) @ 3m		15 minute Leq	57.0	dB(A) @ 3m
Distance to receiver	340	m		Distance to receiver	255	m
Ground absorption correction	-5	dB(A)		Attenuator	0	dB(A)
Distance attenuation	-41.1	dB(A)		Distance attenuation	-38.6	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Facade	13	dB(A)	#	Impact at Facade	21	dB(A)
Air compressor	65	dB(A) @ 2m	#	Air compressor	65	dB(A) @ 2m
Single event duration	120	seconds		Single event duration	120	seconds
Number of events in 15 minutes	2	events		Number of events in 15 minutes	2	events
Worst case duration in 15 minutes	4	minutes		Worst case duration in 15 minutes	4	minutes
15 minute Leq	59.3	dB(A) @ 2m		15 minute Leq	59.3	dB(A) @ 2m
Distance to receiver	340	m		Distance to receiver	255	m
Ground absorption correction	-5	dB(A)		Plant enclosure	0	dB(A)
Distance attenuation	-44.6	dB(A)		Distance attenuation	-42.1	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	12	dB(A)	#	Impact at Façade	20	dB(A)
Truck refrigeration unit	93	dB(A) @ 1m	#	Truck refrigeration unit	93	dB(A) @ 1m
Single event duration	900	seconds		Single event duration	900	seconds
Number of events in 15 minutes	1	events		Number of events in 15 minutes	1	events
Worst case duration in 15 minutes	15	minutes		Worst case duration in 15 minutes	15	minutes
15 minute Leq	93.0	dB(A) @ 1m		15 minute Leq	93.0	dB(A) @ 1m
Distance to receiver	330	m		Distance to receiver	138	m
Distance attenuation	-5	dB(A)		Barrier screening	-12	dB(A)
Distance attenuation	-50.4	dB(A)		Distance attenuation	-42.8	dB(A)
Façade reflection	2.5	dB(A)		Façade reflection	2.5	dB(A)
Impact at Façade	40	dB(A)	#	Impact at Façade	41	dB(A)
Combined evening façade impact	41	dB(A)		Combined evening façade impact	43.8	dB(A)

#### STATEMENT OF ENVIRONMENTAL EFFECTS



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

### **APPENDIX H**

GUIDELINES FOR IMPLEMENTING THE PROTECTION OF THE ENVIRONMENT OPERATIONS (UNDERGROUND PETROLEUM STORAGE SYSTEMS) REGULATION 2019



**Environment Protection Authority** 

# Underground Petroleum Storage Systems

Guidelines for implementing the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019



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Published by: **NSW Environment Protection Authority** 4 Parramatta Square 12 Darcy Street, Parramatta NSW 2150 Locked Bag 5022, Parramatta NSW 2124 Phone: +61 2 9995 5000 (switchboard) Phone: 131 555 (NSW only - environment information and publications requests) Fax: +61 2 9995 5999 TTY users: phone 133 677, then ask for 131 555 Speak and listen users: phone 1300 555 727, then ask for 131 555 Email<sup>.</sup> info@epa.nsw.gov.au Website: www.epa.nsw.gov.au

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# 1. Introduction

# These guidelines provide details on the environmental requirements for operating underground petroleum storage systems in NSW.

Leaks from underground fuel tanks and pipework are a common source of soil and groundwater contamination in NSW. Many of the contaminated sites notified to the NSW Environment Protection Authority (EPA) have involved **underground petroleum storage systems** (UPSS).

There is a clear need for operators of a UPSS to guard against, monitor for, and fix fuel leaks promptly. This can reduce environmental impacts, save costly clean-ups and protect the public.

# 1.1. Aim and scope

The guidelines in this document specify the level of environmental performance expected of an operator of a UPSS in NSW. They are designed to assist with achieving compliance with requirements of the **Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2019**.

The guidelines also summarise best-practice equipment and procedures in the fuel storage and delivery sector and refer to other sources of information about best practice. The guidelines do not cover other legislation and legal obligations that UPSS operators are required to meet, such as those relating to work health and safety, and dangerous goods requirements.

# 1.2. Regulatory framework

The NSW Government introduced a new law in 2008 requiring operators of UPSS to install tanks, pipes and monitoring equipment for underground fuel systems in accordance with industry best practice. The Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation 2008 also required operators to monitor for leaks and have documented management procedures for their underground fuel system.

The Regulation was updated in 2014 and 2019 to include changes in fuel systems terminology, technology and best practice. These guidelines are made under the Regulation and assist with its implementation. In the case of any inconsistency between the Regulation and these guidelines, the Regulation prevails to the extent of the inconsistency.

# 1.3. Appropriate regulatory authority

When the Protection of the Environment Operations (Underground Petroleum Storage Systems) Regulation was first made on 1 June 2008, the EPA was declared to be the **appropriate regulatory authority** (ARA) for all UPSS-related matters. The EPA was responsible for assisting the fuel industry to implement and comply with the new regulatory requirements. It was always envisaged that local councils would resume regulatory responsibility after an implementation period for the new regulatory requirements.

On 1 September 2019 local councils resumed responsibility for regulating most UPSS sites in their local areas. The EPA remains responsible for regulating UPSS sites that are:

- operated by a public authority, or
- subject to an Environment Protection Licence, or
- in the unincorporated areas of NSW where there is no local council, or
- subject to a notice, direction or requirement made, issued or given by the EPA before
   1 September 2019 for a matter under the Regulation until the actions in that notice, direction or requirement have been complied with.

## **Contact details**

### **NSW Environment Protection Authority (EPA)**

Environment Line (02) 9995 5555 or 131 555 (from anywhere in NSW)

Email: upssreg@epa.nsw.gov.au

#### Local councils

To find the contact details for your local council, use the <u>search function</u> on the Office of Local Government website.

#### SafeWork NSW

Phone: 13 10 50

Website: www.safework.nsw.gov.au

To notify SafeWork NSW of an abandoned tank, use this online form: Notification of Schedule 11 Hazardous Chemicals and Abandoned Tanks Guidance Material.

# 1.4. Application of the Regulation

The Regulation applies to all UPSS in NSW, except for:

- storage systems where all tanks are situated wholly above ground (regardless of where any associated pipes, valves and other equipment are situated)
- sumps, separators, stormwater or wastewater collection systems, catchment basins, pits, septic tanks or other like structures, unless petroleum routinely passes through the structure from one part of the storage system to another
- bunded tanks that are situated below ground level but not in the ground (such as in a basement, cellar or tunnel)
- liquefied petroleum gas (LPG) storage systems.

A UPSS is defined in the <u>Regulation</u> as a system with one or more tanks that are completely or partially buried in the ground and which contain, or are intended to contain, petroleum. This definition also includes any piping associated with the tanks and fuel dispensers, but not piping related to vents or vapour recovery.

# **1.5. Referenced documents**

These guidelines include references to the following documents:

- AS 4897–2008, The Design, Installation and Operation of Underground Petroleum Storage Systems
- AS 4976–2008, The Removal and Disposal of Underground Petroleum Storage Tanks
- AS 1692–2006, Tanks for Flammable and Combustible Liquids
- AS 4482.1–2005, Guide to the investigation and sampling of sites with potentially contaminated soil Non-volatile and semi-volatile compounds
- AS 1940– 2017, Storage and Handling of Flammable and Combustible Liquids
- Work Health and Safety Regulation 2017 (WHS Regulation) *Notification of Schedule 11 hazardous chemicals that are used, handled or stored above certain quantities*
- Model Code of Practice: Managing risks of hazardous chemicals in the workplace
- SafeWork NSW safety alert WC01188, <u>Potential risks when removing underground storage</u> <u>tanks</u>.

- Guidelines for sampling design for contaminated land in NSW (EPA, to be published 2021)
- Consultants Reporting on Contaminated Land: Contaminated Land Guidelines (EPA 2020)
- Waste Classification Guidelines (EPA 2014)
- <u>General Guidance for using EPA's Standard Test Procedures for Evaluating Release Detection</u> <u>Methods</u> (USEPA 510-B-19-006; May 2019)
- Guidelines for the NSW Auditor Scheme (3rd edition 2017)
- National Environment Protection (Assessment of Site Contamination) Measure 1999 (NEPC 1999)
- Assessment of Underground Storage Systems (EPHC & NEPC 2003).

# **1.6. Person responsible**

The Regulation defines the **person responsible** for a UPSS as the person who has management and control of the storage system. The person responsible is legally required to ensure the UPSS complies with the requirements of the Regulation. Where a corporation is responsible for a UPSS, an individual who is authorised to act on behalf of that corporation must be nominated to the appropriate regulatory authority as a contact.

Where a UPSS is no longer in use but has not yet been decommissioned, the person responsible is the person who had management and control of the system immediately before it ceased operating. If that person cannot be located, the person who owns the land on which the UPSS is located is deemed to be the person responsible.

Where more than one party is involved in managing a UPSS site through specific legal and/or contractual arrangements, determining the person responsible is a question of fact that depends on the relevant management arrangements and what happens in practice.

# 1.7. Duly qualified person

The Regulation requires that a **duly qualified person** be used to carry out certain activities such as designing, installing, modifying or decommissioning a UPSS. Any testing, repairs and ongoing maintenance of the storage system must also be undertaken by a duly qualified person.

Each of these activities requires different skills and presents varying levels of complexity. Duly qualified persons of different specialisations may therefore be required to undertake different components or stages of an activity (i.e. different stages may require an architect, UPSS installer, a hydrologist, a laboratory analyst, a contaminated land and/or groundwater consultant, a drilling contractor, and so on).

Affiliation to an industry accreditation scheme and/or having relevant trade permits or professional qualifications can help to indicate whether a person may be considered as being duly qualified to undertake the required activity. Table 2 in *Appendix 2: Duly qualified person checklist* provides a checklist to assist in considering who is a duly qualified person.

# 1.8. Planning issues

Planning authorities, usually local councils, assess development proposals under the *Environmental Planning and Assessment Act 1979* (EP&A Act). Such proposals include those for new or modified UPSS or their decommissioning. These planning processes are independent of the Regulation and are not affected by it.

Most development proposals relating to UPSS sites do not require integrated development approval as UPSS sites do not require an environment protection licence.

The Regulation requires specific conditions to be met in the design, installation and commissioning of all new and significantly modified UPSS, as well as when a tank is to be removed or replaced or

the system decommissioned. These requirements are specified in Part 2 of the Regulation and are best considered at the planning stage.

Further information about planning issues is contained in *Appendix 4: Planning and consent for a UPSS.* 

# 1.9. Exemptions

Clause 29 of the Regulation allows the appropriate regulatory authority to exempt a person or a class of person/s from any of the requirements of the Regulation.

The EPA issued exemptions to many UPSS sites when the Regulation was first introduced. These exemptions allowed time for UPSS operators to comply with the new requirements, such as the need to monitor for fuel losses and install groundwater monitoring wells. All these exemptions granted by the EPA have now expired.

It is the EPA's current policy that an exemption will only be considered where it is not possible for the person responsible to comply with certain provisions of the Regulation, and equivalent environmental protection measures can be put in place. The equivalent measures must be designed and installed by a duly qualified person.

On 1 September 2019 councils became the appropriate regulatory authority for most UPSS sites in their local areas. Councils can exempt persons responsible for a UPSS in their local area from complying with any of the requirements of the Regulation. Councils should also develop and/or adopt a policy regarding the granting of exemptions, to ensure consistency and transparency.

Exemptions issued by the EPA or councils:

- may be granted on application or on their own motion
- may be issued to a person or to a class of persons
- must be in writing and be either published in the *Government Gazette* or served upon the person specified in the exemption order
- may be granted subject to conditions as specified in the exemption order
- may be granted for set periods of time or until revoked.

To apply for an exemption, contact the appropriate regulatory authority for the site (see section 1.3) to discuss the application process. The appropriate regulatory authority may charge an application fee for an exemption.

# 1.10. Compliance

The EPA and councils are responsible for enforcing compliance with the Regulation for sites for which they are the appropriate regulatory authority.

The EPA enforces compliance with the Regulation in accordance with its compliance policy. Councils enforce compliance in accordance with their own policies and procedures. The EPA cannot direct a council regarding compliance action for premises for which they are the appropriate regulatory authority, and vice versa.

## Enforcement

Certain enforcement powers are available to appropriate regulatory authorities under the *Protection of the Environment Operations Act 1997* (POEO Act) to enforce compliance with the Regulation and manage and prevent pollution incidents. These powers include issuing clean-up notices and prevention notices requiring actions to be taken at UPSS sites.

