Information for relevant persons

Santos

Van Gogh Coniston Novara VGA-4H GI ST1 Well Intervention/Plug & Abandonment Environment Plan

Activity Overview

Santos is proposing to suspend or plug and abandon (P&A) the VGA-4H GI ST1 well within the Van Gogh Coniston Novara (VGCN) fields. The Operational Area (OA) is located within Commonwealth waters approximately 44 km north-northwest of the North West Cape and 60 km north of Exmouth, Western Australia. (**Figure 1**)

The proposed activities are planned to commence as early as Q3 2026, subject to obtaining all regulatory and business approvals. The expected activity duration is between approximately 10 and 40 days, with the duration subject to change based on potential for operational or weather-related challenges. The Environment Plan (EP) being prepared for the proposed activities will have a validity of five years.

Consultation and Feedback

All petroleum activities in Commonwealth waters must have an EP accepted by the National Offshore Petroleum Safety and Environmental Management Authority (NOPSEMA) before any activities can take place.

Under the *Offshore Petroleum and Greenhouse Gas Storage (Environment) Regulations 2023 (Cth) (OPGGS Environment Regulations)*, Santos is required to consult with relevant persons about proposed activities in the course of preparing an EP. A relevant person includes Commonwealth and State agencies and authorities to which the proposed activity may be relevant, and persons or organisations whose functions, interests or activities may be affected by the proposed activity. Santos meets this requirement by undertaking consultation. More details on consultation and providing feedback can be found on the back page of this factsheet.

If you consider you may be a relevant person, please contact us as soon as possible to initiate consultation with you, and so you can tell us how you would like to be consulted throughout the consultation process or if you need additional information. The consultation period for this EP closes **10 November 2025**.

More details about the Commonwealth Government environmental approval process can be found on the NOPSEMA website at **nopsema.gov.au**.

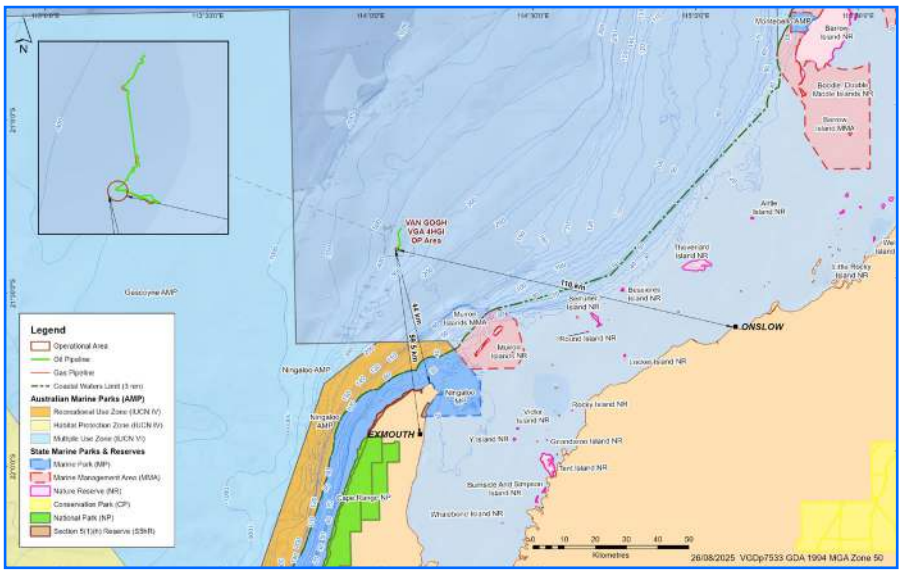

Figure 1. *Van Gogh VGA-4H GI ST1 activity location.*

Table 1. Activity Details

An overview of proposed activities is outlined in Table 1.

Activity details	
Indicative timing	Well suspension/P&A activities may commence any time between Q3 2026 and Q4 2027 with planned commencement date subject to obtaining all regulatory and business approvals.
Duration	Expected duration is between approximately 20 and 40 days for P&A or 10 to 30 days for well suspension, with duration subject to change based on potential for operational or weather-related challenges.
Planned activities	The key activities for a well suspension using a Light Well Intervention Vessel (LWIV) are summarised below. • Mobilisation and positioning of the LWIV on well • Preparation of the Xmas Tree (XT) for well re-entry, including the removal of the debris cap • Deployment of the subsea intervention lubricator (SIL) and workover control system • Recovery of the upper and lower crown plugs • Installation and testing of a mechanical bridge plug in the well • Reinstallation of the lower crown plug • Reinstallation of the upper crown plug, if required • Recovery of the SIL and workover control system • Reinstallation of the corrosion cap • General visual inspection of the well and surrounding seabed • Demobilisation of the LWIV. The key activities for a well P&A using a Mobile Offshore Drilling Unit (MODU) are summarised below. • Mobilisation and positioning of the MODU on well, including the running of anchors, if applicable • Installation of the XT wet park mud mat and Metocean monitoring equipment, if applicable • Preparation of the XT for well re-entry, including the removal of the debris cap • Installation of the Blow Out Preventer (BOP) and riser, including a BOP tethering system, if required • Installation and testing of the well bleed-off package • Recovery of the internal tree cap and upper crown plug • Recovery of the lower crown plug • Displacement of hydrocarbons from well • Installation and testing of the reservoir permanent barriers • Installation and testing of the non-hydrocarbon bearing zones permanent barrier, if required • Recovery of the riser and BOP, including the BOP tethering system, if required • Cut and recovery of the wellhead • Recovery of the Metocean monitoring equipment, if applicable • Recovery of any material/equipment used for activities under this EP • General visual inspection of the well and surrounding seabed • Demobilisation of the MODU, including the recovery of all anchors, if applicable.

Vessels / aircraft and other equipment	• MODU (well P&A activities) or LWIV (well suspension activities), including the use of a Remotely Operated Vehicle (ROV) • Support vessels (up to 3), which may be Anchor Handling Tug Supply (AHTS) vessels, Platform Supply Vessels (PSV), or a combination of the 2 • Helicopters to support crew changes, critical equipment supply and emergency response.
Operational Area	The activities covered by this EP will occur within a 2,500 m radius of VGA-4H GI ST1 subsea well. Other marine users are permitted to use the OA but should exercise caution for safety reasons and stay clear of the safety exclusion zone.
Exclusion zones	A 500 m radius Petroleum Safety Zone (PSZ) exclusion zone will be in place around the MODU/LWIV for the duration of the activity as a safety requirement to protect the MODU/LWIV and other marine users who might be in the area.

