APPENDIX C

Bushfire Management Plan

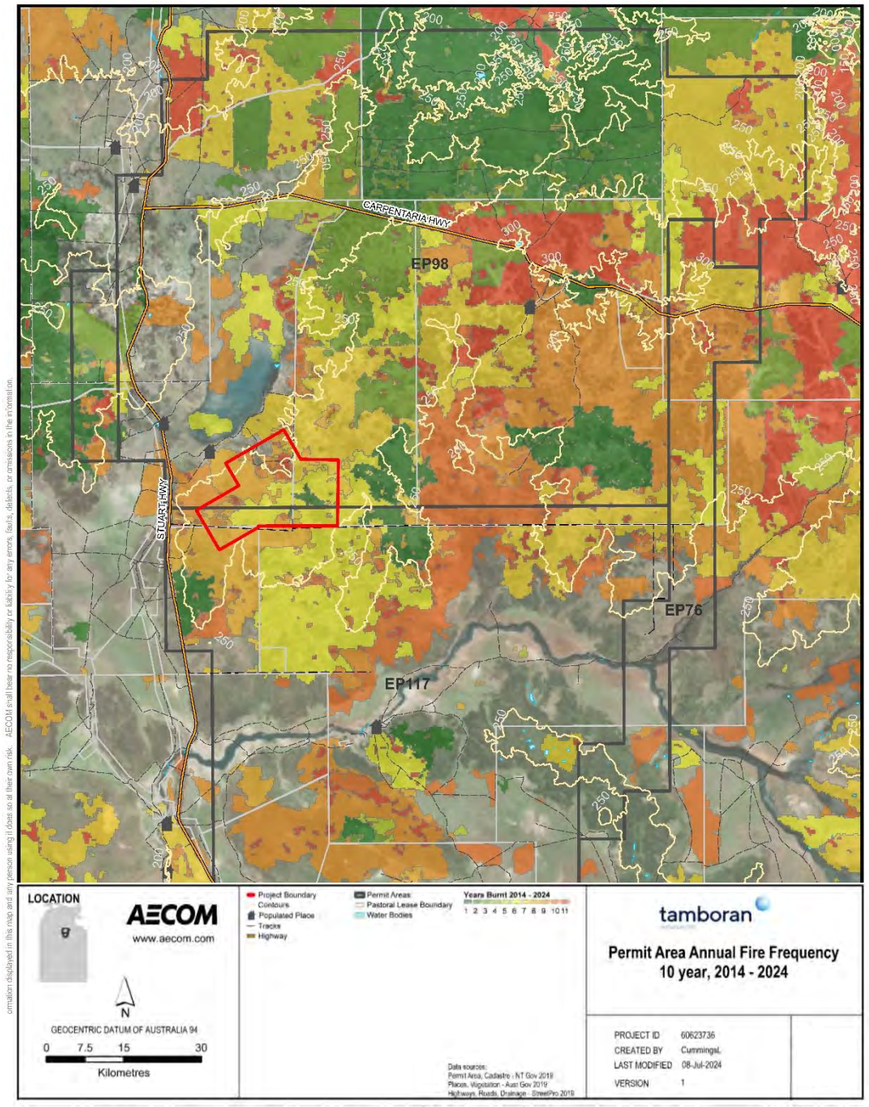
Exploration Permit 98 & 117
Bushfire Management Plan 2024 onwards
Shenandoah South 3D Seismic Program

(Rev 0, Oct-2024)

Location of Shenandoah South Seismic Program	
Property and land uses	Gas exploration and cattle grazing.
Site Fire Management Aim	To reduce the occurrence of, and minimise the impact of bushfires, thereby reducing the threat to life, property, cultural values and the environment.
Site Fire Management Objectives	Mitigate the potential impact of unplanned fires on Tamboran's people, assets and operations and neighboring land uses.

Fire Management Risks

- Ignitions (humans and lightening) on or off site resulting in harm to workers and loss of equipment.
- Fire scar mapping indicates the exploration area burns approximately every 3 to 5 years.
- Bullwaddy and Lancewood vegetation communities occur in areas across the permit and are fire sensitive. Hot fires can reduce habitat quality for both flora and fauna species that use these vegetation communities.
- Spread of high fuel load grassy weeds could increase fire intensity, e.g. gamba, grader and buffel grass, adjacent infrastructure areas and access tracks.

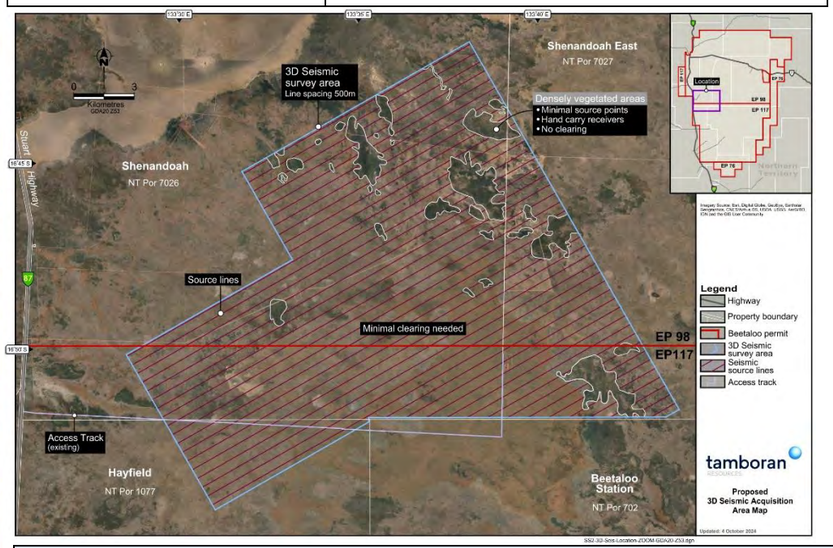


The BMP should be read in conjunction with the overarching Environment Management Plan and Emergency Response Plan for Tamboran's operations in the Beetaloo Basin.

Bushfire Officer	Contact Details	Name
	[redacted]	[redacted]

Properties	Contact Details		Name
Amungee Mungee Station	[redacted]	[redacted]	[redacted]
Hayfield/Shenandoah Station	[redacted]	[redacted]	[redacted]

Properties	Contact Details
[redacted]	[redacted]
Emergency	000 or 112 mobile
NT Bushfires Katherine office (Savanna)	(08) 8973 8876
NT Bushfires Alice Springs office (Barkly)	(08) 8952 3066
NAFI North	https://www.firenorth.org.au/nafi3/
Secure NT (Fire Bans)	https://securent.nt.gov.au/alerts
Fire incident map	https://www.pfes.nt.gov.au/incidentmap/



Bushfire Management Actions	
Seismic acquisition, including line preparation	• Adequate fire protection equipment to be provided to prevent fires, the spread of fire, injury to personnel, and to ensure local bushfire and other fire regulations are observed. • Fire extinguishers to be fitted to all vehicles and key locations at camp. • Line preparation in grassed areas will be flattened to reduce the build-up of fuel within the vehicle's engine bays. Routine inspection of vehicles throughout day.
Neighboring property fire management zone	• Fire management planning meeting with neighboring properties prior to commencing activities and reviewed annually. • Neighbor to advise proponent of planned burns.

Bushfire Preparedness and Planning

Mandatory for all Severe, Extreme and Catastrophic FDI days

The following must be reviewed daily. If fire alerts are active or presenting with a known risk (fire in the area), personnel must execute their contingency plans which need to encompass the following:

- ☐ Procedure on identifying and notifying of a bushfire.
- ☐ Critical equipment to be removed / isolated/ shut down.
- ☐ Safe evacuation routes from site and muster points.
- ☐ Communication methods:
  - ✓ Team channels and / or phone numbers
  - ✓ Area channels and/or phone numbers
- ☐ Closest 'Safe Havens'.

Monitoring

- ☐ Provide timely advice on changes in level of fire risk as available.
- ☐ Monitor team and area common channels for bushfire early warning.
- ☐ Update changes in work location.

Bushfire First Responder Checklist

The following sequence must be followed by the first person responding to a fire:

1. Danger – Remove yourself and others from danger is safe to do so.
2. Alarm – Raise the alarm either on common radio channel or other agreed process.
3. Gather Information –

- ☐ Location – Direction from known reference points, (e.g. roads and Tamboran's infra-structure such as lease pad location).
- ☐ Impacts (actual and potential) – Life, property and the environment.
- ☐ Fire characteristics – Grass or woodlands, flame height, fire front and direction of travel.
- ☐ Weather – Wind strength and direction.
- ☐ Response in progress – What response is underway and by who (Tamboran contractors, pastoralist or Emergency Services).
- ☐ Response required – Tamboran contractors and / or pastoralist and / or Emergency Services.
- ☐ Access – Safe access and egress routes.

4. Notify Tamboran – Fire Officer/Supervisor
5. Notify Pastoralists – Refer to Property Contacts
6. Notify Emergency Services—Call 000 or 112 if Tamboran and pastoralist unable to manage situation
7. Respond—If safe to do so in consultation with pastoralist
8. Handover—To pastoralist or Emergency Services as determined.

Annual Works Calendar

Month	Bushfire Risk	Action	Month	Bushfire Risk	Action
January	Low	• No fire management activity	**July**	High	• Manage vegetation onsite including weeds • Manage fire break and fire access trail • Monitor NAFI • Liaise with neighbor regarding bushfires
February	Low	• No fire management activity	**August**	High	• Monitor NAFI and visual scan horizon for smoke • Liaise with neighbour regarding bushfires • Review the preparedness planning requirements
March	Low	• Weed survey • Planning meeting with neighbor • Annual fire mapping to monitor changes to fire frequency in the relevant area	**September**	High	• Monitor NAFI and visual scan horizon for smoke • Liaise with neighbour regarding bushfires • Review the preparedness planning requirements
April	Low	• No fire management activity	**October**	High	• Monitor NAFI and visual scan horizon for smoke • Liaise with neighbor regarding bushfires • Review the preparedness planning requirements
May	Low	• No fire management activity	**November**	Medium	• Monitor NAFI and visual scan horizon for smoke • Liaise with neighbor regarding bushfires • Review the preparedness planning requirements
June	Medium	• Manage vegetation onsite including weeds • Manage fire break and fire access trail • Monitor NAFI • Liaise with neighbor regarding bushfires.	**December**	Low	• No fire management activity.

APPENDIX D

Weed Management Plan

Review date: 09/10/2024

BEETALOO EXPLORATION PROJECT
WEED MANAGEMENT PLAN

Review date: 09/10/2024

Weed Management Plan

TB2-HSE-MP-11

Review record

REV	DATE	REASON FOR ISSUE	AUTHOR	APPROVER
0	05/10/2018	Issue for release	A Court	M Kernke
1	29/03/2019	Issue for release	A Court	M Kernke
2	20/05/2019	Minor Update	A Court	M Kernke
2.1	10/09/2019	Minor update	M Kernke	M Hanson
2.2	10/09/2019	Minor update to include feedback from Amungee NW-1H EMP review		M Kernke
2.3	25/08/2021	Minor update to content based on DEPWS feedback	M/Kernke	M Kernke
2.4	10/11/2021	Update to include 2021 weed survey	M Kernke	M Kernke
2.5	18/01/2022	Update to include revised RWMP		M Kernke
2.6	27/02/2022	Update to include DEPWs comments	L Pugh	M Kernke
2.7	30/08/2022	Update to refence the *Tennant Creek Weeds Strategy 2021-2026* and Gamba Grass eradication in Zone A	L Pugh	M Kernke
3.0	30/03/2023	Updates to Section 1, 2 and minor edits	L Pugh	L Pugh
3.1	14/04/2023	Edits to figures	L Pugh	L Pugh
3.2	13/03/2024	Addresses regulation 10 and regulation 11 feedback from DEPWS, 29-Feb-2024	L Pugh	L Pugh
3.3	10/07/2024	Buffel grass status revised to a declared weed	L Pugh	L Pugh
3.4	27/09/2024	Updates to section 5 and 9; addresses regulation 10 feedback from DEPWS, 26-Sept-2024	L Pugh	L Pugh
4.0	10/10/2024	Update for SS 3D Seismic EMP and update of regulators of the *Petroleum Act 1984*, Petroleum Regulations 2020 and Petroleum (Environment) Regulations 2016	A Court	L Pugh

Review date: 09/10/2024

Contents

Figures

Tables

Appendices

1 Introduction

1.1 Objectives of the Weed Management Plan

This Weed Management Plan (WMP) has been developed to ensure that the risk of weed introduction and spread, resulting from activities associated with Tamboran's exploration activities are mitigated to protect the economic, community, industry and environmental interests of the Northern Territory (NT).

The plan provides an overview of:

- The project context (Section 2).
- Legal requirements in relation to weed management (Section 3).
- The appointment of a dedicated Weed Officer (Section 4).
- Identified risks and proposed mitigation measures and management objectives (Section 5 and 6).
- The weed species that are considered likely or known to occur within the permit area (Section 6 and 7).
- The annual action plan for those species that are known to occur within the permit area (Section 8).
- Control options for species known to occur within the permit area (Section 8).
- The monitoring, notification, recording and reporting requirements for the WMP (Sections 9 – 12).

This plan is supported by appendices that provide guidance on how to identify weed species in the field and collect the necessary data to support the monitoring and reporting requirements of this WMP.

The location of the proposed exploration activities are shown in Figure 1.

1.2 Intent of the WMP

Weed control is a significant land management issue in the NT. This WMP forms a core component of Tamboran's overarching environmental management strategy and supports the various project Environment Management Plans (EMPs).

The movement of rigs, vehicles, machinery and other materials to, from and within the exploration permit area may result in weeds being moved around the pastoral lease, into the lease from surrounding areas or interstate, depending on where the vehicles and materials are sourced from or returned to.

The focus of this WMP is therefore to ensure that infestations are eradicated, or at the very least that existing weed infestations are controlled such that no further weed species colonise the permit area as a result of Tamboran's activities.

This document is based on the Weed Management Planning Guide - Onshore Shale Gas Development Projects produced by the Department of Environment, Parks and Water Security (DEPWS 2019), now known as the Department of Lands, Planning and Environment (DLPE).

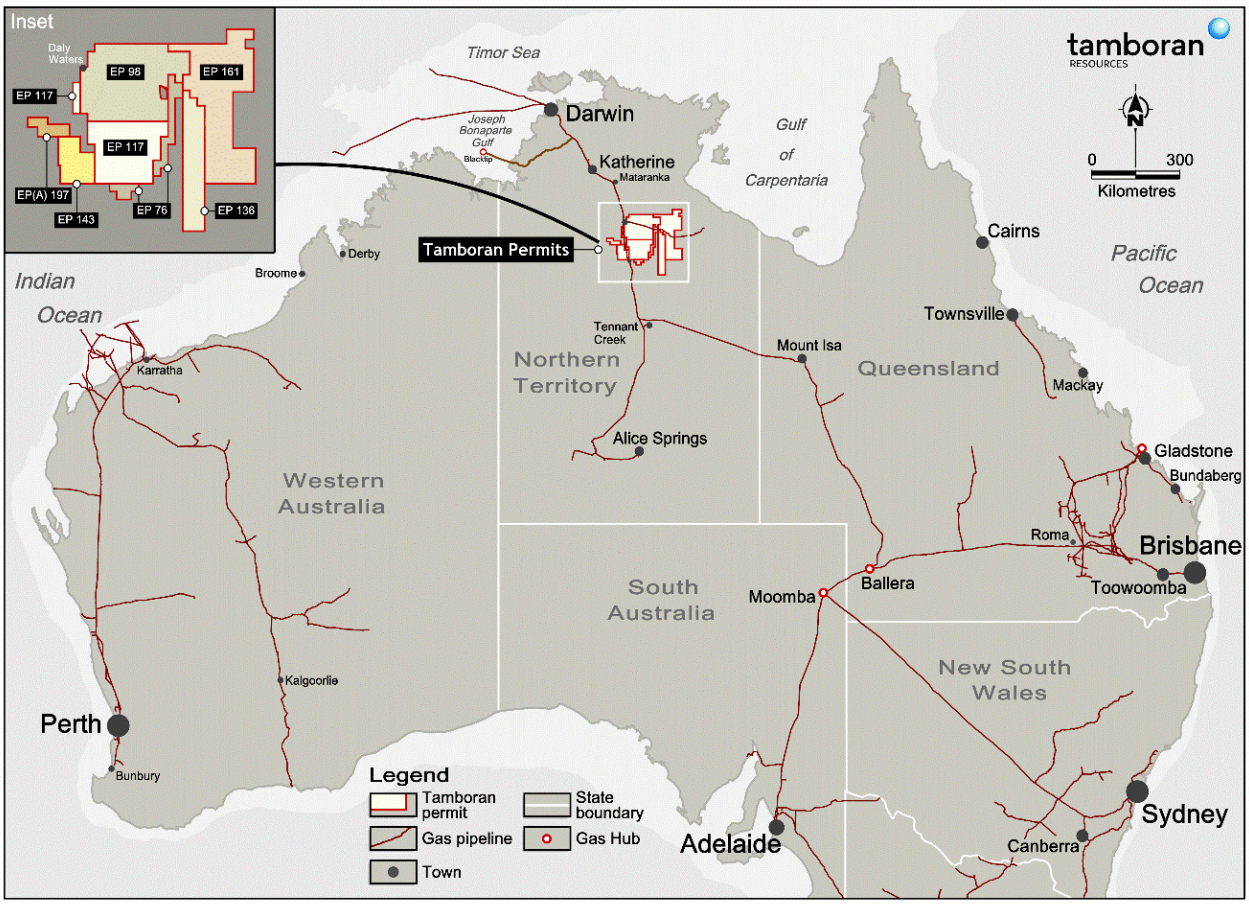


Figure 1 Location of Tamboran exploration permit areas (EPs)

2 Project Context

This plan covers all civil, seismic, drilling, stimulation, rehabilitation and routine maintenance/monitoring activities undertaken by Tamboran within its permit areas (Figure 1).

The primary activities subject to this WMP include but are not limited to:

- Access track construction, use and maintenance
- Gathering line construction, use and maintenance
- Seismic acquisition and line rehabilitation
- Exploration lease pad construction, use and maintenance
- Gravel pit construction and maintenance
- Drilling, stimulating, completing and maintaining petroleum exploration wells
- Routine access, maintenance and monitoring of all exploration areas subject to this plan.

3 Legal Requirements

The following section presents the relevant legislation and statutory obligations for the project.

3.1 Petroleum Act and subordinate legal instruments

Petroleum Act 1984, Petroleum (Environment) Regulations 2016 and ***Code of Practice for Petroleum Activities within the Northern Territory***

The *Petroleum Act 1984* provides the legal framework within which persons are encouraged to undertake effective exploration for petroleum and to develop petroleum production so that the optimum value of the resource is returned to the NT. It regulates the exploration for, and production of petroleum, including environmental protection measures which should be employed during exploration and production activities, including protection of parks and reserves and rehabilitation.

In addition, the Act is supported by the Petroleum (Environment) Regulations 2016 (the Regulations). The Regulations require that regulated activities are carried out in a manner consistent with the principles of ecologically sustainable development, and by which the environmental impacts and environmental risks of the activities are identified and reduced to as low as reasonably practical (ALARP) and acceptable levels.

The *Code of Practice for Petroleum Activities in the Northern Territory* (the Code) is a mandatory code of practice for the petroleum industry to ensure that petroleum activities in the NT are managed according to minimum acceptable standards to ensure that risks to the environment can be managed to a level that is ALARP and acceptable.

Under this legal framework, Tamboran is required to submit an EMP prior to any petroleum exploration or production activity.

EMPs must include:

- potential environmental risks or impacts (in this instance relating to the introduction and spread of weeds)
- appropriate environmental outcomes, environmental performance standards and measurement criteria
- appropriate implementation strategy and monitoring, recording and reporting arrangements, and
- demonstrate that there has been an appropriate level of engagement with directly affected stakeholders in developing the plan.

This WMP is designed to support and implement the requirements of Tamboran's project specific environment management plans.

3.2 NT Weeds Management Act

The aim of the *Weeds Management Act 2001* is *"to protect the Territory's economy, community, industry and environment from the adverse impact of weeds"*.

The purpose of the Act, as defined in section 3, is:

- To prevent the spread of weeds in, into and out of the Territory and to ensure that the management of weeds is an integral component of land management in accordance with the NT Weeds Management Strategy 1996 – 2005 or any other strategy adopted to control weeds in the Territory.

- To ensure there is community consultation in the creation of weed management plans.
- To ensure that there is community responsibility in implementing weed management plans.

As of the 8 July 2024, the Act[1] identifies declared weeds (those which must be controlled) and provides a framework for weed management. Weeds may be classified according to any of the following purposes:

Class A	it is necessary to eradicate the plant
Class B	it is necessary to prevent the growing and spreading of the plant
Class C	it is necessary to prevent the introduction of the plant into the Territory or a part of the Territory
Class D	it is necessary to prevent the plant being spread by the actions of persons.
Unclassified	Declared but not classified as A, B, C or D.

* All Class A and B weeds are also Class C.

The Act enables the relevant Minister to approve statutory weed management plans. Management obligations in these plans must be adhered to.

There are statutory management plans for 10 high priority weed species in the NT. The WMP must address weeds in accordance with their declaration status and the statutory requirements of any relevant weed management plans.

3.3 Regional Weed Management Strategies

Regional Weed Strategies (RWS) have been developed for areas of the NT, with the Tennant Creek regional weeds strategy 2021 – 2026 and the Katherine regional weeds strategy 2021 – 2026, overlapping Tamboran's Beetaloo exploration tenure. The aim of these regional plans is to assist in prioritising weed management by:

- identifying the region's priority weeds and associated pathways of spread to inform management priorities
- identifying landscapes that may need prioritised protection from weed impacts like river corridors or sacred Aboriginal sites
- containing information on alert weeds that are not yet found in the region, but could become major issues if they establish.

3.4 Commonwealth Environment Protection Biodiversity Conservation Act

The objectives of the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) are, among other things to:

- provide for the protection of the environment, especially those aspects of the environment that are matters of national environmental significance; and
- promote ecologically sustainable development through the conservation and ecologically sustainable use of natural resources; and

[1] Refer Part 2, section 7(4).

- promote the conservation of biodiversity; and
- promote a co-operative approach to the protection and management of the environment involving governments, the community, land holders and indigenous peoples; and
- assist in the co-operative implementation of Australia's international environmental responsibilities.

The EPBC Act provides for the identification and listing of key threatening processes on matters of national environmental significance (MNES). A threatening process is defined as a key threatening process if it threatens or may threaten the survival, abundance or evolutionary development of a native species or ecological community. Key threatening processes include invasive species, such as weeds, which have a major impact on Australia's environment, threatening our unique biodiversity and reducing overall species abundance and diversity (DCCEEW, 2018).

Threat abatement plans (TAP) are developed to address key threatening processes. A TAP has been developed covering 5 listed grass species present within the Northern Territory (DCCEEW, 2012). The TAP covers grasses originally introduced to support pastoralism: gamba grass (*Andropogon gayanus*), para grass (*Urochloa mutica*), olive hymenachne (*Hymenachne amplexicaulis*), mission grass (*Pennisetum polystachion*) and annual mission grass (*Pennisetum pedicellatum*).

The controls in this WMP are designed to align with the Commonwealth TAP.

4 Dedicated Weed Officer

As per recommendation 8.3 of the Scientific Inquiry into Hydraulic Fracturing Stimulation there must be a dedicated Weed Officer for each gas field.

The Weed Officer must have relevant skills and experience and availability to successfully manage weed related issues for the project, including:

- Knowledge of the biology/ecology of local weeds.
- Knowledge of relevant weed management frameworks including NT legislation and plans, the EPBC Act.
- Understanding of existing weed management arrangements being undertaken by landholders.

The Weed Officer is responsible and accountable for delivery of all weed related requirements of the project in accordance with the WMP and the overarching EMP, including:

- Planning and execution of weed monitoring requirements, including baseline weed assessments and ongoing monitoring both during periods of gas related activities as well as during the target identification period of February to May.
- Facilitate training all workers (including contractors) in weed management requirements, with support from the NT Government Onshore Petroleum Weed Management Officer.
- Oversight of implementation of weed control mechanisms including but not limited to wash-downs and proactive weed control programs.
- Ensuring all reporting requirements are met.
- Act as the designated point of contact for and rapidly responding to any weed related complaints and incidents in accordance with the pre-determined strategies in this WMP and additional

strategies as required developed in consultation with the Onshore Petroleum Weed Management Officer and affected landholders.

- Review and update of WMPs to remain effective in communication with relevant landholders and Onshore Petroleum Weed Management Officer in consideration of monitoring results and emerging weed issues for both gas and pastoral operations.

Tamboran has appointed the **Beetaloo Field Manager** as the dedicated Weed Officer of the Beetaloo exploration activities. This role is supported by Tamboran's Approvals and HSE personnel.

5 Baseline Weed Species Information

Baseline and annual weed surveys have been completed across the proposed and existing exploration areas. These surveys indicate the abundance of weeds within the proposed and existing project areas are low.

No weeds were detected within the Shenandoah South E&A program during the December 2022, April 2023 and May 2024 field survey. *Hyptis suaveolens* (Hyptis), has been identified at the Kalala S1 and Amungee NW site (access tracks, camp pad and lease pad). Hyptis has also recently been observed at the Velkerri 76 S2 site camp pad and irrigation area. Rubber Bush and *Parkinsonia aculeata* (Parkinsonia) have been previously identified along/in proximity to the Beetaloo W access track, with rubber bush also found along the Kyalla 117 N2 access track. Parkinsonia is considered a Weed of National Significance (WoNS), which are weed species that are the focus of national management programs for the purpose of restricting their spread and/or eradicating them from parts of Australia. These species are specifically presented in Table 1 and Section 9.

Gamba Grass (*Andropogon gayanus*) is a Declared Class A (to be eradicated) weed within the Beetaloo Sub-basin.[2] Gamba Grass is grown within the Class A zone on two pastoral leases under strict permit conditions. These pastoral leases are subject to annual audits and regular inspections to ensure it is not spread outside the permitted areas. An active compliance program is in place to ensure eradication is being achieved in Zone A, as per the requirements of the statutory weed management plan for gamba grass (DEPWS 2020).

One incursion of Gamba Grass was treated at Amungee NW1 (EP 98) in 2023 and another (single plant not in seed) in May 2024 at Kyalla 117 N2 (EP 117). No other incursions pf Gamba grass has been identified within the Tamboran's exploration permits (e.g. EP 117, EP 98 and EP 76). Tamboran is committed to preventing the spread of Gamba Grass into the project area from known Gamba locations. Gamba grass incursions will continue to be identified, recorded and treated in accordance with the Threat Abatement Advice released by the Commonwealth Government.

Figure 2 illustrates the weeds species confirmed in the region during field surveys, along with other weed species that are known to occur or likely to occur within the wider exploration permit areas. This information is based on.

- Tamboran exploration program weed survey data (2014 onwards – results).
- Mapping data provided by the Weed Management Branch, DLPE.
- Guidelines for the Management of the Weeds of Beetaloo 2018 (DLRM et al 2018).
- Tennant Creek weeds strategy 2021 – 2026 and Katherine weeds strategy 2021 – 2026.

[2] The Beetaloo lies within the NT Statutory Weed Management Zone Class A (for eradication).

- Department of Climate Change, Energy, the Environment and Water (DCCEEW) EPBC Act Protected Matters Report database.

Table 1 has been separated into priority weeds, which are broken down into 5 distinct categories:

- Category 1: These species are present in the region and are widely considered feasible to eradicate. They are typically evaluated as very high risk and have isolated and restricted distributions.
- Category 2: These species warrant strategic control across the landscape due to the high impact they have on land managers and on broader economic and environmental values. The key for these species is that outlier populations are practical to eradicate, but there are core infestations that are subject to control and containment. They are typically covered by a statutory weed management plan, the target of a specific program or similar; often they are Weeds of National Significance.
- Category 3: These species have been assessed by the weed risk management system as a medium to high risk (or have not been assessed) and have been identified by stakeholders as posing a threat to the values of the Region. The list is not comprehensive. There are no plans or strategies to manage any one of them as a species across the landscape. They are typically managed on a site basis and to prevent further spread. In some cases there may be local strategies to manage these weeds.
- Category 4: These species are typically evaluated as low risk; however, they do still have local impacts. There are no strategies in place for managing these species at a landscape scale. However, it is important for landholders to implement weed hygiene and other biosecurity measures to prevent the spread of weeds into clean areas, and to control these species where the opportunity arises. Typically, these weeds may become problems around infrastructure, drains and other disturbed areas.
- Category 5: The Weed Management Branch uses a working definition of an ‘alert’ weed as a species:
    - not yet naturalised in a region
    - with the potential to have a high level of impact should it become established
    - having a reasonable likelihood of arriving in the Region (or of being present undetected).

It is noted that Parthenium (*Parthenium hysterophorus*) is a major problem in rangelands and cropping areas of Queensland and is estimated to cost farmers and graziers more than $22 million a year in reduced production and increased management costs. Vehicle, machinery and material movements from Queensland into the project area present a risk of spread of Parthenium if not managed correctly (Department of Primary Industry and Resources 2016).

Additional mapped locations of weeds within the Tennant Creek and Katherine RWMS are provided in Figure 3, Figure 4 and Figure 5.

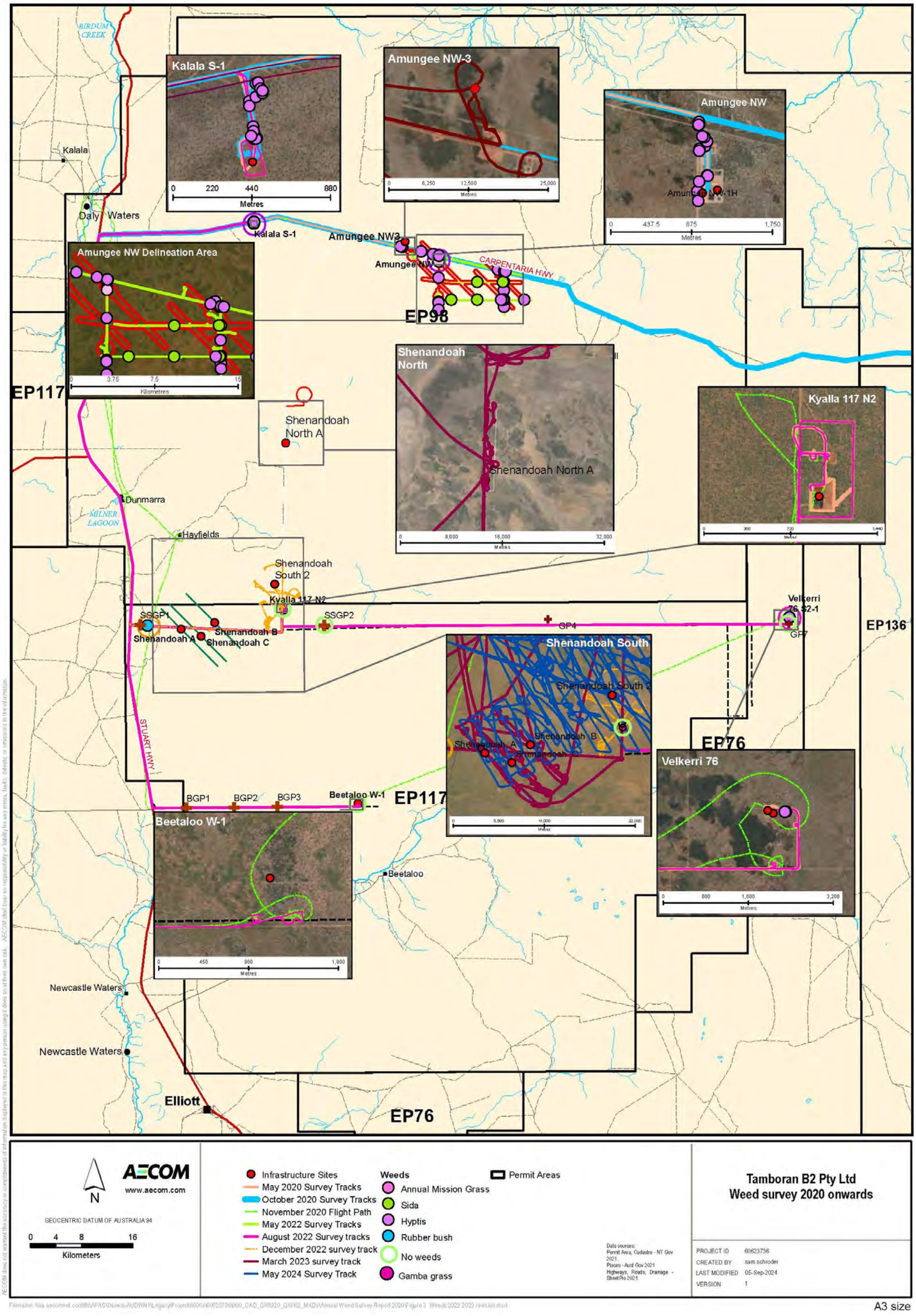


Figure 2 Location of weeds species in EPs

Review date: 02/09/2024

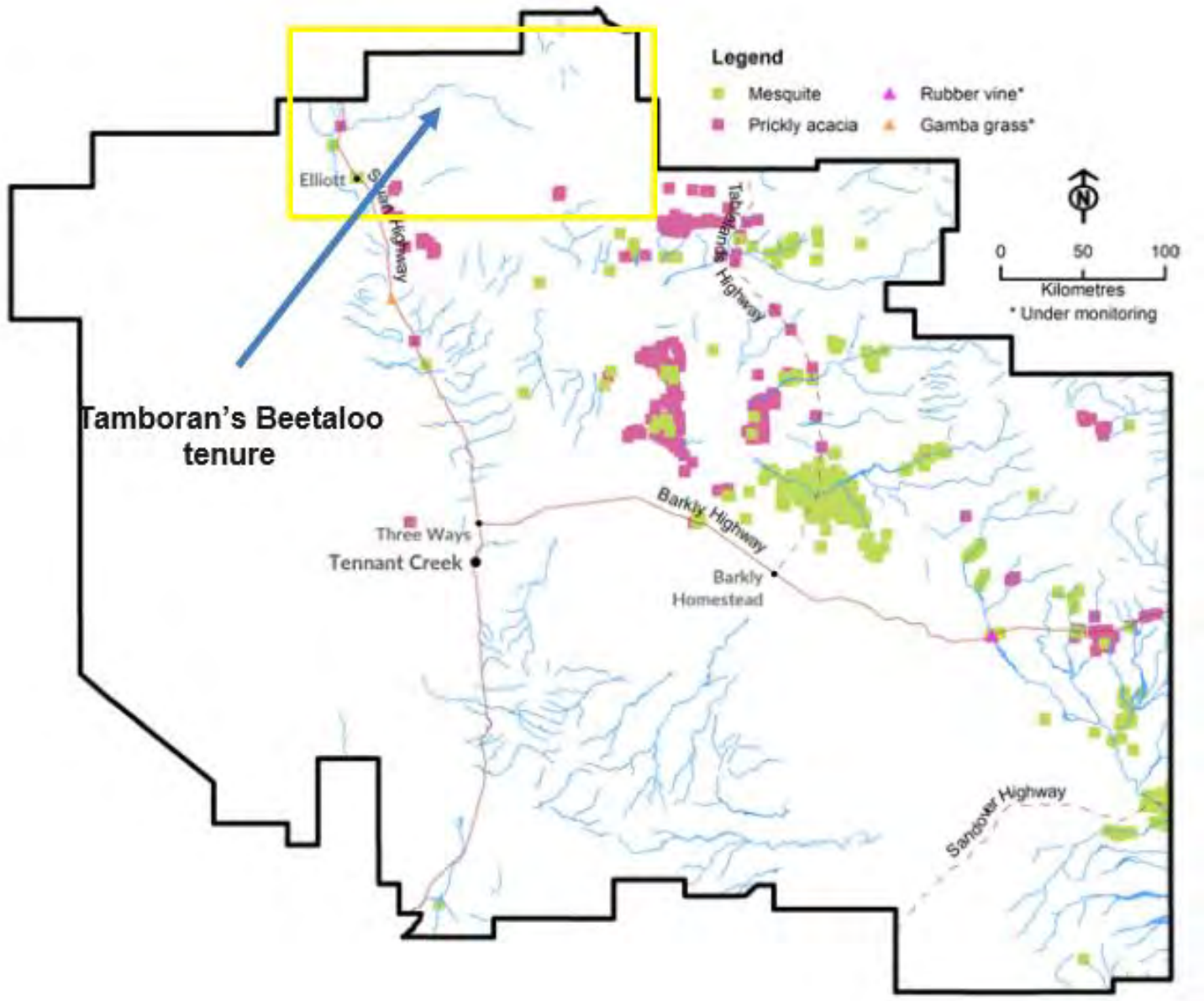


Figure 3 Tennant Creek RWS mapped priority weed for eradication locations (DEPWS 2021)

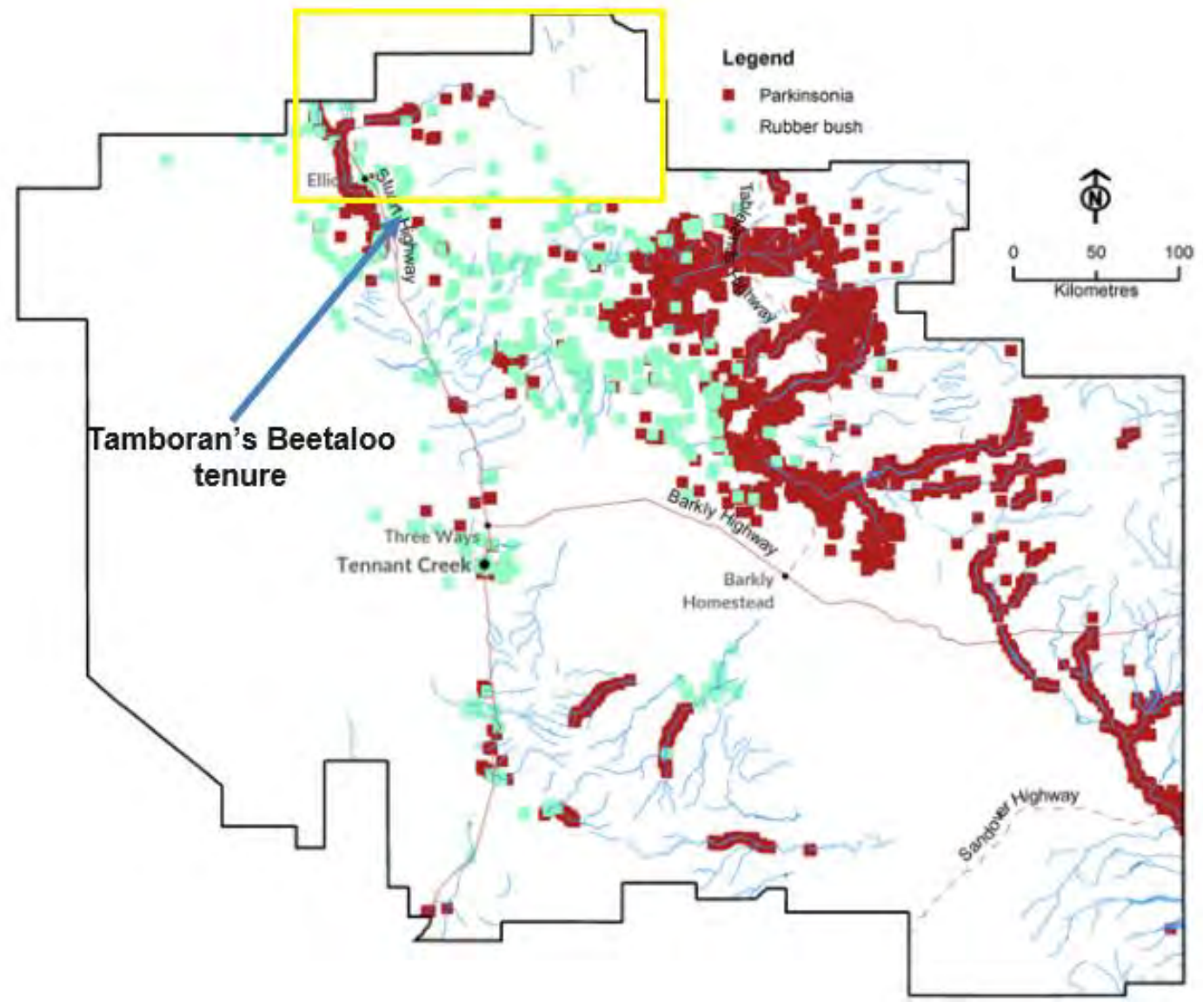
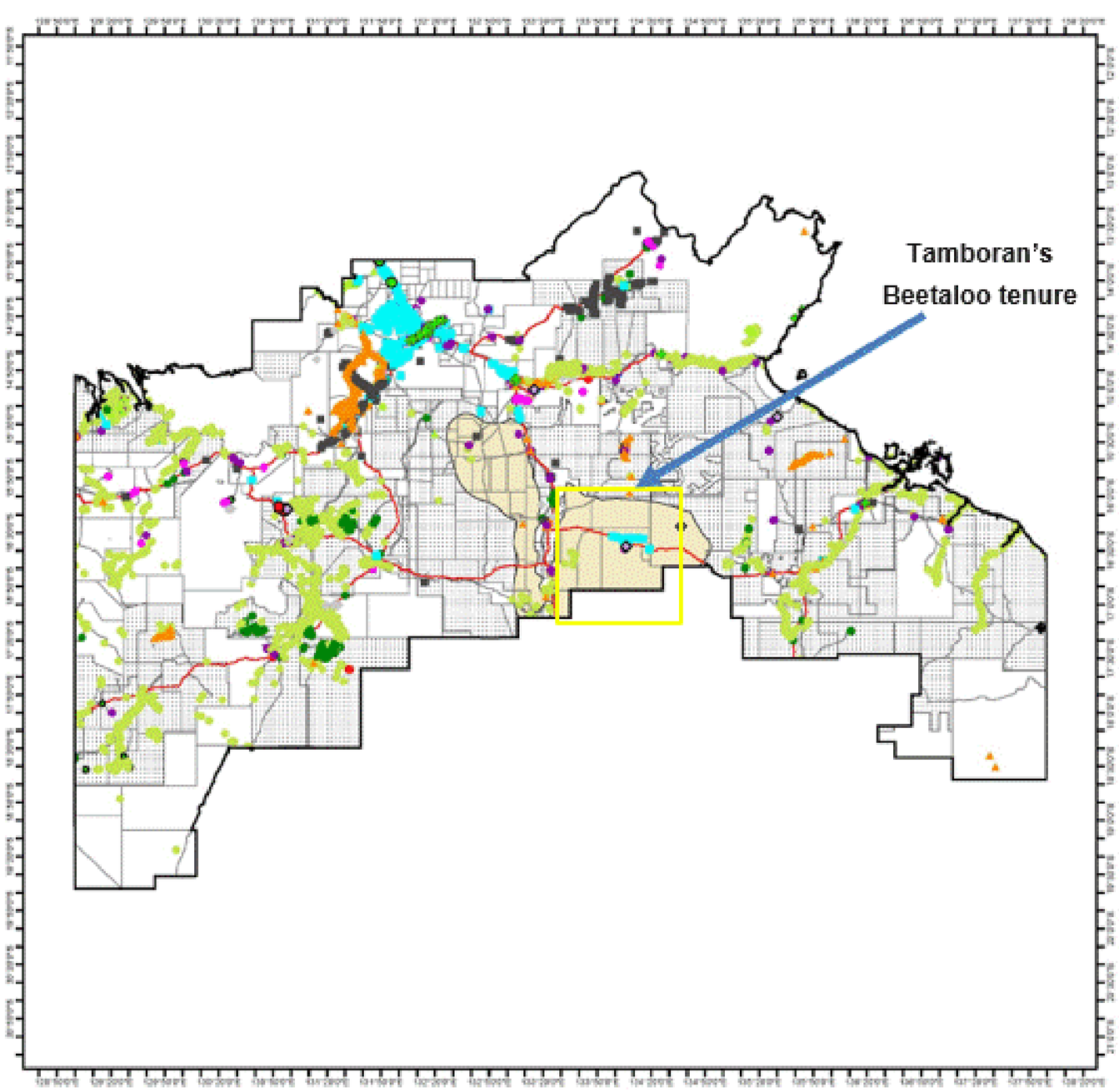


Figure 4 Tennant Creek RWS priority weeds for strategic control (DEPWS 2021)



Katherine Region Priority and Alert Weeds

- Arrowhead
- Athel pine
- Bellyache bush
- Cabomba
- Chinee apple
- Devils claw
- Gamba grass
- Grader grass
- Mesquite
- Mimosa
- Neem
- Parthenium
- Parkinsonia
- Pond apple
- Prickly acacia
- Rats tail grass - Giant
- Rope cactus sp
- Rubber vine
- Rubber vine - Ornamental
- Salvinia
- Siam weed
- Thatch grass
- Water hyacinth
- Water mimosa - plena
- Beetaloo Sub Basin
- Exploration Permit
- NT Cadastre

0 75 150 300 Kilometers

Datum: Geocentric Datum of Australia (GDA94)

CAUTION: The weed infestation information displayed in this area may not be limited to this representation

DATA SOURCE:
Weeds: Weed Management Branch, DENR
Property Infrastructure: Rangelands, DENR
Cadastre/Roads/Placenames:
Dept Lands, Planning and Environment
Drainage: 250K © Commonwealth of Australia (BoM) 2012

For further information, please contact:
Weed Management Branch
Department of Environment, Parks and Water Security (DEPWS)
Goyder Centre, Palmerston NT 0830
Phone: (08) 8999 2355
www.nt.gov.au/weeds

NORTHERN TERRITORY GOVERNMENT

Map compiled: 13/12/2021

Figure 5 Katherine RWS mapped priority and alert weeds

Table 1 NT listed weeds known or likely to occur within the EPs

Scientific name	Common name	Declaration Status*	Category	Data source
Alternanthera pungens	Khaki Weed	Class B & C	4	DCCEEW Protected Matters Report
Andropogon gayanus	Gamba Grass	Class A/B & C WoNS	1	Confirmed within exploration lease. High potential introduction through sourcing of equipment from Katherine and Darwin area.
Calotropis procera	Rubber Bush	Class B & C (south of 16°30' S latitude)	2	Mapped in the exploration lease within the Tennant RWS.
Cryptostegia grandiflora	Rubber Vine	Class A & C	1	Mapped in the exploration lease within the Katherine RWS.
Hyptis suaveolens	Hyptis	Class B & C	4	Confirmed within exploration lease during previous Tamboran weed surveys.
Jatropha gossypiifolia	Bellyache Bush	Class A/B & C WoNS	1	Mapped in the exploration lease within the Katherine RWS. Potential introduction through sourcing of equipment from Katherine area.
Parkinsonia aculeata	Parkinsonia	Class B & C, WoNS	2	Confirmed within exploration lease during previous weed Tamboran surveys and Mapped in the exploration lease within the Katherine RWS. Potential introduction through sourcing of equipment from Katherine area.
Prosopis pallida	Mesquite	Class A & C, WoNS	1	Mapped in the area surrounding exploration lease within the Katherine and Tennant Creek RWS.
Themeda quadrivalvis	Grader Grass	Class B & C, WoNs	5	Confirmed within the exploration lease and mapped in the area within the Katherine RWS. High potential introduction through sourcing of equipment from Katherine area.
Parthenium hysterophorus	Parthenium	Class A & C, WoNS	1/ 5	Confirmed by DLPE to occur within the exploration lease. Potential introduction through equipment sourced from QLD.
Cryptostegia grandiflora	Rubber vine	Class A & C, WoNS	1	Alert Species within the Tennant Creek and Katherine RWS.
Chromolaena odorata	Siam Weed	Class A & C	5	Alert Species Katherine RWS.
Azadirachta indica	Neem	Class B & C	2	Weed Management Branch – Mapping data
Cenchrus ciliaris	Buffel Grass	Declared, Unclassified	3	DCCEEW Protected Matters Report
Cenchrus echinatus	Mossman River Grass	Class B & C	3	DLRM databases (DLRM *et al* 2018)
Datura ferox	Fierce Thornapple	Class A & C	3	DLRM databases (DLRM *et al* 2018)

Scientific name	Common name	Declaration Status*	Category	Data source
Sida acuta	Spinyhead sida	Class B & C	4	Weed Management Branch – Mapping data
Sida cordifolia	Flannel Weed	Class B & C	4	Weed Management Branch – Mapping data DLRM databases (DLRM *et al* 2018)
Sida rhombifolia	Paddy's Lucerne	Class B & C	4	DLRM databases (DLRM *et al* 2018)
Vachillia nilotica	Prickly Acacia	Class A & C, WoNS	1	Mapped in the exploration lease within the Katherine RWS.
Xanthium strumarium	Noogoora Burr	Class B	3	Weed Management Branch – Mapping data DLRM databases (DLRM *et al* 2018)
*All Class A and B weeds are also Class C weeds.				

6 Weed Management Mandatory Requirements

6.1 Weed hygiene declarations for vehicles and equipment

a) All vehicles, equipment and loads are to be clean (free of plant matter, seeds, dirt and mud) and have a valid weed hygiene declaration form prior to accessing any pastoralist property

b) Weed hygiene certificates are only to be issued by an authorised inspector that is satisfied that the vehicle is free of plant matter, seeds, dirt, mud animal wastes and any other time that could potentially represent a biosecurity or weeds risk.

c) An authorised inspector is someone who has successfully completed the nationally recognised "AHCBIO201- Inspect and clean machinery for plan, animal and soil material" training course

d) Weed hygiene declarations shall contain:

   a. The identification details of the vehicle or thing inspected.

   b. Odometer reading (where applicable)

   c. Date and location inspected

   d. Name and signature of the authorised inspector issuing the declaration

   e. The organisation with which the inspector issuing the declaration is affiliated

   f. Name and signature of the driver (where applicable)

e) A biosecurity hygiene declaration for a vehicle/equipment remains valid when the vehicle/equipment:

   a. does not travel off sealed/formed roads, or

   b. clean (i.e. free of biosecurity matter including weeds, pests and diseases, and biosecurity carriers) or

   c. is located on the same or adjacent property and has not encountered any areas with weeds. Areas where it is reasonably expected to encounter weeds include the unsealed shoulders of road corridors and known infestation areas as provided in Figure 2.

f) A biosecurity declaration becomes invalid when:

a. The vehicle or equipment has encountered known areas of weed infestations.

b. The vehicle or equipment has come from a property that is not adjacent to the property to be accessed.

c. It is not known where the vehicle/ equipment has been previously used.

g) Where a vehicle or piece of equipment arrives at site dirty, they shall be refused entry. The vehicle/ equipment must be directed to the closest washdown facility (Tennant Creek or Katherine), recertified and inspected prior to accessing the site.

6.2 Weed Hygiene Declarations for Loads and Material

1. Weed hygiene declarations are to be utilised to satisfy that a load of materials (including hay, seed, sand, gravel, topsoil) is free of or containing a biosecurity matter and carriers. Anyone who is either the seller, supplier or the driver may issue a Weed Hygiene Declaration for a load providing they have direct knowledge of the product and the status as weed free or containing a biosecurity matter.
2. Weed declarations are not required for loads moved within areas within the same or adjacent properties that have been determined through baseline weed studies as being weed free.
3. Where loads of material cannot be determined to be weed free, they shall be returned to the supplier and an alternative clean source utilised.

6.3 Weed Washdown Facility Requirements

1. Cleaning activities should be undertaken at facilities with effective environmental controls to prevent the spread of biosecurity matter.
2. Wash water, mud/ silt, weed material and other contaminants must be bagged and disposed of at a licenced landfill.
3. Where possible, high pressure water spray should be used. This is the preferred method. If this is impractical, (such as at a site location) the minimum requirement is to use a suitable bar or shovel, brooms/ brushes and compressed air to remove contaminants (dry cleaning).

6.4 Equipment Sourcing and Selection

h) Equipment shall be sourced based on the following prioritisation:

a. Local equipment, particularly civil construction equipment, shall be sourced as a priority.

b. Regional equipment (NT) shale be sourced where no local equipment supplier exists

c. Interstate equipment should be sourced only where local/regional equipment is not available (due to availability or cost constraints). In such cases, additional inspections may be required to ensure vehicles/ equipment are free of weed containing material prior to accessing site.

6.5 Interstate Transport

All vehicles, equipment and loads moved interstate/territory shall be free of weeds and weed containing material (vegetation, seed, grass, soil, mud etc.) prior to entry into the NT.

All vehicles, equipment and loads travelling from interstate shall have a further inspection prior to access to any pastoral property. If required, additional cleaning shall be undertaken to remove any weeds or weed carrying material.

Where a load/equipment/ vehicle is unclean and is suspected of not being washed prior to entry into the NT, a load must be refused entry into a pastoralist property. The vehicle will require a washdown at an appropriate facility within the state/territory the equipment/vehicle/load originated from.

6.6 Weed Management Awareness

All staff and contractors shall be made aware of their weed management obligations. This shall be undertaken through:

- Building weed prevention and management requirements into contracts and assessed as a part of work readiness reviews and ongoing assurance activities.
- Inclusion of weed management requirements within site inductions and toolbox talks.

7 Weed Introduction and Spread Risk Assessments

As part of the development of their EMP's, Tamboran undertakes an assessment of the risk of introducing or spreading weeds in the project area. This assessment and the corresponding proposed mitigation measures and management objectives are presented in Table 2. Due to the low abundance of weeds within the EPs, management controls will primarily focus on preventing the introduction of weed species through appropriate equipment sourcing cleaning and inspection.

Table 2 Risk of weed introductions and spread, including management controls

Environmental Values	Maintain the integrity of significant ecosystems and agricultural productivity		
Management Objectives	Avoid the introduction of weeds Avoid the spread of existing weeds		
Measures Criteria	No introduction or spread of declared weeds resulting from Tamboran's activities.		
Activity	**Potential Risks**		**Management controls**
	Introduction of new weeds	**Spread of existing weeds**	
Vehicle and equipment movements	Vehicles and equipment sourced from other locations infested with weed species not found in or around Project Area	Traversing of weed infested areas with machinery	• Code of Practice for Petroleum Activities in the NT, Part A Surface Activities. • Activities will adhere to the guidelines within the NT Weed Management Handbook. • Weed management and control measures to be implemented in alignment with existing landholder biosecurity requirements. • All equipment will have certified equipment wash-down completed prior to entry to the field. Wash-down would occur at

Environmental Values	Maintain the integrity of significant ecosystems and agricultural productivity		
Management Objectives	Avoid the introduction of weeds Avoid the spread of existing weeds		
Measures Criteria	No introduction or spread of declared weeds resulting from Tamboran's activities.		
Activity	**Potential Risks**		**Management controls**
	Introduction of new weeds	**Spread of existing weeds**	
			Contractors deport or a commercial wash facility prior to mobilisation in a manner that prevents pollution of the surrounding environment. • Machinery to be preferentially sourced locally, with machinery sourced from surrounding areas or Queensland being the 2nd and 3rd preferred option respectively. • Weeds will be actively controlled in cleared/ hardstand areas. • Major equipment moves will be planned from weed-free areas to infested areas and not the other way around. • Ensuring all material imported to or between sites is free of weeds.
Construction of access tracks, monitoring bore pads and seismic lines	Importing materials from areas where weeds are present and creating opportunities for weed species to colonise disturbed areas	Traversing of weed infested areas and creating opportunities for weed species to colonise disturbed areas	• Code of Practice for Petroleum Activities in the NT, Part A Surface Activities. • Activities will adhere to the guidelines within the NT Weed Management Handbook. • Weed management and control measures to be implemented in alignment with existing landholder biosecurity requirements. • All equipment will have certified equipment wash-down completed prior to entry to the field. • Ensure field staff, contractors and machinery operators are familiar with hygiene protocols and weed identification. • Machinery to be preferentially sourced locally, with machinery sourced from surrounding areas or Queensland being the 2nd and 3rd preferred option respectively. • Weeds will be actively controlled in cleared/ hardstand areas. • Stabilise disturbed areas.

