APPENDIX N: Stakeholder engagement

APPENDIX N.1 Stakeholder Engagement Logs

- PART A - Stakeholder Engagement Log Summary
- PART B - Stakeholder summary of information provided and the relevant sections of the Petroleum (Environment) Regulations 2016.

Part A - Stakeholder Engagement Log Summary

Date	Originator of communication		Company and person of contact		Contact type	Summary of contact	Does it trigger merit review of objection or claim?	A statement of the interest holder's response to stakeholder	Change to EMP required?	Details of changes the interest holder has made as a result from stakeholder engagement
					9 (1) f	**9(1)c**	**9 (1)d**	**9 (1) e**		**9 (1)g**
05-Dec-19	Origin Energy		NLC		Email	2019 Work Program Clearance Request (for potential exploration works from 2020) EP 98, 117, 76 - Beetaloo Joint Venture (Origin / Falcon) (the **2019 work program**).	No	N/A		
29-Jun-20	Origin Energy		NLC	NLC	Meeting	Meeting to provide an update of the Beetaloo exploration project and discuss sacred sites clearances.	No	Ongoing consultation/engagement with NLC regarding Origins current and future activities.	No	N/A
04-Sep-20	Origin Energy		NLC		Email	Updated Sacred Site Clearance Survey Submission / Information, including COVID safety management plan approved by the NT Chief Health Officer and revised maps.	No	N/A	No	N/A
28-Sep-20	Origin Energy		NLC		Email	Final version of 2019 Work Program Clearance Request submitted to NLC which underpinned the sacred site clearances completed in October 2020	No	The NLC submitted a Conditions of Work report to Origin on the 30 of November 21 outlining a series of restricted work areas and requirements.	No	The site Shenandoah Nth A was chosen to avoid the RWA's in question.
06-Oct-20	Origin Energy		NLC/NTH		In person/ Sacred site clearances	Dave Armstrong (Origin Energy B2 representative) , NLC and NTH completed Sacred site clearances on a range of areas, including Subject Land 2 and Subject Land 1.	No	The NLC submitted a Conditions of Work report to Origin on the 30 of November 21 outlining a series of restricted work areas and requirements.	No	The site Shenandoah Nth A was chosen to avoid the RWA's in question.
27-Oct-20	Origin Energy		NLC		Meeting	Ongoing meeting with NLC to discuss sacred site clearances and exploration activities.	No	Origin discussed a range of future exploration activities and provided a summary of the relevant site and environmental constraints	No	N/A
24-Sep-21	Origin Energy		NLC		Attachment	A work clearance request to the NLC (sacred site avoidance survey request), for potential exploration works from 2022. Report dated 23 September 2021.	No	N/A	No	No
30-Nov-21	NLC		Origin Energy		Email	NLC submit Conditions of Work Report to Origin (post sacred site avoidance survey activities). This covered sacred sites requests within 2019 (made 05/12/19) and 24/09/21). The report included identification Restricted work areas in the vicinity of Subject Land 1 an placed a range of cultural manager requirements for work in the vicinity of these areas.	No	Origin accepted the report.	No	The site Shenandoah Nth A was chosen to avoid the RWA's in question.
14-Dec-22 - 15-Dec-22 16-Dec-22	Tamboran		Traditional owner representatives		In person & email follow-up	Targeted heritage/ sacred site clearances of potential works areas (including Shenandoah South 2) by representatives of AECOM and Native Title holders. All sites were located in existing cleared areas and no additional features identified.	No	N/A	No	N/A
16-Feb-23	Tamboran	M Kernke	NLC		Email; Report	2023 Work program submitted to NLC Providing detailed description of proposed regulated activities within subject land 2, subject land 1 and a broader extension area. Included all stakeholder engaging information required to satisfy the Petroleum Environment Regulations.	N/A	N/A	N/A	N/A
25-Mar-23	Tamboran	E Beresford-Cane	NLC		Email	Draft Presentation provided to NLC covering content of meeting with Native Title Holders in Elliott for the 29 March. Presentation provided an overview of the Beetaloo project, overview of critical environmental aspects including stakeholder engagement, well integrity, groundwater, protection of cultural heritage etc.	No	N/A	N/A	N/A
27-Mar-23	Tamboran	M Kernke	NLC		Email; Report	Revised annual work program and clearance report to include Shenandoah North A. Included all new scope within Shenandoah South E&A EMP- as well as additional scope such as future appraisal gas sale that is not subject to this EMP.	No	N/A	N/A	N/A
29-Mar-23	Tamboran	E Beresford-Cane	NLC		In person	Meeting to introduce Tamboran, present story boards and draft outline of on country meeting items for discussion.	No	All impacts were discussed, including business and environmental under the ILUA. Questions from Native Title holders were answered	No	N/A
31-Mar-23 -13 Apr-23	Tamboran		NLC Traditional owner representatives		In person	Targeted field inspections (cultural heritage and ecology) of Shenandoah South A/B/C, seismic lines and Shenandoah North A by representatives of AECOM and Native Title Holders. No constraints identified as area had already been cleared and new sites identified.	No	N/A	No	N/A
06-Apr-23	Terrabos/ Tamboran	D Armstrong	Hayfield-Shenandoah	V Dyer and family	Email	**SEP:** Provided the Stakeholder Engagement Pack. This is the information pack that outline all proposed on ground operations that are covered in the Land Access Agreement to be negotiation plus future work. The information covers the EMP submitted to the NTG.	No	N/A	No	N/A

Date	Originator of communication		Company and person of contact		Contact type	Summary of contact	Does it trigger merit review of objection or claim?	A statement of the interest holder's response to stakeholder	Change to EMP required?	Details of changes the interest holder has made as a result from stakeholder engagement
					9 (1) f	9(1)c	9 (1)d	9 (1) e		9 (1)g
17-Apr-23	APN -Hayfield Station	V Dyer	Terrabos/ Tamboran	D Armstrong	Email	V Dyer responded to the SEP with questions.	No	DA replied and let V Dyer know Tamboran would get back to her with answers.	No	N/A
18-Apr-23	APN -Hayfield Station	Justin Dyer	Terrabos/ Tamboran	D Armstrong	Email	J Dyer responded to the SEP with questions.	No	DA replied and let J Dyer know Tamboran would get back to him with answers.	No	N/A
21-Apr-23	NLC	Rory Ross	Tamboran	E Beresford-Cane	Email	Email seeking figure 2 and 3 from the revised work program sent to NLC on the 27 March 2023.	No	Refer response and attachment listed on 27-Apr-23 E Beresford-Cane (Tamboran)	No	N/A
23-Apr-23	Terrabos/ Tamboran	D Armstrong	Hayfield-Shenandoah	V Dyer and family	Email	DA emailed V Dyer with responses to questions she had about the SEP which covers to work plan. V Dyer was happy with the information that would allow her family to discuss the workplan and impacts of Hayfield better as we work towards a LACA.	No	N/A	No	N/A
26-Apr-23	Terrabos/ Tamboran	D Armstrong	Hayfield-Shenandoah	J Dyer	Email	DA emailed Justin with responses to questions he had about the SEP which covers to work plan. J Dyer appeared satisfied with the feedback.	No	N/A	No	N/A
27-Apr-23	Tamboran	E Beresford-Cane	NLC		Email	Revised 2023 work program- inclusion of figures as requested on the 21/04/2023	No	N/A	No	N/A
09-May-23	Tamboran	E Beresford-Cane	NLC		Email	AAPA certificate application files forwarded to NLC. AAPA application covered the proposed regulated activities within the previously cleared areas .	No	N/A	No	N/A
30-Jun-23	Tamboran	E Beresford-Cane	NLC		Email	WEL submission and presentation; AAPA presentation	No	Outline of WEL proposed under the Water Act	No	N/A
05-Jul-23	Tamboran	E Beresford-Cane	NLC		Email	AAPA files and scope covering the area and description of the proposed exploration activities.	No	N/A	No	N/A
25-Jul-23	Tamboran	E Beresford-Cane	NLC		Email	Responses to Tamboran 2023 work program, which includes discussion on Water volumes and aquifer properties. This included GIS files, Gantt chart and Water bore SDS.	No	N/A	No	N/A
06-Sep-23	NLC		Tamboran	E Beresford-Cane	Email	Correspondence received from NLC covering a range of aspects, including future proposed activities covered by EMP.	No	Tamboran provided detailed responses to the NLC letter on the 27th of September 2023	Yes	No material changes to the EMP have been made. Additional information was added in various sections where appropriate.
21-Sep-23	Tamboran	M Kernke	NLC		Email	Responses to Tamboran 2023 work program originally submitted in February 2023, GIS files, Gantt chart and SDS.	No	Tamboran provided detailed responses to the NLC letter on 27 September 2023	Yes	No material changes to the EMP have been made. Additional information was added in various sections where appropriate.
27-Sep-23	Tamboran	E Beresford-Cane	NLC		Email	Tamboran Response to letter received 06/09/2023. Included provision of information for the content of the EMP provided as a part of the original 2023 work program report on 16th of February.	No	N/A	No	N/A
27-Sep-23	Tamboran	E Beresford-Cane	NLC		Email	NLC provided with draft presentation deck providing an update of the project , forward program, clearance requests, AAPA certificates, description of regulated activities and key controls, groundwater protection, heritage protection and other impact mitigation measures.	No	N/A	No	N/A
29-Sep-23	Tamboran	M Kernke	NLC		Teleconference	Native Title holder virtual meeting. Provided update on the Beetaloo project, overview of drilling, hydraulic fracturing, groundwater monitoring, heritage protection and water extraction. Included an overview of the proposed 2024 work program.	No	N/A	No	N/A
13-Oct-23	Terrabos/ Tamboran	D Armstrong	Hayfield-Shenandoah	V Dyer and family	Email	Revised Pastoralist Engagement Pack in relation to proposed drilling operations for 2024/25, including 2 new E&A wells on the existing Kyalla site, increasing the lease pad within the current fenced area; and a new pad (Shenandoah S2) and 4 new &EA wells.	No	N/A	No	These sites and regulated activities have been included in the EMP.
26-Oct-23	Tamboran	M Kernke	NLC		Email	Presentation material for the on country meeting with Native Title holders. Including overview of the Beetaloo project, 2023/ 2024 activities, overview of regulated activities, groundwater discussions and proposed sacred site clearances.	No	N/A	No	N/A
31-Oct-23	Hayfield- Shenandoah	V Dyer	Terrabos/ Tamboran	D Armstrong	Email	V Dyer sought additional information on the stakeholder engagement pack provided by Tamboran, including: future temporary processing facilities, aquifers to be accessed, induced seismic results, cattle management vs pipeline, future gas production, washdown facilities.	No	See Table entry of **11 November 2023**. Response is included in Appendix N.1.1.	No	N/A
01-Nov-23	Tamboran	F Thibodeaux E Beresford-Cane	NLC and traditional owner representatives		In person	On country meeting to discuss the 2023 and 2024 work program. Included discussion on proposed 2024 work program, sacred site clearances and water resources of the Beetaloo Basin.	No	N/A	No	N/A
01-Nov-23	Tamboran	M Kernke	NLC		Email	Provided as part of ongoing stakeholder engagement, the final draft Shenandoah South E&A Program EMP, including appendices.	No	Stakeholder requested to see final version. This was subsequently provided.	No	N/A
11-Nov-23	Terrabos/ Tamboran	D Armstrong	Hayfield- Shenandoah	V Dyer	Email	Tamboran responded to questions regarding the proposed future scope. Tamboran provided detailed responses to Hayfield-Shenandoah RFI ongoing stakeholder engagement commitments, including commitment to ongoing stakeholder engagement and working with pastoralist to avoid impacts to cattle. See Appendix N.1.1.	No	N/A	No	N/A
15-Nov-23	Hayfield- Shenandoah	V Dyer	Terrabos/ Tamboran	D Armstrong	Email	V Dyer sought additional information regarding the proposed future scope and the involvement / engagement of Hayfield-Shenandoah with future program planning, including additiona information on the WEL submission, aquifers and washdown bays.	No	N/A	No	N/A

Date	Originator of communication		Company and person of contact		Contact type	Summary of contact	Does it trigger merit review of objection or claim?	A statement of the interest holder's response to stakeholder	Change to EMP required?	Details of changes the interest holder has made as a result from stakeholder engagement
					9 (1) f	9(1)c	9 (1)d	9 (1) e		9 (1)g
16-Nov-23	Terrabos / Tamboran	D Armstrong	Hayfield-Shenandoah	V Dyer	Email	Responses to queries by V Dyer regarding future program planning, including additiona information on the WEL submission, aquifers and washdown bays.	No	N/A	No	N/A
02-Feb-24	Tamboran	E Beresford-Cane	NLC		Email and letter	Tamboran's detailed response to NLC submission to the Minister for Environment dated 12 January 2024, re the Shenandoah South E&A Program EMP (TAM1) and other ILUA matters.	Yes	Tamboran provided a detailed response to NLC feedback on the EMP, outlining where information had been previously provided to the NLC for communication to Traditional Owners / custodians.	Yes	Minor edits were made to the EMP, pertaining to stakeholder engagement and consent, removal of synthetic bases muds, terminology in the chemcial risk assessment; assessment of potential risks / impacts to Aboriginal communities.
06-Mar-24	Tamboran	E Beresford-Cane	NLC		Email	Presentation for the 2024 Work Program meeting, scheduled for March 2024: • update the Native Title Holders on the outcomes of the exploration to date • consultation in respect of the 2024 Work Program • update on the Shenandoah South E&A Progam EMP (TAM1) - including location, sumamry activities and overview of key aspects. • Tamboran's new sacred site clearance request covering 2024 clearances.	No	N/A	No	N/A
14-Mar-24	Tamboran	NLC	Tamboran	E Beresford-Cane	Email	Email correspondence from NLC providing commentary on 2024 work program meeting slides. Correspondence included Presentation on EMP scope that was delivered to NTH in February 2024 summarising the location of the activty and description.	No	N/A	No	N/A
14-Mar-24	Tamboran	E Beresford-Cane	NLC		Email	Acknowledgement of NLC feedback. Tamboran to prepare a second presentation incorporating the NLC feedback.	No	N/A	No	N/A

PART B Stakeholder summary of information provided and the relevant sections of the Petroleum (Environment) Regulations 2016

Section 7(2)(a)	Stakeholder	Document and content	Date provided
(i) “the regulated activity the interest holder proposes to carry out”	Pastoralist	Stakeholder engagement pack: - **Detailed description of the Regulated Activities** covered in the EMP.	27-Dec-19 (under approved EMP) 22-May-22 (under approved EMP) 3-Apr-23 13-Oct-23 15 - 16-Nov-23
	NLC/traditional owners	- Annual on country meetings - Story boards - Annual work program communications - Face-to-face meetings - Work clearance requests - Condition of work reporting	Refer table, Part A
(ii) “the location (or locations) where it is proposed to carry out the activity”	Pastoralist	Stakeholder engagement pack: - **Location of the Regulated Activities** covered in the EMP.	27-Dec-19 (under approved EMP) 22-May-22 (under approved EMP) 3-Apr-23 13-Oct-23 15 - 16-Nov-23
	NLC/traditional owners	- Annual on country meetings - Story boards - Annual work program communications - Face-to-face meetings - Work clearance requests - Condition of work reporting	Refer table, Part A
(iii) "the anticipated environmental impacts and environmental risks of the activity" AND (iv) "the proposed environmental outcomes in relation to the activity"	Pastoralist	Stakeholder engagement pack: - **Environmental outcomes, impacts and risks** associated with the activities covered by the EMP.	27-Dec-19 (under approved EMP) 22-May-22 (under approved EMP) 3-Apr-23 13-Oct-23 15 - 16-Nov-23
	NLC/traditional owners	- Annual on country meetings - Story boards - Annual work program communications - Face-to-face meetings - Work clearance requests - Condition of work reporting	Refer table, Part A
(v) "the possible consequences of carrying out the activity to the stakeholder's rights or activities"	Pastoralist	Stakeholder engagement pack: - **Consequences for stakeholder’s rights or activities** associated with the activities covered by the EMP.	27-Dec-19 (under approved EMP) 22-May-22 (under approved EMP) 3-Apr-23 13-Oct-23 15 - 16-Nov-23
	NLC/traditional owners	- Annual on country meetings - Story boards - Annual work program communications - Face-to-face meetings - Work clearance requests - Condition of work reporting	Refer table, Part A

APPENDIX N.1.1 Pastoral Stakeholder Engagement

From: David Armstrong
To: Val Dyer
Cc: Justin Dyer; Nick Dyer; Sturt Plains; David Close
Subject: Stakeholder Engagement Pack - 2023
Date: Thursday, 6 April 2023 1:03:54 PM
Attachments: image003.png
Pastoralist Engagement Pack- Hayfield Shenandoah April 2023.pdf

---

Hi Val

Please see attached the Stakeholder Engagement Pack. This pack contains information relating to the proposed access agreement plus further information on potential future exploration work.

If you read through it and please ask any questions at any time either via the sheet provided at the end of the SEP or email. Tamboran are happy to provide the relevant people with appropriate experience to discuss any aspect of the SEP.

Hope you have a good Easter

Regards

Dave

DAVID ARMSTRONG

Managing Director
Mobile [redacted]
Address [redacted]
Email [redacted]

TERRABOS CONSULTING
PASTORAL EXPLORATION MINING ABORIGINAL DEVELOPMENT

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> On 5 Apr 2023, at 8:10 pm, Val Dyer <[redacted] wrote:
>
> Thanks David, have sent to Charlie and awaiting the Engagement Pack.
>
> Sent from my iPhone
>
> > On 4 Apr 2023, at 12:20 pm, David Armstrong [redacted] wrote:

Hi Val

As discussed please see attached an up-dated version of the proposed Tamboran Land Access Agreement including the Shenandoah North A vertical well. All maps are now included within the access agreement for your consideration.

I'm going to start initial discussion with the NTG regarding the acceptance by them of this proposed access agreement to try and mitigate any delays that may occur due to their interpretations. This will not effect our negotiations and will mainly focus on well names as they have rejected access agreements for what they deemed to be mis-named wells. As mentioned I'd like to be in front of this to stop delays over small things.

The Stakeholder Engagement Pack will follow and as always please request any further information you may need or questions to be answered.

I look forward to hearing from you once you have review this proposed agreement

Regards

Dave

DAVID ARMSTRONG

Managing Director
Mobile [redacted]
Address
Email [redacted]

<image003.png>

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Begin forwarded message:

From: David Armstrong [redacted]

Subject: Tamboran B2 Pty Ltd - Proposed Land Access and Compensation Agreement
Date: 4 March 2023 at 3:39:47 pm ACST
To: Val Dyer [redacted]
Cc: Justin Dyer [redacted] David Close <[redacted]

Hi Val

Please see attached the proposed Land Access Agreement including the compensation schedule from Tamboran B2 Pty Ltd plus Form 15 Negotiation Notice as per the NT regulations. Also attached are maps for reference to the LAA. These maps will be finalised and inserted in Schedule 2 “Maps” once negotiations are complete.

This proposed LAA covers the following;

1. Drilling of the South Shenandoah 1H well on the existing Kyalla 117 N2 site
2. Drilling of 3 wells on a new site known as Amungee NW3
3. Drilling of 1 well on a new site known as South Shenandoah A
4. Approximately 38 km of seismic in the South Shenandoah area

To follow shortly will be a Stakeholder Engagement Pack (SEP) that will outline the proposed operations. The SEP is designed to fulfill the stakeholder engagement requirements as defined under the Regulations and include;

- the regulated activity the interest holder proposes to carry out
- the location (or locations) where it is proposed to carry out the activity
- the anticipated environmental impacts and environmental risks of the activity
- the proposed environmental outcomes in relation to the activity; and
- the possible consequences of carrying out the activity to the stakeholder’s rights or activities.

This SEP is very similar to previous SEP’s you have received as the operations Tamboran wish to undertake are similar to Origin's apart from the location. As always if you wish to meet with particular topic experts from Tamboran this can be organised. Plus if you would like to meet with NTG regulators to discuss any aspect of Tamboran’s operations I’m happy to organise that as well.

It is proposed to keep the existing Land Access and compensation agreement in place which covers access to the Beetaloo W1 on Beetaloo Station and Valkerri 76 sites on Amungee Station.

As we are meeting on Tuesday 7th March I will cover this LAA as part of my presentation and discussion.

Please review this contact me at anytime if you or anyone have questions.

Regards

Dave

DAVID ARMSTRONG

Managing Director
Mobile
Addres
Email [redacted]

<image003.png>

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HAYFIELD SHENANDOAH STATION

PETROLEUM (ENVIRONMENT) REGULATIONS 2016

STAKEHOLDER ENGAGEMENT PACK

Pastoralist Engagement Pack

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1. Introduction

Tamboran B2 Pty Ltd (Tamboran) is a registered holder and the operator of exploration permits (**EPs**) 76, 98 and 117 located in the Beetaloo Sub-basin. As a part of Tamboran's forward exploration work program, an Environment Management Plan (**EMP**) will be submitted to the Minister for Environment for approval. This EMP will cover a series of regulated activities that may potentially be undertaken on the Hayfield Shenandoah Station being NT Portion 1077, 7027 and 7026 over the 2023 to 2025 period (and beyond). Under Section 6 (2) of the Northern Territory (NT) Petroleum (Environment) Regulations 2016 (**PER**), an EMP can only be submitted to the Minister for approval after the interest holder (Tamboran) has carried out stakeholder engagement in relation to the regulated activity to which the plan relates. This Stakeholder Engagement Pack (SEP) is designed to satisfy this requirement.

The proposed Exploration and Appraisal (E&A) activities on the Hayfield Shenandoah Station are divided into near-term activities anticipated to commence in 2023/2024 and longer-term activities likely to occur in 2024/2025 and beyond. It should be noted that the scope of this SEP is designed to cover a range of E&A success and failure case scenarios; with Land Access and Compensation Agreements (LACA) required to be obtained prior to the execution of any of the defined scope.

The anticipated near-term 2023 scope includes:

- **Shenandoah South 1H E&A Well:** Drilling, stimulation and well testing of the Shenandoah South 1H Exploration & Appraisal (E&A) well targeting the Velkerri shale on the existing Kyalla 117 N2 pad:
- **Amungee NW 3:** Construction of the new E&A location on NT Portion 7027 including the drilling, stimulation and well testing of between 1 to 3 vertical and/or horizontal E&A wells targeting the Velkerri shale
- **Shenandoah South A**: Construction of the new Shenandoah South A location (name likely to be changed) on NT Portion 1077 to enable CY 24 E&A activities
- **Shenandoah South Seismic acquisition:** acquisition of up to approximately 38 km (19 ha) of 2D seismic along newly constructed lines and up to 40km of 2D seismic on existing access tracks. Activity includes seismic line clearing (where required), node deployment and seismic acquisition on NT Portion 1077 and 7026.
- **Shenandoah North A Vertical Well:** Construction of a new E&A location, including access, on NT Portion 7027**,** including the drilling, logging and plug and abandonment of a vertical exploration well

Longer term scope anticipated to commence in 2024 and beyond includes:

- **Shenandoah South B:** Construction of a new E&A location on NT Portion 7026, including the drilling, stimulation and appraisal of multiple petroleum wells.
- **Shenandoah South C:** Construction of a new E&A Location on NT Portion 7026, including the drilling, stimulation and appraisal of multiple petroleum wells.
- **Amungee NW4:** Construction of a new E&A location on NT Portion 7027, including the drilling, stimulation and appraisal of multiple petroleum wells.
- **Shenandoah North B:** Construction of a new E&A location on NT Portion 7027, including the drilling, stimulation and appraisal of multiple petroleum wells. This scope is considered contingent.
- **Amungee NW3 temporary Gas processing facility:** construction and operation of a new temporary gas compression/ liquification facility for the sale of appraisal gas during well testing- including construction and operation of a 1km sales gas pipeline into the McArthur River Mine Pipeline (MRMP)
- **Shenandoah South Temporary Gas processing facility (notionally in the vicinity of Shenandoah south A):** construction and operation of a new temporary gas compression/ liquification facility for the sale of appraisal gas during well testing
- **Shenandoah South Sales Gas Pipeline:** Construction of a 20-40km sales gas pipeline connecting the Amadeus Gas Pipeline (AGP) to the Shenandoah South Gas Processing

Facility

- Construction and ongoing use of access tracks and gravel pit(s) (size and location in consultation with pastoralist).

A detailed description of the regulated activities is provided within the following sections of this Stakeholder Engagement Pack.

2. Stakeholder engagement process

The requirements of stakeholder engagement are outlined in section 7 of the Petroleum Environment Regulations (PER). Specifically, the interest holders are required to provide the following information to each stakeholder:

- the regulated activity the interest holder proposes to carry out
- the location (or locations) where it is proposed to carry out the activity
- the anticipated environmental impacts and environmental risks of the activity
- the proposed environmental outcomes in relation to the activity; and
- the possible consequences of carrying out the activity to the stakeholder's rights or activities.

This SEP is designed to fulfill the stakeholder engagement requirements as defined under the PER. Once stakeholder engagement has been completed, Tamboran will submit an EMP covering all or parts of the proposed activities as described in this document. All engagement after this allocated time will be considered "ongoing stakeholder engagement".

Tamboran proposes that any questions or feedback to the information provided in this pack is formalised via the form included in Appendix A within 28 days of receipt of the SEP. This review timeframe is consistent with the EMP public comment timeframe legislated in the PER for EMPs involving drilling or hydraulic fracturing. This is considered a reasonable period for the stakeholder to respond to the information provided.

Tamboran will ensure that all responses are reviewed and responded to promptly. Tamboran also offers face to face or virtual meetings with stakeholders where subject matter experts can present the information in this pack and answer any questions. These meetings should be arranged within 14 days of receipt of the pack so engagement can be scheduled within the allocated engagement period.

3. Scope

The regulated activities covered in this SEP are associated with the entire lifecycle of the proposed petroleum exploration wells, from site preparation, through to drilling, stimulation, testing, site decommissioning and all ancillary activities to support. The EMP (or variations of such) will be in force for the next 5 years (the maximum duration of an EMP in accordance with the PER), with revisions required to update the activities within the EMP beyond this period.

Acceptance of this SEP and subsequent approval of an EMP by the Northern Territory Government is not an approval to commence the activities. This SEP and subsequent EMP(s) are designed to satisfy the requirements under the PER for the regulated activities proposed.

This SEP does not cover other activity approvals, such as the land access and compensation agreements (LACA) required to be obtained prior to commencement. The requirements for compensation and access agreements for proposed regulated activities are covered under the NT *Petroleum Act 1984* and Petroleum Regulations 2020 and will occur under a separate engagement process. During the LACA process, additional engagement will be completed to provide the pastoralist with further opportunity to discuss any elements of the proposed activity of interest.

As there are multiple opportunities for engagement in the approvals process, any comments received relating to the LACA or other activity/approval not subject to this SEP, will be addressed by Tamboran separately from this stakeholder engagement process.

4. Background

Tamboran B2 Pty Ltd holds the EPs in the Barkly region under the Beetaloo Joint Venture (Beetaloo JV) with Falcon Oil and Gas. The EPs cover 18,512 square kilometres (km^2) of largely pastoral leases on the Sturt Plateau, part of the Barkly Tableland, within the NT (Figure 1). These tenures were granted by the NT Minister for Mining and Industry[1] under the NT *Petroleum Act 1984*.

The regulated activities proposed under this SEP are anticipated to commence within the 2023 to 2025 period (and beyond). Like all exploration programs, proposed activities often cover a range of scenarios governed by a range of technical, regulatory and financial constraints. Any proposed changes will be communicated to the pastoralists through ongoing engagement to ensure any changes in activities, priorities or strategy are promptly communicated and impacts understood.

Similar to Origin's previous strategy, Tamboran B2 will focus its E&A activities around specific areas that could support future production and bringing gas to market as soon as possible. Tamboran is focusing its E&A efforts around two main areas; the Amungee Delineation Area (around the existing Amungee NW location near the Carpentaria Highway) and the Shenandoah South Pilot Area (around the existing Kyalla 117 N2 location). These areas are likely to be the subject of extended (~12-24 month) appraisal programs, which are required in order to assess the commerciality of the underlying shale formations. An additional exploration location, Shenandoah North A, is proposed to assess the continuity of the target shales between the Amungee NW Delineation area and Shenandoah South Pilot Area.

To minimise flaring while appraisal wells are tested to de-risk a large scale development, and to assist in avoiding flaring related Greenhouse Gas (GHG) emissions, Tamboran will progress options to provide beneficial use options for any test gas (there will be a number of technical, regulatory and commercial issues that must be accounted for if gas is to be put into the NT gas network). The sale of gas may occur through the construction of small temporary processing facilities used to transport gas into the adjacent pipeline infrastructure (such as the MCarthur River Mine Pipeline (MRMP) or Amadeus Gas Pipeline (AGP)) or other products such as compressed natural Gas (CNG) or liquefied natural gas (LNG) that are transported offsite in purpose-built tankers or containers. To minimise land clearing and equipment duplication, it is proposed that "hubs" (i.e. centralised lease pads) are used to manage produced hydrocarbons and water, with gathering lines connecting adjacent sites. This is subject to regulatory and land access approvals.

Information on the sale of appraisal gas is provided broadly within the scope of this SEP, with further engagement proposed once the detailed scope is finalised.

5. Location of the Regulated Activities

The proposed exploration activities are located on the Hayfield Shenandoah Pastoral stations. The location of the activities is provided in Table 1 and illustrated in Figure 1 through to Figure 4 The figures are broken down into the following scope:

- Figure 1 Overview of Tamboran's Beetaloo JV tenure and the Hayfield Shenandoah Station
- Figure 2 location of the activities planned for Kyalla 117 N2, Shenandoah South A, Shenandoah South B and Shenandoah South C locations, including seismic lines
- Figure 3 location of the Activities planned at the Shenandoah North A and Shenandoah North B locations
- Figure 4 location of the activities planned for the Amungee NW 3 and Amungee NW 4 location

Importantly, these are indicative estimates of infrastructure size and location, with the exact details of infrastructure confirmed as a part of ongoing engagement and through the LACA process.

[1] Formally the Minister for Mines and Energy.

Table 1 Activity location

Exploration Permit (EP)	Infrastructure description	Proposed disturbance area	Proposed Location		
			GDA94 Zone*	Approx Easting	Approx Northing
2023 Scope					
EP 117	Existing **Kyalla 117 N2**: drilling, stimulation and testing of a new horizonal Velkerri	9.0 ha (36.0 ha within the fence line)	53	356379.72	8137498.48
EP 117	Existing **Kyalla 117 N2** access track: use and ongoing maintenance	2.0 km	53	332404.30 356121.62 356190.96	8135133.99 8133994.93 8138067.92
EP 117	**Gravel Pit A** gravel pit: use and ongoing maintenance	1.5 ha	53	333877.96	8135080.04
EP 117	**Gravel Pit 3-** use and ongoing maintenance	5.0 ha	53	362753.93	8135089.25
EP117	**Shenandoah South A**: including construction of new lease pad (11.0 ha), camp (1.5 ha), laydown (2.5 ha), helipad (0.5 ha) firebreak/Fence line (4.0 ha) and 1.0 km access track (1.5 ha)	~21.0 ha	53	340335.00	8134450.34
EP 117	**Seismic Line A:** 13.0 km clearing and data acquisition	~6.5 ha	53	337174.05 346089.96	8137663.76 8128616.75
EP 117	**Seismic Line B**: 12.0 km line clearing and data acquisition	6.0 ha	53	341094.69 349560.21	8140061.21 8131483.21
EP 117 / EP 98	**Seismic Line C:** 13.0 k**m** clearing and data acquisition	~6.5 ha	53	338588.93 347420.93	8138318.02 8129410.23
EP 117 / EP 98	**Seismic Line D:** 40km along existing access- no clearing	0	53	356369.97 356133.72 332993.62	8150261.64 8133992.65 8135051.93
EP 98	**Amungee NW 3:** including construction of new lease pad (11.0 ha), camp (1.5 ha), laydown/storage area (2.5 ha), helipad (0.5 ha) firebreak line (4.0 ha) and 1km access track (1.5 ha)	<21.0 ha	53	375512.08	8195307.46
EP 98	**Shenandoah North A:** including construction of a new lease pad (3.0 ha), camp pad (1.0 ha), extraction bore and 1.0 km access track (1.5 ha)	5.5 ha	53	356687.00	8163762
2024 and beyond					
EP 98	**Amungee NW 3:** Appraisal gas processing, transportation and sale. Small temporary facility located adjacent to the McArthur River Mine Pipeline (MRMP) with gathering lines	2.5 ha	53	375674.52	8194775.06

Exploration Permit (EP)	Infrastructure description	Proposed disturbance area	Proposed Location		
			GDA94 Zone*	Approx Easting	Approx Northing
	connecting the Amungee NW3 to the temporary facility.				
EP 98	**Amungee NW 4:** including construction of new lease pad (11 ha), camp (1.5 ha), laydown/storage area (2.5 ha), helipad (0.5 ha), firebreak line (4.0 ha) and 1.0 km access track (1.5 ha). Potential gathering line connection to temporary facility at Amungee NW3 to allow appraisal gas sale.	<21.0 ha	53	374605.16	8186993.28
EP98	**Amungee NW4:** access track upgrade, use and maintenance	8.0 km	53	376535.13	8194057.66
EP98	**Amungee NW4 Gravel Pit**	5.0 ha	Location to be selected in consultation with pastoralist		
EP 117	**Shenandoah South B:** including construction of new lease pad (5.0 to 11.0 ha), camp (1.5 ha), firebreak line (4 ha) helipad (0.5ha) and 1.0 km access track (1.5 ha)	~20.0 ha	53	345603.47	8135476.75
EP98	**Shenandoah South C:** including construction of new lease pad (5.0 to 11.0 ha), camp (1.5 ha), helipad (0.5 ha), firebreak line (4.0 ha) and 1.5 km access track (2.0 ha)	~20.0 ha	53	343471.55	8133330.83
EP 98	**Shenandoah North Pad B (contingent site):** including construction of new lease pad (5.0 to 11.0 ha), camp (1.5 ha), helipad (0.5 ha), firebreak line (4.0 ha) and 4.0 km (6.0 ha) access track	~22 ha`	53	359459.65 m	8170476.74

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

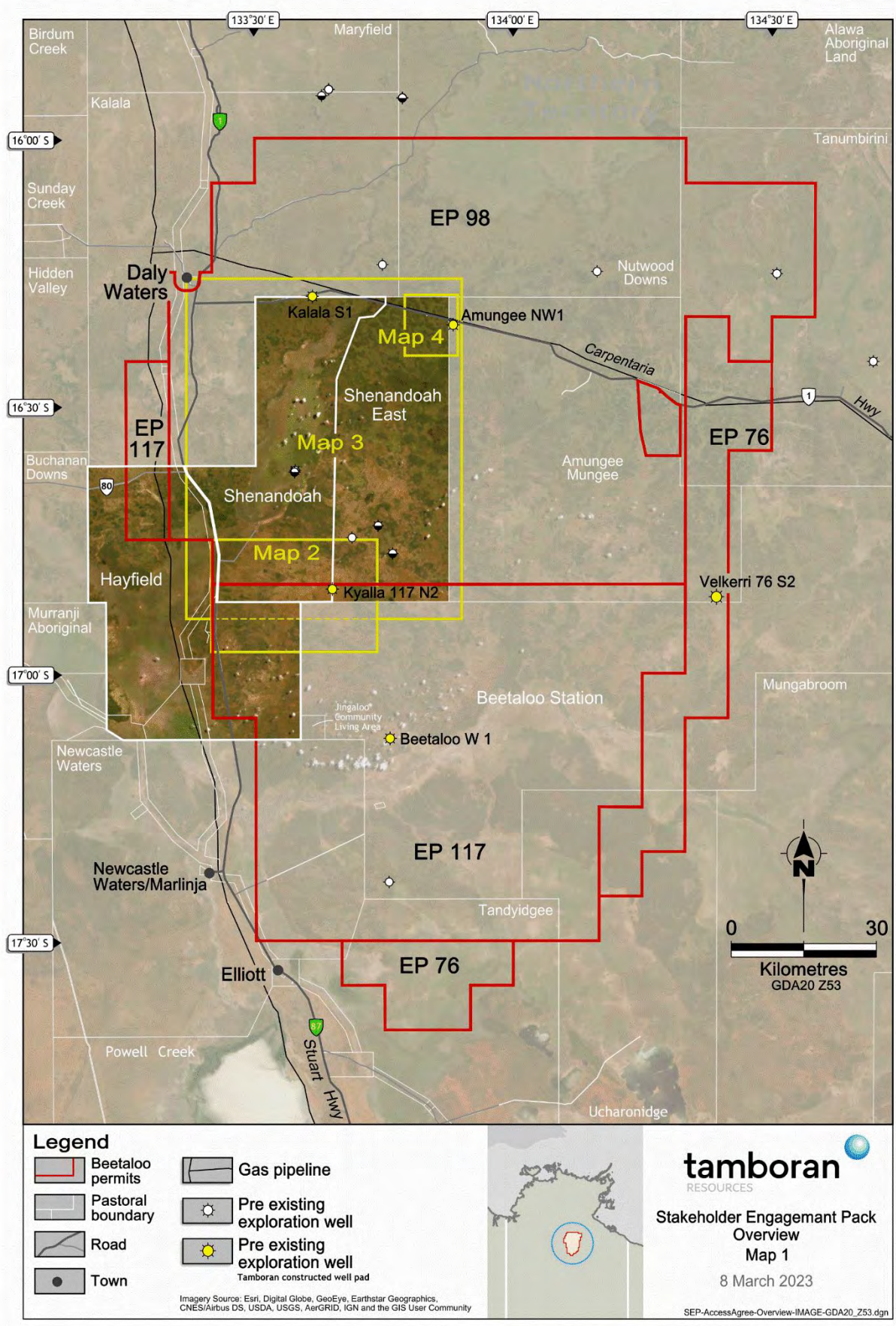
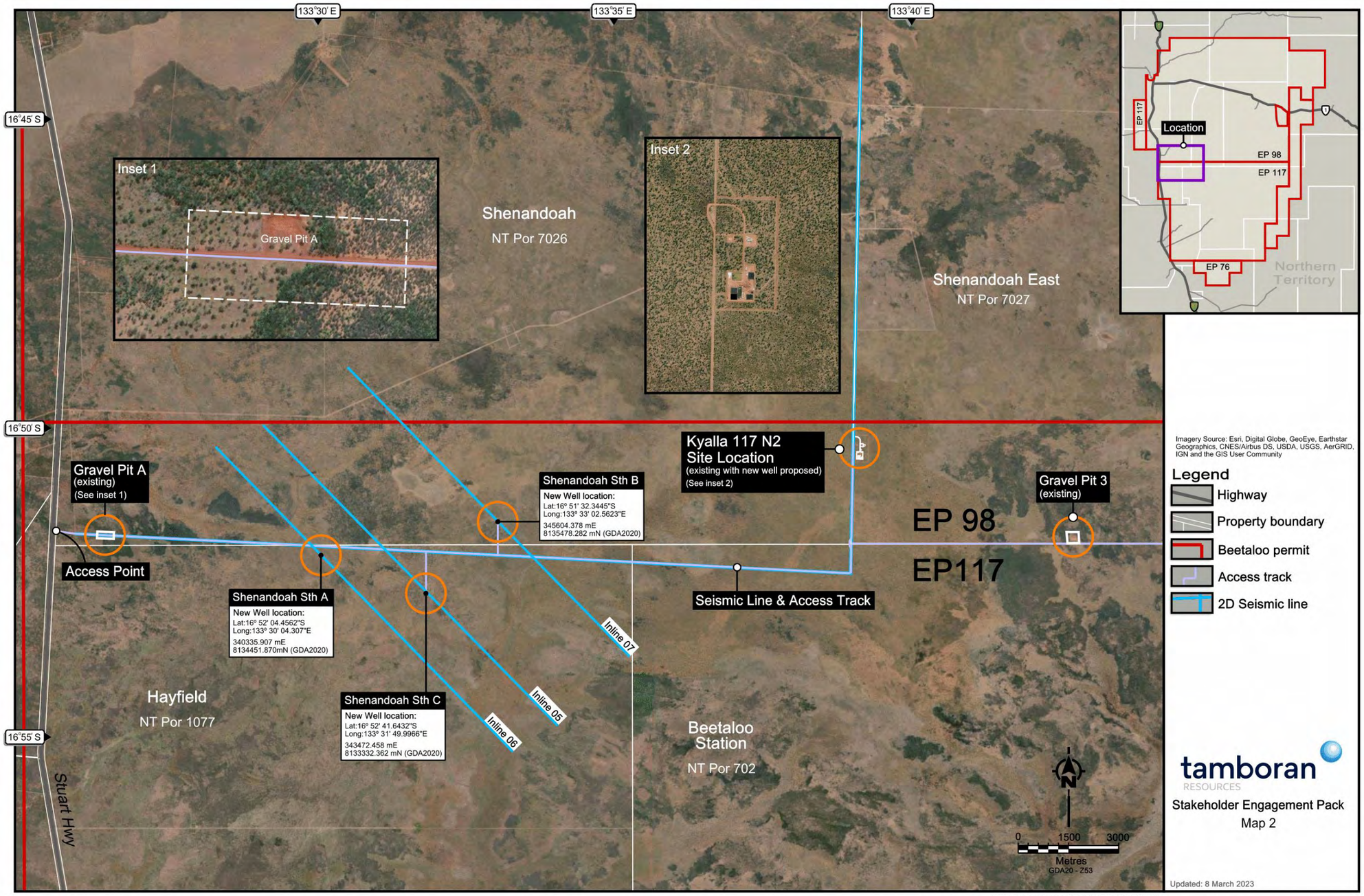


Figure 1 Location of Tamboran Beetaloo JV permit *a*rea and proposed activity locations

Pastoralist Engagement Pack



SEP-AccessAgree-Map3A-GDA20-Z53.dgn

Figure 2 Location of the proposed regulated activities on the Hayfield Shenandoah Station, including Kyalla 117 N2, seismic lines and Shenandoah South A, B and C

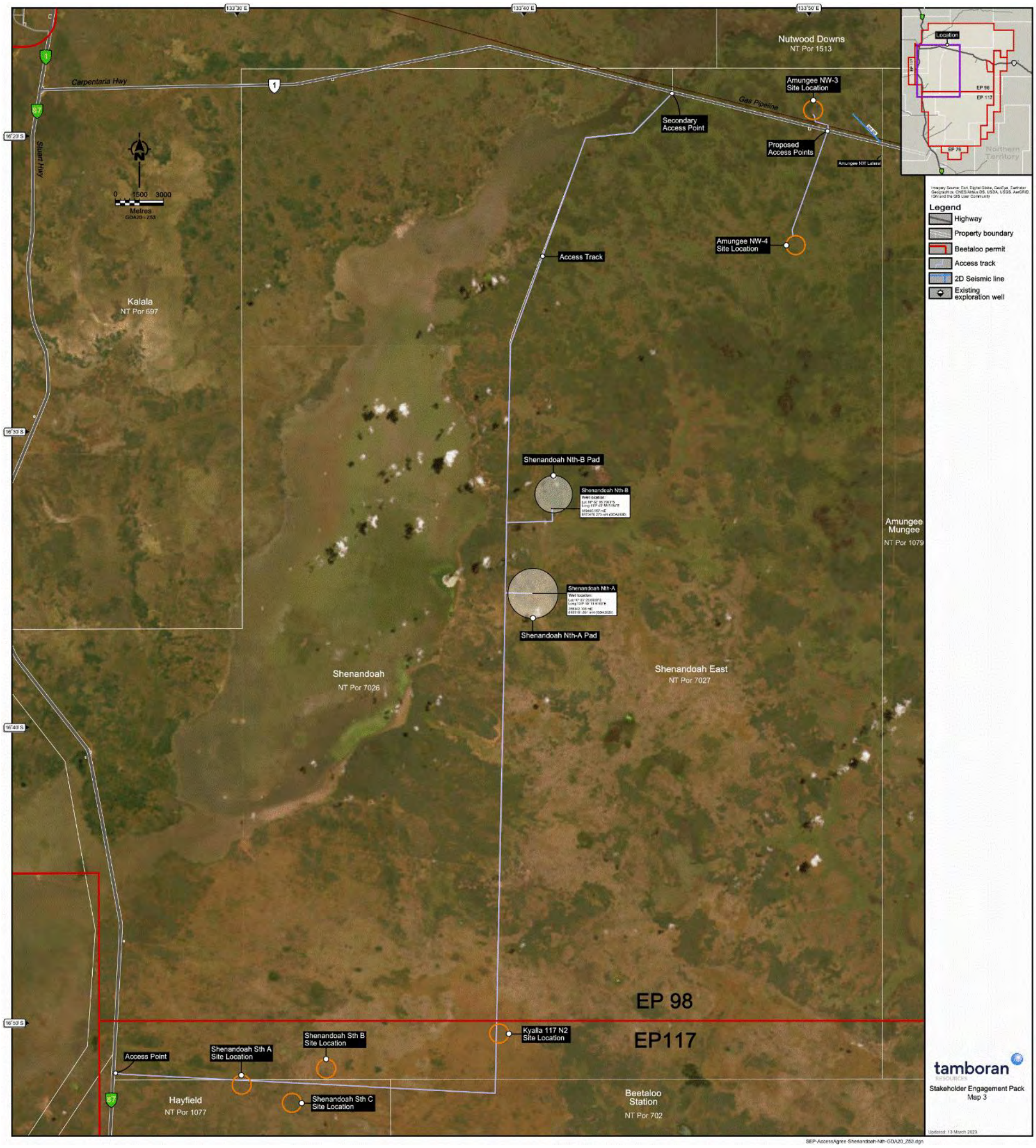


Figure 3 Proposed regulated activities on the Hayfield Shenandoah Station – Shenandoah North A and B

