Proposed Browse to NWS Development

Proposal Content Document

Table 1: General proposal content description

Proposal title	Proposed Browse to NWS Development (State component)
Proponent name	Woodside Energy Ltd, as Operator for and on behalf of the Browse Joint Venture
Short description	Drilling and completion, subsea installation, commissioning, operation, inspection, maintenance and repair and decommissioning of subsea wells and associated subsea infrastructure located in Western Australian State waters, to extract hydrocarbons from the Torosa reservoir, located approximately 425 km north of Broome and approximately 290 km off the Kimberley coast.

Table 2: Proposal content elements

Proposal element	Location / description	Maximum extent, capacity or range (as of 12 October 2022)	Proposed Amendment	Revised extent, capacity or range
Physical elements				
Petroleum production wells Operation & maintenance of subsea infrastructure (e.g. wells, flowlines, and umbilicals) Temporary mooring of a Mobile Offshore Drilling Unit (MODU)	Installation and physical presence of infrastructure within indicative field layout as per Figure 1 below.	Up to 0.24 km^2 of direct seabed disturbance (including 25% contingency). Up to 20 wells.	**Relocating one drill centre (referred to as TRD) so that and no drilling activity occurs within 20 km of Sandy Islet.** **Reduce development envelope (maximum area within which the physical elements will occur) as per Figure 2 below.**	Up to 0.24 km^2 of direct seabed disturbance (including 25% contingency). Up to 20 wells. **No drill centre within 20 km of Sandy Islet.** **All physical elements to be installed within a Development Envelope of 78.3 km^2.**
Construction elements				
Water supply (for installation	Water requirements sourced either	Limited water requirements to support drilling	No change	Limited water requirements to support drilling and

vessels, MODUs and project vessels)	from seawater (reverse osmosis plant) or loaded onto vessels at port.	and completion activities, subsea installation activities (e.g. potential hydrotest), vessel and MODU water needs and potentially also for decommissioning activities.		completion activities, subsea installation activities (e.g. potential hydrotest), vessel and MODU water needs and potentially also for decommissioning activities.
Power supply (installation vessels, MODUs and project vessels)	Power generated on board vessels and MODU.	As per each vessel capacity.	No change	As per each vessel capacity.
Vessel discharges (installation vessels, MODU, and project vessels).	Discharges from vessels and MODU include treated sewage, drain waters, cooling water, sullage, putrescible organic waste and desalination brine.	Limited volumes discharged in accordance with International Convention for the Prevention of Pollution from Ships MARPOL 73/78 Annex I, as applied in Australia under the Commonwealth Protection of the Sea (Prevention of Pollution from Ships) Act 1983 (Part II Prevention of pollution from oil); Marine Orders 91 (Marine pollution prevention – Oil) 2014 as applicable to vessel class; Pollution of Waters by Oil and Noxious Substance Act 1986.	No change	Limited volumes discharged in accordance with International Convention for the Prevention of Pollution from Ships MARPOL 73/78 Annex I, as applied in Australia under the Commonwealth Protection of the Sea (Prevention of Pollution from Ships) Act 1983 (Part II Prevention of pollution from oil); Marine Orders 91 (Marine pollution prevention – Oil) 2014 as applicable to vessel class; Pollution of Waters by Oil and Noxious Substance Act 1986.
Drilling and completions operations	Drill cuttings and drilling fluids. Use of best practice technology to stop	Average of 850 m^3 of cuttings per well, with up to 20 wells to be developed in the	**Torosa Development drilling will incorporate dual pyrotechnically**	Average of 850 m^3 of cuttings per well, with up to 20 wells to be developed in the State Proposal

	hydrocarbon flow to the marine in the remote likelihood a of a loss of well control event during drilling.	State Proposal Area. Up to 17,000 m^3 cuttings total. Up to 130 m^3 of fluid discharged per well during well unloading.	**actuated shear rams.**	Area. Up to 17,000 m^3 cuttings total. Up to 130 m^3 of fluid discharged per well during well unloading. **Torosa Development drilling will incorporate dual pyrotechnically actuated shear rams.**
Hydrotest fluid discharges	Hydrotest fluids discharged at the seabed during integrity testing of the subsea infrastructure	One-off discharges of up to 250 m^3 from the TRF flowline	No change	One-off discharges of up to 250 m^3 from the TRF flowline
Produced water	Low volumes of water that naturally occur within the hydrocarbon bearing geological formations.	Small volumes of formation water may result during well unloading activities by the MODU. These will be directly discharged by the MODU/ l.	No change	Small volumes of formation water may result during well unloading activities by the MODU. These will be directly discharged by the MODU.
Underwater noise emissions	Underwater noise: • generated during drilling, completion and installation activities (including vessel movements using Dynamic Positioning (DP), vertical seismic profiling (VSP) and distributed acoustic sensing (DAS) • from piling activities for mooring	Noise related behavioural disturbance radius of up to approximately 10.5 km around drilling and installation activities. Noise related behavioural disturbance radius of up to approximately 500 m around subsea infrastructure during operations. Noise from piling and mooring installation as required for operations.	**Drilling at Torosa drill centres will only commence when the MODU is being held in place by anchors. Dynamic Positioning will only be used upon arrival and departure at the drilling location.**	Noise related behavioural disturbance radius of up to approximately 10.5 km around drilling and installation activities. Noise related behavioural disturbance radius of up to approximately 500 m around subsea infrastructure during operations. Noise from piling and mooring installation as required for operations.

