BEETALOO EXPLORATION PROJECT GREENHOUSE GAS ABATEMENT PLAN

Review record

Rev	Date	Reason for issue	Reviewer	Approver
0	08/12/2021	Issued for use	RU	MK
1	08/07/2022	Update to include Amungee Delineation Scope	LP	MK
2.0	21/09/2023	Revision	LP	MK
3.0	16/11/2023	Revision to include Shenandoah South E&A program	LP	MK
4.0	08/07/2024	Inclusion of the SPCF facility	BO	MK
4.1	23/10/2024	Minor revision to address OGC comment		MK

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1. INTRODUCTION

Tamboran B2 Pty Ltd (Tamboran) is a registered holder and the operator of Exploration Permit (EP) 98, EP 76 and EP 117 located in the Beetaloo Sub-basin. As a part of its ongoing exploration and appraisal (E&A) program, Tamboran is proposing to undertake a series of activities over the 2025 – 2029 financial years. A Greenhouse Gas Abatement Plan (GGAP) was originally submitted in December 2021, in accordance with the Northern Territory (NT) Greenhouse Gas Emissions Management for New and Expanding Large Emitters (referred to herein as the Large Emitters policy) as the project was anticipated to generate greenhouse gas emissions that will exceed the 100,000 tCO_2e- threshold in a financial year.

This GGAP is an evolving document and is updated based on revisions to the company's exploration strategy and emission profiles.

This GGAP version provides an update to the predicted Greenhouse gas (GHG) emissions associated with Tamboran's future exploration and appraisal programs, specifically the inclusion of the Sturt Plateau Compression Facility (SPCF) which will be constructed to beneficially use gas produced from Tamboran's Shenandoah South Pilot Area sourced under the approved *Beetaloo Basin Shenandoah South E&A Program EMP (TAM1-3)*.

2. PROJECT OVERVIEW

Tamboran is planning to undertake petroleum exploration and appraisal (E&A) works within the Beetaloo Sub-basin to fulfil its commitments under its tenure work program. Over the 2025 to 2029 financial years (FY), Tamboran proposes to drill, stimulate and appraise up to 15 E&A wells to confirm the technical and commercial feasibility of the Velkerri shales in the Shenandoah South Pilot Area under the TAM1-3 EMP (Figure 1).

To allow for the long-term appraisal of wells drilled within the Shenandoah South Pilot Area and to reduce scope 1 GHG emissions, Tamboran proposes to construct the Sturt Plateau Compression Facility (SPCF) in FY 2026. This will allow Tamboran to sell appraisal gas to be used for electricity generation within the NT, avoiding ~1.1 million tonnes of scope 1 CO_2 emissions per annum from the project.

This GGAP covers the regulated activities required to enable Tamboran to undertake the appraisal program as outlined in the various approved EMPs or anticipated future scope.[1]

[1] Approved EMPs can be found on the DEPWS website at: https://depws.nt.gov.au/onshore-gas/environment-management-plan/emp-decisions.

