BENNETT RESOURCES

Bennett Resources Pty Ltd

EP 371 Well Care and Maintenance Environment Plan Summary

BNR_HSE_MP_009

VERSION HISTORY				
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Terms / acronym	Definition / expansion
AHIS	Aboriginal Heritage Inquiry System
APPEA	Australian Petroleum Production and Exploration Association
BME	Black Mountain Exploration Pty Ltd
BNR	Bennett Resources Pty Ltd
BC Act	(WA) *Biodiversity Conservation Act 2016*
DAWE	(Commonwealth) Department of Agriculture, Water and the Environment
DMIRS	Department of Mines, Industry Regulation and Safety
DRF	Declared Rare Flora
DWER	Department of Water and Environmental Regulation
EP	Environment Plan
EP 371	Exploration Permit 371
EP Act	(WA) *Environmental Protection Act 1986*
EPBC Act	(Commonwealth) Environment Protection and Biodiversity Conservation Act 1999
HSE	Health, Safety and Environment
LOWC	Loss of Well Control
OSCP	Oil Spill Contingency Plan
PGER(E)R	Petroleum and Geothermal Energy Resources (Environment) Regulations 2012
TEC	Threatened Ecological Community
WA	Western Australia
WAC	Warlangurru Aboriginal Corporation
YAC	Yungngora Aboriginal Corporation

1 Introduction

1.1 Background

Black Mountain Exploration Pty Ltd (BME) is a private oil and gas exploration and production company headquartered in Fort Worth Texas, with an office in Perth, Western Australia (WA). Bennett Resources Pty Ltd (BNR) is the operator of exploration permit EP371, a wholly owned subsidiary of BME.

BNR is currently exploring for natural gas on its Exploration Permit 371 (EP 371) in the onshore Canning Basin in WA (Figure 1-1).

1.2 Scope

The Environment Plan (EP) has been prepared for the proposed care and maintenance activities for the Asgard 1, Valhalla North 1 and Valhalla 2 wells (the wells) and their associated infrastructure. The care and maintenance of a plugged and abandoned well site (Valhalla 1) and of a well pad undergoing progressive rehabilitation (Jannat 1) are also undertaken under the EP.

The care and maintenance activities proposed to be conducted, and thus covered by this EP summary, include:

- Site inspection,
- Maintenance and repair,
- Downhole well operations,
- Reinstatement and progressive rehabilitation.