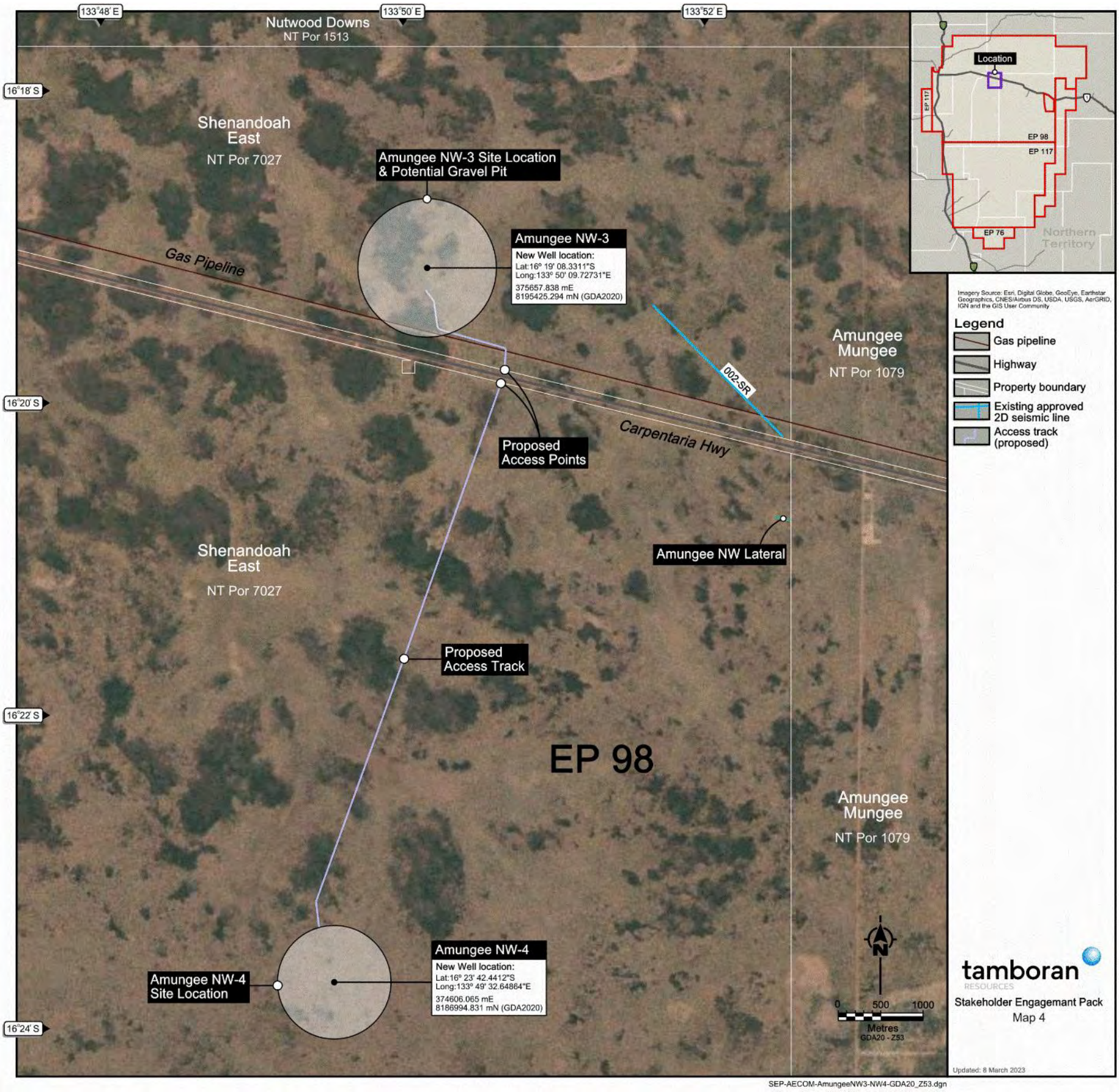


Figure 4 Proposed regulated activities on the Hayfield Shenandoah Station – Amungee NW 3 and Amungee NW 4

6. Detailed Description of the Regulated Activity

6.1 2023 Scope: subject to current land access and compensation agreement

The 2023 activities are associated with the proposed new exploration activities to be carried out across the Hayfield Shenandoah Station include:

- **Shenandoah South 1H E&A Well** on the existing **Kyalla 117 N2** location including
  - Sealing of the Kyalla 117 N2 access track intersection with the Stuart Highway
  - Operation of the existing Kyalla 117 N2 site, including access track, gravel pits (Gravel Pit A and Gravel Pit 3), lease pad, camp pad and helipad.
  - Construction of a well cellar and any civil work on the existing pad to accommodate the activity (such as resurfacing, sump modification etc.)
  - Drilling, stimulation, testing, maintenance, suspension and decommissioning of an E&A well targeting the Velkerri shale.
  - Drilling of 2 new water bores (currently not planned - but contingent)
- **Amungee NW 3**: Construction of a new exploration well pad Amungee NW 3 located north of the Carpentaria highway on NT Portion 7027. This lease location is anticipated to become a centralised “hub” for the Amungee NW area, used to host shared infrastructure such as wastewater storages and drilling waste management, including:
  - Construction a new lease pad (8 to 11.0ha), camp pad (1.5ha), laydown area (2.5ha), helipad (0.5ha), fence line and firebreak (~4.0ha)
  - Construction of a new 1km access track connecting the proposed site to the Carpentaria highway
  - Drilling of up to 8 groundwater monitoring/ extraction bores- including a preliminary bore pad constructed before the main lease pad.
  - Construction of multiple well cellars to accommodate up to 3 E&A wells
  - Drilling, stimulation, testing maintaining and decommissioning of up to 3 horizontal E&A wells.
  - Construction and operation of a centralised mineral waste management area which will be used for the management of drilling and other mineral wastes (such as sand and cement ends). This area will be utilised to manage mineral wastes generated from other E&A locations in the vicinity of the Carpentaria Highway. This includes mineral wastes from other Tamboran locations across the Basin . Mineral waste area will include a large (~100mx 50m), lined sump to dry out material. Dried material will be blended with clean fill and manure (or other organic material) and composted in windrows to produce engineered soil suitable for rehabilitation activities such as gravel pit backfilling. Fluid will be evaporated and/or removed from site.
  - Flaring or beneficial use of produced hydrocarbons (such as onsite power generation), notionally between 30- 180 days (exact duration to be confirmed) .
  - Construction and operation of wastewater tanks, including the transfer of flowback and waste fluids to the site for longer term storage and treatment (evaporation).
  - Construction and ongoing operation of a new gravel pit within the immediate vicinity of Amungee NW 3 to support the surfacing of the access track and infrastructure.
  - This location is anticipated to become a centralised “hub” where gathering lines from adjacent exploration lease pads water and gas is managed from adjacent lease pads (Amungee NW 4 and existing Amungee NW). A schematic of the hub is provided in Figure 6

- **Shenandoah North A Vertical Well:** Construction of a new E&A location on NT Portion 7027**.** Activity includes:
    - Construction of a lease pad (~3 ha), camp pad (1ha) and access track (~1.5ha)
    - Construction and use of groundwater extraction bores (1-2 bores anticipated)
    - Drilling, well logging, diagnostic fracture injection test (DFIT), and P&A of a vertical exploration well
    - Transportation of drilling fluids to Kyalla 117 N2 sump/wastewater tanks
    - Mix-bury-cover of mineral drilling waste onsite
    - Rehabilitation of the site.
- **Shenandoah South A**: Construction of a new E&A location on NT Portion 1077 to enable drilling and stimulation within CY 2024. This lease location is anticipated to become a centralised "hub" for the Shenandoah South area, used to host shared infrastructure such as wastewater storages and drilling waste management. Activity includes:
    - Construction a new lease pad (8 to 11 ha), camp pad (1.5 ha), laydown area (2.5 ha), helipad (0.5 ha), wastewater storage area (~5.0 ha), fence line and firebreak (4.0 ha)
    - Construction of a new 1km access track connecting the existing south boundary access on NT Portion 7026 to the new proposed location
    - Drilling of up to 8 groundwater monitoring/ extraction bores- including a preliminary bore pad
    - Construction of multiple well cellars to accommodate future E&A wells in 2024 and beyond
    - Construction and operation of a centralised mineral waste management area which will be used for the management of drilling and other mineral wastes (such as sand and cement ends). This area will be utilised to manage mineral wastes generated from other E&A locations in the vicinity of the Shenandoah South A location. This includes mineral wastes from other Tamboran locations across the Basin. Mineral waste area will include a large (~100mx 50m), lined sump to dry out material. Dried material will be blended with clean fill and manure (or other organic material) and composted in windrows to produce engineered soil suitable for rehabilitation activities such as gravel pit backfilling. Fluid will be evaporated and/or removed from site.
    - Construction and operation of wastewater tanks, including the transfer of flowback and waste fluids to the site for longer term storage and treatment (evaporation)
    - This location is anticipated to become a centralised "hub" where gathering lines from adjacent exploration lease pads water and gas is managed from adjacent lease pads (Shenandoah South B, C and Kyalla 117 N2). A schematic of the hub is provided in Figure 6
- **Shenandoah South Seismic Acquisition Line A, B and C:** acquisition of up to approximately 38 km (19.0 ha) of 2D seismic, including seismic line preparation (land clearing), node deployment and seismic acquisition (using multiple energy sources).
- **Shenandoah South Seismic Acquisition Line D:** acquisition of up to approximately 40km of 2D seismic on the existing pastoralist tracks with no line clearing. Nodes and receivers will be deployed adjacent to access tracks with minimal vegetation removal. Multiple energy sources (such as dynamite, vibroseis, etc.) will be utilised.
- **All ancillary activities on each site required to undertake E&A activities including:**
    - Power generation, including usage of produced appraisal gas
    - Bulk chemical and fuel handling, storage and use

- Material transport and storage
- Helicopter operations
- Flaring and appraisal gas usage – including future sale of gas
- Flowback wastewater management, recycling and treatment
- Recycling of wastewater, including the recycling of waste drilling fluids, completion fluids and flowback into operational process (such as stimulation make up water)
- Groundwater extraction and monitoring
- Micro-seismic data acquisition and associated works
- Induced seismic monitoring and associated works
- Environmental monitoring for weeds, flora, fauna, soil, air quality and other environmental aspects
- Inspection and maintenance
- Office, workshop and laydown areas
- Rehabilitation of disturbance areas
- Operations of camps at each location
- Subsurface diagnostic tests and data collection on each petroleum exploration well
- Maintenance and monitoring of each of the proposed petroleum exploration wells and infrastructure
- Suspension and decommissioning of the proposed petroleum exploration wells.

6.2 2024 and beyond scope: potential subject of future land access and compensation agreements

Further activity is anticipated to commence in 2024; include more appraisal wells to de-risk a large scale development. To minimise flaring while appraisal wells are tested to de-risk a large scale development, and to assist in avoiding flaring related Greenhouse Gas (GHG) emissions, Tamboran will progress options to provide beneficial use options for any test gas (there will be a number of technical, regulatory and commercial issues that must be accounted for if gas is to be put into the NT gas network).. This is anticipated to reduce appraisal emissions by approximately 90%. Details regarding any infrastructure and/or other activity required to minimise flaring and allowing beneficial use of gas will be provided as engineering design work is completed and approvals are sought.

During this period, gathering lines and small-scale temporary gas treatment and processing facilities are anticipated to be constructed to manage produced hydrocarbons and water. It is anticipated that the Shenandoah South A and Amungee NW 3 location will become water and gas “hubs”, with water and gas flowing to these locations from surrounding sites. This is anticipated to reduce the size of the adjacent locations as infrastructure (such as camps, wastewater tanks, drilling sumps and laydowns) will be shared.

Gas will be preferentially sold in the adjacent Amadeus Gas Pipeline (AGP) or McArthur River Mine Pipeline (MRMP) where technically and economically feasible. Alternative processing options, such as Compressed Natural Gas (CNG) and Liquified Natural Gas (LNG). A new pipeline connection to the APG and a smaller pipeline connecting the proposed locations to the MRMP are being considered and will enable all the extended production gas to be captured and the minimisation of flaring.

The regulated activities that could potentially be completed during this period include:

- Construction of the **Amungee NW3 temporary gas processing facility (GPF) at the existing Amungee NW 3 location.** Temporary GPF includes gas dehydration, conditioning

and compression infrastructure. Gas processing may include temporary Compressed Natural Gas (CNG) or Liquified Natural Gas (LNG) facilities for offsite trucking to domestic markets. Activity includes:

  - Anticipated to be approximately <5 hectares
  - Civil construction activities, including vegetation clearing, gravel surfacing and temporary facility foundations construction
  - Installation of concrete footings
  - Construction of temporary office buildings and laydown
  - An example of a temporary gas processing facility is provided in Figure 12

- Construction of the ~1km **Amungee NW 3 sales gas pipeline** connecting up a temporary Amungee NW3 gas processing facility to the McArthur River Mine Pipeline (MRMP). Activity includes:
  - Vegetation clearing up to 20m in width for approximately 20-40km (depending on the final pipeline route)
  - Topsoil stripping
  - Trenching and pipe laying
  - Backfilling
  - Topsoil reinstatement
  - Vegetation reinstatement
- **Amungee NW 4**: Construction of a new exploration well pad Amungee NW 4 located South of the Carpentaria highway on NT Portion 7027 including:
  - Construction a new lease pad (5 to 11.0ha), camp pad (1.5ha), laydown area (2.5ha), helipad (0.5ha), fence line and firebreak (~4.0ha)- the exact size will depend on whether the Amungee NW3 is used to manage flowback fluids
  - Upgrade (forming and gravel surfacing) of ~7km of existing laneway access track and Carpentaria highway intersection connecting the proposed site to the Carpentaria highway
  - Construction of a new 1km access track connecting the proposed lease pad to the existing laneway
  - Drilling of up to 8 groundwater monitoring/ extraction bores- including a preliminary bore pad constructed before the main lease pad
  - Construction of multiple well cellars to accommodate up to 3 E&A wells
  - Drilling, stimulation, testing maintaining and decommissioning of up to 3 horizontal E&A wells
  - Flaring or onsite use of produced hydrocarbons, nominally between 30- 180 days
  - Construction and operation of wastewater tanks, including the transfer of flowback and waste fluids to the site for longer term storage and treatment (evaporation)
  - Construction and ongoing operation of a new gravel pit within the vicinity of Amungee NW 4 to support the surfacing of the access track and infrastructure. Location to be confirmed with pastoralist.
- **Beneficial use of appraisal gas sale from the Amungee NW3 and Amungee NW4 location**, including:
  - Installation of gathering lines (water and gas) and small field boosters and pumps to connect the proposed exploration well pads to the temporary water and gas

processing facilities. Gathering lines will typically be 10-18m in width located within/ along existing disturbance (such as firebreaks/ access tracks) where possible. Activity includes:

- Vegetation clearing
- Topsoil stripping
- Trenching and pipe layer
- Topsoil reinstatement
- Vegetation reinstatement.

- Construction and operation of temporary offices and support building
- Power generation
- Operation of a small temporary camp

- **Shenandoah South A Drilling, stimulation and testing of multiple E&A wells including**
  - Drilling, stimulation and testing (appraisal) of 1 to 6 E&A wells (depending on pad configuration)
  - Extended appraisal, including flaring and sale of hydrocarbon
  - Wastewater storage, treatment and recycling
  - Ongoing drilling waste management
  - Operation of the camp and laydown yards
- **Shenandoah South B**: Construction of a new E&A location on NT Portion 7026 to enable drilling and stimulation within CY 2024- CY 25 including:
  - Construction a new lease pad (5 to 11 ha), camp pad (1.5 ha), laydown area (0.5 to 2.5 ha), helipad (0.5 ha), fence line and firebreak (4.0 ha) - exact size to be determined based on whether a centralised hub set up is utilised to share infrastructure between sites
  - Construction of a new 1km access track (~1.5ha) connecting the existing South boundary access on NT Portion 7026 to the new proposed location
  - Drilling of up to 8 groundwater monitoring/ extraction bores including a preliminary bore pad drilled before the main lease pad construction
  - Construction of multiple well cellars to accommodate future E&A wells
  - Construction of drilling sump drilling waste management area (for ongoing drilling waste management and mix-bury-cover)
  - Construction and operation of freshwater tanks
  - Drilling, stimulation and testing (appraisal) of 1 to 6 E&A wells (depending on pad configuration)
  - Extended appraisal, including flaring and sale of hydrocarbon (where possible to avoid flaring).
- **Shenandoah South C**: construction of a new E&A location on NT Portion 1077 to enable drilling and stimulation within CY 2024- CY 25 including:
  - Construction a new lease pad (5 to 11 ha), camp pad (1.5 ha), laydown area (0.5 to 2.5 ha), helipad (0.5 ha), fence line and firebreak (4.0 ha) – exact size to be determined based on whether a centralised hub set up is utilised to share infrastructure between sites
  - Construction of a new 1km access track (~1.5ha) connecting the existing South

boundary access on NT Portion 7026 to the new proposed location

- Drilling of up to 8 groundwater monitoring/ extraction bores- including a preliminary bore pad drilled before the main lease pad construction
- Construction of multiple well cellars to accommodate future E&A wells
- Construction of drilling sump drilling waste management area (for ongoing drilling waste management and mix-bury-cover)
- Construction and operation of freshwater tanks
- Drilling, stimulation and testing (appraisal) of 1 to 6 E&A wells (depending on pad configuration)

- Construction and operation of the temporary **Shenandoah South temporary gas processing facility** including gas dehydration, conditioning and compression. Gas processing may include temporary Compressed Natural Gas (CNG) or Liquified Natural Gas (LNG) facilities for offsite trucking to domestic markets. Activity includes:
  - Anticipated to be approximately 2-3 hectares.
  - Civil construction activities, including vegetation clearing, gravel surfacing and temporary facility foundations construction
  - Construction of temporary office buildings and laydown
  - Installation of temporary pipework and compression facilities (anticipated to be skid mounted)
  - Installation of an emergency flare area
  - An example of a proposed facility is provided in Figure 12
- Construction of a **Shenandoah South sales gas pipeline** connecting up a temporary gas treatment and compression facility located in the vicinity of the Shenandoah South A/B/C location with the Amadeus Gas Pipeline (AGP)- 2 potential options provided ranging from 20 to 45km in length. It is anticipated that the pipeline will have an average width of 20m with the activity including:
  - Vegetation clearing
  - Topsoil stripping
  - Trenching and pipe laying
  - Backfilling
  - Topsoil reinstatement
  - Vegetation reinstatement
- **Appraisal gas sale from the Shenandoah South A, B, C and Kyalla 117 N2 locations**, including:
  - Installation of gathering lines (water and gas) and small field boosters and pumps to connect the proposed exploration well pads to the temporary water and gas processing facilities (most likely located in the vicinity of Shenandoah South A). Gathering lines will typically be 10-18m in width located within/ along existing disturbance (such as firebreaks/ access tracks) where possible. Activity includes:
    - Vegetation clearing
    - Topsoil stripping
    - Trenching and pipe layer
    - Topsoil reinstatement

        - Vegetation reinstatement.
    - Onsite generation of compressed natural gas (CNG) and offsite transportation 9refer
    - Onsite generation of Liquified Natural Gas (LNG) and offsite transportation
    - Power generation
    - Operation of a camp
    - Construction and operation of temporary offices and support building
    - Refer Figure 5 for location of proposed infrastructure, including appraisal gas pipeline
    - Extended appraisal, including flaring and sale of hydrocarbon
- **Shenandoah North B:** Scope is considered contingent. Potential construction of a new E&A location on NT Portion 7027 to enable drilling and stimulation within 2024-25 including:
    - Construction a new lease pad (5 to 11 ha), camp pad (1.5 ha), laydown area (0.5 to 2.5 ha), helipad (0.5 ha), fence line and firebreak (4.0 ha)
    - Construction of a new 1km access track (~1.5ha) connecting the existing South boundary access on NT Portion 7026 to the new proposed location
    - Drilling of up to 8 groundwater monitoring/ extraction bores- including a preliminary bore pad drilled before the main lease pad construction.
    - Construction of multiple well cellars to accommodate future E&A wells
    - Construction of drilling sump drilling waste management area (for ongoing drilling waste management and mix-bury-cover)
    - Construction and operation of freshwater tanks
    - Drilling, stimulation and testing (appraisal) of 1 to 6 E&A wells (depending on pad configuration)
    - Extended appraisal, including flaring and sale of hydrocarbon.
- **Kyalla 117 N2**: Drilling of up to an additional 1 to 6 E&A wells on the existing Kyalla 117 N2 site including:
    - Drilling, stimulation and testing (appraisal) of E&A wells (depending on pad configuration)
    - Extended appraisal, including flaring and sale of hydrocarbon
    - Wastewater storage, treatment and recycling
    - Ongoing drilling waste management
    - Operation of the camp and helipad.
- **All ancillary activities on each site required to undertake E&A activities including:**
    - Gravel extraction
    - Power generation, including usage of produced appraisal gas
    - Bulk chemical and fuel handling, storage and use
    - Material transport and storage
    - Helicopter operations
    - Flaring and appraisal gas usage – including future sale of gas
    - Flowback wastewater management, recycling and treatment
    - Recycling of wastewater, including the recycling of waste drilling fluids, completion fluids and flowback into operational process (such as stimulation make up water).

- Groundwater extraction and monitoring
- Micro-seismic data acquisition and associated works
- Induced seismic monitoring and associated works
- Environmental monitoring for weeds, flora, fauna, soil, air quality and other environmental aspects.
- Inspection and maintenance
- Office, workshop and laydown areas
- Operations of camps at each location
- Subsurface diagnostic tests and data collection on each petroleum exploration well.
- Maintenance and monitoring of each of the proposed petroleum exploration wells and infrastructure
- Suspension and decommissioning of the proposed petroleum exploration wells.
- Rehabilitation of disturbance areas
- All other activities ancillary to the above scope.

Indicative images of exploration lease pad construction, exploration well drilling, well stimulation, well testing and potential future compression facilities are provided in Figure 8 to Figure 12. It should be noted that these are provided as a guide and the actual infrastructure arrangement/ type may vary.

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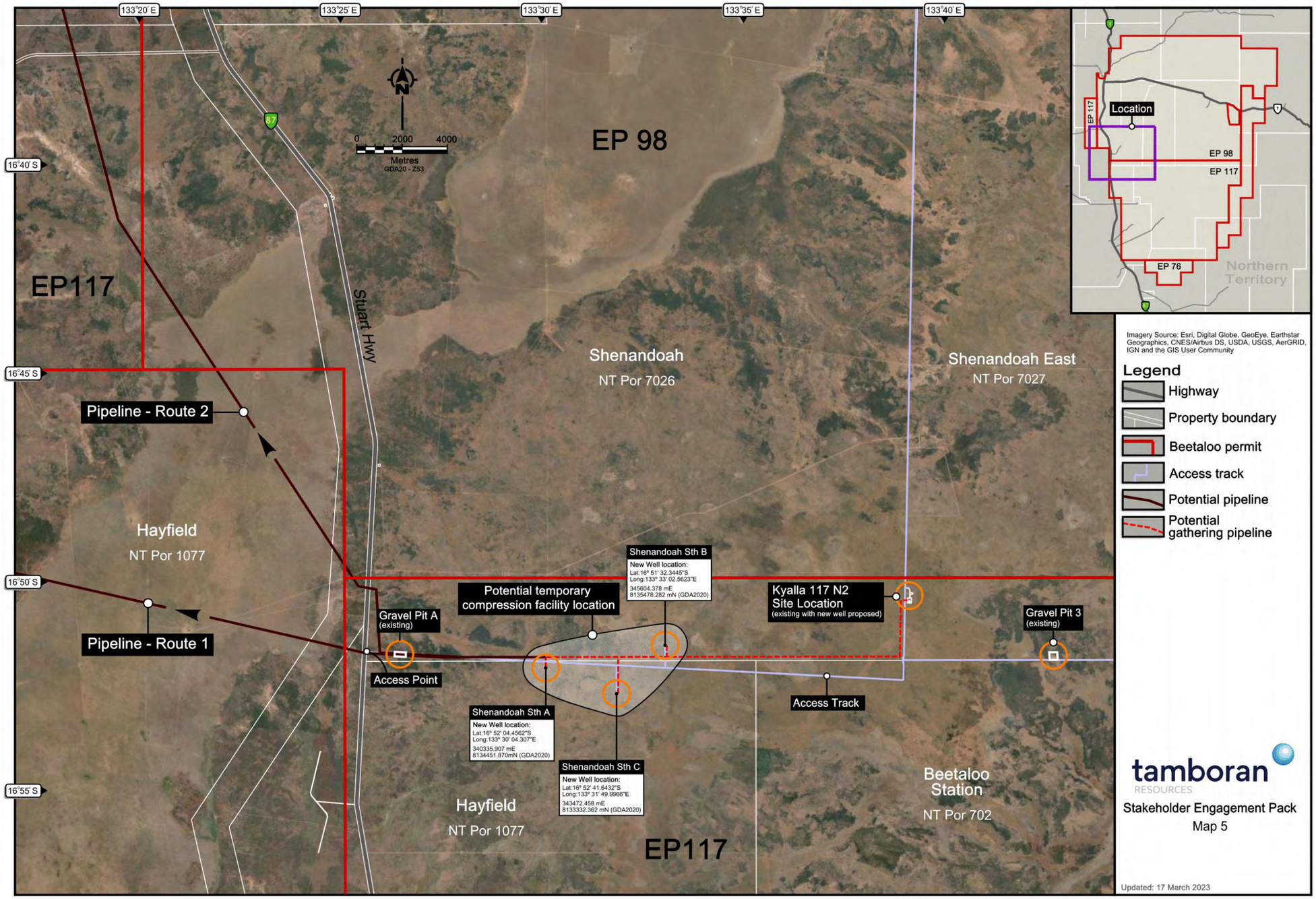

Figure 5 Shenandoah South Pilot Area with potential location of appraisal infrastructure. The temporary compression facility is anticipated to be in the vicinity of the Shenandoah South A/B and C location- with the final location determined through consultation with pastoralists and Native Title Holders

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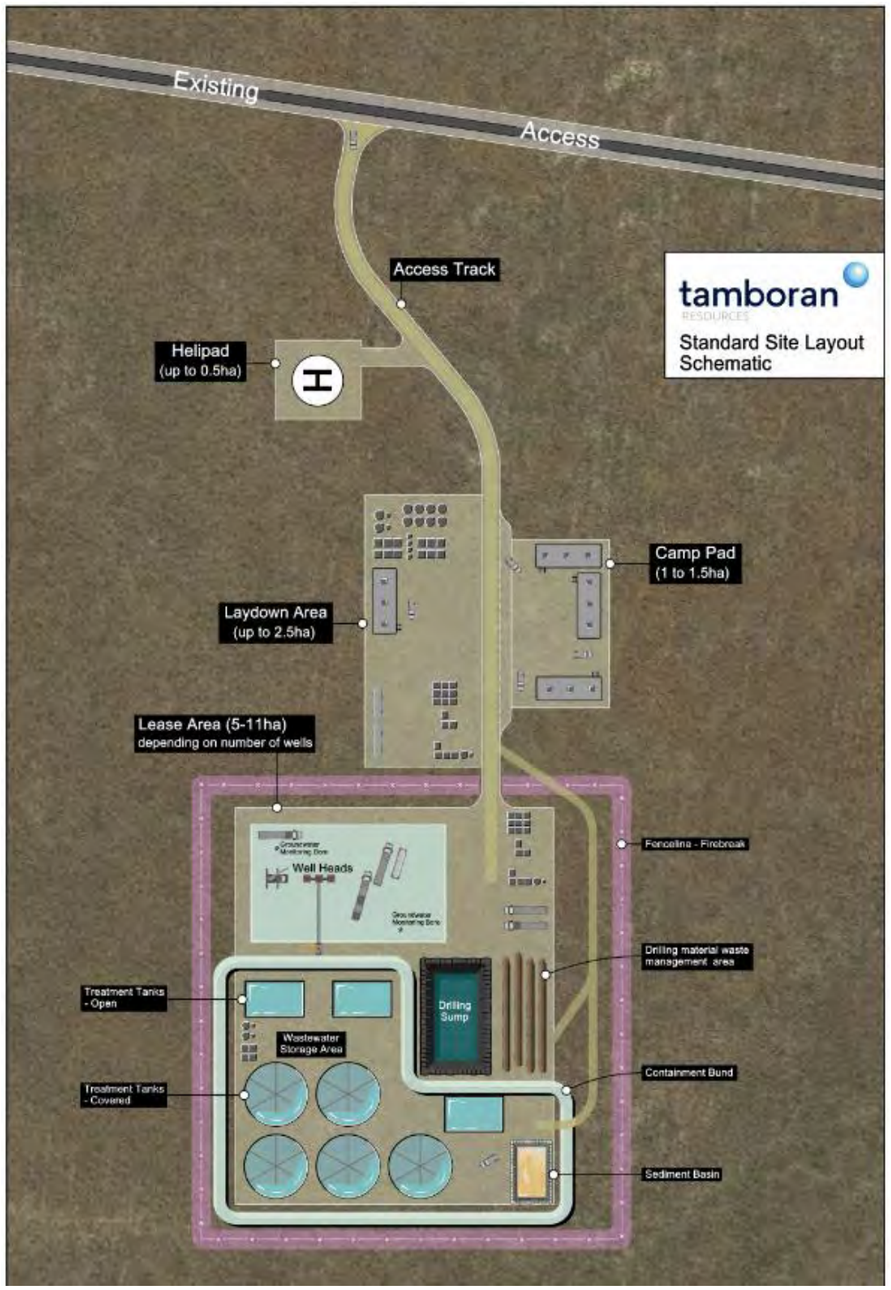

Figure 6 Typical schematic of a 3 well "hub lease pad"

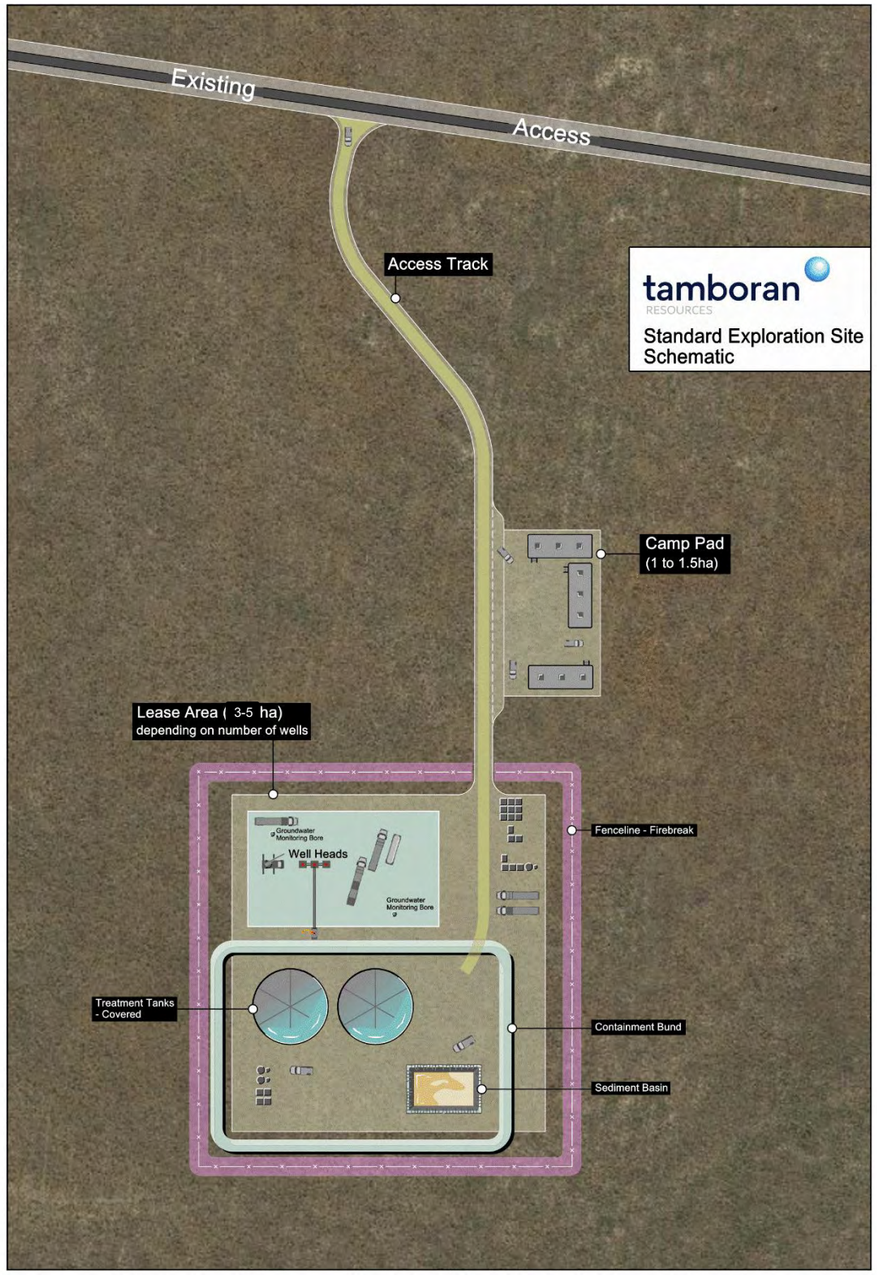

Figure 7 Typical schematic of a standard lease pad supported by a hub

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Figure *8* Overview of an exploration site within the Beetaloo undergoing lease and camp pad construction, with water bore drilling underway

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Figure 9 Typical well site layout during drilling; this is the existing Kyalla 117 N2 site

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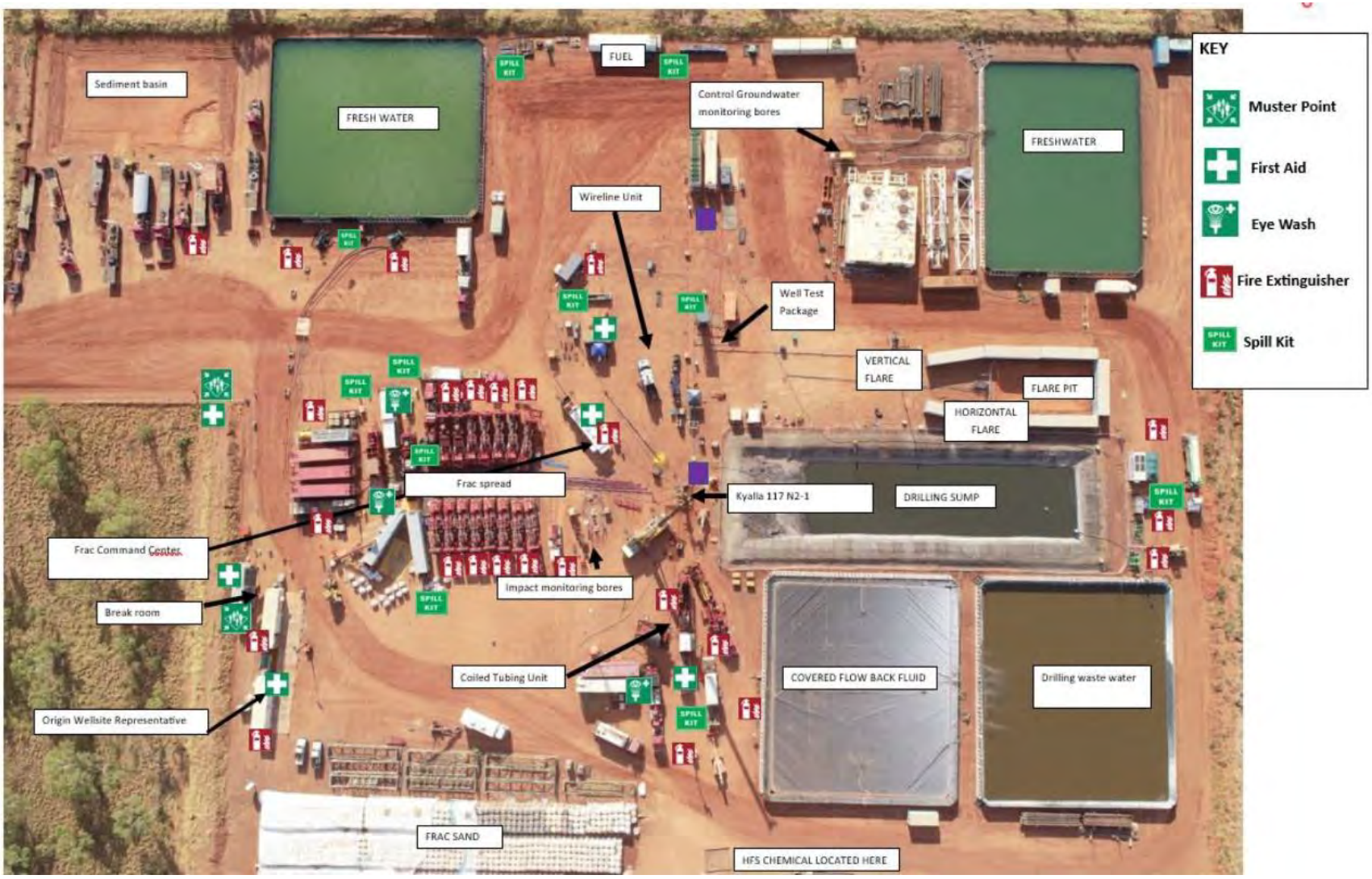

Figure 10 Typical hydraulic fracture stimulation spread at the Kyalla 117 N2 site

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Figure 11 Example of a well test underway at the existing Amungee NW location – noting flaring will be minimal if gas is sold instead of flared

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Figure 12 Example of a temporary gas processing facility used to compress and sell gas into the domestic gas market

6.3 Activity description

The following information details the proposed exploration activities on the Hayfield Shenandoah Station. These descriptions are indicative and general in nature. Minor departures from such descriptions are likely to occur and such departures are covered by the content of this SEP or through ongoing communication with the pastoralist. The information has also been summarised in Table 2 with the relevant activity description and picture.

Table 2 Description of proposed regulated activity

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Groundwater monitoring and extraction bore installation Groundwater monitoring and extraction bores will be constructed using a water bore drilling rig, identical to the rig used to drill pastoral water bores. All groundwater monitoring bores will be constructed in accordance with the *"Minimum Construction Requirements for Water Bores in Australia"*. Bores may be drilled into the Anthony Lagoon Formation (if present and saturated), and/or Gum Ridge Formation. Waste cuttings, drilling fluids, muds and formation fluids will be collected in a small earthen sump and managed in alignment with the practices outlined in the *"Minimum Construction Requirements for Water Bores in Australia"*. The fluid (which is anticipated to be fresh) will be discharged to ground in the area surrounding the lease. The formation cuttings and drill muds will be mixed with soil onsite and incorporated into the lease pad surface.	Located within lease pad disturbance	<6 people	Typically prior to exploration well site construction	2-4 weeks	
Civil construction of lease pads, camp pads, laydowns, helipad, fence lines and firebreaks Each proposed lease pad, including camp pad, laydown yard, helipad, firebreaks and fence lines will be surveyed and demarcated. The sites will be cleared of vegetation, grubbed and stripped of topsoil. Topsoil will be stored around the edge of the lease pad to form a bund, which will be used as both an erosion and sediment control and wastewater containment bund. The lease pad will be levelled, compacted and surfaced with gravel to accommodate exploration activities. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains). Where flowback wastewater is proposed to be stored, the site/storage area will be bunded to prevent offsite release. A sediment retention pond will be installed within the wastewater storage area to manage surface water collected within the bund. Stormwater captured onsite will be tested and released into the adjacent area. Where a site is determined to be a "hub", it will have additional area to host more wastewater storage, drilling waste management and other associated infrastructure. The use of hubs is designed to reduce the size of surrounding lease pad by reducing infrastructure duplication. On each pad 8 m^3 well cellars will be constructed on each of the proposed leases to accommodate the wellhead equipment and blow-out preventer (BOP). Where a sump is to be utilised onsite to manage drill cuttings, drilling sumps will be lined with an impermeable liner to contain all drilling fluid, drilling muds, cuttings, cement returns and waste sand. Drilling sump holding capacity is typically 3000 m^3. The drilling sump / broader site will be fenced to prevent livestock access. The site will be fully fenced with a 20 – 50 m firebreak installed as a firebreak also referred to as an asset protection zone. Each of the access track intersections with the Carpentaria and Stuart Highways are also likely to be upgraded to comply with DIPL requirements, with a turn in bay and sealing of the road verge. During this period, traffic control will be deployed to manage the activity.	Typically 5-11ha per pad	<20 people	Prior to exploration drilling	8-12 weeks	

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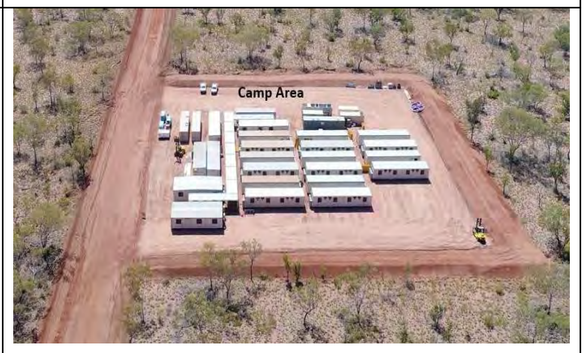
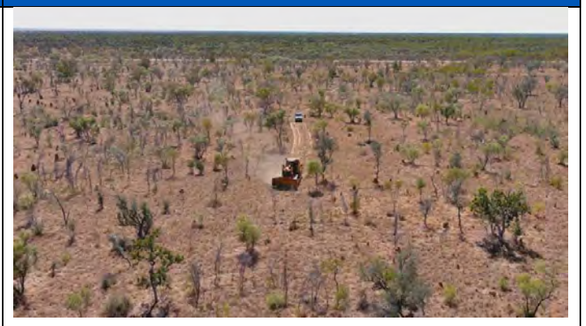
Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Access track construction To minimise disturbance, existing pastoral access tracks will be upgraded where required.. Access tracks will be graded, formed and sheeted within gravel (where required) to maintain a safe driving surface. New access track will be up to 14 m wide; with provisions for a 6 m formed surface and 2m shoulder as per the *NTG Standard Drawings (CS3003) for Typical Cross Section for Rural Environment – Pastoral Access Road 2* (Appendix A). Diversion drains, cut outs and creek bed level crossings will be used to manage overland flow and prevent erosion. Where gathering lines are to be constructed to connect up wells within Shenandoah south, a new access track may be constructed along the Shenandoah east and Shenandoah Station boundary. This will prevent the access track and gathering lines from being constructed on the Beetaloo station due to the current boundary mis-alignment. Access tracks will be periodically maintained to keep in good working order.	23.5km of new access (with an additional 12km if a new access along the Shenandoah East and Shenandoah boundary is required).	<10 people	During civil construction activities	4-6 weeks	
Camp pad construction and camp operation Purpose-built camps will be constructed to support operations. Each camp will be a self-contained facility with accommodation rooms, kitchen, dining mess, offices, ablutions, gymnasium, storerooms, refrigeration, water storage, power generation, solid waste management, fuel storage, water treatment, sewage treatment and sewage irrigation area. All waste will be covered / stored in a manner that prevents feral animal access. An approved wastewater (sewage) treatment plant will be installed to treat all sewage, with treated effluence irrigated in a fenced area adjacent to the camp. Treated effluence treatment and irrigation will occur in accordance with the NT Department of Health requirements. It is anticipated that a centralised camp will be utilised to minimise the number of new pads being constructed. This is anticipated to be Kyalla 117 N2, Shenandoah A, Amungee NW3 and potentially Amungee NW 4 (to prevent continued highway crossings)	N/A- disturbance included in overall exploration site disturbance.	<60 people (including housed staff)	For duration of activity	For duration of activity	
Gravel pit construction and operation Up to 2 5 hectares additional gravel pits will be constructed within the vicinity of the proposed exploration areas around Amungee NW 3 and Amungee NW 4. Existing gravel pits on Shenandoah and Shenandoah East station are likely to be sufficient to support ongoing operations.. Each pit will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100 mm (depending on the depth of topsoil onsite). Subsoils will be removed from the pit and segregated from topsoil. Topsoil and subsoils will be stored around the edge of the lease pad to prevent overland flow into the pit. Upon completion, the pit will be recontoured to leave a slight depression, with subsoils and topsoil reinstated to allow vegetation to re-establish. In some cases, composted drilling waste mixed with subsoil and manure may be utilised as a growth media to back fill the gravel pits where the material is of suitable quality. B-doubles and triples will typically transport gravel to the required point. A schematic of the typical gravel pit operation and rehabilitation is provided in Appendix C.	<10ha	<6	Constructed to support civil construction activities.	For duration of activity	
2D Seismic consists of the following: It is anticipated that seismic surveys will be collected using a combination of small seismic charges, vibroseis, and accelerated weight drop sources. The seismic charges are approximately 1kg and will be installed along each of the 2D lines to a depth of approximately 15 – 20 m underground. The charges will be installed using a small, mounted drill rig. The charges are packed into place and detonated in a controlled fashion with appropriate exclusion zones. The created detonation zone is kept underground, with no surface disturbance anticipated. The detonated charge creates a “thud sound” which can be heard within 2 km radius and felt within a 100 – 200 m radius (typically). Vibroseis trucks may also be utilised as the energy source. These truck have thumper plates	38km of 2D lines x 5 m widths = 19 ha off track Up to 40km of 2D seismic on the existing Kyalla 117 N2 access	Up to 35	Before or after exploration well drilling with the final time to be confirmed	3 – 8 weeks per site	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
underneath which provide the energy source when it comes in contact with the earth's surface. To enable vibroseis truck(s) access, line clearing will be required so that they drive and operate over the survey area. These source lines, will need to be cleared 5 m wide to enable the vibroseis to access. Existing cleared areas will be utilised where possible to reduce disturbance. The line tolerances for weaving around vegetation are allowed and in open Eucalypt woodland, minimal clearing is anticipated. Seismic lines will also be in a manner to avoid any large habitat trees or sensitive flora, with no clearance to be undertaken in watercourses and associated riparian vegetation. Tamboran will also endeavour to avoid clearing large sections of Bullwaddy and lancewood where possible. *Accelerated Weight Drop sources can be mounted to a high-clearance tractor or skid steer and require little to no clearing. The striking mass (hammer) is accelerated downward with the aid of massive stretching springs.*	track (likely to be ~10km) - On track				 e.g. of rehabilitation efforts in progress (HESS, 2013). e.g. of recruitment of vegetation post rehabilitation of open *Eucalyptus* woodland (HESS, 2013).

