STAKEHOLDER CONSULTATION

Barossa Development

Subsea Infrastructure and FPSO Moorings Installation and Pre-Commissioning Environment Plan

Santos

Overview

The Barossa Development is an offshore natural gas development located approximately 300 kilometres north-west of Darwin. The development will backfill gas supply to the existing Darwin LNG (DLNG) facility at Wickham Point.

Santos NA Barossa Pty Ltd (Santos), as Operator, on behalf of co-venturers SK E&S Australia and JERA, is currently executing the Barossa Development with first gas production targeted for the first half of 2025.

The development area is located in Commonwealth waters within petroleum production licence NT/L1, known as the Barossa Field (**Figure 1**). The initial development involves producing natural gas and condensate from the Barossa Field through subsea wells and a network of subsea flowlines and marine risers to a Floating, Production, Storage and Offloading (FPSO) vessel.

Processing will occur on the FPSO to separate the natural gas and condensate. The condensate will be transferred from the FPSO to specialised offtake tankers for export.

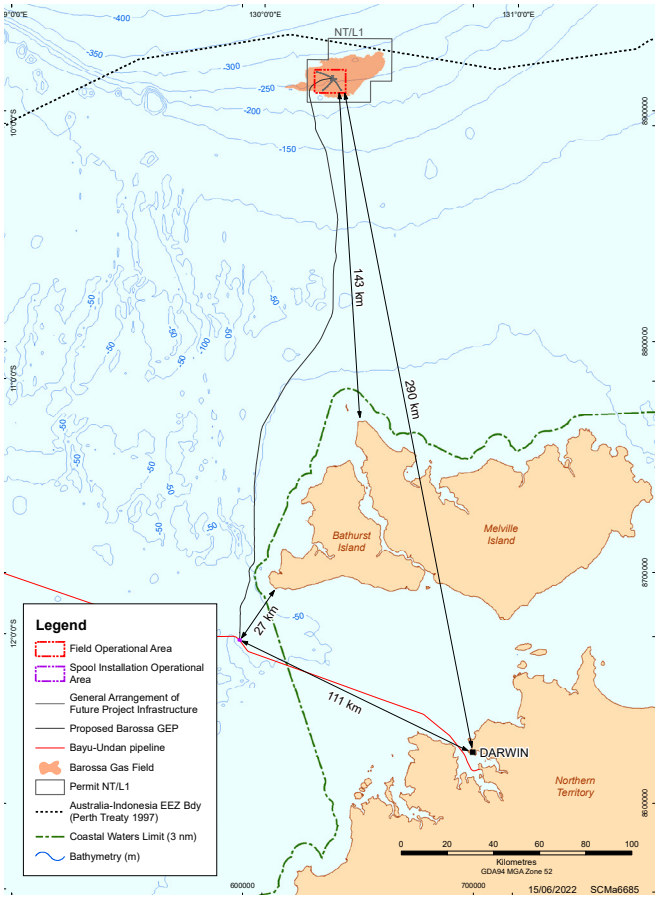
Gas will be transported from the FPSO to the DLNG facility via a new 262 km Barossa Gas Export Pipeline (Barossa GEP) connected to the existing Bayu-Undan to Darwin pipeline. This continues to be the 'base case' for delivery of Barossa gas to the DLNG facility and Santos continues to progress regulatory approvals for this case.

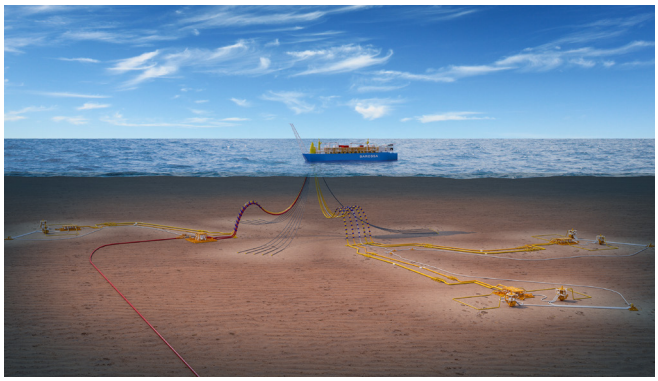
Santos is also investigating the potential extension of the Barossa GEP to Darwin in support of any future opportunity to deliver gas to DLNG while preserving the Bayu-Undan to Darwin pipeline for life extension and/or re-purposing opportunities, including potential Carbon Capture and Storage at Bayu-Undan. Regulatory approvals for this alternative case are also being progressed with the relevant authorities.