### **Clean-up notices**

Under the POEO Act, the appropriate regulatory authority may issue a clean-up notice requiring certain persons to take clean-up action where it reasonably suspects that a pollution incident has occurred or is occurring.

Actions that could be required may include:

- taking appropriate measures to prevent, minimise, remove, disperse, destroy or mitigate any pollution resulting, or likely to result, from the pollution incident
- ascertaining the nature and extent of the pollution incident and any actual or likely resulting harm to the environment or human health
- preparing and/or carrying out a remedial plan of action agreed to by the appropriate regulatory authority.

## **Prevention notices**

Under the POEO Act, an appropriate regulatory authority may issue a prevention notice when it reasonably suspects that an activity has been or is being carried out in an 'environmentally unsatisfactory manner' as defined in the POEO Act.

Examples of actions that may be required by a prevention notice include:

- installing, repairing, altering, replacing, maintaining or operating control equipment or other plant
- monitoring, sampling or analysing any pollution or otherwise ascertaining the nature and extent of pollution or the risk of pollution
- preparing and carrying out a plan of action to control, prevent or minimise pollution or waste
- providing regular progress reports to the appropriate regulatory authority on implementing the action(s) required to be taken by the notice.

## Penalties and offences

The **person responsible** is legally accountable for ensuring their UPSS site(s) complies with the Regulation. There are offences for contravention of the requirements of the Regulation. A person who commits an offence may receive a penalty notice or be prosecuted in court by the appropriate regulatory authority. The Regulation outlines the maximum penalties for offences in the event of court action. A list of penalty notice offences against the Regulation is contained in Schedule 6 of the Protection of the Environment Operations (General) Regulation 2009.

Penalties and offences under the POEO Act may also apply to the operation of a UPSS. For example, it is an offence for a person to willfully or negligently cause any substance to leak, spill or escape from a storage system in a manner that harms, or is likely to harm, the environment. It is also an offence to pollute waters or land.

## Investigation

Chapter 7 of the POEO Act contains the powers of entry and investigation of authorised officers of the EPA and councils. An appropriate regulatory authority or authorised officer may require a wide range of documents to be provided. In these circumstances, anyone furnishing information or making a statement to the appropriate regulatory authority that they know is false or misleading in a material respect is guilty of an offence.

# 2. UPSS equipment

Leaks from underground fuel systems can cause contamination that can harm the environment and human health. Cleaning up contamination is also very expensive. That is why the Regulation requires best-practice equipment to be installed.

# 2.1. New, old and modified UPSS installations

The 2019 <u>Regulation</u> has some slightly different requirements depending on whether a **new** or **old** UPSS is involved.

A UPSS approved, installed or commissioned on or after 1 June 2008 is considered a **new** UPSS and must fully comply with the Regulation.

A UPSS approved, installed or commissioned before 1 June 2008 is considered an old UPSS.

Old UPSSs need to comply with all the operational requirements of the Regulation **except** that they do not need to be retrofitted with the new infrastructure specified in Part 2 of the Regulation, unless there is a significant modification of the system.

Consult with the consent authority, usually local council, whether development approval is necessary for installing new or modifying existing tanks.

# Significantly modified

Any significant modification to an old or new UPSS triggers the need for the system to fully comply with the Regulation. **Significant** means any modification to the UPSS that involves replacement of:

• the whole system

or

• half or more of the tanks in the system.

# 2.2. Mandatory equipment for a new or modified UPSS

All new and significantly modified UPSSs must have equipment installed as required by Australian Standard AS 4897–2008, *The Design, Installation and Operation of Underground Petroleum Storage Systems.* The equipment required by AS 4987–2008 includes (but is not limited to):

- non-corrodible tanks and piping
- secondary containment of tanks and piping
- overfill protection devices
- leak detection for tanks and piping.

For further detail on what constitutes non-corrodible tanks and piping materials, what secondary containment requires and what overfill protection devices are, see Australian Standard AS 4897–2008.

The equipment specified in the Regulation represents the minimum requirements that must be included in new or significantly modified UPSS from an environment protection perspective. This is not intended to limit the use of alternative materials, designs, technology and methods where they can be shown to offer the same or better protection to the environment and human health as the specified equipment.

Tanks and piping will also need to conform with any other state and federal requirements for UPSS for the storage of flammable liquids.

# 2.3. Leak detection systems

All UPSS, whether 'old' or 'new', must have a leak detection system installed and be regularly tested (see parts 3 and 4 of the Regulation). A leak detection system acts as a backup in case the loss monitoring system fails to detect a leak from the UPSS.

A UPSS cannot be used unless a leak detection system is in place. There are numerous types of leak detection systems available (see Figure 1). The most appropriate leak detection system for a site will need to be recommended by a duly qualified person.

A fact sheet on leak detection systems has been prepared as a quick and simple reference.



Figure 1 Leak detection systems for a UPSS

## Groundwater monitoring wells

The preferred leak detection system is a network of groundwater monitoring wells around the UPSS. The wells must be checked and/or tested every six months for the presence of fuel to help detect any leak in the system.

## Installation of wells

A duly qualified person who is experienced in designing and/or installing groundwater monitoring wells, such as a groundwater consultant or groundwater-well driller, should assess the UPSS site and determine the number and positioning of the wells.

The wells must be positioned to maximise the likelihood of intercepting contaminated groundwater if the UPSS were to leak. As a minimum, there must be one well installed up-gradient of the UPSS and two wells down-gradient. If groundwater cannot be found within 10 metres of the surface, an alternative leak detection system may be considered.

The person who designs and/or installs groundwater monitoring wells is required to provide the person responsible for the UPSS with a written report on the installation of the groundwater monitoring wells. This report must outline the final construction details of the wells and the industry standards met in their design and installation. It must also confirm that the wells' design, location and installation satisfy industry best-practice requirements.

The location of each groundwater monitoring well and its designated number (e.g. MW 1, MW 2, etc.) must be identified in the **fuel system operation plan** (section 4.2).

Section 4.5.7 of Australian Standard AS 4897–2008, *The Design, Installation and Operation of Underground Petroleum Storage Systems*, gives further details about the construction and installation of groundwater monitoring wells.

#### **Checking of wells**

Each well must be checked at least every six months for the presence of hydrocarbons as their presence may indicate a leak (see Figure 2). This can be done manually or by using an interface probe or photoionisation detector (PID).

Manual checks should be made immediately after the bailer is raised from each well:

- Make a visual check for a sheen by looking across the water surface in a bright light.
- Make a visual check of the outside of the bailer for a sheen or any sign of hydrocarbons.
- Identify if any hydrocarbon odour is present in the well or bailer.

All health and safety precautions must be followed. A duly qualified person is required to provide training and a detailed written instruction on how to check the wells for contamination and recording of the results. This instruction is to be kept in the fuel system operation plan (section 4.2).

Any odour or sheen observed in the bailer or detected by a PID indicates the likely presence of hydrocarbons in the groundwater under the site. Further sampling will be required to confirm the presence of hydrocarbons.

#### Sampling of wells

If checks of the wells suggest the presence of hydrocarbons, **sampling and analysis of the groundwater is required.** All samples for laboratory testing must be taken by a duly qualified person and be analysed in a laboratory accredited by NATA (the National Association of Testing Authorities).

Wells must be sampled:

- when a new UPSS or tank is installed
- when a new well is installed
- where six-monthly checking indicates that groundwater may be contaminated by petroleum, or
- upon the discovery of a leak, whether through loss monitoring of tanks and piping, inventory control, discrepancy or loss investigation, or some other method.

If the test results confirm that hydrocarbons are present in the groundwater monitoring well, the appropriate regulatory authority (local council or the EPA) must be advised using a **leak notification form**.

The results of groundwater testing and monitoring must be recorded and be kept for at least seven years after the date of the tests. The results must be included in the site's fuel system operation plan or be made available within three days of being requested by an authorised officer (if stored in a centrally maintained database).

For best practice, every six months, each well on site is sampled by a duly qualified person and analysed in a laboratory accredited by NATA (the National Association of Testing Authorities).

## **Groundwater test records**

The results of the six-monthly groundwater monitoring tests must be recorded. The records must include:

- the date and time of the tests
- any observations such as evidence of an odour or sheen or indication of the presence of freephase hydrocarbons
- the name and signature of the person who conducted the tests. For electronically stored records, the name of the person who conducted the tests will suffice.

Sample recording sheets are provided in *Appendix 3: Sample record sheets for groundwater monitoring*. Copies of these records must be kept for at least seven years after the date the of the tests, in the fuel system operation plan.

If it is determined that there are free-phase hydrocarbons in groundwater at the site, or it is likely that offsite migration of hydrocarbons is occurring or has occurred, the appropriate regulatory authority must be notified immediately.

### Alternative leak detection systems

Where groundwater monitoring wells are not effective or suitable, an alternative leak detection system can be used, providing it has been designed and installed by a **duly qualified person**. The duly qualified person must certify in writing that it is appropriate for the site and offers a level of environment protection equivalent to that of groundwater monitoring wells.

The following examples of alternative leak detection systems are not exhaustive. A duly qualified person is free to specify other alternative leak detection systems but must certify these as appropriate for the site. Written certification should be provided to the person responsible for the UPSS and kept with the fuel system operation plan (section 4.2.).

#### Interstitial monitoring

If interstitial monitoring is to be used as an alternative leak detection system, it must be capable of detecting a leak through either the wall of the tank or piping. Testing of the interstitial monitoring system must be undertaken at least every six months as outlined in AS4897 and recorded in the fuel system operations plan.

As interstitial monitoring cannot quantify any losses from a storage system, it cannot be considered a loss monitoring system.

#### Vapour monitoring

This alternative leak detection system can be used either continuously or regularly to monitor for hydrocarbon vapours in the soil surrounding the tanks. Generally, it requires porous backfill material and a tracer element in the tanks that allows vapours to be detected. The vapours cannot be affected by rainfall (moisture) and any background contamination cannot interfere with readings.

Such a system requires installation of vapour monitoring wells designed and located appropriately by a duly qualified person.

#### Equipment integrity testing (EIT)

See section 3.2.

#### Tank-pit observation wells

Tank-pit observation wells are used to check whether liquid in the tank pit contains leaked or spilled petroleum, or vapours.

They are typically installed at the time a UPSS is installed, prior to backfilling the tank excavation, and are best practice. The tank-pit observation well(s) do not have to penetrate the groundwater table as this is not their main purpose.

Tank-pit observation wells can be considered **instead of** groundwater monitoring wells where:

- the receiving environment of any groundwater flow that could potentially contain hydrocarbons is particularly sensitive and near tanks, such as when the UPSS site is near surface waters or an adjacent dwelling with a basement
- the UPSS is located right next to the site boundary
- the groundwater table is normally greater than 10 metres below the surface.

When installing a tank-pit observation well, the duly qualified person should confirm all the following construction details have been met:

- the well construction and installation comply with requirements of AS4897
- the well is installed to intercept the tank excavation area or be as close to it as is technically feasible
- the tank-pit excavation is graded to a low point and a tank-pit observation well has been installed to within 150 millimetres vertically of the low point
- at least one tank-pit observation well is installed in each individual tank excavation pit. For an excavation pit with two or more tanks there must be at least two observation wells
- the well does not penetrate the bottom of the tank excavation and terminates at least 150 millimetres below the bottom of the tank
- the well can detect the presence of petroleum vapour and/or enable confirmation of free-phase petroleum in the tank excavation
- the well is clearly marked and secured to avoid unauthorised access and tampering
- the well is sealed from the ground surface to the top of the filter pack.

#### Visual observation

A duly qualified person may recommend visual observation as the most appropriate leak detection system for a site, particularly where it is determined groundwater monitoring wells would not be practical or effective. For example, groundwater monitoring wells may not be effective at a marina site where tanks are in a tidal zone, or where a UPSS is located next to a waterway.

A rigorous and regular visual check of the waterway (preferably twice a day) with records kept for inspection would be required to justify this as being an appropriate leak detection system.

The person responsible for the UPSS must also ensure that an incident management procedure can be rapidly activated to respond to any observed sheen or hydrocarbon contamination in the waterway. (See section 4.5.)



Figure 2 Checking, sampling and analysing groundwater monitoring wells for groundwater contamination

# 2.4. Other recommended equipment and practices

Equipment or infrastructure that is not required under the Regulation but is part of good environmental practice at UPSS sites includes:

- tank-pit observation wells
- additional monitoring/sensor probes
- the automatic shutdown/cut-off valves integral to the operation of the system.