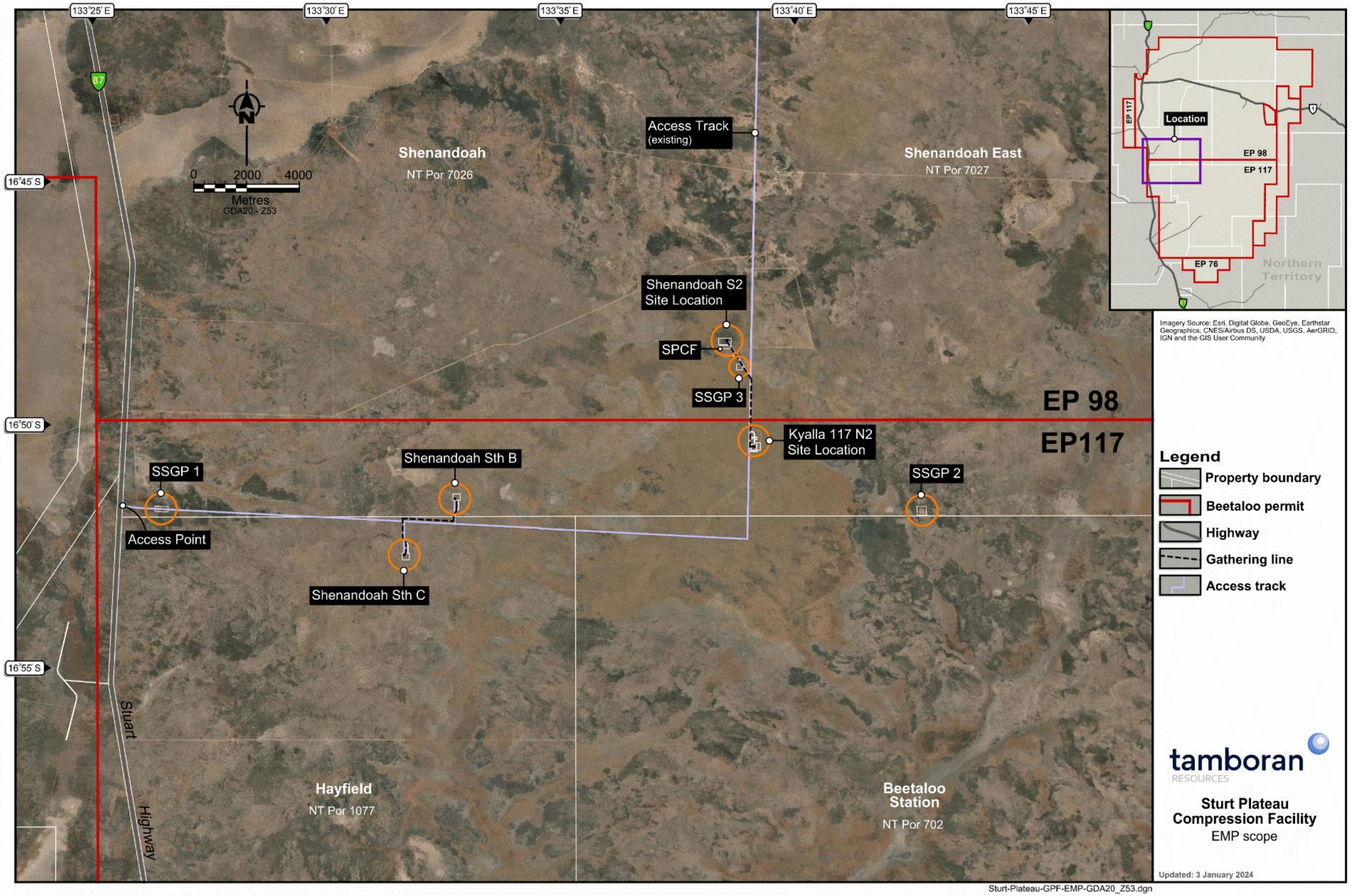

Figure 1: Location of the proposed activities in the Shenandoah South Pilot Area

3. GREENHOUSE GAS ABATEMENT PLAN

The requirements of the GGAP are described extensively in Tamboran's approved or proposed EMPs. These include:

- Sturt Plateau Compression Facility - Appraisal Gas EP 98 and EP 117 (TAM2)
- Beetaloo Basin Shenandoah South Exploration and Appraisal EMP EP 117 & EP 98 (TAM1-3)
- Beetaloo Sub-basin Amungee Multi-well Drilling, Stimulation and Well Testing Program NT EMP EP 98 (ORI11-3)
- Beetaloo Sub-basin Amungee NW Delineation Drilling, Stimulation and Well Testing Program EP 98 & EP 76 EMP (ORI10-3)
- Beetaloo Basin Kalala S1 EMP EP 98 (ORI9-2)
- Beetaloo Basin Beetaloo W1 EMP EP117 (ORI 8-2)
- Beetaloo Basin Amungee NW-1H Stimulation EMP EP 98 (ORI7-2)
- Beetaloo Basin Velkerri 76 Drilling, Stimulation and Well Testing EMP EP 76 (ORI5-4)
- Beetaloo Basin Velkerri 76 S2 Civil Construction EMP EP 76 (ORI4-1)

How Tamboran addresses the GGAP requirements is summarised in Table 1.

Table 1: GGAP summary

#	Requirement	Tamboran response
1	Brief description of the project.	The scope of Tamboran's Financial year (FY) 2025-29 campaign includes: • Drilling, hydraulic fracture stimulation and well testing of 17 exploration and appraisal wells within Tamboran's Beetaloo tenure (exploration permit 76, 98 and 117). • Civil construction activities required to construct lease pads, camp pads, laydown areas, helipads, firebreaks, seismic lines and access tracks to support the drilling the proposed E&A wells. • Construction, commissioning, operation and decommissioning of the SPCF. • Setup and operation of a temporary camps and drilling mini-camp at each of the sites. • Flaring and appraisal gas sale • All other activities required to achieve the exploration program activities. The key focus of the Beetaloo E&A program will be the construction of the SPCF to allow for the sale of appraisal gas to reduce the requirement for longer term (36 month) flaring. Longer term appraisal results are required to confirm resource estimates, which are required to underpin future production investment.
2	An estimate of the project's net scope 1 emissions and how these emissions will contribute to the Territory's overall emissions profile.	The scope 1 emissions break down per year of the Beetaloo project are provided in Appendix A, including offset requirements and residual emission levels. The total scope 1 emission breakdown per activity is provided in Appendix B.

