Appendix A: Modification Notice - Regulation 22

<table>
<tr><td>Interest holder</td><td>Tamboran B2 Pty Ltd</td><td>EMP Title</td><td>Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan</td><td>Unique EMP ID</td><td>ORI10-3</td><td>Mod #</td><td>5</td><td>Date</td><td>20 January 2025</td></tr>
<tr><td>Brief Description</td><td colspan="9">The purpose of the regulation 22 is to incorporate all remaining regulated activities associated with the Beetaloo Basin Velkerri, Civil Construction EP76 S2 EMP (ORI4-1) into the Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 EMP (ORI10-3). The majority of civil construction activities described in the Velkerri Civil EMP have been completed and are captured in subsequent EMP’s for ongoing use and management, as well as rehabilitation. This modification notice aims to reduce administration burden under multiple EMPs for the one well site.

Regulated activities to be subsumed into the Beetaloo Multi-well EMP (ORI10-3) include:
- Construction, maintenance and ongoing management of access tracks to well pad and gravel pits
- Operation and management[2] of three (3) gravel pits

Table 1 Velkerri 76 S2 Gravel pits
<table>
<tr><th>Name</th><th>Size (ha)</th><th>Zone</th><th>Easting</th><th>Northing</th></tr>
<tr><td>VGP1 (constructed)</td><td>3.0</td><td>53</td><td>435623</td><td>8135301</td></tr>
<tr><td>VGP2</td><td>3.0</td><td>53</td><td>433019</td><td>8135263</td></tr>
<tr><td>VGP3</td><td>3.0</td><td>53</td><td>397906</td><td>8136039</td></tr>
</table>
- Ongoing maintenance of 80 km of existing pastoral access track (originally constructed by the pastoralist).
- Decommissioning and rehabilitation of the infrastructure at conclusion of exploration and appraisal.</td></tr>
<tr><td>Geospatial files included?</td><td colspan="9">Yes</td></tr>
<tr><td>Does the proposed change result in a new, or increased, or potential or actual environmental impact or risk?</td><td>If an INCREASE in the existing potential or actual environmental risk, is it provided for in the EMP?</td><td>Does the proposed change require additional mitigation measures to be included?</td><td>Has additional stakeholder engagement been conducted?</td><td>Does it require additional environmental performance standards and measurement criteria?</td><td>Does it affect compliances with Sacred Site Authority Certificates?</td><td colspan="2">Does it affect current rehabilitation, weed fire, wastewater, erosion and sediment control, spill or emergency response plans?</td><td colspan="2">Will the environmental outcome continue to be achieved, and will the impacts and risks be managed to ALARP and acceptable?</td></tr>
<tr><td>No.

The Beetaloo Multi-well EMP (ORI10-3) currently includes provision for gravel pit and access track management, as well as rehabilitation at completion. All clearing activities approved under ORI4-1.1 are to be fully incorporated into ORI10-3.</td><td>No.

The Beetaloo Multi-well EMP (ORI10-3) provides for impacts and risks associated with the construction, use, management and maintenance of gravel pits and access tracks, as well as rehabilitation.</td><td>No.

Existing mitigation measures are in place covering land clearing, erosion and sediment control. The gravel pits and the access tracks will be fully subsumed into the Beetaloo Multi-well EMP (ORI10-3).</td><td>Not applicable.

Stakeholder engagement completed for all activities associated with – Velkerri 76 S2 Water Bore Drilling EMP, Civil EMP and DST EMP. All stakeholders aware that activities on Velkerri 76 S2 are still proposed.</td><td>No.

The environmental performance standards and measurement criteria are sufficiently captured by the Beetaloo Multi-well EMP (ORI10-3) (i.e. protection of soils, water, rehabilitation, etc.)</td><td>No.

Amendment to AAPA Certificate C2020/003 and C2022/02 are not required. Note C2020/003 is a variation to the original AAPA Certificate C2019/039 for the Velkerri 76 S2 site.</td><td colspan="2">No.

Construction, use, management and maintenance of gravel pits and access tracks is already incorporated into the broader regulated activities associated with the planned petroleum wells on Velkerri 76 S2 well site. These activities are captured in existing plans such as rehabilitation, weed, fire, ESCP, that are part of the Beetaloo Multi-well EMP.</td><td colspan="2">Yes.

The environmental outcomes pertaining to the protection of soils, surface water, groundwater, ecology and community are covered by the Beetaloo Multi-well EMP.

The impacts and risks will continue to be managed to ALARP and acceptable.</td></tr>
</table>

[2] Includes rehabilitation of the infrastructure.

Interest holder	Tamboran B2 Pty Ltd	**EMP Title**	Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan	**Unique EMP ID**	ORI10-3	**Mod #**	5	**Date**	20 January 2025
Additional contextual information	The purpose of this regulation 22 notification is to clearly identify the remaining regulated activities under the *Beetaloo Basin Velkerri, Civil Construction EP76 S2 EMP* (ORI4-1) that will be fully subsumed into the *Beetaloo Sub-basin Velkerri 2019-2024 Drilling, Hydraulic fracturing and well testing EMP* (ORI5-4.1). Establishment of gravel pits is described in the Beetaloo Multi-well EMP as a regulated activity. No specific update to the environmental risk assessment necessary, as activities already captured and do not materially change the risks or impacts. AAPA Certificate C2020/003 for the Velkerri 76 S2 scope which was a variation to C2019/039. A regulation 14 notice has been submitted to DEPWS to close out the *Beetaloo Basin Velkerri, Civil Construction EP76 S2 EMP (ORI4-1.1)*. The construction, operation and management of gravel pits, access tracks and associated activities under ORI4-1.1 have been incorporated into the *Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 EMP (ORI10-3)*. The Beetaloo Multi-well EMP (ORI10-3) has four previous regulation 22 notifications as follows: ORI10-3.1 Water bore location change ORI10-3.2 Change to HF fluids ORI10-3.3 Change to completion fluids ORI10-3.4 Bore infrastructure and EMP edits. Tamboran B2 Pty Ltd is now the operator. As such any mention of Origin in the Beetaloo Multi-well EMP (ORI10-3) is replaced with Tamboran.						

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Current EMP text

Executive Summary

Table 1: Description of the proposed exploration and appraisal activities for the Amungee NW and Velkerri 76 S2 sites

Activity	Description
Velkerri 76 S2 scope	
Civil construction activities	• Installation of two additional E&A well cellars and conductors on the existing Velkerri 76 S2 lease pad to accommodate the proposed Velkerri 76 S2-2H and Velkerri 76 S2-3H E&A wells
Site set-up and mobilisation to support the Velkerri 76 S2-2H and Velkerri 76 S2-3H exploration well	• Use of existing access tracks to and from the Velkerri 76 S2 site from the Stuart Highway • Use of the existing Velkerri 76 S2 lease pad, camp pad and helicopter landing pad • Use of existing drilling sump to manage up to 3,000m3 • Use of existing sediment basin and site bund for wastewater management and storage • Set-up of two temporary camps – a main camp located on the camp pad (~70-person capacity) and a drilling mini-camp located on the lease pad (~8-person capacity) • Set-up of chemical and material storage areas • Set-up of drilling rig, including blow-out preventors, fluid systems and associated equipment such as pipe racks, power generation, offices, ablution blocks and cementing units • Set-up of HFS equipment, completions rig and equipment, well testing equipment, and other associated equipment at Velkerri 76 S2 • Approximately 44 traffic movements per day during site demobilisation
E&A activities at the Velkerri 76 S2 site including drilling, HFS and well testing of Velkerri 76 S2-2H and Velkerri 76 S2- 3H	• Operation of the two temporary camps • Transportation, handling and storage of bulk chemicals, fuels and wastes • Drilling of the Velkerri 76 S2-2H and Velkerri 76 S2-3H horizontal E&A wells, including the collection of reservoir quality data during drilling • Well design in accordance with the Code of Practice and approved Well Operations Management Plan (WOMP) including isolation of freshwater aquifers • HFS of Velkerri 76 S2-2H and Velkerri 76 S2-3H • Completion and well testing of the Velkerri 76 S2-2H and Velkerri 76 S2-3H E&A wells • Use of existing surface facilities • Well testing of the Velkerri 76 S2-1 vertical well • Storage of condensate • Gas and condensate flaring in accordance with Code of Practice requirements and as per US EPA 40 CFR 63.11, with a flare tip combustion efficiency of 98% • Trucking of condensate (where beneficial usage is authorised) • Beneficial use of appraisal gas and condensate for on-site power generation and use • Maintenance and monitoring works (including well work overs) on Velkerri 76 S2-2H and Velkerri 76 S2-3H wells in accordance with approved WOMP • Build up testing, suspension and decommissioning Velkerri 76 S2-2H and Velkerri 76 S2-3H E&A wells (if required) in accordance with the Code of Practice • Groundwater extraction of approximately 110 ML under existing groundwater extraction licence (WEL GRF 10285)

Amended EMP text

Executive Summary

Table 1: Description of the proposed exploration and appraisal activities for the Amungee NW and Velkerri 76 S2 sites

Activity	Description
Velkerri 76 S2 scope	
Civil construction activities	• Velkerri 76 S2 well site (7.4 ha) and access track construction and maintenance (10.9 ha). • Construction and operation of approved gravel pits VGP1, VGP2 and VGP3 (9 ha). • Installation of two additional E&A well cellars and conductors on the existing Velkerri 76 S2 lease pad to accommodate the proposed Velkerri 76 S2-2H and Velkerri 76 S2-3H E&A wells.
Site set-up and mobilisation to support the Velkerri 76 S2-2H and Velkerri 76 S2-3H exploration well	• Use of existing access tracks to and from the Velkerri 76 S2 site and gravel pits from the Stuart Highway (noting 80 km is an existing pastoral track constructed by the pastoralist that Tamboran currently maintain) • Use of the existing Velkerri 76 S2 well pad, camp pad, stockpile storage and helicopter landing pad • Use of existing drilling sump to manage up to 3,000 m^3 • Use of existing sediment basin and site bund for wastewater management and storage • Set-up of two temporary camps – a main camp located on the camp pad (~70-person capacity) and a drilling mini-camp located on the well pad (~8-person capacity) • Set-up of chemical and material storage areas • Set-up of drilling rig, including blow-out preventors, fluid systems and associated equipment such as pipe racks, power generation, offices, ablution blocks and cementing units • Set-up of HFS equipment, completions rig and equipment, well testing equipment, and other associated equipment at Velkerri 76 S2 • Approximately 44 traffic movements per day during site demobilisation
E&A activities at the Velkerri 76 S2 site including drilling, HFS and well testing of Velkerri 76 S2-2H and Velkerri 76 S2- 3H	• Operation of the two temporary camps • Transportation, handling and storage of bulk chemicals, fuels and wastes • Drilling of the Velkerri 76 S2-2H and Velkerri 76 S2-3H horizontal E&A wells, including the collection of reservoir quality data during drilling • Well design in accordance with the Code of Practice and approved Well Operations Management Plan (WOMP) including isolation of freshwater aquifers • HFS of Velkerri 76 S2-2H and Velkerri 76 S2-3H • Completion and well testing of the Velkerri 76 S2-2H and Velkerri 76 S2-3H E&A wells • Use of existing surface facilities • Well testing of the Velkerri 76 S2-1 vertical well • Storage of condensate

Interest holder	Tamboran B2 Pty Ltd	EMP Title	Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan	Unique EMP ID	ORI10-3	Mod #	5	Date	20 January 2025

Current EMP text		Amended EMP text	
	• Monitoring activities (including groundwater, stormwater, soils, leak detection and all other low impact ancillary data collection programs)		• Gas and condensate flaring in accordance with Code of Practice requirements and as per US EPA 40 CFR 63.11, with a flare tip combustion efficiency of 98% • Trucking of condensate (where beneficial usage is authorised) • Beneficial use of appraisal gas and condensate for on-site power generation and use • Maintenance and monitoring works (including well work overs) on Velkerri 76 S2-2H and Velkerri 76 S2-3H wells in accordance with approved WOMP • Build up testing, suspension and decommissioning Velkerri 76 S2-2H and Velkerri 76 S2-3H E&A wells (if required) in accordance with the Code of Practice • Groundwater extraction of approximately 110 ML under existing groundwater extraction licence (WEL GRF 10285) • Monitoring activities (including groundwater, stormwater, soils, leak detection and all other low impact ancillary data collection programs)
On-site wastewater management to support ongoing E&A program	• On-site wastewater storage and treatment in accordance with Code of Practice • Use of the drilling sump, enclosed wastewater storage tanks and wastewater treatment tanks to manage drilling and flowback wastewater • Drill cuttings and flowback fluid quality testing in accordance with the Code of Practice • Disposal of drill cuttings within EP76 is subject to the outcomes of chemical analysis in accordance with clause C.4.1.2 of the Code of Practice • Drilling waste storage and disposal located within the existing Velkerri 76 S2 site or transported off-site • On-site treatment of wastewater through evaporation or other alternative methods (such as enhanced evaporation or other mechanical water treatment options) • Off-site disposal of wastewater in accordance with the Waste Management and Pollution Control Act	On-site wastewater management to support ongoing E&A program	• On-site wastewater storage and treatment in accordance with Code of Practice • Use of the drilling sump, enclosed wastewater storage tanks and wastewater treatment tanks to manage drilling and flowback wastewater • Drill cuttings and flowback fluid quality testing in accordance with the Code of Practice • Disposal of drill cuttings within EP76 is subject to the outcomes of chemical analysis in accordance with clause C.4.1.2 of the Code of Practice • Drilling waste storage and disposal located within the existing Velkerri 76 S2 site or transported off-site • On-site treatment of wastewater through evaporation or other alternative methods (such as enhanced evaporation or other mechanical water treatment options) • Off-site disposal of wastewater in accordance with the Waste Management and Pollution Control Act
Site demobilisation	• Demobilisation of exploration equipment, including camps, drilling rigs, HFS equipment, completion rigs, well testing equipment, wastewater storage tanks and various service provider equipment. • Approximately 44 traffic movements per day during site demobilisation.	Site demobilisation	• Demobilisation of exploration equipment, including camps, drilling rigs, HFS equipment, completion rigs, well testing equipment, wastewater storage tanks and various service provider equipment. • Approximately 44 traffic movements per day during site demobilisation.
Site rehabilitation	• Decommissioning and removal of all surface infrastructure and wastes from site including the removal of drilling sump, wastewater tanks, cellars, equipment, non-drilling waste, wastewater and all ancillary equipment • Final rehabilitation activities to return the sites back to a safe, stable and non-polluting form consistent with pre-disturbed condition as outlined in the Velkerri 76 S2 Civil Construction EMP (NT-2050-15-MP-31)	Site rehabilitation	• Decommissioning and removal of all surface infrastructure and wastes from site including the removal of drilling sump, wastewater tanks, cellars, equipment, non-drilling waste, wastewater and all ancillary equipment • Final rehabilitation activities to return the sites back to a safe, stable and non-polluting form consistent with pre-disturbed condition as outlined in the Velkerri 76 S2 Rehabilitation Plan (Appendix O).
The proposed activities will occur within the subject land area which has been approved by the Native Title holders and the Northern Land Council (NLC) and covered by AAPA Certificate C2020/003 and C2022/02.		The proposed activities will occur within the subject land area which has been approved by the Native Title holders and the Northern Land Council (NLC) and covered by AAPA Certificate C2022/02 for the Amungee NW scope and C2020/003 for the Velkerri 76 S2 scope.	

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Current EMP text	Amended EMP text
ES - Description of the existing environment ……. The existing disturbance footprint of the Velkerri 76 S2 site, which currently contains the Velkerri 76 S2-1 E&A well, is approximately 6.7 ha including well lease pad, laydown yard, camp lease pad, stockpile storage area. Existing access tracks connect Velkerri 76 S2 to existing off-site existing gravel pits on EP76. There is no proposed increase to the Velkerri 76 S2 disturbance footprint under this EMP. **NB disturbance footprint calculation in the Beetaloo Multi-well EMP missed the helipad and stockpile storage area. This has been corrected in the amended EMP text.**	**ES - Description of the existing environment** ……. The existing disturbance footprint of the Velkerri 76 S2 site, which currently contains the Velkerri 76 S2-1 E&A well, is approximately 7.4 ha including well pad and laydown yard, camp pad, helipad, stockpile storage area. Existing access tracks connect Velkerri 76 S2 to existing off-site gravel pits on EP76 (VGP1, VGP2 and VGP3). There is no proposed increase to the Velkerri 76 S2 disturbance footprint under this EMP. The total disturbance footprint of the Velkerri 76 S2 well site and associated access tracks and gravel pits is 27.3 ha.
ES – Key environmental risks assessed in the program …… At completion of E&A activities, the sites will be returned to a safe, stable and non-polluting form consistent with pre-disturbed condition and as per the Velkerri 76 S2 Civil Construction EMP (NT-2050-15-MP-31) for the Velkerri 76 S2 site.	**ES – Key environmental risks assessed in the program** …… At completion of E&A activities, the sites will be returned to a safe, stable and non-polluting form consistent with pre-disturbed condition and as outlined in the Rehabilitation Plan (Appendix O).
1.2 Project Boundary Origin proposes to drill, stimulate and test up to two additional petroleum E&A wells on both the Amungee NW and Velkerri 76 S2 sites within EP98 and EP 76 (total of four new wells). These wells will target the Velkerri shale resource.The boundary of this EMP is defined as the area which may be affected by E&A activities. This includes: - existing access tracks to the Velkerri 76 S2 site and Amungee NW site - proposed access track (1.1 km) to the Amungee NW2 location (1.5 ha) - existing Amungee NW and Velkerri 76 S2 lease pad, camp pad, and associated infrastructure (water bores) - existing Velkerri 76 S2 chemical storage areas, lease pad bund, sediment basin, wastewater tanks and drilling sump - proposed expansion of the existing Amungee NW lease pad and camp pad, including the installation of a new fence line and fire break - proposed construction of a helipad and laydown yard at Amungee NW - proposed installation of groundwater extraction/ monitoring bores, including 2 groundwater monitoring bores at the Amungee NW2 location (2.0 ha) - proposed drilling, stimulation, well testing and suspension and abandonment of an additional two petroleum E&A wells at each of the Amungee NW and Velkerri 76 S2 sites - proposed well testing on the existing Amungee NW-1H and Velkerri 76 S2-1 wells. The proposed locations of the infrastructure and associated regulated activities are provided in Table 6 and Figure 5 to Figure 7.	**1.2 Project Boundary** Tamboran proposes to drill, stimulate and test up to two additional petroleum E&A wells on both the Amungee NW and Velkerri 76 S2 sites within EP 98 and EP 76 (total of four new wells). These wells will target the Velkerri shale resource.The boundary of this EMP is defined as the area which may be affected by E&A activities. This includes: - existing access tracks to the Velkerri 76 S2 site and Amungee NW site - proposed access track (1.1 km) to the Amungee NW2 location (1.5 ha) - existing Amungee NW and Velkerri 76 S2 well pad, camp pad, and associated infrastructure (i.e. gravel pits (VGP1, VGP2 and VGP3), water bores, laydown yard, helipad and stockpile storage areas) - existing Velkerri 76 S2 chemical storage areas, well pad bund, sediment basin, wastewater tanks and drilling sump - proposed expansion of the existing Amungee NW lease pad and camp pad, including the installation of a new fence line and fire break - proposed construction of a helipad and laydown yard at Amungee NW - proposed installation of groundwater extraction/ monitoring bores, including 2 groundwater monitoring bores at the Amungee NW2 location (2.0 ha) - proposed drilling, stimulation, well testing and suspension and abandonment of an additional two petroleum E&A wells at each of the Amungee NW and Velkerri 76 S2 sites - proposed well testing on the existing Amungee NW-1H and Velkerri 76 S2-1 wells. The proposed locations of the infrastructure and associated regulated activities are provided in Table 6 and Figure 5 to Figure 8.
Not applicable	**Figure 8: Location of gravel pits VGP1 – VGP3**

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Current EMP text

Table 6: Associated exploration sites and infrastructure covered under this EMP

Exploration Permit	Infrastructure name	Station	Zone*	Approx. Easting	Approx. Northing
Velkerri 76 S2					
EP 76	Existing approved Velkerri 76 S2 lease pad	Amungee Mungee	53	435557	8137497
EP76	Existing approved Velkerri 76 S2-1 E&A well	Amungee Mungee	53	435578	8136331
EP 76	Proposed Velkerri 76 S2-2H E&A well	Amungee Mungee	53	435578	8136346
EP 76	Proposed Velkerri 76 S2-3H E&A well	Amungee Mungee	53	435578	8136362
*Universal Transverse Mercator (UTM) geographic coordinate system is Geocentric Datum of Australia (GDA) 94					

Amended EMP text

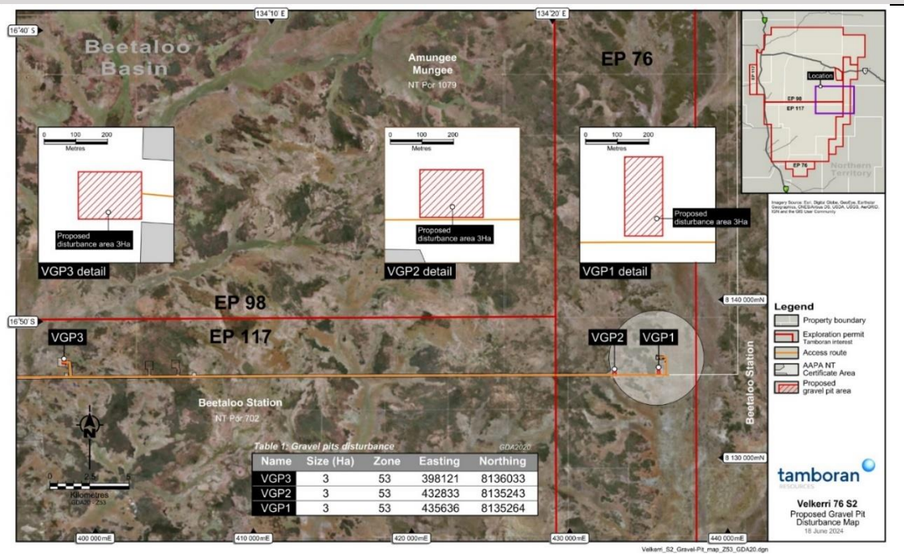

Table 6: Associated exploration sites and infrastructure covered under this EMP

Exploration Permit	Infrastructure name	Station	Zone*	Approx. Easting	Approx. Northing
Velkerri 76 S2					
EP 76	Existing approved Velkerri 76 S2 well pad	Amungee Mungee	53	435557	8137497
EP76	Existing approved Velkerri 76 S2-1 E&A well	Amungee Mungee	53	435578	8136331
EP 76	Proposed Velkerri 76 S2-2H E&A well	Amungee Mungee	53	435578	8136346
EP 76	Proposed Velkerri 76 S2-3H E&A well	Amungee Mungee	53	435578	8136362
EP 76	Existing Velkerri 76 S2 main camp	Amungee Mungee	53	435632	8136163
EP 76	Gravel Pit - VGP1	Amungee Mungee	53	398121	8136033
EP 76	Gravel Pit – VGP2	Amungee Mungee	53	432833	8135243
EP 76	Gravel Pit – VGP3	Amungee Mungee	53	398121	8136033
EP 76/117	Existing access tracks (tracks to gravel pits, well site and 80 km existing pastoral track – 18.3 ha)	Amungee Mungee	Refer Figure 5 and Figure 8		
*Universal Transverse Mercator (UTM) geographic coordinate system is Geocentric Datum of Australia (GDA) 94					

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Current EMP text

3. Description of regulated activity

This EMP covers the regulated activities required to enable Origin to drill, stimulate, test, maintain and decommission the four proposed horizontal E&A wells within the 2022-2026 period. To accommodate this scope, the activities summarised in Table 8 are proposed to be executed under this EMP.

Table 8: Description of the proposed exploration and appraisal activities for the Amungee NW and Velkerri 76 S2 sites

Activity	Description
Velkerri 76 S2 scope	
Civil construction activities	• Installation of two additional E&A well cellars and conductors on the existing Velkerri 76 S2 lease pad to accommodate the proposed Velkerri 76 S2-2H and Velkerri 76 S2-3H E&A wells
Site set-up and mobilisation to support the Velkerri 76 S2-2H and Velkerri 76 S2-3H exploration well	• Use of existing access tracks to and from the Velkerri 76 S2 site from the Stuart Highway • Use of the existing Velkerri 76 S2 lease pad, camp pad and helicopter landing pad • Use of existing drilling sump to manage up to 3,000m3 • Use of existing sediment basin and site bund for wastewater management and storage • Set-up of two temporary camps – a main camp located on the camp pad (~70-person capacity) and a drilling mini-camp located on the lease pad (~8-person capacity) • Set-up of chemical and material storage areas • Set-up of drilling rig, including blow-out preventors, fluid systems and associated equipment such as pipe racks, power generation, offices, ablution blocks and cementing units • Set-up of HFS equipment, completions rig and equipment, well testing equipment, and other associated equipment at Velkerri 76 S2 • Approximately 44 traffic movements per day during site demobilisation
E&A activities at the Velkerri 76 S2 site including drilling, HFS and well testing of Velkerri 76 S2-2H and Velkerri 76 S2- 3H	• Operation of the two temporary camps • Transportation, handling and storage of bulk chemicals, fuels and wastes • Drilling of the Velkerri 76 S2-2H and Velkerri 76 S2-3H horizontal E&A wells, including the collection of reservoir quality data during drilling • Well design in accordance with the Code of Practice and approved Well Operations Management Plan (WOMP) including isolation of freshwater aquifers • HFS of Velkerri 76 S2-2H and Velkerri 76 S2-3H • Completion and well testing of the Velkerri 76 S2-2H and Velkerri 76 S2-3H E&A wells • Use of existing surface facilities • Well testing of the Velkerri 76 S2-1 vertical well • Storage of condensate • Gas and condensate flaring in accordance with Code of Practice requirements and as per US EPA 40 CFR 63.11, with a flare tip combustion efficiency of 98% • Trucking of condensate (where beneficial usage is authorised) • Beneficial use of appraisal gas and condensate for on-site power generation and use • Maintenance and monitoring works (including well work overs) on Velkerri 76 S2-2H and Velkerri 76 S2-3H wells in accordance with approved WOMP • Build up testing, suspension and decommissioning Velkerri 76 S2-2H and Velkerri 76 S2-3H E&A wells (if required) in accordance with the Code of Practice

Amended EMP text

3. Description of regulated activity

This EMP covers the regulated activities required to enable Tamboran to drill, stimulate, test, maintain and decommission the four proposed horizontal E&A wells within the 2022-2026 period. To accommodate this scope, the activities summarised in Table 8 are proposed to be executed under this EMP.

