



**Modification of DA 177-8-2004
Environmental Assessment
Locomotive Refuelling Station
Wambo Coal Rail Loop**



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1 INTRODUCTION

QR National and Wambo Coal Pty Ltd (WCPL - the proponent) propose to establishment of a small locomotive refuelling station adjacent to the Wambo Coal Rail Loop at Warkworth, New South Wales, in the Singleton local government area. **Figure 1** shows the location of the Wambo Coal Mine and Rail Loop.

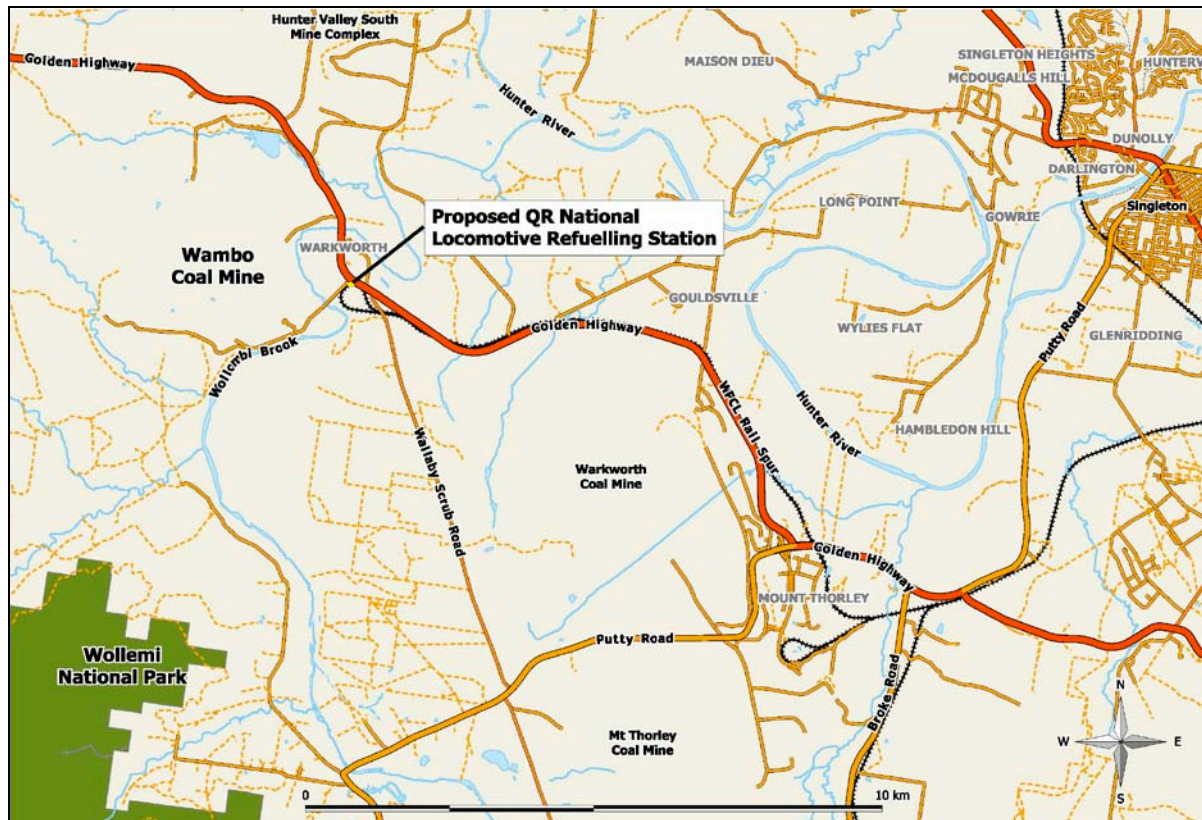


Figure 1: Location of the QR National Refuelling Station and the WCPL Rail Loop.

This Environmental Assessment (EA) document has been prepared to support a minor modification of WCPL rail and coal loading development consent (DA 177-8-2004) for the establishment of the station.

The purpose of the EA is to assess the environmental interactions and impacts of the proposed development and to describe the measures and safeguards required during the construction and operational phases of the locomotive refuelling station.

The EA has been prepared by Wells Environmental Services for QR National, with input from WCPL. Engineering design and plans were prepared by Shaw Engineering (Appendix 1), Oil Management System by SPEL (Appendix 2), EcoBiological Pty Limited undertook a Bushfire Assessment (Appendix 3).

1.1 Need

QR National operate on the Hunter Valley rail network transporting coal from producers through to the port at Newcastle.

Locomotive provisioning (refuelling and addition of sand, water and oil) for QR National trains on the network is currently undertaken at facilities located at Kooragang Island and the rail siding at Ashton Coal Mine near Camberwell. QR National have identified locomotive provisioning as a constraint on meeting targeted network haulage rates.

In order to improve the throughput on the network, QR National has identified the WCPL rail loop as a strategic location for the refuelling and provisioning of locomotives on the network, especially for trains operating south of the Ashton Coal Mine siding near Camberwell.

1.2 Summary

A précis of the proposal is presented below, with a detailed description of the facility presented in Section 2 of the EA document.

Proposal	The proposed modification includes the installation and operation of a small provisioning facility with a total footprint of only 650m ² for the purpose of refilling locomotives with diesel, topping up of engine oil, sand for braking, cabin water and internal cleaning of the operators cabin.
Proponent	QR National / Wambo Coal Pty Limited (WCPL).
Site	Land located on the corner of the Wambo Coal Mine access road and the New England Highway adjacent to, and including, the Wambo Coal Rail Loop, Warkworth, NSW.
Real Property Description	Consistent with DA 177-8-2004 Lot 202 DP 257063 Warkworth, Parish of Warkworth, County of Northumberland.
Land Owner	Wambo Coal Pty Limited.
Estimated Capital Costs	\$1,700,000
Employment Generation	During construction and servicing/ maintenance during operation.
Construction Period	8 weeks onsite from commencement of construction. Many elements are pre-manufactured offsite and installed onsite.
Construction Times	Consistent with the DA 177-8-2004. Monday to Saturday (inclusive) 7.00am to 6.00pm; and Sunday 8.00am to 6.00pm.
Operation Times	Consistent with the DA 177-8-2004. Refuelling and provisioning during day or night, Monday to Sunday.
Environmental Assessment	Section 75W of the <i>Environmental Planning and Assessment Act (EP&A) Act 1979</i> .
Consent Authority	NSW Planning.

2 PROJECT DESCRIPTION

2.1 The Wambo Rail Loop - DA 177-8-2004

Development Application 177-8-2004 for rail and coal loading infrastructure adjacent to the Wambo Coal Mine was approved by the then Minister Assisting the Minister for Infrastructure and Planning in 2004, and was subsequently modified in 2006 (126-10-2006). The development application was state significant, integrated development assessed and approved pursuant to Part 4 of the *Environmental Planning & Assessment (EP & A) Act 1979*.

The WCPL rail spur and loop was commissioned in May 2006 and includes a rail line and loop from Mt Thorley through to the Wambo Coal Mine at Warkworth. In 2009/2010 approximately 5 million tonnes of product coal was transported from the mine on the WCPL rail spur (2009-2010 AEMR).

Key aspects of DA 177-8-2004 are detailed in **Table 1**.

Table 1: Key elements of DA 177-8-2004 approved in 2006.

Aspect	Description	Modification Required
The Development	- Construction and operation of a rail spur, rail loop, coal reclaim area, product coal conveyor and train load-out bin to enable the transport of coal. - Construction of a rail underpass beneath Wallaby Scrub Road. - Upgrading of the intersection between Wallaby Scrub Road and the Golden Highway. - Transport of product coal to the market 24 hours day, 7 days a week.	No
Consent Lapse	21 years from approval (i.e. lapses in 2027).	No
Haulage Limit	15 million tonnes per annum (Mtpa).	No
Construction Hours	7am to 6pm Monday to Saturday (inclusive). 8am to 6pm Sundays and Public Holidays.	No
Operating Hours	24 hours per day 7 days per week with the all practical measures made to minimise train movements on Friday evening (6pm-9pm) and Sunday morning (9am to 12am [assume it implies 12pm]).	No
Relevant Documents	The Applicant shall carry out the development generally in accordance with the: (a) DA 177-8-2004. (b) SEE titled <i>Proposed Alterations to the Wambo Development Project – Rail and Train Loading Infrastructure</i>, dated June 2004, and prepared by Resource Strategies Pty Ltd. (c) letter to the Minister, dated 13 August 2004, from Wambo Coal Pty Ltd. (d) traffic Study titled <i>Report for Upgrade of Walaby Scrub Road/Golden Highway Intersection</i> dated May 2006, and prepared by GHD Pty Ltd. (e) conditions of this consent [DA 177-8-2004 as modified in 2006].	Yes EA titled <i>Locomotive refuelling station Wambo Coal Rail Loop</i>, dated March 2011, prepared by Wells Environmental Services.

2.2 Description Overview

The proposed modification includes the installation and operation of a small provisioning facility with a total footprint of less than 650m² consisting of:

- One 100,000L self bunded, double skinned diesel storage tank (Combustible Class 1) with refuelling hose.

- One 2,000L lubricating oil tank (Combustible Class 2) with retractable hose.
- Two pneumatic eight tonne capacity sand tanks.
- One 10,000L polyethylene water tank with pump and retractable hose for potable water and fire fighting supplies.
- Piping and electrical cabling.
- Electricity sourced from nearby coal loading point.
- Task lighting and level walkways both sides of the track.
- Stairs from the diesel tank to the level northern level walkway.
- Spill control matting.
- Spill and oily water management system.
- A lockable weather proof storage container.
- A two metre chain wire perimeter fence will be installed to minimise vandalism and theft.

Figure 2 illustrates the location of the proposed refuelling station on the WCPL rail loop. Detailed plans of the proposed refuelling station are included within **Appendix 1**. The design and location of the facility has had regard to *AS 1940-2004 The storage and handling of flammable and combustible liquids*.

2.3 Location

The facility is proposed to be located on Lot 202 DP 257063, near the corner of the Wambo Coal Mine access road and the Golden Highway adjacent to and including the Wambo Coal Rail Loop, Warkworth, NSW (see Figure 1 and **Figure 2**). The facility will be approximately 150m east of the Wambo train loader allowing provisioning prior to the train being loaded with coal. **Photograph 1** illustrates the approximate location of the proposed facility as viewed from the Wambo access road.



Photograph 1: View of proposed location from shoulder of Wambo access road looking south east.

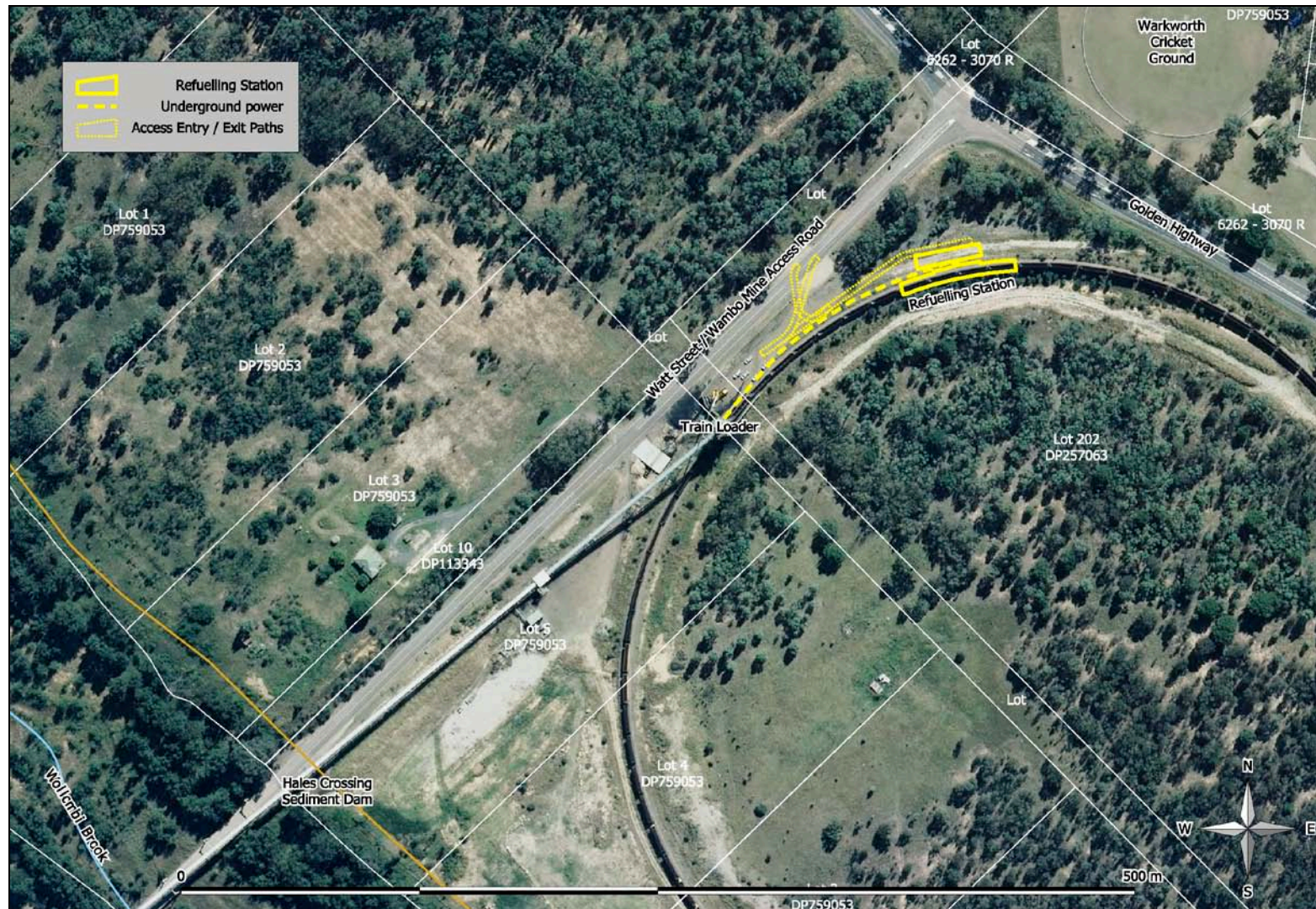


Figure 2: Location of the proposed refuelling station on the WCPL rail loop.