#	Requirement	Tamboran response
		Emissions are estimated to peak at **193,066** tCO_2-e in FY 2025, predominantly associated with the well testing (flaring) of E&A wells drilled and stimulation under the Shenandoah South E&A EMP (TAM1) prior to the commissioning of the SPCF. The maximum potential emissions of Tamboran's activities in 2025 represent 1.35% total NT GHG emissions, reducing to 0.69% of the NT's emissions once the SPCF is commissioned. The construction and operation of the SPCF is a key strategy Tamboran is proposing to reduce emissions during the appraisal stage of its program. Gas from the SPCF will be sold under temporary Beneficial Use of Gas measures under the NT Petroleum Act. Post commissioning of the SPCF in 2026, Tamboran's Scope 1 emissions will fall below the 100 $ktCO_2$-e with the level of flaring being restricted to new well clean up durations. Appraisal gas will be sold in 2026 to the NT Power Water Corporation (PWC) for electricity generation for Territorians. The supply of gas to PWC will not materially increase the emissions of the NT, as gas will be used for power generation regardless of the source.
3	An estimate of the project's net scope 2 emissions and how these emissions will contribute to the Territory's overall emissions profile.	There are no scope 2 emissions associated with Tamboran's Beetaloo exploration program.
4	An estimate of the project's scope 3 emissions.	Scope 3 emissions over the EMP duration include emissions associated with the end use of the gas for electricity generation, transmission of gas via pipeline to the customer, SPCF construction material (steel and cement), well materials and incidental transportation emissions. The project's estimated total 5-year (FY 2025- 29) scope 3 emissions are estimated at 2,877,874 tCO_2-e, with the combustion of gas for electricity by the PWC making up 98% of the total emissions. This figure assumes the maximum volume of gas (50TJ/day) is provided 100% of the time and used for electricity production.
5	An overarching long-term emissions target for the project that represents a meaningful contribution to the Territory's net zero emissions target.	Tamboran's Beetaloo development will be a scope 1 and scope 2 neutral development during full production. This aligns with the NT Government's Net Zero by 2050 Policy and NGERS Safeguard mechanism. How Tamboran intends to use offsets to deal with residual emissions is discussed in item 9 of this plan.
6	Regular interim targets that establish a trajectory to achieving the overarching target and the methods that will be applied to achieve the interim targets.	Interim targets are not relevant for the short-term exploration and appraisal projects. Tamboran has built in emission reduction strategies into its management plans, with the prioritisation of appraisal gas sale to reduce appraisal gas emissions. Offset targets are discussed in item 9 of this plan.
7	An explanation of, and justification for, the proposed long-term and interim targets and how these will make a meaningful contribution to	Tamboran's Beetaloo development will be a scope 1 and scope 2 neutral development during production. This aligns with the NT Government's Net Zero by 2050 Policy and NGERS Safeguard mechanism.

#	Requirement	Tamboran response
	the Territory's emissions target.	During the production phase of the project, emissions will largely be avoided through the electrification of infrastructure, use of renewable energy and engineering design.
8	A demonstration that all reasonable and practical measures have been applied to avoid and mitigate emissions through best practice design, process, technology and management.	Long term appraisal of unconventional resources is required to be generated to prove the commerciality of a potential resource, as well as how the resource can be most efficiently developed. Well testing data is used to generate a well's Estimated Ultimate Recovery (EUR), which determines how many wells are required to be drilled and how often replacement wells are required to be brought online to maintain production levels (i.e. as wells decline over time). Multiple wells on a pad are also used to test potential interference between wells, to optimise the subsurface separation distances of horizontals. This can be used to optimise well numbers per pad. The minimum required appraisal (or piloting) duration for unconventional gas development is typically 2-3 years per geographic region. The more data on production, the lower the commercial risk of a development. This duration is based upon Tamboran's (and previously Origin's) current experience in appraising and developing unconventional gas assets, as well as recommendations from independent petroleum resource evaluation experts (such as NSAI). The construction and operation of the SPCF is a key strategy that Tamboran is proposing to reduce emissions during the appraisal stage of its program. Gas from the SPCF will be sold under the NT Petroleum Act through the temporary Beneficial Use of Gas measures. The mitigation of emissions has been undertaken through: • **Construction and operation of the SPCF**: The primary method to reduce emissions during appraisal. A purpose built facility will be constructed to beneficially use (sell) gas during extended appraisal commencing 2026. This is a significant investment designed to ensure extended appraisal results can be obtained, whilst minimising the generation of GHG emissions**.** • **A modern gas fired compression facility.** The SPCF will utilise new, proven technology that will be designed to reduce emission. This includes elimination of gas driven pneumatic devices and pumps, use of low emission rod packing seals and designing out emissions through the selection of low emission technology and capture of vented emissions where viable. Electric compression is more efficient than gas fired compression, however the lack of regional electricity supply and transmission makes the utilisation of electric compressors during appraisal unfeasible. Electrification will be utilised during full scale production where longer term contracts can underpin the required investment into electrification infrastructure • **Implementation of well shut in strategies to minimise flaring during SPCF maintenance or trips:** Unlike coal seam gas, shale wells can be shut in without affecting well performance. During plant trips or maintenance, the wells will be shut in to eliminate flaring. • **Minimising well clean up and test durations:** Well clean up and testing duration using flaring will be restricted in CY 26- CY 29 to below the 100,000 tCO_2e- threshold. Where possible (i.e. where gathering lines are connected to the SPCF), wells will be cleaned up by flowing inline