Environmental Values	Maintain the integrity of significant ecosystems and agricultural productivity		
Management Objectives	Avoid the introduction of weeds Avoid the spread of existing weeds		
Measures Criteria	No introduction or spread of declared weeds resulting from Tamboran's activities.		
Activity	**Potential Risks**		**Management controls**
	Introduction of new weeds	**Spread of existing weeds**	
Drilling, stimulation and well testing	Introduction of weed species not found in or around EP area.	Traversing of weed infested areas with machinery	• Code of Practice for Petroleum Activities in the NT, Part A Surface Activities. • Activities will adhere to the guidelines within the NT Weed Management Handbook. • Weed management and control measures to be implemented in alignment with existing landholder biosecurity requirements. • All equipment will have certified equipment wash-down completed prior to entry to the field. Wash-down would occur at Contractors deport or a commercial wash facility prior to mobilisation in a manner that prevents pollution of the surrounding environment. • Ensure field staff, contractors and machinery operators are familiar with hygiene protocols and weed identification. • Weeds will be actively controlled in cleared/ hardstand areas. • Major equipment moves will be planned from weed-free areas to infested areas and not the other way around. • Drilling and stimulation equipment will be restricted to cleared lease areas. • Ensuring all material imported to or between sites is free of weeds.
Operational / site management	Personnel unable to identify weeds or unaware of weed species present in areas where machinery and equipment is sourced from	Existing weed distribution not known due to insufficient survey effort, surveys conducted at wrong time of year, surveyors not familiar with / unable to identify	• Code of Practice for Petroleum Activities in the NT, Part A Surface Activities. • Staff members responsible for preventing, identifying and managing weeds to be appropriately trained. • Weed desktop and field-based surveys to be provided to identify existing weed areas. • Pre-and post-wet (February to May) inspections and periodic audits will be

Environmental Values	Maintain the integrity of significant ecosystems and agricultural productivity		
Management Objectives	Avoid the introduction of weeds Avoid the spread of existing weeds		
Measures Criteria	No introduction or spread of declared weeds resulting from Tamboran's activities.		
Activity	**Potential Risks**		**Management controls**
	Introduction of new weeds	**Spread of existing weeds**	
		declared weed species	conducted to identify and report weed outbreaks.
	Insufficient management control to prevent the introduction of weeds	Insufficient management control to prevent the spread of weeds	• Staff members responsible for preventing, identifying and managing weeds to be appropriately trained. • Ensure field staff, contractors and machinery operators are familiar with hygiene protocols and weed identification (Weed identification posters and the NTG Weed Deck will be made available) • Weeds will be actively controlled in cleared/ hardstand areas. • Weed management and control measures to be implemented in alignment with existing landholder biosecurity requirements. • New activities will be planned to address prevention of weed or non-indigenous plant spread.

8 Statutory Weed Management Plans

No statutory weeds have been identified during surveys of the EPs, however the following plans apply to species that have been found / could be potential found in the broader region:

- Weed Management Plan for Athel pine (*Tamarix aphylla*)
- Weed Management Plan for Mesquite (*Prosopis* spp.)
- Weed Management Plan for Prickly Acacia (*Vachella nilotica*)
- Weed Management Plan for Bellyache Bush (*Jatropha gossypiifolia*)
- Weed Management Plan for Neem (*Azadirachta indica*)
- Weed Management Plan for Gamba Grass (*Andropogon gayanus*)
- Weed Management Plan for Grader Grass (*Themeda quadrivalvis*).

The weed management plans establish the legal requirements and management actions to be undertaken by all owners and occupiers of the land on which the declared weed is present in the NT. The aim of each plan is to mitigate the damage caused by the each weed species within specific management areas and zones, through eradication and avoidance of further spread. Conducting land management practices in accordance with the weed management plans will secure compliance with the requirements of the Act.

9 Annual Action Plan

An action plan for each of the weed species identified in the Project Area is presented in Table 3. Treatment options as contained in the NT Weed Management Handbook are presented in Section 9.1 to Section 9.3.

This section will be undated if new weed species are discovered over the life of the program to ensure that statutory requirements with relation to declaration status and relevant weed management plans are addressed (refer to section 8).

As part of the Annual Weed Management Action Plan, Tamboran also commits to undertaking finer detailed weed mapping of all permit areas, lease pads, access tracks and gravel pits, as well as any other areas disturbed as part of the activity.

Table 3 Annual weed management action plan

Management objective	Avoid the introduction of weeds Avoid the spread of existing weeds			
Weed species	**Survey time(s)**	**Treatment time(s)**	**Control options**	**Where located**
Hyptis *Hyptis suaveolens*	6 monthly: pre and post-wet season	Preferred Dec – Mar Also Nov and April	Refer to section 9.1.	Beetaloo access track Access track to Amungee NW Kalala S1 site Velkerri 76 S2 camp pad
Parkinsonia *Parkinsonia aculeata*	6 monthly: pre and post wet season	Preferred Mar – May Also all year round	Refer to section 0.	Beetaloo access track
Rubber Bush *Calotropis procera*	6 monthly: pre and post wet season	Preferred October – March April - July	Refer to section 9.3.	Proximity to the Beetaloo access track Kyalla 117 N2 access track and Stuart Highway intersection
Gamba grass *Andropogon gayanus*	6 monthly: pre and post wet season	• Preferred December – March Also April and November	Refer to section 9.4	Amungee NW1 well site Kyalla 117 N2 well site
Annual Mission grass *Cenchrus pedicellatum*	6 monthly: pre and post wet season	• Preferred December – March Also April and November	Refer to section 9.5	Amungee NW1 well site Kyalla 117 N2 well site

9.1 Hyptis (*Hyptis suaveolens*) Treatment Options

Table 4 includes herbicide and non-chemical treatment options for Hyptis (*Hyptis suaveolens*) (NT Government 2015).

Table 4 Hyptis (*Hyptis suaveolens*) treatment options

Weed Species	Hyptis *(Hyptis suaveolens)*		
Control Methods	**Chemical and concentration**	**Rates**	**Weed growth stage, method and comments**
Herbicides	**2, 4-D amine 625 g/L** Various trade names	320 mL / 100 L	**Seedling or adult (individuals or infestation):** Foliar spray – apply when actively growing.
	Glyphosate 360 g/L Various trade names and formulations	15 mL / 1 L	**Seedling or adult (individuals or infestation):** Foliar spray – apply when actively growing.
Non-chemical applications	• Manually remove all plant material; slash to encourage competition from desirable species.		

Source: Northern Territory Weed Management Handbook (NT Government 2021)

9.2 Parkinsonia (*Parkinsonia aculeata*) Treatment Options

Table 5 includes herbicide and non-chemical treatment options for Parkinsonia (Parkinsonia aculeata) (NT Government 2015).

Table 5 Parkinsonia *(Parkinsonia aculeata)* treatment options

Weed Species	Parkinsonia *(Parkinsonia aculeata)*		
Control Methods	**Chemical and concentration**	**Rate**	**Weed growth stage, method and comments**
Herbicides	**Aminopyralid 8 g/L + Triclopyr 300 g/L + Picloram 100 g/L** Grazon™ Extra	350 mL / 100 L or 3 L / ha	**Seedling (individuals and infestation)** Foliar spray – avoid spraying if plants are stressed or bearing pods – Uptake Spraying Oil required Foliar spray – plants up to 2 m or 2 years old - Uptake Spraying Oil required.
	Triclopyr 240 g/L + Picloram 120 g/L Access™	1 L / 60 L (diesel) 1 L / 60 L (diesel)	**Seedling or adult (individuals or infestation)** Basal bark < 5 cm stem diameter Cut stump > 5 cm stem diameter
	Tebuthiuron 200 g/kg	1.5 g / m^2	**Seedling or adult (individuals or infestation)** Granulated herbicide - ground applied Do not use within 30 m of desirable trees or apply to continuous area > 0.5 ha. Do not use if fire is eminent. Apply when there is soil moisture or prior to rain.
Non-chemical applications	• Blade-ploughing, stick-raking, bulldozing and chaining can be effective if the root layer is removed from the soil. • Cultivation of pasture or native vegetation after mechanical control will help to prevent re-sprouting and seedling establishment. • Fire destroys seed in the soil surface and can be used as a follow-up to remove seedlings after other control efforts. • Fire may also be used to manage mature trees. Hand grubbing for single plants or small outbreaks, ensure removal of the root system. • Biocontrol options are available with establishing slowly in some areas.		
Source: Northern Territory Weed Management Handbook (Northern Territory Government 2021).			

9.3 Rubber bush (*Calotropis procera*) Treatment Options

Table 6 includes herbicide and non-chemical treatment options for rubber bush *(Calotropis procera)* (NT Government, 2015).

Table 6 Rubber bush (*Calotropis procera*) treatment options

Weed Species	Rubber bush *(Calotropis procera)*		
Control Methods	**Chemical and concentration**	**Rate**	**Weed growth stage, method and comments**
Herbicides	**Triclopyr 300 g/L + Picloram 100 g/L Conqueror®** **+ Aminopyralid 8 g/L** Grazon™ Extra	750 mL / 100 L (water) 500-750mL / 100 L (water)	**Seedling (individuals or infestation):** Foliar spray. Check label for recommended adjuvant product. More effective on plants <2m as thorough coverage on all leaves is required
	Triclopyr 240 g/L + Picloram 120 g/L Access™	 1 L / 60 L (diesel) 1 L / 10 L (diesel) 1 L / 60 L (diesel)	**Adult (individuals and infestation):** Basal bark < 5cm stem diameter. Spray all stems. Spray to point of runoff. Thin Line up to 5cm stem diameter. Cut stump > 5cm stem diameter.
	Tebuthiuron (200g/kg) Graslan Pending registration. Please check with Weed Management Branch for status confirmation.	1.5 – 2 g/m^2	**Seedling or adult:** Application to black clay soils in conjunction with seasonal rainfall. Spread granules according to density of the infestation.
	Fluroxypyr (333g/L) Starane™ Advanced	3 L / 100 L (diesel)	**Adult:** Cut stump method for plants up to 10cm diameter and 3m high.
Non-chemical applications	This plant is difficult to eradicate as the deep roots survive almost any treatment. Maintenance of a dense pasture sward will assist in preventing invasion.		
Source: Northern Territory Weed Management Handbook (NT Government, 2021)			

9.4 Gamba grass (*Andropogon gayanus*) Treatment Options

Table 7 includes herbicide and non-chemical treatment options for Gamba grass (*Andropogon gayanus*) (NT Government, 2021).

Table 7 Gamba grass (*Andropogon gayanus*) treatment options

Weed Species	Gamba grass (*Andropogon gayanus*)		
Control Methods	**Chemical and concentration**	**Rate**	**Weed growth stage, method and comments**
Herbicides	**Glysophate 360 g/L** Various trade names and formulations	10 mL / 1 L (water)	**Seedling or adult (individuals or infestation):** Foliar spray – apply when actively growing. Effective chemical control relies on spraying entire plant. For optimal uptake and high mortality rates gamba grass should be sprayed when actively growing and young (leaves should be at least 40 cm long). Spraying plants prior to reaching full height will reduce time and herbicide requirements. Gamba grass is still sensitive to herbicide when flowering. Once gamba grass is seeding and the leaves are drying out herbicide will not be effective.
Non-chemical applications	**Physical:** Individual plants can be removed by hand or by using a mattock. Ensure the entire root mat is removed. Excess soil should be shaken or kicked off root system to ensure regrowth does not occur from the root mat. **Burning:** Burning will not kill gamba grass, low intensity fires, undertaken in the Wet season, can remove rank growth improving access for slashing or spraying. Plants may need to be treated with herbicide prior to burning to create enough dry matter to carry a fire. Avoid using fire as a control method while plants are seeding. Bushfires NT permit would be required to light fire. **Slashing:** Slashing will not eradicate gamba grass, but can reduce the biomass, prevent seeding, create an opportunity for more desirable species to establish and provide improved access to control by other means. Slash young plants prior to seed production from January to March. Ensure equipment and machinery is cleaned prior to moving to new sites.		
Source: Northern Territory Weed Management Handbook (NT Government, 2021)			

9.5 Annual Mission grass (*Cenchrus pedicellatum*) Treatment Options

Table 8 includes herbicide and non-chemical treatment options for Annual Mission grass (*Cenchrus pedicellatum*) (NT Government, 2021).

Table 8 Annual Mission grass (*Cenchrus pedicellatum*) treatment options

Weed Species	Annual Mission grass (*Cenchrus pedicellatum*)		
Control Methods	**Chemical and concentration**	**Rate**	**Weed growth stage, method and comments**
Herbicides	**Glysophate 360 g/L** Various trade names and formulations	10 mL / 1 L (water)	**Seedling or adult (individuals or infestation):** Foliar spray – apply when actively growing.
Non-chemical applications	Annual mission grass can be controlled by slashing prior to seeding (repeated slashing may be required). Adult plants will not persist to the following year.		
Source: Northern Territory Weed Management Handbook (NT Government, 2021)			

10 Notification Procedure

The Onshore Petroleum Weed Management Officer at the Weeds Unit of DLPE should be notified within 48 hours of the discovery of a new weed species in the EP.

Initial notification may be verbal, with follow-up written notification provided within seven working days. The notification should include a preliminary species identification and location information. The Regional Weed Officer will advise what further action is required.

It is noted that some species spread rapidly so immediate action may be required to control spread. For example, as stated above Parthenium (*Parthenium hysterophorus*) is a Class A (to be eradicated) and Class C (not to be introduced) weed in the Northern Territory as well as being classified as a Weed of National Significance. Early detection is crucial in not allowing this species to spread in the Northern Territory (Department of Primary Industry and Resources 2016).

In addition, it is noted that under the Weeds Management Act that:

> *'The owner and occupier of land must… within 14 days after becoming aware of a declared weed that has not previously been, or known to have been, present on the land, notify an officer of the presence of the declared weed'.*

All weed outbreak incidents will be reported in Tamboran's incident reporting system and corrective action initiated.

11 Recording

Records of weed inspections will be maintained by Tamboran.

Data on weed distribution will be maintained within Tamboran's GIS and provided to the Weeds Officer at Weeds Unit at DLPE as part of the annual report on performance against the Weed Management Plan, or as requested. Data will be collected as per the requirements of the NT *Weed Data Collection Manual - Section One Technical Data Description* (Weed Management Branch, 2015). Data will be recorded as per the guidelines provided in Appendix A, using the data sheet provided in Appendix B (Weed Management Branch, 2015).

The NT *Weed ID Deck* (NT Government, 2021) will be referenced to assist with identification of species that have been identified as likely or known to occur in the EP.

Field data will be submitted directly to the Weeds Unit at DLPE in a shapefile format or as an Excel spreadsheet, including incidental identification of weeds and following completion of field surveys.

12 Reporting

All weed outbreak incidents will be reported in Tamboran's incident reporting system and corrective action initiated.

A report on the performance against this Weed Management Plan will be submitted to DLPE on an annual basis. At a minimum, this should include:

a. Details of activities implemented to address weed spread and introduction risks (e.g. vehicle wash down/ blow down locations, examples of track construction from working from weed free areas into weed infested areas to reduce spread).

b. Details of survey and monitoring events, including dates, personnel, maps and track data.

c. Submission of all weed data collected.

d. Overview of weed control events and success rates (weed control should be captured in detail through the data collection process and submitted as a component of (a)).

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APPENDIX A Weed Data Collection Methodology

Field data collection for weed infestations: The following is a guide to efficiently evaluating and recording a weed site in the field. Each record must identify the person or organisation taking the record, as well as the details explained below.

How to record weed area as a point record

1. Record the species

When a weed is sighted, move to the area and confirm identification of the weed. If you cannot positively identify the weed record it as "Unknown weed" and take a sample or photograph, do not try to guess. If more than one weed species is present, then repeat the process with separate records for each species.

2. Assess the size of the weed patch

Look across the area of weeds to the furthest weed plant and decide the diameter. Decide if the area is best fits in a circle of either 20, 50 or 100 m. If it is a single plant or small patch you would choose 20 m. The size 100 m extends about as far as you can see on the ground, if the weeds extend out of sight you will need to make another point further on. You may place overlapping circle areas to reflect different densities.

3. Assess the density of weeds within the circle

Decide how much of the area is covered by weeds. Assign a score from 2 to 5 based on the percentage table below. It will be useful (if possible) to move into the centre of the weed circle. Consider the whole circle size chosen in step 2 deciding on the density score. Area covered should be determined by a 'projected canopy' method.

Density categories

1 = Absent, no weeds of this species in this area.

2 = < 1%, Very few, not many weeds – e.g. single plant, perhaps with seedlings.

3 = 1 -10%, More than one or two isolated plants but not a lot – e.g. a few small plants.

4 = 11-50%, A lot, up to half the area covered – e.g. a tree, dense patches of weeds.

5 = > 50%, Dominant cover is weed, more than half covered – e.g. thickets, monocultures.

4. Record the location

Take the GPS location (ideally) from the centre of the circle. If weed seeds may be spread or it is difficult to access the centre, it is acceptable to take the reading from the location as close to the centre as practical.

5. Record the treatment

Record the method you apply a treatment to the weeds, or record 'No Treatment'. Choose from the list of treatment methods – e.g. no treatment, unknown, treated, foliar spray etc.

How to record weed area as a line (polyline) record

1. Record the species

When a weed is sighted, move to the area and confirm identification of the weed. If you cannot positively identify the weed record it as “Unknown weed” and take a sample or photograph, do not try to guess. If more than one weed species is present, then repeat the process with separate records for each species.

2. Assess the ‘best fit’ width in metres of the linear weed area

Look along the area of weeds to the furthest weed plant and decide a width that best sums up the width of the infestation from values of 5, 20, 50 or 100 m. If the width is too variable, you may need to make more than one line or consider recording as points or as a polygon.

3. Assess the density of weeds within the line

For the area of the line, being from start to finish at the designated width, decide the area covered by weeds. Assign a score from 2 to 5 based on the percentage table below. Consider the whole line area when deciding on the density score. Area covered should be determined by a ‘projected canopy’ method.

Density categories

1 = Absent, no weeds of this species in this area.

2 = < 1%, Very few, not many weeds – e.g. single plant, perhaps with seedlings.

3 = 1 -10%, More than one or two isolated plants but not a lot – e.g. a few small plants.

4 = 11-50%, A lot, up to half the area covered – e.g. a tree, dense patches of weeds.

5 = > 50%, Dominant cover is weed, more than half covered – e.g. thickets, monocultures.

4. Record the location

Start the GPS track, or line sketch from one end of the linear weed area. Walk or sketch a line as best fit through the middle of the linear weed area and finish at the end point.

5. Record the treatment

Record the method you apply a treatment to the weeds, or record ‘No Treatment’. Choose from the list of treatment methods – e.g. no treatment, unknown, treated, foliar spray etc.

How to record weed area as a polygon record

1. Record the species

When a weed is sighted, move to the area and confirm identification of the weed. If you cannot positively identify the weed record it as “Unknown weed” and take a sample or photograph, do not try to guess. If more than one weed species is present, then repeat the process with separate records for each species.

2. Assess the extent of the weed area an ensure it can be practically enclosed

Polygons are good for clearly delineated areas of weeds; you should be able to walk around the edge of the weed area with confidence. Ensure the defined area of weed at a similar density can be delineated before attempting to create the area, you may need more than one polygon. If the area is poorly defined, then the point method may be a more useful.

3. Assess the density of weeds within the polygon

Assess the area covered by weeds for density, you may need to move to several vantage points to get a clear picture. Assign a score from 2 to 5 based on the percentage table below. Consider the whole area within the polygon when deciding on the density score. Area covered should be determined by a ‘projected canopy’ method.

Density categories

1 = Absent, no weeds of this species in this area.

2 = < 1%, Very few, not many weeds – e.g. single plant, perhaps with seedlings.

3 = 1 -10%, More than one or two isolated plants but not a lot – e.g. a few small plants.

4 = 11-50%, A lot, up to half the area covered – e.g. a tree, dense patches of weeds.

5 = > 50%, Dominant cover is weed, more than half covered – e.g. thickets, monocultures.

4. Record the location

Start the GPS track, or polygon sketch from one point of the polygon weed area. It is useful to start from a landmark or flagging tape. Create the polygon edge line by walk a path or sketching along the outer edge of the weed area until you return to the start point. If using a GPS track to create the polygon, ensure that you cross your start point so as to close the polygon.

5. Record the treatment

Record the method you apply a treatment to the weeds in the area, or record ‘No Treatment’. Choose from the list of treatment methods– e.g. no treatment, unknown, treated, foliar spray etc.

Appendix B Example Weed Data Collection Sheet

tamboran
RESOURCES

Weed Management Plan

TB2-HSE-MP-11

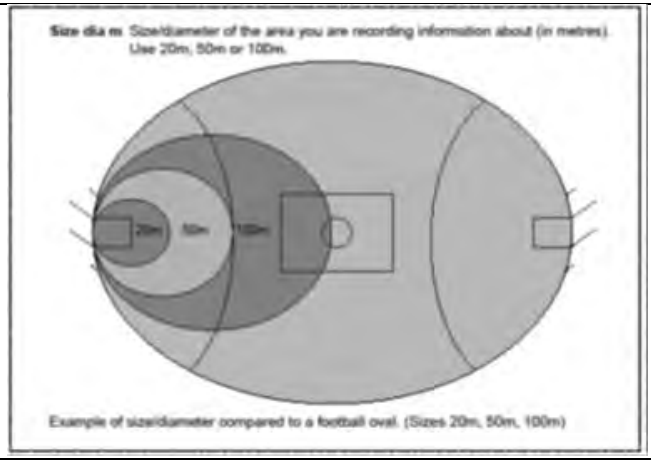
RECORDER:					PROJECT:							LOCALITY:		
ORG_NAME:					GPS NAME/MODEL:							RECORDING METHOD:		
SITE_ID	DATE_REC	LAT_G94	LONG_G94	WEED_NAME	SIZE_DIA_M	DENS_CAT	SEEDLINGS	JUVENILES	ADULTS	SEED_PRES	PAST_TREAT	TREATMENT	HERBICIDE	COMMENTS

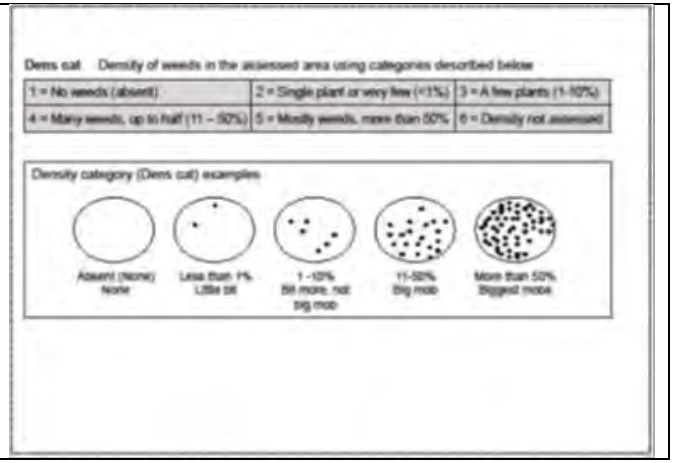
Notes:

Treatment method
Control method applied today as per below.
If none, record 'No treatment'

- Foliar spray
- Residual application
- Basal bark
- Cut stump
- Stem injection
- Aerial spray
- Slashed or cut
- Hand pull

Herbicide	The active ingredient(s) of the herbicide applied today (if any)
GPS waypt	Waypoint ID as entered in the GPS
Weed name	Common name or scientific name for the weed recorded
S (y/n)	Seedlings: Are seedlings visible?
J (y/n)	Juveniles: Are juvenile plants visible?
A (y/n)	Adults: Are there adult plants, or seeds, or evidence of past seeding present?
Seed (y/n)	Seeds: Are seeds visible today? Or plants with seeds or pods?
Treat (y/n)	Treatment: Did you apply treatment to this site?
Comment	Record any notes for yourself here.





(Source: Northern Territory Weed Data Collection Manual - Section One Technical Data Description)

APPENDIX E

Erosion and Sediment Control Plan

BEETALOO BASIN EXPLORATION PROJECT

Erosion and Sediment Control Plan

EP 76, EP 98 and EP 117

This document outlines the basic principles for contractors to develop site specific erosion and sediment control plans for Beetaloo Basin Exploration Program.

REV	DATE	REASON FOR ISSUE	AUTHOR	APPROVER
0	29/03/2019	Issued for use	A.Court	M.Hanson
1	28/06/2019	Revised based on comments received by DEPWS	A.Court/J.Jentz	M.Hanson
2	16/07/2019	Updated Primary ESCP	A.Court/J.Jentz	M.Hanson
3	19/11/2021	Update overarching ESCP	P.Szamosi/J.Jentz	M.Kernke
4	23/02/2022	Update overarching ESCP	P.Szamosi/J.Jentz	M.Kernke
5	08/07/2022	Update for Amungee delineation area	A.Court	M.Kernke
6	13/09/2022	Update overarching ESCP	J.Jentz	L. Pugh
7	23/06/2023	Revised to include update Amungee NW3, Shenandoah North and South	A Court	L Pugh
8	20/10/2023	Revised to include updated for all sites	A Court	L Pugh
9	27/03/2024	Updated on Reg 10/11 Comments	A Court	L Pugh
10	23/04/2024	Updated on Reg 10/11 Comments	L Pugh	M Kernke
11	06/06/2024	Inclusion of the SPCF	A Court	M Kernke
12	26/09/2024	Minor figure edits for the SPCF	L Pugh	M Kernke
13	15/10/2024	Inclusion of 3D Seismic Program activities	A Court	M Kernke
14	06/03/2024	Minor edit for 3D Seismic EMP	A Court	M Kernke

CPESC Review

Date	CPESC Name / Position	Signature
19/07/2023	Tim Anderson MAgrSc, BAgrSc (Hons), CPESC (#2723), CEnvP (#002).	

Contents

Figures

Tables

Appendices

1 Introduction

This Erosion and Sediment Control Plan (ESCP) has been developed to ensure best practice erosion and sediment controls are implemented during Tamboran's[1] exploration activities within EP 76, EP 98 and EP 117, to avoid or minimise and control erosion and offsite impacts, such as sedimentation of waterways.

This ESCP has been developed to provide direction for Tamboran and contractors to implement erosion and sediment control (ESC) during construction of the well pads and associated infrastructure, the Sturt Plateau Compression Facility (SPCF), worker camps and access tracks, seismic lines as well as during ongoing maintenance and monitoring once sites are established. This ESCP has been updated to include proposed Shenandoah South 3D Seismic Program (SS 3D Seismic Program) which is in the Shenandoah South E&A area on EP98 and EP117.

The design of the exploration well pads, SPCF, seismic lines and access tracks comply with Northern Territory (NT) and local government statutory laws and regulations and are to be designed to meet all relevant and applicable codes and standards. This ESCP has been developed in accordance with the following guidelines:

- Code of Practice for Petroleum Activities in the Northern Territory (DEPWS & DITT, 2019)
- Best Practice Erosion and Sediment Control (IECA, 2008)
- Land Clearing Guidelines (DEPWS, 2024)
- Erosion and Sediment Control Guidelines for Rural Development Environment Fact Sheet (DLRM, 2018).

The location of the proposed exploration activities are shown on Figure 1.

Please note the following Northern Territory Government (NTG) Department name changes for the regulation of Onshore Petroleum activities in the NT:

- The Department of Environment, Parks and Water Security (DEPWS) is now referred to as Department of Lands, Planning and Environment (DLPE).
- The Department of Industry, Tourism and Trade (DITT) is now referred to as Department of Mining and Energy (DME).

[1] Including its subsidiaries.

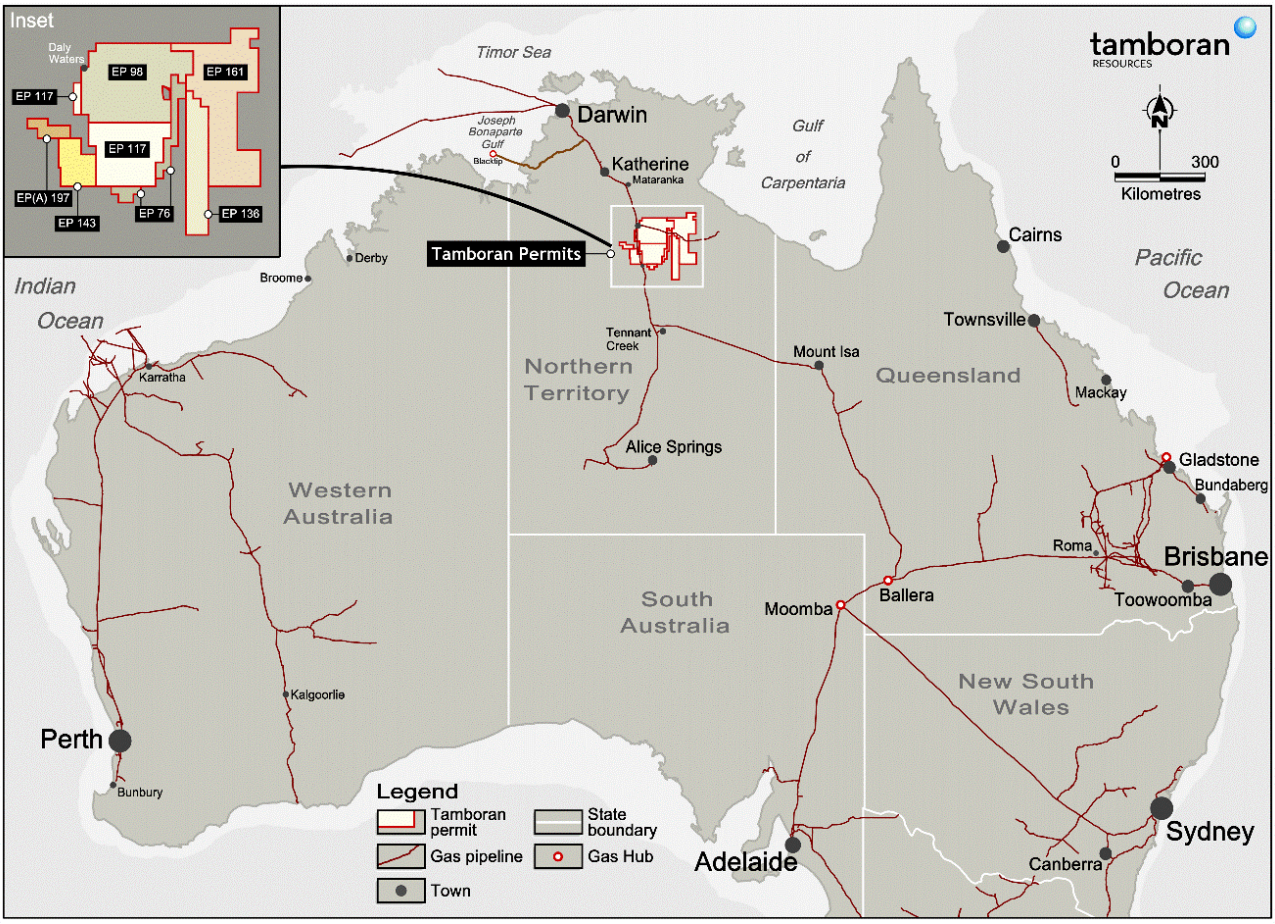


Figure 1: Location of Tamboran exploration permit areas (EPs)

2 Project Context

This plan covers all civil, seismic acquisition, well drilling, stimulating, rehabilitation and routine maintenance/monitoring activities undertaken by Tamboran, its subsidiaries and their contractors within permit EP76, EP98 and EP117 as detailed in Table 1, Table 2 and shown in Figure 2– Figure 5.

Table 1: ESCP infrastructure per Beetaloo Exploration EMP

EMP	EP	Well pad(s)	Camp(s)	Helipad	Seismic line(s)	Access track(s)	Gravel pit(s)	Gathering lines	Other
Velkerri 76 S2 EMP (ORI5-4) Doc #: NT-2050-15-MP-032	76	X	X	X	–	X	X	–	–
Amungee NW-1H (ORI7-2) Doc #: CDN/ID NT-2050-35-PH-0018	98	X	X	–	–	X	–	–	–
Beetaloo W-1 EP 117 EMP (ORI8-2) Doc #: NT-2050-15-MP-039	117	X	X	–	–	X	X	–	–
Kalala S1 EMP (ORI9-2) Doc #: NT-2050-MP-040	98	X	X	X	–	X	X	–	–
Beetaloo Sub-basin Multiwell Drilling, Stimulation & Well Testing Program EMP (ORI10-3) Doc #: NT-2050-15-MP-041	76 & 98	X	X	X	–	X	X	–	–
Amungee NW Delineation Program EMP (ORI11-3) Doc #: NT-2050-15-MP-0088	98	X	X	X	X	X	X	–	–
Shenandoah South E&A program EMP (TAM1-3) Doc #: B2-HSE-MP-08	98 & 117	X	X	X	X	X	X	X	–
Sturt Plateau Compression Facility - Appraisal Gas EMP (TAM2-3) Doc #: TB2-HSE-MP-13	98 & 117	–	X	–	–	–	–	X (between SS2 wells and SPCF)	X SPCF pad Fence line
Shenandoah South 3D Seismic EMP (TAM3-2) Doc #: TB2-HSE-MP-14	98 & 117	–	–	–	X	–	–	–	–

Table 2: Coordinates of centroid 2D seismic and exploration well sites

INFRASTRUCTURE	COORDINATES (Zone 53)			
	Start of line		End of line	
	Lat	Long	Lat	Long
Amungee delineation area seismic lines (EP 98) - EMP ORI11-3				
001-SR	-16.32434	133.82875	-16.39386	133.89996
002-SR	-16.32112	133.85894	-16.35325	133.89186
003-SR	-16.34104	133.87802	-16.39438	133.93218
004-SR	-16.36162	133.93763	-16.41430	133.99165
005-SR	-16.34667	133.95114	-16.39806	134.00384
006-SR	-16.37223	133.86042	-16.37795	134.00306
007-SR	-16.34267	133.88364	-16.34584	133.88032
008-SR	-16.34459	133.88562	-16.34777	133.88229
009-SR	-16.34652	133.88759	-16.34970	133.88427
010-SR	-16.34845	133.88957	-16.35163	133.88624
Shenandoah South E&A 2D Seismic Lines (EP 117 and EP 98) – EMP TAM1-3				
Shenandoah South Line A	-16.83863	133.47175	-16.92103	133.55480
Shenandoah South Line B	-16.83284	133.48508	-16.91394	133.56735
Shenandoah South Line C	-16.81729	133.50872	-16.89536	133.58758
Shenandoah South E&A Gathering Lines (EP 117 and EP 98) – EMP TAM1-3				
***Shenandoah South B to Shenandoah South C (~4.11 km)* – EMP TAM1-3**				
Start – Shenandoah South B pad	345035	8135461	–	
Intersection to existing track	345046	8134499		
Intersection to Shenandoah South C	343442	8134573		
End – Shenandoah South C pad	–		343471	8133331

Kyalla 117 N2 to Shenandoah South 2 (~4.5 km) – EMP TAM1-3 and EMP TAM2-3				
Start – Kyalla 117 N2 pad	356274	8137505	–	
Intersection to existing track	356189	8137509		
Intersection to Shenandoah South 2	356205	8140071		
End – Shenandoah South 2 pad	–		355060	8141514
Shenandoah South 3D Seismic Program (EP 98 and EP 117) – EMP TAM3-2				
1	343278	8146979	354493	8153454
2	343528	8146546	354743	8153021
3	343778	8146113	354993	8152588
4	344028	8145680	355243	8152155
5	344278	8145247	355493	8151722
6	344528	8144814	355743	8151289
7	344778	8144381	355993	8150856
8	345028	8143948	356243	8150423
9	345300	8143527	356493	8149990
10	345550	8143094	356743	8149557
11	337573	8137911	356993	8149124
12	337823	8137478	357243	8148691
13	338073	8137045	357493	8148258
14	338323	8136612	357743	8147825
15	338573	8136179	357993	8147392
16	338823	8135746	358243	8146959
17	339073	8135313	358493	8146526
18	339323	8134880	358743	8146093
19	339573	8134447	358993	8145660
20	339823	8134014	359243	8145227
21	340073	8133581	359493	8144794
22	340323	8133148	359743	8144361
23	340594	8132728	359993	8143928
24	340844	8132295	360243	8143495
25	341094	8131862	360493	8143062
26	341344	8131429	360743	8142629
27	341594	8130996	360993	8142196
28	341844	8130563	361243	8141763
29	350408	8134930	361493	8141330

30	351416	8134934	361743	8140897
31	352424	8134938	361993	8140463
32	353431	8134943	362243	8140030
33	354439	8134947	362493	8139597
34	355447	8134952	362743	8139164
35	356455	8134956	362993	8138731
36	357484	8134973	363243	8138298
37	358492	8134978	363493	8137865
38	359500	8134982	363743	8137432
39	360507	8134987	363993	8136999
40	361515	8134991	364243	8136566
41	362523	8134996	364493	8136133
42	363531	8135000	364743	8135700

Well sites, SPCF, access track and gravel pit reference	**Coordinates (approximate)**		
	Zone	**Easting**	**Northing**
Amungee NW	53	415515	8180683
Amungee NW-2	53	381039	8192324
Amungee NW-3	53	375512	8195308
Amungee NW-4	53	376611	8193100
Amungee NW-5	53	390313.6	8187337
Kalala S1	53	351740	8198030
Velkerri 76 S2	53	435488	8136321
Kyalla 117 N2	53	356175	8137500
Beetaloo W (Kyalla 117 W1)	53	368312	8106695
Shenandoah S2	53	355291	8140676
Shenandoah S B	53	345035	8135464
Shenandoah S C	53	343471	8133330
Shenandoah N A	53	356687	8163762
Sturt Plateau Compression Facility	53	355195	8141324

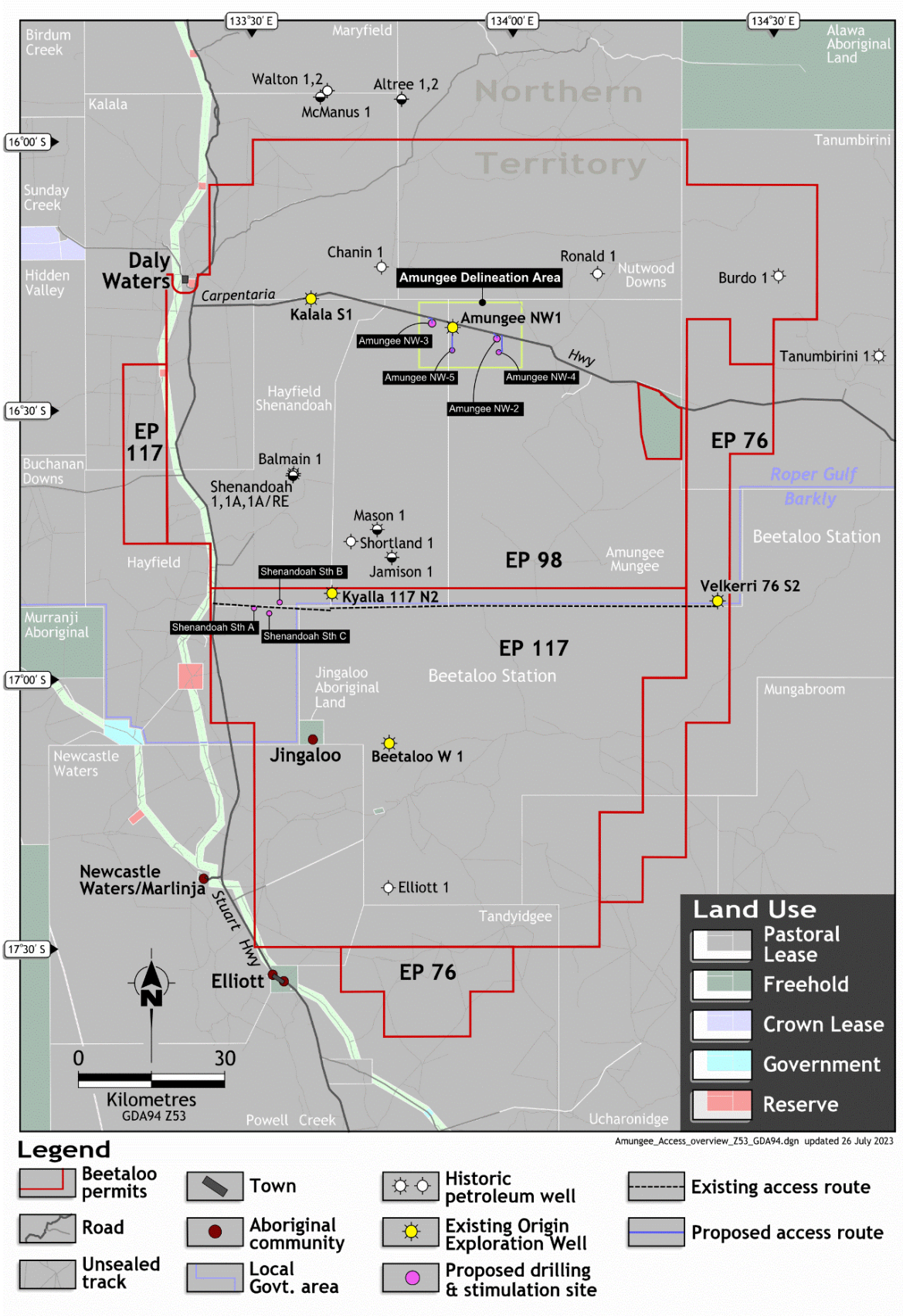


Figure 2: Location of Tamboran's exploration well sites and existing infrastructure

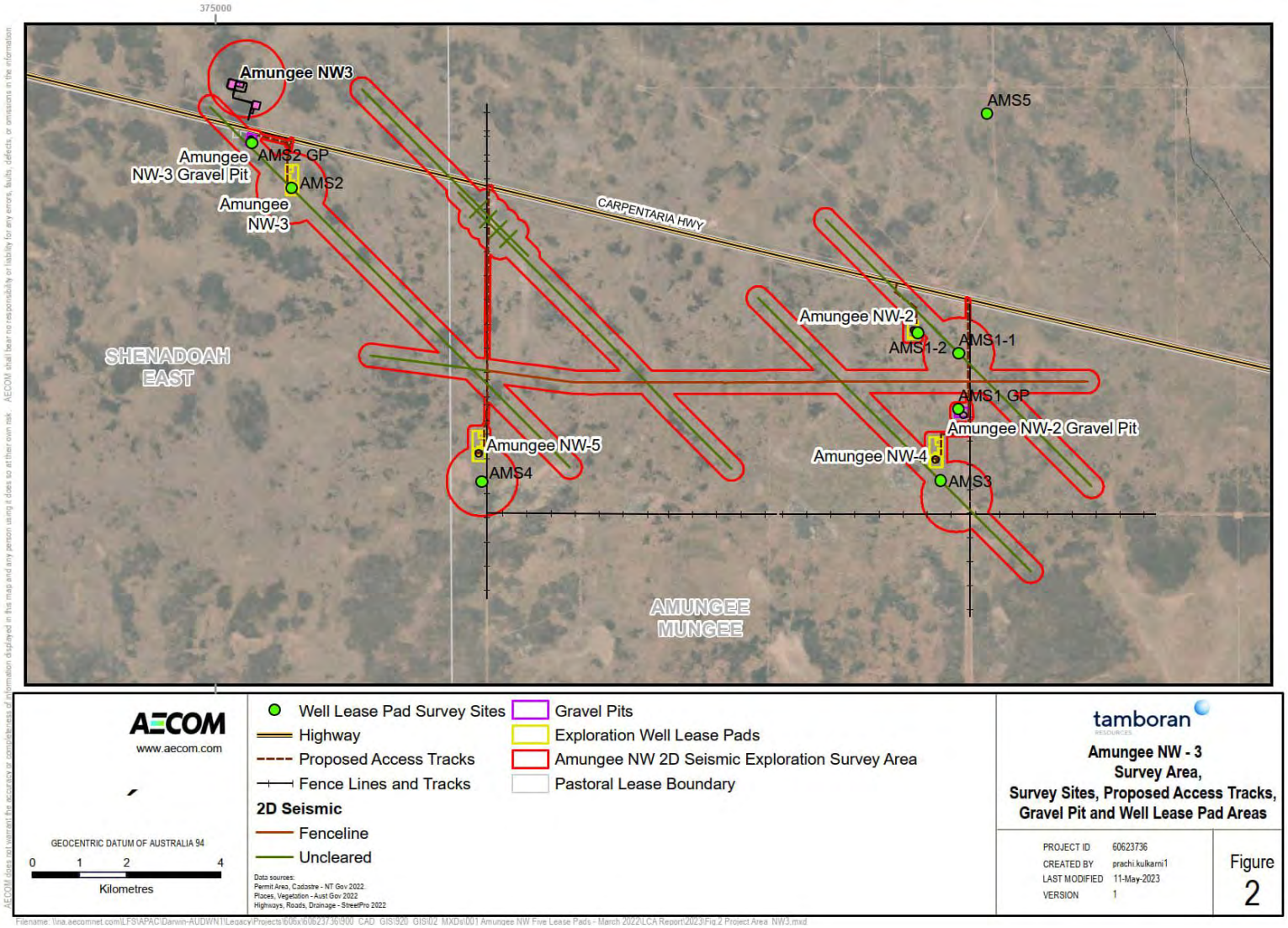


Figure 3: Location of Amungee seismic survey areas

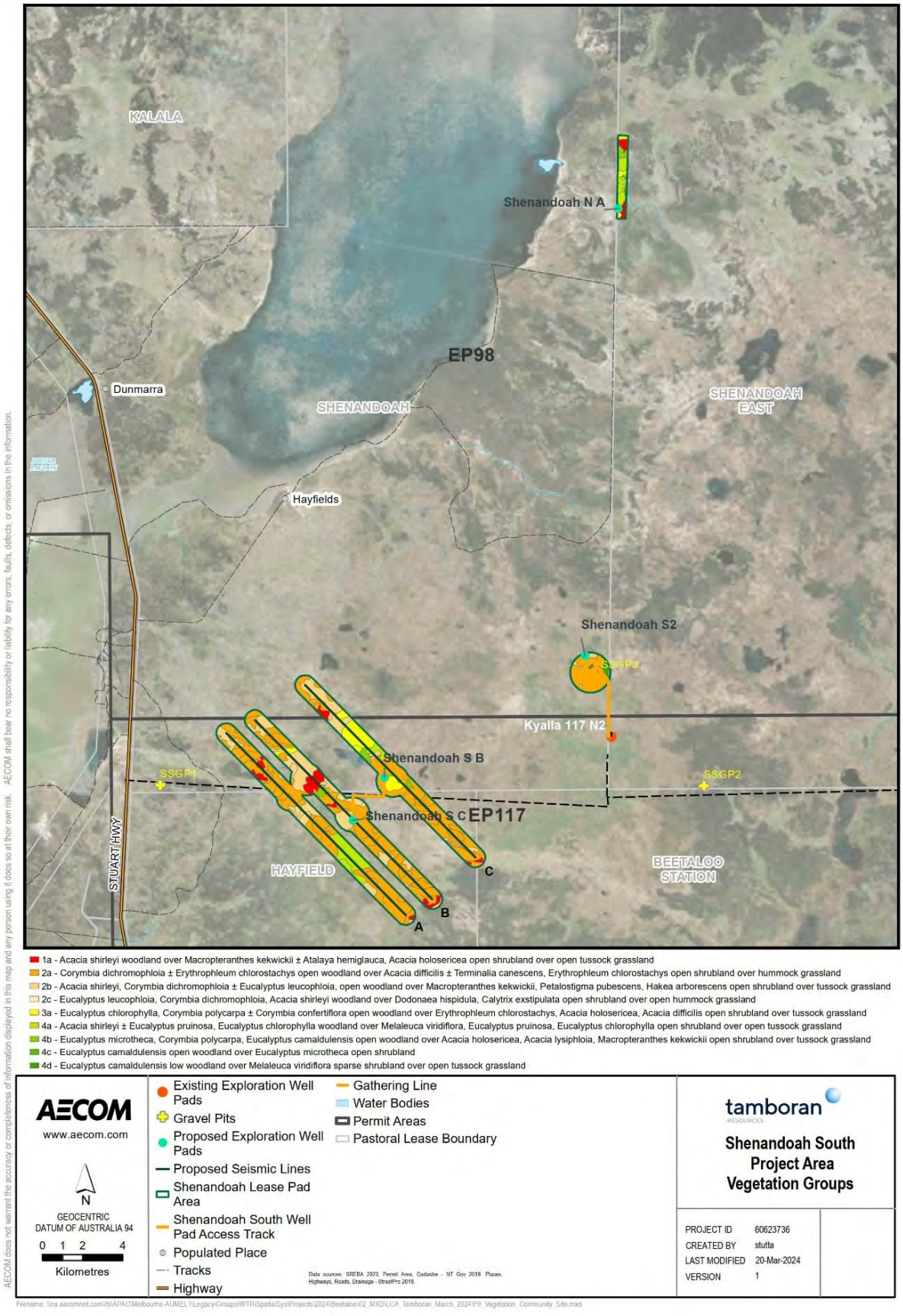


Figure 4: Location of Shenandoah South E&A (includes vegetation communities)

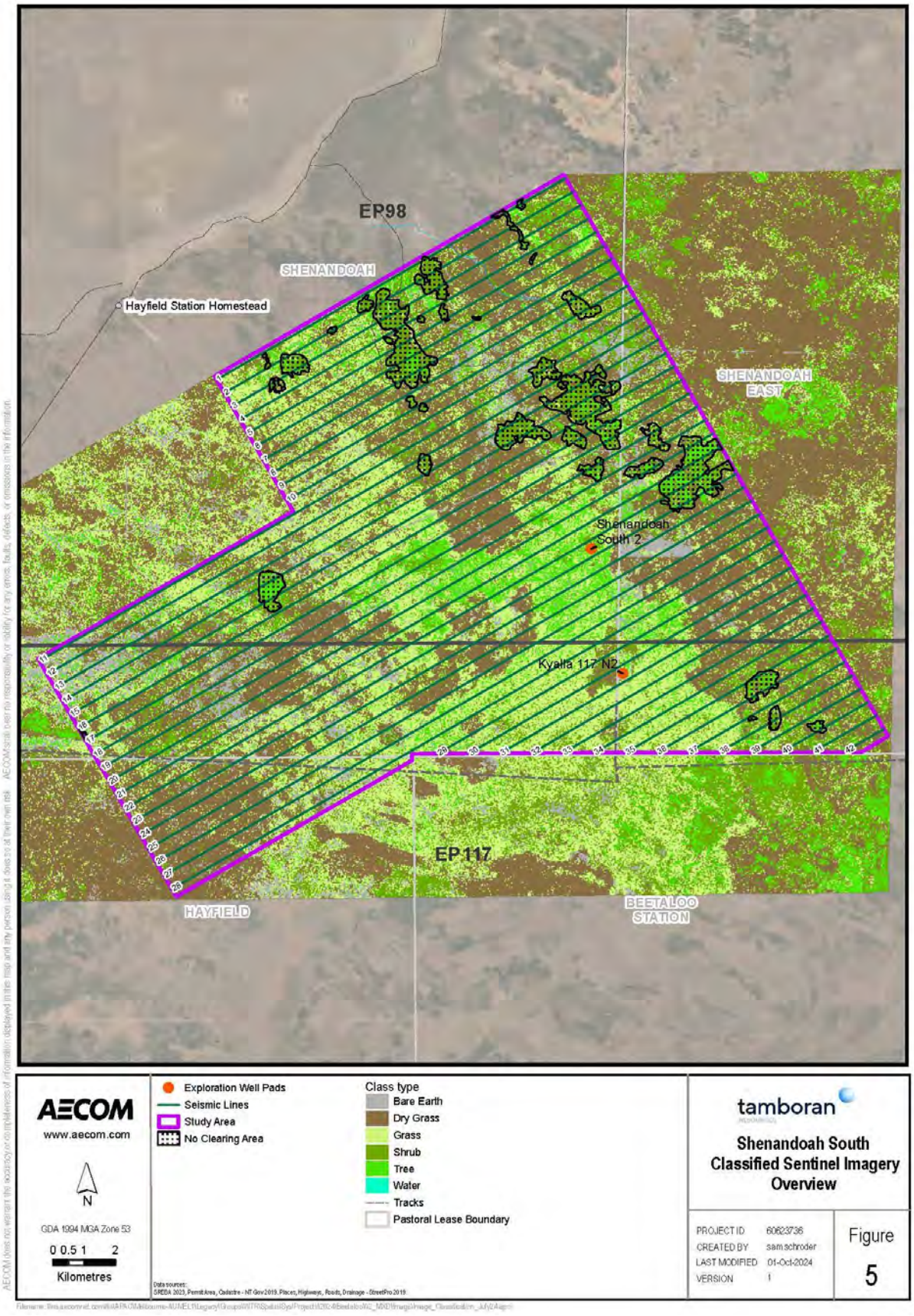


Figure 5: Location of Shenandoah South 3D seismic program

The primary activities subject to this ESCP are:

- Construction and or ongoing maintenance of exploration well pads, SPCF pad, camp pads, stockpile areas, helipad and wet weather storage area.
- Minor intersection upgrade works at the intersection with the Stuart Highway and Carpentaria Highway in accordance with Road Agency approval and Permit to Work within NT Government road reserves.
- 2D and 3D seismic line preparation, data collection and rehabilitation.
- Installation of gathering lines between well pads
- Construction and ongoing maintenance of access tracks.
- Gravel extraction, as required, for construction and maintenance of drill pads and sections of the access tracks.
- All other activities ancillary to the seismic survey and drilling, stimulation and well testing of an exploration well.

2.1 Legislation

The activities outlined within the EMP, which this management sub-plan is a component of, aim to comply with relevant guidelines associated with exploration activities, such as International Erosion Control Association (IECA) *Best Practice for Erosion and Sediment Control* (2008), IECA *Appendix P: Land Based Pipeline Construction December 2015* (Addendum to IECA 2008), the *Australian Pipeline Industry Association Code of Environmental Practice for Onshore Pipelines 2017* and the *Code of Practice for Onshore Petroleum Activities in the Northern Territory 2019* (the Code).

2.1.1 Code of Practice for Onshore Petroleum Activities in the Northern Territory 2019

The Code is a mandatory code of practice for the petroleum industry to ensure that petroleum activities in the Northern Territory are managed according to minimum acceptable standards to ensure that risks to the environment can be managed to a level that is as low as reasonably practical (ALARP) and acceptable.

Under these regulations, Tamboran is required to submit an EMP prior to any petroleum exploration or production activity. The EMP for a petroleum activity must include a primary ESCP outlining all activities. This should be developed by a suitably qualified person in accordance with relevant guidelines including specific environmental outcomes and environmental performance standards to be included in the implementation strategy in the EMP. The ESCP must include:

- A risk assessment in relation to the potential impact to the environment from erosion and sedimentation associated with the proposed activities. Including an assessment of site-specific conditions and the nature and timing of works with the NT Land Clearing Guidelines (DEPWS, 2024) website and any amendments.
- Where the Primary ESCP requires it, a further ESCP must be developed by a suitably qualified person in relation to the relevant matters identified in the Primary ESCP and implemented by the interest holder.
- Road and pipeline designs must:
    - minimise erosion of exposed road surfaces and drains
    - ensure that roads and pipeline surface water flow paths minimise erosion of all exposed surfaces and drains

- comply with legislative requirements.

- The requirements of the Land Clearing Guidelines 2024 as published on the DLPE website and amended from time to time must be complied with in relation to protection of natural waterways as a result of land disturbance and ensure the following:
  - appropriate buffers are implemented around natural waterways
  - disturbance in the wet season is minimised
  - the number of crossing points is minimised
  - crossings are established as close as practicable to right angles to the waterway
  - material changes in the shape of the waterway are avoided
  - material changes in the volume, speed or direction of flow or likely flow of water in the waterway are avoided
  - alteration to the stability of the bed or banks of the waterway (including by removal of vegetation) is avoided
  - erosion risk, sedimentation and pollution of waterways is minimised through the appropriate design and implementation of best practice erosion and sediment control measures.

3 Aims and Objectives

The ESCP aims to:

- Address key soil and water management issues, including legislative and client requirements.
- Determine the "Type" of ESC to be implemented during construction, post construction and until exploration activities are completed.
- Where practical identify, eliminate and reduce hazards and associated risks inherent in specific work activities, which if untreated could lead to a diminished product or create the potential for an accident, dangerous occurrence or environmental incident.

The objective of this ESCP is to manage Tamboran's activities within the EP in a manner that minimises the impacts upon soil, vegetation and surface water which may result from soil disturbance activities including seismic line preparation, land clearing associated with well pad establishment.

This ESCP may be amended as required, in response to the monitoring and maintenance programs described herein to avoid significant and/or sustained deterioration in downstream water quality. Standard drawings are provided as a guide, with the construction supervisor and Tamboran engineers making final determination on site.

Strategies shall be developed, implemented and reviewed on a regular basis, so that risks are identified, measured and recorded throughout the course of the project.