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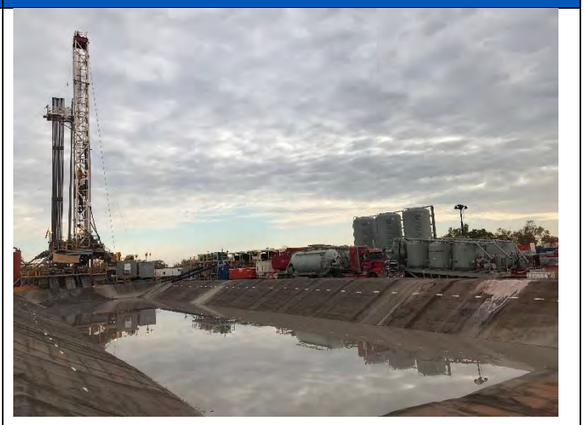
Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Microseismic survey and induced seismic monitoring Microseismic Monitoring Surveys are undertaken 'listen to' the Hydraulic Fracture Stimulation Operations on each of the sites. Seismic receivers called geophones are individual weatherproof units that contain a sensitive seismic recording device, memory storage, a long-life battery and GPS locator. The geophones are deployed 5 – 25 m apart along lines or in a grid over an area of 30 – 40 km^2 around each of the wells during stimulation activities. Geophone deployment locations are located on foot by GPS locator. A handheld battery drill is used to create a 4 cm diameter hole with an auger bit, a small quantity of water may be used to stabilise the soil. The geophone is inserted into the hole so that the top of the receiver is flush with the surface of the ground (see picture). The geophones are deployed prior to the commencement of stimulation and retrieved after the stimulation has concluded. Deployment and retrieval of the geophones is undertaken in small teams of 2 or 3 people, with the number of deployment teams dependent on survey size. The teams are supported by a light 4WD vehicle or an all-terrain vehicle to carry equipment, gear, water, communication (radio/satellite phone), first aid kits and safety gear. Induced seismic monitoring will also be undertaken at the same time as the microseismic monitoring. A temporary seismic receiver is installed ~1km from the well site, with a small amount of other equipment such as solar panels and data transfer equipment. The equipment can be fenced off with temporary fencing if there are cattle in the area. The data from the seismic receiver is sent wirelessly back to the well site to enable live monitoring of seismic events during hydraulic fracture stimulation. The Induced Seismic Monitoring equipment is installed prior to hydraulic fracture stimulation, and remains installed, collecting data for up to 2 months after the conclusion of hydraulic fracture stimulation. No line clearing or heavy machinery is required for either activity, as the activities are considered to have a minimal impact.	Variable – similar to scouting over a 30-40km^2 area	Up to 10	Before or after exploration well drilling with the final time to be confirmed	4-10 weeks per site	
Exploration well drilling Up to 1-6 petroleum exploration wells are proposed to be drilled at the proposed locations. The exact number will depend on appraisal success and through ongoing negotiations with the pastoralist. Wells cannot be drilled without an approved Land Access and Each well will be drilled into an underlying prospective petroleum reservoir (anticipated to be the Velkerri shale) to a typical maximum depth of 1000 – 4000 m. Each well will be deviated into the horizontal position, with a lateral drilled typically to between 1000m 4000 m (Tamboran's current base case for Shenandoah South A is 3000m) Each petroleum well is designed and constructed in accordance with the Code of Practice for Onshore Petroleum Activities within the NT (Code of Practice) to maintain well integrity and protect aquifers and the environment. A Well operations management plan (WOMP) is required to be submitted to the regulator and approved prior to the drilling of any wells. The WOMP outlines the well design and drilling practices that will be deployed to ensure compliance with the Code of Practice and protect underlying aquifers and the environment. Each well is anticipated to be constructed with multiple casing and cement strings, typically 4 casing strings (conductor casing, surface casing, intermediate casing and production casing). Once the well design is approved by the NTG, a rig package will be mobilised to site, which consists of a drilling rig (comprising rig matting, a rig floor, mast or derrick, rig engine, blow out preventor, catwalk, safety flare etc.), pipe racks, casing strings, drilling rods, rig fluid system (mud tanks, shakers, mud treatment system and pipework) storage trailers, bunded chemical storage areas, workshop portable onsite offices, crib huts, mini-rig camp and sewage treatment system and irrigation area), freshwater storage tanks, diesel power generation, cement trucks, bulk fuel storage, water transfer pumps, fork lifts, lighting towers, crane, etc. The rig will be constructed over the pre-installed stove pipe and cellar. Once functional, drilling will proceed down below the first encountered aquifer, where the first casing section of the well will be installed (either in the Anthony Lagoon Formation if present and saturated or the Gum Ridge formation (anticipated to be present). After the surface casing is set, a BOP will be installed, to ensure any	N/A located on proposed lease pad	<60 people	Pastoralist to be notified when drilling proposed	Typically 60 – 90 days per well	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
influxes of gas, water or pressure are able to be safely managed during drilling of the remaining sections of the well. The drilling rig will continue to drill the other casing and cement sections. The integrity of each of these casing strings is tested through a combination of leak off tests, casing pressure tests, cement return tracking and cement bond logs. Upon completion of drilling, a barrier integrity verification report is submitted to the regulator summarising the integrity of the well. Once each well is finished drilling, the well head is installed, and the rig is either “walked” to the next adjacent location with the process repeated or mobilised to a new location. A low toxicity water-based drilling mud is to be used as the base fluid for drilling, which primarily contain low toxicity salts (KCL and NaCL) and polymers. Drilling mud is required to maintain well control, provide formation stability, lubricate and control the temperature of the drill bit and lift cuttings to the surface. The fluid system consists of water with a sodium or potassium-based salt (to prevent formation swelling) and a viscosifying agent such as bentonite. Other low toxicity chemicals such as barite, citric acid, sodium bicarbonate and loss circulation material (fibres such as coconut coir or nut hulls etc.) may also be used. The chemicals used for drilling are consistent with those used for water bore drilling. Waste drilling muds, fluids, cuttings and mineral waste (such as cement returns, sand etc.) brought to surface will be stored either a) in temporary cutting bins/ tanks and then periodically moved to a centralised “hub” for ongoing management or b) within an onsite lined drilling sump. Drilling fluids will typically be evaporated and then removed from the sump and disposed of offsite. During the top hole drilling section, low salinity wastewater may be recycled as dust suppression where it is authorised to do so. Solid waste within the drilling sump will be allowed to dry out and then either removed from site or disposed of onsite in accordance with the Code of Practice. Where onsite disposal is proposed, a risk assessment will be completed demonstrating that the activity can occur with no residual environmental harm. Onsite disposal can include encapsulation or mix bury cover, depending on the site-specific details and final composition of the drilling waste material. Subsurface diagnostic tools will be run on the well during and after drilling to understand the nature of the target reservoir. Some sections of the formation may be cored or have sidewall samples collected, which will add further analysis of the reservoir properties. To assist with determining the suitability and capacity of these formations for potential gas extraction activities, diagnostic fracture injection test (DFIT) may be conducted across several shale intervals to evaluate the geo-mechanical and reservoir properties of the targeted formation. Prior to a DFIT, a cement bond log and casing pressure test is completed to ensure the integrity of the cement and steel casing. A DFIT involves the injecting of small volumes of a water (approximately 30 barrels (5,000 L) per DFIT) at low pumping rates to create a small fracture in the target interval. The well is shut-in, and the pressure allowed to fall-off naturally. Monitoring the fall-off pressure over time allows information to be derived about the reservoir. The fluid does not contain proppant so that the fracture closes naturally when the fluid leaks off into formation. The analysis of pressure, during injection and after shut-in, provide powerful tools for understanding and subsequently informing the design for a future hydraulic fracturing process (not in this scope). Any returned fluid will be stored within the lined drilling sump, temporary tanks or disposed of offsite at a licenced facility.					

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Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Hydraulic Fracture Stimulation Upon completion of drilling activities at each site, a frack spread will be mobilised to site to commence hydraulic fracture stimulation (HFS or stimulation) activities on each drilled well. A frack spread consists of: • Data van: On-site office to execute stimulation activities. • Water storage: Tanks will be constructed on-site, capable of managing both make-up water and flowback water. Tanks will be double lined with leak detection capable of monitoring any leaks between the primary and secondary liner. Tank number will depend on encountered flowback volume and can range between 5 – 12 tanks (the exact number may be more or less than the anticipated number). • Proppant trailer: A large sand storage and delivery trailer that holds the proppant. • Hydration unit: Used to add stimulation additives and viscosifying fluids. • Blender unit: Used to mix proppant and fluid additives, prior to its injection into the well. • High pressure pumps: Pumps which inject the hydraulic fracturing fluid mixtures from the blender unit down the well, via the surface lines and hydraulic fracturing wellhead or coiled tubing unit. • Coiled tubing unit: A large length of coiled steel pipe that can be temporarily installed in the well to perform various downhole operations. • Wireline unit: Plug and perforation deployment. • Ancillary support buildings: Offices, workshop, cranes, chemical storage area, equipment storage, power generation and all other activities required to support stimulation activities. Stimulation involves the injection of a slurry, primarily consisting of water and sand (proppant), plus a small percentage of chemicals at high pressure into the target section of the horizontal wellbore approximately 1000 m – 4000 m below ground level (depending on the depth of the target formation). Typically, 90% or higher of the total volume in stimulation fluids is a combination of fresh water and sand (~6 – 8%), with the remainder as fluid-conditioning additives (~2 – 4%). Wastewater, including drilling, completion and flowback fluid, will also be preferentially utilised within the stimulation fluid to minimise raw water use, reduce ongoing wastewater storage requirements and minimise offsite trucking. Where wastewater is to be recycled, it typically will be filtered to remove solids, treated with a biocide to reduce bacteria growth and then blended with raw water prior to being added to the blender. Stimulation chemists will factor in the wastewater's chemistry during the fluid design to ensure compatibility. Prior to the commencement of stimulation activities, the integrity of the well is tested with a cement bond log and pressure casing test. This integrity report is submitted to the regulator prior to the commencement of stimulation activities. The stimulation fluid is pressurised by the high-pressure pumping units and directed downhole via a manifold to the discrete target intervals along the horizontal wellbore (referred to as 'stages'). Each stage will be isolated and perforated using a plug and perforation gun assembly deployed via a wireline unit. As the pressure is sustained, the fractures propagate radially from the well, through the target rock. Once optimal fracture propagation has been achieved, the proppant (sand) is pumped down the well and into the open fractures. This process is repeated for each stage. Where multiple wells are drilled on a well pad consecutively, they will typically all be stimulated in sequence. This maximises efficiency and reduces mobilisation requirements. The final number of stages pumped in each well is dependent on the useable length of the horizontal wellbore and in-situ geological conditions.	N/A located on proposed lease pad	<50 people	Post exploration well drilling	2 – 8 weeks per well depending on stimulation size	

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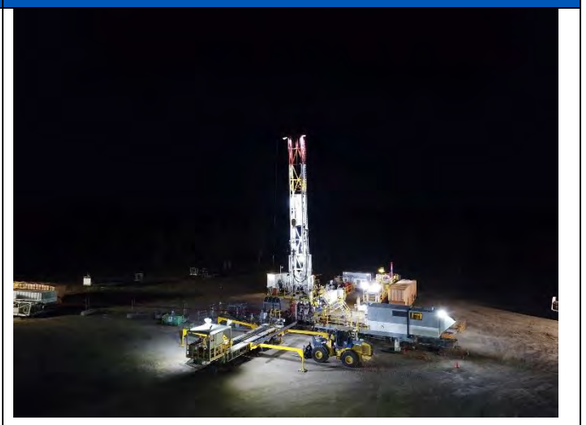
Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Well completion Once each well has been stimulated, a completion rig will be mobilised to site to "complete" the well. This involves installing downhole equipment such as packers, plugs, production tubing, artificial lift required to enable the production testing.	N/A located on proposed lease pad	<12 people	Post stimulation	1 – 2 weeks	
Well testing Once each well has been completed, the well will be brought online and tested for a period of 1 to 24 months. Tamboran proposes to flare for 90 days, with the sale of appraisal gas seen as a priority (once lawfully able to do so). Where appraisal gas sale is possible (i.e. through a pipeline or onsite compressed natural gas/ Liquified Natural Gas processing, appraisal duration will likely extend for the full 24 months. To enable the testing, a well test package will be installed at the site consisting of: • separators (to separate gas, condensate and water) • flares (either a vertical or horizontal), • flare pit (if a horizontal flare is utilised • surface pipework, manifolds, and tanks • communication and generator shacks • workshops/ storerooms • bulk diesel tanks • wastewater storage tanks (converted freshwater storage tanks used for stimulation makeup water) • water transfer equipment • wastewater evaporation and treatment units • camp accommodation. Each of the exploration wells will be underbalanced (or "unloaded") to initiate production, either through its own energy or through artificial lift (such as through a Nitrogen lift or pump). The fluid and gas will be sent through a separator, with all hydrocarbons metered and either flared or sent via gathering lines to a centralised facility (hub) to be beneficially used (sold/ used for power generation). Flowback water will be discharged from the separator into designated wastewater storage tanks onsite or transported via gathering lines to a centralised "hub". Multiple well testing operations may be required to test the behaviour of the formation to determine whether extended shut ins can affect well productivity. After or during production testing operations the well/s may be shut in for a period to allow the pressure to naturally build up to assess reservoir pressure.	N/A located on proposed lease pad	<12 people during production testing	During exploration activities	Typically 1 to 24 months	

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Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Wastewater tank storage Wastewater can be generated as Flowback, Drilling wastewater and completion fluids. Flowback refers to water utilised for HFS that is “flowed-back” to surface. Flowback is typically saline, with elevated boron, barium, strontium and other metals. The saltiness of the water is the highest hazard. Drilling wastewater is fluid that results from drilling the well and often includes salts, muds and other additives (such as surfactants, polymers, biocides, lubricants etc.). the fluid utilised for the drilling through aquifers is low toxicity, less saline and is typically suitable for use as dust suppression or recycling. Completion fluids are generally salt or polymer weighted fluids designed to prevent corrosion or inhibit formation pressure/ reaction. Flowback, drilling and completion wastewater will be recycled as a priority to reduce raw water usage and minimise ongoing waste storage and disposal. Recycled wastewater will be mixed with raw water within wastewater tanks and utilised in stimulation make up water (typically at a ration of 1 part wastewater to 5 parts raw water or higher) . Where wastewater cannot be recycled, wastewater will be treated on site via evaporation (or other treatment technologies) and removed from site upon completion of activities. Evaporation is used to minimise the volume of wastewater required to be transported offsite, reducing the amount of truck movements. Double lined wastewater tanks will be utilised to store wastewater, with the volume and number of tanks installed dependent on the anticipated flowback return volume. It is anticipated that a combination of enclosed tanks and open treatment tanks will be utilised at each site, with the overall tank capacity determined by the number of wells, horizontal length of each well, stimulated stages of the proposed wells and whether the site has been designed as a centralised wastewater storage area (or a “hub”). As previously discussed, centralised hubs may be constructed to collect wastewater via gathering lines from multiple lease pads to reduce the overall activities disturbance area and reduce wastewater storage cost. Wastewater storage tanks may be deployed for extended periods to enable flowback to be stored prior to being recycled at other exploration locations or to allow ongoing evaporation or treatment of produced wastewater. Treatment of wastewater may also be undertaken onsite, with water treatment options such as submerged combustion units, enhanced evaporation units etc. utilises to reduce wastewater volume onsite. Wastewater from other sites across the basin may also be managed onsite, to consolidate Tamboran’s regional wastewater treatment/ management footprint. Wastewater storage tanks have continuous level monitoring, with leak detection sensors located within the interstitial space between the primary and secondary liners. They will be specifically designed to withstand cyclonic wind ratings and be routinely inspected to maintain integrity. In accordance with the Code of Practice, sufficient enclosed tank capacity must be onsite to store all wastewater during the wet season (October to April). Flowback can only be stored within open tanks where undergoing treatment (such as evaporation). Open evaporation tanks must have a 1:1000 annual re-occurrence Interval (ARI) wet or dry season freeboard (i.e., available tank space to accommodate rainfall), which is typically 1.3 M or 0.3 M respectively. The lease pad or a specifically constructed wastewater storage areas will be bunded to contain 110% of the volume of the largest tank stored onsite. Centralised “hub sites” are anticipated to be constructed at Shenandoah South A and Amungee nW3. Other sites may be chosen as hubs in consultation with the pastoralist.	N/A located on proposed lease pad	<4 persons	During wastewater storage activities	3 – 36 months	

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Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Flaring During well testing, all produced hydrocarbons (gas and liquids) will be flared onsite unless they can be used for onsite power generation or sold. Two flares may be installed, with a vertical flare used to manage gas and a horizontal flare used to manage condensate. The vertical flare will be an American Petroleum Industry (API) 537 and a US EPA AP 42 compliant unit, with a 98% combustion efficiency. The vertical flare (see figure) will have a constant pilot flame, with an autoignition system that provides electrical impulses to a spark plug continuously. If the flare was to go out, the spark would ignite the flare within 1.3 seconds. A horizontal flare may be used to combust condensate if produced during well testing. A horizontal flare will be equipped with 3 independent nozzles, located in a 20 m x 10 m clay lined flume. Flares will be located at least 45 m from the surrounding vegetation, with flaring not undertaken during total fire ban periods.	N/A located on proposed lease pad	<12 people during production testing	During exploration activities	During production testing	
Condensate management Where condensate (liquids rich gas that “condenses” when brought to the surface) is generated, it is separated and stored within double lined condensate tanks. Condensate may either then be trucked offsite or combusted in the horizontal flare. Condensate is not anticipated to be generated in sufficient quantities at the proposed locations.	N/A	1-2 trucks per day	During exploration activities	During production testing	

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<table>
<tr><th>Activity description</th><th>Disturbance area</th><th>Typical personnel numbers</th><th>Timing</th><th>Duration</th><th>Activity example pictures</th></tr>
<tr>
<td>
Gathering and main pipeline construction

Where exploration results are sufficient, each lease pad may be connected to a centralised gas and water processing facility (hub) via a gathering pipeline. The gathering pipeline will be constructed to transport both gas and water to/and from a pad. Gathering pipelines will be constructed in a cleared right of way of approximately 14-18 m wide.

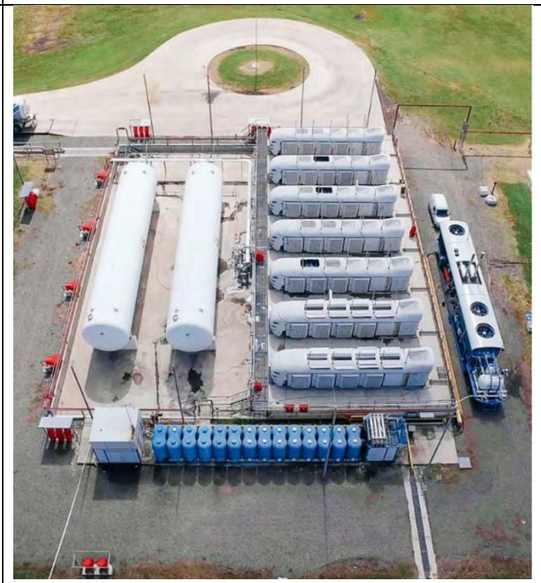
Sold appraisal gas would likely be sold into the domestic gas market via a high-pressure main pipeline constructed to connect processing facilities to the existing Amadeus Gas Pipeline or McArthur River Mine Pipeline (MMRP). This will avoid 90% of the Greenhouse Gas emissions generated if the gas was flared.

Pipeline corridors will be typically up to 50 m wide, with the exact route and length dependent on final site selection. Construction for the gathering and main pipelines generally include the following activities:
<table>
<tr><th>Stage</th><th>Description</th></tr>
<tr><td>Location</td><td>An initial route selection study will be conducted for the pipeline to optimise the pipeline route to connect to the Amadeus pipeline. Further fine-tuning and route refinement will continue throughout the planning phase of the project to ensure the route does not interfere with any sacred sites, cultural heritage or environmentally sensitive features.</td></tr>
<tr><td>Pipe</td><td>The gas transmission pipeline will be a buried, high pressure steel pipeline. It will be designed and constructed in accordance with the requirements of AS 2885 Pipelines – Gas and Liquid Petroleum. The pipeline will be buried for its entire length and will be deep enough so current land use activities can continue after the pipe has been installed. The minimum depth of cover over the pipeline will be 750 mm. For road crossings the depth of cover will be increased to ensure protection of the pipeline and the asset or feature being crossed by the pipeline.</td></tr>
<tr><td>Early Works</td><td>To support the approvals and detailed design activities, several activities take place prior to the main construction phases. Generally known as ‘early works’ these activities include a range of field-based activities. These activities inform the Approvals and Design teams about field conditions and are often iterative, as additional identified information results in changes to aspects of the project scope requiring revisiting and rework of the project scope. These activities include but are not limited to general investigations, surveys for the pipeline, sacred sites, cultural heritage, environmental and soil & geotechnical.</td></tr>
<tr><td>Survey</td><td>The limits of the right of way (ROW) working width shall be marked with stakes at visible intervals.

A survey crew will work ahead of the initial clearance of vegetation from the ROW. This survey crew will utilise the project benchmarks to check and re-establish all agreed intersection points (IPs), mark the right of way boundaries and place offset/recovery pegs.</td></tr>
<tr><td>Clear and Grade</td><td>To allow construction activities to commence, the pipeline alignment needs to be cleared of vegetation, rocks, trees, etc to provide mainline construction vehicles access. Clearing and grading shall be minimised to the extent necessary for the safe construction of the pipeline and shall in any event not exceed the maximum permissible width of the ROW except where additional working areas are defined and agreed.

Light vegetation removed during clearing shall be stockpiled outside of the stripped ROW working area and will be respread during restoration unless the property owner requests that the vegetation be left as stockpiles.</td></tr>
<tr><td>Pipe Transport and Stringing</td><td>Stockpiled pipe will be delivered to the ROW along the identified access tracks using prime movers and trailers. The specific logistics of the pipe</td></tr>
</table>
</td>
<td>25 – 50 m wide</td>
<td>~15 – 50</td>
<td>Main pipeline construction expected to start dry season 2024</td>
<td>3 – 6 months</td>
<td>
 </td>
</tr>
</table>

Activity description		Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
	haulage will be developed during the planning phase. The pipe trucks will only utilise specific access tracks which will be constructed (or upgraded) to allow them to pass. Pipe will be strung (placed on the ROW) directly from trailers onto saw dust filled bags or equivalent using a Vacuum lift pipe handler mounted on a hydraulic excavator, end hooks or slings depending on the pipe length and size, terrain. Strung pipe shall be supported clear of the ground and in a manner that will not damage the pipe or coating.					
Trenching	A trench is formed to accommodate the welded pipe strings and achieve the required depth of cover in accordance with the pipeline design. The trench shall be excavated along the surveyed and pegged centreline, in accordance with the minimum cover specified. Trenching operations are carried out utilising a combination of bucket wheel trenchers, rocksaws & 30T excavators. Accordingly, excavation plant, equipment and techniques will be selected to accommodate the anticipated conditions and required production rates. In areas of hard rock, controlled blasting using explosives may be required to break the rock to permit removal by excavator.					
Welding	Line pipe ends will be welded together (butt welded) to form pipe strings up to a typical length of 1km. The mainline welding crew is the engine room for the project's welding and sets the pace for mainline construction. The very agile and mobile poor boy crew carries out all difficult mainline welding sections and provides start joints for the mainline crew. Additional welding resources carry out all tie-ins and special crossings.					
Lower in, padding and backfill	The coated pipe shall be lowered-in using a series of side booms, so the pipeline has adequate and properly distributed slack, the pipe is not unduly stressed, and the pipe coating is not damaged. Where the excavated material and the bottom of trench are free of material that could damage the pipe, the pipe shall be laid directly on the trench bottom. The excavated material shall be used directly for bedding and padding. Where excavated material does not meet the specification, padding machines (screening machines) or similar will be used to produce bedding and padding. The trench will be back filled using the remaining trench spoil (excavated material) following the padding operation. The trench is compacted by wheel and/or track rolling with the backfilling equipment. Areas requiring higher compaction, such as road crossings, will be undertaken with an excavator mounted vibrating plate or other suitable manually operated or driven compaction equipment.					
Reinstatement	The pipeline ROW will be reinstated which includes replacement of previously stripped topsoil and rootstock, installation of contour banks, reinstatement of fencing & install new gates and revegetation as necessary. Restoration of the ROW shall be completed in accordance with the Code of Practice					
Pipeline testing	The pipeline will be hydrostatic pressure tested to prove the strength and leak tightness of the installed pipeline. The hydrostatic testing will be conducted by a certified mechanical testing laboratory and all test reports are to be certified.					
Commissioning	The commissioning phase of the works can be broken into two components, pre-commissioning and commissioning. Pre-commissioning is the exercise of manually proving each component of the pipeline/facility system prior to the introduction of gas. Example testing includes:					

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
• Verification that all parts are installed as detailed on engineering drawings, including position, orientation, part numbers, etc • Hydrostatic testing (confirming the system is leak tight), cleaning (blow through with air and cleanliness checks), drying and blow-through of piping • Bolt torquing of flanged connections • Functional testing of all manual valves through full extent of travel • Functional testing of all actuators and control valves through full extent of travel • Earthing compliance checks • Instrument calibration and installation checks • Insulation, continuity and point to point testing of all circuits installed by the contractor Following the pre-commissioning phase, the asset becomes ready for the introduction of gas. The pipeline corridors will be inspected routinely and be kept free of woody vegetation for the life of the asset. Cattle will be allowed to access the corridors once vegetation cover has been re-established post construction.					
Appraisal gas sale: To minimise flaring during the production testing phase of the wells, Tamboran will be developing facilities and a pipeline to enable this gas to be captured rather than flared. Gas and water will be collected from the proposed multiwell lease pads and piped to centralised Gas Processing and Water storage/ recycling/ treatment areas (these are typically referred to as “hubs”) . This is anticipated to reduce appraisal emissions by approximately 90% and eventually enable all the extended production gas to be captured and flaring stopped. The sale of appraisal gas may occur through any combination of the following: • Onsite compression and sale into the adjacent domestic gas pipelines • Onsite liquification to produce Liquified Natural Gas (LNG) and offsite transportation to market • Onsite compression to produce compressed natural Gas (CNG) and offsite transportation to transportation. It is anticipated that such centralised gas processing facilities will be constructed at Amungee NW 3 and Shenandoah South A. The exact location will be determined in consultation with the pastoralist. As a part of the gas processing facility construction and operation, a range of temporary facilities will be required during construction. These may include work areas for equipment and pipe storage and lay down areas, and a site office. The location of the temporary facilities will ensure facilities are located at a suitable distance from watercourses, are constructed on existing disturbance areas (such as laydowns or lease pads where available), are not endangered by threat of flood, do not require clearing of sensitive vegetation and are managed in such a way as to ensure no long-term land contamination issues. Typical manning during operations is <10 people. During construction, ~50 people may be required. These are indicative numbers with the final manning levels will be finalised during the activity planning. Several trucking movements per day will be required to removed CNG and LNG from site where this processing option is chosen. Below is an overview of appraisal gas facility construction. Stage | Description	9.0 ha	<10 people operating and <50 people during construction	Upon completion of well testing – potentially 2024	Potentially up to 2 years (24 months) at each site- or as approved by the Minister.	 *Example facility – the Buquebus LNG Facility in Buenos Aires Argentina*

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<table>
<tr><th colspan="2">Activity description</th><th>Disturbance area</th><th>Typical personnel numbers</th><th>Timing</th><th>Duration</th><th>Activity example pictures</th></tr>
<tr><td colspan="2"><table>
<tr><td>Mobilisation</td><td>Establishment of access track into site and site offices and amenities, laydown areas, erosion and sediment controls installation as per the requirements of the approval management plans, site communications links and construction set out survey.</td></tr>
<tr><td>Earthworks and Civil Works</td><td>Preparation of topsoil and sub-fill for establishment of foundation – including excavation and removal of unsuitable fill materials from site, import of required sub-grade fill materials, grading and levelling of the facility pad and final capping and import of road base materials to design specification. Works may also include ongoing upgrading of existing access tracks.</td></tr>
<tr><td>Underground Services</td><td>Trenching of facility pad as required to install buried services and piping, backfill and compaction of trenches, including installation of crossing reinforcement for protection of buried services in trafficable areas.</td></tr>
<tr><td>Piling</td><td>Installation of steel pile foundations by driving into the prepared facility pad and/or pre-drilling as required and welding of pile caps onto piles in preparation for skids to be landed.</td></tr>
<tr><td>Structural Mechanical and Piping</td><td>Installation of pre-assembled skidded pipe rack modules onto foundations requiring lifting onto pile caps and welding in place, bolting flanges to connect interfacing skids and equipment packages, installation of site run utilities piping, lifting and welding in place of skidded equipment packages.</td></tr>
<tr><td>Electrical and Instrumentation</td><td>Installation of cables and cable supports, ladders and trays, termination of cables into relevant panels (control and low voltage), installation of tubing and glanding of instruments, mounting instruments onto piping or instrument stands.</td></tr>
<tr><td>Plant Commissioning</td><td>This stage involves the testing and commissioning of all equipment on the site, in preparation for operations.</td></tr>
</table>
.</td><td></td><td></td><td></td><td></td><td>
A truck mounted compression facility

Example of a temporary gas processing facility</td></tr>
<tr><td colspan="2">Drilling waste management

All waste drilling fluids, muds, cuttings, completion fluid and cement returns will be managed in either a) centralised drilling waste management area on a “hub” (i.e. Amungee Nw 3 or Shenandoah A) which consists of a lined sump to allow the material to dry or b) a smaller lined drilling sump on-site. To reduce the number of sumps constructed, it is preferred that a centralised waste management area is constructed at the hub, with periodic transfers of drilling fluids and mineral waste undertaken during activities.

Hub drilling waste area- the centralised drilling waste area will be designed to manage the waste from multiple wells drilled per year. Drilling waste (including frack sand, cuttings, muds, cement ends and other drilling related fluids) will be stored in temporary cuttings bins and/or tanks on each lease pad where drilling underway. The waste will be intermittently (typically 2-3 trucks per day at the peak) transported to the centralised area where the material is placed into a lined “paint tray” style sump to separate the liquids from the solid waste. The material will be allowed to dry out over the wet season and parts of the dry season and once dry, will be removed from the sump and mixed with available clean fill and organic material (manure). The material will then be tested to ensure it meets the approved standards (such as AS 4419:2018- Soils for landscaping and garden use) and reused for growth media during rehabilitation (such as for gravel pit backfill).

For sites where drilling mineral waste will be disposed of onsite, the material will be sampled as per the Code of Practice and a detailed risk assessment completed to determine whether onsite encapsulation or mix bury cover can occur in an environmentally acceptable manner. In most cases, drilling wastes will be dewatered, blended with clean fill and encapsulated onsite within an impermeable liner. A capping layer will be added to enable vegetation re-establishment. To reduce the number of sites where material is mix-buried covered, multiple wells from other locations may be disposed of at a selected location.

An overview of the Drilling waste composting process is provided in Appendix B. An overview of the</td><td>N/A- within proposed lease pad</td><td>< 6 people</td><td>Upon completion of drilling activities</td><td>7 days</td><td> </td></tr>
</table>

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
mix bury cover process is provided in Attachment C					
Wet season operations Exploration activities (including drilling, stimulation and well testing operations) may occur over the wet season. Where wet season operations are undertaken the following risk controls will be implemented: • All chemicals, fuels, equipment, tanks and materials required for ongoing operations will be stored on-site prior to the onset of the wet season. • All equipment required to respond to emergency situations will be on-site; this includes earth moving equipment, vacuum trucks, wireline rigs, cementing equipment etc. and equipment and material to deal with well control issues, spills and other emergency events. • All chemicals storage areas will be bunded, with covers used (where safe and appropriate) to prevent rain ingress and bund overflows. • Enclosed tanks will be utilised as the primary measure to store wastewater with enough enclosed tank capacity to store all wastewater on-site (see figure). • Enclosed wastewater storage volume will be sufficient to manage all wastewater stored onsite. • Open working evaporation tanks and mud sumps will have enough freeboard to manage an entire 1:1000 ARI wet season event (not just one (1) rainfall event but an entire season's rainfall total). • Helicopters will be used to transport people and supplies into and out of the site when access is restricted. • No transportation of wastewater or chemicals will be undertaken during the wet season unless a risk assessment is undertaken that demonstrates the risk is As Low as Reasonably Practicable (ALARP) and acceptable (as per the Code of Practice). • Wastewater storage area is bunded, which will prevent all off-site release of chemicals and stormwater practicable (ALARP). • During flowback wastewater stormwater will be retained on-site via the sediment retention pond prior to release. • Overland flow will be diverted around lease pads.	N/A	N/A	October - May	7 months of the year	
Site monitoring and inspections consisting of the following: • **Groundwater monitoring:** Groundwater monitoring bores are required to be installed on the lease pad before the commencement of hydraulic fracture stimulation activities. Groundwater monitoring is undertaken at the site commencing 6 months before stimulation and then quarterly for 3 years after. Groundwater monitoring involves purging a monitoring bore of water, measuring field parameters (level, electrical conductivity) and collecting laboratory samples and • **Site and exploration well monitoring:** An operator or contractor will access the site to perform checks on the exploration well and stability of the site. Checks include pressure readings and visual checks of valve integrity. In some cases, a helicopter may be utilised to complete the inspections. Surveys are completed fortnightly. • **Weed inspections:** Access to the site by several contractors/ Tamboran personnel in light vehicles to identify weeds. In some cases, a helicopter may be utilised. Contractors may perform spot sprays with a NTG recommended weed treatment. Surveys are completed pre and post wet season. • **Erosion and sediment control inspections:** Access to the site by several contractors/ Tamboran personnel in light vehicles to identify erosion or stability issues. Inspection will be used to schedule maintenance to repair any defects identified. In some cases, a helicopter may be utilised to complete the inspections. Surveys are completed pre and post wet season. • **Gas leak detection surveys:** Access to the site by 2 – 3 contractors / Tamboran personnel in light vehicles to perform mandatory gas testing using handheld gas meters. Surveys are	N/A	<2 – 6 people	Fortnightly/ 6 monthly (depending on activity)	1 day per inspection	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
completely.					
Site maintenance (**lease pad, camp pad, access tracks and gravel pit):** Includes grading, erosion and sediment control repair, vegetation management, firebreak management, weed management, fence repair and all other ancillary activities required to maintain a site and associated with infrastructure. This includes maintenance of the access track interception with the Carpentaria Highway. The work will be undertaken by civil maintenance contractors and Tamboran personnel.	N/A	<10 people	6 monthly; pre and post wet season maintenance	<7 days per activity, depending on the nature of the activity	

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Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Well head maintenance: Maintenance is completed annually on each well. Maintenance includes valve checking, testing, greasing and (in some cases) replacement, as well as any other activities required to maintain the integrity of the well.	N/A located on proposed lease pad	<20 people depending on activity	Annually	< 7 days per activity, depending on nature of maintenance	
Well intervention, data acquisition and testing: Subsurface activities may be undertaken periodically on each of the well to perform maintenance or collect additional information on the properties of the well or the reservoir. These type of well interventions typically include performing cement bond logs, casing pressure tests, running reservoir evaluation or production logging tools, cement and casing remediation activity (if required during the life of the well), setting downhole mechanical plugs and gauges, casing perforation, subsurface barrier maintenance/ installation and production tubing installation/repair or replacement. This generally involves the use of a variety of equipment dependent on the activity being completed. This typically may involve any of the following equipment: completion rig, coil tubing, wireline unit, data van, cement or pump truck, crane, trucks, power generation, support trucks and other support vehicles.	N/A located on proposed lease pad	<20 people depending on activity	Ad hoc requests, typically 2 interventions within the next 5 years	<10 days per activity	

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Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Petroleum well plugging and decommissioning: Once a petroleum well is no longer required, each well will be decommissioned. Decommissioning involves the permanent removal of the well through the placement of cement plugs to isolate the target reservoir from overlying aquifers in accordance with the Code of Practice: Onshore Petroleum Activities within the Northern Territory (Code of Practice). Once plugs are installed, they are pressure tested to confirm the underlying formations have been adequately sealed off. The well head is then removed. A permanent marker is added to indicate the location of the plugged and abandoned well.	N/A located on proposed lease pad	<12 people	End of well life	<10 days	
Chemical and fuel storage: All chemicals and fuels (diesel) required to support exploration activities will be stored in accordance with the relevant regulatory requirements, including the use of secondary containment (bunding) onsite. The Code of Practice has implemented a range of additional controls, including requirements for routine inspections, emergency response procedures and spill management. Anticipated chemical and fuel volumes vary dependent on activity, but may involve the storage of the following types of chemicals and volumes: • Stimulation and drilling chemicals (friction reducers, surfactants, crosslinkers, breakers, buffers, acids, bases, biocides, scale inhibitors, corrosion inhibitors, clay stabilisers, loss of circulation material, drilling muds, salts etc.). Volumes typically less than 20 KL per chemical, with some chemicals stored at higher (such as pH control) or lower (such as biocides and corrosion inhibitors) volumes depending on their purpose and planned use. • Diesel – typically 100 KL stored but may be 500 KL if wet season activities are proposed. • Other chemicals and hydrocarbons: including oils and greases, lubricants, hydraulic fluid, cleaning chemicals, domestic chemicals etc. used to support operations.	N/A- located on existing area	N/A	During exploration activities	During exploration activities	

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Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Waste management (other than : Any waste generated during exploration activities will be stored onsite in accordance with the *Waste Management and Pollution Control Act 1998* and Code of Practice and transported offsite to a licenced waste management facility. All wastes (other than drilling mineral waste) will be stored within skips or equivalent and removed from site at the end of each activity.	N/A	1 -2 trucks during operations	During explorations activities	During explorations activities	
Groundwater extraction: Groundwater extractions from the purpose-built groundwater monitoring onsite or another approved extraction bore (which may include trucking water from adjacent properties) will be completed periodically to support exploration activities. All groundwater take will likely be from the Gum Ridge Formation and will licenced under Tamboran's existing Water Extraction Licence (WEL) GRF 10285. A new WEL may be submitted covering additional groundwater take and alternative groundwater formations, where required. It is anticipated that groundwater extraction volumes to support this program is anticipated to be less than 350 ML/year (spread across multiple sites), primarily used during the initial stimulation. Once drilling and stimulation has ceased, minimal ongoing water extraction from the site will be required.	N/A	N/A	Ongoing to support exploration activities	During exploration activities	
Traffic management: Access to each of the proposed exploration sites is via the Carpentaria highway. Peak traffic volumes are anticipated to be associated with the drilling rig mobilisation and demobilisation. Traffic volumes may reach up to 44 vehicles per day spread over a 4-week period. During operations (drilling, stimulation or well testing), vehicle movements to the site are anticipated to be less than 10 movements per day. This period is likely to extend typically 60 days per exploration well, 45 days per stimulation and during the duration of a well test (30 – 365 days). During wastewater storage, an operator is anticipated to inspect the sites2-3 times per week (pending wet season access). Once the well is suspended or decommissioned, vehicle movements will reduce to 1 vehicle per fortnight or 1 vehicle per 6 months respectively.	N/A	N/A	During exploration activities	During large mobilisations or works within the road corridor	

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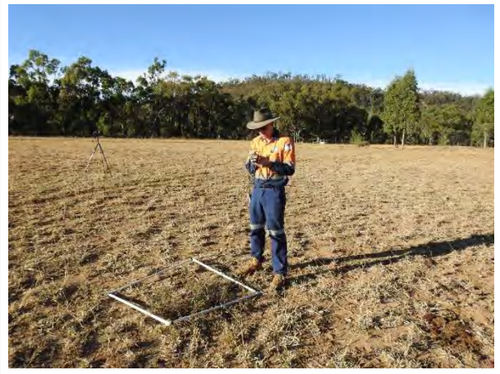
Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Site rehabilitation: Within 6 months of the E&A wells at a site is plugged and decommissioned, the site will be rehabilitated. This involves: a) the removal of all surface facilities (e.g. well heads, fencing, water bores, tanks), b) deep ripping of compacted surfaces, c) recontouring landforms, d) respreading of topsoil from the topsoil stockpiles, e) re-seeding (if required), and f) ongoing monitoring and maintenance of the rehabilitation.	N/A		Within 6 months of the plugging and abandonment of all E&A wells	<14 days, with ongoing monitoring and maintenance	 

7. Environmental outcomes, impacts and risk

The environmental outcomes, potential impacts and risks associated with the ongoing exploration activities are summarised in Table 3. This information will also be provided in an EMP covering the proposed regulated activity, which will be submitted to the Department of Environment, Parks and Water Security (DEPWS) for formal assessment and approval.

Under the PER, an environmental outcome means an outcome that will be achieved if the environmental impacts and environmental risks of a regulated activity are reduced to a level that is as ALARP, and acceptable.

Environmental impacts are defined by the PER as any adverse change, or potential adverse change, to the environment resulting wholly or partly from a regulated activity.

Environmental risks are defined by the PER as the chance of something happening that will have an environmental impact, measured in terms of environmental consequences and the likelihood of those consequences happening.

Both the consequence and likelihood of a potential impact can be reduced through the adoption of controls, which must be applied to reduce a risk down to an ALARP and acceptable level.

