

## **APPENDIX Y: TRAFFIC MANAGEMENT PLAN**

# Construction Works – Traffic Management Plan

Darwin Magnetite Processing Facility Access Road

**TNG Limited**

19 November 2019

Ref: 2019-0208



Building exceptional  
outcomes together



# Contents

**Project: Construction Works – Traffic Management Plan | Darwin Magnetite Processing Facility Access Road**  
**Client: TNG Limited**  
**Ref: 2019-0208**

<b>1</b>	<b>TRAFFIC CONTROL STATEMENT - Declaration</b>	<b>4</b>
<b>2</b>	<b>Glossary</b>	<b>5</b>
<b>3</b>	<b>Introduction</b>	<b>6</b>
3.1	Purpose and Scope	6
3.2	Objectives and Strategies	6
<b>4</b>	<b>Project Overview</b>	<b>7</b>
4.1	Project Location	7
4.2	Project Details and Site Constraints/Impacts	7
4.3	Project Representatives	8
4.4	Traffic Management Administration	8
4.5	Work Health and Safety Plan	9
4.6	Provision to Address Environmental Conditions	13
4.7	Worksite Access	14
<b>5</b>	<b>Hazard Identification, Risk Assessment and Legal Requirements</b>	<b>16</b>
<b>6</b>	<b>Emergency Arrangements and Contingencies</b>	<b>17</b>
6.1	Emergency Services	17
<b>7</b>	<b>Approvals</b>	<b>19</b>
7.1	General	19
<b>8</b>	<b>Notification</b>	<b>20</b>
8.1	Public Notification	20
8.2	Notification of Other Agencies	20
<b>9</b>	<b>Traffic Assessment &amp; Analysis</b>	<b>21</b>
9.1	Existing & Proposed Speed Zones	21
9.2	Existing Traffic Environment	21
9.3	Minimum Lane Requirements and Carriageway Impacts	22
9.4	Barrier Requirements	22
<b>10</b>	<b>Traffic Management Implementation</b>	<b>23</b>
10.1	Staging of Work / Traffic Management	23
10.2	Traffic Guidance Schemes	23



10.3	Signage and Device Requirements. ....	23
10.4	Site Access.....	23
<b>11</b>	<b>Communication. ....</b>	<b>24</b>
11.1	General.....	24
<b>12</b>	<b>Traffic Management Monitoring. ....</b>	<b>25</b>
12.1	Daily Inspections.....	25
12.2	TMP Auditing .....	26
12.3	Records. ....	26
<b>13</b>	<b>Traffic Management Implementation Standards. ....</b>	<b>27</b>
13.1	Sequence and Staging .....	27
13.2	Signage .....	27
13.3	Flashing Arrow Signs. ....	28
13.4	Delineation.....	28
13.5	Speed zoning.....	29
13.6	Provision for night works.....	29
13.7	Temporary Pavement Markings .....	29
13.8	Aftercare Signage .....	30
13.9	Taper Lengths.....	30
<b>14</b>	<b>Management Review .....</b>	<b>31</b>
14.1	TMP Review and Improvement.....	31
14.2	Variations to Standards and Plans .....	31
<b>15</b>	<b>References .....</b>	<b>32</b>

## Figures

<b>Figure 1</b>	<b>Locality Plan (Works Proposed Within Road Reserve) .....</b>	<b>7</b>
-----------------	---	----------

## Appendices

**Appendix A – Risk Assessment**

**Appendix B – Incident Report Form**

**Appendix C – Daily Diary Template**

**Appendix D – DIPL Permit to Work**

**Appendix E – Temporary Speed Limit Authorisation**

**Appendix F – Traffic Data**

**Appendix G – TGS Minimum – Works and Aftercare**

**Appendix H – Compliance Checklist**

**Appendix I – Vehicle, small plant, equipment and miscellaneous store list**

**Appendix J – Vehicle Movement Plan**

**Appendix K – Variation Request**



# 1 TRAFFIC CONTROL STATEMENT - Declaration

I Kurt Faux (WZ1 Accreditation No. 23639) declare that I have designed this Traffic Management Plan based on information provided by TNG Limited. The Traffic Management Plan prepared, is in accordance with Northern Territory Government, Department of Infrastructure Planning and Logistics – Permit to Work within the Northern Territory Government Road Reserve and the Australian Standard AS1742.3 – 2009: Manual of Uniform Control Devices Part 3: Traffic Control for Works on Roads.

1. Compliance has been achieved by the development of this TMP.
2. The Australian Standards and Provision for Traffic have been met as per the detailed risk assessment and treatments to an acceptable level.
3. Satellite imaging, contract drawings and consultation with the client were used to assess site requirements.

Signature: ..... *Raux* .....

Date: 19/11/2019

ITEM	NAME/PCBU	ACCREDITATION DETAILS	EXPIRY DATE	SIGNATURE
TMP Designed By	Kurt Faux	WZ1 #23639	30.11.2021	<i>Raux</i>
TMP Checked By	Bryden Smith	WZ1 #23640	30.11.2021	<i>Bryden Smith</i>
DIPL Suitability Audit	TBC			
Local Government Suitability Audit	TBC			
Permit Application Holder	TBC			
Project Manager	TBC			



## 2 Glossary

AS	Australian Standard
AS/NZS	Australian and New Zealand Standard
COD	City of Darwin
COP	City of Palmerston
DIPL	Department of Infrastructure Planning and Logistics
PFES	Northern Territory Police, Fire and Emergency Services
PtoW	Permit to Work
RSA	Road Safety Auditor
TGS	Traffic Guidance Schemes
TMP	Traffic Management Plan
TOC	DIPL Traffic Operations Centre
WHS	Work Health and Safety (National Uniform Legislation) Act and Regulations
WHSMP	Work Health and Safety Management Plan
WZ1	Workzone Traffic Management Plan Designer



## 3 Introduction

### 3.1 Purpose and Scope

Tonkin has been engaged by Animal Plant Mineral Pty Ltd to undertake a traffic impact assessment on behalf of TNG Limited, for a proposed magnetite processing facility located on Channel Island Road, Northern Territory.

It is understood that TNG proposes to construct and operate the Darwin Processing Facility on land within Lot 1817, Hundred of Ayers, Middle Arm. The site is located adjacent to the Elizabeth River and is approximately 507 ha. It is understood that the design life of the Processing Facility will be 40 years.

It is proposed that materials will be transported from Mount Peake Project, 1,400km south of Darwin, to the facility by rail. The material will be processed at the facility and then transported to Darwin's East Arm Wharf by rail.

The Processing Facility would process magnetite concentrate to produce:

- Vanadium pentoxide - for use in steel, non-ferrous alloys, chemicals, catalysts and energy storage (vanadium redox batteries).
- Titanium dioxide pigment - for use in paint, and coatings.
- Iron Oxide fines - for use in steel making.

The three products will be exported through the Port of Darwin's East Arm Wharf.

As part of the proposed facility, the following transport infrastructure will be required to be constructed:

- Road access to/from the existing Channel Island Road.
- A rail siding running parallel to the Adelaide-Darwin rail line.

This Traffic Management Plan (TMP) outlines the traffic control and traffic management procedures to be implemented by the Project Manager and Project Contractors to manage potential hazards associated with the traffic environment during the project.

### 3.2 Objectives and Strategies

The objectives of the Traffic Management Plan are:

- To provide protection to workers and the general public from traffic hazards that may arise as a result of the construction activity.
- To manage potential adverse impacts on traffic flows to ensure network performance is maintained at an acceptable level.
- To minimise adverse impacts on users of the road reserve and adjacent properties and facilities.

In an effort to meet these objectives the Traffic Management Plan will incorporate the following strategies:

- Providing a sufficient number of traffic lanes to accommodate vehicle volumes.
- Ensuring delays are minimised.
- Ensuring all road users are managed including motorists, pedestrians, cyclists, people with disabilities and people using public transport.
- Ensuring work activities are carried out sequentially to minimise adverse impacts.
- Provision will be made for works personnel to enter the work area in a safe manner in accordance with safety procedures.
- All entry and exit movements to and from traffic streams shall be in accordance with the requirements of safe working practices.



## 4 Project Overview

### 4.1 Project Location

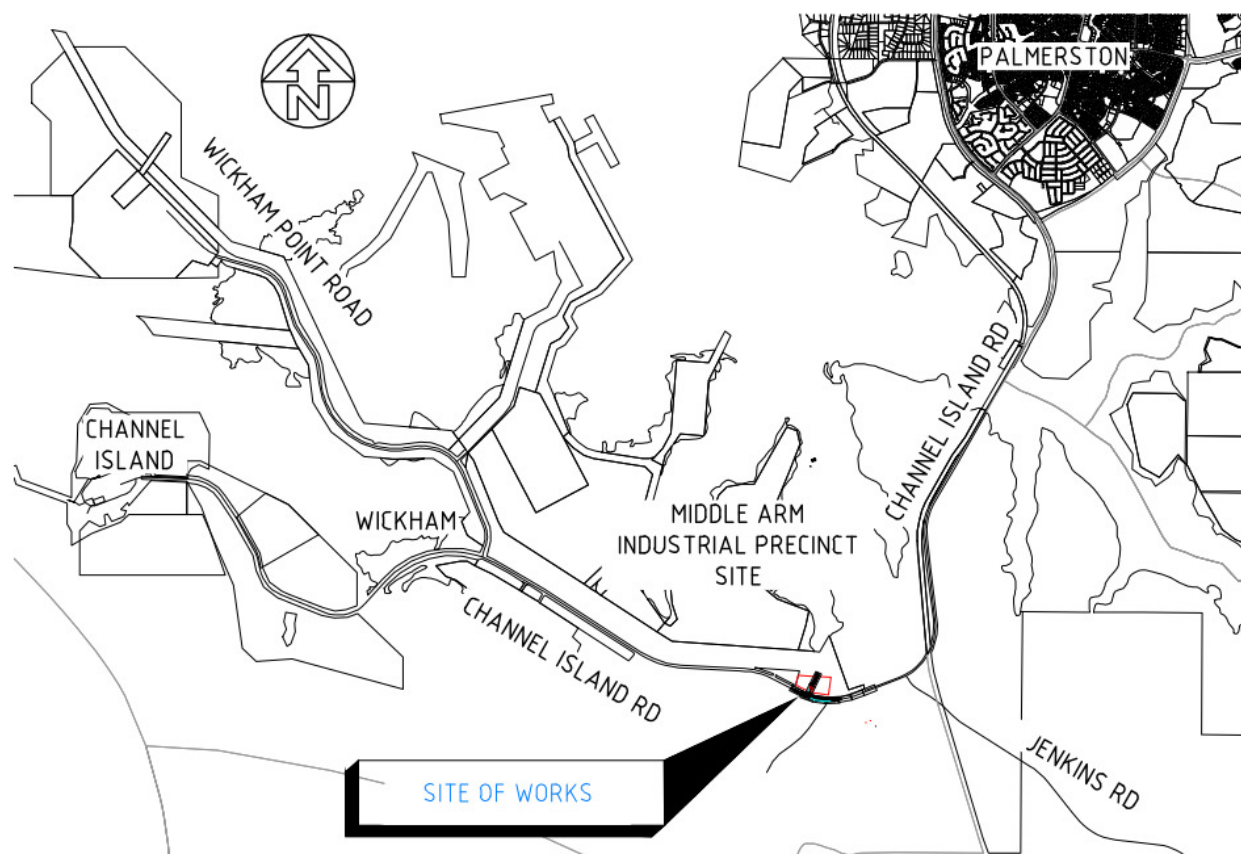


Figure 1 Locality Plan (Works Proposed Within Road Reserve)

### 4.2 Project Details and Site Constraints/Impacts

ITEM	DESCRIPTION
Project Title	Magnetite Processing Facility Access Road
Road Classification, Existing Speed Limit	Collector – Rural Industrial, 90km/h
Road Authority	NT Government
Local Government	Department of Infrastructure planning and logistics
Client	TNG Limited
Principal Contractor	TBC
Sub-Contractor	TBC





ITEM	DESCRIPTION
Scope of Works	Construction of access road to/from the existing Channel Island Road
Staging of Work	<p>The project includes the construction of a new road including earthworks, drainage, culverts, sealing and line marking of Channel Island Road.</p> <p>Clearing and grubbing</p> <p>Earthworks including the pushing and screening and/or blending and/or importation up of specified fill materials into stockpile</p> <p>Pavements including the pushing and screening and/or blending and/or importation up of specified pavement materials into stockpile</p> <p>Stabilization</p> <p>Spray sealing</p> <p>Road furniture and traffic control devices</p> <p>Pavement markings</p> <p>Fencing</p> <p>Drainage works</p> <p>Protection works</p> <p>Rehabilitation</p> <p>Loading, transport and delivery of principal supplied materials from nominated storage yard to site.</p>
Project Date	TBC
Hours / Days of Work	TBC
Duration of Work	TBC – approx. 6 Months
Other Constraints	N/A
Concurrent/adjacent Works or Projects	N/A

### 4.3 Project Representatives

Position	Name	Contact Details
Road Authority Representative	TBC	TBC- address mobile email etc.
Local Government	TBC	TBC- address mobile email etc.
Project Manager / Principal Contractor	TBC	TBC- address mobile email etc.
Site Supervisor/Manager	TBC	TBC- address mobile email etc.

### 4.4 Traffic Management Administration

Role	Name	Contact Details
TMP Design	Kurt Faux	08 8981 7155 – kurt.faux@tonkin.com.au
TMP Implementation	TBC	TBC



## **4.5 Work Health and Safety Plan**

### **4.5.1 Work Health and Safety**

All persons and organisations undertaking these works or using the roadwork site have a duty of care under statute and common law to themselves, their employees and all site users, lawfully using the site, to take all reasonable measures to prevent accident or injury.