See Australian Standard AS4987–2008, *The Design, Installation and Operation of Underground Petroleum Storage Systems*, for further information.

### Fill points

It is best practice that each fill point:

- be dedicated to one tank only
- be accessible from the vehicle unloading position with a hose no more than six metres long
- have a spill containment device with a minimum capacity of 15 litres
- have a system for the safe removal of any petroleum (or contaminated water) that collects in the spill containment device
- allow adequate access for visual inspection
- be identified on site drawings.

#### **Dispenser sumps**

It is best practice to install sumps under fuel dispensers to prevent the release of petroleum to the environment. Dispenser sumps must:

- be able to collect and contain leaks from the dispenser
- have a system in place to detect liquid in the sump and send an alarm or notification to the site operator
- have a system for the safe removal of any petroleum (or contaminated water) that collects in the sump.

Consider keeping a record of the date, quantity and nature of any petroleum that is removed from a dispenser sump. While not required by the Regulation, these records may be useful for reconciliation purposes or in determining whether loss from a system to a dispenser sump is an ongoing problem that needs to be rectified.

## Cathodic protection for steel tanks and piping

All new and significantly modified UPSS with steel tanks and piping must be cathodically protected against corrosion, and designed and installed in accordance with the following Australian Standards:

- AS 2832.1–2004, Cathodic Protection of Metals: Part 1 Pipes and Cables
- AS 2832.2–2003, Cathodic Protection of Metals: Part 2 Compact Buried Structures.

An effective cathodic protection system should minimise the risk of corrosion and the potential for petroleum to leak from a UPSS.

Best practice for cathodic protection of steel tanks and piping includes:

- inspection and testing within 12 weeks of installation and at least every year thereafter
- where impressed-current cathodic protection systems are used, monthly monitoring of the system in accordance with a corrosion specialist's instructions (to ensure correct operation)
- maintenance of cathodic protection systems in accordance with recommendations of the manufacturer
- documenting the maintenance requirements and inspection and testing procedures, and retaining these records in the fuel system operation plan.

## Management of service-station forecourt areas

While not strictly a UPSS issue, management of forecourt run-off at a UPSS site is an important part of the design of the facility and should be considered at the planning stage. An EPA Practice Note, <u>Managing Run-Off from Service Station Forecourts</u>, describes how to design and operate a best-practice management system for forecourt run-off to avoid polluting waters.

# 3. Design and installation of a UPSS

Fuel is often stored in underground storage systems to save space and for safety reasons. However, storing fuel underground creates a risk that a leak may occur undetected.

# 3.1. Design and installation – regulatory requirements

All new and significantly modified UPSS coming into operation for the first time (i.e. being commissioned) must be designed, installed and tested in accordance with the provisions of clauses 6–13 of the Regulation.

To meet the requirements of the Regulation, a UPSS must:

- be designed by a duly qualified person
- be installed by a duly qualified person
- include the equipment required by Australian Standard AS 4897–2008
- pass an **equipment integrity test** carried out in accordance with the written directions of a duly qualified person. (See section 3.2.)

The duly qualified person(s) who designs and/or installs a UPSS must prepare written documentation and details of all relevant industry standards and specifications used in the design and installation process. This documentation must be given to and retained by the person responsible for the system.

This is important information about the UPSS because standards and specifications may vary over time. This documentation will detail the standards and specifications used at the time the system was installed. If the system leaks in the future, the documentation can be used to determine how the system is configured and help find the source of the leak.

As part of this documentation process, current **as-built drawings** for the system must be prepared at the completion of the installation process and provided to the person responsible. The Regulation defines these drawings as ones that depict the current configuration of the UPSS in relation to the storage site (that is, as installed below ground level). There must be detailed site plans (to a recognisable scale) that depict the final installed configuration of all parts of a UPSS and any construction deviations from plan showing all features of the storage site as currently built. The drawings do not include pre-construction drawings.

Consult with the consent authority, usually local council, on any necessary approval/s that may be required for installing a new UPSS on site.

Further, ensure all requirements of the Work Health and Safety Regulation 2017 (WHS Regulation) have been considered – in particular, the notification of Schedule 11 hazardous chemicals that are to be used, handled or stored above certain quantities.

# 3.2. Equipment integrity testing

An **equipment integrity test** (EIT) measures the containment integrity of the tanks, fittings and pipes by applying a pressure or vacuum to them and measuring any pressure changes.

An EIT must be performed on all new, repaired and significantly modified UPSS prior to the system being commissioned. The EIT must be undertaken in accordance with section 8.5 of AS 4897–2008. An EIT is also a useful diagnostic tool to assist in confirming the location of a leak that has been detected by a loss monitoring system. (See section 4.3.)

The person performing the EIT must provide the person responsible for the UPSS with a certificate stating how the testing was carried out, that the method used is a certified method and results of the EIT. These documents must be kept for seven years after the system is decommissioned.

## Minimum requirements for equipment integrity tests

An EIT must:

- be capable of detecting a leak of 0.38 litres per hour, with a probability of detection of at least 95% and a probability of false detection of 5% or less in accordance with AS 4897–2008, *The Design, Installation and Operation of Underground Petroleum Storage Systems*
- be conducted by a duly qualified person in accordance with the manufacturer's written instructions specific to the UPSS component/s
- use a nationally approved and certified method of testing that meets, at a minimum, the requirements or certification standards of <u>General Guidance for Using EPA's Standard Test</u> <u>Procedures for Evaluating Release Detection Methods</u> (USEPA 510-B-19-006; May 2019).

Usually an EIT involves a vacuum or pressure test (using inert gases) on the UPSS. The duly qualified person carrying out the test will determine the best test method. Both tanks and pipework need to be tested.

## Frequency of equipment integrity testing

The Regulation requires an EIT to be conducted:

- before a new UPSS is commissioned
- after any modification or upgrade of UPSS (including tank relining)
- after any repair following the discovery of a leak in the system or replacement of tanks or piping.

EITs are generally not considered adequate as the sole method for leak detection because they are done infrequently. However, if an EIT is recommended as an alternative leak detection system for a UPSS, it is to be conducted at least annually and be coupled with **statistical inventory reconciliation analysis** (SIRA) undertaken at least monthly.

# 3.3. Record-keeping

The Regulation requires documents detailing the design, installation, modification and repair of a UPSS to be kept for specified periods of time. The person responsible must keep records during the life of the system that detail any modifications, replacement of tanks or piping, any EITs and any decommissioning and site reports. To ensure this important documentation is preserved, it is required to be passed to subsequent operators of the UPSS upon transfer or sale of the system. Section 4.9 of these guidelines provides further details of record-keeping requirements.

Details of the certification and record-keeping requirements for EITs are outlined in Appendix C of AS 4897–2008, *The Design, Installation and Operation of Underground Petroleum Storage Systems.* 

# 4. Operation of a UPSS

Operators of UPSSs must ensure their fuel systems are monitored for leaks.

# 4.1. Introduction

Part 4 of the Regulation requires the following measures to be in place for any operating UPSS:

- a fuel system operation plan
- a loss monitoring system
- an incident management procedure
- a maintenance schedule for the system
- an inventory of staff training and induction about the system.

These measures are required for all operating UPSS, whether they are classed as 'old' (pre-1 June 2008) or 'new' (post-1 June 2008) systems.

# 4.2. Fuel system operation plan

A UPSS must not be used unless a fuel system operation plan (formerly known as an environment protection plan) has been developed and implemented at the site by the person responsible. The fuel system operation plan is a document describing how the underground fuel system at the site is configured, managed and maintained. Staff should be able to refer to the plan quickly for guidance in the event of an incident (e.g. leak or spill) and inform contractors and regulators about the specific features of the site and system.

An EPA fact sheet, Fuel System Operation Plans, provides a quick and simple reference.

Clause 18 of the Regulation requires a fuel system operation plan include:

- · details of the loss monitoring system used for the UPSS
- an incident management procedure that sets out the actions to be followed in dealing with any leaks and spills from the UPSS
- maintenance details for the UPSS
- the current 'as built' drawings as per section 6.4.3 of AS4897. Where current as-built drawings are not available for a system (e.g. the system is very old and inadequate records have been kept), an approximate diagram of the known layout of the underground structures can be included, noting that 'this is a best approximation'
- a plan of the storage site, including but not limited to the location of the storage system, all buildings and associated infrastructure, all fences and gates, location of all groundwater monitoring wells, unsealed surfaces, drainage and services, buildings and associated infrastructure (above and below ground)
- a list of industry standards that were followed for the design, installation and operation of the UPSS
- a copy of industry standards that have been followed in constructing and maintaining the UPSS
- a copy of the specifications for the design, installation and operation of the UPSS. If this information is not included, the person responsible can instead provide evidence in the plan of their attempts to obtain this information (see clause 18(5)(c) of the Regulation)
- an inventory of employee site induction and incident management training that has been provided to site staff.

Additionally, the fuel system operation plan must include:

- the person responsible for the UPSS along with a 24-hour contact number for that person
- where a body or organisation is responsible, the title and contact details of the individual who is authorised to act on behalf of the company in relation to the control of the UPSS
- the name of the person who owns the storage site (if the site owner is different from the person responsible for the UPSS)
- land title particulars (such as the lot and DP numbers) of the land on which the UPSS is situated
- details of access to the system and its security, including information on all locks, gates, fences and similar, and how to open them
- written instructions provided by the duly qualified person on how to check groundwater monitoring wells
- monitoring and/or sampling (dates and results) of the site's groundwater monitoring wells or alternative leak detection system
- details and certification of any tank abandonment and/or decommissioning undertaken on site
- the location of all records kept in accordance with Part 5 or 6 of the Regulation.

The fuel system operation plan must comply with any other requirements outlined in this guideline and must also be updated as required.

## Format and keeping of the fuel system operation plan

A fuel system operation plan must be accessible on site and contain information and records specific to the UPSS located on site. The plan can be held electronically or in hardcopy form, either as a dedicated document or as part of other site management procedures.

The plan must also be kept up to date by the person responsible identified in the plan. It must be able to be provided to the appropriate regulatory authority upon request.

If records that are a required component of the plan (e.g. groundwater monitoring records stored in electronic format) are stored offsite, this must be disclosed in the plan. These records must be made available to the appropriate regulatory authority within three days of a request being made by an authorised officer.

The person responsible for the UPSS should also ensure the plan is complete and implemented. It is recommended that duly qualified and experienced persons prepare certain procedural documents (such as the maintenance schedule, site drawings, and details of industry standards and specifications) to ensure that these documents are accurate and complete.

The person responsible for a UPSS must retain each version of the plan for at least seven years after the decommissioning of the UPSS. The person responsible may change if the site is sold or its ownership transferred, or through some other business or contractual change. In that case, all documents must be transferred to the new person responsible. These documents include copies of the current fuel system operation plan and any previous such plans (formerly known as environment protection plans).

# 4.3. Loss monitoring

A UPSS cannot be used unless a loss monitoring system is in place. A combination of loss monitoring systems can be used at a site (e.g. automated tank gauging and statistical inventory reconciliation analysis).

Monitoring for unexpected losses of fuel or gains of water in underground tanks and pipes will help detect any leaks early. Early detection will minimise environmental impacts and clean-up costs. Loss monitoring is mandatory for all UPSS, whether old, new or modified.

An EPA fact sheet, Loss Monitoring Systems, provides a quick and simple reference.

A loss monitoring system is a fuel stock reconciliation system based on three data inputs:

- the amount of fuel delivered into the system
- the amount of fuel sold or used
- the amount of fuel remaining in stock.

It is designed to ensure that the amount of fuel that **should be present** in the UPSS **is actually present**, and that there are no unexpected losses or gains.

The loss monitoring system must be designed by a duly qualified person and comply with section 4.5 of this document and/or Appendix D of Australian Standard AS 4897–2008.

Various methods of loss monitoring are available which comply with approved and certified methods of testing that meet, at a minimum, the requirements or certification standards of <u>General</u> <u>Guidance for Using EPA's Standard Test Procedures for Evaluating Release Detection Methods</u> (USEPA 510-B-19-006; May 2019). They can be broadly categorised into automated and manual methods.