2.4 Construction

The station is expected to take approximately eight weeks to construct onsite. Many elements are prefabricated offsite and transported to site for installation. Construction will occur in accordance with DA 177-8-2004 (as amended) on Monday to Saturday (inclusive) 7.00am to 6.00pm and Sunday 8.00am to 6.00pm. If construction has not been delayed, construction activities on a Saturday or Sunday are unlikely to occur.

2.5 Diesel

Refuelling of locomotives at the site is required to improve network efficiencies. On average two trains per day will use the loop, with a peak of up to six trains per day. It is expected that approximately two thirds of locomotives using the loop will need to refuel.

Fuelling of locomotives will be undertaken day or night, seven days per week. A complete re-fuelling will take approximately 30 minutes per train consuming 15,000L of diesel and will be undertaken by the train driver.

Diesel will be delivered to the station using road registered 27-33t tankers carrying up to approximately 33,000L. On average it would be expected that one fuel delivery every second day will be required, while during peak use one delivery per day may be required.

The diesel storage tank will be located at the base of the rail embankment with diesel pumped to the refill point. The refilling operation incorporates several spill prevention features including a security card to activate the pump, a refill nozzle that must be connected to the fuel tank to flow, an operator dead man switch and a cut-off valve in the event of a ruptured pipe. The hydrocarbon management system is described in *Section 2.11*.

The diesel storage tank will be a double skinned self bunded diesel storage tank with a capacity of approximately 100,000L. The selected tank design is a Transtank T108E with an extended pumping bay. The tank has a capacity of 108,000L and a safe fill of 95,000L. The tank is 13.1m long, 3m wide and 3.3m height (the oil tank is integrated into the structure creating a total length of approximately 15m). **Photograph 2** provides an example of the proposed diesel tank, the actual diesel tank will be painted *River Gum Green* consistent with the coal loading facilities.

The design and location of the tank is designed to be compliant with AS 1940-2004 *The storage and handling of flammable and combustible liquids*.



Photograph 2: Transtank with lockable extended pumping bay, actual tank will be painted *River Gum Green*.

2.6 Oil

Oil is required for topping up of engine oil in the locomotives, this is done as required with typical consumption expected to be less than 4,000L per year.

The oil storage tank is also self bunded and is integrated with the diesel tank, it will have a capacity of 2,250L and a safe fill capacity of 2,000L.

The tank will be refilled by truck on average every six months.

Oil will be pumped via a low pressure pipeline from the tank and decanted into the locomotives via two retractable hose and trigger nozzles. These retractable hose reels will be located above spill containment grates adjacent to the rail track.

2.7 Sand

Sand is required by locomotives to reduce slippage and increase friction between the rolling stock and the railway tracks, typically 50kg of sand will be required per refuelling event, with more required during wet weather. Each locomotive has at least four sand boxes that are topped up as required.

Two pneumatic eight tonne capacity sand tanks will be installed adjacent to the diesel tank. Sand in the tanks will be pneumatically agitated from an electric compressor and transferred to the sand trolleys kept on the walkways. The sand trolleys are pneumatically powered and are refilled from the main tanks and wheeled to the sand boxes as required.

The sand tanks will be refilled by truck typically every two months.

2.8 Water

Potable water is required to top-up cabin water and engine water as required, consumption of water is approximately 100 litres per locomotive per fuelling event.

One 10,000L polypropylene water tank will be installed within the facility. Water from the tank will be pumped and dispensed via a retractable hose and trigger nozzle.

Water will be sourced by a local water contractor obtaining water from the Singleton reticulated water mains. WCPL currently import all potable water to site, it is likely that the water will be sourced from the same contractor. The tank will be topped up as required.

The tank will be fitted with a 65mm storz outlet to provide suitable connection for attending Rural Fire Brigades in the event of a fire.

2.9 Storage, Cleaning and Inspection of Locomotives

A prefabricated lockable weather proof storage container will house all consumables, and provisioning equipment, spill kits, Material Safety Data Sheets (MSDS) registers and cleaning materials. Parallel level walkways (approximately 60 metres in length) will be installed either side of the track to assist operational staff undertake provisioning and inspect the locomotives.

2.10 Electrical Power, Lighting and Security

Three phase 415 volt electrical power will be sourced from the WCPL train loader via a direct buried underground cable alongside the rail embankment.

Low power non-intrusive site lighting will be installed for night time operations to comply with occupational health and safety regulations and *Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting*. Lighting will be configured to be activated on arrival of the train and turn off after a set period.

All pumps and external equipment is locked to deter interference and vandalism. All loose items and equipment are to be locked in the storage facility when not in use.

A two metre high chain wire perimeter fence with lockable gate will be installed around the outside of the facility to deter unauthorised access, theft and vandalism. There will be no gating across the rail track.

2.11 Spill and Hydrocarbon Management

All personnel involved in the use of hydrocarbons on the site will be trained in the appropriate use of facility and emergency response measures. There are three main aspects with respect to onsite hydrocarbons that will require management, being:

- Occasional drips / minor spillage from oil and diesel refilling at both the locomotives and refilling of the oil and diesel tanks.
- Spillage at the locomotive or at tank refilling location as a result of theft or vandalism.
- Spillage at the locomotive or at tank refilling location as a result of operator error.
- Spillage at the tanks, refilling of the tanks or locomotives due to equipment failure.

To address these aspects, the following controls will be implemented:

- Fuel tanks are self bunded and double skinned.
- Absorbent spill control matting located between the tracks in the refuel area (absorbs approximately 12L/m², replacement every 18 months or as required in event of saturation by spill, rainfall evaporates).
- Drip and spill control grates located at the two refill points connected to a *SPEL Puraceptor*[™] oily water management system.
- A bunded concrete area for tanker refilling connected to the *SPEL Puraceptor*[™] oily water management system.
- Fuel refill areas will be locked, reducing potential for vandalism or theft.
- Fuel pumps cannot be activated without a QR National access card.
- The refuelling hose connects to the locomotive fuel tank using a *Banlaw* nozzle eliminating accidental spills.
- A "dead man switch" is located at the refuelling point requiring pressing every 15 seconds from the driver in order to activate the pump.
- Emergency shut off valves are located in the piping system, limiting the extent of spills.
- Spill containment kits will be kept within the lockable onsite storage container.
- Monthly inspections, servicing and maintenance (or as required) of the station, in addition to visual inspections by locomotive drivers during refuelling.

2.11.1 Puraceptor Oily Water Management System

The *SPEL Puraceptor*[™] oily water management system is a full retention separator that will treat flows from the three refill areas and is sized to contain more than the anticipated maximum oil and diesel spillage enabling it to be fully operational at all times (refer to **Appendix 2** for further information).

The selected system has a working capacity (the volume of water held before treated water discharges from the outflow) of 2050L with a treatment rate of up to 4L/s, and a spill capacity of a

further 1,000L. Once at working capacity the unit treats and discharges water at 4L/s until the working capacity is again reached. With the small catchment area for the system (approximately 30m²), the system is capable of treating the equivalent of over 2,000mm of rainfall per hour, significantly in excess of rainfall rates.

The gravity operated system has a containment chamber fitted with an automatic closure device specifically designed to treat and contain major spills. The unit will have a alarm signal that will notify QR National representatives (via SMS or similar) in the event of a spillage that is in excess of 10% of the spill capacity (i.e. 100L), similarly the system will alert where when progressive spillage reaches this capacity. From the containment chamber water flows through to the coalescer chamber that reduces oil concentrations to 5mg/L or less at the point of discharge.

No visible oil and grease is permitted to leave the site. Visible oil and grease in water is considered equivalent to a criterion of 10mg/L. Treated water from the *SPEL Puraceptor*[™] has levels of 5mg/L or less, and is therefore considered acceptable for discharge to stormwater.

During the first six months, monthly sampling (or during outflow) of the outlet will be undertaken and analysed for total petroleum hydrocarbons. Following the initial sampling period where oil and grease levels in the outlet are found to be maintained at or below the stated 5mg/L, sampling will be scheduled to occur at six monthly intervals.

2.12 Site Access and Fuel Transport

Site access is gained via the Wambo Coal entrance road. A widened road shoulder provides ample area for trucks to pull off the road before entering the site. Trucks enter through the main access gates to the coal loading facility and reverse generally parallel to the rail loop until level with the facility. After refilling the tank, the trucks will then leave the site and enter the Wambo access road in a forward direction.

The Wambo Coal access road intersection with the Golden Highway has a left hand turn deceleration lane, and protected right hand turn acceleration lane.

Replenishing of diesel, sand and oil will be undertaken during daylight hours. As detailed above the expected traffic will be as follows:

- Diesel - average of one fuel delivery every two days, or one delivery per day at peak.
- Oil - average of one truck every six months.
- Sand - one truck per month.
- Water - average of one truck per week or as required (coordinated with existing WCPL contractor where feasible).
- Maintenance - weekly inspections by QR National and/or maintenance contractor.

Maximum operational traffic would be up to five trucks entering the site on any one day (this assumes that all tanks need to be topped up at once). This however is considered highly unlikely, and a minor increase relative to existing traffic entering the Wambo Coal Mine.

2.13 Station Management

The facility will be inspected and managed by a QR National representative on a monthly basis. As site usage increases the frequency of these inspections by this representative will also increase. All construction and operational works will meet relevant WCPL occupational health and safety requirements.

2.14 Project Alternatives

In order to maximise the efficiency of the Hunter Coal Network, improving the provisioning of locomotives has been identified as an aspect that requires improvement. QR National are currently developing plans for a major provisioning and service facility at Hexham. To increase operational flexibility QR National have a need for further provisioning points on the Hunter Coal Network.

QR National recently secured a coal haulage contract for the Wambo Coal mine making the Wambo Rail Loop a strategically favourable location. Facilities must be located so as not to compromise the efficiency of the rail loop operations. As such, the facility must be located either before the loading point or at least one train length after the loading point. Three locations for the refuelling station were identified, these options are assessed in **Table 2**.

Table 2: Assessment of alternative locations for the development.

Options	Strengths	Weaknesses
Option 1 (Selected) Outside Track Loop Before Load Out Bin.	- Good access for deliveries of oil, fuel and sand. - Location is suitable in context of adjacent coal loading bin. - Some visual screening from Golden Highway. - Some visual screening from Wambo entry road. - Close to water and power. - Minimal earthworks required. - Location allows train to provision, then load coal and go.	- High visibility when leaving Wambo. - Care needed with spillage control system. - Some security issues to be assessed.
Option 2 Inside Track Loop Before Load Out Bin. Trucks fill from outside loop via lines bored through embankment.	- Deliveries of oil, fuel and sand made from outside track loop. - Excellent screening from Golden Highway. - Excellent screening from Wambo entry road. - Close to water and power. - Security good due to limited vehicle access inside loop. - Location allows train to provision, then load coal and go.	- Care needed with spillage control system. - Access to inside of loop requires work to provide appropriate access for heavy vehicles. - Possible increased bushfire risk. - Spillage control required on both sides of track for refill. - Located out of view from passing traffic could expose facility to vandalism. - Close to offset woodland community protected under the <i>Environmental Protection & Biodiversity Conservation Act 1999</i>.
Option 3 Outside Track Loop After Load Out Bin. - Located off Wallaby Scrub Road. - Located within a cutting.	- Excellent screening from Golden Highway. - Excellent screening from Wallaby Scrub Road. - Close to power. - Provisioning train allows 2nd train into loop.	- Intersection with access road requires upgrade. - Entrance road requires upgrade for all-weather access. - Earthworks required for delivery vehicles turn-around. - Remote location potential security risk. - Care needed with spillage control system.

3 LEGISLATION

3.1 Environmental Planning & Assessment Act 1979

Development Application (DA) 177-8-2004 for rail and coal loading infrastructure for the Wambo Coal Mine was approved by the then Minister Assisting the Minister for Infrastructure and Planning in 2004, and was subsequently modified in 2006 (126-10-2006). The development application was state significant, integrated development assessed and approved pursuant to Part 4 of the *Environmental Planning & Assessment (EP & A) Act 1979*.

WCPL propose to modify DA 177-8-2004 to permit the construction of the locomotive refuelling station on the WCPL rail loop.

Clause 8J(8) of the *Environmental Planning and Assessment Regulation 2000 (EP&A Regulation)* states:

(8) *For the purposes only of modification, the following development consents are taken to be approvals under Part 3A of the Act and section 75W of the Act applies to any modification of such a consent:*

- (a) *a development consent granted by the Minister under section 100A or 101 of the Act,*
- (b) *a development consent granted by the Minister under State Environmental Planning Policy No 34—Major Employment-Generating Industrial Development,*
- (c) *a development consent granted by the Minister under Part 4 of the Act (relating to State significant development) before 1 August 2005 or under clause 89 of Schedule 6 to the Act,*
- (d) *a development consent granted by the Land and Environment Court, if the original consent authority was the Minister and the consent was of a kind referred to in paragraph (c).*

The development consent, if so modified, does not become an approval under Part 3A of the Act.

As DA 177-8-2004 was state significant development that had a capital investment value of more than 20 million and was approved under Part 4 of the *EP&A Act 1979* in 2004, paragraph (b) and (c) above apply, and the modification to DA 177-8-2004 is to be pursuant to section 75W of the *EP&A Act 1979*.

The proposed modification will have minimal environmental impact due to the following:

- It will be located within an area that was disturbed during the construction of the WCPL rail loop.
- It will be located on lands consistent with the property schedule for DA 177-8-2004.
- Train movements on the rail loop will be consistent with the original approval.
- It will be located in a visually discrete location, within a setting of similar, but larger infrastructure (i.e. the train loading bin).
- The facility has an extensive hydrocarbon and spill containment management system.

DA 177-8-2004, as modified with the inclusion of the locomotive refuelling station, will remain substantially unchanged from the development for which the consent was originally granted (and as amended).

The consent authority for the project is NSW Minister for Planning.

3.2 State Environmental Planning Policies (SEPP's)

A review of State Environmental Planning Policies (SEPP's) which could possibly apply to the train fuelling facility is provided in **Table 3** below.