This TMP forms part of the overall project Work Health and Safety Management Plan (WHSMP), and provides details on how all road users considered likely to pass through, past, or around the worksite will be safely and efficiently managed for the full duration of the site occupancy and works.

All traffic management works and control devices shall be in accordance with:

- AS 1742 – Manual of uniform traffic control devices
  - Part 1 – General introduction and index of signs
  - Part 2 – Traffic control for general use
  - Part 3 – Traffic control for works on roads
  - Part 4 – Speed controls
- AS/NZS ISO 31000– Risk Management – Principles and Guidelines
- AS/NZS 4602– High visibility safety garments
- AS/NZS 1906.1Retroreflective materials
- AS/NZS 3845 Road safety barrier systems
- AS 4191 Portable traffic signals
- NTTM Northern Territory Testing Methods
- NTMTM Northern Territory Materials Testing Manual
- AUSTROADS Guide to the Geometric Design of Rural Roads
- AUSTROADS Guide to the Geometric Design of Urban Roads
- AUSTROADS Bridge Design Code
- NT WorkSafe All Relevant Bulletins
- Truck and Trailer Mounted Attenuator National Guidelines

### **4.5.2 Competencies**

TNG Limited have engaged Tonkin to prepare this Traffic Management Plan and associated controls for the works.

The Contractor will ensure that at all times during working hours a supervisory person will be available who is accredited in “Workzone Traffic Supervisor (WZ 3)” as well as ensuring that traffic controllers used on the project are experienced in high traffic volume situations and have completed the recommended accredited courses in traffic control.

### **4.5.3 Responsibilities**

The TNG Limited Project Manager has the ultimate responsibility to ensure the TMP is implemented for the prevention of injury and property damage to employees, contractors, sub-contractors, road users and all members of the public.

The Project Manager will ensure all site personnel are fully aware of their responsibilities, and that traffic controllers are appropriately trained and accredited and that sufficient controllers are available to ensure appropriate breaks are taken.



All personnel engaged in the field activities will follow the correct work practices as required by AS1742.3.

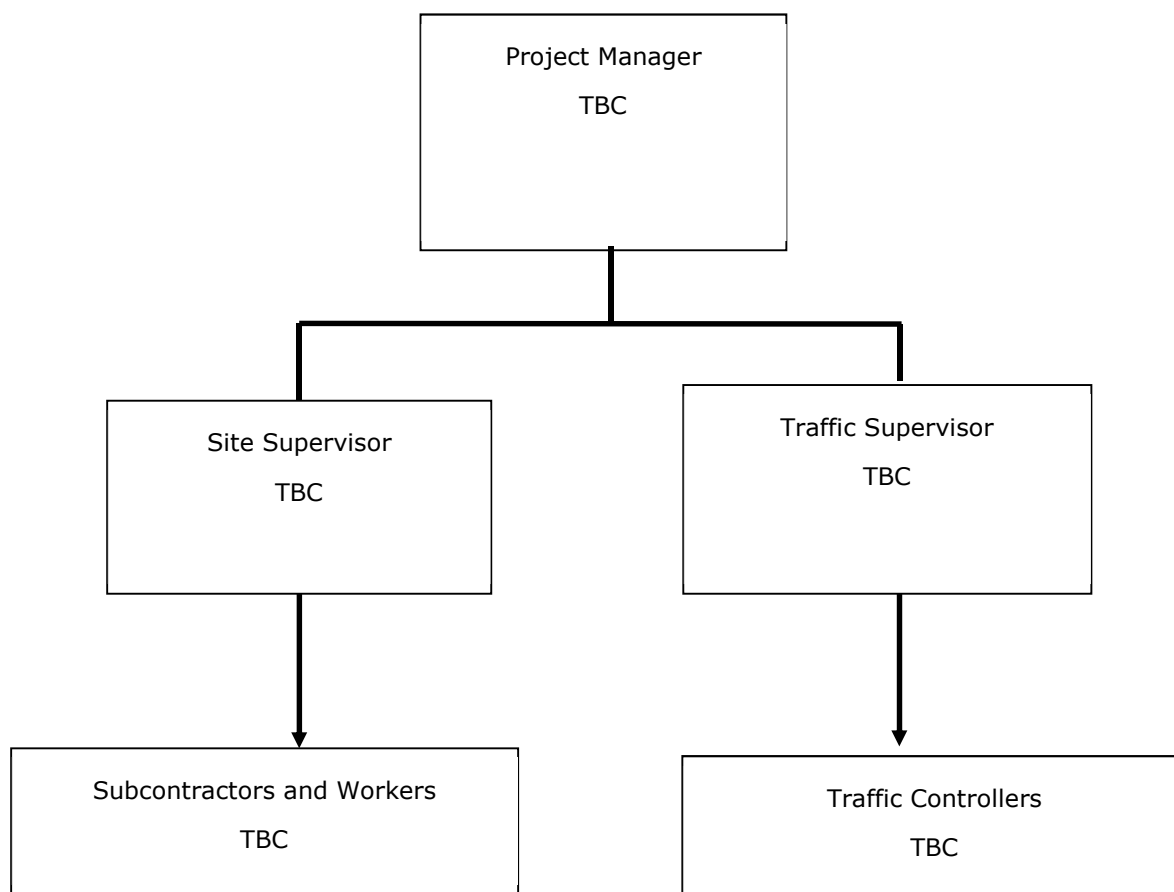
All personnel shall not commence or continue work until all signs, devices and barricades are in place and operational in accordance with the requirements of the TMP.

All personnel responsible for traffic control shall ensure that the number, type and location of signs, devices and barricades are to a standard not less than Appendix G of this plan and AS1742.3 (except where specifically detailed in this TMP with reasons for the variations). Should a situation arise that is not covered by this TMP or AS1742.3, the Road Authority Representative shall be notified.

The Road Authority Representative may direct erection, relocation or removal of signs or devices, which, in the opinion of the Road Authority Representative, are not in accordance with the TMP and do not provide sufficient safety for road users. If such directions are not complied with, the Road Authority Representative may arrange for erection, relocation or removal by others at the cost of the Contractor.

#### **4.5.4 Specific Responsibilities.**

The following diagram outlines the responsibility hierarchy of this contact.





#### 4.5.4.1 Project Manager

The project manager shall:

- Ensure all traffic control measures of this TMP are placed and maintained in accordance with this plan and the relevant Acts, Codes, Standards and Guidelines
- Ensure suitable communication and consultation with the affected stakeholders is maintained at all times
- Ensure inspections of the Traffic Controls are undertaken in accordance with the TMP, and results recorded. Any variations shall be detailed together with reasons
- Review feedback from field inspections, worksite personnel and members of the public, and take action to amend the traffic control measures as appropriate following approval from the Road Authority's Representative
- Arrange and/or undertake any necessary audits and incident investigations

#### 4.5.4.2 Site Supervisor

The site supervisor is responsible for overseeing the day-to-day activities, and is therefore responsible for the practical application of the TMP, and shall:

- Instruct workers on the relevant safety standards, including the correct wearing of high visibility safety garments shirts/vests/trousers etc
- Ensure traffic control measures are implemented and maintained in accordance with the TMP
- Undertake and submit the required inspection and evaluation reports to management
- Render assistance to road users and stakeholders when incidences arising out of the works affect the network performance or the safety of road users and workers
- Take appropriate action to correct unsafe conditions, including any necessary modifications to the TMP.

#### 4.5.4.3 Traffic Management Personnel

- At least one person on site shall be accredited in Workzone Traffic Supervisor (WZ 3), and shall have the responsibility of ensuring the traffic management devices are set out in accordance with the TMP
- At least one person accredited in Workzone Traffic Management Plan Designer

WZ1 shall be available to attend the site at short notice at all times to manage variations, contingencies and emergencies, and to take overall responsibility for traffic management.

#### 4.5.4.4 Traffic Controllers

Traffic Controllers shall be used to control road users to avoid conflict with plant, workers, traffic and pedestrians, and to stop and direct traffic in emergency situations.

Traffic Controllers shall:

- Operate in accordance with the Traffic Section 4.10 and Appendix C of AS1742.3
- Be accredited in Workzone Traffic Supervisor (WZ 3) if required to implement TMP
- Hold a current Traffic Controller's accreditation (WZ 2)
- Take appropriate breaks as required by AS1742.3 and/or WHS (NUL) Regulations.

#### 4.5.4.5 Workers and Subcontractors

Workers and Subcontractors shall

- Correctly wear of high visibility safety garments shirts/vests/trousers, in addition to other protective equipment required (e.g. footwear, eye protection, helmet sun protection etc), at all times whilst on the worksite



- Comply with the requirements of the TMP and ensure no activity is undertaken that will endanger the safety of other workers or the general public
- Enter and leave the site by approved routes and in accordance with safe work practices

#### **4.5.5 Personal Protective Equipment**

All personnel entering the work site shall correctly wear high visibility safety garments shirts/vests/trousers to AS/NZS 4602, in addition to other protective equipment required on a site-by-site basis (e.g. protective footwear, eye protection, helmet, sun protection, respiratory devices etc) at all times whilst on the worksite.

#### **4.5.6 Plant and Equipment**

All plant and equipment at the workplace shall meet statutory requirements and have the required registration, licences or certification where required. All mobile equipment shall be fitted with suitable reversing alarms. All mobile plant and vehicles shall be fitted with a pair of rotating flashing yellow lamps in accordance with AS1742.3 clause 3.12.1. All workers will be made aware of the safe work practice at the time of the site induction.

#### **4.5.7 Incident/Accident Procedures**

In the event of an incident or accident, whether or not involving traffic or road users, all work shall cease and traffic shall be stopped as necessary to avoid further deterioration of the situation. First Aid shall be administered as necessary, and medical assistance shall be called for if required. For life threatening injuries an ambulance shall be called on telephone number 000. The Police shall also be called on 000 for traffic crashes where life threatening injuries are apparent. Any traffic crash resulting in non-life-threatening injury shall immediately be reported to a NT Police Service on 131 444 and to the Road Authority Representative on (number TBC).

Broken down vehicles and vehicles involved in minor non-injury crashes shall be temporarily moved to the verge as soon as possible after details of the crash locations have been gathered and noted. Where necessary to maintain traffic flow, vehicles shall be temporarily moved into the closed section of the work area behind the cones, providing there is no risk to vehicles and their occupants or workers. Suitable recovery systems shall be used to facilitate prompt removal of broken down or crashed vehicles. Assistance shall be rendered to ensure the impact of the incident on the network is minimised.

Details of all incidents and accidents shall be reported to the Site Supervisor and Project Manager using the incident report form at Appendix B (or similar).

#### **4.5.8 Trip Hazards**

The worksite and its immediate surroundings shall be suitably protected and free of hazards, which could result in tripping by non-motorised road users. Hazards, which cannot be removed, shall be suitably protected to prevent injury to road users, including those with sight impairment. Where level differences are significant, suitable barriers, which preclude pedestrian access shall be used.

Where works extend beyond daylight hours and adjacent lighting is insufficient to illuminate hazards to non-motorised road users, appropriate temporary lighting shall be installed.

The worksite shall be kept tidy to reduce the risk to workers.



## **4.6 Provision to Address Environmental Conditions**

### **4.6.1 Weather**

Weather is not expected to adversely impact on the effectiveness of the traffic control detailed on the attached TGS's. Notwithstanding this, should adverse weather conditions be encountered during the works, the following contingency plans should be activated. Note: any adjustments to the plan shall be risk assessed and approved by someone holding a WZ1 or Road Authority representative.

#### **4.6.1.1 Rain**

In the event of rain, an on-site assessment shall be made where sign spacing and tapers may be extended by 25% to account for increased stopping distances. "Slippery When Wet" signs may be placed as required and all changes shall be recorded in the daily diary.

Where rain occurs, Traffic Management Personnel shall audit the site and where signage and / or devices are not clearly visible, signage may need to be adjusted to improve visibility or if necessary provide additional signage and delineation. Where stopping distances are adversely affected by wet surfaces, spacing between signs may need to be adjusted to provide increased reaction time for drivers. In cases where it is determined that the rain is so heavy that the risk is considered unacceptable, all work shall cease until rain has cleared. All changes shall be noted in the daily diary.

#### **4.6.1.2 Floods**

Should works be affected by flooding to the extent that the worksite becomes impassable or risk is considered unacceptable, all work shall cease immediately and Traffic Controllers (and other personnel if necessary) shall be deployed immediately to close the site and direct traffic around the flooded area (under the direction of the project manager or traffic manager). Emergency services and the Road Authority shall be notified immediately and Traffic Controllers shall remain onsite until emergency services and the Road Authority personnel arrive and take control of the site.

#### **4.6.1.3 Sun Glare**

Where sun glare is identified as adversely affecting a driver's ability to sight signage and / or traffic control devices, sign locations may need to be adjusted and additional delineation and/or traffic control devices provided to address the risk from glare. Additionally, in the event that traffic control is adversely affected by glare at sunset and sunrise, traffic controllers may need to assist in maintaining low traffic speeds.

All changes are to be noted in the daily diary.

#### **4.6.1.4 Fog/Dust/Smoke**

Where fog, dust or smoke is identified as adversely affecting a driver's ability to sight signage and / or traffic control devices, sign locations may need to be adjusted and additional delineation and/or traffic control devices provided to address the risk. All changes are to be noted in the daily diary.

Should works be affected by fog, dust or smoke to the extent that risk is considered unacceptable, all work shall cease immediately and Traffic Controllers (and other personnel if necessary) shall be deployed immediately to close the site. Emergency services and the Road Authority shall be notified immediately, and Traffic Controllers shall remain onsite until emergency services and the Road Authority personnel arrive and take control of the site.