Table 2. Permit and Operational Area locations and water depths

Activities are proposed in the OA, details of which are outlined in Table 2.

	Latitude (GDA 94)	Longitude (GDA 94)	Water Depth
Well location	21° 23’ 52.23” S	114° 04’ 4.11” E	320 – 350m across the OA
Permit WA-35 L	21° 19′ 55.34″ S	114° 00′ 4.81″ E	260 – 460 m across the permit
	21° 19′ 55.33″ S	114° 10′ 4.8″ E	
	21° 24′ 55.34″ S	114° 10′ 4.8″ E	
	21° 24′ 55.34″ S	114° 00′ 4.81″ E	

Activity Purpose

Santos is proposing to suspend or plug and abandon (P&A) the VGA-4H GI ST1 well within the Van Gogh Coniston Novara (VGCN) fields as a component of the well decommissioning process.

Well suspension involves the installation of an interim mechanical barrier plug using a LWIV to temporarily abandon the well. If suspended, the well would be fully decommissioned in future years.

P&A is full decommissioning of the well using a MODU and involves removal of well infrastructure to allow placement of permanent plugs in the well as well as restoration of the seabed in line with the EP. Both methods are well recognised and accepted industry practices.

Both the LWIV and MODU will require support vessels and helicopters. Also, the LWIV and MODU will require an ROV throughout the suspension/P&A activities.

The proposed activities may commence as early as Q3 2026, subject to obtaining all regulatory and business approvals. The expected activity duration is between approximately 10 and 40 days and is subject to change if operational or weather-related challenges are encountered. The Environment Plan (EP) being prepared for the proposed activities will have a validity of five years.

Indicative examples of semi-submersible MODU (image above) and of a LWIV (image below).

Defining the environment that may be affected

Santos has undertaken an assessment to define environmental and socio-economic values and sensitivities that may be affected by proposed activities. To do this, Santos has considered the areas where activity impacts and risks may occur.

The OA where activities associated with the EP occur comprises a 2,500 m radius around the VGA-4H GI ST1 well (**Figure 1**).

The environment that may be affected (EMBA) is defined as the widest geographic extent of potential ecological and socio-economic impacts resulting from a credible worst-case hydrocarbon spill event.

For this EP, a loss of well control is the worst-case credible hydrocarbon spill event.

To determine the extent of the EMBA, Santos considered exposure values for the four phases of a hydrocarbon spill: shoreline accumulation, floating hydrocarbons, dissolved and entrained hydrocarbons in the water column.

These exposure values, combined with advanced and sophisticated computer spill modelling, enable Santos to present the areas that could be affected in the unlikely event of a spill.

The computer modelling overlays a great number (hundreds) of individual spill simulations, accounting for the range of potential metocean conditions, and combines all these hypothetical spill events into a single map (**Figure 2**).

This modelling helps Santos to determine the EMBA and develop tailored response strategies for the range of credible spill scenarios. These strategies are described in the Oil Pollution Emergency Plan for this EP, which will be reviewed and assessed by the Regulator.