Table 8: Description of the proposed exploration and appraisal activities for the Amungee NW and Velkerri 76 S2 sites

Activity	Description
Velkerri 76 S2 scope	
Civil construction activities	• Velkerri 76 S2 well site (7.4 ha) and access track construction and maintenance (10.9 ha). • Construction and operation of approved gravel pits VGP1, VGP2 and VGP3 (9 ha). • Installation of two additional E&A well cellars and conductors on the existing Velkerri 76 S2 lease pad to accommodate the proposed Velkerri 76 S2-2H and Velkerri 76 S2-3H E&A wells.
Site set-up and mobilisation to support the Velkerri 76 S2-2H and Velkerri 76 S2-3H exploration well	• Use of existing access tracks to and from the Velkerri 76 S2 site and gravel pits from the Stuart Highway (noting 80 km is an existing pastoral track constructed by the pastoralist that Tamboran currently maintain) • Use of the existing Velkerri 76 S2 well pad, camp pad, stockpile storage and helicopter landing pad • Use of existing drilling sump to manage up to 3,000 m^3 • Use of existing sediment basin and site bund for wastewater management and storage • Set-up of two temporary camps – a main camp located on the camp pad (~70-person capacity) and a drilling mini-camp located on the well pad (~8-person capacity) • Set-up of chemical and material storage areas • Set-up of drilling rig, including blow-out preventors, fluid systems and associated equipment such as pipe racks, power generation, offices, ablution blocks and cementing units • Set-up of HFS equipment, completions rig and equipment, well testing equipment, and other associated equipment at Velkerri 76 S2 • Approximately 44 traffic movements per day during site demobilisation
E&A activities at the Velkerri 76 S2 site including drilling, HFS and well testing of Velkerri 76 S2-2H and Velkerri 76 S2- 3H	• Operation of the two temporary camps • Transportation, handling and storage of bulk chemicals, fuels and wastes • Drilling of the Velkerri 76 S2-2H and Velkerri 76 S2-3H horizontal E&A wells, including the collection of reservoir quality data during drilling • Well design in accordance with the Code of Practice and approved Well Operations Management Plan (WOMP) including isolation of freshwater aquifers • HFS of Velkerri 76 S2-2H and Velkerri 76 S2-3H • Completion and well testing of the Velkerri 76 S2-2H and Velkerri 76 S2-3H E&A wells • Use of existing surface facilities • Well testing of the Velkerri 76 S2-1 vertical well

Interest holder	Tamboran B2 Pty Ltd	EMP Title	Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan	Unique EMP ID	ORI10-3	Mod #	5	Date	20 January 2025

Current EMP text

	• Groundwater extraction of approximately 110 ML under existing groundwater extraction licence (WEL GRF 10285) • Monitoring activities (including groundwater, stormwater, soils, leak detection and all other low impact ancillary data collection programs)
On-site wastewater management to support ongoing E&A program	• On-site wastewater storage and treatment in accordance with Code of Practice • Use of the drilling sump, enclosed wastewater storage tanks and wastewater treatment tanks to manage drilling and flowback wastewater • Drill cuttings and flowback fluid quality testing in accordance with the Code of Practice • Disposal of drill cuttings within EP76 is subject to the outcomes of chemical analysis in accordance with clause C.4.1.2 of the Code of Practice • Drilling waste storage and disposal located within the existing Velkerri 76 S2 site or transported off-site • On-site treatment of wastewater through evaporation or other alternative methods (such as enhanced evaporation or other mechanical water treatment options) • Off-site disposal of wastewater in accordance with the Waste Management and Pollution Control Act
Site demobilisation	• Demobilisation of exploration equipment, including camps, drilling rigs, HFS equipment, completion rigs, well testing equipment, wastewater storage tanks and various service provider equipment. • Approximately 44 traffic movements per day during site demobilisation.
Site rehabilitation	• Decommissioning and removal of all surface infrastructure and wastes from site including the removal of drilling sump, wastewater tanks, cellars, equipment, non-drilling waste, wastewater and all ancillary equipment • Final rehabilitation activities to return the sites back to a safe, stable and non-polluting form consistent with pre-disturbed condition as outlined in the Velkerri 76 S2 Civil Construction EMP (NT-2050-15-MP-31)

Table 13: Velkerri 76 S2 site activity summary table

Component	Existing Velkerri 76 S2 site	EMP scope	Total site activity summary
General			
Number of E&A wells	One appraisal well: Velkerri 76 S2-1H	Two additional E&A wells: Velkerri 76 S2-2H, Velkerri 76 S2-3H	3 E&A wells (One vertical and two horizontal wells)

Amended EMP text

	• Storage of condensate • Gas and condensate flaring in accordance with Code of Practice requirements and as per US EPA 40 CFR 63.11, with a flare tip combustion efficiency of 98% • Trucking of condensate (where beneficial usage is authorised) • Beneficial use of appraisal gas and condensate for on-site power generation and use • Maintenance and monitoring works (including well work overs) on Velkerri 76 S2-2H and Velkerri 76 S2-3H wells in accordance with approved WOMP • Build up testing, suspension and decommissioning Velkerri 76 S2-2H and Velkerri 76 S2-3H E&A wells (if required) in accordance with the Code of Practice • Groundwater extraction of approximately 110 ML under existing groundwater extraction licence (WEL GRF 10285) • Monitoring activities (including groundwater, stormwater, soils, leak detection and all other low impact ancillary data collection programs)
On-site wastewater management to support ongoing E&A program	• On-site wastewater storage and treatment in accordance with Code of Practice • Use of the drilling sump, enclosed wastewater storage tanks and wastewater treatment tanks to manage drilling and flowback wastewater • Drill cuttings and flowback fluid quality testing in accordance with the Code of Practice • Disposal of drill cuttings within EP76 is subject to the outcomes of chemical analysis in accordance with clause C.4.1.2 of the Code of Practice • Drilling waste storage and disposal located within the existing Velkerri 76 S2 site or transported off-site • On-site treatment of wastewater through evaporation or other alternative methods (such as enhanced evaporation or other mechanical water treatment options) • Off-site disposal of wastewater in accordance with the Waste Management and Pollution Control Act
Site demobilisation	• Demobilisation of exploration equipment, including camps, drilling rigs, HFS equipment, completion rigs, well testing equipment, wastewater storage tanks and various service provider equipment. • Approximately 44 traffic movements per day during site demobilisation.
Site rehabilitation	• Decommissioning and removal of all surface infrastructure and wastes from site including the removal of drilling sump, wastewater tanks, cellars, equipment, non-drilling waste, wastewater and all ancillary equipment • Final rehabilitation activities to return the sites back to a safe, stable and non-polluting form consistent with pre-disturbed condition as outlined in the Velkerri 76 S2 Rehabilitation Plan (Appendix O).

Table 13: Velkerri 76 S2 site activity summary table

Component	Existing Velkerri 76 S2 site	EMP scope	Total site activity summary
General			
Number of E&A wells	One appraisal well: Velkerri 76 S2-1H spudded 12 August 2021	Two additional E&A wells: Velkerri 76 S2-2H, Velkerri 76 S2-3H	3 E&A wells (One vertical and two horizontal wells)

Interest holder	Tamboran B2 Pty Ltd	EMP Title	Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan	Unique EMP ID	ORI10-3	Mod #	5	Date	20 January 2025

Current EMP text			
Number of stimulations	Existing Velkerri 76 S2-1 to be stimulated in 2022	Stimulation of Velkerri 76 S2-2H, Velkerri 76 S2-3H	3
Number of water extraction/monitoring bores	Two existing bores: RN041133 (monitoring), RN041134 (production / monitoring) and 2 additional proposed	0	4
Number of gravel pits approved under EMP	3	0	3
Operational workforce	~20 people during operations	70 people during drilling and stimulation activities 2-4 people during well testing	<70 people
Main camp capacity	N/A camp decommissioned	70-person	70-person
Drilling mini-camp	N/A camp decommissioned	8-person	8-person
Stages per well	20	20	N/A
Proppant use	1500t	180t -250t of proppant per stage per well	10,500 to 14,000t
Disturbance			
AAPA certificate	All works covered under C2020/003		
Total area of disturbance	6.70 ha (4.5 ha lease pad, 1 ha wet weather laydown yard, 1.2 ha camp lease pad)	N/A no change to existing disturbance area	6.70 ha
Traffic			
Peak traffic movements (per day)	<16 vehicles per day during peak mobilization and demobilization	44	44
Average traffic movements first 6-9 months post mobilisation	4-6 trucks per day	10-15 (for 6-months)	10-15 (for 6-months)
Average traffic movements for remaining 6 months	1 per week	3-4 (for 6-months)	3-4 (for 6-months)
Truck load-out: wastewater transport	N/A	~40 truck movements	~40 truck movements
Water use and stormwater management			
Groundwater extraction licence	All take covered under existing WEL GRF 10285		
Estimated groundwater usage	N/A	110ML	110ML
Stormwater retention basin	Existing sediment basin	Existing sediment basin	Existing sediment basin
Wastewater management			
Flowback/wastewater volume generated on-site	1.8ML[3]	24ML (12ML/well)	24ML (12ML/well)
Enclosed wastewater tank capacity	N/A	Wet season: 26.5ML (5 x 5.3ML tanks) Dry season: 10.6ML (2 x 5.3ML tanks)	Wet season: 26.5ML Dry season: 10.6ML
Open treatment tank capacity (including freeboard)	3.2 ML (1 x 3.2 ML tanks)	Wet season: 6.5ML (5 x 5.3ML tanks)	Wet season: 6.5ML Dry season: 34.4ML

Amended EMP text			
Number of stimulations	Velkerri 76 S2-1 suspended, vertical stimulation delayed	Stimulation of Velkerri 76 S2-2H, Velkerri 76 S2-3H	3 stimulations
Number of water extraction/monitoring bores	Two existing bores: RN041133 (monitoring), RN041134 (production / monitoring) and 2 additional proposed	0	4
Number of gravel pits approved under EMP	3	3	3
Operational workforce	~20 people during operations	70 people during drilling and stimulation activities 2-4 people during well testing	<70 people
Main camp capacity	N/A camp decommissioned	70-person	70-person
Drilling mini-camp	N/A camp decommissioned	8-person	8-person
Stages per well	20	20	N/A
Proppant use	1500t	180t -250t of proppant per stage per well	10,500 to 14,000t
Disturbance			
AAPA certificate	All works covered under C2020/003		
Total area of disturbance	7.4 ha (4.5 ha well pad, 1 ha laydown yard, 1.2 ha camp pad, 0.5 ha helipad, stockpile storage area 0.2 ha)	N/A no change – total disturbance area of 27.3 ha	7.4 ha
	3 x 3 ha gravel pit		9.0 ha
	82 km of access tracks (pastoral track and constructed track to well site and gravel pits)		10.9 ha
Traffic			
Peak traffic movements (per day)	<16 vehicles per day during peak mobilization and demobilization	44	44
Average traffic movements first 6-9 months post mobilisation	4-6 trucks per day	10-15 (for 6-months)	10-15 (for 6-months)
Average traffic movements for remaining 6 months	1 per week	3-4 (for 6-months)	3-4 (for 6-months)
Truck load-out: wastewater transport	N/A	~40 truck movements	~40 truck movements
Water use and stormwater management			
Groundwater extraction licence	All take covered under existing WEL GRF 10285		
Estimated groundwater usage	N/A	110 ML	110 ML
Stormwater retention basin	Existing sediment basin	Existing sediment basin	Existing sediment basin
Wastewater management			
Flowback/wastewater volume generated on-site	1.8 ML[4]	24 ML (12 ML/well)	24 ML (12 ML/well)

[3] Assumes a vertical 4 stage HFS
[4] Assumes a vertical 4 stage HFS

Interest holder	Tamboran B2 Pty Ltd	EMP Title	Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan	Unique EMP ID	ORI10-3	Mod #	5	Date	20 January 2025

Current EMP text

		Dry season: 34.4ML (8 x 5.3ML tanks)	
Bunded tank pad containment capacity	10ML	10ML	10ML
Maximum flowback wastewater on-site	1.8[4]	14.91ML	14.91ML
Flowback/wastewater volume (final predicted for treatment and off-site disposal)	0.2ML	1ML	1ML
Sump capacity	~3,000m^3	Use existing sump	3,000m^3
Total volume of drilling mud and cuttings generated	N/A	~1,500m^3	~1,500m^3
Total volume of waste drilling and completion fluid per well	N/A	2ML per well	4ML
Transfer pumps	6 x 6 inch: up to 23 ML/day	6 x 6 inch: up to 23 ML/day	6 x 6 inch: up to 23 ML/day
Greenhouse gases and emissions			
Flares	Vertical and horizontal flare	Horizontal flare	Vertical and horizontal flare
tCO_2-e emissions	N/A	70,229 to 130,852 tCO_2-e (Maximum 180 day well test)	70,229 to 130,852 tCO_2-e (Maximum 180 day well test)

Amended EMP text

Enclosed wastewater tank capacity	N/A	Wet season: 26.5 ML (5 x 5.3ML tanks) Dry season: 10.6 ML (2 x 5.3 ML tanks)	Wet season: 26.5 ML Dry season: 10.6 ML
Open treatment tank capacity (including freeboard)	3.2 ML (1 x 3.2 ML tanks)	Wet season: 6.5 ML (5 x 5.3ML tanks) Dry season: 34.4 ML (8 x 5.3ML tanks)	Wet season: 6.5 ML Dry season: 34.4 ML
Bunded tank pad containment capacity	10 ML	10 ML	10 ML
Maximum flowback wastewater on-site	1.8[4]	14.91ML	14.91ML
Flowback/wastewater volume (final predicted for treatment and off-site disposal)	0.2ML	1ML	1ML
Sump capacity	~3,000 m^3	Use existing sump	3,000 m^3
Total volume of drilling mud and cuttings generated	N/A	~1,500m^3	~1,500 m^3
Total volume of waste drilling and completion fluid per well	N/A	2 ML per well	4 ML
Transfer pumps	6 x 6 inch: up to 23 ML/day	6 x 6 inch: up to 23 ML/day	6 x 6 inch: up to 23 ML/day
Greenhouse gases and emissions			
Flares	Vertical and horizontal flare	Horizontal flare	Vertical and horizontal flare
tCO_2-e emissions	N/A	70,229 to 130,852 tCO_2-e (Maximum 180 day well test)	70,229 to 130,852 tCO_2-e (Maximum 180 day well test)

3.7 Gravel pit construction

Gravel will be required to surface the expanded lease pad, camp pad, laydown area, helipad and access tracks. Gravel will be sourced from a new gravel pit located approximately 11km East of the Amungee NW site within the Amungee Mungee Station. The pit will be constructed and expanded progressively to 3.5ha, with approximately 10,000m^3 of gravel sourced from the pit.

Gravel pits will be cleared, with topsoil and subsoil stripped, segregated and stockpiled onsite for future revegetation.

Gravel pit rehabilitation will commence within 12 months once there is no viable gravel left. However, if viable gravel remains, gravel pits may be transferred to the pastoralist subject to approval form both DEPWS and pastoralist.

Gravel pits are anticipated to be up to 3m in depth, with the final depth dependent on the level of gravel present at the site. Fencing will be used around gravel pits where the pit batters represent a potential fall hazard to livestock and fauna.

Upon cessation of activities, the gravel pits will be recontoured back to a stable, safe and non-polluting form. Subsoils and topsoil will be reinstated across the gravel pit and natural revegetation used as the primary vegetation reinstatement measure.

Note: the Amugee NW gravel pit was removed by regulation 22 notice to enable construction of access track (1.5 ha) for Amungee NW2 and 2 bore pads (2 ha). (ORI10-3.1).

3.7 Gravel pits

Gravel will be sourced from one of the three gravel pits (VGP1, VGP2 or VGP3) for Velkerri 76 S2 activities summarised in Table 13.1 and shown in Figure 8. Approximately 10,000 m3 of gravel in total will be required to surface the well pad, camp pads and access tracks. This may be extracted from one pit, or from multiple pits depending on the volume and quality of the gravel encountered at each proposed gravel pit location (Figure 8).

Table 13.1 Gravel pit locations

Exploration Permit	Infrastructure Name	Station	Zone*	Approx Easting	Approx Northing	Disturbance Area (ha)
EP76	VGP1	Amungee Mungee	53	435623	8135301	3.0^
EP 76	VGP2	Amungee Mungee	53	433019	8135263	3.0^
EP117	VGP3	Amungee Mungee	53	397906	8136039	3.0^
					Total Disturbance Area (Ha)	**9.0**

** Universal Transverse Mercator (UTM) geographic coordinate system is Geocentric Datum of Australia (GDA) 94.*

A typical image of a gravel pit in the Beetaloo is provided in Figure 1.

Interest holder	Tamboran B2 Pty Ltd	EMP Title	Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan	Unique EMP ID	ORI10-3	Mod #	5	Date	20 January 2025

Current EMP text	Amended EMP text
	 *Figure 1: Example of a typical operational gravel pit* Gravel pits will be cleared, with topsoil and subsoil stripped, segregated and stockpiled onsite for future revegetation. Gravel pit rehabilitation will commence within 12 months once there is no viable gravel left. However, if viable gravel remains, gravel pits may be transferred to the pastoralist subject to approval form both DEPWS and pastoralist. Gravel pits are anticipated to be up to 3 m in depth, with the final depth dependent on the level of gravel present at the site. Fencing will be used around gravel pits where the pit batters represent a potential fall hazard to livestock and fauna. Upon cessation of activities, the gravel pits will be recontoured back to a stable, safe and non-polluting form. Subsoils and topsoil will be reinstated across the gravel pit and natural revegetation used as the primary vegetation reinstatement measure.

Interest holder	Tamboran B2 Pty Ltd	EMP Title	Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan	Unique EMP ID	ORI10-3	Mod #	5	Date	20 January 2025

Current EMP text

6.6.4 Ecology – flora, fauna and habitat

Table 52: Environmental outcomes, performance standards and measurement criteria – Ecology

Environmental performance measures – Ecology				
Environmental outcome	**Environmental performance standards**		**Measurement criteria**	**Records**
No significant impact to high valued habitats and threatened flora and fauna as a result of Origin's exploration activities	EC-1	No releases of wastewater (drilling fluid and flowback) off the lease into the surrounding vegetation	Weekly site inspections confirm no loss of containment (structural failure, overtopping or major spills) resulting in off-site releases of wastewater	Weekly site inspection completed during wastewater storage
	EC-2	<7 individual fauna deaths per week for 2 consecutive weeks caused by flowback water storage	Daily checks of wastewater tanks for fauna mortality	Fauna interaction log retained
	EC-3		Weekly checks of area immediately surrounding lease pad for fauna deaths	Fauna interaction log retained
	EC-4	<0 threatened fauna deaths caused by flowback storage	Daily checks of wastewater tanks for fauna mortality	Fauna interaction log retained
	EC-5		Weekly checks of area immediately surrounding lease pad for fauna deaths	Fauna interaction log retained
	EC-6	No uncontrolled bushfires caused by Origin's exploration activities	Zero reported incidents of uncontrolled bushfire caused by Origin's activities	Fire incident data to be retained for all Origin unplanned fires
	EC-7	Weed surveys completed on all Origin disturbed areas	6-monthly pre and post-wet season weed surveys completed on all Origin controlled disturbed areas	Annual weed monitoring and management report

Environmental performance measures – Ecology				
Environmental outcome	**Environmental performance standards**		**Measurement criteria**	**Records**
	EC-8	Year-on-year decline in the size and density of all weed infestations introduced as a result of Origin's activities	Annual report demonstrates weed infestation size and density of weed outbreaks introduced by Origin's activities are reducing each year	Annual weed monitoring and management report
Risk sources	• Activity (vehicle and machinery) noise and lighting on well pads and access tracks (Risk ID 32) • Structural failure and overtopping of flowback storage tanks and drilling sump (Risk ID 33) • Introduction and spread of weeds in the area (Risk ID 34) • Accidental ignition of fire from exploration activities (drilling, stimulation, flaring and general access (Risk ID 35) • Poor rehabilitation of the site reduces regional habitat and promotes weed invasions (Risk ID 36) • Trapping and drowning of fauna in storage tanks and sumps (Risk ID 37) • Contaminants in water and soil pass through the food chain and bioaccumulate in fauna causing detrimental impacts to local species and communities (Risk ID 38) • Vehicle collisions with fauna – fauna mortality results in a localised decline in species abundance (Risk ID 39) • Encouragement of feral animals and other pest species increases leading to competition with native species. This includes the introduction of cane toads (Risk ID 40)			

Amended EMP text

6.6.4 Table 52: Environmental outcomes, performance standards and measurement criteria – Ecology

Environmental performance measures – ecology				
Environmental outcome	**Environmental performance standards**		**Measurement criteria**	**Records**
No significant impact to high valued habitats and listed threatened flora and fauna from Tamboran's exploration activities.	EC-1	No releases of wastewater (drilling fluid and flowback) off the lease into the surrounding vegetation.	Weekly site inspections confirm no loss of containment (structural failure, overtopping or major spills) resulting in off-site releases of wastewater.	Weekly site inspection completed during wastewater storage.
	EC-2	<7 individual fauna deaths per week for 2 consecutive weeks caused by flowback water storage.	Daily checks of wastewater tanks for fauna mortality.	Fauna interaction log retained.
	EC-3		Weekly checks of area immediately surrounding lease pad for fauna deaths.	Fauna interaction log retained.
	EC-4	No listed threatened fauna deaths caused by flowback storage.	Daily checks of wastewater tanks for fauna mortality.	Fauna interaction log retained.
	EC-5		Weekly checks of area immediately surrounding lease pad for fauna deaths.	Fauna interaction log retained.
	EC-6	No uncontrolled bushfires caused by Tamboran's exploration activities	Zero reported incidents of uncontrolled bushfire caused by Tamboran's activities.	Fire incident data to be retained for all Tamboran unplanned fires.
	EC-7	Weed surveys completed on all Tamboran disturbed areas.	6-monthly pre and post-wet season weed surveys completed on all Tamboran controlled disturbed areas.	Annual weed monitoring and management report.
	EC-8	Year-on-year decline in the size and density of all weed infestations introduced because of Tamboran's activities.	Annual report demonstrates weed infestation size and density of weed outbreaks introduced by Tamboran's activities are reducing each year.	Annual weed monitoring and management report.
	EC-9	No unauthorised clearing.	Total clearing levels within the authorised clearing levels stated in the EMP. No clearing outside of approved areas defined in the EMP.	Survey and spatial data collected confirms disturbance levels are within approved limits and areas.
	EC-10	Wetlands and riparian vegetation protected from clearing.	No clearing of riparian vegetation or wetlands recorded.	Global positioning system (GPS) survey data for disturbed areas retained.
	EC-11	Impacts to large trees (>25cm trunk @ 1.3 m) minimised during clearing.	All large trees proposed to be cleared are recorded, with	Large tree clearing log to be retained including trees that were avoided.

Interest holder	Tamboran B2 Pty Ltd	EMP Title	Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan	Unique EMP ID	ORI10-3	Mod #	5	Date	20 January 2025

Current EMP text	Amended EMP text
	justification as to why clearing could not be avoided.
	EC-12 | No disturbance of Grey Falcon nesting sites | No clearing within 300 m of known Grey Falcon nesting sites. | Records of pre-clearance surveys retained documenting presence/absence of nesting sites.
	Risk sources • Activity (vehicle and machinery) noise and lighting on well pads, access tracks and gravel pits (Risk ID 32) • Structural failure and overtopping of flowback storage tanks and drilling sump (Risk ID 33) • Introduction and spread of weeds in the area (Risk ID 34) • Accidental ignition of fire from exploration activities (drilling, stimulation, flaring, clearing and general access (Risk ID 35) • Poor rehabilitation of the site reduces regional habitat and promotes weed invasions (Risk ID 36) • Trapping and drowning of fauna in storage tanks and sumps (Risk ID 37) • Contaminants in water and soil pass through the food chain and bioaccumulate in fauna causing detrimental impacts to local species and communities (Risk ID 38) • Vehicle collisions with fauna – fauna mortality results in a localised decline in species abundance (Risk ID 39) • Encouragement of feral animals and other pest species increases leading to competition with native species. This includes the introduction of cane toads (Risk ID 40) • Land clearing activities that could impact on listed threatened species and/or their habitat (Risk ID 46). • Cumulative risk from exploration activities and existing agricultural activities resulting in impacts to vegetation communities, fragmentation and poses a threat to protected flora and fauna (Risk ID 76).
7.4 Erosion and sediment control plan An erosion and sediment control plan has been developed to outline how the Amungee NW site will be operated to minimise the risk of erosion and sediment releases to the surrounding environment. The ESCP is provided in Appendix H.	**7.4 Erosion and sediment control plan** An erosion and sediment control plan has been developed to outline how the Amungee NW and Velkerri 76 S2 sites will be operated to minimise the risk of erosion and sediment releases to the surrounding environment. The ESCP is provided in Appendix H.
7.5 Rehabilitation Plan Once a determination has been made to decommission an asset, a site-specific rehabilitation strategy will be developed for each disturbed area in consultation with DEPWS. A specific strategy for each area is required to ensure the operational history of the site is considered during rehabilitation planning (such as spills etc.). As per the Code of Practice, rehabilitation will commence within 12 months of determining an asset is no longer required. Each petroleum well will be plugged and decommissioned in accordance with the Petroleum Codes of Practice. All tanks, surface infrastructure and wastes will be removed from site and disposed of in accordance with the Waste Management and Pollution Control Act 1998. All remaining assets with a residual beneficial use (such as water bores, laydown yards, gates, fences, fresh water tanks etc.) will be offered for transfer to the pastoralist, subject to DEPWS approval and compliance with the Code of Practice. Prior to considering the transfer of ownership, Origin will: - undertake an assessment of the current status of the asset and whether it can be beneficially used by the local pastoralist. Where a beneficial use is anticipated, identify works required to be undertaken to ready the asset for transfer (i.e. any repairs, site remediation, equipment removal etc.) - obtain written agreement from the pastoralist to take ownership of the asset and document any stipulated liabilities.	**7.5 Rehabilitation Plan** Once a determination has been made to decommission an asset, a site-specific rehabilitation strategy will be developed for each disturbed area in consultation with DEPWS. A specific strategy for each area is required to ensure the operational history of the site is considered during rehabilitation planning (such as spills etc.). As per the Code of Practice, rehabilitation will commence within 12 months of determining an asset is no longer required. Each petroleum well will be plugged and decommissioned in accordance with the Petroleum Codes of Practice. All tanks, surface infrastructure and wastes will be removed from site and disposed of in accordance with the Waste Management and Pollution Control Act 1998. All remaining assets with a residual beneficial use (such as water bores, laydown yards, gates, fences, fresh water tanks etc.) will be offered for transfer to the pastoralist, subject to DEPWS approval and compliance with the Code of Practice. Prior to considering the transfer of ownership, Tamboran will: - undertake an assessment of the status of the asset and whether it can be beneficially used by the local pastoralist. Where a beneficial use is anticipated, identify works required to be undertaken to ready the asset for transfer (i.e. any repairs, site remediation, equipment removal etc.) - obtain written agreement from the pastoralist to take ownership of the asset and document any stipulated liabilities.

Interest holder	Tamboran B2 Pty Ltd	**EMP Title**	Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Program Exploration Permit (EP) 98 & 76 Environment Management Plan	**Unique EMP ID**	ORI10-3	**Mod #**	5	**Date**	20 January 2025

Current EMP text	**Amended EMP text**
Where an asset cannot be beneficially utilised, the site will be rehabilitated to the pre-existing condition using assisted natural regeneration. This will include: - Removal of all surface facilities - Removal of all weeds and contaminated materials/wastes - Re-spreading of stockpiled topsoil - Backfilling of all open sumps - Reshaping the site to as close to natural form as possible - Ripping or scarifying any compacted surface - Spreading of stockpiled vegetation to aid in surface water flow control - Spreading seed of suitable local native species which has been determined through analogue sites representative surrounding vegetation communities - Any native seed supply and rehabilitation services will be sourced using Indigenous suppliers (where available). - Yearly monitoring of the rehabilitation success requirements to assess the rehabilitation status of a site and determine where additional remedial works are required The rehabilitation plan for Amungee is provided in Appendix O. Rehabilitation at Velkerri 76 S2 will be conducted in accordance with this EMP, the Beetaloo Basin Velkerri 76 S2 Drilling, Stimulation and Well Testing Program EMP (NT-2050-15-MP-032) and the Beetaloo Basin Velkerri 76 S2 Civil Construction EMP (NT-2050-15-MP-031).	Where an asset cannot be beneficially utilised, the site will be rehabilitated to the pre-existing condition using assisted natural regeneration. This will include: - Removal of all surface facilities - Removal of all weeds and contaminated materials/wastes - Re-spreading of stockpiled topsoil - Backfilling of all open sumps - Reshaping the site to as close to natural form as possible - Ripping or scarifying any compacted surface - Spreading of stockpiled vegetation to aid in surface water flow control - Spreading seed of suitable local native species which has been determined through analogue sites representative surrounding vegetation communities - Any native seed supply and rehabilitation services will be sourced using Indigenous suppliers (where available). - Yearly monitoring of the rehabilitation success requirements to assess the rehabilitation status of a site and determine where additional remedial works are required The rehabilitation plan for Amungee NW and Velkerri 76 S2 is provided in Appendix O.
Appendix H Erosion and Sediment Control Plan	A copy of the approved Tamboran Beetaloo Basin ESCP version 10 which incorporates Velkerri 76 S2 well site and associated access tracks is provided as Attachment 1.
Appendix O Rehabiliation Plan	Revised Appendix O to Tamboran template and in accordance with current DLPE Rehabiliation Plan requirements provided as Attachment 2.
All other appendices are consistent with the Beetaloo Multi-well EMP (ORI10-3).	

ATTACHMENT 1: Beetaloo ESCP V10

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

CPESC Review

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

Contents

Figures

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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, worker camps and access tracks, seismic lines as well as during ongoing maintenance and monitoring once sites are established.

The design of the exploration well pads, seismic lines and access tracks will 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, 2021)
- 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.

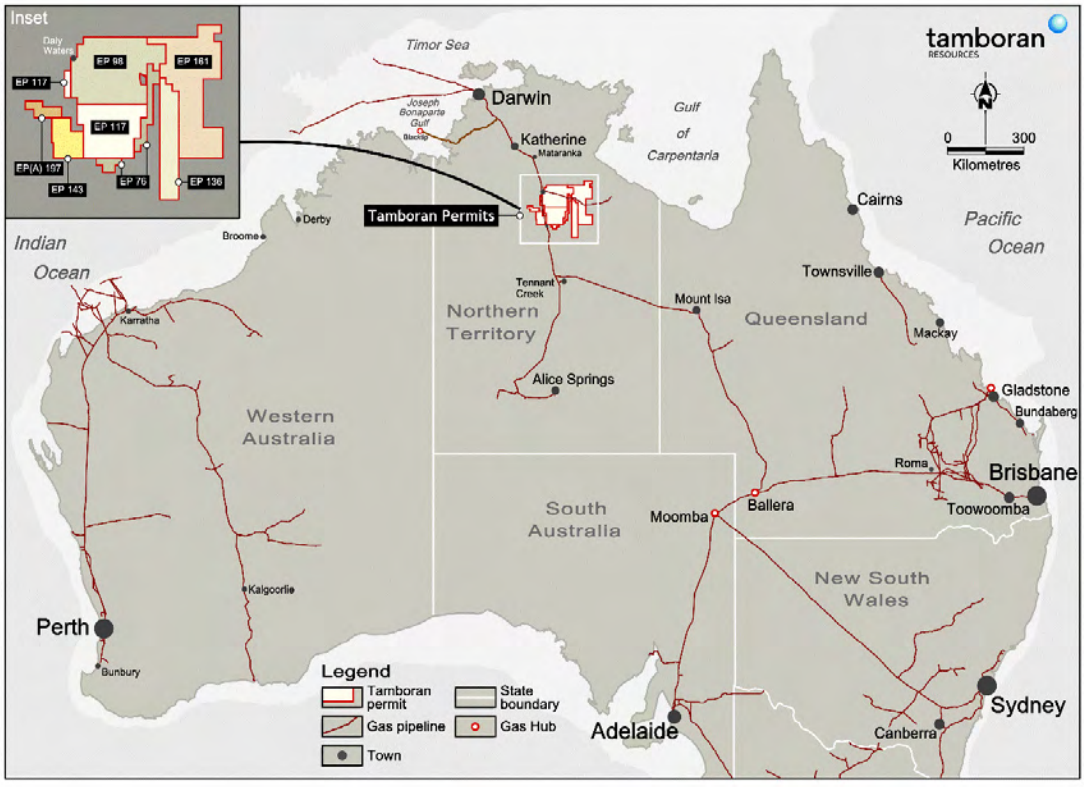


Figure 1: Location of Tamboran exploration permit areas (EPs)

[1] Including its subsidiaries.