Due to potential chance for activities to lead up to the wet season, wet weather contingencies have been identified in this plan and the overarching EMP (BOM, 2012). It is anticipated that due to the known ground conditions across the region, ground conditions following rainfall events can make access impossible. The primary mitigation will be to monitor weather forecasts daily during the program and where rainfall is likely to result in an event that has potential to limit access, the subcontractor will stabilise the current work areas and go into standby mode until such time can assess the track conditions to recommence activities.

Further strategies will be developed, implemented and reviewed on a regular basis so that risks are identified, measured and recorded throughout the course of exploration activities. Any significant changes to the ESCP will be subject to review and approval by the Department of Lands, Planning and Environment (DLPE) Land Management Team.

3.1 Compliance with IECA Guideline

The ESCP has been prepared by suitably qualified and experienced personnel that understand the intent and minimum standards of IECA. The team that prepared the plan consist of the following:

- Alana Court – BEnvSci, PGDipEnvMgt. Senior Environmental Manager with over 24 years' experience. Alana completed the IECA erosion and sediment control training (2013) and is experienced in providing advice to managing environmental requirements in the Beetaloo Sub-Basin including erosion and sediment control for the past 20 years.
- James Jentz – BEng, RPEQ, CPEng. Civil Engineer with over 30 years' experience in the design and documentation of civil engineering projects. James has signed off all civil drawings under his qualification.

4 Civil Construction Schedule

The exploration schedule for Tamboran's activities will primarily occur from May each year extending into September while rainfall risk rating is considered very low (0 to 30 mm).

Implementation of the ESCP will commence as soon as access is granted and continue throughout the exploration activities until such time that the site is stabilised.

If exploration activities continue through to the wet season, Tamboran will implement the wet weather contingency planning. Planning will occur during August – September and will be implemented between 1 October to 30 April, based on the rainfall erosion risk rating identified in Section 5.1.

Wet weather contingency planning includes the following actions:

- Tamboran to review program schedule to determine what activities will extend into the wet season.
- Undertake inspections of all assets to ensure appropriate ESC in place and are functional before 1 October each year.
- Conduct maintenance on all ESC established onsite before 1 October each year.
- Complete a stocktake on available ESC equipment on site, and where required purchase new equipment before the 1 October each year.

5 Permit Area Erosion Susceptibility

Erosion susceptibility varies throughout the Tamboran permit area, dependent upon the soil types, slope and extent of ground disturbance. Apart from the erosive impact of climatic conditions, soil erosion is influenced mainly by the inherent properties of the soils and the processes which occurred during the formation of the landscapes.

Erosion will occur in the permit area if the land is used beyond its capacity, as is seen if land is overstocked or vehicle movements not controlled, for example. The locations of the exploration well sites for Tamboran have been examined in the field to determine the risk of erosion occurring from exploration activities.

Factors considered include the following:

- Season (R Factor) – the timing of the project works will occur mostly within the dry season of the NT, which has low amounts of rainfall and is considered a low-risk factor. Risk levels of rainfall data of Daly Waters and Newcastle waters can be seen in Table 2 and Table 3 which present the erosion risk rating based on average monthly rainfall using the rating system provided in the IECA (2008) Table 4.4.2 for Daly Waters (northern sites) and Newcastle Waters (southern sites).

Table 3: Erosion risk rating based on average monthly rainfall at Daly Waters (Bureau of Meteorology 2023)

Item	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	165.4	165.4	120.1	23.6	5.0	5.6	1.5	1.7	4.9	22.5	59.4	110
Erosion Risk*	H	H	H	VL	VL	VL	VL	VL	VL	VL	M	H

* E = Extreme (>225 mm); H = High (100+ to 225 mm); M = Moderate (45+ to 100 mm); L = Low (30+ to 45 mm); VL = Very Low (0 to 30 mm)

Table 4: Erosion risk rating based on average monthly rainfall at Newcastle Waters (Bureau of Meteorology 2023)

Item	Jan	Feb	Mar	Apr	May	June	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	125.5	130.9	93.7	24.6	9.3	5.3	3.4	1.0	5.4	20.9	35.7	77.3
Erosion Risk*	H	H	M	VL	VL	VL	VL	VL	VL	VL	L	M

* E = Extreme (>225 mm); H = High (100+ to 225 mm); M = Moderate (45+ to 100 mm); L = Low (30+ to 45 mm); VL = Very Low (0 to 30 mm)

- Soil type (K Factor) – soils with higher clay content are prone to generation of bulldust and are easily eroded by wind and water. Gravelly soils tend to be more robust to disturbance on the scale expected for Tamboran exploration activities. The primary soil type encountered across the permit can generally be described as silty SAND, SM with some gravel. These soils are considered to have a low to medium erodibility potential when the soils are disturbed.
- Slope length – the slope of the exploration area is one of the characteristics that will help to determine the risk of erosion during rainfall events, with steeply inclined areas a higher risk than small undulations in the landform. The Tamboran exploration areas subject to this ESCP are generally flat with a slope of <1%. There are some slight undulations that occur throughout the area, generally being less than 2% gradient, however some areas are known to be greater 2%. Treatments are defined for sections less than 2% and greater than 2% in this plan. The relevant treatment will be considered on a case-by-case basis.
- Aspect – the position of the seismic lines, access tracks and pads in relation to the direction of the contour should be considered and creation of tracks and the well pads across (as opposed to parallel with) the contour should be avoided.
- Groundcover – clearing will be conducted to construct access tracks, establish gravel pits and earthworks relating to construction of the exploration well pad and associated camps, as well as line preparation for seismic exploration. The method that will be used for seismic line preparation will consist of dozer and grader, ensuring that topsoil and root stock is retained.

The clearing method used for gravel pits and construction of well pads, SPCF pad and camp pads will consist of a dozer to initially clear vegetation and then dozer or grader to strip topsoil, ensuring that rootstock is retained in the stockpiled topsoil. Expected machinery includes grader, 4W loader, tip truck, water truck, water tanks, excavators and compactors.

- Drainage line crossings – potential for minor drainage lines to occur across the exploration area. Generally, these can be trafficable with minimal modification of the creek bed required.

5.1 Erosion Hazard Assessment for EP 76, EP 98 and EP 117

5.1.1 Erosion Hazard Assessment for EP76, EP98 and EP117 – Well Pads, Access Tracks

An Erosion Hazard Assessment for all sites subject to this ESCP has been completed to inform the specific issues and actions that will be required for conducting activities within the permit areas. Table 5 (Amungee, Kalala, Kyalla, Velkerri and Beetaloo) and (Shenandoah South 2, South B, South C and North A) present the results of the assessment for exploration well pads and the SPCF adjacent to the Shenandoah South 2 well pad. The IECA (2008) Explanatory Notes for the assessment are presented Appendix A.

Table 5: Erosion hazard assessment for EP 76, EP 98 and EP 117 – well pads and access tracks

Condition (as described by IECA, 2008)	Points	Erosion Hazard Score					Trigger value
		Amungee Delineation Area*	Kalala S1	Kyalla 117 N2	Velkerri 76 S2	Beetaloo W	
AVERAGE SLOPE OF DISTURBANCE AREA [1]							
• not more than 3% [3% =33H:1V]	0	0	0	0	0	0	4
• more than 3% but not more than 5% [5% =20H:1V]	1	Comment - Topographical survey of well sites indicated (low relief) with a slope <3% (refer Appendix B)					
• more than 5% but not more than 10% [10% =10H:1V]	2						
• more than 10% but not • more than 15% [15%= 6.7H:1V]	4						
• more than 15%	6						
SOIL CLASSIFICATION GROUP (AS1726) [2]							
• GW, GP, GM, GC	0	2	2	2	2	2	-
• SW, SP, OL, OH	1	Comment – Geotechnical testing indicated SM - Silty sands, poorly graded sand-silt mixtures (refer Appendix C[2]).					
• SM, SC, MH, CH	2						
• ML, CL, or if imported fill is used, or if soils are untested	3						

[2] Note, Amungee NW, Beetaloo W and Kalala S well sites were constructed prior to 2018.

Condition (as described by IECA, 2008)	Points	Erosion Hazard Score					Trigger value
		Amungee Delineation Area*	Kalala S1	Kyalla 117 N2	Velkerri 76 S2	Beetaloo W	
EMERSON (DISPERSION) CLASS NUMBER [3]							
• Class 4, 6, 7, or 8	0	4	4	4	4	4	6
• Class 5	2	Comment – Class 3 or default- Amungee Delineation Area Class 3 or default - soils disturbed by cut and fill operations or construction traffic are likely to discolor stormwater (i.e. cause turbid runoff). Controls to reduce turbidity are required.					
• Class 3, (default value if soils are untested)	4						
• Class 1 or 2	6						
DURATION OF SOIL DISTURBANCE [4]							
• not more than 1 month	0	2	2	2	2	2	6
• more than 1 month but not more than 4 months	2	Comment – Clearing and earthworks are expected to be between 1 and 4 months.					
• more than 4 months but not more than 6 months	4						
• more than 6 months	6						
AREA OF DISTURBANCE [5]							
• not more than 1000 m^2	0	6	6	6	6	6	6
• more than 1000 m^2 but not more than 5000 m^2	1	Comment – All exploration well sites are greater than 4 ha but less than 12 ha of disturbance.					
• more than 5000 m^2 but not more than 1 ha	2						
• more than 1 ha but not • more than 4 ha	4						
• more than 4 ha	6						
WATERWAY DISTURBANCE [6]							
• No disturbance to a watercourse, open drain or channel	0	0	0	0	0	0	2
• Involves disturbance to a constructed open drain or • channel	1	Comment – Not near natural water courses (refer Appendix D).					
• Involves disturbance to a natural watercourse	2						
REHABILITATION METHOD [7] Percentage of area (relative to total disturbance) revegetated by seeding without light mulching (i.e. worst-case revegetation method).							
• not more than 1%	1	1	1	1	1	1	-
• more than 1% but not	2						

Condition (as described by IECA, 2008)	Points	Erosion Hazard Score					Trigger value
		Amungee Delineation Area*	Kalala S1	Kyalla 117 N2	Velkerri 76 S2	Beetaloo W	
• more than 5%		Comment – topsoil replaced along batters to commence assisted natural regeneration.					
• more than 5% but not more than 10%	3						
• more than 10%	4						
RECEIVING WATERS [8]							
• Saline waters only	0	2	2	2	2	2	-
• Freshwater body (e.g. creek or freshwater lake or river)	2	Comment – not located within the major flow pathway (refer to flood assessment in the Amungee Delineation Area Land Condition Assessment).					
SUBSOIL EXPOSURE [9]							
• No subsoil exposure except of service trenches	0	0	0	0	0	0	-
• Subsoils are likely to be exposed	2						
EXTERNAL CATCHMENTS [10]							
• No external catchment	0	1	1	1	1	1	-
• External catchment diverted around the soil disturbance	1	Comment – refer to civil design drawings (Appendix E to Appendix M)					
• External catchment not diverted around the soil disturbance	2						
ROAD CONSTRUCTION [11]							
• No road construction	0	2	2	2	2	2	-
• Involves road construction works	2						
pH OF SOILS TO BE REVEGETATED [12]							
• more than pH 5.5 but less than pH 8	0	0	0	0	0	0	-
• other pH values, or if soils are untested	1	Comment – Soil pH 5.5 to 8.0					
Total Score [13]		**20**	**16**	**20**	**20**	**20**	
For guidance purposes only: [13] A primary ESCP must be submitted to the local government for approval during the planning phase for any development that obtains a total point score of 17 or greater or when any trigger value is scored or exceeded							

Table 6: Erosion hazard assessment for EP 76, EP 98 and EP 117 – Shenandoah E&A Program

Condition (as described by IECA, 2008)	Points	Erosion Hazard Score					Trigger value
		Shenandoah South E&A Program					
		South B	South C	South 2 (inclusive of SPCF pad)	North A		
AVERAGE SLOPE OF DISTURBANCE AREA [1]							
• not more than 3% [3% =33H:1V]	0	0	0	0	0		4
• more than 3% but not more than 5% [5% =20H:1V]	1	Comment - Topographical survey of well sites indicated (low relief) with a slope <2% (refer Appendix B)					
• more than 5% but not more than 10% [10% =10H:1V]	2						
• more than 10% but not more than 15% [15%= 6.7H:1V]	4						
• more than 15%	6						
SOIL CLASSIFICATION GROUP (AS1726) [2]							
• GW, GP, GM, GC	0	2	2	2	2		-
• SW, SP, OL, OH	1	Comment – Geotechnical testing indicated SM - Silty sands, poorly graded sand-silt mixtures (refer Appendix C).					
• SM, SC, MH, CH	2						
• ML, CL, or if imported fill is used, or if soils are untested	3						
EMERSON (DISPERSION) CLASS NUMBER [3]							
• Class 4, 6, 7, or 8	0	6	6	4	6		6
• Class 5	2	Comment – Class 3 or default- Class 3 or default - soils disturbed by cut and fill operations or construction traffic are likely to discolour stormwater (i.e. cause turbid runoff). Controls to reduce turbidity are required.					
• Class 3, (default value if soils are untested)	4						
• Class 1 or 2	6						
DURATION OF SOIL DISTURBANCE [4]							
• not more than 1 month	0	2	2	2	2		6
• more than 1 month but not more than 4 months	2	Comment – Clearing and earthworks are expected to be between 1 and 4 months.					
• more than 4 months but not more than 6 months	4						
• more than 6 months	6						

Condition (as described by IECA, 2008)	Points	Erosion Hazard Score					Trigger value
		Shenandoah South E&A Program					
		South B	South C	South 2 (inclusive of SPCF pad)	North A		
AREA OF DISTURBANCE [5]							
• not more than 1000 m2	0	6	6	6	6		6
• more than 1000 m2 but not more than 5000 m2	1	Comment – All exploration well sites are greater than 4 ha but less than 12 ha of disturbance.					
• more than 5000 m2 but not more than 1 ha	2						
• more than 1 ha but not • more than 4 ha	4						
• more than 4 ha	6						
WATERWAY DISTURBANCE [6]							
• No disturbance to a watercourse, open drain or channel	0	0	0	0	0		2
• Involves disturbance to a constructed open drain or • channel	1	Comment – Not near natural water courses (refer Appendix D).					
• Involves disturbance to a natural watercourse	2						
REHABILITATION METHOD [7] Percentage of area (relative to total disturbance) revegetated by seeding without light mulching (i.e. worst-case revegetation method).							
• not more than 1%	1	1	1	1	1		-
• more than 1% but not • more than 5%	2	Comment – topsoil replaced along batters to commence assisted natural regeneration.					
• more than 5% but not more than 10%	3						
• more than 10%	4						
RECEIVING WATERS [8]							
• Saline waters only	0	2	2	2	2		-
• Freshwater body (e.g. creek or freshwater lake or river)	2	Comment – not located within the major flow pathway (refer to flood assessment for each well pad)					

Condition (as described by IECA, 2008)	Points	Erosion Hazard Score					Trigger value
		Shenandoah South E&A Program					
		South B	South C	South 2 (inclusive of SPCF pad)	North A		
SUBSOIL EXPOSURE [9]							
• No subsoil exposure except of service trenches	0	0	0	0	0		-
• Subsoils are likely to be exposed	2						
EXTERNAL CATCHMENTS [10]							
• No external catchment	0	1	1	1	1		-
• External catchment diverted around the soil disturbance	1	Comment – refer to civil design drawings (Appendix E to Appendix M)					
• External catchment not diverted around the soil disturbance	2						
ROAD CONSTRUCTION [11]							
• No road construction	0	2	2	2	2		-
• Involves road construction works	2						
pH OF SOILS TO BE REVEGETATED [12]							
• more than pH 5.5 but less than pH 8	0	0	0	0	0		-
• other pH values, or if soils are untested	1						
Total Score [13].		**22**	**22**	**20**	**22**		
For guidance purposes only: [13] A primary ESCP must be submitted to the local government for approval during the planning phase for any development that obtains a total point score of 17 or greater or when any trigger value is scored or exceeded							

5.1.2 Erosion Hazard Assessment for Seismic Surveys

Table 7 presents the results of the assessment for the seismic programs.

Table 7: Erosion hazard assessment for EP 76, EP 98 and EP 117 –seismic survey areas

Condition (as described by IECA, 2008)	Points	Score	Trigger value
		Seismic Survey Areas	
AVERAGE SLOPE OF DISTURBANCE AREA [1]			
• not more than 3% [3% = 33H:1V]	0	1	4
• more than 3% but not more than 5% [5% = 20H:1V]	1	Comment - Topographical data of well sites indicated (low relief) with a slope <1-2%. Isolated areas increase to 3% to 5%. Value of 1 adopted as worst case scenario.	
• more than 5% but not more than 10% • [10% = 10H:1V]	2		
• more than 10% but not more than 15% [15% = 6.7H:1V]	4		
• more than 15%	6		
SOIL CLASSIFICATION GROUP (AS1726) [2]			
• GW, GP, GM, GC	0	2	-
• SW, SP, OL, OH	1	Comment – Initial soil testing during the baseline survey indicated SM - Silty sands, poorly graded sand-silt mixtures (refer EMP).	
• SM, SC, MH, CH	2		
• ML, CL, or if imported fill is used, or if soils are untested	3		
EMERSON (DISPERSION) CLASS NUMBER [3]			
• Class 4, 6, 7, or 8	0	4	6
• Class 5	2	Comment – Class 3 – Specific testing for Emerson Class not conducted. Therefore, default value used.	
• Class 3, (default value if soils are untested)	4		
• Class 1 or 2	6		
DURATION OF SOIL DISTURBANCE [4]			
• not more than 1 month	0	2	6
• more than 1 month but not more than 4 months	2	Comment – Line preparation to rehabilitation will be less than 1-month duration, however worst-case allowance used.	
• more than 4 months but not more than 6 months	4		
• more than 6 months	6		
AREA OF DISTURBANCE [5]			
• not more than 1000 m^2	0	1	6
• more than 1,000 m^2 but not more than 5,000 m^2	1	Comment – Due to the tread lightly approach of the line preparation using	

Condition (as described by IECA, 2008)	Points	Score	Trigger value
		Seismic Survey Areas	
• more than 5,000 m^2 but not more than 1 ha	2	existing tracks and minimising tree and shrub clearing and the re-instatement of topsoil and vegetation as soon as possible after acquisition, results in no more than 5,000 m^2 assessed at any one time.	
• more than 1 ha but not more than 4 ha	4		
• more than 4 ha	6		
WATERWAY DISTURBANCE [6]			
• No disturbance to a watercourse, open drain or channel	0	2	2
• Involves disturbance to a constructed open drain or channel	1	Comment – Activities require crossing of some minor drainage lines (i.e intermittent stream 1 and 2). Not considered to be major works and will be re-instated as completion of acquisition. Also noted that majority of drainage crossings would be avoided for seismic program or would use a tread lightly approach such as on foot resulting in no disturbance.	
• Involves disturbance to a natural watercourse	2		
REHABILITATION METHOD [7] Percentage of area (relative to total disturbance) revegetated by seeding without light mulching (i.e. worst-case revegetation method).			
• not more than 1%	1	1	-
• more than 1% but not more than 5%	2	Comment – Topsoil and vegetated material to be replaced over disturbance within 2 weeks post activity for natural regeneration.	
• more than 5% but not more than 10%	3		
• more than 10%	4		
RECEIVING WATERS [8]			
• Saline waters only	0	N/A	-
• Freshwater body (e.g. creek or freshwater lake or river)	2	Comment – not applicable because freshwater bodies are ephemeral drainage lines only, with no flowing water at time of acquisition (dry season acquisition).	
SUBSOIL EXPOSURE [9]			
• No subsoil exposure except of service trenches	0	0	-
• Subsoils are likely to be exposed	2		
EXTERNAL CATCHMENTS [10]			
• No external catchment	0	0	-
• External catchment diverted around the soil disturbance	1	Comment – Not considered applicable based on the activities being completed	

Condition (as described by IECA, 2008)	Points	Score	Trigger value
		Seismic Survey Areas	
• External catchment not diverted around the soil disturbance	2	are temporary seismic lines.	
ROAD CONSTRUCTION [11]			
• No road construction	0	0	-
• Involves road construction works	2	Comment – only temporary seismic lines required. No construction of new tracks is necessary. Existing pastoral tracks to be treated post activity.	
pH OF SOILS TO BE REVEGETATED [12]			
• more than pH 5.5 but less than pH 8	0	0	-
• other pH values, or if soils are untested	1	**Comment –** Majority soils recorded within Soil pH range 5.5-8 across exploration area. Some areas recorded outside range but considered minimal risk to seismic program.	
Total Score [13]		**13**	
For guidance purposes only: [13] A primary ESCP must be submitted to the local government for approval during the planning phase for any development that obtains a total point score of 17 or greater or when any trigger value is scored or exceeded.			

The erosion hazard assessment for the Tamboran permit areas, all report equal to, or just below the point score of 17. Based on the trigger value being met the ESCP is required for majority of Tamboran's activities.

5.2 Soil Loss Estimate

IECA (2008) soil loss estimation has been used to determine the type of controls the project should adopt to limit soil loss during construction when soils are exposed to rainfall. Long term average soil loss resulting from sheet and rill flow can be predicted using the Revised Universal Soil Loss Equation (RUSLE).

Soil loss calculated using RUSLE for the project area was calculated as follows:

A = R K LS C P

Where A = annual soil loss due to erosion [tonnes/hectare/year (t/ha/yr)]

R = rainfall erosivity factor based on = 6297)

K = soil erodibility factor of 0.055 for silt loam)

LS = topographic factor derived from slope length and slope gradient (0.24)

C = cover and management factor (1)

P = erosion control practice factor (1.3)

It is noted that the annual R-factor of 6297 for the Katherine region has been adopted as per comment received by DLPE Land Management Team. Since preparation of the initial ESCP, additional geotechnical information has been obtained which provides a larger sample size of the proposed permit areas.

The geotechnical sampling completed on the sites is as provided in Table 8. As such, the K-factor has been determined from Table E4 of the IECA Guidelines.

Revision of the LS-factor on more detailed design drawings shows a total slope length of approx. 200 m at a gradient of 0.00120 m/m (0.12%), indicative of the gradients across both sites. A LS factor of 0.24 was adopted, indicating a 200 m slope at 0.01 m/m (1%) for sites on the Amungee delineation, Kalala, Kyalla, Velkerri and Beetaloo. The slopes based on the contour information at hand for the Shenandoah South 2, South B, South C, North A (and option 2) are provided in Table 8.

Based on the reviewed RUSLE soil loss methodology, the Annual Soil Loss estimate using these values is 33 t/ha/yr – 204 t/ha/yr. A combination of Type 3, Type 2 and Type 1 sediment controls will be required based on the RUSLE equation.

All the proposed activities for the exploration program are planned during the dry season (May to September) when the erosion risk rating for rainfall is very low (refer to Table 2 and Table 3). Where activities occur in the wet season, Tamboran's wet weather contingency plan will be implemented (refer Table 12).

Table 8: RUSLE value and factors

Site	R	K Factor	Slope %	LS	C	P	A (t/ha/yr)
Amungee Delineation	6297	0.055	1	0.24	1	1.3	108
Kalala	6297	0.055	1	0.24	1	1.3	108
Kyalla	6297	0.055	1	0.24	1	1.3	108
Velkerri	6297	0.055	1	0.24	1	1.3	108
Beetaloo	6297	0.055	1	0.24	1	1.3	108
Shenandoah S A	6297	0.043	0.5 - 1.0	0.24	1	1.3	84
Shenandoah S B	6297	0.043	0.3 - 0.5	0.24	1	1.3	84
Shenandoah S C	6297	0.017	0.3 - 0.5	0.24	1	1.3	33
Shenandoah S2	6297	0.055	1	0.24	1	1.3	108
Shenandoah N A	6297	0.025	1.5 - 2.0	0.58	1	1.3	204
Shenandoah N A (option 2)	6297	0.025	1.5 - 2.0	0.58	1	1.3	204

5.3 Erosion Risk and Determination of ESC

Erosion risk ratings for the Project area have been determined based on the average monthly erosivity (R-factor of 6297), average monthly rainfall depth (mm) (refer Table 2 and Table 3 above) and soil loss (estimated at between 108t/ha/yr and 204t/ha/yr). As indicated in Table 9, the Project has an erosion risk rating of "very low" to "low".

Table 9: Erosion risk rating (adapted from IECA, 2008, Tables 4.4.1, 4.4.2 and 4.4.3)

Erosion Risk Rating	Average Monthly Erosivity (R-Factor)	Average Monthly Rainfall Depth (mm)	Soil Loss (t/ha/yr)
Very Low	0 to 60	0 to 30*	0 to 150
Low	60+ to 100	30+ to 45	150+ to 225

Erosion Risk Rating	Average Monthly Erosivity (R-Factor)	Average Monthly Rainfall Depth (mm)	Soil Loss (t/ha/yr)
Moderate	100+ to 285	45+ to 100	225+ to 500
High	285+ to 1,500	100+ to 225	500+ to 1,500
Extreme	>1,500*	>225	>1,500

* It is noted that the monthly erosivity factor would only be triggered during rainfall events. The construction period is proposed to occur from July to October and based on assessment of the average monthly rainfall for the region (refer Table 2 and Table 3), the erosion risk rating is considered very low (0 to 30 mm during this time). It is anticipated that at completion of construction the site would be stabilised for normal operation.

Table 10 provides an indication of the "Type" of erosion and sediment controls that should be deployed during construction depending on annual soil loss. Based on the proposed construction schedule during the dry season, the project is determined to trigger the use of Type 3, Type 2and Type 1 erosion and sediment controls, based on the soil loss rate for the site in question. Refer to the results in Table 8 for the soil loss calculations and compare to Table 10, for the type of soil loss controls required.

Table 10: Sediment control standard (adapted from IECA 2008, Table 4.5.1)

Catchment Area (m^2)	Soil Loss Rate Limit (t/ha/yr)		
	Type 1	Type 2	Type 3
250	N/A	N/A	All Cases
1000	N/A	N/A	All Cases
2500	N/A	>75	75
>2500	>150	150	75

Table 11 provides a range of erosion and sediment controls that can be deployed on the project for each 'Erosion and Sediment Control Type'.

Table 11: Classifications of sediment controls

Type 1	Type 2	Type 3
Sheet flow		
Buffer zone capable of infiltrating 100% of stormwater runoff or processed water Infiltration basin or sand filter bed capable of infiltration of 100% of flow	Buffer zone capable of infiltrating 100% of stormwater runoff Compost / mulch berm	Buffer Zone capable of infiltrating 100% of stormwater runoff Filter fence Modular sediment trap Sediment fence
Concentrated flow		
Sediment basin (sized in accordance with design standard)	Sediment basin (smaller than the design standard) Filter tube dam Rock filter dam Sediment trench Sediment weir	Coarse sediment trap Modular sediment trap U-shaped sediment trap
Dewatering sediment control		

Type 1	Type 2	Type 3
Type F/D Sediment Basin Stilling Pond	Filter bag or filter tube filter pond Filter tube dam Portable sediment tank Settling pond Sump pit	Compost berm Filter fence Grass filter bed Hydro cyclone Portable sediment tank Sediment fence
In-stream sediment control		
Pump sediment laden water to an off-stream type F/D sediment basin or high filtration system	Filter tube barrier Modular sediment barrier Rock filter dam Sediment weir	Modular sediment barrier Sediment filter cage

The site specific ESCP drawings are provided in Appendix E to Appendix M.

Standard drawings that may be applicable for the Project, including controls for access tracks and stream crossings are provided in Appendix N. The final design of the ESC controls will be dependent on decisions made in the field by the Supervising Engineer and site conditions. Any significant changes to those identified in this ESCP will be reported through to DLPE Land Management Team for review and approval. Tamboran and its civil contractors will be responsible for notifying of any changes.

Standard drawings for erosion and sediment controls are available at: http://www.austieca.com.au/publications/book-6-standard-drawings.

5.3.1 Modifying the ESC Measures

It is possible that some ESC measures will require modification as the project is constructed and in response to the performance of ESC measures or changes in project circumstances. The modifications may be considered minor, moderate or significant. Moderate and minor changes will occur, and it is expected that significant modifications will be the exception. If significant erosion events occur, significant changes to the measures used will be required and should be approved by a CPESC or suitably qualified consulting engineer.

To accommodate the range of circumstances likely to occur, a change management decision matrix is presented in Table 12. Where changes are required, these will be risked assessed through a change management process and kept in a change management register.

Table 12: Change management decision matrix

Authority required	Minor	Moderate		Significant
	Maintenance of all measures	Removal or relocation of minor temporary controls	Permanent measure relocation	Permanent measure removal/revisions to ESCP
Tamboran onsite company rep	✓	×	×	×
Site supervisor	-	✓	×	×
CPESC	-	-	✓	✓
Consulting engineer	-	-	✓	✓

✓ Authorised to undertake
× Not authorised to undertake
- Denotes that authority level is not required

Examples of different types of sediment controls can be seen in Table 7. Examples of minor temporary controls would fall under Type 3 sediment controls while Type 2 and Type 1 sediment controls provide examples of permanent measures.

It is noted that minor and permanent are not indications of how long the sediment controls are in place. At completion of the activities, the disturbed areas to be restored and/or rehabilitated to pre-disturbed conditions consistent with the surrounding land use.

If ESC measures are observed to be ineffective (e.g. obvious sediment deposition has occurred, or is occurring in a waterway), the source of the sediment must be identified, and corrective ESC measures implemented.

6 Erosion and Sediment Controls

6.1 Well Exploration Areas

Based on the erosion susceptibility of the exploration area, the ESCP measures to be adopted for the exploration programs are summarised in Table 13. These ESCP measures have been considered during the design of the exploration well pads and associated infrastructures, inclusive of the SPCF, and will be implemented by the Tamboran contractors during the construction and maintenance activities.

Table 13: Measures to be implemented for erosion and sediment control – well exploration areas

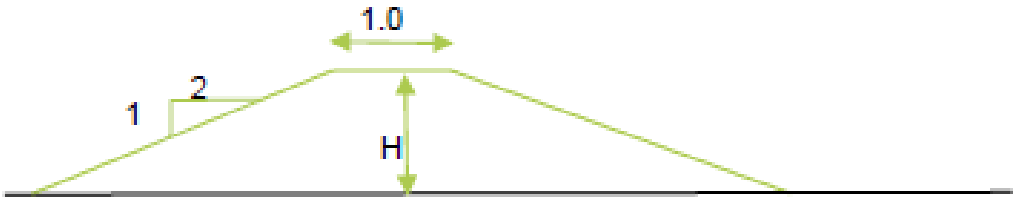
Activity	Management controls
Land clearing	• Undertake selective clearing (only clearing areas that are necessary for construction and ESC activities), using lighter machinery such as graders or smaller bulldozers, taking care not to overwork the site. Overworking the site can lead to the loss of topsoil, compaction, formation of windrows and wheel rutting. • Minimise tree clearing activities only during the dry season (May to September) to allow the ground surface to stabilise before the onset of the wet season (October to April). • Retain vegetation buffers surrounding streams and creeks, as outlined in the *NTG Land Clearing Guidelines 2021*. • Undertake clearing for each stage in small units over time, keeping the disturbed areas small and time of exposure short, in conjunction with progressive re-vegetation (assisted natural regeneration using available topsoil). • Take all reasonable and practicable measures to minimise the removal of, or disturbance to, trees, shrubs and ground covers (organic or inorganic) that are to be retained. • If bulk tree clearing is required, it must occur in a manner that minimises disturbance to existing ground cover (organic or inorganic). • Bulk tree clearing and grubbing of the site must be immediately followed by specified temporary stabilisation measures (e.g. gravel, soil berm) prior to commencement of each stage of construction works. • Land clearing should not occur unless preceded by the installation of appropriate drainage and sediment control measures. The exception would be any land clearing necessary to allow installation of these control measures. Prior to land clearing, establish tree protection zones around vegetation to be retained e.g. identify with high-visibility tape, or light fencing. • All land clearing must be in accordance with the Federal, Territory and local government vegetation clearing requirements and IECA Table 4.4.7 Best practice land clearing and rehabilitation requirements. • All reasonable and practicable steps to be taken to apply best practice Erosion control measures following earthworks and site stabilised prior to anticipated rainfall. Disturbed areas will be stabilised with a minimum 60% cover within 30 days of completion.

Activity	Management controls

Access tracks	• Where possible, use existing roads and tracks to access the well sites, and where new tracks are required, they should be located along the most direct and practicable route to the well site (noting Velkerri 76 S1 access track has been diverted around the sensitive Bullwaddy/Lancewood vegetation type).
	• Trucks entering and exiting the site will be constrained in such a manner to prevent dropping or tracking material on the Highway in accordance with the Road Agency Approval (ref 2018-0186-D2).
	• Monitor Stuart Highway during construction and operation. Where tracked material on the road pavement becomes a potential safety issue, Tamboran and its contractors will sweep and clean material off the road. If Stuart Highway turn-in results in dust, dirt creating hazard to road users, additional ESC will be considered including installation of shaker grid or rock pad.
	• Minimise track width and surface disturbance (e.g. topsoil, seed and root stock) as far as practicable to allow safe passage of required equipment.
	• Disturbed areas will be stabilised with a minimum 60% cover 30 days of completion if rainfall possible.
	• Where gravelling is warranted (Stuart Highway and Carpentaria Turn-in), the formation process can remove undesirable material and/or box the imported material where it is required. Track formation will be required for the following reasons:
	  • Drainage control, especially in areas where erosion or sediment influences are evident, any vegetation, topography, wheel rutting or
	  • compaction is likely to intercept, concentrate and channel water.
	  • Where the topography of the track location or the drainage characteristics of the soil are likely to hinder access for a protracted time period following rain (e.g. 1 to 2 weeks).
	  • Where natural side-slope poses a safety hazard to potential users of the track (e.g. contractors, landowners).
	• Place scrub and vegetation cleared from the route adjacent to the route where practical to facilitate its return to the disturbed area. Where this occurs, spread the material out rather than form windrows. Allow disturbed areas to be stabilised and natural regeneration of the native grasses to occur.
	• Construct access tracks with table drains that are free draining.
	• Avoid road crowning to allow water to naturally cross the road.
	• Form tracks to allow off-road drainage. Where track intercepts the direction of overland flow and re-directs this flow to a non-natural drainage line, install erosion control works to minimise potential erosion.
	• The design and position of erosion control measures to be determined in the field by experienced operator and site engineer, based on the site characteristics of the access track location.
	• Where construction of table drains are deemed necessary, they should have a broad flat base at least 1 m wide and should not be graded to produce a 'V' shape. To minimise erosion, the slope should be no greater than 0.5% on erodible soils or 1% on stable soils.

Activity	Management controls
	• Where encounter dispersive / erosive soils they should be stabilised with gypsum or other stabiliser, as determined by laboratory analysis of soils. • Where cut-out drains are required, they should be spaced based on the slope of the area i.e. 0.5% slope, allow for cut-out draining every 170-180 m or 1 % slope, allow for cut-out drainage every 120-130 m etc. (refer to NT Road Drainage Fact Sheet). It is noted that the recommended distance between turn-out drains is a guide and may not apply to all locations along the access track. • Monitor road conditions to ensure deterioration does not occur. Assist in the maintenance and repair work on roads and tracks used. • Following completion of activities and within 2 years after the surrender of a lease, the land surrounding or affected by the installation of access tracks shall be restored in accordance with the site-specific rehabilitation plan and final determination of asset (i.e. if transferring asset ownership to landholder).
Placement of gathering lines along access tracks	• Placement and installation of gathering lines in accordance with the Upstream Polyethylene Gathering Networks – CSG Industry Code of Practice (Version 5.0 August 2019) and Appendix P - Land-based pipeline construction (IECA, December 2015). • Route selection of gathering lines should consider the location of start and end points, well locations and access requirements, hydraulic requirements based on topography, existing services and infrastructure, and current and future land use. • Gathering line route to be selected such that the pipe can be installed, tested, and operated safely and practically. • Gathering line to be placed above ground within the access track corridor (but not within the trafficable area), minimising the need for additional vegetation clearing where possible. Topsoil to be removed to allow gathering line to be placed directly on the subsoil layer to minimise soil disbursement. • Extra protection of gathering line to be provided where necessary, particularly to prevent damage from conditions such as traffic and cattle movement and at stream and river crossings (where applicable). • Allow for trafficable cross banks where gathering line crosses the access tracks. No other area of the gathering line to be trafficable. • Where gathering line intersects an overland flow path, allow for sheet flow to pass to avoid concentrated flow resulting in scouring. • Install sediment controls such as fibre rolls or mulch berms along line to control velocity and capture minor sediment. • Avoid rocky areas and steep slopes and side slopes if possible. • Align gathering line straight up and down slopes. • Contents of pipes to be clearly labelled based on Table 3.3.1 Colour Specification (i.e. yellow for gas, produced formation water purple, etc.). • Fire protection measures to be employed by reducing fuel loads by up to 5 m either side of the gathering line. • Regularly inspect, monitor and maintain ESC measures.

Activity	Management controls

Pad construction / maintenance	• Pad construction to be in accordance with the typical ESCP (refer **Appendix E**). The topsoil berm dimension to be in accordance with the IECA Figure 1 Standard Drawing MB-01 presented in **Appendix N**.
	  • Use topsoil berms to divert upstream runoff from undisturbed areas ('clean' water) around and away from disturbed areas, and back to the environment.
	  • Topsoil bunds are to be formed to the profile provided in the sketch below. Bund height (H) is specified on the drawings.
	  • Where topsoil bunds are to be utilised for wastewater storage spill containment, topsoil bunds are to be formed to the profile provided in the sketch below. Bund height shall consider the well pad slope and volume of wastewater stored onsite. The typical, low point bund height is specified on the drawings, assuming a 0.2% storage area fall.
	 
	
	  • Topsoil to be compacted to 95% mmdd.
	  • Use topsoil berms to contain / manage runoff from disturbed construction areas ('dirty' water) and prevent release to environment without treatment.
	  • Treat runoff from construction areas through suitable sediment controls (e.g. sediment traps).
	  • Configure berms so that upstream runoff does not mix with construction area runoff prior to treatment of construction area runoff.
	• Where topsoil stripping is required, the stripping depth would be in accordance with Technical Instruction (NT-2050-15-TI-0001) and amelioration rates agreed with the Construction Supervisor, Tamboran engineers and by a suitably qualified ESC practitioner. It is noted that the expected nominal depth of topsoil across the well pads at locations ranges from <100 mm to 150 mm. Final strip depth will be confirmed in the field. Any changes to the adopted ESCs will be reflected in the ESCP and to satisfaction of DLPE.
	• Stockpiled felled trees nearby for future use in rehabilitation.
	• Inspect on a regular basis in accordance with Section 5 Maintenance.
	• Damage or maintenance is undertaken by an appropriately qualified person i.e. contractor / Tamboran.
	• Following completion of activities and within 2 years after the surrender of a lease, the land surrounding or affected by the exploration wells

Activity	Management controls
	shall be restored in accordance with the site-specific rehabilitation plan and final determination of asset (i.e. if transferring asset ownership to landholder).
Stream and creek crossings	Where a crossing is required to be upgraded, a bed level crossing as detailed in **Appendix L**, will be installed in accordance with the following: • Crossings will be aligned perpendicular to the water flow. • Crossing will be constructed from clean rocks (minimal fine material) that are an equivalent or larger size than the natural bed material at the crossing. • The surface is to be left rough and not to be over compacted (e.g. track-rolled finish or rougher). • The lowest point of the bed level crossing will be installed at the level of the lowest point of the natural stream bed (preconstruction), within the footprint of the proposed crossing. • There must be a height difference of at least 100 mm up to ≤ 300 mm from the lowest point of the crossing to the edges of the low flow section of the crossing. Where scour protection is required: • Scour protection must abut the surface edge of the crossing at the same level (this is to ensure that there is no drop in elevation at the join). • If the crossing is set below bed level then the surface of the scour protection must also be below bed level. • The stream bed must abut the scour protection at the same level (this is to ensure that there is no drop in elevation at the join). • The scour protection is installed at a gradient no steeper than 1 in 20 or the natural channel gradient, whichever is steeper. • Scour protection must incorporate a low flow channel. Use clean rocks (minimal fine material), at least 100 mm diameter. • Ensure the rock armouring is not over compacted but left at the same level and uneven (track-rolled finish or rougher). • Use clean rocks (minimal fine material), at least 100 mm diameter. • The retention of vegetation buffers, as outlined in the NTG Land Clearing Guidelines 2019, as they relate to stream order has been considered for the siting of proposed access tracks and pads. • Site specific progressive ECPs should be approved by DLPE prior to any disturbance. • Should activities pushout to the wet season, the DLPE to be reviewed and updated for wet season conditions. The revision to be reviewed and approved by DLPE during September to allow implementation of the plan prior to the onset of the wet season. Wet season ESCP to be implemented between 1 October to 30 April.
Soil and stockpile management	• Stockpile existing topsoil, where available, so that it can be reused on the site for ESC and future rehabilitation at completion of project. • Stockpiles of erodible material that has the potential to cause environmental harm if displaced, must be:

Activity	Management controls
	• Appropriately protected from wind, rain, concentrated surface flow and excessive up-slope stormwater surface flows. • Located at least 2m from any hazardous area or retained vegetation. • Located up-slope of an appropriate sediment control system. • Provided with an appropriate protective cover (synthetic or vegetative) if the materials are likely to be stockpiled for more than 28 days. • Provided with an appropriate protective cover (synthetic or vegetative) if the materials are likely to be stockpiled for more than 10 days during those months that have an erosion risk rating higher than medium. • A suitable flow diversion system must be established immediately up-slope of a stockpile of erodible material that has the potential to cause. • environmental harm if displaced, if the up-slope catchment area draining to the stockpile exceeds 1,500m^2. • Avoid creating windrows. Do not create windrows across creeks, use rollers when putting in tracks in preference to dozers, or walk the dozer with the blade raised off the ground.
Site management	• All disturbed areas identified as very low, low, medium or high erosion risk must be suitably stabilised prior to anticipated rainfall, from the day that soil disturbances on the area have been finalised- IECA Table 4.4.7. • Tracks to be regularly inspected for early signs of compaction, erosion and soil degradation (generation of bulldust). Ongoing maintenance and repair work should be implemented as required on tracks. • No off-lease or off-road driving. • The construction schedule must aim to minimise the duration that any and all areas of soil are exposed to the erosive effects of wind, rain and surface water flow. • Land-disturbing activities must: • allow stormwater to pass through the site in a controlled manner and at non-erosive flow velocities. • minimise soil erosion resulting from rain, water flow and/or wind. • minimise adverse effects of sediment runoff, including safety issues. • prevent, or at least minimise, environmental harm resulting from work-related soil erosion and sediment runoff. • ensure that the value and use of land/properties adjacent to the site (including access roads) are not diminished as a result of the adopted ESC measures. • Additional and/or alternative ESC measures must be implemented in the event that unacceptable off-site sedimentation is occurring as a result of the work activities. • Sediment deposited off the site as a direct result of an on-site activity, must be collected and the area appropriately rehabilitated as soon as reasonable and practicable, and in a manner that gives appropriate consideration to the safety and environmental risks associated with the

Activity	Management controls
	sediment deposition.
Drainage control	• Where reasonable and practicable, stormwater runoff entering the site, must be diverted around or through the area in a manner that minimises soil erosion and the contamination of water for all discharges. • All reasonable and practicable measures must be implemented to control flow velocities a manner that prevents soil erosion along drainage paths and at the entrance and exit of all drains and drainage pipes during storms up to the relevant design storm discharge.

Erosion control	• If synthetic reinforced erosion control mats or blankets are required, they must not be placed in, or adjacent to, riparian zones and watercourses if such materials are likely to cause environmental harm to wildlife or wildlife habitats.
	• A minimum 60% ground cover must be achieved on all non-completed earthworks exposed to accelerated soil erosion. If further construction activities or soil disturbances are likely to be suspended for more than 30 days during months when the expected rainfall erosivity is less than 60;
	  • minimum 70% cover within 30 days if between 60 and 100;
	  • minimum 70% cover within 20 days if between 100 and 285;
	  • minimum 80% cover within 10 days if between 285 and 1,500; and
	  • minimum 95% cover within 5 days if greater than 1,500.

Sediment control	• Optimum benefit must be made of every opportunity to trap sediment within the work site, and as close as practicable to its source. • Sediment pond to be installed and operated to both collect and retain sediment (refer to Drawing NT-2050-15-MP-0021 and NT-2050-15-MP-022 in Appendix E). Design details of the sediment pond is provided in NT-2050-20-DD-0030. • All reasonable and practicable measures must be taken to prevent, or at least minimise, the release of sediment from the site (section 7.5). • Sediment control devices must be de-silted and made fully operational as soon as reasonable and practicable after a sediment-producing event if the device's sediment retention capacity falls below 75% of its design retention capacity. • Materials removed from sediment control devices must be disposed of in a manner that does not cause ongoing soil erosion or environmental harm.
Wet weather contingency	• 7-day forecast from the Bureau of Meteorology (BOM) to be monitored and the civil and water bore construction activities planned around the forecasts. • Where forecasts indicate rainfall is likely to result in an event that has potential to limit access to the work area, the civil and water bore contractor will stabilise the current work areas and go into standby mode until such time they can assess the track condition after an event to recommence activities. • Emergency response – a post-rainfall/flood damage reconnaissance and assessment will be undertaken as soon as the area becomes

Activity	Management controls
	accessible. Any damage observed would be repaired as soon as practicable after the event and ensure the controls and measures are in place prior to the next rainfall event.
Site rehabilitation	• Following completion of works, disturbed areas are to be restored and/or rehabilitated. • Gravel pits to have topsoil returned and re-profiled. • All compacted areas will be ripped and scarified to promote regeneration of vegetation; this may require assistance through spread of native seed stock. • All disturbed areas will be allowed to naturally regenerate or be revegetated on completion of use. • Compacted areas will be contour ripped to 0.5m depth where practicable. • At completion of activities, establish vegetation similar to adjacent vegetation, unless agreement with landowner for alternative use. • Remove and appropriately dispose of all synthetic erosion and sediment control materials. • All disturbed areas identified as very low, low, medium or high erosion risk must be suitably stabilised prior to anticipated rainfall, from the day that soil disturbances on the area have been finalised- IECA Table 4.4.7. • Stabilise disturbed areas quickly to reduce the potential for erosion. Methods of stabilisation will be site specific and based, in part, on laboratory analysis of soils for erosive and dispersive characteristics. • Previously removed vegetation and topsoil will be uniformly re-spread over disturbed area to assist with rehabilitation process through agencies of increased infiltration and return of seed-bearing topsoil. If required, additional native seed mix from the area could be respread to speed up rehabilitation process. • Windrows of debris that cannot be removed should be aligned down the contour or in a manner appropriate to avoid channeling and concentrating runoff. All other windrows are to be removed as soon as practicable. • The type of ground cover applied to completed earthworks is compatible with the anticipated long-term land use, environmental risk, and site rehabilitation measures.

6.2 2D and 3D Seismic Activities

Based on the erosion susceptibility of the exploration areas, the ESCP measures to be adopted for the 2D and 3D seismic exploration programs are summarised in Table 14 below. These ESCP measures have been considered during the design of the seismic program and will be implemented by the Tamboran contractors during the construction and maintenance activities.

Table 14: Measures to be implemented for erosion and sediment control – seismic survey areas

Activity	Management controls
Vegetation clearing	• Undertake selective clearing (only clearing areas that are necessary for surveying lines), using lighter machinery such as graders or smaller bulldozers, taking care not to overwork tracks. Overworking the site can lead to the loss of topsoil, compaction, formation of windrows and wheel rutting. Refer to the first dot point in the seismic line preparation and access track and camp establishment/maintenance section below. • Ground surface to be stabilised before the onset of the wet season (November to March). • Undertake clearing for each stage in small units over time, keeping the disturbed areas small and exposure time short, in conjunction with progressive re- vegetation (assisted natural regeneration using available topsoil and removed vegetation). • Take all reasonable and practicable measures to minimise the removal of, or disturbance to, trees, shrubs and ground covers (organic or inorganic) that are to be retained. • All vegetation clearing must be in accordance with the Federal, Territory and local government vegetation clearing requirements and IECA Table 4.4.7 Best practice land clearing and rehabilitation requirements detailed Appendix O. • Best practice erosion control measures will be implemented in accordance with the ESCP following earthworks and site stabilised prior to anticipated rainfall. • Disturbed areas will be stabilised in accordance with the Rehabilitation Management Plan, as per Section 7.4.

<table>
<tr><th>Activity</th><th>Management controls</th></tr>
<tr><td>Creek and Drainage Line Crossings</td><td>Minimise disturbance in the buffers in accordance with the stream order of the encountered drainage line in accordance with the buffers provided below:
<table>
<tr><th>Class</th><th>Stream order</th><th>Minimum buffer width (m)</th><th>Measured from</th></tr>
<tr><td>Drainage depression</td><td>Not applicable</td><td>25</td><td>The outer edge of the drainage depression, which is the extent of the associated poorly drained soils and associated vegetation.</td></tr>
<tr><td>Intermittent streams</td><td>First</td><td>25</td><td>The outer edge of the riparian vegetation or levee (whichever is greater).
If braided channels are present, the edge of the outer most stream channel</td></tr>
<tr><td>Intermittent streams</td><td>Second</td><td>50</td><td>As above</td></tr>
<tr><td>Creeks</td><td>Third and fourth</td><td>100</td><td>As above</td></tr>
<tr><td>Rivers</td><td>Fifth and higher</td><td>250</td><td>As above</td></tr>
</table>

No additional material will be used for the seismic acquisition to cross over the creek crossing. Existing crossings will not be altered.
The activities shall be completed in a manner that does not cause a:

material change to the shape of a waterway,
material change to the volume, speed or direction of flow or likely flow of water in or into a waterway, or
alteration to the stability of the bed or banks of a waterway, including by removal of vegetation.

Ongoing monitoring of creek and drainage crossing condition prior to, during and at completion of rehabilitation.
Reinstate the original topography of the creek or drainage bed following seismic acquisition.
</td></tr>
<tr><td>Seismic line preparation</td><td>
The method for line preparation described in the EMP is to use existing pastoral station tracks wherever practicable, or minimise the complete removal of the vegetation, with vehicles to traverse over or around the vegetation instead, leaving as much intact as possible. Assessment of the survey area indicates that in the order of 80 to 90% of the undisturbed areas will be traversed as a blade up exercise.
Minimising vegetation and soil disturbance is the default position for the seismic program. Wherever possible vegetation and soil shall not
</td></tr>
</table>

Activity	Management controls
	be disturbed when establishing survey lines (i.e. blade up). If disturbance is required, establishment of survey lines which will form a runoff channel is to be avoided. • Seismic vehicles that enter and exit the site will be constrained in such a manner to prevent dropping or tracking material on the Highway in accordance with the Road Agency Approval. • Place scrub and vegetation cleared from the route adjacent to the route where practical to facilitate its return to the disturbed area. Where this occurs, spread the material out rather than form windrows. Allow disturbed areas to be stabilised and natural regeneration of the native grasses to occur.

Site management	• All plant and equipment brought to site is to be certified a "free" of weeds, soil pathogens and pests.
	• All disturbed areas identified as very low, low, medium or high erosion risk must be suitably stabilised prior to anticipated rainfall, from the day that soil disturbances on the area have been finalised - IECA Table 4.4.7 in Appendix O.
	• Land-disturbing activities must:
	  • Allow stormwater to pass through the site in a controlled manner and at non-erosive flow velocities. Where this cannot be achieved, reference should be made to installing controls as detailed in the following section.
	  • Minimise soil erosion resulting from rain, water flow and/or wind.
	  • Minimise adverse effects of sediment runoff, including safety issues.
	  • Prevent, or at least minimise, environmental harm resulting from work-related soil erosion and sediment runoff.
	  • Ensure that the value and use of land/properties adjacent to the site (including access roads) are not diminished as a result of the adopted ESC measures.
	• Additional and/or alternative ESC measures must be implemented in the event that unacceptable off-site sedimentation is occurring as a result of the work activities.
	• Sediment deposited off the site as a direct result of an on-site activity, must be collected and the area appropriately rehabilitated as soon as reasonable and practicable, and in a manner that considers the safety and environmental risks associated with the sediment deposition.

Wet weather contingency	• Wet season contingency planning to be conducted where activities extend into the wet season. • 7-day forecast from the Bureau of Meteorology (BOM) to be monitored and the seismic exploration activities planned around the forecasts. • Where forecasts indicate rainfall is likely to result in an event that has potential to limit access to the work area, the seismic contractor will stabilise the current work areas and go into standby mode until such time they can assess the track condition after an event to recommence activities. • Emergency response - a post-rainfall/flood damage reconnaissance and assessment will be undertaken as soon as area becomes accessible.

Activity	Management controls
	• Any damage observed would be repaired as soon as practicable after the event.
Site rehabilitation	• Within 2 weeks of the activities being completed, disturbed areas are to be restored and/or rehabilitated. Reference should be made to Tamboran's Rehabilitation Management Plans. • All compacted areas will be ripped and scarified to promote regeneration of vegetation. • All disturbed areas will be allowed to naturally regenerate or be revegetated on completion of use. • At completion of activities, establish vegetation to the standard of that registered in the pre-assessment, or better. • All disturbed areas identified as very low, low, medium or high erosion risk must be suitably stabilised prior to anticipated rainfall, from the day that soil disturbances on the area have been finalized as per the requirements of IECA Table 4.4.7 (Appendix O). • Stabilise disturbed areas quickly to reduce the potential for erosion. • Previously removed vegetation and topsoil will be uniformly re-spread over disturbed area to assist with rehabilitation process through agencies of increased infiltration and return of seed-bearing topsoil. If required, additional native seed mix from the area could be respread to speed up rehabilitation process. This will be confirmed during rehabilitation monitoring activities. • This will be confirmed during rehabilitation monitoring activities. • Windrows to be removed as soon as practicable. • The type of ground cover applied to completed earthworks is compatible with the anticipated long-term land use, environmental risk, and site rehabilitation measures. • At completion, the disturbed areas are to be restored and/or rehabilitated to original pre-disturbed condition consistent with surrounding land use. • Remove and appropriately dispose of all synthetic erosion and sediment control materials.

6.3 ESC Treatment Options for Specific Situations

Appendix N to Appendix P contain typical erosion and sediment control measures that are to be applied throughout the project when required. Treatments are identified for specific situations and should be applied appropriately. Five different seismic line treatments are identified below.

- Blade up areas where only wheel tracks will develop – no treatments required.
- Surface bladed by grader to smooth out ground surface to allow vehicle movements. No tree removal. Topsoil will be bladed off by grader and windrowed for later respreading at completion of data recording, to preserve the soil structure. Whoa boys or roll over banks to be provided as per details in Appendix P.
    - At the conclusion of activities, or as part of progressive rehabilitation, or the anticipated onset of a significant rainfall event which will require the site to be abandoned, topsoil would be respread and ripped into the soil surface.
    - Works on grade (>2%)– Surface bladed by grader to smooth out ground surface to allow vehicle movements. No tree removal. Topsoil will be bladed off by grader and windrowed for later respreading at completion of data recording, to preserve the soil structure. Whoa boys or roll over banks to be provided as per details in Appendix P.
    - At the conclusion of activities, or as part of progressive rehabilitation, or the anticipated onset of a significant rainfall event which will require the site to be abandoned, topsoil would be respread and ripped into the soil surface.
- Wooded communities e.g. Lancewood/Bullwaddy – For most of the program wherever practical, activities should be planned to avoid impacts to Lancewood and Bullwaddy vegetation communities. Where this is not possible, the vegetation community would require measures as follows:
    - A survey line of 3.5 to 5 m maximum cleared by the dozer avoiding trees where possible, but selective clearing if required. Felled trees to be pushed to the nearby bushland to enable vehicle access through the site, but reinstated post survey.
    - Following clearing the topsoil bladed off by grader and windrowed for later respreading with the vegetated material at completion of data recording.
    - The line preparation will require blading to a sufficient depth, no greater than 150 mm, to enable the safe access of the vehicles where required. The purpose of the blading is to reduce the risk of tyre puncture from the Lancewood which is known to snap off at ground level leaving a spike protruding.
    - Whoa boys or roll over banks to be provided as per detail in Appendix P.
    - At the conclusion of activities, or as part of progressive rehabilitation, or the anticipated onset of a significant rainfall event which will require the site to be abandoned, topsoil would be respread at a thickness of 150 mm and ripped into the soil surface.
    - Felled vegetation will be evenly spread over the top soiled area to provide additional protection against erosion.
- Seasonally inundated areas - Similar to the wooded communities described above, high clay content soils (vertosols) are also found in seasonally inundated areas (i.e. wetlands/floodplains). Unlike the wooded areas these clays continue at depth, making the scraping back of topsoil less effective in keeping bulldust down and preserving soil structure.

