

Appendix A: Change notice – Regulation 22

Interest holder	Origin Energy B2 Pty Ltd		Beetaloo Sub-basin Multi-well Testing Program Exploration P	Unique EMP ID	ORI10-3	Mod #	1	Date	15 August 2022	
Brief Description	Revised location of stock watering trough.		oundwater monitoring bores at	t Amungee NW2 in response to	a late pastoral	request to m	nove Amun	gee NW2	infrastructure a	pproximately 1.4 km from an existing
Geospatial files included? Does the proposed change result in a new, or increased, or potential or actual environmental impact or risk?	Attached. If an INCREASE in the existing potential or actual environmental risk, is it provided for in the EMP?	Does the proposic change require additional mitigate measures to be included?	stakeholder	Does it require additional environmental performance standards and measurement criteria?	Does it affect compliances Sacred Site A Certificates?	with Authority	rehabil wastew sedime	affect cu itation, we rater, eros ent contro ency resp	eed fire, sion and	Will the environmental outcome continue to be achieved and will the impacts and risks be managed to ALARP and acceptable?

Does the proposed change result in a new, or increased, or potential or actual environmental impact or risk?	If an INCREASE in the existing potential or actual environmental risk, is it provided for in the EMP?	Does the proposed change require additional mitigation measures to be included?	Has additional stakeholder engagement been conducted?	Does it require additional environmental performance standards and measurement criteria?	Does it affect compliances with Sacred Site Authority Certificates?	Does it affect current rehabilitation, weed fire, wastewater, erosion and sediment control, spill or emergency response plans?	Will the environmental outcome continue to be achieved and will the impacts and risks be managed to ALARP and acceptable?
Amungee NW2 activity mod	lification- change in loc	ation and additional gro	undwater monitoring bo	re (impact bore)			
No. The existing EMP includes provision to clear a 3.5 ha area for a gravel pit at the Amungee NW2 location.	N/A No increased impact or risk.	No. Existing mitigation measures are in place covering land clearing, erosion and sediment control.	Yes. The relocation of the monitoring bores and new access track is at the specific request of the pastoralist for the Amungee Mungee Station.	No. Environmental performance standards for the protection of ecology and soils are sufficient.	No. Clearing to support the regulated activity is covered by the existing AAPA certificate C2022/002.	No. Origin operates all sites under a suite of management plans which contain common elements for all operating sites. Existing plans remain valid and appropriate to cover any potential risk covered under the proposed modification in alignment with the existing approved EMP.	Yes. Origin only intends to clear sufficient surface areas to place the monitoring bores and access track. Environmental outcomes pertaining to the protection of soils, surface water, groundwater, ecology and community are covered in the existing EMP and will not be impacted.
Additional contextual information	The modification to the pastoralist. This construction of the pastoralist. This construction is a second of the pastoralist. The proposed change is described in the EMP – Amungee NW2 gravel (existing) and Appendix An additional groundward of up to 4 new groundward.	aint was not identified during the Amungee NW 2 site has with this notice). A LACA of the Amungee NW2 location in Amungee NW2 location in i.e. open woodland typication and access track (3.5 has C (proposed).	location was made during ing initial stakeholder engages existing archaeological covering the activities at All will result in the site moving ally dominated by <i>Corymbia</i>), which will be removed the sum Ridge impact monitoring the sum of the site of the sit	agement completed in April 2 and ecology scouting (including mungee NW2 is underway are ing approximately 1.4 km to the ingression of the change ingression is also proposed to core at Amungee NW2. Altho	022. An alternative location of the second will be executed prior to the east as illustrated in Appends of Macropteranthes kekele-out. A land condition summer be constructed at the Amun	the site away from existing water infra- was selected, which has subsequently ents) and is covered under the existing the commencement of activities (noting endix A. The vegetation type at the ne- wickii. This disturbance will be directly leary of the existing and new proposed gee NW2 location. The Amungee Muncrease the number of groundwater in	y been approved by the pastoralist in g AAPA certificate C2022/002 g stakeholder engagement has been w location is consistent with that offset against the approved location is provided in Appendix B