The Commonwealth Government's independent expert regulator for offshore oil and gas development, NOPSEMA, has accepted Santos' Offshore Project Proposal (OPP) and subsequent Environment Plans to drill the production wells in the Barossa Field and install the Barossa GEP.

During 2022 Santos will submit two further Environment Plans to NOPSEMA for assessment – one for the installation and pre-commissioning of Subsea Infrastructure and FPSO Moorings in the Barossa Field and the other for Production Operations covering the sustained operations of the FPSO and the Barossa GEP. This consultation package relates to the installation and pre-commissioning of Subsea Infrastructure and FPSO Moorings.

Figure 1: Barossa Development Location





Activities

Within the Barossa Field a network of subsea infrastructure must be installed to connect the production wells to the FPSO and the FPSO to the Barossa GEP to control the flow of product. Additionally a subsea mooring system and turret must be installed to secure the FPSO on location. Installation of a spool (i.e. a small segment of pipe to connect two separate pipelines) is also required at the southern end of the Barossa GEP. **Figure 2** shows the indicative infrastructure lay-out. Additional information is included in **Table 1**.

Timing

Installation activities are expected to commence in Q4 2023 and take approximately eight months to complete. Santos commits to notifying relevant stakeholders of the activity commencement date once confirmed and to providing at least quarterly activity updates.

Table 1: Activity Information

ACTIVITY INFORMATION	
Location	Santos permit NT/L1 (the Barossa Field) located in Commonwealth waters and at the southern end of the GEP within NT/PL5 within Commonwealth waters.
Schedule	Targeting commencement in Q4 in 2023.
Duration	Installation and pre-commissioning will take approximately eight months. The infrastructure will remain in a preserved state, as relevant, until the commencement of production operations.
Water depth	230-280 metres.
Vessels	Reel-lay vessel; construction vessels; support and supply vessels (such as tugs, barges and ROVs), collectively referred to as 'activity vessels'.
Key activities	Vessel activities within the Operational Area, including (see Figure 2 for field layout including acronyms): • Pre-installation, as-laid and as-constructed surveys • Installation of temporary subsea positioning systems • Installation of FPSO mooring system • Installation of structures and supporting structures: - lateral buckling initiation site(s) construction - FLET, manifold and Umbilical Termination Assembly (UTA) foundations - riser and riser tethering - umbilical and UTA - spool and well jumpers and support mattresses - flowline walking mitigation mattresses - scour mitigation of structure foundations • Flowline installation, including FLETs • Potential span rectification: - pre-lay and post-lay flowline span rectification • Deballasting of Submerged Turret Production (STP) buoy during mooring line hook-up and riser installation • Pre-commissioning: - flood, clean, gauge and pressure testing (FCGT) - dewatering - preconditioning - nitrogen packing - flushing and leak testing • Spool installation • Preservation phase • Inspection, maintenance and repair activities (IMR) • Vessel and aviation support.