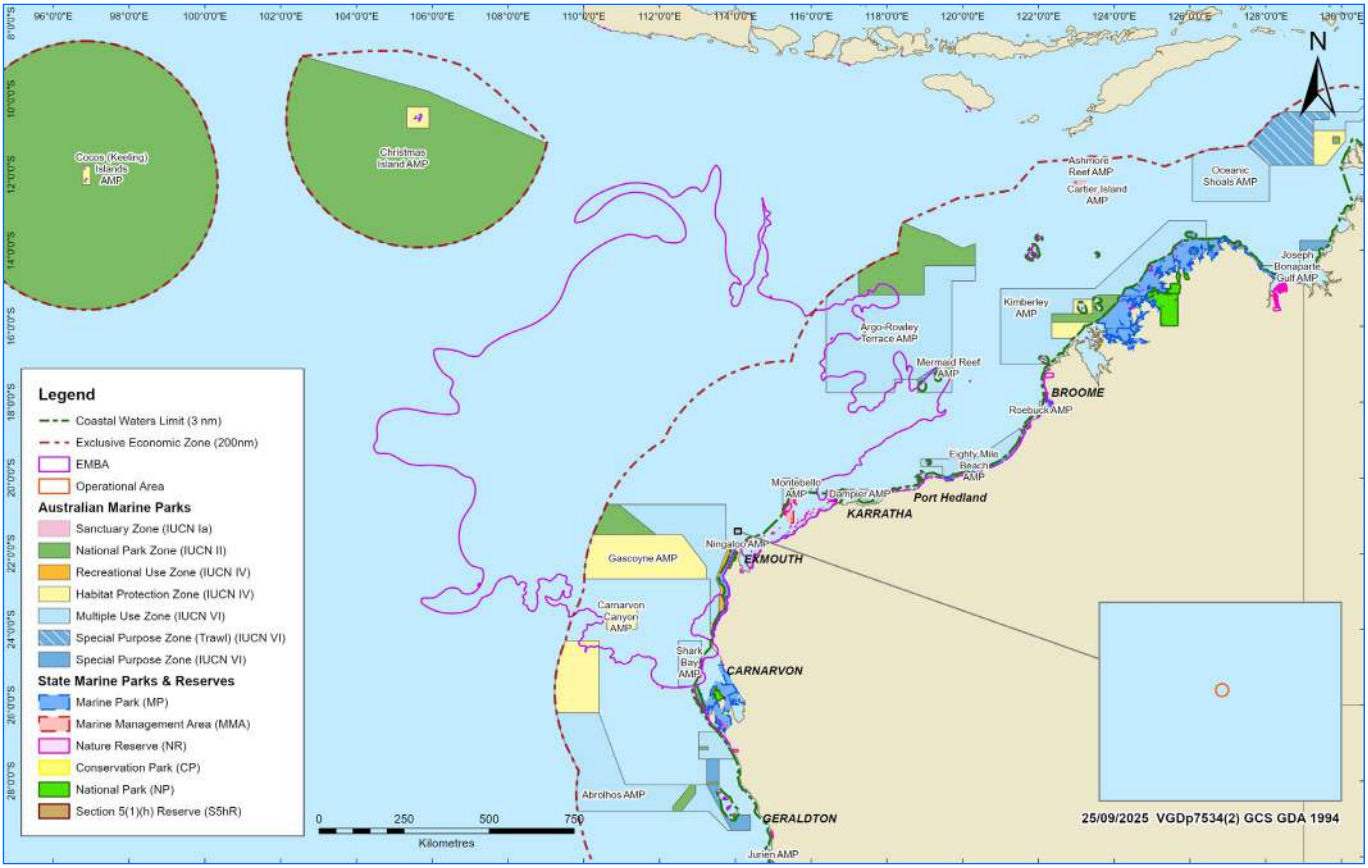

Figure 2. *Van Gogh VGA-4H GI ST1 Well P&A Activity EMBA*

Santos has undertaken a review of publicly available information to identify environmental, social, economic and cultural values and sensitivities that may be affected by activity impacts and risks. The outcomes of this review are summarised in **Table 3**

Table 3. Environmental values and sensitivities

Value / Sensitivity	Description	Spatial overlap with OA	Spatial overlap with EMBA	Public Information Review
Biologically Important Areas	Biologically important areas (BIAs) are spatially defined areas where aggregations of individuals of a species are known to display biologically important behaviour such as reproduction, foraging, resting or migration.	Yes	Yes	The OA overlaps the following BIAs: • Wedge-tailed Shearwater (breeding) • Pygmy Blue Whale (migration) • Humpback Whale (migration – north & south) • Whale Shark (foraging) • Flatback Turtle (reproduction) • Loggerhead Turtle (reproduction) • Green Turtle (reproduction) • Hawksbill Turtle (reproduction) The EMBA also includes BIAs for dugong, marine turtles, seabirds, seals, sharks, whales, and dolphins.

Table 3. Environmental values and sensitivities ... continued

Value / Sensitivity	Description	Spatial overlap with OA	Spatial overlap with EMBA	Public Information Review
Key Ecological Features	Key Ecological Features (KEFs) are elements of the Commonwealth marine environment that are considered to be of regional importance for either a region's biodiversity or its ecosystem function and integrity.	Yes	Yes	One KEF (Continental Slope Demersal Fish Communities KEF) intercepts the OA. There are 13 KEFs present within the EMBA: • Commonwealth marine environment surrounding the Houtman Abrolhos Islands • Western demersal slope and associated fish communities • Commonwealth waters adjacent to Ningaloo Reef •Western rock lobster • Ancient coastline at 125 m depth contour • Exmouth Plateau • Canyons linking the Cuvier Abyssal Plain and the Cape Range Peninsula • Wallaby Saddle • Commonwealth marine environment within and adjacent to the west coast inshore lagoons • Continental Slope Demersal Fish Communities • Mermaid Reef and Commonwealth waters surrounding Rowley Shoals • Seringapatam Reef and Commonwealth waters in the Scott Reef Complex • Glomar Shoals

Table 3. Environmental values and sensitivities ... continued

Value / Sensitivity	Description	Spatial overlap with OA	Spatial overlap with EMBA	Public Information Review
Listed and Protected Marine Fauna	The Australian Government uses the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) to protect and manage threatened, migratory and marine species.	Yes	Yes	The OA and EMBA are traversed by a range of listed and protected marine species that include seabirds, whales, turtles and sharks. The protected matters search tool report for the operational area identified 26 listed species and the search for the EMBA identified 107 listed species.
Protected Areas	World Heritage Areas (WHA) Commonwealth Heritage Listed (CHL) National Heritage Listed (NHL)	No	Yes	No WHAs, CHL or NHL areas intercept the OA. The closest WHA to the OA is the Ningaloo Coast WHA located approximately 27 km. The EMBA contains: Three WHAs: • Shark Bay • The Ningaloo Coast • The Murujuga Cultural Landscape Two CHLs: • Ningaloo Marine Area • Learmonth Air Weapons Range Facility Three NHLs: • Shark Bay • The Ningaloo Coast • Dampier Archipelago (including Burrup Peninsula)

Table 3. Environmental values and sensitivities ... continued

Value / Sensitivity	Description	Spatial overlap with OA	Spatial overlap with EMBA	Public Information Review
Protected Areas	Australian Marine Parks	No	Yes	No Australian Marine Parks (AMP) intercept the OA. The nearest Australian Marine Parks to the OA are the Gascoyne and Ningaloo AMPs (28 km). The EMBA intersects with 13 Australian Marine Parks.
Protected Areas	Western Australian Marine Parks and Marine Management Areas	No	Yes	There are no Western Australian Marine Parks or Marine Management Areas located within the OA. The Muiron Islands Marine Park (33 km) is the closest WA State Protected area, to the OA. The EMBA intersects 13 state Marine Parks/Marine Management Areas.

Table 3. Environmental values and sensitivities ... continued

Value / Sensitivity	Description	Spatial overlap with OA	Spatial overlap with EMBA	Public Information Review
Protected Areas	Wetlands of International or National Importance	No	Yes	There are no Wetlands of International or National importance located within the OA. The closest Ramsar Wetland is the Eighty Mile Beach, over 530 km from the OA. The EMBA intersects four Ramsar wetland and fourteen wetlands of national importance. RAMSAR: • Roebuck bay • Eighty-mile beach • Hosnies spring • The dales Wetlands of National Importance: • Learmonth Air Weapons Range - Saline Coastal Flats • Bundera Sinkhole • Shark Bay East • Exmouth Gulf East • Cape Range Subterranean Waterways • Lake MacLeod • Eighty Mile Beach System • Willie Creek Wetlands • "The Dales", Christmas Island • Bunda-Bunda Mound Springs • Roebuck Bay • Leslie (Port Hedland) Saltfields System • Hosine's Spring, Christmas Island • Mermaid Reef

Table 3. Environmental values and sensitivities ... continued

Value / Sensitivity	Description	Spatial overlap with OA	Spatial overlap with EMBA	Public Information Review
Communities	Local Government Area	No	Yes	No Local Government Areas intercept the OA. The closest Local Government Area to the OA is the Shire of Exmouth, which is located approximately 32 km from the OA. There are a number of local Government Areas within the EMBA.
Indigenous, subsistence or customary fishing	Indigenous, subsistence or customary fishing areas	No	Yes	Traditional Indigenous fishing in WA waters predominately occurs within inshore tidal waters and is not expected in the OA. Traditional Indigenous fishing in WA waters may occur in the EMBA.
Recreational fishing	Recreational fishing areas	No	Yes	Recreational fishing is unlikely to occur within the OA. Recreational fishing is known to occur within the EMBA.