The recommendation in these include:

- line preparation with vehicles traversing directly of the annual grasses, flattening or slashing for data acquisition i.e. blade up (noting bushfire precautions recommended).
- Where soils have been compacted in the seasonally inundated areas, a light ripping to break up the surface is recommended to promote growth of stratum 3 grasses.

7 Monitoring

7.1 Construction

Monitoring for soil erosion and related issues is best undertaken at critical stages, such as:

- At the time of the baseline land condition assessment.
- During siting of access tracks and exploration areas, this is when there is the greatest opportunity to avoid erosion problems.
- After completion of a specific phase of activity, all disturbed areas will be monitored before and after the wet season.
- When accessing the site after the wet season, all disturbed areas should be inspected for signs of erosion. If significant impacts are identified remediation works may need to be conducted prior to continued vehicular access.
- In the unlikely event that water is required to be released from the sediment pond, the stored water will be visually assessed (no sheen, or turbidity) and physical parameters (pH, EC) taken to ensure release water will not impact on any downgradient sensitive receiving environments (refer Section 7.3). It is noted that well sites do not have any sensitive receiving water bodies located in proximity to the sites.

When accessing the site after the wet season, all disturbed areas should be inspected for signs of erosion. If significant impacts are identified remediation works may need to be conducted.

7.2 Operations

Visual inspections will be undertaken throughout the seismic survey activities to assess the impact risk level of the regulated activities being undertaken and the likelihood of accelerated erosion occurring. A review of mitigation measures that are implemented throughout the project phase will be conducted regularly to assess the efficacy and that the standard is maintained.

All other areas to be inspected before and after the wet season to identify the occurrence of erosion and sedimentation. Where erosion is observed, maintenance activities shall be undertaken. Ongoing monitoring and maintenance shall occur throughout the life of the infrastructure until the land is handed back.

7.3 ESC Trigger Action Response Plan

The following Trigger Action Response Plan (TARP) is to be implemented during construction:

- Monitoring requirements:
  - 7-day forecast from Bureau of Meteorology (BOM) to be monitored and construction and ground disturbance activities to planned around the forecast.
  - Daily visual inspection of access track, lease pads and campsite conditions for duration of civil construction activities.

- Routine visual inspections of the creek and drainage line access track crossings and the wastewater containment system at the camp weekly or following a rainfall event (i.e. greater than 20 mm in 24 hours).
- Review ESC across the site and where required implement maintenance prior to 1 October each year.

- Action:
  - On establishment of each exploration well pad, undertake jar testing work to determine anticipated settling rate of sediments on site. This will inform flocculent dosing requirements as required.
  - Where monitoring has indicated weather condition have impacted the integrity of the erosion and sediment controls, operators must adopt one of the treatment plans from section 6.0 to mitigate the impacts of rainfall and ensure that the ESC devices are reinstated as soon as physically practicable after the event.
  - Inspection of all ESC devices across the worksite and physical water quality testing (physical parameters only) at the well pad sediment basin should be conducted prior to discharge of water offsite. Water quality discharge indicators include:
    - No visible oil, grease or other hydrocarbons
    - pH: Between 5.2 – 9.0[1]
    - EC: 1,300 µS/cm.[2]

[1] *The proposed minimum pH is reflective of observed regional rainfall pH levels, with pH levels of 5.24 observed at Daly Waters on March 20, 2024. Tamboran has observed pH levels on its enclosed tank lids and sediment basins around the pH of 5 level. Given the large volume of rainwater that falls on a site in a very short period, the pH in the sediment basin is anticipated to be low, before increasing as they interact with the receiving soils. This has been observed in sediment basins onsite, with pH increasing from 5.2 to 6.5 over several hours after a rainfall event due to the low buffer capacity of rainwater. Given the existing pH of rainwater is approximately 5.2, we believe this to be an appropriate release limit for stormwater.*

[2] *The proposed limit of 1,300 µs/cm was chosen as it aligns with the EC of the Gum Ridge formation (the main source of water used on proposed sites) and the ANZECC short term irrigation guideline value for moderately sensitive crops (Table 9.2.5 of the ANZEC Guidelines (2000) Volume 3, Chapter 9, Primary industries).*

The proposed EC limit is underpinned by modelling designed to assess the changing soil salinities and the potential for impact on the receiving vegetation types, including Eucalyptus, Acacia, Melaleuca species and native grasses which are common to the area. Many of these species have been shown to have a moderate to high tolerance to salinity.

The results of the modelling indicate the maximum root zone salinity will be in the order of 1.6 dS/m (for a sandy loam) to 1.7 dS/m (for a clay). This is below the likely vegetation root zone salinity of the vegetation types in the area. Also, the sodium adsorption ratio (SAR) for the Gum Ridge Formation was calculated at 2, which when combined with the EC values, indicates that the release of stormwater based on the revised release criteria is unlikely to cause soil structural issues.

The adopted discharge criteria are widely used by Tamboran at its other operational sites on EP 117, EP 98 and EP 76, with no negative effects on soil properties or native vegetation.

Response:

- Post-rainfall/flood damage reconnaissance and assessment to be undertaken as soon as the area becomes accessible. Any damage observed would be repaired as soon as practicable after the event and ensure the controls and measures are in place prior to the next rainfall event.
- If water quality conditions meet discharge indicators, beneficial reuse of water may be considered for construction activities.
- Maintain dewatering records for any sediment basins including pH, EC, visual description and volume of water dewatered.
- External NATA accredited laboratory testing of soil/sediment or surface water would only be required for the following triggers:
    - Work area has a known existing contaminating event in the preceding 3 months that could influence stormwater discharge quality (refer to Tamboran's Spill Management Plan appended to the EMP).
    - The visual inspection and physical water quality testing indicated potential contamination.
    - Where there is a sensitive receiving water body within 200 m of the discharge point.

7.4 Rehabilitation

7.4.1 Well Sites including, SPCF, Access Tracks, Gathering Lines, Gravel Pits and Camps

Where rehabilitation of a site is required, rehabilitation monitoring will be undertaken annually to assess the rehabilitation success and determine whether additional remedial works are required. Success criteria are defined in the relevant EMP and include:

- Safe for humans and wildlife
- Non-polluting
- Stable, with appropriate vegetation cover
- Land condition suitable for existing pastoral land use.

7.4.2 Seismic Line Acquisition

Rehabilitation will be undertaken along all newly cleared survey lines concurrently with the completion of the survey process. Reference should be made to the relevant Rehabilitation Management Plan prepared in support of each EMP. Rehabilitation of all areas must be undertaken in accordance with the methodologies described in the Rehabilitation Management Plan and treatments in Appendix P of this document.

Rehabilitation monitoring will be undertaken before and after the initial wet season and then annually for 5 years to assess the rehabilitation success and determine whether additional remedial works are required. Success criteria are defined in the relevant EMP and include:

- safe for humans and wildlife
- non-polluting
- stable, with appropriate vegetation cover
- waterways are not materially changed.
- land condition suitable for existing pastoral land use.

7.5 Incident Reporting

The constructor must follow incident reporting requirements covered in the Tamboran incident management directive.

Sediment release and turbidity increase incidents can require some assessment to determine if they are reportable, as controls are only designed to cope with certain rain events (refer to IECA, 2008).

The constructor must:

- Report sediment release and turbidity increase incidents.
- Include justification in each case of why the incident is, or is not, reportable to the regulator based on:
    - The state of the controls prior to the rainfall
    - The design standard applied (IECA, 2008)
    - The actual rainfall received, based on the nearest data source available
    - Whether the design storm event was exceeded or not; and
    - Whether environmental harm was caused or not.

7.6 Records

Records shall be retained demonstrating areas have been inspected. Photographic records will be maintained over the duration of the activities for documenting soil disturbance.

All environmentally relevant incidents are to be recorded in a field log that must remain accessible to all relevant regulatory authorities.

Minimum records to be retained for each site include:

Location of disturbance	Area of disturbance	Date	Close out

7.7 ESCP Revisions

Where major changes are required to the proposed controls in the ESCP through Tamboran's change management processes, DLPE would be advised and a revised ESCP provided. Should any civils be required during the wet season, the wet weather contingency plan outlined in Table 13 will be implement.

7.8 Maintenance

All temporary erosion and sediment control measures, including drainage control measures, must be fully operational and maintained in proper working order at all times during the project.

When undertaking construction work, erosion and sediment control measures must be inspected:

- at least daily (when work is occurring on-site during the wet season)
- within 24 hours of expected rainfall
- within 18 hours of a rainfall event of sufficient intensity and duration to cause runoff on-site or greater than 20 mm in 24 hours.

Once operational, inspections of the site will continue daily while onsite, and before and after the wet season. Where erosion is observed, maintenance activities shall be undertaken.

Sediment removed from sediment traps and places of sediment deposition must be disposed of in a lawful manner that does not cause ongoing soil erosion or environmental harm. Laboratory testing will be required to determine contamination status, however if consistent with surrounding natural environment and can be returned to site.

Prior to the completion of activities on the ground, the construction areas will be stabilised to the satisfaction of the construction supervisor.

8 References

APGA. 2019. *Upstream Polyethylene Gathering Networks – CSG Industry Code of Practice* (Version 5.0 August 2019). Australian Pipelines and Gas Association, QLD.

Catchment and Creeks Pty Ltd. 2012. *Erosion & Sediment Control – A Field Guide for Construction Site Managers V5*. Catchment and Creeks. Brisbane. QLD.

Department of Agriculture, Fisheries and Forestry. 2013. *Code for Self-Assessable Development Minor Waterway Barrier Works Part 4: Bed Level Crossings Code Number WWBW01 April 2013*. State of Queensland, Qld.

Department of Environment, Parks and Water Security (DEPWS) 2024. *Land Clearing Guidelines*. Version 2. Northern Territory Government.

IECA. 2008. *Best Practice Erosion and Sediment Control – for building and construction sites*. Picton, NSW: International Erosion Control Association (Australasia).

IECA & Australian Pipelines and Gas Association Ltd (APGA). 2015. *Appendix P: Land-Based Pipeline Construction* (addendum to IECA 2008). Picton, NSW: International Erosion Control Association (Australasia).

Scientific Inquiry into Hydraulic Fracturing in the Northern Territory. 2018. *Scientific Inquiry into Hydraulic Fracturing in the Northern Territory – Final Report*.

APPENDIX A Erosion hazard assessment explanatory notes

reference: IECA, 2008, *Best Practice Erosion and Sediment Control Hazard Assessment Form)*

Requirements: Specific issues or actions required by the proponent.

Warnings: Issues that should be considered by the proponent.

Comments: General information relating to the topic.

[1] **REQUIREMENTS:**

For sites with an average slope of proposed land disturbance greater than 10%, a preliminary ESCP must be submitted to the regulatory authority for approval during planning negotiations.

Proponents must demonstrate that adequate erosion and sediment control measures can be implemented on-site to effectively protect downstream environmental values.

If site or financial constraints suggest that it is not reasonable or practicable for the prescribed water quality objectives to be achieved for the proposal, then the proponent must demonstrate that alternative designs or construction techniques (e.g. pole homes, suspended slab) cannot reasonably be implemented on the site.

WARNINGS:

Steep sites usually require more stringent drainage and erosion controls than flatter grade sites.

COMMENTS:

The steeper the land, the greater the need for adequate drainage controls to prevent soil and mulch from being washed from the site.

[2] **REQUIREMENTS:**

If the actual soil K-factor is known from soil testing, then the Score shall be determined from Table 1.

If a preliminary ESCP is required during planning negotiations, then it must be demonstrated that adequate space is available for the construction and operation of any major sediment traps, including the provision for any sediment basins and their associated embankments and spillways. It must also be demonstrated that all reasonable and practicable measures can be taken to divert the maximum quantity of sediment-laden runoff (up to the specified design storm) to these sediment traps throughout the construction phase and until the contributing catchment is adequately stabilised against erosion.

WARNINGS: -

The higher the point score, the greater the need to protect the soil from raindrop impact and thus the greater the need for effective erosion control measures. A point score of 2 or greater will require a greater emphasis to be placed on revegetation techniques that do not expose the soil to direct rainfall contact during vegetation establishment, e.g. turfing and *Hydro mulching*.

COMMENTS:

Table 2 provides an *indication* of soil conditions likely to be associated with a particular Soil group based on a statistical analysis of soil testing across NSW. This table provides only an initial estimate of the likely soil conditions.

The left-hand-side of the table provides an indication of the type of sediment basin that will be required (Type C, F or D). The right-hand-side of the table provides an indication of the likely erodibility of the soil based on the Revised Universal Soil Loss Equation (RUSLE) K-factor.

Table 3 provides some general comments on the erosion potential of the various soil groups.

Table 1 – Score if soil K-factor is known

	RUSLE soil erodibility K-factor			
	K < 0.02	0.02<K<0.04	0.04<K<0.06	K > 0.06
Score	0	1	2	3

Table 2 – Statistical analysis of NSW soil data [1]

Unified Soil Class System	Likely sediment basin classification (%)			Probable soil erodibility K-factor (%) [2]			
	Dry	Wet		Low	Moderate	High	Very High
	Type C	Type F	Type D	K < 0.02	0.02<K<0.04	0.04<K<0.06	K > 0.06
GM	30	58	12	12	51	26	12
GC	42	33	25	13	71	17	0
SW	40	48	12	49	39	12	0
SP	53	32	15	76	18	5	1
SM	21	67	12	26	48	25	1
SC	26	50	24	16	64	18	2
ML	5	63	32	4	35	45	16
CL	9	51	39	12	56	19	13
OL	2	80	18	34	61	5	1
MH	12	41	48	15	19	41	25
CH	5	44	51	39	43	11	7

Notes: [1] Analysis of soil data presented in Landcom (2004).

[2] Soil erodibility based on Revised Universal Soil Loss Equation (RUSLE) K-factor.

Unified Soil Classification System (USCS)

GW Well graded gravels, gravel-sand mixtures, little or no fines
GP Poorly graded gravels, gravel-sand mixture, little or no fines
GM Silty gravels, poorly graded gravel-sand-silt mixtures
GC Clayey gravels, poorly graded gravel-sand-clay mixtures SW Well graded sands, gravelly sands, little or no fines
SP Poorly graded sands, gravelly sands, little or no fines
SM Silty sands, poorly graded sand-silt mixtures
SC Clayey sands, poorly graded sand-clay mixtures
ML Inorganic silts & very fine sands, rock flour, silty or clayey fine sands with slight plasticity
CL Inorganic clays, low–medium plasticity, gravelly clays, sandy clays, silty clays, lean clays
OL Organic silts and organic silt-clays of low plasticity
MH Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts
CH Inorganic clays of high plasticity, fat clays
OH Organic clays of medium to high plasticity

Table 3 – Typical properties of various soil groups [1]

Soil Groups	Typical properties [2]
GW, GP	Low erodibility potential.
GM, GC	Low to medium erodibility potential. May create turbid runoff if disturbed as a result of the release of silt and clay particles.
SW, SP	Low to medium erodibility potential.
SM, SC	Medium erodibility potential. May create turbid runoff if disturbed as a result of the release of silt and clay particles.
MH, CH	Highly variable (low to high) erodibility potential. Will generally create turbid runoff if disturbed.
ML, CL	High erodibility potential. Tendency to be dispersive. May create some turbidity in runoff if disturbed.

Note: [1] After Soil Services & NSW DLWC (1998).
[2] Any soil can represent a high erosion risk if the binding clays or silts are unstable.

Table 4 provides **general** guidelines on the suitability of various soil groups to various engineering applications.

Table 4 – Engineering suitability based on Unified Soil Classification [1]

Unified Soil Class	USC Group	Embankments		Fill	Slope stability	Untreated roads
		Water retaining	Non- water retaining			
Well graded gravels	GW	Unsuitable	Excellent	Excellent	Excellent	Average
Poorly graded gravel	GP	Unsuitable	Average	Excellent	Average	Unsuitable
Silty gravels	GM	Unsuitable	Average	Good	Average	Average
Clayey gravels	GC	Suitable	Average	Good	Average	Excellent
Well graded sands	SW	Unsuitable	Excellent	Excellent	Excellent	Average
Poorly graded sands	SP	Unsuitable	Average	Good	Average	Unsuitable
Silty sands	SM	Suitable [2]	Average	Average	Average	Poor
Clayey sands	SC	Suitable	Average	Average	Average	Good
Inorganic silts	ML	Unsuitable	Poor	Average	Poor	Unsuitable
Inorganic clays	CL	Suitable [2]	Good	Average	Good	Poor
Organic silts	OL	Unsuitable	Unsuitable	Poor	Unsuitable	Unsuitable
Inorganic silts	MH	Unsuitable	Poor	Poor	Poor	Unsuitable
Inorganic clays	CH	Suitable [2]	Average	Unsuitable	Average	Unsuitable
Organic clays	OH	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable
Highly organic soils	Pt	Unsuitable	Unsuitable	Unsuitable	Unsuitable	Unsuitable

Unified Soil Class	USC Group	Embankments		Fill	Slope stability	Untreated roads
		Water retaining	Non- water retaining			
Notes: [1] Modified from Hazelton & Murphy (1992) [2] Suitable only after modifications to soil such as compaction and/or erosion protection						

[3] If the soils have not been tested for Emerson Class, then adopt a score of 4.

REQUIREMENTS:

Works proposed on sites containing Emerson Class 1 or 2 soils have a very high pollution potential and must submit a conceptual ESCP to the regulatory authority for review and/or approval (as required by the authority) during planning negotiations.

WARNINGS:

Class 3 and 5 soils disturbed by cut and fill operations or construction traffic are highly likely to discolour stormwater (i.e. cause turbid runoff). Chemical stabilisation will likely be required if these soils are placed immediately adjacent to a retaining wall. Any disturbed Class 1, 2, 3 and 5 soils that are to be revegetated must be covered with a non-dispersive topsoil as soon as possible (unless otherwise agreed by the regulatory authority).

Class 1 and 2 soils are highly likely to discolour (pollute) stormwater if exposed to rainfall or flowing water. Treatment of these soils with gypsum (or other suitable substance) will most likely be required. These soils should not be placed directly behind a retaining wall unless it has been adequately treated (stabilised) or covered with a non-dispersible soil.

[4] The duration of disturbance refers to the total duration of soil exposure to rainfall up until a time when there is at least 70% coverage of all areas of soil.

REQUIREMENTS:

All land developments with an expected soil disturbance period greater than 6 months must submit a conceptual ESCP to the regulatory authority for review and/or approval (as required by the authority) during planning negotiations.

COMMENTS:

Construction periods greater than 3 months will generally experience at least some significant storm events, independent of the time of year that the construction (soil disturbance) occurs.

[5] **REQUIREMENTS:**

Development proposals with an expected soil disturbance in excess of 1ha must submit a conceptual ESCP to the regulatory authority for review and/or approval (as required by the regulatory authority) during planning negotiations.

The area of disturbance refers to the total area of soil exposed to rainfall or dust-producing winds either as a result of:

(a) the removal of ground cover vegetation, mulch or sealed surfaces;
(b) past land management practices;
(c) natural conditions.

WARNINGS:

A *Sediment Basin* will usually be required if the disturbed area exceeds 0.25ha (2500m^2) within any sub-catchment (i.e. land flowing to one outlet point).

COMMENTS:

For soil disturbances greater than 0.25ha, the revegetation phase should be staged to minimise the duration for which soils are exposed to wind, rain and concentrated runoff.

[6] **REQUIREMENTS:**

All developments that involve earthworks or construction within a natural watercourse (whether that

watercourse is in a natural or modified condition) must submit a conceptual ESCP to the regulatory authority for review and/or approval (as required by the regulatory authority) during planning negotiations.

Permits and/or licences may be required from the State Government, including possible submission of the ESCP to the relevant Government department.

[7] **REQUIREMENTS:**

No areas of soil disturbance shall be left exposed to rainfall or dust-producing winds at the end of a development without an adequate degree of protection and/or an appropriate action plan for the establishment of at least 70% cover.

COMMENTS:

Grass seeding without the application of a light mulch cover is considered the least favourable revegetation technique. A light mulch cover is required to protect the soil from raindrop impact, excessive temperature fluctuations, and the loss of essential soil moisture.

[8] **COMMENTS:**

All receiving waters can be adversely affected by unnatural quantities of sediment-laden runoff. Freshwater ecosystems are generally more susceptible to ecological harm resulting from the inflow of fine or dispersible clays than saline water bodies. The further inland a land disturbance is, the greater the potential for the released sediment to cause environmental harm as this sediment travels towards the coast.

For the purpose of this clause it is assumed that all sediment-laden runoff will eventually flow into saline waters. Thus, sediment-laden discharges that flow first into freshwater are likely to adversely affect both fresh and saline water bodies and are therefore considered potentially more damaging to the environment.

This clause does **not** imply that sediment-laden runoff will not cause harm to saline waters.

[9] **COMMENTS:**

This clause refers to subsoils exposed during the construction phase either as a result of past land practices or proposed construction activities. The exposure of subsoils resulting from the excavation of minor service trenches should not be considered.

[10] **WARNINGS:**

The greater the extent of external catchment, the greater the need to divert up-slope stormwater runoff around any soil disturbance.

COMMENTS:

The ability to separate “clean” (i.e. external catchment) stormwater runoff from “dirty” site runoff can have a significant effect on the size, efficiency and cost of the temporary drainage, erosion, and sediment control measures.

[11] **REQUIREMENTS:**

Permission must be obtained from the owner of a road reserve before placing any erosion and sediment control measures within the road reserve.

WARNINGS:

Few sediment control techniques work efficiently when placed on a road and/or around roadside stormwater inlets. Great care must be taken if sediment control measures are located on a public roadway, specifically:

- safety issues relating to road users;
- the risk of causing flooding on the road or within private property.

The construction of roads (whether temporary or permanent) will usually modify the flow path of stormwater runoff. This can affect how “dirty” site runoff is directed to the sediment control measures.

COMMENTS:

“On-road” sediment control devices are at best viewed as secondary or supplementary sediment control measures. Only in special cases and/or on very small projects (e.g. kerb and channel replacement) might these controls be considered as the “primary” sediment control measure.

[12] **WARNINGS:**

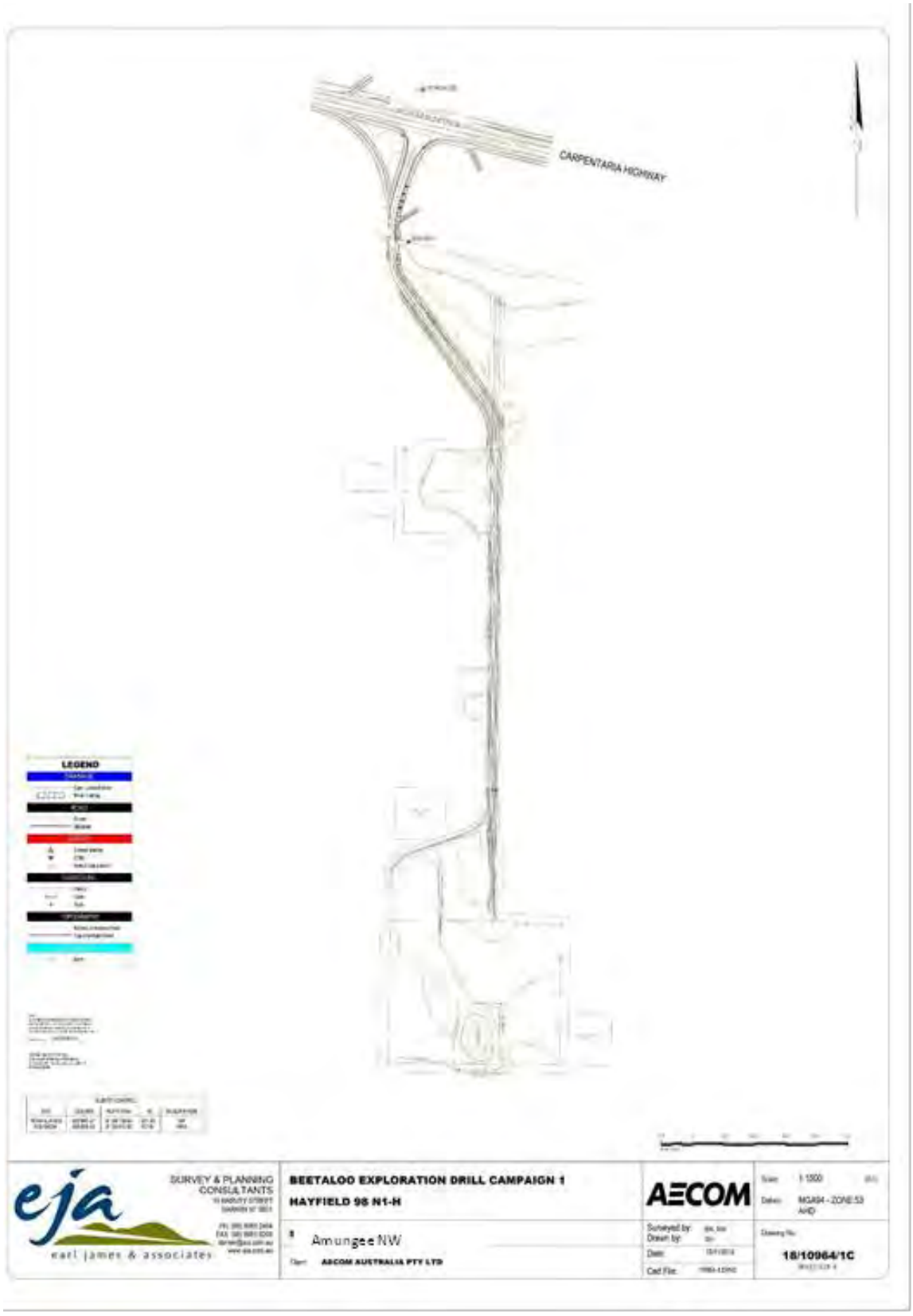
Soils with a pH less than 5.5 or greater than 8 will usually require treatment in order to achieve satisfactory revegetation. Soils with a pH of less than 5 (whether naturally acidic or in acid sulfate soil areas) may also

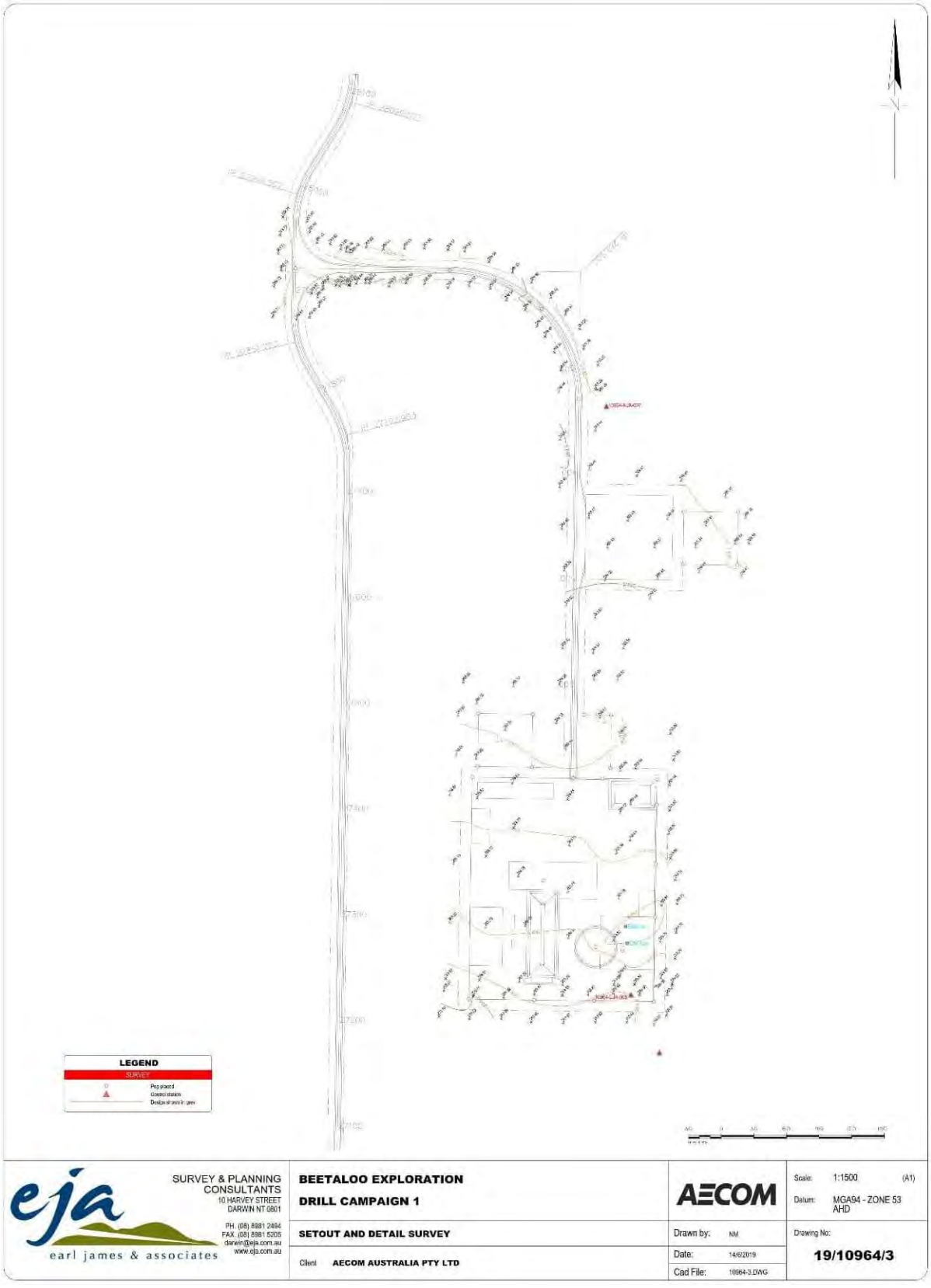
limit the choice of chemical flocculants (e.g. Alum) for use in the flocculation of *Sediment Basins*.

[13] **REQUIREMENTS:**

A preliminary ESCP must be submitted to the local government for approval during the planning phase for any development that obtains a total point score of 17 or greater or when any trigger value is scored or exceeded.

APPENDIX B Well pad and highway topographical survey




LEGEND
SURVEY
SURVEY & PLANNING CONSULTANTS
10 HARVEY STREET
DARWIN NT 0801
PH. (08) 8981 2494
FAX. (08) 8981 5205
darwin@eja.com.au
www.eja.com.au
earl james & associates
BEETALOO EXPLORATION
DRILL CAMPAIGN 1
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Client AECOM AUSTRALIA PTY LTD
AECOM
Drawn by: NM
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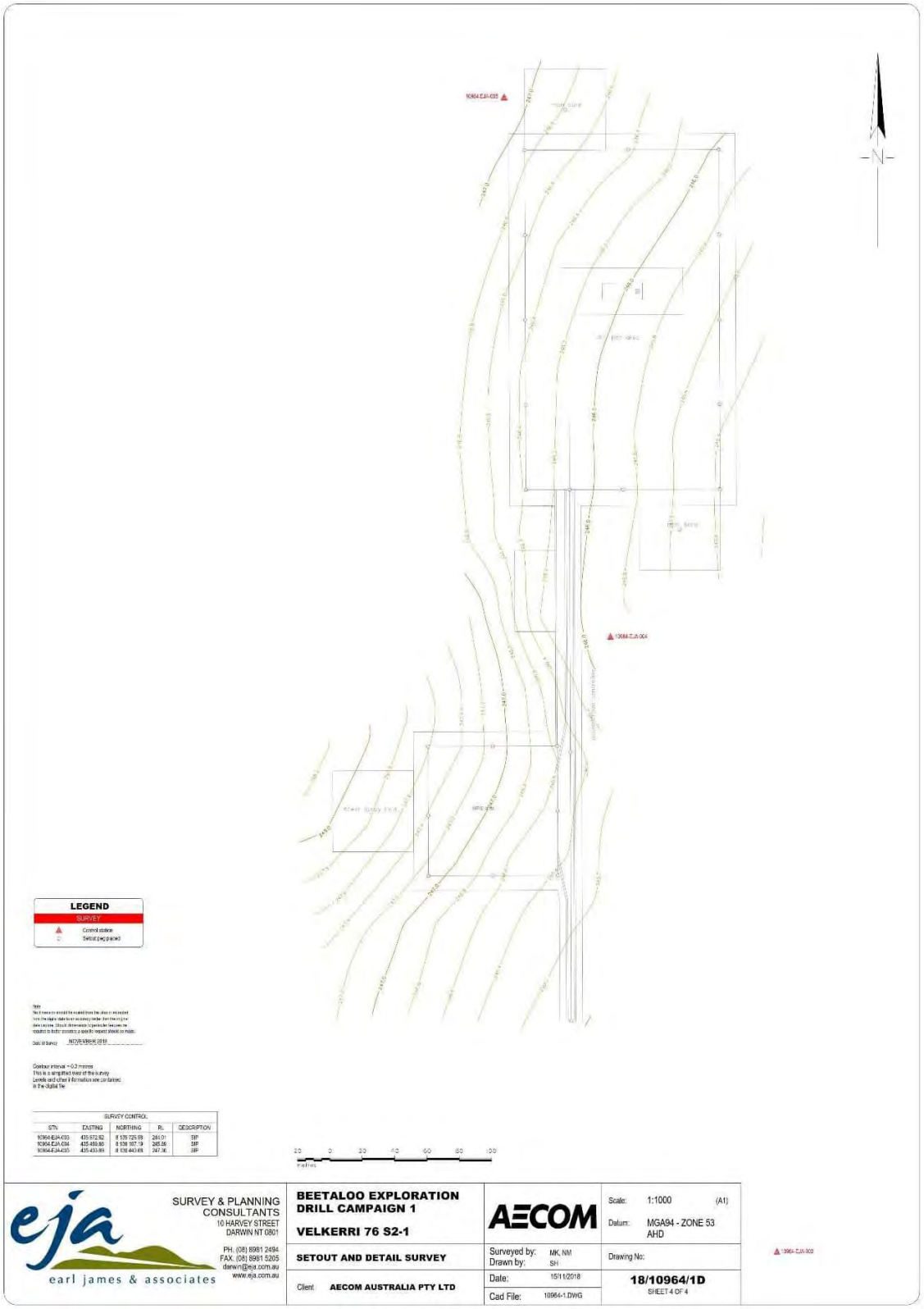
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10 HARVEY STREET
DARWIN NT 0801
PH. (08) 8981 2494
FAX. (08) 8981 5205
darwin@eja.com.au
www.eja.com.au
earl james & associates
BEETALOO EXPLORATION DRILL CAMPAIGN 1
VELKERRI 76 S2-1
SETOUT AND DETAIL SURVEY
Client: AECOM AUSTRALIA PTY LTD
AECOM
Surveyed by: MK, NM
Drawn by: SH
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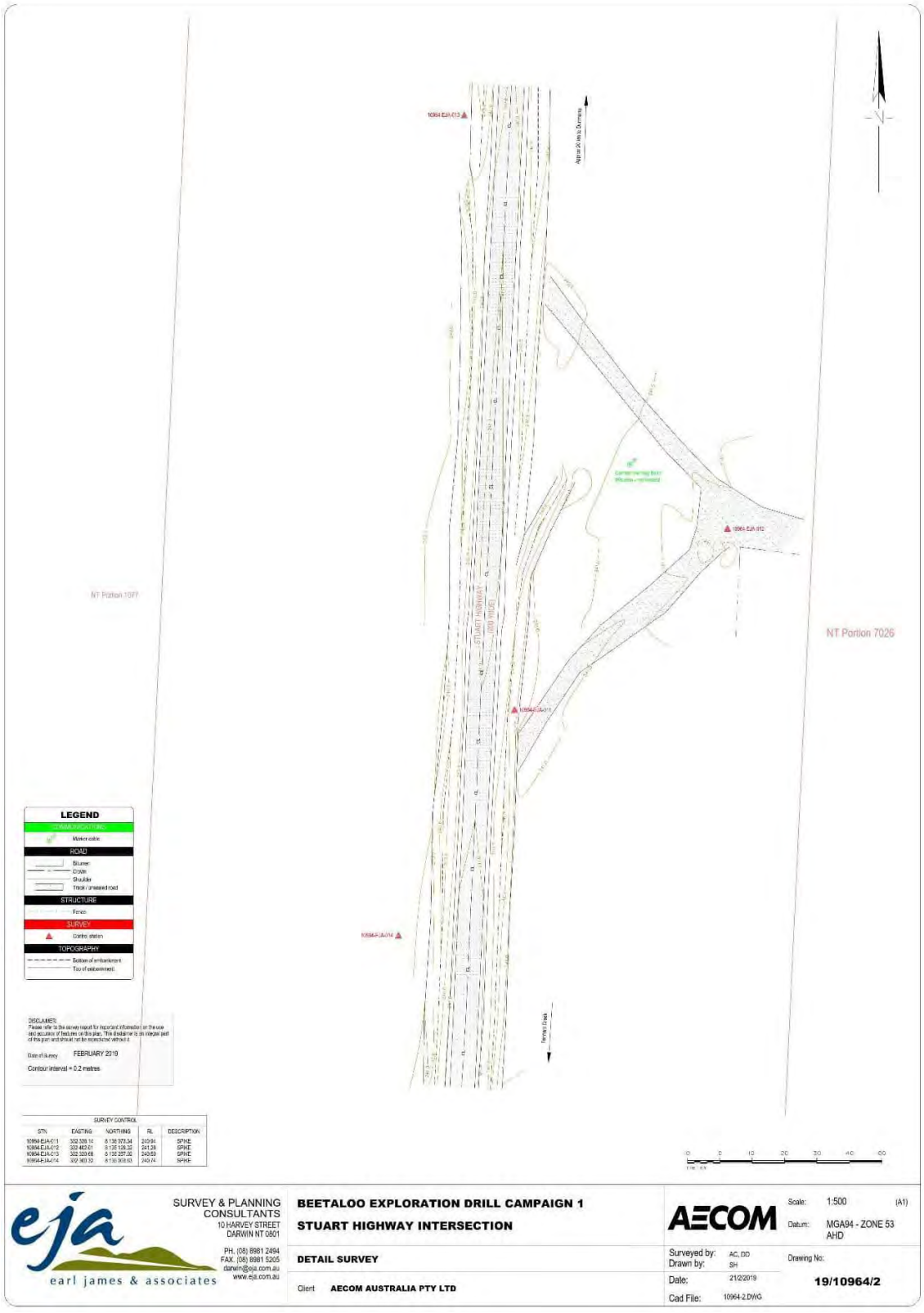
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ROAD
STRUCTURE
SURVEY
TOPOGRAPHY
NT Portion 7026
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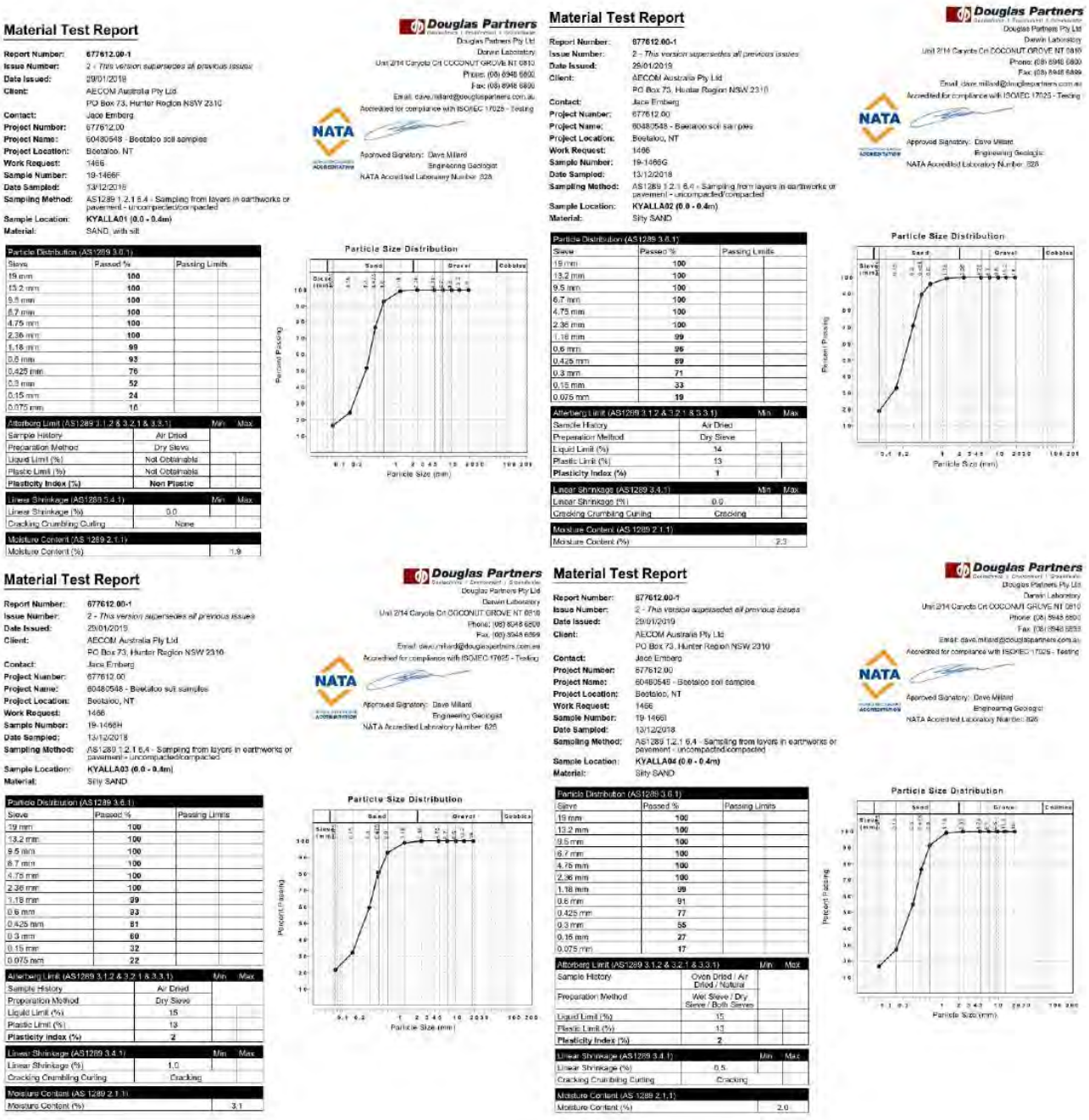
10964-EJA010 332 329.68 8 136 237.26 249.69 SPIKE
10964-EJA014 332 363.32 8 136 908.63 240.74 SPIKE
eja earl james & associates
SURVEY & PLANNING CONSULTANTS
10 HARVEY STREET
DARWIN NT 0801
PH. (08) 8981 2494
FAX. (08) 8981 5205
darwin@eja.com.au
www.eja.com.au
BEETALOO EXPLORATION DRILL CAMPAIGN 1
STUART HIGHWAY INTERSECTION
DETAIL SURVEY
Client AECOM AUSTRALIA PTY LTD
AECOM
Scale: 1:500 (A1)
Datum: MGA94 - ZONE 53 AHD
Surveyed by: AC, DD
Drawn by: SH
Date: 21/2/2019
Cad File: 10964-2.DWG
Drawing No: 19/10964/2

APPENDIX C Geotechnical laboratory results



Material Test Report

Douglas Partners
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Crt COCONUT GROVE NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: dave.millard@douglaspartners.com.au
Accredited for compliance with ISO/IEC 17025 - Testing

NATA
Approved Signatory: Dave Millard
Engineering Geologist
NATA Accredited Laboratory Number: 828

Report Number:	**677612.00-1**
Issue Number:	*2 - This version supersedes all previous issues*
Date Issued:	29/01/2019
Client:	AECOM Australia Pty Ltd PO Box 73, Hunter Region NSW 2310
Contact:	Jace Emberg
Project Number:	677612.00
Project Name:	60480548 - Beetaloo soil samples
Project Location:	Beetaloo, NT
Work Request:	1466
Sample Number:	19-1466F
Date Sampled:	13/12/2018
Sampling Method:	AS1289 1.2.1 6.4 - Sampling from layers in earthworks or pavement - uncompacted/compacted
Sample Location:	**KYALLA01 (0.0 - 0.4m)**
Material:	SAND, with silt

Particle Distribution (AS1289 3.6.1)

Sieve	Passed %	Passing Limits	
19 mm	100		
13.2 mm	100		
9.5 mm	100		
6.7 mm	100		
4.75 mm	100		
2.36 mm	100		
1.18 mm	99		
0.6 mm	93		
0.425 mm	76		
0.3 mm	52		
0.15 mm	24		
0.075 mm	16		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)

		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	Not Obtainable		
Plastic Limit (%)	Not Obtainable		
Plasticity Index (%)	**Non Plastic**		

Linear Shrinkage (AS1289 3.4.1)

		Min	Max
Linear Shrinkage (%)	0.0		
Cracking Crumbling Curling	None		

Moisture Content (AS 1289 2.1.1)

Moisture Content (%)	1.9

Particle Size Distribution

Material Test Report

Douglas Partners
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Crt COCONUT GROVE NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
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Contact:	Jace Emberg
Project Number:	677612.00
Project Name:	60480548 - Beetaloo soil samples
Project Location:	Beetaloo, NT
Work Request:	1466
Sample Number:	19-1466G
Date Sampled:	13/12/2018
Sampling Method:	AS1289 1.2.1 6.4 - Sampling from layers in earthworks or pavement - uncompacted/compacted
Sample Location:	**KYALLA02 (0.0 - 0.4m)**
Material:	Silty SAND

Particle Distribution (AS1289 3.6.1)

Sieve	Passed %	Passing Limits	
19 mm	100		
13.2 mm	100		
9.5 mm	100		
6.7 mm	100		
4.75 mm	100		
2.36 mm	100		
1.18 mm	99		
0.6 mm	96		
0.425 mm	89		
0.3 mm	71		
0.15 mm	33		
0.075 mm	19		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)

		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	14		
Plastic Limit (%)	13		
Plasticity Index (%)	**1**		

Linear Shrinkage (AS1289 3.4.1)

		Min	Max
Linear Shrinkage (%)	0.0		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)

Moisture Content (%)	2.3

Particle Size Distribution

Material Test Report

Douglas Partners
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Crt COCONUT GROVE NT 0810
Phone: (08) 8948 6800
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Contact:	Jace Emberg
Project Number:	677612.00
Project Name:	60480548 - Beetaloo soil samples
Project Location:	Beetaloo, NT
Work Request:	1466
Sample Number:	19-1466H
Date Sampled:	13/12/2018
Sampling Method:	AS1289 1.2.1 6.4 - Sampling from layers in earthworks or pavement - uncompacted/compacted
Sample Location:	**KYALLA03 (0.0 - 0.4m)**
Material:	Silty SAND

Particle Distribution (AS1289 3.6.1)

Sieve	Passed %	Passing Limits	
19 mm	100		
13.2 mm	100		
9.5 mm	100		
6.7 mm	100		
4.75 mm	100		
2.36 mm	100		
1.18 mm	99		
0.6 mm	93		
0.425 mm	81		
0.3 mm	60		
0.15 mm	32		
0.075 mm	22		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)

		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	15		
Plastic Limit (%)	13		
Plasticity Index (%)	**2**		

Linear Shrinkage (AS1289 3.4.1)

		Min	Max
Linear Shrinkage (%)	1.0		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)

Moisture Content (%)	3.1

Particle Size Distribution

Material Test Report

Douglas Partners
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Crt COCONUT GROVE NT 0810
Phone: (08) 8948 6800
Fax: (08) 8948 6899
Email: dave.millard@douglaspartners.com.au
Accredited for compliance with ISO/IEC 17025 - Testing

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Contact:	Jace Emberg
Project Number:	677612.00
Project Name:	60480548 - Beetaloo soil samples
Project Location:	Beetaloo, NT
Work Request:	1466
Sample Number:	19-1466I
Date Sampled:	13/12/2018
Sampling Method:	AS1289 1.2.1 6.4 - Sampling from layers in earthworks or pavement - uncompacted/compacted
Sample Location:	**KYALLA04 (0.0 - 0.4m)**
Material:	Silty SAND

Particle Distribution (AS1289 3.6.1)

Sieve	Passed %	Passing Limits	
19 mm	100		
13.2 mm	100		
9.5 mm	100		
6.7 mm	100		
4.75 mm	100		
2.36 mm	100		
1.18 mm	99		
0.6 mm	91		
0.425 mm	77		
0.3 mm	55		
0.15 mm	27		
0.075 mm	17		

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)

		Min	Max
Sample History	Oven Dried / Air Dried / Natural		
Preparation Method	Wet Sieve / Dry Sieve / Both Sieves		
Liquid Limit (%)	15		
Plastic Limit (%)	13		
Plasticity Index (%)	**2**		

Linear Shrinkage (AS1289 3.4.1)

		Min	Max
Linear Shrinkage (%)	0.5		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289 2.1.1)

Moisture Content (%)	2.0

Particle Size Distribution

Material Test Report

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Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Coryota Crt COCONUT GROVE NT 0810
Phone: (08) 8948 6900
Fax: (08) 8948 6999
Email: dave.millard@douglaspartners.com.au
Accredited for compliance with ISO/IEC 17025 - Testing

NATA

Approved Signatory: Dave Millard
Engineering Geologist
NATA Accredited Laboratory Number: 828

Report Number:	677612.00-1
Issue Number:	2 - *This version supersedes all previous issues*
Date Issued:	25/01/2019
Client:	AECOM Australia Pty Ltd PO Box 73, Hunter Region NSW 2310
Contact:	Jace Emberg
Project Number:	677612.00
Project Name:	60480548 - Beetaloo soil samples
Project Location:	Beetaloo, NT
Work Request:	1466
Sample Number:	19-1466A
Date Sampled:	13/12/2018
Sampling Method:	AS1289.1.2.1 6.4 - Sampling from layers in earthworks or pavement - uncompacted/compacted
Sample Location:	**VELKERR01 (0.0 - 0.4m)**
Material:	Silty SAND, trace gravel

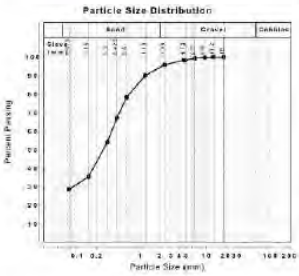
Particle Distribution (AS1289.3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	99	
4.75 mm	98	
2.36 mm	96	
1.18 mm	90	
0.6 mm	78	
0.425 mm	67	
0.3 mm	54	
0.15 mm	35	
0.075 mm	29	

Atterberg Limit (AS1289.3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	25		
Plastic Limit (%)	15		
Plasticity Index (%)	**10**		

Linear Shrinkage (AS1289.3.4.1)		Min	Max
Linear Shrinkage (%)	4.5		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289.2.1.1)	
Moisture Content (%)	8.6

Particle Size Distribution



Material Test Report

Douglas Partners

Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Coryota Crt COCONUT GROVE NT 0810
Phone: (08) 8948 6900
Fax: (08) 8948 6999
Email: dave.millard@douglaspartners.com.au
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Engineering Geologist
NATA Accredited Laboratory Number: 828

Report Number:	677612.00-1
Issue Number:	2 - *This version supersedes all previous issues*
Date Issued:	25/01/2019
Client:	AECOM Australia Pty Ltd PO Box 73, Hunter Region NSW 2310
Contact:	Jace Emberg
Project Number:	677612.00
Project Name:	60480548 - Beetaloo soil samples
Project Location:	Beetaloo, NT
Work Request:	1466
Sample Number:	19-1466B
Date Sampled:	13/12/2018
Sampling Method:	AS1289.1.2.1 6.4 - Sampling from layers in earthworks or pavement - uncompacted/compacted
Sample Location:	**VELKERR02 (0.0 - 0.4m)**
Material:	Silty SAND

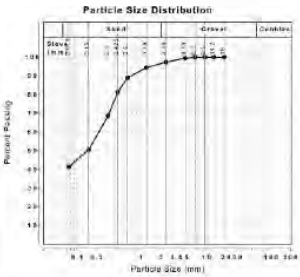
Particle Distribution (AS1289.3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	100	
4.75 mm	99	
2.36 mm	97	
1.18 mm	94	
0.6 mm	89	
0.425 mm	81	
0.3 mm	68	
0.15 mm	50	
0.075 mm	41	

Atterberg Limit (AS1289.3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	18		
Plastic Limit (%)	13		
Plasticity Index (%)	**5**		

Linear Shrinkage (AS1289.3.4.1)		Min	Max
Linear Shrinkage (%)	3.5		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289.2.1.1)	
Moisture Content (%)	5.6

Particle Size Distribution



Material Test Report

Douglas Partners

Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Coryota Crt COCONUT GROVE NT 0810
Phone: (08) 8948 6900
Fax: (08) 8948 6999
Email: dave.millard@douglaspartners.com.au
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NATA Accredited Laboratory Number: 828

Report Number:	677612.00-1
Issue Number:	2 - *This version supersedes all previous issues*
Date Issued:	25/01/2019
Client:	AECOM Australia Pty Ltd PO Box 73, Hunter Region NSW 2310
Contact:	Jace Emberg
Project Number:	677612.00
Project Name:	60480548 - Beetaloo soil samples
Project Location:	Beetaloo, NT
Work Request:	1466
Sample Number:	19-1466C
Date Sampled:	13/12/2018
Sampling Method:	AS1289.1.2.1 6.4 - Sampling from layers in earthworks or pavement - uncompacted/compacted
Sample Location:	**VELKERR03 (0.0 - 0.4m)**
Material:	Silty SAND

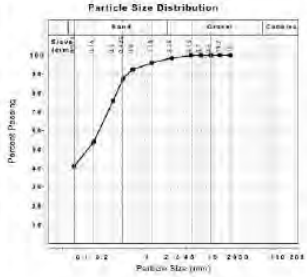
Particle Distribution (AS1289.3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	100	
4.75 mm	100	
2.36 mm	99	
1.18 mm	96	
0.6 mm	92	
0.425 mm	88	
0.3 mm	76	
0.15 mm	54	
0.075 mm	41	

Atterberg Limit (AS1289.3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	19		
Plastic Limit (%)	12		
Plasticity Index (%)	**7**		

Linear Shrinkage (AS1289.3.4.1)		Min	Max
Linear Shrinkage (%)	3.5		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289.2.1.1)	
Moisture Content (%)	4.9

Particle Size Distribution



Material Test Report

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Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Coryota Crt COCONUT GROVE NT 0810
Phone: (08) 8948 6900
Fax: (08) 8948 6999
Email: dave.millard@douglaspartners.com.au
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Report Number:	677612.00-1
Issue Number:	2 - *This version supersedes all previous issues*
Date Issued:	25/01/2019
Client:	AECOM Australia Pty Ltd PO Box 73, Hunter Region NSW 2310
Contact:	Jace Emberg
Project Number:	677612.00
Project Name:	60480548 - Beetaloo soil samples
Project Location:	Beetaloo, NT
Work Request:	1466
Sample Number:	19-1466D
Date Sampled:	13/12/2018
Sampling Method:	AS1289.1.2.1 6.4 - Sampling from layers in earthworks or pavement - uncompacted/compacted
Sample Location:	**VELKERR04 (0.0 - 0.4m)**
Material:	Silty SAND

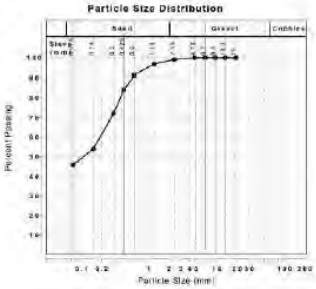
Particle Distribution (AS1289.3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	100	
4.75 mm	100	
2.36 mm	99	
1.18 mm	97	
0.6 mm	91	
0.425 mm	84	
0.3 mm	72	
0.15 mm	54	
0.075 mm	46	

Atterberg Limit (AS1289.3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Dry Sieve		
Liquid Limit (%)	24		
Plastic Limit (%)	13		
Plasticity Index (%)	**11**		

Linear Shrinkage (AS1289.3.4.1)		Min	Max
Linear Shrinkage (%)	4.5		
Cracking Crumbling Curling	Cracking		

Moisture Content (AS 1289.2.1.1)	
Moisture Content (%)	5.2

Particle Size Distribution



Material Test Report

Report Number: 215285.00-1
Issue Number: 1
Date Issued: 13/05/2022
Client: AECOM Australia Pty Ltd
PO Box 3175, Darwin NT 0801
Contact: David van de Hoek
Project Number: 215285.00
Project Name: Project 60623736 - February
Project Location: Not Supplied, - NT
Client Reference: Project 60623736
Work Request: 4176
Sample Number: DW-4176B
Date Sampled: 06/05/2022
Dates Tested: 10/05/2022 - 12/05/2022
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: AMS2 - Gravel Pit Amungee NW3
Material: Silty Sandy Gravel