#### Automated inventory reconciliation

Automated inventory reconciliation is the preferred loss monitoring method. Sensor probes in underground tanks perform **automated tank gauging** (ATG), constantly measuring the amount of fuel in each tank. This information is combined with fuel delivery and sales data and reconciled. This method can usually meet the performance criterion for detecting losses of fuel (or gains of water) from the system of 0.76 litres per hour or greater, with at least 95% accuracy.

#### Manual wet-stock reconciliation

This is a basic loss monitoring method that involves manually dipping tanks to measure fuel levels and calculating whether fuel is lost, or water gained, after accounting for fuel sales and deliveries.

Tank levels are typically measured daily by manually dipping each tank using a dipstick. This process is less accurate than automated systems because of uncertainties introduced by the calibration of the dipstick, the thermal expansion of fuel and how accurately the dipstick is read. Manual wet-stock reconciliation is acceptable if the operator can demonstrate that the process can detect any loss from the system at or above 0.76 litres per hour with at least 95% accuracy.

All manual dips and reconciliation undertaken must be recorded in a legible manner and kept on site. If requested by an authorised officer, the person responsible for the UPSS should be able to demonstrate that the amount of fuel that should be in the tank is the amount of fuel that is actually in it.

#### Statistical inventory reconciliation analysis

Statistical inventory reconciliation analysis (SIRA) is a best-practice method of loss monitoring using computer software to conduct ongoing statistical analysis of fuel inventory, delivery and dispensing data. It can be used with data inputs from either ATG and/or manual dipping methods.

SIRA is a service usually provided to UPSS operators by a specialist third party. It is mostly provided as a monthly report that flags data inconsistencies. These inconsistencies flag possible leaks in the system that the operator must investigate immediately. (See section 4.4 below.)

### Other loss monitoring methods

Interstitial monitoring detects any change in liquid or pressure in the space between doubleskinned tanks and piping systems. It is only suitable as a back-up loss monitoring system for a UPSS.



Figure 3 Loss monitoring systems and methods

## Accuracy

The frequency, sensitivity and reliability of loss monitoring will lead to a high level of confidence that any potential fuel loss (or gain in water) will be detected in time to allow a response before a risk is posed to human health or the environment.

The loss monitoring system must at least meet the detection limit of 0.76 litres per hour or greater, with at least 95% accuracy.

To achieve industry best practice, a duly qualified independent third party needs to certify that the loss monitoring methods used meet the requirements of the Regulation, in line with the protocols and system of verification recommended by the *Standard test procedures for evaluating leak detection methods: Volumetric tank tightness methods US EPA/530/UST-90/004*, United States Environmental Protection Agency (USEPA 1990).

# 4.4. Loss detection and investigation procedures

Discrepancies identified by the loss monitoring system can indicate a potential loss of fuel from the system, an influx of groundwater or delivery of fuel into the wrong tank. They do not necessarily mean that the UPSS is leaking. A 'fail' or 'inconclusive' SIRA result could be caused by mis-calibrated dispensers, inaccurately metered deliveries, human error in recording, or stolen product.

If loss monitoring detects a discrepancy in fuel levels, or a fail notification is received from SIRA, the person responsible for the UPSS must take action to investigate the discrepancy within 60 days of becoming aware of it. If a leak is confirmed, further action must be taken to identify the

source of the leak, stop it, fix it and record the details of the actions taken in the fuel system operation plan.

Investigating discrepancies may involve system checks, such as reviewing inventory records and checking measuring equipment and records. The person responsible may wish to engage a qualified person with suitable experience in discrepancy or loss investigations to identify the cause of the discrepancy.

See Appendix 5: Loss monitoring investigation, Table 6, for suggested loss detection procedures.

# 4.5. Incident management procedures

All persons responsible for a UPSS must have documented incident management procedures as part of their fuel system operation plan. These procedures should outline:

- how the person responsible will determine whether an apparent loss of petroleum has been caused by a leak or spill, or has arisen from something else (such as incorrectly calibrated equipment or faulty accounting procedures)
- what has to be done if there has been a leak or spill.

Under 'what has to be done', consider putting the following points into your incident management procedures:

- who should notify the site supervisor that there has been a leak or spill, and who will notify the appropriate regulatory authority if necessary
- how you will:
  - $\circ$  prevent any more petroleum being released into the environment
  - identify and address any risks posed by the petroleum vapour fire, explosion or people breathing the vapour
  - o identify the source of any spill or leak
  - engage a duly qualified person to identify the nature and extent of any contamination caused by the spill or leak
  - o prevent any further release of petroleum into the environment
  - o recover or remove the spilled/leaked petroleum
  - remove or (where practicable) repair leaking UPSS components, in accordance with industry best practice.

# 4.6. Incident logs

The Regulation requires the person responsible for a UPSS to ensure that an incident log is maintained which records:

- actions by anyone, other than at the direction of the person responsible, that have affected, are
  affecting, or could affect the integrity of the UPSS
- any unplanned or abnormal incidents, including operational disruptions or equipment failures, that have affected, are affecting, or could affect the long-term safety of the UPSS.

The incident log must be kept on site or at a location specified in the fuel system operation plan.

# 4.7. Incident notification

Where a leak or spill at a UPSS is causing or is likely to cause material harm to the environment or human health, the person responsible must notify the appropriate regulatory authority of the incident **immediately**. The appropriate regulatory authority is either the local council or the EPA (see section 1.3).

Failure to report such pollution incidents is an offence under Part 5.7 of the POEO Act. Incidents involving a UPSS that must be notified include (but are not limited to):

- a leak or spill from a UPSS, verified in accordance with loss detection or incident management procedures, that is causing or threatens material harm to human health or the environment
- evidence on the site of free-phase hydrocarbons in surface water or groundwater at the site
- evidence that off-site migration of hydrocarbons could occur, is occurring or has occurred.

A written notification must be submitted to the appropriate regulatory authority **within seven days** of the incident. This written notification must be made using a leak notification form obtained from the appropriate regulatory authority (ARA). If the EPA is the ARA, use the EPA's <u>UPSS Regulation</u> <u>leak notification form</u>. In all other cases, contact the local council for its leak notification form.

# 4.8. System maintenance

A UPSS must not be used unless all gauges, indicators, probes, sensors and any other measuring instruments in the system are checked and maintained (and where necessary calibrated) in accordance with the manufacturer's specifications and/or recommendations.

System maintenance procedures and a maintenance schedule must be documented in the fuel system operation plan.

# 4.9. Record-keeping

The Regulation requires certain documents detailing the design, construction, operation and decommissioning of UPSS to be kept for specified periods of time. This is to preserve vital information about the system so that in the event of any leak or failure, details can be accessed quickly and used in any response.

The person responsible for a UPSS must retain the following required documents for a minimum of **seven years from their date of creation**:

- certificates and associated documentation relating to equipment integrity testing
- data from any measuring instrument such as loss monitoring equipment and leak detection equipment
- documentation associated with loss investigation
- any notifications of a pollution incident involving the system given to the ARA.

The person responsible for a UPSS must retain the following documents for a minimum of **seven** years from the date of the decommissioning of a UPSS:

- certificates and associated documentation relating to equipment integrity testing
- reports detailing the installation of a leak detection system (e.g. a groundwater monitoring well installation report)
- each version of the fuel system operation plan
- records about any significant modifications to the system
- reports associated with the removal or replacement of tanks or the decommissioning of the system
- the incident log for the system
- any reports made as a consequence of action taken under Part 5.7 of the POEO Act in connection with a pollution incident involving the system

## Changes in responsibility

Within 30 days of a change in responsibility for a UPSS, the person formerly responsible for the system should deliver to the new person responsible all the documents they have for the system that are required to be retained.

## Access to records

Under the POEO Act, a fuel system operation plan must be provided to an authorised officer upon request.

Records that are a required component of the fuel system operations plan but are stored offsite (e.g. groundwater monitoring records stored in electronic format) must be disclosed in the plan. These records must be made available to the appropriate regulatory authority within three days of being requested by an authorised officer.

# 5. Modifying a UPSS

Any significant modification to a UPSS (that is, replacing or upgrading half or more of the tanks in the system) means the whole UPSS must meet all the requirements of the Regulation.

The person responsible must ensure that all equipment and infrastructure is modified, repaired or reused in accordance with AS 4897–2008, *The Design, Installation and Operation of Underground Petroleum Storage Systems*, and with the procedures outlined in this section. Repairs must leave systems both structurally sound and fully functional.

Recommendations and requirements relating to the repair, testing, reuse and documentation of modifications are discussed in the following sections.

# 5.1. Repair of a UPSS

As a minimum, all relevant documentation associated with the repair of UPSS equipment must meet:

- the equipment manufacturer's instructions
- the equipment's original specifications
- be retained by the person responsible for repair for at least seven years.

## Steel tanks

Steel tanks can be repaired only if they have been inspected by a duly qualified person who can certify that the tank:

- is suitable for repair
- is structurally sound
- has not previously been repaired using an internal lining.

Where a duly qualified person has certified that the tank is suitable for repair, the repair must:

- be supervised by a lining-equipment manufacturer
- meet the requirements of industry best practice and occupational health and safety legislation.

When installation of the internal lining is complete, before the repaired tank is commissioned, it:

- must be inspected internally by a competent and experienced person and certified to be structurally sound
- must be cathodically protected

• must pass an equipment integrity test (section 3.2).

### Other tanks

Tanks constructed of fibre-reinforced thermosetting resin composite, or with an outer wall of this material and a steel inner wall, must be repaired in accordance with the tank manufacturer's instructions and the requirements outlined in this section. Tanks can be repaired only if they have been internally inspected by a competent and experienced person: that person must certify that the tank has been repaired in accordance with the tank manufacturer's instructions.

The person responsible must ensure that the person repairing the system provides written documentation that it has been repaired in an appropriate manner and, where relevant, in accordance with the manufacturer's specifications.

## **Steel piping**

Any steel piping that has leaked, is suspected of leaking, or is otherwise in need of repair, must **not** be repaired or reused but instead replaced.

## Other piping

Piping, other than steel piping, that has leaked or is suspected of leaking, must be either replaced or repaired in accordance with the piping manufacturer's instructions, or otherwise decommissioned and removed from the ground.

Any replacement piping must meet the requirements outlined in section 4.3 of AS 4897–2008, *The Design, Installation and Operation of Underground Petroleum Storage Systems.* Repaired or replaced components must pass an equipment integrity test before the UPSS system is recommissioned.

# 5.2. Re-use of UPSS tanks

## Non-steel tanks

The reuse of non-steel tanks is to meet the following requirements:

- the tank has been designed and installed in accordance with the requirements of section 3 of this guideline
- an equipment integrity test has been performed and the tank passed the test
- the tank manufacturer has inspected the tank to be reused, certified that it meets all the relevant requirements of this section and provided a warranty appropriate for the expected life of the UPSS.

All relevant documentation associated with the reuse of the tank must be retained by the person responsible for a UPSS for at least seven years from the date the system is decommissioned.

## Steel tanks

Steel tanks can only be reused when they meet the following requirements:

- the tank conforms with the requirements of AS 1692–2006, *Tanks for Flammable and Combustible Liquids*, as amended or updated
- the tank manufacturer has inspected the tank internally and externally and has certified that it is suitable for reuse because:
- the tank has not been repaired previously and:
  - o is structurally sound
  - $\circ$  no areas of the tank's walls are less than 100% of their original thickness

- the tank's dielectric coating has been tested and meets the requirements for a new tank, including condition, thickness and electrical insulation
- the tank is installed in accordance with the requirements of section 3 of this guideline
- an equipment integrity test has been performed and the tank passed the test.

### Notes

AS4897 stipulates that tanks which have been taken out of service shall only be reused for the storage of used oil.

SafeWork NSW must be notified beforehand and approve of any proposed change to the contents of an operational tank, for example changing from diesel storage to unleaded petrol.

# 5.3. Record-keeping – significant modifications

Details of any significant modifications to a UPSS must be documented and kept for at least seven years after decommissioning of the system. Records are to include as a minimum:

- a comprehensive description of the modifications
- the dates the modifications were started and completed
- the results and certification of the equipment integrity test that was carried out
- a revised copy of the as-built drawings that reflects the modifications and is included with the fuel system operation plan.

# 6. Decommissioning a UPSS

Where a tank or UPSS has not been used to store fuel for two or more years or where it is not intended to be used to store fuel again, it is deemed to be **abandoned** (see Figure 4).

Abandoned UPSSs or tanks **must be decommissioned** appropriately. This means to remove the system or render it permanently unusable.