### **4.6.2 Terrain**

Terrain is not expected to adversely impact the effectiveness of the traffic control detailed on the attached TGS's. The location of the intersection is on a bend which may affect sight distances, there are also subtle grades that may affect acceleration or deceleration.



### **4.6.3 Vegetation**

Where vegetation is identified as adversely affecting a driver's ability to sight signage and / or traffic control devices, sign locations may need to be adjusted and additional delineation and/or traffic control devices provided to address the risk from shadows. Additionally, in the event that traffic control is adversely affected by shadows, spotters may need to assist in maintaining low traffic speeds.

All changes are to be noted in the daily diary.

### **4.6.4 Existing Traffic and Advertising Signage**

Where existing traffic and advertising signage is identified as adversely affecting a driver's ability to sight signage and / or traffic control devices, sign locations may need to be adjusted and additional delineation and/or traffic control devices provided to address the risk. All changes are to be noted in the daily diary.

Should works be affected existing traffic and advertising signage to the extent that risk is considered unacceptable, all traffic signs in the affected area are to be covered and the advertising signage is to be relocated or removed.

### **4.6.5 Structures**

Existing structures in the area which could affect sightlines or access, or which will be affected by the works that are required to be removed must have prior approval from the DIPL's Superintendent or the Superintendent's Representative.

### **4.6.6 Fumes**

All work vehicles and plant equipment are to be maintained regularly. All personal are to work at safe distances from plant equipment and traffic, should personal be affected by excess fumes to the extent that risk is considered unacceptable, the personal to be taken offsite to be treated if affected.

### **4.6.7 Noise Control**

All noise to be kept at a minimum where possible and construction works to occur during the day.

## **4.7 Worksite Access**

### **4.7.1 Pedestrian access (including Facilities for people with disabilities and other vulnerable road users)**

Pedestrians are not anticipated due to the location of the work area. However, if pedestrians are apparent they will be guided by workers on site safely around the worksite.

### **4.7.2 Cyclists**

There may be some cyclists present during the works and if they are apparent, they will be guided by spotters on site safely around the worksite.

### **4.7.3 Site Access for Works Vehicles**

Works vehicles, plant and personnel entering and leaving the worksite shall do so only at designated locations to be determined on site. Work vehicles must enter the work area with the existing flow of traffic.

Work vehicles shall slow down, engage vehicle-mounted warning device/s, and indicate 100m (built up area) and 200m (Open area) prior to entering the worksite. Traffic controllers shall assist work vehicles in entering and exiting the work area when required. All vehicles and Plant equipment entering or



leaving the work area shall obtain clearance from the traffic controller before proceeding into a live traffic lane.

#### **4.7.4 Emergency Vehicle Access.**

Emergency services vehicles that travel through the worksite will have priority over other road users, they will also have access the site should an emergency situation arise on-site during the works.

Proposed detours will be forwarded to each emergency service prior to works.

#### **4.7.5 Public Transport.**

The proposed works will have no effect on bus stop locations.

#### **4.7.6 Access to Adjoining Development/Properties**

Where access to adjoining development/properties is identified as adversely affecting a driver, detours have been implemented along with relevant signs. Additionally, in the event that traffic control is adversely affected by access, the work zone traffic supervisor may need to assist in maintaining low traffic speeds. All changes are to be noted in the daily diary.

#### **4.7.7 Existing Parking Facilities**

N/A to this TMP as there is no parking facilities nearby.

#### **4.7.8 Special Events and Other Works.**

The proposed works are intended to be undertaken when there are no other works or special events. In the event that the works is adversely affected by a special event or other works, work zone traffic supervisor may need to assist in maintaining low traffic speeds.

All changes are to be noted in the daily diary.

#### **4.7.9 School Crossings.**

N/A to this TMP as there are no school crossings in the area.

#### **4.7.10 Impact on Adjoining Road Network**

Traffic data has been obtained from the relevant authority and assessed. Should the adjoining roads be affected with excessive delays or queue lengths to the extent that risk is considered unacceptable, work zone traffic supervisor will need to assist in keeping the delays to a minimum and traffic flowing. All changes are to be noted in the daily diary.

#### **4.7.11 Heavy and Oversized Vehicles and Loads**

Existing heavy and oversized vehicle movement is not restricted, minimum lane widths provided Hazard Identification, Risk Assessment and Legal requirements.





## 5 Hazard Identification, Risk Assessment and Legal Requirements.

A detailed risk assessment can be found at Appendix A

Legal and other requirements

The Contractor recognises that the traffic management plan has been developed and shall be implemented with due consideration and in accordance with the following legislative, environment and industry standards where applicable.

- NT Work Health and Safety (National Uniform Legislation) Act
- NT Work Health and Safety (National Uniform Legislation) Regulations
- NT WorkSafe Relevant Bulletins / Safety Alerts
  - o Construction
  - o Fatigue
  - o Manual Handling
  - o Plant and Machinery
- NT Control of Roads Act
- NT Traffic Act
- NT DIPL Technical Requirements for Works Within the NT Government Road Reserve
- Department of Transport G7 - Information for Interstate and Overseas Visitors to the Northern Territory
- Department of Transport G9 – NT Workzone Traffic Management ID card
- Australian Standard AS 1742 – Manual of uniform traffic control devices
  - Part 1 – General introduction and index of signs
  - Part 2 – Traffic control for general use
  - Part 3 – Traffic control for works on roads
  - Part 4 – Speed controls
- AS/NZS ISO 31000– Risk Management – Principles and Guidelines
- AS/NZS 4602– High visibility safety garments
- AS/NZS 1906.1; Retro-reflective materials
- AS/NZS 4192; Illuminated flashing arrow signs
- AS 4191; Portable traffic signals
- AS/NZS 3845; Road safety barrier systems
- Truck and Trailer Mounted Attenuator National Guidelines

The Contractor shall ensure that the requirements of these documents and other relevant information will be monitored and the Traffic Management Plan adjusted to meet changing requirements where necessary.



## **6 Emergency Arrangements and Contingencies**

### **6.1 Emergency Services**

Emergency services shall be notified via PFES of the proposed works nature, location, date and times as well as contact details for the site supervisor.

#### **6.1.1 Dangerous Goods**

Should any incident arise involving vehicles transporting dangerous goods, all work shall cease immediately, machinery and vehicles turned off and the area cleared of personnel as soon as possible. Traffic Controllers (and other personnel if necessary) shall be deployed immediately to ensure no traffic or other road users approach the area.

Emergency services shall be notified via PFES of the proposed works nature, location, date and times as well as contact details for the site supervisor. All site personnel shall be briefed on evacuation and control procedures.

#### **6.1.2 Damage to Services**

In the event that gas services are damaged, all work shall cease immediately, machinery and vehicles turned off and the area cleared of personnel as soon as possible. Traffic Controllers (and other personnel if necessary) shall be deployed immediately to ensure no traffic or other road users approach the area. The Police Service and relevant supply authority shall be called immediately. Damage to any other services shall be treated in a similar manner except machinery may remain operational and access may be maintained where it is safe to do so.

All site personnel shall be briefed on evacuation and control procedures.

#### **6.1.3 Failure of Services**

##### **6.1.3.1 7.1.1 Failure of Traffic Signals**

N/A to this TMP as there are no signals nearby.

##### **6.1.3.2 7.1.2 Failure of Street lighting**

N/A to this TMP as there is no street lighting in the area.

##### **6.1.3.3 7.1.3 Failure of Power**

In the event that power infrastructure is damaged and poses a risk through live current, Traffic Controllers (and other personnel if necessary) shall be deployed immediately to secure the site and prevent entry to the area affected by live power. Power and Water Corporation shall be notified immediately 1800 245 090.

#### **6.1.4 Contingency Planning.**

##### **6.1.4.1 Road Crash or Vehicle Breakdown within Site.**

Road plant within the work area that may impact on any services requiring access to a crash site will be cleared from the area quickly as necessary.

On-site traffic controllers will be equipped with mobile communications to advise and/or liaise with emergency services to ensure a prompt response should the need arise.

There will be accredited First Aid personnel on site to assist where required.



#### 6.1.4.2 Serious Injury or Fatality.

In the case of serious injury or fatality occurring within the traffic control zone all work shall cease immediately, machinery and vehicles turned off and the area cleared of personnel as soon as possible. Traffic Controllers (and other personnel if necessary) shall be deployed immediately to ensure no traffic or other road users approach the area.

Emergency services shall be notified of the incident and all road workers and traffic management personnel shall preserve the scene leaving everything in situ, until direction is given by Police or NT WorkSafe.

A site-specific detour route and/or road closure point will be determined, signed and controlled by traffic management personnel and advised to Police, who will take charge of the site upon arrival. Detour routes will be determined so as to cater for all types of vehicles required to use them. An example of how to manage an emergency can be found in Appendix B of AS1742.3.

All site personnel shall be briefed on control procedures covering incidents and crashes that result in serious injury or fatalities.

#### 6.1.5 Emergency Contacts

In the event of an emergency the following relevant authorities must be contacted and advised of nature of works, location, type of emergency and contact details for the site supervisor.

Emergency Service	E-mail/Website	Phone (Emergency)
NT Police Service	<a href="http://www.pfes.nt.gov.au">www.pfes.nt.gov.au</a>	000
St. John Ambulance	<a href="http://www.stjohnnt.org.au">www.stjohnnt.org.au</a>	8922 6200
PFES	<a href="http://www.pfes.nt.gov.au">www.pfes.nt.gov.au</a>	000
Power	<a href="http://www.powerwater.com.au">www.powerwater.com.au</a>	1800 245 090
Water	<a href="http://www.powerwater.com.au">www.powerwater.com.au</a>	1800 245 090
Gas	<a href="http://www.ntgas.com.au">www.ntgas.com.au</a>	-
DIPL TOC	<a href="http://Tipd.dot.nt.gov.au">Tipd.dot.nt.gov.au</a>	1800 246 199



## **7 Approvals**

### **7.1 General**

Prior to works commencing it is considered necessary to advise all road users of the forthcoming works, the likely timeframe of the works and the road conditions likely to be encountered. Advice shall consist of the following:

- Liaison with emergency services (i.e. Police, St John Ambulance, Fire and Emergency Services)
- Liaison with Local authorities regarding local issues;
- Liaison with other stakeholders (e.g. Power, Water Corp, Buslink, etc.)
- Liaison as necessary with affected residents.

Refer front cover for register of approvals by road and service authorities.



## **8 Notification**

### **8.1 Public Notification**

The public shall be notified of the works and traffic management arrangements which will effect journey times via:

- Notice to Motorists in the weekend paper placed two weeks in advance, one week in advance and at the commencement of works;
- Letter drop to all residents and businesses within the traffic control zone one week ahead of the scheduled works; and,
- VMS boards during the works.

### **8.2 Notification of Other Agencies**

In accordance with the CofP all relevant agencies shall be notified using the Application for

Permit to Work within the NT Government Road Reserve form attached at Appendix D. A distribution list is provided on the bottom of the form. Other agencies shall be notified as required.



## 9 Traffic Assessment & Analysis.

Channel Island Road is a two lane sealed road under the care and control of the NT Government (Department of Infrastructure, Planning and Logistics). It consists of a single carriageway with one lane in each direction, the posted speed limit is 90km/h at the proposed location of the processing facility. The road consists of sealed and unseal shoulders with a total sealed width of approximately 8m, lane widths are approximately 3.5m in each direction.

Channel Island Road extends from Palmerston to the north and Channel Island power Station to the south-west. Given the primarily industrial area to south-west of Channel Island Road, it is understood that most of the traffic utilising the road is generated by industry.

There is a level rail crossing on Channel Island Road, approximately 500m north-east of the intersection with Jenkins Road. The intersection with Jenkins Road has dedicated turn lanes provided.

To the north of the proposed site is the Elizabeth River bridge which spans approximately 500m.

### 9.1 Existing & Proposed Speed Zones

At the area of works the posted speed is 90km/h and the proposed speed zone is 60km/h on the Channel Island Road, refer to Appendix E for Temporary Speed Limits Authorisation

### 9.2 Existing Traffic Environment

Based on 2017 traffic data, Channel Island Road has an annual average daily traffic (AADT) of 3,055 vehicles per day (vpd) with a commercial vehicle (CV) percentage of 33.9% (data from DIPL Annual Traffic Report, 2017).

It is noted that Channel Island Road had significantly higher traffic volumes (approximately 50% higher than existing) in the proceeding years when the construction of the Inpex project was underway.

#### 9.2.1 Volume and Composition

Channel Island Road is classified as a Collector – Rural Industrial and therefore carries moderate volumes of regional, commuter and commercial traffic.

In accordance with the terms of DIPL Specifications and AS1742.3 (2009) several site constraints have been imposed. These constraints include:

- Maintaining the existing number of traffic lanes for the duration of the works.
- Maintaining a minimum trafficable lane width of 3 metres for all temporary lanes for the duration of the works.
- The use of temporary 60 km/h speed restrictions past the worksite with the written approval of Road Authorities.
- Merges associated with buses must be designed for a lateral shift of 0.6 m/sec at the prevailing speed zone.

The existing traffic environment has been assessed using the relevant traffic data, refer to Appendix F.



## **9.3 Minimum Lane Requirements and Carriageway Impacts.**

### **9.3.1 Traffic Flow Capacity (Mid-block and/or intersection) Analysis**

Traffic flow should be maintained wherever possible. Traffic volumes and movements will be analysed against the requirements detailed in clause 4.13 of AS 1742.3 and risk tables to ensure levels of service are acceptable to the Road Authority.

### **9.3.2 Duration and Hours of Proposed Works**

Works will only be permitted during times where traffic flow has been determined to be at the allowable capacity based on the traffic flow analysis. No works will proceed until approval is obtained from the Road Authority.