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	95	
9.5 mm	88	
6.7 mm	83	
4.75 mm	76	
2.36 mm	54	
1.18 mm	48	
0.6 mm	46	
0.425 mm	46	
0.3 mm	43	
0.15 mm	29	
0.075 mm	19	

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Wet Sieve		
Liquid Limit (%)	Not Obtainable		
Plastic Limit (%)	Not Obtainable		
Plasticity Index (%)	**Non Plastic**		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289 3.1.2		
Linear Shrinkage (%)	0.0		
Cracking Crumbling Curling	Cracking		

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	8		
Soil Description	Natural Soil		
Nature of Water	Demineralised Water		
Temperature of Water (°C)	26.5		

Douglas Partners
Geotechnics | Environment | Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8946 6800
Email: Sunil.Sukhdeo@douglaspartners.com.au

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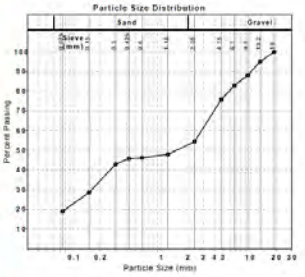
Approved Signatory: Sunil Sukhdeo
Laboratory Manager
Laboratory Accreditation Number: 828



Material Test Report

Report Number: 215285.00-1
Issue Number: 1
Date Issued: 13/05/2022
Client: AECOM Australia Pty Ltd
PO Box 3175, Darwin NT 0801
Contact: David van de Hoek
Project Number: 215285.00
Project Name: Project 60623736 - February
Project Location: Not Supplied, - NT
Client Reference: Project 60623736
Work Request: 4176
Sample Number: DW-4176C
Date Sampled: 06/05/2022
Dates Tested: 10/05/2022 - 12/05/2022
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: AMS2 Amungee NW3
Material: Silty Gravel

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	99	
9.5 mm	97	
6.7 mm	92	
4.75 mm	83	
2.36 mm	59	
1.18 mm	52	
0.6 mm	52	
0.425 mm	51	
0.3 mm	50	
0.15 mm	41	
0.075 mm	32	

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Wet Sieve		
Liquid Limit (%)	16		
Plastic Limit (%)	10		
Plasticity Index (%)	6		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289 3.1.2		
Linear Shrinkage (%)	2.5		
Cracking Crumbling Curling	Cracking		

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	7		
Soil Description	Natural Soil		
Nature of Water	Demineralised Water		
Temperature of Water (°C)	25.6		

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Geotechnics | Environment | Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8946 6800
Email: Sunil.Sukhdeo@douglaspartners.com.au

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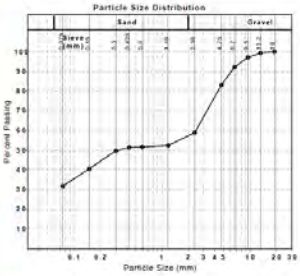

Material Test Report

Report Number: 215285.00-1
Issue Number: 1
Date Issued: 13/05/2022
Client: AECOM Australia Pty Ltd
PO Box 3175, Darwin NT 0801
Contact: David van de Hoek
Project Number: 215285.00
Project Name: Project 60623736 - February
Project Location: Not Supplied, - NT
Client Reference: Project 60623736
Work Request: 4176
Sample Number: DW-4176D
Date Sampled: 03/05/2022
Dates Tested: 10/05/2022 - 12/05/2022
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: AMS3 Amungee NW4
Material: Silty Sandy Gravel

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	99	
9.5 mm	97	
6.7 mm	86	
4.75 mm	76	
2.36 mm	59	
1.18 mm	51	
0.6 mm	50	
0.425 mm	49	
0.3 mm	47	
0.15 mm	36	
0.075 mm	27	

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Wet Sieve		
Liquid Limit (%)	14		
Plastic Limit (%)	12		
Plasticity Index (%)	2		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289 3.1.2		
Linear Shrinkage (%)	1.0		
Cracking Crumbling Curling	Cracking		

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	8		
Soil Description	Natural soil		
Nature of Water	Demineralised Water		
Temperature of Water (°C)	26.6		

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Geotechnics | Environment | Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8946 6800
Email: Sunil.Sukhdeo@douglaspartners.com.au

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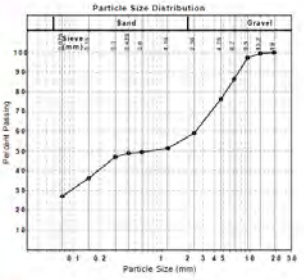

Material Test Report

Report Number: 215285.00-1
Issue Number: 1
Date Issued: 13/05/2022
Client: AECOM Australia Pty Ltd
PO Box 3175, Darwin NT 0801
Contact: David van de Hoek
Project Number: 215285.00
Project Name: Project 60623736 - February
Project Location: Not Supplied, - NT
Client Reference: Project 60623736
Work Request: 4176
Sample Number: DW-4176E
Date Sampled: 05/05/2022
Dates Tested: 10/05/2022 - 12/05/2022
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: AMS4 Amungee NW5
Material: Clayey Sandy Gravel

Particle Size Distribution (AS1289 3.6.1)		
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	97	
9.5 mm	94	
6.7 mm	90	
4.75 mm	83	
2.36 mm	64	
1.18 mm	54	
0.6 mm	52	
0.425 mm	51	
0.3 mm	49	
0.15 mm	38	
0.075 mm	28	

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Wet Sieve		
Liquid Limit (%)	21		
Plastic Limit (%)	11		
Plasticity Index (%)	10		

Linear Shrinkage (AS1289 3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289 3.1.2		
Linear Shrinkage (%)	4.0		
Cracking Crumbling Curling	Cracking		

Emerson Class Number of a Soil (AS 1289 3.8.1)		Min	Max
Emerson Class	2		
Soil Description	Natural Soil		
Nature of Water	Demineralised Water		
Temperature of Water (°C)	25.6		

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Geotechnics | Environment | Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8946 6800
Email: Sunil.Sukhdeo@douglaspartners.com.au

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Laboratory Manager
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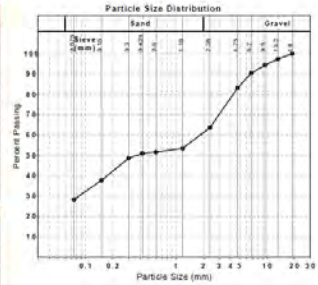

Material Test Report

Report Number: 220270.00-2
Issue Number: 1
Date Issued: 21/04/2023
Client: AECOM Australia Pty Ltd
PO Box 3175, Darwin NT 0801
Contact: William Iddell
Project Number: 220270.00
Project Name: Material Testing
Project Location: Beetaloo Basin, Beetaloo N t
Work Request: 4919
Sample Number: DW 4919E
Date Sampled: 01/04/2023
Dates Tested: 13/04/2023 - 19/04/2023
Sampling Method: Sampled by Client
The results apply to the sample as received.
Sample Location: **Shenandoah NA (Option 1)**
Material: Clayey Sand

Particle Size Distribution (AS1289 3.6.1)

Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	99	
4.75 mm	98	
2.36 mm	95	
1.18 mm	91	
0.6 mm	90	
0.425 mm	87	
0.3 mm	78	
0.15 mm	54	
0.075 mm	46	

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1) Min Max

Sample History	Air Dried
Preparation Method	Wet Sieve
Liquid Limit (%)	19
Plastic Limit (%)	11
Plasticity Index (%)	**8**

Linear Shrinkage (AS1289 3.4.1) Min Max

Moisture Condition Determined By	AS 1289.3.1.2
Linear Shrinkage (%)	**4.0**
Cracking Crumbling Curling	None

Emerson Class Number of a Soil (AS 1289 3.8.1) Min Max

Emerson Class	**3**
Soil Description	Natural Soil
Nature of Water	Distilled Water
Temperature of Water (°C)	25.5

Douglas Partners
Geotechnics I Environment I Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 0800
Email: Sunil.Sukhdeo@douglaspartners.com.au

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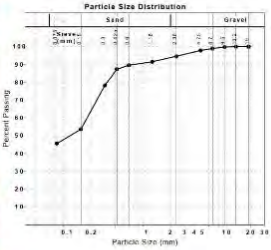
Laboratory Manager
Laboratory Accreditation Number: 828

Particle Size Distribution



Material Test Report

Report Number: 220270.00-2
Issue Number: 1
Date Issued: 21/04/2023
Client: AECOM Australia Pty Ltd
PO Box 3175, Darwin NT 0801
Contact: William Iddell
Project Number: 220270.00
Project Name: Material Testing
Project Location: Beetaloo Basin, Beetaloo N t
Work Request: 4919
Sample Number: DW 4919G
Date Sampled: 02/04/2023
Dates Tested: 13/04/2023 - 20/04/2023
Sampling Method: Sampled by Client
The results apply to the sample as received.
Sample Location: **Shenandoah NA (Option 2)**
Material: Sandy Clay

Particle Size Distribution (AS1289 3.6.1)

Sieve	Passed %	Passing Limits
6.7 mm	100	
4.75 mm	100	
2.36 mm	99	
1.18 mm	96	
0.6 mm	93	
0.425 mm	89	
0.3 mm	77	
0.15 mm	54	
0.075 mm	46	

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1) Min Max

Sample History	Air Dried
Preparation Method	Wet Sieve
Liquid Limit (%)	25
Plastic Limit (%)	12
Plasticity Index (%)	**13**

Linear Shrinkage (AS1289 3.4.1) Min Max

Moisture Condition Determined By	AS 1289.3.1.2
Linear Shrinkage (%)	**6.5**
Cracking Crumbling Curling	Cracking

Emerson Class Number of a Soil (AS 1289 3.8.1) Min Max

Emerson Class	**6**
Soil Description	Natural Soil
Nature of Water	Distilled Water
Temperature of Water (°C)	25.5

Douglas Partners
Geotechnics I Environment I Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 0800
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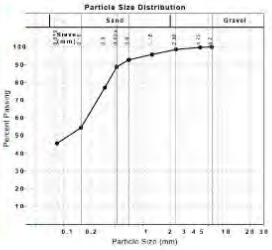
Laboratory Manager
Laboratory Accreditation Number: 828

Particle Size Distribution



Material Test Report

Report Number: 220270.00-2
Issue Number: 1
Date Issued: 21/04/2023
Client: AECOM Australia Pty Ltd
PO Box 3175, Darwin NT 0801
Contact: William Iddell
Project Number: 220270.00
Project Name: Material Testing
Project Location: Beetaloo Basin, Beetaloo N t
Work Request: 4919
Sample Number: DW 4919I
Date Sampled: 03/04/2023
Dates Tested: 13/04/2023 - 20/04/2023
Sampling Method: Sampled by Client
The results apply to the sample as received.
Sample Location: **Shenandoah NB**
Material: Silty Sandy Gravel

Particle Size Distribution (AS1289 3.6.1)

Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	99	
9.5 mm	97	
6.7 mm	90	
4.75 mm	77	
2.36 mm	48	
1.18 mm	38	
0.6 mm	35	
0.425 mm	34	
0.3 mm	32	
0.15 mm	24	
0.075 mm	18	

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1) Min Max

Sample History	Air Dried
Preparation Method	Wet Sieve
Liquid Limit (%)	15
Plastic Limit (%)	11
Plasticity Index (%)	**4**

Linear Shrinkage (AS1289 3.4.1) Min Max

Moisture Condition Determined By	AS 1289.3.1.2
Linear Shrinkage (%)	**3.0**
Cracking Crumbling Curling	Cracking

Emerson Class Number of a Soil (AS 1289 3.8.1) Min Max

Emerson Class	**3**
Soil Description	Natural Soil
Nature of Water	Distilled Water
Temperature of Water (°C)	25.5

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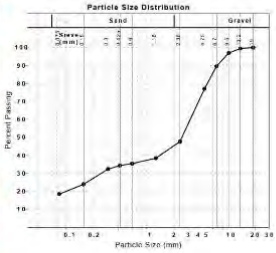
Geotechnics I Environment I Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 0800
Email: Sunil.Sukhdeo@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Sunil Sukhdeo
Laboratory Manager
Laboratory Accreditation Number: 828

Particle Size Distribution



Material Test Report

Report Number: 220270.00-2
Issue Number: 1
Date Issued: 21/04/2023
Client: AECOM Australia Pty Ltd
PO Box 3175, Darwin NT 0801
Contact: William Iddell
Project Number: 220270.00
Project Name: Material Testing
Project Location: Beetaloo Basin, Beetaloo N t
Work Request: 4919
Sample Number: DW 4919A
Date Sampled: 31/03/2023
Dates Tested: 13/04/2023 - 19/04/2023
Sampling Method: Sampled by Client
The results apply to the sample as received.
Sample Location: **Shenandoah SA**
Material: Silty Sand with Gravel

Particle Size Distribution (AS1289 3.6.1)

Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	99	
6.7 mm	97	
4.75 mm	93	
2.36 mm	82	
1.18 mm	78	
0.6 mm	76	
0.425 mm	73	
0.3 mm	67	
0.15 mm	29	
0.075 mm	20	

Atterberg Limit (AS1289 3.1.2 & 3.2.1 & 3.3.1) Min Max

Sample History	Air Dried
Preparation Method	Wet Sieve
Liquid Limit (%)	13
Plastic Limit (%)	11
Plasticity Index (%)	**2**

Linear Shrinkage (AS1289 3.4.1) Min Max

Moisture Condition Determined By	AS 1289.3.1.2
Linear Shrinkage (%)	**5.0**
Cracking Crumbling Curling	Cracking

Emerson Class Number of a Soil (AS 1289 3.8.1) Min Max

Emerson Class	**3**
Soil Description	Natural Soil
Nature of Water	Distilled Water
Temperature of Water (°C)	25.5

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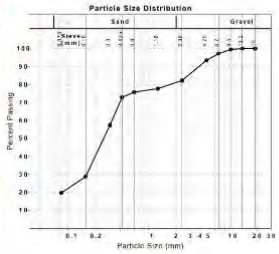
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 0800
Email: Sunil.Sukhdeo@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Sunil Sukhdeo
Laboratory Manager
Laboratory Accreditation Number: 828

Particle Size Distribution



Material Test Report

Report Number: 220270.00-2
Issue Number: 1
Date Issued: 21/04/2023
Client: AECOM Australia Pty Ltd
PO Box 3175, Darwin NT 0801
Contact: William Riddell
Project Number: 220270.00
Project Name: Material Testing
Project Location: Beetaloo Basin, Beetaloo N t
Work Request: 4919
Sample Number: DW 4919D
Date Sampled: 01/04/2023
Dates Tested: 13/04/2023 - 19/04/2023
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **Shenandoah SB**
Material: Silty Sand

Particle Size Distribution (AS1289.3.6.1)

Sieve	Passed %	Passing Limits
6.7 mm	100	
4.75 mm	100	
2.36 mm	100	
1.18 mm	99	
0.6 mm	95	
0.425 mm	86	
0.3 mm	62	
0.15 mm	34	
0.075 mm	27	

Atterberg Limit (AS1289.3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Wet Sieve		
Liquid Limit (%)	14		
Plastic Limit (%)	10		
Plasticity Index (%)	**4**		

Linear Shrinkage (AS1289.3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**2.0**		
Cracking Crumbling Curling	None		

Emerson Class Number of a Soil (AS 1289.3.8.1)		Min	Max
Emerson Class	**3**		
Soil Description	Natural Soil		
Nature of Water	Distilled Water		
Temperature of Water (°C)	25.5		

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Phone: (08) 8948 6800
Email: Sunil.Sukhdeo@douglaspartners.com.au

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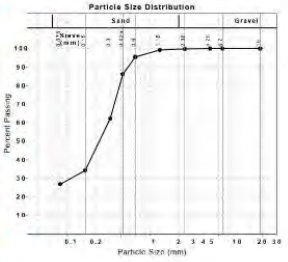
Approved Signatory: Sunil Sukhdeo
Laboratory Manager
Laboratory Accreditation Number: 828

Particle Size Distribution



Material Test Report

Report Number: 220270.00-2
Issue Number: 1
Date Issued: 21/04/2023
Client: AECOM Australia Pty Ltd
PO Box 3175, Darwin NT 0801
Contact: William Riddell
Project Number: 220270.00
Project Name: Material Testing
Project Location: Beetaloo Basin, Beetaloo N t
Work Request: 4919
Sample Number: DW 4919C
Date Sampled: 31/03/2023
Dates Tested: 13/04/2023 - 19/04/2023
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **Shenandoah SC**
Material: Sandy Clay With Gravel

Particle Size Distribution (AS1289.3.6.1)

Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	100	
4.75 mm	100	
2.36 mm	98	
1.18 mm	98	
0.6 mm	95	
0.425 mm	90	
0.3 mm	72	
0.15 mm	49	
0.075 mm	41	

Atterberg Limit (AS1289.3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Wet Sieve		
Liquid Limit (%)	22		
Plastic Limit (%)	12		
Plasticity Index (%)	**10**		

Linear Shrinkage (AS1289.3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	**8.0**		
Cracking Crumbling Curling	Cracking		

Emerson Class Number of a Soil (AS 1289.3.8.1)		Min	Max
Emerson Class	3		
Soil Description	Natural Soil		
Nature of Water	Distilled Water		
Temperature of Water (°C)	25.5		

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Douglas Partners Pty Ltd
Darwin Laboratory
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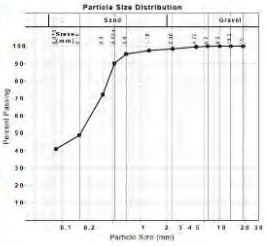
Email: Sunil.Sukhdeo@douglaspartners.com.au

Accredited for compliance with ISO/IEC 17025 - Testing

Approved Signatory: Sunil Sukhdeo
Laboratory Manager
Laboratory Accreditation Number: 828

Particle Size Distribution



Material Test Report

Report Number: 220270.00-1
Issue Number: 1
Date Issued: 20/01/2023
Client: AECOM Australia Pty Ltd
PO Box 3175, Darwin NT 0801
Contact: William Riddell
Project Number: 220270.00
Project Name: Material Testing
Project Location: Beetaloo Basin, Beetaloo NT
Work Request: 4776
Sample Number: DW-4776F
Date Sampled: 14/12/2022
Dates Tested: 13/01/2023 - 18/01/2023
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: **Shen South 2**
Material: Silty SAND

Particle Size Distribution (AS1289.3.6.1)

Sieve	Passed %	Passing Limits
4.75 mm	100	
2.36 mm	100	
1.18 mm	99	
0.6 mm	94	
0.425 mm	81	
0.3 mm	57	
0.15 mm	28	
0.075 mm	20	

Atterberg Limit (AS1289.3.1.2 & 3.2.1 & 3.3.1)		Min	Max
Sample History	Air Dried		
Preparation Method	Wet Sieve		
Liquid Limit (%)	13		
Plastic Limit (%)	11		
Plasticity Index (%)	2		

Linear Shrinkage (AS1289.3.4.1)		Min	Max
Moisture Condition Determined By	AS 1289.3.1.2		
Linear Shrinkage (%)	0.5		
Cracking Crumbling Curling	Cracking		

Emerson Class Number of a Soil (AS 1289.3.8.1)		Min	Max
Emerson Class	5		
Soil Description	Natural		
Nature of Water	Demineralised Water		
Temperature of Water (°C)	25		

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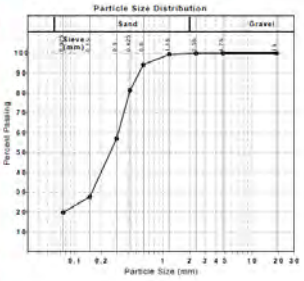
Geotechnics | Environment | Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Caryota Circuit Coconut Grove NT 0810
Phone: (08) 8948 6800
Email: Sunil.Sukhdeo@douglaspartners.com.au

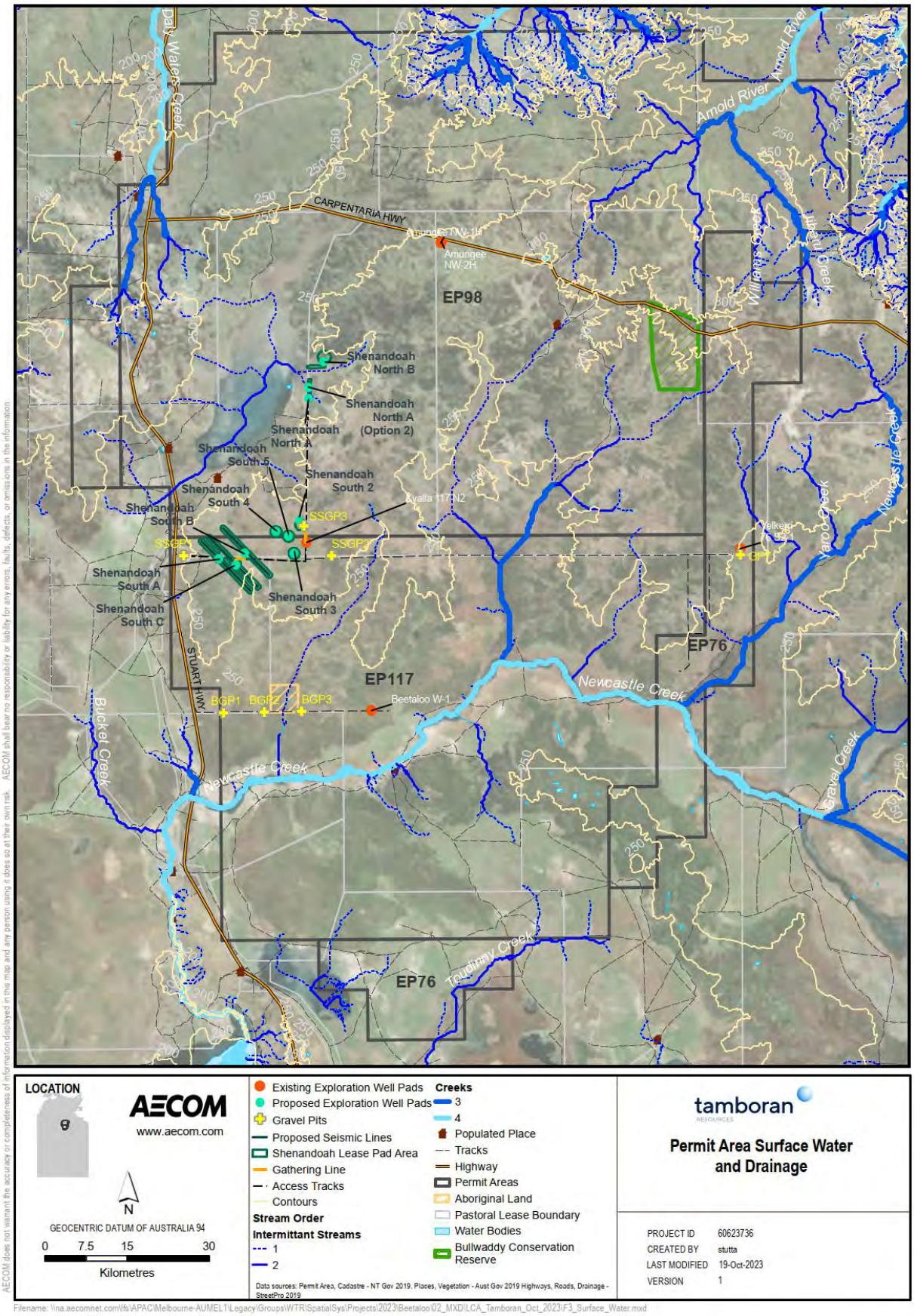
Accredited for compliance with ISO/IEC 17025 - Testing

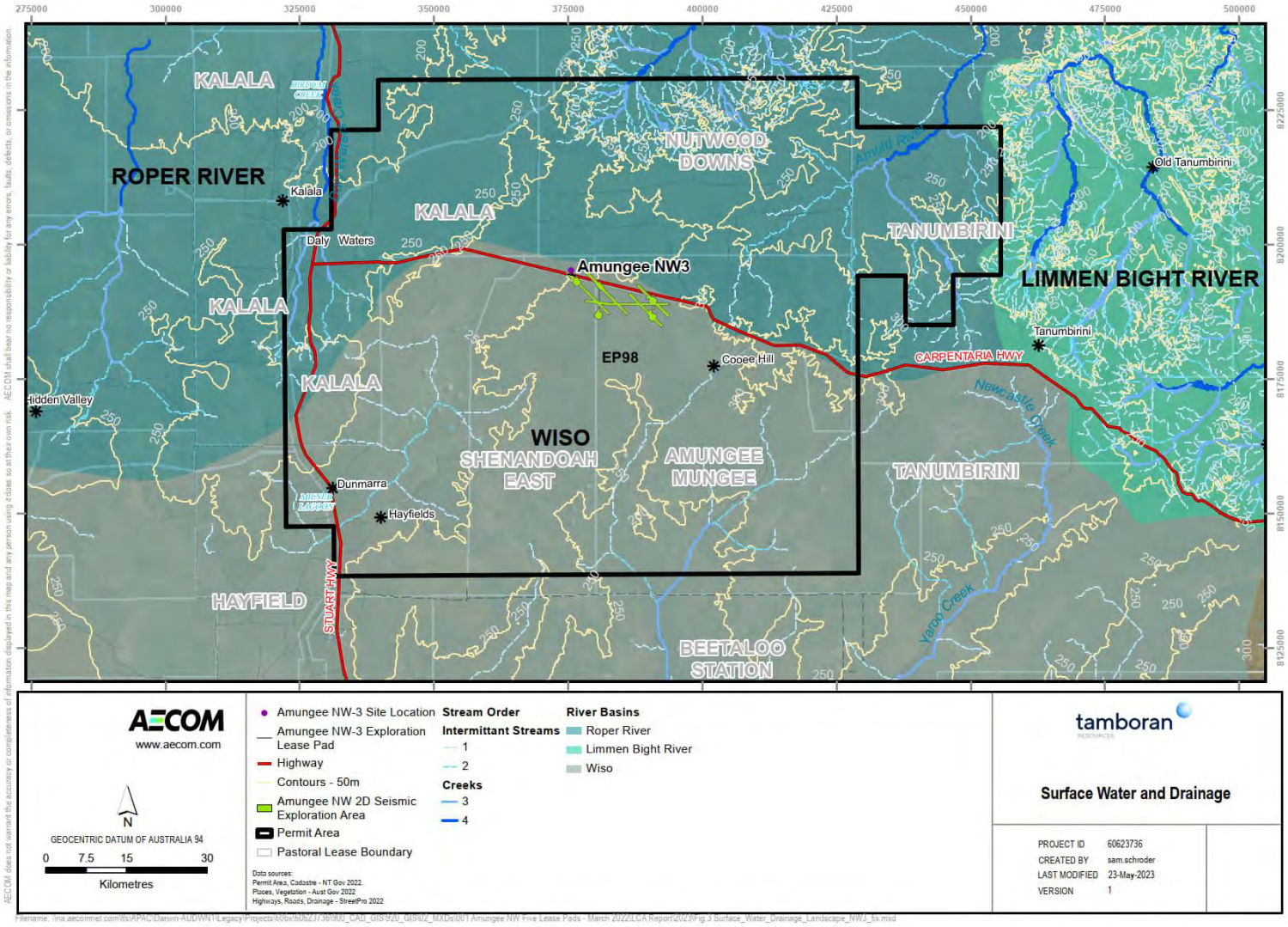
Approved Signatory: Sunil Sukhdeo
Laboratory Manager
Laboratory Accreditation Number: 828

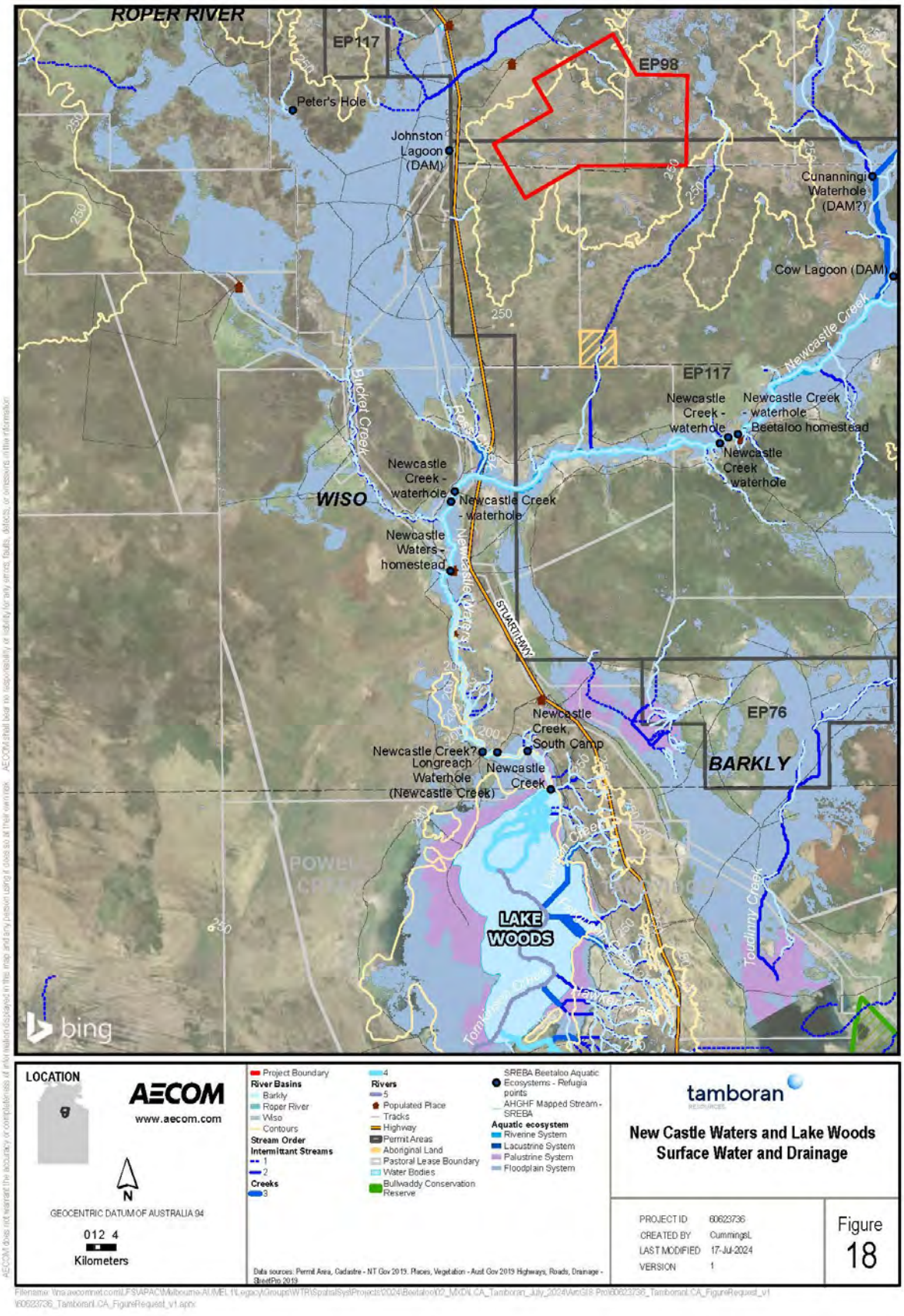
Particle Size Distribution



APPENDIX D Permit area surface water

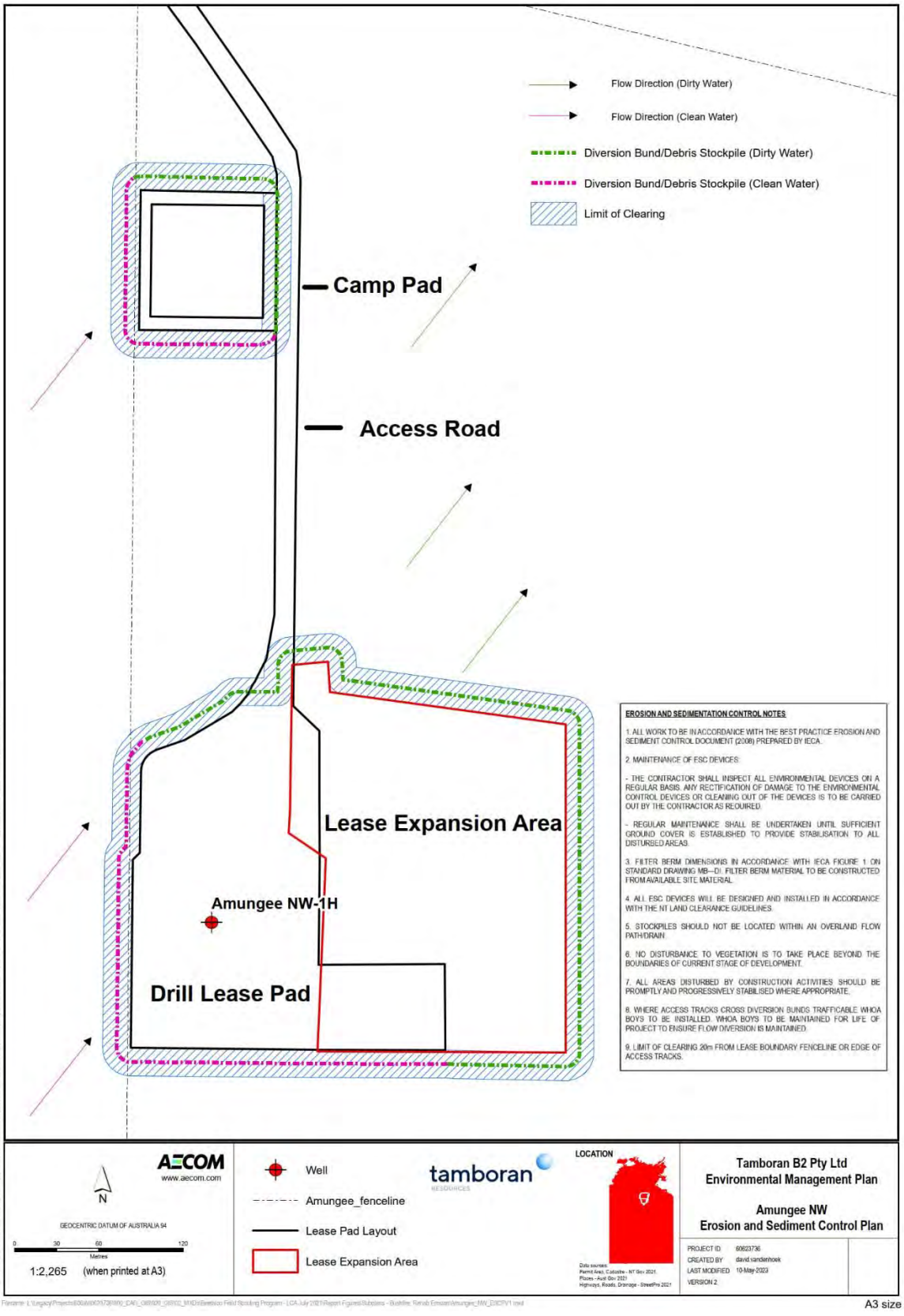



KALALA
ROPER RIVER
Kalala
Daly Waters
NUTWOOD DOWNS
Old Tanumbirini
TANUMBIRINI
LIMMEN BIGHT RIVER
Amungee NW3
Tanumbirini
CARPENTARIA HWY
EP98
Cooee Hill
Hidden Valley
WISO
SHENANDOAH EAST
AMUNGEE MUNGEE
Dunmarra
Hayfields
HAYFIELD
STUART HWY
BEETALOO STATION
Yarra Creek
Newcastle Creek
AECOM
www.aecom.com
Amungee NW-3 Site Location
Amungee NW-3 Exploration Lease Pad
Highway
Contours - 50m
Amungee NW 2D Seismic Exploration Area
Permit Area
Pastoral Lease Boundary
Stream Order
Intermittant Streams
1
2
Creeks
3
4
River Basins
Roper River
Limmen Bight River
Wiso
GEOCENTRIC DATUM OF AUSTRALIA 94
0 7.5 15 30
Kilometres
tamboran RESOURCES
Surface Water and Drainage
PROJECT ID 60623736
CREATED BY sam.schroder
LAST MODIFIED 23-May-2023
VERSION 1


ROPER RIVER
EP117
EP98
Peter's Hole
Johnston Lagoon (DAM)
Cunanningi Waterhole (DAM?)
Cow Lagoon (DAM)
Newcastle Creek
Bucket Creek
EP117
Newcastle Creek - waterhole
Newcastle Creek - waterhole Beetaloo homestead
Newcastle Creek waterhole
WISO
Newcastle Creek - waterhole
Newcastle Creek - waterhole
Newcastle Waters - homestead
STUART HWY
EP76
BARKLY
Newcastle Creek, South Camp
Newcastle Creek?
Longreach Waterhole (Newcastle Creek)
Newcastle Creek
LAKE WOODS
bing
LOCATION
AECOM
www.aecom.com
N
GEOCENTRIC DATUM OF AUSTRALIA 94
0 1 2 4
Kilometers
Project Boundary
River Basins
Barkly
Roper River
Wiso
Contours
Stream Order
Intermittant Streams
1
2
Creeks
3
4
Rivers
5
Populated Place
Tracks
Highway
Permit Areas
Aboriginal Land
Pastoral Lease Boundary
Water Bodies
Bullwaddy Conservation Reserve
SREBA Beetaloo Aquatic Ecosystems - Refugia points
AHGHF Mapped Stream - SREBA
Aquatic ecosystem
Riverine System
Lacustrine System
Palustrine System
Floodplain System
Data sources: Permit Area, Cadastre - NT Gov 2019. Places, Vegetation - Aust Gov 2019 Highways, Roads, Drainage - StreetPro 2019
tamboran RESOURCES
New Castle Waters and Lake Woods Surface Water and Drainage
PROJECT ID 60623736
CREATED BY CummingsL
LAST MODIFIED 17-Jul-2024
VERSION 1
Figure 18

APPENDIX E Erosion and sediment control plans:

- **Amungee NW**
- **Amungee NW-2**
- **Amungee NW-3**
- **Amungee NW-4**
- **Amungee NW-5**
- **Shenandoah South A**
- **Shenandoah South B**
- **Shenandoah South C**
- **Shenandoah South 2, including SPCF**
- **Shenandoah North A**
- **Shenandoah North A (option 2)**


Flow Direction (Dirty Water)
Flow Direction (Clean Water)
Diversion Bund/Debris Stockpile (Dirty Water)
Diversion Bund/Debris Stockpile (Clean Water)
Limit of Clearing
Camp Pad
Access Road
Lease Expansion Area
Amungee NW-1H
Drill Lease Pad
EROSION AND SEDIMENTATION CONTROL NOTES
1. ALL WORK TO BE IN ACCORDANCE WITH THE BEST PRACTICE EROSION AND SEDIMENT CONTROL DOCUMENT (2008) PREPARED BY IECA.
2. MAINTENANCE OF ESC DEVICES:
- THE CONTRACTOR SHALL INSPECT ALL ENVIRONMENTAL DEVICES ON A REGULAR BASIS. ANY RECTIFICATION OF DAMAGE TO THE ENVIRONMENTAL CONTROL DEVICES OR CLEANING OUT OF THE DEVICES IS TO BE CARRIED OUT BY THE CONTRACTOR AS REQUIRED.
- REGULAR MAINTENANCE SHALL BE UNDERTAKEN UNTIL SUFFICIENT GROUND COVER IS ESTABLISHED TO PROVIDE STABILISATION TO ALL DISTURBED AREAS.
3. FILTER BERM DIMENSIONS IN ACCORDANCE WITH IECA FIGURE 1 ON STANDARD DRAWING MB—DI. FILTER BERM MATERIAL TO BE CONSTRUCTED FROM AVAILABLE SITE MATERIAL.
4. ALL ESC DEVICES WILL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE NT LAND CLEARANCE GUIDELINES.
5. STOCKPILES SHOULD NOT BE LOCATED WITHIN AN OVERLAND FLOW PATH/DRAIN.
6. NO DISTURBANCE TO VEGETATION IS TO TAKE PLACE BEYOND THE BOUNDARIES OF CURRENT STAGE OF DEVELOPMENT.
7. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHOULD BE PROMPTLY AND PROGRESSIVELY STABILISED WHERE APPROPRIATE.
8. WHERE ACCESS TRACKS CROSS DIVERSION BUNDS TRAFFICABLE WHOA BOYS TO BE INSTALLED. WHOA BOYS TO BE MAINTAINED FOR LIFE OF PROJECT TO ENSURE FLOW DIVERSION IS MAINTAINED.
9. LIMIT OF CLEARING 20m FROM LEASE BOUNDARY FENCELINE OR EDGE OF ACCESS TRACKS.
AECOM
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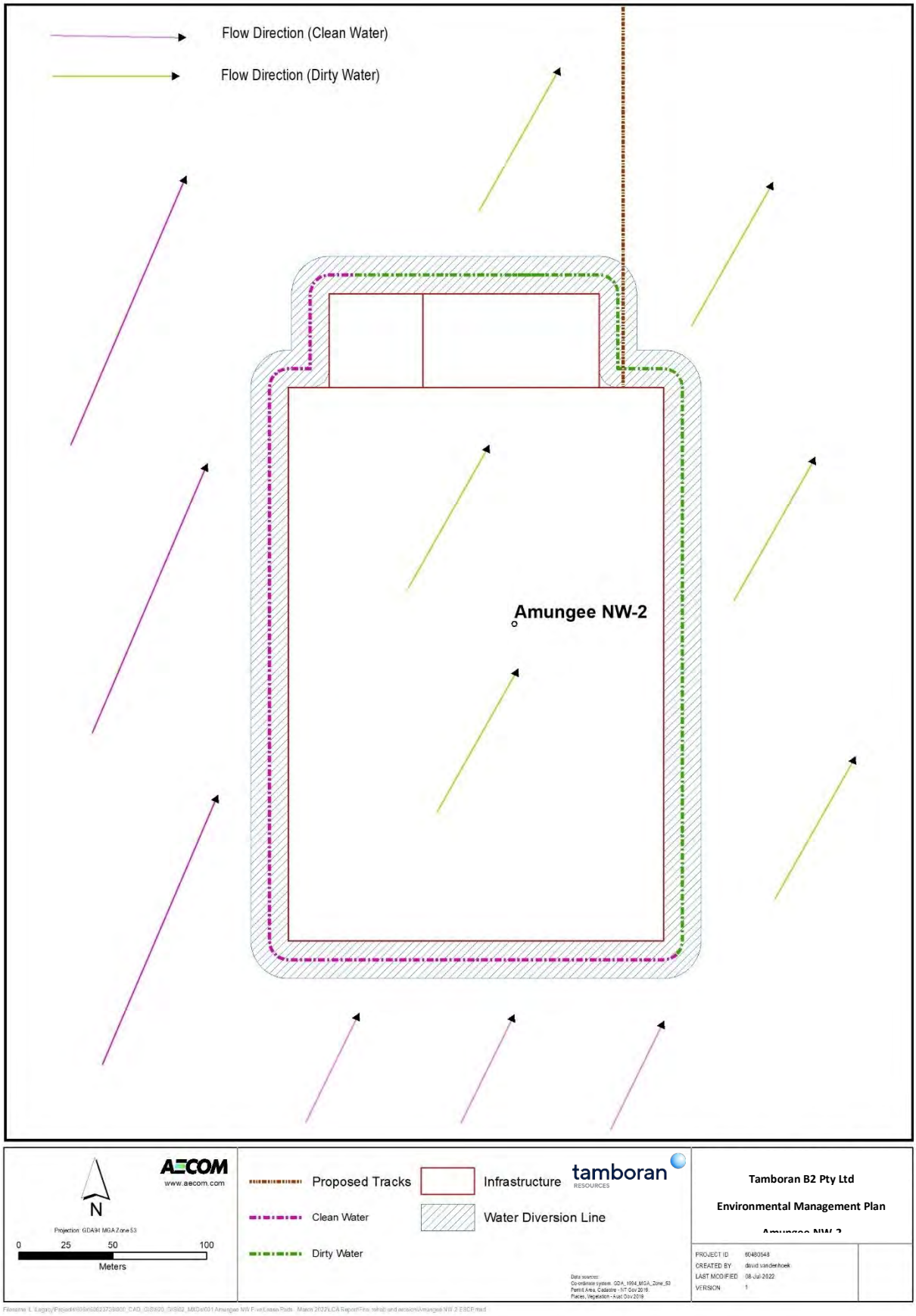
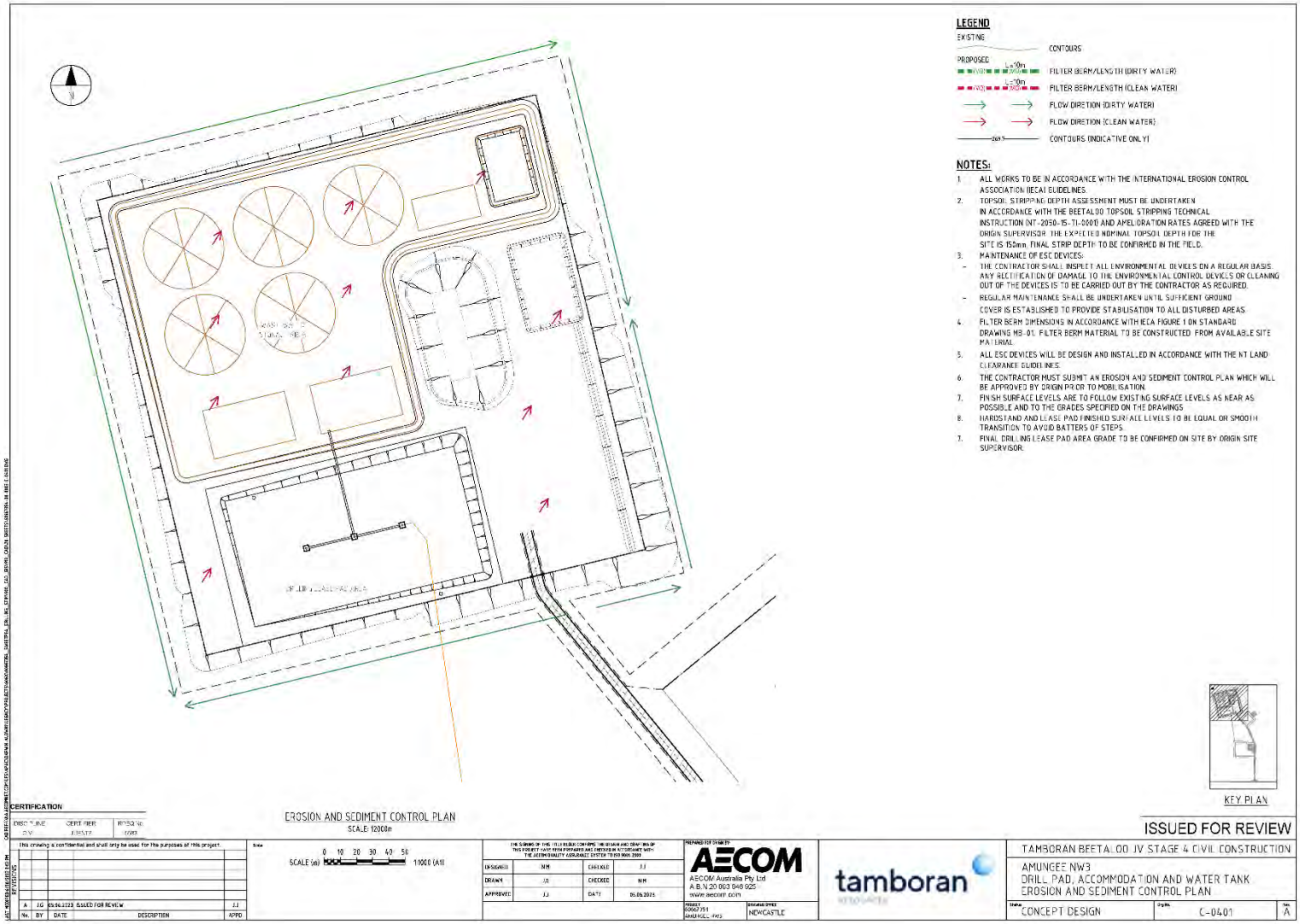
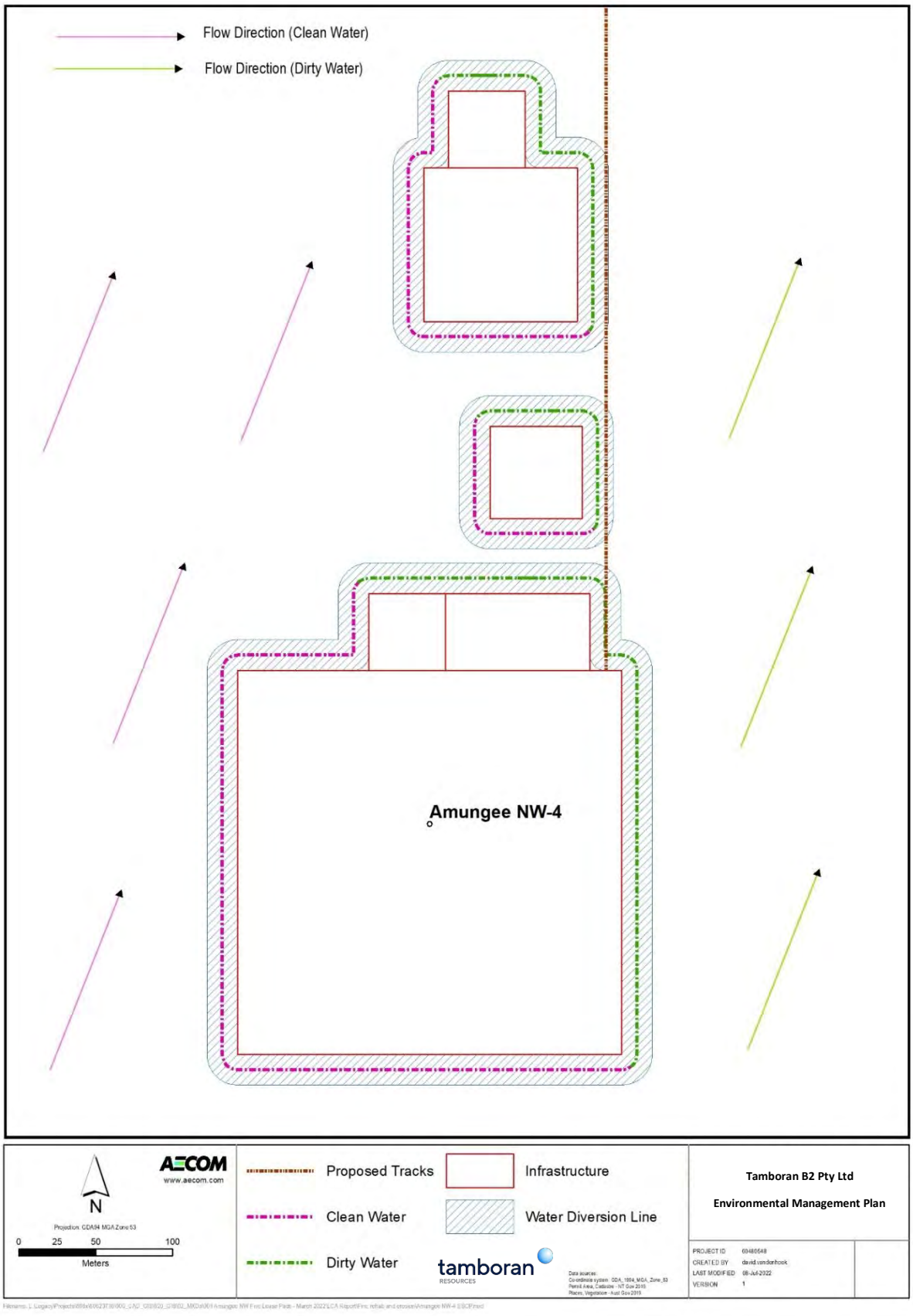
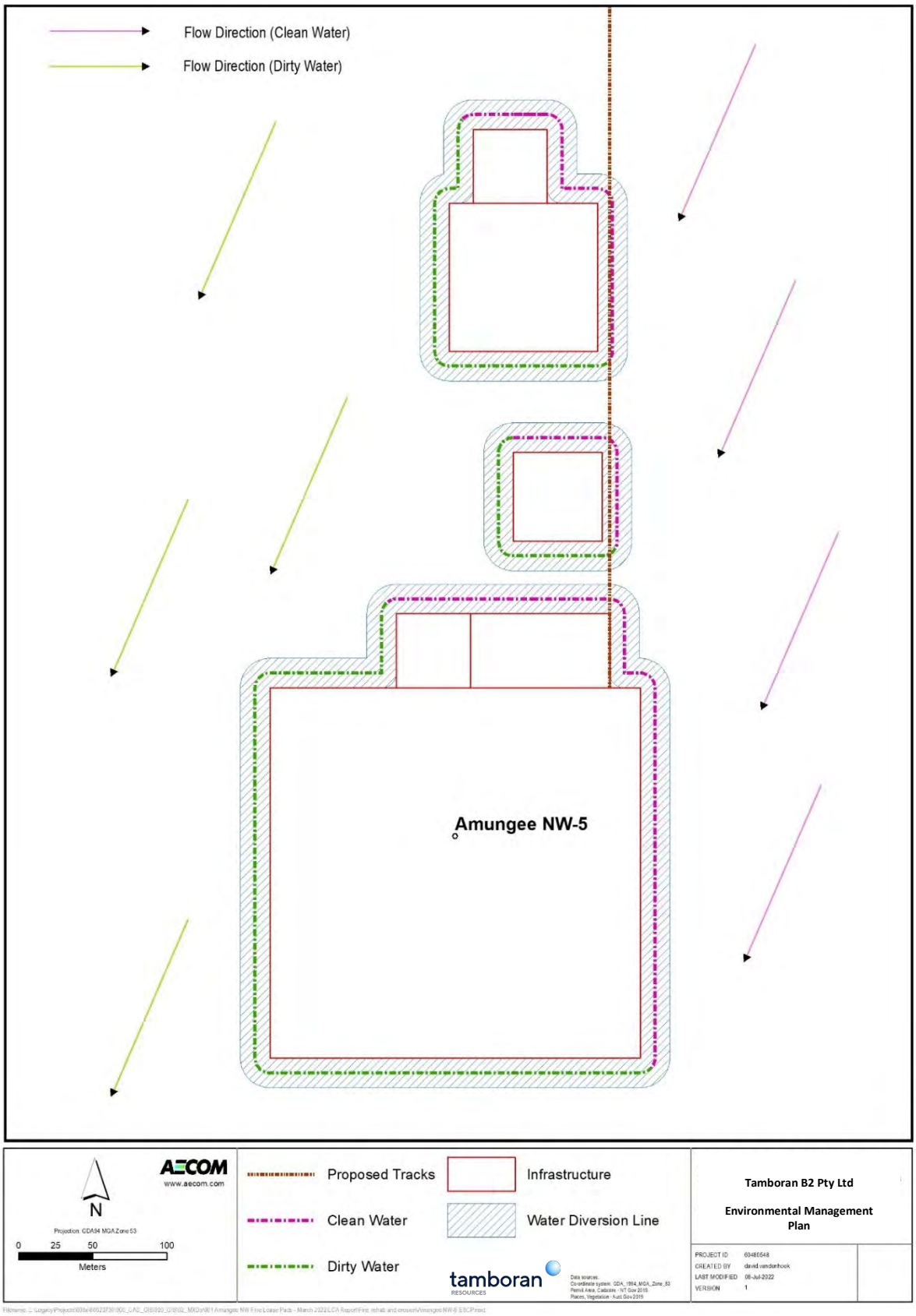
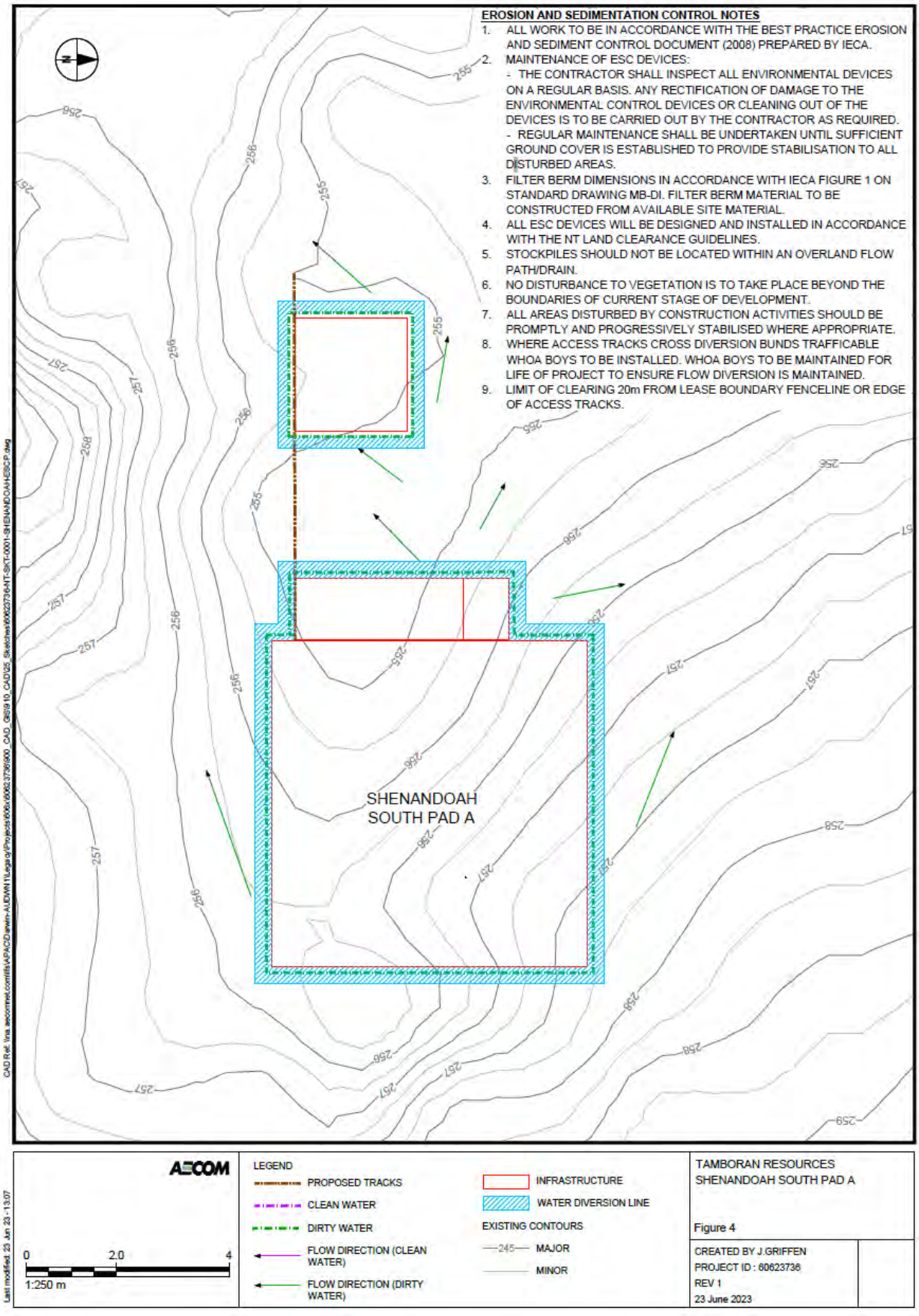
N
GEOCENTRIC DATUM OF AUSTRALIA 94
0 30 60 120
Metres
1:2,265 (when printed at A3)
Well
Amungee_fenceline
Lease Pad Layout
Lease Expansion Area
tamboran RESOURCES
LOCATION
Tamboran B2 Pty Ltd
Environmental Management Plan
Amungee NW
Erosion and Sediment Control Plan
PROJECT ID 60623736
CREATED BY david.vandenhoek
LAST MODIFIED 10-May-2023
VERSION 2
A3 size