Table 3 Environmental risks and controls of proposed variation

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls

Groundwater use and quality	• To manage exploration activities to prevent unsustainable depletion of groundwater resources
	• Preserve groundwater quality to protect environmental and pastoral use
		• No adverse changes to groundwater quantity is anticipated to be associated with exploration activities.
		• Impacts to aquifers levels anticipated to be negligible, with rapid recharge observed from other Gum Ridge Formation bores utilised within the Basin.
		• No material changes to groundwater quality anticipated form exploration activities.
		• No impact to Groundwater Dependent Ecosystem's (GDE) or stygofauna from exploration activities (extraction and well construction)
		• No reduction in pastoral productivity through reduced groundwater volumes
			• Low risk of groundwater contamination from drilling fluids during construction of the conductor/ surface casing in the Cambrian Limestone Aquifers due to the selection of low toxicity drilling fluids
			• Low risk of cross flow of deep formations (such as the target shales) to shallow aquifers through inappropriate well barrier design and construction due to the presence of the Code of Practice controls and verification processes.
			• Low risk of crossflow through fracture growth into aquifer from stimulation activities allowing the migration of fluid and gas due to the controls within the Code of Practice and underlying separation distance between the target formation and Cambrian Limestone aquifers.
			• Low risk of stimulation activity inducing seismic activity that enables cross formational flow between shallow aquifers due to seismic stability of region and lack major faults or fracture zones.
			• Low risk of stimulated zones intersecting offset wells (including the adjacent horizontal wells) or intersecting an existing geohazard due to seismic control, pressure monitoring during stimulation and lack of older petroleum wells in close proximity.
				• All petroleum wells are to be designed, constructed, operated and decommissioned in accordance with the mandatory controls within the Code of Practice. The Code of Practice outlines specific controls measures designed to protect underlying groundwater resources including:
				  • Exploration wells designed with multiple cement and steel casing barriers to protect aquifers
				  • Drilling fluids and muds must have a low residual toxicity
				  • Groundwater monitoring must be completed before and after stimulation to detect contamination
				  • Well integrity confirmation to prove barrier performance aquifer isolation (casing pressure tests, formation leak off tests, cement bond logs etc.).
				  • Separation between stimulated shale resources and aquifers must be sufficient to ensure the risk of fracture growth is ALARP
				  • Pressure monitoring completed to ensure maximum allowable operating pressure is not exceeded during stimulation.
				  • Ongoing well integrity monitoring and maintenance throughout the life of each well

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			• Low risk of crossflow/well integrity caused by the deviation of an E&A well into the adjacent well during drilling due to downhole GPS tracking tools and proximity alarms • Low risk of leakage of either flowback, produced water, or hydrocarbons (liquid and gaseous) from suspended or abandoned wells to groundwater due to well design and integrity management. • Low risk of leaks from gathering lines, with gathering lines constructed as per Australian Standard, leak detection in place to identify pipeline failures and routine inspections completed. • Low risk of surface contamination from storage and disposal of drilling fluids, additives, muds and cuttings on-site due to low toxicity of drilling muds and disposal risk assessment process. • Low risk of groundwater contamination from surface spills from storage, handling and transportation of flowback water due to the storage and spill management requirements outlined in the Code of Practice. • Low risk of groundwater contamination from the storage, handling and transportation of chemicals, fuels and wastes due to the mandatory code of practice controls (such as mandated use of secondary containment) • Low risk of groundwater contamination from overtopping of	to ensure aquifers are protected • All wells are to be decommissioned in accordance with the Code of Practice, with cement plugs utilised to separate aquifer units. • All surface storages of wastewater and chemicals to have secondary containment to prevent spills to the ground • An emergency response plan must be implemented outlining how spills and emergencies will be responded to. • Drilling fluids and wastes to be stored within a lined sump • Gathering lines and pipelines constructed as per Australian standard, leak detection in place to identify pipeline failures and routine inspections completed. • Flowback wastewater must be stored in double lined tanks with leak detection and level monitoring • Double lined enclosed wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All open treatment tanks are to be operated with a 1:1000Annual re-occurrence interval (ARI) wet season or dry season (whichever is applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone)

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			drilling sumps and flowback tanks (including during wet season) due to level alarms and use of enclosed tanks. • Low risk of groundwater contamination from the use of recycled flowback and other wastewater in stimulation fluid • Low risk of groundwater contamination from a failure of flowback storage tank due to the design standards of the tank (cyclone rated steel tank structures) and routine integrity inspections • Low risk from over extraction of groundwater for civils, drilling and stimulation and other ancillary activities due to the yield of the Cambrian Limestone Aquifers and available allocation volumes (as assessed in the WEL).	• Groundwater monitoring from monitoring bores installed at the site must be completed prior to and after stimulation to detect any contamination. • All water take covered by an existing Water Extraction Licence (WEL) GRF 10285 • New extraction bores must model potential impact on adjacent pastoral bores prior to being added to WEL. • All water take to be metered and reported quarterly to the regulator • No pastoralists groundwater bores within 1 km of each proposed site • Wastewater, including flowback and drilling fluids, to be preferentially used in stimulation fluid to reduce raw water usage.
Soils	• Avoid, minimise and control soil erosion and discharge of sediment or soil into waterways or established drainage systems • Minimise disturbance of soil, vegetation and drainage during site activities • Prevent the contamination of soil to maintain the viability of soil resources	• Clearing of vegetation to support exploration and appraisal activities. • Soil compaction from access tracks, leases, infrastructure (pipelines and temporary gas processing facilities) and seismic lines. • Increased sedimentation transportation from disturbed areas • Loss of productivity of disturbed areas until final rehabilitation has been achieved	• Medium risk of soil erosion from cleared areas (access tracks, lease pads, camp pads, temporary compression facility, pipelines, gravel pits and laydown areas) occurring on disturbed sites due to high intensity wet seasons. Risk is a low consequence (minor impact), possible (<50% chance of occurring) event. • Low risk Reduction in land production through poor erosion and sediment control practices • Low risk of spills/leaks from the on-site storing and handling of fuels. Condensate, hydrocarbons, drilling additives, stimulation additives, flowback fluid, solid wastes, storage	• Site selected to avoid sensitive soil units and slopes which may increase erosion hazard. • All land clearing (including during the establishment of seismic lines) to align with the requirements of the code of Practice and NT Land Clearing Guidelines (2019) • Erosion and sediment control practices to be utilised at all disturbed sites to minimise erosion. • Sites (including gravel pits) maintained to minimise sediment releases, with erosion and sediment control plan in place • Pre and post wet season monitoring completed on all disturbed areas

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
	• Minimise residual impacts to pastoralist usage of exploration areas		and transportation of wastes causing soil contamination. • Low risk of drill sump and flowback tank overtopping due to mandatory freeboard and monitoring controls • Low risk of chemical and waste transportation accident causing soil contamination due to licenced chemical/ waste provider use, spill response and emergency response requirements. • Low risk of contamination from on-site disposal of drill muds and cuttings with site specific assessment completed to ensure disposal is environmentally acceptable. • Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Low risk of wastewater evaporation mist transported offsite during wastewater treatment due to wind speed/direction cut offs and routine site inspections during operations. • Low risk of greywater and sewerage disposal from camp wastewater treatment plants due to the irrigation area being appropriately sized, fenced and quality aligning with the NT Department of Health requirements. • Low risk of reduction in land production through poor infrastructure placement as infrastructure is preferentially located in existing disturbed area, with no	(including seismic lines) to identify and repair erosion • Construction within the wet season to be avoided to reduce the erosion risk. • Vegetation clearing watercourses to be avoided as far as reasonably practicable (i.e. only when a new access is required to be constructed) • During seismic surveys, vegetation clearing within open woodlands to be minimal • All chemicals and fuels to be stored with secondary containment as per code of Practice. • During wastewater storage, the site is to be fully bunded to contain the volume of an entire wastewater tank if a structural failure occurred • Flowback wastewater must be stored in double lined tanks with leak detection and level monitoring • Double lined enclosed wastewater tanks with leak detection and level monitoring used to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All open treatment tanks and sumps are to be operated with a 1:1000Annual re-occurrence interval (ARI) wet season or dry season (whichever is applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone)

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			sensitive soil types present in the immediate vicinity. • Low risk of reduction in land productivity from poor rehabilitation due to mandatory rehabilitation requirements and security bond requirements • Low risk of pipeline subsidence creating erosion with ongoing monitoring and maintenance.	• Stormwater to be retained onsite during wastewater storage and tested prior to release • All spills of chemicals and wastewater to be cleaned up upon detection. • Irrigation of greywater and treated effluent to be undertaken in accordance with DoH requirements • Disposal of drilling muds, cuttings and mineral waste to be undertaken in accordance with Code of Practice, with onsite disposal only permitted where the potential harm to the environment can be demonstrated as ALARP and acceptable. • Site to be rehabilitated back to pre-existing/ agreed state with pastoralist input. • Pipeline to have vegetation reinstated post construction to stabilise corridor and prevent erosion. • Pipeline monitoring and repair work to minimise/ respond to pipeline subsidence
Emissions (dust, greenhouse and combustion emissions)	• Avoid environmental nuisance at sensitive receptors • Minimise impacts to pastoralists and surrounding ecological communities from dust	• Dust on vegetation in the immediate vicinity of activities reduces plant palatability • Impacts of dust nuisance to birds and fauna in the immediate vicinity of activities, specifically access tracks and seismic lines • Emissions from the combustion of diesel. • Emissions from power generation for onsite	• Low risk of dust impacts generated during Civil activities, drilling operations, stimulation activities well testing due to use of dust suppression and routine maintenance of access tracks and infrastructure • Low risk of reduction in regional air quality resulting from emissions from the combustion of diesel due to the temporal nature of the activities and selection of efficient equipment.	• Site located away from sensitive receptors, such as homesteads • Dust suppression to be used on access tracks, lease pads and gravel pits to minimise dust emissions where practicable • Outside of high intensity activities (such a s civil construction, drilling and stimulation) Dust levels consistent with standard pastoral activities (such as mustering/truck load outs) on the property

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
	• Minimise greenhouse gas emissions	compression and liquification facilities. • Generation of Greenhouse gasses	• Low risk of reduction in regional air quality from gas and condensate flaring due to the combustion efficiency of the flare and preferential sale of appraisal hydrocarbons. • Low risks of reduction in air quality from emission associated with onsite power generation (supporting compression and liquefaction infrastructure) equipment to be utilised to limit NOx and CO emissions. • Low risk of air emissions from chemical releases during drilling and stimulation activities impacting livestock, fauna and people due to chemical handling procedures limiting emissions during mixing. • Medium risk of bushfire from accidental ignition by site activities (civil works, drilling, flaring, grinding) or personnel. The consequence of a fire is considered serious, with the likelihood Highly unlikely. • Low risk of uncontrolled release of gas impacting a receptor during drilling, stimulation, barrier failure, operator error or vehicle collision due to the well design, blow out prevention, well integrity and lack of sensitive receptors preventing impacts. • Low risk of leak of gas from wells or gas compression facilities due to the well/ facility design, routine leak detection and repair and separation distance from receptors,	• Venting of raw gas is tightly controlled under the Code of Practice, with no material volume of gas to be vented • A reduced emission completion (flare) to be utilised to combust all hydrocarbons • Flares to be compliant with USEPA design standards, including 98% flare efficiency • Stimulation chemical mixing procedures deployed (such as enclosed hoppers) that minimises dust emissions • Firebreaks to be maintained around well and camp pads to minimise bushfire risk • Flaring exclusion zones to be maintained around flare • No flaring during total fire bans • Slashing, grinding and other higher risk fire activities to be undertaken with appropriate controls to mitigate the risk of bushfire (such as buffer zones, use of fir trailers, fire breaks etc.) • During seismic surveys, no vegetation is to be mulched and bushfire management protocols implemented. • Vehicles to be equipped with fire extinguishers • 6 monthly gas leak detection on all exploration wells and equipment, with annual inspections on pipelines

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			• Low risk of greenhouse gas emission impacts from appraisal gas sale/ well testing (climate change) as volumes are small in comparison to local, regional, domestic and international levels.	• Low NOx and Low CO gas fired compression/ power generation utilised to minimise air emissions. • Appraisal gas will be beneficially used through sale of CNG/LNG/ piped natural gas to reduce flaring and minimise flaring to reduce scope 1 and 2 emissions.
Surface Water	• Avoid and minimise the potential contamination caused by the discharge of sediment or contaminated storm water to waterways or established drainage systems. • Contain any potential contaminants for treatment or disposal.	• Increased sedimentation transportation from disturbed areas (access tracks, lease pads, seismic lines etc.)	• Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Low risk of gathering pipeline failure and release of flowback through pipe material selection, design, quality Assurance/ quality Control testing and use of leak detection. • Low risk of drill sump and flowback tank overtopping due to mandatory freeboard and monitoring controls • Low risk of a transportation accident releasing chemical or wastewater (drilling fluid and flowback) due to the use of licenced wastewater/ chemical transportation providers, spill management and emergency response requirements. • Low risk of spills to surface water from chemicals and fuel storage and handling activities due to use of secondary containment and separation distance to watercourses. • Low risk of stormwater releases from activities contaminating surface water due to stormwater segregation and testing procedures.	• No take of surface water permitted or proposed • Lease pad located away from watercourses- typically 1km or greater • Seismic activities to: • avoid vegetation clearing as much as practicable in open woodlands, limit clearing to grasses and shrubs • Maintain viable root stock to promote rapid rehabilitation • Avoid seismic lines in water courses (unless co-located with an access track) • Site maintained to minimise sediment releases, with erosion and sediment control plan in place • Double lined enclosed wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All wastewater tanks engineered to withstand failure, cyclone rated construction • All open treatment tanks and sumps are to be operated with a 1:1000Annual re-occurrence interval

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			• Low risk of infrastructure (including pipeline) changing surface hydrology and flow due to infrastructure design and avoidance of overland flow locations. • Low risk of changes to terrestrial ground surface levels associated with seismic activity due to the stability of the basin and geomechanical properties of the target and overlying formations. • Low risk of gathering line failure releasing flowback fluid to the environment	(ARI) wet season or dry season (whichever is applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone) • During wastewater storage, the site is to be fully bunded to contain the volume of an entire wastewater tank if a structural failure occurred • All gathering lines to be welded as per Australian Standards, hydrotested during construction to verify integrity prior to being brought into service • Gathering lines to utilise flowmeters/ pressure monitoring to identify leaks (such as flow/ pressure drops) • Gathering lines to be inspected 6 monthly to identify subsidence/ potential integrity issues. All spills of chemicals and wastewater to be cleaned up upon detection. • Irrigation of greywater and treated effluent to be undertaken in accordance with DoH requirements • No offsite releases of drilling or stimulation wastewater proposed or permitted • Stormwater retained onsite during wastewater storage, with testing completed prior to offsite release • Site selected to avoid major structural features, such as faults • Basin is seismically stable, with low seismic activity reported.

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
Flora and Fauna	• Minimise disturbance to flora and fauna • No disturbance to high conservation areas • Avoid the introduction of weeds • Avoid the spread of existing weeds • Minimise the loss of pastoral productivity	• Clearing of vegetation communities (such as Open Corymbia/eucalypt woodland, Bullwaddy and/ or Lancewood) to support exploration activities (lease pad extension and seismic lines). • Loss of fauna and flora habitat • Loss of livestock grazing area • Loss of productivity of disturbed areas until final rehabilitation has been achieved	• Low risk of impacts to sensitive vegetation communities from seismic activities, with high ecological areas avoided • Low risk of threatened fauna mortality during clearing, with all sites to be inspected prior to clearing to avoid fauna. • Low risk of vehicle and machinery noise and lighting on well pads and access tracks causing material impacts to threatened fauna or livestock. • Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Medium risk of introduction and spread of weeds in the area due to equipment washdowns, inspection and certification requirements. Monitoring and routine treatment completed on identified outbreaks. Impact from weed introductions/spread is considered moderate, with likelihood Unlikely. • Medium risk of bushfire from accidental ignition by site activities (civil works, seismic activities, drilling, flaring, grinding) or personnel on fauna, flora and land productivity. The consequence of a fire is considered serious, with the likelihood Highly unlikely. • Low risk of flora, fauna and livestock being trapped and drowning in	• Seismic activities to: o avoid clearing of mature trees and protected flora o In open woodlands, limit clearing to grasses and shrubs o Maintain viable root stock to promote rapid rehabilitation o No seismic lines in riparian zones o Implement fire management controls, include rapid response • Vegetation to be inspected for fauna prior to clearing. Where fauna are identified, work shall stop in the immediate vicinity until they leave the area. • Site to be fully fenced during operations • Open pits to be fully fenced to prevent livestock access • Sumps to have fauna ladders or liner material (such as coletanche) with sufficient friction to allow fauna to escape. • Gravel pits to be left open to act as watering point for livestock when not in use • Vehicle speed limit restricted to 60km/hr • Dust suppression used to limit dust impacts to vegetation • Limited night-time activities proposed. • Site to be rehabilitated back to pre-existing/ agreed state with pastoralist • All equipment and loads to be inspected and certified weed free prior to entry

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			storage tanks, sumps and pits due to the design of storages and fencing. • Low risk of contaminants in water and soil pass through the food chain and bioaccumulate in fauna causing detrimental impacts to local species and communities due to chemical storage and handling practices. Fences are utilised to restrict livestock access. • Low risk of vehicle collisions with fauna – fauna mortality results in a localised impact to listed threatened species, due to avoidance of night-time driving, speed limit restrictions and number of vehicle movements. • Low risk of reduction in land productivity from poor rehabilitation due to mandatory rehabilitation requirements and security bond requirements Reduction in land production through bushfire • Low risk of impacts to flora and fauna through the encouragement of feral animals and other pest species leading to competition with native species. This includes the introduction of cane toads.	• 6 monthly weed inspections to be completed with all identified weeds treated. • Weeds sprayed periodically to restrict weed numbers.
Environmental Nuisance and Amenity- including dust, noise, light, odour and vibration	• Minimise impacts to pastoralist operations	• Construction of exploration infrastructure onsite changes land use from pastoral to industrial. • Light and noise nuisance to fauna and livestock in immediate vicinity of activity • Increased traffic to proposed exploration area • Noise, light, odour and dust emissions in the immediate	• Low of changes in property amenity through the construction and operation of exploration infrastructure due to location of activities and separation distance from receptors • Low risk of increased vehicle accident as access points away from pastoral access. • Low risk of adverse impacts to fauna from traffic are anticipated, with	• Sites located away from homesteads and local communities • Flaring to be minimised to avoid light generation • Site is located away from pastoralist main access points • Maximum peak traffic during mobilisation and demobilisation is likely to be typically less than<44 vehicle movements per day for 2 weeks.

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
		vicinity of the lease pad or temporary gas processing facility. • A visible hue visible from operations at night during flaring or from temporary gas compression facility lighting. • Noise impacts from helicopter movements • Noise and vibration impacts during seismic activities.	impact levels consistent with standard road traffic levels. • Low risk of helicopter movements causing impacts to receptors based on location of site away from homesteads • Low risk of noise, dust, light and vibration impacts associated with temporary appraisal gas facility	• Speed limit restricted on the access tracks to <60km/hr • Dust suppression to be utilised to minimise dust emissions • Where helicopter movements are planned, the pastoralist to be engaged prior to ensure helicopter do not interfere with pastoral activities. • Seismic surveys to avoid sensitive receptors, such as homesteads, local communities, sacred sites etc. • Compression/ power generation/ CNG/ LNG facilities to be designed to minimise aesthetic impacts and located away from homesteads and local communities. • Lighting of infrastructure designed to minimise aesthetic impacts during the evening
Native Title and Sacred sites	• Minimise impacts to Native Title holders and avoid impacts to sacred sites	• Reduction in foraging and hunting areas • Reduction in land amenity • Loss of spiritual connection with land due to industrialisation • Impact to sacred sites.	• Low risk of reduction in foraging and hunting areas due to limited footprint and absence of surface water in the vicinity of activity. • Low risk of reduction in land amenity due to remote location of activity, limited footprint, prioritisation on rehabilitation and reinstatement of disturbed areas • Low risk of losing spiritual connection with country due to low activity intensity, stringent environmental controls and ongoing stakeholder engagement, • Low risk of impacts to sacred sites due to NLC clearances and AAPA certificates/	• Exploration agreements with Native Title holders in place • Approved annual work programs in place • Sacred site clearances completed prior to work, with AAPA certificates in place • Prevention of activities from accessing sacred sites or other areas which have not been cleared/ approved by Native Title holders. • All infrastructure to be kept in a non-polluting form, with rehabilitated undertaken upon cessation of activities back to a state consistent to pre-disturbed levels.

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
				• NLC clearance surveys completed to identify and protect sacred sites • AAPA certificates in place for all exploration activities involving disturbance.

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8. Consequences for Stakeholder Rights and Activities

8.1 Stakeholders Rights

Pastoral Lessees within the Northern Territory have non-exclusive rights to conduct their pastoral activities on the land granted under the Northern Territory Pastoral Lands Act (2016). Tamboran respects these legal rights and seeks a sustainable relationship with Pastoral Lessees so that both parties can co-exist on the land. Tamboran proposes to achieve this via the following key principles:

1. Formal stakeholder engagement aligned with the requirements of Section 7.2 (a) of the Northern Territory Petroleum (Environment) Regulations 2016.
2. Structured and timely process for the execution of an access agreement and associated compensation under the Northern Territory Petroleum Regulations 2020.
3. Mutually agreed ongoing, regular engagement and communications.

Tamboran's impacts to stakeholder rights are limited to accessing and utilisation of defined sections of the pastoral lease for authorised petroleum exploration activities. Impacts to rights are restricted to a loss of pastoral productivity over the areas for which Tamboran has established infrastructure, such as lease pads, camp pads, gravel pits and access tracks. Access to demarcated zones around the well pad is also restricted, to ensure stakeholder and community safety.

8.2 Stakeholders Activities

In accordance with s.7.2 of the PER, Tamboran is required to provide the pastoralists information on the potential consequences of undertaking the regulated activities on a stakeholder's rights.

A summary of the potential consequences of the activity and mitigation controls are summarised in Table 3 Potential consequences and control measures.

All impacts are anticipated to be restricted to the immediate vicinity of the proposed activities, with no long term or material reduction in pastoral productivity anticipated. Upon cessation of activities, rehabilitation will occur to bring any disturbed land back to a state consistent with the pre-disturbed level.

All potential impacts will be included in the Land access and Compensation Agreement, along with make good requirements which ensure the pastoralists ongoing right to utilise the land for pastoral activities is protected.

Table 3 Potential consequences of the activity on stakeholders' activities

Pastoralist Activity	Potential Consequence to Activities	Mitigations
Pastoral time	• Impact to pastoralist time as they are required to engage with Tamboran as a part of the planning and approval for the proposed activity.	• Tamboran undertakes engagement in good faith, with information provided in a variety of formats to reduce time pressures as far as reasonably practicable. • Tamboran will endeavour to minimise the amount of impost on pastoralist activities- noting a level of initial and ongoing interaction will be required between lease holders. • Tamboran proposes to compensate pastoralist for their time.
Pastoralist site access	• Exploration vehicles along access track (including tankers selling CNG and LNG) may interact with pastoralist activities- mustering and pastoralist vehicles. • Restricted access to exploration well and fenced area during the length of	• Pastoralist engaged throughout exploration activity planning to incorporate pastoralist feedback into activity to reduce impacts. • Camps with workers bussed to site (where possible) to minimise vehicle movements. • Hazardous areas to be fenced and signed to communicate potential safety hazards. • Compensation to be paid for loss of

Pastoralist Activity	Potential Consequence to Activities	Mitigations
	proposed activities. • Restricted access during seismic surveys. • Dust and noise generated from activity may cause minor disruption to livestock in the immediate vicinity of activity.	available grazing land and disturbance.
Pastoral activities- grazing and mustering	• elevated levels of noise are anticipated to occur around proposed well pads during drilling, stimulation and well testing. • elevated levels of noise in the immediate vicinity temporary gas compression facilities • Potential elevated noise and vibration within vicinity of seismic shoot (typically within 2-500m of activity). • Disturbance of cattle in the immediate vicinity of the activity when civil construction, drilling, stimulation and well testing are undertaken. • Dust impacts on immediate adjacent vegetation has the potential to temporarily reduce yield. • Reduction in pastoral productivity through poor rehabilitation. • Potential introduction or spread of weeds. • Helicopter movements in vicinity of pastoral activities may disturb cattle/ mustering operations. • Potential impacts on cattle and pastoral business where gates are left open. • Potential impacts from Air emissions	• Pastoralist engaged throughout exploration activity planning to minimise impact on cattle and pastoral activities. • Compensation to be paid for loss of available grazing land and disturbance. • Full fencing of well pad to restrict cattle. • Speed limits restricted to 60 km/hr. • Dust control utilised to reduce dust emissions. • Site to be rehabilitated back to pre-existing state, with security bond in place if company fails to rehabilitate. • Weed management plan implemented, including requirements for weed hygiene inspections and certificates on all equipment and vehicles. • 6 monthly weed monitoring and spraying of weeds using a NT Government approved treatment. • Pastoralist to notified and engaged prior to commencing helicopter movements to mitigate interference. • Induction with all exploration contractors and staff in relation to pastoral operations. This induction to be developed with input from pastoralist. • Use of grids, gate signage, inductions and regular gate monitoring and reporting to pastoralist to minimise occurrence of gates being left open. • On-going liaising with pastoralist throughout on ground operations. • Low NOx compression and infrastructure chosen to reduce air emissions

Pastoralist Activity	Potential Consequence to Activities	Mitigations
Pastoral activities- ongoing productivity of area post rehabilitation	• Reduction in productivity due to erosion and sediment releases. • Reduction in productivity due to wastewater, chemical/fuel spills- including from gathering lines and wastewater containments (tanks and sumps) • Reduction in pastoral productivity through poor rehabilitation. • Potential introduction or spread of weeds.	• Routine site maintenance completed to ensure functioning of erosion and sediment control. • All fuels and chemicals to be stored within secondary containment, with no storage of hydraulic fracture stimulation flowback work drilling wastewater. • All spills remediated as required in the EMP/spill management plan. • Gathering and pipeline reinstatement to bring ground cover back to pipeline corridors post construction. This will support ongoing grazing activities (potentially increasing the yield of these area due to a lack of woody vegetation). • End of life rehabilitation to return land back to pre-existing state or as agreed to with pastoralist. • Rehabilitation security with NTG retained. • Weed management plan implemented, including requirements for weed hygiene inspections and certificates on all equipment and vehicles. • 6 monthly weed monitoring and spraying of weeds using a NT Government approved treatment.
Pastoral access to groundwater	• No anticipated impacts as proposed groundwater take is to be covered under a WEL.	• All groundwater take to be authorised under a WEL. • Water extraction from pastoralist bores not proposed, unless specifically approved by pastoralist through an agreement. • Tamboran to allow access to water extraction bores for pastoral take (with prior agreement between the parties)
Pastoral access to surface water	• No anticipated impacts as no surface water take, interference or wastewater discharges proposed.	• No surface water proposed to be taken.
Pastoralist's amenity	• Minor elevated levels of noise in the immediate vicinity of the infrastructure during civil construction, drilling, stimulation, completion, well testing and operation of temporary gas processing facilities. • Dust generation creates visible amenity impact • During seismic charge detonation, noise is	• Site to be located away from main pastoralist entry points and homestead. • Dust suppression to be utilised where practicable • Noise and vibration from seismic surveys is typically a dull thud not felt outside of 200 m or heard outside of 2 km. • Site selection to avoid placing flares and exploration activities on regional high points. • Sale of appraisal gas will reduce visible

Pastoralist Activity	Potential Consequence to Activities	Mitigations
	infrequent and typically a dull thud. • Visual presence of infrastructure within pastoralist lease. • Potential visible hue form flare and night-time at distance.	hue.

9. Stakeholder Engagement Plan Feedback

All feedback on the proposed activities and their potential impacts, risks and proposed controls should be provided to Tamboran via the feedback form in Appendix A within the 28-day time period. Where no comments on contents relating to the requirements of the PER are received within the 28-day period, the PER Stakeholder Engagement requirements will be considered fulfilled. Ongoing stakeholder engagement will then proceed.

All lessee comments and associated Tamboran responses will be documented and provided to DEPWS as a part of the EMP approval process.

10. Ongoing Stakeholder Engagement

To keep the Hayfield Shenandoah representatives informed of the status of the regulated activities, the following ongoing engagement is proposed:

- Quarterly engagement on the status of exploration activities
- Fortnightly engagement prior to the commencement of activities under this SEP
- Adhoc engagement as requested by the APN Pty Ltd Pastoral Representative
- Future engagement on additional petroleum exploration activities (If and when proposed) which are not covered under this EMP

Alternative engagement frequencies can be accommodated at the request of the nominated representative.

Tamboran would also like to extend an invitation to the Pastoral lessees to attend any of the proposed exploration activities to further seek comfort in their understanding and to highlight the nature in which operations are conducted.

11. Commonly used Acronyms & Abbreviations

Acronym	Meaning
AAPA	Aboriginal Areas Protection Authority
AGP	Amadeus Gas Pipeline
ALARP	As Low as Reasonably Practicable
BMP	Bushfire Management Plan
CBL	Cement Bond Log
CNG	Compressed Natural Gas
Code of Practice	Code of Practice: Onshore Petroleum Activities within the Northern Territory
DEPWS	Department of Environment, Parks and Water Security
DIPL	Department of Infrastructure, Planning and Logistics
DFIT	Diagnostic Fracture Injection Test
DoH	Department of Health
E&A	Exploration and Appraisal
EC	Electrical Conductivity
EPA	Environment Protection Authority (NT)
EP	Exploration Permit (e.g. EP76, EP98 and EP117)
EMP	Environmental Management Plan
ERP	Emergency Response Plan
ESCP	Erosion and Sediment Control Plan
GHG	Greenhouse Gas
Ha	hectare
HFS	Hydraulic Fracture Stimulation
JV	Joint Venture
Km	Kilometre
LNG	Liquified natural Gas
m	metre
MRMP	McArthur River Mine Pipeline
NLC	Northern Land council
NT	Northern Territory
NTG	Northern Territory Government

Acronym	Meaning
NTH	Native Title Holder
RWA	Restricted Work Area
SPMP	Spill Management Plan
TO	Traditional Owner
WEL	Water Extraction Licence
WMP	Weed management Plan
WOMP	Well Operations Management Plan
WWMP	Wastewater Management Plan

Appendix A – Stakeholder Feedback Form

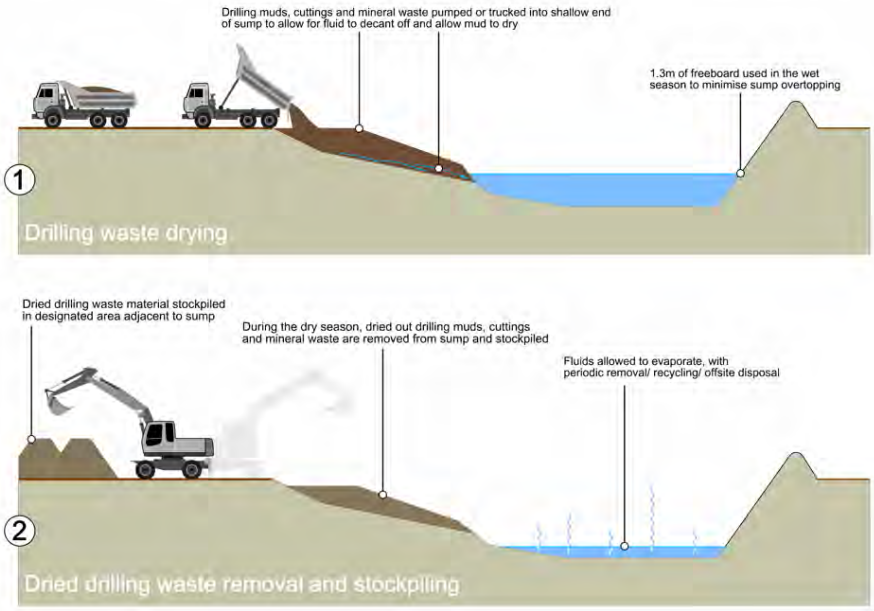
Stakeholder Feedback Form NT-2050-95-AQ-0003

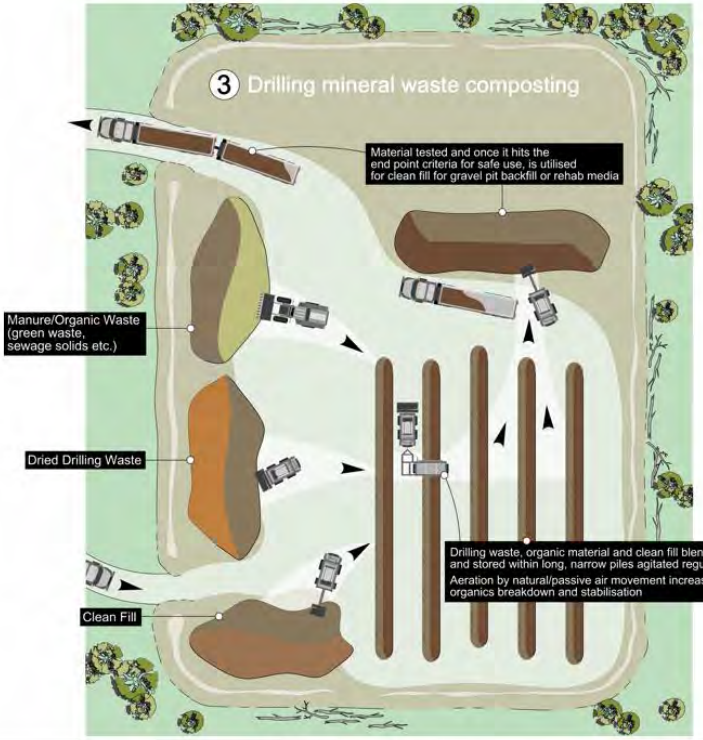
Stakeholder:	
Document Referenced:	
Controlled Doc Number:	

#	Ref	Comment	Date	Tamboran Feedback	Date

Pastoralist Engagement Pack

Appendix B- Overview of Drilling waste composting strategy





Appendix C Drilling sump mix bury cover

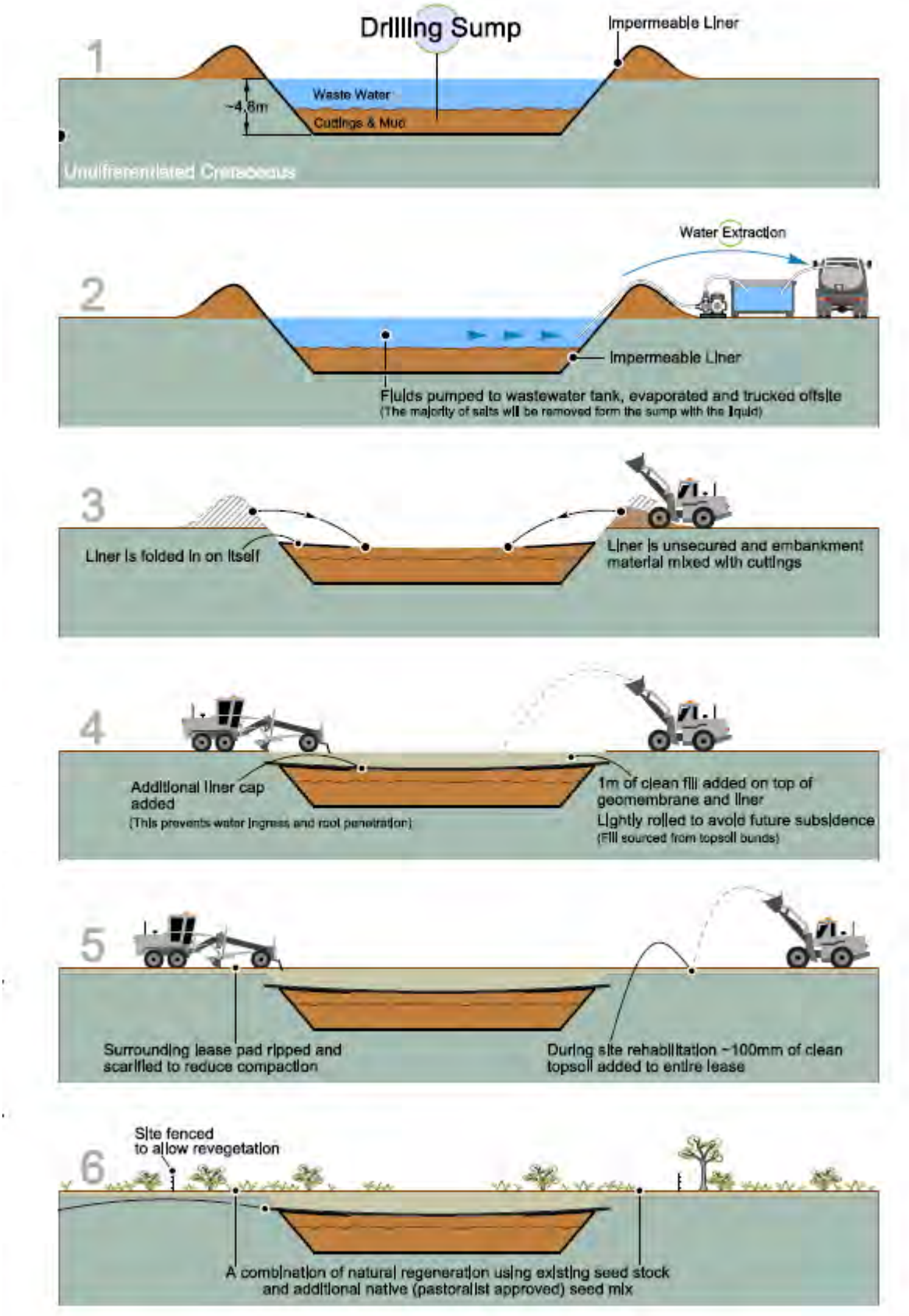
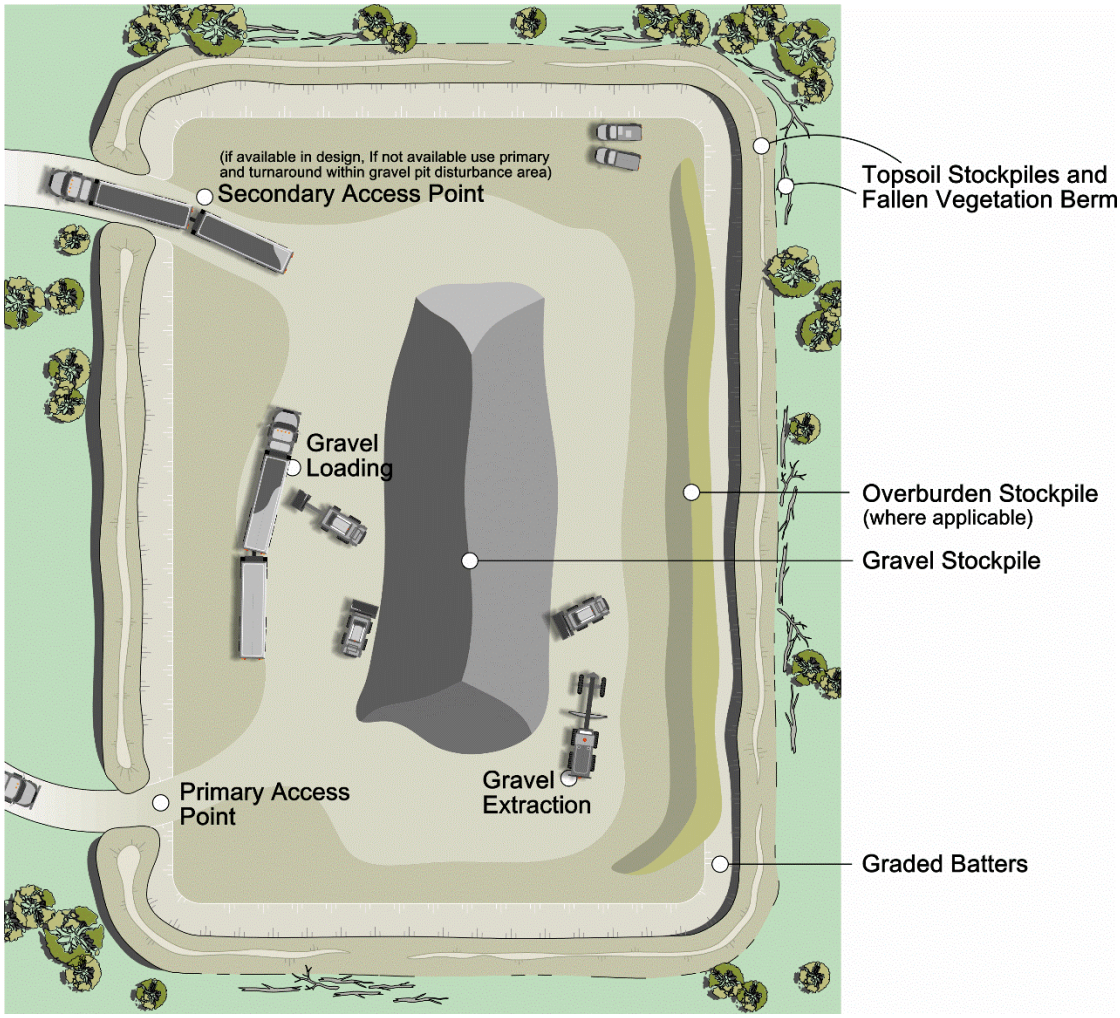
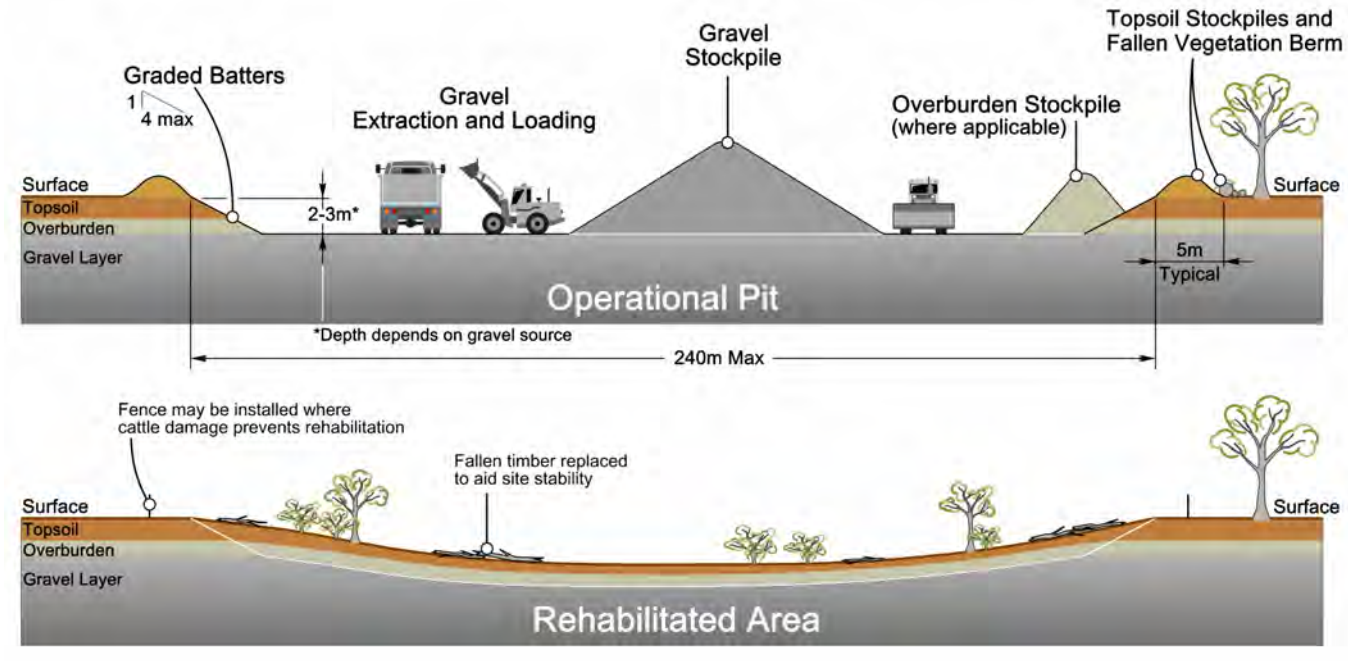


Figure 13 Illustration of the onsite burial of drilling waste at each location

Appendix D Gravel Pit Generic Layout, Operations and Rehabilitation





From: David Armstrong
To: Val Dyer
Cc: Justin Dyer; Nick Dyer; Sturt Plains; David Close (Archive); [redacted]
Subject: Re: Stakeholder Engagement Pack - 2023
Attachments: image003.png
Pastoralist Engagement Pack- Hayfield Shenandoah April 2023 copy (dragged) 11.pdf
V Dyer - Stakeholder Feedback Form NT.pdf

Hi Val

Please find attached responses to your question. Tamboran is grateful for the feedback and are happy to work with you on reducing impacts where that can practically happen.

Please remember stakeholder engagement does not finish with answering these questions. If ever you or anyone at Hayfield has a question please reach out and the appropriate person will endeavour to respond.

I'll touch base with you early this week

Regards

Dave

DAVID ARMSTRONG

Managing Director
Mobile [redacted]
Addres
Email

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On 17 Apr 2023, at 10:36 am, Val Dyer [redacted] wrote:

Hi David

Thank you for the very extensive and clear Engagement Pack.

Please find attached responses for further feedback .

Other family members will provide their feedback directly to you.

There are a couple of matters which we would like clarified prior to finalising the LACA.

Just wondering whether a meeting can be arranged for this purpose.

Regards
Val

From: David Armstrong [redacted]
Sent: Thursday, 6 April 2023 1:00 PM
To: Val Dyer [redacted]
Cc: Justin Dyer <[redacted] Nick Dyer [redacted]>; Sturt Plains [redacted]; David Close [redacted]
Subject: Stakeholder Engagement Pack - 2023

Hi Val

Please see attached the Stakeholder Engagement Pack. This pack contains information relating to the proposed access agreement plus further information on potential future exploration work.

If you read through it and please ask any questions at any time either via the sheet provided at the end of the SEP or email. Tamboran are happy to provide the relevant people with appropriate experience to discuss any aspect of the SEP.