## **9.4 Barrier Requirements**

N/A to this TMP



## 10 Traffic Management Implementation.

### 10.1 Staging of Work / Traffic Management.

All activities relating to installation, staging and removal of signage, lane closures and work activities shall be recorded in the Daily Diary detailing that the time at which they occur.

#### 10.1.1 Stage 1

TBC - detail stage of project and TGS or work method statements that are applicable

#### 10.1.2 Stage 2

TBC - detail stage of project and TGS or work method statements that are applicable

#### 10.1.3 Stage 3

TBC - detail stage of project and TGS or work method statements that are applicable

#### 10.1.4 Stage 4

TBC - detail stage of project and TGS or work method statements that are applicable

#### 10.1.5 Night Work Provisions

Not applicable, no night time works required.

#### 10.1.6 After Care

During the periods outside of construction, works is to be shut down. Traffic lanes will not be closed and detours won't be required.

### 10.2 Traffic Guidance Schemes

The Traffic Guidance Schemes outlined in Appendix G and listed below have been provided for the following stages to demonstrate the type of controls that will be implemented throughout the term of the contract.

Drawing Number	Version	Details
TBC	TBC	TBC
TBC	TBC	TBC
TBC	TBC	TBC

### 10.3 Signage and Device Requirements.

Signage requirements are shown on each Traffic Control Guidance Plan.

Should the use of additional (not shown on the TGS or listing of devices) or reduced number of devices be required due to unforeseen needs, they shall be recorded within the Daily Diary as a variation to the TMP, following prior approval.

### 10.4 Site Access

Refer to TGS for work vehicles entry and exit points.

Entry and exit to the worksite refer Appendix J may be assisted by a Traffic Controller / Spotter.





## **11 Communication.**

### **11.1 General**

Prior to works commencing it is considered necessary to advise all road users of the forthcoming works, the likely timeframe of the works and the road conditions likely to be encountered. Advice shall be provided to those agencies affected by the works. These details are provided in the Permit to Work Application Form, see Appendix D.

#### **11.1.1 Radio communications**

All vehicle and plant operators and traffic control personnel shall be able to be contacted at all times using radio communications. Any channel changes shall be notified to all personnel at Toolbox Meetings.

#### **11.1.2 Mobile Phone communications**

All traffic control personnel shall use mobile phones in accordance with the site induction and Australian Road Rules only.



## 12 Traffic Management Monitoring.

### 12.1 Daily Inspections

Prior to works commencing the Site Supervisor shall undertake to communicate the Traffic Management Plan to all key stakeholders and affected parties.

On completion of setting out the traffic control measures, the site is to be monitored for a suitable period of time. If traffic speeds on the approaches to the work site are assessed as being above the temporary posted speed zone for the work site, the Site Supervisor is to initiate action to modify the approach signage and tapers in accordance with the requirements of AS1742.3. All such actions are to be recorded in the Daily Diary. Should road users be observed to continue to travel in excess of the posted speed limit, the police are to be requested to attend the site to enforce the temporary posted speed limit.

The Workzone Traffic Management Plan Designer WZ1 accredited supervisory person at the worksite may conditionally approve changes made to a complex traffic management plan subject to review and endorsement of the change by an Road Safety Auditor (RSA) / Road Authority Representative as soon as practicably possible.

The Traffic Management Contractor shall ensure that all temporary signs, devices and controls are maintained at all times. To achieve this, procedures in line with the requirements outlined in AS1742.3 Appendix A will be instituted. The monitoring program shall incorporate inspections:

- Before the start of work activities on site,
- During the hours of work,
- Closing down at the end of the shift period, and
- After hours.

A daily record of the inspections shall be kept indicating

- When traffic controls were erected,
- When changes to controls occurred and why the changes were undertaken,
- Any significant incidents or observations associated with the traffic controls and their impacts on road users or adjacent properties.

The Traffic Management Contractor shall ensure that personnel are assigned to monitor the traffic control scheme. Inspections shall at least satisfy the following requirements.

#### 12.1.1 Before work starts.

- Inspect all signs and devices to ensure they are undamaged, clean and comply with the requirements depicted on the Traffic Guidance Schemes.
- Switch off all lamps check and clean as necessary;
- Confirm Traffic Management plan for the day's activities;
- After any adjustments have been made to the signs and devices, conduct a drive through inspection to confirm effectiveness.



### **12.1.2 During Work hours.**

- Designate and ensure that appropriate work personnel drive through the site periodically to inspect all signs and devices and ensure they are undamaged and comply with the requirements depicted on the Traffic Guidance Schemes;.
- Conduct on the spot maintenance/repairs as required;
- When traffic controllers are on the Job, ensure they remain in place at all times. Relieve controllers as necessary to ensure attentiveness is retained;
- Re position signs or required by work processes throughout the day and keep records of any changes.

### **12.1.3 Closing down Each Day**

- Conduct a pre-close down inspection, allowing time for any appropriate maintenance works;
- Remove any unnecessary signage (e.g. Prepare to Stop, Symbolic Workers);
- Replace any unnecessary signage with appropriate delineation;
- Install barriers and lights where required;
- Drive through site and confirm all signs and devices are operating correctly with no misleading visual cues;
- Record details of inspection and any changes made to layout.

### **12.1.4 After Hours**

- Appoint personnel to conduct after dark checks. Replace any signs / devices not working, missing or damaged and record in diary.
- Appoint personnel to conduct checks on non-work days (e.g. weekends). Replace any signs / devices not working, missing or damaged and record in diary.
- The frequency of inspections needs to align with the amount of traffic management on site, weather conditions, vehicle types and volumes, road user behaviour and site specific risks.

## **12.2 TMP Auditing**

One compliance audit using the 'Compliance Audit Checklist for Traffic Management for Works on Roads at Appendix H shall be conducted following setting up of the traffic management and prior to commencement of the works.

Audit findings, recommendations and actions taken shall be documented and copies forwarded to the Project Manager and the Road Authority's Representative.

## **12.3 Records.**

A daily diary recording all inspections including variations to the approved TMP shall be kept using Standard Forms "Daily Diary".

The Traffic Supervisor is to record all inspections made on a daily basis and at those times prescribed by the Traffic Management Implementation Standards. Upon completion of each day the Traffic Supervisor shall provide copies of the daily diary record to the Project Manager.

The Traffic Supervisor is to record all variations made to the approved Traffic Management Plan on a daily basis and indicate clearly the nature of the variations and the reason for the variations. Upon completion of each day the Traffic Supervisor shall provide copies of the variation record to the Project Manager.



## 13 Traffic Management Implementation Standards.

### 13.1 Sequence and Staging

Before work commences, signs and devices at approaches to the work area shall be erected in accordance with the adopted TGS, in the following order:

- Advance warning signs.
- All intermediate advance warning and regulatory signs and devices required in advance of the taper or start of the work area.
- All delineating devices required to form a taper including flashing arrow signs or temporary hazard markers where required.
- Delineation past the work area or into a side track.
- Other warning signs or regulatory signs.

Delineation devices such as cones and bollards should be placed in the same sequence, i.e. those furthest in advance of the work placed first.

Where a work area is moving progressively along the road, relocation of the signs ahead should take place in the above sequence. Those behind should be relocated in the reverse sequence.

Signs and devices that are erected before they are required shall be covered by a suitable material. The cover shall be removed immediately prior to the commencement of work.

Removal of traffic control signs and devices should be undertaken in the reverse order of erection, progressing from the work area out toward the approaches.

Refer to Traffic Guidance Schemes in specific Traffic Management Plans for individual worksite details. General sequence for implementing, maintaining and dismantling traffic control shall be as below.

### 13.2 Signage

#### 13.2.1 Alignments and signage details.

The requirements for the closure and realignment of lanes and any other traffic arrangement necessary to accommodate the works shall be detailed in specific Traffic Management Plan work staging and on the Traffic Guidance Schemes. All traffic control shall be implemented and maintained in accordance with the requirements of Australian Standard AS 1742.3, DIPL PtoW Standard Practices.

#### 13.2.2 Requirements for signs.

All signs used shall conform to the designs and dimensions as shown in Australian Standard AS 1742.3 and the DIPL Permit to Work.

Prior to installation, all signs and devices shall be checked by the Site Supervisor or a suitably qualified person to ensure that they are in good condition and meet the following requirements:

- Mechanical condition - Items that are bent, broken or have surface damage shall not be used.
- Cleanliness - Items should be free from accumulated dirt, road grime or other contamination.
- Colour of fluorescent signs - Fluorescent signs whose colour has faded to a point where they have lost their daylight impact shall be replaced.
- Retroreflectivity. - Signs for night-time use whose retroreflectivity is degraded either from long use or surface damage and does not meet the requirements of AS 1906 shall be replaced.
- Battery operated devices - shall be checked for lamp operation and battery condition.



Where signs do not conform either to the requirements of AS 1742.3 or would fail to pass any of the above checks, they shall be replaced on notice.

Signs and devices shall be positioned and erected in accordance with the locations and spacing's shown on the drawings. All signs shall be positioned and erected such that:

- They are properly displayed and securely mounted;
- They are within the driver's line of sight;
- They cannot be obscured from view;
- They do not obscure other devices from the driver's line of sight;
- They do not become a possible hazard to workers or vehicles; and
- They do not deflect traffic into an undesirable path.

Signs and devices that are erected before they are required shall be covered by a suitable opaque material. The cover shall be removed immediately prior to the commencement of work.

Where there is a potential for conflict of information between existing signage and temporary signage erected for the purpose of traffic control, the existing signs shall be covered. The material covering the sign shall ensure that the sign cannot be seen under all conditions i.e. day, night and wet weather. Care will be taken to ensure existing signs are not damaged by the covering material or by plastic or adhesive tape.

### **13.2.3 Tolerances on positioning of signs and devices**

Where a specific distance for the longitudinal positioning of signs or devices with respect to other items or features is stated, for the spacing of delineating devices or for the length of tapers or markings, the following tolerances may be applied: -

- (a) Positioning of signs, length of tapers or markings:
  - (i) Minimum, 10% less than the distances or lengths given.
  - (ii) Maximum, 25% more than the distances or lengths given.
- (b) Spacing of delineating devices:
  - (i) Maximum, 10% more than the spacing shown.
  - (ii) No minimum.

These tolerances shall not apply where a distance, length or spacing is already stated as a maximum, a minimum or a range.

## **13.3 Flashing Arrow Signs.**

N/A for this TMP.

## **13.4 Delineation.**

### **13.4.1 General**

Cones shall be used for delineation unless other treatment is specified in the Traffic Management Plan or on the Traffic Guidance Schemes. All cones shall be at least 700 millimetres in height and constructed from fluorescent orange or red material that is resilient to impact and will not damage vehicles when hit at low speed. Cones will be fitted with suitable white retro-reflective tape placed in accordance with AS 1742.3.

Cones shall be designed to be stable under reasonably expected wind conditions and air turbulence from passing traffic.



The base of the cones will be secured so that they are not dislodged by traffic. Cones will be inspected at intervals necessary to ensure any mis-alignment or displacement is identified and corrected prior to this causing disruption to traffic.

Where specified, temporary frangible or otherwise non-hazardous delineator posts or bollards may be used for edge protection and taper delineation. Posts or bollards shall have a maximum dimension of 60 millimetres when measured along the longest side of a square or rectangular section or across the diameter of a circular section. Base design shall permit easy fixing to either sealed or unsealed surfaces and not intrude into traffic lanes greater than 50 millimetres from the face of the post or bollard.

All posts or bollards shall be erected in accordance with the Traffic Guidance Schemes. Posts and bollards shall be a minimum of 1000 mm. high, capable of being fixed to the road pavement by a suitable road adhesive or by fastening bolts or spikes. Fixing shall be in accordance with manufacturer's recommendations.

Posts and bollards shall be fitted with suitable white retro-reflective tape placed in accordance with AS 1742.3.

All posts or bollards will be inspected daily and where displaced or missing made good immediately. All delineator posts are to be completely removed at the completion of all stages of construction and prior to the placement of asphalt surfacing. If adhesive is used to affix the posts this shall be completely removed from the road surface so that a flush surface is obtained.

#### **13.4.2 Delineation spacing.**

Shall be provided on each individual TGS Refer Appendix G.

### **13.5 Speed zoning.**

Temporary speed zones shall be implemented as detailed the staged Traffic Guidance Schemes during work shift hours in accordance with the Traffic Management Plan and guidelines contained in Australian Standard AS 1742.3.

Speed zones shall be in accordance with the guidelines contained in Australian Standard AS 1742.3 and as prescribed in the Traffic Management Plan and detailed on the Traffic Guidance Schemes.

### **13.6 Provision for night works.**

All signs used at night are to be Class 1 Retro-reflective material and delineation will be either retro-reflective or be sufficiently illuminated.

Flashing lamps may be used to draw attention to signs and all personnel engaged on night work shall wear high visibility retro-reflective jackets.

### **13.7 Temporary Pavement Markings**

Temporary pavement markings shall be installed after each individual stage of works prior to the application of the ultimate pavement marking in accordance with the following:

- After profiling works lanes shall be delineated by temporary Retroreflective Raised Pavement Markers (RRPMs).
- After asphalt works have been carried out lanes shall be delineated by either ultimate pavement markings, temporary RRPMs or temporary painted pavement markings.
- Temporary RRPMs shall be installed at not less than 4m spacing and not greater than 12m spacing.



## **13.8 Aftercare Signage**

Aftercare signage shall be installed between work shifts as determined to be applicable on site and applicable to the state of completion of the road works and pavement markings in accordance with the following requirements:

## **13.9 Taper Lengths**

Tapers are to be provided at each merge and are to be in accordance with the relevant Australian standards and local road authority specification.