Proper decommissioning of an individual tank or UPSS significantly reduces the environmental and human health risk if the site is to be redeveloped in future. A site environmental assessment is required to ensure that there is no adverse and/or ongoing contamination from the former UPSS. A decommissioning report must be provided to the relevant local council.

# 6.1. Decommissioning a tank or system

If a tank or UPSS has been abandoned, a duly qualified person must be engaged to:

- remove all flammable and/or combustible liquid and dispose of it appropriately, and
- remove any residual flammable vapour for safe disposal, and
- remove the tank/s and associated pipework

or

• if it is not reasonably practicable to remove the tank or UPSS, ensure that it is made safe by filling the tank with an inert solid material.

Examples of when it may not be reasonably practicable to remove a tank include where the removal would present an unacceptable risk of damage to:

- a supporting foundation of an existing building or structure
- an in-service tank or UPSS
- sub-surface pipework, services infrastructure or assets which are unrelated to the UPSS
- a sensitive receiving environment.

In these circumstances, it is recommended that a duly qualified person (i.e. a structural or electrical engineer) confirms that it is impractical to remove the tank(s).

If the UPSS or tank is to be removed from the ground, it must be correctly disposed of in accordance with:

- Australian Standard AS 1940–2017, *The Storage and Handling of Flammable and Combustible Liquids*
- Australian Standard AS 4976–2008, *The Removal and Disposal of Underground Petroleum Storage Tanks*
- SafeWork NSW safety alert WC01188, <u>Potential risks when removing underground storage</u> <u>tanks</u>.



Figure 4 Overview of requirements for abandoning or removing a UPSS

# 6.2. Notification requirements of a tank or system being decommissioned

## Planning requirements – local authorities

Clause 23 of the Regulation requires the person responsible for the storage system to advise the relevant local council **at least 30 days prior to the proposed decommissioning** of the tank or storage system. For urgent or unforeseen situations, the notification must be made as soon as possible.

Consult with the local council for any requirements and/or approvals necessary for the proposed tank removal and/or remediation works.

Then, no later than 60 days following the decommissioning of a tank or UPSS, a report must be provided to the relevant local council (or the EPA, if the UPSS is located in an unincorporated area). If remediation of the site is required, the report is required no later than 60 days after the remediation has been completed.

The report must meet requirements outlined in *Appendix 6: Site reporting requirements following decommissioning of a UPSS*.

Where a disused tank is recommissioned, the Regulation will apply to the tank and any associated piping. This includes the need to conduct an equipment integrity test prior to recommissioning.

## Work health and safety requirements – SafeWork NSW

Along with environmental risk, an abandoned UPSS can pose significant risk to people and property. Any residual flammable vapour in a tank can be ignited resulting in fire and explosion. This presents a particularly dangerous hazard when an abandoned tank is left on a site which, in time, may be subject to redevelopment, excavation works and/or a change of land use.

SafeWork NSW must be notified when a UPSS or underground tank has been abandoned using the <u>prescribed SafeWork NSW form</u>.

The person responsible for the tank or UPSS will also need to demonstrate that the tank has been decommissioned appropriately as required by the <u>Hazardous Material and Abandoned Tanks</u> <u>guide.pdf</u>.

# 6.3. Reporting requirements following the decommissioning, removal or replacement of a UPSS

The person responsible for the tank or UPSS at the time of decommissioning must ensure that the site is investigated for any potential contamination.

A report must be submitted to the relevant local authority (usually council) within 60 days of the decommissioning of a system or tank, or the completion of any necessary remediation works. Where a tank or UPSS located in an unincorporated area has been decommissioned, or the operator is a public authority, the report must be provided to the EPA.

The relevant authority must be satisfied that the report delivers on the regulatory requirements following decommissioning, removal or replacement of a storage system.

## Preparation by a duly qualified person

The report must be prepared by a duly qualified person in accordance with this guideline.

See section 1.7 and *Appendix 2: Duly qualified person checklist* for help in determining whether a person is **duly qualified** to report on the requirements following decommissioning, removal or replacement of a storage system.

# Where a duly qualified person chooses to deviate from the relevant requirements of these guidelines, clear reasons must be given at each reporting stage to justify this decision.

### Description of processes and assessment of contamination

The report must describe the processes used to decommission, remove or replace the tanks and assess contamination at the storage site.

If the storage system is no longer intended to be used or being replaced, the report must outline:

- why the storage system is being decommissioned or replaced. Is there a proposed change of land use? You will need to confirm that all required approvals, permits etc. were attained and notifications to authorities made
- how the storage system was decommissioned or replaced (what method/s were used) without risk to the environment or human health and safety
- who the duly qualified person/s was who decommissioned the storage system
- where the storage system was located on the site
- where the storage system has been taken for appropriate disposal
- when the decommissioning works started and when they were completed.

#### Assessing the risk of contamination

Each site with a decommissioned, abandoned or removed storage system must also be assessed to determine if a tank or associated piping has leaked and caused contamination, and if so, what the extent of contamination is.

There may be no immediate evidence of contamination at all. If there is contamination, it may be:

- in the immediate vicinity of where the UPSS was located, such as the tank pit
- across part or all of the site
- in areas beyond the site boundary.

The likelihood of contamination from a decommissioned storage system can be determined from certain risk factors. These include (but are not limited to):

- the age and condition of tanks, piping and associated equipment
- any localised ground and/or groundwater contamination identified on the walls and/or pooling at the bottom of the tank pit during excavation
- the history of compliance with loss monitoring and leak detection requirements
- any previous known leak incidents
- known hydrogeology of the local area; for example, preferential pathways such as cracks, fissures or utility corridors. These, along with permeable material, need to be considered as likely conduits of hydrocarbon contamination.

The reasoning for determining the risk of contamination from a UPSS must be detailed clearly and concisely.

## Designing and implementing a sampling program

A properly considered sampling program should:

- identify the sampling objective, and
- outline the sampling scope, and
- take the situation into account when determining the number and location of points to be sampled. The number of samples, and where they are taken, will depend on whether the storage system will be removed or decommissioned in situ. If the decommissioning is in situ, the tank pit will not be fully excavated, so there will be less opportunity to see or smell soil immediately around and beneath the tank. In this case, more samples will have to be taken from the site to establish that it is not contaminated and will be suitable for its proposed use
- describe how the contamination status of the site was assessed and evaluated to determine any necessary remediation strategy. Sampling programs at UPSS sites must establish the depth and lateral spread of any contamination and arrive at a scientifically defensible and statistically valid dataset that characterises chemical concentrations.

Hydrocarbon contamination must be analysed using discrete samples. Composite sampling must be avoided because volatiles may be lost through mixing. For more information, refer to:

- Guidelines for sampling design for contaminated land in NSW (EPA, to be published 2021)
- o Consultants Reporting on Contaminated Land: Contaminated Land Guidelines (EPA 2020).

The examples below are indicative only for an appropriate sampling program.

### Example 1

An underground storage tank being decommissioned is assessed as being in good physical condition. There is no previous history of contamination from six-monthly testing of groundwater monitoring wells located onsite. The initial observation of the walls and bottom of the tank pit indicates no discolouration or contamination of soil or back fill.

#### Contamination risk: low.

**Sampling program**: sample from tank-pit walls and bottom and areas of associated pipework. Continue observation during decommissioning works for any change in contamination risk.

#### Example 2

The site is old and the age of the UPSS is unknown. The forecourt has evidence of staining and surface water management/disposal practices do not appear to meet best practice. Loss monitoring and leak detection records are unavailable. During excavation, it is observed that the tank pit is emitting diesel odours.

#### Contamination risk: medium.

**Sampling program**: samples collected only from the walls and/or bottom of the tank pit may not necessarily represent the full extent of contamination. The sampling program would need to be extended appropriately to ascertain extent of contamination across the site.

#### Example 3

During tank-pit excavation, it is observed that backfill from the tank pit (and/or surrounding soil profiles) is discoloured and/or has significant odour. The service station is in a low-lying area where the water table is generally high. A patch of vegetation on an adjacent site appears to be dying.

#### Contamination risk: high.

**Sampling program**: samples collected only from the walls and/or bottom of the tank pit are unlikely to represent the full extent of contamination on and/or off site. The sampling plan is to be extended appropriately to ascertain extent of contamination across and potentially beyond the site.

### Escalation of the risk of contamination

The extent of contamination will need to be re-assessed if further evidence of contamination is identified or suspected during initial site excavations or sampling activities. The sampling and analysis plan will need to be escalated to ensure appropriate levels of testing is undertaken to establish the full extent of contamination.

If the appropriate regulatory authority reasonably believes contamination may have occurred across and/or beyond the site boundaries, it can request further sampling be conducted to confirm the contamination status.

## Describe any necessary remediation works.

This part of the report must indicate whether the sampling program identified contamination on the site. This section has been prepared to help achieve a uniform approach on site reporting requirements.

The report must outline:

- the location, nature, level and extent of any contamination identified on the site
- the appropriate remediation strategies used
- the objectives of any remediation activities have been met
- any residual contamination on the site is not having an impact on the environment
- the site is suitable for its ongoing or future use.

The assessment of the site must focus on collecting clear evidence to ascertain whether these goals have been met.

The necessary remediation goals and site assessment processes must be clearly defined and understandable to the appropriate regulatory authority.

A conceptual site model (CSM) is also useful to characterise a site. It can be used to test the assessment outcomes and indicate whether there are gaps in the data that may warrant further investigation and remediation.

The CSM must be updated as new information is obtained, creating a more realistic model for identifying issues such as permeability of the soil/sediment, known groundwater flow patterns within the area, and whether undetected preferential pathways for contaminant migration may be present. If a CSM is to be submitted to the appropriate regulatory authority, it must comply with the requirements of the *National Environment Protection (Assessment of Site Contamination) Measure1999* (as amended in 2013).

Appendix 6: Checklist for reporting following the decommissioning, removal or replacement of a UPSS shows what can be included in a decommissioning report for the local council (or EPA). The report must ultimately provide a clear conclusion stating whether the site is suitable for its existing or proposed future use.

# 6.4. Record-keeping

The decommissioning report for storage system must be retained by the final person responsible for the UPSS for seven years from the date of decommissioning.

In situations where there is a change of land use, additional site investigation, remediation and/or procedures may be required, consistent with the requirements of the relevant planning authority and State Environmental Planning Policy No 55 – Remediation of Land.

# 6.5. Reporting considerations

## Data quality objectives

Reporting activities are to be informed by the **data quality objectives** (DQO) process, which is used to define the type, quantity and quality of data needed to support a decision relating to the environmental condition of the site. The development of a sampling program with a pre-determined DQO process provides the statistical basis for decision-making. A sampling analysis plan (SAP), which explains the justification for sampling and the practices to be adopted as part of the plan, must include a quality assurance/quality control protocol to ensure sample integrity. (See <u>Contaminated Land Management: Guidelines for the NSW Auditor Scheme</u>.)

## Quality assurance/Quality control (QA/QC)

The inherent nature of chemicals associated with UPSS (generally liquid, highly mobile and volatile) is such that degradation, volatilisation and/or transformation may affect a sample's integrity from the time the sample is recovered. Attention must be paid to preserving the sample's integrity and how the sample is handled must be documented under a **chain of custody** protocol.

Guidance on appropriate sample collection and preservation methods, health and safety, decontamination of sampling equipment between successive sampling, and quality assurance procedures, can be found in Australian Standard 4482.1–2005, *Guide to the investigation and sampling of sites with potentially contaminated soil – Non-volatile and semi-volatile compounds*.

## Soil sampling

Soil sampling design and assessment at a UPSS site must be undertaken in accordance with the following NSW guidelines:

- Guidelines for sampling design for contaminated land in NSW (EPA, to be published 2021)
- Consultants Reporting on Contaminated Land: Contaminated Land Guidelines
- Contaminated Land Management: Guidelines for the NSW Auditor Scheme.

All contamination assessments for sites containing a UPSS must also be performed in line with the *National Environment Protection (Assessment of Site Contamination) Measure 1999* (NEPC 1999) and *Assessment of Underground Storage Systems* (EPHC & NEPC 2003).

It is recommended that waste materials exported for disposal, or backfill sourced on-site or imported to the site, be characterised using an appropriate frequency and method of soil sampling. For further information, refer to the <u>Waste Classification Guidelines</u>.

Where there are departures from the guidelines, clear justification must be given and any significant deviations listed.