ACTIVITY INFORMATION (CONTINUED)		
Key infrastructure	• Approximately fifteen suction anchors with mooring chains, sheathed wires and mooring line buoyancy elements (MLBEs) for floating FPSO mooring • STP buoy for securement of the FPSO mooring lines and temporary hang-off of the risers • Three 14" and three 6" corrosion resistant alloy rigid flowlines with a nominal length of 19 km • Flowline end terminations (FLETs) at the end of each flowline • Displacement initiator structures along the flowline routes to control lateral bucking in operation • Four manifolds • 6" and 12" risers and riser tether base structures • Umbilicals with UTA • Spools and well jumpers • Steel tube, optical and electrical flying leads • Subsea support structures (flowline walking mitigation, support mattresses, scour protection, stabilisation, foundations).	
Exclusion zone	Proposed 'Petroleum Safety Zones' (up to 500 m radius) around installed subsea infrastructure. A temporary Precautionary Exclusion Zone around operating vessels and STP Buoy within the Operational Area will also be requested (as per AMSA process).	
Operational area	Approximately 134 square kilometres. See Figure 1 and 3. All activities (above) will be undertaken within the Barossa Field with the exception of the installation of a spool at the southern end of the Barossa GEP.	
Natural environment	The Operational Area is located within Commonwealth waters in the Timor Sea, within the North Marine Region (NMR). Seabed is generally flat and devoid of any significant bathymetric features. Marine sediments are predominantly silty sand and lack hard substrate. The estimated total seabed footprint for the infrastructure is ~25 hectares.	
Proximity to key regional features	**Regional Feature**	**Distance (nearest point from Operational Area)**
	Darwin NT	~300km (Field OA); ~120km (Spool OA)
	Tiwi Islands, NT	~140km (Field OA); ~27km (Spool OA)
	Oceanic Shoals Australian Marine Park	~50km (Field OA); ~46km (Spool OA)
	Key Ecological Feature - Shelf Break and Slope of Arafura Shelf	Partial overlap with Field OA
	Commercial Fisheries - Supplementary information provided to commercial fishers	Partial overlap with Timor Reef Fishery, Northern Prawn Fishery (Field OA); and NT Spanish Mackerel Fishery (Spool OA)
Petroleum activity	This EP does not provide for hydrocarbon production activities. Pre-commissioning activities do not include the introduction of hydrocarbons.	
Worst case hydrocarbon spill scenario	Potential hydrocarbon spill risks will be described in the EP including vessel collision and accidental damage to installed production wells. Those deemed as credible spill risks will be modelled and assessed in detail.	
Response tier required	A Level 3 response would be implemented as per the activity-specific Oil Pollution Emergency Plan (OPEP).	

Figure 2: Barossa Field Indicative Layout for Subsea Infrastructure and FPSO Moorings Installation