Table 3: Consideration of State Environmental Planning Policies

State Environmental Planning Policy	Relevance to Development
State Environmental Planning Policy No. 33 – Hazardous and Offensive Development This SEPP defines “hazardous” and “offensive” development, and, require that sufficient information be supplied to the consent authority to assess whether the development is hazardous or offensive and to improve conditions to reduce the impact of the development.	The provisioning facility is not an “offensive” or “hazardous” industry. NOTE: As a Manifested Site, the QR National fuelling facility will need to comply with Workcover NSW notification requirements for the additional quantity of lubricating oil stored and handled at the site. The Dangerous Goods notification will be carried out in accordance with the requirements of the Dangerous Goods regulation and code of practice. The appropriate forms, plans and layout drawings will be completed for submission to Workcover NSW at the Construction Certificate stage of the approval process by a competent person under the Dangerous Goods Amendment Act 2003.
State Environmental Planning Policy No. 44 – Koala Habitat Protection This SEPP encourages the conservation and management of koala habitats, to ensure permanent free-living koala populations will be maintained over their present range. The SEPP requires the consent authority to consider whether land the subject of a development application is “potential koala habitat” or “core koala habitat”.	The locomotive refuelling station does not contain any koala habitat.
State Environmental Planning Policy No. 55 – Remediation of Land This SEPP was enacted to provide a state-wide approach to the remediation of contaminated land for the purpose of minimising the risk of harm to the health of humans and the environment.	The site of the locomotive refuelling station is free of contamination.
State Environmental Planning Policy (Major Development) 2005 This SEPP identifies development to which the development assessment and approval process under Part 3A of the EP&A Act 1979 applies and establishes the Minister for Planning as the consent authority for development classified as a “major project”.	The proposed locomotive refuelling station is not a class of development to which Schedule 1 of Part 3A of the SEPP Major Developments 2005 applies.
SEPP (Infrastructure) 2007 The infrastructure SEPP aims to provide a consistent planning regime for infrastructure and the provision of services across New South Wales together with requiring consultation with relevant public authorities during the assessment process.	The proposed development is consistent with the provisions of the SEPP.
State Environmental Planning Policy (Mining, Petroleum and Extractive Industries) 2007 This SEPP aims facilitate the orderly and economic use and development of land containing mineral petroleum and extractive material resources, while encouraging ecologically sustainable development for the purpose of the proper management of the resources and promoting the social and economic welfare of the State.	The proposed locomotive refuelling station is development permissible with consent. Note: Under this SEPP construction, maintenance and storage of fuel, gas and oil where the total volume is less than 50,000L is complying development. Given the size of the proposed diesel storage, development consent will be required for this refuelling station.
State Environmental Planning Policy (Exempt and Complying Development Codes) 2008 This policy aims to provide streamlined assessment processes for	The proposed locomotive refuelling station is not exempt or complying development. Note: Under this SEPP the construction and installation of an

State Environmental Planning Policy	Relevance to Development
development that complies with specified development standards.	above ground fuel tank not exceeding 5,000L is exempt development. Given the size of the proposed diesel storage, development consent will be required for this refuelling station.

3.3 Singleton Local Environmental Plan 1996

The site of the proposed locomotive refuelling station is zoned 1(a) (Rural Zone) pursuant to the provisions of Singleton Local Environmental Plan (SLEP) 1996. The train fuelling facility is a permissible form of development within the 1(a) (Rural Zone) subject to development consent being granted by the consent authority.

It is noted that nothing in SLEP 1996 by virtue of clause 36, *"restricts or prohibits or enables the consent authority to restrict or prohibit" the carrying out by persons carrying on railway undertakings on land comprised in their undertakings any development required in connection with the movement of traffic by rail.*"

3.4 Singleton Development Control Plan

A single city wide Development Control Plan, known as the "Singleton Development Control Plan" came into force on 17 December, 2007 and applies to development requiring consent under SLEP 1996. The purpose of the development control plan is to provide (where appropriate) detailed provisions relating to development matters for the Singleton local government area.

The development control plan provides guidelines for land use and development. Those sections of the development control plan relevant to the refuelling station include:

- Element 9 – Vehicle Parking and Manoeuvrability.
- Element 11 – Erosion and Sediment Control.
- Element 13 – Waste Management.
- Element 17 – Site Contamination.

Each of the elements (above) are assessed in Section 4 of the EA document.

3.5 Statutory Approvals

The approvals required for the construction and operation of the locomotive refuelling station are as follows:

- Approval of S75W modification to DA 177-8-2004.
- Approval by Mine Subsidence Board pursuant to section 91 of the as approval is required under the Mine Subsidence Compensation Act 1961 *"to alter or erect improvements"* within the declared Patrick Plains Mine Subsidence District.
- Approval by "competent" person under NSW OH&S Dangerous Goods Amendment Act, 2003.
- Construction Certificate.
- Compliance Certificate.
- Notification by competent person to Workcover NSW.

3.6 Environment Protection and Biodiversity Conservation Act 1999

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) defines proposals that are likely to have a significant impact on a matter of national environmental significance. The EPBC Act requires that Commonwealth approval be obtained for any proposals that are likely to impact on a matter of national environmental significance as a "controlled action".

The proposed locomotive refuelling station will not impact on matters of national environmental significance.

4 SITE ANALYSIS, IMPACTS AND MITIGATION

4.1 The Wambo Rail Loop

Figure 3 illustrates the location of the site with respect to the disturbance footprint of the WCPL rail loop.

The area was surveyed and assessed for Aboriginal heritage, European heritage, flora, fauna, noise, air quality as part of the Environmental Impact Statement (EIS) titled *Wambo Development Project* (Resource Strategies Pty Ltd 2003) for DA 306-7-2003 and the SEE titled *Proposed Alterations to the Wambo Development Project - Rail and Train Loading Infrastructure* (Resource Strategies Pty Ltd, 2004) for DA 177-8-2004. With respect to potential surface water impacts these were assessed, however there was no consideration within the EIS or the SEE to the storage of diesel and oil near the loop, this is assessed within **Section 2.11**.

As is evident by the aerial, the area of the facility was significantly altered and disturbed as part of the construction for the rail loop. As no new ground disturbance is required, the disturbance of items of Aboriginal Heritage, European Heritage or flora and fauna is highly unlikely.



Figure 3: Location of the proposed locomotive refuelling station with respect to the disturbance footprint in April 2007 (sourced from Google Earth) associated with the construction of the rail loop.

4.2 Surrounding Land Use

The facility is located on vacant lands adjacent to and including the WCPL rail loop.

- To the north of the site is the Wambo access road, native bushland and further north is the Warkworth village.
- To the east is the Golden Highway, on the eastern side of the Golden Highway is the Warkworth recreation grounds, rural lands and isolated dwellings.
- To the west of the site is the WCPL train loading facility, Wollombi Brook and the Wambo Coal Mine.
- To the south of the site is native bushland and privately owned rural lands.

4.3 Acoustics

Refuelling and provisioning of locomotives takes approximately one (1) hour with engines typically turned off. Refuelling and provisioning occurs prior to the train being loaded at the rail loading facility that takes three (3) to four (4) hours.

Noise impacts associated with the construction and operation of the WCPL rail loop and loading facility were assessed within DA 177-8-2004. The operation of the facility will not introduce any significant new sources or duration of noise, trucks are not inconsistent with existing trucks accessing the Wambo Coal Mine.

Construction of the facility will occur during daytime hours and will be restricted to hours consistent with the DA 177-8-2004 (as amended).

4.4 Air Quality

No adverse impacts to the existing air quality regime are envisaged as a consequence of the construction or operations associated with the facility.

No additional greenhouse gases will be generated by vehicles (trains and semi trailers) associated with the facility as these vehicles are already in operation within the Hunter Valley coal chain.

Construction of the facility has the potential to generate dust. Emissions during the construction phase will be minimal. Exposed areas will be kept to a minimum and where necessary any dust will be suppressed by water cart.

4.5 Flora, Fauna and Heritage

The area has been heavily disturbed and modified during the construction of the WCPL rail loop. The site of the fuelling facility is located on the rail embankment and on a gravelled track running parallel to the rail where there is little or no vegetation. The existing track will be realigned north of the facility impacting a small area of primarily Rhodes Grass (*Chloris gayana*), some small wattle saplings may also require removal.

The area within the rail loop and north of the site is the Warkworth Sands Woodland an endangered ecological community protected under the *Threatened Species Conservation Act 1995*. These areas will not be impacted by the station and its construction.

4.6 Heritage

The area is free of items of heritage significance (Aboriginal or European).

4.7 Bushfire

The area is mapped by the Rural Fire Brigade as bushfire prone lands. EcoBiological prepared a bushfire threat assessment for the refuelling station (refer to Appendix 3). The assessment determined that existing cleared areas around the facility, such as the rail loop and associated buffer to the south, and the Wambo mine access and Golden Highway to the north are sufficient for the protection of the assets and provision of safe access (for personnel and equipment) to or from the station in the event of a fire.

The site's 10,000L polypropylene water tank will have a 65mm storz outlet installed and positioned in a suitable location for connection by Rural Fire Service brigades if required. Other fire fighting supplies will be kept on site in the event of a fire during construction.

An Emergency Management Plan will be prepared for the facility for approval by the Fire Brigade pursuant to the *Occupational Health and Safety Regulation 2001*.

Wambo Coal Mine currently has a Bushfire Management Plan, the plan provides fire prevention, protection and suppression strategies for the mine and adjacent lands. The facility would operate in accordance with this management plan.

4.8 Surface Water

The site naturally drains to the north west to a culvert and drainage swale adjacent to the Wambo mine access road, this drains west to Hales Crossing Sediment Dam that in turn overflows (when full) into the Wollombi Brook located approximately over 400m west of the site.

The refuelling station will be designed such that runoff and treated water from the *SPEL Puraceptor™* oily water management system drains to the west and reports to the Hales Crossing Sediment Dam. For further detail on the *SPEL Puraceptor™* refer to *Section 2.11.1*.

Potential impacts to surface water from the development include:

- Sedimentation during construction.
- Hydrocarbon contamination from spills and leaks of diesel and oil.

During construction the area of disturbed ground will be kept to a minimum and sediment fence will be erected where necessary down gradient of the facility.

Measures proposed to control hydrocarbon contamination during operation are detailed within *Section 2.11*.

4.9 Soils - Erosion and Sedimentation

Erosion and sedimentation control will be undertaken in accordance with an approved plan. A sedimentation and erosion control plan will accompany the Construction Certificate for approval by Singleton Council.

4.10 Waste Management

There will be no significant quantities of waste during the construction or operational phases of the project. All recyclable waste will be separated and recycled where possible.

Any waste generated during the operational phase will be disposed at an approved waste management facility by a registered waste management contractor.

4.11 Visual Impact

The facility has been designed to be an innocuous development with a small footprint and minimal height. As shown by the facility cross section (see Drawings in Appendix 1) the facility has minimal exposure above the existing level of the rail embankment. The fuel, oil tank and storage container will be painted *Rivergum Green* consistent with the colour of the rail loading bin.

From the Golden Highway the facility is located largely behind a vegetated visual bund adjacent to the highway at the corner of the mine access road. Visibility from the highway to the facility is heavily filtered by existing vegetation. No significant impacts to the visual amenity of passing motorists expected.

From the Wambo access road the facility is not readily visible entering the site, but is visible when leaving along the Wambo access road. The facility is consistent with the appearance of the train loading bin.

Night lighting of the facility will be shielded and activated only for arriving trains and will turn off after a set period and established in accordance with *Australian Standard AS4282 (INT) 1997 – Control of Obtrusive Effects of Outdoor Lighting*. Lighting of the facility will not impact the night time visual amenity of the area or passing motorists on the Golden Highway.

The facility will not impact the existing visual amenity of the area.

4.12 Traffic

As stated in Section 2.12, site access is gained via the Wambo Coal access road approximately 115m west of Wambo access road's intersection with the Golden Highway. The Wambo Coal access road intersection with the Golden Highway has a left hand turn deceleration lane, and protected right hand turn acceleration lane.

A widened road shoulder provides ample area for trucks to pull off the road before entering the site. Trucks enter through the main access gates to the coal loading facility and reverse generally parallel to the rail loop until level with the facility. The truck will then leave the site and enter the Wambo access road in a forward direction.

As stated in Section 2.12, a maximum of up to five (5) trucks per day may enter the site, on average however this is likely to be less than (1) truck per day. Considering the minor levels of traffic required to enter the site, minimal impacts are expected to the serviceability of Wambo mine access road or intersection with the Golden Highway.

Given the short duration of construction, the associated traffic generation is likely to be minor in the context of existing traffic volumes.

Where feasible, the facility will be serviced by existing trucks and contractors entering the Wambo site, so as to minimise traffic generation.

5 JUSTIFICATION AND CONCLUSION

QR National operate on the Hunter Valley rail network transporting coal from producers through to the port at Newcastle. Locomotive provisioning for QR National trains on the network is currently undertaken at facilities located at Kooragang Island and the rail siding at Ashton Coal Mine near Camberwell. QR National have identified locomotive provisioning as a constraint on meeting targeted network haulage rates.

In order to improve the throughput on the network, QR National has identified the WCPL rail loop as a strategic location for the refuelling and provisioning of locomotives on the network. DA 177-8-2004 provided for the construction and operation of a rail loop and associated train loading facilities, it is proposed to modify DA 177-8-2004 pursuant to Section 75W to incorporate the locomotive refuelling station.

The proposed facility will operate consistent with the Wambo Coal Mine Environmental Management System and Environment Management Plans. In addition, the refuelling facility will be regularly inspected by a QR National representative so as to ensure the facility operates safely and efficiently.

This assessment has determined that the proposed provisioning facility is appropriately located, makes efficient use of existing infrastructure and can be constructed and operated within the footprint of an existing disturbance footprint resulting in minimal environmental impacts.