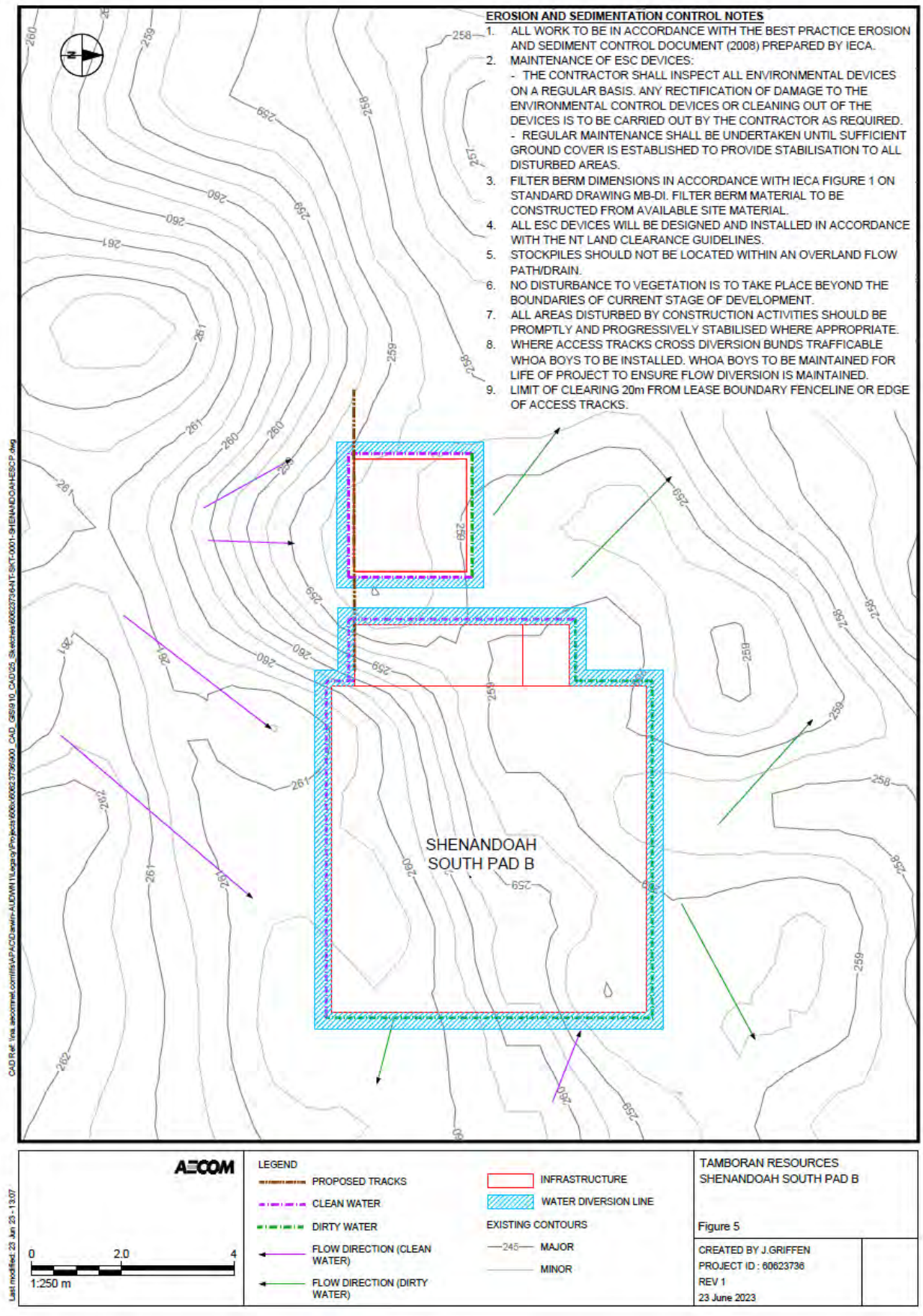

Flow Direction (Clean Water)
Flow Direction (Dirty Water)
Amungee NW-2
N
AECOM
www.aecom.com
Projection: GDA94 MGA Zone 53
0 25 50 100
Meters
Proposed Tracks
Clean Water
Dirty Water
Infrastructure
Water Diversion Line
tamboran RESOURCES
Tamboran B2 Pty Ltd
Environmental Management Plan
PROJECT ID 60480548
CREATED BY david.vanderhoek
LAST MODIFIED 08-Jul-2022
VERSION 1


LEGEND
EXISTING
CONTOURS
PROPOSED
FILTER BERM/LENGTH (DIRTY WATER)
FILTER BERM/LENGTH (CLEAN WATER)
FLOW DIRETION (DIRTY WATER)
FLOW DIRETION (CLEAN WATER)
CONTOURS (INDICATIVE ONLY)
NOTES:
1. ALL WORKS TO BE IN ACCORDANCE WITH THE INTERNATIONAL EROSION CONTROL ASSOCIATION (IECA) GUIDELINES.
2. TOPSOIL STRIPPING DEPTH ASSESSMENT MUST BE UNDERTAKEN IN ACCORDANCE WITH THE BEETALOO TOPSOIL STRIPPING TECHNICAL INSTRUCTION (NT-2050-15-TI-0001) AND AMELIORATION RATES AGREED WITH THE ORIGIN SUPERVISOR. THE EXPECTED NOMINAL TOPSOIL DEPTH FOR THE SITE IS 150mm. FINAL STRIP DEPTH TO BE CONFIRMED IN THE FIELD.
3. MAINTENANCE OF ESC DEVICES:
– THE CONTRACTOR SHALL INSPECT ALL ENVIRONMENTAL DEVICES ON A REGULAR BASIS. ANY RECTIFICATION OF DAMAGE TO THE ENVIRONMENTAL CONTROL DEVICES OR CLEANING OUT OF THE DEVICES IS TO BE CARRIED OUT BY THE CONTRACTOR AS REQUIRED.
– REGULAR MAINTENANCE SHALL BE UNDERTAKEN UNTIL SUFFICIENT GROUND COVER IS ESTABLISHED TO PROVIDE STABILISATION TO ALL DISTURBED AREAS.
4. FILTER BERM DIMENSIONS IN ACCORDANCE WITH IECA FIGURE 1 ON STANDARD DRAWING M8-01. FILTER BERM MATERIAL TO BE CONSTRUCTED FROM AVAILABLE SITE MATERIAL.
5. ALL ESC DEVICES WILL BE DESIGN AND INSTALLED IN ACCORDANCE WITH THE NT LAND CLEARANCE GUIDELINES.
6. THE CONTRACTOR MUST SUBMIT AN EROSION AND SEDIMENT CONTROL PLAN WHICH WILL BE APPROVED BY ORIGIN PRIOR TO MOBILISATION.
7. FINISH SURFACE LEVELS ARE TO FOLLOW EXISTING SURFACE LEVELS AS NEAR AS POSSIBLE AND TO THE GRADES SPECIFIED ON THE DRAWINGS.
8. HARDSTAND AND LEASE PAD FINISHED SURFACE LEVELS TO BE EQUAL OR SMOOTH TRANSITION TO AVOID BATTERS OR STEPS.
7. FINAL DRILLING LEASE PAD AREA GRADE TO BE CONFIRMED ON SITE BY ORIGIN SITE SUPERVISOR.
KEY PLAN
CERTIFICATION
EROSION AND SEDIMENT CONTROL PLAN
SCALE: 1:2000@A1
ISSUED FOR REVIEW
AECOM
AECOM Australia Pty Ltd
A.B.N 20 093 846 925
www.aecom.com
tamboran
TAMBORAN BEETALOO JV STAGE 4 CIVIL CONSTRUCTION
AMUNGEE NW3
DRILL PAD, ACCOMMODATION AND WATER TANK
EROSION AND SEDIMENT CONTROL PLAN
CONCEPT DESIGN
C-0401
A


Flow Direction (Clean Water)
Flow Direction (Dirty Water)
Amungee NW-4
N
AECOM
www.aecom.com
Projection: GDA94 MGA Zone 53
0 25 50 100
Meters
Proposed Tracks
Infrastructure
Clean Water
Water Diversion Line
Dirty Water
tamboran RESOURCES
Tamboran B2 Pty Ltd
Environmental Management Plan
PROJECT ID 60480648
CREATED BY david.vandonkoek
LAST MODIFIED 08-Jul-2022
VERSION 1


Flow Direction (Clean Water)
Flow Direction (Dirty Water)
Amungee NW-5
N
AECOM
www.aecom.com
Projection: GDA94 MGA Zone 53
0 25 50 100
Meters
Proposed Tracks
Clean Water
Dirty Water
Infrastructure
Water Diversion Line
tamboran RESOURCES
Tamboran B2 Pty Ltd
Environmental Management Plan
PROJECT ID 60486548
CREATED BY david.vandenhoek
LAST MODIFIED 08-Jul-2022
VERSION 1


EROSION AND SEDIMENTATION CONTROL NOTES
1. ALL WORK TO BE IN ACCORDANCE WITH THE BEST PRACTICE EROSION AND SEDIMENT CONTROL DOCUMENT (2008) PREPARED BY IECA.
2. MAINTENANCE OF ESC DEVICES:
- THE CONTRACTOR SHALL INSPECT ALL ENVIRONMENTAL DEVICES ON A REGULAR BASIS. ANY RECTIFICATION OF DAMAGE TO THE ENVIRONMENTAL CONTROL DEVICES OR CLEANING OUT OF THE DEVICES IS TO BE CARRIED OUT BY THE CONTRACTOR AS REQUIRED.
- REGULAR MAINTENANCE SHALL BE UNDERTAKEN UNTIL SUFFICIENT GROUND COVER IS ESTABLISHED TO PROVIDE STABILISATION TO ALL DISTURBED AREAS.
3. FILTER BERM DIMENSIONS IN ACCORDANCE WITH IECA FIGURE 1 ON STANDARD DRAWING MB-DI. FILTER BERM MATERIAL TO BE CONSTRUCTED FROM AVAILABLE SITE MATERIAL.
4. ALL ESC DEVICES WILL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE NT LAND CLEARANCE GUIDELINES.
5. STOCKPILES SHOULD NOT BE LOCATED WITHIN AN OVERLAND FLOW PATH/DRAIN.
6. NO DISTURBANCE TO VEGETATION IS TO TAKE PLACE BEYOND THE BOUNDARIES OF CURRENT STAGE OF DEVELOPMENT.
7. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHOULD BE PROMPTLY AND PROGRESSIVELY STABILISED WHERE APPROPRIATE.
8. WHERE ACCESS TRACKS CROSS DIVERSION BUNDS TRAFFICABLE WHOA BOYS TO BE INSTALLED. WHOA BOYS TO BE MAINTAINED FOR LIFE OF PROJECT TO ENSURE FLOW DIVERSION IS MAINTAINED.
9. LIMIT OF CLEARING 20m FROM LEASE BOUNDARY FENCELINE OR EDGE OF ACCESS TRACKS.
SHENANDOAH SOUTH PAD A
AECOM
LEGEND
PROPOSED TRACKS
CLEAN WATER
DIRTY WATER
FLOW DIRECTION (CLEAN WATER)
FLOW DIRECTION (DIRTY WATER)
INFRASTRUCTURE
WATER DIVERSION LINE
EXISTING CONTOURS
245 MAJOR
MINOR
0 2.0 4
1:250 m
TAMBORAN RESOURCES
SHENANDOAH SOUTH PAD A
Figure 4
CREATED BY J.GRIFFEN
PROJECT ID : 60623736
REV 1
23 June 2023


EROSION AND SEDIMENTATION CONTROL NOTES
1. ALL WORK TO BE IN ACCORDANCE WITH THE BEST PRACTICE EROSION AND SEDIMENT CONTROL DOCUMENT (2008) PREPARED BY IECA.
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- THE CONTRACTOR SHALL INSPECT ALL ENVIRONMENTAL DEVICES ON A REGULAR BASIS. ANY RECTIFICATION OF DAMAGE TO THE ENVIRONMENTAL CONTROL DEVICES OR CLEANING OUT OF THE DEVICES IS TO BE CARRIED OUT BY THE CONTRACTOR AS REQUIRED.
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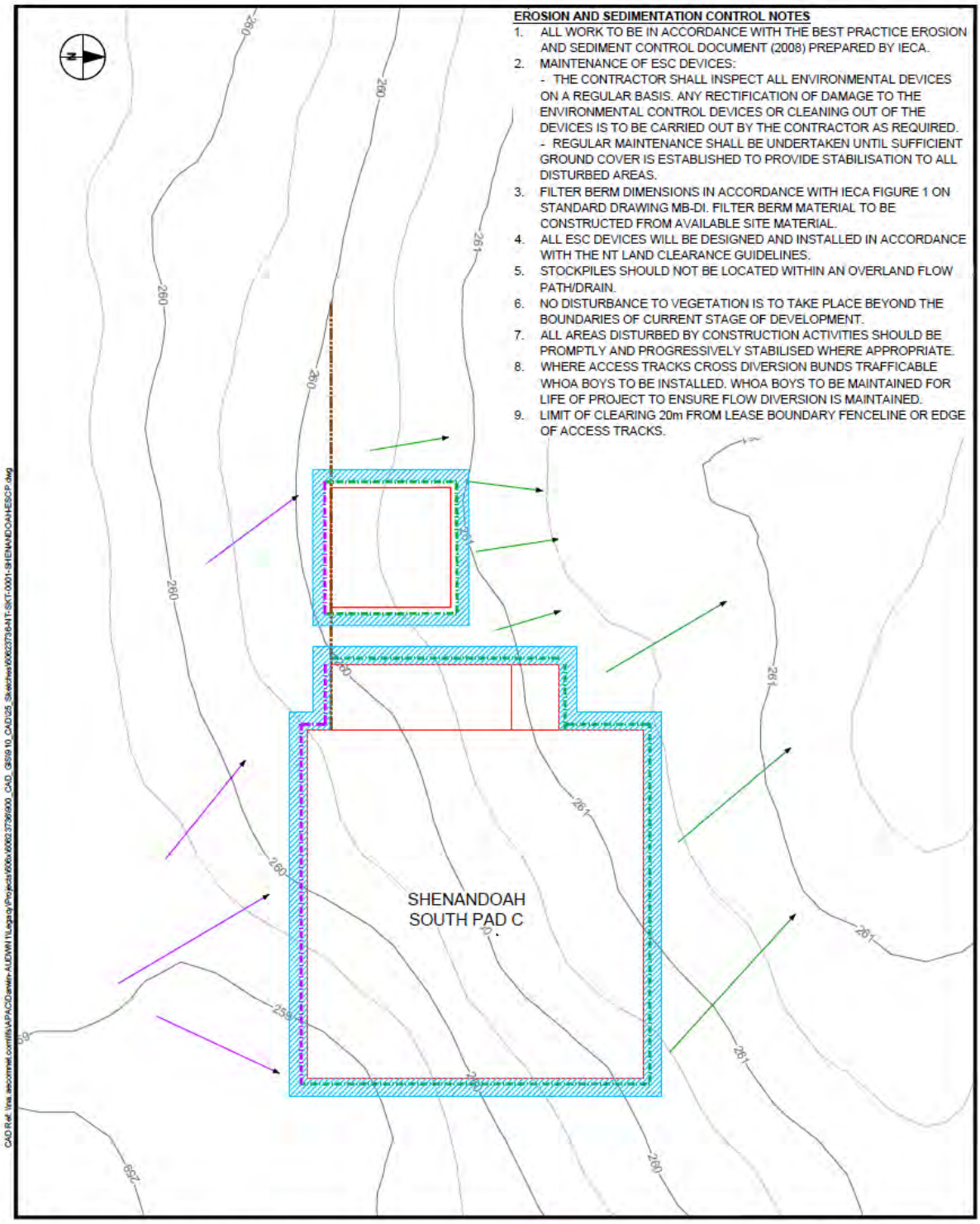
4. ALL ESC DEVICES WILL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE NT LAND CLEARANCE GUIDELINES.
5. STOCKPILES SHOULD NOT BE LOCATED WITHIN AN OVERLAND FLOW PATH/DRAIN.
6. NO DISTURBANCE TO VEGETATION IS TO TAKE PLACE BEYOND THE BOUNDARIES OF CURRENT STAGE OF DEVELOPMENT.
7. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHOULD BE PROMPTLY AND PROGRESSIVELY STABILISED WHERE APPROPRIATE.
8. WHERE ACCESS TRACKS CROSS DIVERSION BUNDS TRAFFICABLE WHOA BOYS TO BE INSTALLED. WHOA BOYS TO BE MAINTAINED FOR LIFE OF PROJECT TO ENSURE FLOW DIVERSION IS MAINTAINED.
9. LIMIT OF CLEARING 20m FROM LEASE BOUNDARY FENCELINE OR EDGE OF ACCESS TRACKS.
SHENANDOAH
SOUTH PAD B
AECOM
LEGEND
PROPOSED TRACKS
CLEAN WATER
DIRTY WATER
FLOW DIRECTION (CLEAN WATER)
FLOW DIRECTION (DIRTY WATER)
INFRASTRUCTURE
WATER DIVERSION LINE
EXISTING CONTOURS
MAJOR
MINOR
0 2.0 4
1:250 m
TAMBORAN RESOURCES
SHENANDOAH SOUTH PAD B
Figure 5
CREATED BY J.GRIFFEN
PROJECT ID : 60623736
REV 1
23 June 2023


EROSION AND SEDIMENTATION CONTROL NOTES
1. ALL WORK TO BE IN ACCORDANCE WITH THE BEST PRACTICE EROSION AND SEDIMENT CONTROL DOCUMENT (2008) PREPARED BY IECA.
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- THE CONTRACTOR SHALL INSPECT ALL ENVIRONMENTAL DEVICES ON A REGULAR BASIS. ANY RECTIFICATION OF DAMAGE TO THE ENVIRONMENTAL CONTROL DEVICES OR CLEANING OUT OF THE DEVICES IS TO BE CARRIED OUT BY THE CONTRACTOR AS REQUIRED.
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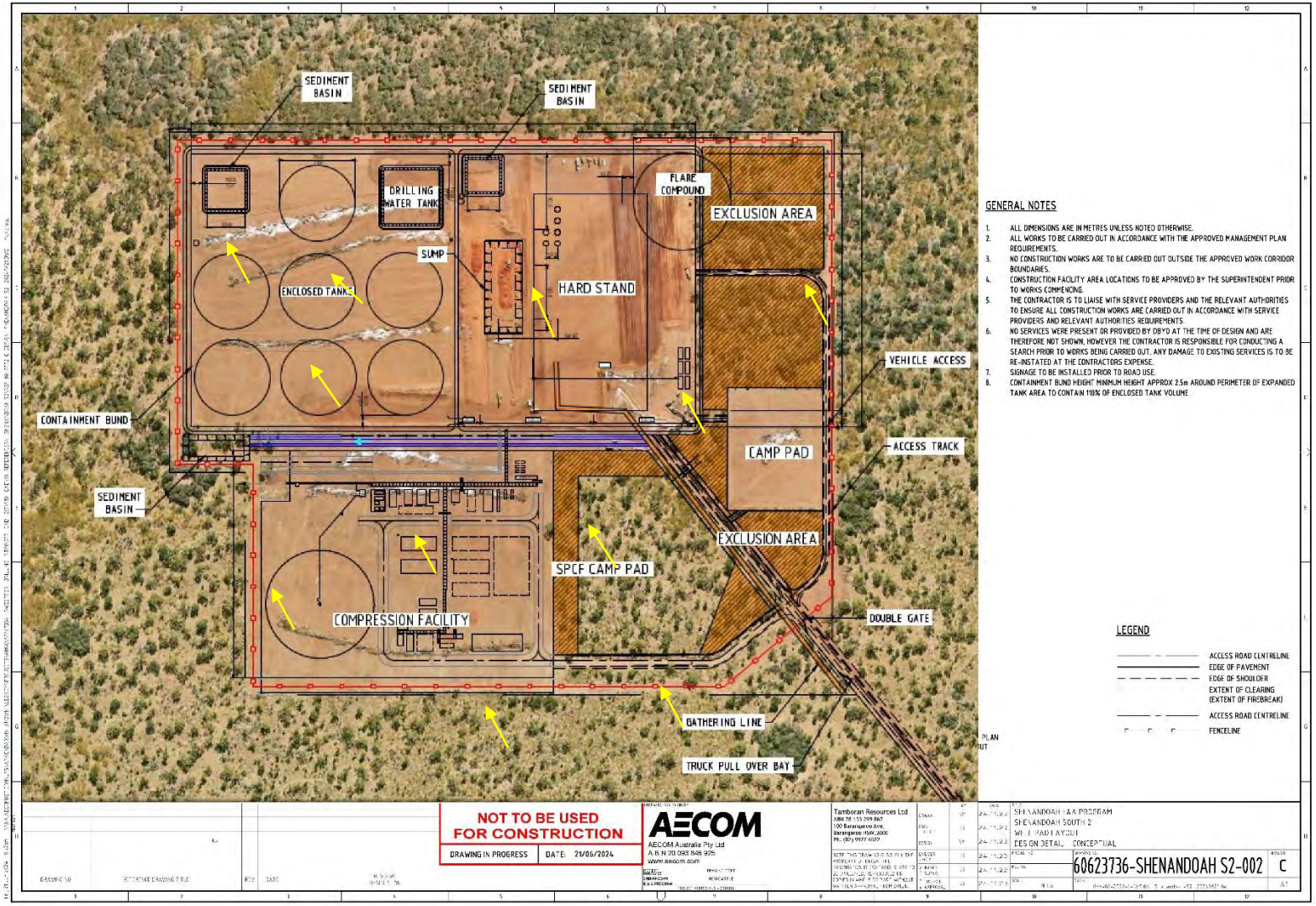
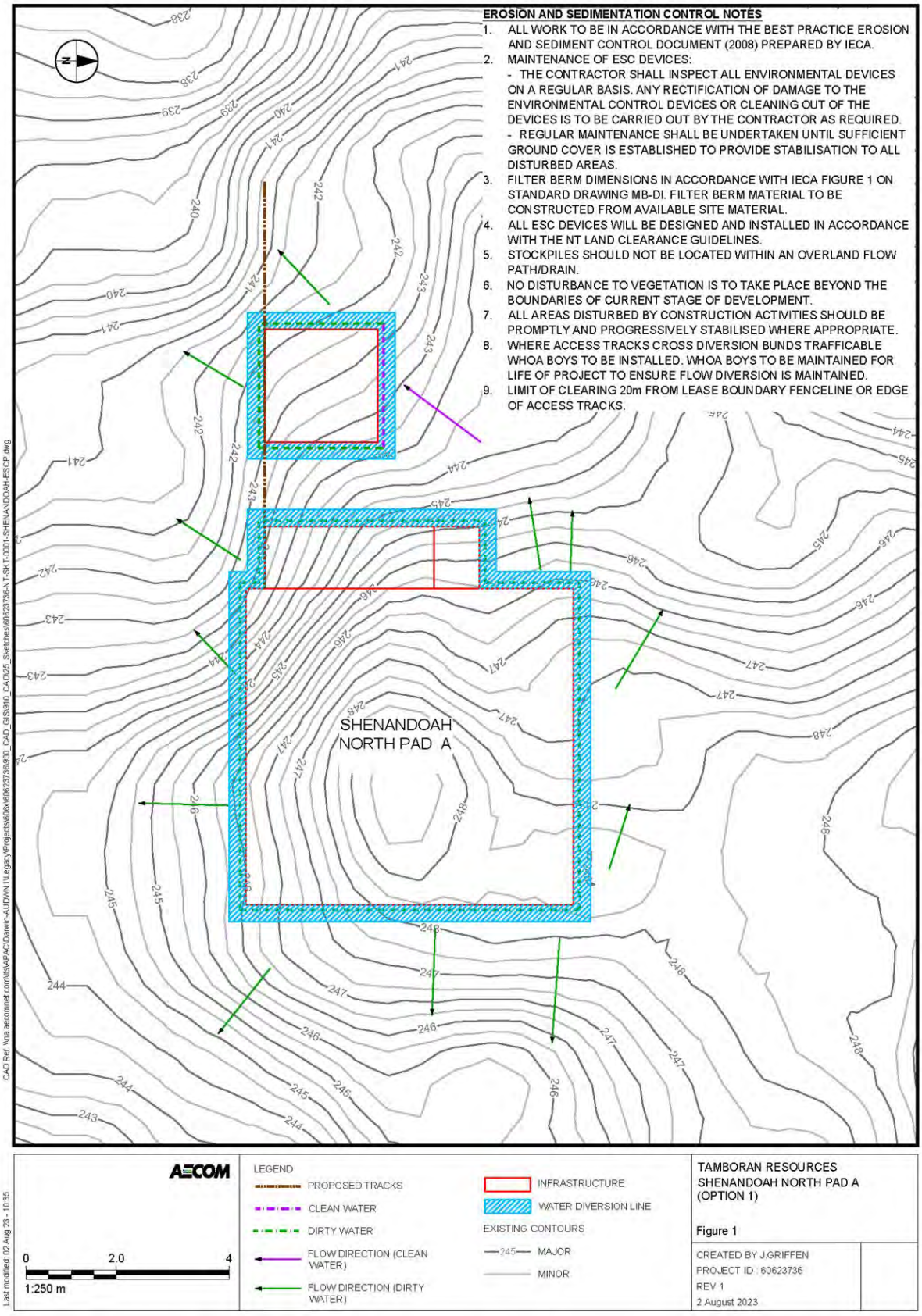
5. STOCKPILES SHOULD NOT BE LOCATED WITHIN AN OVERLAND FLOW PATH/DRAIN.
6. NO DISTURBANCE TO VEGETATION IS TO TAKE PLACE BEYOND THE BOUNDARIES OF CURRENT STAGE OF DEVELOPMENT.
7. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHOULD BE PROMPTLY AND PROGRESSIVELY STABILISED WHERE APPROPRIATE.
8. WHERE ACCESS TRACKS CROSS DIVERSION BUNDS TRAFFICABLE WHOA BOYS TO BE INSTALLED. WHOA BOYS TO BE MAINTAINED FOR LIFE OF PROJECT TO ENSURE FLOW DIVERSION IS MAINTAINED.
9. LIMIT OF CLEARING 20m FROM LEASE BOUNDARY FENCELINE OR EDGE OF ACCESS TRACKS.
SHENANDOAH SOUTH PAD C
AECOM
LEGEND
PROPOSED TRACKS
CLEAN WATER
DIRTY WATER
FLOW DIRECTION (CLEAN WATER)
FLOW DIRECTION (DIRTY WATER)
INFRASTRUCTURE
WATER DIVERSION LINE
EXISTING CONTOURS
MAJOR
MINOR
0 2.0 4
1:250 m
TAMBORAN RESOURCES
SHENANDOAH SOUTH PAD C
Figure 6
CREATED BY J.GRIFFEN
PROJECT ID : 60623736
REV 1
23 June 2023



NB: This ESCP shows the directional flow for the Shenandoah S2 site, including the proposed integration between the well site and the SPCF.


EROSION AND SEDIMENTATION CONTROL NOTES
1. ALL WORK TO BE IN ACCORDANCE WITH THE BEST PRACTICE EROSION AND SEDIMENT CONTROL DOCUMENT (2008) PREPARED BY IECA.
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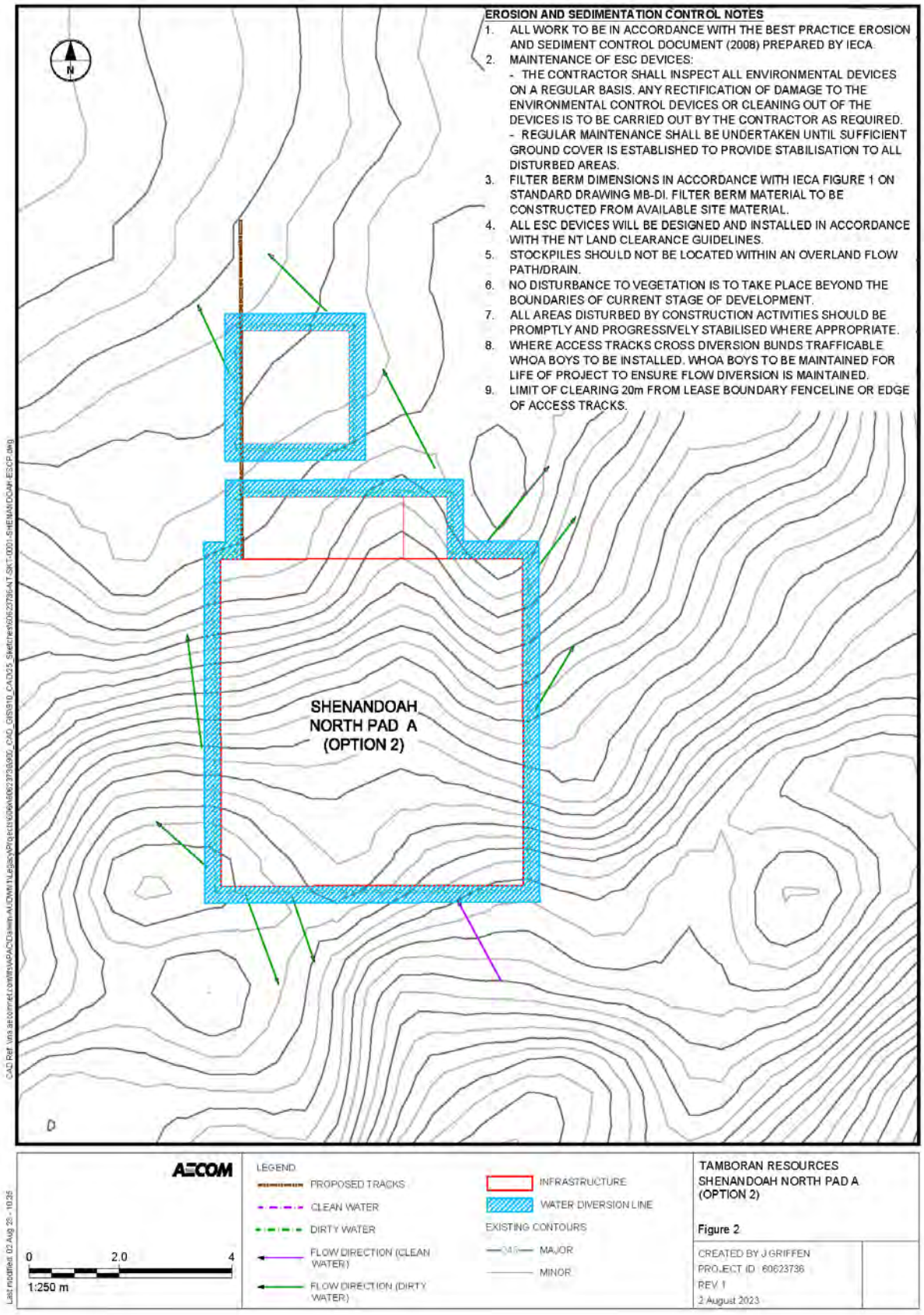
- THE CONTRACTOR SHALL INSPECT ALL ENVIRONMENTAL DEVICES ON A REGULAR BASIS. ANY RECTIFICATION OF DAMAGE TO THE ENVIRONMENTAL CONTROL DEVICES OR CLEANING OUT OF THE DEVICES IS TO BE CARRIED OUT BY THE CONTRACTOR AS REQUIRED.
- REGULAR MAINTENANCE SHALL BE UNDERTAKEN UNTIL SUFFICIENT GROUND COVER IS ESTABLISHED TO PROVIDE STABILISATION TO ALL DISTURBED AREAS.
3. FILTER BERM DIMENSIONS IN ACCORDANCE WITH IECA FIGURE 1 ON STANDARD DRAWING MB-DI. FILTER BERM MATERIAL TO BE CONSTRUCTED FROM AVAILABLE SITE MATERIAL.
4. ALL ESC DEVICES WILL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE NT LAND CLEARANCE GUIDELINES.
5. STOCKPILES SHOULD NOT BE LOCATED WITHIN AN OVERLAND FLOW PATH/DRAIN.
6. NO DISTURBANCE TO VEGETATION IS TO TAKE PLACE BEYOND THE BOUNDARIES OF CURRENT STAGE OF DEVELOPMENT.
7. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHOULD BE PROMPTLY AND PROGRESSIVELY STABILISED WHERE APPROPRIATE.
8. WHERE ACCESS TRACKS CROSS DIVERSION BUNDS TRAFFICABLE WHOA BOYS TO BE INSTALLED. WHOA BOYS TO BE MAINTAINED FOR LIFE OF PROJECT TO ENSURE FLOW DIVERSION IS MAINTAINED.
9. LIMIT OF CLEARING 20m FROM LEASE BOUNDARY FENCELINE OR EDGE OF ACCESS TRACKS.
SHENANDOAH NORTH PAD A
N
CAD Ref: \\na.aecomnet.com\fs\APAC\Darwin-AUDWN1\Legacy\Projects\60x\60623736\400_CAD_GIS\910_CAD\25_Sketches\60623736-NT-SKT-0001-SHENANDOAH-ESCP.dwg
Last modified: 02 Aug 23 - 10:35
AECOM
0 2.0 4
1:250 m
LEGEND
PROPOSED TRACKS
CLEAN WATER
DIRTY WATER
FLOW DIRECTION (CLEAN WATER)
FLOW DIRECTION (DIRTY WATER)
INFRASTRUCTURE
WATER DIVERSION LINE
EXISTING CONTOURS
245 MAJOR
MINOR
TAMBORAN RESOURCES
SHENANDOAH NORTH PAD A
(OPTION 1)
Figure 1
CREATED BY J.GRIFFEN
PROJECT ID : 60623736
REV 1
2 August 2023


EROSION AND SEDIMENTATION CONTROL NOTES
1. ALL WORK TO BE IN ACCORDANCE WITH THE BEST PRACTICE EROSION AND SEDIMENT CONTROL DOCUMENT (2008) PREPARED BY IECA.
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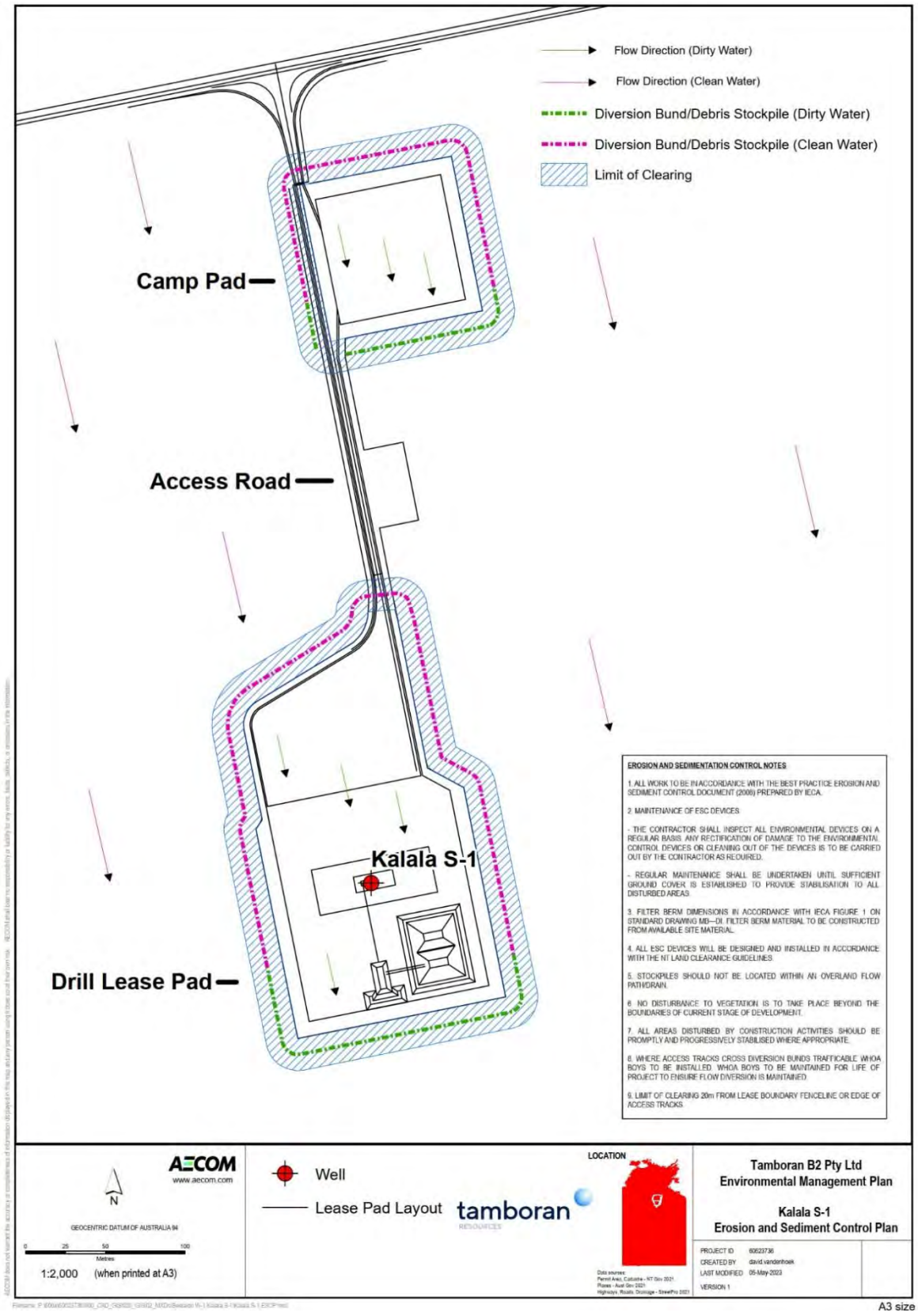
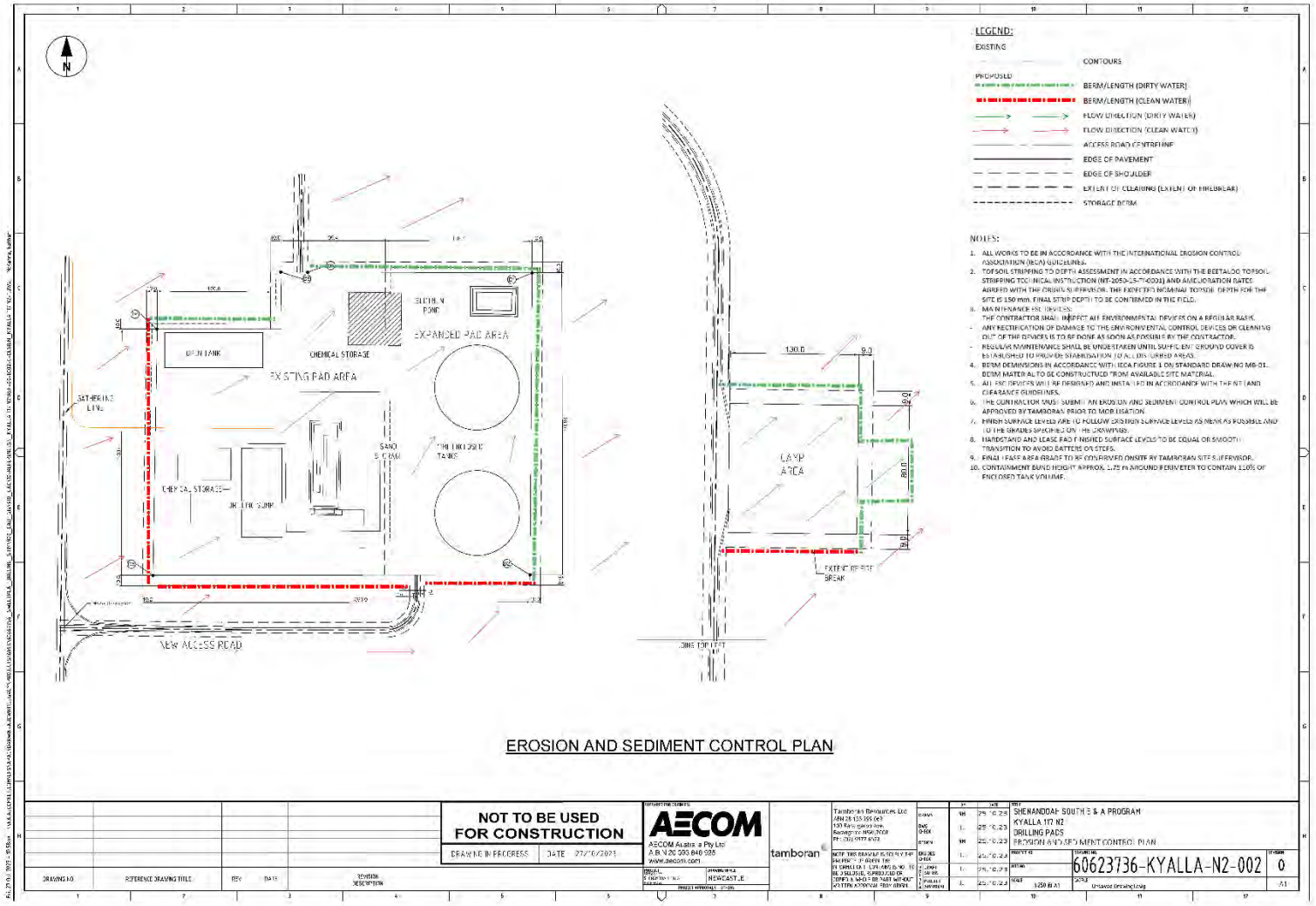
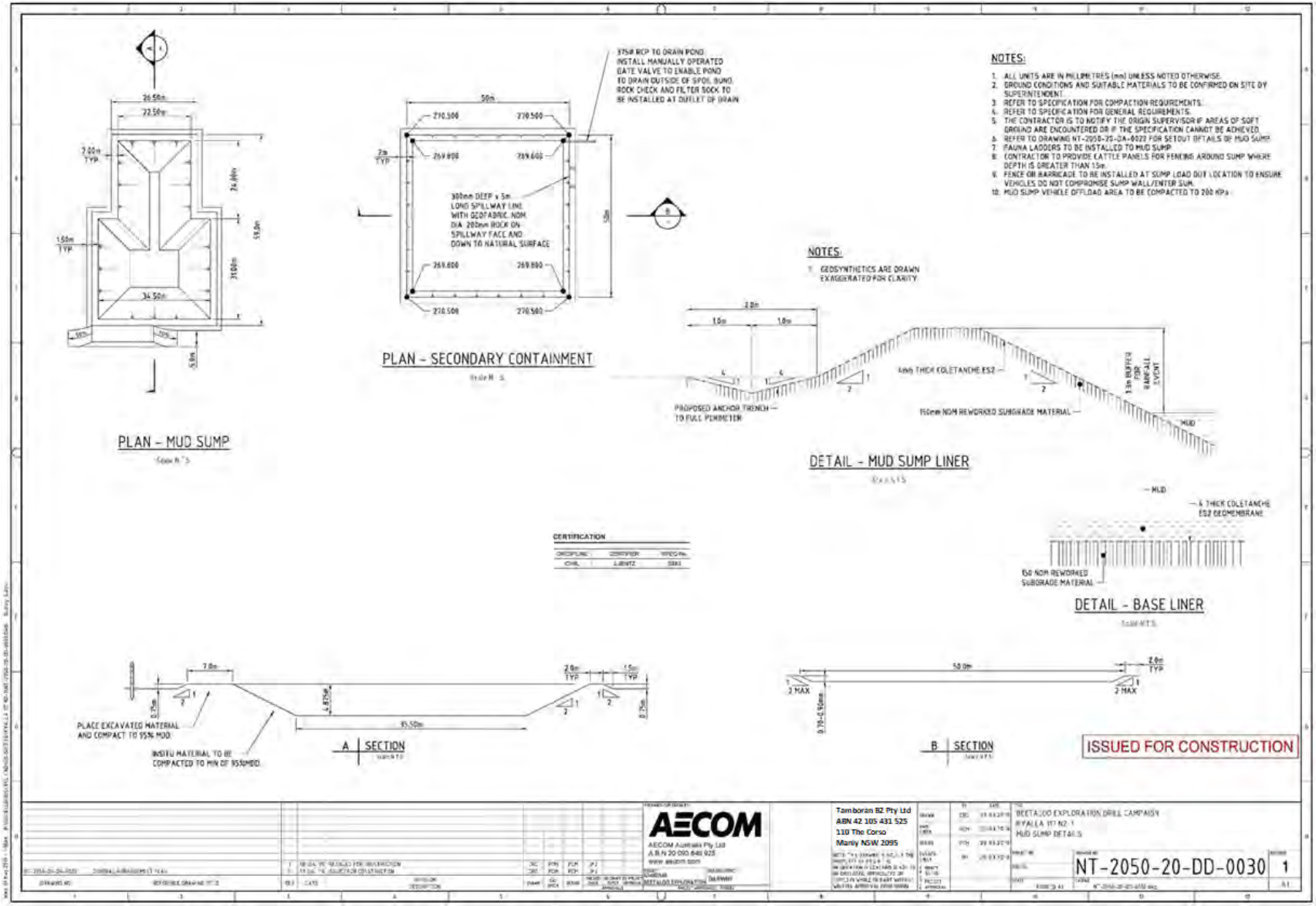
- REGULAR MAINTENANCE SHALL BE UNDERTAKEN UNTIL SUFFICIENT GROUND COVER IS ESTABLISHED TO PROVIDE STABILISATION TO ALL DISTURBED AREAS.
3. FILTER BERM DIMENSIONS IN ACCORDANCE WITH IECA FIGURE 1 ON STANDARD DRAWING MB-DI. FILTER BERM MATERIAL TO BE CONSTRUCTED FROM AVAILABLE SITE MATERIAL.
4. ALL ESC DEVICES WILL BE DESIGNED AND INSTALLED IN ACCORDANCE WITH THE NT LAND CLEARANCE GUIDELINES.
5. STOCKPILES SHOULD NOT BE LOCATED WITHIN AN OVERLAND FLOW PATH/DRAIN.
6. NO DISTURBANCE TO VEGETATION IS TO TAKE PLACE BEYOND THE BOUNDARIES OF CURRENT STAGE OF DEVELOPMENT.
7. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHOULD BE PROMPTLY AND PROGRESSIVELY STABILISED WHERE APPROPRIATE.
8. WHERE ACCESS TRACKS CROSS DIVERSION BUNDS TRAFFICABLE WHOA BOYS TO BE INSTALLED. WHOA BOYS TO BE MAINTAINED FOR LIFE OF PROJECT TO ENSURE FLOW DIVERSION IS MAINTAINED.
9. LIMIT OF CLEARING 20m FROM LEASE BOUNDARY FENCELINE OR EDGE OF ACCESS TRACKS.
N
SHENANDOAH NORTH PAD A (OPTION 2)
D
AECOM
LEGEND
PROPOSED TRACKS
CLEAN WATER
DIRTY WATER
FLOW DIRECTION (CLEAN WATER)
FLOW DIRECTION (DIRTY WATER)
INFRASTRUCTURE
WATER DIVERSION LINE
EXISTING CONTOURS
MAJOR
MINOR
0 2.0 4
1:250 m
TAMBORAN RESOURCES
SHENANDOAH NORTH PAD A (OPTION 2)
Figure 2
CREATED BY J GRIFFEN
PROJECT ID : 60623736
REV 1
2 August 2023

Appendix F Erosion and sediment control plan for Kalala S1

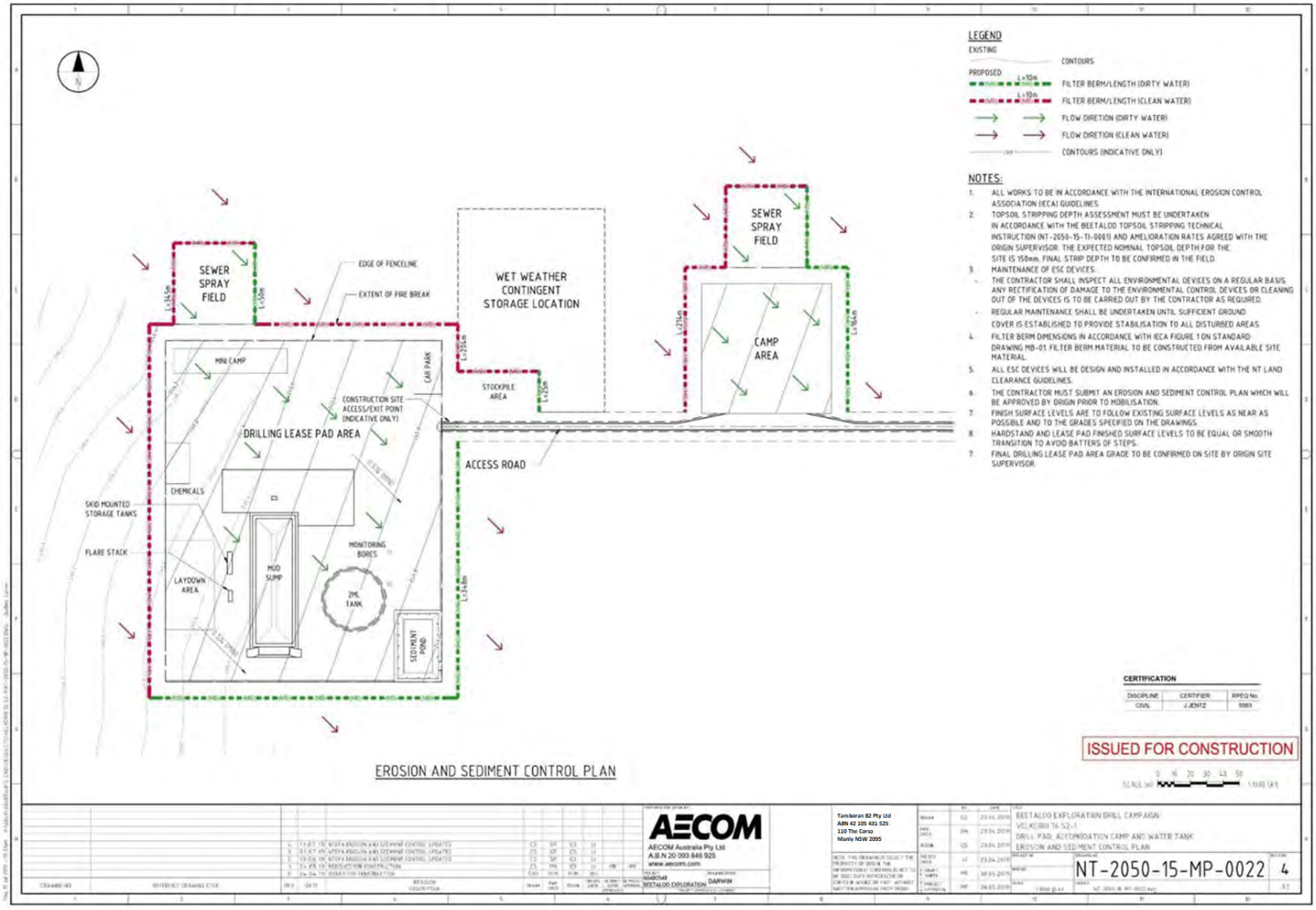


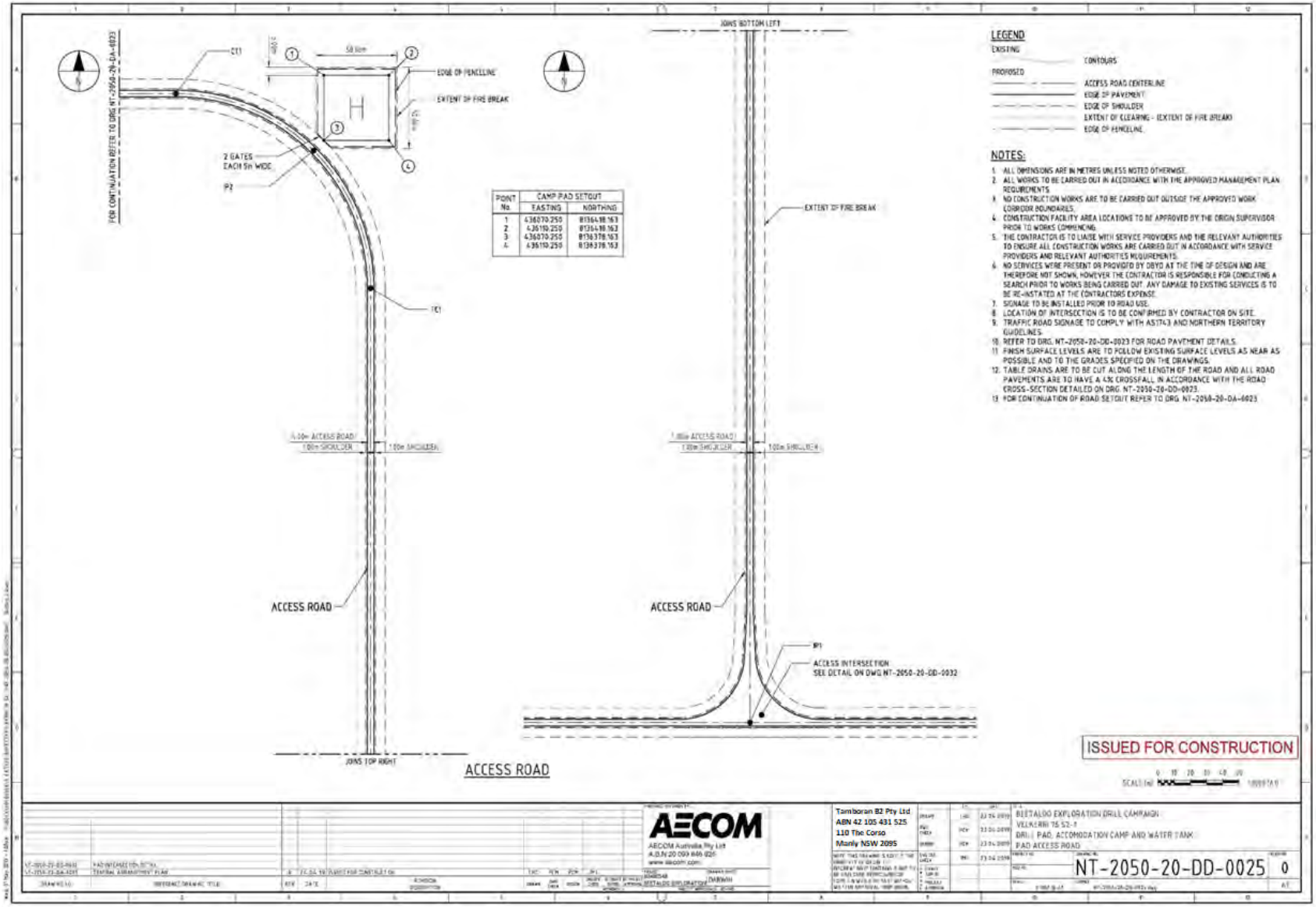
Appendix G Erosion and sediment control plan for Kyalla 117-N2