#	Requirement	Tamboran response
		which is referred to as a Reduced Emission Completion. This will eliminate flaring during well clean up. • **Minimising production rates during flaring:** Well not connected to the SPCF will have production rates "choked" in the FY 26 to 29 period to reduce production volumes to ensure emissions stay below the 100,000 tCO_2e- threshold. Choking a well can still provide valuable pressure data. • **Use of the best practice emission management controls** outlined in the *Code of Practice: Onshore petroleum activities in the Northern Territory* (the Code) including compressor seal requirements, gas driven pneumatic instrumentation and pumps, reduced emissions completions, compressor seal requirements, minimisation of venting and utilisation of leak detection and repair programs.
9	A description of all strategies proposed to avoid, mitigate and offset the project's scope 1 and scope 2 emissions.	1. GHG emissions will be mitigated through the adoption of the following practices in alignment with the code of practice and best practice: • The beneficial use of gas is expected to reduce appraisal scope 1 emissions by approximately 95%, representing the avoidance of ~1.1 million tCO_2-e per year of emissions compared to flaring. • The development and implementation of a methane emission management plan (D5.1). • SPCF engineering and design, including: ○ utilisation of instrument air to elimination methane emissions from pneumatic devices and pumps (D.5.7.2 C) ○ capture of vented emissions where feasible ○ change out of compressor rod packing seals every 26,000 hours or 36 months (whichever is sooner) (D.5.7.2 B). ○ Adoption of field turn down strategies to mitigate flaring, with no routine facility flaring • Restrictions on venting, with no routine venting utilised (D.5.9). • Use of a Reduced Emissions Completion (REC) where possible (D.5.9). • Implementation on a routine Leak Detection and Repair (LDAR) program (D.5.3.). • Pressure and gas testing all in service equipment to ensure any leaks are identified and fixed prior to commission (D.5.9). • Flanges, valves and fittings are all API compliant and gas tight (D.5.9). • Equipment is appropriately sized and regularly maintained to minimise diesel wastage (D.5.9). • Routine site inspections and assurance undertaken to ensure equipment is maintained and operated as per manufacturers' requirements. 2. Well clean up and test duration and volume will be restricted in CY 26 to 29 to keep emissions are below the 100,000 tCO_2e- threshold. 3. Where the emissions from a defined facility exceed the 100,000 tCO_2e- threshold NGERS safeguard emissions trigger, all scope 1

#	Requirement	Tamboran response
		emissions for that reporting period will be offset in accordance with the Commonwealth NGERS Safeguard requirements. 4. Where emissions are below the NGERS safeguard trigger, a % of residual emissions shall be voluntarily offset using credible carbon credit units approved by the Commonwealth Clean Energy Regulator or the Commonwealth's Climate Active Carbon Neutral Standard. This ensures the project is in alignment with the NT Net Zero by 2050 Policy. 5. Where emissions are below the NGERS safeguard, minimum offset levels shall increase year-on-year by 3.7% (based on a baseline financial year of 2023) to result in a linear decrease in residual emission levels to net zero by 2050 as per the following schedule: – Financial year 2025: 11.1% of total emission offset. – Financial year 2026 14.8% of total emissions offset. – Financial year 2027 18.5% of total emissions offset. – Financial year 2028 22.5% of total emissions offset. – Financial Year 2029 26.2% of total emissions offset. 6. Estimates of offset volumes and residual emission levels are provided in Appendix A. 7. Actual emission levels produced during a financial year will be estimated in accordance with the National Greenhouse and Energy Reporting Scheme (NGERS) reporting methodology. 8. Offsets volumes shall be calculated retrospectively, by multiplying the actual emission volumes generated during a financial year with the corresponding financial year offset % requirement level. 9. Offsets shall be secured and retired within 6 months of the end of a financial year.
10	Flexibility to review mitigation actions and abatement plans so they can be improved and updated to enable further emissions reductions going forward.	Tamboran has prioritised the sale of appraisal gas and actively monitor and manage emissions to below the 100 ktCO_2 during the operation of the SPCF. It will also offset a % of emission below the 100 ktCO_2 trigger in line with the NT Net Zero by 2050 target.
11	A schedule for periodic public reporting on implementation and progress against the interim and overarching targets and any changes that have had to be made to the strategies proposed in the GGAP to deliver on the targets.	1. Tamboran is required under condition D.6.2 of the Code of Practice to report its GHG emissions to the Department of Environment, Parks and Water Security on an annual basis. During this report, Tamboran assesses the level of GHG emissions against its EMP estimated levels to demonstrate it has met it has met its performance standards. 2. A report from an appropriately qualified independent person shall be provided to DEPWS by October 31 each year, verifying the actual emission levels estimated and confirming the required offset for the previous financial year have been acquired and retired.
12	Information about the project's obligations under the Australian Government's National Greenhouse and	Where Tamboran exceeds 100 ktCO_2 in a reporting period (financial year), Tamboran will trigger the NGERS reporting threshold and safeguard mechanism. A baseline emission intensity will be generated for

#	Requirement	Tamboran response
	Energy Reporting Act 2007 and any expected baseline determinations.	Tamboran's activities which will be zero. This means all emissions over the threshold are required to be offset.
13	A timetable for review that is considerate of the project's lifespan and the identified interim and overarching targets.	The emissions associated with the project will be reviewed as a part of the GGAP or at least annually.

4. REFERENCES

Heinz Schandl, Tim Baynes, Nawshad Haque, Damian Barrett and Arne Geschke (2019). *Final Report for GISERA Project G2 - Whole of Life Greenhouse Gas Emissions Assessment of a Coal Seam Gas to Liquefied Natural Gas Project in the Surat Basin, Queensland, Australia*. CSIRO, Australia.