Table 4. Economic values and sensitivities

Feature	Description	Spatial overlap with OA	Spatial overlap with EMBA	Public Information Review
Commercial fishing	Commercial fishing (Cth)	Yes	Yes	Four Commonwealth managed fisheries overlap the OA. FishCube data confirms no recent active fishing efforts within the OA. Five Commonwealth managed fisheries overlap with the EMBA.
	Commercial fishing (WA)	Yes	Yes	Six Western Australian managed fisheries overlap the OA. FishCube data confirms no recent active fishing efforts within the OA. The EMBA overlaps 21 WA State managed fisheries.
Defence	Designated defence activity areas	Yes	Yes	The OA intersects Defence Practice area and training area (RAAF Base Learmonth),
Energy Industry	Offshore carbon capture and storage activities	No	Yes	The OA does not intersect any Greenhouse Gas (GHG) assessment permits for offshore carbon capture and storage activities. The nearest carbon capture and storage is located approximately 6.9 km from the OA in G-18-AP. There are multiple offshore carbon capture and storage activities within the EMBA.
	Oil and gas activities	No	Yes	The OA does not intersect any other oil and gas activity and associated infrastructure. There are oil and gas activities within the EMBA.
	Offshore renewables activities	No	No	The OA does not intersect any Offshore Energy Infrastructure (OEI) licences for proposed offshore renewables activities. The nearest OEI licence is located off the coast of Bunbury, more than 1264 km south of the OA.

Table 4. Economic values and sensitivities ... continued

Value / Sensitivity	Description	Spatial overlap with OA	Spatial overlap with EMBA	Public Information Review
Shipping	AMSA shipping fairways and recorded vessel movements and shipping routes	No	Yes	No shipping fairways are within the OA. There are shipping fairways and vessel movements and shipping routes within the EMBA.
	Port areas	No	Yes	The OA does not intersect any Port Authority boundaries. The closest port to the OA is the Port of Exmouth, which is approximately 45 km south.
Telecommunications infrastructure	Subsea telecommunications cables	No	Yes	The OA does not intersect any subsea telecommunications cables. There are subsea telecommunications cables within the EMBA.
Tourism	Marine and coastal tourism	No	Yes	No known tourism activities occur in the OA. Tourism activities are known to occur in the EMBA.

Table 5. Cultural values and sensitivities

Feature	Description	Spatial overlap with OA	Spatial overlap with EMBA	Public Information Review
Aboriginal Heritage	Registered Aboriginal Heritage sites protected under the: *Aboriginal and Torres Strait Islander Heritage Protection Act 1984 (Cth)*	No	Yes	There are no registered Aboriginal Heritage sites within the OA. Aboriginal Heritage sites are present along the eastern boundaries of the EMBA.
	Registered Aboriginal Heritage sites protected under the: *Aboriginal Heritage Act 1972 (WA)*	No	Yes	There are no registered sites within the OA. Aboriginal Heritage sites are present along the eastern boundaries of the EMBA.
Cultural Heritage	Registered cultural sites under the: *Underwater Cultural Heritage Act 2018 (Cth)* *Maritime Archaeology Act 1973 (WA)*	No	Yes	No known sites of shipwrecks, sunken aircraft or other types of underwater cultural heritage were identified within the OA using the "Australian National Shipwrecks" dataset. There are shipwrecks within the EMBA.

Environmental impact and risk assessment considers planned activities and unplanned events:

- **Planned activities** come with unavoidable and known impacts that occur as part of the Activity, such as noise and atmospheric emissions.
- **Unplanned events** are not expected to occur, such as accidental discharges or spills. These events are assessed to ensure that, in the unlikely of an occurrence, the risks are managed adequately (through contingency measures).

Table 6 and 7 summarises the potential environmental impacts, risks and associated management measures to reduce environmental consequences to minor and As Low as Reasonably Practicable (ALARP).for the proposed Activity.

Table 6. Proposed activity potential impacts

Proposed activity potential impacts	
Noise emissions	

Description of impacts
Noise will be generated by:
• MODU operations
• LWIV Dynamic positioning (DP) systems
• Flaring during well bleed off activities
• Activity support and survey vessels
• Helicopters
Elevated underwater noise has the potential to change marine fauna behaviour such as attraction, avoidance and disorientation. The sensitivity of fauna to elevated noise levels varies depending on individual response.
Noise from proposed activities are not expected to impact socio-economic receptors as the impacts to fish from underwater noise are limited to localised behavioural changes that will not have any flow on impact to commercial fishing operations.
	Compliance with the following key management measures
	• Implement Santos' *Protected Marine Fauna Interaction and Sighting Procedure* for vessel and aircraft movements. This procedure limits marine fauna approach distances and speed, allowing marine fauna to be avoided or to move away which complies with Part 8 of *Environment Protection and Biodiversity Conservation Regulations (EPBC Regulations) for interacting with cetaceans* including:
	  • Support vessels will not travel faster than 6 knots within 300 m of a cetacean or turtle (caution zone) and minimise noise;
	  • Support vessels will not approach closer than 50 m to a dolphin or turtle and/or 100 m for a whale; and
	  • Vessels' movements and helicopter flights comply with Part 8 of EPBC Regulations for interacting with cetaceans.
	• Marine assurance standards and planned vessel maintenance will minimise noise generated from vessels and MODU by ensuring they are operated, maintained and crewed in accordance with industry standards and regulatory requirements.
	• Vessel planned maintenance system to maintain vessel dynamic positioning engines and machinery
	  • Vessel bridge crew receive induction in marine fauna observations and marine fauna interaction requirements