	installation for the MODU (note that this is unlikely to be required) • from installation vessels, MODUs and project vessels • from helicopter movements to/from the MODU			**Drilling at Torosa drill centres will only commence when the MODU is being held in place by anchors. Dynamic Positioning will only be used upon arrival and departure at the drilling location.**
Light emissions – operational lighting	Artificial light emitted by installation vessels, MODUs and project vessels.	Limited to functional lighting at levels that provide a safe working environment for personnel.	No change	Limited to functional lighting at levels that provide a safe working environment for personnel.
Light emissions – flaring	Intermittent flaring from the MODU during well unloading. This occurs only during well installation.	As required for operations and safety.	**Planned flaring from the MODU will not occur at night time.**	**Planned flaring from the MODU will not occur at night time.**
Air emissions – offshore activities	Air emissions resulting from power generation on project vessels and MODU.	As required for operations and safety.	No change	As required for operations and safety.
Operational elements				
Operation of inspection maintenance and repair vessels to maintain subsea infrastructure	Vessels will operate within the State proposal area, in close proximity to installed infrastructure. Discharges from vessels and include treated sewage, drain waters, cooling water, sullage, putrescible organic waste and desalination brine.	Vessel discharges are performed with International Convention for the Prevention of Pollution from Ships.	No change	Vessel discharges are performed with International Convention for the Prevention of Pollution from Ships.

Operation of up to 20 subsea wells and associated subsea infrastructure	Wells are controlled via umbilicals (e.g. containing electrical or hydraulic connections) via the Torosa FPSO.	Hydraulic fluid may be released to the environment, expected to have no last effect on the environment.	No change	Hydraulic fluid may be released to the environment, expected to have no last effect on the environment.
Subsea control fluid discharge	Control fluid discharged at the x-mas trees to maintain valve functionality.	Intermittent discharge of water-based hydraulic control fluid when subsea valves are actuated (~0.1 L). Maximum volume of control fluid that will be released to the marine environment per manifold is 1,900 L per year of water based fluid containing approximately ~3% active ingredient (40– 68 L of control fluid additive).	No change	Intermittent discharge of water-based hydraulic control fluid when subsea valves are actuated (~0.1 L). Maximum volume of control fluid that will be released to the marine environment per manifold is 1,900 L per year of water based fluid containing approximately ~3% active ingredient (40– 68 L of control fluid additive).
Underwater noise emissions	Underwater noise: • generated from subsea infrastructure during operations • from inspection maintenance and repair (IMR) vessel activities.	Noise related behavioural disturbance radius of up to approximately 500 m around subsea infrastructure during operations. Noise related behavioural disturbance radius of up to approximately 5 km around subsea IMR vessels.	No change	Noise related behavioural disturbance radius of up to approximately 500 m around subsea infrastructure during operations. Noise related behavioural disturbance radius of up to approximately 5 km around subsea IMR vessels.
Light emissions – operational lighting	Artificial light will emitted by project vessels and MODUs.	Limited to functional lighting at levels that provide a safe working	No change	Limited to functional lighting at levels that provide a safe working

		environment for personnel.		environment for personnel.
Air emissions – offshore activities	Air emissions resulting from power generation on project vessels and MODU.	As required for operations.	No change	As required for operations.
Proposal elements with greenhouse gas emissions				
Construction elements:				
Installation and construction vessels (including MODU flaring/well unloading) and activities.	Scope 1: N/A Scope 3: ~0.31* million tonnes CO2-e over project life. *No more than 50,000 tonnes CO2-e in any given year.		No change	Scope 1: N/A Scope 3: ~0.31* million tonnes CO2-e over project life. *No more than 50,000 tonnes CO2-e in any given year.
Operation elements:				
Fugitive emissions from subsea infrastructure	Scope 1: <0.01 million tonnes CO2-e over project life.		No change	Scope 1: <0.01 million tonnes CO2-e over project life.
Inspection maintenance and repair vessel operations	Scope 3: 0.03 million tonnes CO2-e over project life.		No change	Scope 3: 0.03 million tonnes CO2-e over project life.
Includes onshore and offshore processing and use (combustion) of product by customers.	Scope 3: ~650 million tonnes CO_2e		No change	Scope 3: ~650 million tonnes CO_2e
Rehabilitation				
N/A				
Commissioning				
Wells and flowline infrastructure each may have a brief period (days) of commissioning prior to coming into full production in which non-routine emissions or discharges may occur. This includes a brief period			No change	No change

when hydrocarbons from a newly completed well may be sent to the MODU (drill rig) to be flared, in order to prevent impacts to the production system. Subsea flowlines may also discharge inhibited seawater to the ocean during commissioning.				
Decommissioning				
At the end of the proposed Browse to NWS Development life, all subsea infrastructure will be decommissioned in accordance with good oilfield practice and relevant legislation and practice at the time. This is likely to include well suspension, plugging and abandoning wells and removing the subsea infrastructure. All infrastructure installed above the seabed will be designed to allow removal.			No change	No change
Other elements which affect extent of effects on the environment				
Proposal time*	Maximum project life	Until 2070	No change	Until 2070
	Construction phase	Well construction and subsea installation activities may occur at any time during the operations phase. First activity to occur no earlier than 2027.	No change	Well construction and subsea installation activities may occur at any time during the operations phase. First activity to occur no earlier than 2027.
	Operations phase	Until 2070	No change	Until 2070
	Decommissioning phase	5 years, prior to 2070	No change	5 years, prior to 2070