Appendix A Scope 1 emissions breakdown, offsets and residual emissions per year

Emission period	Cumulative tCO_2-e	Potential emission offset requirements (tCO_2)	Total cumulative residual emissions tCO_2 (Total emissions minus offsets)
FY 2025	193,066	193,066*	0*
FY 2026	96,775	14,226	82,549
FY 2027	97,041	17,856	79,186
FY 2028	94,423	20,867	73,556
FY 2029	87,779	22,646	65,132
Total	**569,085**	**268,661***	**300,323***

*Assumes the NGERS safeguard 100 $ktCO_2$ trigger has been reached and offset requirements triggered.

Appendix B Tamboran's project scope 1 emissions estimate

Summary of Tamboran's Total scope 1 emissions estimates from FY 2025 to 2029. This includes existing approved scope and new scope.

Activity	Anticipated volume	Estimated emissions	Estimate methodology and assumptions
Existing approved EMPs- Shenandoah south E&A proposed scope and site maintenance			
Diesel combustion – transport to cover seismic program	25 kL	68 t	Diesel estimates multiplied by NGERS emission factor from NGER Determination: Division 2.4.2 Method 1 emissions of carbon dioxide, methane and nitrous oxide from liquid fuels other than petroleum-based oils or greases, section 2.41 Method 1—emissions of carbon dioxide, methane and nitrous oxide and Part 3—Fuel combustion—liquid fuels and certain petroleum-based products for stationary energy purposes item 40: Energy Content Factor (GJ/kg) 38.6 CO_2 Factor 69.9 $kgCO_2$-e/ GJ of diesel CH_4 Factor 0.1 kgO_2-e/ GJ of diesel N_2O Factor 0.2 $kgCO_2$-e/ GJ of diesel
Diesel combustion civil construction	465 kL	1260 t	Diesel estimates multiplied by NGERS emission factor from NGER Determination: Division 2.4.2 Method 1 emissions of carbon dioxide, methane and nitrous oxide from liquid fuels other than petroleum-based oils or greases, section 2.41 Method 1—emissions of carbon dioxide, methane and nitrous oxide and Part 3—Fuel combustion—liquid fuels and certain petroleum-based products for stationary energy purposes item 40: Energy Content Factor (GJ/kg) 38.6 CO_2 Factor 69.9 $kgCO_2$-e/ GJ of diesel CH_4 Factor 0.1 kgO_2-e/ GJ of diesel N_2O Factor 0.2 $kgCO_2$-e/ GJ of diesel
Diesel combustion – site maintenance	253.9	690	Diesel estimates multiplied by NGERS emission factor from NGER Determination: Division 2.4.2 Method 1 emissions of carbon dioxide, methane and nitrous oxide from liquid fuels other than petroleum-based oils or greases, section 2.41 Method 1—emissions of carbon dioxide, methane and nitrous oxide and Part 3—Fuel combustion—liquid fuels and certain petroleum-based products for stationary energy purposes item 40: Energy Content Factor (GJ/kg) 38.6 CO_2 Factor 69.9 $kgCO_2$-e/ GJ of diesel CH_4 Factor 0.1 kgO_2-e/ GJ of diesel

Activity	Anticipated volume	Estimated emissions	Estimate methodology and assumptions
			N_2O Factor 0.2 $kgCO_2$-e/ GJ of diesel
Diesel combustion – transport to cover drilling/stimulation mobilisation and transport activities (including offsite wastewater transport)	1,544 kL	4,196 t	Diesel estimates multiplied by NGERS emission factor from NGER Determination: Division 2.4.2 Method 1 emissions of carbon dioxide, methane and nitrous oxide from liquid fuels other than petroleum-based oils or greases, section 2.41 Method 1—emissions of carbon dioxide, methane and nitrous oxide and Part 3—Fuel combustion—liquid fuels and certain petroleum-based products for stationary energy purposes item 40: Energy Content Factor (GJ/kill) 38.6 CO_2 Factor 69.9 $kgCO_2$-e/ GJ of diesel CH_4 Factor 0.1 kgO_2-e/ GJ of diesel N_2O Factor 0.2 $kgCO_2$-e/ GJ of diesel
Diesel combustion – drilling	3,504 kL	9,495 t	Diesel estimates multiplied by NGERS emission factor from NGER Determination: Division 2.4.2 Method 1 emissions of carbon dioxide, methane and nitrous oxide from liquid fuels other than petroleum-based oils or greases, section 2.41 Method 1—emissions of carbon dioxide, methane and nitrous oxide and Part 3—Fuel combustion—liquid fuels and certain petroleum-based products for stationary energy purposes item 40: Energy Content Factor (GJ/kill) 38.6 CO_2 Factor 69.9 $kgCO_2$-e/ GJ of diesel CH_4 Factor 0.1 kgO_2-e/ GJ of diesel N_2O Factor 0.2 $kgCO_2$-e/ GJ of diesel
Diesel combustion – camp	488 kL	1,322 t	Diesel consumption estimates multiplied by NGERS emission factor from NGER Determination: Division 2.4.2 Method 1 emissions of carbon dioxide, methane and nitrous oxide from liquid fuels other than petroleum-based oils or greases, section 2.41 Method 1—emissions of carbon dioxide, methane and nitrous oxide and Part 3—Fuel combustion—liquid fuels and certain petroleum-based products for stationary energy purposes item 40: Energy Content Factor (GJ/kill) 38.6 CO_2 Factor 69.9 $kgCO_2$-e/ GJ of diesel CH_4 Factor 0.1 kgO_2-e/ GJ of diesel N_2O Factor 0.2 $kgCO_2$-e/ GJ of diesel
Fugitive methane emissions – drill cuttings	17.77 t	497.5 t	Estimate by engineer based on gas saturation and core volume multiplied by NGERS Global Warming Potential (GWP) of 28 tCO_2e/tCH_4.