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 and shown in Figure 2 – Figure 4.

Table 1: Coordinates of centroid 2D seismic and exploration well sites

2D seismic line reference	Seismic line coordinates (Zone 52)			
	Start of line		End of line	
	Lat	Long	Lat	Long
Amungee delineation area seismic lines (EP 98)				
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
2D seismic line reference	**Seismic line coordinates**			
	Start of line		**End of line**	
	Lat	**Long**	**Lat**	**Long**
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 Seismic Lines (EP 117 and EP 98)				
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)				
Shenandoah South B to Shenandoah South C (~4.11 km)				
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)				
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

Well site, access track and gravel pit reference	**Well pads**		
	Zone	**Easting**	**Northing**
Velkerri 98 E1	53	415515	8180683
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
Kyalla 98 W1	53	364955	8177458
Kalala S1	53	351740	8198030
Velkerri 76 S1	53	424362	8113273
Velkerri 76 N1	53	440940	8107032
Velkerri 76 S2	53	435488	8136321
Kyalla 117 N2	53	356175	8137500
Velkerri 117 E1	53	428861	8120782
Beetaloo W (Kyalla 117 W1)	53	368312	8106695
Shenandoah S 2	53	355291	8140676
Shenandoah S B	53	345035	8135464
Shenandoah S C	53	343471	8133330
Shenandoah N A	53	356687	8163762

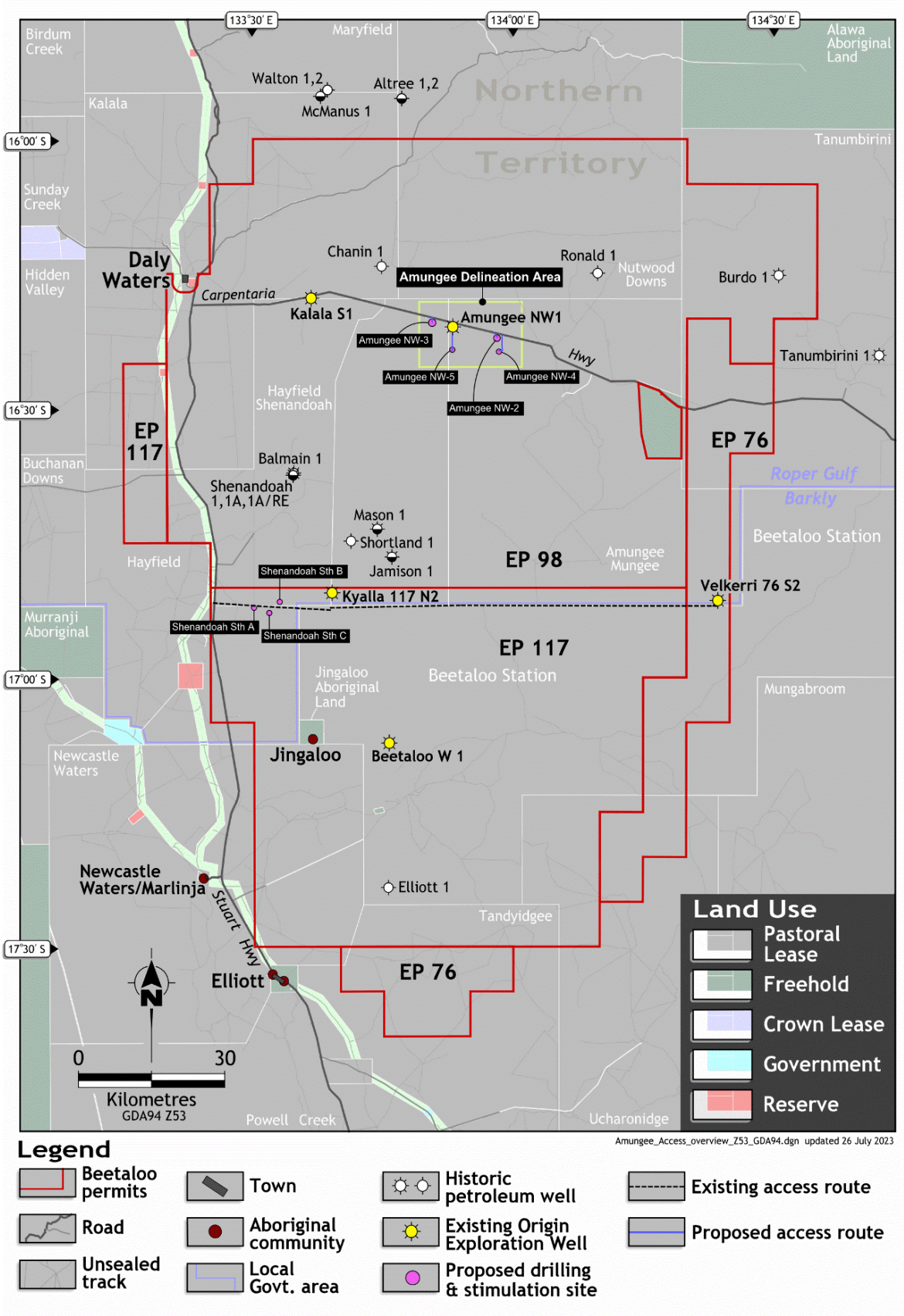


Figure 2: Location of Tamboran's exploration well sites and existing infrastructure

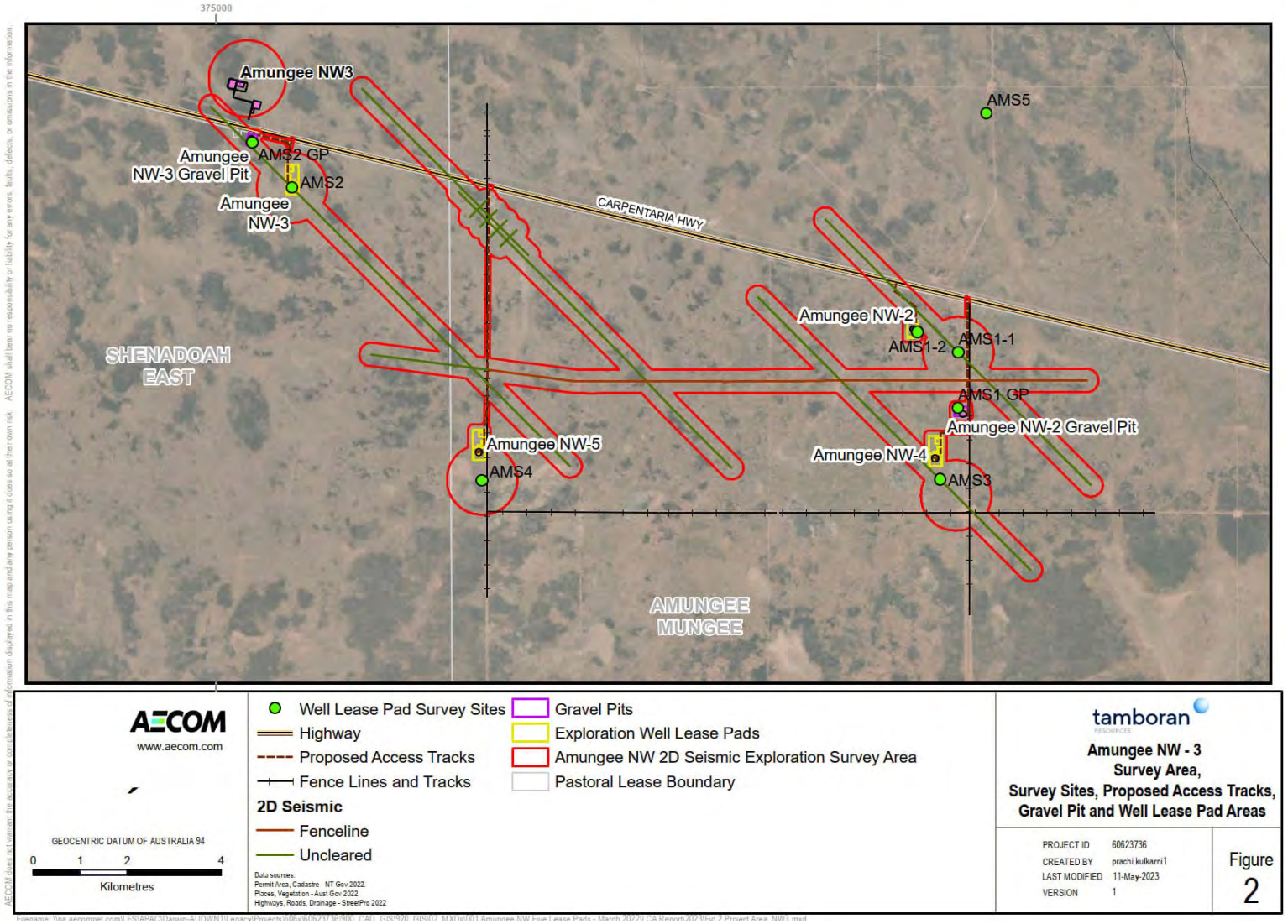


Figure 3: Location of Amungee seismic survey areas

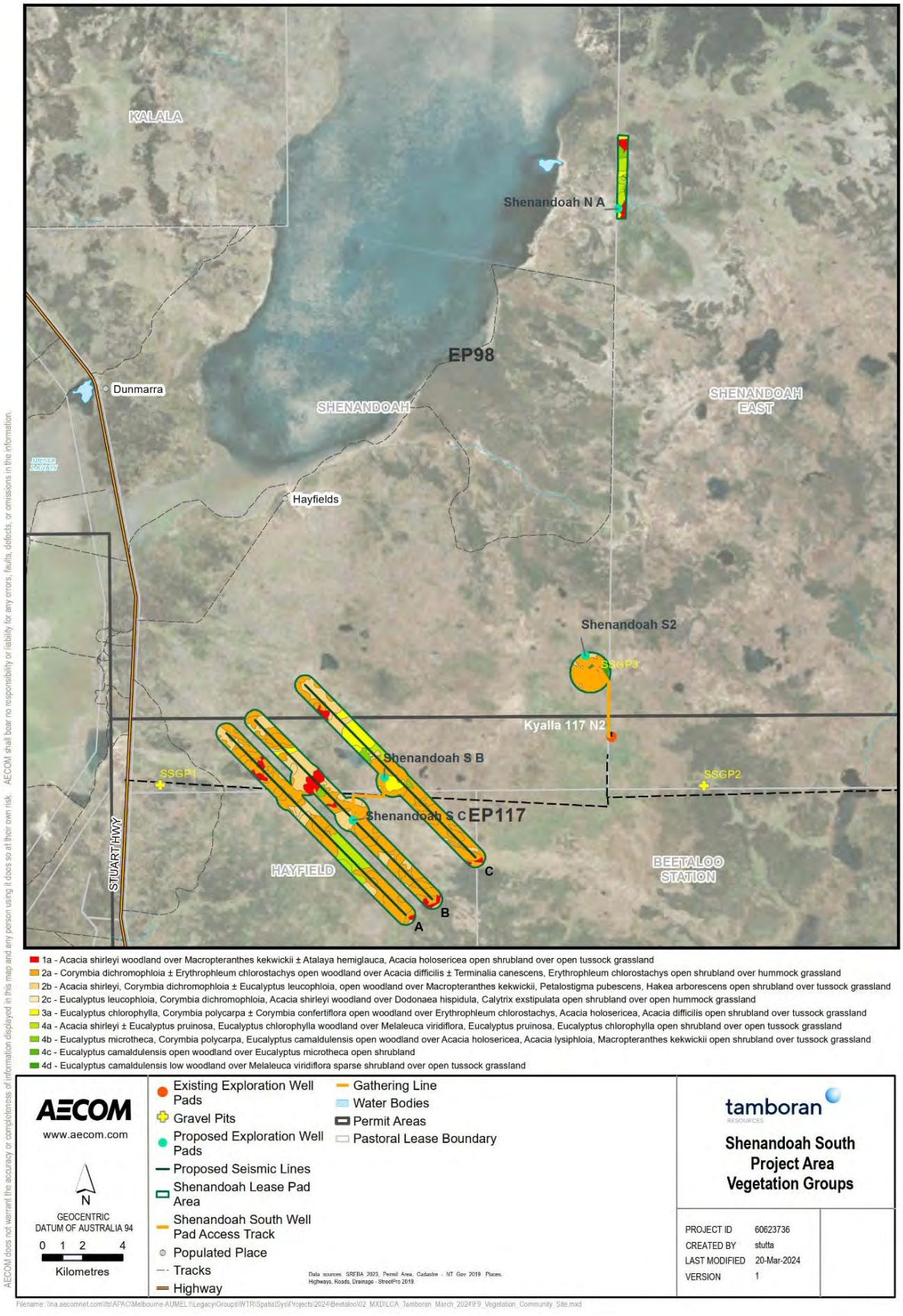


Figure 4: Location of Shenandoah South E&A (includes vegetation communities)

The primary activities subject to this ESCP are:

- Construction and or ongoing maintenance of exploration well pads, 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.
- 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, 2021) 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 as published on the DEPWS 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 Environment, Parks and Water Security (DEPWS) 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. Principal Environmental Scientist with over 18 years' experience and completed the IECA erosion and sediment control training (2013). Over 20 years' experience providing advice to managing environmental requirements in the Beetaloo Basin including erosion and sediment control.
- 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 2: 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 3: 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 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 4 (Amungee, Kalala, Kyalla, Velkerri and Beetaloo) and Table 5 (Shenandoah South 2, South B, South C and North A) present the results of the assessment for exploration well pads. The IECA (2008) Explanatory Notes for the assessment are presented Appendix A.

Table 4: 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).					
• 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	4	4	4	4	6
• Class 5	2	Comment – Class 3 or default- Amungee Delineation Area					
• Class 3, (default value if	4						

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	
soils are untested)		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 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 in close proximity to 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 • 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						

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	
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 5: 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	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	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 in close proximity to 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	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 6 presents the results of the assessment for the seismic programs.

Table 6: 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 worse as 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. Not considered to be major works and will be re-instated as completion of acquisition	
• 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	2	-
• Freshwater body (e.g. creek or freshwater lake or river)	2	Comment – Minor drainage lines, with no flowing water at time of 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 are temporary seismic lines.	
• External catchment not diverted around the soil disturbance	2		
ROAD CONSTRUCTION [11]			
• No road construction	0	0	-
• Involves road construction works	2		

Condition (as described by IECA, 2008)	Points	Score	Trigger value
		Seismic Survey Areas	
		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]		**15**	
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.

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 DEPWS 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 7. 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 7.

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 7: 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 8, the Project has an erosion risk rating of "very low" to "low".

Table 8: 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
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 9 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 7 for the soil loss calculations and compare to Table 9, for the type of soil loss controls required.

Table 9: 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 10 provides a range of erosion and sediment controls that can be deployed on the project for each 'Erosion and Sediment Control Type'.

Table 10: 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	Coarse sediment trap Modular sediment trap U-shaped sediment trap

Type 1	Type 2	Type 3
	Rock filter dam Sediment trench Sediment weir	
Dewatering sediment control		
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 DEPWS 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 11. Where changes are required, these will be risked assessed through a change management process and kept in a change management register.

Table 11: 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 11. These ESCP measures have been considered during the design of the exploration well pads and associated infrastructures and will be implemented by the Tamboran contractors during the construction and maintenance activities.

Table 12: Measures to be implemented for erosion and sediment control – well exploration areas

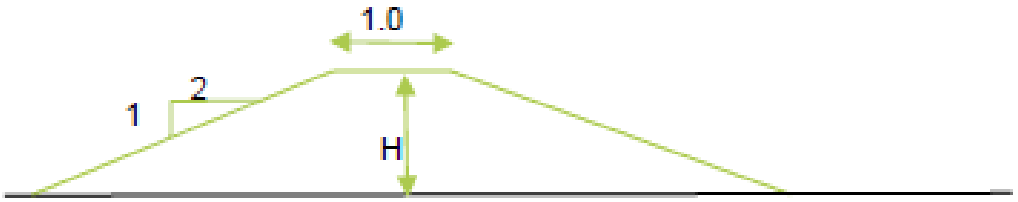
Activity	Management controls
Land clearing	• Undertake selective clearing (only clearing areas that are necessary for construction and ESC activities), using lighter machinery such as graders or smaller bulldozers, taking care not to overwork the site. Overworking the site can lead to the loss of topsoil, 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 DEPWS.
	• 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 DEPWS prior to any disturbance. • Should activities pushout to the wet season, the ESCP to be reviewed and updated for wet season conditions. The revision to be reviewed and approved by DEPWS 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.

Activity	Management controls

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:
	  • 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

Activity	Management controls
	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 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

Activity	Management controls
	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 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 Seismic Activities

Based on the erosion susceptibility of the exploration areas, the ESCP measures to be adopted for the 2D seismic exploration programs are summarised in Table 12 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 13: 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 riparian buffers in accordance with the stream order of the encountered drainage line in accordance with the buffers provided below:
<table>
<tr><th>Riparian 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 5 m maximum should be cleared by the dozer removing the trees. Felled trees should be pushed to the side to enable vehicle access through the site.
    - 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. 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 and in the southern survey area. 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 locations is that line preparation would consist primarily of the vehicles traversing directly of the annual grasses, flattening or slashing for data acquisition i.e. blade up.

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 6.0 – 8.0
    - EC: 1300 µS/cm.

  The adopted discharge criteria are based on ANZECC 2000 Table 3.3.4 and Table 3.3.5 default trigger values for pH and conductivity (EC, salinity) indicative of slightly disturbed ecosystems in tropical Australia, as well as consideration of the distance and type of nearby sensitive surface water receptors as ephemeral drainage lines and creeks.

- **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.
  - 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, 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, DEPWS 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.

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) 2021. *Land Clearing Guidelines*. 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:**

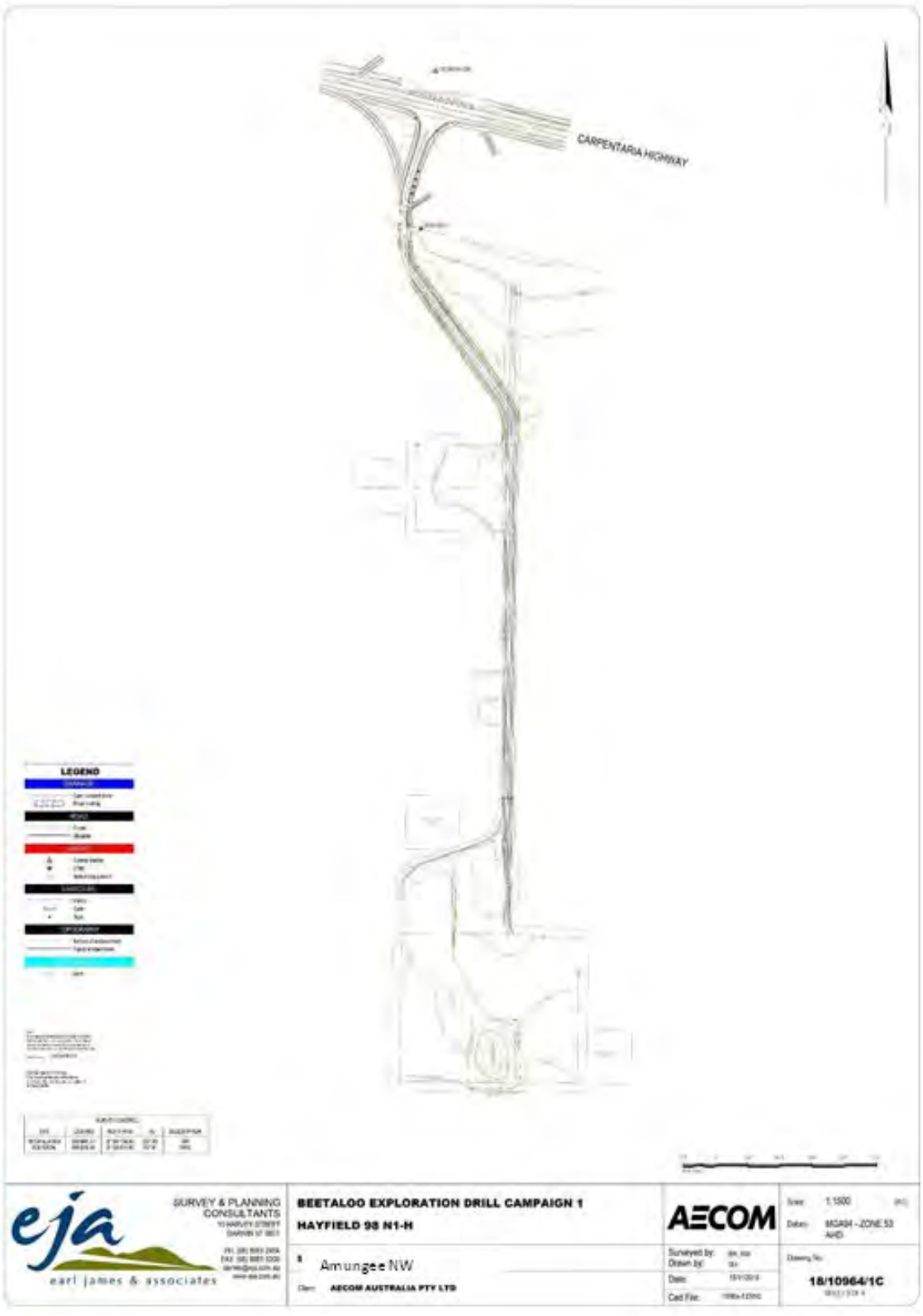
Soils with a pH less than 5.5 or greater than 8 will usually require treatment in order to achieve satisfactory revegetation. Soils with a pH of less than 5 (whether naturally acidic or in acid sulfate soil areas) may also

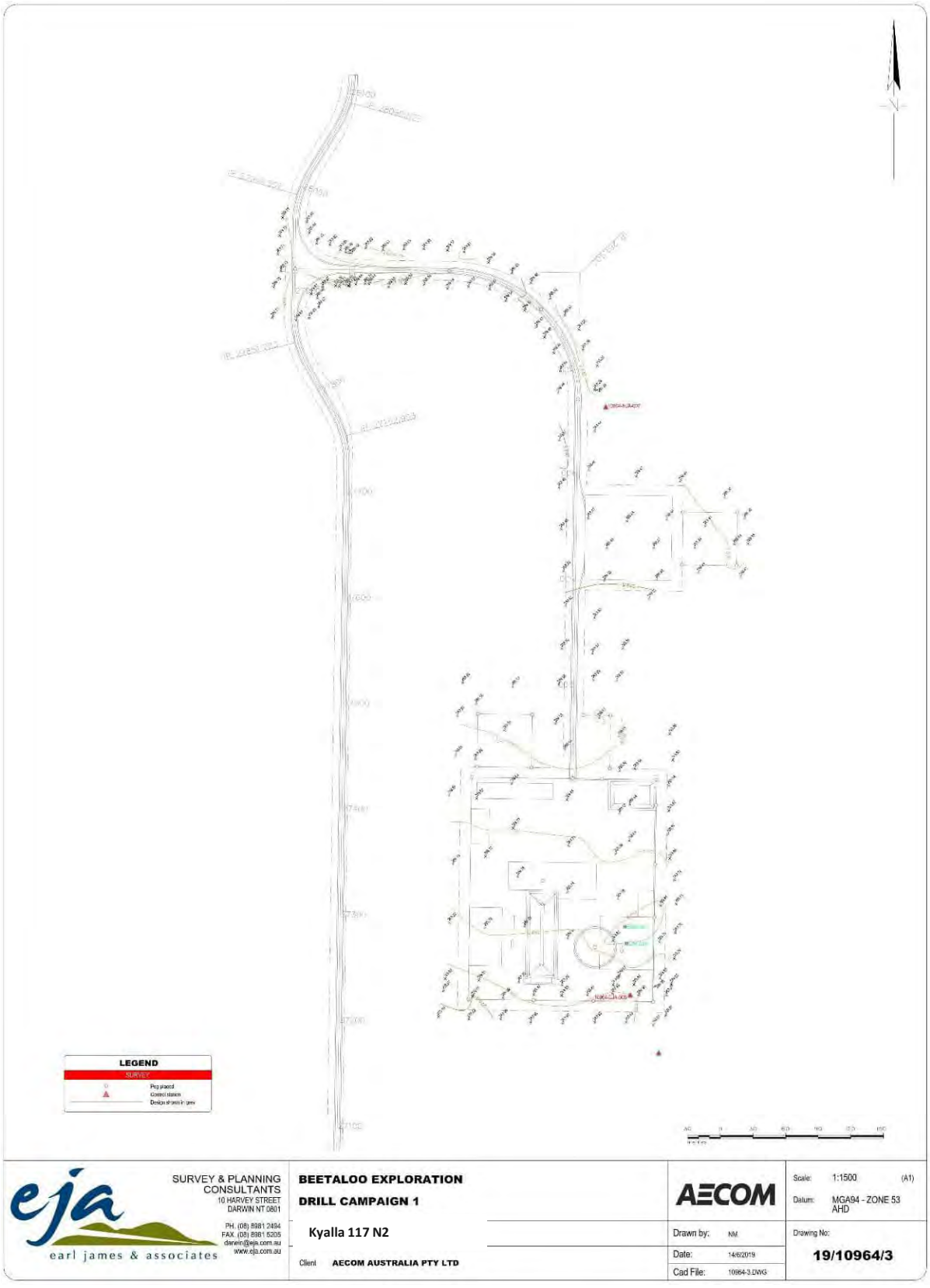
limit the choice of chemical flocculants (e.g. Alum) for use in the flocculation of *Sediment Basins*.