Hope you have a good Easter

Regards

Dave

DAVID ARMSTRONG

Managing Director
Mobile
Addres
Email [redacted]

<APN Response to Engagement Pack.pdf>

Table 3 Environmental risks and controls of proposed variation

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls

Groundwater use and quality	• To manage exploration activities to prevent unsustainable depletion of groundwater resources
	• Preserve groundwater quality to protect environmental and pastoral use
		• No adverse changes to groundwater quantity is anticipated to be associated with exploration activities.
		• Impacts to aquifers levels anticipated to be negligible, with rapid recharge observed from other Gum Ridge Formation bores utilised within the Basin.
		• No material changes to groundwater quality anticipated form exploration activities.
		• No impact to Groundwater Dependent Ecosystem's (GDE) or stygofauna from exploration activities (extraction and well construction)
		• No reduction in pastoral productivity through reduced groundwater volumes
			• Low risk of groundwater contamination from drilling fluids during construction of the conductor/ surface casing in the Cambrian Limestone Aquifers due to the selection of low toxicity drilling fluids
			• Low risk of cross flow of deep formations (such as the target shales) to shallow aquifers through inappropriate well barrier design and construction due to the presence of the Code of Practice controls and verification processes.
			• Low risk of crossflow through fracture growth into aquifer from stimulation activities allowing the migration of fluid and gas due to the controls within the Code of Practice and underlying separation distance between the target formation and Cambrian Limestone aquifers.
			• Low risk of stimulation activity inducing seismic activity that enables cross formational flow between shallow aquifers due to seismic stability of region and lack major faults or fracture zones.
			• Low risk of stimulated zones intersecting offset wells (including the adjacent horizontal wells) or intersecting an existing geohazard due to seismic control, pressure monitoring during stimulation and lack of older petroleum wells in close proximity.
				• All petroleum wells are to be designed, constructed, operated and decommissioned in accordance with the mandatory controls within the Code of Practice. The Code of Practice outlines specific controls measures designed to protect underlying groundwater resources including:
				  • Exploration wells designed with multiple cement and steel casing barriers to protect aquifers
				  • Drilling fluids and muds must have a low residual toxicity
				  • Groundwater monitoring must be completed before and after stimulation to detect contamination
				  • Well integrity confirmation to prove barrier performance aquifer isolation (casing pressure tests, formation leak off tests, cement bond logs etc.).
				  • Separation between stimulated shale resources and aquifers must be sufficient to ensure the risk of fracture growth is ALARP
				  • Pressure monitoring completed to ensure maximum allowable operating pressure is not exceeded during stimulation.
				  • Ongoing well integrity monitoring and maintenance throughout the life of each well

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			• Low risk of crossflow/well integrity caused by the deviation of an E&A well into the adjacent well during drilling due to downhole GPS tracking tools and proximity alarms • Low risk of leakage of either flowback, produced water, or hydrocarbons (liquid and gaseous) from suspended or abandoned wells to groundwater due to well design and integrity management. • Low risk of leaks from gathering lines, with gathering lines constructed as per Australian Standard, leak detection in place to identify pipeline failures and routine inspections completed. • Low risk of surface contamination from storage and disposal of drilling fluids, additives, muds and cuttings on-site due to low toxicity of drilling muds and disposal risk assessment process. • Low risk of groundwater contamination from surface spills from storage, handling and transportation of flowback water due to the storage and spill management requirements outlined in the Code of Practice. • Low risk of groundwater contamination from the storage, handling and transportation of chemicals, fuels and wastes due to the mandatory code of practice controls (such as mandated use of secondary containment) • Low risk of groundwater contamination from overtopping of	to ensure aquifers are protected • All wells are to be decommissioned in accordance with the Code of Practice, with cement plugs utilised to separate aquifer units. • All surface storages of wastewater and chemicals to have secondary containment to prevent spills to the ground • An emergency response plan must be implemented outlining how spills and emergencies will be responded to. • Drilling fluids and wastes to be stored within a lined sump • Gathering lines and pipelines constructed as per Australian standard, leak detection in place to identify pipeline failures and routine inspections completed. • Flowback wastewater must be stored in double lined tanks with leak detection and level monitoring • Double lined enclosed wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All open treatment tanks are to be operated with a 1:1000Annual re-occurrence interval (ARI) wet season or dry season (whichever is applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone)

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			drilling sumps and flowback tanks (including during wet season) due to level alarms and use of enclosed tanks. • Low risk of groundwater contamination from the use of recycled flowback and other wastewater in stimulation fluid • Low risk of groundwater contamination from a failure of flowback storage tank due to the design standards of the tank (cyclone rated steel tank structures) and routine integrity inspections • Low risk from over extraction of groundwater for civils, drilling and stimulation and other ancillary activities due to the yield of the Cambrian Limestone Aquifers and available allocation volumes (as assessed in the WEL).	• Groundwater monitoring from monitoring bores installed at the site must be completed prior to and after stimulation to detect any contamination. • All water take covered by an existing Water Extraction Licence (WEL) GRF 10285 • New extraction bores must model potential impact on adjacent pastoral bores prior to being added to WEL. • All water take to be metered and reported quarterly to the regulator • No pastoralists groundwater bores within 1 km of each proposed site • Wastewater, including flowback and drilling fluids, to be preferentially used in stimulation fluid to reduce raw water usage.
Soils	• Avoid, minimise and control soil erosion and discharge of sediment or soil into waterways or established drainage systems • Minimise disturbance of soil, vegetation and drainage during site activities • Prevent the contamination of soil to maintain the viability of soil resources	• Clearing of vegetation to support exploration and appraisal activities. • Soil compaction from access tracks, leases, infrastructure (pipelines and temporary gas processing facilities) and seismic lines. • Increased sedimentation transportation from disturbed areas • Loss of productivity of disturbed areas until final rehabilitation has been achieved	• Medium risk of soil erosion from cleared areas (access tracks, lease pads, camp pads, temporary compression facility, pipelines, gravel pits and laydown areas) occurring on disturbed sites due to high intensity wet seasons. Risk is a low consequence (minor impact), possible (<50% chance of occurring) event. • Low risk Reduction in land production through poor erosion and sediment control practices • Low risk of spills/leaks from the on-site storing and handling of fuels. Condensate, hydrocarbons, drilling additives, stimulation additives, flowback fluid, solid wastes, storage	• Site selected to avoid sensitive soil units and slopes which may increase erosion hazard. • All land clearing (including during the establishment of seismic lines) to align with the requirements of the code of Practice and NT Land Clearing Guidelines (2019) • Erosion and sediment control practices to be utilised at all disturbed sites to minimise erosion. • Sites (including gravel pits) maintained to minimise sediment releases, with erosion and sediment control plan in place • Pre and post wet season monitoring completed on all disturbed areas

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
	• Minimise residual impacts to pastoralist usage of exploration areas		and transportation of wastes causing soil contamination. • Low risk of drill sump and flowback tank overtopping due to mandatory freeboard and monitoring controls • Low risk of chemical and waste transportation accident causing soil contamination due to licenced chemical/ waste provider use, spill response and emergency response requirements. • Low risk of contamination from on-site disposal of drill muds and cuttings with site specific assessment completed to ensure disposal is environmentally acceptable. • Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Low risk of wastewater evaporation mist transported offsite during wastewater treatment due to wind speed/direction cut offs and routine site inspections during operations. • Low risk of greywater and sewerage disposal from camp wastewater treatment plants due to the irrigation area being appropriately sized, fenced and quality aligning with the NT Department of Health requirements. • Low risk of reduction in land production through poor infrastructure placement as infrastructure is preferentially located in existing disturbed area, with no	(including seismic lines) to identify and repair erosion • Construction within the wet season to be avoided to reduce the erosion risk. • Vegetation clearing watercourses to be avoided as far as reasonably practicable (i.e. only when a new access is required to be constructed) • During seismic surveys, vegetation clearing within open woodlands to be minimal • All chemicals and fuels to be stored with secondary containment as per code of Practice. • During wastewater storage, the site is to be fully bunded to contain the volume of an entire wastewater tank if a structural failure occurred • Flowback wastewater must be stored in double lined tanks with leak detection and level monitoring • Double lined enclosed wastewater tanks with leak detection and level monitoring used to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All open treatment tanks and sumps are to be operated with a 1:1000Annual re-occurrence interval (ARI) wet season or dry season (whichever is applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone)

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			sensitive soil types present in the immediate vicinity. • Low risk of reduction in land productivity from poor rehabilitation due to mandatory rehabilitation requirements and security bond requirements • Low risk of pipeline subsidence creating erosion with ongoing monitoring and maintenance.	• Stormwater to be retained onsite during wastewater storage and tested prior to release • All spills of chemicals and wastewater to be cleaned up upon detection. • Irrigation of greywater and treated effluent to be undertaken in accordance with DoH requirements • Disposal of drilling muds, cuttings and mineral waste to be undertaken in accordance with Code of Practice, with onsite disposal only permitted where the potential harm to the environment can be demonstrated as ALARP and acceptable. • Site to be rehabilitated back to pre-existing/ agreed state with pastoralist input. • Pipeline to have vegetation reinstated post construction to stabilise corridor and prevent erosion. • Pipeline monitoring and repair work to minimise/ respond to pipeline subsidence
Emissions (dust, greenhouse and combustion emissions)	• Avoid environmental nuisance at sensitive receptors • Minimise impacts to pastoralists and surrounding ecological communities from dust	• Dust on vegetation in the immediate vicinity of activities reduces plant palatability • Impacts of dust nuisance to birds and fauna in the immediate vicinity of activities, specifically access tracks and seismic lines • Emissions from the combustion of diesel. • Emissions from power generation for onsite	• Low risk of dust impacts generated during Civil activities, drilling operations, stimulation activities well testing due to use of dust suppression and routine maintenance of access tracks and infrastructure • Low risk of reduction in regional air quality resulting from emissions from the combustion of diesel due to the temporal nature of the activities and selection of efficient equipment.	• Site located away from sensitive receptors, such as homesteads • Dust suppression to be used on access tracks, lease pads and gravel pits to minimise dust emissions where practicable • Outside of high intensity activities (such a s civil construction, drilling and stimulation) Dust levels consistent with standard pastoral activities (such as mustering/truck load outs) on the property

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
	• Minimise greenhouse gas emissions	compression and liquification facilities. • Generation of Greenhouse gasses	• Low risk of reduction in regional air quality from gas and condensate flaring due to the combustion efficiency of the flare and preferential sale of appraisal hydrocarbons. • Low risks of reduction in air quality from emission associated with onsite power generation (supporting compression and liquefaction infrastructure) equipment to be utilised to limit NOx and CO emissions. • Low risk of air emissions from chemical releases during drilling and stimulation activities impacting livestock, fauna and people due to chemical handling procedures limiting emissions during mixing. • Medium risk of bushfire from accidental ignition by site activities (civil works, drilling, flaring, grinding) or personnel. The consequence of a fire is considered serious, with the likelihood Highly unlikely. • Low risk of uncontrolled release of gas impacting a receptor during drilling, stimulation, barrier failure, operator error or vehicle collision due to the well design, blow out prevention, well integrity and lack of sensitive receptors preventing impacts. • Low risk of leak of gas from wells or gas compression facilities due to the well/ facility design, routine leak detection and repair and separation distance from receptors,	• Venting of raw gas is tightly controlled under the Code of Practice, with no material volume of gas to be vented • A reduced emission completion (flare) to be utilised to combust all hydrocarbons • Flares to be compliant with USEPA design standards, including 98% flare efficiency • Stimulation chemical mixing procedures deployed (such as enclosed hoppers) that minimises dust emissions • Firebreaks to be maintained around well and camp pads to minimise bushfire risk • Flaring exclusion zones to be maintained around flare • No flaring during total fire bans • Slashing, grinding and other higher risk fire activities to be undertaken with appropriate controls to mitigate the risk of bushfire (such as buffer zones, use of fir trailers, fire breaks etc.) • During seismic surveys, no vegetation is to be mulched and bushfire management protocols implemented. • Vehicles to be equipped with fire extinguishers • 6 monthly gas leak detection on all exploration wells and equipment, with annual inspections on pipelines

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			• Low risk of greenhouse gas emission impacts from appraisal gas sale/ well testing (climate change) as volumes are small in comparison to local, regional, domestic and international levels.	• Low NOx and Low CO gas fired compression/ power generation utilised to minimise air emissions. • Appraisal gas will be beneficially used through sale of CNG/LNG/ piped natural gas to reduce flaring and minimise flaring to reduce scope 1 and 2 emissions.
Surface Water	• Avoid and minimise the potential contamination caused by the discharge of sediment or contaminated storm water to waterways or established drainage systems. • Contain any potential contaminants for treatment or disposal.	• Increased sedimentation transportation from disturbed areas (access tracks, lease pads, seismic lines etc.)	• Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Low risk of gathering pipeline failure and release of flowback through pipe material selection, design, quality Assurance/ quality Control testing and use of leak detection. • Low risk of drill sump and flowback tank overtopping due to mandatory freeboard and monitoring controls • Low risk of a transportation accident releasing chemical or wastewater (drilling fluid and flowback) due to the use of licenced wastewater/ chemical transportation providers, spill management and emergency response requirements. • Low risk of spills to surface water from chemicals and fuel storage and handling activities due to use of secondary containment and separation distance to watercourses. • Low risk of stormwater releases from activities contaminating surface water due to stormwater segregation and testing procedures.	• No take of surface water permitted or proposed • Lease pad located away from watercourses- typically 1km or greater • Seismic activities to: • avoid vegetation clearing as much as practicable in open woodlands, limit clearing to grasses and shrubs • Maintain viable root stock to promote rapid rehabilitation • Avoid seismic lines in water courses (unless co-located with an access track) • Site maintained to minimise sediment releases, with erosion and sediment control plan in place • Double lined enclosed wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All wastewater tanks engineered to withstand failure, cyclone rated construction • All open treatment tanks and sumps are to be operated with a 1:1000Annual re-occurrence interval

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			• Low risk of infrastructure (including pipeline) changing surface hydrology and flow due to infrastructure design and avoidance of overland flow locations. • Low risk of changes to terrestrial ground surface levels associated with seismic activity due to the stability of the basin and geomechanical properties of the target and overlying formations. • Low risk of gathering line failure releasing flowback fluid to the environment	(ARI) wet season or dry season (whichever is applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone) • During wastewater storage, the site is to be fully bunded to contain the volume of an entire wastewater tank if a structural failure occurred • All gathering lines to be welded as per Australian Standards, hydrotested during construction to verify integrity prior to being brought into service • Gathering lines to utilise flowmeters/ pressure monitoring to identify leaks (such as flow/ pressure drops) • Gathering lines to be inspected 6 monthly to identify subsidence/ potential integrity issues. All spills of chemicals and wastewater to be cleaned up upon detection. • Irrigation of greywater and treated effluent to be undertaken in accordance with DoH requirements • No offsite releases of drilling or stimulation wastewater proposed or permitted • Stormwater retained onsite during wastewater storage, with testing completed prior to offsite release • Site selected to avoid major structural features, such as faults • Basin is seismically stable, with low seismic activity reported.

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
Flora and Fauna	• Minimise disturbance to flora and fauna • No disturbance to high conservation areas • Avoid the introduction of weeds • Avoid the spread of existing weeds • Minimise the loss of pastoral productivity	• Clearing of vegetation communities (such as Open Corymbia/eucalypt woodland, Bullwaddy and/ or Lancewood) to support exploration activities (lease pad extension and seismic lines). • Loss of fauna and flora habitat • Loss of livestock grazing area • Loss of productivity of disturbed areas until final rehabilitation has been achieved	• Low risk of impacts to sensitive vegetation communities from seismic activities, with high ecological areas avoided • Low risk of threatened fauna mortality during clearing, with all sites to be inspected prior to clearing to avoid fauna. • Low risk of vehicle and machinery noise and lighting on well pads and access tracks causing material impacts to threatened fauna or livestock. • Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Medium risk of introduction and spread of weeds in the area due to equipment washdowns, inspection and certification requirements. Monitoring and routine treatment completed on identified outbreaks. Impact from weed introductions/spread is considered moderate, with likelihood Unlikely. • Medium risk of bushfire from accidental ignition by site activities (civil works, seismic activities, drilling, flaring, grinding) or personnel on fauna, flora and land productivity. The consequence of a fire is considered serious, with the likelihood Highly unlikely. • Low risk of flora, fauna and livestock being trapped and drowning in	• Seismic activities to: ○ avoid clearing of mature trees and protected flora ○ In open woodlands, limit clearing to grasses and shrubs ○ Maintain viable root stock to promote rapid rehabilitation ○ No seismic lines in riparian zones ○ Implement fire management controls, include rapid response • Vegetation to be inspected for fauna prior to clearing. Where fauna are identified, work shall stop in the immediate vicinity until they leave the area. • Site to be fully fenced during operations • Open pits to be fully fenced to prevent livestock access • Sumps to have fauna ladders or liner material (such as coletanche) with sufficient friction to allow fauna to escape. • Gravel pits to be left open to act as watering point for livestock when not in use • Vehicle speed limit restricted to 60km/hr • Dust suppression used to limit dust impacts to vegetation • Limited night-time activities proposed. • Site to be rehabilitated back to pre-existing/ agreed state with pastoralist • All equipment and loads to be inspected and certified weed free prior to entry

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			storage tanks, sumps and pits due to the design of storages and fencing. • Low risk of contaminants in water and soil pass through the food chain and bioaccumulate in fauna causing detrimental impacts to local species and communities due to chemical storage and handling practices. Fences are utilised to restrict livestock access. • Low risk of vehicle collisions with fauna – fauna mortality results in a localised impact to listed threatened species, due to avoidance of night-time driving, speed limit restrictions and number of vehicle movements. • Low risk of reduction in land productivity from poor rehabilitation due to mandatory rehabilitation requirements and security bond requirements Reduction in land production through bushfire • Low risk of impacts to flora and fauna through the encouragement of feral animals and other pest species leading to competition with native species. This includes the introduction of cane toads.	• 6 monthly weed inspections to be completed with all identified weeds treated. • Weeds sprayed periodically to restrict weed numbers.
Environmental Nuisance and Amenity- including dust, noise, light, odour and vibration	• Minimise impacts to pastoralist operations	• Construction of exploration infrastructure onsite changes land use from pastoral to industrial. • Light and noise nuisance to fauna and livestock in immediate vicinity of activity • Increased traffic to proposed exploration area • Noise, light, odour and dust emissions in the immediate	• Low of changes in property amenity through the construction and operation of exploration infrastructure due to location of activities and separation distance from receptors • Low risk of increased vehicle accident as access points away from pastoral access. • Low risk of adverse impacts to fauna from traffic are anticipated, with	• Sites located away from homesteads and local communities • Flaring to be minimised to avoid light generation • Site is located away from pastoralist main access points • Maximum peak traffic during mobilisation and demobilisation is likely to be typically less than<44 vehicle movements per day for 2 weeks.

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
		vicinity of the lease pad or temporary gas processing facility. • A visible hue visible from operations at night during flaring or from temporary gas compression facility lighting. • Noise impacts from helicopter movements • Noise and vibration impacts during seismic activities.	impact levels consistent with standard road traffic levels. • Low risk of helicopter movements causing impacts to receptors based on location of site away from homesteads • Low risk of noise, dust, light and vibration impacts associated with temporary appraisal gas facility	• Speed limit restricted on the access tracks to <60km/hr • Dust suppression to be utilised to minimise dust emissions • Where helicopter movements are planned, the pastoralist to be engaged prior to ensure helicopter do not interfere with pastoral activities. • Seismic surveys to avoid sensitive receptors, such as homesteads, local communities, sacred sites etc. • Compression/ power generation/ CNG/ LNG facilities to be designed to minimise aesthetic impacts and located away from homesteads and local communities. • Lighting of infrastructure designed to minimise aesthetic impacts during the evening
Native Title and Sacred sites	• Minimise impacts to Native Title holders and avoid impacts to sacred sites	• Reduction in foraging and hunting areas • Reduction in land amenity • Loss of spiritual connection with land due to industrialisation • Impact to sacred sites.	• Low risk of reduction in foraging and hunting areas due to limited footprint and absence of surface water in the vicinity of activity. • Low risk of reduction in land amenity due to remote location of activity, limited footprint, prioritisation on rehabilitation and reinstatement of disturbed areas • Low risk of losing spiritual connection with country due to low activity intensity, stringent environmental controls and ongoing stakeholder engagement, • Low risk of impacts to sacred sites due to NLC clearances and AAPA certificates/	• Exploration agreements with Native Title holders in place • Approved annual work programs in place • Sacred site clearances completed prior to work, with AAPA certificates in place • Prevention of activities from accessing sacred sites or other areas which have not been cleared/ approved by Native Title holders. • All infrastructure to be kept in a non-polluting form, with rehabilitated undertaken upon cessation of activities back to a state consistent to pre-disturbed levels.

Stakeholder Feedback

Stakeholder:	Hayfield Shenandoah
Document Referenced:	
Controlled Doc Number:	

#	Ref	Comment	Date	Tamboran Feedback	Date
	Intro	Reference is made to the sale of gas which is not included in the current draft LACA. Production requires a new agreement	6/4/23	The current LACA does not cover the scenario of sale of appraisal gas. This will be covered under future negotiations once the new Petroleum Legislation Amendment bill 2022 comes into force. This is anticipated to occur in June 2023. Under the new legislation passed by the NT G'vot 'Appraisal' gas can be sold, with approval from the Resources Minister, to eliminate the need to flare (essentially waste) gas during the exploration process. This will be allowed under a Exploration/ Retention Licence and is not deemed as production (which is authorised under a Production Licence). The cost of installing infrastructure to manage appraisal gas could be prohibitive depending on the location of the well to a pipeline. The sale of appraisal gas is primarily about reducing Greenhouse gas emissions generated during the processes of evaluating whether production from a shale resource is viable.. A summary of the new proposed Petroleum Legislation Amendment Bill is provided below and can be found at: https://legislation.nt.gov.au/en/Bills/Petroleum-Legislation-Amendment-Bill-2022-S-68?format=assented # Petroleum Legislation Amendment Bill 2022 Issued 17 Oct 2022 The *Petroleum Legislation Amendment Bill 2022* was introduced to the Legislative Assembly last week during the October 2022 parliamentary sittings. The Bill's amendments to the *Petroleum Act 1984* (the Act) will implement 13 recommendations from the Final Report of the Hydraulic Fracturing Inquiry (the Inquiry). The changes introduced in the Bill will significantly improve the regulatory framework for the onshore petroleum industry and the ability to manage environmental impacts and risks to acceptable levels in a manner contemplated by the Inquiry. The Bill contains the following amendments relative to the Inquiry recommendation:	

				• introduces the requirement to comply with nationally consistent guidelines for human health and environmental risk assessment (Rec 7.4 and 10.1); • provides for the implementation of new charges to recover the cost of undertaking the Strategic Regional Environmental Baseline Assessment (SREBA) studies, including the Strategic Social Impact Assessment (Rec 12.2); • introduces a framework for new charges for industry, that will recover the costs associated with regulating the onshore gas industry (Rec 14.1); • establishes a comprehensive financial assurance framework to improve securities and insurance requirements for onshore petroleum operations (Rec 14.13); • introduces an orphan well levy and fund to enable the government to monitor orphan wells as well as take action, as required, to secure the integrity of any orphan wells (Rec 14.14); • enables the repeal of the Schedule of Onshore Petroleum Exploration and Production by establishing a legal framework for activity permissioning plans, assessment timeframes, approval criteria and reporting obligations in the Act and introducing new regulation-making powers to support them (Rec 14.17); • empowers the community through key decision making processes. This includes introducing third party merits review for key decisions made under the Petroleum legislation (Rec 14.24); • strengthens community confidence in the regulatory framework by amending cost rules so that litigation genuinely brought in public interest may not be subject to a costs order, introducing new civil enforcement proceedings and reversing the onus of proof for pollution and environmental harm offences; (Rec 14.25; 14.31 and 14.32);	

- enables a more rigorous legislative framework that will provide a strong deterrent for non-compliance. Inspectors appointed under the Act, and relevant CEOs will have broader powers and more ways to ensure that gas companies are compliant with the law (Rec 14.29); and
- increases penalties and offences in the Act so that they will be comparable with or exceed equivalent penalties across all Australian jurisdictions (Rec 14.33).

Other amendments within the Bill include:

- enabling exploration for and production of naturally occurring hydrogen by amending the definition of petroleum; and
- enabling industry applications for Government to consider the use and sale of appraisal petroleum in preference to flaring or venting to reduce greenhouse gas emissions at the source. These applications will not be considered until the commencement of the Act and all Inquiry recommendations have been implemented, as determined by Government in 2023.

The Bill is available on the Government's Legislation database website and will be debated in the November 2022 parliamentary sittings. This Bill is the third amendment to the Act since implementation of Inquiry recommendations commenced in 2018.

Government will not consider any production approvals for shale gas activities until all Inquiry recommendations are implemented.

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	5	Shenandoah North A and B locations are on a water catchment to significant wetlands		We agree with your comment and would only proceed with this work in the dry season (anticipated months being September to October). This particular well is only a vertical which should be drilled within a matter of 3-4 weeks. Upon completion, the well will be plugged and abandoned and the site rehabilitated.	
	6.1	'Hubs' are designed to receive waste from other wells on the other properties		Correct. We seek flexibility to be able to dispose of waste produced on other pastoral stations on a hub. However, we do not anticipate large volumes of waste being moved to these sites from adjacent stations due to the following: • Almost all of our future work program is earmarked for the Hayfield/ Shenandoah Station. • Trucking distances from other pastoral stations is likely to be prohibitively expensive. We would envisage that only drilling waste from adjacent sites in close proximity would use the hub location i.e. Amungee NW on Amungee Station site could use the Amungee NW3 location.	
	6.2	'Temporary' gas processing facilities from 2024?. This is production and requires a new agreement. See definition of production in the draft LACA		As discussed above, these temporary facilities will cover the sale of appraisal gas under our exploration permit (which is different to full, long term "Production" under a "Production Licence"). These temporary facilities are proposed to beneficially use the gas to avoid flaring and subsequent greenhouse gas generation. The "Production phase" will occur once the appraisal phase is completed. This (including the sale of appraisal gas) will require a new LAA and additional regulatory approvals prior to commencement (such as production licenses and additional environmental approvals).	
	6.2	What's a well caller?		A well cellar is a 8m3 concrete lined pit which is installed at each well head to accommodate the well head equipment and blow out preventor (BOP). These are typically pre-fabricated offsite. An example is provide below. 	

	6.2	Sales gas pipelines. Locations of options?		In figure 5 of the Stakeholder Engagement Pack, we have put two potential indicative pipeline routes. The exact pipeline route has not been selected, as the pipeline providers are currently assessing the most suitable tie in location with the existing pipelines. Ideally, the pipeline will be constructed running East to West along the existing access track, under the Stuart highway to connect up the Amadeus Gas Pipeline (AGP). However, due to the potential for submersion of the connection point with the AGP (the connection point will require some small surface facilities on the black soil country), the pipeline may need to be routed to an existing connection point near the Buchanan Highway to the North. We are awaiting the pipeline providers to confirm the most suitable route. The pipeline route will be the subject of ongoing engagement and a separate LAA. are seeking to engage with you as early as possible	
	8.2	Access: Tankers selling LNG and CNG also suggest 'production'		As previously discussed, the potential processing, transportation and sale of both LNG/ CNG is anticipated to be restricted to the appraisal phase, as a way of reducing the volume of flaring required to test the shale resource. This will be authorised under the new Petroleum Amendment Bill 2022 under an Exploration Permit. The "production phase" which will commence post appraisal, once the relevant Production Licences (PL), environmental approvals and LAA's have been obtained.	
		Risks associated with on site disposal/ treatment of solids and liquids		The risks associated with the onsite disposal/ treatment of solids and liquids has been described in table 3 of the engagement pack. These risks have cover both ongoing flowback storage and treatment (primarily evaporation) as well as drilling waste management. The specific risks outlined in Table 3 include: Please see attached highlighted areas of Table 3	
		There appears to be some incompatibility between draft LACA and Engagement Pack with regards to production. Mostly in terms of timing and the ongoing provisions in the LACA		Copy of email sent to Val. To clarify that the Stakeholder Engagement Pack (SEP) is based on information within the Environmental Management Plan (EMP) submitted to the NTG and includes what is being sort in the LACA. It can take up to 18 months to get a drill location approved (including NLC/TO approvals, AAPA cert etc) and 4 to 6 months for the NTG to approval an EMP after its submitted. Exploration company's therefore need to include potential work out to 2 years or more to ensure they are covered as the approvals process does not give a quick turnaround. The SEP includes operational aspects they may not be in the LACA but is in the EMP and these things may never happen or are varied over time. What is in the LACA is what Tamboran would like to do and the extra information in the SEP gives you insight into what they might want to do in the future.	

From: Val Dyer
To: david
Subject: RE: Stakeholder Engagement Pack - 2023
Date: Monday, 24 April 2023 3:04:28 PM

Hi David

Thanks for the feedback which will help us in the finalisation of further queries and the agreement.

Regards
Val

From: David Armstrong <[redacted]
Sent: Sunday, 23 April 2023 11:27 AM
To: Val Dyer <[redacted]
Cc: Justin Dyer [redacted] Nick Dyer <[redacted] Sturt Plains [redacted] David Close [redacted]
Subject: Re: Stakeholder Engagement Pack - 2023

Hi Val

Please find attached responses to your question. Tamboran is grateful for the feedback and are happy to work with you on reducing impacts where that can practically happen.

Please remember stakeholder engagement does not finish with answering these questions. If ever you or anyone at Hayfield has a question please reach out and the appropriate person will endeavour to respond.

I'll touch base with you early this week

Regards

Dave

DAVID ARMSTRONG

Managing Director
Mobile
Addres
Email [redacted]

From: David Armstrong
To: Justin Dyer
Cc: Val Dyer
Subject: Re: Stakeholder Engagement Pack - 2023
Attachments: image003.png
J Dyer - Stakeholder Feedback Form NT_.pdf

Hi Justin

Please se attached information feedback from Tamboran regarding your questions. They are good questions and Tamboran appreciates them and wants to continue working with you to minimise and control impacts

If you have any further questions let me know

Regards

Dave

DAVID ARMSTRONG

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> On 19 Apr 2023, at 2:50 pm, [redacted] wrote:
>
> Thanks Dave, apologise for my messy handwriting and you might have to translate some of my responses. Let me know if you have any questions or need further explanation.
> Thanks
> Justin
>
> ---
>
> **From:** David Armstrong [redacted]
> **Sent:** Wednesday, 19 April 2023 2:46 PM
> **To:** Justin Dyer [redacted]
> **Subject:** Re: Stakeholder Engagement Pack - 2023
>
> Thanks Juddy

I'll follow up with Tamboran

Cheers

Dave

DAVID ARMSTRONG

Managing Director
Mobile
Addres
Email [redacted]

<image001.png>
www.terrabos.com.au

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On 18 Apr 2023, at 3:26 pm, [redacted] wrote:

Gday Dave,
Please find my response to SEP.
Regards
Justin

From: David Armstrong [redacted]
Sent: Monday, 17 April 2023 10:48 AM
To: Val Dyer <[redacted]
Cc: Justin Dyer [redacted]; Nick Dyer [redacted] Sturt Plains [redacted] David Close <[redacted]
Subject: Re: Stakeholder Engagement Pack - 2023

Hi Val

Thanks for your response and I'll start gathering the answers today.

Yes we can have a meeting to discuss the LACA. I'm reasonable flexible so if you would like to suggest a time I'll work around you. If you have any feedback you could provide me before the meeting so

I'm prepared that would be good.

Regards

Dave

DAVID ARMSTRONG

Managing Director
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> On 17 Apr 2023, at 10:36 am, Val Dyer [redacted] wrote:
>
> Hi David
>
> Thank you for the very extensive and clear Engagement Pack.
>
> Please find attached responses for further feedback .
>
> Other family members will provide their feedback directly to you.
>
> There are a couple of matters which we would like clarified prior to finalising the LACA.
>
> Just wondering whether a meeting can be arranged for this purpose.
>
> Regards
> Val

From: David Armstrong [redacted]>
Sent: Thursday, 6 April 2023 1:00 PM
To: Val Dyer [redacted]>
Cc: Justin Dyer [redacted]>; Nick Dyer [redacted]; Sturt Plains [redacted]>; David Close <[redacted]
Subject: Stakeholder Engagement Pack - 2023

Hi Val

Please see attached the Stakeholder Engagement Pack. This pack contains information relating to the proposed access agreement plus further information on potential future exploration work.

If you read through it and please ask any questions at any time either via the sheet provided at the end of the SEP or email. Tamboran are happy to provide the relevant people with appropriate experience to discuss any aspect of the SEP.

Hope you have a good Easter

Regards

Dave

DAVID ARMSTRONG

Managing Director
Mobile
Addres
Email [redacted]

<APN Response to Engagement Pack.pdf>

<IMG_20230418_0002.pdf>

Stakeholder Feedback

Stakeholder:	Hayfield Shenandoah – Justin Dyer
Document Referenced:	
Controlled Doc Number:	

#	Ref	Comment	Date	Origin Feedback	Date
	8.1& 8.2	Impact of ongoing AAPA clearance certificates. More of and more permanent sites of cultural significant and unregistered sacred sites and registered sacred sites and other unforeseen "future sacred sites". New variation of definition of sites such as "song lines". • Will inhibit our future development	6/4/23	**AAPA certificates and clearances**. We note your concern that our activity may cause unforeseen issue where you may wish to further develop your station. However, we are happy to share what information we have as that may protect you from damaging a sacred sites as all land users come under the NT Sacred Sites Act. AAPA sacred sites to date have (largely) been associated with permanent/ semi-permanent water courses. These features are often linked together to form song lines/ dreaming tracks and include Newcastle Creek and to a lesser extent the Balmain Lagoon area. These features are widely known, with value recognised. Other than these water bodies, new sacred site types have not been identified (that we are aware of). There are examples of where important features have been identified yet have not been classified as a scared site. For example, during the 2022 sacred site clearances around the Amungee NW area, an archaeological scatter associated with an indigenous camp was identified adjacent to a perennial water body on the Shenandoah East/ Amungee Mungee Station boundary. Although these were important heritage features, they were not considered a sacred site by the Native Title Holders (NTH). Tamboran's sacred site clearance requirements form a part of our Exploration Agreements (EA's) entered with the determined Native Title Holders (NTH). We are required to have the NTH's clear all proposed areas for which petroleum activities are proposed. These requirements are not new and have been in place (in most cases) since the early 2000's. Changes in the NT Petroleum (Environment) Regulations also require an AAPA certificate to be held for all areas for which exploration activities are to be undertaken. AAPA (through an agreement in our EA with NTH's) use the NTH clearances to generate our APPA clearance certificates. The clearances are granted in reference to the petroleum activities proposed, with conditions of works not transferrable to other land users (such as pastoralists). We are happy to open an ongoing dialogue with you to a) utilise Tamboran's clearances to the benefit of the pastoralist where possible and b) ensure we do not set unreasonable precedence's in regard to clearances or feature protection (i.e. implement controls well beyond industry/ NTH expectations).	
		Our ability for carbon credits/ credit acquisition?		**Carbon Credits-** One of Tamboran's key policies moving forward to is produce Net Zero CO2 gas through the way we operate and credit off sets. There is a potential for carbon credits on the Stations. These could potentially be generated by either a) Savannah burning carbon credits or b) human induced regeneration c) soil carbon projects, d) beef cattle herd	

				management and e) a range of other potential methods. Based on some informal high level work completed by Origin previously, the volume of Carbon credits is likely to be constrained due to a) rainfall and b) the current pastoral land use being of lower intensity compared to other areas in Australia. If this is something the pastoralist is happy to explore further with Tamboran, Tamboran could help facilitate a screening study with the intent to enter into a partnership to secure credits to supports its future onshore gas development offsetting requirements. Please advise.	
		• Market acceptance of our beef		**Market acceptance of Beef:** significant levels of onshore gas developments exist across the Darling Downs/ Maronoa Districts and Cooper Basin within Queensland and South Australia. There has been no reduced marketability of beef produced form these areas. In the contrary, additional revenue and associated infrastructure (such as access tracks, watering points etc.) from onshore gas developments has often been used to increase the value of herd through better station drought proofing infrastructure (access to water and revenue during dry periods) and revenue to support infrastructure/ station improvements (such as pasture improvements, irrigation etc.).	
		• Real estate value • Stigma		**Stigma and real estate value-** properties with passive income from Onshore gas production activities are in high demand from investors. These properties, as evidenced in QLD's Darling downs and Maronoa districts, are attractive and have been the target of investors. There is no credible evidence that onshore gas has de-valued real estate prices or created a negative stigma attached to the properties. Given how tightly the onshore gas industry is regulated and the quality of infrastructure implemented- we do not anticipate any decline in real estate value or stigma created. Below sign is outside of Miles in Qld Darling Downs area. 	
		Peaceful enjoyment of the land		**Peaceful enjoyment-** In the area immediately adjacent to the activity, there will be a reduction in the peaceful enjoyment of the station. However, given the location away from homesteads and low intensity of the current proposed or future potential activities, we do not see these impacts as materially impacting on the overall enjoyment of the stations. The greatest level of impact will likely be through ongoing engagement/communication with Operational staff, to facilitate activity planning/execution and ensure that all parties are aware of each other's activities and potential constraints.	

		Time and Scrutiny		**Time and scrutiny-** Time spent negotiating contracts and engaging with Tamboran is compensated through the LAA process. Given both tenure holders (pastoral and exploration permit holders) have obligations to allow the lawful activities of the other interest holders, we believe compensation is an appropriate mechanism. Tamboran also seeks to build transparency of its activities with host pastoralists and will actively look for opportunities to collaborate and design our activities to maximise the long-term residual benefits to the pastoralists through infrastructure (such as access tracks, water bores, laydowns, gravel pits etc. where appropriate and business opportunities).	

Appendix A – Stakeholder Feedback Form

Stakeholder Feedback Form NT-2050-95-AQ-0003

Stakeholder:	APN Pty Ltd.
Document Referenced:	
Controlled Doc Number:	

#	Ref	Comment	Date	Tamboran Feedback	Date
	8.1 & 8.2	- Impact of ongoing AAPA clearence certificates. More of and more permanant sites of cultural significants, Onregistered Sacred Sites and registered Sacred Sites and other unforseen "Future Sacred Sites" New variations of definition of Sites such as "Song Lines" It is like someone says "wedding" when you engage. (With Aboriginal Orgs.)			
		- Will Inhibit our future development.			
		- Our ability for Carbon credit aquisition?			
		- Market acceptance of our beef.			
		- Stigma			
		- Real Estate Value			
		- Peace Full Enjoyment.			
		- Time & Scrutiny energy			

From:	David Armstrong
To:	Val Dyer
Cc:	Justin Dyer; Nick Dyer; Sturt Plains; Robert Wear
Subject:	Information Pack - Proposed Work Program 2024/25
Date:	Friday, 13 October 2023 1:51:31 PM
Attachments:	image003.png Pastoralist Engagement Pack- Hayfield Shenandoah Oct 2023.pdf

Hi Val

As discussed please see attached Tamboran Pastoralist Engagement Pack. This information is in relation to proposed drilling operations for 2024/25. Due to drilling results and information gathered this year, the work program has altered a little hence the attached information pack outlines this proposal. Moving forward we would need to discuss and negotiate an access agreement including compensation.

A basic description of the proposed work program is,

- Drill 2 new wells on the existing Kyalla site. This would make a total of 4 wells on that site. To do this the drill pad would have to be enlarged slightly. This enlargement of the drill pad would be within the current fenced area so no more land is required.
- Constructed a new pad (South Shenandoah 2) approximately 3.7 km north of the Kyalla site just west of the fence line. It is proposed to drill 4 wells on this site over 2024/25.

Once you have read this, if you require, I can organise meetings with appropriate people to answer specific question where they have expertise.

I'll allow you to read over this however if you have any questions please call me anytime.

Regards

Dave

DAVID ARMSTRONG

Managing Director
Mobile
Addres
Email [redacted]

TERRABOS CONSULTING
PASTORAL
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HAYFIELD SHENANDOAH STATION

PETROLEUM (ENVIRONMENT) REGULATIONS 2016
STAKEHOLDER ENGAGEMENT PACK

SEPTEMBER 2023

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Stakeholder Engagement Pack

1. Introduction

Tamboran B2 Pty Ltd (Tamboran) is a registered holder and the operator of exploration permits (**EPs**) 76, 98 and 117 located in the Beetaloo Sub-basin. As a part of Tamboran's forward exploration work program, an Environment Management Plan (**EMP**) must be in place covering all proposed regulated activities. Before an EMP can be submitted to the Minister for Environment for approval, stakeholder engagement in accordance with section 6 (2) of the Northern Territory (NT) Petroleum (Environment) Regulations 2016 (**PER**) must be completed. This Stakeholder Engagement Pack (**SEP**) is designed to satisfy this requirement, covering a range of activities that are intending to form part of a future EMP application.

Tamboran previously provided a SEP on the 06/04/2023 covering a range of regulated activities that may potentially be undertaken on the Hayfield Shenandoah Station (being NT Portion 1077, 7027 and 7026). The recent (September 2023) drilling of the Shenandoah S-1H by Tamboran has confirmed the prospectivity of the deep Velkerri shales in the Shenandoah South area, with arguably the best Velkerri B shale intersection within the Basin. The positive result has prompted Tamboran to modify their forward exploration strategy, with a new focus on defining the Velkerri shale resource within the vicinity of the existing Kyalla 117 N2 site.

The additional activities proposed under this SEP are summarised as:

- **Expansion of the existing Kyalla 117 N2 site**: the Kyalla 117 N2 site will be expanded within the current fenced area to support the drilling of 2 additional E&A wells. The expansion will increase the lease pad size from 5.2 hectares (ha) to approximately 9.0 ha. The lease pad expansion is required to accommodate the storage of additional wastewater tanks and material storage.
- **Drilling of 2 new E&A wells; Shenandoah S-2H and 3H E&A Well on Kyalla 117 N2:** Drilling of the Shenandoah S-2H and 3H Exploration & Appraisal (E&A) wells in 2024 targeting the Velkerri shale on the existing Kyalla 117 N2 pad. Shenandoah S-2H will be stimulated and tested in 2024, with the Shenandoah S-3H stimulated and tested in 2025. An additional 4 wells may be drilled on the pad beyond 2025.
- **Construction of the new Shenandoah S2 exploration location**: Construction of the new Shenandoah S2 location approximately 3km north-northwest of Kyalla 117 on NT Portion 7026 to enable 2024 E&A activities. This includes civil construction of an access tracks, new gravel pit, lease pad, laydown yard and drilling of water bores.
- **Drilling of 4 new E&A wells- Shenandoah S2-1/1H , 2H, 3H and 4H on the Shenandoah S2 location:** Two of the proposed E&A wells are proposed to be drilled in 2024 on the newly constructed Shenandoah S2 location. Two additional wells will be drilled in 2025 on the site. One well will be stimulated and tested in 2024, with the remaining wells in 2025 (or beyond).

A detailed description of the regulated activities is provided within the following sections of this Stakeholder Engagement Pack.

2. Stakeholder engagement process

The requirements of stakeholder engagement are outlined in section 7 of the PER. Specifically, the interest holders are required to provide the following information to each stakeholder:

- the regulated activity the interest holder proposes to carry out
- the location (or locations) where it is proposed to carry out the activity
- the anticipated environmental impacts and environmental risks of the activity
- the proposed environmental outcomes in relation to the activity; and
- the possible consequences of carrying out the activity to the stakeholder's rights or activities.

This SEP is designed to fulfill the stakeholder engagement requirements as defined under the PER. Once stakeholder engagement has been completed, Tamboran will submit an EMP covering all or parts of the proposed activities as described in this document. All engagement after this allocated time

will be considered “ongoing stakeholder engagement”.

Tamboran proposes that any questions or feedback to the information provided in this pack is formalised via the form included in Appendix A within 14 days of receipt of the SEP. Additional time can be provided if requested. This review timeframe is consistent with the EMP public comment timeframe legislated in the PER for EMPs involving drilling or hydraulic fracturing. This is considered a reasonable period for the stakeholder to respond to the information provided.

Tamboran will ensure that all responses are reviewed and responded to promptly. Tamboran also offers face to face or virtual meetings with stakeholders where subject matter experts can present the information in this pack and answer any questions. These meetings should be arranged within 7 days of receipt of the pack so engagement can be scheduled within the allocated engagement period.

3. Scope/ Limitations of Engagement

The regulated activities covered in this SEP are associated with the entire lifecycle of the proposed petroleum exploration wells, from site preparation, through to drilling, stimulation, testing, site decommissioning and all ancillary activities to support. The EMP (or variations of such) will be in force for the next 5 years (the maximum duration of an EMP in accordance with the PER), with revisions required to update the activities within the EMP beyond this period.

Acceptance of this SEP and subsequent approval of an EMP by the Northern Territory Government is not an approval to commence the activities. This SEP and subsequent EMP(s) are designed to satisfy the stakeholder engagement requirements under the PER for the regulated activities proposed.