Table 6. Proposed activity potential impacts ... continued

Light emissions	

Description of impacts
Light will be generated by:
• Flaring activities
• Artificial lighting for:
  • operational and navigational safety during the Activity;
  • spot lighting when needed, such as deploying or retrieving equipment; and
  • when ROVs are working underwater.
Light may impact threatened, migratory or local fauna (e.g. marine mammals, marine turtles, sharks, rays, other fish and seabirds) and socio-economic receptors (cultural features). For example, fish may be attracted to artificial light, leading to a short-term localised increase in fauna activity.
The vessels, including the MODU are expected to produce similar light levels to other marine vessels in the region.
	Compliance with the following key management measures
	• Lighting is to be limited to that required for safe operations and navigation and will comply with the following maritime regulations:
	  • International Regulations for Preventing Collisions at Sea (COLREGS) / Marine Orders 30: Prevention of Collisions, and
	  • Marine Orders 21: Safety of Navigation and Emergency Procedures.
	• The Commonwealth *National Light Pollution Guidelines for Wildlife* (2023) will be followed as reasonably practicable.

Table 6. Proposed activity potential impacts ... continued

Physical presence and interaction with other marine users	

Description of impacts
Interaction with other marine users may occur as a result of but not limited to:
• MODU/LWIV and ROV presence in OA
• Support vessels and helicopters presence in OA
• Presence of well infrastructure and other equipment on seabed
The presence of the activity could potentially temporarily inhibit or impact other marine user groups including commercial and recreational fishing, tourism, commercial shipping and other oil and gas activities.
	Compliance with the following key management measures
	• All project vessels operating within the OA will adhere to the navigation safety requirements:
	  • International Regulations for Preventing Collisions at Sea 1972,
	  • Chapter 5 of International Convention for the Safety of Life at Sea 1974,
	  • International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, and
	  • the *Navigation Act 2012* and any subsequent Marine Orders that specify standards for crew training and competency, navigation, communication, and safety measures.
	• The Australian Hydrographic Office will be advised of project activities and installed infrastructure to facilitate issuing Notices to Mariners and maintaining nautical charts.
	• The MODU and activity vessels will maintain navigation aids to facilitate identification by other users.
	• A 500 m exclusion zone will be established and maintained around MODU/LWIV
	• Lighting will be used as required for safe work conditions and navigational purposes

Table 6. Proposed activity potential impacts ... continued

Seabed and benthic (above seabed level) habitat disturbance	
Description of impacts Seabed disturbance will occur by: • MODU positioning and anchoring • Cutting of wellhead • Placement of objects on the seabed such as ROV baskets • Marine growth removal Seabed disturbance could result in localised removal of epifauna or decreases in the abundance and diversity of local infauna. The total area of seabed disturbance that has been calculated for the proposed activities: • Rov baskets up to 24 m^2 per placement activity • Pre-lay of MODU anchors in OA where the semi-submersible will be used: conservatively 2,520 m^2 for the well	**Compliance with the following key management measures** • The semi-submersible MODU anchor mooring design and station keeping system will be designed to limit the extent of seabed disturbance by minimising the length of mooring line deployed. • No planned mooring of support vessels. • All deployed equipment is to be recovered at the end of activity to enable seabed and habitat recovery. • Santos continues to consider risks and impacts to cultural values and additional control measures may be adopted following site surveys.
Operational discharges - vessels	
Description of impacts The types of vessel discharges are typical of most offshore commercial vessels and include: • Bilge water • Cooling water • Deck drainage • Desalination brine • Food waste • Sewage and greywater • Ballast water • Firefighting foam Discharges from the MODU and support vessels may create a localised and temporary reduction in marine water quality.	**Compliance with the following key management measures** • Santos' chemical selection process will be implemented so that environmentally acceptable chemicals are used. • Additives will be selected and optimised for biodegradability as well as low aquatic toxicity and bioaccumulation potential. • All wastewater discharges will comply with relevant MARPOL 73/78, *Navigation Act 2012, Protection of the Sea (Prevention of Pollution from Ships) Act 1983* and subsequent Marine Order requirements (as appropriate for vessel classification). • Marine Order 91 (Marine Pollution Prevention – Oil), which implements Annex I of MARPOL 73/78. • Marine Order 95 (Marine Pollution Prevention – Garbage), which implements Annex V of MARPOL 73/78. • Marine Order 96 (Marine Pollution Prevention – Sewage), which implements Annex IV of MARPOL 73/78. • Santos Waste (Garbage) Management Procedures

Table 6. Proposed activity potential impacts ... continued

Operational discharges - drilling	
Description of impacts The types of routine drilling discharges include: • Brine • Drilling muds, which will be water-based for this activity • Drilling fluids and cuttings • Subsea control fluids • Cement and completion fluids (such as well clean up and suspension fluids) • Formation water • Chemicals such as tracer dyes Drilling discharges will be intermittent during the activity with volumes discharged dependent on a range of variables. Drilling discharges to the marine environment will result in a localised (around the discharge location) and temporary (minutes to hours) reduction in water quality. The OA is in a well mixed deep open water environment. The discharges are expected to be dispersed and diluted rapidly with concentrations significantly dropping the further away from the discharge location. Water quality change outside the OA is therefore unlikely to occur.	**Compliance with the following key management measures** • Chemical selection procedures so that only environmentally acceptable products are used in the activity. • Cuttings management system to ensure all drilling fluid will be recovered prior to the cuttings discharge to the sea. • Well test procedures to reduce oil in water content of drilling fluids • Inventory control procedure- restricts type and volume of drilling discharges