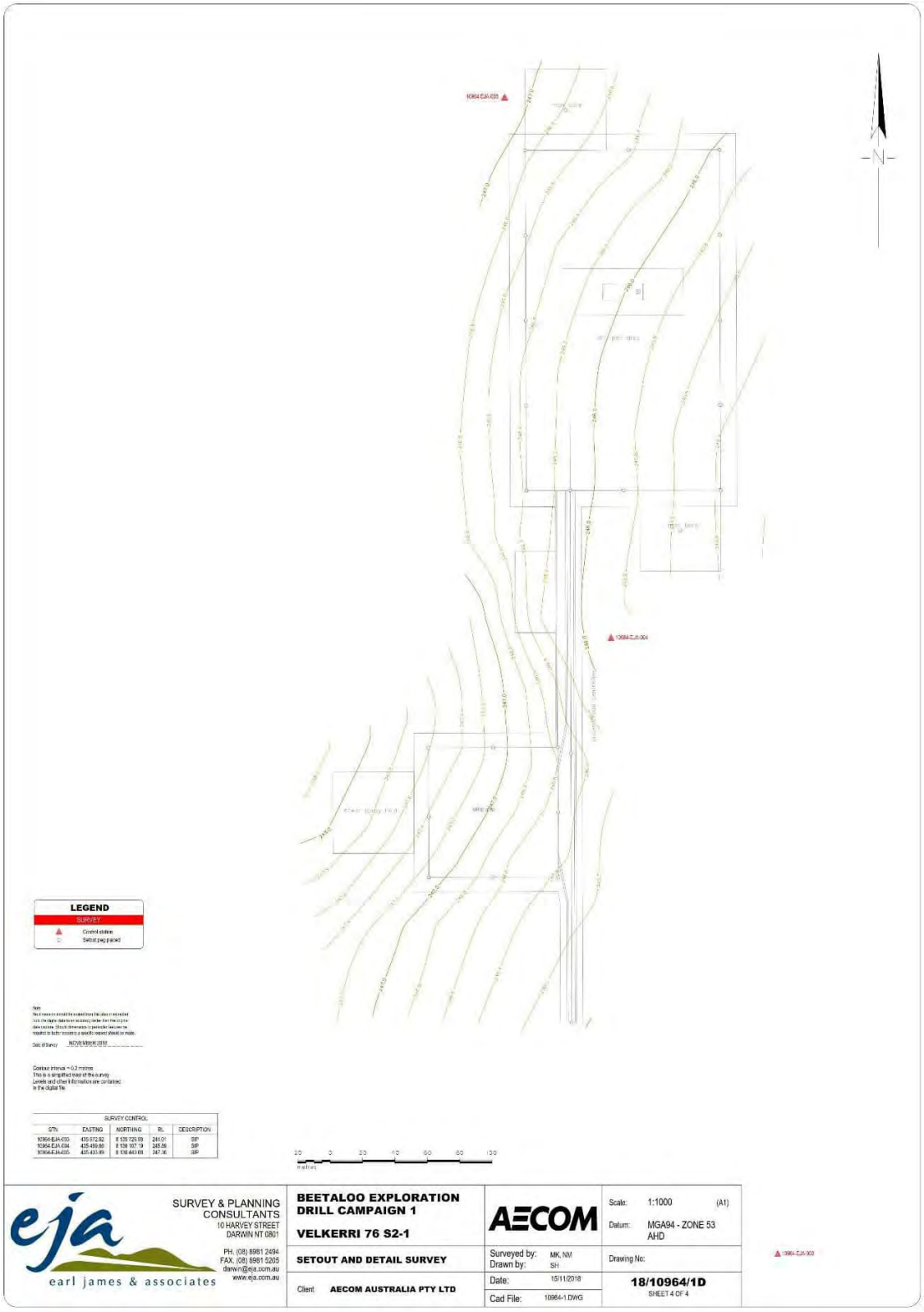
[13] **REQUIREMENTS:**

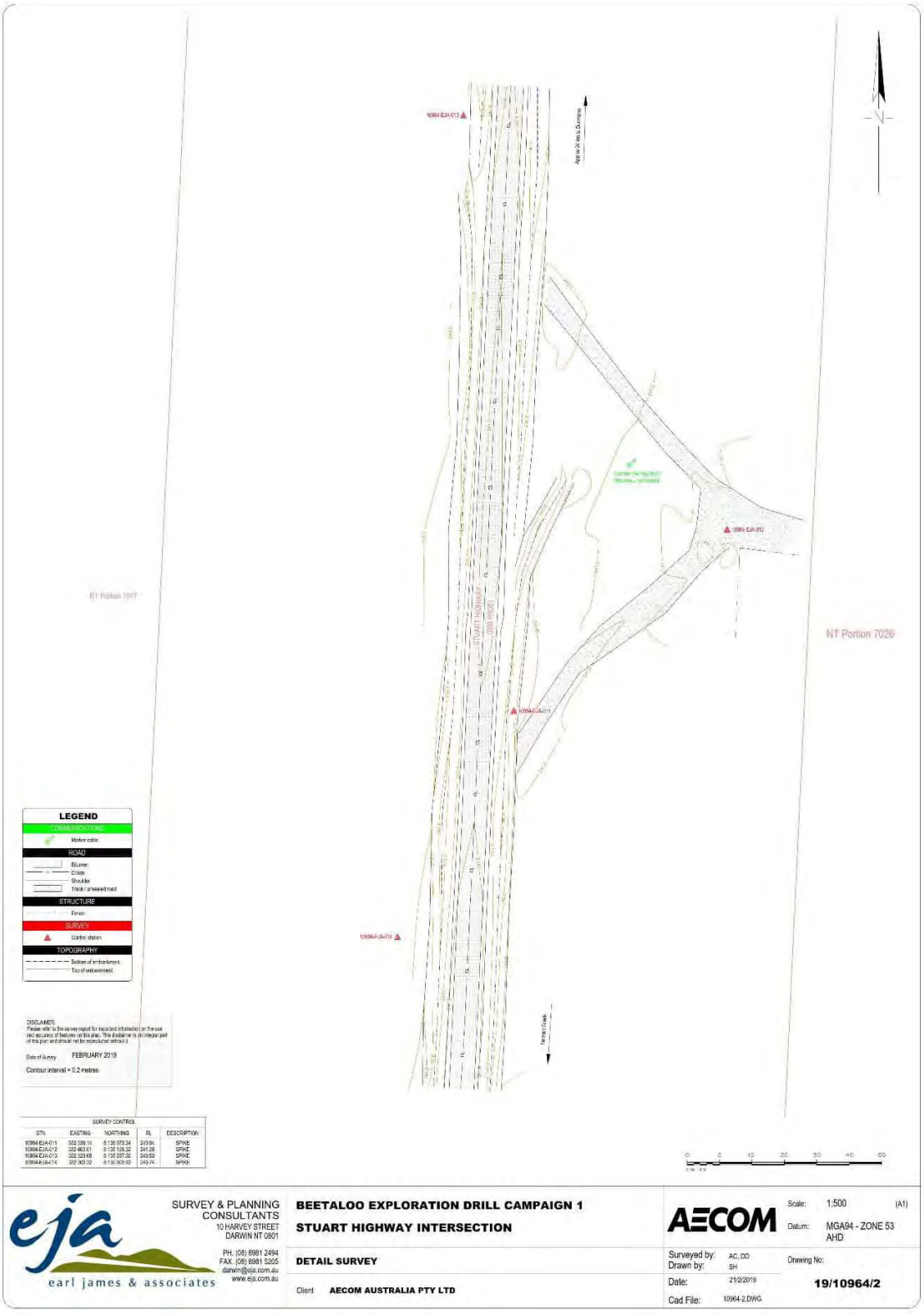
A preliminary ESCP must be submitted to the local government for approval during the planning phase for any development that obtains a total point score of 17 or greater or when any trigger value is scored or exceeded.

APPENDIX B Well pad and highway topographical survey




LEGEND
SURVEY
SURVEY & PLANNING CONSULTANTS
10 HARVEY STREET
DARWIN NT 0801
PH. (08) 8981 2484
FAX. (08) 8981 5205
darwin@eja.com.au
www.eja.com.au
earl james & associates
BEETALOO EXPLORATION
DRILL CAMPAIGN 1
Kyalla 117 N2
Client AECOM AUSTRALIA PTY LTD
AECOM
Drawn by: NM
Date: 14/8/2019
Cad File: 10964-3.DWG
Scale: 1:1500 (A1)
Datum: MGA94 - ZONE 53 AHD
Drawing No:
19/10964/3


LEGEND
SURVEY
Control station
Setout peg placed
SURVEY CONTROL
STN
EASTING
NORTHING
RL
DESCRIPTION
Contour interval = 0.2 metres
This is a simplified map of the survey.
Levels and other information are contained in the digital file.
20 0 20 40 60 80 100
metres
N
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
VELKERRI 76 S2-1
SETOUT AND DETAIL SURVEY
Client: AECOM AUSTRALIA PTY LTD
AECOM
Surveyed by: MK, NM
Drawn by: SH
Date: 15/11/2018
Cad File: 10964-1.DWG
Scale: 1:1000 (A1)
Datum: MGA94 - ZONE 53 AHD
Drawing No:
18/10964/1D
SHEET 4 OF 4


LEGEND
ROAD
STRUCTURE
SURVEY
TOPOGRAPHY
NT Portion 7026
STUART HIGHWAY
DISCLAIMER
Date of survey FEBRUARY 2019
Contour interval = 0.2 metres
SURVEY CONTROL
STN EASTING NORTHING RL DESCRIPTION
10964-EJA-011 332 326.14 8 138 973.34 249.94 SPIKE
10964-EJA-012 332 462.61 8 138 126.32 241.28 SPIKE
10964-EJA-013 332 329.68 8 138 237.20 249.69 SPIKE
10964-EJA-014 332 303.32 8 138 908.63 249.74 SPIKE
earl james & associates
SURVEY & PLANNING CONSULTANTS
10 HARVEY STREET
DARWIN NT 0801
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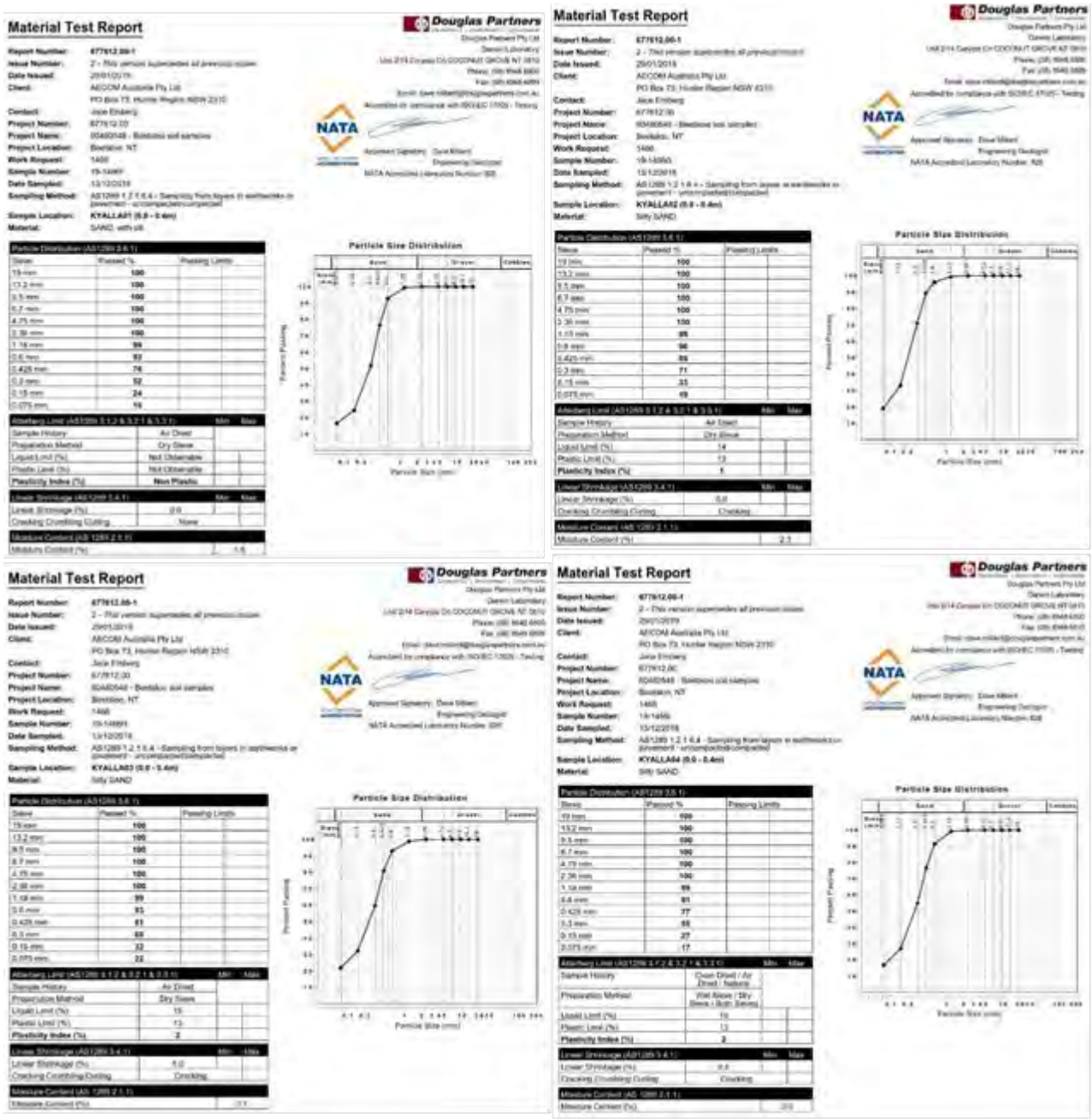
FAX. (08) 8981 5205
darwin@eja.com.au
www.eja.com.au
BEETALOO EXPLORATION DRILL CAMPAIGN 1
STUART HIGHWAY INTERSECTION
DETAIL SURVEY
Client AECOM AUSTRALIA PTY LTD
AECOM
Scale: 1:500 (A1)
Datum: MGA94 - ZONE 53 AHD
Surveyed by: AC, DD
Drawn by: SH
Date: 21/2/2019
Cad File: 10964-2.DWG
Drawing No: 19/10964/2

APPENDIX C Geotechnical laboratory results



Material Test Report

Douglas Partners

Particle Size Distribution

Material Test Report

Douglas Partners

Particle Size Distribution

Material Test Report

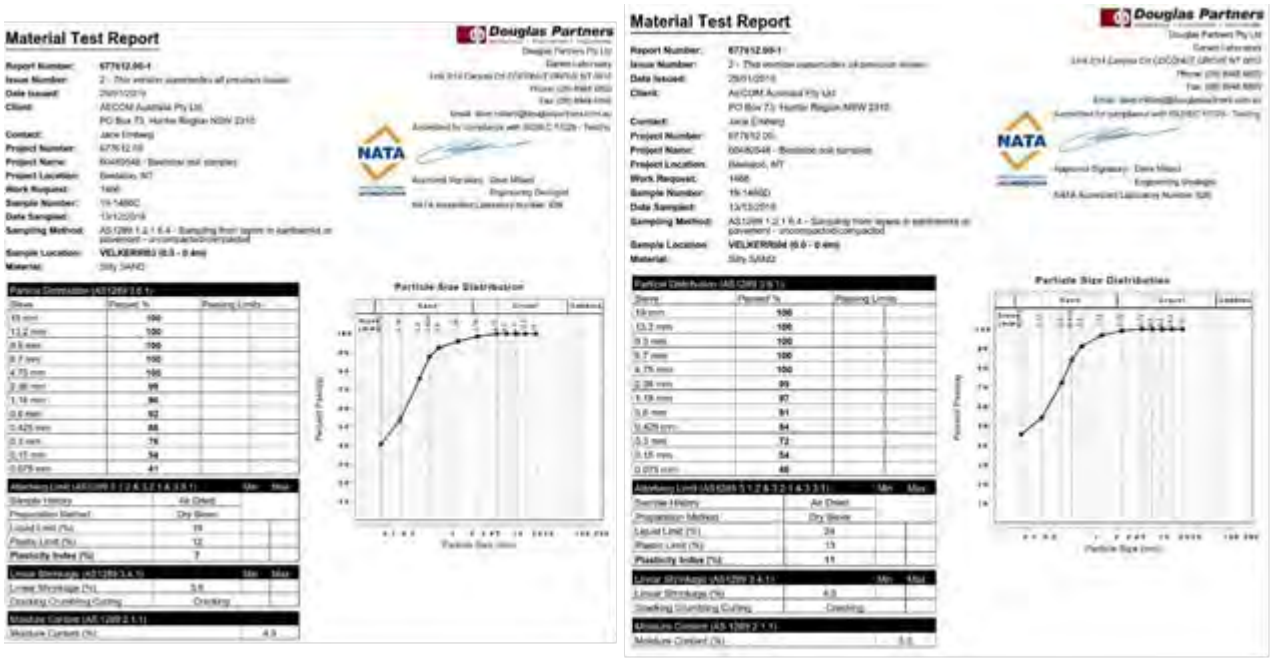
Douglas Partners

Particle Size Distribution

Material Test Report

Douglas Partners

Particle Size Distribution



Material Test Report

Douglas Partners

NATA

Particle Size Distribution

Material Test Report

Douglas Partners

NATA

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
9.7 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

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Darwin Laboratory
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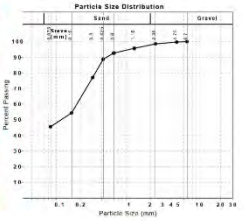
ilac-MRA NATA
Accredited for compliance with ISO/IEC 17025 - Testing

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 4919F
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: **Amungee NW3**
Material: Clayey Gravelly Sand

Particle Size Distribution (AS1289 3.6.1)

Sieve	Passed %	Passing Limits
26.5 mm	100	
19 mm	99	
13.2 mm	98	
9.5 mm	97	
6.7 mm	94	
4.75 mm	91	
2.36 mm	65	
1.18 mm	45	
0.6 mm	40	
0.425 mm	39	
0.3 mm	37	
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 (%)	18
Plastic Limit (%)	10
Plasticity Index (%)	**8**

Linear Shrinkage (AS1289 3.4.1) Min Max

Moisture Condition Determined By	AS 1289.3.1.2
Linear Shrinkage (%)	**4.5**
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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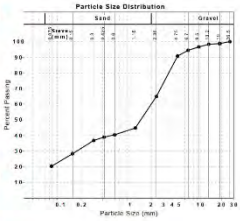
Approved Signatory: Sunil Sukhdeo
Laboratory Manager
Laboratory Accreditation Number: 828

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 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

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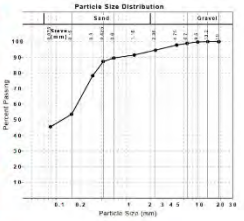
Laboratory Manager
Laboratory Accreditation Number: 828

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 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
9.7 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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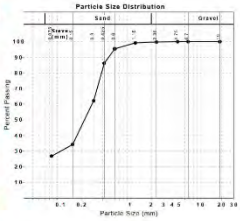
Approved Signatory: Sunil Sukhdeo
Laboratory Manager
Laboratory Accreditation Number: 828

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 N1
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

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Laboratory Manager
Laboratory Accreditation Number: 828

Particle Size Distribution (AS1289 3.6.1)

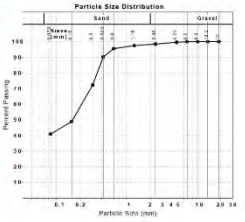
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	100	
6.7 mm	100	
4.75 mm	100	
2.36 mm	98	
1.18 mm	98	
0.6 mm	95	
0.425 mm	90	
0.3 mm	72	
0.15 mm	49	
0.075 mm	41	

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 (%)	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	

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 N1
Work Request: 4919
Sample Number: DW 4919S
Date Sampled: 03/04/2023
Dates Tested: 13/04/2023 - 19/04/2023
Sampling Method: Sampled by Client
The results apply to the sample as received
Sample Location: Amungee NW4
Material: Silty Sand with Gravel

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

Particle Size Distribution (AS1289 3.6.1)

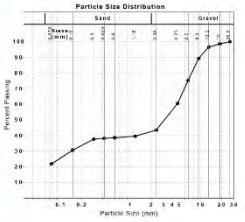
Sieve	Passed %	Passing Limits
26.5 mm	100	
19 mm	99	
13.2 mm	97	
9.5 mm	89	
6.7 mm	75	
4.75 mm	60	
2.36 mm	43	
1.18 mm	40	
0.6 mm	39	
0.425 mm	38	
0.3 mm	38	
0.15 mm	31	
0.075 mm	22	

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 (%)	12	
Plasticity Index (%)	**4**	

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	5	
Soil Description	Natural Soil	
Nature of Water	Distilled water	
Temperature of Water (°C)	25.5	

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 N1
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

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Douglas Partners Pty Ltd
Darwin Laboratory
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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 (AS1289 3.6.1)

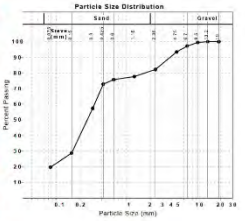
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	100	
9.5 mm	99	
6.7 mm	97	
4.75 mm	93	
2.36 mm	82	
1.18 mm	78	
0.6 mm	76	
0.425 mm	73	
0.3 mm	67	
0.15 mm	29	
0.075 mm	20	

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	

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 N1
Work Request: 4919
Sample Number: DW 4919H
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

Douglas Partners
Geotechnics | Environment | Groundwater
Douglas Partners Pty Ltd
Darwin Laboratory
Unit 2/14 Garyula 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 (AS1289 3.6.1)

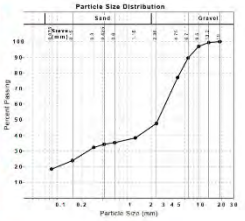
Sieve	Passed %	Passing Limits
19 mm	100	
13.2 mm	99	
9.5 mm	97	
6.7 mm	90	
4.75 mm	77	
2.36 mm	48	
1.18 mm	38	
0.6 mm	35	
0.425 mm	34	
0.3 mm	32	
0.15 mm	24	
0.075 mm	18	

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**	

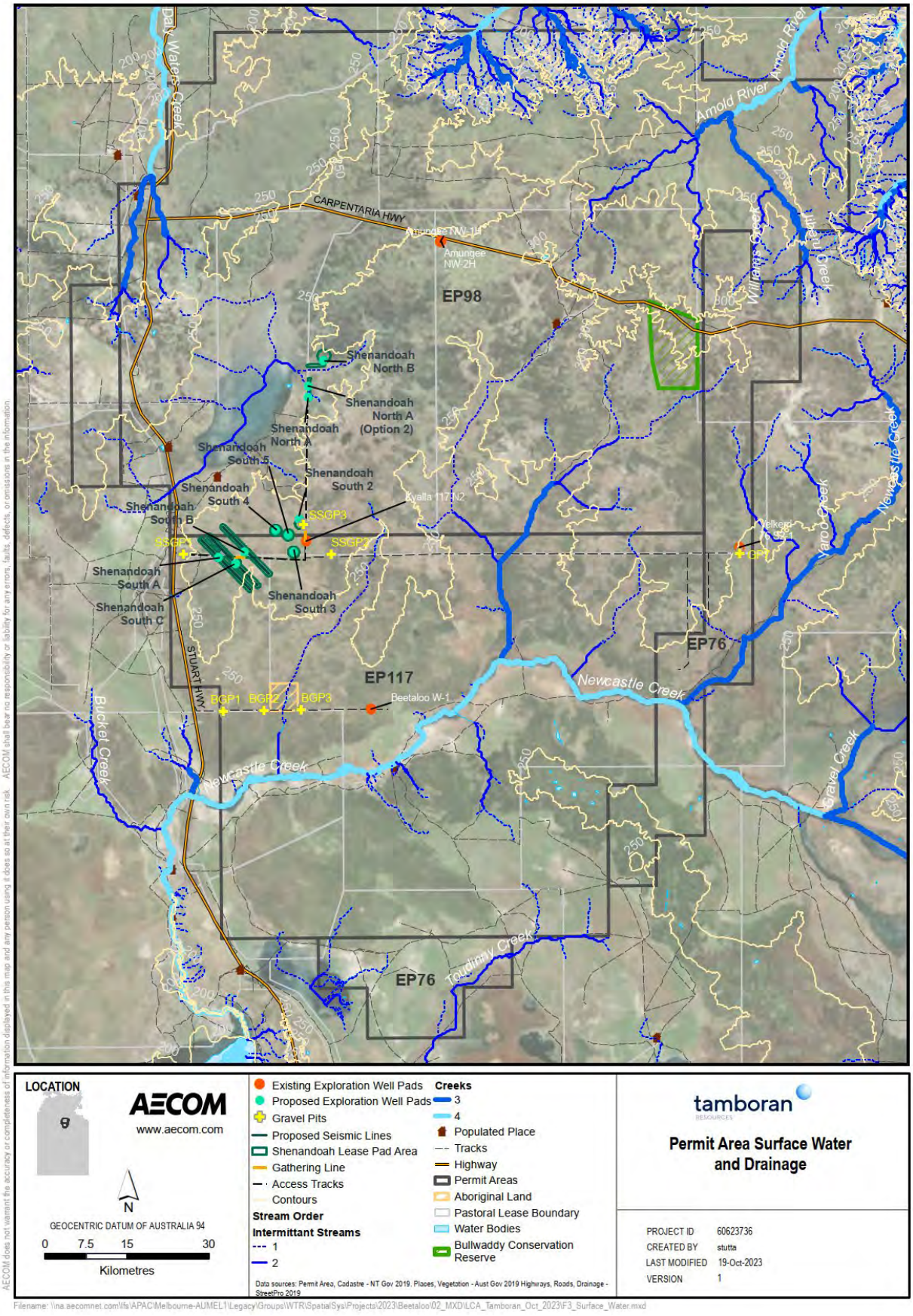
Linear Shrinkage (AS1289 3.4.1)	Min	Max
Moisture Condition Determined By	AS 1289.3.1.2	
Linear Shrinkage (%)	3.0	
Cracking Crumbling Curling	Cracking	

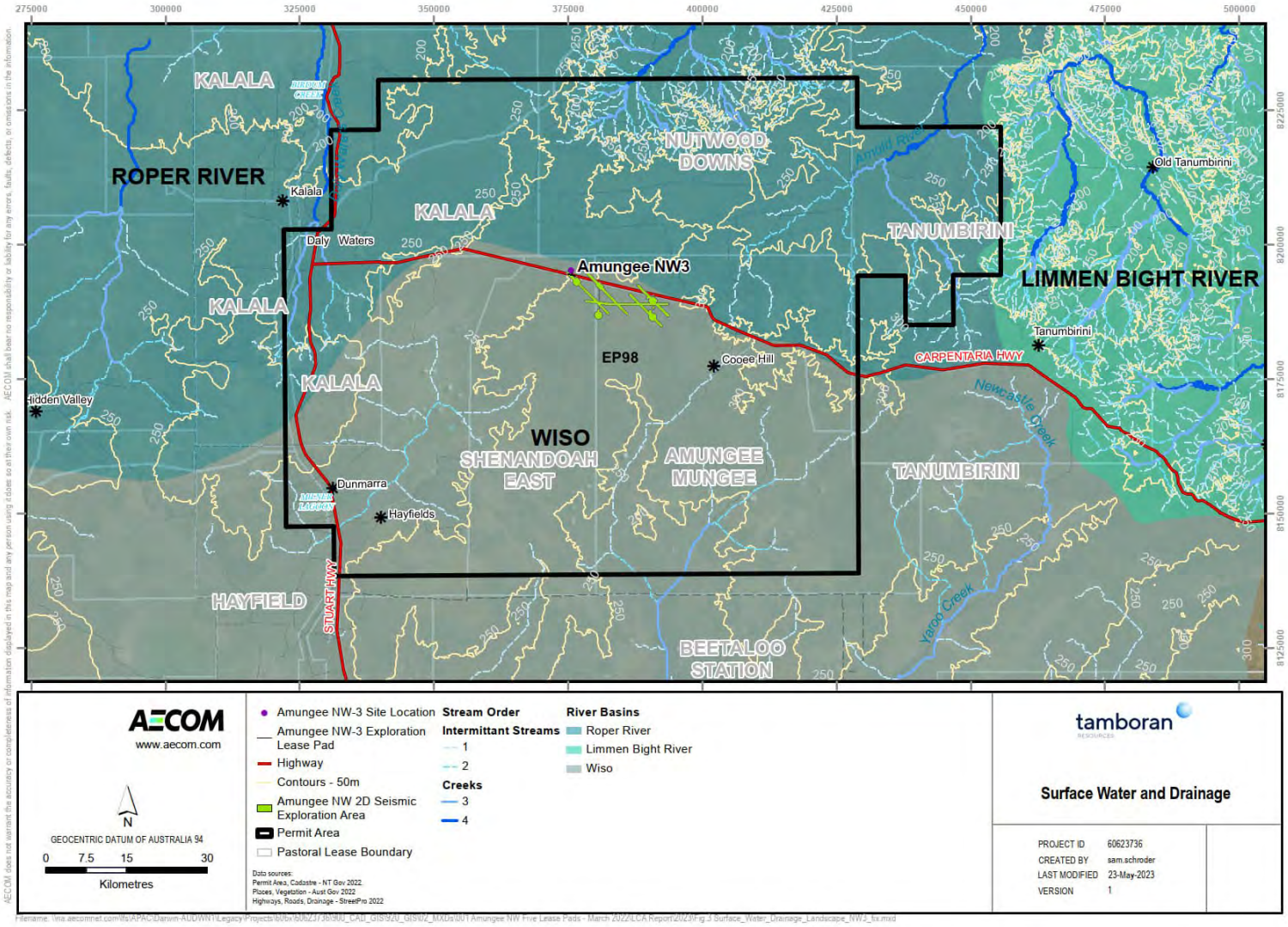
Emerson Class Number of a Soil (AS 1289 3.8.1)	Min	Max
Emerson Class	3	
Soil Description	Natural Soil	
Nature of Water	Distilled Water	
Temperature of Water (°C)	25.5	

Particle Size Distribution



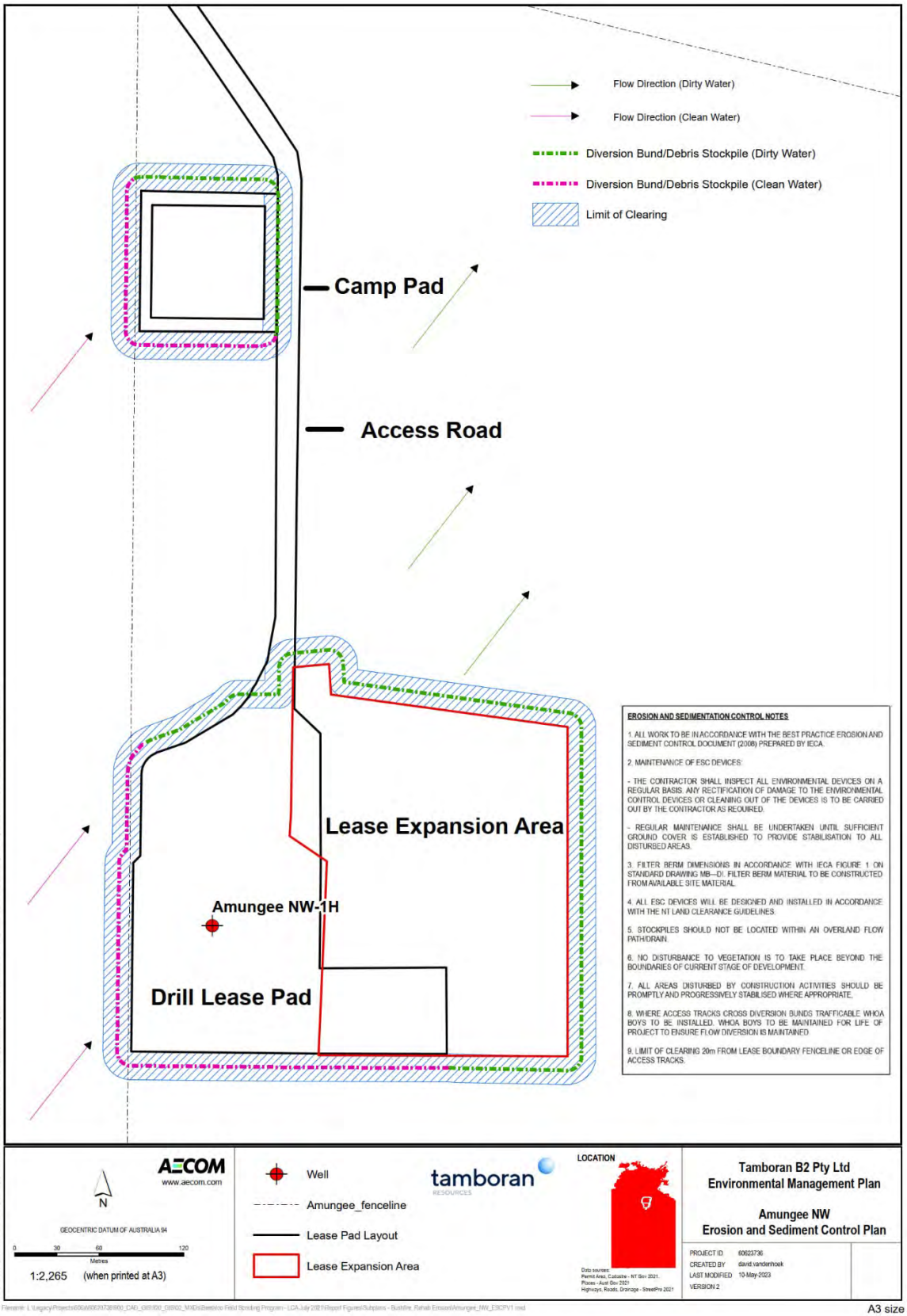
APPENDIX D Permit area surface water




KALALA
ROPER RIVER
Kalala
NUTWOOD DOWNS
Old Tanumbirini
KALALA
TANUMBIRINI
Daly Waters
Amungee NW3
LIMMEN BIGHT RIVER
KALALA
Tanumbirini
EP98
Cooee Hill
CARPENTARIA HWY
KALALA
Hidden Valley
WISO
SHENANDOAH EAST
AMUNGEE MUNGEE
TANUMBIRINI
Dunmarra
Hayfields
HAYFIELD
STUART HWY
BEETALOO STATION
Yarrar Creek
AECOM
www.aecom.com
N
GEOCENTRIC DATUM OF AUSTRALIA 94
0 7.5 15 30
Kilometres
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
tamboran RESOURCES
Surface Water and Drainage
PROJECT ID 60623736
CREATED BY sam.schroder
LAST MODIFIED 23-May-2023
VERSION 1