## **14 Management Review**

### **14.1 TMP Review and Improvement**

Due to the project construction exceeding 6 months it is recommended that a formal review of the Traffic Management Plan is completed to assist with continuous improvement, ensuring it's continuing suitability, adequacy and effectiveness. It is recommended that comments and complaints received from the public are registered and taken in to consideration with the review of the TMP. The procedure should ensure there is regular monitoring of the register by management and appropriate action taken.

### **14.2 Variations to Standards and Plans**

TBC





## 15 References

- AS 1742 – Manual of uniform traffic control devices
  - Part 1 – General introduction and index of signs
  - Part 2 – Traffic control for general use
  - Part 3 – Traffic control for works on roads
  - Part 4 – Speed controls
- AS/NZS ISO 31000– Risk Management – Principles and Guidelines
- AS/NZS 4602– High visibility safety garments
- AS/NZS 1906.1Retroreflective materials
- AS/NZS 3845 Road safety barrier systems
- AS 4191 Portable traffic signals
- NTTM Northern Territory Testing Methods
- NTMTM Northern Territory Materials Testing Manual
- AUSTROADS Guide to the Geometric Design of Rural Roads
- AUSTROADS Guide to the Geometric Design of Urban Roads
- AUSTROADS Bridge Design Code
- NT WorkSafe All Relevant Bulletins
- Truck and Trailer Mounted Attenuator National Guidelines

## Appendix A – Risk Assessment

## Introduction

This Traffic Management Plan (TMP) outlines the procedures and processes that will be engaged by the contractor to manage potential hazards associated with the traffic environment whilst undertaking

## Location

The work will primarily be undertaken at the proposed magnetite processing facility located on Channel Island Road, Northern Territory. All work associated with this TMP will occur on the verge and or carriageway. Work in some locations may impact on the users of the carriageway.

## Site Constraints / Impacts

Channel Island Road is classified as a Collector – Rural Industrial and therefore carries moderate volumes of regional, commuter and commercial traffic.

In accordance with the terms of DIPL Specifications and AS1742.3 (2009) several site constraints have been imposed. These constraints include:

- Maintaining a number of traffic lanes and bus lanes in accordance with the approved TMP.
- Maintaining a minimum trafficable lane width of 3 metres for all temporary lanes for the duration of the works.
- Maintaining bus priority for north and southbound bound buses during the period of their operation
- The use of temporary 60 km/h speed restrictions past the worksite with the written approval of Road Authorities.
- Merges associated with buses must be designed for a lateral shift of 0.6 m/sec at the prevailing speed zone.

## Objectives and Strategies

The objectives of the Traffic Management Plan are;

- To provide protection to workers and the public from traffic hazards that may arise as a result of the activity.
- To manage potential adverse impacts on traffic flows to ensure network performance is maintained at an acceptable level.
- To minimise adverse impacts on users of the road reserve and adjacent properties and facilities.
- To minimise adverse impacts on pedestrian movements.

To meet these objectives the Traffic Management Plan will incorporate the following strategies;

- Provide a sufficient number of traffic lanes to accommodate vehicle volumes.
- Ensure delays are minimised.
- Ensure all road users are managed including motorists, pedestrians, cyclists, people with disabilities and people using public transport.
- Ensuring activities are carried out sequentially to minimise adverse impacts.
- Provision will be made for works personnel to enter the work area in a safe manner in accordance with safety procedures.
- All entry and exit movements to and from traffic streams shall be in accordance with the requirements of safe working practices.

To clearly understand the risks associated with the traffic environment and determine the way identified hazards will be managed, the following schedule outlines the risk management process undertaken for traffic issues associated with the activities. The risk assessment process has been undertaken in accordance with Australian Standard AS/NZS ISO 31000, Risk Management.

The risk assessment assumes the worst most likely outcome should the risk event occur. Assessment of likelihood assumes that no risk control is in place - that is, it defines the risk that would be expected to be associated with the activity should no traffic management be undertaken. This is known as pure risk.

The Risk Treatments proposed are based on evaluation of the risks associated with specified events and application of the appropriate control measures necessary to bring risk levels to a point that is "As low as is reasonably practicable" ALARP. Wherever possible, risk control is based on the desirable hierarchy of control i.e. the elimination of the hazard, substitution with a less hazardous activity, provision of engineering controls and provision of management controls.

### Location of works.



### Hazard Identification, Risk Assessment and Legal requirements.

The following details the preliminary assessment of site hazards likely to be encountered, the level of risk associated with each and the control proposed. Note that the risk level is the level of assessed risk *without* the controls in place. The controls listed have been determined as being appropriate in reducing the risk to a level that is acceptable.

## Risk Classification Tables

### QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT

Level	Consequence	Description
1	Insignificant	Mid-block hourly traffic flow per lane is equal to or less than the allowable lane capacity detailed in AS1742.3. No impact to the performance of the network. Affected intersection leg operates at a Level of Service (LoS) of A or B. No property damage.
2	Minor	Mid-block hourly traffic flow per lane is greater than the allowable road capacity and less than 110% of the allowable road capacity as detailed in AS1742.3. Minor impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of C. Minor property damage.
3	Moderate	Midblock hourly traffic flow per lane is equal to and greater than 110% and less than 135% of allowable road capacity as detailed in AS1742.3. Moderate impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of D. Moderate property damage.
4	Major	Midblock hourly traffic flow per lane is equal to and greater than 135% and less than 170% of allowable road capacity as detailed in AS1742.3. Major impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of E. Major property damage.
5	Catastrophic	Midblock hourly traffic flow per lane is equal to and greater than 170% of allowable road capacity as detailed in AS1742.3. Unacceptable impact to the performance of the network. Intersection performance operates at a Level of Service (LoS) of F. Total property damage.

**WHS QUALITATIVE MEASURES OF CONSEQUENCE OR IMPACT**

Level	Consequence	Description
1	Insignificant	No treatment required
2	Minor	First aid treatment required.
3	Moderate	Medical treatment required or Lost Time Injury
4	Major	Single fatality or major injuries or severe permanent disablement
5	Catastrophic	Multiple fatalities.

**QUALITATIVE MEASURES OF LIKELIHOOD**

Level	Likelihood	Description
A	Almost certain	The event or hazard: is expected to occur in most circumstances, will probably occur with a frequency in excess of 10 times per year.
B	Likely	The event or hazard: Will probably occur in most circumstances, will probably occur with a frequency of between 1 and 10 times per year.
C	Possible	The event or hazard: might occur at some time, will probably occur with a frequency of 0.1 to 1 times per year (i.e. once in 1 to 10 years).
D	Unlikely	The event or hazard: could occur at some time, will probably occur with a frequency of 0.02 to 0.1 times per year (i.e. once in 10 to 50 years).
E	Rare	The event or hazard: may occur only in exceptional circumstances, will probably occur with a frequency of less than 0.02 times per year (i.e. less than once in 50 years).

**IMPORTANT NOTE:** The likelihood of an event or hazard occurring shall first be assessed over the duration of the activity (i.e. "period of exposure"). For risk assessment purposes the assessed likelihood shall then be proportioned for a "period of exposure" of one year.

Example: An activity has a duration of 6 weeks (i.e. "period of exposure" = 6 weeks). The event or hazard being considered is assessed as likely to occur once every 20 times the activity occurs (i.e. likelihood or frequency = 1 event/20 times activity occurs = 0.05 times per activity). Assessed annual

likelihood or frequency = 0.05 times per activity x 52 weeks/6 weeks = 0.4 times per year. Assessed likelihood = Possible.

#### QUALITATIVE RISK ANALYSIS MATRIX – RISK RATING

Likelihood	Consequence				
	Insignificant (1)	Minor (2)	Moderate (3)	Major (4)	Catastrophic (5)
Almost certain (A)	<b>Low 5</b>	<b>High 10</b>	<b>High 15</b>	<b>Very High 20</b>	<b>Very High 25</b>
Likely (B)	<b>Low 4</b>	<b>Medium 8</b>	<b>High 12</b>	<b>Very High 16</b>	<b>Very High 20</b>
Possible (C)	<b>Low 3</b>	<b>Low 6</b>	<b>Medium 9</b>	<b>High 12</b>	<b>High 15</b>
Unlikely (D)	<b>Low 2</b>	<b>Low 4</b>	<b>Low 6</b>	<b>Medium 8</b>	<b>High 10</b>
Rare (E)	<b>Low 1</b>	<b>Low 2</b>	<b>Low 3</b>	<b>Low 4</b>	<b>Medium 7</b>

#### MANAGEMENT APPROACH FOR RESIDUAL RISK RATING

<b>Residual Risk Rating</b>	<b>Required Treatment</b>
Very High	Unacceptable risk. <b>HOLD POINT</b> . Work cannot proceed until risk has been reduced.
High	High priority, WHS Officer and WZ1 or RSA must review the risk assessment and approve the treatment and endorse the TGS prior to its implementation.
Medium	Medium Risk, standard traffic control and work practices subject to review by accredited WZ1 personnel prior to implementation.
Low	Managed in accordance with the approved management procedures and traffic control practices.

## Risk Register

Risk Event	Consequence	PTR – Pre-treatment Risk Rating			Treatment	RR – Residual Risk Rating		
		Pre – treatment Risk – (Pure)				Residual Risk		
		L	C	PTR		L	C	RR
<b>Site / Location</b>								
Site access	Compromised safe access to worksite	C	4	VH1 2	Vehicle movement plan Pedestrian movement plan One-way circuits Work zone traffic supervisor /Spotter Approvals	D	4	MEDIUM 9
Length of worksite <i>(Mobile Works?)</i>	Excessive length of worksite including rural areas	C	3	M9	Work zone traffic supervisor/spotter to assist in vehicle movement and plant movement.	D	3	LOW 6
<b>Traffic Impacts</b>								
Traffic queues and delays	Unacceptable long delays to road users	B	1	L4	Work zone traffic supervisor/spotter to assist in vehicle movement and plant movement in order to minimise delays	B	1	LOW 4



Site in operation during times of low visibility <i>(Night Works Urban)</i>	Sight distance or vision of road user compromised on approach to work area	C	3	M9	Additional signage provided along with additional delineators	D	3	LOW 6
Incorrect placement of devices	Sight distance or vision of road user compromised on approach to work area	C	3	M9	Correct locations of signs and devices used.	D	3	LOW 6
<b>Lane Availability</b>								
Need to maintain a minimum number of available lanes	Traffic volume not adequately accommodated	B	3	H12	Providing adequate through lanes and detour for right turning vehicles	D	3	LOW 6
Closure of high volume traffic lanes and impact on remaining trafficable lanes	Inadequate provision made for high volume traffic  Volume of traffic in remaining lanes becomes unacceptably high	C	3	M9	Spotter to assist in vehicle movement and signage used to provide clarity.	D	3	LOW 6
<b>Times of Operation</b>								
Periods in which work can and cannot occur	Works occurs at inappropriate times on the day and night	B	3	H12	Keeping works within the low traffic volume hours during the day.	D	3	LOW 6
Requirement to implement TMP for more than 14 hours within a single shift	Traffic Management Staff Fatigue	C	4	H12	Allowing regular breaks for TM staff and using additional staff as required	D	4	MEDIUM 8

<b>Speed Choices</b>								
Credible speed limits, considering the safety of workers and road users	Road users travel at inappropriate speed due to lack of understanding of applicable speed limits	B	4	VH1 6	Additional warning signs along with an increased buffer zone for workers.	D	4	MEDIUM 8
<b>Specification, Standards, Rules and Policies</b>								
Clarity of applicable specifications, standards, rules and policies. Some document may change because of different accreditation levels <i>(WZ1 WZ2 WZ3 WZ4)</i> <i>(Update of DIPL Specifications)</i> <i>(Revised AS1742.3)</i> <i>(Introduction of Austroads Guidance Notes1-11)</i>	Application of incorrect or expired specifications, standards, rules and policies.  Older accreditation may be governed by older standards, roles, specifications and/or policies	C	3	M9	Ensuring the latest specifications, standards, rules and policies are implemented. Ensuring everyone's accreditation is current	D	3	LOW 6
<b>Stake Holders</b>								

Stakeholders who must be approached for discussions regarding the training and assessment and its impact.	Stakeholder opposition to simulated worksites	B	1	L4	Providing the stakeholder with relevant information with enough time to discuss concerns prior to works.	C	1	LOW 3
<b>Environmental Risk</b>								
Existing vegetation	Obscures positing of signs and devices	B	3	H12	Moving the position of the signs in such a way that the vegetation doesn't obstruct the sign, whilst keeping in the allowable tolerance	D	3	LOW 6
Shadowing or glare in east west direction.	Impact on visibility of traffic control devices	B	3	H12	Work zone supervisor and spotter to assist in vehicle and pedestrian movement during hours of restricted vision	C	3	MEDIUM 9
Inclement weather or smoke <i>(Wet Season – rain - wind)</i> <i>(Dry season – smoke)</i>	Impact on visibility of traffic control devices. Change in conditions of road surface	C	3	M9	Reducing the speed further.	D	3	LOW 6
Conflict between existing signage or infrastructure and temporary signage.	Compromised legibility of work site.	C	3	M9	Using covers over existing signs to eliminate confusions, using the correct spacing for temporary signs	D	3	LOW 6
Works between sunset and sun rise	Insufficient lighting affecting visibility of workers equipment vehicles plant and road users	C	3	M9	Limiting the hours of work during the time where there is insufficient lighting	E	3	LOW 3

<b>Vulnerable Road Users</b>								
Pedestrians, cyclist, people with disabilities and other vulnerable road users such as children, parents with prams, users of small – wheeled vehicles and mobility aides and elderly.	Unable to pass safely the site using existing paths	D	4	M8	Spotter to assist all pedestrians and cyclists when crossing.	E	4	LOW 4
<b>Personnel Access</b>								
Requirement for vehicle traffic to exit and enter the traffic stream	Use of inappropriate exist and entry points. Unsafe site exit and entry to the traffic stream	C	3	M9	Work zone traffic supervisor to assist in vehicle movement and plant movement in order to minimise disruption to traffic stream	D	3	LOW 6
<b>Path Users</b>								
Clear direction for path users	Unfamiliar and illegible paths which are not used by path users				NOT APPLICABLE			NOT APPLICABLE
Surfacing of temporary paths	Surface not appropriate for pram, stroller, wheel chairs and the visually impaired				NOT APPLICABLE			NOT APPLICABLE