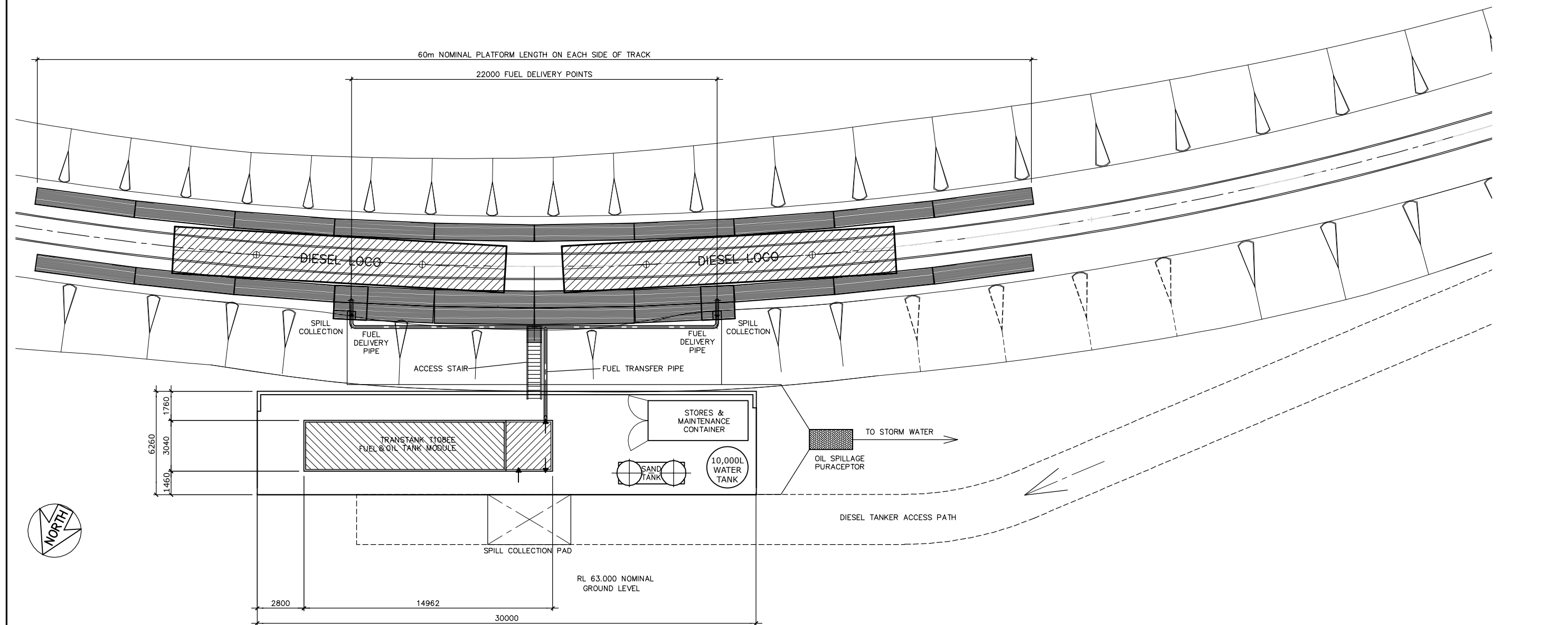
It is respectfully requested that the Minister for NSW Planning and Infrastructure grant conditional consent to the proposed locomotive refuelling station.

6 REFERENCES

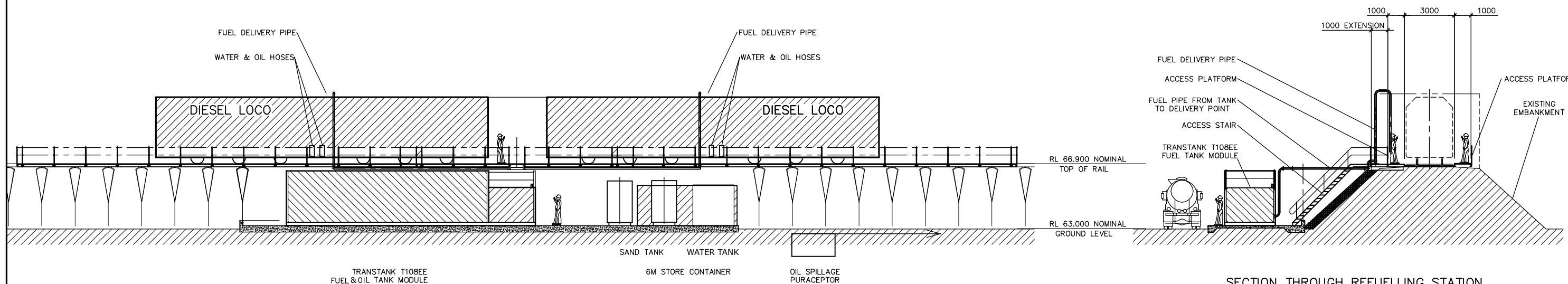
- AS 1940-2004 *The storage and handling of flammable and combustible liquids.*
- Commonwealth Legislation - *Environment Protection Biodiversity Conservation Act 1999.*
- NSW Legislation - *Dangerous Goods Amendment Act 2003.*
- NSW Legislation - *Environmental Planning and Assessment Act, 1979.*
- NSW Legislation - *Environmental Planning and Assessment Regulations, 2000.*
- NSW Legislation - *Occupational Health and Safety Act, 2000.*
- NSW Legislation - *Occupational Health and Safety Regulations, 2001.*
- NSW EPA, 1994. *Guidelines for Assessing Service Station Sites.*
- Resource Strategies Pty Ltd, 2003. *Environmental Impact Statement (EIS) titled Wambo Development Project for DA 306-7-2003.*
- Resource Strategies Pty Ltd, 2004. *SEE titled Proposed Alterations to the Wambo Development Project - Rail and Train Loading Infrastructure for DA 177-8-2004.*
- Singleton Council (1996). *Singleton Local Environmental Plan 1996.*
- *Google Earth 2007 Aerial.*

APPENDIX 1

PLANS



PLAN ON REFUELLING STATION



ELEVATION ON REFUELLING STATION

SECTION THROUGH REFUELLING STATION

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D	DRAWING UPDATED	2/3/2011
C	DRAWING UPDATED	16/2/2011
B	DRAWING UPDATED	27/1/2011
A	ORIGINAL ISSUE	
REV	DESCRIPTION OF REVISION	DATE

DRAWING No.	REFERENCE DRAWING
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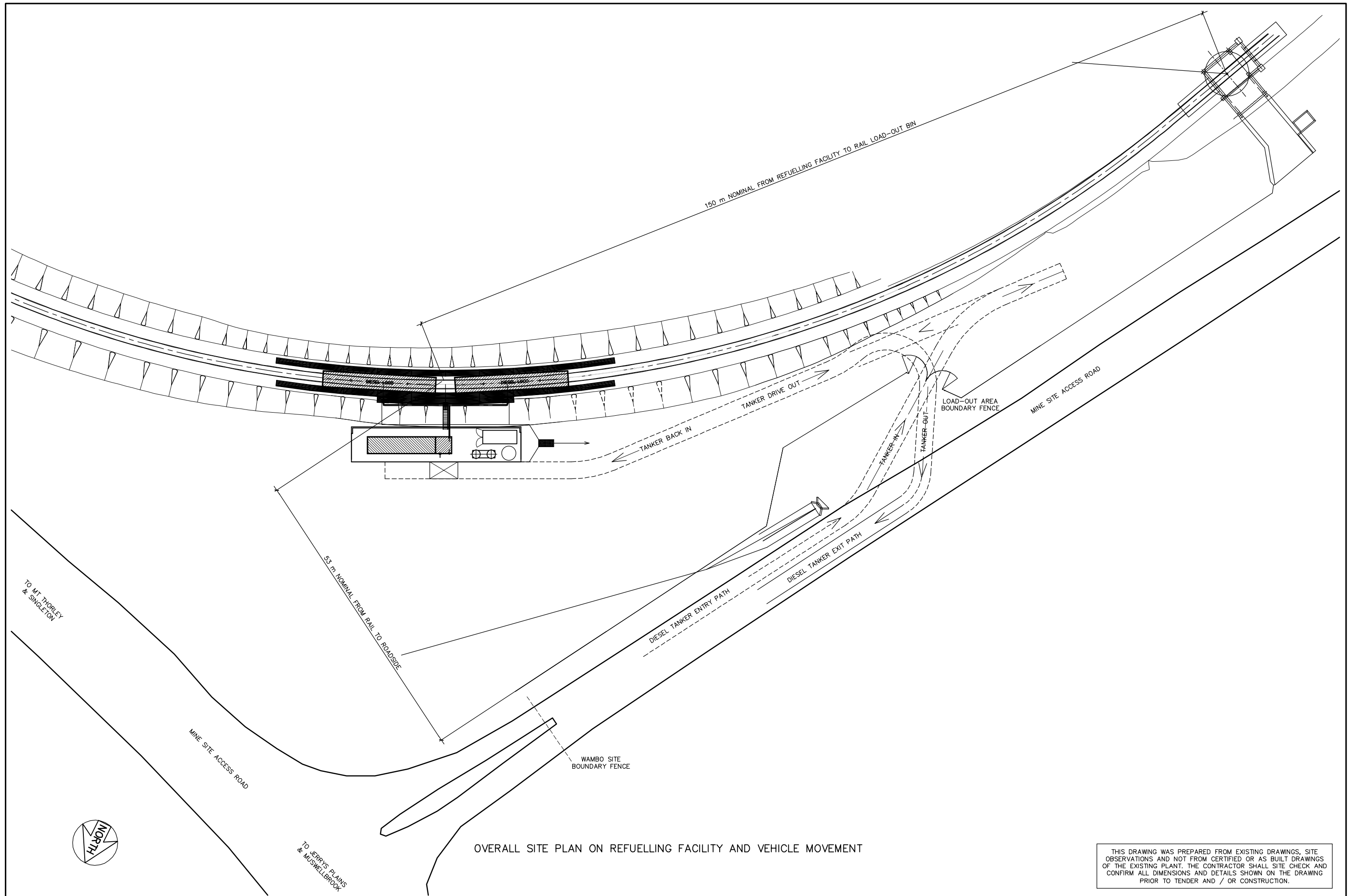
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QR NATIONAL COAL WAMBO COAL PREP. PLANT - RAIL LOADOUT LOCOMOTIVE REFUELLING STATION SITE ARRGT	
CADFILE	21167-01 rE.dwg
SCALE	1 : 100
B1 SHEET	
DRAWING NUMBER	21167 - 02
REVISION	F1



OVERALL SITE PLAN ON REFUELLING FACILITY AND VEHICLE MOVEMENT

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QR NATIONAL COAL WAMBO COAL PREP. PLANT - RAIL LOADOUT LOCOMOTIVE REFUELING STATION OVERALL SITE ARRANGEMENT			
CADFILE	21167-01 rf.dwg	DRAWING NUMBER	21167 - 01
SCALE	1 : 100	B1 SHEET	REVISION D1

APPENDIX 2

SPEL PURACEPTOR™

SPEL Separator Commissioning Operation and Maintenance



Puraceptor Class 1

Operation and Maintenance Manual

Introduction

Congratulations on your purchase of a SPEL Environmental Stormwater Quality Improvements Device.
With proper care and by following a few simple guide lines your system will give you many years of dependable service.

Important

Only qualified personnel should maintain, operate and repair you Stormwater system. Any wiring of equipment should be performed by a qualified electrician.

Warning

Operation may cause injury. Take all necessary precautions, wear protective equipment, refer to Engineers Department.
For your own safety, read all instruction manuals prior to working on equipment.

Safety Precautions

- Follow all “occupation, health and safety” regulations.
- Ensure maintenance personnel are aware of “Confined Spaces” guidelines, which must be followed.
 - Make sure that there is sufficient oxygen and that there are no poisonous gases present.
 - Check the explosion risk before welding or using electric hand tools.
 - Do not ignore health hazards. Observe strict cleanliness.
 - Ensure that the lifting equipment (where required) is in good condition.
- All personnel who are to work with these systems should be vaccinated against diseases that can occur.
 - Keep a first aid kit handy.

Health & Safety

Maintenance should be carried out by a competent contractor in accordance with the above procedures.

Health and Safety at Work legislation and good building practice.

A warning notice should be visible at the top of each access shaft - ‘danger, harmful fumes’ and ‘respirators should be worn in this tank.’ Before entering persons must be qualified in accordance with ‘confined space’ requirements



Information contained in this data sheet is approximate and for general guidance only. In accordance with the companies policy of constant improvement and development SPEL Products reserves the right to change the specification without prior notice.

Puraceptor Class 1

SPEL Operation and Maintenance Manual

Service Stations

Fuel Depots

Windfarms

Switchyards

Sub Stations

Power Stations

Industrial Locations

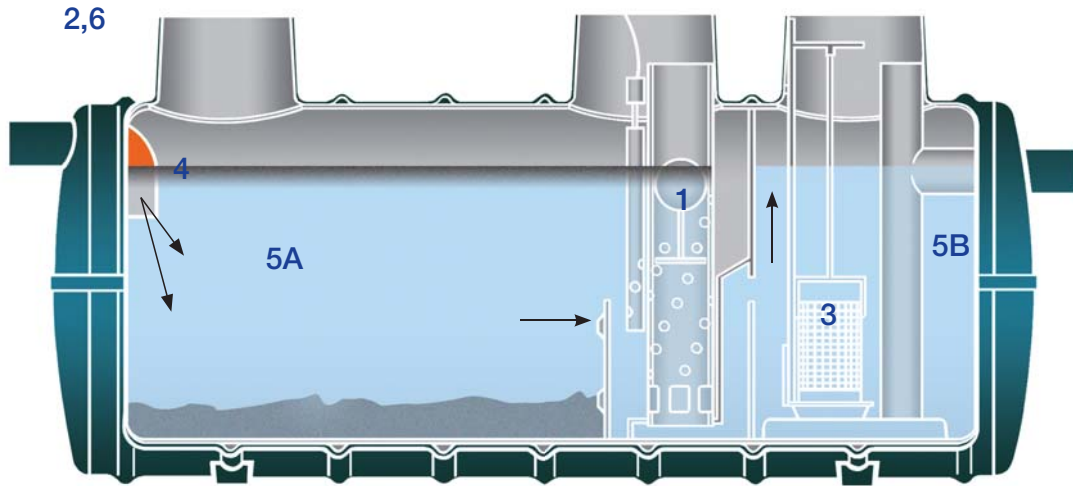
Contents

SPEL Puraceptor - How it works	page 2
SPEL Puraceptor Maintenance	page 3
SPEL Coalescer Units	page 4
SPEL Auto Closure Device	page 5
SPEL Oil Alert System	page 6
Spare Parts List	page 8

SPEL PURACEPTOR™ CLASS 1

Oil containment

“How it works”



SPEL PURACEPTOR™ is a **FULL RETENTION** separator that treats all flows and is sized to contain more than the anticipated maximum oil spillage enabling it to be fully operational at all times.