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**
- **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
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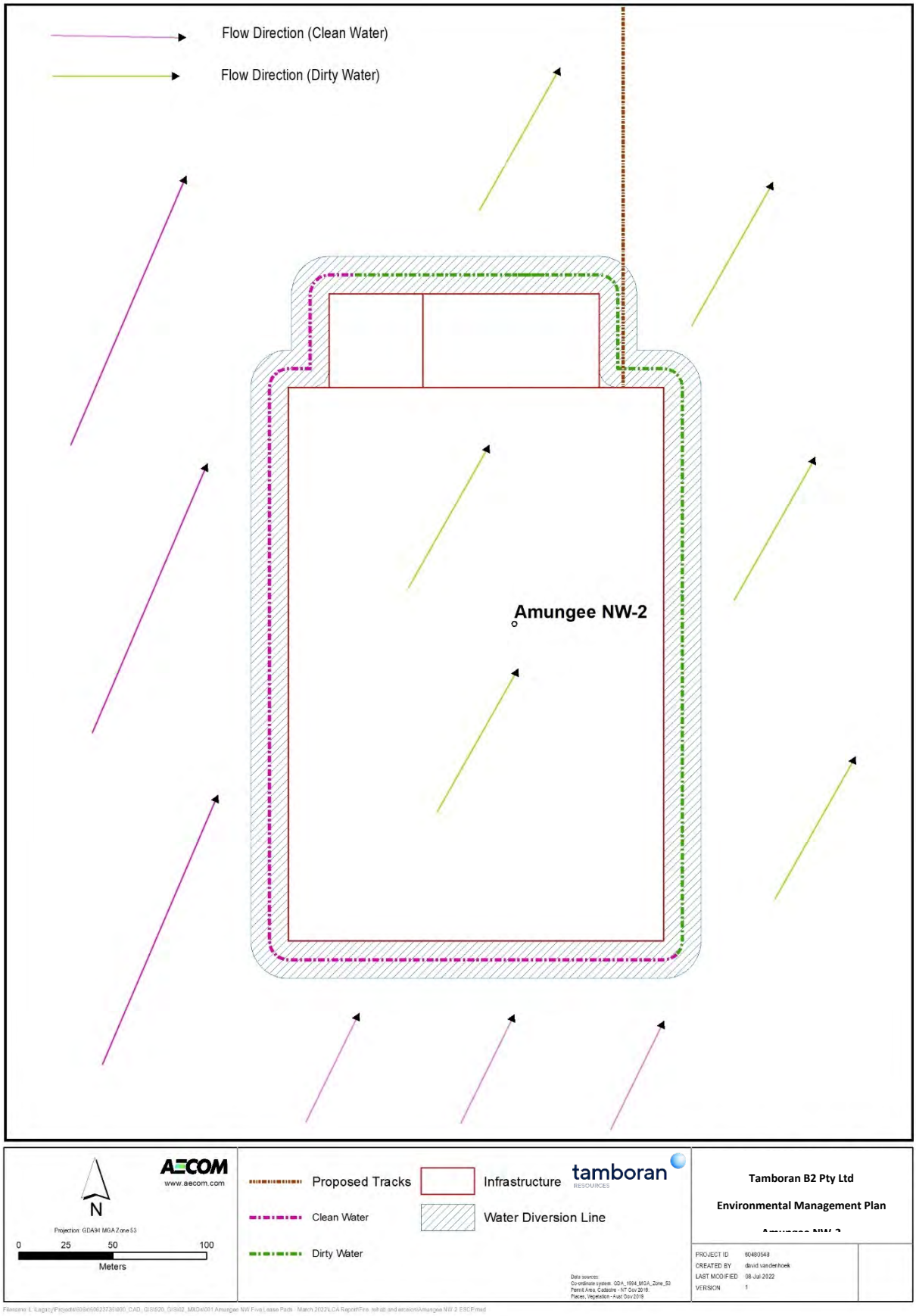
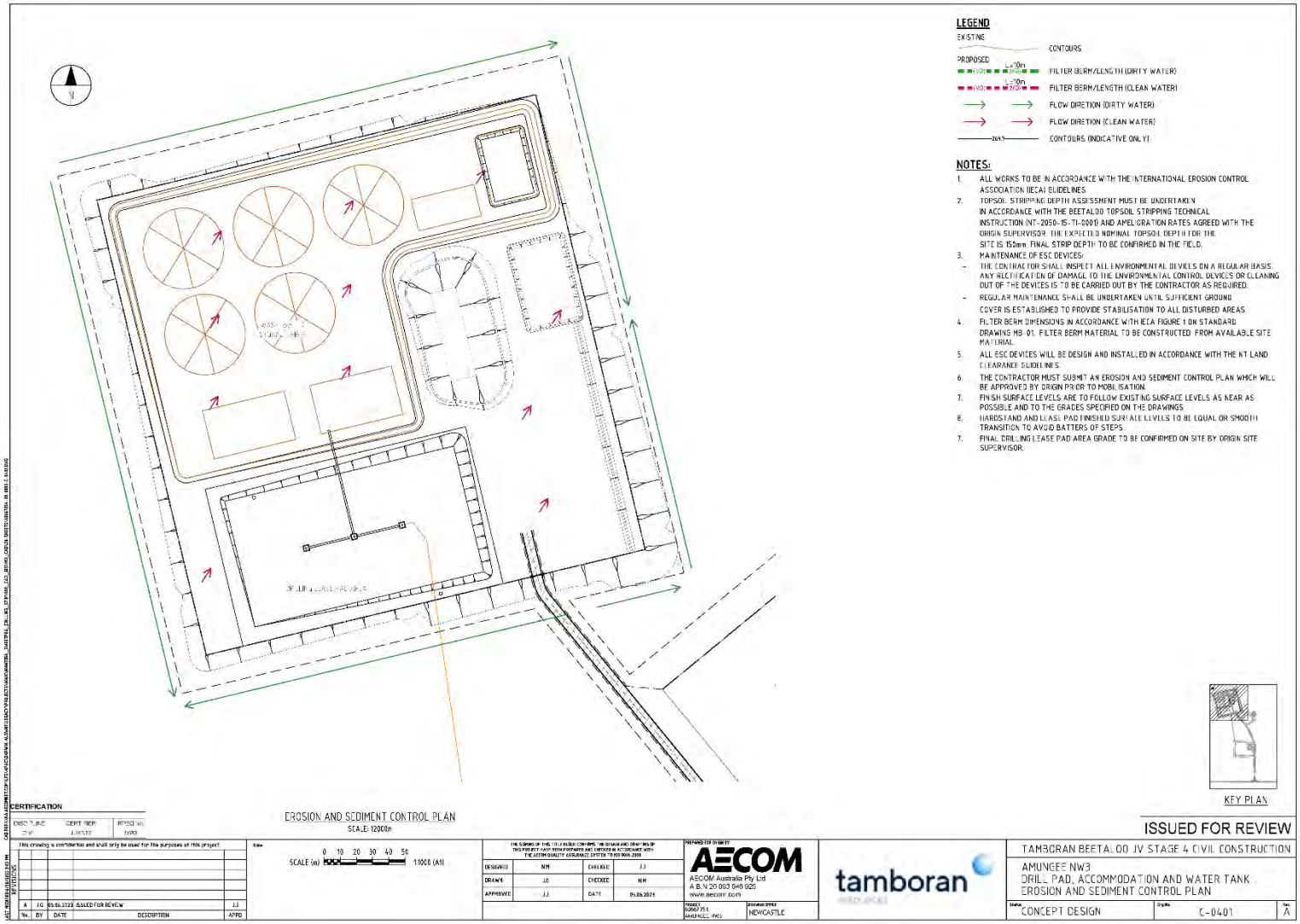
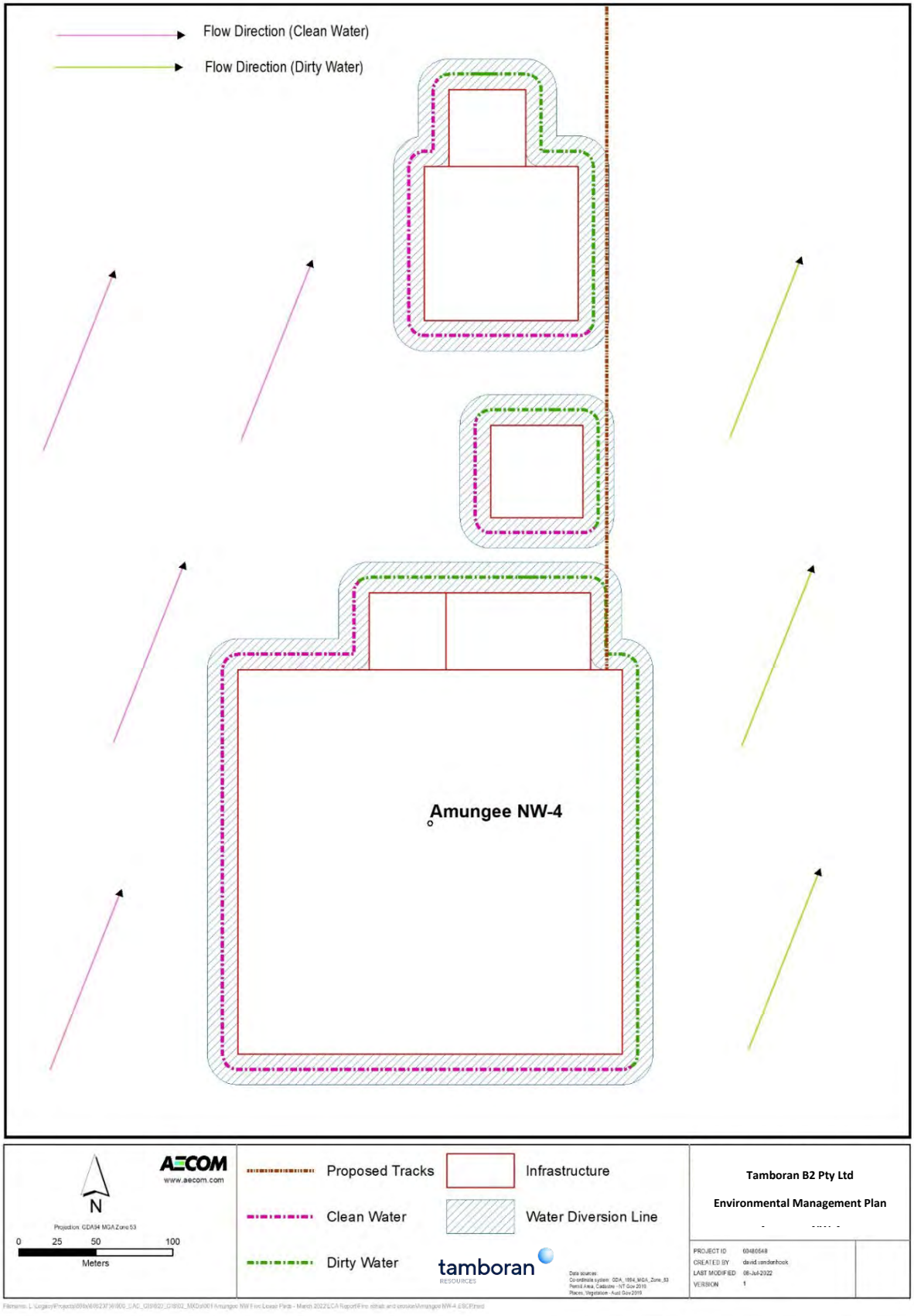
7. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHOULD BE PROMPTLY AND PROGRESSIVELY STABILISED WHERE APPROPRIATE.
8. WHERE ACCESS TRACKS CROSS DIVERSION BUNDS TRAFFICABLE WHOA BOYS TO BE INSTALLED. WHOA BOYS TO BE MAINTAINED FOR LIFE OF PROJECT TO ENSURE FLOW DIVERSION IS MAINTAINED.
9. LIMIT OF CLEARING 20m FROM LEASE BOUNDARY FENCELINE OR EDGE OF ACCESS TRACKS.
AECOM
www.aecom.com
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.vanderhoek
LAST MODIFIED 10-May-2023
VERSION 2

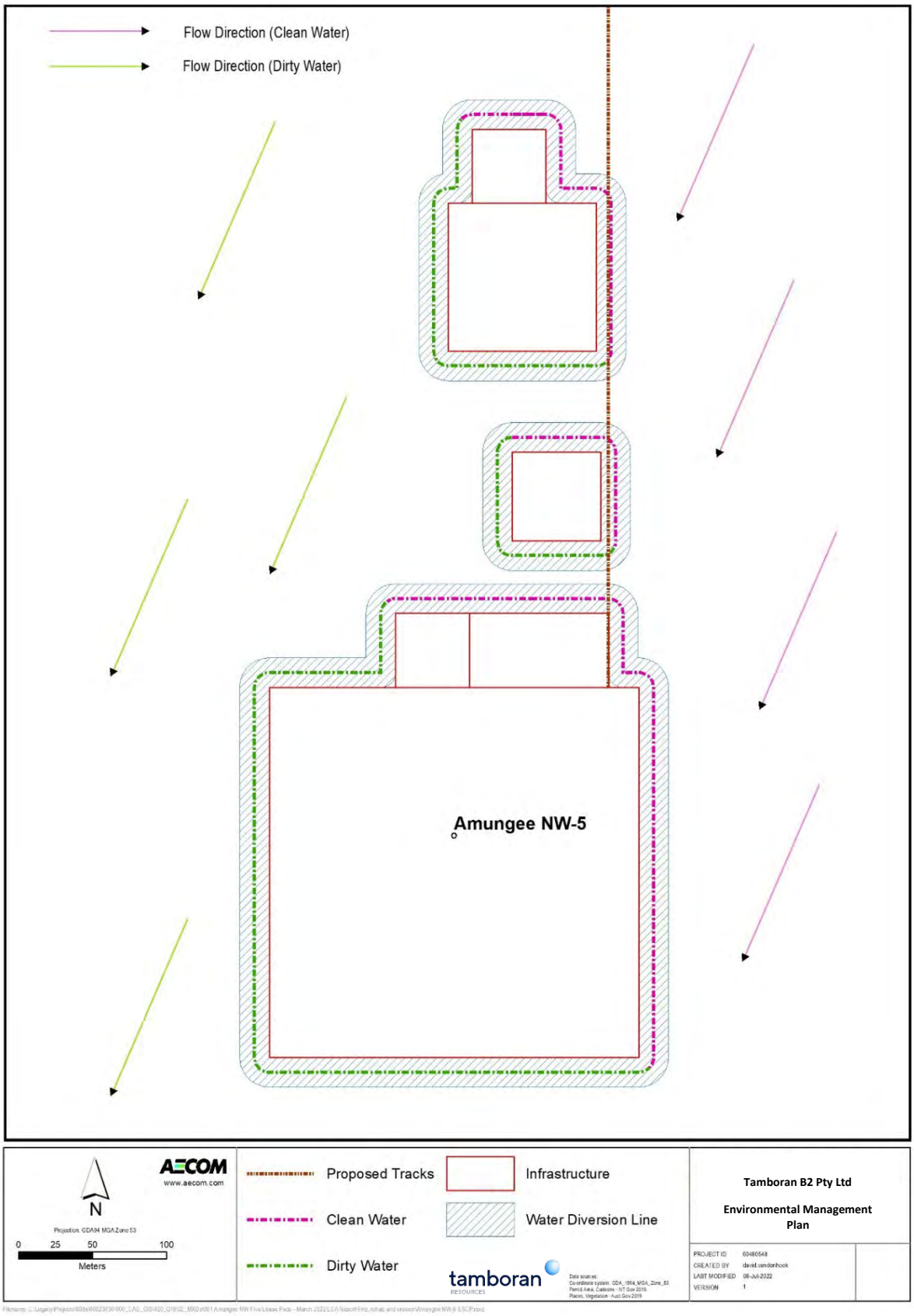
A3 size

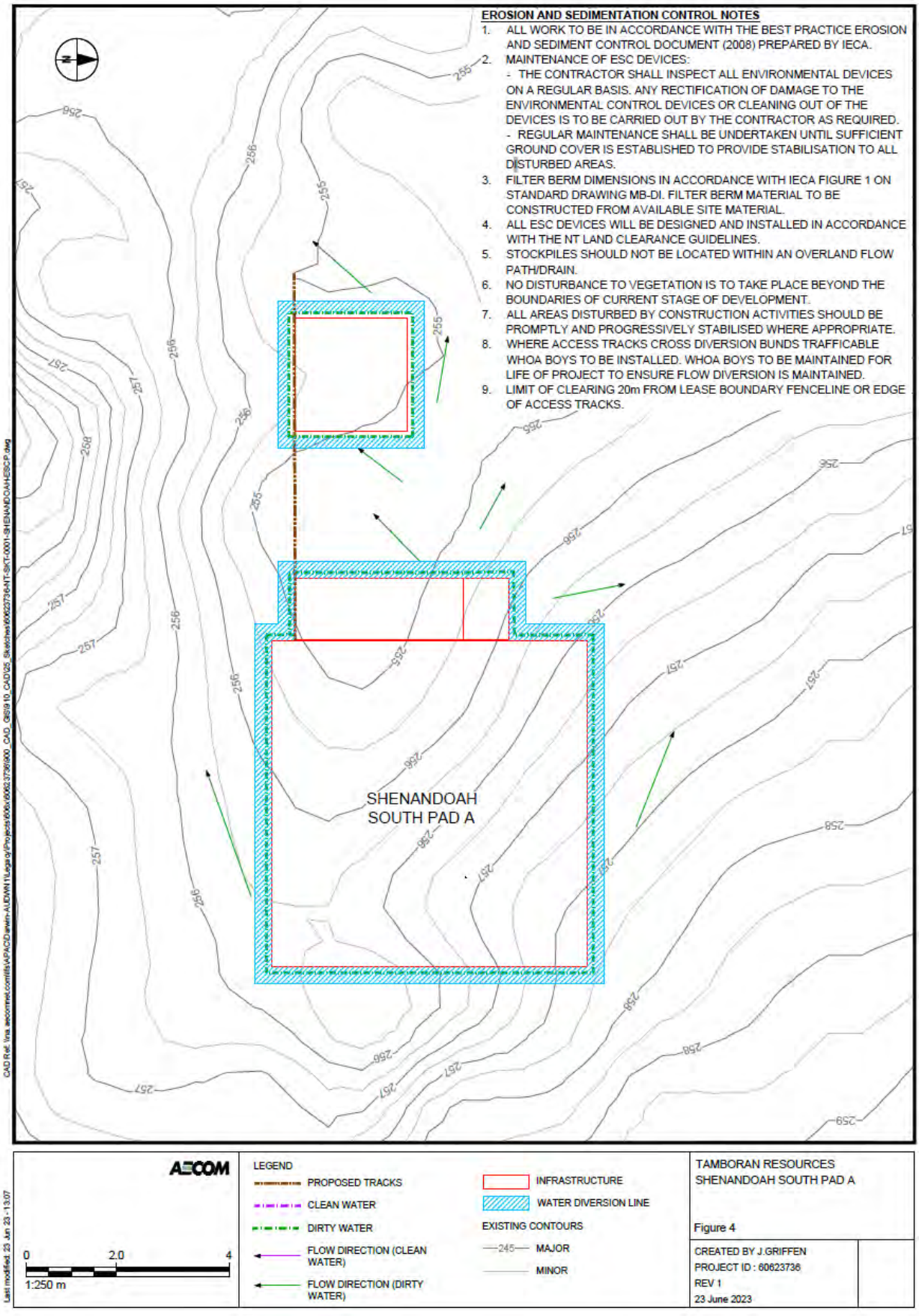

Flow Direction (Clean Water)
Flow Direction (Dirty Water)
Amungee NW-2
N
AECOM
www.aecom.com
Projection: GDA94 MGA Zone 53
0 25 50 100
Meters
Proposed Tracks
Clean Water
Dirty Water
Infrastructure
Water Diversion Line
tamboran RESOURCES
Tamboran B2 Pty Ltd
Environmental Management Plan
PROJECT ID 60480549
CREATED BY david.vanderhoek
LAST MODIFIED 08-Jul-2022
VERSION 1



Review due: 13/09/25


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.vandenhoek
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 60480548
CREATED BY david.vandonkook
LAST MODIFIED 08-Jul-2022
VERSION 1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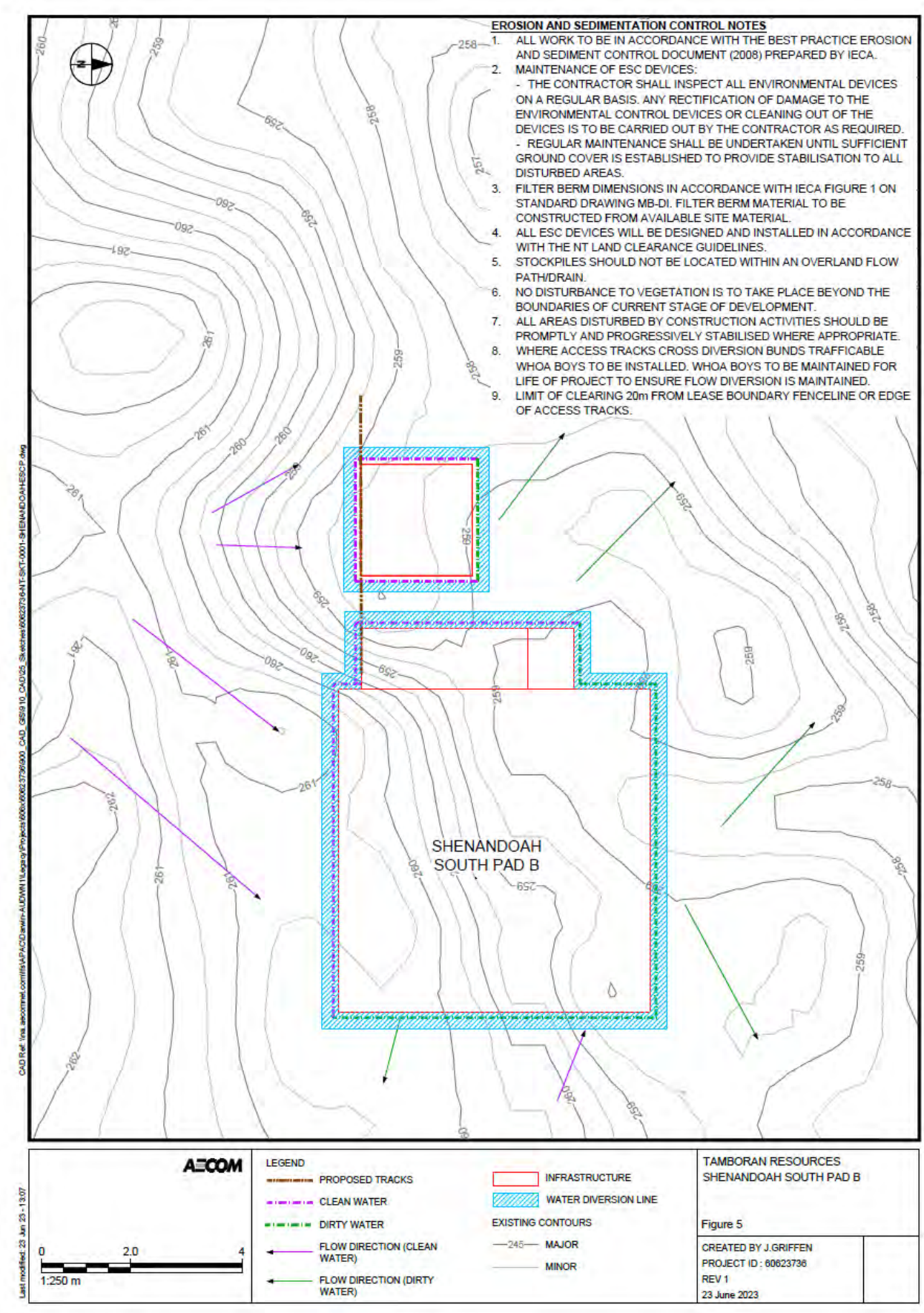
9. LIMIT OF CLEARING 20m FROM LEASE BOUNDARY FENCELINE OR EDGE OF ACCESS TRACKS.
SHENANDOAH SOUTH PAD A
AECOM
LEGEND
PROPOSED TRACKS
CLEAN WATER
DIRTY WATER
FLOW DIRECTION (CLEAN WATER)
FLOW DIRECTION (DIRTY WATER)
INFRASTRUCTURE
WATER DIVERSION LINE
EXISTING CONTOURS
245 MAJOR
MINOR
0 2.0 4
1:250 m
TAMBORAN RESOURCES
SHENANDOAH SOUTH PAD A
Figure 4
CREATED BY J.GRIFFEN
PROJECT ID : 60623736
REV 1
23 June 2023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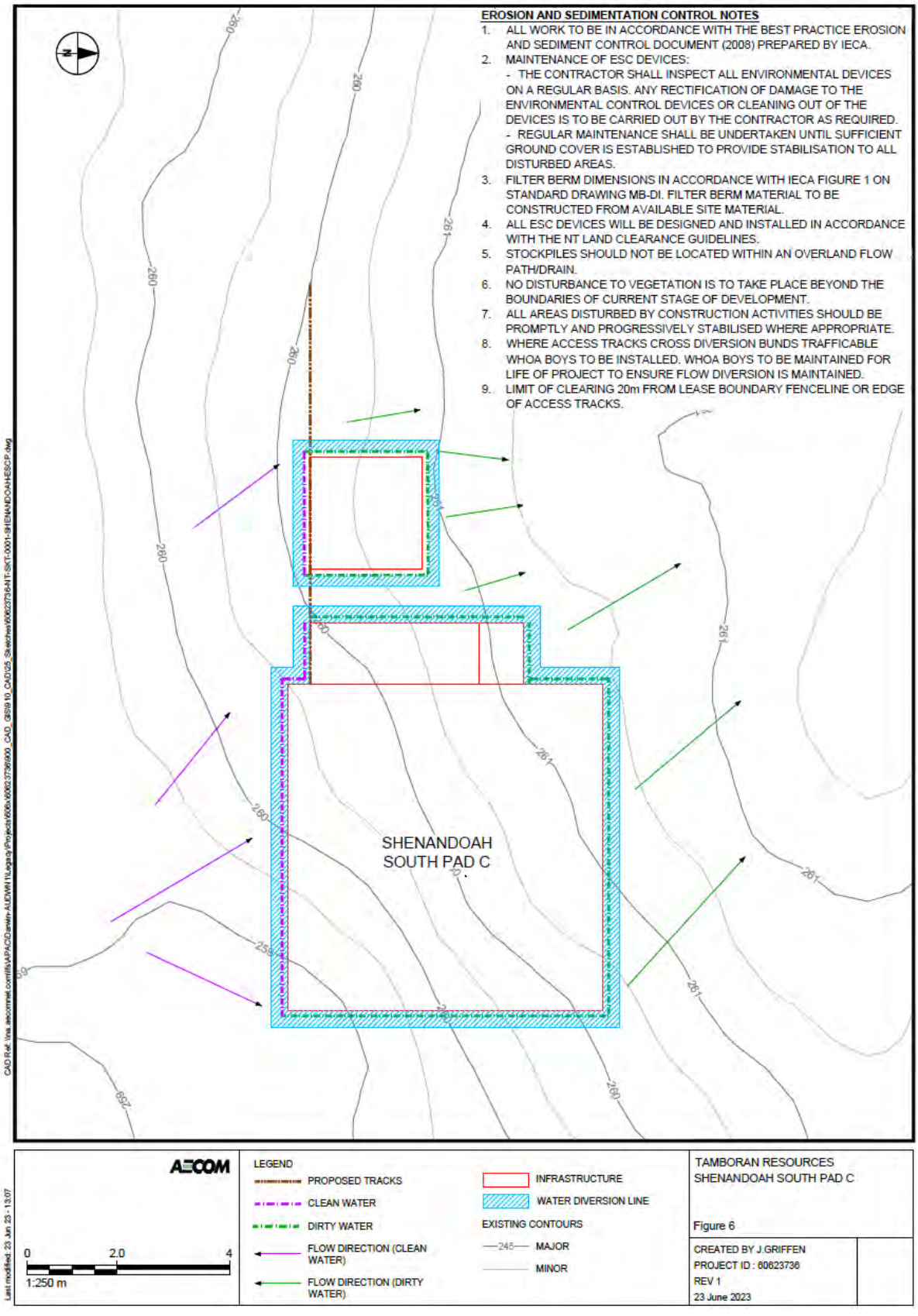
SHENANDOAH
SOUTH PAD B
AECOM
LEGEND
PROPOSED TRACKS
CLEAN WATER
DIRTY WATER
FLOW DIRECTION (CLEAN WATER)
FLOW DIRECTION (DIRTY WATER)
INFRASTRUCTURE
WATER DIVERSION LINE
EXISTING CONTOURS
MAJOR
MINOR
0 2.0 4
1:250 m
TAMBORAN RESOURCES
SHENANDOAH SOUTH PAD B
Figure 5
CREATED BY J.GRIFFEN
PROJECT ID : 60623736
REV 1
23 June 2023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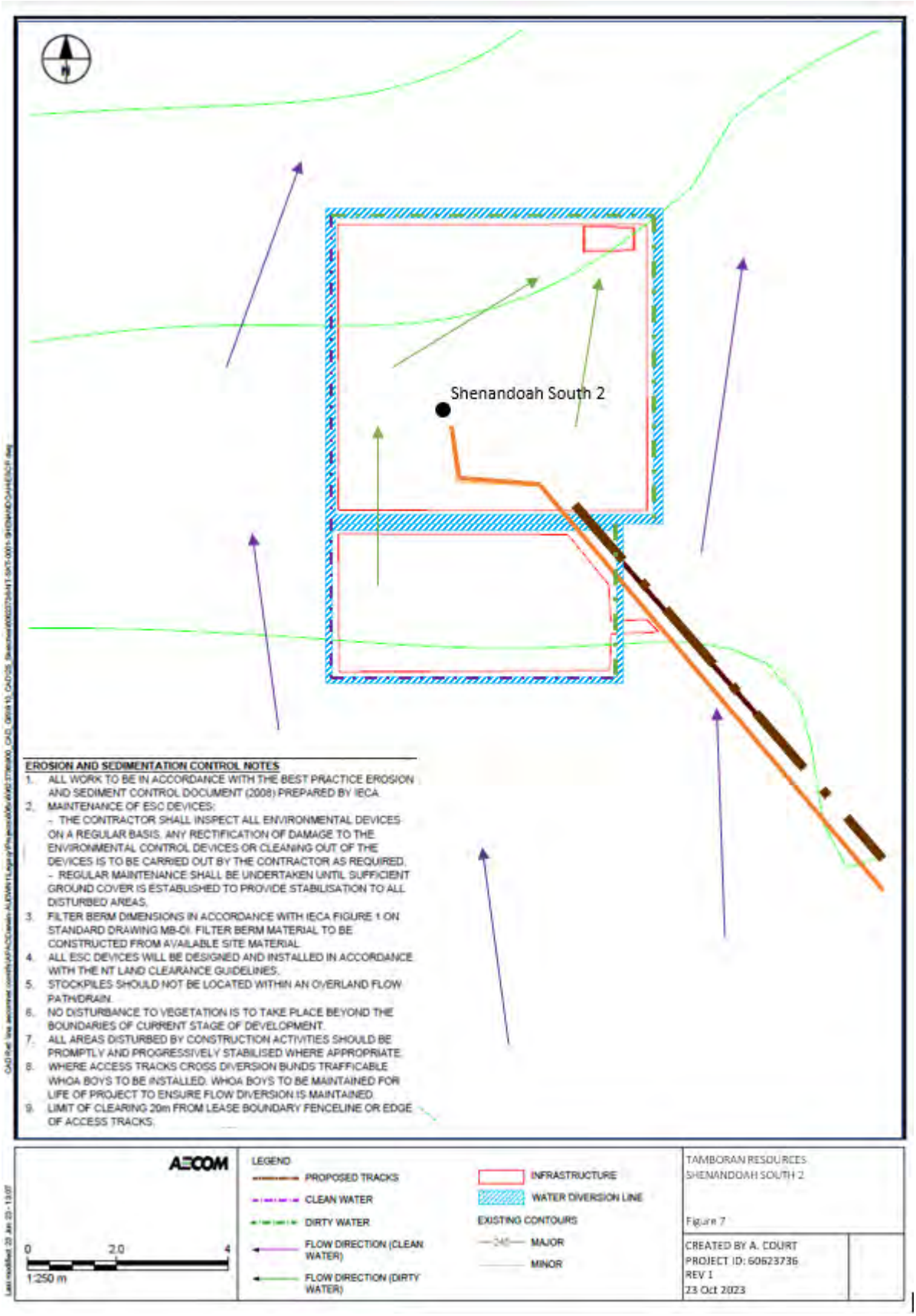
SHENANDOAH SOUTH PAD C
AECOM
LEGEND
PROPOSED TRACKS
CLEAN WATER
DIRTY WATER
FLOW DIRECTION (CLEAN WATER)
FLOW DIRECTION (DIRTY WATER)
INFRASTRUCTURE
WATER DIVERSION LINE
EXISTING CONTOURS
MAJOR
MINOR
0 2.0 4
1:250 m
TAMBORAN RESOURCES
SHENANDOAH SOUTH PAD C
Figure 6
CREATED BY J.GRIFFEN
PROJECT ID : 60623736
REV 1
23 June 2023