This SEP does not cover other activity approvals, such as the land access and compensation agreements (LACA) required to be obtained prior to commencement. The requirements for compensation and access agreements for proposed regulated activities are covered under the NT *Petroleum Act 1984* and Petroleum Regulations 2020 and will occur under a separate engagement process. During the LACA process, additional engagement will be completed to provide the pastoralist with further opportunity to discuss any elements of the proposed activity of interest.

As there are multiple opportunities for engagement in the approvals process, any comments received relating to the LACA or other activity/approval not subject to this SEP, will be addressed by Tamboran separately from this stakeholder engagement process.

4. Background

Tamboran B2 Pty Ltd holds the EPs in the Barkly region under the Beetaloo Joint Venture (Beetaloo JV) with Falcon Oil and Gas. The EPs cover 18,512 square kilometres (km^2) of largely pastoral leases on the Sturt Plateau, part of the Barkly Tableland, within the NT. These tenures were granted by the NT Minister for Mining and Industry[1] under the NT *Petroleum Act 1984*.

The regulated activities proposed under this SEP are anticipated to commence within the 2024 to 2026 period (and beyond). Like all exploration programs, proposed activities often cover a range of scenarios governed by a range of technical, regulatory and financial constraints. Any proposed changes will be communicated to the pastoralists through ongoing engagement to ensure any changes in activities, priorities or strategy are promptly communicated and impacts understood.

Tamboran B2 is focusing its E&A activities around specific areas that could support future production and bringing gas to market as soon as possible. As outlined in the previous SEP provided to the pastoralist on the 06/04/2023, Tamboran is focusing its E&A efforts around two main areas; the Shenandoah South Pilot Area (around the existing Kyalla 117 N2 location) and the Amungee Delineation Area (around the existing Amungee NW location near the Carpentaria Highway).

The recent (September 2023) drilling of the Shenandoah S-1H by Tamboran has confirmed the prospectivity of the deep Velkerri shales in the Shenandoah South Area. This result has prompted Tamboran to modify its forward strategy, to further evaluate the resource within the vicinity of the

[1] Formally the Minister for Mines and Energy.

Kyalla 117 N2 site. The Shenandoah S A/B/C locations remain viable future E&A locations, with wells likely drilled at these locations in the coming years.

Conversely, the recent difficulties experienced with the Amungee NW 2H has prompted Tamboran to return to back the Amungee NW location (on the Amungee Mungee Station) to drill another E&A well. This well is referred to as Amungee NW 3H. Amungee NW 3H was spudded in late-September, with the hydraulic fracture and test not planned to Q2/3 2024. While Tamboran remains confident of the success of this proposed well, this change will delay construction of the proposed Amungee NW3 location on East Shenandoah (located on north of the Carpentaria Highway).

The next location will ultimately depend on the results achieved from Shenandoah S 1H and Amungee NW-3H. Should Shenandoah 1H achieve positive well results, then efforts will centre around the existing Kyalla 117 N2 site. Should Shenandoah S 1H underperform and a positive well result from Amungee NW 3H is achieved, then efforts will shift to the Amungee Delineation Area (around the Carpentaria). Should both wells show high prospectivity – then E&A activities are likely to focus on the area for which can bring gas to market the quickest. This may mean prioritisation of wells on Amungee NW3 with gas directed into the Macarthur River Mine Pipeline (MRMP) and/or focus on the Shenandoah South area with a pipeline connecting the Amadeus Gas Pipeline (AGP) prioritised. The ultimate decision is likely to be based on commercial factors, such as pipeline capacity and tolling arrangements.

Like the previous communicated SEP, Tamboran intends to reduce flaring and subsequent greenhouse gas (GHG) emissions generation through the beneficial use of appraisal gas. A level of flaring will be required to justify any capital expenditure on beneficially using appraisal gas. Flaring will typically occur for ~ 30-180 days at each well site depending on observed production rates and whether gas can be beneficial used (sold or utilised onsite). Where gas can be beneficially sold, then Tamboran will seek to minimise flaring as much as practicable.

The sale of appraisal gas may occur through the construction of temporary processing facilities and pipelines to transport gas into the adjacent pipeline infrastructure (such as the McArthur River Mine Pipeline (MRMP) or Amadeus Gas Pipeline (AGP)). Tamboran may also look to generate compressed natural gas (CNG) or liquefied natural gas (LNG) onsite, which will be transported to customers regionally. To minimise land clearing and equipment duplication, it is proposed that lease pads will be connected by gathering lines to allow for the movement and storage of water and produced gas between sites. This is designed to reduce the construction of new infrastructure required for wastewater tanks. A laydown is also proposed adjacent to Shenandoah S2 to store material (drilling rods, casing, proppant, bulk chemicals etc.) required for the forward program.

Information on the sale of appraisal gas is provided broadly within the scope of this SEP, including the indicative locations for future appraisal gas facilities and pipelines. This scope is considered highly conceptual in an effort to communicate the types of future infrastructure that may eventuate. Tamboran acknowledges that further engagement is required once the detailed scope moves beyond the conceptual stage.

5. Location of the Regulated Activities

The proposed additional exploration activities are located on the Hayfield Shenandoah Pastoral stations. The location of the proposed new activities is provided in Table 1 and illustrated in Figure 1.

An overview of all the proposed activities within the Shenandoah South Area is provided in Figure 2 to provide context about how all the scope will fit together.

Table 1 Regulated activity location

Exploration Permit (EP)	Infrastructure description	Proposed disturbance area	Proposed location		
			GDA94 Zone*	Approx Easting	Approx Northing
EP 117	**Expansion of Kyalla 117 N2**: Upgrade of the pad form ~5.2ha to 9ha to accommodate additional wastewater storage.	~16 ha	53	356379.72	8137498.48
EP 117	**Shenandoah S 2H & 3H:** Drilling, stimulation and testing of up to 4 new E&A wells targeting the Velkerri shale. It is anticipated that 2 E&A wells will be drilled in 2024, with an additional 2 drilled in 2025 and beyond.	N/A	53	356379.72	8137498.48
EP 98	**Shenandoah S2- New Exploration site** including construction of new lease pad (up to 12 ha), Fence line (4.0 ha) and 2.0 km access track (2.8 ha) and new laydown yard (5ha).	23.8 ha	53	355335.00	8141529.00
Ep 98	**Shenandoah S2-1/1H &2H:** Drilling, stimulation and testing of up to 4 new E&A wells targeting the Velkerri shale. It is anticipated that 2 E&A wells will be drilled on the new site in 2024 (including the vertical pilot) , with an additional 2 drilled in 2025 and beyond.	N/A	53	355335.00	8141529.00
EP98	**Shenandoah S2 Gravel Pit (SSGP 3**) construction and operation of a gravel pit up to 5 hectares	5.0 ha	53	355980.01	8140259.19

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

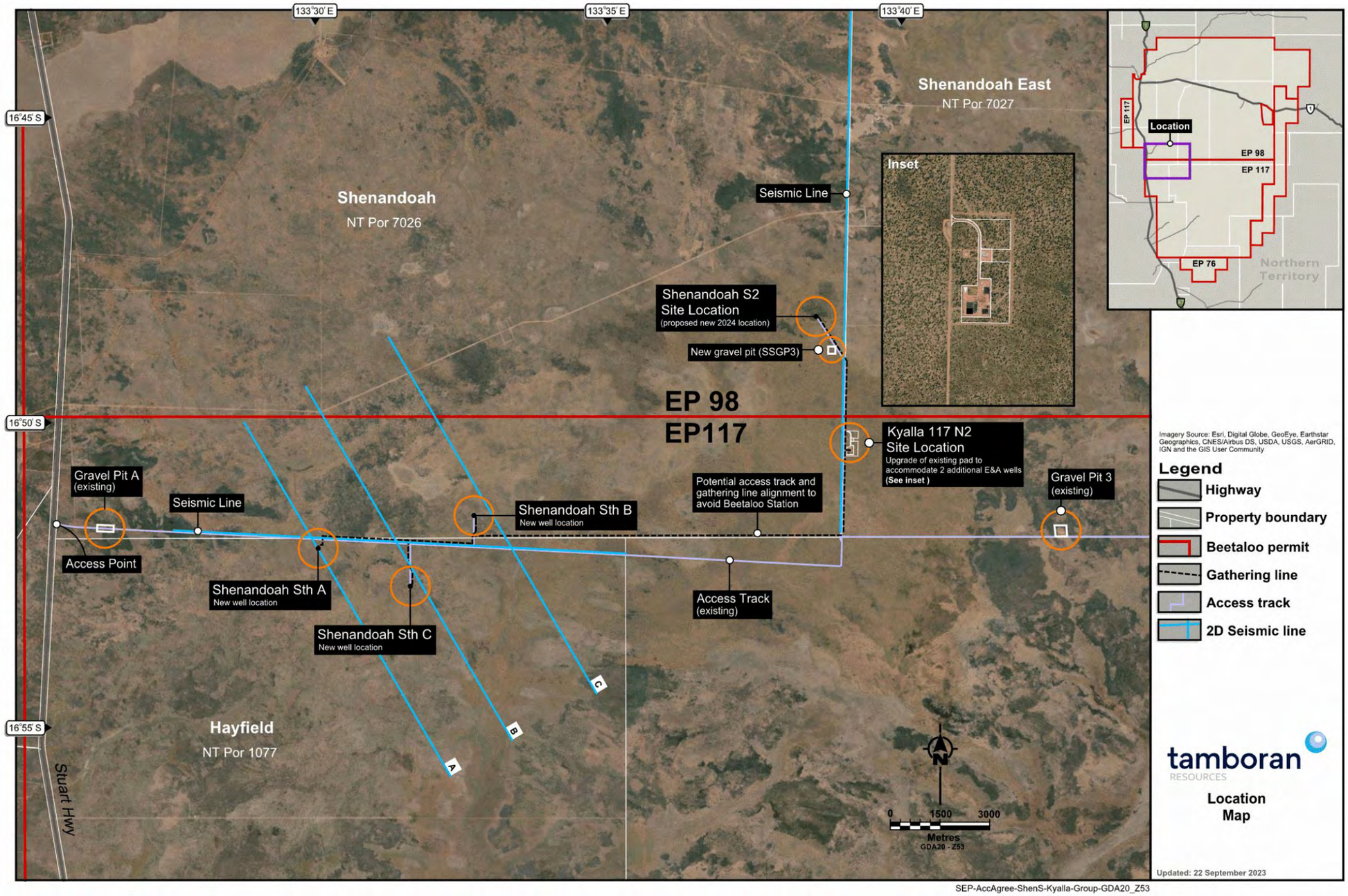


Figure 1 Proposed location of new regulated activity scope covered under this SEP

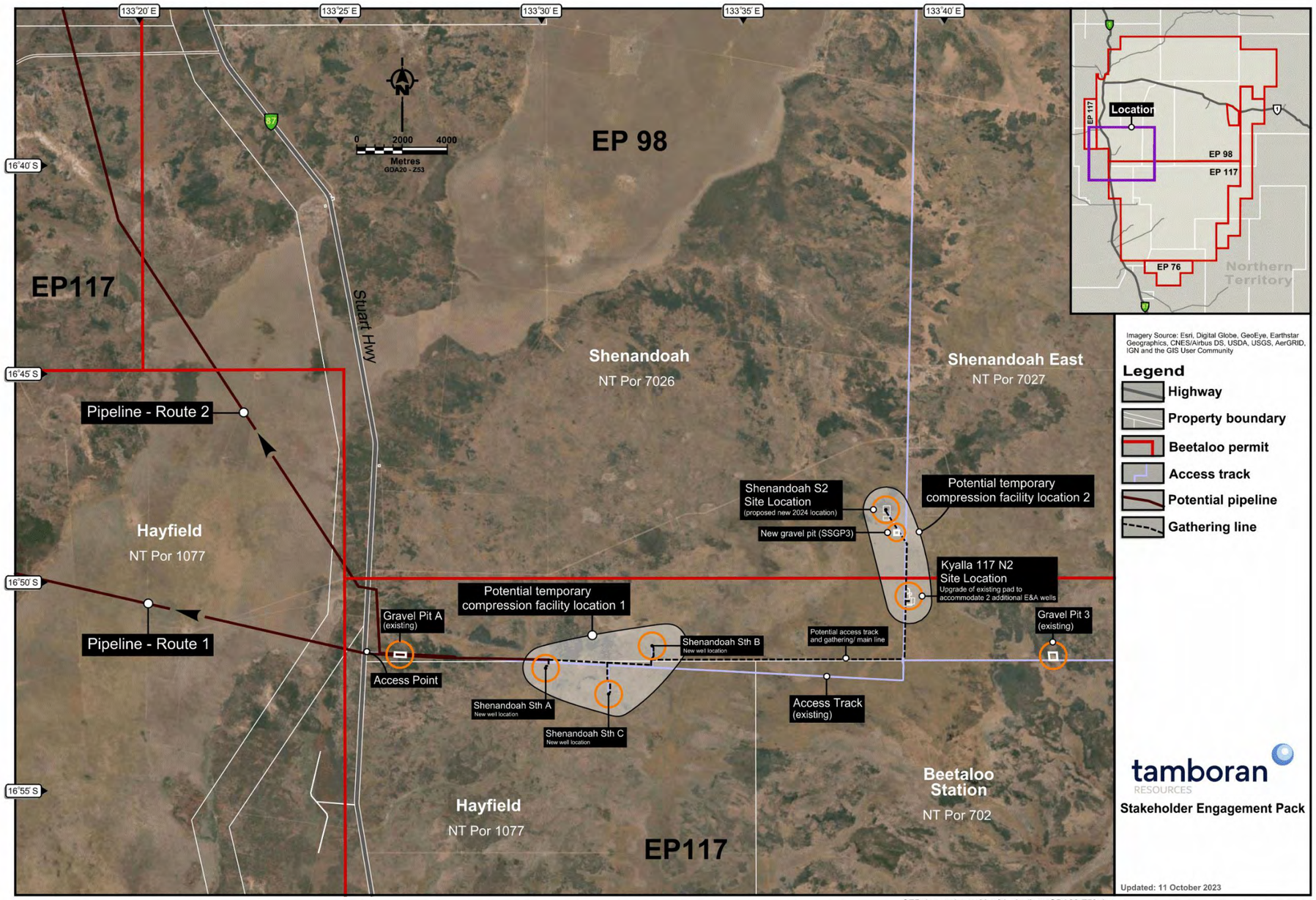


Figure 2 Location of all regulated activities on the Hayfield Shenandoah Station, including insights into the location of future infrastructure (indicative- subject to ongoing discussion). 2 proposed temporary facility locations are provided to demonstrate where appraisal gas facilities may be eventually constructed (subject to exploration success).

6. Detailed Description of the Regulated Activity

6.1 Additional scope

The additional proposed exploration activities to be carried out across the Hayfield Shenandoah Station include:

- **Expansion of the existing Kyalla 117 N2** site within the existing fence line including:
    - Civil construction to increase the pad size from ~ 5.2 ha to 9 ha to accommodate additional E&A wells, sand loading and water storage, as well as improve site access.
    - Indicative schematic of the site expansion is provided in Figure 3
- **Drilling of 2 new wells on Kyalla 117 N2 (Shenandoah S- 2H and 3H E&A Well)** including
    - Operation of the Kyalla 117 N2 site, including access track, gravel pits (Gravel Pit A and Gravel Pit 3), lease pad, camp pad and helipad.
    - Construction of 2 new well cellars
    - Drilling, stimulation, testing, maintenance, suspension and decommissioning of 2 new E&A well targeting the Velkerri shale. An additional 2 new wells are proposed for 2025 (subject to confirmation)
    - Low term management of flowback and drilling wastes, including management of wastes from other sites within the Beetaloo
    - Drilling of new water bores (currently not planned - but contingent)
- **Shenandoah S2**: Construction of a new exploration well pad Shenandoah S2 located north of the existing Kyall 117 N2 location on NT Portion 7026. This construction of this new site includes:
    - Construction a new lease pad (up to 12 ha) and fence line and firebreak (~4.0 ha).
    - Construction of a new 2 km access track connecting the proposed site to the existing access track.
    - Construction of a 5 ha laydown yard to accommodate material storage required for longer horizontals and wet season operations.
    - Upgrade and use of the existing pastoralist access track from the Kyalla 117 N2 site to the turn off to Shenandoah S2.
    - Drilling of up to 8 groundwater monitoring/ extraction bores- including a preliminary bore pad constructed before the main lease pad construction.
    - Construction of multiple well cellars to accommodate E&A wells
    - Construction and operation of wastewater tanks, including the transfer of flowback and waste fluids to the adjacent Kyalla 117 N2 site for longer term treatment and storage.
    - Gathering lines may be constructed connecting the Shenandoah S2 site with the Kyalla 117 N2 site. These gathering lines may be temporary aboveground lines or buried lines and used to move gas and water between sites.
    - A schematic of the proposed Shenandoah S2 location is provided in Figure 4
- **Drilling, stimulation, testing maintaining and decommissioning of 4 horizontal E&A wells on the new Shenandoah S2**. 2 new E&A wells will be drilled in CY 2024- and a further 2 wells from 2025. Stimulation and testing activities will be carried out within the 2024 and 2025 period. Activity includes:
    - Drilling, stimulation and well testing
    - Flaring or beneficial use of produced hydrocarbons (such as onsite power generation), notionally between 30 – 180 days (exact duration to be confirmed).
    - Storage and management of flowback and drilling wastes, including management of wastes

from other sites within the Beetaloo

- **Construction and ongoing operation of a new gravel pit (SSGP3) up to 5 ha** within the immediate vicinity of Shenandoah S2 site to support the surfacing of the access track and infrastructure.

- **All ancillary activities on each site required to undertake E&A activities including:**
  - Power generation, including usage of produced appraisal gas
  - Bulk chemical and fuel handling, storage and use
  - Material transport and storage
  - Helicopter operations
  - Flaring and appraisal gas usage – including future sale of gas
  - Flowback wastewater management, recycling and treatment
  - Recycling of wastewater, including the recycling of waste drilling fluids, completion fluids and flowback into operational process (such as stimulation make up water)
  - Groundwater extraction and monitoring
  - Micro-seismic data acquisition and associated works
  - Induced seismic monitoring and associated works
  - Environmental monitoring for weeds, flora, fauna, soil, air quality and other environmental aspects
  - Inspection and maintenance
  - Office, workshop and laydown areas
  - Operations of camps at each location
  - Subsurface diagnostic tests and data collection on each petroleum exploration well
  - Maintenance and monitoring of each of the proposed petroleum exploration wells and infrastructure
  - Suspension and decommissioning of the proposed petroleum exploration wells.
  - Rehabilitation of disturbance areas
- Photographs of typical activity phases is provided in Figure *5* to Figure 9.

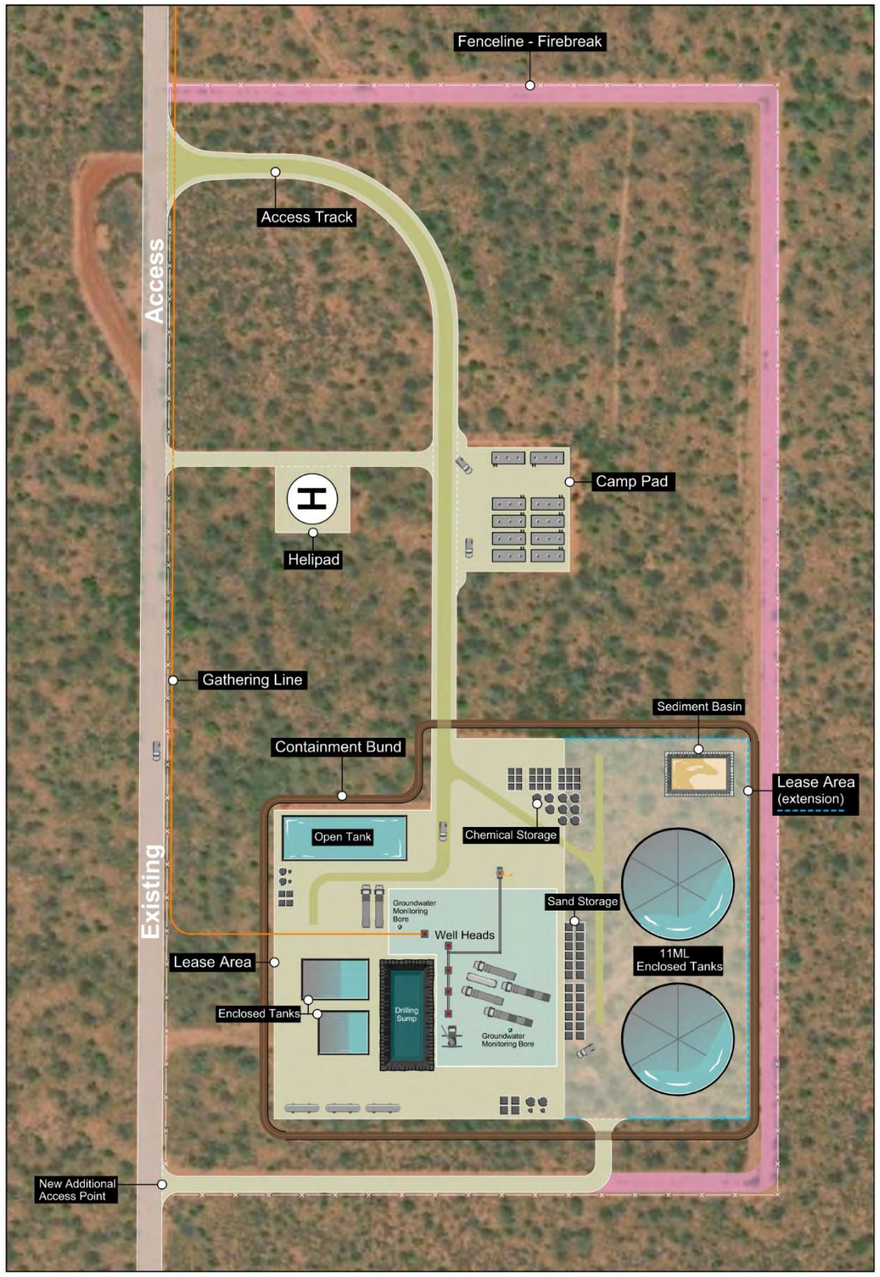


Figure 3 Schematic of the proposed expanded Kyalla 117 N2 location to support additional wells and ongoing fluid and drilling waste management

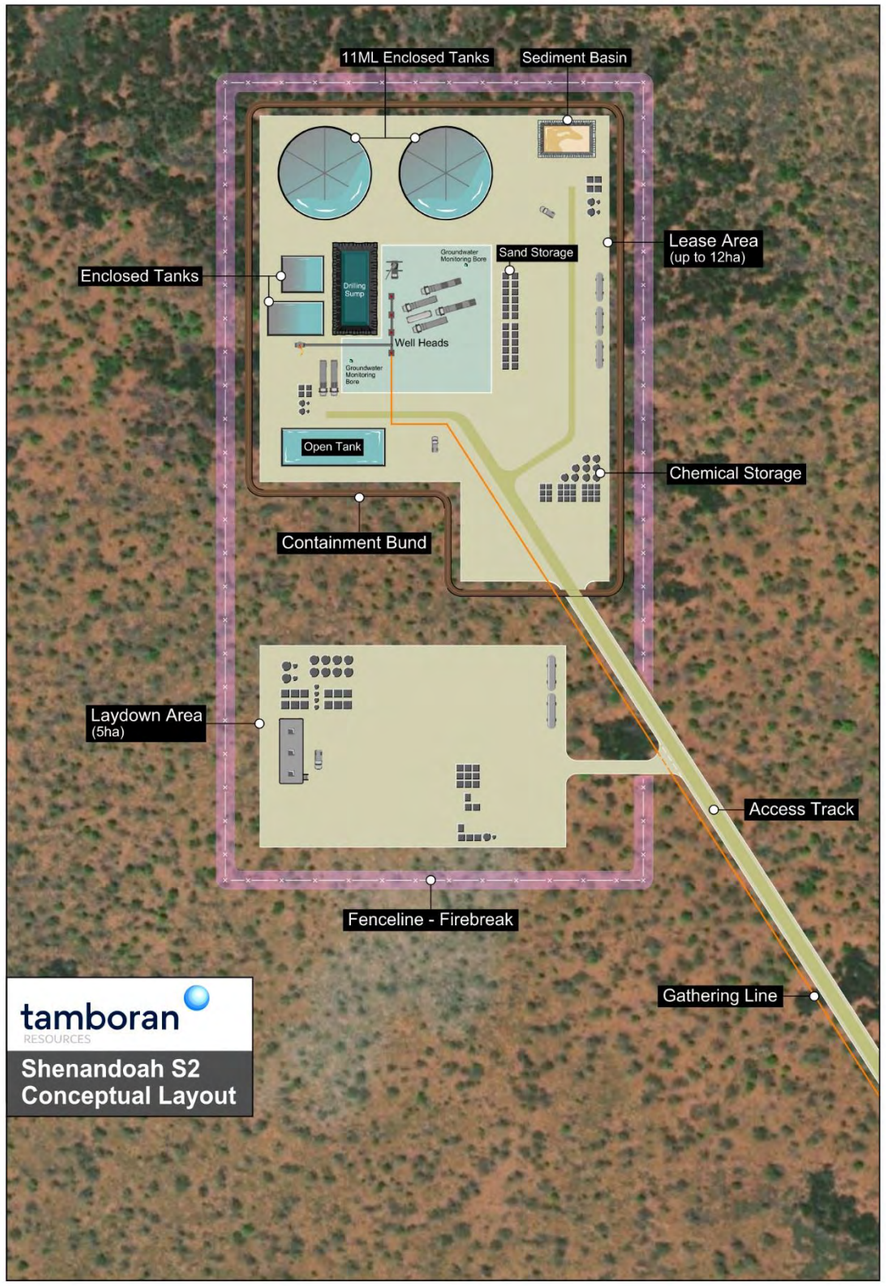


Figure 4 conceptual schematic of what Shenandoah S2 may look like

Figure *5* Overview of an exploration site within the Beetaloo undergoing lease and camp pad construction, with water bore drilling underway

Figure 6 Typical well site layout during drilling; this is the existing Kyalla 117 N2 site

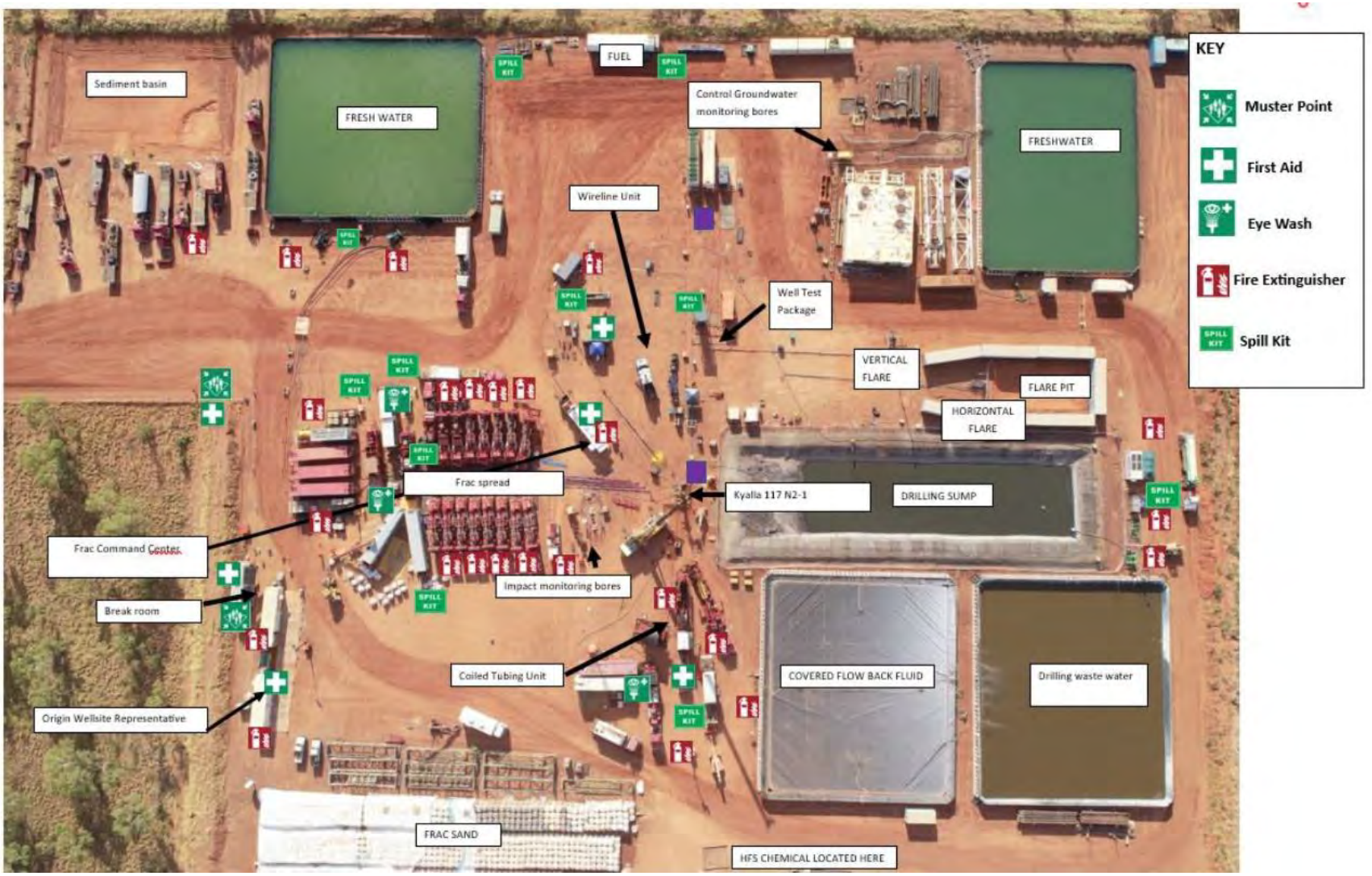


Figure 7 Typical hydraulic fracture stimulation spread at the Kyalla 117 N2 site

Figure 8 Example of a well test underway at the existing Amungee NW location – noting flaring will be minimal if gas is sold instead of flare

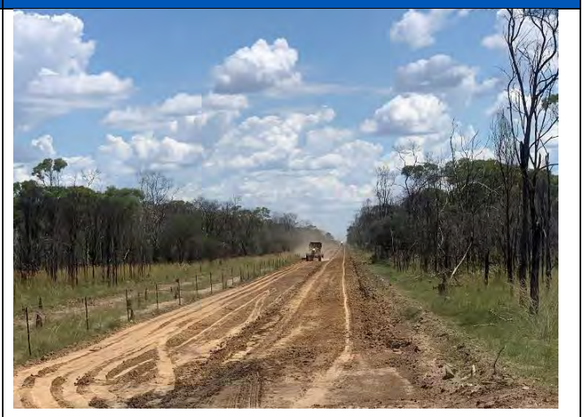
Figure 9 Example of a temporary gas processing facility used to compress and sell gas into the domestic gas market

6.2 Activity description

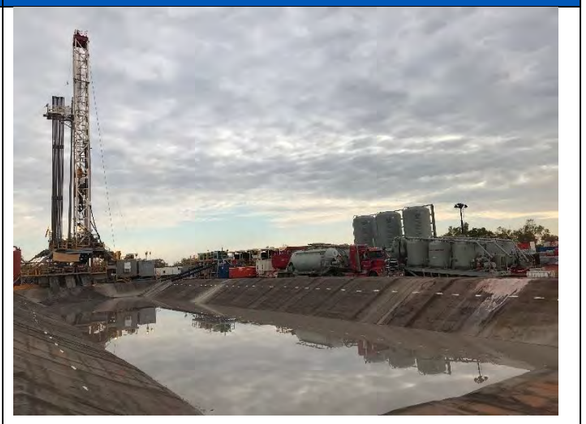
The following information details the proposed exploration activities on the Hayfield Shenandoah Station. These descriptions are indicative and general in nature. Minor departures from such descriptions are likely to occur and such departures are covered by the content of this SEP or through ongoing communication with the pastoralist. The information has also been summarised in Table 2 with the relevant activity description and picture.

Table 2 Description of proposed regulated activity

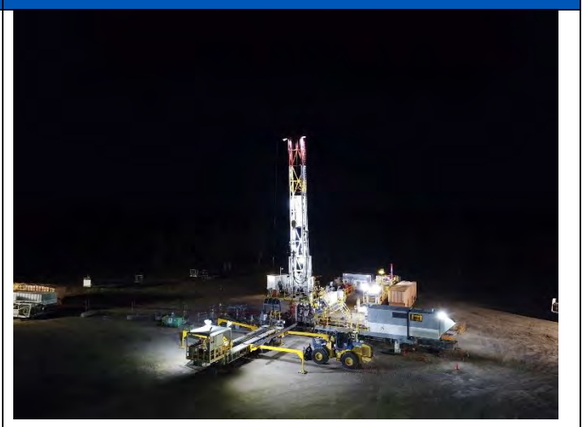
Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Groundwater monitoring and extraction bore installation Groundwater monitoring and extraction bores will be constructed using a water bore drilling rig, identical to the rig used to drill pastoral water bores. All groundwater monitoring bores will be constructed in accordance with the *"Minimum Construction Requirements for Water Bores in Australia"*. Bores may be drilled into the Anthony Lagoon Formation (if present and saturated), and/or Gum Ridge Formation. Waste cuttings, drilling fluids, muds and formation fluids will be collected in a small earthen sump and managed in alignment with the practices outlined in the *"Minimum Construction Requirements for Water Bores in Australia"*. The fluid (which is anticipated to be fresh) will be discharged to ground in the area surrounding the lease. The formation cuttings and drill muds will be mixed with soil onsite and incorporated into the lease pad surface.	Located within lease pad disturbance	<6 people	Typically prior to exploration well site construction	2-4 weeks	
Civil construction of lease pads, camp pads, laydowns, helipad, fence lines and firebreaks The lease pad will be cleared of vegetation, grubbed and stripped of topsoil. Topsoil will be stored around the edge of the lease pad to form a bund, which will be used as both an erosion and sediment control and wastewater containment bund. The lease pad will be levelled, compacted and surfaced with gravel to accommodate exploration activities. Erosion and sediment controls will be constructed around the disturbed areas (such as rock check drains, woah boys and diversion drains). Where flowback wastewater is proposed to be stored, the site/storage area will be bunded to prevent offsite release. A sediment retention pond will be installed within the wastewater storage area to manage surface water collected within the bund. Stormwater captured onsite will be tested and released into the adjacent area. Wastewater (including solids) from drilling and flowback may be transferred and stored between sites 9Kyalla 117 N2 and Shenandoah S2) to reduce the size of surrounding lease pad. Utilisation of shared infrastructure will reduce infrastructure duplication and reduce land clearing requirements. On each pad 8 m^3 well cellars will be constructed on each of the proposed leases to accommodate the wellhead equipment and blow-out preventer (BOP). Where a sump is to be utilised onsite to manage drill cuttings, drilling sumps will be lined with an impermeable liner to contain all drilling fluid, drilling muds, cuttings, cement returns and waste sand. Drilling sump holding capacity is typically 3000 m^3. The drilling sump / broader site will be fenced to prevent livestock access. The site will be fully fenced with a 20 – 50 m firebreak installed as a firebreak also referred to as an asset protection zone. Each of the access track intersections with the Carpentaria and Stuart Highways are also likely to be upgraded to comply with DIPL requirements, with a turn in bay and sealing of the road verge. During this period, traffic control will be deployed to manage the activity.	Shenandoah S2- up to 12.0 ha. Kyalla 117 N2 up to 9.0 ha	<20 people	Prior to exploration drilling	8-12 weeks	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Access track construction To minimise disturbance, existing pastoral access tracks will be upgraded where required. Access tracks will be graded, formed and sheeted within gravel (where required) to maintain a safe driving surface. New access track will be up to 14 m wide; with provisions for a 6 m formed surface and 2m shoulder as per the *NTG Standard Drawings (CS3003) for Typical Cross Section for Rural Environment – Pastoral Access Road 2* (Appendix A). Diversion drains, cut outs and creek bed level crossings will be used to manage overland flow and prevent erosion. Access tracks will be periodically maintained to keep in good working order.	2km of new access with upgrade and use of an additional ~2 km of existing pastoral track	<10 people	During civil construction activities	4-6 weeks	
Camp construction and operation It is anticipated that the Kyalla 117 n2 camp pad will be utilised to support operations. Each camp will be a self-contained facility with accommodation rooms, kitchen, dining mess, offices, ablutions, gymnasium, storerooms, refrigeration, water storage, power generation, solid waste management, fuel storage, water treatment, sewage treatment and sewage irrigation area.	N/A- disturbance included in overall exploration site disturbance.	<90 people (including housed staff)	For duration of activity	For duration of activity	
Gravel pit construction and operation A new 5 hectares additional gravel pit will be constructed within the vicinity of Shenandoah S2 (SSGP3). Existing gravel pits A and 3 will also be utilised. Each pit will be cleared of vegetation, grubbed and stripped of topsoil down to approximately 100 mm (depending on the depth of topsoil onsite). Subsoils will be removed from the pit and segregated from topsoil. Topsoil and subsoils will be stored around the edge of the lease pad to prevent overland flow into the pit. Upon completion, the pit will be recontoured to leave a slight depression, with subsoils and topsoil reinstated to allow vegetation to re-establish. In some cases, composted drilling waste mixed with subsoil and manure may be utilised as a growth media to back fill the gravel pits where the material is of suitable quality. B-doubles and triples will typically transport gravel to the required point. A schematic of the typical gravel pit operation and rehabilitation is provided in Appendix C.	<5.0 ha of new pits	<6	Constructed to support civil construction activities.	For duration of activity	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Microseismic survey and induced seismic monitoring Microseismic Monitoring Surveys are undertaken 'listen to' the Hydraulic Fracture Stimulation Operations on each of the sites. Seismic receivers called geophones are individual weatherproof units that contain a sensitive seismic recording device, memory storage, a long-life battery and GPS locator. The geophones are deployed 5 – 25 m apart along lines or in a grid over an area of 30 – 40 km^2 around each of the wells during stimulation activities. Geophone deployment locations are located on foot by GPS locator. A handheld battery drill is used to create a 4 cm diameter hole with an auger bit, a small quantity of water may be used to stabilise the soil. The geophone is inserted into the hole so that the top of the receiver is flush with the surface of the ground (see picture). The geophones are deployed prior to the commencement of stimulation and retrieved after the stimulation has concluded. Deployment and retrieval of the geophones is undertaken in small teams of 2 or 3 people, with the number of deployment teams dependent on survey size. The teams are supported by a light 4WD vehicle or an all-terrain vehicle to carry equipment, gear, water, communication (radio/satellite phone), first aid kits and safety gear. Induced seismic monitoring will also be undertaken at the same time as the microseismic monitoring. A temporary seismic receiver is installed ~1km from the well site, with a small amount of other equipment such as solar panels and data transfer equipment. The equipment can be fenced off with temporary fencing if there are cattle in the area. The data from the seismic receiver is sent wirelessly back to the well site to enable live monitoring of seismic events during hydraulic fracture stimulation. The Induced Seismic Monitoring equipment is installed prior to hydraulic fracture stimulation, and remains installed, collecting data for up to 2 months after the conclusion of hydraulic fracture stimulation. No line clearing or heavy machinery is required for either activity, as the activities are considered to have a minimal impact.	Variable – similar to scouting over a 30 – 40 km^2 area	Up to 10	Before or after exploration well drilling with the final time to be confirmed	4-10 weeks per site	
Exploration well drilling Up to 4 petroleum exploration wells are proposed to be drilled at the proposed locations, with 2 wells drilled at each location in Calendar year 2024 (2 at the existing Kyalla 117 N2 and 2 at the new Shenandoah S2). Additional wells will likely to be drilled on the site in 2025 and/or beyond. The exact number will depend on appraisal success and through ongoing negotiations with the pastoralist. Each well will be drilled into an underlying prospective petroleum reservoir (anticipated to be the Velkerri shale) to a typical depth of between 3000- 3500 m. Each well will be deviated into the horizontal position, with a lateral drilled up to 4000 m (Tamboran's current base case is 3000 m). Each petroleum well is designed and constructed in accordance with the *Code of Practice for Onshore Petroleum Activities within the NT* (the Code) to maintain well integrity and protect aquifers and the environment. A Well operations management plan (WOMP) is required to be submitted to the regulator and approved prior to the drilling of any wells. The WOMP outlines the well design and drilling practices that will be deployed to ensure compliance with the Code and protect underlying aquifers and the environment. Each well is anticipated to be constructed with multiple casing and cement strings, typically 4 casing strings (conductor casing, surface casing, intermediate casing and production casing). Once the well design is approved by the NTG, a rig package will be mobilised to site, which consists of a drilling rig (comprising rig matting, a rig floor, mast or derrick, rig engine, blow out preventor, catwalk, safety flare etc.), pipe racks, casing strings, drilling rods, rig fluid system (mud tanks, shakers, mud treatment system and pipework) storage trailers, bunded chemical storage areas, workshop portable onsite offices, crib huts, mini-rig camp and sewage treatment system and irrigation area), freshwater storage tanks, diesel power generation, cement trucks, bulk fuel storage, water transfer pumps, fork lifts, lighting towers, crane, etc. The rig will be constructed over the pre-installed stove pipe and cellar. Once functional, drilling will proceed down below the first encountered aquifer, where the first casing section of the well will be installed (either in the Anthony Lagoon Formation if present and saturated or the Gum Ridge formation	N/A located on proposed lease pad	<60 people	Pastoralist to be notified when drilling proposed	Typically 60 – 90 days per well	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
(anticipated to be present). After the surface casing is set, a BOP will be installed, to ensure any influxes of gas, water or pressure are able to be safely managed during drilling of the remaining sections of the well. The drilling rig will continue to drill the other casing and cement sections. The integrity of each of these casing strings is tested through a combination of leak off tests, casing pressure tests, cement return tracking and cement bond logs. Upon completion of drilling, a barrier integrity verification report is submitted to the regulator summarising the integrity of the well. Once each well is finished drilling, the well head is installed, and the rig is either "walked" to the next adjacent location with the process repeated or mobilised to a new location. A low toxicity water-based drilling mud is to be used as the base fluid for drilling, which primarily contain low toxicity salts (CaCl, KCl and NaCl) and polymers. Drilling mud is required to maintain well control, provide formation stability, lubricate and control the temperature of the drill bit and lift cuttings to the surface. The fluid system consists of water with a sodium or potassium-based salt (to prevent formation swelling) and a viscosifying agent such as bentonite. Other low toxicity chemicals such as barite, citric acid, sodium bicarbonate and loss circulation material (fibres such as coconut coir or nut hulls etc.) may also be used. The chemicals used for drilling are consistent with those used for water bore drilling. Waste drilling muds, fluids, cuttings and mineral waste (such as cement returns, sand etc.) brought to surface will be stored either a) in temporary cutting bins/ tanks and then periodically moved to an existing site for ongoing management or b) within an onsite lined drilling sump. Drilling fluids will typically be evaporated and then removed from the sump and disposed of offsite. During the top hole drilling section, low salinity wastewater may be recycled as dust suppression where it is authorised to do so. Solid waste within the drilling sump will be allowed to dry out and then either removed from site or disposed of onsite in accordance with the Code. Where onsite disposal is proposed, a risk assessment will be completed demonstrating that the activity can occur with no residual environmental harm. Onsite disposal can include encapsulation or mix bury cover, depending on the site-specific details and final composition of the drilling waste material. Subsurface diagnostic tools will be run on the well during and after drilling to understand the nature of the target reservoir. Some sections of the formation may be cored or have sidewall samples collected, which will add further analysis of the reservoir properties. To assist with determining the suitability and capacity of these formations for potential gas extraction activities, diagnostic fracture injection test (DFIT) may be conducted across several shale intervals to evaluate the geo-mechanical and reservoir properties of the targeted formation. Prior to a DFIT, a cement bond log and casing pressure test is completed to ensure the integrity of the cement and steel casing. A DFIT involves the injecting of small volumes of a water (approximately 30 barrels (5,000 L) per DFIT) at low pumping rates to create a small fracture in the target interval. The well is shut-in, and the pressure allowed to fall-off naturally. Monitoring the fall-off pressure over time allows information to be derived about the reservoir. The fluid does not contain proppant so that the fracture closes naturally when the fluid leaks off into formation. The analysis of pressure, during injection and after shut-in, provide powerful tools for understanding and subsequently informing the design for a future hydraulic fracturing process (not in this scope). Any returned fluid will be stored within the lined drilling sump, temporary tanks or disposed of offsite at a licenced facility.					