	Upgrade of the accomply with Depart	nt EMP text			EMP ID					A
	comply with Depart					Ame	nded EMP	text		
	Upgrade of the access track intersection with the Carpentaria Highway to comply with Department of Infrastructure, Planning and Logistics requirements Expansion of the existing camp pad from 0.9 ha to 1.2 ha Installation of two additional E&A well cellars and conductors on the lease pad to accommodate the proposed Amungee NW-2H and Amungee NW-3H wellhead and surface facilities Construction of a drilling sump on the lease pad to manage drilling fluids, muds and cuttings of up to 5,000m³ Construction of a site bund for wastewater storage Construction of a sediment basin to manage stormwater during wastewater storage Drilling of up to four additional groundwater monitoring/ extraction bores within the proposed exploration areas (if required), including the construction of a groundwater monitoring bore approximately 11 km to the east of the existing Amungee NW lease pad in preparation for future exploration activities. Construction of a helipad (up to 1 ha) and laydown area (up to 1 ha) Construction of a 20m x 2km fence line and firebreak around the Amungee NW site (~4 ha) Construction and operation of a gravel pit up to 3.5 ha				• Exprime service of the active of the activ	apply with Depuirements. In ungee NW2 I ansion of the allation of two to accommon head and surfuction of a struction of a stru	partment of including collocation (1) existing of additional odate the purface facilities of up to a site bunda sediment four additions at Amungmungee Nima helipad (value) a 20m x 2km a	Infrastructionstructions. 5 ha) camp pace al E&A woroposed ties camp on the 5,000m ³ I for waste to basin to conal groun atton are gee NW2 W lease up to 1 h km fence	on of a new on of a new on of a new on of a new	nd conductors on the lease NW-2H and Amungee NW-3H d to manage drilling fluids, age ormwater during wastewater onitoring/ extraction bores ed), including 2 groundwater oproximately 11 km to the east aration for future exploration own area (up to 1 ha) ebreak around the Amungee
 1.2 Project boundary The boundary of this EMP is defined as the area which may be affected by E&A activities. This includes: existing access tracks to the Velkerri 76 S2 site and Amungee NW site existing Amungee NW and Velkerri 76 S2 lease pad, camp pad, and associated infrastructure (water bores) existing Velkerri 76 S2 chemical storage areas, lease pad bund, sediment basin, wastewater tanks and drilling sump proposed expansion of the existing Amungee NW lease pad and camp pad, including the installation of a new fence line and fire break 				 existing Amungee NW and Velkerri 76 S2 lease pad, camp pad, and associated infrastructure (water existing Velkerri 76 S2 chemical storage areas, lease pad bund, sediment basin, wastewater 					ociated infrastructure (water borenent basin, wastewater tanks a	

Proposed construction of a new gravel pit on the Amungee Mungee Station

• proposed well testing on the existing Amungee NW-1H and Velkerri 76 S2-1 wells.

wells at each of the Amungee NW and Velkerri 76 S2 sites

• proposed drilling, stimulation, well testing and suspension and abandonment of an additional two petroleum E&A

proposed installation of groundwater extraction/ monitoring bores, including 2 groundwater monitoring bores

proposed drilling, stimulation, well testing and suspension and abandonment of an additional two petroleum

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E&A wells at each of the Amungee NW and Velkerri 76 S2 sites

at the Amungee NW2 location (2.0 ha)