Shenandoah South 2
EROSION AND SEDIMENTATION CONTROL NOTES
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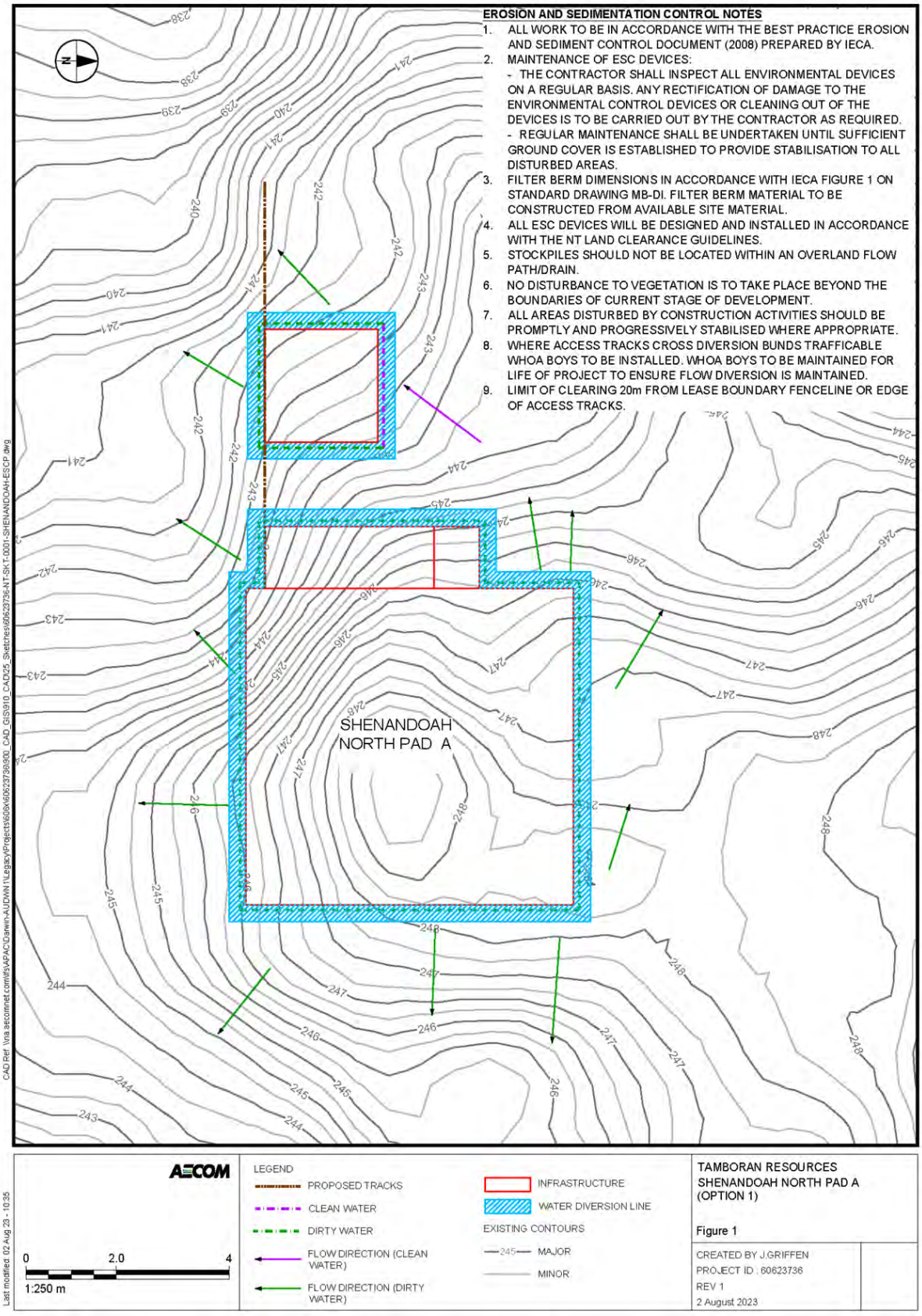
9. LIMIT OF CLEARING 20m FROM LEASE BOUNDARY FENCELINE OR EDGE OF ACCESS TRACKS.
AECOM
0 2.0 4
1:250 m
LEGEND
PROPOSED TRACKS
CLEAN WATER
DIRTY WATER
FLOW DIRECTION (CLEAN WATER)
FLOW DIRECTION (DIRTY WATER)
INFRASTRUCTURE
WATER DIVERSION LINE
EXISTING CONTOURS
MAJOR
MINOR
TAMBORAN RESOURCES
SHENANDOAH SOUTH 2
Figure 7
CREATED BY A. COURT
PROJECT ID: 60623736
REV 1
23 Oct 2023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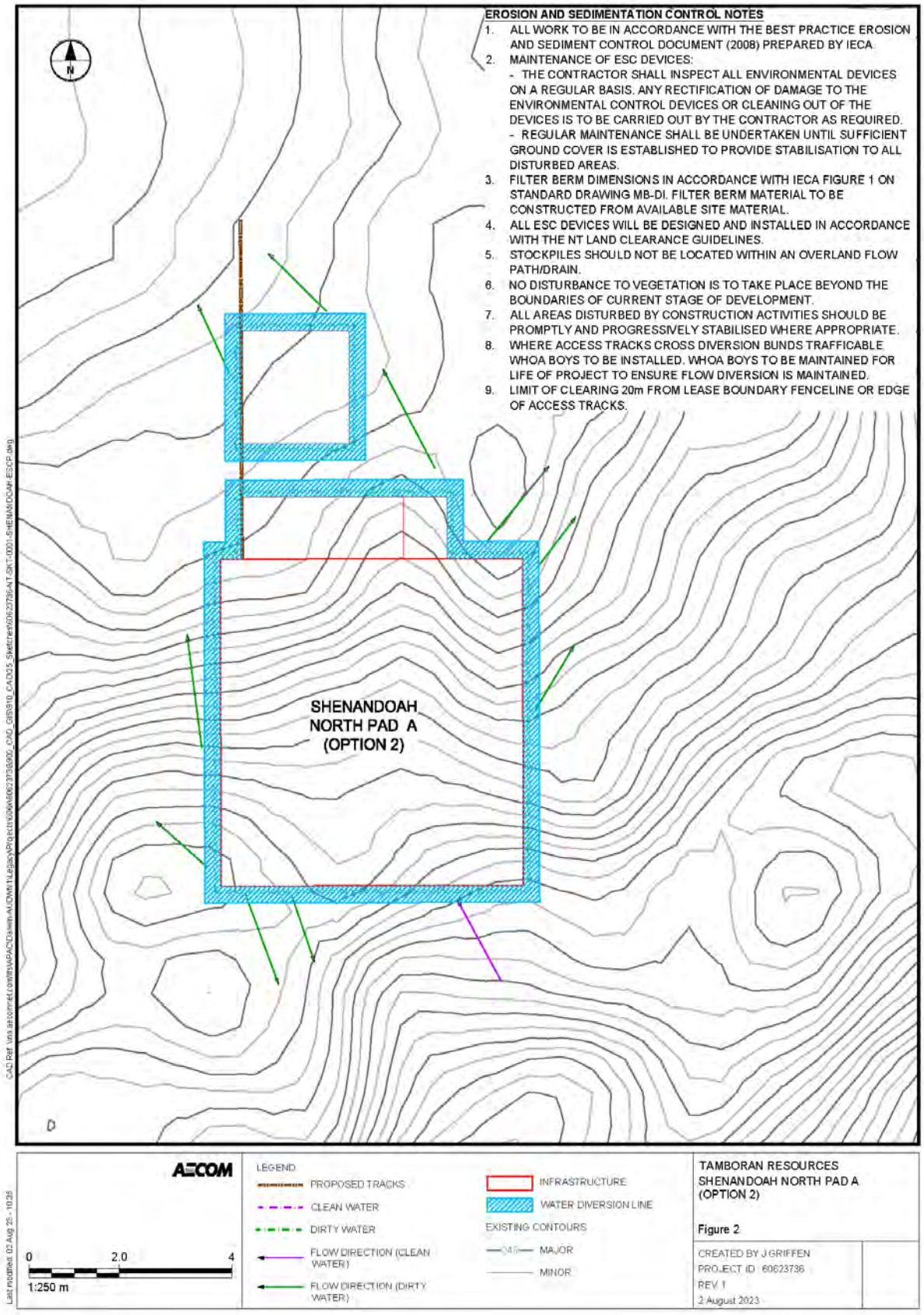
9. LIMIT OF CLEARING 20m FROM LEASE BOUNDARY FENCELINE OR EDGE OF ACCESS TRACKS.
SHENANDOAH NORTH PAD A
N
AECOM
LEGEND
PROPOSED TRACKS
CLEAN WATER
DIRTY WATER
FLOW DIRECTION (CLEAN WATER)
FLOW DIRECTION (DIRTY WATER)
INFRASTRUCTURE
WATER DIVERSION LINE
EXISTING CONTOURS
245 MAJOR
MINOR
0 2.0 4
1:250 m
TAMBORAN RESOURCES
SHENANDOAH NORTH PAD A
(OPTION 1)
Figure 1
CREATED BY J.GRIFFEN
PROJECT ID : 60623736
REV 1
2 August 2023
CAD Ref: \\na.aecomnet.com\fs\APAC\Darwin-AUDWN1\Legacy\Projects\606x\60623736\300_CAD_GIS\910_CAD\25_Sketches\60623736-NT-SKT-0001-SHENANDOAH-ESCP.dwg
Last modified: 02 Aug 23 - 10:35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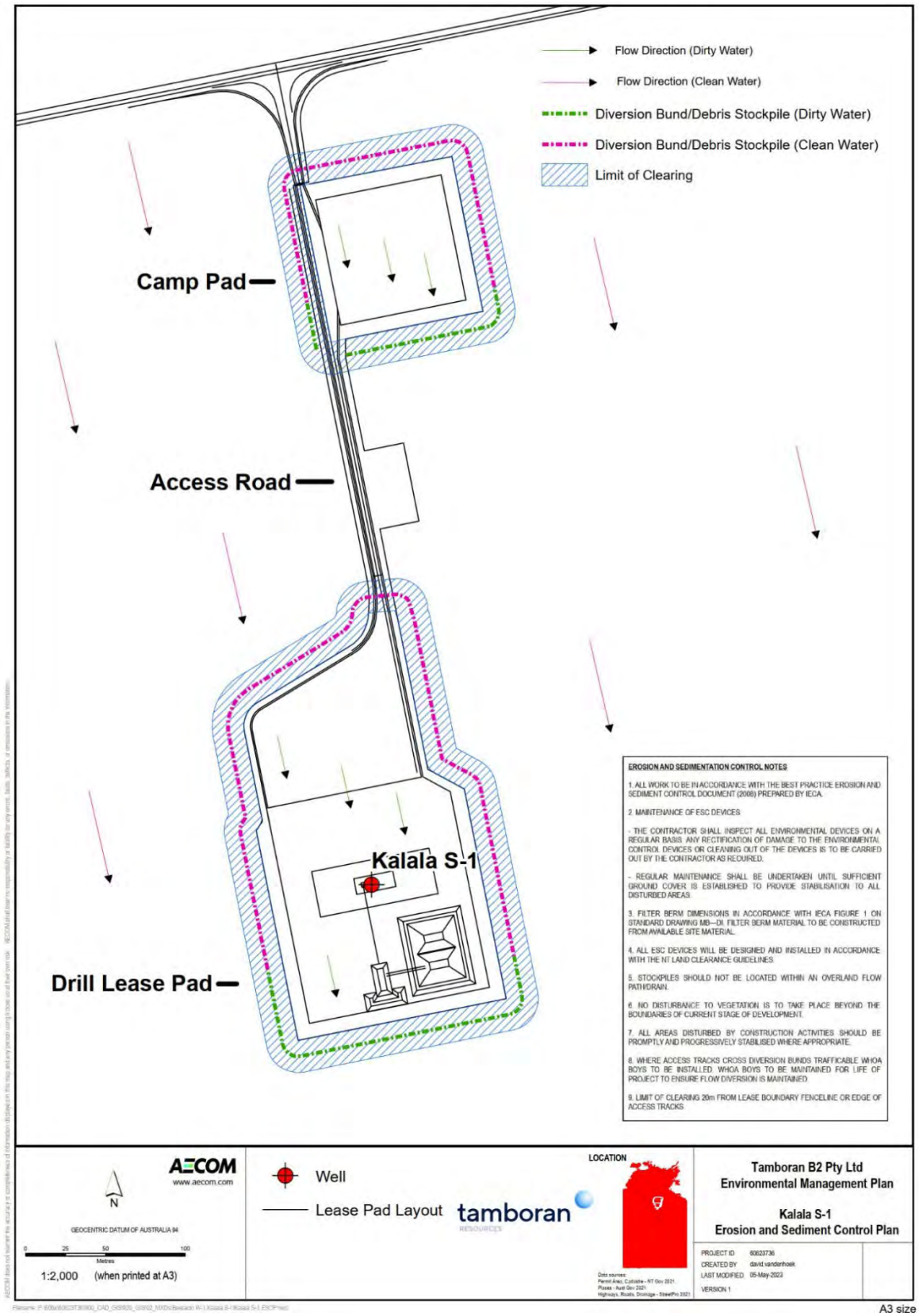
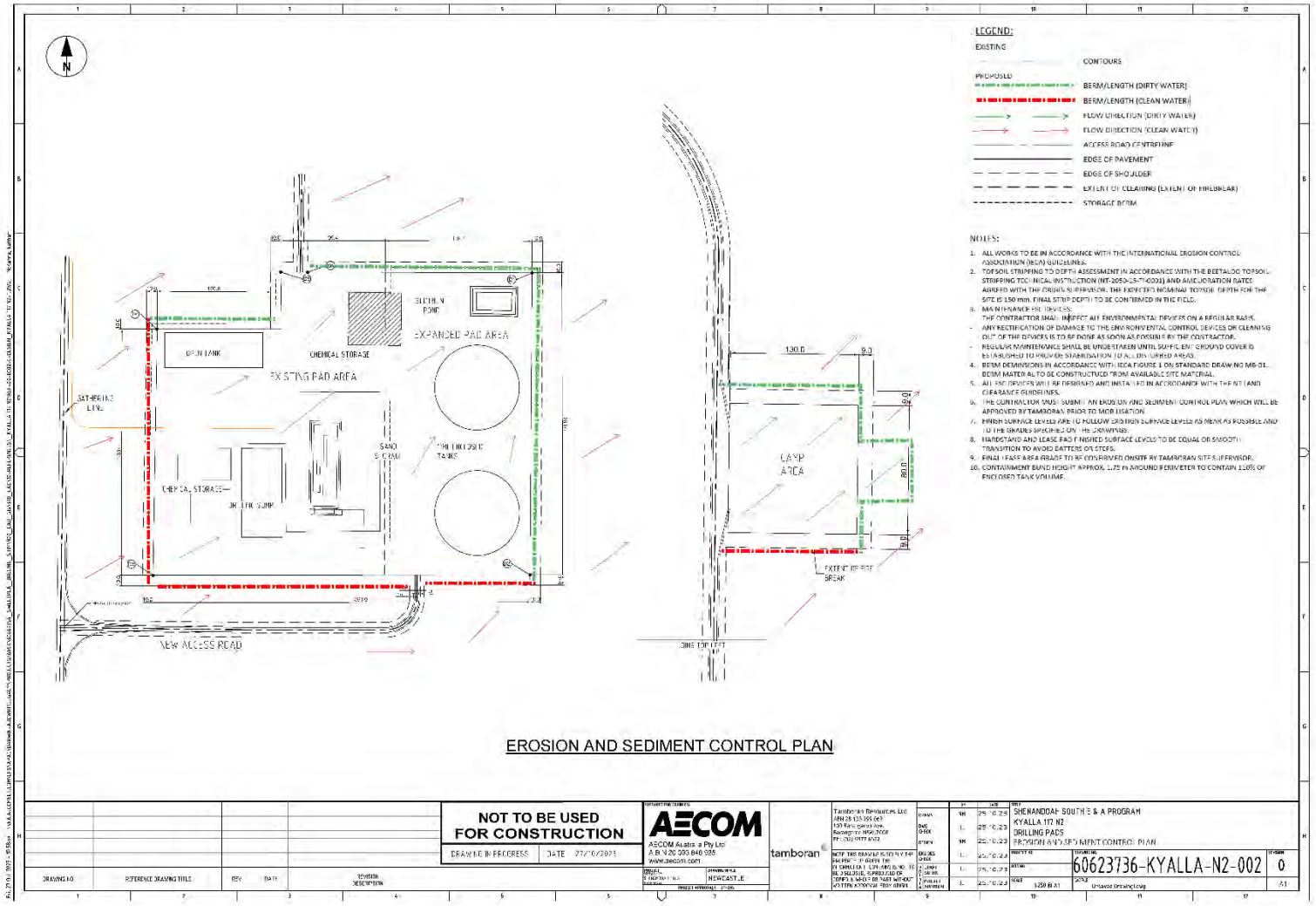
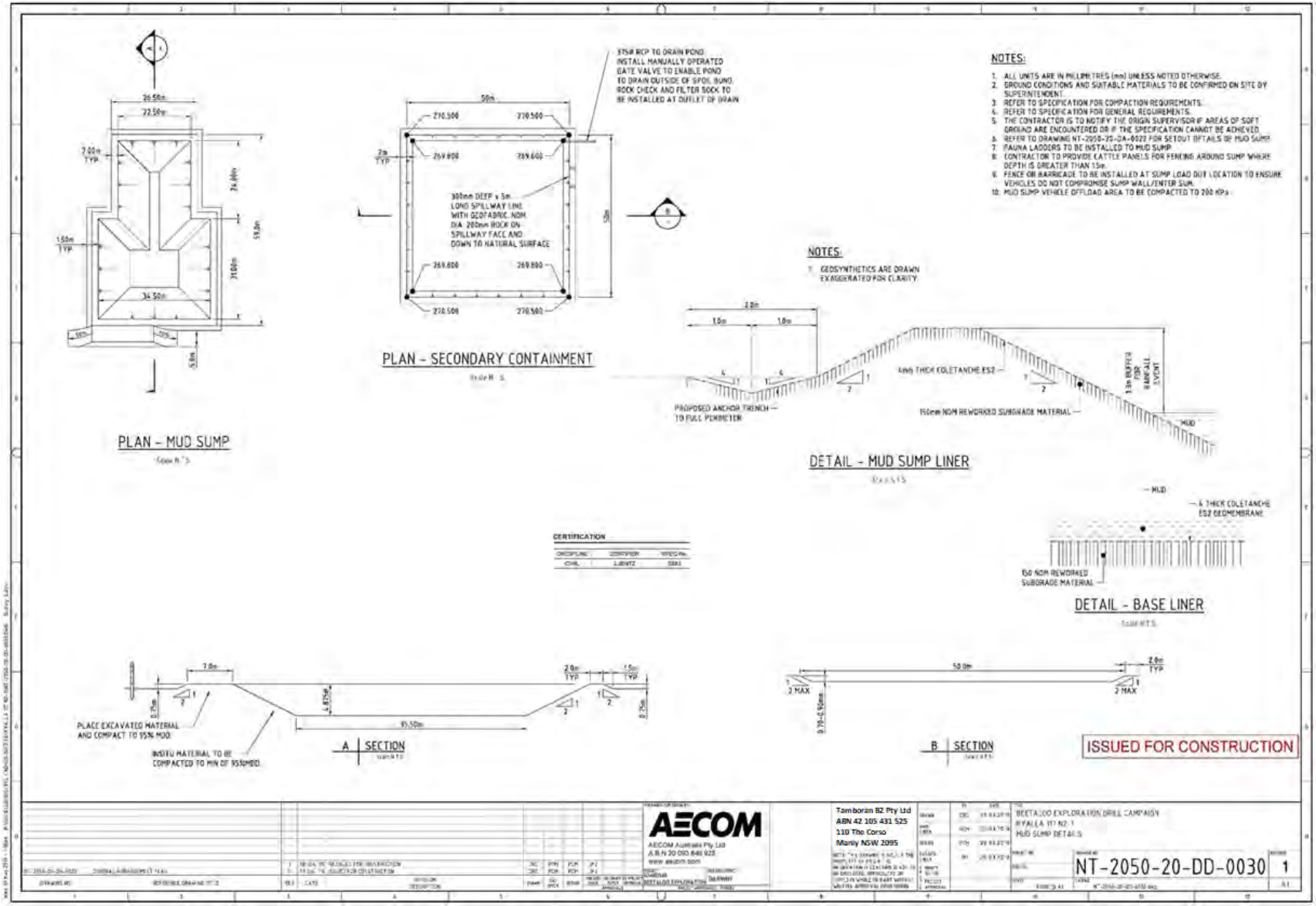
9. LIMIT OF CLEARING 20m FROM LEASE BOUNDARY FENCELINE OR EDGE OF ACCESS TRACKS.
N
SHENANDOAH NORTH PAD A (OPTION 2)
D
AECOM
LEGEND
PROPOSED TRACKS
CLEAN WATER
DIRTY WATER
FLOW DIRECTION (CLEAN WATER)
FLOW DIRECTION (DIRTY WATER)
INFRASTRUCTURE
WATER DIVERSION LINE
EXISTING CONTOURS
MAJOR
MINOR
0 2.0 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