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Hydraulic Fracture Stimulation Upon completion of drilling activities at each site, a frack spread will be mobilised to site to commence hydraulic fracture stimulation (HFS or stimulation) activities on each drilled well. A frack spread consists of: • Data van: On-site office to execute stimulation activities. • Water storage: Tanks will be constructed on-site, capable of managing both make-up water and flowback water. Tanks will be double lined with leak detection capable of monitoring any leaks between the primary and secondary liner. Tank number will depend on encountered flowback volume and can range between 5 – 12 tanks (the exact number may be more or less than the anticipated number). • Proppant trailer: A large sand storage and delivery trailer that holds the proppant. • Hydration unit: Used to add stimulation additives and viscosifying fluids. • Blender unit: Used to mix proppant and fluid additives, prior to its injection into the well. • High pressure pumps: Pumps which inject the hydraulic fracturing fluid mixtures from the blender unit down the well, via the surface lines and hydraulic fracturing wellhead or coiled tubing unit. • Coiled tubing unit: A large length of coiled steel pipe that can be temporarily installed in the well to perform various downhole operations. • Wireline unit: Plug and perforation deployment. • Ancillary support buildings: Offices, workshop, cranes, chemical storage area, equipment storage, power generation and all other activities required to support stimulation activities. Stimulation involves the injection of a slurry, primarily consisting of water and sand (proppant), plus a small percentage of chemicals at high pressure into the target section of the horizontal wellbore. Typically, 90% or higher of the total volume in stimulation fluids is a combination of fresh water and sand (~6 – 8%), with the remainder as fluid-conditioning additives (~2 – 4%). Wastewater, including drilling, completion and flowback fluid, will also be preferentially utilised within the stimulation fluid to minimise raw water use, reduce ongoing wastewater storage requirements and minimise offsite trucking. Where wastewater is to be recycled, it typically will be filtered to remove solids, treated with a biocide to reduce bacteria growth and then blended with raw water prior to being added to the blender. Stimulation chemists will factor in the wastewater's chemistry during the fluid design to ensure compatibility. Prior to the commencement of stimulation activities, the integrity of the well is tested with a cement bond log and pressure casing test. This integrity report is submitted to the regulator prior to the commencement of stimulation activities. The stimulation fluid is pressurised by the high-pressure pumping units and directed downhole via a manifold to the discrete target intervals along the horizontal wellbore (referred to as 'stages'). Each stage will be isolated and perforated using a plug and perforation gun assembly deployed via a wireline unit. As the pressure is sustained, the fractures propagate radially from the well, through the target rock. Once optimal fracture propagation has been achieved, the proppant (sand) is pumped down the well and into the open fractures. This process is repeated for each stage. Where multiple wells are drilled on a well pad consecutively, they will typically all be stimulated in sequence. This maximises efficiency and reduces mobilisation requirements. The final number of stages pumped in each well is dependent on the useable length of the horizontal wellbore and in-situ geological conditions.	N/A located on proposed lease pad	<50 people	Post exploration well drilling	2 – 8 weeks per well depending on stimulation size	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Well completion Once each well has been stimulated, a completion rig will be mobilised to site to "complete" the well. This involves installing downhole equipment such as packers, plugs, production tubing, artificial lift required to enable the production testing.	N/A located on proposed lease pad	<12 people	Post stimulation	1 – 2 weeks	
Well testing Once each well has been completed, the well will be brought online and tested typically for a period of 30-180 days. Tamboran proposes to flare early wells for approximately 180 days, to justify the capital expenditure to justify the sale of appraisal gas. Where appraisal gas sale is possible (i.e. through a pipeline or onsite compressed natural gas/ Liquified Natural Gas processing), flaring will be avoided where possible. The duration of testing involving appraisal gas sale may extend beyond 24 months. To enable the testing, a well test package will be installed at the site consisting of: • separators (to separate gas, condensate and water) • flares (either a vertical or horizontal), • flare pit (if a horizontal flare is utilised • surface pipework, manifolds, and tanks • communication and generator shacks • workshops/ storerooms • bulk diesel tanks • wastewater storage tanks (converted freshwater storage tanks used for stimulation makeup water) • water transfer equipment • wastewater evaporation and treatment units • camp accommodation. Each of the exploration wells will be underbalanced (or "unloaded") to initiate production, either through its own energy or through artificial lift (such as through a Nitrogen lift or pump). The fluid and gas will be sent through a separator, with all hydrocarbons metered and either flared or sent via gathering lines to an existing site (Kyalla 117 N2 or Shenandoah S2) to be beneficially used (sold/ used for power generation). Flowback water will be discharged from the separator into designated wastewater storage tanks onsite or transported via gathering lines to an existing site for centralised management. Multiple well testing operations may be required to test the behaviour of the formation to determine whether extended shut ins can affect well productivity. After or during production testing operations the well/s may be shut in for a period to allow the pressure to naturally build up to assess reservoir pressure.	N/A located on proposed lease pad	<12 people during production testing	During exploration activities	Typically 1 to 24 months	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Wastewater tank storage Wastewater can be generated as Flowback, Drilling wastewater and completion fluids. Flowback refers to water utilised for HFS that is "flowed-back" to surface. Flowback is typically saline, with elevated boron, barium, strontium and other metals. The saltiness of the water is the highest hazard. Drilling wastewater is fluid that results from drilling the well and often includes salts, muds and other additives (such as surfactants, polymers, biocides, lubricants etc.). the fluid utilised for the drilling through aquifers is low toxicity, less saline and is typically suitable for use as dust suppression or recycling. Completion fluids are generally salt, or polymer weighted fluids designed to prevent corrosion or inhibit formation pressure/ reaction. Flowback, drilling and completion wastewater will be recycled as a priority to reduce raw water usage and minimise ongoing waste storage and disposal. Recycled wastewater will be mixed with raw water within wastewater tanks and utilised in stimulation make up water (typically at a ratio of 1 part wastewater to 5 parts raw water or higher). Where wastewater cannot be recycled, wastewater will be treated on site via evaporation (or other treatment technologies) and removed from site upon completion of activities. Evaporation is used to minimise the volume of wastewater required to be transported offsite, reducing the amount of truck movements. Double lined wastewater tanks will be utilised to store wastewater, with the volume and number of tanks installed dependent on the anticipated flowback return volume. It is anticipated that a combination of enclosed tanks and open treatment tanks will be utilised at each site, with the overall tank capacity determined by the number of wells, horizontal length of each well, stimulated stages of the proposed wells and whether the site has been designed to accommodate receiving water from other adjacent sites. As previously discussed, gathering lines connecting the lease pads may be constructed to enable fluid and gas movement to reduce the overall activities disturbance area and reduce wastewater storage cost. Wastewater storage tanks may be deployed for extended periods to enable flowback to be stored prior to being recycled at other exploration locations or to allow ongoing evaporation or treatment of produced wastewater. Treatment of wastewater may also be undertaken onsite, with water treatment options such as submerged combustion units, enhanced evaporation units etc. utilises to reduce wastewater volume onsite. Wastewater from other sites across the basin may also be managed onsite, to consolidate Tamboran's regional wastewater treatment/ management footprint. Wastewater storage tanks have continuous level monitoring, with leak detection sensors located within the interstitial space between the primary and secondary liners. They will be specifically designed to withstand cyclonic wind ratings and be routinely inspected to maintain integrity. In accordance with the Code, sufficient enclosed tank capacity must be onsite to store all wastewater during the wet season (October to April). Flowback can only be stored within open tanks where undergoing treatment (such as evaporation). Open evaporation tanks must have a 1:1000 annual re-occurrence interval (ARI) wet or dry season freeboard (i.e., available tank space to accommodate rainfall), which is typically 1.3 M or 0.3 M respectively. The lease pad or a specifically constructed wastewater storage areas will be bunded to contain 110% of the volume of the largest tank stored onsite.	N/A located on proposed lease pad	<4 persons	During wastewater storage activities	3 – 36 months	

<table>
<tr><th>Activity description</th><th>Disturbance area</th><th>Typical personnel numbers</th><th>Timing</th><th>Duration</th><th>Activity example pictures</th></tr>
<tr><td>Flaring

During well testing, all produced hydrocarbons (gas and liquids) will be flared onsite unless they can be used for onsite power generation or sold. Two flares may be installed, with a vertical flare used to manage gas and a horizontal flare used to manage condensate. The vertical flare will be an American Petroleum Industry (API) 537 and a US EPA AP 42 compliant unit, with a 98% combustion efficiency. The vertical flare (see figure) will have a constant pilot flame, with an autoignition system that provides electrical impulses to a spark plug continuously. If the flare was to go out, the spark would ignite the flare within 1.3 seconds.

A horizontal flare may be used to combust condensate if produced during well testing. A horizontal flare will be equipped with 3 independent nozzles, located in a 20 m x 10 m clay lined flume.

Flares will be located at least 45 m from the surrounding vegetation, with flaring not undertaken during total fire ban periods.</td><td>N/A located on proposed lease pad</td><td><12 people during production testing</td><td>During exploration activities</td><td>During production testing</td><td> </td></tr>
<tr><td>Gathering and main pipeline construction

Where exploration results are sufficient, the Kyalla 117 N2 and Shenandoah S2 pads may be connected via a gathering pipeline to enable the movement of water and gas between sites. Gathering pipelines will be constructed in a cleared right of way of approximately 15 m wide.

<table>
<tr><th>Stage</th><th>Description</th></tr>
<tr><td>Location</td><td>An initial route selection study will be conducted for the pipeline to optimise the pipeline route to connect to the Amadeus pipeline. Further fine-tuning and route refinement will continue throughout the planning phase of the project to ensure the route does not interfere with any sacred sites, cultural heritage or environmentally sensitive features.</td></tr>
<tr><td>Pipe</td><td>The gas transmission pipeline will be a buried, high pressure steel pipeline. It will be designed and constructed in accordance with the requirements of AS 2885 Pipelines – Gas and Liquid Petroleum. The pipeline will be buried for its entire length and will be deep enough so current land use activities can continue after the pipe has been installed. The minimum depth of cover over the pipeline will be 750 mm. For road crossings the depth of cover will be increased to ensure protection of the pipeline and the asset or feature being crossed by the pipeline.</td></tr>
<tr><td>Early Works</td><td>To support the detailed design activities, several activities take place prior to the main construction phases. Generally known as ‘early works’ these activities include a range of field-based activities. These activities inform the Design teams about field conditions and are often iterative, as additional identified information results in changes to aspects of the project scope requiring revisiting and rework of the project scope. These activities include but are not limited to general investigations, surveys for the pipeline, sacred sites, cultural heritage, environmental and soil & geotechnical.</td></tr>
</table>
</td><td>~ 15 m wide</td><td>~15 – 50</td><td>Main pipeline construction expected to start dry season 2024</td><td>3 – 6 months</td><td> </td></tr>
</table>

Activity description		Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Survey	The limits of the right of way (ROW) working width shall be marked with stakes at visible intervals. A survey crew will work ahead of the initial clearance of vegetation from the ROW. This survey crew will utilise the project benchmarks to check and re-establish all agreed intersection points (IPs), mark the right of way boundaries and place offset/recovery pegs.					
Clear and Grade	To allow construction activities to commence, the pipeline alignment needs to be cleared of vegetation, rocks, trees, etc to provide mainline construction vehicles access. Clearing and grading shall be minimised to the extent necessary for the safe construction of the pipeline and shall in any event not exceed the maximum permissible width of the ROW except where additional working areas are defined and agreed. Light vegetation removed during clearing shall be stockpiled outside of the stripped ROW working area and will be respread during restoration unless the property owner requests that the vegetation be left as stockpiles.					
Pipe Transport and Stringing	Stockpiled pipe will be delivered to the ROW along the identified access tracks using prime movers and trailers. The specific logistics of the pipe haulage will be developed during the planning phase. The pipe trucks will only utilise specific access tracks which will be constructed (or upgraded) to allow them to pass. Pipe will be strung (placed on the ROW) directly from trailers onto saw dust filled bags or equivalent using a Vacuum lift pipe handler mounted on a hydraulic excavator, end hooks or slings depending on the pipe length and size, terrain. Strung pipe shall be supported clear of the ground and in a manner that will not damage the pipe or coating.					
Trenching	A trench is formed to accommodate the welded pipe strings and achieve the required depth of cover in accordance with the pipeline design. The trench shall be excavated along the surveyed and pegged centreline, in accordance with the minimum cover specified. Trenching operations are carried out utilising a combination of bucket wheel trenchers, rocksaws & 30T excavators. Accordingly, excavation plant, equipment and techniques will be selected to accommodate the anticipated conditions and required production rates. In areas of hard rock, controlled blasting using explosives may be required to break the rock to permit removal by excavator.					
Welding	Line pipe ends will be welded together (butt welded) to form pipe strings up to a typical length of 1km. The mainline welding crew is the engine room for the project's welding and sets the pace for mainline construction. The very agile and mobile poor boy crew carries out all difficult mainline welding sections and provides start joints for the mainline crew. Additional welding resources carry out all tie-ins and special crossings.					
Lower in, padding and backfill	The coated pipe shall be lowered-in using a series of side booms, so the pipeline has adequate and properly distributed slack, the pipe is not unduly stressed, and the pipe coating is not damaged. Where the excavated material and the bottom of trench are free of material that could damage the pipe, the pipe shall be laid directly on the trench bottom. The excavated material shall be used directly for bedding and padding. Where excavated material does not meet the specification, padding machines (screening machines) or similar will be used to produce bedding and padding. The trench will be back filled using the remaining trench spoil (excavated material) following the padding operation. The trench is compacted by wheel and/or track rolling with the backfilling equipment. Areas requiring higher compaction, such as road crossings, will be					

Activity description		Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
	undertaken with an excavator mounted vibrating plate or other suitable manually operated or driven compaction equipment.					
Reinstatement	The pipeline ROW will be reinstated which includes replacement of previously stripped topsoil and rootstock, installation of contour banks, reinstatement of fencing & install new gates and revegetation as necessary. Restoration of the ROW shall be completed in accordance with the Code.					
Pipeline testing	The pipeline will be hydrostatic pressure tested to prove the strength and leak tightness of the installed pipeline. The hydrostatic testing will be conducted by a certified mechanical testing laboratory and all test reports are to be certified.					
Commissioning	The commissioning phase of the works can be broken into two components, pre-commissioning and commissioning. Pre-commissioning is the exercise of manually proving each component of the pipeline/facility system prior to the introduction of gas. Example testing includes: • Verification that all parts are installed as detailed on engineering drawings, including position, orientation, part numbers, etc • Hydrostatic testing (confirming the system is leak tight), cleaning (blow through with air and cleanliness checks), drying and blow-through of piping • Bolt torquing of flanged connections • Functional testing of all manual valves through full extent of travel • Functional testing of all actuators and control valves through full extent of travel • Earthing compliance checks • Instrument calibration and installation checks • Insulation, continuity and point to point testing of all circuits installed by the contractor Following the pre-commissioning phase, the asset becomes ready for the introduction of gas.					
	The pipeline corridors will be inspected routinely and be kept free of woody vegetation for the life of the asset. Cattle will be allowed to access the corridors once vegetation cover has been re-established post construction.					

<table>
<tr><th>Activity description</th><th>Disturbance area</th><th>Typical personnel numbers</th><th>Timing</th><th>Duration</th><th>Activity example pictures</th></tr>
<tr>
<td>
Appraisal gas sale: To minimise flaring during the production testing phase of the wells, Tamboran will be developing facilities and a pipeline to enable this gas to be captured rather than flared. Gas and water will be collected from the proposed multi-well lease pads and piped to centralised gas processing and water storage/ recycling/ treatment areas. This is anticipated to reduce appraisal emissions by approximately 90% and eventually enable all the extended production gas to be captured and flaring stopped.

The sale of appraisal gas may occur through any combination of the following:
• Onsite compression and sale into the adjacent domestic gas pipelines
• Onsite liquification to produce liquified natural gas (LNG) and offsite transportation to market
• Onsite compression to produce compressed natural gas (CNG) and offsite transportation to transportation.

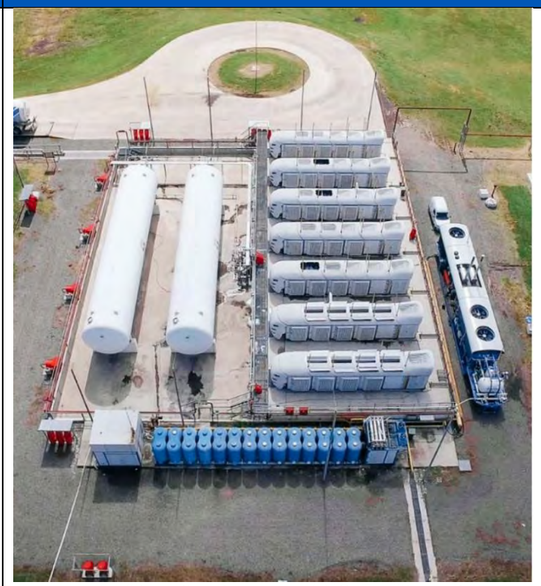
It is anticipated that such centralised gas processing facilities will be constructed at or around Shenandoah South A or Kyalla 117 N2/ Shenandoah S2. The exact location will be determined in consultation with the pastoralist.

As a part of the gas processing facility construction and operation, a range of temporary facilities will be required during construction. These may include work areas for equipment and pipe storage and lay down areas, and a site office.

The location of the temporary facilities will ensure facilities are located at a suitable distance from watercourses, are constructed on existing disturbance areas (such as laydowns or lease pads where available), are not endangered by threat of flood, do not require clearing of sensitive vegetation and are managed in such a way as to ensure no long-term land contamination issues.

Typical manning during operations is <10 people. During construction, ~50 people may be required. These are indicative numbers with the final manning levels will be finalised during the activity planning.

Several trucking movements per day will be required to removed CNG and LNG from site where this processing option is chosen.

Below is an overview of appraisal gas facility construction.
<table>
<tr><th>Stage</th><th>Description</th></tr>
<tr><td>Mobilisation</td><td>Establishment of access track into site and site offices and amenities, laydown areas, erosion and sediment controls installation as per the requirements of the approval management plans, site communications links and construction set out survey.</td></tr>
<tr><td>Earthworks and civil works</td><td>Preparation of topsoil and sub-fill for establishment of foundation – including excavation and removal of unsuitable fill materials from site, import of required sub-grade fill materials, grading and levelling of the facility pad and final capping and import of road base materials to design specification. Works may also include ongoing upgrading of existing access tracks.</td></tr>
<tr><td>Underground services</td><td>Trenching of facility pad as required to install buried services and piping, backfill and compaction of trenches, including installation of crossing reinforcement for protection of buried services in trafficable areas.</td></tr>
<tr><td>Piling</td><td>Installation of steel pile foundations by driving into the prepared facility pad and/or pre-drilling as required and welding of pile caps onto piles in preparation for skids to be landed.</td></tr>
<tr><td>Structural mechanical and piping</td><td>Installation of pre-assembled skidded pipe rack modules onto foundations requiring lifting onto pile caps and welding in place, bolting flanges to connect interfacing skids and equipment packages, installation of site run utilities piping, lifting and welding in place of skidded equipment packages.</td></tr>
</table>
</td>
<td>9.0 ha</td>
<td><10 people operating and <50 people during construction</td>
<td>Upon completion of well testing – potentially 2024</td>
<td>Potentially up to 2 years (24 months) at each site- or as approved by the Minister.</td>
<td>

Example facility – the Buquebus LNG Facility in Buenos Aires Argentina

A truck mounted compression facility

Example of a temporary gas processing facility
</td>
</tr>
</table>

Activity description		Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Electrical and Instrumentation	Installation of cables and cable supports, ladders and trays, termination of cables into relevant panels (control and low voltage), installation of tubing and glanding of instruments, mounting instruments onto piping or instrument stands.					
Plant commissioning	This stage involves the testing and commissioning of all equipment on the site, in preparation for operations.					
.						
Drilling waste management All waste drilling fluids, muds, cuttings, completion fluid and cement returns will be managed in either a purpose-built sump on each site or through the transfer of material to existing sites to share waste management infrastructure (referred to as a remote sump). To reduce the number of sumps constructed, it is preferred that a centralised sump is utilised, with periodic transfers of drilling fluids and mineral waste undertaken between sites during activities. Where drilling waste is to be transferred to a remote sump (including frack sand, cuttings, muds, cement ends and other drilling related fluids) will be stored in temporary cuttings bins and/or tanks on each lease pad where the drilling underway. The waste will be intermittently (typically 2-3 trucks per day at the peak) transported to the remote sump to separate the liquids from the solid waste. The material will be allowed to dry out over the wet season and parts of the dry season and once dry, will be removed from the sump and mixed with available clean fill and organic material (manure). The material will then be tested to ensure it meets the approved standards (such as AS 4419:2018- Soils for landscaping and garden use) and reused for growth media during rehabilitation (such as for gravel pit backfill). For sites where drilling mineral waste will be disposed of onsite, the material will be directly discharged to the sump. Prior to the sump decommissioning, the sump material will be sampled as per the Code and a detailed risk assessment completed to determine whether onsite encapsulation or mix bury cover can occur in an environmentally acceptable manner. In most cases, drilling wastes will be dewatered, blended with clean fill and encapsulated onsite within an impermeable liner. A capping layer will be added to enable vegetation re-establishment. To reduce the number of sites where material is mix-buried covered, multiple wells from other locations may be disposed of at a selected location. An overview of the Drilling waste composting process is provided in Appendix B. An overview of the mix bury cover process is provided in Attachment C.		N/A- within proposed lease pad	< 6 people	Upon completion of drilling activities	7 days	
Wet season operations Exploration activities (including drilling, stimulation and well testing operations) may occur over the wet season. Where wet season operations are undertaken the following risk controls will be implemented: • All chemicals, fuels, equipment, tanks and materials required for ongoing operations will be stored on-site prior to the onset of the wet season. • All equipment required to respond to emergency situations will be on-site; this includes earth moving equipment, vacuum trucks, wireline rigs, cementing equipment etc. and equipment and material to deal with well control issues, spills and other emergency events. • All chemicals storage areas will be bunded, with covers used (where safe and appropriate) to prevent rain ingress and bund overflows. • Enclosed tanks will be utilised as the primary measure to store wastewater with enough enclosed tank capacity to store all wastewater on-site (see figure). • Enclosed wastewater storage volume will be sufficient to manage all wastewater stored onsite. • Open working evaporation tanks and mud sumps will have enough freeboard to manage an entire 1:1000 ARI wet season event (not just one (1) rainfall event but an entire season's rainfall total). • Helicopters will be used to transport people and supplies into and out of the site when access is		N/A	N/A	October - May	7 months of the year	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
restricted. • No transportation of wastewater or chemicals will be undertaken during the wet season unless a risk assessment is undertaken that demonstrates the risk is As Low as Reasonably Practicable (ALARP) and acceptable (as per the Code). • Wastewater storage area is bunded, which will prevent all off-site release of chemicals and stormwater practicable (ALARP). • During flowback wastewater stormwater will be retained on-site via the sediment retention pond prior to release. • Overland flow will be diverted around lease pads.					
Site monitoring and inspections consisting of the following: • **Groundwater monitoring:** Groundwater monitoring bores are required to be installed on the lease pad before the commencement of hydraulic fracture stimulation activities. Groundwater monitoring is undertaken at the site commencing 6 months before stimulation and then quarterly for 3 years after. Groundwater monitoring involves purging a monitoring bore of water, measuring field parameters (level, electrical conductivity) and collecting laboratory samples and • **Site and exploration well monitoring:** An operator or contractor will access the site to perform checks on the exploration well and stability of the site. Checks include pressure readings and visual checks of valve integrity. In some cases, a helicopter may be used to complete the inspections. Surveys are completed fortnightly. • **Weed inspections:** Access to the site by several contractors/ Tamboran personnel in light vehicles to identify weeds. In some cases, a helicopter may be used. Contractors may perform spot sprays with a NTG recommended weed treatment. Surveys are completed pre and post wet season. • **Erosion and sediment control inspections:** Access to the site by several contractors/ Tamboran personnel in light vehicles to identify erosion or stability issues. Inspection will be used to schedule maintenance to repair any defects identified. In some cases, a helicopter may be utilised to complete the inspections. Surveys are completed pre and post wet season. • **Gas leak detection surveys:** Access to the site by 2 – 3 contractors / Tamboran personnel in light vehicles to perform mandatory gas testing using handheld gas meters. Surveys are completed 6 monthly.	N/A	<2 – 6 people	Fortnightly/ 6 monthly (depending on activity)	1 day per inspection	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Site maintenance (**lease pad, camp pad, access tracks and gravel pit):** Includes grading, erosion and sediment control repair, vegetation management, firebreak management, weed management, fence repair and all other ancillary activities required to maintain a site and associated with infrastructure. This includes maintenance of the access track interception with the / Stuart Highway. The work will be undertaken by civil maintenance contractors and Tamboran personnel.	N/A	<10 people	6 monthly; pre and post wet season maintenance	<7 days per activity, depending on the nature of the activity	
Well head maintenance: Maintenance is completed annually on each well. Maintenance includes valve checking, testing, greasing and (in some cases) replacement, as well as any other activities required to maintain the integrity of the well**.**	N/A located on proposed lease pad	<20 people depending on activity	Annually	< 7 days per activity, depending on nature of maintenance	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Well intervention, data acquisition and testing: Subsurface activities may be undertaken periodically on each of the well to perform maintenance or collect additional information on the properties of the well or the reservoir. These type of well interventions typically include performing cement bond logs, casing pressure tests, running reservoir evaluation or production logging tools, cement and casing remediation activity (if required during the life of the well), setting downhole mechanical plugs and gauges, casing perforation, subsurface barrier maintenance/ installation and production tubing installation/repair or replacement. This generally involves the use of a variety of equipment dependent on the activity being completed. This typically may involve any of the following equipment: completion rig, coil tubing, wireline unit, data van, cement or pump truck, crane, trucks, power generation, support trucks and other support vehicles.	N/A located on proposed lease pad	<20 people depending on activity	Ad hoc requests, typically 2 interventions within the next 5 years	<10 days per activity	
Petroleum well plugging and decommissioning: Once a petroleum well is no longer required, each well will be decommissioned. Decommissioning involves the permanent removal of the well through the placement of cement plugs to isolate the target reservoir from overlying aquifers in accordance with the Code. Once plugs are installed, they are pressure tested to confirm the underlying formations have been adequately sealed off. The well head is then removed. A permanent marker is added to indicate the location of the plugged and abandoned well.	N/A located on proposed lease pad	<12 people	End of well life	<10 days	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Chemical and fuel storage: All chemicals and fuels (diesel) required to support exploration activities will be stored in accordance with the relevant regulatory requirements, including the use of secondary containment (bunding) onsite. The Code has implemented a range of additional controls, including requirements for routine inspections, emergency response procedures and spill management. Anticipated chemical and fuel volumes vary dependent on activity, but may involve the storage of the following types of chemicals and volumes: • Stimulation and drilling chemicals (friction reducers, surfactants, crosslinkers, breakers, buffers, acids, bases, biocides, scale inhibitors, corrosion inhibitors, clay stabilisers, loss of circulation material, drilling muds, salts etc.). Volumes typically less than 20 KL per chemical, with some chemicals stored at higher (such as pH control) or lower (such as biocides and corrosion inhibitors) volumes depending on their purpose and planned use. • Diesel – typically 100 KL stored but may be 500 KL if wet season activities are proposed. • Other chemicals and hydrocarbons: including oils and greases, lubricants, hydraulic fluid, cleaning chemicals, domestic chemicals etc. used to support operations.	N/A- located on existing area	N/A	During exploration activities	During exploration activities	
Waste management (other than wastewater): Any waste generated during exploration activities will be stored onsite in accordance with the *Waste Management and Pollution Control Act 1998* and Code, and transported offsite to a licenced waste management facility. All wastes (other than drilling mineral waste) will be stored within skips or equivalent and removed from site at the end of each activity.	N/A	1 -2 trucks during operations	During explorations activities	During explorations activities	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures
Groundwater extraction: Groundwater extractions from the purpose-built groundwater monitoring onsite or another approved extraction bore (which may include trucking water from adjacent properties) will be completed periodically to support exploration activities. All groundwater take will likely be from the Gum Ridge Formation and will be licenced under Tamboran's existing Water Extraction Licence (WEL) GRF 10285. A new WEL may be submitted covering additional groundwater take and alternative groundwater formations, where required. It is anticipated that groundwater extraction volumes to support this program is anticipated to be less than 450 ML/year (spread across multiple sites), primarily used during the initial stimulation. Once drilling and stimulation has ceased, minimal ongoing water extraction from the site will be required.	N/A	N/A	Ongoing to support exploration activities	During exploration activities	
Traffic management: Access to each of the proposed exploration sites is via the Carpentaria highway. Peak traffic volumes are anticipated to be associated with the drilling rig mobilisation and demobilisation. Traffic volumes may reach up to 44 vehicles per day spread over a 4-week period. During operations (drilling, stimulation or well testing), vehicle movements to the site are anticipated to be less than 10 movements per day. This period is likely to extend typically 60 days per exploration well, 45 days per stimulation and during the duration of a well test (30 – 365 days). During wastewater storage, an operator is anticipated to inspect the sites 2-3 times per week (pending wet season access). Once the well is suspended or decommissioned, vehicle movements will reduce to 1 vehicle per fortnight or 1 vehicle per 6 months respectively.	N/A	N/A	During exploration activities	During large mobilisations or works within the road corridor	
Site rehabilitation: Within 6 months of the E&A wells at a site is plugged and decommissioned, the site will be rehabilitated. This involves: a) the removal of all surface facilities (e.g. well heads, fencing, water bores, tanks), b) deep ripping of compacted surfaces, c) recontouring landforms, d) respreading of topsoil from the topsoil stockpiles, e) re-seeding (if required), and f) ongoing monitoring and maintenance of the rehabilitation.	N/A		Within 6 months of the plugging and abandonment of all E&A wells	<14 days, with ongoing monitoring and maintenance	

Activity description	Disturbance area	Typical personnel numbers	Timing	Duration	Activity example pictures

7. Environmental Outcomes, Impacts and Risks

The environmental outcomes, potential impacts and risks associated with the ongoing exploration activities are summarised in Table 3. This information will also be provided in an EMP covering the proposed regulated activity, which will be submitted to the Department of Environment, Parks and Water Security (DEPWS) for formal assessment and approval.

Under the PER, an environmental outcome means an outcome that will be achieved if the environmental impacts and environmental risks of a regulated activity are reduced to a level that is as ALARP, and acceptable.

Environmental impacts are defined by the PER as any adverse change, or potential adverse change, to the environment resulting wholly or partly from a regulated activity.

Environmental risks are defined by the PER as the chance of something happening that will have an environmental impact, measured in terms of environmental consequences and the likelihood of those consequences happening.

Both the consequence and likelihood of a potential impact can be reduced through the adoption of controls, which must be applied to reduce a risk down to an ALARP and acceptable level.

Table 3 Environmental risks and controls of proposed variation

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls

Groundwater use and quality	• To manage exploration activities to prevent unsustainable depletion of groundwater resources
	• Preserve groundwater quality to protect environmental and pastoral use
		• No adverse changes to groundwater quantity is anticipated to be associated with exploration activities.
		• Impacts to aquifers levels anticipated to be negligible, with rapid recharge observed from other Gum Ridge Formation bores utilised within the Basin.
		• No material changes to groundwater quality anticipated form exploration activities.
		• No impact to Groundwater Dependent Ecosystems (GDE) or stygofauna from exploration activities (extraction and well construction)
		• No reduction in pastoral productivity through reduced groundwater volumes
			• Low risk of groundwater contamination from drilling fluids during construction of the conductor/ surface casing in the Cambrian Limestone Aquifers due to the selection of low toxicity drilling fluids
			• Low risk of cross flow of deep formations (such as the target shales) to shallow aquifers through inappropriate well barrier design and construction due to the presence of the Code controls and verification processes.
			• Low risk of crossflow through fracture growth into aquifer from stimulation activities allowing the migration of fluid and gas due to the controls within the Code and underlying separation distance between the target formation and Cambrian Limestone aquifers.
			• Low risk of stimulation activity inducing seismic activity that enables cross formational flow between shallow aquifers due to seismic stability of region and lack major faults or fracture zones.
			• Low risk of stimulated zones intersecting offset wells (including the adjacent horizontal wells) or intersecting an existing geohazard due to seismic control,
				• All petroleum wells are to be designed, constructed, operated and decommissioned in accordance with the mandatory controls within the Code. The Code outlines specific controls measures designed to protect underlying groundwater resources including:
				  • Exploration wells designed with multiple cement and steel casing barriers to protect aquifers
				  • Drilling fluids and muds must have a low residual toxicity
				  • Groundwater monitoring must be completed before and after stimulation to detect contamination
				  • Well integrity confirmation to prove barrier performance aquifer isolation (casing pressure tests, formation leak off tests, cement bond logs etc.).
				  • Separation between stimulated shale resources and aquifers must be sufficient to ensure the risk of fracture growth is ALARP
				  • Pressure monitoring completed to ensure maximum allowable

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			pressure monitoring during stimulation and lack of older petroleum wells in close proximity. • Low risk of crossflow/well integrity caused by the deviation of an E&A well into the adjacent well during drilling due to downhole GPS tracking tools and proximity alarms • Low risk of leakage of either flowback, produced water, or hydrocarbons (liquid and gaseous) from suspended or abandoned wells to groundwater due to well design and integrity management. • Low risk of leaks from gathering lines, with gathering lines constructed as per Australian Standard, leak detection in place to identify pipeline failures and routine inspections completed. • Low risk of surface contamination from storage and disposal of drilling fluids, additives, muds and cuttings on-site due to low toxicity of drilling muds and disposal risk assessment process. • Low risk of groundwater contamination from surface spills from storage, handling and transportation of flowback water due to the storage and spill management requirements outlined in the Code.	operating pressure is not exceeded during stimulation. • Ongoing well integrity monitoring and maintenance throughout the life of each well to ensure aquifers are protected • All wells are to be decommissioned in accordance with the Code, with cement plugs utilised to separate aquifer units. • All surface storages of wastewater and chemicals to have secondary containment to prevent spills to the ground • An emergency response plan must be implemented outlining how spills and emergencies will be responded to. • Drilling fluids and wastes to be stored within a lined sump • Gathering lines and pipelines constructed as per Australian standard, leak detection in place to identify pipeline failures and routine inspections completed. • Flowback wastewater must be stored in double lined tanks with leak detection and level monitoring • Double lined enclosed wastewater tanks with leak detection and level

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			• Low risk of groundwater contamination from the storage, handling and transportation of chemicals, fuels and wastes due to the mandatory Code controls (such as mandated use of secondary containment) • Low risk of groundwater contamination from overtopping of drilling sumps and flowback tanks (including during wet season) due to level alarms and use of enclosed tanks. • Low risk of groundwater contamination from the use of recycled flowback and other wastewater in stimulation fluid • Low risk of groundwater contamination from a failure of flowback storage tank due to the design standards of the tank (cyclone rated steel tank structures) and routine integrity inspections • Low risk from over extraction of groundwater for civils, drilling and stimulation and other ancillary activities due to the yield of the Cambrian Limestone Aquifers and available allocation volumes (as assessed in the WEL).	monitoring used to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All open treatment tanks are to be operated with a 1:1000 ARI wet season or dry season (whichever is applicable) freeboard • All wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone) • Groundwater monitoring from monitoring bores installed at the site must be completed prior to and after stimulation to detect any contamination. • All water take covered by an existing WEL GRF 10285 • New extraction bores must model potential impact on adjacent pastoral bores prior to being added to WEL. • All water take to be metered and reported quarterly to the regulator • No pastoralists groundwater bores within 1 km of each proposed site • Wastewater, including flowback and drilling fluids, to be preferentially used in stimulation fluid to reduce raw water usage.

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
Soils	• Avoid, minimise and control soil erosion and discharge of sediment or soil into waterways or established drainage systems • Minimise disturbance of soil, vegetation and drainage during site activities • Prevent the contamination of soil to maintain the viability of soil resources • Minimise residual impacts to pastoralist usage of exploration areas	• Clearing of vegetation to support exploration and appraisal activities. • Soil compaction from access tracks, leases, infrastructure (pipelines and temporary gas processing facilities). • Increased sedimentation transportation from disturbed areas • Loss of productivity of disturbed areas until final rehabilitation has been achieved	• Medium risk of soil erosion from cleared areas (access tracks, lease pads, camp pads, temporary compression facility, pipelines, gravel pits and laydown areas) occurring on disturbed sites due to high intensity wet seasons. Risk is a low consequence (minor impact), possible (<50% chance of occurring) event. • Low risk Reduction in land production through poor erosion and sediment control practices • Low risk of spills/leaks from the on-site storing and handling of fuels. Condensate, hydrocarbons, drilling additives, stimulation additives, flowback fluid, solid wastes, storage and transportation of wastes causing soil contamination. • Low risk of drill sump and flowback tank overtopping due to mandatory freeboard and monitoring controls • Low risk of chemical and waste transportation accident, causing soil contamination due to licenced chemical/ waste provider use, spill response and emergency response requirements. • Low risk of contamination from on-site disposal of drill muds and cuttings with site specific assessment	• Site selected to avoid sensitive soil units and slopes which may increase erosion hazard. • All land clearing to align with the requirements of the Code and *NT Land Clearing Guidelines* (2019) • Erosion and sediment control practices to be utilised at all disturbed sites to minimise erosion. • Sites (including gravel pits) maintained to minimise sediment releases, with erosion and sediment control plan in place • Pre and post wet season monitoring completed on all disturbed areas to identify and repair erosion • Construction within the wet season to be avoided to reduce the erosion risk. • Vegetation clearing watercourses to be avoided as far as reasonably practicable (i.e. only when a new access is required to be constructed) • All chemicals and fuels to be stored with secondary containment as per the Code • During flowback wastewater storage, the site is to be fully bunded to contain the volume of an entire

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			completed to ensure disposal is environmentally acceptable. • Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Low risk of wastewater evaporation mist transported offsite during wastewater treatment due to wind speed/direction cut offs and routine site inspections during operations. • Low risk of greywater and sewerage disposal from camp wastewater treatment plants due to the irrigation area being appropriately sized, fenced and quality aligning with the NT Department of Health requirements. • Low risk of reduction in land production through poor infrastructure placement as infrastructure is preferentially located in existing disturbed area, with no sensitive soil types present in the immediate vicinity. • Low risk of reduction in land productivity from poor rehabilitation due to mandatory rehabilitation requirements and security bond requirements	wastewater tank if a structural failure occurred • Flowback wastewater must be stored in double lined tanks with leak detection and level monitoring • Double lined enclosed wastewater tanks with leak detection and level monitoring used to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All open treatment tanks and sumps are to be operated with a 1:1000 ARI wet season or dry season (whichever is applicable) freeboard • All flowback wastewater to be transferred to enclosed tanks within 8 hours of a significant rainfall event occurring (such as a cyclone) • Stormwater to be retained onsite during wastewater storage and tested prior to release • All spills of chemicals and wastewater to be cleaned up upon detection. • Irrigation of greywater and treated effluent to be undertaken in accordance with DoH requirements • Disposal of drilling muds, cuttings and mineral waste to be undertaken in accordance with Code, with onsite

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			• Low risk of pipeline subsidence creating erosion with ongoing monitoring and maintenance.	disposal only permitted where the potential harm to the environment can be demonstrated as ALARP and acceptable. • Site to be rehabilitated back to pre-existing/ agreed state with pastoralist input. • Pipeline to have vegetation reinstated post construction to stabilise corridor and prevent erosion. • Pipeline monitoring and repair work to minimise/ respond to pipeline subsidence
Emissions (dust, greenhouse and combustion emissions)	• Avoid environmental nuisance at sensitive receptors • Minimise impacts to pastoralists and surrounding ecological communities from dust • Minimise greenhouse gas emissions	• Dust on vegetation in the immediate vicinity of activities reduces plant palatability • Impacts of dust nuisance to birds and fauna in the immediate vicinity of activities, specifically access tracks • Emissions from the combustion of diesel. • Emissions from power generation for onsite compression and liquification facilities. • Generation of Greenhouse gasses	• Low risk of dust impacts generated during civil activities, drilling operations, stimulation activities well testing due to use of dust suppression and routine maintenance of access tracks and infrastructure • Low risk of reduction in regional air quality resulting from emissions from the combustion of diesel due to the temporal nature of the activities and selection of efficient equipment. • Low risk of reduction in regional air quality from gas and condensate flaring due to the combustion efficiency of the flare and preferential sale of appraisal hydrocarbons.	• Site located away from sensitive receptors, such as homesteads • Dust suppression to be used on access tracks, lease pads and gravel pits to minimise dust emissions where practicable • Outside of high intensity activities (such a s civil construction, drilling and stimulation) Dust levels consistent with standard pastoral activities (such as mustering/truck load outs) on the property • Venting of raw gas is tightly controlled under the Code, with no material volume of gas to be vented

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			• Low risks of reduction in air quality from emission associated with onsite power generation (supporting compression and liquefaction infrastructure) equipment to be utilised to limit NOx and CO emissions. • Low risk of air emissions from chemical releases during drilling and stimulation activities impacting livestock, fauna and people due to chemical handling procedures limiting emissions during mixing. • Medium risk of bushfire from accidental ignition by site activities (civil works, drilling, flaring, grinding) or personnel. The consequence of a fire is considered “serious”, with the likelihood “highly unlikely”. • Low risk of uncontrolled release of gas impacting a receptor during drilling, stimulation, barrier failure, operator error or vehicle collision due to the well design, blow out prevention, well integrity and lack of sensitive receptors preventing impacts. • Low risk of leak of gas from wells or gas compression facilities due to the well/ facility design, routine leak detection and repair and separation distance from receptors,	• A reduced emission completion (flare) to be utilised to combust all hydrocarbons • Flares to be compliant with USEPA design standards, including 98% flare efficiency • Stimulation chemical mixing procedures deployed (such as enclosed hoppers) that minimises dust emissions • Firebreaks to be maintained around well and camp pads to minimise bushfire risk • Flaring exclusion zones to be maintained around flare • No flaring during total fire bans • Slashing, grinding and other higher risk fire activities to be undertaken with appropriate controls to mitigate the risk of bushfire (such as buffer zones, use of fir trailers, fire breaks etc.) • Vehicles to be equipped with fire extinguishers • 6 monthly gas leak detection on all exploration wells and equipment, with annual inspections on pipelines

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			• Low risk of greenhouse gas emission impacts from appraisal gas sale/ well testing (climate change) as volumes are small in comparison to local, regional, domestic and international levels.	• Low NOx and Low CO gas fired compression/ power generation utilised to minimise air emissions. • Appraisal gas will be beneficially used through sale of CNG/LNG/ piped natural gas to reduce flaring and minimise flaring to reduce scope 1 and 2 emissions.
Surface Water	• Avoid and minimise the potential contamination caused by the discharge of sediment or contaminated storm water to waterways or established drainage systems. • Contain any potential contaminants for treatment or disposal.	• Increased sedimentation transportation from disturbed areas (access tracks, lease pads, etc.)	• Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Low risk of gathering pipeline failure and release of flowback through pipe material selection, design, quality assurance/ quality control testing and use of leak detection. • Low risk of drill sump and flowback tank overtopping due to mandatory freeboard and monitoring controls • Low risk of a transportation accident releasing chemical or wastewater (drilling fluid and flowback) due to the use of licenced wastewater/ chemical transportation providers, spill management and emergency response requirements. • Low risk of spills to surface water from chemicals and fuel storage and handling activities due to use of	• No take of surface water permitted or proposed • Lease pad located away from watercourses- typically 1km or greater • Site maintained to minimise sediment releases, with erosion and sediment control plan in place • Double lined enclosed wastewater tanks with leak detection and level monitoring utilised to store all wastewater, with open treatment tanks used to reduce wastewater volumes • All wastewater tanks are engineered and constructed to withstand failure and are cyclone rated • All open treatment tanks and sumps are to be operated with a 1:1000 ARI wet season or dry season (whichever is applicable) freeboard • All flowback wastewater to be transferred to enclosed tanks within

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			secondary containment and separation distance to watercourses. • Low risk of stormwater releases from activities contaminating surface water due to stormwater segregation and testing procedures. • Low risk of infrastructure (including pipeline) changing surface hydrology and flow due to infrastructure design and avoidance of overland flow locations. • Low risk of changes to terrestrial ground surface levels associated with seismic activity due to the stability of the basin and geomechanical properties of the target and overlying formations. • Low risk of gathering line failure releasing flowback fluid to the environment	8 hours of a significant rainfall event occurring (such as a cyclone) • During flowback wastewater storage, the site is to be fully bunded to contain the volume of an entire wastewater tank if a structural failure occurred • All gathering lines to be welded as per Australian Standards, hydrotested during construction to verify integrity prior to being brought into service • Gathering lines to utilise flowmeters/ pressure monitoring to identify leaks (such as flow/ pressure drops) • Gathering lines to be inspected 6 monthly to identify subsidence/ potential integrity issues. All spills of chemicals and wastewater to be cleaned up upon detection. • Irrigation of greywater and treated effluent to be undertaken in accordance with DoH requirements • No offsite releases of drilling or stimulation wastewater proposed or permitted • Stormwater retained onsite during wastewater storage, with testing completed prior to offsite release • Site selected to avoid major structural features, such as faults

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
				• Basin is seismically stable, with low seismic activity reported.
Flora and Fauna	• Minimise disturbance to flora and fauna • No disturbance to high conservation areas • Avoid the introduction of weeds • Avoid the spread of existing weeds • Minimise the loss of pastoral productivity	• Clearing of vegetation communities (such as Open Corymbia/eucalypt woodland, Bullwaddy and/ or Lancewood) to support exploration activities (lease pad extension). • Loss of fauna and flora habitat • Loss of livestock grazing area • Loss of productivity of disturbed areas until final rehabilitation has been achieved	• Low risk of impacts to sensitive vegetation communities from clearing, with high ecological areas avoided • Low risk of threatened fauna mortality during clearing, with all sites to be inspected prior to clearing to avoid fauna. • Low risk of vehicle and machinery noise and lighting on well pads and access tracks causing material impacts to threatened fauna or livestock. • Low risk of contamination from a flowback wastewater tank failure due to the structural design of the tanks, site bunding, emergency response requirements and spill management requirements. • Medium risk of introduction and spread of weeds in the area due to equipment washdowns, inspection and certification requirements. Monitoring and routine treatment completed on identified outbreaks. Impact from weed introductions/spread is considered moderate, with likelihood Unlikely. • Medium risk of bushfire from accidental ignition by site activities (civil works, drilling, flaring,	• Vegetation to be inspected for fauna prior to clearing. Where fauna are identified, work shall stop in the immediate vicinity until they leave the area. • Site to be fully fenced during operations • Open pits to be fully fenced to prevent livestock access • Sumps to have fauna ladders or liner material (such as coletanche) with sufficient friction to allow fauna to escape. • Gravel pits to be left open to act as watering point for livestock when not in use • Vehicle speed limit restricted to 60km/hr • Dust suppression used to limit dust impacts to vegetation • Limited night-time activities proposed. • Site to be rehabilitated back to pre-existing/ agreed state with pastoralist

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			grinding) or personnel on fauna, flora and land productivity. The consequence of a fire is considered serious, with the likelihood Highly unlikely. • Low risk of flora, fauna and livestock being trapped and drowning in storage tanks, sumps and pits due to the design of storages and fencing. • Low risk of contaminants in water and soil pass through the food chain and bioaccumulate in fauna causing detrimental impacts to local species and communities due to chemical storage and handling practices. Fences are utilised to restrict livestock access. • Low risk of vehicle collisions with fauna – fauna mortality results in a localised impact to listed threatened species, due to avoidance of night-time driving, speed limit restrictions and number of vehicle movements. • Low risk of reduction in land productivity from poor rehabilitation due to mandatory rehabilitation requirements and security bond requirements • Reduction in land production through bushfire • Low risk of impacts to flora and fauna through the encouragement of feral animals and other pest species	• All equipment and loads to be inspected and certified weed free prior to entry • Routine weed inspections to be completed with all identified weeds treated. • Weeds sprayed periodically to restrict weed numbers.