It has two chambers, a coalescer and is fitted with an automatic closure device specifically designed to treat and contain major oil spills thereby making it suitable for high risk applications.

It achieves a water discharge quality of 5mg light liquids per litre complying to European Standard BS EN 858.1. 2006. Treatable flow rates range from 2LPS to 200LPS. Pipe sizes range from 100mm to 450mm (larger sizes on request).

Careful and proper planning by corporate Australia and government bodies is essential when designing and implementing systems that are effective in protecting our environment. The proven and independently accredited SPEL PURACEPTOR™ (complies to European Standard BS EN 858.1 2006) is an Australian made stormwater treatment and oil containment device that can contain and prevent light liquid pollutants from discharging into our waterways.

1 AUTOMATIC CLOSURE DEVICE

The AUTOMATIC CLOSURE DEVICE (A.C.D.) is a precisely engineered device comprising a water-bouyant ball that is sensitive to any change in the water density as a consequence of light liquids build up, thereby automatically activating a process of depressing the A.C.D. to SHUT OFF the separator, preventing pollutants from discharging to drains and waterways.

2 FULL RETENTION

All liquid is treated. There is no by-pass operation.

3 COALESCER EQUIPPED

Provides a coalescing process for the separation of smaller globular of light liquid pollutants to reduce the light liquid content in the outlet to **5mg/litre or less**.

4 INLET DIP PIPE - FLAME TRAP

For minimum turbulence and to prevent fire and inflammable vapours passing through to the drainage system.

5 TWO CHAMBER

A non-turbulant flow through two horizontal treatment chambers, utilising the underflow principle to retain light liquids in all flow conditions.

A. CONTAINMENT CHAMBER: Where Total Suspended Solids (TSS) silt, sediments, sludge and gross pollutants are trapped and settle on the chamber floor and where light liquids are contained.

B. COALESCER CHAMBER: Where light liquids separation is enhanced reducing it to **5mg/litre** or less prior to discharge.

6 GRAVITY OPERATED

Will function in the event of power failure and fits into existing pipe drainage systems or new sites.

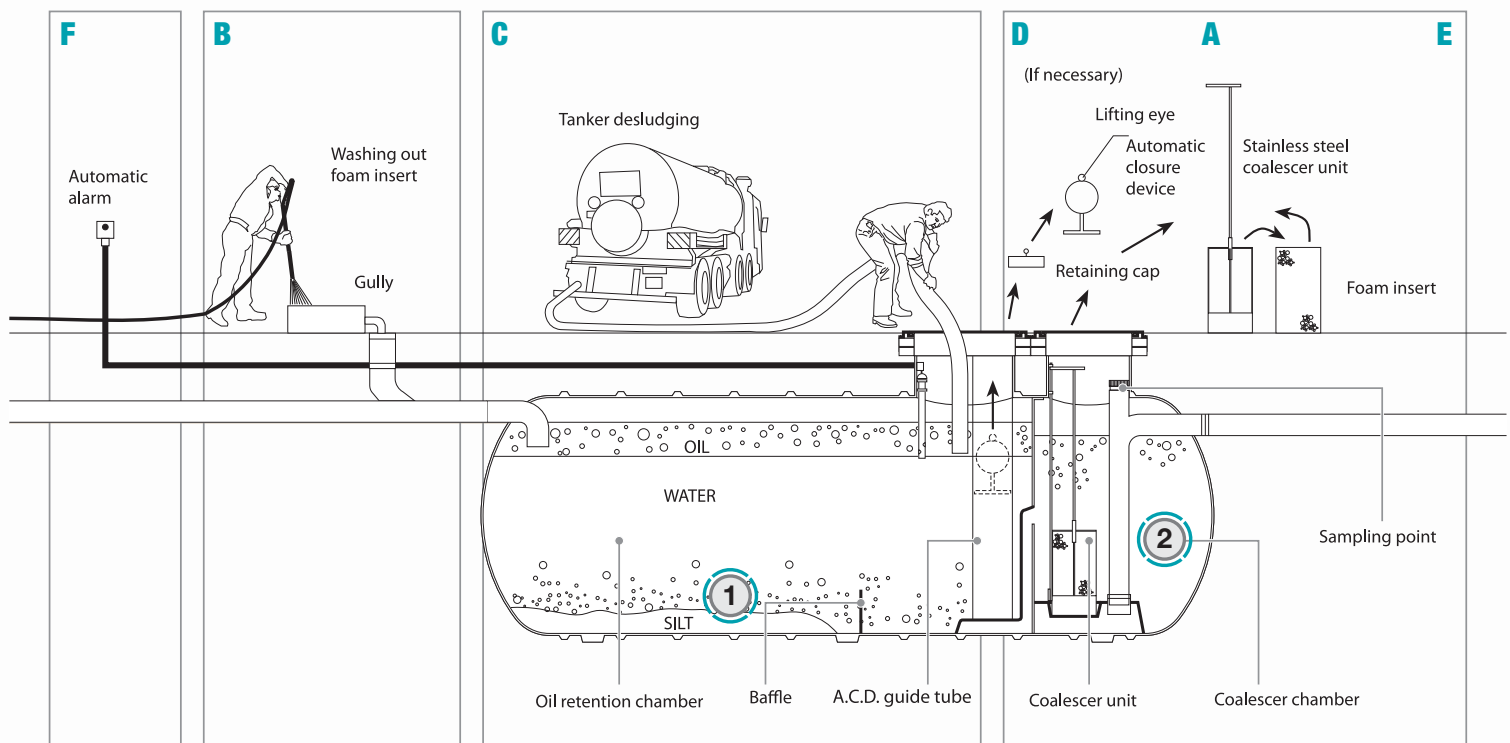
7 MAINTENANCE

Easy and safe with no entering of the tank required.

SPEL SPEL PURACEPTOR™

Puraceptors™ should be inspected at three - six - or twelve monthly intervals depending on site conditions, to determine the depth of retained pollutants and silt in both chambers and the correct operating of the ACD (automatic closure device). When the depth of the oil/fuel retained has reached the predetermined design level, (approx. 50mm) or after a spill it should be cleaned out.

- 1 CONTAINMENT CHAMBER:** Where silt, sediments, sludge, gross pollutants settle out and light liquids are retained. The auto closure device operates in its retaining tube next to the oil alert sensor probe.
- 2 COALESCER CHAMBER:** Where light liquids separation is enhanced prior to discharge and where the coalescer unit is incorporated, the coalescer should be removed and cleaned in accordance with the requirements set out in the coalescer data sheet.



MAINTENANCE PROCEDURE

A Coalescer unit

Use the lifting handle or the chain and lift the coalescer unit out of the tank and place it near the Puraceptor™. In a retained area so pollutants do not escape.

B Cleaning foam insert

Remove foam insert and wash with normal water pressure ensuring the dirty water runs into the Puraceptor™.

C Sucking out oil/fuel and silt

Suck off the retained oil from both chambers of the Puraceptor™ and then the silt deposited on the bottom, leaving sufficient water to ensure the (auto closure device) ACD remains floating.

D Sucking out complete contents (if necessary)

If the quantity of pollutants exceeds recommended level, the complete contents of the Puraceptor™ may need to be removed. After sucking out completely, remove the ACD. Using a pole with a hook, lift out the ACD using the lifting eye on the float.

E Re-insert coalescer unit and ACD

Re-insert the foam insert into the stainless steel coalescer unit and re-insert the coalescer unit into the Puraceptor™ as provided with the SPEL lifting/location/locking system.

Partially fill the Puraceptor™ with clean water (if necessary) to ensure the ACD when re-inserted remains floating. Re-insert the ACD.

Finally check the ACD is floating and the retaining cap has been replaced to safeguard against its removal by unauthorised persons, unless depth of tank precludes doing so from ground level.

F SPEL automatic alarm/monitoring system

The SPEL automatic alarm/monitoring system probe should be lifted out of the probe protection tube, wiped clean and re-inserted. the system should now be reset according to instructions.

Important note:

When cleaning out, ensure both chambers are sucked out equally starting with the first chamber and then the second chamber and back again. Ensuring even water pressure against baffle wall.

SPEL SPEL COALESCER UNITS

The SPEL Puraceptor™ Class 1 separator and the SPEL Stormceptor™ Class 1 by-pass separators incorporate coalescer units. The coalescer units provide a coalescence process for the separation of small globules of light liquid pollutants before final discharge to the surface water drain.

Coalescers are found in the second chamber of the SPEL Puraceptor™ and the second chamber of the SPEL Stormceptor™ Class 1

Prior to installation

1. Remove any strapping / ropes which have been used to hold the coalescer units from shifting in transit.
2. The access shaft(s) above the coalescer units should be covered to prevent ingress of concrete, dust, debris etc., which could clog the foam inserts.
3. On completion of installation, check that the coalescer unit is inserted securely into the base socket.

On heavily polluted sites silt and contaminants may build up in the coalescer unit foam inserts and add significantly to its weight. Use lifting chain sets that are on hooks at ground level for safe lifting with a tripod or hoist.

Installation

During installation, it is important that the foam inserts are not clogged with dust, debris or drops of wet concrete. To safeguard against this, we recommend covering the access shaft with a sheet of polythene, if not already covered.

Commissioning

On completion of installation, check the foam insert is fitted inside the stainless steel coalescer unit and the coalescer unit is inserted securely into the base socket.

Maintenance

1. Lift handle and coalescer unit out of the tank and place in a retained area so pollutants do not escape.
2. Remove foam insert and wash with normal water pressure ensuring the dirty water runs into the Puraceptor™ / Stormceptor™.
3. Make sure the hole in the centre of the coalescer foam is facing towards the manhole when installed in the tank.
4. Re-insert the foam insert into the stainless steel coalescer unit and re-insert the coalescer into the Puraceptor™ / Stormceptor™. After the tank has been cleaned.

SPEL COALESCER UNITS GUIDE RAIL SYSTEM/LIFTING, LOCATING AND LOCKING SYSTEM

SPEL coalescer unit guide rail system

This facilitates easy insertion and removal of coalescer units. The system is robust, manufactured throughout in stainless steel and is action positive, leaving no doubt the coalescer unit is located properly.

Brackets fixed to the top and bottom of the coalescer unit simply engage the stainless steel guide rail fixed to the top of the stub access shaft. The coalescer is then lowered in the normal way, being guided at the correct angle into the conical base unit which finally locates the coalescer unit into its final position.

Extension guide rails can be incorporated into the SPEL extension shafts to suit (preferably when ordered with the separator).

However, when the separator is full of water, debris or sludge accumulated over a period could prevent the coalescer unit from re-seating correctly after servicing.

The coalescer unit lifting / locating / locking system ensures the coalescer unit is seated correctly and can be locked into position to prevent tampering.

The stainless steel lifting handle can be extended to suit deep tank inverts and provide easy access for lifting manually or with a tripod and hoist utilising the lifting hook.

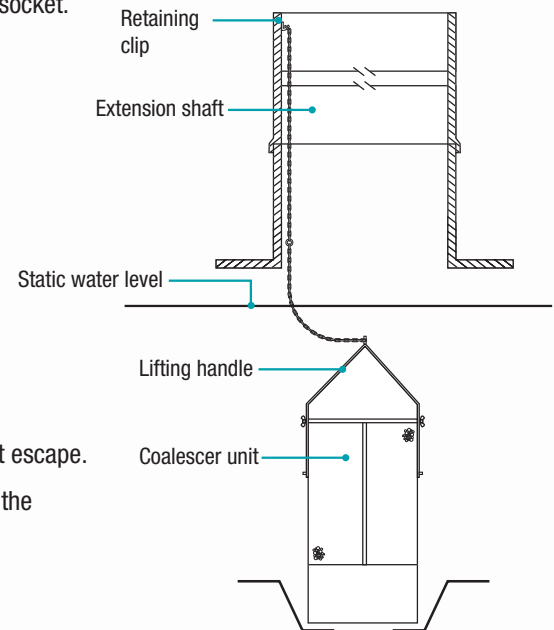


Figure 1. Coalescer unit with lifting chains

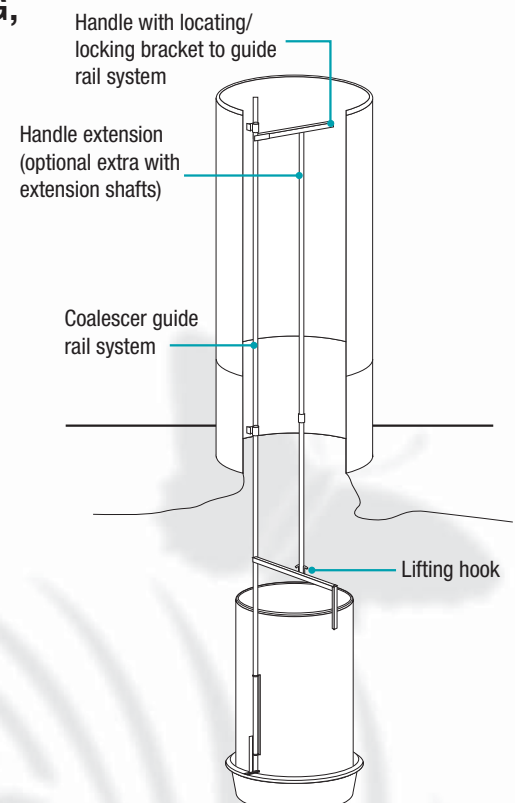


Figure 2. SPEL coalescer unit guide rail system/lifting, locating and locking system

• **SPEL ACD** The Automatic Closure Device (ACD) is found in the first chamber of a Puraceptor™. The purpose of the ACD is to close the separator off automatically when the maximum storage capacity of light liquid is attained.

The ACD is to ensure that in the event of a major spillage, pollutants do not pass into the drainage system; it should not be regarded as a substitute for an automatic alarm / monitoring system.

Prior to installation

Prior to installation the ACD retaining tube should be covered to prevent ingress of concrete etc., which could fall onto the ACD and upset it's calibration.