Location of pedestrian crossings	Crossing position unfamiliar to path users				NOT APPLICABLE			NOT APPLICABLE
<b>Emergency Vehicle Access</b>								
Emergency vehicle access to site	Delay to emergency services travelling through the site. Delay to emergency services attending emergencies on site	C	3	M9	Priority given to emergency vehicles. Spotters to assist in getting emergency vehicles through site quickly.	D	3	LOW 6
<b>Public Transport</b>								
Bus stops and railway crossing located within the traffic control zone.	Impact on provision of usual public transport services.				NOT APPLICABLE			NOT APPLICABLE
<b>Access to Adjoining development</b>								
Adjoining properties with access near or at the site	Compromised access to adjoining development for property owners and occupiers	D	2	L4	Spotter to assist in vehicle movement in order to minimise compromised access. Detours provided for turning traffic.	E	2	LOW 2
<b>Rural Area</b>								
Presence of stock crossing routes	Disruption of essential stock crossing times				NOT APPLICABLE			NOT APPLICABLE

(Livestock – wandering cattle)  Wild life (Buffalo pigs Kangaroos etc)	Wandering onto road way causing unsafe area for workers or travelling road user.							
Low quality or road surfacing	Existing road surface unsafe for worksite				NOT APPLICABLE			NOT APPLICABLE
<b>Existing Parking Facilities</b>								
Parking facilities exist within the proposed temporary worksite.	Reduction in available parking facilities for the local area.				NOT APPLICABLE			NOT APPLICABLE
<b>School Crossings</b>								
Presence of school crossing within site area requiring relocation.	Safe school crossing practices compromised.				NOT APPLICABLE			NOT APPLICABLE
<b>Impact on Adjoining Road Work</b>								
Change of traffic flow impacts on surrounding road network.	Excessive queue lengths Excessive delays	D	2	L4	Working outside of peak hours to limit queue length and excessive delays	E	1	LOW 1

<b>Heavy and Oversized Vehicles and Loads</b>								
Accommodation of truck traffic and oversize loads	Inadequate lane widths Inadequate provision for turning movements Inadequate vertical alignments	C	3	M9	Work zone traffic supervisor and spotter to assist in vehicle movement when required.	D	3	LOW 6
<b>Other issues as Specified by Road Asset Owner</b>								
Specific restrictions relating to dates or days, particularly around school holiday periods and other significant dates	Impact on schedule operation of the work site	C	3	M9	Limit or stop works outside the days, dates or hours.	E	3	LOW 3
<b>Site Specific Risk for each TGS</b>								
<b>TGS TBC</b>								
Construction worker struck by vehicle, working within the carriageway. This could be	Serious injury or death	C	4	H12	Extend the safety buffer zone from the worksite.	D	4	MEDIUM 8

caused by a vehicle who has ignored the warning signs.								
<b>TGS TBC</b>								
Pedestrian/cyclist struck by vehicle, whilst detouring around the work site due to change traffic conditions	Serious injury or death	B	4	VH16	Work zone traffic supervisor and spotter to assist in pedestrian/cyclist movement when required. Aftercare to provide adequate signage and delineation.	D	4	MEDIUM 8
<b>Aftercare TGS TBC</b>								
Intoxicated pedestrian coming from Free Spirit Resort confused about crossing due to changed conditions	Serious injury or death	B	4	VH16	Using reflective bollards/cones and appropriate signage to clearly show the alternative crossing.	D	4	MEDIUM 8



# Appendix B – Incident Report Form

## Incident notification form

Sections 35 to 39 of the *Work Health and Safety (National Uniform Legislation) Act* (WHS (NUL) Act) states NT WorkSafe must be notified of the occurrence as soon as practicable by the PCBU on **1800 019 115**. You will be given an incident notification Reference Number that must be included on this form. This number is proof of your notification phone call as soon as was practicable.

In addition to immediate (as soon as is practicable) phone notification, this 2-page notification form must be faxed or emailed to NT WorkSafe within **48 hours** after the incident occurrence. Fax: **08 8999 5141**. Email: [ntworksafe@nt.gov.au](mailto:ntworksafe@nt.gov.au)

For more information please see NT WorkSafe bulletin Incident Notifications.

<b>Reference Number:</b>		<b>Date:</b>	
--------------------------	--	--------------	--

### Person submitting details (if completing form by hand, please print **BLOCK** letters)

Name:			
Position title:			
Name of employer/self-employed person notifying:			
ABN:			
Business address: (Not Postal Address)			
Suburb:	State:	Postcode:	
Work number:	Mobile number:		
Email address:			

### Incident details

Date of incident:		Time of incident: (am/pm)	
Death of a person	<input type="checkbox"/>	Serious injury or illness	<input type="checkbox"/>
		Dangerous incident	<input type="checkbox"/>
Name of employer of any Injured or deceased person(s) if different from above: i.e.: subcontractor			
ABN:			
Address or location where the incident occurred:			
Describe the specific location of the incident:			

### Work activity being undertaken at the time of the incident:

Provide a description of work being undertaken at the time of the incident including identifying any plant, substance and equipment involved

**Witnesses**

Name of person(s) who saw the incident or was first on the scene

**Details of injured/deceased person(s)**

Full name:			
Date of birth:		Occupation/Job title:	
Direct worker <input type="checkbox"/>	Contractor <input type="checkbox"/>	Member of public <input type="checkbox"/>	Other <input type="checkbox"/>
Address:			
Suburb:		State:	Postcode:
Work number:		Mobile number:	
Email address:			

**Injury/illness**

Provide a description of any injury or illness		
Did the person receive treatment following the injury/illness? If yes, describe treatment below	Yes <input type="checkbox"/>	No <input type="checkbox"/>

**Action**

Describe any Action taken/intended, if any, to prevent recurrence of the incident

**Declaration of notifier**

Date form submitted:		Signed:		I have submitted this form electronically (signature is not required)	<input type="checkbox"/>
----------------------	--	---------	--	---	--------------------------

## Appendix C – Daily Diary Template

**Location:** \_\_\_\_\_ **Client:** \_\_\_\_\_ **Date:** \_\_\_\_\_

**TMP No:** \_\_\_\_\_ **TGS No:** \_\_\_\_\_ **Weather Conditions:** \_\_\_\_\_ **Diary Sheet: of** \_\_\_\_\_

**Start Time at Depot:** \_\_\_\_\_ **Time Arrive Onsite:** \_\_\_\_\_ **Commencement of Site Setup:** \_\_\_\_\_ **Site Setup and Operational:** \_\_\_\_\_

**Site Pulled Down at:** \_\_\_\_\_ **Time Aftercare signs setup:** \_\_\_\_\_ **TGS No:** \_\_\_\_\_ **Time left site:** \_\_\_\_\_ **Finish time at Depot:** \_\_\_\_\_

**Day Works**       **Night Works**       **Emergency Response**      **Site Setup as per TGS**  **Yes**  **No (if not comment on next page)**

**Attendance at Pre-Start Meeting**      **Did an incident occur (if yes complete incident report form)**  **Yes**  **No**

I confirm that the above times of 'setup' and 'pulldown' of traffic management signs and devices are a true and correct

Name (Site Supervisor): \_\_\_\_\_ Signed: \_\_\_\_\_

**Drive Through Checks** (Checks must be conducted at least every 2 hours)

Time of check entered. Rule off and leave blank if the check does not apply to the site. Make a note of any issues on the next page.

<b>Traffic Management Site Checks</b>	1	2	3	4	5	6	7	8	9	10
<b>Time</b>										
Are signs upright, clean, visible, level & stable										
Are taper lengths correct										
Are speed limit signs correct and doubled up										
Are sign spacings correct										
Are cone/bollard alignments straight & spaced correctly										
Are devices operating correctly										
Have pedestrians been catered for										
Are lane widths adequate										
Are vehicle queue lengths acceptable										

Is road surface condition adequate										
------------------------------------	--	--	--	--	--	--	--	--	--	--

**No. of Traffic Management Vehicles Onsite:** \_\_\_\_\_

**No. of Traffic Management Personnel Onsite:** \_\_\_\_\_

**Traffic Management Personnel Names & Accreditations:**

Position	Name	Accreditation Details	Time of Break from Stop/Slow (Traffic controllers must have a 15 minute break every two hours of constant stop/slow operation)							
			On	Off	On	Off	On	Off	On	Off
Crew Leader:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:

Traffic Controller:			:	:	:	:	:	:	:	:
Traffic Controller:			:	:	:	:	:	:	:	:

Additional  
Comments

---



---



---



---



---



---



---



---



---



---



---



---

I confirm that the details contained herein are true and correct

Name: (Traffic Management Crew Leader):

\_\_\_\_\_

Signed:

\_\_\_\_\_

## **Appendix D – DIPL Permit to Work**

**APPLICATION FOR PERMIT TO WORK WITHIN THE NT GOVERNMENT ROAD RESERVE**

PROPOSED WORK DETAILS					
Applicant's Name					
Business/Company Name					
ABN					
Road Name/s					
Location of works					
Description of works					
Dates of Proposed Works		From: / /20		To: / /20	
DEVELOPMENT/SERVICE & ROAD AGENCY APPROVALS					
DEVELOPMENT/SERVICE APPROVAL DETAILS:			ROAD AGENCY APPROVAL DETAILS:		
APPROVAL NUMBER:			APPROVAL NUMBER:		
APPROVED BY:			APPROVED BY:		
WORK ZONE TRAFFIC MANAGEMENT PLAN (TMP)					
The TMP shall be in accordance with the current AS1742.3, Provisions for Traffic and designed by a Northern Territory accredited Traffic Management Plan Designer. (WZ1)					
TMP Designed By:			Accreditation No.:		
INDEMNITY					
Public Liability Insurance minimum \$10 million					
Policy No.					
Policy holder					
Insurer		Expiry Date		/ /20	
Copy attached		Yes		If No, permit will not be approved	
APPLICANT'S DECLARATION					
<ul style="list-style-type: none"> <li>I/We understand that the permit is granted under the terms and conditions set out on the attached Conditions and Specifications and have read and understand those conditions and agree to comply with them accordingly.</li> <li>I/We agree to pay all fees and charges as assessed and estimated by DIPL prior to approval. (non-refundable).</li> </ul>					
Applicant's Name		Phone No			
Signature		Fax No			
Date		/ /20		E-mail	
RTM Receipt No:		Date:		/ /20	
DIPL Office Use Only - if all items below have <b>not</b> been met, the permit approval will <b>not</b> be granted					
TMP sufficient for use & attached.	RTM Receipt attached	Insurance details attached & compliant	Conditions of Approval signed, dated & attached.	Development approval confirmed with R/A or Database	WZTM Accreditation numbers supplied & registered at MVR
<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>	<b>Yes</b>
Permit approval Number:	Permit expiry date:		Processed By:		/ /20
	/ /20		Delegated Officer:		/ /20
Special Conditions:					
Extension of time: (Refer to Clause 1.5)					
Extended permit expiry date: / /20 . Approval officer: / /20					

Information collected on this permit application form may be made available under the *Information Act*.

# **Appendix E – Temporary Speed Limit Authorisation**

**TEMPORARY SPEED LIMIT AUTHORISATION**

LOCATION				
FROM CH:		TO CH:		
LOCATION DESCRIPTION				
TYPE OF WORK				
<b>DURATION</b>				
DATE FROM:		/	/20	DATE TO:
				/
				/20
Including / Excluding Weekends (circle one)				
TIME (EACH DAY)		Start Shift:	Hrs	Finish Shift:
				Hrs
		Start Shift:	Hrs	Finish Shift:
				Hrs
		Start Shift:	Hrs	Finish Shift:
				Hrs
ASSOCIATED PROJECT		No/Name:		
EXISTING SPEED LIMIT/s		KM/H	KM/H	KM/H
REQUESTED SPEED LIMIT/s		KM/H	KM/H	KM/H
REQUESTING PERSON				
REQUESTING ORGANISATION				
<b>DIPL AUTHORISATION</b> (Print Name, Sign & Date)				
Name:		Signature:		Date:
				/
				/20
Comments:				
DIPL Approving Officer to forward authorised document to: NT Police.				

## Appendix F – Traffic Data

Count data for count station on Channel Island Road:

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Inbound (veh/day)	339	371	454	502	872	1,514	2,199	1,548	1,358	<b>1,520</b>
Outbound (veh/day)	339	372	439	496	674	1,442	2,388	1,812	1,566	<b>1,535</b>
Two-Way (veh/day)	678	743	893	998	1,546	2,956	4,587	3,360	2,924	<b>3,055</b>

---

**Daily traffic volumes anticipated to be in the order of 150-200 vpd (peak hours).**

# **Appendix G – TGS Minimum – Works and Aftercare**



To be completed once construction methodologies have been identified.

## Appendix H – Compliance Checklist

Name:



Date:

---

# Traffic Management for Works on Roads

## **Introduction**

This document is a sample checklist for Traffic Management for Works on Roads. It is based on the Austroads Road Safety Audit Checklist 5 and it incorporates specific requirements in Western Australia. This checklist should be read in conjunction with Australian Standards AS 1742.3 and the DIPL Road Safety Auditor/ Permit to Work within the NT Government Road Reserve.

This checklist should be treated as a guide only. It does not provide an exhaustive list of questions to identify all possible instances of non-compliance that may be detected at a worksite in respect to a given Traffic Management Plan.