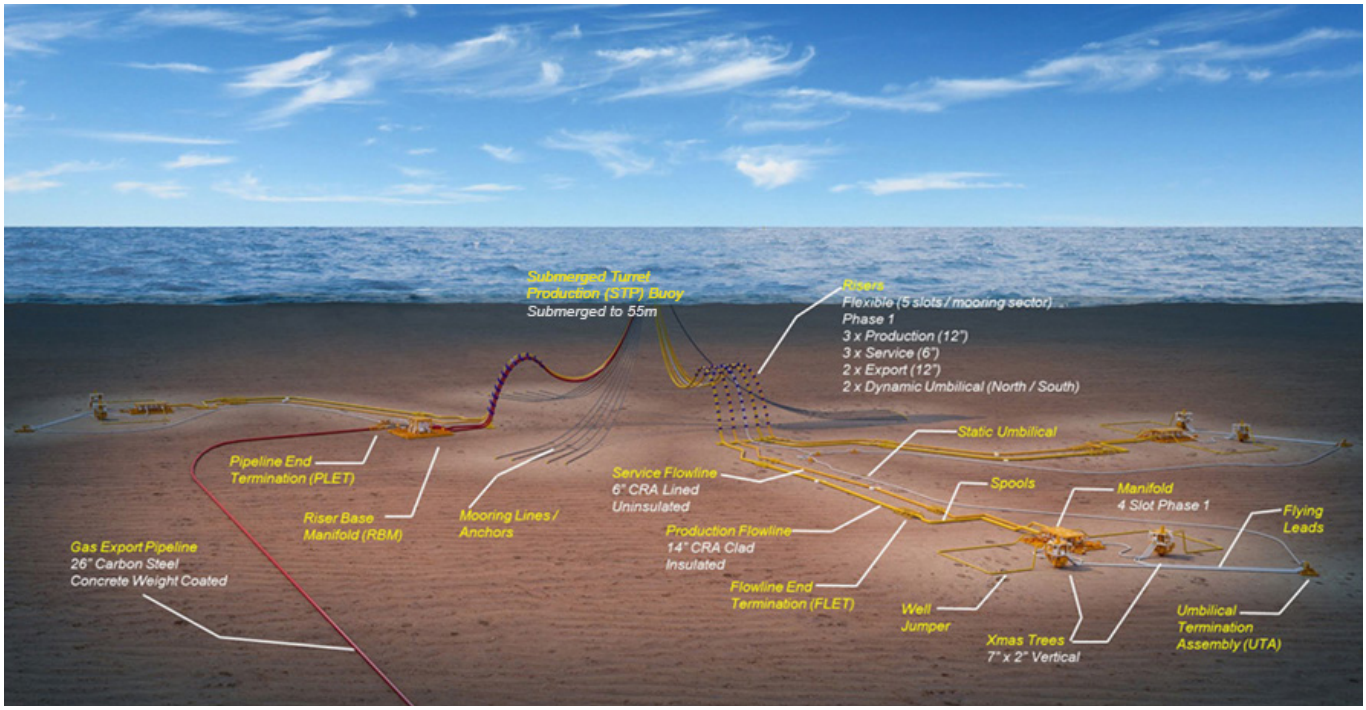
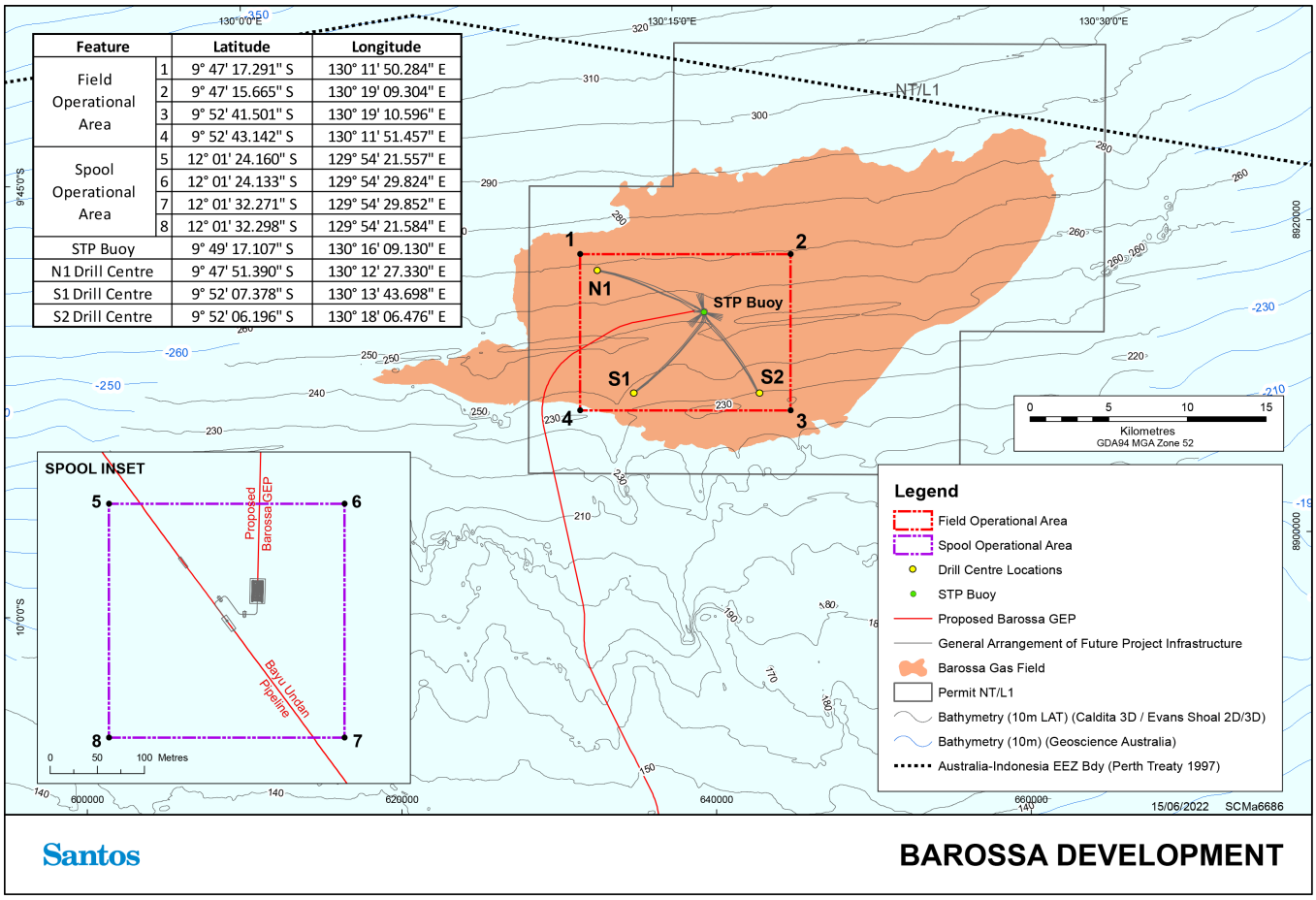