Operation and Maintenance

If the tank should fill with light liquid, the ACD which is calibrated for a specific gravity of 0.85, will automatically sink and close off the SPEL Puraceptor™.

Normally routine maintenance would include removing light liquid intercepted within the Puraceptor™. If a SPEL automatic alarm / monitoring system is incorporated, it will automatically indicate when the Puraceptor™ should be emptied. Only in an emergency will the Puraceptor™ fill to it's maximum and operate the ACD.

In such an event the Puraceptor™ should be completely sucked out and the ACD lifted out. Check that the ACD is in good working condition – ie. Lifting hook secure and sealed; float not leaking; knuckle joint free and clean; sealing ring intact and complete. Clean with warm soapy water before re-inserting.

To re-insert the ACD, partially fill the Puraceptor™ with clean water (if necessary) to ensure the ACD when re-inserted remains floating. Re-insert the ACD.

Finally check the ACD is floating and the retaining cap has been replaced to safeguard against it's removal by unauthorised persons, unless depth of tank precludes doing so from ground level.

SPEL Puraceptor™ Class 1 separators – Two Chamber Models

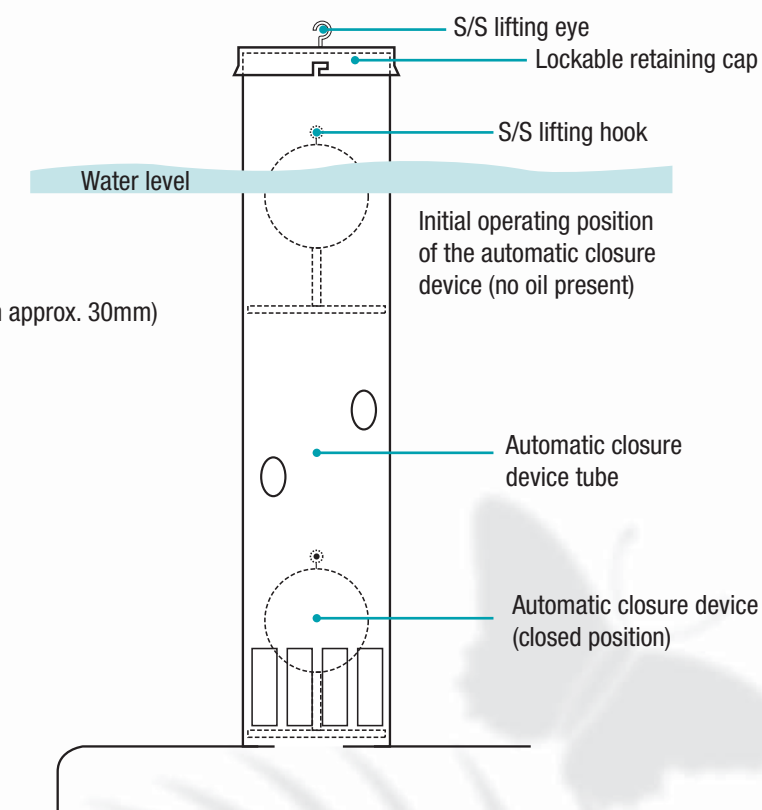
Commissioning

After the tank has been installed, leave the water in.

1. Remove the ACD from the packing box, taking care not to cause damage.
2. Remove the retaining cap from the top of the retaining tube in the separator.
3. Insert the ACD into the retaining tube using the lifting eye provided, ensuring it floats correctly with the float (top section approx. 30mm) just visible above the water level.
4. Replace the retaining cap. This is to safeguard against the removal of the float by unauthorised persons or rising above the tube under abnormal conditions.

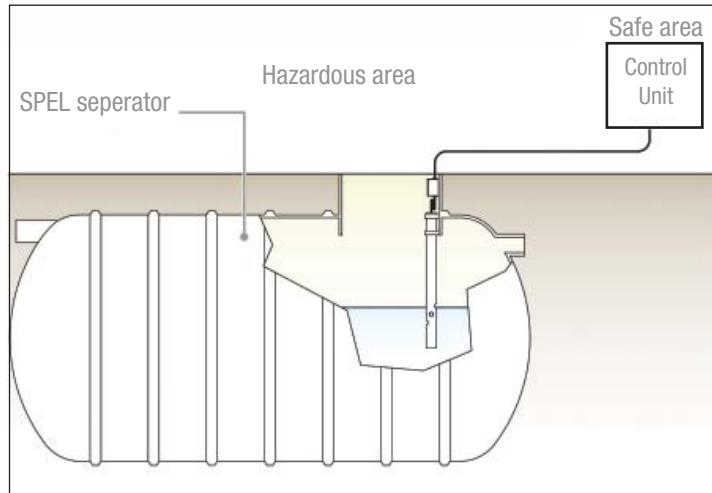
Note: If the tank's invert depth exceeds 1 metre, it is advisable to remove the retaining cap prior to installation and only replace after inserting the ACD, if it is possible to do so from ground level.

Automatic closure device SPEL Puraceptor™ Class 1 separators (two chamber)



The SPEL automatic alarm/monitoring system provides a audible warning alarm when the level of the oil in the SPEL separator reaches approximately 10% of the storage volume under static liquid level conditions. This is a early warning system that is used for spills or lack of maintenance.

The system comprises of a probe mounted in the main separation chamber which senses when the designed volume of light liquids has accumulated and sends a signal to the electronic control unit activating a red 'empty now' warning light and an audible alarm,



Operation

The probe is freely suspended in the probe protection tube in the separator at the correct level. When the oil-layer or depth of hydrocarbons reaches the predetermined level, the top of the probe will be immersed in the oil, breaking the circuit and activating the alarm. It is a 'fail-safe' system providing complete assurance that it is operative. If a fault occurs it will be signalled immediately.

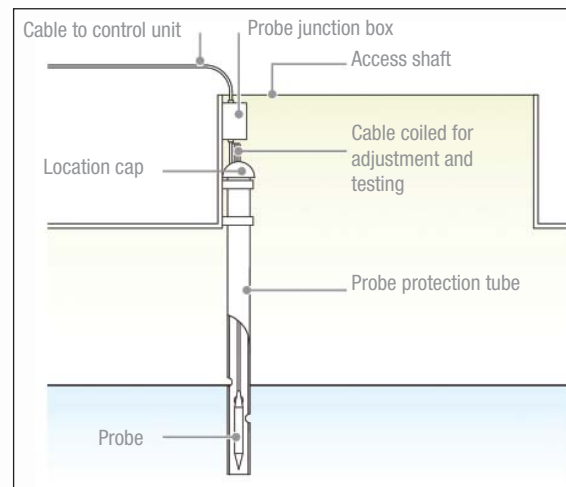
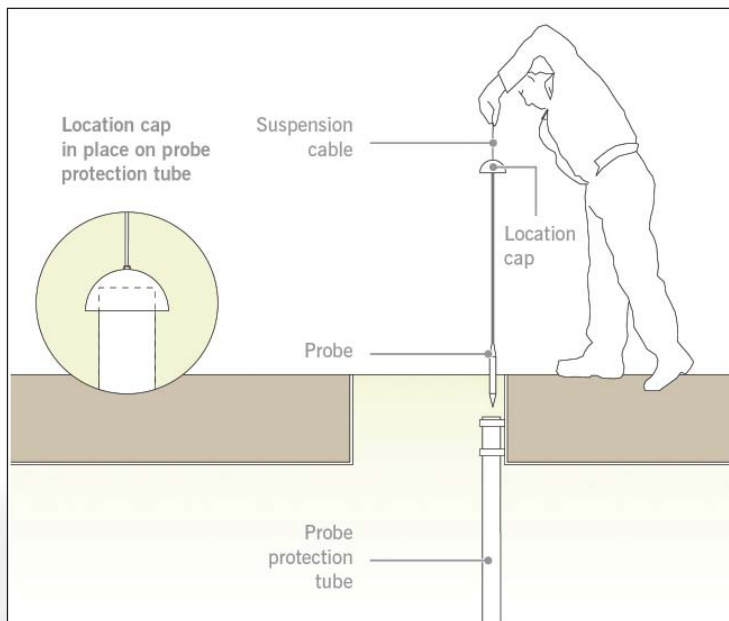
Installation

Control unit (general positioning)

The control unit has been designed to be located indoors and outdoors, within a nonhazardous area. It should be wall mounted and positioned such that the LED display and push switches on the front panel can be readily seen and accessed. The unit can be secured to the wall by using the four mounting holes provided. Included within the control is an intrinsically safe circuit (approved according to ATEX Directive 94/9/EC), to which the probe unit is connected.

Maintenance

When the separator is maintained, lift the probe out of the probe protection tube, check it operates the alarm (see under Tests Ref. 10.2) and at the same time wipe oil and contaminants from the probe to prevent a fake alarm after re-inserting.



Insert probe onsite

The probe protection tube is factory fitted and the probe matched to ensure the alarm is activated when the light liquids reach approximately 10% of the storage volume the SPEL separator is designed for.

All that is required on site is to undertake the electrical installation in accordance with the instructions provided and lower the probe with the pre-fixed location cap into the probe protection tube. When the cap locates onto the top of the probe protection tube, the probe is suspended at the correct level.

Control unit (electrical connections)

1. Mains voltage connection;

The control unit should be connected to a suitable 220/240V AC supply and fused at 3 amps.

Note: This appliance must be earthed.

2. Control unit/probe junction box connection

Wiring from the control unit to the probe junction box in the separator chamber requires a 3-core screened, 0.75mm core section cable.

Maximum cable length: 300 metres.

3. Probe connection

A 5 metre 3-core probe cable is normally fitted to the junction box and the probe.

After all connections have been made, the cables must be secured by tightening each entry gland.

Probe

The probe is installed freely suspended in the SPEL separator within the probe protection tube. The 3-core cable is connected into the junction box mounted in the access shaft above the probe protection tube. Extra cable is provided to enable raising the junction box where extension shafts are incorporated.

Important note: In all cases good, standard electrical practice should be followed and the installation must conform to the Australian Wiring Rules – AS 3000 – 2007. In essence, the installation must be such that the intrinsic safety is no compromised by:

- Exposure to risk of mechanical damage
- Unauthorised modification of interference
- Exposure to moisture, dust and foreign bodies
- Excessive heat
- Invasion of intrinsically safe circuit by other electrical equipment or circuitry

Certificate of conformity

The alarm device has been approved to be used in explosion-hazardous areas. The control unit and probe are approved according to ATEX Directive 94/9/EC. These approvals mean that the probes can be installed in Zone 0, which is continuously explosion-hazardous.

The SPEL oilset control unit must be located in the safe area, but it can be connected to the probe without any barrier.

Tests (10.2)

The function can be tested by lifting the probe within the probe protection tube. In approximately 5 seconds, the alarm is given by a red light and audible signal. Both relays release. Push the RESET button - the buzzer goes off and relay pulls in.

When the probe is placed in water again, relay pulls in and the red light goes off.

Cable break and short circuit test

Also the function can be tested in case of cable fault or short circuit. First cause short circuit in probe cable terminals 1 and 2. Then the yellow light of short circuit is lit. Both the relays pick up and the buzzer goes on. Remove the short circuit and reset the buzzer.

Simulated Function Test

The function of probe, cable and electronics can be tested. Push the TEST button for 2 to 5 seconds. Both relays pick up, and the red light is lit. When the TEST button is released, the red light goes off and relay returns to its normal position. The buzzer and relay must be reset.

Installation

Important note: It is important that installation is carried out by a competent technician familiar with this type of equipment or contact our Special Products Division for installation, commissioning and maintenance service.

SPARE PARTS LIST

DATE: _____

INVOICE NO: _____

TYPE: _____

MODEL: _____

SERIAL NO: _____

JOB NO: _____

LINE	DESCRIPTION	QTY	PART No.
1			
2			
3			
4			
5			
6			
7			
8			

For all spare parts enquiries, please ring 1800 631 202

APPENDIX 3

BUSHFIRE THREAT ASSESSMENT



ecobio logical

survey & assessment

Bushfire Threat Assessment

Diesel and Sand Filling Point

Wambo Coal Rail Loop



PO Box 585
64 Medcalf Street
Warners Bay NSW 2282

Tel 1300 881 869
Fax 1300 881 035

www.ecobiological.com.au

ABN 74 114 440 041

ecobiological

Bushfire Threat Assessment:

Diesel and Sand Filling Point

Wambo Coal Rail Loop

Lot 202 DP 257063

Warkworth, Singleton

NSW

A BCA Class 5-8 and 10 development

Report prepared for QR National / Wambo Coal Pty Limited (WPCL).

This report was prepared for the sole use of the proponents, their agents and any regulatory agencies involved in the development application approval process. It should not be otherwise referenced without permission.

Prepared By:
ecobiological

Name	Qualifications	Date	Signature	Report Issue
Dan Pedersen	Bushfire Threat Consultant, Grad.Dip. BPAD (UWS) FPAA Certified Practitioner No. BPD-PA-16293	31.03.11		A



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Executive Summary

The following Bushfire Threat Assessment has been prepared for the proposed train diesel and sand filling point (provisioning facility) located on the Wambo Coal rail loop. This is considered under the NSW Planning for Bushfire Protection (PBP) as Other Development (Section 4.3.6 f, PBP 2006). In general, the BCA fire safety construction provisions for class 5-8 and 10 buildings are taken as acceptable solutions. The aims and objectives of PBP will apply in relation to other matters such as access, water and services, emergency planning and landscape/vegetation management.

The location for development is at the corner of Watt Street (Wambo Mine Entrance Road) and Golden Highway, Warkworth. Site is described as Lot 202 DP 257063, Warkworth, in the Singleton Local Government Area (LGA). The land is owned by Wambo Coal Pty Ltd. The client is QR National / Wambo Coal Pty Limited (WPCL).

The proposed provisioning facility is impacted by bush fire prone vegetation described as woodland. The slopes out to 140m from the development site are generally flat to 1 degree.

The development location has suitable APZ established through surrounding infrastructure, and will have suitable water supplies and access provisions for emergency situations. The proposed development can meet the aim of PBP and provides for the protection of human life (community, residents and fire fighters) and to minimise impacts on property from the threat of bushfire, while having due regard to development potential, on-site amenity and protection of the environment. The proposed development can meet also the objectives of PBP.