Table 6. Proposed activity potential impacts ... continued

Atmospheric emissions	
Description of impacts	**Compliance with the following key management measures**
Atmospheric emissions will occur from: • Fuel combustion to operate the MODU, vessels and helicopters • Operation of vessel incinerators • Flaring from MODU during well bleed off activities Atmospheric emission from the above activities may result in a temporary, localised reduction of air quality in the environment immediately surrounding the discharge point during the activity. Non-GHG emissions (NOx and SOx), can lead to a reduction in local air quality. Other atmospheric emissions may include greenhouse gases (GHG) such as CO_2, N_2O and CH_4. GHG emissions are linked to global warming and climate change.	• The MODU and support vessels will comply with MARPOL Annex VI (Prevention of Air Pollution from Ships), the *Navigation Act 2012*, the *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* and subsequent Marine Orders, which require vessels to have a valid International Air Pollution Prevention Certificate (for vessels more than 400 tonnage), and to use low-sulphur fuel. • Ozone-depleting substances onboard vessels and the facilities will comply with relevant MARPOL 73/78 (Annex VI - air pollution), *Navigation Act 2012*, *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* and subsequent Marine Order requirements (as appropriate for vessel classification). • Vessel preventative maintenance systems. • Measure, monitor or estimate fuel and flare emissions (in accordance with the National Pollutant Inventory). • Emissions, energy consumption and energy production data will be reported annually to the Clean Energy Regulator by the vessel contractors in accordance with *National Greenhouse and Energy Reporting Act 2007* requirements. • Well test procedure to reduce risk of hydrocarbons being released to air and sea • MODU planned maintenance system – reduces emissions by ensuring contracted MODU is operated, maintained and manned in accordance with industry standards and regulatory requirements. The control measures to be adopted are designed to be consistent with maritime regulations and petroleum industry standards.

Table 7. Potential activity risks

Potential activity risks	
Unplanned introduction of invasive marine species (IMS)	

Description of risks
Introduction of invasive marine species (IMS) may occur due to:
• Biofouling on vessels and external/internal niches (such as sea chests, seawater systems)
• Biofouling on equipment that is routinely submerged in water (such as ROVs)
• Discharge of high-risk ballast water
If successfully established, IMS can:
• Outcompete native species for food or space
• Prey on native species
• Change the nature of the environment
• Impact fisheries or aquaculture
• Impact human health through released toxins
• Reduce coastal aesthetics
• Cause damage to marine and industrial equipment and infrastructure
	Compliance with the following key management measures
	• Ballast water exchange operations will comply with the International Convention for the Control and Management of Ships' Ballast Water and Sediments 2004 (as appropriate to vessel class), Australian Ballast Water Management Requirements (DAWE 2020), *Protection of the Sea (Harmful Anti-fouling Systems) Act 2006*, and *Biosecurity Act 2015*, including:
	  • all ballast water exchanges conducted more than 12 nm from land
	  • vessel Ballast Water Management Plan stipulating that ballast water exchange records will be maintained Compliance with Santos IMS Management Plan
	• Biofouling management for vessels will be in accordance with the IMO Guidelines.
	• Compliance with the International Convention on the Control of Harmful Anti-fouling Systems on Ships 2001.
	• Valid International Anti-Fouling Systems Certificate.

Table 7. Potential activity risks ... continued

Unplanned interaction with marine fauna	

Description of risks
Potential interaction with marine fauna may occur as a result of:
• MODU operations
• Vessel operations
• Helicopter operations
Marine fauna in surface waters that are most at risk from vessel collision include marine mammals, marine turtles and whale sharks.
The MODU is not self-propelled and will be stationary once on location and MODU related marine fauna interactions are not anticipated.
Potential strike or collision may result in severe injury or mortality.
	Compliance with the following key management measures
	• Monitoring of surrounding marine environment by support vessel(s).
	• Santos' Procedure for interacting with marine fauna, which is designed to align with the EPBC Regulations 2000. This procedure limits marine fauna approach distances and speed, allowing marine fauna to be avoided or to move away.
	• Vessels within the OA will adhere to the requirements of the EPBC Regulations Part 8.1 – Interacting with cetaceans, (except in emergency conditions or when manoeuvring is not possible), which include:
	  • Implement a caution zone of 150 m for dolphins and 300 m for whales;
	  • Vessels will not knowingly approach closer than 50 m to a dolphin and 100 m to a whale (i.e. no approach zone);
	  • Make sure a vessel does not drift or approach within 50 m of a dolphin or 100 m of a whale; and
	  • Vessels will not knowingly travel more than 6 knots within the caution zone of a dolphin or whale.
	• Helicopters within the designated OA will adhere to the requirements of the EPBC Regulations Part 8.1 – Interacting with cetaceans (except in emergency conditions or when manoeuvring is not possible), which includes:
	  • not operating the helicopter at a height lower than 1650 feet or within a horizontal radius of 500 m of a cetacean, and
	  • not allowing the aircraft to approach a cetacean from head on.
	• Vessel standard operating procedure.

Table 7. Potential activity risks ... continued

Unplanned release of solid objects	

Description of risks
• Objects that could be accidentally released to the marine environment from vessels or during installation activities include:
• Non-hazardous solid wastes (paper, plastics and packaging)
• Hazardous solid wastes, (such as batteries, fluorescent tubes and aerosol cans)
• Equipment and materials (supplies, hard hats, tools or infrastructure parts)
Dropped objects from the MODU or support vessels may occur due to:
• Overfull or uncovered bins
• Incorrectly disposed items
• Incidents during transfers of waste or supplies
• Accidentally dropped objects/lost equipment
• Solid objects, equipment and other items lost at sea could lead to disturbance of benthic habitats in the area where the object has been dropped
	Compliance with the following key management measures
	• All wastewater discharges will comply with relevant MARPOL 73/78, *Navigation Act 2012*, *Protection of the Sea (Prevention of Pollution from Ships) Act 1983* and subsequent Marine Order requirements (as appropriate for vessel classification)
	• Objects dropped overboard will be recovered where practicable to mitigate the environmental consequences from objects remaining in the marine environment, unless the environmental consequences are minor, or safety risks are disproportionate to the environmental consequences
	• Waste management procedures will include:
	  • Classification of wastes including segregation of wastes into recyclable and non-recyclable materials
	  • Appropriate storage of wastes
	  • Transportation and disposal of wastes by a licenced waste contractor at licenced waste management facilities in accordance with waste classifications
	• Crane and lifting operations will comply with the following:
	  • Lifting equipment will be inspected and certified
	  • Preventative maintenance will be carried out, and lifting operators will be competent and qualified