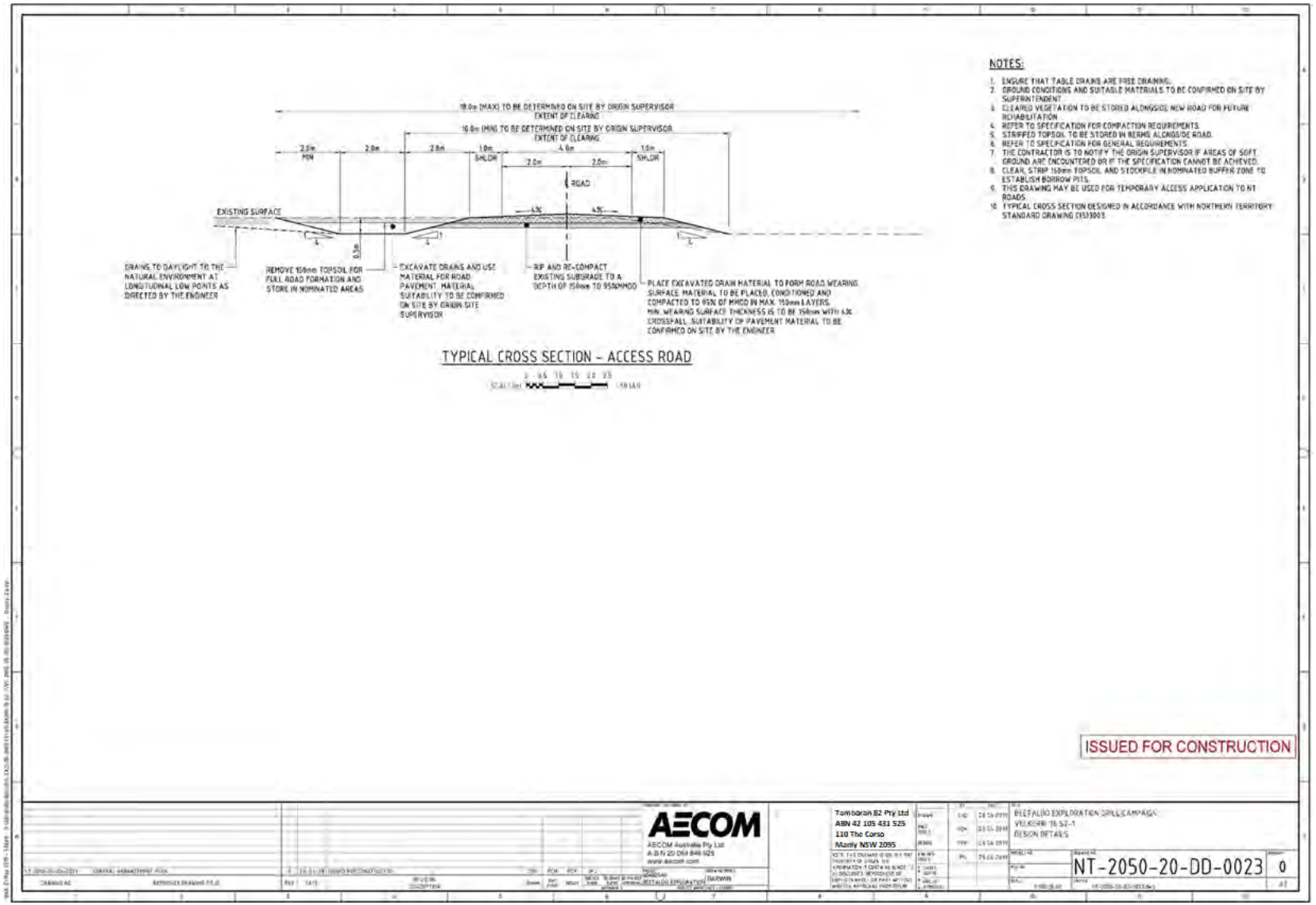


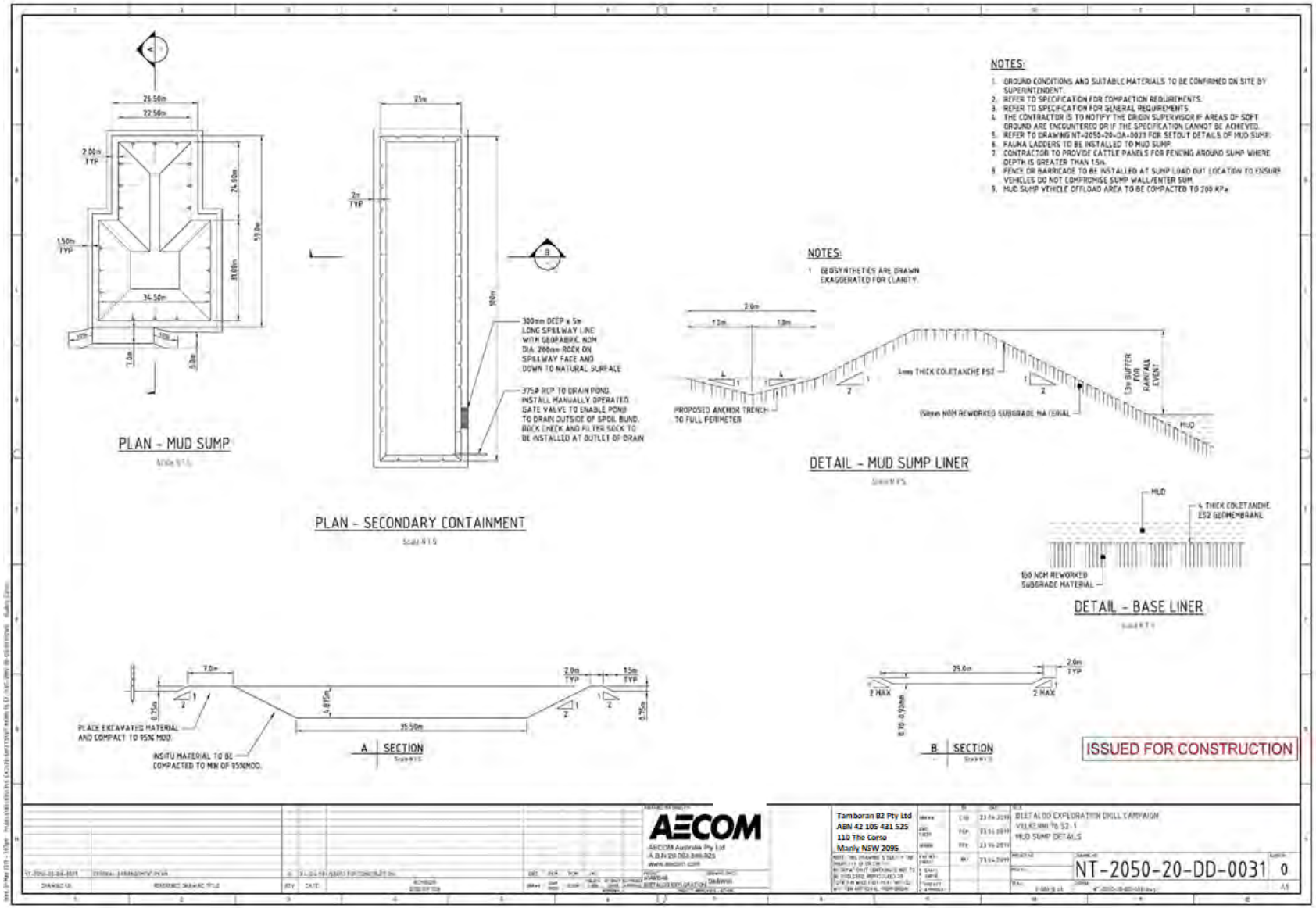

PLAN - MUD SUMP
PLAN - SECONDARY CONTAINMENT
375ø RCP TO DRAIN POND. INSTALL MANUALLY OPERATED GATE VALVE TO ENABLE POND TO DRAIN OUTSIDE OF SPOIL BUND. ROCK CHECK AND FILTER SOCK TO BE INSTALLED AT OUTLET OF DRAIN
300mm DEEP x 5m LONG SPILLWAY LINE WITH GEOFABRIC. NOM DIA 200mm ROCK ON SPILLWAY FACE AND DOWN TO NATURAL SURFACE
NOTES:
1. ALL UNITS ARE IN MILLIMETRES (mm) UNLESS NOTED OTHERWISE.
2. GROUND CONDITIONS AND SUITABLE MATERIALS TO BE CONFIRMED ON SITE BY SUPERINTENDENT.
3. REFER TO SPECIFICATION FOR COMPACTION REQUIREMENTS.
4. REFER TO SPECIFICATION FOR GENERAL REQUIREMENTS.
5. THE CONTRACTOR IS TO NOTIFY THE ORIGIN SUPERVISOR IF AREAS OF SOFT GROUND ARE ENCOUNTERED OR IF THE SPECIFICATION CANNOT BE ACHIEVED.
6. REFER TO DRAWING NT-2050-ZS-DA-0022 FOR SETOUT DETAILS OF MUD SUMP.
7. FAUNA LADDERS TO BE INSTALLED TO MUD SUMP.
8. CONTRACTOR TO PROVIDE CATTLE PANELS FOR FENCING AROUND SUMP WHERE DEPTH IS GREATER THAN 1.5m.
9. FENCE OR BARRICADE TO BE INSTALLED AT SUMP LOAD OUT LOCATION TO ENSURE VEHICLES DO NOT COMPROMISE SUMP WALL/ENTER SUM.
10. MUD SUMP VEHICLE OFFLOAD AREA TO BE COMPACTED TO 200 KPa.
NOTES:
1. GEOSYNTHETICS ARE DRAWN EXAGGERATED FOR CLARITY
PROPOSED ANCHOR TRENCH - TO FULL PERIMETER
1.5mm THICK COLETANCHE ES2
150mm NOM REWORKED SUBGRADE MATERIAL
DETAIL - MUD SUMP LINER
MUD
6 THICK COLETANCHE ES2 GEOMEMBRANE
150 NOM REWORKED SUBGRADE MATERIAL
DETAIL - BASE LINER
CERTIFICATION
PLACE EXCAVATED MATERIAL AND COMPACT TO 95% MOD
INSITU MATERIAL TO BE COMPACTED TO MIN OF 95%MOD
A SECTION
B SECTION
ISSUED FOR CONSTRUCTION
AECOM
AECOM Australia Pty Ltd
A.B.N 20 093 846 925
www.aecom.com
Tamboran B2 Pty Ltd
ABN 42 105 431 525
110 The Corso
Manly NSW 2095
BEETALOO EXPLORATION DRILL CAMPAIGN
MUD SUMP DETAILS
NT-2050-20-DD-0030
1

Appendix H Erosion and sediment control plan for Velkerri 76 S2




JOINS BOTTOM LEFT
FOR CONTINUATION REFER TO DRG NT-2050-20-DA-0023
CT1
EDGE OF FENCELINE
EXTENT OF FIRE BREAK
2 GATES EACH 5m WIDE
P2
TC1
CAMP PAD SETOUT
POINT No.
EASTING
NORTHING
1 436070.250 8136498.163
2 436159.250 8136498.163
3 436070.250 8136378.163
4 436159.250 8136378.163
EXTENT OF FIRE BREAK
ACCESS ROAD
ACCESS ROAD
P1
ACCESS INTERSECTION
SEE DETAIL ON DWG NT-2050-20-DD-0032
JOINS TOP RIGHT
ACCESS ROAD
LEGEND
EXISTING
CONTOURS
PROPOSED
ACCESS ROAD CENTERLINE
EDGE OF PAVEMENT
EDGE OF SHOULDER
EXTENT OF CLEARING - (EXTENT OF FIRE BREAK)
EDGE OF FENCELINE
NOTES:
1. ALL DIMENSIONS ARE IN METRES UNLESS NOTED OTHERWISE.
2. ALL WORKS TO BE CARRIED OUT IN ACCORDANCE WITH THE APPROVED MANAGEMENT PLAN REQUIREMENTS.
3. NO CONSTRUCTION WORKS ARE TO BE CARRIED OUT OUTSIDE THE APPROVED WORK CORRIDOR BOUNDARIES.
4. CONSTRUCTION FACILITY AREA LOCATIONS TO BE APPROVED BY THE ORIGIN SUPERVISOR PRIOR TO WORKS COMMENCING.
5. THE CONTRACTOR IS TO LIAISE WITH SERVICE PROVIDERS AND THE RELEVANT AUTHORITIES TO ENSURE ALL CONSTRUCTION WORKS ARE CARRIED OUT IN ACCORDANCE WITH SERVICE PROVIDERS AND RELEVANT AUTHORITIES REQUIREMENTS.
6. NO SERVICES WERE PRESENT OR PROVIDED BY DBYD AT THE TIME OF DESIGN AND ARE THEREFORE NOT SHOWN, HOWEVER THE CONTRACTOR IS RESPONSIBLE FOR CONDUCTING A SEARCH PRIOR TO WORKS BEING CARRIED OUT. ANY DAMAGE TO EXISTING SERVICES IS TO BE RE-INSTATED AT THE CONTRACTORS EXPENSE.
7. SIGNAGE TO BE INSTALLED PRIOR TO ROAD USE.
8. LOCATION OF INTERSECTION IS TO BE CONFIRMED BY CONTRACTOR ON SITE.
9. TRAFFIC ROAD SIGNAGE TO COMPLY WITH AS1743 AND NORTHERN TERRITORY GUIDELINES.
10. REFER TO DRG. NT-2050-20-DD-0023 FOR ROAD PAVEMENT DETAILS.
11. FINISH SURFACE LEVELS ARE TO FOLLOW EXISTING SURFACE LEVELS AS NEAR AS POSSIBLE AND TO THE GRADES SPECIFIED ON THE DRAWINGS.
12. TABLE DRAINS ARE TO BE CUT ALONG THE LENGTH OF THE ROAD AND ALL ROAD PAVEMENTS ARE TO HAVE A 4% CROSSFALL IN ACCORDANCE WITH THE ROAD CROSS-SECTION DETAILED ON DRG. NT-2050-20-DD-0023.
13. FOR CONTINUATION OF ROAD SETOUT REFER TO DRG. NT-2050-20-DA-0023
ISSUED FOR CONSTRUCTION
AECOM
Tamboran B2 Pty Ltd
ABN 42 105 431 525
110 The Corso
Manly NSW 2095
BEETALOO EXPLORATION DRILL CAMPAIGN
DRILL PAD, ACCOMODATION CAMP AND WATER TANK
PAD ACCESS ROAD
NT-2050-20-DD-0025 0


NOTES:
1. ENSURE THAT TABLE DRAINS ARE FREE DRAINING.
2. GROUND CONDITIONS AND SUITABLE MATERIALS TO BE CONFIRMED ON SITE BY SUPERINTENDENT.
3. CLEARED VEGETATION TO BE STORED ALONGSIDE NEW ROAD FOR FUTURE REHABILITATION.
4. REFER TO SPECIFICATION FOR COMPACTION REQUIREMENTS.
5. STRIPPED TOPSOIL TO BE STORED IN BERMS ALONGSIDE ROAD.
6. REFER TO SPECIFICATION FOR GENERAL REQUIREMENTS.
7. THE CONTRACTOR IS TO NOTIFY THE ORIGIN SUPERVISOR IF AREAS OF SOFT GROUND ARE ENCOUNTERED OR IF THE SPECIFICATION CANNOT BE ACHIEVED.
8. CLEAR, STRIP 150mm TOPSOIL AND STOCKPILE IN NOMINATED BUFFER ZONE TO ESTABLISH BORROW PITS.
9. THIS DRAWING MAY BE USED FOR TEMPORARY ACCESS APPLICATION TO NT ROADS.
10. TYPICAL CROSS SECTION DESIGNED IN ACCORDANCE WITH NORTHERN TERRITORY STANDARD DRAWING DS13003.
18.0m (MAX) TO BE DETERMINED ON SITE BY ORIGIN SUPERVISOR EXTENT OF CLEARING
10.0m (MIN) TO BE DETERMINED ON SITE BY ORIGIN SUPERVISOR EXTENT OF CLEARING
2.5m MIN
2.0m
2.0m
1.0m SHLDR
4.0m
2.0m
2.0m
1.0m SHLDR
ROAD
EXISTING SURFACE
4.5%
4.5%
DRAINS TO DAYLIGHT TO THE NATURAL ENVIRONMENT AT LONGITUDINAL LOW POINTS AS DIRECTED BY THE ENGINEER
REMOVE 150mm TOPSOIL FOR FULL ROAD FORMATION AND STORE IN NOMINATED AREAS
EXCAVATE DRAINS AND USE MATERIAL FOR ROAD PAVEMENT. MATERIAL SUITABILITY TO BE CONFIRMED ON SITE BY ORIGIN SITE SUPERVISOR
RIP AND RE-COMPACT EXISTING SUBGRADE TO A DEPTH OF 150mm TO 95%MMDD
PLACE EXCAVATED DRAIN MATERIAL TO FORM ROAD WEARING SURFACE MATERIAL TO BE PLACED, CONDITIONED AND COMPACTED TO 95% OF MMDD IN MAX. 150mm LAYERS. MIN. WEARING SURFACE THICKNESS IS TO BE 350mm WITH 6% CROSSFALL. SUITABILITY OF PAVEMENT MATERIAL TO BE CONFIRMED ON SITE BY THE ENGINEER
TYPICAL CROSS SECTION – ACCESS ROAD
ISSUED FOR CONSTRUCTION
AECOM
AECOM Australia Pty Ltd
A.B.N 20 093 846 925
www.aecom.com
Tamboran B2 Pty Ltd
ABN 42 105 431 525
110 The Corso
Manly NSW 2095
BEETALOO EXPLORATION DRILL CAMPAIGN
VELKERRI 76 S7-1
DESIGN DETAILS
NT-2050-20-DD-0023
0


NOTES:
1. GROUND CONDITIONS AND SUITABLE MATERIALS TO BE CONFIRMED ON SITE BY SUPERINTENDENT.
2. REFER TO SPECIFICATION FOR COMPACTION REQUIREMENTS.
3. REFER TO SPECIFICATION FOR GENERAL REQUIREMENTS.
4. THE CONTRACTOR IS TO NOTIFY THE ORIGIN SUPERVISOR IF AREAS OF SOFT GROUND ARE ENCOUNTERED OR IF THE SPECIFICATION CANNOT BE ACHIEVED.
5. REFER TO DRAWING NT-2050-20-DA-0023 FOR SETOUT DETAILS OF MUD SUMP.
6. FAUNA LADDERS TO BE INSTALLED TO MUD SUMP.
7. CONTRACTOR TO PROVIDE CATTLE PANELS FOR FENCING AROUND SUMP WHERE DEPTH IS GREATER THAN 1.5m.
8. FENCE OR BARRICADE TO BE INSTALLED AT SUMP LOAD OUT LOCATION TO ENSURE VEHICLES DO NOT COMPROMISE SUMP WALL/ENTER SUM.
9. MUD SUMP VEHICLE OFFLOAD AREA TO BE COMPACTED TO 200 KPa
PLAN - MUD SUMP
300mm DEEP x 5m LONG SPILLWAY LINE WITH GEOPAVE NON DIA. 200mm ROCK ON SPILLWAY FACE AND DOWN TO NATURAL SURFACE
375Ø RCP TO DRAIN POND. INSTALL MANUALLY OPERATED GATE VALVE TO ENABLE POND TO DRAIN OUTSIDE OF SPOIL BUND. BACK CHECK AND FILTER SOCK TO BE INSTALLED AT OUTLET OF DRAIN
PLAN - SECONDARY CONTAINMENT
NOTES:
1 GEOSYNTHETICS ARE DRAWN EXAGGERATED FOR CLARITY.
PROPOSED ANCHOR TRENCH TO FULL PERIMETER
4mm THICK COLETANCHE PS2
150mm NOM REWORKED SUBGRADE MATERIAL
1.5m BUFFER FOR 1% ANNUAL EVENT
MUD
DETAIL - MUD SUMP LINER
4. THICK COLETANCHE PS2 GEOMEMBRANE
150 NOM REWORKED SUBGRADE MATERIAL
DETAIL - BASE LINER
PLACE EXCAVATED MATERIAL AND COMPACT TO 95% MDD.
INSITU MATERIAL TO BE COMPACTED TO MIN OF 95%MDD.
A SECTION
B SECTION
ISSUED FOR CONSTRUCTION
AECOM
Tamboran B2 Pty Ltd
ABN 42 105 431 525
110 The Corso
Manly NSW 2095
BEETALOO EXPLORATION DRILL CAMPAIGN
MUD SUMP DETAILS
NT-2050-20-DD-0031
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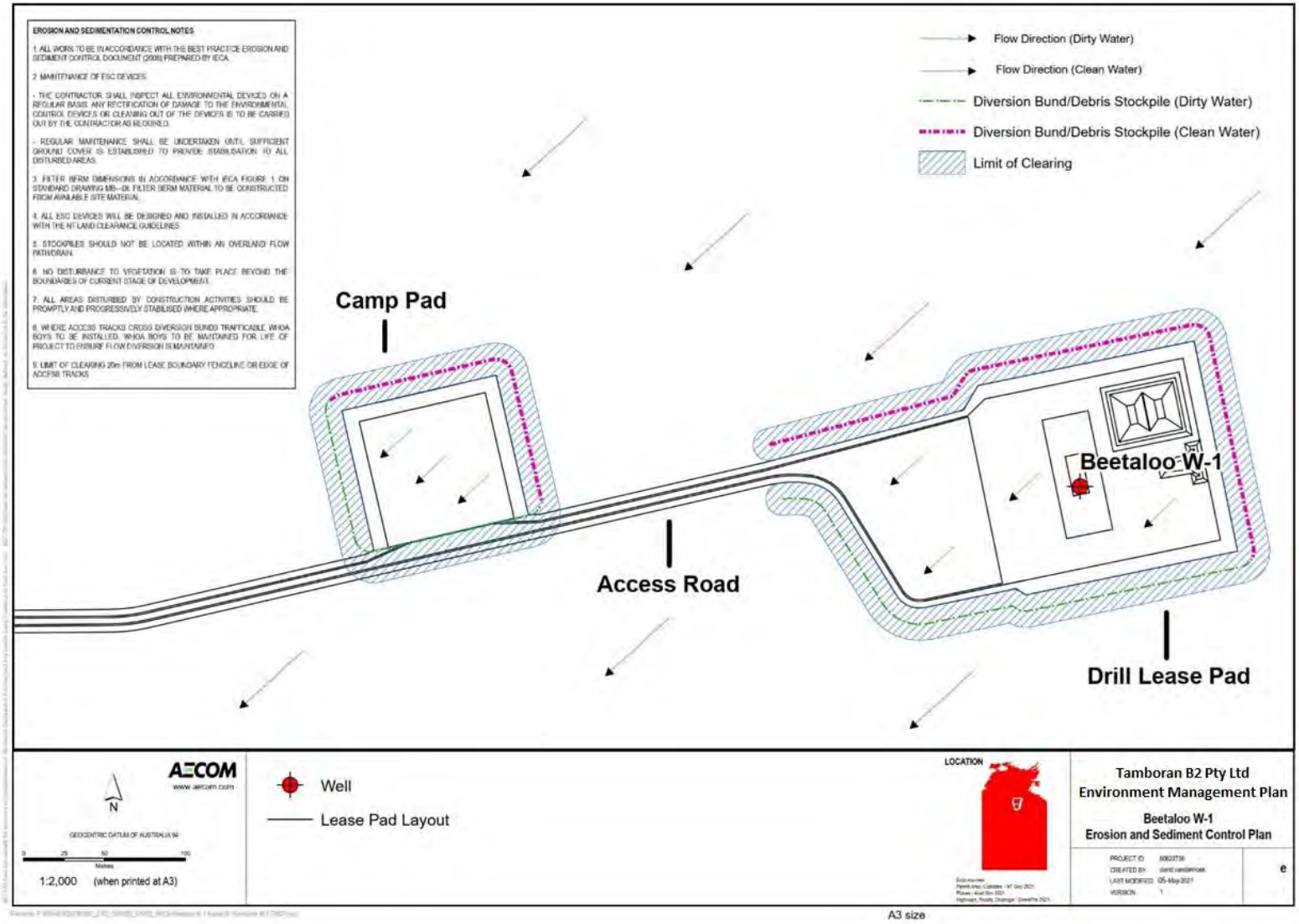
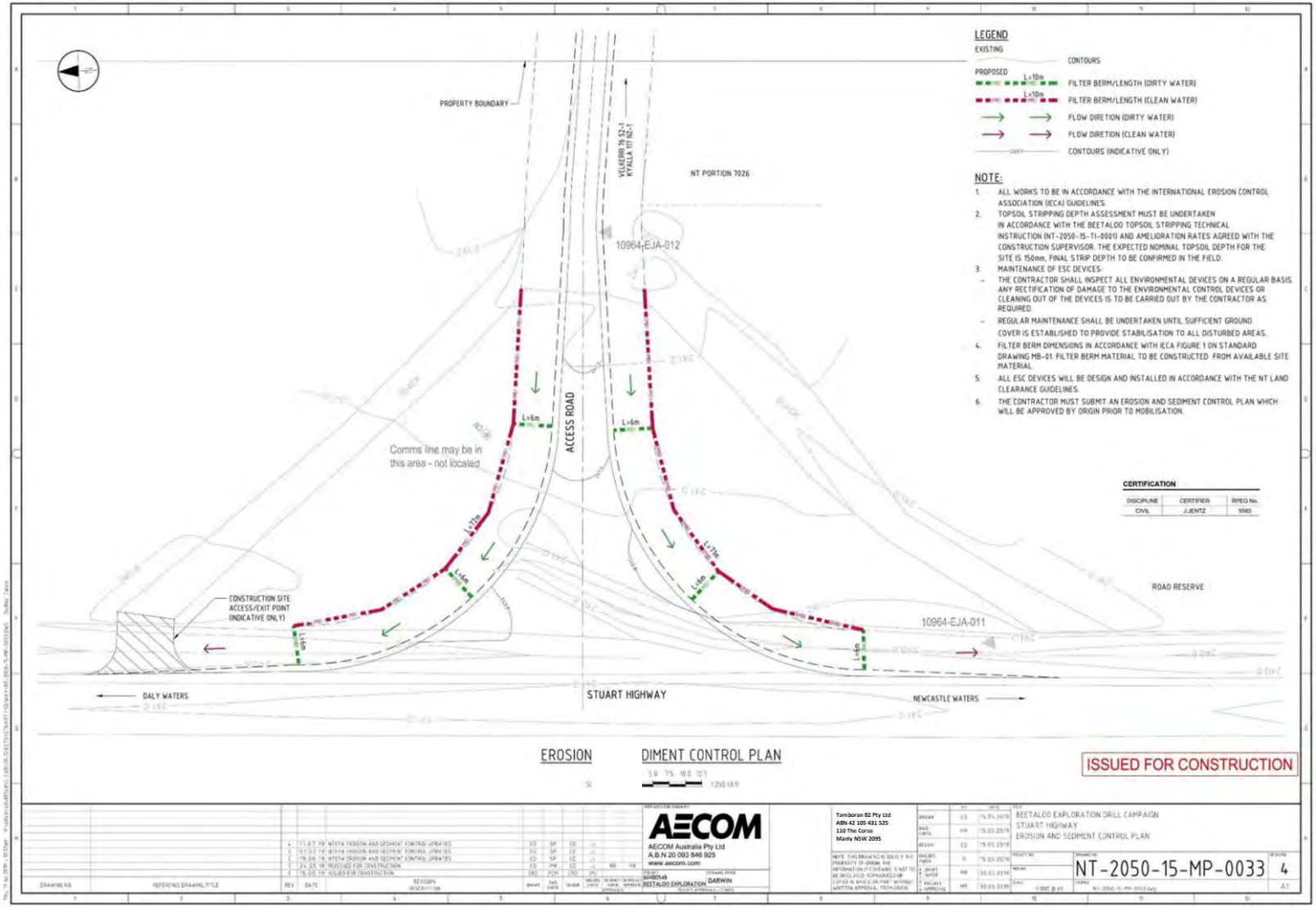
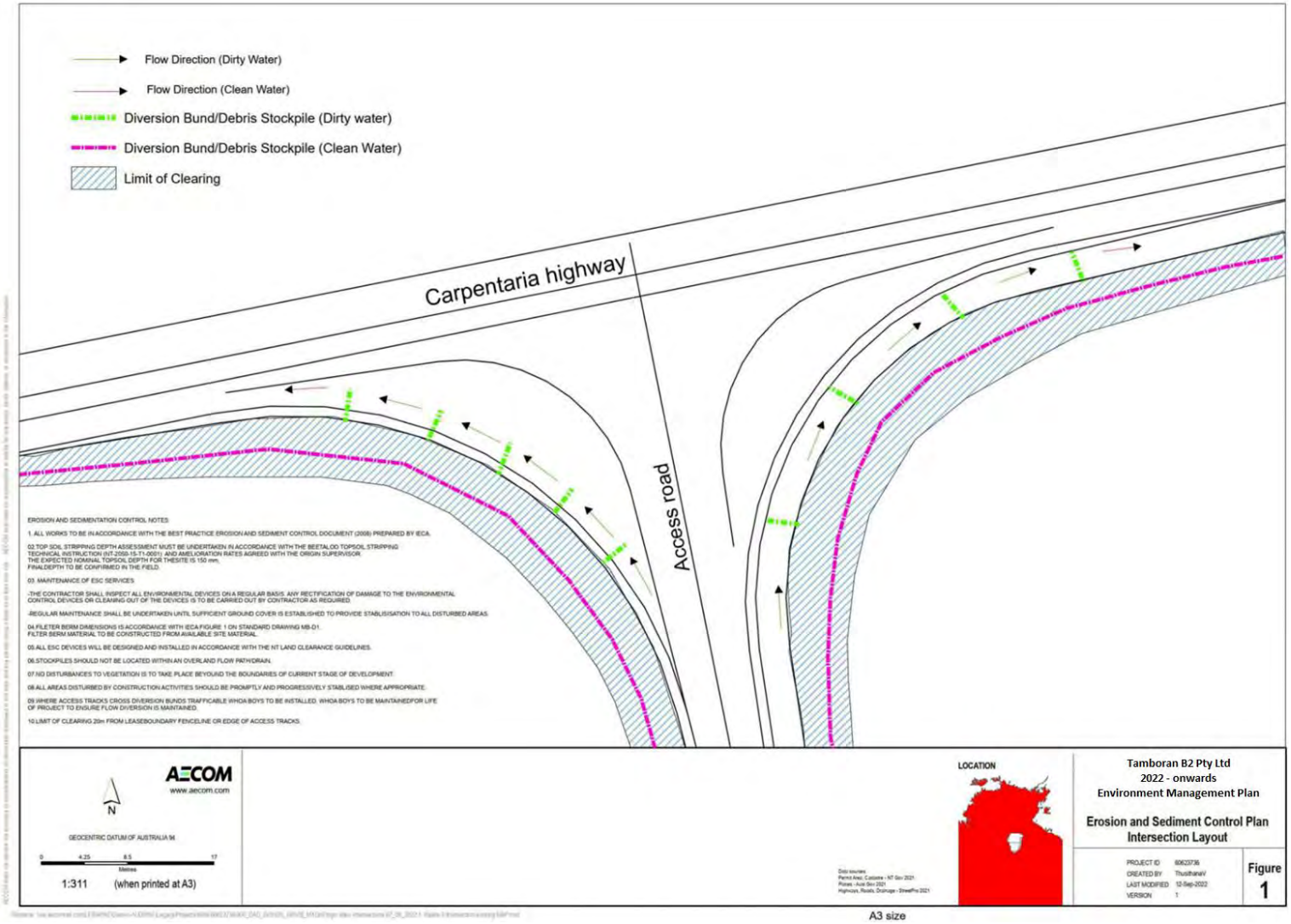
Appendix I Erosion and sediment control plan for Beetaloo W



Appendix J Erosion and sediment control plan for Stuart Highway intersection

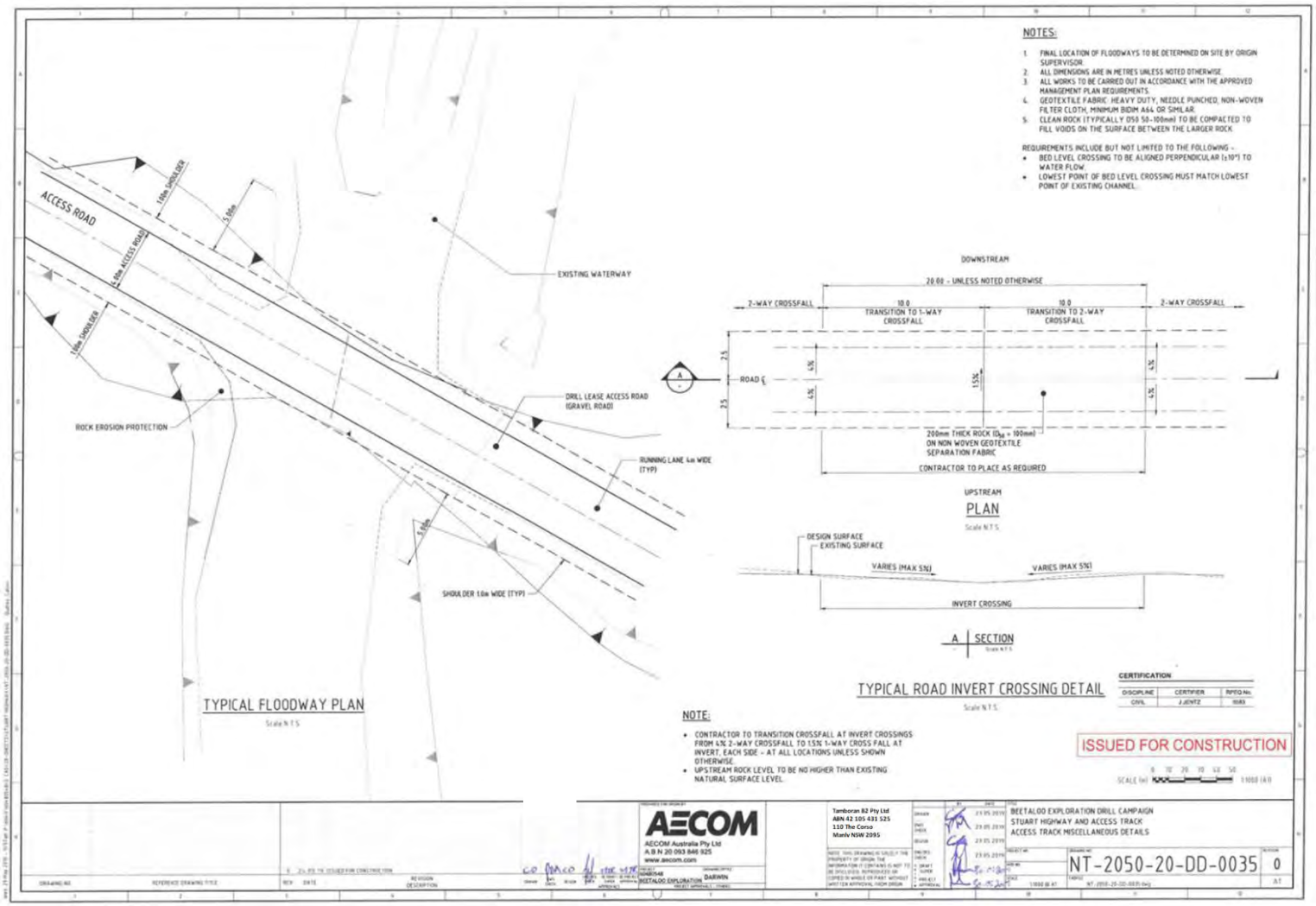


Appendix K Erosion and sediment control plan for typical Carpentaria Highway intersection

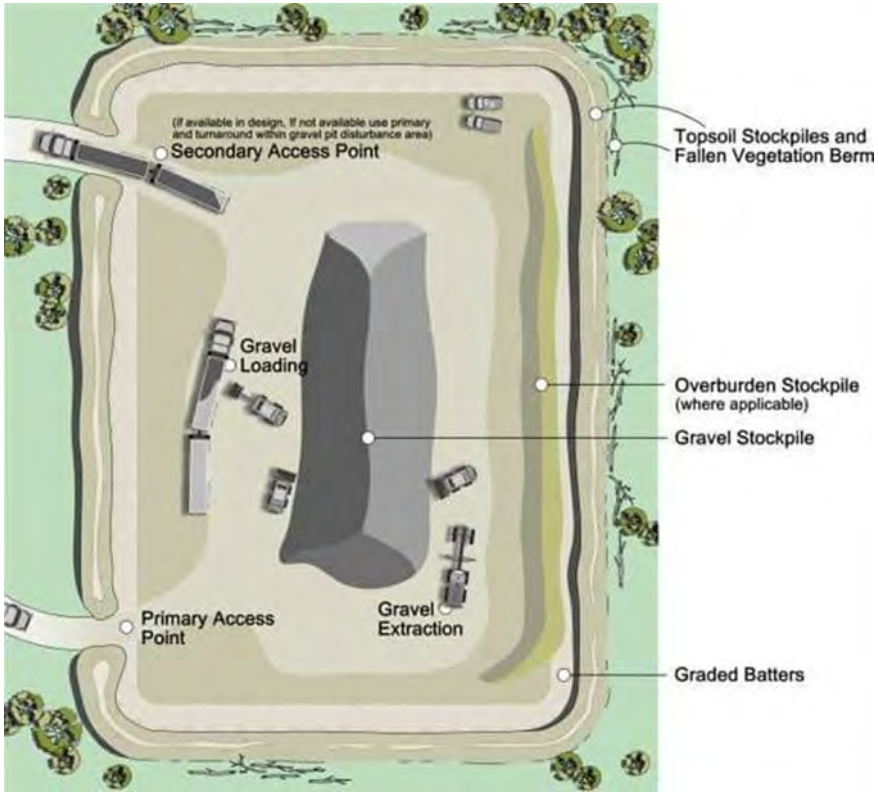


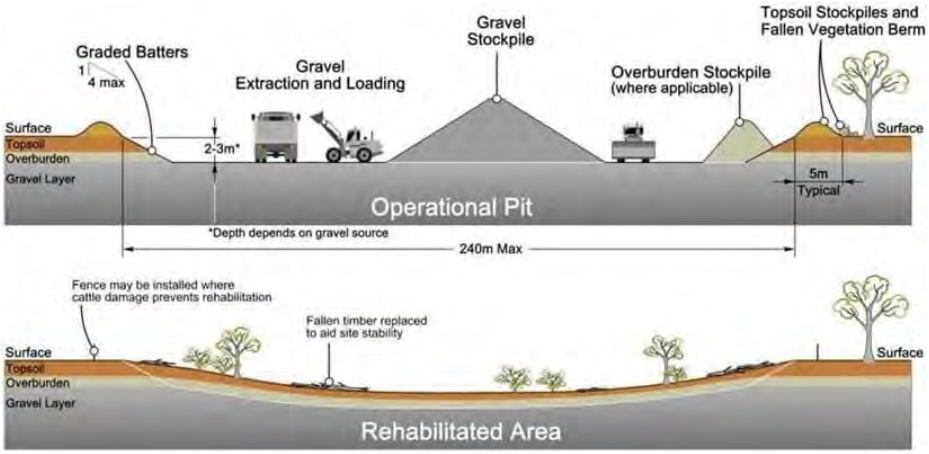
A3 size

Appendix L Erosion and sediment control plan for typical road invert crossing



Appendix M Erosion and sediment control schematic for typical gravel pit





Appendix N Other IECA standard specifications (as required)

MATERIALS

(i) MULCH MUST COMPLY WITH THE REQUIREMENTS OF AS4454.

(ii) MAXIMUM SOLUBLE SALT CONCENTRATION OF 5dS/m.

(iii) MOISTURE CONTENT OF 30 TO 50% PRIOR TO APPLICATION.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND EXTENT. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, MATERIAL TYPE, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. WHEN SELECTING THE LOCATION OF A MULCH FILTER BERM, TO THE MAXIMUM DEGREE PRACTICAL, ENSURE THE BERM IS LOCATED:

(i) TOTALLY WITHIN THE PROPERTY BOUNDARIES;

(ii) ALONG A LINE OF CONSTANT ELEVATION (PREFERRED, BUT NOT ALWAYS PRACTICAL);

(iii) AT LEAST 1m, IDEALLY 3m, FROM THE TOE OF A FILL EMBANKMENT;

(iv) AWAY FROM AREAS OF CONCENTRATED FLOW.

3. ENSURE THE BERM IS INSTALLED IN A MANNER THAT AVOIDS THE CONCENTRATION OF FLOW ALONG THE BERM, OR THE UNDESIRABLE DISCHARGE OF WATER AROUND THE END OF THE BERM.

4. ENSURE THE BERM HAS BEEN PLACED SUCH THAT PONDING UP-SLOPE OF THE BERM IS MAXIMISED.

5. ENSURE BOTH ENDS OF THE BERM ARE ADEQUATELY TURNED UP THE SLOPE TO PREVENT FLOW BYPASSING PRIOR TO WATER PASSING OVER THE BERM.

6. ENSURE 100% CONTACT WITH THE SOIL SURFACE.

7. WHERE SPECIFIED, TAKE APPROPRIATE STEPS TO VEGETATE THE BERM.

MAINTENANCE

1. DURING THE CONSTRUCTION PERIOD, INSPECT ALL BERMS AT LEAST WEEKLY AND AFTER ANY SIGNIFICANT RAIN. MAKE NECESSARY REPAIRS IMMEDIATELY.

2. REPAIR OR REPLACE ANY DAMAGED SECTIONS.

3. WHEN MAKING REPAIRS, ALWAYS RESTORE THE SYSTEM TO ITS ORIGINAL CONFIGURATION UNLESS AN AMENDED LAYOUT IS REQUIRED OR SPECIFIED.

4. REMOVE ACCUMULATED SEDIMENT IF THE SEDIMENT DEPOSIT EXCEEDS A DEPTH OF 100mm OR 1/3 THE HEIGHT OF THE BERM.

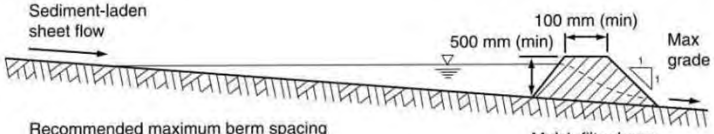
5. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

REMOVAL (IF REQUIRED)

1. WHEN DISTURBED AREAS UP-SLOPE OF THE BERM ARE SUFFICIENTLY STABILISED TO RESTRAIN EROSION, THE BERM MAYBE REMOVED.

2. REMOVE ANY COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

3. REHABILITATE/REVEGETATE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.



Recommended maximum berm spacing

Land slope	Max spacing
< 2%	30 m
5%	25 m
10%	15 m
20%	8 m

Figure 1 - Typical placement of mulch filter berm

Drawn:	Date:		
GMW	Apr-10	Mulch Filter Berms	MB-01

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MATERIAL

ROCK MULCH: 25–75mm DURABLE, WEATHER RESISTANT AND EVENLY GRADED WITH 50% BY WEIGHT LARGER THAN THE SPECIFIED NOMINAL ROCK SIZE (IF SPECIFIED).

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND APPLICATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF APPLICATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. SPREAD ENOUGH ROCK TO COMPLETELY COVER THE SURFACE OF THE SOIL AT THE DENSITY OR THICKNESS SPECIFIED IN THE APPROVED PLANS. IF THE APPLICATION DENSITY IS NOT SUPPLIED, THEN APPLY AT A THICKNESS OF AT LEAST 50mm OR TWICE THE NOMINAL ROCK SIZE (WHICHEVER IS GREATER).

3. IF THE EXPOSED SOILS ARE DISPERSIVE, THEN ENSURE THESE SOILS ARE COVERED WITH A LAYER OF NON-DISPERSIVE SOIL (MINIMUM 200mm) BEFORE PLACEMENT OF ROCK.

4. MAKE ALL NECESSARY ADJUSTMENTS TO ENSURE ANY SURFACE FLOW IS ALLOWED TO PASS FREELY ACROSS THE TREATED AREA FOLLOWING ITS NATURAL DRAINAGE PATH.

MAINTENANCE

1. INSPECT ALL TREATED SURFACES FORTNIGHTLY AND AFTER RUNOFF-PRODUCING RAINFALL.

2. CHECK FOR RILL EROSION, OR DISLODGMENT OF THE ROCKS.

3. REPLACE ANY DISPLACED ROCKS TO MAINTAIN THE REQUIRED COVERAGE.

4. IF WASH-OUTS OCCUR, REPAIR THE SLOPE AND REINSTALL ROCK COVER.

5. IF THE ROCK MULCHING IS NOT EFFECTIVE IN CONTAINING THE SOIL EROSION IT SHOULD BE REPLACED, OR AN ALTERNATIVE EROSION CONTROL PROCEDURE ADOPTED.

Drawn:	Date:		
GMW	Dec-09	Rock Mulching	MR-01

PREPARATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND DIMENSIONAL DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, OR EXTENT, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. TAKE ALL NECESSARY STEPS TO ENSURE DISTURBANCE TO THE BUFFER ZONE IS MINIMISED THROUGHOUT THE TIME IT IS USED AS A SEDIMENT TRAP.

3. TO THE MAXIMUM DEGREE PRACTICABLE, ENSURE FLOW PASSING THROUGH THE BUFFER ZONE IS NOT ALLOWED TO CONCENTRATE WITHIN DRAINAGE DEPRESSIONS, SWALES, RILLS OR WHEEL TRACKS.

4. WHERE NECESSARY, INSTALL APPROPRIATE DRAINAGE CONTROLS UP-SLOPE OF THE BUFFER ZONE TO DISTRIBUTE THE INFLOW ALONG THE FULLY LENGTH OF THE BUFFER ZONE AS 'SHEET FLOW'.

5. WHERE NECESSARY, INSTALL A COARSE SEDIMENT TRAP, SUCH AS A SEDIMENT FENCE, UP-SLOPE OF THE BUFFER ZONE TO REDUCE THE QUANTITY OF SEDIMENT PASSING ONTO THE GRASS. GENERALLY THIS IS REQUIRED IF LARGE QUANTITIES OF COARSE SEDIMENT ARE EXPECTED.

6. IF REQUIRED, INSTALL A LIGHT BARRIER FENCE TO CLEARLY IDENTIFY THE BUFFER ZONE AND HELP EXCLUDE CONSTRUCTION TRAFFIC.

MAINTENANCE

1. INSPECT THE BUFFER ZONE ON A REGULAR BASIS AND AFTER RUNOFF-PRODUCING RAINFALL.

2. ENSURE THAT THERE IS NO SOIL EROSION AND THAT SEDIMENT DEPOSITION IS NOT CAUSING THE CONCENTRATION OF FLOW THROUGH THE BUFFER ZONE, OR FLOW BYPASSING.

3. IF THE BUFFER ZONE HAS BEEN DISTURBED, TAKE NECESSARY STEPS TO RE-ESTABLISH SUITABLE SHEET FLOW CONDITIONS.

4. REMOVE EXCESSIVE ACCUMULATIONS OF SEDIMENT THAT MAY CAUSE THE CONCENTRATION OF FLOW. EXCESSIVE SEDIMENT SHOULD BE REMOVED AFTER EACH RUNOFF-PRODUCING RAINFALL EVENT, OR WHERE APPROPRIATE, EVENLY RAKED INTO THE SOIL. SEDIMENT SHOULD BE REMOVED IN A MANNER THAT AVOIDS DAMAGE TO THE BUFFER ZONE OR THE CREATION OF WHEEL TRACKS DOWN THE SLOPE.

5. EXCESSIVE SEDIMENT MAY BE DEFINED AS:

(i) ANY SEDIMENT THAT COVERS A PORTION OF THE GRASSED SURFACE; OR

(ii) SEDIMENT DEPOSITION SUCH THAT THE GRASS STRAND HEIGHT ABOVE THE SEDIMENT IS LESS THAN 50mm; OR

(iii) A DEPOSITION OF SEDIMENT IN EXCESS OF 750g/m^2 (APPROXIMATELY THE EQUIVALENT OF THREE 70mm DIAMETER BALLS OF DRY SOIL).

6. THE SOURCE OF ANY EXCESSIVE SEDIMENT SHOULD BE INVESTIGATED AND CONTROLLED WHERE PRACTICAL.

7. TAKE APPROPRIATE STEPS TO MAINTAIN AT LEAST 75% GRASS COVER OVER THE BUFFER ZONE.

8. WHERE PRACTICAL, MAINTAIN ANY GROUNDCOVER VEGETATION AT A HEIGHT GREATER THAN THE EXPECTED DEPTH OF WATER FLOW AND AT LEAST 50mm.

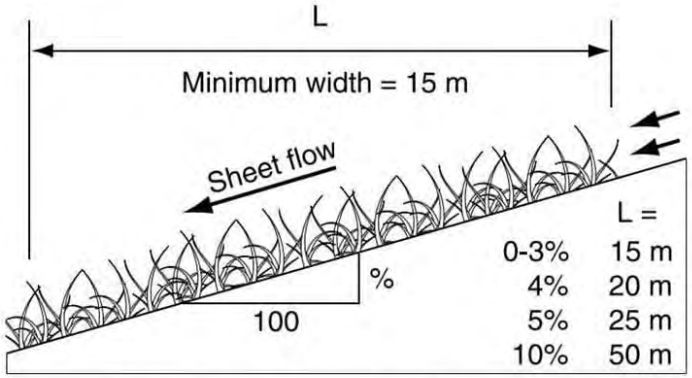

Figure 1 - Minimum dimensional requirements of a grassed buffer zone

Drawn:	Date:		
GMW	Apr-10	Buffer Zones (grassed)	BZ-01

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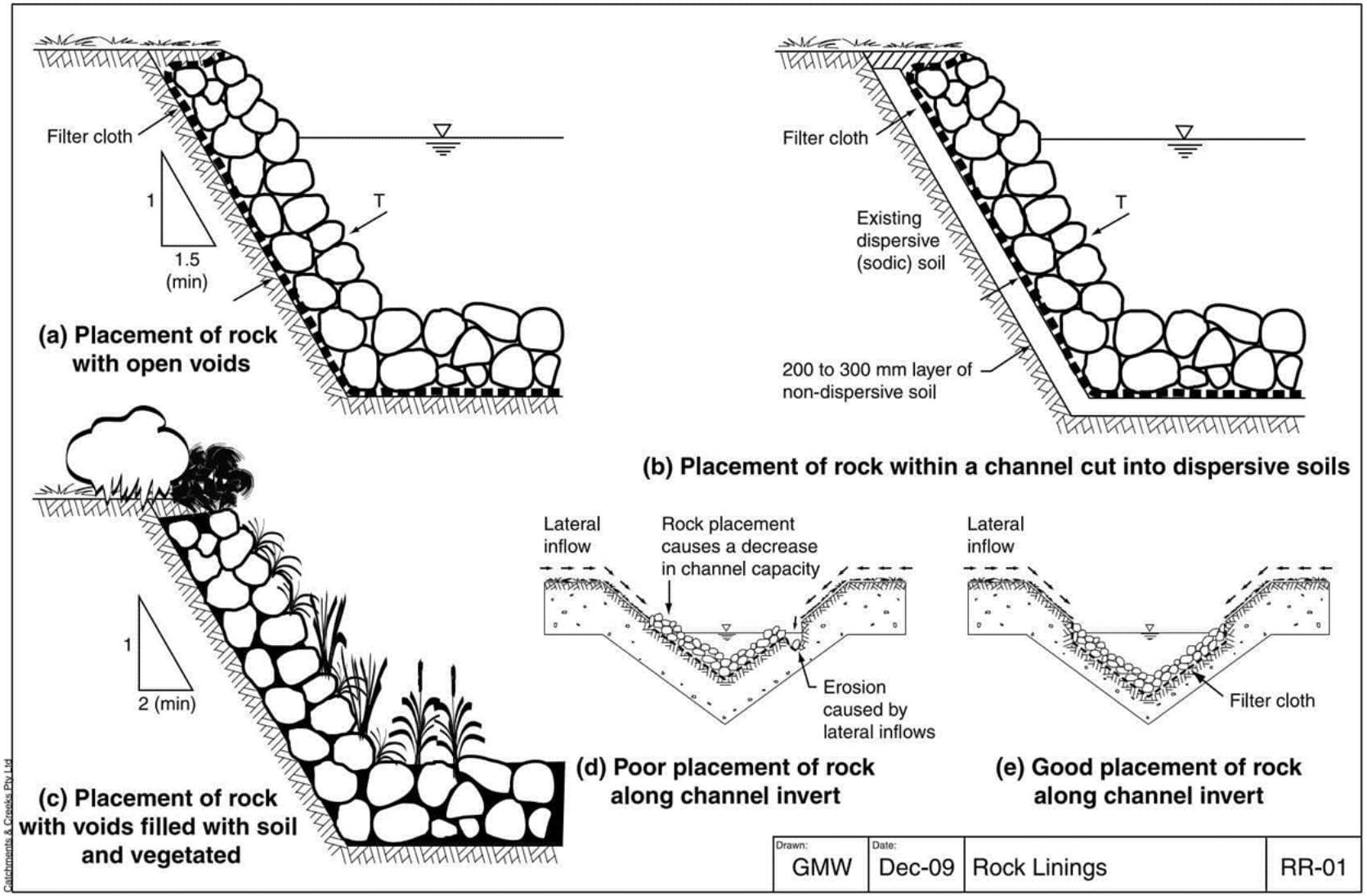
Filter cloth
1
1.5
(min)
T
(a) Placement of rock with open voids
Filter cloth
T
Existing dispersive (sodic) soil
200 to 300 mm layer of non-dispersive soil
(b) Placement of rock within a channel cut into dispersive soils
1
2 (min)
(c) Placement of rock with voids filled with soil and vegetated
Lateral inflow
Rock placement causes a decrease in channel capacity
Erosion caused by lateral inflows
(d) Poor placement of rock along channel invert
Lateral inflow
Filter cloth
(e) Good placement of rock along channel invert
Catchments & Creeks Pty Ltd
Drawn: GMW
Date: Dec-09
Rock Linings
RR-01

MATERIALS

ROCK: HARD, ANGULAR, DURABLE, WEATHER RESISTANT AND EVENLY GRADED WITH 50% BY WEIGHT LARGER THAN THE SPECIFIED NOMINAL ROCK SIZE AND SUFFICIENT SMALL ROCK TO FILL THE VOIDS BETWEEN THE LARGER ROCK. THE DIAMETER OF THE LARGEST ROCK SIZE SHOULD BE NO LARGER THAN 1.5 TIMES THE NOMINAL ROCK SIZE. SPECIFIC GRAVITY TO BE AT LEAST 2.5.

GEOTEXTILE FABRIC: HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH, MINIMUM BIDIM A24 OR EQUIVALENT.

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT AND INSTALLATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF INSTALLATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. CLEAR THE PROPOSED CHANNEL AREA OF TREES, STUMPS, ROOTS, LOOSE ROCK, AND OTHER OBJECTIONABLE MATERIALS.