Activity	Anticipated volume	Estimated emissions	Estimate methodology and assumptions
Fugitive emissions – completion (venting)	492 t methane	13,779 t	1 completion day per well Table 5-23 Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry; American Petroleum Institute (API), 2009 NGERS completion factor of 25.9 tonnes of methane per day multiple by NGERS Global Warming Potential (GWP) of 28 tCO_2-e/tCH_4
Fugitive emission – wastewater storage	20.9 t methane	586 t	Emissions multiplied by Table 5-10 produced saltwater tank methane flashing emission factors - Compendium of Greenhouse Gas Emissions Methodologies for the Oil and Gas Industry; American Petroleum Institute (API), 2009 emission factor of 0.11 tCH_4/ML (assuming 2% salinity, 250 psi separator pressure) multiplied by NGERS Global Warming Potential (GWP) of 28 tCO_2-e/tCH_4.
Well testing – flared natural gas emissions	4,993 TJ of natural gas total	324,559 t	Flared estimate using forecasted P50 success case of 18 TJ/day per well. Estimated production rates multiplied by NGER Determination: Subdivision 3.3.2.2—Oil or gas exploration and development (emissions that are flared) section 3.44 Method 1—oil or gas exploration and development item 1: CO_2 Factor 2.8 tCO_2-e/ t unprocessed gas CH_4 Factor 0.933 tCO_2-e/ t unprocessed gas N_2O Factor 0.026 tCO_2-e/ t unprocessed gas
Well stimulation – stationary sources (diesel combustion)	1,835 kL	4,972 t	Diesel consumption estimated from historical data and multiplied by NGERS emission factor from NGER Determination: Division 2.4.2 Method 1 emissions of carbon dioxide, methane and nitrous oxide from liquid fuels other than petroleum-based oils or greases, section 2.41 Method 1—emissions of carbon dioxide, methane and nitrous oxide and Part 3—Fuel combustion—liquid fuels and certain petroleum-based products for stationary energy purposes item 40: Energy Content Factor (GJ/kg) 38.6 CO_2 Factor 69.9 $kgCO_2$-e/ GJ of diesel CH_4 Factor 0.1 kgO_2-e/ GJ of diesel N_2O Factor 0.2 $kgCO_2$-e/ GJ of diesel
Well testing – (wastewater transport	271.5 kL	736t	Diesel consumption estimated from historical data and multiplied by NGERS emission factor from NGER Determination: Division 2.4.2 Method 1 emissions of

Activity	Anticipated volume	Estimated emissions	Estimate methodology and assumptions
including in transport emissions)			carbon dioxide, methane and nitrous oxide from liquid fuels other than petroleum-based oils or greases, section 2.41 Method 1—emissions of carbon dioxide, methane and nitrous oxide and Part 3—Fuel combustion—liquid fuels and certain petroleum-based products for stationary energy purposes item 40: Energy Content Factor (GJ/kg) 38.6 CO_2 Factor 69.9 $kgCO_2$-e/ GJ of diesel CH_4 Factor 0.1 kgO_2-e/ GJ of diesel N_2O Factor 0.2 $kgCO_2$-e/ GJ of diesel
Fugitive emissions- onsite sewage treatment	365 people days/year	198	Section 5.3 Estimating emissions from wastewater treatment: NATIONAL GREENHOUSE ACCOUNTS FACTORS Australian National Greenhouse Accounts August 2022.
Land clearing for site preparation and seismic surveys	88.26 ha land clearing (77 tCO_2e/ ha)	5845.6 t	TAGG 2013 Appendix I vegetation clearing methodology, Table 6, assumed maximum potential biomass class = 1.
Sturt Plateau Compression facility emission estimates			
Diesel combustion – civil construction, foundations and plant construction	1,300 KL	3,116.5	Diesel estimates multiplied by NGERS emission factor from NGER Determination: Division 2.4.2 Method 1 emissions of carbon dioxide, methane and nitrous oxide from liquid fuels other than petroleum-based oils or greases, section 2.41 Method 1—emissions of carbon dioxide, methane and nitrous oxide and Part 3—Fuel combustion—liquid fuels and certain petroleum-based products for stationary energy purposes item 40: • Energy Content Factor (GJ/kg) 38.6 • CO_2 Factor 69.9 $kgCO_2$-e/ GJ of diesel • CH_4 Factor 0.1 kgO_2-e/ GJ of diesel N_2O Factor 0.2 $kgCO_2$-e/ GJ of diesel
Diesel Combustion – camps	905 KL	4430	Diesel estimates multiplied by NGERS emission factor from NGER Determination: Division 2.4.2 Method 1 emissions of carbon dioxide, methane and nitrous oxide from liquid fuels other than petroleum-based oils or greases, section 2.41 Method 1—emissions of carbon dioxide, methane and nitrous oxide and Part 3—Fuel combustion—liquid fuels and certain petroleum-based products for stationary energy purposes item 40: • Energy Content Factor (GJ/kg) 38.6 • CO_2 Factor 69.9 $kgCO_2$-e/ GJ of diesel • CH_4 Factor 0.1 kgO_2-e/ GJ of diesel