Interest holde		Origin Energy B2 B4	ty EMP	Postalas C	Sub-basin Multi-w	voll Drilling Cti	mulation and \\/-	II Tooting	Unimes	ORI10-3	Mod # 1	Doto	20 July 202	22	
interest noide	r	Origin Energy B2 Pt Ltd	Title		Exploration Permi	•		ell Testing	Unique EMP ID	ORI10-3	MIOG #	Date	20 July 202		
Current EMP text									Am	ended EMP text	·				
Table 6: Associ	ated exploration	sites and infrastructu	re covered under this E	MP			Table 6: Assoc	iated explorati	on sites and in	frastructu	re covered under	this EMP			
Exploration Permit	Infrastructure	cture name Station Zone* Approx. Approx. Northing			Exploration Permit	Infrastructure name			ation	Zone*	Approx. Easting	Approx. Northing			
Amungee NW	l .						Amungee N\	N							
EP98		ol monitoring bore NW2 location	Amungee Mungee	53	390693	8189431	EP98		nitoring <mark>bores</mark> gee NW2 locati		mungee Mungee	53	389882	<mark>8190068</mark>	
EP98	Proposed new	Amungee gravel pit	Carpentaria Highway road corridor	53	390900	8188279	EP98	Proposed nev	<mark>v Amungee gr</mark>		<mark>arpentaria Highwa</mark> ad corridor	/ 53	<mark>390900</mark>	8188279	
EP98	Existing access	tracks	Amungee Mungee	Not A	pplicable		EP98	Existing acces	ss tracks	Aı	nungee Mungee	Not Ap	plicable		
							EP98	Proposed acc Amungee NV		A	mungee Mungee	<mark>53</mark>	389488	8191084	
Table 8: Descri	ption of the exp	oration and appraisal	activities at Amungee N	NW and Vell	kerri 76 S2		Table 8: Descr	iption of the ex	ploration and	appraisal	activities at Amun	gee NW and	Velkerri 76 S2		
Activity	[escription					Activity		Description						
Amungee NW	/ scope						Amungee N\	N scope							
activities		Expansion of the existing Amungee NW site lease pad from 3.56 ha to 10 ha to accommodate the new exploration and appraisal (E&A) wells and anticipated freshwater and wastewater storage Upgrade of the access track intersection with the Carpentaria Highway to comply with Department of Infrastructure, Planning and Logistics requirements Expansion of the existing camp pad from 0.9 ha to 1.2 ha Installation of two additional E&A well cellars and conductors on the lease pad to accommodate the proposed Amungee NW-2H and Amungee NW-3H wellhead and surface facilities Construction of a drilling sump on the lease pad to manage drilling fluids, muds and cuttings of up to 5,000m³ Construction of a site bund for wastewater storage Construction of a sediment basin to manage stormwater during wastewater storage Drilling of up to four additional groundwater monitoring/ extraction bores within the proposed exploration areas (if required), including the construction of a groundwater monitoring bore approximately 11km to the east of the existing Amungee NW lease pad in preparation for future exploration activities. Construction of a helipad (up to 1ha) and laydown area (up to 1ha) Construction of a 20m x 2km fence line and firebreak around the Amungee NW site (~4 ha)					Civil construction activities	ction	Consider of the activity	mmodate water and ade of the ly with De truction of the lation of the commodal ead and struction of and cuttion of the properties of the properties.	the existing Amungithe new exploration of the new exploration of the repartment of Infrastian access track (in the existing camp processed Amunge of the the proposed Amunge of the existing sump of the sediment basing of the sedim	on and apprage section with tructure, Plan 1.1 km) to the ad from 0.9 h well cellars mungee NW the lease page m³ astewater state to manage s coundwater rareas (if requ 1/2 (2.0 ha) ap e pad in prep	he Carpentarioning and Logice Amungee NV ha to 1.2 ha hand conductoring and Amundad to manage horage tormwater dustronitoring/eximately for proximately for arration for furown area (up	Is and anticipated a Highway to stics requirements V2 location (1.5) rs on the lease pagee NW-3H drilling fluids, ring wastewater extraction bores g 2 groundwater 1 km to the east ture exploration to 1 ha)	