3. EXCAVATE THE CHANNEL TO THE LINES AND GRADES AS SHOWN ON THE PLANS. OVER-CUT THE CHANNEL TO A DEPTH EQUAL TO THE SPECIFIED DEPTH OF ROCK PLACEMENT SUCH THAT THE FINISHED ROCK SURFACE WILL BE AT THE ELEVATION OF THE SURROUNDING LAND.

4. ROCK MUST BE PLACED WITHIN THE CHANNEL AS SPECIFIED WITHIN THE APPROVED PLANS, INCLUDING THE PLACEMENT OF ANY SPECIFIED FILTER LAYER.

5. IF DETAILS ARE NOT PROVIDED ON THE ROCK PLACEMENT, THEN THE PRIMARY ARMOUR ROCK MUST BE EITHER PLACED ON:

(i) A FILTER BED FORMED FROM A LAYER OF SPECIFIED SMALLER ROCK (ROCK FILTER LAYER);

(ii) AN EARTH BED LINED WITH FILTER CLOTH;

(iii) AN EARTH BED NOT LINED IN FILTER CLOTH, BUT ONLY IF ALL VOIDS BETWEEN THE ARMOUR ROCK ARE TO BE FILLED WITH SOIL AND POCKET PLANTED IMMEDIATELY AFTER PLACEMENT OF THE ROCK.

6. IF A ROCK/AGGREGATE FILTER LAYER IS SPECIFIED, THEN PLACE THE FILTER LAYER IMMEDIATELY AFTER THE FOUNDATIONS ARE PREPARED. SPREAD THE FILTER ROCK IN A UNIFORM LAYER TO THE SPECIFIED DEPTH BUT A MINIMUM OF 150mm. WHERE MORE THAN ONE LAYER OF FILTER MATERIAL HAS BEEN SPECIFIED, SPREAD EACH LAYER SUCH THAT MINIMAL MIXING OCCURS BETWEEN EACH LAYER OF ROCK.

7. IF A GEOTEXTILE (FILTER CLOTH) UNDERLAY IS SPECIFIED, PLACE THE FABRIC DIRECTLY ON THE PREPARED FOUNDATION. IF MORE THAN ONE SHEET OF FABRIC IS REQUIRED TO OVER THE AREA, OVERLAP THE EDGE OF EACH SHEET AT LEAST 300mm AND PLACE ANCHOR PINS AT MINIMUM 1m SPACING ALONG THE OVERLAP.

8. ENSURE THE GEOTEXTILE FABRIC IS PROTECTED FROM PUNCHING OR TEARING DURING INSTALLATION OF THE FABRIC AND THE ROCK. REPAIR ANY DAMAGE BY REMOVING THE ROCK AND PLACING WITH ANOTHER PIECE OF FILTER CLOTH OVER THE DAMAGED AREA OVERLAPPING THE EXISTING FABRIC A MINIMUM OF 300mm.

9. WHERE NECESSARY, A MINIMUM 100mm LAYER OF FINE GRAVEL, AGGREGATE OR SAND SHOULD BE PLACED OVER THE FABRIC TO PROTECT IT FROM DAMAGE.

10. PLACEMENT OF ROCK SHOULD FOLLOW IMMEDIATELY AFTER PLACEMENT OF THE FILTER LAYER. PLACE ROCK SO THAT IT FORMS A DENSE, WELL-GRADED MASS OF ROCK WITH A MINIMUM OF VOIDS.

11. PLACE ROCK TO ITS FULL THICKNESS IN ONE OPERATION. DO NOT PLACE ROCK BY DUMPING THROUGH CHUTES OR OTHER METHODS THAT CAUSE SEGREGATION OF ROCK SIZES.

12. THE FINISHED SURFACE SHOULD BE FREE OF POCKETS OF SMALL ROCK OR CLUSTERS OF LARGE ROCKS. HAND PLACING MAY BE NECESSARY TO ACHIEVE THE PROPER DISTRIBUTION OF ROCK SIZES TO PRODUCE A RELATIVELY SMOOTH, UNIFORM SURFACE. THE FINISHED GRADE OF THE ROCK SHOULD BLEND WITH THE SURROUNDING AREA. NO OVERFALL OR PROTRUSION OF ROCK SHOULD BE APPARENT.

13. IMMEDIATELY UPON COMPLETION OF THE CHANNEL, VEGETATE ALL DISTURBED AREAS OR OTHERWISE PROTECT THEM AGAINST SOIL EROSION.

14. WHERE SPECIFIED, FILL ALL VOIDS WITH SOIL AND VEGETATE THE ROCK SURFACE IN ACCORDANCE WITH THE APPROVED PLAN.

MAINTENANCE

1. ROCK-LINED CHANNELS SHOULD BE INSPECTED PERIODICALLY AND AFTER SIGNIFICANT STORM EVENTS. CHECK FOR SCOUR OR DISLODGED ROCK. REPAIR DAMAGED AREAS IMMEDIATELY.

2. CLOSELY INSPECT THE OUTER EDGES OF THE ROCK PROTECTION. ENSURE WATER ENTRY INTO THE CHANNEL OR CHUTE IS NOT CAUSING EROSION ALONG THE EDGE OF THE ROCK PROTECTION.

3. CAREFULLY CHECK THE STABILITY OF THE ROCK LOOKING FOR INDICATIONS OF PIPING, SCOUR HOLES, OR BANK FAILURES.

4. REPLACE ANY DISPLACED ROCK WITH ROCK OF A SIGNIFICANTLY (MINIMUM 110%) LARGER SIZE THAN THE DISPLACED ROCK.

Drawn:	Date:		
GMW	May-10	Rock Linings	RR-02

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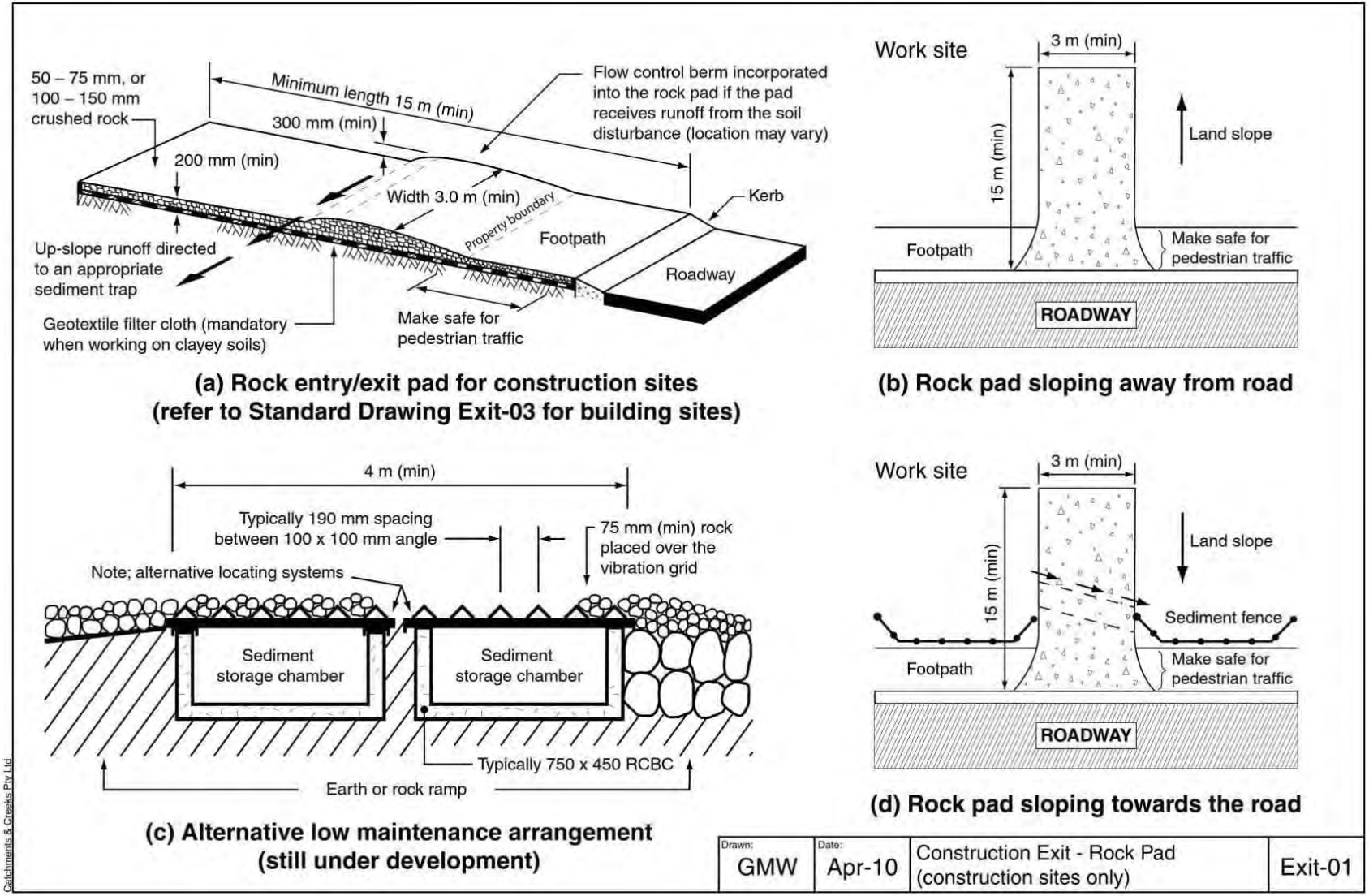

50 – 75 mm, or
100 – 150 mm
crushed rock
Minimum length 15 m (min)
300 mm (min)
200 mm (min)
Flow control berm incorporated into the rock pad if the pad receives runoff from the soil disturbance (location may vary)
Width 3.0 m (min)
Property boundary
Kerb
Footpath
Roadway
Up-slope runoff directed to an appropriate sediment trap
Geotextile filter cloth (mandatory when working on clayey soils)
Make safe for pedestrian traffic
(a) Rock entry/exit pad for construction sites
(refer to Standard Drawing Exit-03 for building sites)
Work site
3 m (min)
15 m (min)
Land slope
Footpath
Make safe for pedestrian traffic
ROADWAY
(b) Rock pad sloping away from road
4 m (min)
Typically 190 mm spacing between 100 x 100 mm angle
75 mm (min) rock placed over the vibration grid
Note; alternative locating systems
Sediment storage chamber
Sediment storage chamber
Typically 750 x 450 RCBC
Earth or rock ramp
(c) Alternative low maintenance arrangement
(still under development)
Work site
3 m (min)
15 m (min)
Land slope
Sediment fence
Footpath
Make safe for pedestrian traffic
ROADWAY
(d) Rock pad sloping towards the road
Drawn: GMW
Date: Apr-10
Construction Exit - Rock Pad (construction sites only)
Exit-01
Catchments & Creeks Pty Ltd

MATERIALS

ROCK: WELL GRADED, HARD, ANGULAR, EROSION RESISTANT ROCK, NOMINAL DIAMETER OF 50 TO 75mm (SMALL DISTURBANCES) OR 100 TO 150mm (LARGE DISTURBANCES). ALL REASONABLE MEASURES MUST BE TAKEN TO OBTAIN ROCK OF NEAR UNIFORM SIZE.

FOOTPATH STABILISING AGGREGATE: 25 TO 50mm GRAVEL OR AGGREGATE.

GEOTEXTILE FABRIC: HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH ('BIDIM' A24 OR EQUIVALENT).

INSTALLATION

1. REFER TO APPROVED PLANS FOR LOCATION AND DIMENSIONAL DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. CLEAR THE LOCATION OF THE ROCK PAD, REMOVING STUMPS, ROOTS AND OTHER VEGETATION TO PROVIDE A FIRM FOUNDATION SO THAT THE ROCK IS NOT PRESSED INTO SOFT GROUND. CLEAR SUFFICIENT WIDTH TO ALLOW PASSAGE OF LARGE VEHICLES, BUT CLEAR ONLY THAT NECESSARY FOR THE EXIT. DO NOT CLEAR ADJACENT AREAS UNTIL THE REQUIRED EROSION AND SEDIMENT CONTROL DEVICES ARE IN PLACE.

3. IF THE EXPOSED SOIL IS SOFT, PLASTIC OR CLAYEY, PLACE A SUB-BASE OF CRUSHED ROCK OR A LAYER OF HEAVY-DUTY FILTER CLOTH TO PROVIDE A FIRM FOUNDATION.

4. PLACE THE ROCK PAD FORMING A MINIMUM 200mm THICK LAYER OF CLEAN, OPEN-VOID ROCK.

5. IF THE ASSOCIATED CONSTRUCTION SITE IS UP-SLOPE OF THE ROCK PAD, THUS CAUSING STORMWATER RUNOFF TO FLOW TOWARDS THE ROCK PAD, THEN FORM A MINIMUM 300mm HIGH FLOW CONTROL BERM ACROSS THE ROCK PAD TO DIVERT SUCH RUNOFF TO A SUITABLE SEDIMENT TRAP.

6. THE LENGTH OF THE ROCK PAD SHOULD BE AT LEAST 15m WHERE PRACTICABLE, AND AS WIDE AS THE FULL WIDTH OF THE ENTRY OR EXIT AND AT LEAST 3m. THE ROCK PAD SHOULD COMMENCE AT THE EDGE OF THE OFF-SITE SEALED ROAD OR PAVEMENT.

7. FLARE THE END OF THE ROCK PAD WHERE IT MEETS THE PAVEMENT SO THAT THE WHEELS OF TURNING VEHICLES DO NOT TRAVEL OVER UNPROTECTED SOIL.

8. IF THE FOOTPATH IS OPEN TO PEDESTRIAN MOVEMENT, THEN COVER THE COARSE ROCK WITH FINE AGGREGATE OR GRAVEL, OR OTHERWISE TAKE WHATEVER MEASURES ARE NEEDED TO MAKE THE AREA SAFE.

MAINTENANCE

1. INSPECT ALL SITE ENTRY AND EXIT POINTS PRIOR TO FORECAST RAIN, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER RUNOFF-PRODUCING RAINFALL, OR OTHERWISE AT FORTNIGHTLY INTERVALS.

2. IF SAND, SOIL, SEDIMENT OR MUD IS TRACKED OR WASHED ONTO THE ADJACENT SEALED ROADWAY, THEN SUCH MATERIAL MUST BE PHYSICALLY REMOVED, FIRST USING A SQUARE-EDGED SHOVEL, AND THEN A STIFF-BRISTLED BROOM, AND THEN BY A MECHANICAL VACUUM UNIT, IF AVAILABLE.

3. IF NECESSARY FOR SAFETY REASONS, THE ROADWAY SHALL ONLY BE WASHED CLEAN AFTER ALL REASONABLE EFFORTS HAVE BEEN TAKEN TO SHOVEL AND SWEEP THE MATERIAL FROM THE ROADWAY.

4. WHEN THE VOIDS BETWEEN THE ROCK BECOMES FILLED WITH MATERIAL AND THE EFFECTIVENESS OF THE ROCK PAD IS REDUCED TO A POINT WHERE SEDIMENT IS BEING TRACKED OFF THE SITE, A NEW 100mm LAYER OF ROCK MUST BE ADDED AND/OR THE ROCK PAD MUST BE EXTENDED.

5. ENSURE ANY ASSOCIATED DRAINAGE CONTROL MEASURES (e.g. FLOW CONTROL BERM) ARE MAINTAINED IN ACCORDANCE WITH THEIR DESIRED OPERATIONAL CONDITIONS.

6. DISPOSE OF SEDIMENT AND DEBRIS IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.

REMOVAL

1. THE ROCK PAD SHOULD BE REMOVED ONLY AFTER IT IS NO LONGER NEEDED AS A SEDIMENT TRAP.

2. REMOVE MATERIALS AND COLLECTED SEDIMENT AND DISPOSE OF IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.
3. RE-GRADE AND STABILISE THE DISTURBED GROUND AS NECESSARY TO MINIMISE THE EROSION HAZARD.

Drawn:	Date:		
GMW	Apr-10	Construction Exit - Rock Pad (construction sites only)	Exit-02

APPLICATION

1. REFER TO APPROVED PLANS FOR LOCATION, EXTENT, AND APPLICATION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, EXTENT, OR METHOD OF APPLICATION CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

2. FILL OR SUITABLY CONTOUR ANY EXISTING RUTTING, RILLING OR GULLIES.

3. SUITABLY DIVERT UP-SLOPE STORMWATER RUNOFF AROUND TREATED AREA AS DIRECTED WITHIN THE APPROVED PLANS, OR OTHERWISE AS DIRECTED BY THE SITE ENGINEER.

4. APPLY TREATMENT TO THE AREA TO THE DEPTH AND FREQUENCY (SPACING) SPECIFIED ON THE APPROVED PLANS, OR OTHERWISE AS DIRECTED BY THE SITE ENGINEER.

5. IMMEDIATELY SEED AND MULCH ROUGHENED AREAS TO OPTIMISE SEED GERMINATION AND GROWING CONDITIONS.

MAINTENANCE

1. DURING THE CONSTRUCTION PERIOD, INSPECT THE TREATED AREA PRIOR TO FORECAST RAINFALL, DAILY DURING EXTENDED PERIODS OF RAINFALL, AFTER SIGNIFICANT RUNOFF PRODUCING RAINFALL, OR OTHERWISE ON A WEEKLY BASIS.

2. FILL EROSION RILLS SLIGHTLY ABOVE THE ORIGINAL GRADE, OR REGRADE THE SLOPE AS DIRECTED TO REMOVE THE RILLS.

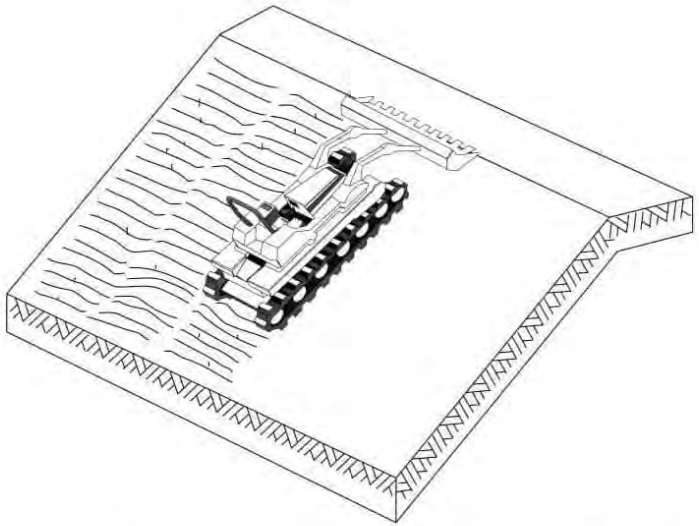


Figure 1 - Application of surface roughening on slope

Drawn:	Date:		
GMW	Dec-09	Surface Roughening	SR-01

Catchments & Creeks Pty Ltd

Appendix O Table 4.4.7 IECA best practice land clearing and rehabilitation requirements

Risk[1]	Best practice requirements
All cases	• All reasonable and practicable steps taken to apply best practice erosion control measures to completed earth works, or otherwise stabilise such works, prior to anticipated rainfall – including existing unstable, undisturbed, soil surfaces under the management or control of the building/construction works.
Very low	• Land clearing limited to 8 weeks of work if rainfall is reasonably possible. • Disturbed soil surfaces stabilised with minimum 60% cover[2] within 30 days of completion of works if rainfall is reasonably possible. • Unfinished earthworks are suitably stabilised if rainfall is reasonably possible, and disturbance is expected to be suspended for a period exceeding 30 days.
Low	• Land clearing limited to maximum 8 weeks of work. • Disturbed soil surfaces stabilised with minimum 70% cover[2] within 30 days of completion of works within any area of a work site. • Unfinished earthworks are suitably stabilised if rainfall is reasonably possible and disturbance is expected to be suspended for a period exceeding 30 days. • Appropriate protection of all planned garden beds is strongly recommended.
Moderate	• Land clearing limited to a maximum 6 weeks of work. • Disturbed soil surfaces stabilised with minimum 70% cover[2] within 20 days of completion of work within any area of a work site. • All planned garden beds protected with a minimum 75mm layer of organic *Mulching*, heavy *Erosion Control Blanket, Rock Mulching,* or the equivalent. • Staged construction and stabilisation of earth batters (steeper than 6H:1V) in maximum 3m vertical increments wherever reasonable and practicable. • The use of turf to form grassed surfaces given appropriate consideration. • Soil stockpiles and unfinished earthworks are suitably stabilised if disturbance is expected to be suspended for a period exceeding 10 days.

Risk[1]	Best practice requirements
High	• Land clearing limited to a maximum 4 weeks of work. • Disturbed soil surface stabilised with minimum 75% cover[2] within 10 days of completion of works within any area of a work site. • All planned garden beds protected with a minimum 75mm layer of organic *Mulching*, heavy *Erosion Control Blanket, Rock Mulching,* or the equivalent. • Staged construction and stabilisation of earth batters (steeper than 6H:1V) in maximum 3m vertical increments wherever reasonable and practicable. • The use of turf to form grassed surfaces given appropriate consideration. • Soil stockpiles and unfinished earthworks are suitably stabilised if disturbance is expected to be suspended for a period exceeding 10 days.
Extreme	• Land clearing limited to maximum 2 weeks of work. • Disturbed soil surfaces stabilised with minimum 80% cover[2] within 5 days of completion of works within any area of a work site. • All planned garden beds protected with a minimum 75mm layer of organic *Mulching*, heavy *Erosion Control Blanket, Rock Mulching,* or the equivalent. • Staged construction and stabilisation of earth batters (steeper than 6H:1V) in maximum 2m vertical increments wherever reasonable and practicable. • High priority given to the use of turf to form grassed surfaces. • Soil stockpiles and unfinished earthworks are suitably stabilised if disturbance is expected to be suspended for a period exceeding 5 days.

1. Erosion risk based on monthly erosivity (Table 4.4.1), average monthly rainfall depth (Table 4.4.2), or soil loss rate (Table 4.4.3) as directed by the regulatory authority.
2. Minimum cover requirements may be redirected if the natural cover of the immediate land is less than the nominated value, for example in arid and semi-arid areas or on coastal sand dunes.

Appendix P Erosion and sediment control treatment – seismic lines

Blade up erosion controls

Figure 1 shows the condition of land following blade up traverse of survey area. No treatment required.

Figure 1 Typical condition 'blade up' treatment

Surface bladed by grader (including woodland areas)

Erosion control treatments as follows:

- A diversion bank shall be installed along sections of the survey lines where material has been stripped from the surface (refer Table 12).
- The bank shall be constructed as a cut and push operation. Lines shall be ripped across the area at a grade of 0.3%. A shallow channel should be cut along this line (approximately 0.6 metres deep). Excavated material is dumped on the down slope side of the channel then compacted and smoothed out to form a bank with even batters and a level top (refer Figure 2).
- To aid trafficability, an approach and departure ramp shall be shaped during construction of the bank.
- The bank should direct runoff into undisturbed vegetation or into an existing drain (care needs to taken to ensure that erosion does not occur where the water runs down into the drain).
- Ensure the diversion bank is not eroded by traffic.
- Undertake maintenance as necessary.

Table 12: Bank spacing requirements (m)

Slope		Diversion bank spacing (m)
%	Gradient	
0.5	1:200	170-180
1	1:100	120-130
2	1:50	90-100
3	1:33	70-80
4	1:25	60-70
5	1:20	55-60
6	1:17	40-45

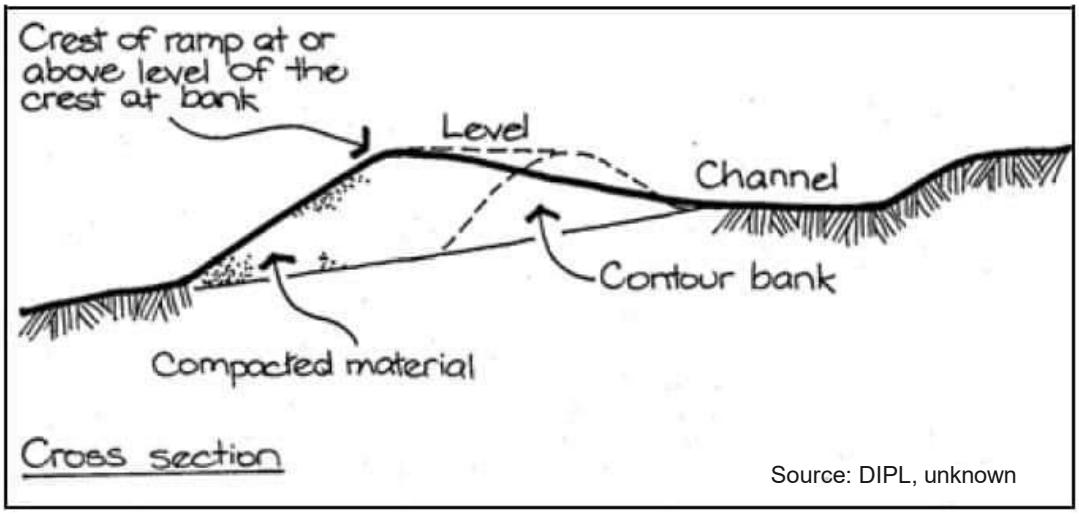


Figure 2 Whoa boys or roll over banks drawing

Woodland area erosion controls

Figure 3 shows the expected final rehabilitation treatment for woodland areas disturbed by the seismic survey activities. In the event of an expected significant rainfall event which will require the site to be abandoned, a similar treatment is to be adopted.

- Step 1. Respread windrowed topsoil of disturbed area and ripped into the soil surface.
- Step 2. Spread vegetation over top soiled area in an even layer.

Felled vegetation will be evenly spread over the top soiled area to provide additional protection against erosion.

Figure 3 Treatment for woodland areas

Typical offlet drain detail of access tracks

Figure 4 shows the typical offlet drain and table drain block detail, which consists of the following actions:

- Construct access tracks with table drains that are free draining.
- Avoid road crowning to allow water to naturally cross the road.
- Form tracks to allow off-road drainage. Where track intercepts the direction of overland flow and re-directs this flow to a non-natural drainage line, install erosion control works to minimise potential erosion.
- The design and position of erosion control measures to be determined by experienced operator and site engineer, based on the site characteristics of the access track location.
- Where construction of table drains are deemed necessary, they should have a broad flat base at least 1 m wide and should not be graded to produce a 'V' shape. To minimise erosion,
- the slope should be no greater than 0.5% on erodible soils or 1% on stable soils.
- Where encounter dispersive / erosive soils they should be stabilised with gypsum or other stabiliser, as determined by laboratory analysis of soils.
- Where cut-out drains are required, they should be spaced based on the slope of the area i.e. 0.5% slope, allow for cut-out draining every 170-180 m or 1 % slope, allow for cut-out drainage every 120-130 m etc. (refer to NT Road Drainage Fact Sheet). It is noted that the recommended distance between turn-out drains is a guide and may not apply to all locations along the access track.

- Monitor road conditions to ensure deterioration does not occur. Assist in the maintenance and repair work on roads and tracks used.

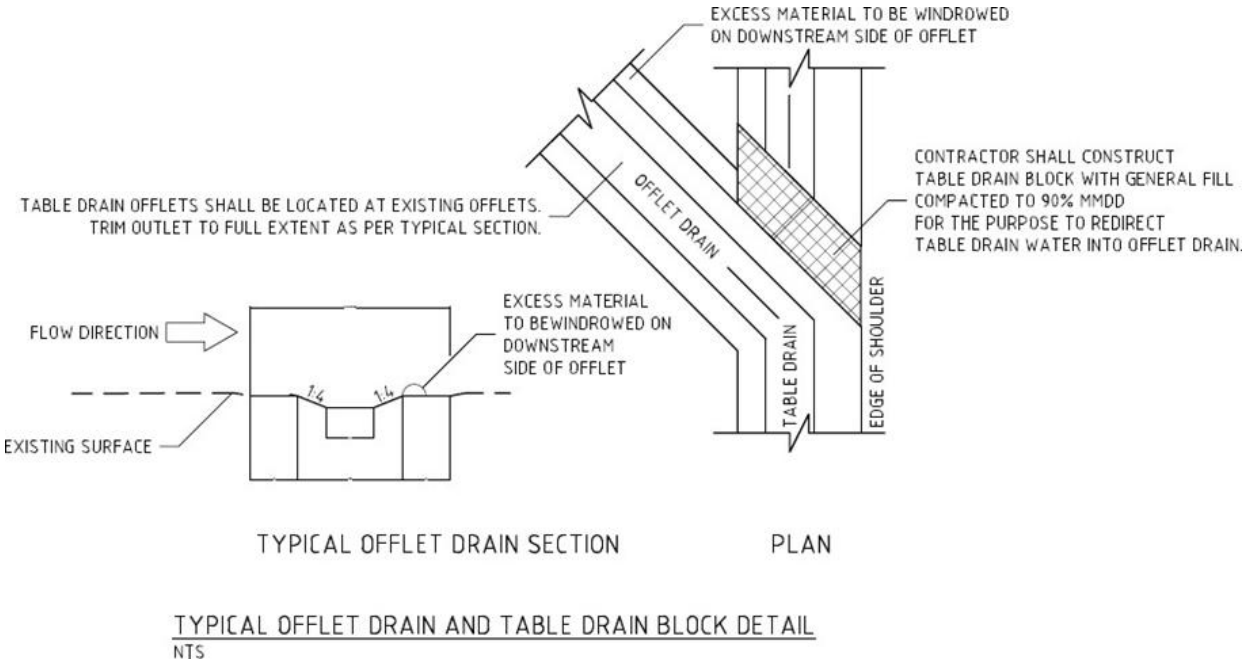


Figure 4 Typical offlet drain and table drain block diagram

APPENDIX F

EMP Commitment Register

Appendix F Shenandoah South 3D Seismic Environmental Commitment Register

Obligation details	Accountability	When
The layout of the site and exact placement of seismic lines will be informed by the environmental sensitivities and mitigation measures identified in this EMP. This includes additional scouting as required, where 3D seismic lines need to be moved or areas to avoid to accommodate pastoral or new / additional cultural heritage considerations.	Project Manager, Senior Manager Geoscience and Beetaloo Field Manager	Site establishment
No clearing of large trees for the 3D seismic program in stream crossings and wetlands.	Senior Manager Geoscience and Beetaloo Field Manager	Continuous
The monitoring and maintenance under the erosion and sediment control plan shall be implemented.	Senior Manager Geoscience	Pre and post wet season
The spill management plan will be implemented including spill prevention, detection, response and reporting measures.	Senior Manager Geoscience	Throughout the activity
The bushfire management plan will be implemented to reduce the risk of bushfires.	Senior Manager Geoscience	Throughout the activity
Secondary containment will be implemented for all chemical storage and handling areas.	Senior Manager Geoscience	Throughout the activity
Tamboran and its subcontractors will prioritise the use of local labour where such skill sets are available.	Project Manager Contracts Administrator	Activity planning
The weed management plan shall be implemented, including assuring all equipment and vehicles on-site have a valid weed hygiene certificate and routine monitoring is completed. All identified weeds associated with Tamboran's activities to be treated and managed in consultation with the DLPE Onshore Petroleum Weed Management Officer.	Beetaloo Field Manager Senior Manager Geoscience	Throughout the activity and post rehabilitation
Records of weed distribution will be maintained within Tamboran's GIS and provided to the DLPE Onshore Petroleum Weed Management Officer.	Environment and Approvals Manager	Throughout the activity
All groundwater will be extracted, monitored and recorded in accordance with the water extraction licence.	Environment and Approvals Manager	Throughout the activity
All wastes will be transported and disposed of at licensed facilities in accordance with the *NT Waste Management and Pollution Control Act 1998*.	Senior Manager Geoscience	Throughout the activity
Surface water will not be used for any activities proposed in this EMP or future operations.	Project Manager	Throughout the activity
Stormwater flooding across the cleared site will be managed to minimise impacts from erosion and sedimentation.	Project Manager	Throughout the activity
Tamboran have committed to comply with conditions as prescribed by AAPA for the duration of the program.	Project Manager	Throughout the activity
Tamboran has committed resources and time to allow competent and experienced personnel to participate in educational and community information sessions from Darwin in the north, to Alice Springs in the south and across to Borroloola in the east.	Project Manager	Planning and implementation of activities
Appropriate housekeeping standards will be maintained, and the site will be maintained free of rubbish.	Beetaloo Field Manager or Operating Company Representative (OCR)	Throughout the activity

Obligation details	Accountability	When
Camps will be used to mitigate the impact on available accommodation and townships.	Project Manager	Throughout the activity
Wastewater, sewage and sullage generated by the domestic camp activities will be managed by a Department of Health approved sewage treatment system or captured and removed from site.	Project Manager	During wastewater (sewage) management
Monitor access track conditions to ensure deterioration with possible increase in dust creation, does not occur and undertake rehabilitation as required.	Beetaloo Field Manager or Operating Company Representative (OCR)	Daily during the activity
Areas identified as high priority in the AECOM cultural heritage assessment report (Appendix B.1) will be avoided during the 3D seismic survey, as well as any known sites or Aboriginal archaeological places and objects that have been identified	Beetaloo Field Manager or Operating Company Representative (OCR)	Prior to commencement of an activity. Daily during the activity
Unrecorded heritage places and objects protected under the Heritage Act 2011, and will be avoided. If avoidance is not feasible, a stop work order will remain in place for the heritage place or object and an Application to carry out work will be lodged with the Heritage Council. The stop work order will remain in place until after the Heritage Council has made a decision regarding the Application to Carry Out Works.	HSE Representative	When encounter unrecorded heritage place/object.
Tamboran will progressively implement a rehabilitation plan to rehabilitate all disturbed areas.	Health Safety and Environment Representative	With 12 months of determining an asset is no longer required
Work instructions summarising the requirements of this EMP will be prepared and submitted to contractors performing work under this EMP. Field Map Workbook to be developed identifying all Buffer areas around sensitive areas identified in the EMP and no clearing areas.	HSE Representative	Prior to commencement of an activity.

APPENDIX G

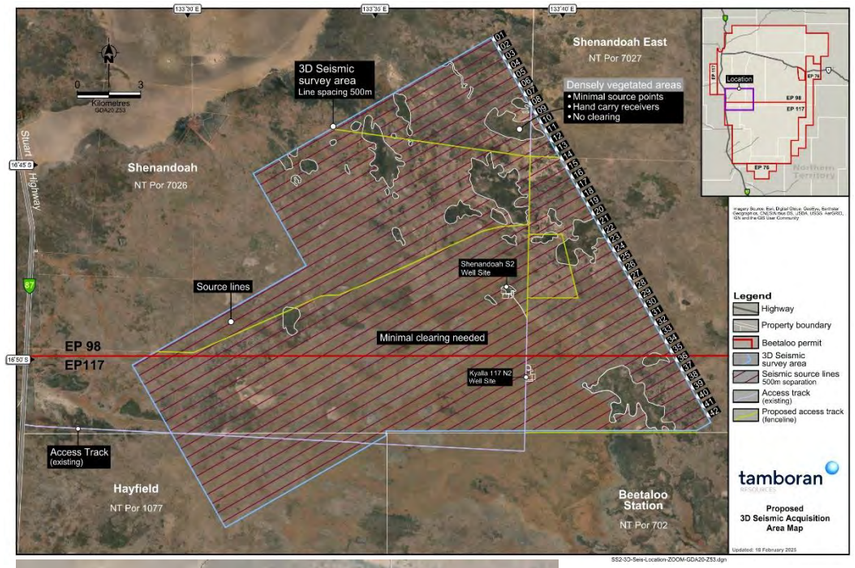
Rehabilitation Management Plan

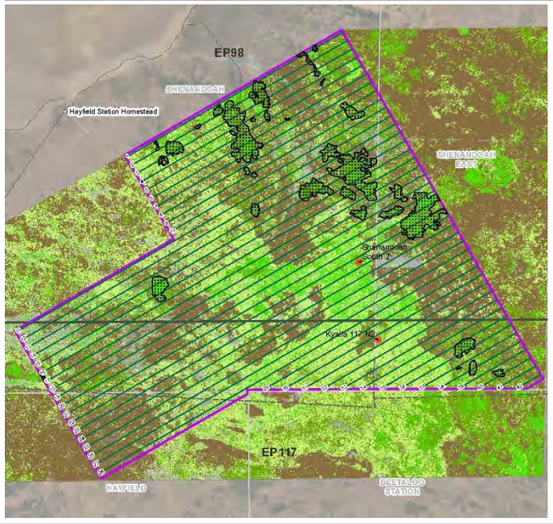
Exploration Permit 98 and 117
Rehabilitation Management Plan 2025 onwards
Shenandoah South 3D Seismic Program

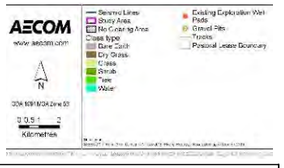
Name	Contact details
[redacted]	[redacted]

Location of EP98 & EP117 - Shenandoah South 3D Seismic Area

Property and land uses	Gas exploration, cattle grazing, and native title rights and interests recognised by the native title determinations over the land and waters.
Climate	The permit area is described as arid to semi-arid. Climate is influenced by the monsoon and there is a distinct wet and dry season. Most rainfall (90%) occurs during the summer months, between October and March. Annual rainfall varies across the permit area is around 680 mm, with rainfall totals show moderate variability and drought conditions are known to occur every 10 years.
Pre-disturbance land condition summary	The Shenandoah South 3D seismic area occurs within the Beetaloo Land System, which is classified as lateritic plains and rises associated with deeply weathered profiles (laterite) including sand sheets and other depositional products, sandy and earth soils. Baseline survey (May 2024) conducted for the planned 3D seismic program did not encounter weeds or other major disturbance. Bushfire has not occurred in area in over 4-8 years. Habitat along the seismic alignment was in moderate to good condition. The habitat contained refuge opportunities for small birds and reptiles in the form of large woody debris and flowering plants. Area is subject to overland flow. No creeks occur within the proposed alignment, although a Stream Order 1 occurs in the northern section. Flood plain and Palustrine systems are also within the planned seismic line program area. A likelihood of occurrence assessment identified 22 fauna species listed under the EPBC Act and/or TPWC Act. One flora species listed under TPWC Act. Assessed that impacts can be mitigated through measures identified in the EMP.







Rehabilitation aims and objectives

Site management aim	The aim is to rehabilitate any part of the land affected by the regulated activity to a safe condition consistent with industry standards, the Code and in consultation with the landholder.
Rehabilitation objectives	The rehabilitation objective is to provide a stable landform, which supports a) the rights and interests of the Native Title Holders in the land and water, and b) a resilient self-sustaining vegetation community that can withstand impacts including fire and cattle grazing and is safe to humans and wildlife.

Vegetation community description

Vegetation community	Description	Total Area ha (%)	Canopy cover (%)	Ground cover (%)
Community 1a	*Acacia shirleyi* mid high woodland over, *Macropteranthes kekwickii, Terminalia volucris* mid high open shrubland, over *Eragrostis fallax*, *Sorghum intrans*, *Waltheria indica* mid high open tussock grassland	7,121 ha (19.84%)	10-55	5-40
Community 2a	*Corymbia dichromophloia* ± *Erythrophleum chlorostachys* mid high open woodland, over *Acacia difficilis*, *Terminalia canescens*, *Dodonaea hispidula* mid high open shrubland, over *Triodia bitextura* ± *Chrysopogon fallax*, *Schizachyrium fragile* mid high hummock grassland	16,578 ha (46.18%)	8-24	30-60
Community 2b	*Acacia shirleyi*, *Corymbia dichromophloia* ± *Corymbia polycarpa* mid high open woodland, over *Terminalia canescens*, *Macropteranthes kekwickii* ± *Petalostigma pubescens* mid high open shrubland, over *Triodia bitextura*, *Schizachyrium fragile*, *Chrysopogon fallax* mid high hummock grassland	3,954 ha (11.01%)	8-22	15-70
Community 2c	*Eucalyptus leucophloia* low open woodland, over *Acacia gonoclada*, *Melaleuca viridiflora*, *Terminalia canescens* mid high open shrubland, over *Eriachne armittii*, *Eulalia aurea* mid high open tussock grassland	146 ha (0.41%)	8	20
Community 3a	*Corymbia polycarpa*, ± *Erythrophleum chlorostachys* mid high open woodland, over *Acacia difficilis* ± *Atalaya hemiglauca* mid high open shrubland, over *Chrysopogon fallax*, *Sehima nervosum* mid high tussock grassland	1,341 ha (3.47%)	7-22	15-80
Community 3b	*Eucalyptus chlorophylla*, *Acacia shirleyi* mid high open woodland, over *Acacia difficilis*, *Macropteranthes kekwickii, Bauhinia cunninghamii* mid high open shrubland, over *Chrysopogon fallax, Schizachyrium fragile*, *Eragrostis tenellula* mid high tussock grassland	1,019 ha (2.84%)	12-35	15-55
Community 4a	*Eucalyptus pruinosa* ± *Eucalyptus chlorophylla*, *Atalaya hemiglauca* low open woodland, over *Carissa lanceolata*, *Terminalia canescens* mid high open shrubland, over *Eulalia aurea, Chrysopogon fallax* mid high tussock grassland	310 ha (0.86%)	8	30-50
Community 4b	*Corymbia polycarpa, Eucalyptus microtheca* mid high open woodland, over *Hakea arborescens, Melaleuca nervosa* mid high open shrubland, over *Aristida contorta, Waltheria indica* mid high open tussock grassland	322 ha (0.9%)	8	15-60
Community 4c1	*Acacia ancistrocarpa* ± *Melaleuca viridiflora* tall shrubland, over *Triodia bitextura*, *Schizachyrium fragile* mid high hummock grassland	3,137 ha (8.74%)	30-45	40-60
Community 4c2	*Melaleuca viridiflora*, *Terminalia canescens* low sparse shrubland, over *Eulalia aurea*, *Eriachne obtusa* open tussock grassland	1,507 ha (4.2%)	6	30
Community 5	*Lophostemon grandiflorus, Eucalyptus microtheca* ± *Eucalyptus camaldulensis* low open woodland, over *Lophostemon grandiflorus, Acacia difficilis* mid high open shrubland, over *Eragrostis speciosa, Eragrostis fallax* mid high sparse tussock grassland	462 ha (1.29%)	14-22	5

Pre-disturbance photos of vegetation communities

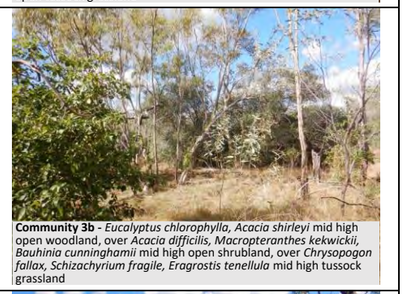
Community 1a - *Acacia shirleyi* mid high woodland over, *Macropteranthes kekwickii, Terminalia volucris* mid high open shrubland, over *Eragrostis fallax*, *Sorghum int5rans*, *Waltheria indica* mid high open tussock grassland

Community 2a - *Corymbia dichromophloia* ± *Erythrophleum chlorostachys* mid high open woodland, over *Acacia difficilis*, *Terminalia canescens*, *Dodonaea hispidula* mid high open shrubland, over *Triodia bitextura* ± *Chrysopogon fallax*, *Schizachyrium fragile* mid high hummock grassland

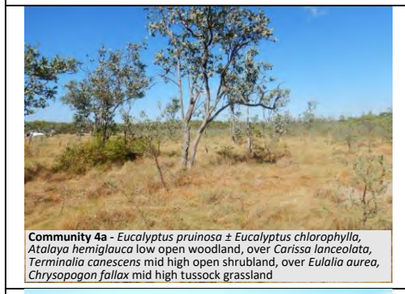
Community 2b - *Acacia shirleyi, Corymbia dichromophloia* ± *Corymbia polycarpa* mid high open woodland, over *Terminalia canescens, Macropteranthes kekwickii* ± *Petalostigma pubescens* mid high open shrubland, over *Triodia bitextura, Schizachyrium fragile, Chrysopogon fallax*

Community 2c - *Eucalyptus leucophloia* low open woodland, over *Acacia gonoclada, Melaleuca viridiflora, Terminalia canescens* mid high open shrubland, over *Eriachne armittii, Eulalia aurea* mid high open tussock grassland

Community 3a - *Corymbia polycarpa, ± Erythrophleum chlorostachys* mid high open woodland, over *Acacia difficilis ± Atalaya hemiglauca* mid high open shrubland, over *Chrysopogon fallax, Sehima nervosum* mid high tussock grassland



Community 3b - *Eucalyptus chlorophylla, Acacia shirleyi* mid high open woodland, over *Acacia difficilis, Macropteranthes kekwickii, Bauhinia cunninghamii* mid high open shrubland, over *Chrysopogon fallax, Schizachyrium fragile, Eragrostis tenellula* mid high tussock grassland

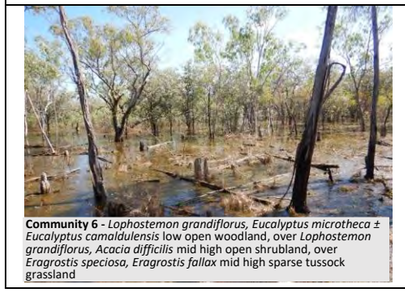


Community 4a - *Eucalyptus pruinosa ± Eucalyptus chlorophylla, Atalaya hemiglauca* low open woodland, over *Carissa lanceolata, Terminalia canescens* mid high open shrubland, over *Eulalia aurea, Chrysopogon fallax* mid high tussock grassland

Community 4b - *Corymbia polycarpa, Eucalyptus microtheca* mid high open woodland, over *Hakea arborescens, Melaleuca nervosa* mid high open shrubland, over *Aristida contorta, Waltheria indica* mid high open tussock grassland

Community 4c1 - *Acacia ancistrocarpa ± Melaleuca viridiflora* tall shrubland, over *Triodia bitextura, Schizachyrium fragile* mid high hummock grassland

Community 4c2 - *Melaleuca viridiflora, Terminalia canescens* low sparse shrubland, over *Eulalia aurea, Eriachne obtusa* open tussock grassland



Community 6 - *Lophostemon grandiflorus, Eucalyptus microtheca* ± *Eucalyptus camaldulensis* low open woodland, over *Lophostemon grandiflorus, Acacia difficilis* mid high open shrubland, over *Eragrostis speciosa, Eragrostis fallax* mid high sparse tussock grassland

Community 1a and 2b aerial photo

The RMP should be read in conjunction with the overarching *Environment Management Plan and Emergency Response Plans for Tamboran's operations in the Beetaloo Basin*. *Prepared* [redacted] *Senior Environmental Approval Manager. Figures and vegetation data presented in this plan was prepared by AECOM Australia Pty Ltd from May 2024 field survey.*

Rehabilitation risk	
Key Risks	**Controls**
Drought - impacting the establishment of rehabilitated vegetation	• Time rehabilitation actions to coincide with the beginning of the wet season, to ensure access to the site and maximise the establishment period of vegetation over the wet season. • Re-spread topsoil across the site to utilise the local seed bank. • Ongoing monitoring to identify if further seed inputs are required. • Collection of seed from the local area to ensure seed stock is suited to the climatic conditions of the site.
Fire - impacting revegetation	• Establish a mix of perennial and annual grass species. • Establish a mix of resprouting (e.g., *Eucalyptus* spp. and *Corymbia* spp.) and reseeding species (e.g., *Acacia* spp.). • Ongoing monitoring to determine fire impacts on revegetation. • Ongoing monitoring to determine if further seed inputs are required.
Grazing - impacting revegetation	• Establish a mix of perennial and annual grass species. • Re-spread timber with topsoil. • Ongoing monitoring to determine grazing impacts on revegetation. • Ongoing monitoring to determine if further seed inputs are required. • Ongoing monitoring to determine if fencing is required.
Exposed ground - leading to an increase in weed establishment and/or erosion	• Remove windrows and topsoils. • Respread of topsoil and vegetated matter across the site. • Annual weed surveys of rehabilitated area once rehabilitation is established. • Control of any weed incursions.

Rehabilitation strategy		
Parameter	**Methods**	**Objective**
Vegetation	• Rehabilitation to seismic lines will be completed progressively after seismic has been acquired on each line to reduce exposed soils and minimise runoff in first flush events. • Disturbed areas to be allowed to naturally regenerate or revegetate on completion of the regulated activity. • All compacted areas to be ripped and scarified to promote regeneration of vegetation, this may require assistance through spread of native seed stock. Where possible, native seed stock would be supplied by local indigenous suppliers.	• Establish vegetation trending toward the target vegetation community for the area disturbed (i.e. species richness, %cover and structure) and in accordance with the Code (Clause A.3.9(d)). • Reinstate disturbance area to its pre-disturbed condition. • The type of ground cover applied to completed earthworks is to be compatible with the anticipated long-term land use, environmental risk, and site rehabilitation measures.
Ground cover	• Previously removed vegetation and topsoil will be uniformly respread over disturbed area. This will assist with the rehabilitation process by increasing infiltration and returning seed-bearing topsoil, as well as reducing erosion. • Shot holes disturbances will be reinstated via respreading soils and vegetated matter. • After first 12 months, additional input of native seed mix may be required from the area to assist rehabilitation process.	
Landform stability	• All windrows are to be removed as soon as practicable after seismic survey completion.	

Final success criteria (5 years)	
Area to be rehabilitated	• Total area of surface disturbance is 221.36 ha. • Total area required for rehabilitation 56.25 ha, with up to additional 20 ha contingency (76 ha in total) to accommodate seasonal regrowth variability.
Vegetation composition returned to an agreed and as close to pre-disturbance level that requires little or no ongoing management	• Vegetation composition (i.e. type, density) equivalent to 60% of the analogue site, showing a trajectory to becoming ecologically integrated into the surrounding area and self-sustaining. • Perennial species cover, including woody species such as trees and shrubs (i.e. Acacia, Eucalypt and Bullwaddy) and perennial grass/forb species equivalent to 60% of the analogue site. • Ground foliage cover equivalent to 60% of the target vegetation community. • The dominant flora species in the mid and ground strata equivalent to 80% of the analogue site. • Organic litter and course woody debris equivalent to 50% of the analogue site. • Evidence native fauna is using habitat (i.e. tracks, scats, burrows).
Watercourse crossings	• All stream order 1 crossings and other waterways, where intersected, to be reinstated to the original topography. • No evidence of erosion as result of activity present within water course by end of the first 12 months.
Erosion	• Less than 5 % erosion evident after the first 12 months and no rill/sheet/gully erosion evident by year 5.
Weeds	• No weed infestations in rehabilitated area that are declared under the NT *Weeds Management Act*.
Hazardous materials and waste	• All hazardous material and waste removed from site upon completion of works to licensed landfill facilities or recycling facilities.
Safety for humans and wildlife	• Rehabilitation of disturbance areas to be similar in landform to the surrounding area. No steep slopes or barriers to remain on site that endanger wildlife, livestock or humans. • No windrows remaining as result of exploration activity. • 100% of all surface facilities removed including fencing (star pickets / fencing wire) from exploration activity.

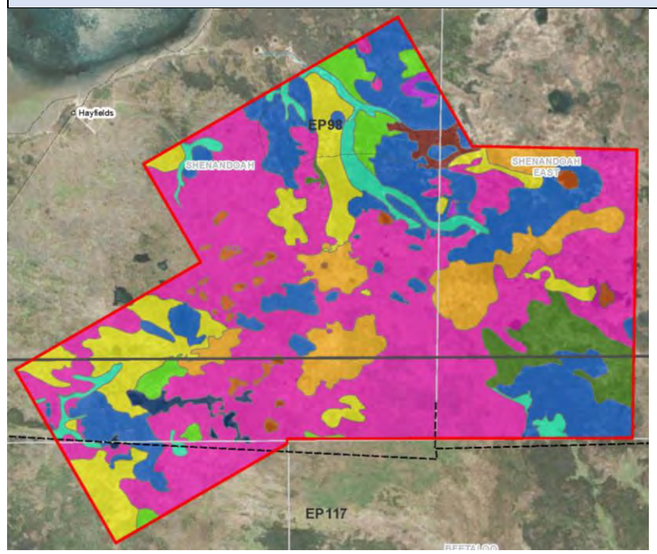
Monitoring program and schedule

Stage	Timing	Method	Measurable attributes (Record of data/description, GPS and photographic evidence)	Corrective actions
Planning and Design	Prior to and commencement of line preparation	• Ground truth/pre-disturbance survey to obtain geospatial data prior to disturbance including planned access routes, buffers and identify hazards and obstacles including existing erosion areas or weeds. • Identify proposed analogue sites.	• Weed species/patch. • Erosion areas. • Waterlogged areas.	• Weed management. • Establish buffers as per EMP requirements.
Seismic program	During activity	• Visual inspections of seismic lines for potential ESC issues and weeds. • Obtain georeferenced points of retained trees, waterlogged areas avoided etc.	• No visible erosion. • No declared weeds.	• Weed management • Repair and reinstate soils
Progressive Rehabilitation (following data recording)	Within 2 - 6 weeks of completion of the survey	• Ripping of compacted areas. • Topsoil, windrows and cleared vegetation stockpiled to be respread across the seismic line. • Refer to detail in Tamboran's Erosion and Sediment Control Plan	• All disturbed areas must be considered suitably stabilised as per IECA Table in the Tamboran's Erosion and Sediment Control Plan (Appendix E).	• N/A

Preliminary assessment	Post rehabilitation, end of wet season survey (ideally between February and July) within 12 months of rehabilitation completion	• Analogue sites will be established in one or more of the 11 vegetation communities identified in the baseline Land Condition Assessment (AECOM 2024) at adjacent undisturbed sites.
		• Permanent 100 m x 4 m transects (one or more per vegetation community based on the level of disturbance of the type of community), will be established at disturbed and analogue sites including photo monitoring point(s).
		• Collect 1 x 1 m ground cover quadrats every 10 m along each 100 m transect.
		• Transects to be positioned <20 m from pastoral and gas infrastructure assets (i.e. access tracks, fence lines, well pads, water troughs) to reduce edge effects.
			• Weed presence/absence (species and density).
			• Disturbance (fire frequency and intensity, evidence of feral animal/ cattle).
			• Evidence of erosion (type of erosion, approximate area of erosion).
			• Vegetation condition (comparison to analogue sites):
			  • Seedling/sapling density of dominant species respective to each vegetation community.
			  • % ground cover.
			  • % annual cover vs % perennial cover.
			  • number of species at canopy, mid and ground strata.
				Corrective action as required based on third-party report and/landholder feedback:
				• Erosion remediated
				• Weed management
				• Additional seeding
				• Soil amelioration

Early rehabilitation	Years 1, 2 and 3 post rehabilitation, end of wet season survey (February to July)	• Monitoring to be undertaken using permanent transects at analogue and disturbed sites. • Collect data as per preliminary methods. • Compare results from monitoring sites with analogue sites and previous year's assessment to determine if require additional management inputs (i.e. seeding, stabilisation). • Annually review success criteria.	• Early assessment of rehabilitation will determine attributes of woody plants in each 100 m x 4 m transect. • Assessment of species richness, DBH (>1.5 cm) and height (>2 m), in addition to measurable attributes described within the preliminary assessment.	
Long-term rehabilitation	Annually until final success criteria has been met, end of wet season survey (February to July)		• Long-term assessment to determine establishment, recruitment, and growth rate attributes of plant species, in addition to parameters described during preliminary and early rehabilitation stage.	
Completion of rehabilitation	5 years post rehabilitation or when achieve final success criteria.	• Final inspection and report prepared by a suitably qualified person as per rehabilitation monitoring program. • Signoff by landowner and regulator.	• As per final success criteria (5 years).	• N/A

3D seismic program rehabilitation zones



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Legend

- Project Boundary
- Populated Place
- Tracks
- Permit Areas
- Pastoral Lease Boundary

Vegetation Community

- Comm 1a- A. shirleyi mid high woodland
- Comm 2a - C. dichromophloia ± Erythrophleum chlorostachys mid high open woodland
- Comm 2b - A. shirleyi, C. dichromophloia ± C. polycarpa mid high open woodland
- Comm 2c - E. leucophloia low open woodland
- Comm 3a - C. polycarpa, ± Erythrophleum chlorostachys mid high open woodland
- Comm 3b - E. chlorophylla, A. shirleyi mid high open woodland
- Comm 4a - E. pruinosa ± E. chlorophylla, Atalaya hemiglauca low open woodland
- Comm 4b - C. polycarpa, E. microtheca mid high open woodland
- Comm 4c1 - Acacia ancistocarpa ± M. viridiflora tall shrubland
- Comm 4c2 - M. viridiflora, Terminalia canescens low sparse shrubland
- Comm 5 - Lophostemon grandiflorus, E. microtheca ± E. camaldulensis low open woodland

tamboran RESOURCES

Shenandoah South Project Area Vegetation Communities

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Figure 2