## **Definitions**

**Traffic Management Audit:** A formal examination of a Traffic Management Plan in which an independent, qualified examiner reports on the project's incident potential, safety and convenience performance.

**Suitability Audit:** A systematic and independent examination of the extent to which the Auditee's Traffic Management Plan addresses specified requirements and provides a measure of the Auditee's **capability** in meeting those requirements.

**Compliance Audit:** A systematic and independent examination of the extent to which an Auditee fulfils their traffic management requirements (including the Traffic Management Plan) and provides a measure of the Auditee's **performance** in meeting specified requirements.

**Traffic Management Plan:** That part of the Auditee's management plans which outlines the control measures for hazards associated with the traffic environment. The Traffic Management Plan also documents strategies to manage impacts created by works activities on the broader road network.

**Audit Team:** The team of people assembled to undertake the audit led by an appropriately competent and experienced team leader.

**Auditee:** The proponent of a Traffic Management Plan or the person(s) responsible for the implementation (and maintenance) of the Traffic Management Plan.

## **Reference Documents**

- Australian Standard AS 1742 - Manual of uniform traffic control devices Part 3 Traffic control devices for works on roads
- Australian Standard Field Guides series HB81
- DIPL Road Safety Auditor/ Permit to Work within the NT Government Road Reserve

## **Advice to Personnel Undertaking the Compliance Audit**

It is essential that personnel conducting a traffic management Compliance audit have the approval of either the Constructing Authority or the Road Authority prior to arriving at the worksite.

An "Entry Meeting" should be convened with the Auditee to obtain all relevant documentation from the Auditee and any other sources. Following the "on-site" inspection where the Traffic Management Plan has been implemented, the Auditor should meet with the Auditee at an "Exit Meeting" to convey the Findings and Recommendations from the Audit.

As soon as practical, a Corrective Action Request Form (See Appendix "A") identifying the Audit Findings and Recommendations is to be conveyed to representatives of the Road Authority and the Construction Authority. Areas where "Improvements" could be made should also be identified in the Corrective Action Request Form. The completed Corrective Action Request Form should be returned to the Audit Team Leader for inclusion in the Audit Report.

During the site inspection, Audit Team personnel should wear appropriate high visibility vests, safety foot apparel and helmets (where required), and comply with any other safety requirements that are applicable to the worksite being audited.

**Approvals,  
Traffic  
Management  
Plan**

<b>Item</b>	<b>Issues to be Considered</b>	<b>Yes/No</b>	<b>Comments</b>
1 Approvals	Have all the necessary approvals been obtained for access to the worksite?		
	Check for any major changes since the "Suitability Audit" on the Traffic Management Plan (TMP) was carried out.		
	Is the TMP for the roadwork approved by an Authorised Body? If not, has DIPL approval been obtained?		
2 Railway Crossings	Is the worksite in the vicinity of a Railway Crossing? If so, have the necessary approvals been obtained from the Railway Authority?		
	Does the TMP comply with the conditions of approval imposed?		
3 Traffic Signals	Is the worksite in the vicinity of Traffic Signals? If so, have the necessary approvals been obtained from DIPL?		
	Has the Traffic Operations Centre been advised of the scope and extent of the roadworks?		
4 Traffic Management Plan	Is there a Traffic Management Plan for the roadworks? If so, is it an approved Traffic Management Plan.		
	Does the Traffic Management Plan involve "complex traffic arrangements" as defined in the Code of Practice? If so, has the Traffic Management Plan been prepared, or reviewed and endorsed by a Road Authority		
	Check that the conditions for which the Traffic Management Plan was approved still apply.		
	Check for conditions of approval relating to working hours, number of traffic lanes, lane widths, signs & site instructions		
	Check to ensure that Traffic Control Diagrams (TCD) are included in the Traffic Management Plan. - Are these appropriate for the worksite?		
	Have the Traffic Control Diagrams (TCD) been assigned a unique reference number, dated and signed by an AWTM accredited person?		

**Pavement  
Geometry and  
Condition**

5. Active Worksites	Is there more than one active worksite?. If so are they part of the same project?		
	Are there approved Traffic Control Diagrams (TCD) for each of the active worksites?		

Item	Issues to be Considered	Yes/No	Comments
------	-------------------------	--------	----------

1 Geometry of Horizontal and Vertical Alignment	Are the roadworks located safely with respect to horizontal and vertical alignment? If not, does the signing and delineation erected cater for this?		
	Are the transitions from the existing road to the roadworks safe and clearly laid out?		

2 Speed Limits	Are the speed limits established on-site consistent with the modified road environment? If not, should this be changed or should the "safety space" to the worksite be increased?		
-------------------	---	--	--

3 Traffic Lane Safety and Visibility	Are the worksites clearly defined and appropriately separated from passing traffic?		
	Are the travel paths for both directions of traffic clearly defined? Check the transition at the interface of the modified alignment.		
	Is there the need to separate the opposing traffic flows?		

4 Marking and Delineation	Are centre lines, edge lines, lane lines clear and unambiguous?		
	Are temporary reflective markers (tags) installed to define the pavement markings? Are these well maintained?		
	Are movement paths through intersections delineated where required?		
	Are all fixed objects adjacent to and close to the travel path treated to ensure visibility at night?		

5 Cross Sections	Are lane widths, shoulders medians and other cross section features consistent with the requirements of DIPL Specifications		
------------------------	---	--	--

6 Pavement Condition	Is the road pavement free of defects (excessive rutting, potholes or loose material)?		
----------------------------	---	--	--

7 Ponding	Is the pavement free of areas where ponding or sheet flow of water may cause safety problems?		
--------------	---	--	--

Project: \_\_\_\_\_  
 Audited by: \_\_\_\_\_  
 Date: \_\_\_\_\_

**Traffic Control  
Devices**

8 Skid Resistance	Is the road pavement sealed? If so, does the pavement appear to have adequate skid resistance, especially on steep descents?
-------------------------	---

Item	Issues to be Considered	Yes/No	Comments
------	-------------------------	--------	----------

1 Traffic Control Devices Layout	Are the Traffic Control Devices set out in accordance with the Traffic Control Guidance Plan (TCGP)?		
	Sign legend, sequence and spacing?		
	Lateral placement and mounting height?		
	Are "Reduce Speed" signs located in accordance with AS 1742.3?		
	Are buffer zones established? Are the zone lengths consistent with the requirements of AS 1742.3?		
	Are "repeater" speed limit signs erected in accordance with AS 1742.3?		
	Are all signs and devices placed such that they are clearly visible to approaching drivers and other road users both day and night?		
	Are the signs erected at the correct mounting height on supports that are straight and stable?		
2 Traffic Lane Closures	Do the temporary works involve shoulder or traffic lane closures?		
	Are the taper lengths in accordance with AS 1742.3 for the posted speed limit?		
	Are traffic cones, bollards upright, secure, correctly spaced and neatly aligned?		
	Do the "lane status" signs depict the representative number of traffic lanes available at the sign?		
	Are temporary hazard markers (T5-4 and T5-5) aligned and spaced to comply with the requirements of AS 1742.3?		

Project: \_\_\_\_\_

Audited by: \_\_\_\_\_

Date: \_\_\_\_\_

**Traffic Control  
Devices**

- contd.

Item	Issues to be Considered	Yes/No	Comments
3 Traffic Control Devices Presentation	Are the illuminated flashing arrow signs located in accordance with the requirements of AS 1742.3?		
	Are the legends on the traffic signs consistent with those shown in AS 1742.3 and DIPL Road Safety Auditor/ Permit to Work within the NT Government Road Reserve? - If not, are they consistent with the functions intended?		
4 Redundant Signs	Are the signs clean, legible and presented on Class 1 retro reflective background?		
	Are redundant permanent signs (eg. Speed limit) covered over?		
5 After Work Hours	Are the signs remaining on-site after "work hours" (eg. Speed limit, symbolic worker, prepare to stop) applicable?		
6 Traffic Cones and Bollards	Do the traffic cones and bollards used meet the height and retro reflective band width for the road environment?		
7 Variable Message Signs	Are the variable message signs (VMS) used compliant with the requirements of AS 1742.3? As per DIPL Road Safety Auditor/ Permit to Work within the NT Government Road Reserve		
	Are these (VMS) signs located in the transition zone?		
	Are the letter sizes in accordance with AS 1742.3?		
	Are the number of "screens", legend and message consistent with the requirements of AS 1742.3?		
8 Portable Traffic Signals	Have the necessary approvals been obtained for the use of portable traffic signals?		
	Are these being used for the purpose intended (shuttle control)?		
	Are the single traffic lane lengths consistent with the requirements of AS 1742.3?		
	Are the portable traffic signals preceded by a "Prepare to Stop" (T1-18) sign?		
	Is the minimum sight distance of 150 metres available to the primary signal face?		

Project: \_\_\_\_\_  
Audited by: \_\_\_\_\_  
Date: \_\_\_\_\_



**Side Tracks,  
Unsealed  
Roads,  
Clearance to  
Excavations &  
Lateral Hazards**

Item	Issues to be Considered	Yes/No	Comments
	Are the traffic signals vehicle-actuated or on fixed time control?. Has the traffic signal operation been monitored to ensure safe and effective control without undue delays to traffic?		
1 Length, Width and Geometry	Does the constructed sidetrack meet the requirements of Specification 210 in maximum length, horizontal alignment geometry and width?		
2 Delineation	Is the forward geometry of the sidetrack well delineated? Are temporary hazard markers and roadworks delineators installed?		
3 Pavement Surface	Is the sidetrack sealed? If not, are provisions made for the maintenance of the surface condition?		
4 Unsealed Roads	Is the travel path well delineated with the correct coloured delineators in accordance with AS/NZS 1906.1?		
	Are the gradients of the pavement such (4%-6%) that surface water is dispersed?		
	Is there a maintenance regime for the pavement surface?. Has this been carried out?		
	Are speed limit signs erected?. If so, is the pavement surface maintained such that the posted speed limit is safe?		
5 Clear Zone	Are non-frangible objects located within the clear zone?. Can these be removed, re-located or shielded?		
6 Batter Slopes and Excavations	Are non-recoverable batter slopes or excavations located within the clear zone?.		
	Does the delineation offset and safety space provided comply with the TMR Code of Practice?		
7 Safe Workplace	Are the clearances from the worksite consistent with the requirements of AS 1742.3? If not, is the appropriate delineation provided or are Road Safety Barriers (RSB) installed?		
8 Road Safety Barriers	Are suitably rated Road Safety Barriers (RSB) installed in accordance with AS1742.3		
	Are the Road Safety Barriers installed with the recommended off-set from the travelled way?		

Project: \_\_\_\_\_

Audited by: \_\_\_\_\_

Date: \_\_\_\_\_

---

Are the Road Safety Barriers installed compliant with the manufacturer's requirements relating to minimum length, dynamic deflection clearance and end treatment?

---

**Compliance Audit  
Traffic Management  
for Works on Roads**

**Checklist 5.5**

Other Road  
Users,  
Traffic  
Controllers &  
Record  
Keeping

Project: -----

Audited by: -----

Date: -----

Item	Issues to be Considered	Yes/No	Comments
1 Pedestrians and Cyclists	Are appropriate travel paths and crossing points provided for pedestrians and cyclists?		
	Are pedestrians and cyclists warned of obstructions and temporary works hazards on their travelled way?		
	Are containment fences used to provide visible separation between the travelled way, the worksite and pedestrians?		
	Are facilities for pedestrians and cyclists in terms of width and pavement surface provided past the worksite?		
2 Elderly and Disabled	Are facilities for wheelchair users in terms of width, ramp gradients and pavement surface provided past the worksite?		
3 School Crossing	Is the worksite in the vicinity of a School Crossing? If so, has the Police School Crossing Section been informed?.		
	Has the crossing been appropriately relocated and provision made for alternate access to and from the crossing?		
4 Public Transport	Are bus stops appropriately located with adequate clearance from the traffic lane for safety and visibility?		
	Have the Bus Operators been informed of the changes.		
	Can pedestrians safely gain access to the bus stops?		
5 Over Dimensioned Vehicles	Has provision been made to accommodate the passage of over-dimensioned vehicles? If not, has the appropriate detour been provided?		
6 Driveways	Has provision been made to maintain vehicular access to properties? If not, has alternate access been provided?		
7 Traffic Controllers	Are the Traffic Controllers used on the worksite accredited, suitably attired and correctly positioned relative to sight distance and the "Prepare to Stop" signs?		
8 Record Keeping	Are the daily routine tasks of inspecting and maintaining the traffic control devices on-site recorded?		

Project:

Audited by:

Date:

---

Does the "Daily Diary" include the Traffic Control Diagram (TCD) number to identify the devices erected on-site for that day?