Table 7. Potential activity risks ... continued

Unplanned hazardous liquid release (non-hydrocarbon)	
Description of risks Unplanned hazardous liquid release (non-hydrocarbon) may occur during: • Transferring, storing or using bulk products (e.g., mixed cement) • Mechanical failure of equipment, such as a tank or pipework failure • Handling and storage spill and leaks due to insufficient fastening • Hose or hose connection failure or leak • Lifting – dropped objects damaging liquid vessels (containers) inadequate bunding Non-hydrocarbon liquids include miscellaneous chemicals and waste streams (brine, mixed cement, cleaning and cooling agents, stored or spent chemicals and leftover paint materials) used or stored on board activity vessels, including the MODU. • Impacts to water quality are expected to be short-term and localised due to the selection of environmentally acceptable chemicals, the relatively small size of an unplanned spill and the rapid dispersal. • A decrease in water quality is likely to be restricted to the immediate area surrounding the spill location and contained within the OA. • Due to the small volumes and expected rapid dilution to concentrations below impact thresholds, impacts to water quality are not expected to cause flow-on effects to sediment quality, benthic habitats or socio-economic receptors such as commercial fisheries and/or cultural features.	**Compliance with the following key management measures** Santos has a suite of procedures to manage the selection, storage, handling and clean-up of chemicals and other non-hydrocarbon liquids. All project vessels operating within the OA will adhere to the navigation safety requirements including: • International Regulations for Preventing Collisions at Sea 1972 • Chapter 5 of International Convention for the Safety of Life at Sea 1974 • International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978 • the *Navigation Act 2012* and any subsequent Marine Orders that specify standards for training and competency, navigation, communication, and safety measures • All vessels involved in the project will have a valid SOPEP or Shipboard Marine Pollution Emergency Plan (as appropriate for vessel classification). Vessels will have spill response plans. • Santos chemical selection process will be implemented so that environmentally acceptable chemicals are used • All project vessels subject to Santos' marine assurance procedures ensuring contracted vessels are operated, maintained and crewed in accordance with industry standards and regulatory requirements • A 500 m exclusion zone will be established and maintained around the MODU/LWIV • Spill kits will be available on-board vessels and personnel will receive an induction/training to inform them of deck spill response requirements. • Chemical storage areas will typically be set up in cabinets or bunded storage areas • Vessel lifting standards and cargo transfer procedures

Table 7. Potential activity risks ... continued

Unplanned minor hydrocarbon release	
Description of risks	**Compliance with the following key management measures**
Unplanned minor hydrocarbon release may occur due to: • Loss of primary containment • Pipework failure or rupture, hydraulic hose failure • Lifting – dropped objects damaging diesel infrastructure • Human error during tank filling or storage container transfers Minor releases refer to relatively small volumes of hydrocarbons from storage containers, transfer equipment and pipework on the MODU or support vessels that enters the marine environment. Most of these types of release occur within bunded deck areas, and are less than $1m^3$, however it remains possible for such spills to enter the marine environment. A localised decrease in water quality may occur, however due to the relatively small volumes impacts are expected to be short term as the hydrocarbon would rapidly dilute and dissolve into the ocean. Marine fauna may transit through the OA and encounter the release. However, it is expected impacts to fauna would be short term and result in behavioural changes, as they move away from the area where the spill occurred. Minor hydrocarbon releases are not expected to impact any socio-economic receptors such as commercial fisheries and/or cultural features.	• Dropped object prevention procedures to reduce the potential for dropped objects during lifting operations (including tote tanks and drum lifts) • Hazardous chemical management procedures to reduce the potential of spills and leaks (discharges) to the marine environment by controlling the storage, handling and clean-up of hazardous chemicals • General chemical management procedures to reduce spills, leaks and discharges by implementing procedures for the safe handling and storage of chemicals • Dangerous goods managed in accordance with International Maritime Dangerous Goods Code to reduce the potential of an accidental minor spills • MODUs and vessels have spill response plans • Remotely operated vehicle (ROV) inspection and maintenance procedures • Documented maintenance program is in place for equipment on vessels and MODU that provides a status on the maintenance of equipment • Emergency response capability (including equipment, personnel contracts, MOUs) will be maintained in accordance with approved SOPEPS accepted EPs and OPEPs • Bulk liquid transfer procedure to provide detail about chemical bunkering processes being undertaken • Well test procedures to reduce the risk of hydrocarbons being released to sea and air

Table 7. Potential activity risks ... continued

Unplanned marine diesel oil (MDO) release	

Description of risks
An unplanned release of MDO to the marine environment could occur from:
• A collision between the activity vessels and an errant third-party vessel due to factors such as human error, poor navigation, vessel equipment failure or poor weather. Such events could have sufficient impact to result in the rupture of a diesel tank leading to a loss of integrity and releasing 325 m^3 in the environment. This is considered credible given the diesel tanks may not be protected or double-hulled and fuel tank ruptures resulting in a hydrocarbon release have occurred before within the maritime industry.
Vessel - MODU Refuelling:
• spills during refuelling can occur through several pathways, including fuel hose breaks, coupling failure or tank overfilling, where fuel bunkering would need to be stopped manually.
• Fuel released prior to the cessation of pumping as well as fuel remaining in the transfer line may escape to the environment releasing 37.5m^3 of MDO.
Potential impacts that may occur as a result of hydrocarbon exposure could include:
• Sub-lethal stress and, in some cases, total or partial mortality of sensitive benthic organisms (e.g., corals) and the early life stages of resident fish and invertebrate species.
• A reduction in water quality has the potential to impact marine fauna. Some species of marine fauna may have cultural significance.
• Seabirds that encounter sea surface hydrocarbons may experience secondary effects through ingestion of condensate after eating exposed fish or preening.
Potential for temporary disruption to fishing activities e.g. disruption/ displacement of Fishing activities caused by the physical presence of the slick, loss of catch, decline in commercially important fish stocks and/or suspension of fishing operations
	Compliance with the following key management measures
	• Bulk liquids transferred in accordance with the bulk transfer procedure to reduce the risk of a release to sea.
	• MODUs and vessels have spill response plans.
	• Remotely operated vehicle (ROV) inspection and maintenance procedures.
	• Documented maintenance program is in place for equipment on vessels and MODU that provides a status on the maintenance of equipment.
	• All project vessels operating within the OA will adhere to the navigation safety requirements including:
	  • International Regulations for Preventing Collisions at Sea 1972,
	  • Chapter 5 of International Convention for the Safety of Life at Sea 1974,
	  • International Convention on Standards of Training, Certification and Watchkeeping for Seafarers 1978, and
	  • the *Navigation Act 2012* and any subsequent Marine Orders that specify standards for crew training and competency, navigation, communication, and safety measures.
	• The AHS will be advised of project activities to facilitate issuing Notices to Mariners and maintaining nautical charts prior to commencement of the activities.
	• Accepted OPEP in place for all activities.
	• A 500 m exclusion zone will be established and maintained around the MODU/LWIV
	• Oil-spill modelling and environmental risk assessments for development of this EP and OPEP will consider the full range of credible worst-case scenario consequences based on best available oil-spill modelling.
	• The MODU and vessels will maintain navigation aids.
	Santos will undertake consultation with relevant persons for all petroleum activities within the scope of these activities in accordance with the OPGGS (E) Regulations.