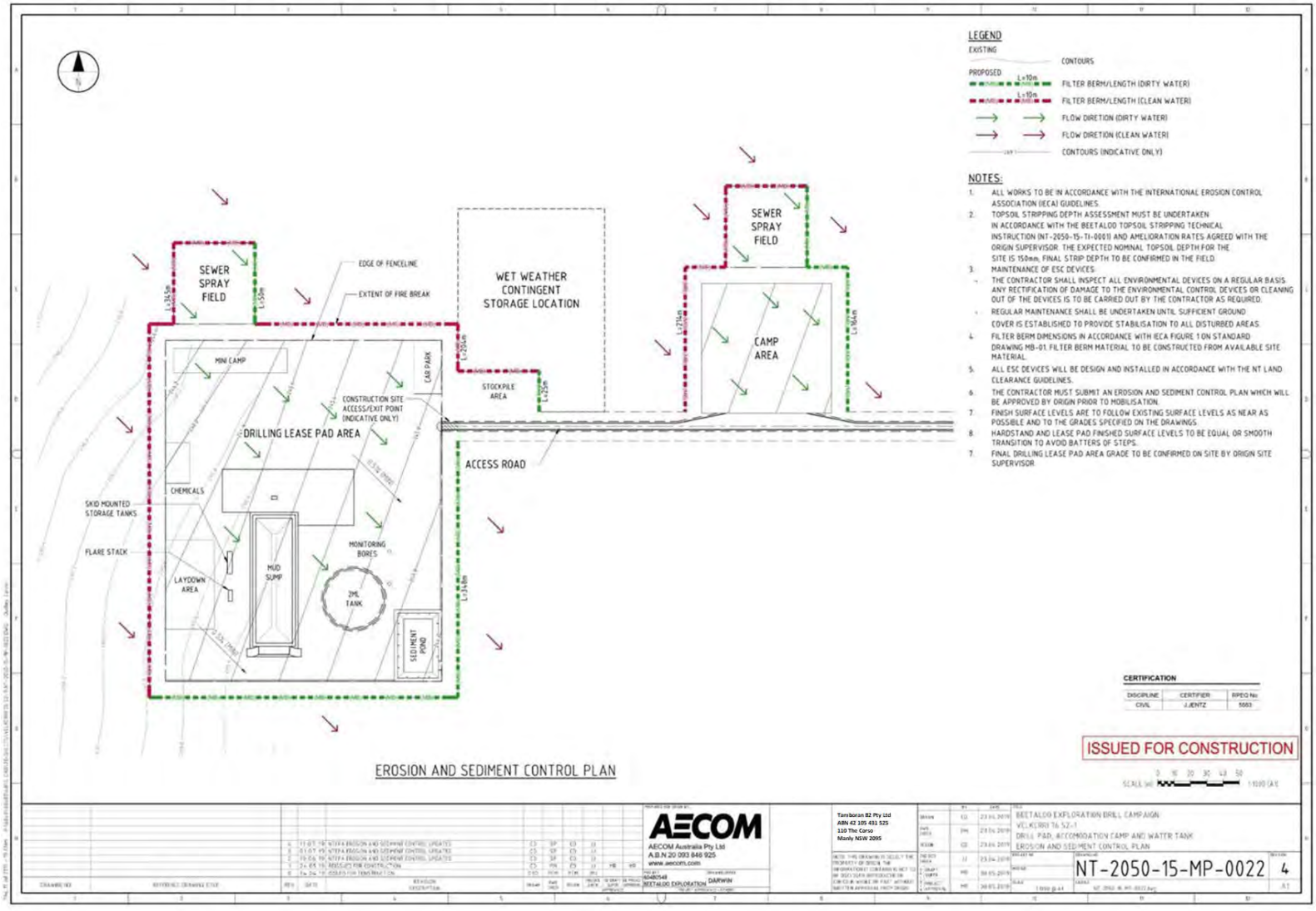


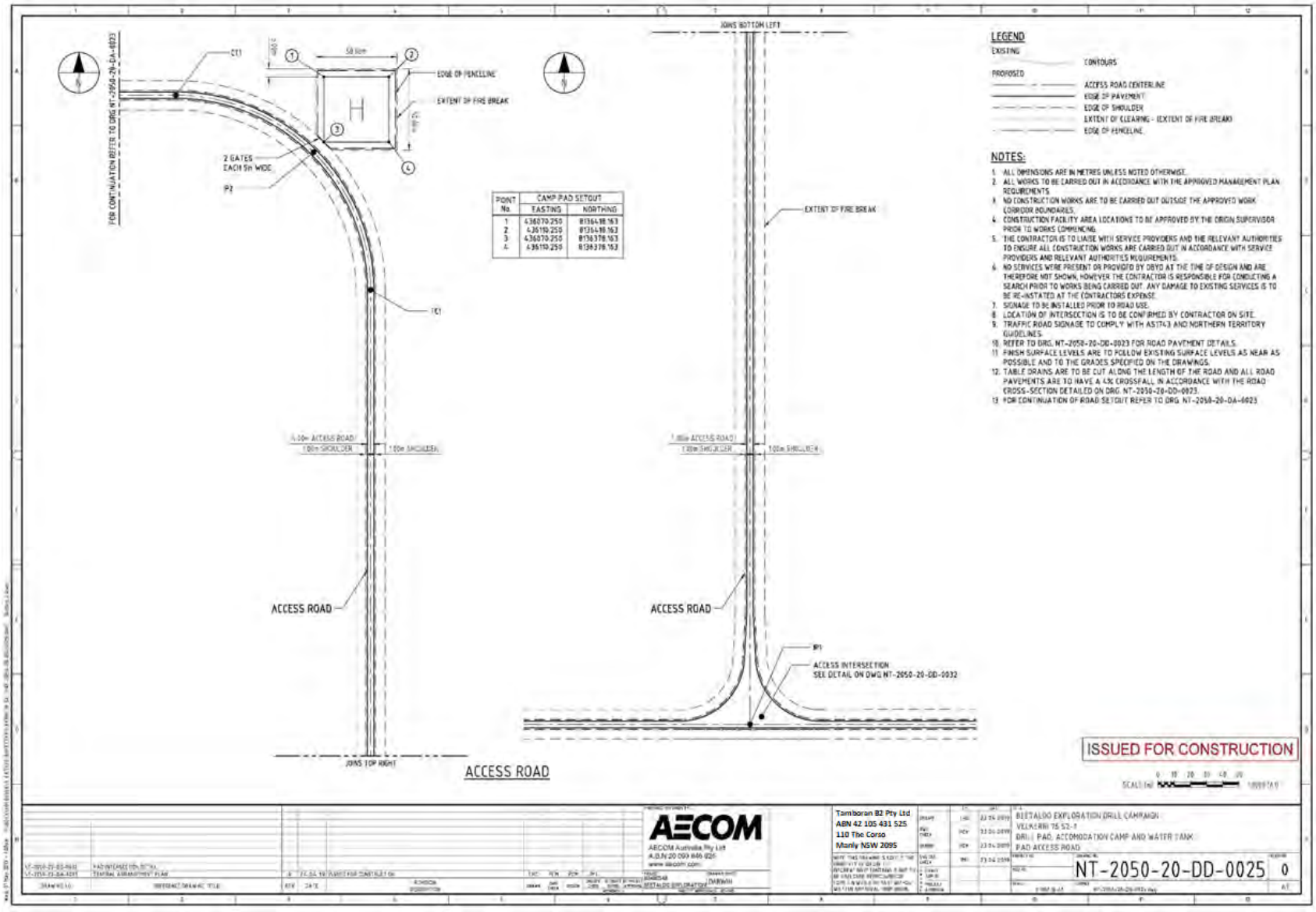
Appendix G Erosion and sediment control plan for Kyalla 117-N2

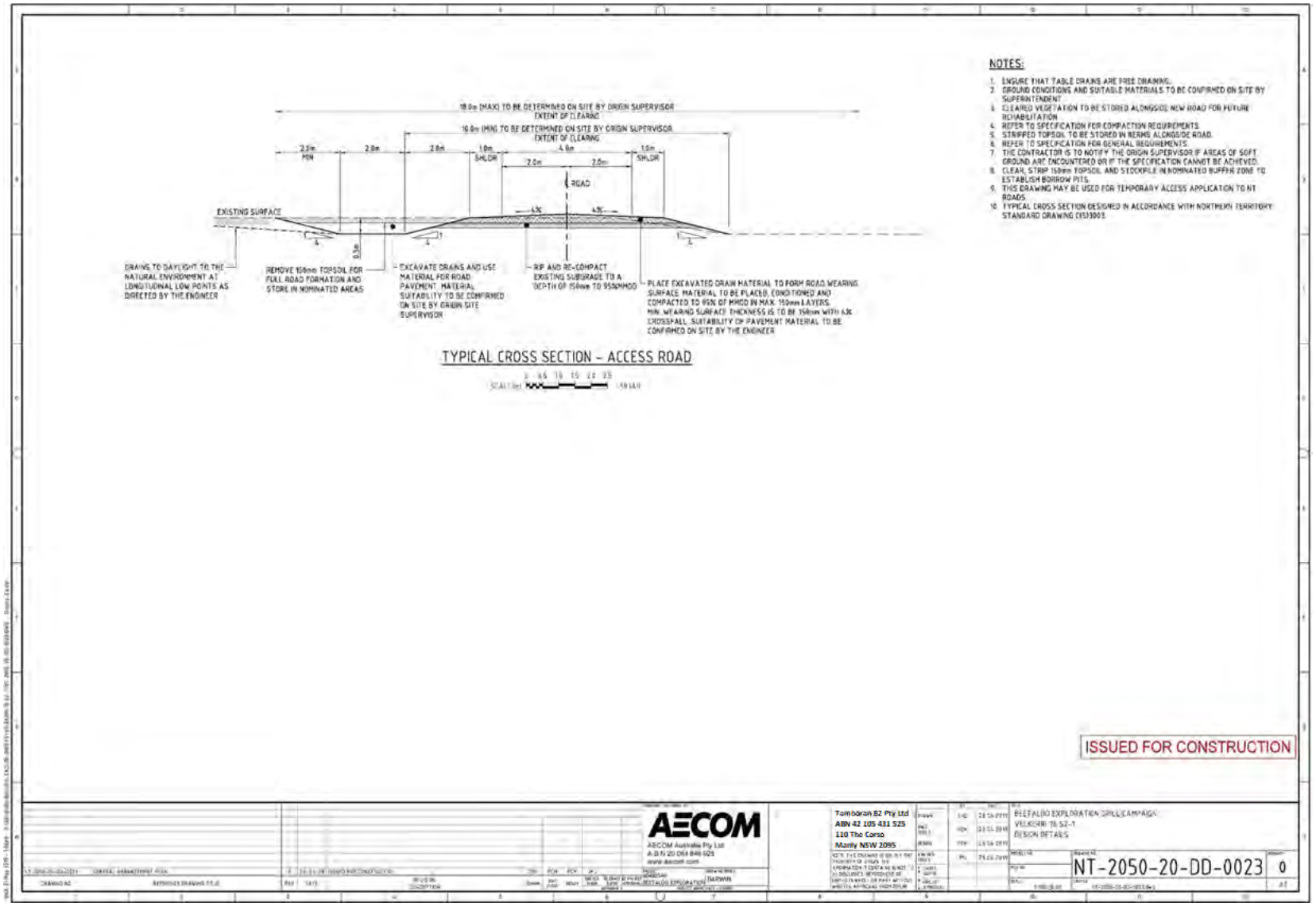


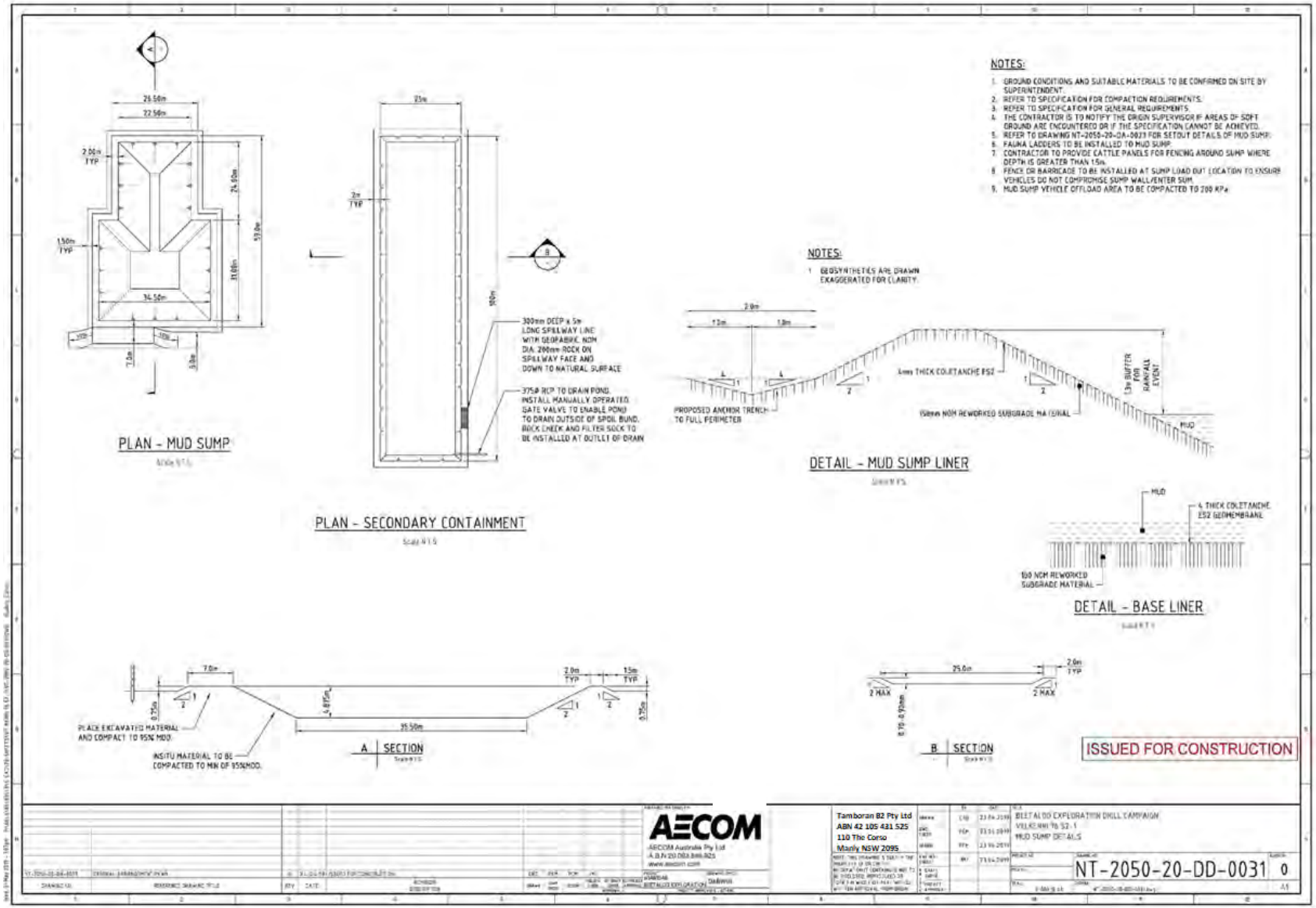

PLAN - MUD SUMP
PLAN - SECONDARY CONTAINMENT
375ø RCP TO DRAIN POND. INSTALL MANUALLY OPERATED GATE VALVE TO ENABLE POND TO DRAIN OUTSIDE OF SPOIL BUND. ROCK CHECK AND FILTER SOCK TO BE INSTALLED AT OUTLET OF DRAIN
300mm DEEP x 5m LONG SPILLWAY LINE WITH GEOFABRIC. NOM DIA 200mm ROCK ON SPILLWAY FACE 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
4mm THICK COLETANCHE ES2
150mm NOM REWORKED SUBGRADE MATERIAL
MUD
DETAIL - MUD SUMP LINER
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
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

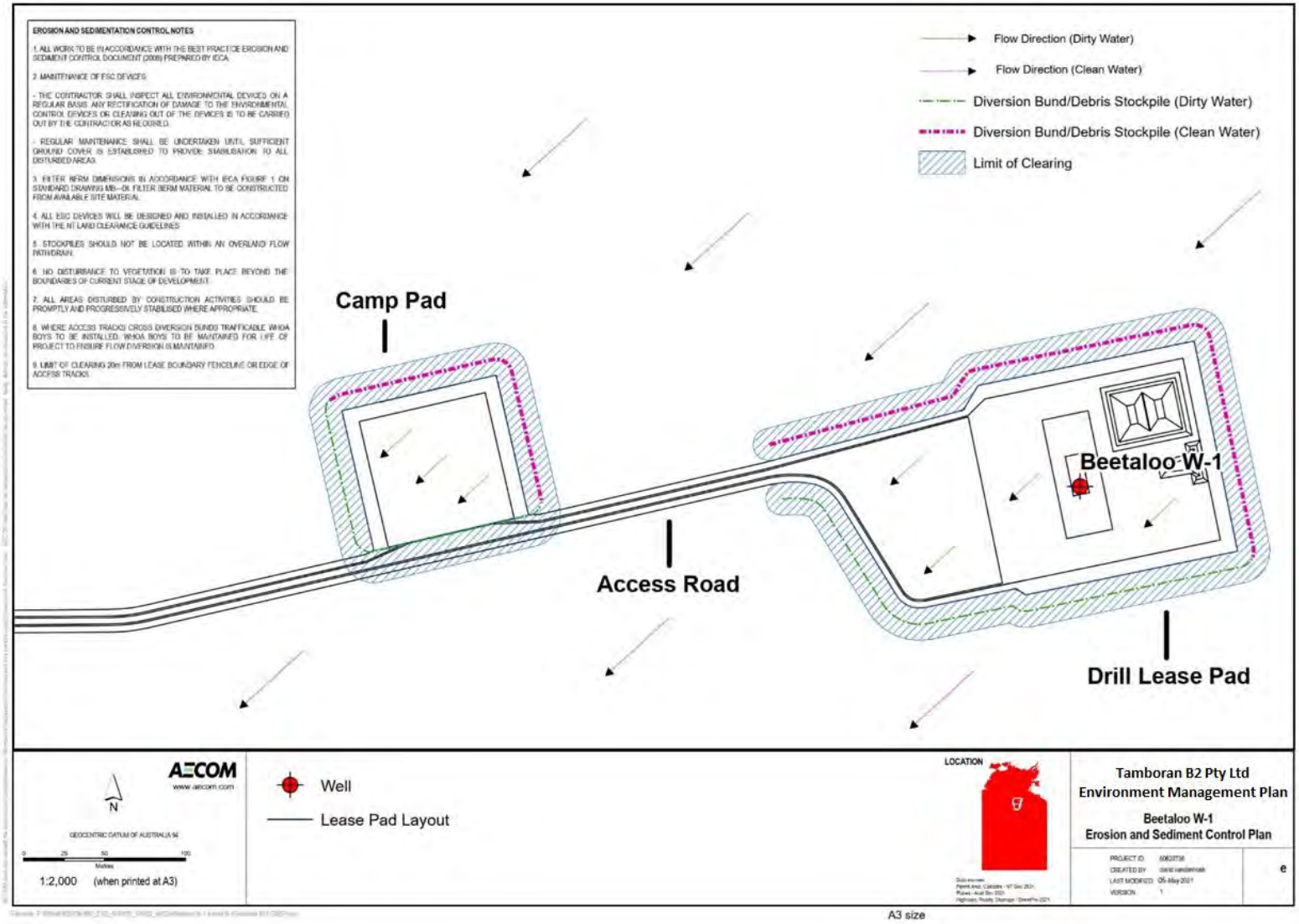



JOINS BOTTOM LEFT
FOR CONTINUATION REFER TO DRG NT-2050-20-DA-0023
CT1
EDGE OF FENCELINE
EXTENT OF FIRE BREAK
2 GATES EACH 5m WIDE
IP2
TC1
CAMP PAD SETOUT
POINT No.
EASTING
NORTHING
1 436070.250 8136498.163
2 436159.250 8136498.163
3 436070.250 8136378.163
4 436159.250 8136378.163
EXTENT OF FIRE BREAK
ACCESS ROAD
ACCESS ROAD
IP1
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
AECOM Australia Pty Ltd
A.B.N 20 093 846 925
Tamboran B2 Pty Ltd
ABN 42 105 431 525
110 The Corso
Manly NSW 2095
BEETALOO EXPLORATION DRILL CAMPAIGN
VELKERRI 7S S2-1
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%
0.15
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
A1

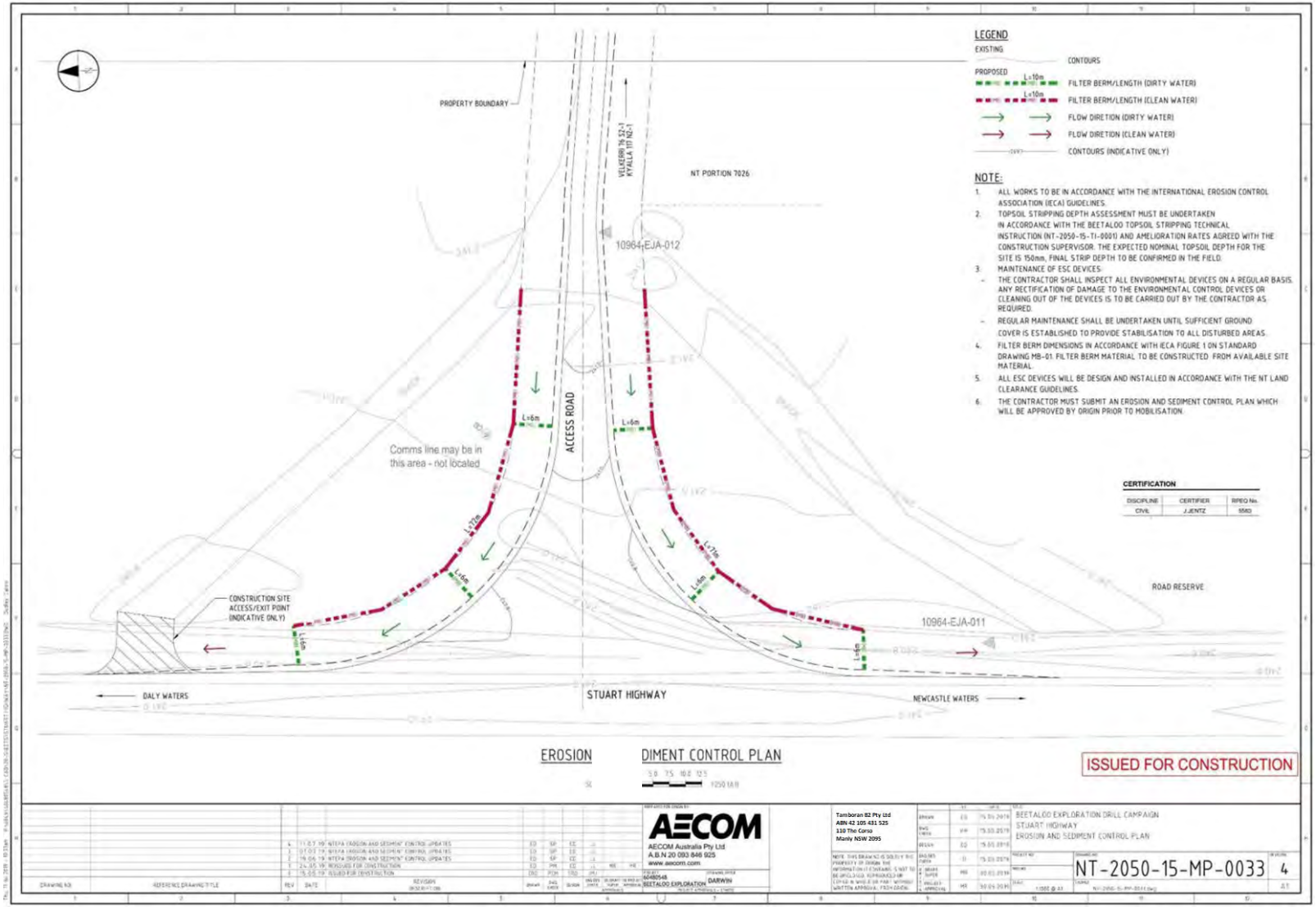

NOTES:
1. GROUND CONDITIONS AND SUITABLE MATERIALS TO BE CONFIRMED ON SITE BY SUPERINTENDENT.
2. REFER TO SPECIFICATION FOR COMPACTION REQUIREMENTS.
3. REFER TO SPECIFICATION FOR GENERAL REQUIREMENTS.
4. THE CONTRACTOR IS TO NOTIFY THE ORIGIN SUPERVISOR IF AREAS OF SOFT GROUND ARE ENCOUNTERED OR IF THE 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 GEOPAVING, NOM 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
1.5m BUFFER FOR 1:100 YEAR RAINFALL EVENT
150mm NOM REWORKED SUBGRADE MATERIAL
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
0

Appendix I Erosion and sediment control plan for Beetaloo W

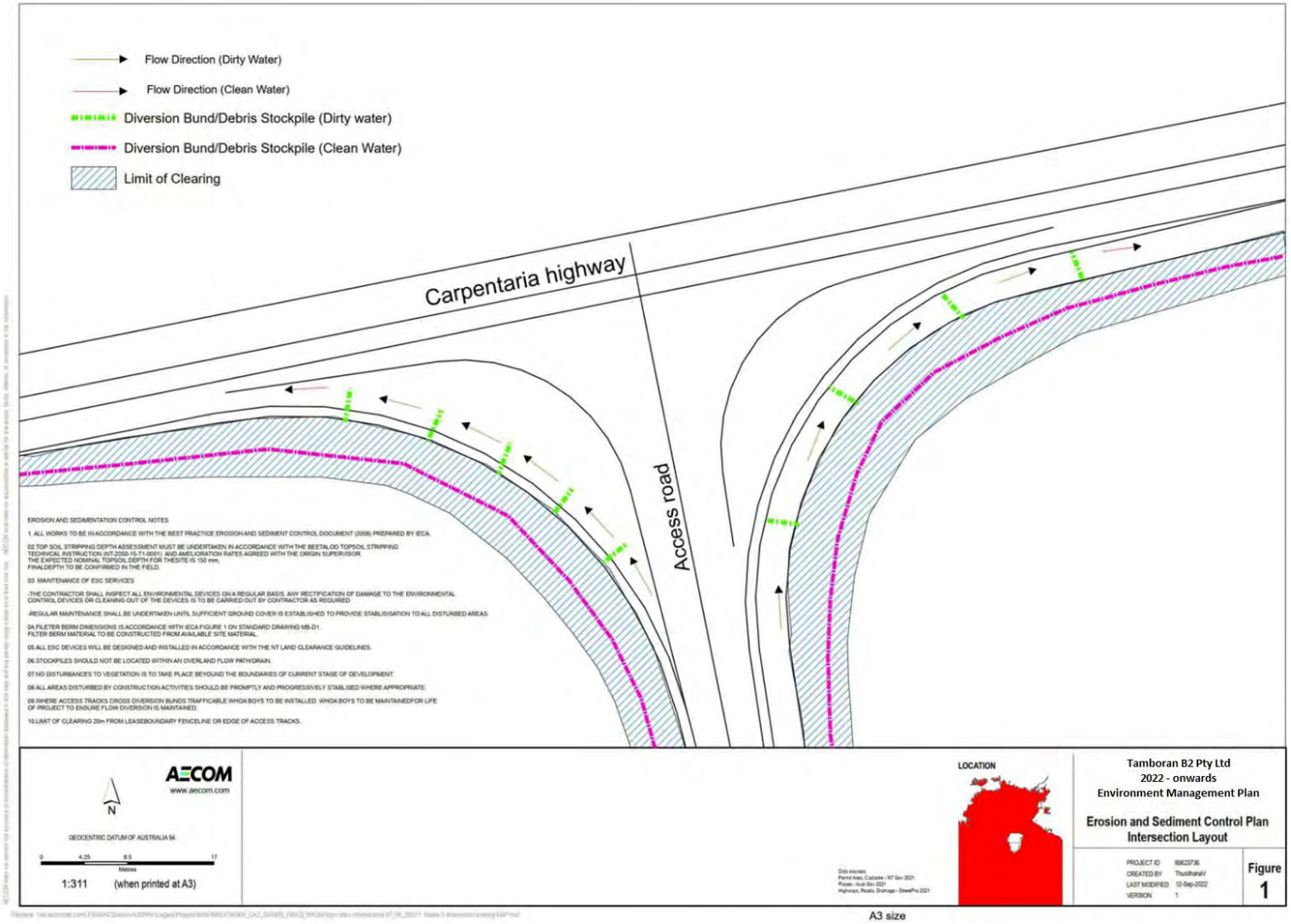


A3 size

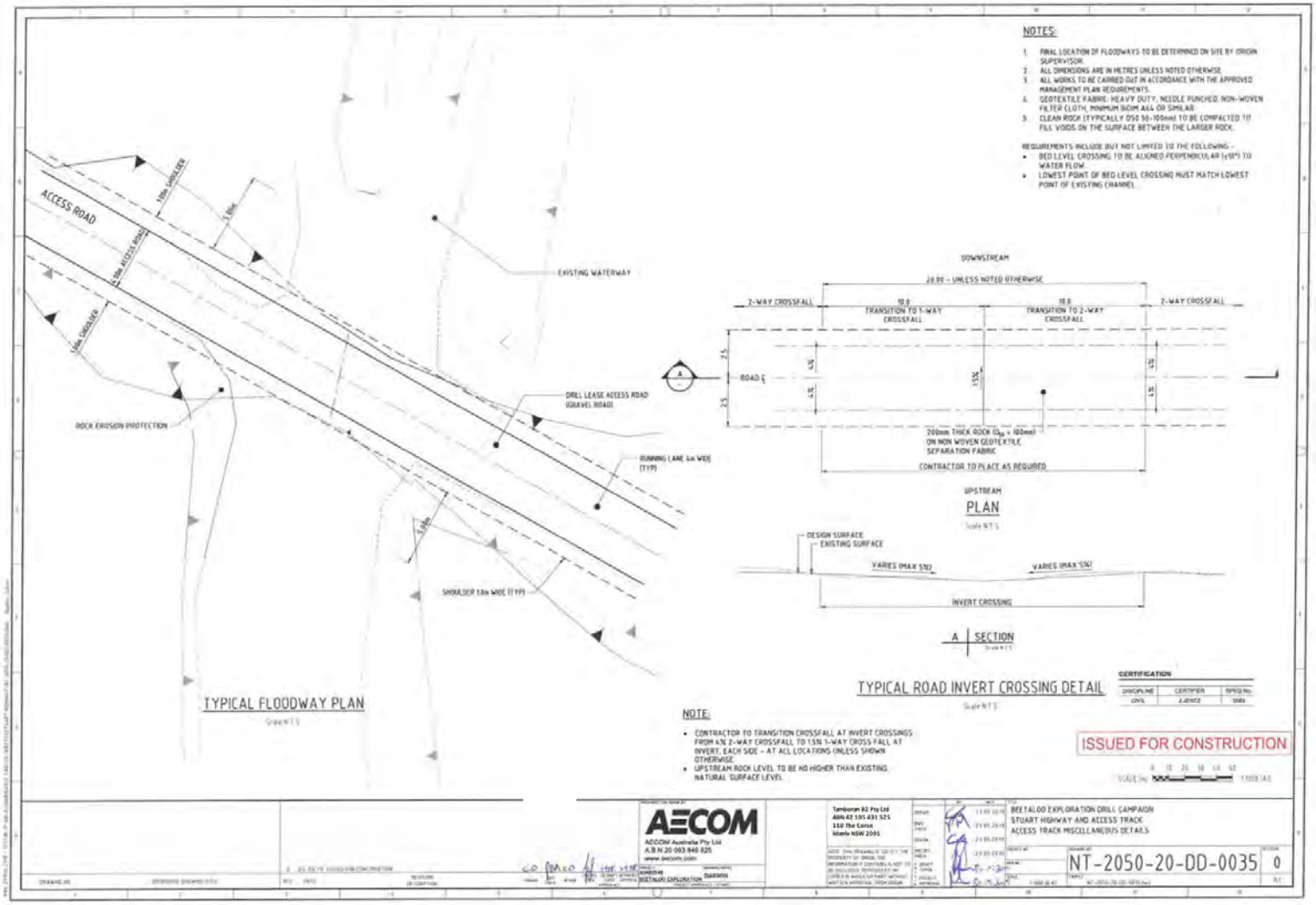
Appendix J Erosion and sediment control plan for Stuart Highway intersection



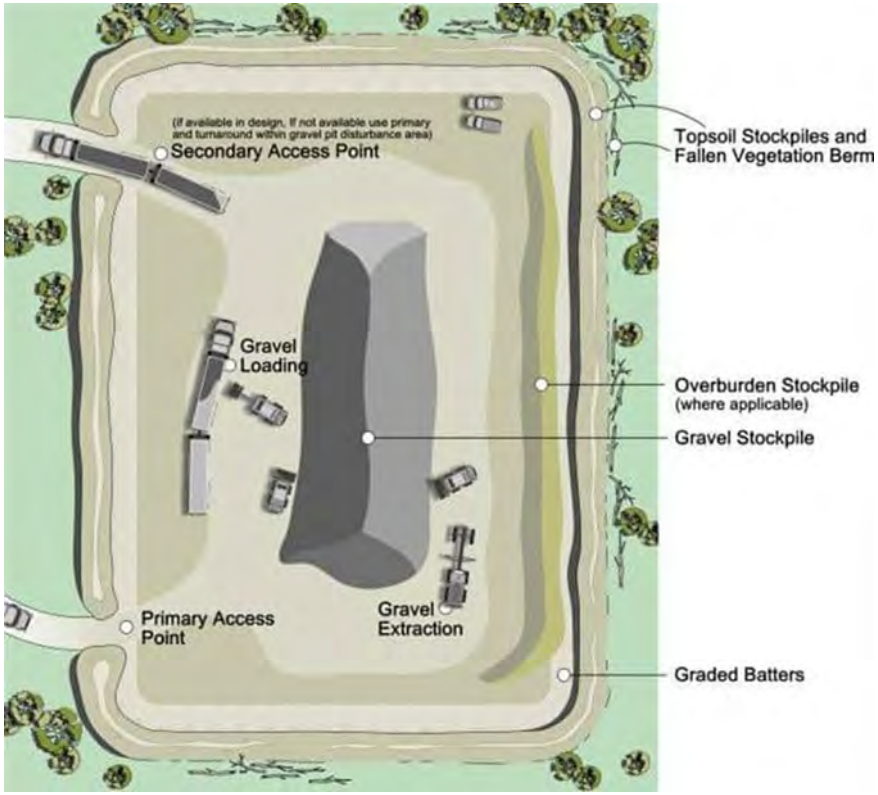
Appendix K Erosion and sediment control plan for typical Carpentaria Highway intersection

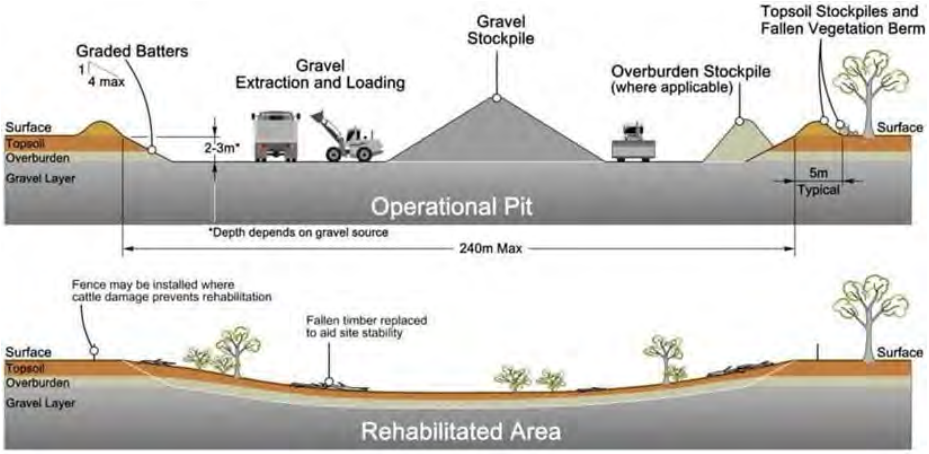


Appendix L Erosion and sediment control plan for typical road invert crossing



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.