** Proponents should only provide realistic timeframes to avoid unnecessary change to proposal applications at referral (section 38C), assessment (section 43A) or post assessment (section 45C).*

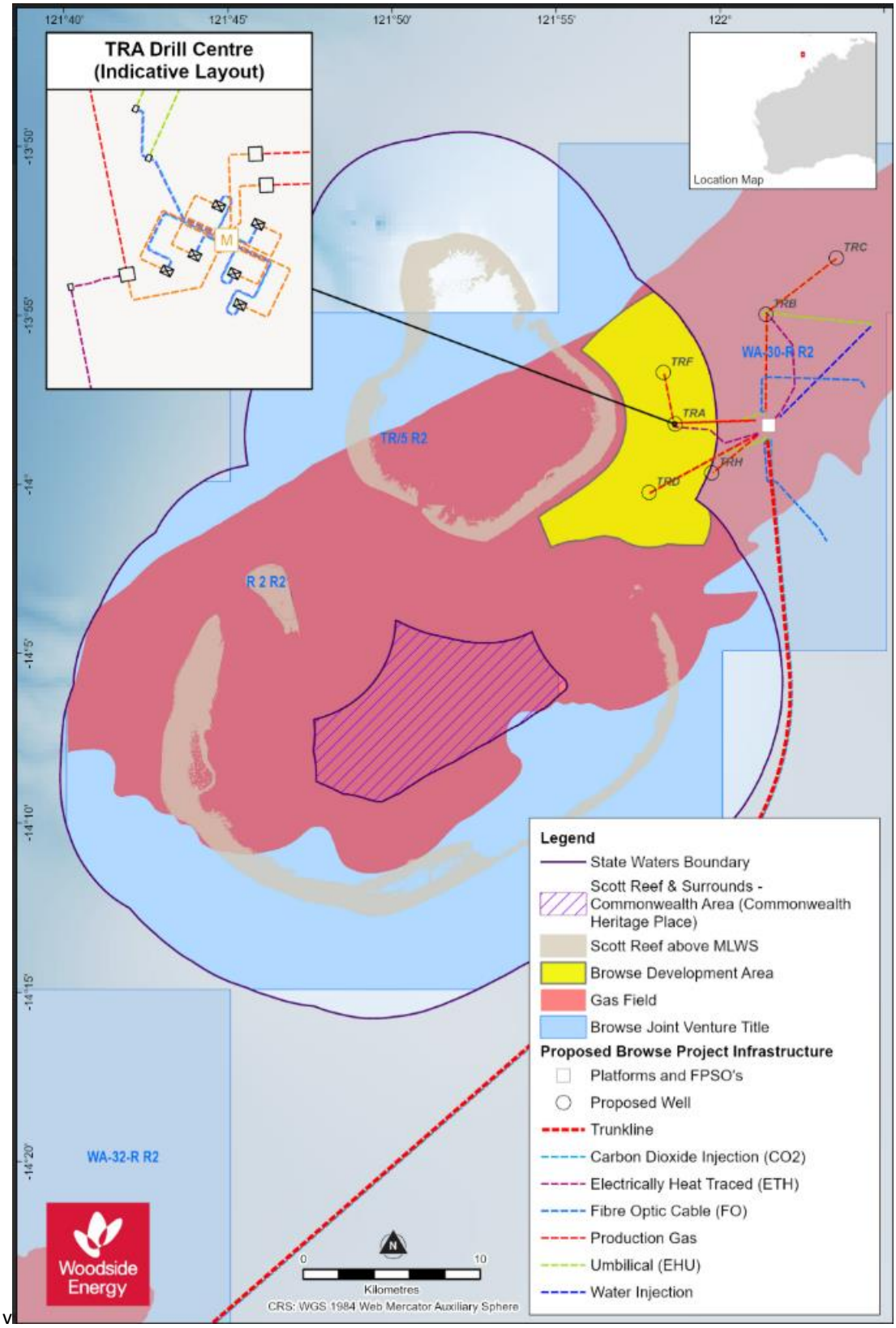

Figure 1 – Proposed Revised State Proposal Area (yellow) and indicative field layout.

Table 1 Updated indicative locations of Browse Drill Centres. All wells associated with each of the three drill centres will be located within 500m of this centroid.

Centroid point	Coordinates (GDA94)	
	Longitude	Latitude
TRA	389 521 E,	8 455 338 N
TRD	387 315 E,	8 451 598 N
TRF	388 865 E,	8 458 144 N