Interest holder	Origin Energy B2 Pty Ltd	EMP Title		Sub-basin Multi-well Drilling, Stir Exploration Permit (EP) 98 & 76	_	Unique EMP ID	ORI10-3	Mod #	1	Date	20 July 2	022
	Amended EMP text											
						◆ Co	nstruction ar	d operatio	n of a gra	/el pit up t	o 3.5 ha	
Table 12: Amungee NW s	ite activity summary table				Table 12: Amungee NW s	ite activity sum	mary table					
Component	Existing Amungee NW site	EMP scope		Total site activity summary	Component	Existing Amungee NW site			EMP scope			Total site activity
General					Communi							summary
Number of water extraction/monitoring bores	3 existing bores: RN039896 (production bore), RN038493 (production), RN040894 (monitoring/production)	3 bores on the NW site and 1 d bore on the An NW2 location	control nungee	7	Number of water extraction/monitoring bores	3 existing bore (production be (production), (monitoring/p	ore), RN0384 RN040894	I hores on the Amungee NM I		site and 2 monitoring bores		7
Number of gravel pits approved under EMP	0	Gravel to be sourced from approved DIPL gravel pits covered by AAPA certificate C2022/02		Gravel to be sourced from approved DIPL gravel pits covered by AAPA certificate C2022/02	Number of gravel pits approved under EMP	0		<mark>ap</mark>	Gravel to be sourced from other approved Origin sites or DIPL approved pits covered by AAPA certificate C2022/002			Gravel to be sourced from other approved Origin sites covered by AAPA certificate
2.7 Crovel nit const	mustices.				Delete section 3.7 Gravel	pit constructio	n.					C2022/002
will be sourced from a ne Mungee Station. The pit v	surface the expanded lease pa w gravel pit located approximate will be constructed and expande bit. The typical image of a grave	ely 11km East of tood progressively to	the Amungee 3.5ha, with	NW site within the Amungee approximately 10,000m³ of	No gravel pits will be con activity – i.e. 3.5 ha will b	structed on Am	ungee NW si					
Gravel pits will be cleared	l, with topsoil and subsoil stripp	ed, segregated an	nd stockpiled	onsite for future revegetation.								
Gravel pit rehabilitation v remains, gravel pits may l												
-	d to be up to 3m in depth, with sed around gravel pits where th											
-	es, the gravel pits will be recont ted across the gravel pit and na			nd non-polluting form. Subsoils primary vegetation								

ORI10-3 Interest holder Origin Energy B2 Pty **EMP** Beetaloo Sub-basin Multi-well Drilling, Stimulation and Well Testing Unique Mod# **Date** 20 July 2022 Program Exploration Permit (EP) 98 & 76 EMP Title EMP ID **Current EMP text Amended EMP text** Figure 1: Example of a typical operational gravel pit 3.3 3.3 Groundwater bore installation Groundwater bore installation Groundwater monitoring / extraction bores have been installed at each of the Amungee NW (three existing bores) Groundwater monitoring / extraction bores have been installed at each of the Amungee NW (three existing bores) and Velkerri 76 S2 sites (two existing control bores). Up to 2 additional groundwater monitoring/production bores are and Velkerri 76 S2 sites (two existing control bores). Up to 3 additional groundwater monitoring/production bores are to be installed under this EMP at Amungee NW site and 1 new control monitoring bore located at the Amungee NW2 to be installed under this EMP at Amungee NW site and 2 new control monitoring bore located at the Amungee NW2 location (refer Table 6). Additional groundwater monitoring bores will be installed on the Velkerri 76 S2 site prior to location (refer Table 6). Additional groundwater monitoring bores will be installed on the Velkerri 76 S2 site prior to the stimulation of the vertical well in 2022 under the existing approved Velkerri 76 S2 drilling, stimulation and well the stimulation of the vertical well in 2022 under the existing approved Velkerri 76 S2 drilling, stimulation and well testing EMP. testing EMP. The Amungee NW bores will be installed on the proposed activity area (either on the lease pad, camp pad or laydown The Amungee NW bores will be installed on the proposed activity area (either on the lease pad, camp pad or laydown

area). The new Amungee NW2 monitoring bores (2) will be installed in the location of the future exploration site. The

bores will target the Gum Ridge Formation, as the Anthony Lagoon formation is absent at the Amungee NW site.

area). The new Amungee NW2 monitoring bore will be installed in a lightly vegetated area which is the location of a

future exploration site. The bores will target the Gum Ridge Formation, as the Anthony Lagoon formation is absent at

the Amungee NW site.