Figure 3: Environment Plan Operational Area



Environmental Impacts and Risks

The following aspects associated with planned activities have the potential to cause environmental impacts:

- Noise emissions
- Light emissions
- Atmospheric emissions
- Seabed and benthic habitat disturbance
- Interaction with other marine users
- Operational discharges
- Dewatering and pre-commissioning fluid discharges

In addition, the following unplanned events can cause potential environmental impacts:

- Dropped objects
- Introduction of Invasive Marine Species (IMS)
- Collision with marine fauna
- Loss of hazardous and non-hazardous materials
- Implementation of spill response

The environmental assessments considered the following information:

- The activities involve standard offshore industry installation and pre-commissioning practices
- The identified environmental aspects, receiving environment and potential impacts and risks are well understood
- The Field Operational Area is a significant distance from the nearest land
- The Field Operational Area is in an offshore location that does not coincide with any marine reserves or biological important areas (BIAs)
- Duration of activity at the southern Operational Area to install the spoil is anticipated to be less than one week
- The Field Operational Area has a relatively small development footprint in a deep offshore marine environment
- Large areas of surrounding undisturbed habitat remains available for marine fauna
- The benthic habitats in the area are widely represented at a regional scale
- Atmospheric and water quality changes will be localised, with recovery measured in hours to days given the nature and scale of discharges and dispersive open-ocean environment
- Greenhouse gas emissions will be limited to offshore vessel and aviation activities
- Impact on the activities of other marine users, mainly commercial fishers, will be temporary and offset by the availability of extensive actively fished areas outside the Operational Area

Santos draws stakeholders' attention to the significant amount of publicly available information on the existing environment, impacts and risks and management approach for the project. This information is contained within the Barossa Development Area OPP, Development Drilling EP and GEP Installation EP available on the NOPSEMA website.

Control Measures

Santos will implement control measures to ensure environmental impacts and risks are acceptable and 'as low as reasonably practicable' (ALARP). These measures will be detailed in the EP submitted to NOPSEMA for assessment. The EP will be publicly available on the NOPSEMA website.

In addition to control measures for managing specific environmental impacts and risks, the EP will include control measures to minimise interactions with other marine users. Control measures identified by stakeholders to address any objections or claims will be considered by Santos and documented in the EP.

AREA OF INTEREST	SANTOS COMMITMENTS
Maritime notices • **Notice to Mariners (NTM)** • **AUSCOAST warnings**	A notification will be provided to address the presence of vessels and subsea infrastructure within the Operational Areas regarding navigational risks. Notifications are provided to the Australian Maritime Safety Authority Joint Rescue Coordination Centre, Australian Hydrographic Office and designated port authorities.
Stakeholder notifications	Other relevant marine users identified during stakeholder consultation will be provided a commencement notification at least two weeks prior to the activity commencing. Santos will have a process in place to ensure any stakeholder feedback is recorded, evaluated and responded to.
Monitoring during activity to reduce potential for collision or interference with other marine users	Vessels undertaking the activities will monitor for approaching third-party vessels and communicate with the vessels.

Feedback

In accordance with Division 2.2A – Consultation in Preparing an Environment Plan - of the Commonwealth *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2009*, Santos is consulting with 'relevant persons' whose functions, interests or activities may be affected by the activities to be carried out under this Environment Plan. The consultation process will help inform the preparation of the plan that, once completed, will be submitted to NOPSEMA for formal assessment and made publicly available.

If you have any objections, claims or information requests please contact us by 15 July 2022 via phone or email. Santos will endeavour to address all stakeholder feedback prior to the Environment Plan being submitted to NOPSEMA.

Consultation for this activity will be ongoing post regulatory acceptance, until the activity is completed.

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