## **Groundwater assessment**

Groundwater assessment is critical in determining any potential environmental effects of a UPSS. When UPSS contents leak into soil there may be low or non-detectable concentrations within the soil matrix while groundwater is contaminated beyond drinking-water standards.

Groundwater must be assessed if soil contamination has been encountered or identified. Keep in mind the possibility of residual groundwater contamination at sites where the UPSS has been abandoned or removed but the environmental assessment has been inadequate or not done at all. Groundwater assessment at or beyond a UPSS site must be undertaken in accordance with the EPA's <u>Guidelines for the Assessment and Management of Groundwater Contamination</u>.

The factors to consider in an assessment include:

- $\circ$  the distance to receptor(s), both surface and groundwater
- whether sufficient monitoring wells are located on site, installed correctly and positioned to intercept contaminants down-gradient
- o whether bore logs are available and sufficiently detailed
- groundwater flow direction
- whether there are other potential sources of contamination.

Groundwater monitoring wells must be designed and installed by a duly qualified person as required under Part 3 of the Regulation.

The NSW Department of Planning, Industry and Environment (DPIE) and WaterNSW have requirements for licensing the installation of water bores and wells and must be contacted before installing any wells on a UPSS site.

## **Contaminants of concern**

The duly qualified person will need to determine a list of contaminants of concern to consider when investigating, remediating or reporting on a UPSS site. This list may include, as a minimum:

- total petroleum hydrocarbons (TPH) (C6-C9, C10-C36)
- benzene, toluene, ethyl benzene and xylene (BTEX)
- chlorinated solvents (degreasers)
- polycyclic aromatic hydrocarbons (PAHs), including benzo(a)pyrene
- lead
- the pH of the medium.

Other analytes that can be considered include:

- MTBE and other possible fuel additives such as ethanol
- selected heavy metals (such as cadmium, chromium, zinc, copper, mercury, arsenic and nickel)
- phenols.

Where additional contaminants are suspected and/or identified during preliminary site screening, these must also be included as part of the test suite.

Depending on site history, other possible contaminants could include:

- petroleum fuels, lubricating oils, and additives such as organometallic compounds, surfactants, biocides, molybdenate compounds and corrosion inhibitors
- waste oils and cooling liquids of highly variable compositions
- chemicals associated with the fuel manufacturing process, such as catalysts, metals and solvents that may have been used at the site (i.e. vanadium, cobalt, molybdenum and platinum)
- o other chemicals, including pesticides/herbicides
- asbestos (as a result of mechanical repairs including the cleaning of parts, brake machining and other repairs).

Review of the site history supplemented by field screening can help determine if any information on potential contaminants can be gathered while on site.

## **Documenting field practices**

Field observations and activities must be accurately recorded by an experienced person, through contemporaneous written notes supplemented by photos or video. Good-quality visual evidence

may be hard to obtain because of adverse site conditions, such as poor lighting in excavations. Appropriate personal protective equipment must be used and WH&S (work health and safety) procedures adhered to at sites that may have volatile substances, particularly in confined spaces.

Use standardised checklists to record critical aspects of tank pulls to ensure comprehensive and consistent data capture. The records provide evidence to justify decisions made during the site works and to allow critical assessment of the appropriateness of the site works undertaken.

# **Appendix 1: Definitions**

The terms used in this guideline have the same meaning as in the Regulation or as listed below. If any inconsistency arises, the definitions in the Regulation take precedence.

Table 1	Definitions of terms used in the UPSS Regulation
	Deminitions of terms used in the of oo Regulation

Term	Definition
Abandoned tank	<ul> <li>The tank is taken to be abandoned if:</li> <li>the tank has not been used to store petroleum product for two years, or</li> <li>the person responsible does not intend to use the</li> </ul>
	tank to store petroleum product again
Appropriate regulatory authority (ARA)	See definition in section 6 of the POEO Act, although in the context of the Regulation, local councils share the ARA responsibility for UPSS sites with the NSW EPA from the commencement of the Regulation on 1 September 2019.
As-built drawings (current)	Drawings that depict the current configuration of the storage system in relation to the storage site.
Cathodic protection system	Method of preventing or reducing corrosion of a metal surface by making the metal a cathode (i.e. the positive charge) by using either an impressed direct current or attached sacrificial anodes.
Commission	To bring a storage system or leak detection system into use for the first time following its installation, modification or repair.
Decommission	To remove a storage system or to render it permanently unusable.
Discrepancy	A lack of agreement or balance. There is a <b>discrepancy</b> in fuel levels when there is a difference between amount of fuel that should be in an underground storage tank and the amount of fuel that is actually in it.
Duly qualified person	A person who has competence and experience (in relation to a specific activity) that is recognised by a peak body in the relevant industry, or recognised generally in the relevant industry as appropriate for that activity.
Fuel system operation plan (the plan)	Documentation for a storage system that contains the procedures and other information required by clause 18 of the Regulation.
Equipment integrity test (EIT)	A test conducted to evaluate whether a storage system is providing containment as originally designed, in accordance with the manufacturer's specification. The EIT must be able to detect a leak of 0.38 litres per hour with a probability of detection at least 95% and a false detection of 5% or less in accordance with AS4897- 2008 (AS 2008a).

Term	Definition
Groundwater monitoring well	A well that has been installed as part of a groundwater monitoring system around an UPSS site. It must be located in an appropriate place to detect any leaked petroleum that may have migrated into the groundwater (or to characterise the quality of groundwater flowing onto the UPSS site).
Incident management procedure	A documented response procedure to manage a leak or spill of petroleum from a storage system; also known as leak or spill response procedure.
Installation	The original installation of a storage system on the premises on the storage site, including any work in the vicinity of the storage site necessary for the installation and anything done to the system before it is commissioned.
Leak	Any loss of petroleum from a storage system because the storage system is not providing full and continuous containment of petroleum.
Loss detection	Procedures and processes able to identify the cause of a discrepancy (loss or gain) from any part of an UPSS (e.g. leak from tanks or pipework).
Loss monitoring system	One or more procedures for undertaking inventory control (reconciliation) of the petroleum in a system. The procedure(s) must be able to identify a discrepancy in the volume of petroleum (either loss or gain) and have the means to record any identified discrepancy that triggers the need for further action.
Modification	Any upgrade, extension, alteration or replacement of the system, or any component of the system, but not including:
	<ul> <li>anything done to the system before it is first commissioned</li> </ul>
	<ul> <li>anything done to the system after it is decommissioned</li> </ul>
	<ul> <li>anything done to the system as part of routine maintenance (including any repairs to the system that are done in the course of regular scheduled upkeep of the system)</li> </ul>
	• anything done to the system before 1 June 2008
	<ul> <li>anything done to a storage site, or any building on a storage site, that does not directly affect the system.</li> </ul>
Modified storage system	A storage system that has been modified.
ΝΑΤΑ	National Association of Testing Authorities
New storage system	Any storage system that is not an old storage system.
Term	Definition
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Old storage system	Any storage system:
	<ul> <li>for which development consent had been obtained under the Environmental Planning and Assessment Act 1979 before 1 June 2008</li> </ul>
	or
	<ul> <li>for which installation had lawfully commenced before 1 June 2008</li> </ul>
	or
	<ul> <li>that was commissioned before 1 June 2008.</li> </ul>
Person responsible	The person who has the management and control of a system. If a system is no longer in use but has not been decommissioned, the person responsible is the person who had management and control of the storage system immediately before it ceased to be used or, if that person cannot be located, the person who owns the land on which the storage system is located.
Petroleum	Any fuel that consists predominantly of a mixture of hydrocarbons, whether or not the fuel includes additives (such as ethanol) and includes used oil.
Piping	Pipework within a UPSS that is integral to the transfer and routine containment of petroleum.
Remediate	In the context of this guideline, remediate means:
	<ul> <li>removing, dispensing, destroying, mitigating or containing the contamination of any land or waters</li> </ul>
	or
	<ul> <li>eliminating or reducing any hazard arising from the contamination of the land, including by preventing the entry of persons or animals on the land.</li> </ul>
Secondary containment	Equipment or infrastructure such as double-walled tanks and double-walled piping (with an interstitial space) that is designed to contain a leak and/or prevent it from escaping beyond the containment area of a UPSS.
Significant modification	Any modification to the system that results in:
	<ul> <li>the replacement of the whole system</li> </ul>
	or
	<ul> <li>the replacement of a half or more of the tanks in the system.</li> </ul>
Spill	Any loss of containment of petroleum from a storage system during physical management, such as:
	<ul> <li>transfer, delivery or removal</li> </ul>
	any UPSS operation
	maintenance or testing
	repair or closure.

Term	Definition
Storage system	A system of tanks, pipes, valves and other equipment that is designed to:
	contain petroleum
	or
	<ul> <li>control the passage of petroleum into, out of, through or within the system,</li> </ul>
	<ul> <li>and includes any structure through which petroleum routinely passes from one part of the system to another.</li> </ul>
Sump	In relation to a storage system, a structure used for the purpose of collecting spilled or excess oil, water and other liquids in the system.
Tank	A container or vessel intended for the storage of petroleum within a storage system that, for the purpose of the Regulation, is buried below the ground surface to such an extent that the base of the tank (in the ground) is not visible.
Underground petroleum storage system (UPSS)	Same meaning as <b>storage system</b> .
Use	To allow petroleum to remain in the system.
Used (waste) oil	Oil that has been used for lubricating or other purposes and has become unsuitable for its purpose due to the presence of impurities or loss of the original properties (and it is not intended for combustion).

## Appendix 2: Duly qualified person checklist

The Regulation requires a duly qualified person to be a person who has competence and experience in relation to that specific activity. While there is no 'one size fits all' competency or qualification that sanctions a person as being duly qualified, the checklist below can be used to help determine whether the person undertaking a specific UPSS activity can be considered to be duly qualified.

#### Table 2 Qualifications and competencies of a duly qualified person

#### **Qualifications and competencies**

□ Does the person have appropriate qualification(s)? (Engineering, science, environmental or relevant trade certificate.)

 $\Box$  Is the person a member of a prescribed professional organisation? (That is, one that requires an entrance exam, minimum qualification and/or ongoing professional development.)

#### □ Documented experience working on UPSS activities

□ Knowledge of the Protection of Environment (Underground Petroleum Storage Systems) Regulation 2019

 $\square$  Knowledge of the Protection of the Environment Operations Act 1997

□ Understanding of the requirements of AS 4897–2008

□ Familiarity with relevant industry standards, policies, requirements, guidelines and codes of practice

## Appendix 3: Sample record sheets for groundwater monitoring

Groundwater monitoring test record - six-monthly visual inspections - business details

Business details
Site name (or name of business) Click or tap here to enter text.
Address Click or tap here to enter text.
Lot and DP number Click or tap here to enter text.
WorkCover dangerous goods (DG) notification number Click or tap here to enter text.
WorkCover DG notification – expiry date Click or tap here to enter text.

Table 3

#### Table 4 Groundwater monitoring test record – six-monthly visual inspections – test details

Well number	Date	Time	Type of test (visual inspection*)	Observations (e.g. visible sheen or evidence of free-phase hydrocarbons)	Number of samples	Name of sampler	Company	ABN	Signature
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This form must be kept for at least seven (7) years from the date of the last test recorded.

\* Interface probe results must be recorded on a separate sheet by a suitably qualified and experienced person.

## Appendix 4: Planning and consent

#### Role of consent and determining authorities

From 1 September 2019, regulatory responsibility for the Protection of the Environment Operations (Underground Petroleum Storage System) Regulation 2019 (the Regulation) is shared between the NSW Environment Protection Authority and local authorities (councils). Councils continue to be responsible under the POEO Act for regulating environmental issues such as spills and stormwater pollution resulting from UPSS site activities.

A council also has responsibility for considering development applications incorporating a UPSS for which they are the **consent authority** under planning legislation. Councils should therefore establish a clear set of management requirements for UPSS installations at the planning stage. Incorporating UPSS requirements in consent conditions is an effective way to ensure that UPSS sites comply with the Regulation from the beginning of a development.

Environmental assessment for UPSS activities undertaken by public authorities, departments or agencies is undertaken under Part 5 of the *Environmental Planning and Assessment Act 1979*.

#### Australian Standards

Consent authorities are encouraged to ensure that new and significantly modified UPSS developments adopt design standards consistent with the Regulation and industry best practice set out in the appropriate industry standards, such as Australian Standard AS 4897–2008, *The Design, Installation and Operation of Underground Petroleum Storage Systems.* 

Other industry standards that may be useful to planners and proponents include:

- AS 1940–2017, Storage and Handling of Flammable and Combustible Liquids
- AS 4976–2008, The Removal and Disposal of Underground Petroleum Storage Tanks.