Recommendations have been provided in Section 3 of the report. In combination the recommendations would provide a satisfactory level of bushfire protection to the subject lot.



Please Note:

This report is prepared in accordance with current accepted practice as described in the NSW Rural Fire Service guide *Planning for Bushfire Protection, 2006 – a Guide for Councils, Planners, Fire Authorities, Developers and Home Owners, AS 3959–1999 Construction of buildings in bushfire-prone areas, and the Building Code of Australia (BCA) 2007*.

This report is not an insurance policy. Owing to the unpredictable nature of bushfires and of weather conditions at the time of a bushfire, this report cannot be taken as a warranty that the recommended bushfire mitigation measures will protect the property from damage in every possible bushfire event. Ultimately, the onus is on the land owner to accept the risks associated with development on the site in light of the identified bushfire threat.



1. Introduction

Under the Rural Fires and Environmental Assessment Legislation Amendment Act 2002 (amends the Environmental Planning and Assessment Act 1979) all local councils are required to ensure that all developments in bushfire prone lands conform to documented bushfire protection specifications.

The following Bushfire Threat Assessment has been prepared for the proposed train diesel and sand filling point (provisioning facility) located on the Wambo Coal rail loop.

The location for development is at the corner of Watt Street (Wambo Mine Entrance Road) and Golden Highway, Wambo (in the Warkworth village). The land is owned by Wambo Coal Pty Ltd. The client is QR National / Wambo Coal Pty Limited (WPCL).

Site is described as Lot 202 DP 257063, Warkworth, in the Singleton Local Government Area (LGA). Singleton Council Bushfire Prone Land Map identifies the property as having bush fire prone vegetation.

The site of the development is zoned 1(a) rural (Singleton Council Local Environmental Plan 1996 Zoning Map).

1.1. Proposal

Development Application 177-8-2004 for rail and coal loading infrastructure adjacent to the Wambo Coal Mine was approved by the then Minister Assisting the Minister for Infrastructure and Planning in 2004, and was subsequently modified in 2006 (126-10-2006). The development application was state significant, integrated development assessed and approved pursuant to Part 4 of the Environmental Planning & Assessment (EP & A) Act 1979.

The proposed modification includes the installation and operation of a small provisioning facility for the purpose of refilling locomotives with diesel, topping up of engine oil, sand for braking, cabin water and internal cleaning of the operator's cabin. The proposed modification includes the installation and operation of a small provisioning facility consisting of:



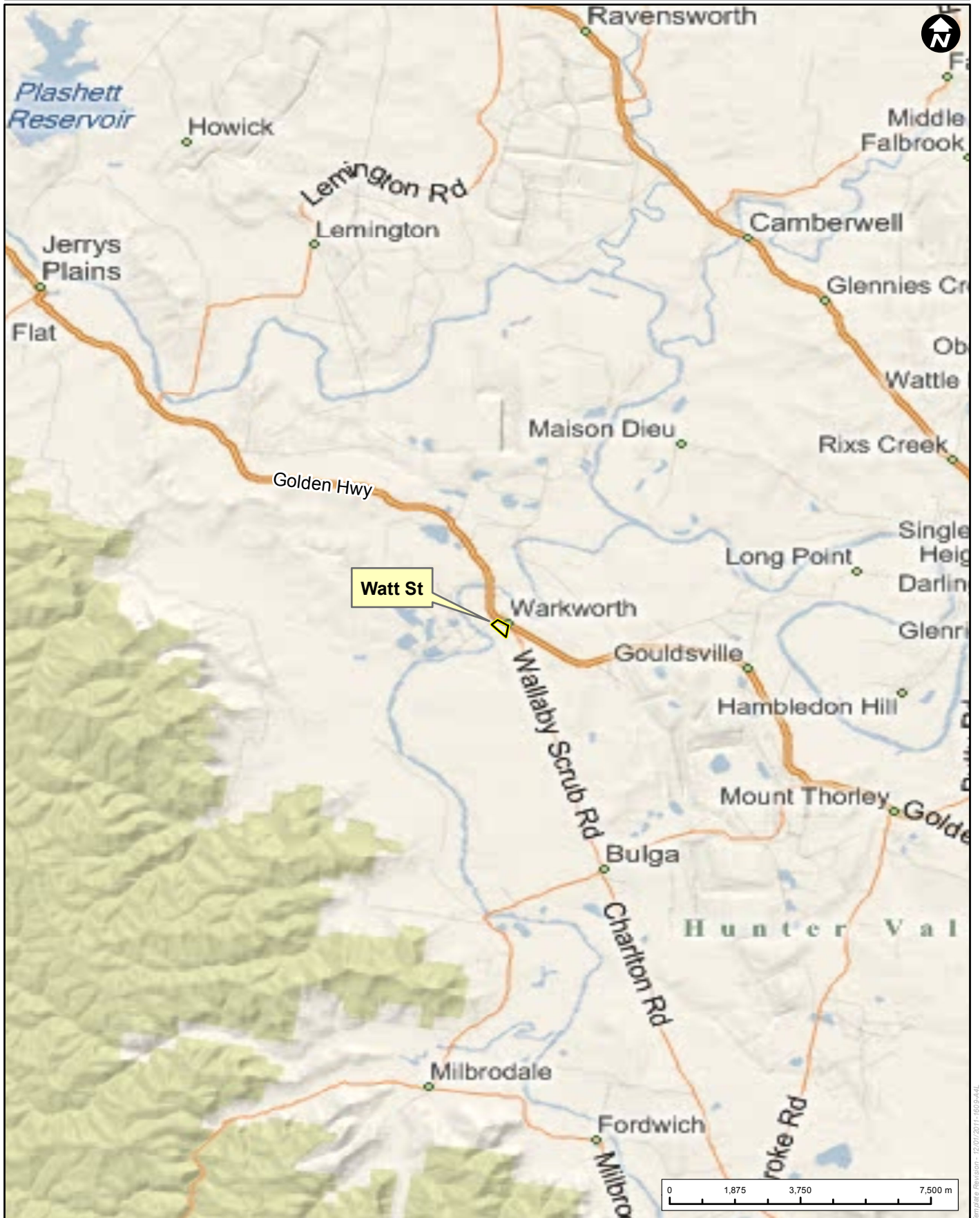
- One (1) 100,000L self bunded, double skinned diesel storage tank (Combustible Class 1) with refuelling hose.
- One (1) 2,000L lubricating oil tank (Combustible Class 2) with retractable hose.
- Two (2) pneumatic 7.5 tonne capacity sand tanks.
- One (1) 10,000L polyethylene water tank with pump and retractable hose for potable water.
- Piping and electrical cabling.
- Electricity sourced from nearby coal loading point.
- Task lighting and level walkways both sides of the track.
- Stairs from the diesel tank to the level northern level walkway.
- Spill control matting.
- Spill and oily water management system.
- A lockable weather proof storage container.
- A 2 metre chain wire perimeter fence will be installed to minimise vandalism and theft.

Plans of the proposed provisioning facility are included within Appendix 1 of the Environmental Assessment prepared by Wells Environmental Services (2011). The design and location of the facility has had regard to AS 1940-2004 *The storage and handling of flammable and combustible liquids*.

The proposed development type is best described as a Class 5 to 8 and 10 buildings under the BCA 2010 and will be assessed as 'other development' under the NSW Rural Fires Services *Planning for Bushfire Protection 2006* (PBP). The BCA does not provide any bushfire specific performance requirements and AS3959-2009 does not apply as a set of 'deemed to satisfy' (DTS) provisions, however, the aims and objectives of PBP apply in relation to other matters such as access, water and services, emergency planning and landscape/vegetation management.

The site locality, surrounding vegetation and landscape characteristics are shown in Figure 1 and Figure 2.

Figure 1 - Locality Map



Legend

Subject Site

ecobiological
survey & assessment

Map Projection:
NSW Lamberts Conformal Conic

Data Sources:
BingStreetMap - 2011
ecobiological - 2011

Project Ref: 278-810

Plot Date: 31/03/2011 10:13

Revision: 001 (Chelayne)



Figure 2: Aerial figure showing surrounding landscape and vegetation types.

Figure 2 - Vegetation Community Mapping



Legend

- Subject Site
- Railway Line
- Provisioning Facility
- Warkworth Sands Woodland
- Central Hunter Bullock Forest Regeneration



Map Projection:
NSW Lamberts Conformal Conic

Data Sources:
BingMap - 2011
HunterCMAVISMap2295 - 2006
ecobiological - 2011

Project Ref:	278-810
Plot Date:	5/04/2011 12:52
Revision:	001 (Chelayne)



1.1.1. PBP Aims and Objectives

All development on bushfire prone land must satisfy the aims and objectives of PBP.

The aim of PBP is to use the NSW development assessment system to provide for the protection of human life (community, residents and fire fighters) and to minimise impacts on property from the threat of bushfire, while having due regard to development potential, on-site amenity and protection of the environment.

The objectives of PBP are to;

- Afford occupants of any building adequate protection from exposure to a bushfire;
- Provide for a defensible space to be located around buildings;
- Provide appropriate separation between a hazard and buildings which, in combination with other measures, prevent direct flame contact and material ignition;
- Ensure that safe operational access and egress for emergency service personnel and residents is available;
- Provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the Asset Protection Zone (APZ); and
- Ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bushfire fighting).

1.2. Scope of Assessment

This report evaluates the potential bushfire threat and other matters such as access, water and services, emergency planning and landscape/vegetation management to the train provisioning facility on the site and recommends mitigation measures to protect human life and property. It provides the applicant, Council and the Rural Fire Service with an independent assessment of the proposed development having regard to construction within a bushfire prone area.

Recommendations in Section 3 of this report should provide a reasonable and acceptable level of bushfire safety to the proposed development, its occupants and attending fire fighters.



1.3. Site Assessment Methodology

The site assessment methodology utilised for determining level of bushfire attack for this development has been sourced from section A3.5 of the Addendum: Appendix 3 of the NSW RFS Planning for Bushfire Protection (2010). The assessment procedure used to determine the category of bushfire attack is in accordance with AS3959 (2009).

The procedure is listed below:

- 1) Determine vegetation types and classes around the site as follows:

Identify all vegetation in each direction from the proposed building line on the development site for a distance of 140m taking into consideration canopy cover, shrub and groundcover species.

Classify the vegetation structure in accordance with Keith (2004) and assess fuel loads as set out in AS3959 (2009).

- 2) Determine the separation of the major vegetative threat from the proposed dwellings.
- 3) Determine the effective slope.
- 4) Determine the FDI rating for the Local Government Area using Table A2.3.
- 5) Determine the category of bushfire attack for the site by assessing the relevant FDI, determined vegetation, distance and slope classes.
Apply the highest attack category if more than one is obtained
- 6) Establish a minimum Asset Protection Zone using PBP 2006 Table A2.4.
- 7) Establish an appropriate level of construction for the development using Australian Standard AS 3959-2009 and BAL assessment in accordance with AS 3959-2009 Section 2.
- 8) Acknowledge specific construction conditions in accordance with Planning for Bushfire Protection (2006) Amended Appendix 3 – Released 2010.

Further assessments are made on the site with regards to other matters such as access, water and services, emergency planning and



landscape/vegetation management. Assessment of these issues will align with performance criteria in Chapter 4 of PBP.

1.4. Legislation

This assessment follows the prescribed methodology and assessment principles published by the NSW Rural Fires Services *Planning for Bushfire Protection 2006* (PBP), for determining the construction requirements for building in designated bush fire prone areas.

1.4.1. Other Development

This development is considered an Other Development and Section 79BA of the EP&A Act 1997 applies. Section 79BA requires compliance with PBP (2006). Where an Other Development proposal does not comply with aims and objectives, the construction requirements for bushfire protection will need to be considered on a case by case basis.

This type of development does not require a Bush Fire Safety Authority (BFSA) from the NSW RFS.

1.4.2. Planning Policies and Guidelines

- NSW RFS Guidelines Planning for Bushfire Protection 2006 (PBP 2006) and Addendum: Appendix 3 (2010);
- Australian Standards AS3959-2009;
- The Building Code of Australia (BCA 2010);
- The provisions of Singleton Council Local Environmental Plan 1996 apply in respect to the land.



2. Site Description

ecobiological conducted an inspection of the subject lot and its surrounds on the 30 March 2011.

2.1. Location and Surrounding Land Use

The subject site is located at the corner of Watt Street and Golden Highway, Warkworth. The immediate construction area has been cleared of vegetation previously for the construction of the rail loop and associated infrastructure (Figure 2). The facility will be approximately 150m east of the Wambo train loader allowing provisioning prior to the train being loaded with coal.

The surrounding land use includes coal mining and associated infrastructure, rural lands and woodland vegetation in bushland areas.

2.2. Fire Weather

Singleton LGA is within the Greater Hunter and has a FDI rating set at 100.

2.3. Water Supply

Potable water is accessible on-site. The new development will need to consider the availability of water for bushfire protection. The provision of a dedicated 10,000 litre static water supply (storage can be an amalgam of quantities) would offer the proposed development an independent fire fighting advantage in the event of bushfire impacting the location. Such a water supply would be fitted with a 65mm Storz outlet to provide suitable connection for attending RFS brigades.

2.4. Access and egress

The Golden Highway is the major access route to and from the site. This road would support higher vehicle density associated with bush fire fighting and evacuation (Plate 1).



Site access is gained via the Wambo Coal entrance road (Watt Road). A widened road shoulder provides ample area for trucks to pull off the road before entering the site (Plate 2).



Plate 1. Golden Highway intersection with Watt Street.



Plate 2. Watt Street looking toward Wambo Coal mine, and showing train loading facility to the left.

2.5. Bushfire Hazard (Vegetation)

Vegetation within and surrounding the subject site (Figure 2) has been classified using formations and sub-formations identified in Keith (2004) and supported by the HunterCMAVISMap 2295 (2006). Table 1 below details the predominant vegetation hazard, out to a distance of 140m in each from the development location.

Table 1: Vegetation type and estimated maximum fuel loading for 140m in each direction from the development site.

Direction	Vegetation Type and Hazard
North	Woodland. 15t/ha
East	Remnant Vegetation (Woodland) <15t/ha
South	Woodland. 15t/ha
West	Woodland. 15t/ha

The vegetation surrounding the proposed development site is generally a woodland formation. The vegetation to the east is fragmented by Golden Highway and Warkworth sporting grounds. Plates 3-6 below show the general vegetation characteristics.