---

Project: -----

Audited by: -----

Date: -----

TRAFFIC MANAGEMENT CORRECTIVE ACTION REQUEST

Date : \_\_\_\_\_

CAR No. \_\_\_\_\_

PROJECT: \_\_\_\_\_

---

**1. Non-Conformance**

Risk Category \_\_\_\_\_

Signature \_\_\_\_\_  
**(Auditor)**

Signature \_\_\_\_\_  
**(Auditee's Acknowledgement)**

---

**2. Proposed Corrective Action**

Response required by \_\_\_\_\_

Signature \_\_\_\_\_  
**(Auditee)**

Planned Completion Date \_\_\_\_\_

---

**3. Follow up Details:**

Proposed Follow up Date \_\_\_\_\_

Signature \_\_\_\_\_  
**(Auditor)**

CAR Close out Date \_\_\_\_\_

**The Auditor is to provide copies of this form to the Asset Owner, Initiator and/or Superintendent as soon as practicable after the site inspection. The completed form is to be returned to the Auditor for inclusion in the Audit Report.**

---

## TRAFFIC MANAGEMENT AUDIT CORRECTIVE ACTION REPORT



Location/

Audit Type: **COMPLIANCE**

Report Title:

Auditor:

Organisation:

Date of Report:

<b>Audit Recommendation</b>	<b>Risk Category</b>	<b>Agree/ Disagree</b>	<b>Intended Action</b>	<b>By When</b>	<b>Reason</b>

**This Form is to be completed by the Auditee and returned to the Traffic Management Auditor for inclusion in the Traffic Management Audit Report.**

Signature of Auditee... Position/Title... Date: / /

# **Appendix I – Vehicle, small plant, equipment and miscellaneous store list**

This list may require signs and devices to be added

## Sign/Device List

Sign/Device Type	Code	Size/Other	Quantity
Roadwork 1km Ahead	T1-16A	1800x600	
Roadwork 2km Ahead	T1-16A	1800x600	
Roadwork Next km Ahead	T1-16A	1800x600	
Roadwork Ahead	T1-1A	1800x600	
Road Plant Ahead	T1-3-1A	900x600	
Road Plant Ahead	T1-3-2B	1800x600	
Road Plant on Side Road	T1-27A	1800x600	
Next 2km	T1-28A	600x600	
Next 2km	T1-28B	900x900	
Symbolic Worker	T1-5A	900x600	
Symbolic Worker	T1-5B	1200x900	
MMS Mobile works signs		1350x1150	TBC by DIPL
2 Lane Status	T2-6-1A	1200x900	
Speed Signs	R4-1-40	450x600	
Speed Signs	R4-1-50	450x600	
Speed Signs	R4-1-60	450x600	
Speed Signs	R4-1-70	450x600	
Speed Signs	R4-1-80	450x600	
Speed Signs	R4-1-90	450x600	
End 80	R4-12		
End 60	R4-60	450x600	
End 40	R4-12		
80 Ahead	G9-79		
60 Ahead	G9-79	450x600	
40 Ahead	G9-79		
Temporary Hazard	T5-4	1500x450	
Temporary Hazard	T5-5	600x600	
Prepare To Stop	T1-18B	1200x900	



Traffic Controller Symbolic	T1-34	
Stop/Slow Bats	R6-8/T7-1	450mm
Stop/Slow Bats	R6-8/T7-1	600mm
Stop Here on Red Signal	R6-6	
Signals Ahead	T1-30	
Signals Ahead	TW3-3 (LT)	
Slippery	T3-3	
Soft Edge	T3-6	
Rough Surface	T3-7	
Loose Stones	T3-9A	900x600
Loose Stones	T3-9B	1500x900
Gravel Road	T3-13	
Loose Surface	T3-14	
Pedestrian Watch your Step	T8-1	
Truck Entering	T2-25	
Truck Entering	W5-22 (LT)	
Traffic Hazard	T1-10	
Cones		450mm to 500mm
Cones		700mm and over
Traffic Bollards		All Heights

## Traffic Management Vehicles, Small Plant, Equipment And Miscellaneous Stores Required For The Duration Of The Project

Vehicle Plant Equipment and Miscellaneous Stores	Code	Size/Other	Quantity
Lead Vehicle	C +		
Work Vehicle	C LR MR HR		
Shadow Vehicle	C +		
Tail Vehicle	C +		
Truck Mounted Attenuator	LR MR HR		
Illuminated Flashing Arrow Sign	A Light vehicle	1260mmx650mm	
Illuminated Flashing Arrow Sign	B Cab Truck Mounted	1500mmx770mm	
Illuminated Flashing Arrow Sign	C Trailer or Truck Mounted	2400mmx1200mm	
Signals Ahead	T1-30		
Sign Stand	Trestle		
Sign Legs	Light weight		
Sign Legs	Steel		
Sign Legs	Post	(1.5m +)	
Oz Spikes			
Oz Spikes and Posts	Double sided clamps		
Two Way Radios Vehicle mounted			
Two Way Radios Hand Held			
Lighting Tower			
Variable Message Board			

# Appendix J – Vehicle Movement Plan

# VEHICLE MOVEMENT PLAN

Project: Darwin Magnetite Processing Facility Access Road

Project Number: 2019-0208

## VEHICLE MOVEMENT BETWEEN SITE AND SURROUNDING ROAD NETWORK

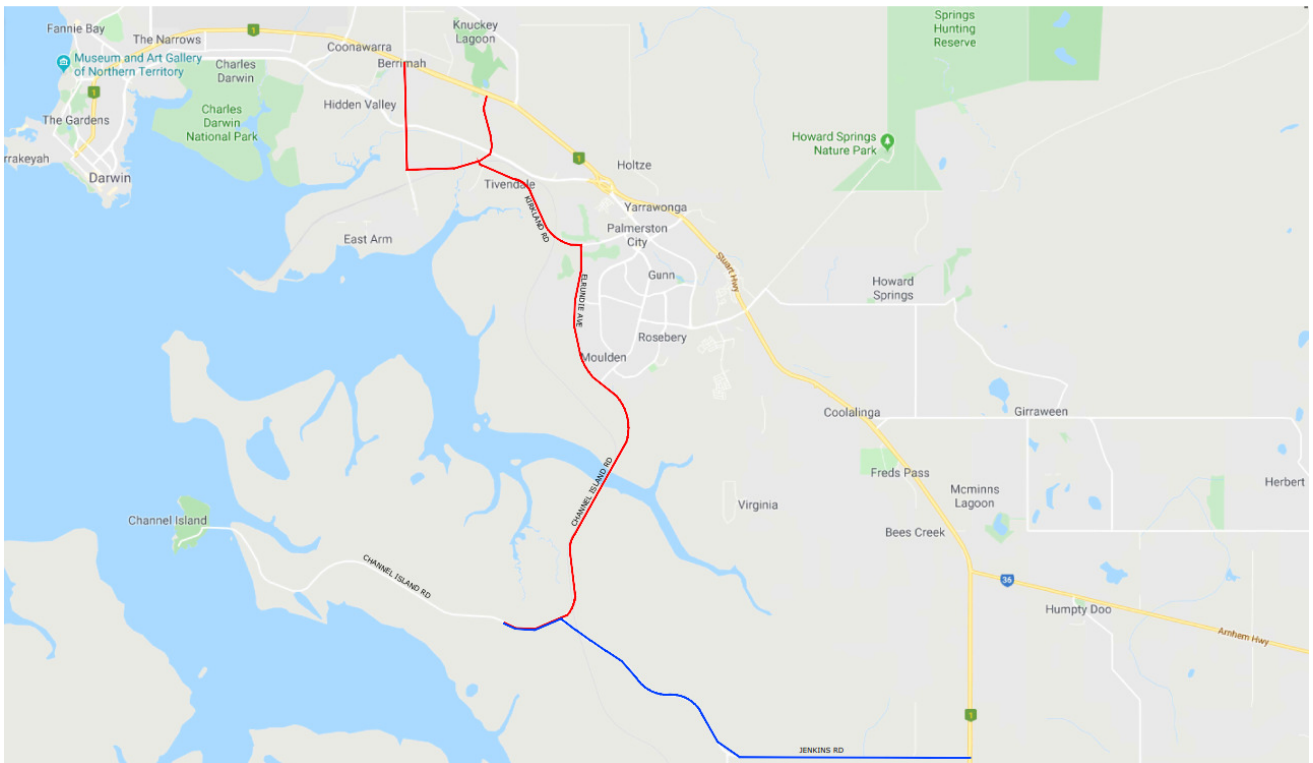
Vehicles departing site on route to the laydown area shall do so as described below.

Vehicles entering the traffic stream shall have the vehicle rotating lamp activated prior to entering the traffic stream and undertake the following:

- Enter the traffic flow, and
- Turn off the rotating yellow lamp(s) once a speed of 80 km/h is reached.

Vehicles approaching from the South West (including from the Arnhem Highway) will exit the Stuart Highway onto Jenkins Road and then to Channel Island Road proceeding inbound to avoid Palmerston city. Refer blue route shown below.

Vehicles travelling outbound from Darwin Port or surrounds will travel to Wishart Road. Vehicles shall then continue travelling on Kirkland Road before exiting onto Elrundie Avenue, vehicles are to proceed straight onto Channel Island Road. All vehicle traffic to and from the site is to avoid Palmerston city. Refer red route shown below.



## **PROCEDURE FOR ENTERING/EXITING WORKSITE AND TRAFFIC LANE**

Vehicles entering and exiting the traffic stream do so in an environment that is different from normal situations, and as such drivers need to be mindful of the conditions that may affect the safety of these movements.

Vehicles and plant required to enter the site shall do so as described below:

- At the start of the merge traffic by manoeuvring behind the delineations and utilizing the closed lanes to traverse the work site.
- All entry and exist movements will be in accordance with the Road Traffic Code and shall be undertaken in the following manner:
- As 'following' drivers would not commonly expect 'leading' vehicles to leave the roadway, their attention may be reduced. In recognition of this, drivers leaving the carriageway shall be required to undertake the following safe work practice:
- Decelerate slowly and signal their intention by indicator to leave the freeway traffic stream well in advance of their departure point.
- Activate the vehicle's rotating yellow lamp once a speed of 60 km/h has been reached and at least 50m prior to the entry locations.
- Switch on the vehicles hazard lights once the vehicle is stationary.

Vehicles entering the traffic stream shall have the vehicle rotating lamp activated prior to entering the traffic stream and undertake the following:

- Switch off the vehicle hazard lights.
- Indicate intention to enter the traffic stream using direction indicators.
- Ensure there is a suitable gap from oncoming traffic to allow for a safe entry manoeuvre.
- Accelerate while still in the emergency lane of coned off work site.
- Enter the traffic flow, and
- Turn off the rotating yellow lamp(s) once a speed of 80 km/h is reached.

## **PARKING FOR PERSONAL VEHICLES**

Contractors are to use nominated car parks at site office.

# Appendix K – Variation Request

## Variation to AS 1742.3 (2009) and SSRW SPRM PTW

### APPLICATION FOR APPROVAL TO VARY REQUIREMENTS OF AS1742.3 SSRW SSRM or PTW

**Request for Approvals to variations to be submitted at least one (2) week in advance, – except in an emergency This Approval for Variation shall be attached as a supplement to the Traffic Management Plan (TMP)**

#### Form Instruction

- Section A** – Identify the Principal Agency / person commissioning the activity. (Does not include contractors, subcontractors or **traffic** management company/traffic planners etc).
- Section B** – Identify activity location, start / finish date and time, type of traffic management, description location of activity.
- Section C** – For Works undertaken on a Territory road or on behalf of DIPL or Local Government Authority the details of the risk assessment process identified in this application form must be documented and endorsed<sup>1</sup> by an accredited WZ1 or RSA.

All applications to be addressed to the applicable DIPL Regional office. For contact information please refer to the DIPL PTW.

For all other applications the details of the risk assessment process identified in this application form must be documented and endorsed by the person responsible for approving the implementation of the traffic management plan.

Contact with the appropriate road authority should be made prior to lodgment of this application to determine its suitability and for any additional requirements. All applications to be addressed to the appropriate Authorised Body. If no listing can be found, refer this application to the appropriate DIPL Regional office.

- Section D** - Risk implication, identification and assessment process must be undertaken in accordance with Risk Management – Principles and Guidelines AS/NZS ISO 31000 and **Risk Assessment Techniques IEC/ISO 31010**. The likelihood and consequences should be rated after the application of any additional counter measures taken utilising Tables respectively.

- Incomplete or applications not signed** by the traffic planner will not be processed.

<b>A</b>	Applicant (Principal for the Works)				
Postal address					
Suburb		State		Postcode	
Project Manager			Telephone		
Email			Facsimile		

<b>B</b>	Anticipated start date			Anticipated finish date		
Daily work hours;	From		To		Weekend work applicable	Yes Sat Sun N o
Location of works (Road/Street Suburb),						
Road type (eg undivided, two lane)						
Description of works						
Are alterations to permanent traffic signals required?			Yes No N/A			
Posted Speed Limit		Worksite speed limit		After hours speed limit		

<b>C</b>	Traffic Planner					
DIPL Certification	RSA <input type="checkbox"/>		WZ1 <input type="checkbox"/>		WZ1 <input type="checkbox"/>	
Accreditation Number						
Postal address						
Suburb			State		Postcode	
Email			Telephone		Facsimile	
<b>Endorsement signature</b>			Date			

<b>For Internal Use Only</b>			
Approving Road Authority			
Approving Officer Position			
Application Approved	Yes <input type="checkbox"/>	No <input type="checkbox"/>	If Not Why Not
Additional Conditions			
Approved By: Signature	Title	Date	File

Type of Variation	<input type="checkbox"/> PtoW	<input type="checkbox"/> AS1742.3	<input type="checkbox"/> Other..... .....
-------------------	-------------------------------	-----------------------------------	--



<b>D</b> <b>Description of Variation Requested</b> (If insufficient space use other side)	<b>Specify Point of Departure from Standard / PtoW</b> (List section and page number)	<b>Justification</b> (Why is this necessary)	<b>Additional Counter Measures To Be Taken</b> Identify additional counter measures to be used to negate the lesser treatment)	<b>Identified Risk Implication2 Descriptor (Tick)</b> ✓
				<input type="checkbox"/> Insignificant <input type="checkbox"/> Minor <input type="checkbox"/> Moderate <input type="checkbox"/> Major <input type="checkbox"/> Catastrophic <b>Consequence</b>  <input type="checkbox"/> Almost certain <input type="checkbox"/> Likely <input type="checkbox"/> Possible <input type="checkbox"/> Unlikely <input type="checkbox"/> Rare <b>Likelihood</b>  <input type="checkbox"/> Extreme <input type="checkbox"/> High <input type="checkbox"/> Moderate <input type="checkbox"/> Low <b>Residual Risk</b>