#### General considerations for consent conditions

As with many developments, it may not be practical for all technical aspects to be resolved prior to the submission of a development application. However, to ensure all activities are completed to an appropriate standard by a duly qualified person, the planning authority may choose to include a broad condition of consent that will necessitate the minimum requirements of the Regulation are to be met.

It may also be useful to stage when and how the requirements are to be met. For example, design of a new UPSS by a duly qualified person may be required at the consent stage, whereas the satisfactory results of an equipment integrity test may be required before an occupancy certificate is issued.

Council may also consider requiring declarations or proof of qualifications to be submitted with the development application, to support the claim that the contractors engaged are duly qualified persons.

## Issues to be considered by consent authorities under the Regulation

A UPSS must meet all the relevant requirements of the Regulation where planning approval is granted **on or after 1 June 2008.** 

The key issues that consent authorities need to consider when assessing a UPSS development are outlined in Table 5 below.

Action(s) the proposal involves	Requirements to be incorporated into the planning approval conditions	Regulation (reference)
Design and installation of a new UPSS	The UPSS must be designed and installed by a duly qualified person. UPSS equipment must meet the relevant industry standards and design specifications, as documented in AS 4897.	Part 2 clauses 6–9 Part 3 clauses 15–17
	The UPSS must not operate without loss monitoring and leak detection systems.	
	Installation reports for UPSS equipment must be prepared by a duly qualified person.	
	If relevant, a plan showing the locations of groundwater monitoring wells is prepared by a duly qualified person, must be included.	
	Current, 'as built' drawings of the system must be prepared by a duly qualified person and included in the <b>fuel system</b> <b>operation plan</b> . The newly installed UPSS must not be commissioned unless an equipment integrity test is performed and the system has been certified as having satisfied the test. The person responsible must be provided with the certificate and the results of the equipment integrity test	
	5,	

## Table 5Guidance for Consent and Determining authorities considering an underground petroleum<br/>storage system (UPSS) proposal.

Action(s) the proposal involves	Requirements to be incorporated into the planning approval conditions	Regulation (reference)
A significant modification to an existing UPSS	The modification must be designed and implemented by a duly qualified person. Must meet the relevant industry standards and design specifications, as documented in AS 4897. Must not be operated without loss monitoring and leak detection systems. Must be recorded and current 'as built' drawings revised to reflect the modified system. Must not be commissioned unless an equipment integrity test is performed. and the system has been certified as having satisfied the test and the person responsible provided with the certificate and the results of the equipment integrity test	Part 2 clauses 10–13 Part 5 clause 22 Part 3 clauses 15–17
Removal and/or replacement of a UPSS tank	A report for the storage site must be prepared by a duly qualified person and submitted to the relevant local authority no later than 60 days after the tank is removed or replaced. The report must describe the processes used to remove or replace the tanks concerned, assess contamination at the storage site, and detail any remediation work carried out during the removal or replacement of the tank. A modified system involving the removal or replacement of any tank must not be commissioned unless an equipment integrity test is performed. The person responsible for the UPSS must be provided with the certificate and the results of the equipment integrity test.	Part 5 clause 24

Action(s) the proposal involves	Requirements to be incorporated into the planning approval conditions	Regulation (reference)
Decommissioning of a UPSS	The person responsible for the storage system must notify the relevant local authority no later than 30 days before the system is decommissioned or removed. A site report must be prepared and submitted to the local authority no later than 60 days after the system is decommissioned. If remediation of the site is also required as part of decommissioning, the report must be submitted to the local authority no later than 60 days after the remediation is completed.	Part 5 clauses 23–24
	The report must be prepared by a duly qualified person and describe the processes used to decommission the storage system and those used to assess contamination at the storage site. The report must also describe any remediation works that were carried out during the removal of the tanks.	

Action(s) the proposal involves	Requirements to be incorporated into the planning approval conditions	Regulation (reference)
Current or proposed operation of a UPSS	A fuel system operation plan (FSOP) must be prepared and implemented.	Part 4 clauses 18–21 Part 6 clauses 26–28
	Measuring instruments in the system must be checked and maintained in accordance with the manufacturer's instructions, (or the FSOP if there are no such instructions) and recording of the data produced.	
	Undertake loss monitoring and appropriate record-keeping of the results.	
	Test the leak detection system as per the written instructions of a duly qualified person.	
	Investigate any discrepancies detected by the loss monitoring system within 60 days of becoming aware of the discrepancy.	
	In addition:	
	<ul> <li>any documents required by clause 26 of the Regulation (such as records of activities, equipment integrity tests measuring instrument data and incidents) must be kept for at least seven years from their date of creation</li> </ul>	
	<ul> <li>where responsibilities for the system change, all relevant records must be transferred to the new person within 30 days.</li> </ul>	

#### **Repair to a UPSS**

Depending on the nature of the activity, repairs may not trigger the need for development consent. Following repair or rectification after discovery of a leak, a modified or repaired storage system can only be recommissioned where an **equipment integrity test** (EIT) has been performed in line with the written directions of a duly qualified person and the system satisfies the EIT.

## Appendix 5: Loss monitoring investigation

To assist in determining the cause of a discrepancy identified during loss monitoring, the following system checks may be initiated (where appropriate) by the person responsible for a UPSS.

Suspected issue	Loss or gain?	System check
Inventory records	Loss or gain	Check the inventory control records of the preceding three months (or to a point where records are deemed satisfactory) to ensure the discrepancy has not been caused by a record-keeping error.
Security/pilfering	Loss	Check the following:
		<ul> <li>for sites that do not operate continuously (non-24-hour sites), that all tank openings (e.g. dip and fill points) are secured</li> <li>on self-serve sites, that controlled authorisation of dispensers is operating</li> <li>CCTV or similar security system (where available) is working correctly.</li> </ul>
Dipstick	Loss or gain	Check the following:
		<ul> <li>the dipstick(s), for wear or damage (replace if necessary)</li> </ul>
		<ul> <li>that each tank has the correct dipstick</li> </ul>
		<ul> <li>if using automatic tank gauging, that the system is operating to the manufacturer's specifications.</li> </ul>
Water	Gain	Check each tank for the presence of water by using:
		an interface probe     or
		<ul> <li>water-finding paste on a dipstick.</li> </ul>
		Identify entry point(s) (e.g. if the tank has a hole, or water is entering via open valve, fill point, etc.).
Pumps and piping manifolds	Loss	For a dispenser with a pump located inside the dispenser unit, remove covers and check valves and pipework for leaks, both during operation and when switched off
		For submersible pumps, lift the pump cover and check wells for leaks.
		For piping manifolds, lift the pit cover and check for any leak.
Tank-pit	Loss	Check:
observation wells and groundwater monitoring wells		<ul> <li>for any evidence of petroleum in the tank-pit observation well and/or groundwater monitoring well, by using a measuring instrument such as an interface probe or a clean see-through bailer lowered slowly into the well to observe water interface</li> </ul>
		<ul> <li>for vapours, by using a portable gas analyser.</li> </ul>
		Undertake further investigation of the system to identify the source of leak.
Vents	Loss	Check:
		<ul> <li>vent caps for any visible blockages</li> </ul>
		<ul> <li>vents for evidence of petroleum blow-out at either vent outlet or below vents on ground or buildings.</li> </ul>

#### Table 6 Suggested loss monitoring procedures

Dispenser pumps are over or under dispensing	Loss or gain	<ul> <li>Check:</li> <li>that dispenser totals and console totals are recorded and fall within their accepted tolerances, and that the records produced by each, for the same period, correlate within acceptable limits</li> <li>the maintenance schedule and calibration of dispensers.</li> </ul>
Sales test	Loss or gain	<ul> <li>Determine tank and dispenser relationships by identifying single stock systems.</li> <li>Establish opening stock information and do not alter the single stock systems for the duration of the sales test.</li> <li>During the sales test the operator must satisfy the requirements of the delivery procedures and run the test for five days unless significant loss or gain variations can be determined in a shorter period.</li> <li>The final stock reconciliation must be performed by the person responsible for the UPSS.</li> </ul>
Interstitial monitoring (for equipped UPSSs only)	Loss	<ul> <li>Check:</li> <li>the system is active</li> <li>leak detection measurements (e.g. liquid levels or pressure levels) are within the manufacturer's tolerances</li> <li>leak detection measurements have been recorded for the system.</li> <li>If any losses outside the manufacturer's leak detection tolerances have been reported in the last six months, further investigate the system to identify the source of leak.</li> </ul>
Human error	Loss or gain	<ul> <li>Check:</li> <li>UPSS installation records – was the installer accredited/certified?</li> <li>for inaccurate measuring/recording</li> <li>delivery losses/tank filling activities</li> <li>for inadequate system management</li> <li>for failure to complete physical system checks.</li> </ul>
Recent repairs undertaken on UPSS	Loss or gain	<ul><li>Check:</li><li>maintenance of records</li><li>in the case of repair and reuse, whether compatible materials were used.</li></ul>
Temperature	Loss or gain	<ul> <li>Check:</li> <li>delivery temperature correction</li> <li>calculations have been temperature-corrected to 15°C (or recommended ambient temperature).</li> </ul>
Equipment integrity test	Loss or gain	If none of the above investigations reveals a reason for the discrepancy in the reconciliation records, an EIT may be considered and performed in accordance with section 3.2 of these UPSS Guidelines.

# Appendix 6: Checklist for reporting following the decommissioning, removal or replacement of a UPSS

Where a UPSS has been decommissioned, removed or replaced a report must be provided to the local council.

The report must:

- be prepared by a duly qualified person in accordance with these guidelines
- describe how the storage system was decommissioned
- outline how the storage site was assessed and whether any contamination was identified.

The following checklist is designed to help achieve a uniform approach to reporting on UPSS sites following decommissioning, replacement or removal of a storage system and assist compliance with clause 23 and 24 of the Regulation.

The reporting requirements outlined below are consistent with reporting requirements in <u>Consultants Reporting on Contaminated Land: Contaminated Land Guidelines</u> (EPA 2020).

Each section in the checklist can be considered for a UPSS site where a storage system has been decommissioned, replaced or removed. However, not all the items relating to each subject (as provided in the checklist) will be relevant to each site.

Report section	Required information	Included
Document control	Date, version number	
	Author and reviewer (including qualification and/or certification details), contact details, company name, ABN	
	Who commissioned the report	
Executive summary	Summary of key findings, observations and sampling results	
Introduction	Background	
	Purpose of report – i.e. whether it is for the decommissioning, replacement or removal of a storage system	
	Objectives of the sampling program	
	Scope of work – how the storage system will be decommissioned, replaced or removed	
Site information	Name, address, lot & DP number, local government area	
	Site owner's trading name, description of owner (company, operator, third party), current site use, reason for removal/decommissioning	

#### Table 7 Sample checklist for a report for the decommissioning, replacement or removal of a storage system

Report section	Required information	Included
Site information (continued)	Details of person responsible for the UPSS (if different to site owner)	
	Geographic coordinates	
	Locality map	
	Current site plan with scale bar, showing the direction of north, local water drainage and other local environmentally significant features	
Site history and proposed site use	Summary of site use, zoning, proposed site use, proposed development details (if any)	
	Current and historical details of the underground storage tanks located on site	
Site condition and surrounding environment	Topography, hydrology, geology, groundwater depth and direction	
	Direction of surface drainage	
	Distance to surface water features and observations of any local sensitive environment/s	
	Groundwater bores located on or near the site	
	Summary of adjacent sites' use, zoning, off-site effects, etc.	
	Summary of any evidence of existing site contamination, including discolouration of soils, dead or dying vegetation on or near the site, staining or discolouration of surface areas, any pooling of odorous and/or tainted water in the tank pit	
Existing records	Summary of any previous equipment integrity tests (EITs), groundwater monitoring well six-monthly monitoring results and loss monitoring methods and results. Append if necessary	
Conceptual site model	Contamination sources and extent, concentration and predicted movement of contaminants	
Table 2(a) of the Consultants	Refer to contaminants of concern – section 6.5.5	
Reporting on Contaminated Land: Contaminated Land Guidelines (EPA 2020)	Mechanism for contamination, affected media, receptors and exposure pathways	
, , , , , , , , , , , , , , , , , , ,	Assessment of any identified data gaps	
	Sampling analysis and quality plan – methodology and justification Refer to:	
	• quality assurance and control – section 6.5.2	
	<ul> <li>son sampling – section 6.5.3</li> <li>groundwater assessment – section 6.5.4</li> </ul>	
	~	