Table 7. Potential activity risks ... continued

Unplanned hydrocarbon release from loss of well control	
Description of risks Based on industry statistics and Santos' risk assessments, the likelihood of a loss of well control event leading to a spill of this size is considered 'remote' – requires exceptional circumstances and is unlikely even in the long term. The combination of the standard prevention control measures (i.e., safe drilling methods), and the spill response strategies, as presented in the OPEP, together reduce the hydrocarbon spill risk to a low level Potential impacts that may occur as a result of hydrocarbon exposure could include: • Sub-lethal stress and, in some cases, total or partial mortality of sensitive benthic organisms (e.g., corals) and the early life stages of resident fish and invertebrate species. • A reduction in water quality has the potential to impact marine fauna. Some species of marine fauna may have cultural significance. • Seabirds that encounter sea surface hydrocarbons may experience secondary effects through ingestion of condensate after eating exposed fish or preening. • Potential for temporary disruption to fishing activities e.g. disruption/ displacement of • Fishing activities caused by the physical presence of the slick, loss of catch, decline in commercially important fish stocks and/or suspension of fishing operations	**Compliance with the following key management measures** • Industry standard safe drilling methodologies, including inherently safe well designs and well control measures, are to be implemented • Drilling and Completions Management Process, including well integrity standards and NOPSEMA accepted Well Operations Management Plan (WOMP) • MODU and support vessel spill response plans including predrilling source control plan • A 500 m exclusion zone will be established and maintained around the LWIV/MODU • Oil-spill modelling and environmental risk assessments for development of the EP and OPEP will consider the full range of credible worst-case scenario consequences based on best available oil-spill modelling • The AHS will be advised of project activities to facilitate issuing Notices to Mariners and maintaining nautical charts prior to commencement of activities • Marine assurance standards and planned maintenance to ensure that MODU and vessels are operated, maintained and crewed in accordance with industry standards and regulatory requirements • Documented maintenance program is in place for equipment on MODU that provides a status on the maintenance of equipment • Prior to each campaign commencement, an assurance check will be undertaken in accordance with Santos Environment Management of Change Procedure • Source control emergency response plans will be in place for all drilling activities, including but not limited to relief well drilling.

Consultation

In preparing an EP for submission to NOPSEMA, a titleholder must consult with each 'relevant person', including relevant Commonwealth and State Departments or agencies, and persons (or organisations) whose functions, interests or activities may be affected by the activity proposed to be carried out under an EP.

Your input is important:

- So that Santos can understand the environmental values in the OA and the EMBA, and the environmental impacts and risks associated with the proposed activity;
- To inform Santos how consultation processes may need to be adapted for different relevant persons; and
- To ensure that Santos provides information to relevant persons in an appropriate and accessible manner.

Consultation also helps Santos to identify values and sensitivities where information is not publicly available, such as spiritual and cultural connections to land and sea country. This enables Santos to receive first-hand feedback on commercial and recreational fishing, tourism and local community activities and interests.

Consultation provides Santos with an opportunity to receive feedback from authorities, persons and organisations whose interests or activities may be affected by proposed petroleum activities.

This feedback helps Santos to refine or change the management measures it plans to address any potential activity impacts and risks. Santos' objective for the proposed activities will be carried out in a manner by which the environmental impacts and risks of the activity will be reduced to a level that is ALARP and acceptable over the life of the activity.

Providing feedback

You might be a relevant person if, for example, you have spiritual or cultural connections to land and sea country in accordance with Indigenous tradition that might be affected by our activity, or if you otherwise carry out recreational or commercial fishing, tourism or other activities that might be affected by our proposed activity, or if you are part of a local community that might be affected by our proposed activity.

Relevant persons being consulted on EPs under the OPGGS Environment Regulations should note that they:

- are entitled to be given sufficient information to allow them to make an informed assessment of the possible consequences of the activity on their functions, interests or activities;
- are entitled to be allowed a reasonable period for the consultation; and
- may request particular information provided in consultation not be published.

If you consider you may be a relevant person, please contact us to initiate consultation with you, so you can tell us how you would like to be consulted throughout the consultation process or if you need additional information. Consultation dates for proposed activities are published on Santos' Consultation Hub website.

The merits of relevant person feedback provided through the consultation process will be considered during the EP development with a summary of responses summarised and included in the EP submitted to NOPSEMA for assessment. Please let us know if you would like your personal/organisational details or any particular information provided during consultation to not be published, and we will ensure that it is included in a separate report which is not published on NOPSEMA's website.

More information about how community members can participate in environmental approvals for activities proposed in Commonwealth waters has been published in a **brochure** by NOPSEMA.

Contact

E: offshore.consultation@santos.com
T: 1800 267 600
santos.com/offshoreconsultation