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
			leading to competition with native species. This includes the introduction of cane toads.	
Environmental Nuisance and Amenity- including dust, noise, light, odour and vibration	• Minimise impacts to pastoralist operations	• Construction of exploration infrastructure onsite changes land use from pastoral to industrial. • Light and noise nuisance to fauna and livestock in immediate vicinity of activity • Increased traffic to proposed exploration area • Noise, light, odour and dust emissions in the immediate vicinity of the lease pad or temporary gas processing facility. • A visible hue visible from operations at night during flaring or from temporary gas compression facility lighting. • Noise impacts from helicopter movements	• Low of changes in property amenity through the construction and operation of exploration infrastructure due to location of activities and separation distance from receptors • Low risk of increased vehicle accident as access points away from pastoral access. • Low risk of adverse impacts to fauna from traffic are anticipated, with impact levels consistent with standard road traffic levels. • Low risk of helicopter movements causing impacts to receptors based on location of site away from homesteads • Low risk of noise, dust, light and vibration impacts associated with temporary appraisal gas facility	• Sites located away from homesteads and local communities • Flaring to be minimised to avoid light generation • Site is located away from pastoralist main access points • Maximum peak traffic during mobilisation and demobilisation is likely to be typically less than<44 vehicle movements per day for 2 weeks. • Speed limit restricted on the access tracks to <60 km/hr • Dust suppression to be utilised to minimise dust emissions • Where helicopter movements are planned, the pastoralist to be engaged prior to ensure helicopter do not interfere with pastoral activities. • Compression/ power generation/ CNG/ LNG facilities to be designed to minimise aesthetic impacts and located away from homesteads and local communities.

Aspect	Environmental outcomes	Environmental impacts	Potential risk	Controls
				• Lighting of infrastructure designed to minimise aesthetic impacts during the evening
Native Title and Sacred sites	• Minimise impacts to Native Title holders and avoid impacts to sacred sites	• Reduction in foraging and hunting areas • Reduction in land amenity • Loss of spiritual connection with land due to industrialisation • Impact to sacred sites.	• Low risk of reduction in foraging and hunting areas due to limited footprint and absence of surface water in the vicinity of activity. • Low risk of reduction in land amenity due to remote location of activity, limited footprint, prioritisation on rehabilitation and reinstatement of disturbed areas • Low risk of losing spiritual connection with country due to low activity intensity, stringent environmental controls and ongoing stakeholder engagement, • Low risk of impacts to sacred sites due to NLC clearances and AAPA certificates.	• Exploration agreements with Native Title holders in place • Approved annual work programs in place • Sacred site clearances completed prior to work, with AAPA certificates in place • Prevention of activities from accessing sacred sites or other areas which have not been cleared/ approved by Native Title holders. • All infrastructure to be kept in a non-polluting form, with rehabilitated undertaken upon cessation of activities back to a state consistent to pre-disturbed levels. • NLC clearance surveys completed to identify and protect sacred sites • AAPA certificates in place for all exploration activities involving disturbance.

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8. Consequences for Stakeholder Rights and Activities

8.1 Stakeholder rights

Pastoral Lessees within the Northern Territory have non-exclusive rights to conduct their pastoral activities on the land granted under the Northern Territory Pastoral Lands Act (2016). Tamboran respects these legal rights and seeks a sustainable relationship with Pastoral Lessees so that both parties can co-exist on the land. Tamboran proposes to achieve this via the following key principles:

1. Formal stakeholder engagement aligned with the requirements of Section 7.2 (a) of the Northern Territory Petroleum (Environment) Regulations 2016.
2. Structured and timely process for the execution of an access agreement and associated compensation under the Northern Territory Petroleum Regulations 2020.
3. Mutually agreed ongoing, regular engagement and communications.

Tamboran's impacts to stakeholder rights are limited to accessing and utilisation of defined sections of the pastoral lease for authorised petroleum exploration activities. Impacts to rights are restricted to a loss of pastoral productivity over the areas for which Tamboran has established infrastructure, such as lease pads, camp pads, gravel pits and access tracks. Access to demarcated zones around the well pad is also restricted, to ensure stakeholder and community safety.

8.2 Stakeholder activities

In accordance with s.7.2 of the PER, Tamboran is required to provide the pastoralists information on the potential consequences of undertaking the regulated activities on a stakeholder's rights.

A summary of the potential consequences of the activity and mitigation controls are summarised in Table 3 Potential consequences and control measures.

All impacts are anticipated to be restricted to the immediate vicinity of the proposed activities, with no long term or material reduction in pastoral productivity anticipated. Upon cessation of activities, rehabilitation will occur to bring any disturbed land back to a state consistent with the pre-disturbed level.

All potential impacts will be included in the Land access and Compensation Agreement, along with make good requirements which ensure the pastoralists ongoing right to utilise the land for pastoral activities is protected.

Table 3 Potential consequences of the activity on stakeholders' activities

Pastoralist Activity	Potential Consequence to Activities	Mitigations
Pastoral time	• Impact to pastoralist time as they are required to engage with Tamboran as a part of the planning and approval for the proposed activity.	• Tamboran undertakes engagement in good faith, with information provided in a variety of formats to reduce time pressures as far as reasonably practicable. • Tamboran will endeavour to minimise the amount of impost on pastoralist activities- noting a level of initial and ongoing interaction will be required between lease holders. • Tamboran proposes to compensate pastoralist for their time.
Pastoralist site access	• Exploration vehicles along access track (including tankers selling CNG and LNG) may interact with pastoralist activities- mustering and pastoralist vehicles. • Restricted access to exploration well and fenced area during the length of proposed activities. • Dust and noise generated from activity may cause minor disruption to livestock in the immediate vicinity of	• Pastoralist engaged throughout exploration activity planning to incorporate pastoralist feedback into activity to reduce impacts. • Camps with workers bussed to site (where possible) to minimise vehicle movements. • Hazardous areas to be fenced and signed to communicate potential safety hazards. • Compensation to be paid for loss of available grazing land and disturbance.

Pastoralist Activity	Potential Consequence to Activities	Mitigations
	activity.	
Pastoral activities- grazing and mustering	• elevated levels of noise are anticipated to occur around proposed well pads during drilling, stimulation and well testing. • elevated levels of noise in the immediate vicinity temporary gas compression facilities • Disturbance of cattle in the immediate vicinity of the activity when civil construction, drilling, stimulation and well testing are undertaken. • Dust impacts on immediate adjacent vegetation has the potential to temporarily reduce yield. • Reduction in pastoral productivity through poor rehabilitation. • Potential introduction or spread of weeds. • Helicopter movements in vicinity of pastoral activities may disturb cattle/ mustering operations. • Potential impacts on cattle and pastoral business where gates are left open. • Potential impacts from air emissions	• Pastoralist engaged throughout exploration activity planning to minimise impact on cattle and pastoral activities. • Compensation to be paid for loss of available grazing land and disturbance. • Full fencing of well pad to restrict cattle. • Speed limits restricted to 60 km/hr. • Dust control utilised to reduce dust emissions. • Site to be rehabilitated back to pre-existing state, with security bond in place if company fails to rehabilitate. • Weed management plan implemented, including requirements for weed hygiene inspections and certificates on all equipment and vehicles. • 6 monthly weed monitoring and spraying of weeds using a NT Government approved treatment. • Pastoralist to notified and engaged prior to commencing helicopter movements to mitigate interference. • Induction with all exploration contractors and staff in relation to pastoral operations. This induction to be developed with input from pastoralist. • Use of grids, gate signage, inductions and regular gate monitoring and reporting to pastoralist to minimise occurrence of gates being left open. • On-going liaising with pastoralist throughout on ground operations. • Low NOx compression and infrastructure chosen to reduce air emissions
Pastoral activities- ongoing productivity of area post rehabilitation	• Reduction in productivity due to erosion and sediment releases. • Reduction in productivity due to wastewater, chemical/fuel spills- including from gathering lines and wastewater containments (tanks and sumps) • Reduction in pastoral productivity through poor rehabilitation. • Potential introduction or spread of weeds.	• Routine site maintenance completed to ensure functioning of erosion and sediment control. • All fuels and chemicals to be stored within secondary containment, with no storage of hydraulic fracture stimulation flowback work drilling wastewater. • All spills remediated as required in the EMP/spill management plan. • Gathering and pipeline reinstatement to bring ground cover back to pipeline corridors post construction. This will support ongoing grazing activities (potentially increasing the yield of these area due to a lack of woody vegetation). • End of life rehabilitation to return land back to pre-existing state or as agreed to with

Pastoralist Activity	Potential Consequence to Activities	Mitigations
		pastoralist. • Rehabilitation security with NTG retained. • Weed management plan implemented, including requirements for weed hygiene inspections and certificates on all equipment and vehicles. • Routine weed monitoring and spraying of weeds using a NT Government approved treatment.
Pastoral access to groundwater	• No anticipated impacts as proposed groundwater take is to be covered under a WEL.	• All groundwater take to be authorised under a WEL. • Water extraction from pastoralist bores not proposed, unless specifically approved by pastoralist through an agreement. • Tamboran to allow access to water extraction bores for pastoral take (with prior agreement between the parties)
Pastoral access to surface water	• No anticipated impacts as no surface water take, interference or wastewater discharges proposed.	• No surface water proposed to be taken.
Pastoralist's amenity	• Minor elevated levels of noise in the immediate vicinity of the infrastructure during civil construction, drilling, stimulation, completion, well testing and operation of temporary gas processing facilities. • Dust generation creates visible amenity impact • Visual presence of infrastructure within pastoralist lease. • Potential visible hue form flare and night-time at distance.	• Site to be located away from main pastoralist entry points and homestead. • Dust suppression to be utilised where practicable • Site selection to avoid placing flares and exploration activities on regional high points. • Sale of appraisal gas will reduce visible hue.

9. Stakeholder Engagement Plan Feedback

All feedback on the proposed activities and their potential impacts, risks and proposed controls should be provided to Tamboran via the feedback form in Appendix A within the 28-day time period. Where no comments on contents relating to the requirements of the PER are received within the 28-day period, the PER Stakeholder Engagement requirements will be considered fulfilled. Ongoing stakeholder engagement will then proceed.

All lessee comments and associated Tamboran responses will be documented and provided to DEPWS as a part of the EMP approval process.

10. Ongoing Stakeholder Engagement

To keep the Hayfield Shenandoah representatives informed of the status of the regulated activities, the following ongoing engagement is proposed:

- Quarterly engagement on the status of exploration activities
- Fortnightly engagement prior to the commencement of activities under this SEP
- Ad hoc engagement as requested by the APN Pty Ltd Pastoral Representative

- Future engagement on additional petroleum exploration activities (If and when proposed) which are not covered under the EMP

Alternative engagement frequencies can be accommodated at the request of the nominated representative.

Tamboran would also like to extend an invitation to the Pastoral lessees to attend any of the proposed exploration activities to further seek comfort in their understanding and to highlight the nature in which operations are conducted.

11. Commonly Used Acronyms and Abbreviations

Acronym	Meaning
AAPA	Aboriginal Areas Protection Authority
AGP	Amadeus Gas Pipeline
ALARP	As Low as Reasonably Practicable
BMP	Bushfire Management Plan
CBL	Cement Bond Log
CNG	Compressed Natural Gas
Code	Code of Practice: Onshore Petroleum Activities within the Northern Territory
DEPWS	Department of Environment, Parks and Water Security
DIPL	Department of Infrastructure, Planning and Logistics
DFIT	Diagnostic Fracture Injection Test
DoH	Department of Health
E&A	Exploration and Appraisal
EC	Electrical Conductivity
EPA	Environment Protection Authority (NT)
EP	Exploration Permit (e.g. EP76, EP98 and EP117)
EMP	Environmental Management Plan
ERP	Emergency Response Plan
ESCP	Erosion and Sediment Control Plan
GHG	Greenhouse Gas
Ha	hectare
HFS	Hydraulic Fracture Stimulation
JV	Joint Venture
Km	Kilometre
LNG	Liquified natural Gas
m	metre
MRMP	McArthur River Mine Pipeline
NLC	Northern Land council
NT	Northern Territory
NTG	Northern Territory Government

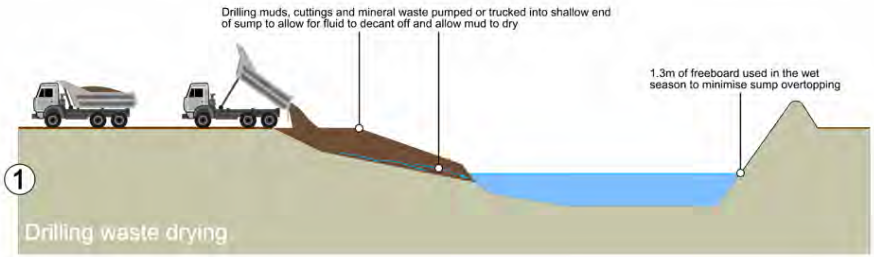
Acronym	Meaning
NTH	Native Title Holder
RWA	Restricted Work Area
SMP	Spill Management Plan
TO	Traditional Owner
WEL	Water Extraction Licence
WMP	Weed Management Plan
WOMP	Well Operations Management Plan
WWMP	Wastewater Management Plan

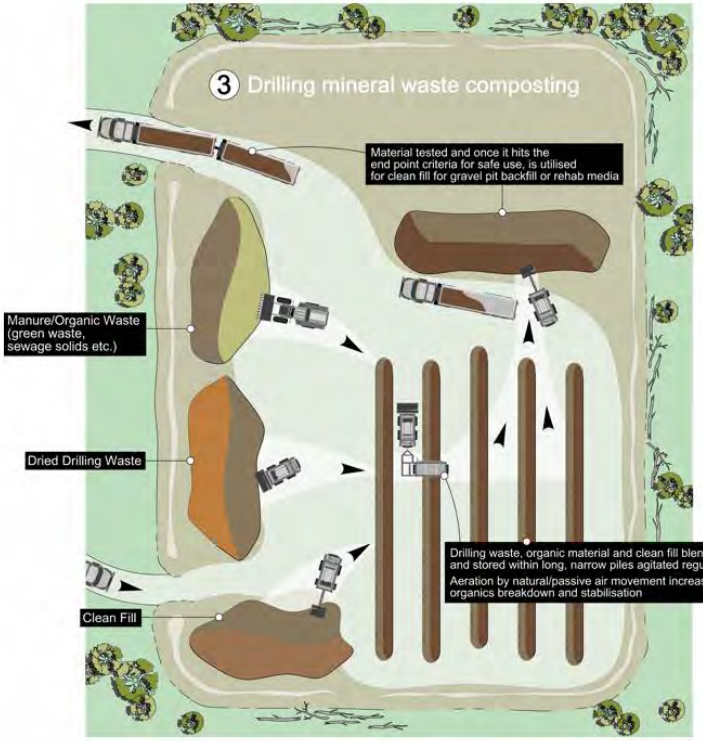
Appendix A – Stakeholder Feedback Form NT-2050-95-AQ-0003

Stakeholder:	
Document Referenced:	
Controlled Doc Number:	

#	Ref	Comment	Date	Tamboran Feedback	Date

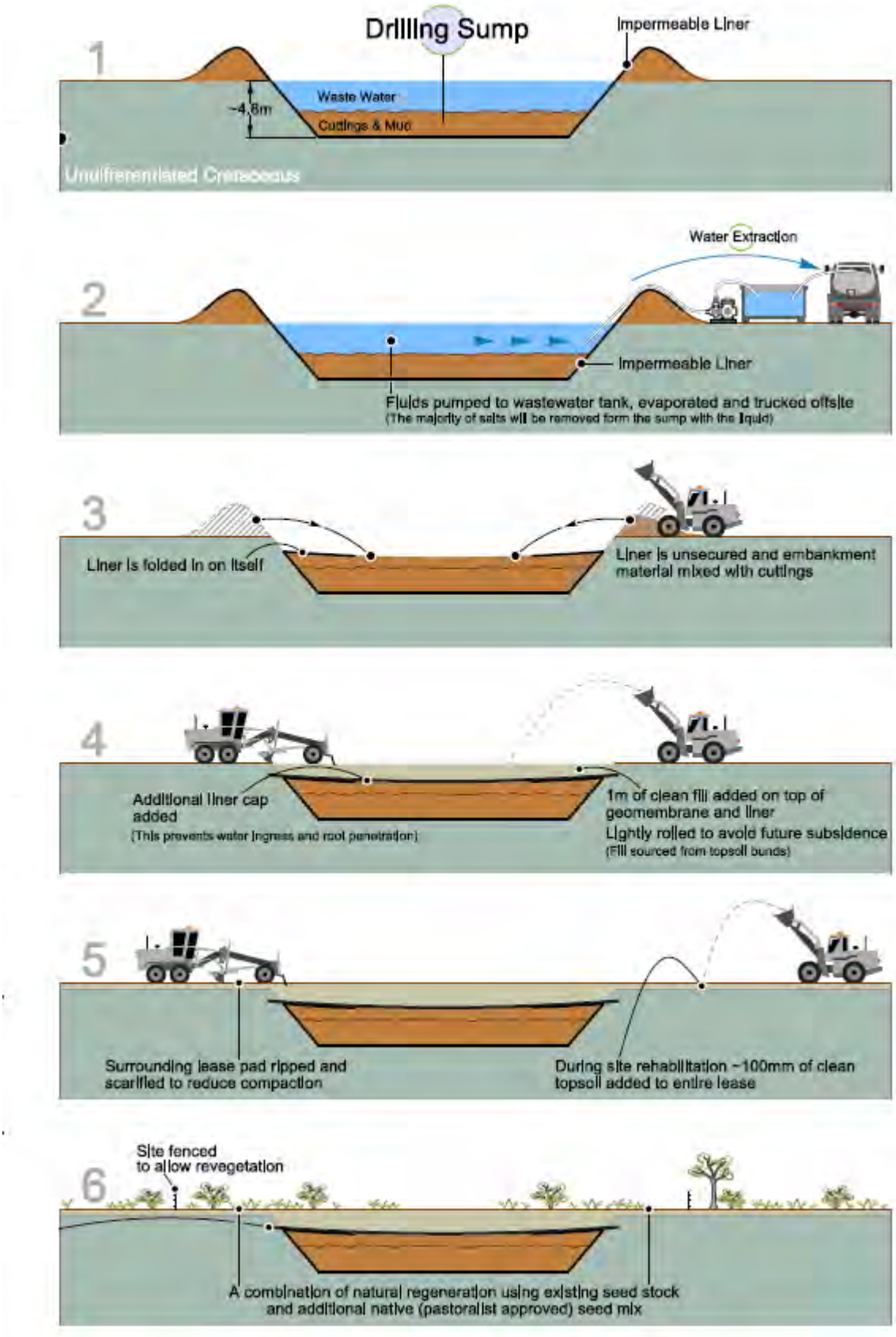
Appendix B Overview of drilling waste composting strategy



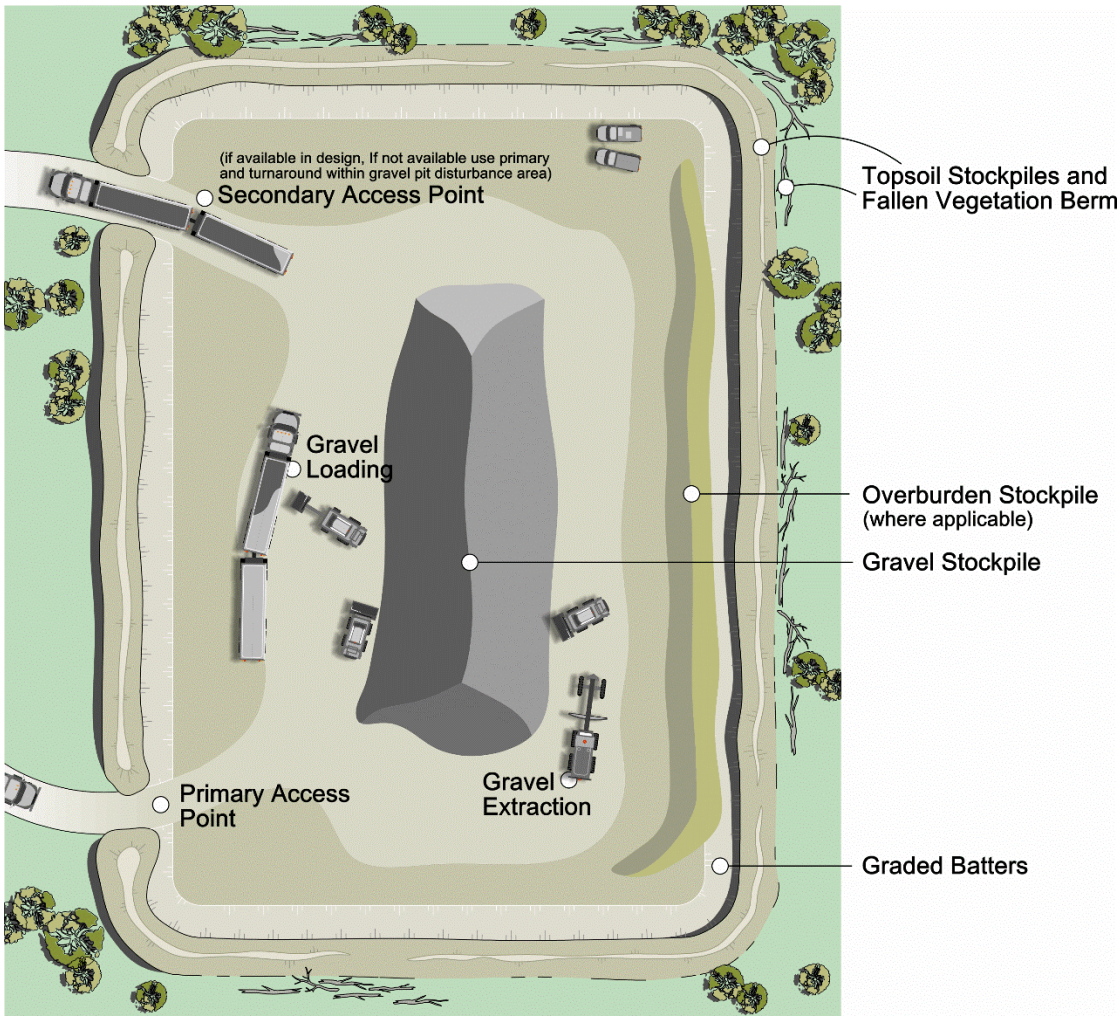


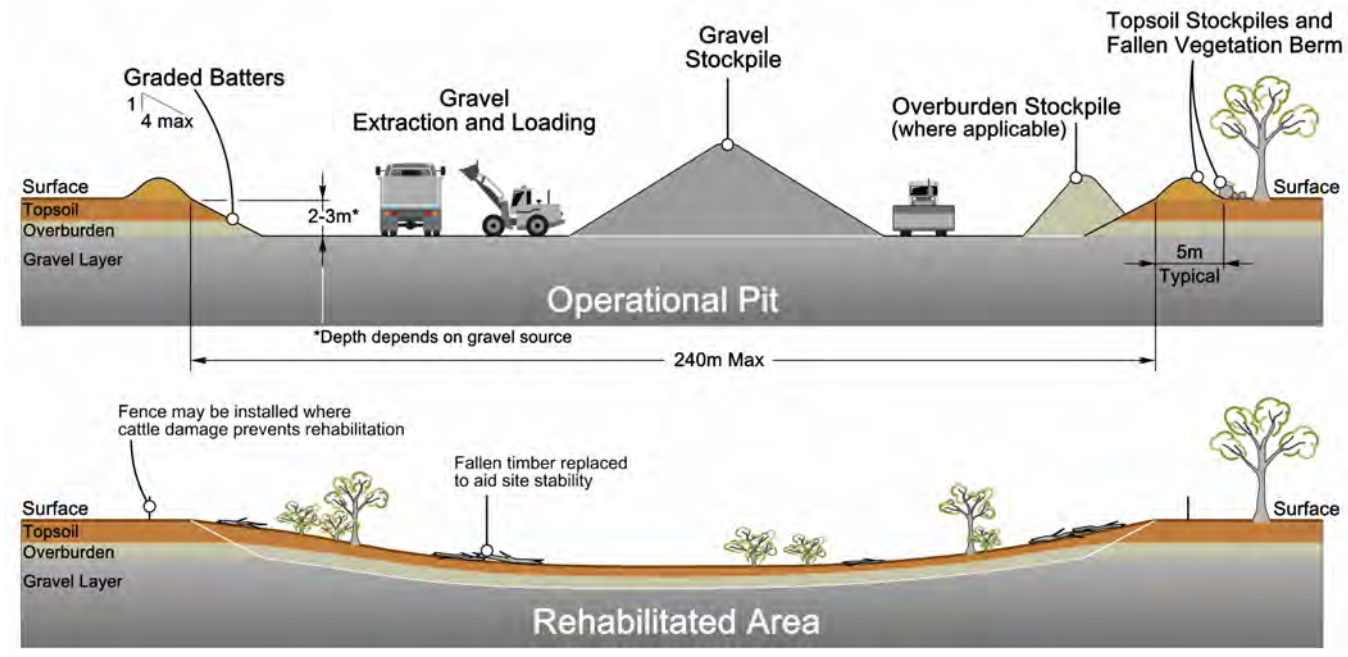
Appendix C Drilling sump mix bury cover

Illustration of the onsite burial of drilling waste at each location



Appendix D Gravel pit generic layout, operations and rehabilitation





Appendix A – Stakeholder Feedback Form NT-2050-95-AQ-0003

Stakeholder:	APN Pty Ltd: Hayfield, Shenandoah, Shenandoah East.
Document Referenced:	SEP
Controlled Doc Number:	NT-2050-95-AQ-0003

#	Ref	Comment	Date	Tamboran Feedback	Date
	6.1.	• Please clarify that location of temp gas processing is at Shen. Sth?			
		• Confirm acquifers being accessed for 8 bores @ Shenandoah S2 site?			
	Other	• Are there results from induced seismic monitoring conducted on recent fracking @ Kyalla? (Origin)			
		• Construction of pipeline. How will cattle movements be managed during construction & following? There is a risk of cattle falling into trenches & bogging during rain events ~~as~~ when trenches sink a bit. Happened before.			
		• Production - we note that production may occur			
		• Washdowns - how and where? Certificates?			
		• Note: water being accessed from Gum Ridge for drilling & stimulation.			

From: David Armstrong
To: Val Dyer
Cc: Justin Dyer; Nick Dyer; Sturt Plains; Robert Wear
Subject: Re: Information Pack - Proposed Work Program 2024/25
Date: Saturday, 11 November 2023 3:09:14 PM
Attachments: image003.png

Hi Val

Thankyou for your questions to the SEP. Please see attached responses from Tamboran. As always consultation and engagement is on going so if you or anyone have any question please ask.

If you need more information regarding these questions please let me know

I'll give you a call early this week to discuss

Regards

Dave

Comment	Tamboran response
Please clarify that location of temp gas processing is at Shenandoah Sth ?	With a successful well test of Shenandoah S 1H- it wold be envisaged that the temporary compression facility could be located in the vicinity of Kyalla 117 N2/ Shenandoah S2. The current location next to the proposed Shenandoah South A (along the access track) could still be suitable- but gathering costs connecting Kyalla 117 N2 to this location are quite high (~$6-10 million). Therefore, to produce gas from the existing Shenandoah S 1H well- the facility location may need to be closer to Kyalla 117 N2. Detailed engagement regarding the location of the facility will follow pending the results of Shenandoah S-1H well test- Potentially early 2024.
Confirm aquifers being accessed for 8 bores Shenandoah S2?	Tamboran is required to drill monitoring bores in both in Anthony Lagoon and Gum Ridge aquifers. Extract is currently only proposed form the Gum ridge formation- however may be from the Anthony Lagoons in the future. The water extraction licence is proposed to be increased to 450 megs.
[redacted]	[redacted]
	Tamboran will work with the pastoralists to determine the best way of managing cattle in the vicinity of any construction site. Any disruption to pastoral activities will be compensated for, including any additional actions required for the pastoralist to manage cattle within the vicinity of our activities. During construction, temporary fencing will be used at all time to prevent stock access to any open trenches. Trenches, other than the immediate working area, are not left open during the night, with any open trench fenced. Land bridges/ designated areas to allow cattle to navigate through the right of way are commonly provided to ensure cattle can continue to pass through the ROW to access water and feed. These may be required in consultation with the pastoralists- depending on the amount of cattle within the paddocks and proximity to watering points etc. When reinstating the Right of Way, the area above the pipe will be appropriately compacted to reduce subsidence risks. Compaction of the overburden is key to minimising subsidence. An appropriate native grass seed mix will be applied to actively encourage revegetation and stabilisation. Depending on soil moisture levels, the gathering lines will be routinely (potentially daily) watered until sufficient cover has been re-

	established. This is typically 2-4 weeks, depending on the time of the year and rainfall. During this period of regular watering, any defects such as subsidence, will be rectified. Any cattle bogged would be quickly identified and rescued- minimising the chance of livestock loss. Once the right of way has stabilised, we would seek the Pastoralist sign off at this point that re-instatement is sufficient. At this point, the risk to cattle would be low and routine inspections (typically monthly/ significant rainfall) would be completed to monitor for any erosion/ subsidence.
[redacted] How will cattle movements during construction and following? There is a risk of cattle falling in trenches and bogging during rain events when trenches sink a bit. Happened before	[redacted]
[redacted]	[redacted]
Washdowns- how and where? Certificates?	Tamboran has access to the AEM washdown facility at Daly Waters. Each vehicle and load of equipment must be inspected by a person who has obtained qualification in AHCBIO 203 and issued with a vehicle hygiene certificate.

DAVID ARMSTRONG

Managing Director
Mobile
Address
Email [redacted]

TERRABOS CONSULTING
PASTORAL
EXPLORATION
MINING
ABORIGINAL
DEVELOPMENT

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On 31 Oct 2023, at 6:57 pm, Val Dyer [redacted] > wrote:

Dear David

Finally read the SEP. Please find our response attached.

How soon do you need a response to APN accepting or otherwise the bores at Kyalla from your previous email on that matter?

Thanks and regards
Val

From: David Armstrong <[redacted]
Sent: Friday, 13 October 2023 2:49 PM
To: Val Dyer <[redacted]
Cc: Justin Dyer [redacted]>; Nick Dyer [redacted]>; Sturt Plains [redacted] Robbie Wear <[redacted]>
Subject: Information Pack - Proposed Work Program 2024/25

Hi Val

As discussed please see attached Tamboran Pastoralist Engagement Pack. This information is in relation to proposed drilling operations for 2024/25. Due to drilling results and information gathered this year, the work program has altered a little hence the attached information pack outlines this proposal. Moving forward we would need to discuss and negotiate an access agreement including compensation.

A basic description of the proposed work program is,

- Drill 2 new wells on the existing Kyalla site. This would make a total of 4 wells on that site. To do this the drill pad would have to be enlarged slightly. This enlargement of the drill pad would be within the current fenced area so no more land is required.
- Constructed a new pad (South Shenandoah 2) approximately 3.7 km north of the Kyalla site just west of the fence line. It is proposed to drill 4 wells on this site over 2024/25.

Once you have read this, if you require, I can organise meetings with appropriate people to answer specific question where they have expertise.

I'll allow you to read over this however if you have any questions please call me anytime.

Regards

Dave

DAVID ARMSTRONG

Managing Director
Mobile
Addres
Email [redacted]

<SEP response31102023.pdf>

From: Val Dyer <[redacted]>
Date: 15 November 2023 at 5:27:57 pm AEDT
To: David Armstrong <d[redacted]u>
Cc: Justin Dyer <a[redacted]>, Nick Dyer [redacted]>, Sturt Plains [redacted]>, Robbie Wear <rc[redacted]>
Subject: RE: Information Pack - Proposed Work Program 2024/25

Hi David
Thanks for Tamboran's responses. Please see response below

Temporary Compression Facility: Noted

Drilling of 8 bores:
Which aquifer does the 450 meg application relate to?

Seismic Monitoring Data:
APN looks forward to being briefed regarding data collected from the previous frack at Kyalla.

Protection of cattle during pipeline construction:
APN will be pleased to share its local knowledge with the planners of laying the pipeline.

Appraisal Gas Sales:
Can you advise how and when a decision was made to define temporary sale of gas as 'non-production'? APN assumes that a temporary sale of appraisal gas will require a new LACA.

Washdowns: Can the logistics of verification be discussed between Robbie and Justin?

Thanks Dave
Regards
Val

From: David Armstrong <d[redacted]
Sent: Saturday, 11 November 2023 4:09 PM
To: Val Dyer <[redacted]
[redacted]>; [redacted]ick Dyer [redacted]>; Sturt Plains <[redacted]
Robbie Wear [redacted]
Subject: Re: Information Pack - Proposed Work Program 2024/25

Hi Val

Thankyou for your questions to the SEP. Please see attached responses from Tamboran. As always consultation and engagement is on going so if you or anyone have any question please ask.

If you need more information regarding these questions please let me know

I'll give you a call early this week to discuss

Regards

Dave

Comment	Tamboran response
	With a successful well test of Shenandoah S 1H- it wold be envisaged that the temporary compression facility could be located in the vicinity of Kyalla 117 N2/ Shenandoah S2.

Please clarify that location of temp gas processing is at Shenandoah Sth ?	The current location next to the proposed Shenandoah South A (along the access track) could still be suitable- but gathering costs connecting Kyalla 117 N2 to this location are quite high (~$6-10 million). Therefore, to produce gas from the existing Shenandoah S 1H well- the facility location may need to be closer to Kyalla 117 N2. Detailed engagement regarding the location of the facility will follow pending the results of Shenandoah S-1H well test- Potentially early 2024.
Confirm aquifers being accessed for 8 bores Shenandoah S2?	Tamboran is required to drill monitoring bores in both in Anthony Lagoon and Gum Ridge aquifers. Extract is currently only proposed form the Gum ridge formation- however may be from the Anthony Lagoons in the future. The water extraction licence is proposed to be increased to 450 megs.
Are there results from the induced seismic monitoring conducted on recent fracking @Kyalla (Origin)	The microseismic collected for Kyalla 117 N2-1H has been completed. Our geologists has indicated the results did not show any major seismicity- and will prepare something to share with Hayfield over the coming days. We have a new induced seismicity monitoring station on for the Shenandoah S-1H well. We will endeavour to share this information as well.
Construction of pipelines. How will cattle movements during construction and following? There is a risk of cattle falling in trenches and bogging during rain events when trenches sink a bit. Happened before	Tamboran will work with the pastoralists to determine the best way of managing cattle in the vicinity of any construction site. Any disruption to pastoral activities will be compensated for, including any additional actions required for the pastoralist to manage cattle within the vicinity of our activities. During construction, temporary fencing will be used at all time to prevent stock access to any open trenches. Trenches, other than the immediate working area, are not left open during the night, with any open trench fenced. Land bridges/ designated areas to allow cattle to navigate through the right of way are commonly provided to ensure cattle can continue to pass through the ROW to access water and feed. These may be required in consultation with the pastoralists- depending on the amount of cattle within the paddocks and proximity to watering points etc. When reinstating the Right of Way, the area above the pipe will be appropriately compacted to reduce subsidence risks. Compaction of the overburden is key to minimising subsidence. An appropriate native grass seed mix will be applied to actively encourage revegetation and stabilisation. Depending on soil moisture levels, the gathering lines will be routinely (potentially daily) watered until sufficient cover has been re-established. This is typically 2-4 weeks, depending on the time of the year and rainfall. During this period of regular watering, any defects such as subsidence, will be rectified. Any cattle bogged would be quickly identified and rescued- minimising the chance of livestock loss. Once the right of way has stabilised, we would seek the Pastoralist sign off at this point that re-instatement is sufficient. At this point, the risk to cattle would be low and routine inspections (typically monthly/ significant rainfall) would be completed to monitor for any erosion/ subsidence. APA are the contractor in charge of the pipeline approvals and construction and will contact you directly through Dave Armstrong.
	Under this SEP, we are providing forward looking statements into where and when we think the sale of appraisal gas may occur. Appraisal gas sale is not considered "production" under the NT Petroleum Act. Temporary sale of appraisal gas is authorised under the NT Petroleum act- to reduce greenhouse gas emissions from flaring. This ensures operators can obtain the required data to underpin a development, whilst not creating excessive greenhouse gas emissions from flaring a product that is in high demand. Pending the appraisal of these wells and subsequent data collected, Tamboran will seek the required approvals to commence production.

Production- we note production may occur	Detailed engagement regarding the potential future production will follow pending the results of Shenandoah S-1H well test- Potentially early 2024.
Washdowns- how and where? Certificates?	Tamboran has access to the AEM washdown facility at Daly Waters. Each vehicle and load of equipment must be inspected by a person who has obtained qualification in AHCBIO 203 and issued with a vehicle hygiene certificate.

DAVID ARMSTRONG

Managing Director
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On 31 Oct 2023, at 6:57 pm, Val Dyer [redacted] wrote:

Dear David

Finally read the SEP. Please find our response attached.

How soon do you need a response to APN accepting or otherwise the bores at Kyalla from your previous email on that matter?

Thanks and regards
Val

From: David Armstrong [redacted]
Sent: Friday, 13 October 2023 2:49 PM
To: Val Dyer [redacted] >
Cc: Justin Dyer [redacted] Nick Dyer [redacted]; Sturt Plains <[redacted]>; Robbie Wear [redacted]
Subject: Information Pack - Proposed Work Program 2024/25

Hi Val

As discussed please see attached Tamboran Pastoralist Engagement Pack. This information is in relation to proposed drilling operations for 2024/25. Due to drilling results and information gathered this year, the work program has altered a little hence the attached information pack outlines this proposal. Moving forward we would need to discuss and negotiate an access agreement including compensation.

A basic description of the proposed work program is,

- Drill 2 new wells on the existing Kyalla site. This would make a total of 4 wells on that site. To do this the drill pad would have to be enlarged slightly. This enlargement of the drill pad would be within the current fenced area so no more land is required.
- Constructed a new pad (South Shenandoah 2) approximately 3.7 km north of the Kyalla site just west of the fence line. It is proposed to drill 4 wells on this site over 2024/25.

Once you have read this, if you require, I can organise meetings with appropriate people to answer specific question where they have expertise.

I'll allow you to read over this however if you have any questions please call me anytime.

Regards

Dave

DAVID ARMSTRONG

Managing Director
Mobile
Address [redacted]

Email [redacted]

[redacted]

From: David Armstrong
To: Val Dyer
Cc: Justin Dyer; Nick Dyer; Sturt Plains; Robert Wear
Subject: Re: Information Pack - Proposed Work Program 2024/25
Date: Thursday, 16 November 2023 6:37:08 AM
Attachments: image003.png

Hi Val

Thankyou for your questions, please see below responses. As mentioned I have been engaged by the pipeline contractor (APA) to work with you as your point of contact. I've had discussions with them about protection of cattle and it's important to them. They are keen to meet with you before Christmas so I'll touch base with Justin and see if it will work.

Moving forward Tamboran will now lodge their Environmental Management Plan with the NTG for assessment regarding the work covered within this Stakeholder Engagement Pack. This assessment takes 90 days and Tamboran has to answer questions that might come back from the government.

Engagement with you does not finish just because the EMP is lodge, as always it is on going so if you have any more questions please do not hesitate to ask.

I will look at getting a proposed access agreement to you by the end of next week that would cover this work. It's my thought that we do a variation to the current access agreement however I'm open to suggestions.

Tamboran very much appreciates your on going positive engagement and they do not take this lightly.

Regards

Dave

Temporary Compression Facility: Noted

Drilling of 8 bores:
Which aquifer does the 450 meg application relate to? Gum Ridge Formation. This is the deeper aquifer

Seismic Monitoring Data:
APN looks forward to being briefed regarding data collected from the previous frack at Kyalla. We have put a request into the team to prepare a summary report suitable for distribution. We have attached the full report, noting it is quite difficult to interpret. Please note this is confidential. The report did not detect any major seismic events.

Protection of cattle during pipeline construction:
APN will be pleased to share its local knowledge with the planners of laying the pipeline. We appreciate the offer. APA will be constructing the pipeline and the protection of cattle is imperative.

Appraisal Gas Sales:
Can you advise how and when a decision was made to define temporary sale of gas as 'non-production'? APN assumes that a temporary sale of appraisal gas will require a new LACA. Correct, a new LACA will be required. Once the decision has been made to sell appraisal gas, additional engagement and a new agreement to enable that activity will be triggered.

Washdowns: Can the logistics of verification be discussed between Robbie and Justin? Yes- we are happy for Justin and Robbie to discuss weed washdowns further. Robbie is Tamboran's nominated Weed Officer.

DAVID ARMSTRONG

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On 15 Nov 2023, at 3:57 pm, Val Dyer <[redacted] wrote:

Hi David

Thanks for Tamboran's responses. Please see response below

Temporary Compression Facility: Noted

Drilling of 8 bores:
Which aquifer does the 450 meg application relate to?

Seismic Monitoring Data:
APN looks forward to being briefed regarding data collected from the previous frack at Kyalla.

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Thanks Dave
Regards
Val

From: David Armstrong [redacted]
Sent: Saturday, 11 November 2023 4:09 PM
To: Val Dyer <[redacted]
Cc: Justin Dyer [redacted]; Nick Dyer [redacted]; Sturt Plains <[redacted]
Robbie Wear [redacted]
Subject: Re: Information Pack - Proposed Work Program 2024/25

Hi Val

Thankyou for your questions to the SEP. Please see attached responses from Tamboran. As always consultation and engagement is on going so if you or anyone have any question please ask.

If you need more information regarding these questions please let me know

I'll give you a call early this week to discuss

Regards

Dave

Comment	Tamboran response
Please clarify that location of temp gas processing is at Shenandoah Sth ?	With a successful well test of Shenandoah S 1H- it wold be envisaged that the temporary compression facility could be located in the vicinity of Kyalla 117 N2/ Shenandoah S2. The current location next to the proposed Shenandoah South A (along the access track) could still be suitable- but gathering costs connecting Kyalla 117 N2 to this location are quite high (~$6-10 million). Therefore, to produce gas from the existing Shenandoah S 1H well- the facility location may need to be closer to Kyalla 117 N2. Detailed engagement regarding the location of the facility will follow pending the results of Shenandoah S-1H well test- Potentially early 2024.
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Regards

Dave

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<SEP response31102023.pdf>