Report section	Required information	Included
Data quality objectives For further guidance see Table	Refer to data quality objectives – section 6.5.1	
2(b) of the Consultants Reporting on Contaminated Land: Contaminated Land Guidelines (EPA 2020) if more detail is required.)	Field screening protocols	
	Photos, logs, field observations	
Validation results and discussion	Summary of results from sampling program, in a table that shows:	
	<ul> <li>essential details i.e. sample identification numbers, depth, etc</li> </ul>	
	<ul> <li>sample descriptions of all media (soil, groundwater etc)</li> </ul>	
	<ul> <li>remediation criteria</li> <li>highlighting samples that exceed remediation criteria</li> </ul>	
	Site plans or excavation logs of all sample locations	
	Site plan(s) showing extent of soil and/or groundwater contamination	
Remediation options	Summary of options available	
See Table 2(d) of the Consultants Reporting on Contaminated Land: Contaminated Land Guidelines (EPA 2020) if more detail is required)	<ul> <li>Preferred option and rationale – Remediation Action Plan (RAP)</li> <li>Remediation details: <ul> <li>roles and responsibilities</li> <li>sequence of works</li> <li>work health and safety issues</li> <li>site preparation</li> <li>methodology and timeframes</li> </ul> </li> <li>Waste management – waste classification report in accordance with EPA waste classification guidelines</li> <li>Documentation – including material handling and tracking</li> </ul>	
Quality assurance and quality	Refer to section 6.5.2	
control (QA/QC)	Verification of compliance with regulatory requirement	
	Identify and discuss any ongoing monitoring (if required)	
Conclusions and	Brief summary of all findings	
recommendations	Rationale and justification in reaching the conclusions	
	Any recommendations based on the conclusions	
	A clear statement that the duly qualified person considers the subject site to be suitable for the proposed use or other nominated potential uses	
	A statement detailing all limitations and constraints on the use of the site (where applicable)	
	Recommendations for further work, if appropriate	

#### STATEMENT OF ENVIRONMENTAL EFFECTS



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

## APPENDIX I AHIMS SEARCH

Document Set ID: 1859142 Version: 1, Version Date: 12/05/2021



#### AHIMS Web Services (AWS) Search Result

Date: 08 September 2020

Nathan Bartlett

1A Wirraway Street Tamworth New South Wales 2340 Attention: Nathan Bartlett

Email: nathan@sixhillsgroup.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 7313, DP:DP1147165 with a Buffer of 1000 meters, conducted by Nathan Bartlett on 08 September 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

6 Aboriginal sites are recorded in or near the above location.
0 Aboriginal places have been declared in or near the above location. \*

#### If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

#### Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.



#### AHIMS Web Services (AWS) Search Result

Date: 08 September 2020

Nathan Bartlett

1A Wirraway Street Tamworth New South Wales 2340 Attention: Nathan Bartlett

Email: nathan@sixhillsgroup.com.au

Dear Sir or Madam:

AHIMS Web Service search for the following area at Lot : 7313, DP:DP1147165 with a Buffer of 50 meters, conducted by Nathan Bartlett on 08 September 2020.

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

3 Aboriginal sites are recorded in or near the above location.
0 Aboriginal places have been declared in or near the above location. \*

#### If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

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- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.



#### AHIMS Web Services (AWS) Search Result

Date: 08 September 2020

Nathan Bartlett

1A Wirraway Street Tamworth New South Wales 2340 Attention: Nathan Bartlett

Email: nathan@sixhillsgroup.com.au

Dear Sir or Madam:

<u>AHIMS Web Service search for the following area at Lot : 217, DP:DP41546 with a Buffer of 1000 meters,</u> <u>conducted by Nathan Bartlett on 08 September 2020.</u>

The context area of your search is shown in the map below. Please note that the map does not accurately display the exact boundaries of the search as defined in the paragraph above. The map is to be used for general reference purposes only.



A search of the Office of the Environment and Heritage AHIMS Web Services (Aboriginal Heritage Information Management System) has shown that:

0 Aboriginal sites are recorded in or near the above location.
0 Aboriginal places have been declared in or near the above location. \*

#### If your search shows Aboriginal sites or places what should you do?

- You must do an extensive search if AHIMS has shown that there are Aboriginal sites or places recorded in the search area.
- If you are checking AHIMS as a part of your due diligence, refer to the next steps of the Due Diligence Code of practice.
- You can get further information about Aboriginal places by looking at the gazettal notice that declared it. Aboriginal places gazetted after 2001 are available on the NSW Government Gazette (http://www.nsw.gov.au/gazette) website. Gazettal notices published prior to 2001 can be obtained from Office of Environment and Heritage's Aboriginal Heritage Information Unit upon request

#### Important information about your AHIMS search

- The information derived from the AHIMS search is only to be used for the purpose for which it was requested. It is not be made available to the public.
- AHIMS records information about Aboriginal sites that have been provided to Office of Environment and Heritage and Aboriginal places that have been declared by the Minister;
- Information recorded on AHIMS may vary in its accuracy and may not be up to date .Location details are recorded as grid references and it is important to note that there may be errors or omissions in these recordings,
- Some parts of New South Wales have not been investigated in detail and there may be fewer records of Aboriginal sites in those areas. These areas may contain Aboriginal sites which are not recorded on AHIMS.
- Aboriginal objects are protected under the National Parks and Wildlife Act 1974 even if they are not recorded as a site on AHIMS.
- This search can form part of your due diligence and remains valid for 12 months.

#### STATEMENT OF ENVIRONMENTAL EFFECTS



Demolition of an Existing Highway Service Centre and Construction of a Highway Service Centre (Class 6)

## **APPENDIX J**

**FLOOD IMPACT ASSESSMENT** 





## Narrabri Travel Centre, Flood Impact Assessment

11553 Newell Highway (Lot 217 DP41546), Narrabri

The Thistle Company of Australia

0328-07-C, 25 July 2018

For and on behalf of WRM Water & Environment Pty Ltd Level 9, 135 Wickham Tce, Spring Hill PO Box 10703 Brisbane Adelaide St Qld 4000 Tel 07 3225 0200

Greg Roads Director/Principal Engineer

NOTE: This report has been prepared on the assumption that all information, data and reports provided to us by our client, on behalf of our client, or by third parties (e.g. government agencies) is complete and accurate and on the basis that such other assumptions we have identified (whether or not those assumptions have been identified in this advice) are correct. You must inform us if any of the assumptions are not complete or accurate. We retain ownership of all copyright in this report. Except where you obtain our prior written consent, this report may only be used by our client for the purpose for which it has been provided by us.



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 Table 2.1 - Railway culvert details \_\_\_\_\_\_3



## 1 Introduction

The Thistle Company of Australia (TCOA) propose to redevelop the Shell Service Station and associated infrastructure at 11553 Newell Highway (Lot 217 DP41546), Narrabri. The redeveloped site will be known as the Narrabri Travel Centre. Figure 1 shows the development layout of the proposed Narrabri Travel Centre.

The proposed development site is located within the 2% and 1% annual exceedance probability (AEP) flood extent from Long Gully, as identified in the Narrabri Flood Study (WRM, 2016). As part of the development application TCOA has requested WRM to assess the flood impact of the proposed development. This report presents the results of the flood impact assessment.

## 2 Existing flood risk

The existing conditions modelling (WRM, 2016) showed that the development site is inundated by the 2% and 1% AEP Long Gully (local) flood events. The development site is not inundated by smaller Long Gully design events and is not inundated by Namoi River 1% AEP design flooding.

The modelling conducted for the Narrabri Flood Study (WRM, 2016) did not include the rail culvert under the Narrabri West Walgett Railway between Mooloobar Street and Railway Street South (see Figure 2). At the time of conducting the Narrabri Flood Study details of this culvert were not available.

For the purpose of the Narrabri Travel Centre flood impact assessment this rail culvert was surveyed and included in the flood model. Details of this culvert are shown in Table 2.1 and Figure 2 shows the updated existing conditions 1% AEP design flood depths (after inclusion of this culvert in the model). It should be noted that existing conditions peak flood levels at the development site were not reduced by inclusion of this culvert in the model.

Structure Detail	Value
Culvert Type	Reinforced Concrete Pipe
Number of Barrels	1
Diameter	1.5 m
Upstream Invert (approximate)	211.56
Downstream Invert (approximate)	211.17
Culvert Length (approximate)	26

Table 2.1 - Railway culvert details

Figure 2 shows that the eastern half of the development site is inundated for the Long Gully 1% AEP design flood event under existing conditions. Flood depths onsite are up to approximately 0.8 m with a peak flood level of 214.75 mAHD. For the 2% AEP Long Gully design flood, only a small portion of the site is inundated with a peak flood level of 214.63 mAHD.

The existing ground levels across the site vary between 213.96 mAHD and 215.27 mAHD, with an average site level of 214.75 mAHD.



#### 3.1 PROPOSED DEVELOPMENT

The proposed development will consist of the travel centre structure and a large hardstand area for parking (refer to Figure 1). The finished floor level of the travel centre structure is proposed to be 215.55 mAHD, approximately 0.8 m above the 1% AEP Long Gully flood level. There are other areas of fill on the site, though the bulk of filling is concentrated in areas of the site that are not inundated in the 1% AEP event.

The site layout, including the impervious noise barrier along the northern edge of the site were input into the Narrabri flood model to determine the extent of any impacts for the 2% and 1% AEP Long Gully design flood events.

#### 3.2 PEAK WATER LEVEL IMPACTS

Figure 3 shows the extent of flood impact caused by the proposed development for the 2% AEP Long Gully design flood. Figure 4 shows the extent of flood impacts caused by the development for the 1% AEP the Long Gully design flood. With respect to the impact mapping in Figure 3 and Figure 4, the following is of note:

- For the 2% AEP design flood event, the peak flood level impacts are confined to the undeveloped gully on the southern side of Kelvin Vickery Avenue. Water levels on this undeveloped parcel of land are increased by up to 80 mm. No existing dwellings are adversely impacted by the development in the 2% AEP design flood event;
- For the 1% AEP design flood event, the peak flood level impacts are further spread with limited areas on the northern side of Kelvin Vickery Avenue impacted. Flood impacts at all existing flooded dwellings are less than 10 mm and there is no change in the number of inundated dwellings; and
- The proposed Narrabri Travel Centre structure is not inundated in the 1% AEP design flood event.

## 4 Summary of findings

The Thistle Company of Australia propose to redevelop the Shell Service Station at 11553 Newell Highway (Lot 217 DP41546), Narrabri. Flood modelling has been undertaken to define the flood impacts for the proposed development. The results of the flood modelling are as follows:

- The proposed development site is not inundated for the 1% AEP Namoi River (regional) design flood;
- The development site is inundated by flooding from Long Gully for the 2% AEP event;
- The 2% AEP and 1% AEP Long Gully flood events were modelled with peak level impacts found in different areas for both events. No dwellings were located in these impacted areas; and
- No flood level impacts greater than 10 mm were experienced at any dwelling, and the total number of dwellings inundated was not changed for both the 2% AEP and 1% AEP Long Gully design flood events.



## **5** References

WRM, 2016'Narrabri Flood Study', Report prepared for Narrabri Shire Council<br/>by WRM Water & Environment Pty Ltd, December 2016.



Figure 1 - Proposed site layout



ERED GRASSED SWALE TO CEIVE SURFACE FLOW AND NEL TOWARDS DISCHARGE STERN END INTO EXISTING DRAINAGE PATH,				
,				
A TEASTERN CORNER TO E FLOW OUTLETS BETWEEN RNAL FLOW PATHS, NEW CH EXISTING SURFACE IND BETWEEN FLOW PATHS,				
EASTERN IARGING TO AGE PATH TED KERB.				
, DISCHARGING TO NG EAST SIDE OF				
H DRAIN EXISTING N AT RCBC				
POINT IN 14.83				
600 RCBC				
G LEVELS OF 214.83				
8 1/2960 DOCUMENT No.; - 1				
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Figure 2 - Long Gully existing conditions flood depths and levels, 1% AEP event

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Figure 3 - Predicted flood level impact, proposed development minus existing conditions, Long Gully 2% AEP event

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Figure 4 - Predicted flood level impact, proposed development minus existing conditions, Long Gully 1% AEP event

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