Activity	Anticipated volume	Estimated emissions	Estimate methodology and assumptions
			N_2O Factor 0.2 $kgCO_2$-e/ GJ of diesel
Diesel combustion – SPCF operations back-up generator	200 KL	210.8	Diesel estimates multiplied by NGERS emission factor from NGER Determination: Division 2.4.2 Method 1 emissions of carbon dioxide, methane and nitrous oxide from liquid fuels other than petroleum-based oils or greases, section 2.41 Method 1—emissions of carbon dioxide, methane and nitrous oxide and Part 3—Fuel combustion—liquid fuels and certain petroleum-based products for stationary energy purposes item 40: • Energy Content Factor (GJ/kg) 38.6 • CO_2 Factor 69.9 $kgCO_2$-e/ GJ of diesel • CH_4 Factor 0.1 kgO_2-e/ GJ of diesel N_2O Factor 0.2 $kgCO_2$-e/ GJ of diesel
Diesel combustion – transport to cover the Project mobilisation and transport activities	354 KL	1245	Diesel estimates multiplied by NGERS emission factor from NGER Determination: Division 2.4.2 Method 1 emissions of carbon dioxide, methane and nitrous oxide from liquid fuels other than petroleum-based oils or greases, section 2.41 Method 1—emissions of carbon dioxide, methane and nitrous oxide and Part 3—Fuel combustion—liquid fuels and certain petroleum-based products for stationary energy purposes item 40: • Energy Content Factor (GJ/kill) 38.6 • CO_2 Factor 69.9 $kgCO_2$-e/ GJ of diesel • CH_4 Factor 0.1 kgO_2-e/ GJ of diesel N_2O Factor 0.2 $kgCO_2$-e/ GJ of diesel
Fugitive emissions – onshore natural gas wellheads	50 TJ/day	1265.5	NGERS Determination - 3.73A Method 1—onshore natural gas production, other than emissions that are vented or flared—wellheads • CO_2 Factor 1.32×10^{-3} tCO_2-e/ equipment hour CH_4 Factor 2.60×10^{-6} tCO_2-e/ equipment hour
Fugitive emissions – separators	2 separators	63	NGERS Determination -3.73LA Method 2—natural gas gathering and boosting, other than emissions that are vented or flared—natural gas gathering and boosting stations – gas separators • CO_2 Factor 1.24×10^{-3} tCO_2-e/ equipment hour • CH_4 Factor 3.08×10^{-6} tCO_2-e/ equipment hour Assumes 95% equipment availability.
Fugitive emissions from gathering pipeline	4.5 km	78.5	1. NGERS Determination 3.73LB Method 2—onshore natural gas production, other than emissions that are vented or flared—onshore gas gathering and boosting pipelines Onshore has gathering and boosting pipeline (plastic)

Activity	Anticipated volume	Estimated emissions	Estimate methodology and assumptions
			• CO_2 Factor $6.99x10^{-4}$ tCO_2-e/ hour/km of gathering pipeline • CH_4 Factor $2.85x10^{-6}$ tCO_2-e/ hour/km of gathering pipeline 2. 4.5km of gathering between Kyalla 117 N2 and Shenandoah S2
Fugitive emissions from wastewater	53.6	72	1. NGERS Determination: 3.73NB Method 2—produced water (other than emissions that are vented or flared) 2. Emissions factor WP × 0.0016 + 0.4342 3. Assume 750PSI separator pressure and 20,000mg/L TDS
Fugitive emissions – reciprocating compressor	5	555	1. NGERS Determination -3.73LA Method 2—natural gas gathering and boosting, other than emissions that are vented or flared—natural gas gathering and boosting stations Reciprocating compressors • CO_2 Factor $1.14x10^{-4}$ tCO_2-e/ equipment hour • CH_4 Factor $4.6x10^{-2}$ tCO_2-e/ equipment hour Assumes all (5) reciprocating compressors are constructed and operational for 95% of time.
Fugitive emissions – compressor start up emissions	15 events	905.6	Subdivision 3.3.9A.9—Natural gas production—emissions that are vented—vessel blowdowns, compressor starts and compressor blowdowns Table 6-33 Gathering sediment emission factor for other non-routine releases. Compressor starts 0.16/tonnes CH4/ start
Fugitive emissions – metering stations	1 station	23	1. NGERS Determination -3.73LA Method 2—natural gas gathering and boosting, other than emissions that are vented or flared—natural gas gathering and boosting stations metering installations and associated piping • CO_2 Factor $2.45x10^{-6}$ tCO_2-e/ equipment hour CH_4 Factor $9.86x10^{-4}$ tCO_2-e/ equipment hour
Fugitive emissions – TEG dehydration emissions	50 TJ/day	8462.5	NGERS Determination: Division 3.3.9C- Natural gas processing (emissions that are vented or flared). Section 3.88G Method 1- emissions from system upsets, accidents and deliberate releases from process vents- gas processing API Compendium of GHG Emissions Methodologies for the Natural Gas and Oil Industry Table 6-17 Production segment uncontrolled gas dehydration methane emission factors excludes glycol gas-assisted pump emissions 0.18667 tonnes CH4/106 sm3 gas processed