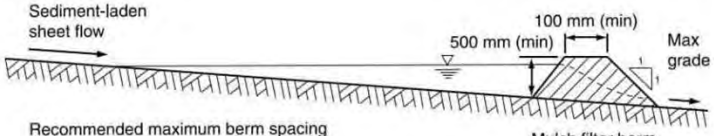
5. DISPOSE OF SEDIMENT IN A SUITABLE MANNER THAT WILL NOT CAUSE AN EROSION OR POLLUTION HAZARD.

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

Catchments & Creeks Pty Ltd

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.

Catchments & Creeks Pty Ltd

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.

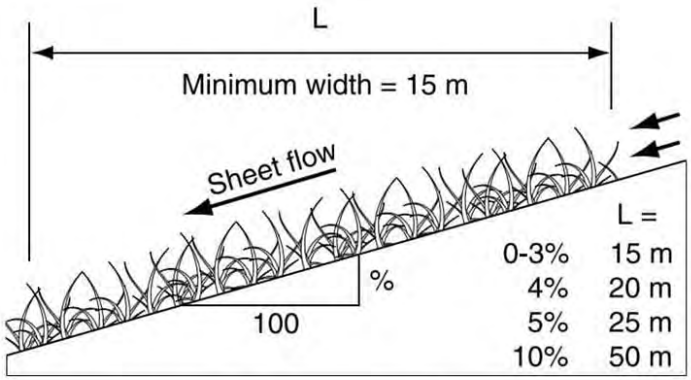
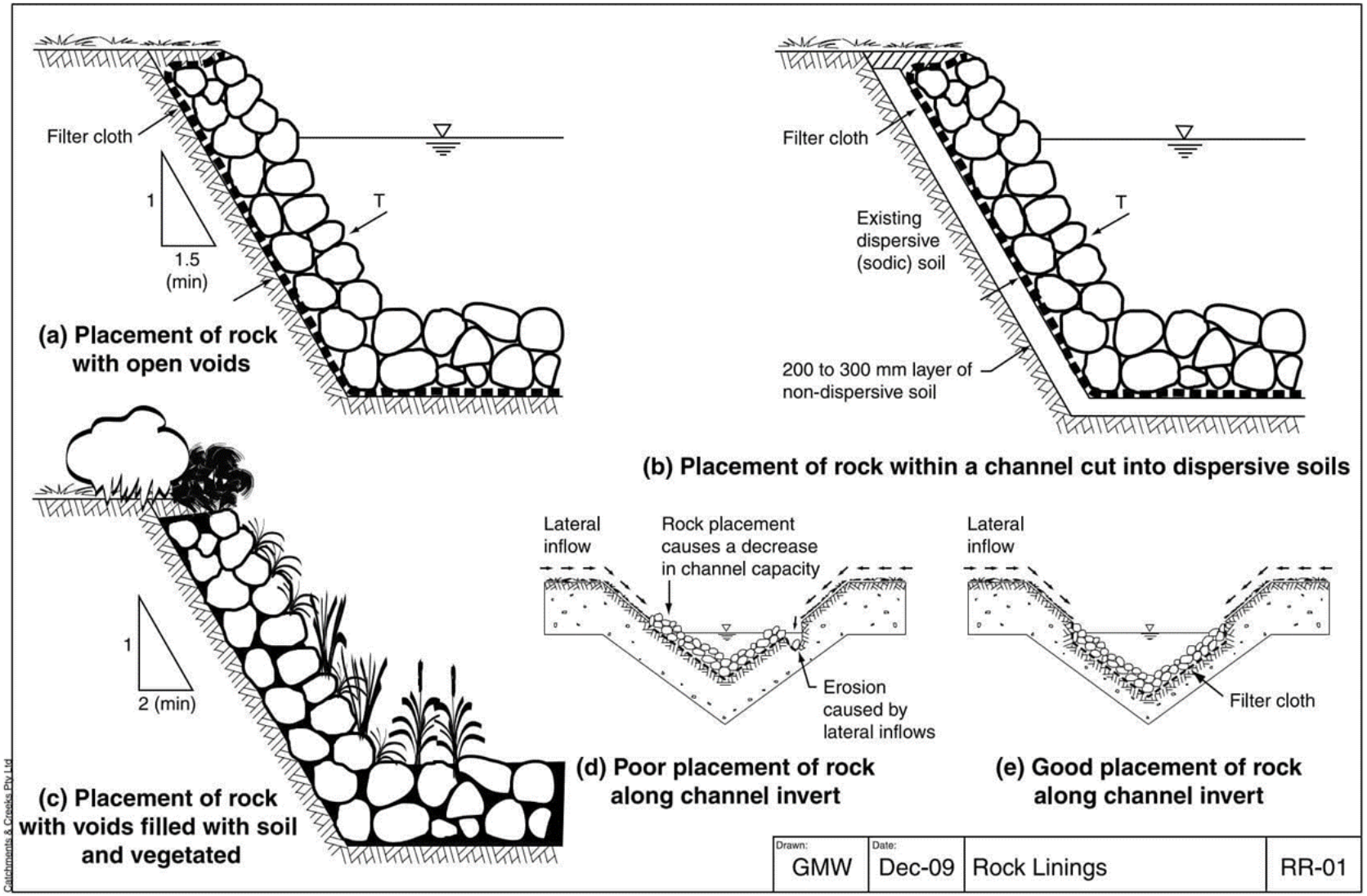


Figure 1 - Minimum dimensional requirements of a grassed buffer zone

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

Catchments & Creeks Pty Ltd


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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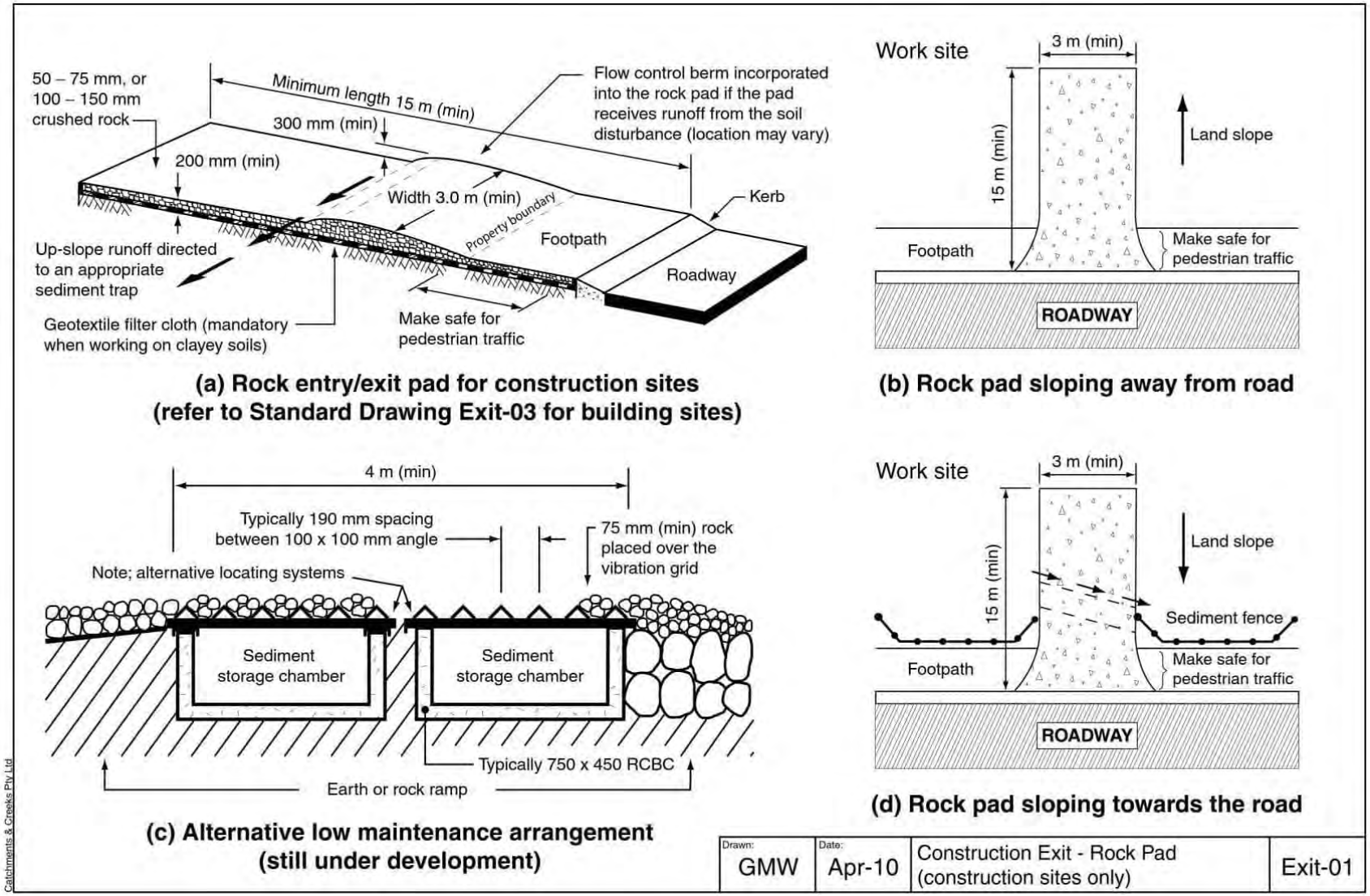
50 – 75 mm, or
100 – 150 mm
crushed rock
Minimum length 15 m (min)
300 mm (min)
200 mm (min)
Flow control berm incorporated into the rock pad if the pad receives runoff from the soil disturbance (location may vary)
Width 3.0 m (min)
Property boundary
Kerb
Footpath
Roadway
Up-slope runoff directed to 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
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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.

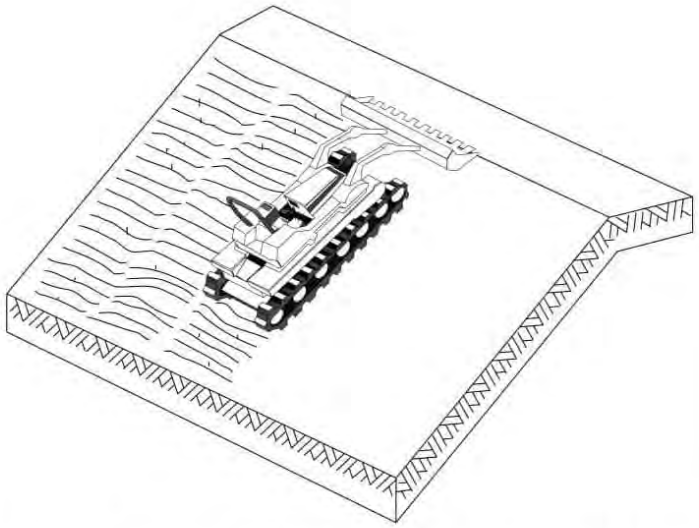

Figure 1 - Application of surface roughening on slope

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

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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

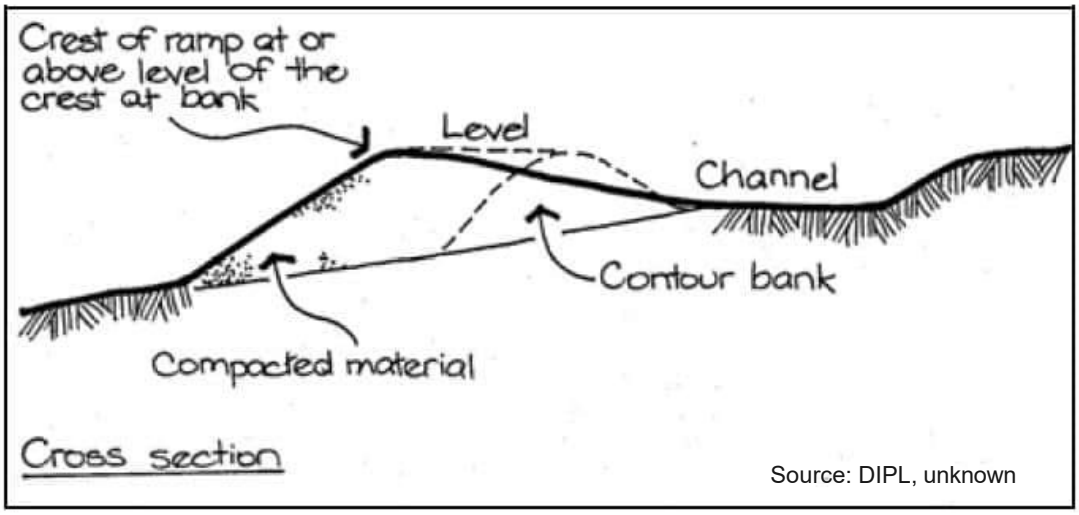


Figure 2 Whoa boys or roll over banks drawing

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.

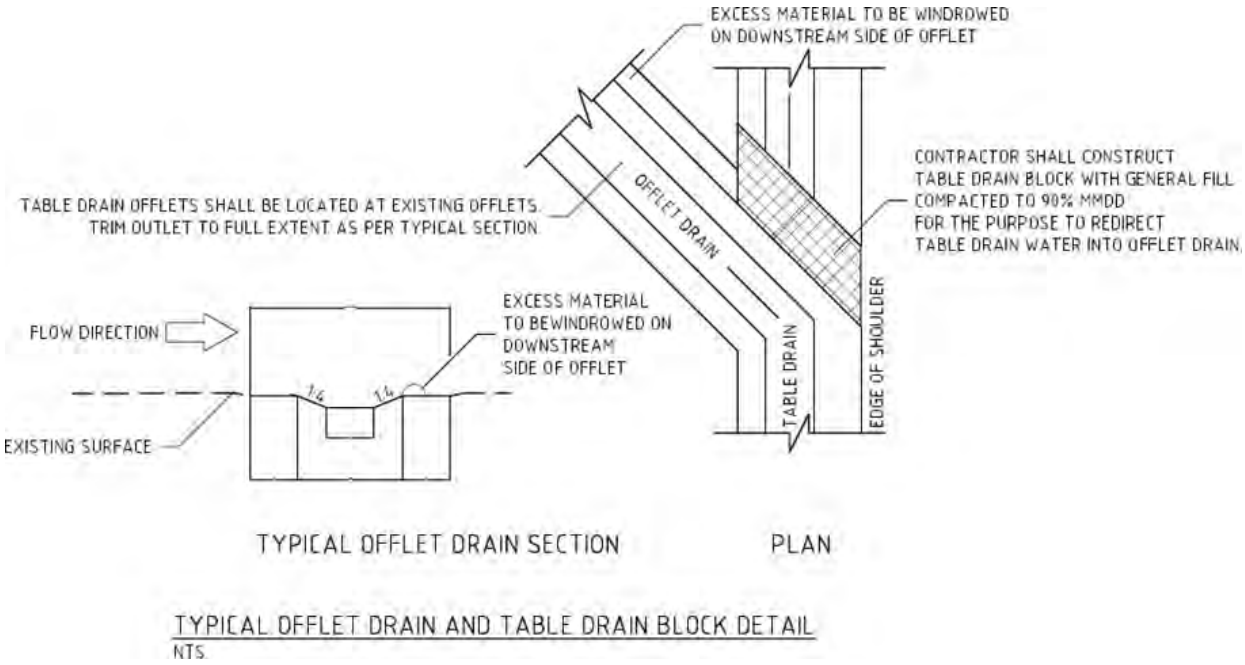


Figure 4 Typical offlet drain and table drain block diagram

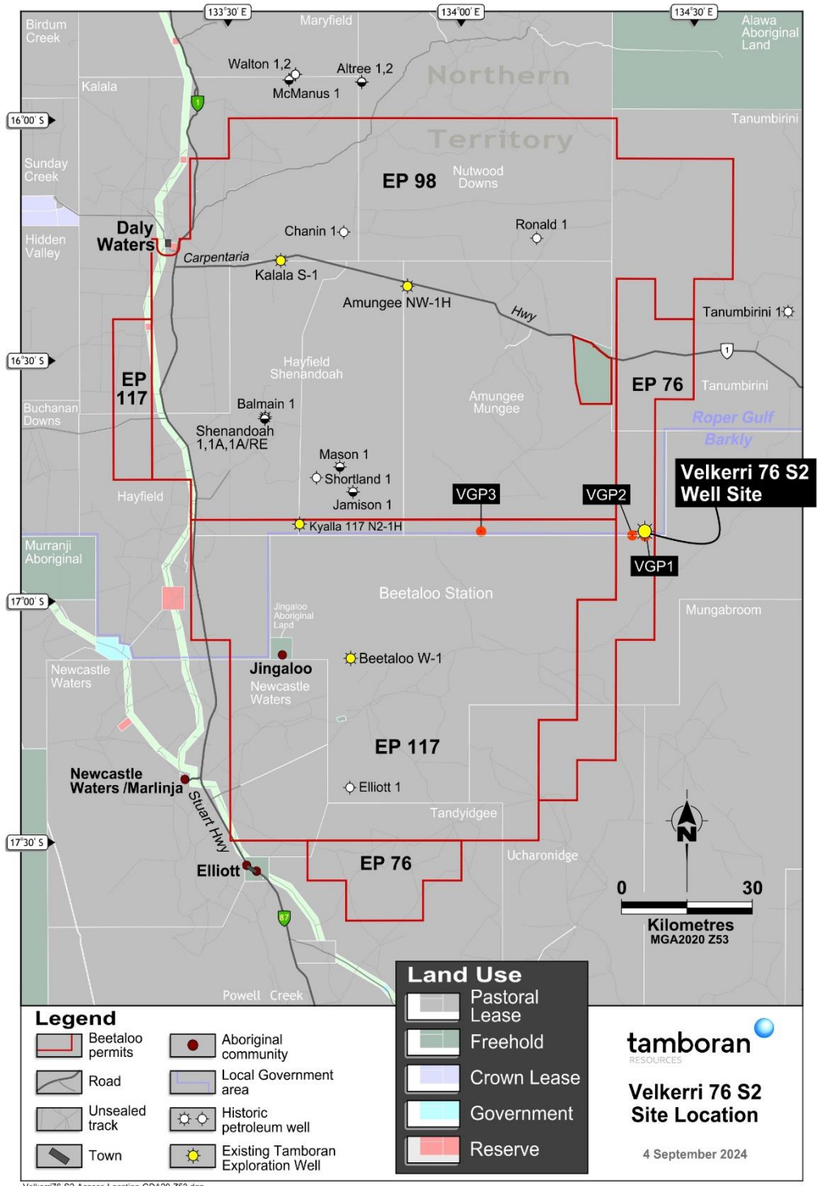
ATTACHMENT 2: Velkerri 76 S2 Rehabilitation Plan (revision 1)

tamboran RESOURCES

Exploration Permit 76
Rehabilitation Management Plan 2024 onwards
Velkerri 76 S2 Well Site and Gravel Pits

Rev 1, Sept-2024

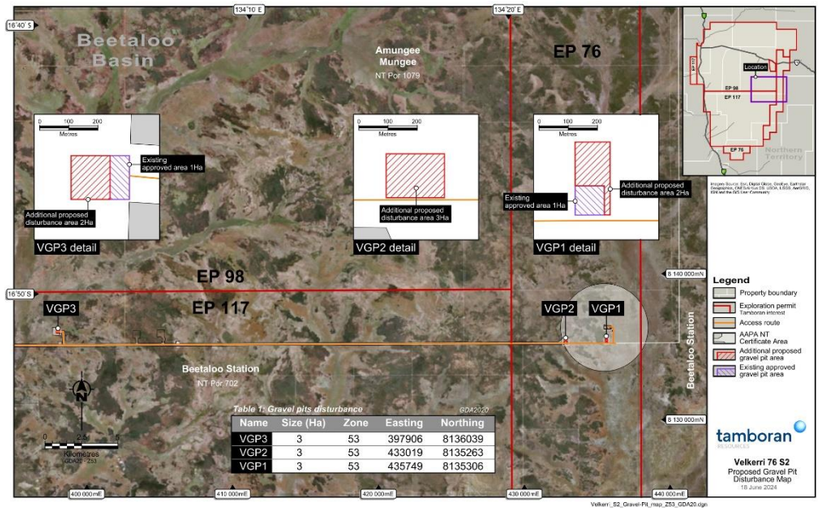
Location of Velkerri 76 S2 and Gravel Pits (VGP1, VGP2 and VGP3)	
Property and land uses	Gas exploration, cattle grazing, and native title rights and interests recognised by the native title determinations over the land and waters.
Climate	The permit area is described as arid to semi-arid. Climate is 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 Velkerri 76 S2 well site (Zone 53; 435557 E, 8137497 N) is located within 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 conducted for the Velkerri 76 S2 well site did not encounter weeds or other major disturbance. Bushfire has not occurred in area in over 4-8 years. Habitat in the area of Velkerri 76 S2 in good condition with minor disturbance from grazing impacts. The habitat contained good habitat values for wildlife including large hollow bearing trees common and refuge opportunities for small birds and reptiles in the form of good coverage of leaf litter, grass cover and large woody debris.



Velkerri76-S2-Access-Location-GDA20-Z53.dgn

Name	Contact details
Robert Wear Beetaloo Field Manager	[redacted]

Rehabilitation zones			
Infrastructure	**Size (ha)**	**Soil type / slope**	**Vegetation community / dominant species**
Well pad and laydown	5.5	Lateritic red earths, sands and podzols <1% slope.	Eucalyptus low woodland/Eucalyptus (mixed) low open woodland/Iseilema (mixed) tussock grassland and Acacia open forest/Acacia tall open shrubland/Chrysopogon (mixed) low opentussock grassland
Camp pad	1.2		
Helipad	0.5		
Stockpile Storage Area	0.2		
VGP1	3.0		
VGP2	3.0		
VGP3	3.0		
80 km existing pastoral track	8.0		Acacia low woodland/Eragrostis (mixed) low open tussock
2 km Access track constructed	2.9		As per well pad
Disturbance	**27.3**		

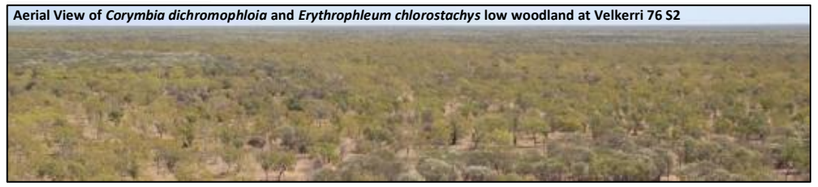


Velkerri_S2_Gravel-Pit_risp_Z53_GDA20.dgn

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.

Pre-disturbance photos of vegetation community

Aerial View of *Corymbia dichromophloia* and *Erythrophleum chlorostachys* low woodland at Velkerri 76 S2



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 will be implemented for disturbance areas following completion of the individual activity within 12 months. • 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. • 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 post construction and at completion of the activities.	

Monitoring program and schedule			
Stage	**Timing**	**Method**	**Measurable attributes**
Progressive rehabilitation	Within 6-12 weeks of completion of activities	• Topsoil, windrows and cleared vegetation stockpiled are to be respread following the works. • 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 Erosion and Sediment Control Plan.
Preliminary assessment	Post rehabilitation, end of wet season survey (February to June) within 12 months.	• Analogue sites will be established for the two vegetation communities identified in the baseline Land Condition Assessment (AECOM 2019) at adjacent undisturbed sites. • Permanent 100 m x 4 m transects (one per vegetation 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.	Following measurable attributes will be compared with analogue sites: • Seedling/sapling density of dominant species respective to each vegetation community. • Percentage of ground cover respective to bare land and vegetation. • Number of species at canopy, mid and ground strata. • Evidence of erosion (type of erosion, approximate area of erosion). • Weed presence/absence (species and density). • Disturbance (fire frequency and intensity, evidence of feral animal/ cattle) • Incidental observations.

Early rehabilitation	Years 1, 2 and 3 post rehabilitation, end of wet season survey (February to June).	• 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).
		  • Implement reseeding if species richness does not show a trajectory to achieving pre-disturbance conditions 5 years post disturbance.
		  • Species which fail to naturally recover from soil seed bank will be selected for reseeding.
		• Annually review success criteria.
			• Early assessment of rehabilitation will determine attributes of woody plants in each 100 m x 4 m transect.
			• Including assessment of species, DBH (>1.5 cm) and height (>2 m), in addition to parameters described within the preliminary assessment.

Long-term rehabilitation	Annually until final success criteria has been met, end of wet season survey (February to June).		• Long-term assessment to determine establishment, recruitment, and growth rate attributes of plant species, in addition to parameters described during early rehabilitation stage.

Final success criteria	
Area to be rehabilitated	• Total area of approved surface disturbance is 27.3 ha. • Total area required for rehabilitation 27.3 ha.
Vegetation composition	• Vegetation composition (i.e. type, density) trending towards the target vegetation community and self-sustaining. • Vegetation is sustainable for long term with the only required maintenance consistent with the final land use. • Sign of woody vegetation regrowth (i.e. Acacia, Eucalypt and Bullwaddy) following rehabilitation and within 12-18 months. • Ground foliage cover consistent with the target vegetation community where disturbance occurred. • Achieve minimum of 30% diversity within the first 12 months and maintained for at least 3 years following rehabilitation consistent with analogue sample site. • Final success based on the following attributes - % canopy and ground cover, stratum 3 species richness, woody species diversity.
Watercourse crossings	• All stream crossings, where intersected, to be reinstated to the original topography. • No evidence of erosion as result of activity present within first 12 months.
Erosion	• Site stabilisation to occur and all erosion and sediment control infrastructure removed. • Less than 5 % erosion should be evident after the first 12 months and no subsidence or erosion should be evident for at least 5 years after completion.
Weeds	• No establishment of weed species 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. • No residual soil contamination that poses a threat of environmental harm.
Safety for humans and wildlife	• Rehabilitation of disturbance areas should be similar in landform to the surrounding area. No steep slopes or barriers to remain on site that endanger wildlife, livestock or humans. • Windrows removed. • Water bores and exploration wells to be sealed and isolated (as required). • Removal of all surface facilities including fencing (star pickets / fencing wire).