Plate 3: Woodland vegetation to the north.



Plate 4: The vegetation to the east is fragmented by Golden Highway and Warkworth sporting grounds.



Plate 5: Woodland vegetation within the rail loop to the south of the proposed development area.



Plate 6: Woodland vegetation across Watt Street to the west.



2.6. Slope Assessment

The effective slopes are slopes that affect the behaviour of a bushfire. Slopes impact the rate of fire spread, flame lengths and fire intensity. The effective slopes are measured under the vegetation hazard that will impact the development site. A site slope is also provided, assessed as the slope of the development site between the hazard and the development. Where no hazard is within 140m from the development site, no slope assessment is required.

Average slope was measured using a Suunto© inclinometer. Table 2 below details the slope assessment.

Table 2: Determination of Bushfire Attack for subject site.

Direction	Effective Slope (°)
North	Flat
East	1 upslope
South	Flat
West	1 downslope

2.7. APZ Asset Protection Zones

APZ are buffer zones that help to ensure that a progressive reduction in fuel occurs between the bushfire hazard and building site. This area aims to provide a defendable space and manage heat intensities at the building surface. Asset Protection Zones incorporate two main areas: an Inner Protection Area (IPA) and an Outer Protection Area (OPA).

- The IPA is an area where fuels, which could become involved in a fire, are minimised, therefore reducing the impact of direct flame contact and radiant heat. An IPA should provide a tree canopy cover less than 15% and located greater than 2 metres from any part of the roofline of a dwelling. Gardens of flammable vegetation are not to be kept under trees and should be no closer than 10m from exposed windows or doors. Trees should have lower limbs removed up to a height of 2 metres above ground level.
- The OPA is adjacent to the hazard and is managed by reducing the fuel loadings. An OPA should provide a tree canopy of less than 30% and should have the understorey managed (mowed) on an



annual basis in advance of the fire season. The aim is to reduce the fires rate of spread and the likelihood of crown fire, while the remaining canopy filters embers.

The size of each component of the APZ is measured horizontally in metres and is dependent on the vegetation classification, effective slope and FDI rating (PBP 2006). The existing APZ is the APZ setbacks currently available to the development site. The required APZ is the APZ setback required to achieve a specified bush fire attack level (BAL).

The minimum specifications for APZ to ensure the construction is not located within the flame zone or under excessive radiant heat are defined in Table A2.4 of PBP (2006). The site has existing setbacks provided in road and rail infrastructure that would achieve the required APZ (Figure 3).

Table 3: Existing APZ.

Direction	Existing APZ
North	100m
East	67m
South	23m
West	54m

Figure 3 - Bushfire Attack Level



Legend

- Subject Site
- Railway Line
- Provisioning Facility
- Asset Protection Zone (APZ)



Map Projection:
NSW Lamberts Conformal Conic

Data Sources:
WellsEnvironmental - 2011
ecobiological - 2011

Project Ref:	278-810
Plot Date:	1/04/2011 15:42
Revision:	001 (Chelayne)



2.8. Bushfire Attack Level

The bush fire attack level (BAL) is determined using the vegetation type, distance from vegetation class and effective slope. Table 4 shows the BAL from each direction as calculated from the Bush Fire Attack assessor (output report Appendix 1).

Table 4: Determination of Bushfire Attack Level for development site.

Direction	Hazard	Effective Slope (°)	Proposed APZ	BAL rating
North	Woodland. 15t/ha	Flat	100m	BAL 12.5
East	Remnant Vegetation (Woodland) <15t/ha	1 upslope	67m	BAL 12.5
South	Woodland. 15t/ha	Flat	23m	BAL 19
West	Woodland. 15t/ha	1 downslope	54m	BAL 12.5

2.9. Construction Standards

In general, the BCA fire safety construction provisions for class 5-8 and 10 buildings are taken as acceptable solutions.

The proposed development is assessed as BAL 19. Australian Standard AS 3959-2009 *Construction of Buildings in Bushfire-Prone Areas* (AS 3959) sets out requirements for the construction of various elements of a building in order to reduce the likelihood of ignition of the building when subject to bushfire attack. The level of building construction is defined as BAL and is equivalent to the BAL rating derived from the above assessment.

2.10. Emergency Response Arrangements

The cleared nature of the surrounding area allows for a suitable safe access and egress for emergency services and the general community.

Evacuation of the site could be achieved along Golden Highway.

The existing layout would allow fire fighting crews to attach to the static water supply and have good access to the site and adjacent vegetation hazard.



Bushfire protection measures including sufficient static water supplies, suitable access through the existing public road, surrounding roads, and existing internal access are considered adequate for emergency response management.

2.11. Bushfire Maintenance Plans/Fire Emergency Procedures

Wambo Coal Mine currently has a Bushfire Management Plan, the plan provides fire prevention, protection and suppression strategies for the mine and adjacent lands. The facility would operate in accordance with this management plan.

An Emergency Management Plan will be prepared for the facility for approval by the Fire Brigade pursuant to the Occupational Health and Safety Regulation 2001.



3. Recommendations

The following measures are recommended to mitigate the risk of bushfire on the proposed development. Provided the following recommendations are implemented in full, it is our opinion that the proposed development complies with the requirements of PBP (2006).

3.1. APZ Setbacks

The site of development will have suitable APZ established in surrounding road and rail infrastructure to afford occupants adequate protection from exposure to a bushfire and provide a defensible space around buildings.

3.2. Building and Construction Standards

In general, the BCA fire safety construction provisions for class 5-8 and 10 buildings are taken as acceptable solutions. The constructions of buildings must consider the bushfire impact and construction requirements of AS3959-2009.

- The BAL rating for this site is BAL 19.

3.3. Access Arrangements

The provisioning facility has suitable public road access to ensure that safe operational access and egress for emergency service personnel, plant operators and any staff members is available.

3.4. Water and Services

To ensure that utility services are adequate to meet the needs of fire fighters (and others assisting in bushfire fighting) the following is recommended:

- A minimum 10,000 litre static water supply is provided in the form of a water tank.
- The tank will be situated in a location accessible to RFS and fire fighting services.



- A 65mm Storz valve will be fitted for RFS connection.

3.5. Emergency Planning

The facility would operate in accordance with the Wambo Coal Mine Bushfire Management Plan.

An Emergency Management Plan will be prepared for the facility for approval by the Fire Brigade pursuant to the Occupational Health and Safety Regulation 2001.

3.6. Landscape/vegetation Management

To provide for ongoing management and maintenance of bushfire protection measures, including fuel loads in the APZ the following is recommended:

- The APZ are managed on frequent basis.
- Ensure the tree canopy cover less than 15% and located greater than 2 metres from any part of the development.
- Any trees within the APZ area should have lower limbs removed up to a height of 2 metres above ground level.



4. Conclusion

The proposed provisioning facility is impacted by bush fire prone vegetation described as woodland. The slopes out to 140m from the development site are generally flat to 1 degree.

The proposed development can meet the aim of PBP and to provide for the protection of human life (community, residents and fire fighters) and to minimise impacts on property from the threat of bushfire, while having due regard to development potential, on-site amenity and protection of the environment.

The proposed development can also meet the objectives of PBP.

- Construction of the proposed development does not involve the clearing of natural vegetation to achieve setbacks required for APZ and defendable space. These setbacks will be managed through ongoing landscape management to ensure fire risk toward the asset is mitigated.
- The proposal will be included within the Wambo Coal Bushfire Management Plan and an Emergency Management Plan will be prepared for the facility.
- The site has existing public roads and suitable access provisions for a bushfire emergency situation.
- Static water supplies have been recommended to provide the RFS with a suitable supply for fire fighting in the immediate locality.

Recommendations have been provided in Section 3 of the report. In combination the recommendations would provide a satisfactory level of bushfire protection to the subject lot.



5. References

Australian Standard 3959–1999: Construction of Buildings in Bushfire-Prone Areas.

Keith, D (2004). Ocean Shores to desert Dunes: The native vegetation of New South Wales and the ACT.

NSW Rural Fire Service guide Planning for Bushfire Protection, 2006. Prepared in cooperation with Planning NSW.

Singleton Council (1996). Singleton Local Environmental Plan 1996.

Standards Australia Handbook HB 36–1993 Building in Bushfire Prone Areas.

Wells Environmental Services (2011). Environmental Assessment: Diesel and Sand Filling Point Wambo Coal Rail Loop.



6. APPENDIX 1

Bush Fire attack assessor program output.



Bushfire Attack Assessment Report

AS3959 (2009) Version 1.4.2

Print Date: 1/04/2011

Assessment Date: 1/04/2011

Site Street Address: Wambo Rail Loop, Warkworth
Assessor: admin; admin
Fire Danger Index: 100 (Fire Weather Area: Greater Hunter)
Local Government Area: Singleton Alpine Area: No

Equations Used

Transmissivity: Fuss and Hammins, 2002
Flame Length: RFS PBP, 2001
Rate of Fire Spread: Noble et al., 1980
Radiant Heat: Drysdale, 1985; Sullivan et al., 2003; Tan et al., 2005
Peak Elevation of Receiver: Tan et al., 2005
Peak Flame Angle: Tan et al., 2005

Run Description: East

Vegetation Information

Vegetation Type:	Remnant Vegetation	Vegetation Group:	Remnant Vegetation
Vegetation Slope:	0 Degrees	Vegetation Slope Type:	Downslope
Surface Fuel Load(t/ha):	10	Overall Fuel Load(t/ha):	12

Site Information

Site Slope	0 Degrees	Site Slope Type:	Downslope
Elevation of Receiver(m)	Default	APZ/Separation(m):	67

Fire Inputs

Veg./Flame Width(m):	100	Flame Temp(K)	1090
----------------------	-----	---------------	------

Calculation Parameters

Flame Emissivity:	95	Relative Humidity(%):	25
Heat of Combustion(kJ/kg)	18600	Ambient Temp(K):	308
Moisture Factor:	5		

Program Outputs

Category of Attack:	LOW	Peak Elevation of Receiver(m):	4.59
Level of Construction:	BAL 12.5	Fire Intensity(kW/m):	7440
Radiant Heat(kW/m2):	2.81	Flame Angle (degrees):	84
Flame Length(m):	9.24	Maximum View Factor:	0.049
Rate Of Spread (km/h):	1.2	Inner Protection Area(m):	67
Transmissivity:	0.748	Outer Protection Area(m):	0

Run Description: North	
<u>Vegetation Information</u>	
Vegetation Type: Woodland	Vegetation Group: Forest and Woodland
Vegetation Slope: 0 Degrees	Vegetation Slope Type: Downslope
Surface Fuel Load(t/ha): 15	Overall Fuel Load(t/ha): 25
<u>Site Information</u>	
Site Slope 0 Degrees	Site Slope Type: Downslope
Elevation of Receiver(m) Default	APZ/Separation(m): 100
<u>Fire Inputs</u>	
Veg./Flame Width(m): 100	Flame Temp(K) 1090
<u>Calculation Parameters</u>	
Flame Emissivity: 95	Relative Humidity(%): 25
Heat of Combustion(kJ/kg) 18600	Ambient Temp(K): 308
Moisture Factor: 5	
<u>Program Outputs</u>	
Category of Attack: LOW	Peak Elevation of Receiver(m): 7.3
Level of Construction: BAL 12.5	Fire Intensity(kW/m): 23250
Radiant Heat(kW/m2): 2.23	Flame Angle (degrees): 83
Flame Length(m): 14.7	Maximum View Factor: 0.041
Rate Of Spread (km/h): 1.8	Inner Protection Area(m): 100
Transmissivity: 0.723	Outer Protection Area(m): 0
Run Description: south	
<u>Vegetation Information</u>	
Vegetation Type: Woodland	Vegetation Group: Forest and Woodland
Vegetation Slope: 1 Degrees	Vegetation Slope Type: Upslope
Surface Fuel Load(t/ha): 15	Overall Fuel Load(t/ha): 25
<u>Site Information</u>	
Site Slope 0 Degrees	Site Slope Type: Downslope
Elevation of Receiver(m) Default	APZ/Separation(m): 23
<u>Fire Inputs</u>	
Veg./Flame Width(m): 100	Flame Temp(K) 1090
<u>Calculation Parameters</u>	
Flame Emissivity: 95	Relative Humidity(%): 25
Heat of Combustion(kJ/kg) 18600	Ambient Temp(K): 308
Moisture Factor: 5	
<u>Program Outputs</u>	
Category of Attack: MODERATE	Peak Elevation of Receiver(m): 6.58
Level of Construction: BAL 19	Fire Intensity(kW/m): 21700
Radiant Heat(kW/m2): 18.57	Flame Angle (degrees): 71
Flame Length(m): 13.92	Maximum View Factor: 0.295
Rate Of Spread (km/h): 1.68	Inner Protection Area(m): 23
Transmissivity: 0.829	Outer Protection Area(m): 0

Run Description: west	
<u>Vegetation Information</u>	
Vegetation Type:	Woodland
Vegetation Slope:	1 Degrees
Surface Fuel Load(t/ha):	15
Vegetation Group:	Forest and Woodland
Vegetation Slope Type:	Downslope
Overall Fuel Load(t/ha):	25
<u>Site Information</u>	
Site Slope	0 Degrees
Elevation of Receiver(m)	Default
Site Slope Type:	Downslope
APZ/Separation(m):	54
<u>Fire Inputs</u>	
Veg./Flame Width(m):	100
Flame Temp(K)	1090
<u>Calculation Parameters</u>	
Flame Emissivity:	95
Heat of Combustion(kJ/kg)	18600
Moisture Factor:	5
Relative Humidity(%):	25
Ambient Temp(K):	308
<u>Program Outputs</u>	
Category of Attack:	LOW
Level of Construction:	BAL 12.5
Radiant Heat(kW/m2):	6.69
Flame Length(m):	15.54
Rate Of Spread (km/h):	1.93
Transmissivity:	0.765
Peak Elevation of Receiver(m):	7.6
Fire Intensity(kW/m):	24911
Flame Angle (degrees):	78
Maximum View Factor:	0.115
Inner Protection Area(m):	54
Outer Protection Area(m):	0