Activity	Anticipated volume	Estimated emissions	Estimate methodology and assumptions
			Methane % converted from 78.8% to 92% (92%/78.8%)
Fugitive emissions – pressure relief valves	20 valves	0.4	NGERS Determination: Division 3.3.9C- Natural gas processing (emissions that are vented or flared). Section 3.88G Method 1- emissions from system upsets, accidents and deliberate releases from process vents- gas processing API Compendium of GHG Emissions Methodologies for the Natural Gas and Oil Industry Table 6-17 Production segment uncontrolled gas dehydration methane emission factor excludes glycl gas-assisted pump emissions 0.18667 tonnes CH4/106 sm^3 gas processed Converted to 92% methane (92/78.8%)
Fugitive emissions – equipment vents	6.7 kg/hr	4907.6	NGERS Determination: Division 3.3.9C- Natural gas processing (emissions that are vented or flared). Section 3.88G Method 1- emissions from system upsets, accidents and deliberate releases from process vents- gas processing API Compendium of GHG Emissions Methodologies for the Natural Gas and Oil Industry API 6.4.6.1 Equipment and process blowdowns) Compressor distance piece vent (2 vents @ 3 kg/hour), oily water separator vent (1 vent @ 0.5 kg/hr, GC and moisture analyser vent (2 @ 0.1 kg/hr)
Fugitive emissions – flanges	450 flanges	868.5	1. NGERS Determination -3.73C Method 3—natural gas gathering and boosting, other than emissions that are vented or flared—natural gas gathering and boosting stations- Flanges- gas production • CO_2 Factor 4.78×10^{-8} tCO_2-e/ equipment hour • CH_4 Factor 1.23×10^{-5} tCO_2-e/ equipment hour 2. Engineering estimate of number of flanges through the plant- 450 flanges
Fugitive emissions – valves	100 valves	8.65	1. NGERS Determination -3.73C Method 3—natural gas gathering and boosting, other than emissions that are vented or flared—natural gas gathering and boosting stations- Valves gas production • CO_2 Factor 4.21×10^{-7} tCO_2-e/ equipment hour • CH_4 Factor 1.08×10^{-4} tCO_2-e/ equipment hour 2. Engineering estimate of number of valves through the plant- 100 valves.

Activity	Anticipated volume	Estimated emissions	Estimate methodology and assumptions
Fugitive emissions – equipment blowdowns without flare	3 events	789.6	NGERS Determination: Division 3.3.9C- Natural gas processing (emissions that are vented or flared). Section 3.88G Method 1- emissions from system upsets, accidents and deliberate releases from process vents- gas processing API Compendium of GHG Emissions Methodologies for the Natural Gas and Oil Industry API 6.4.6.1 Equipment and process blowdowns Assumes 4.7tCH4 per blowdown representing full gas plant blowdown twice per year (other releases sent to flare).
Flared natural gas emissions – SPCF plant commissioning, upsets and maintenance- Total TJ flared	1,375 TJ	89,379	Flared estimate using forecasted P50 success case of 4.5 TJ/day per well. Estimated production rates multiplied by NGER Determination: Subdivision 3.3.2.2—Oil or gas exploration and development (emissions that are flared) section 3.44 Method 1—oil or gas exploration and development item 1: • CO_2 Factor 2.8 tCO_2-e/ t unprocessed gas • CH_4 Factor 0.933 tCO_2-e/ t unprocessed gas N_2O Factor 0.026 tCO_2-e/ t unprocessed gas
Compressor and power generation fuel gas usage	1642.5 TJ	84,252	1. NGERS Determination: Division 2.3.2 Method 1 emissions of carbon dioxide, methane and nitrous oxide , section 2.2 Method 1—emissions of carbon dioxide, methane and nitrous oxide and schedule 1 Part 2 Fuel combustion- gaseous fuels Stationary energy purposes- Unprocessed natural gas. 2. Compressor fuel gas consumption 2.8% and assume 0.2% fuel gas for onsite power generation making a 3% fuel gas consumption rate for the facility.
Fugitive emissions- onsite sewage treatment	30 people days/year	14.75	Section 5.3 Estimating emissions from wastewater treatment: NATIONAL GREENHOUSE ACCOUNTS FACTORS Australian National Greenhouse Accounts August 2022.
Land clearing	3.0 ha	231	TAGG 2013 Appendix E vegetation clearing methodology.
Total emissions over project (5 years)		569,085	