Appendix B: Land condition assessment of the original (approved) Amungee NW 2 site

	A	mungee NW2 (original)						
Location	GDA94, Zone 53, 0390739E, 8189607N	Vegetation community		eum chlorostachy chlorophylla ope				
Vegetation description		Erythrophleum chlorostachys and Eucalyptus chlorophylla mid high open woodland, over Petalostigma pubescens mid high open shrubland, over Chrysopogon fallax sparse tussock grassland						
Vegetation transect	No canopy 61.3%, Erythro canescens 8.2%, Corymb	No canopy 61.3%, Erythrophleum chlorostachys 10.2%, Petalostigma pubescens 9.5%, Terminalia canescens 8.2%, Corymbia ferruginea 6.7%, Acacia difficilis 1.2%, Terminalia volucris 1.2%, Bauhinia cunninghamii 0.7%, Hakea arborescens 0.7%, Grevillea parallela 0.25%						
Basal area (5 sweeps)	Corymbia dichromophloia	17 (Macropteranthes kekwickii 1.5, Petalostigma pubescens, Corymbia dichromophloia, Erythrophleum chlorostachys, Terminalia canescens, Eucalyptus chlorophylla, Bauhinia cunninghamii) 3.4 m²/ha area (average)						
Landform	1							
Simple slope								
Habitat								
Poor – scattered fallen logs, shallow leaf litter. Tree hollows, mistletoe and flowering plants absent								
1% Disturbance								
Fire damage > 2 years ago. No erosion. Cattle impacts								
Vegetation Structure	Upper storey: 5 - 12 m	Erythrophleum chlorostachys (8	3%) and <i>Euc</i> a	alyptus chlorophy	lla (2%)			
	Mid-storey: 0.5 - 5 m	Petalostigma pubescens (15%), Terminalia canescens (2%) and Terminalia volucris (1%)						
	Understorey: 0 - 0 5 m	Chrysopogon fallax (6%) and E	riachne ciliar	is (2%) tussock g	rasses			
Soil texture	Loamy sand and sandy loam in upper 0.25 m.							
Soil drainage	Well drained							
Soil colour	5YR 3/3. Dark brown							
Soil pH	6.0 (0-0.1m), 5.7 (0.1- 0.25m)							
Termite mounds	Sparse		45		E. S. C.			
Ground cover	20% Vegetation, 10% Litter, 70% Bare Soil			为海上	16			

Appendix C: Land condition assessment of the proposed new Amungee NW 2 site

	Amunge	e NW-2 (new	site)
Location	GDA94, zone 53, 0389927E, 8190027N	Vegetation community	Corymbia dichromophloia and Eucalyptus chlorophylla open woodland
Vegetation description		d Santalum lance	hylla mid high open woodland, over <i>Erythrophleum</i> eolatum mid high open shrubland, over n tussock grassland
Vegetation transect	No canopy 68.2%, Eucalyptus ch 5.6%, Corymbia ferruginea 3.8% Brachychiton paradoxus 0.8%, B	, Erythrophleum (Macropteranthes kekwickii 5.9%, Acacia difficilis chlorostachys 2.8%, Terminalia canescens 1%, aamii 0.8%
Basal area (5 sweeps)	42 (Macropteranthes kekwickii 10 tree 9, Corymbia ferruginea 4, Er 3.5, Acacia difficilis 3, Eucalyptus	ythrophleum chlo	prostachys (average)
Landform		MIN A	
Simple slope			
Habitat			
Scattered tree hollows, common falling logs. Mistletoe and flowering plants absent.			
Slope		W IN	
1%			
Disturbance		角族	
Fire damage > 2 years ago. No erosion. Cattle impacts			
Vegetation Structure	Upper storey: 5 - 12 m	Corymbia dichr	omophloia (7%), Eucalyptus chlorophylla (3%)
Structure	Mid-storey: 0.5 - 5 m	Erythrophleum lanceolatum (3	chlorostachys (6%), Acacia difficilis (4%), Santalum %)
	Understorey: 0 – 0.5 m	Chrysopogon fa	allax (16%), Sorghum plumosum (2%)
Soil texture	Sandy loam grading to sandy clay loam at 0.2 m		
Soil drainage	Well drained		
Soil colour	2.5YR 3/4 dark reddish brown		
Soil pH	5.7 (0-0.2m), 6.0 (0.2-0.55m)		
Termite mounds	Sparse		

	Amungee NW-2 (new site)									
Ground cover	20% Vegetation, 10% Litter, 70% Bare Soil									