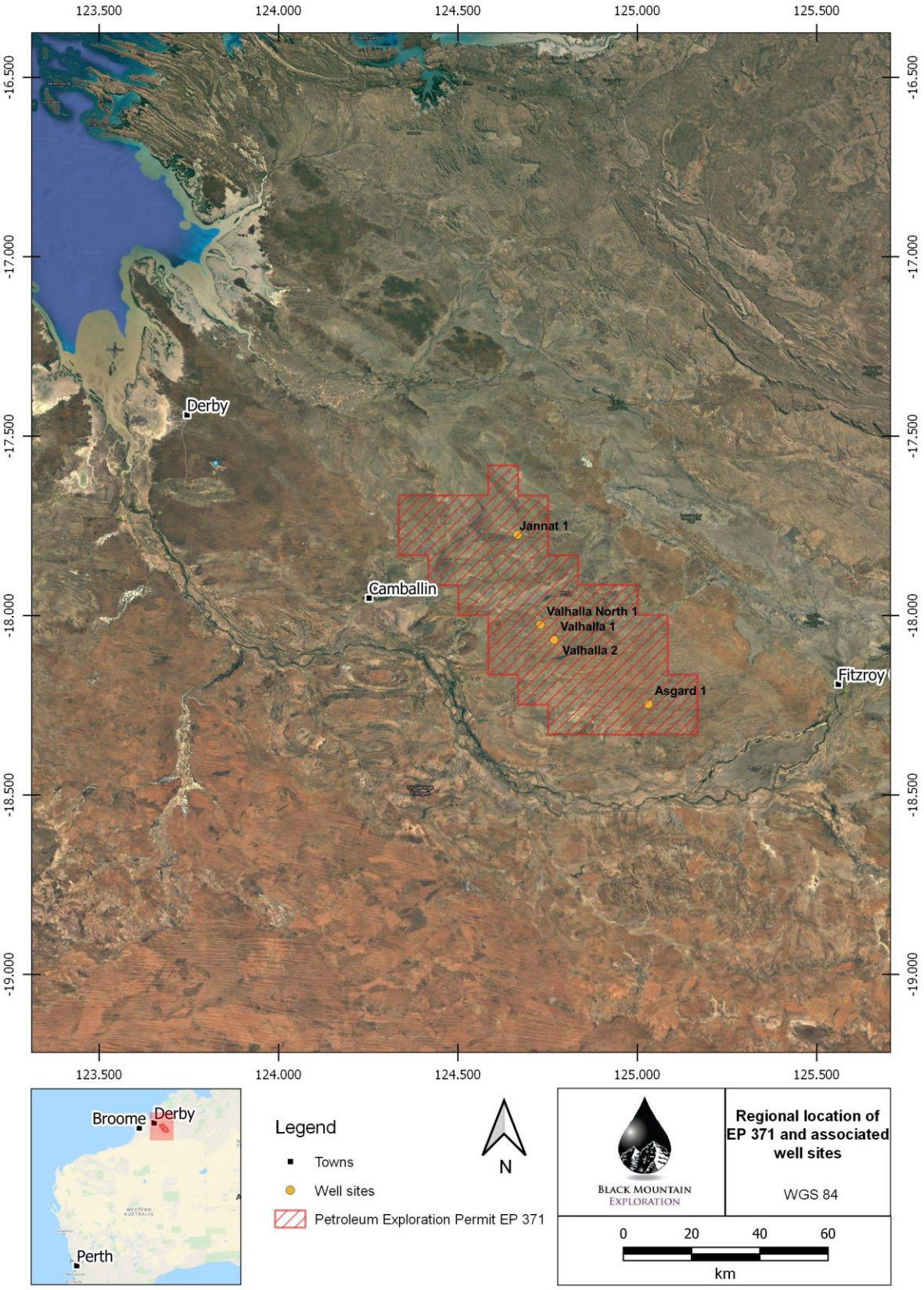

Figure 1-1: Regional Location of EP 371

1.3 Nominated Operator

Contact details for the operator BNR are listed below in Table 1-1.

Table 1-1: Operator contact details

Name	Samantha Richardson
Position	Vice President of Operations and Commercial
Organisation	Black Mountain Exploration Pty Ltd
Address	Level 9, 40 The Esplanade, Perth WA 6000
Phone number	08-6370-5200
Email	perthoffice@bennettresources.com.au

2 Description of the Activities

2.1 Location

All assets are located within EP 371 (Figure 2-1), approximately 70 km south east of Derby from the nearest permit border, in the Shire of Derby-West Kimberley. EP 371 is located just within the Fitzroy River catchment area in Western Australia's Canning Basin. Access to these well sites is possible from the Great Northern Highway, smaller roads and existing access tracks.

The assets comprise well sites or hard-stands that contain a variety of idle infrastructure. The status of the assets is presented in Table 2-1.

Table 2-1: Asset status

Well Name	Well Status	Drilled	Plugged	Well Infrastructure		
				Wellhead	Xmas Tree	Cellar
Asgard 1	Suspended	2012	N/A	Yes	No	Grating and fenced
Jannat 1[1]	N/A			N/A		N/A
Valhalla North 1	Suspended	2012	N/A	Yes	Yes	Grating and fenced
Valhalla 1	Plugged and abandoned (P&A)	2007	2007	N/A		Grating and fenced
Valhalla 2	Suspended	2011	N/A	Yes	Yes	Grating and fenced

[1] A well site was constructed for a prospective Jannat 1 well – however Jannat 1 was never drilled.

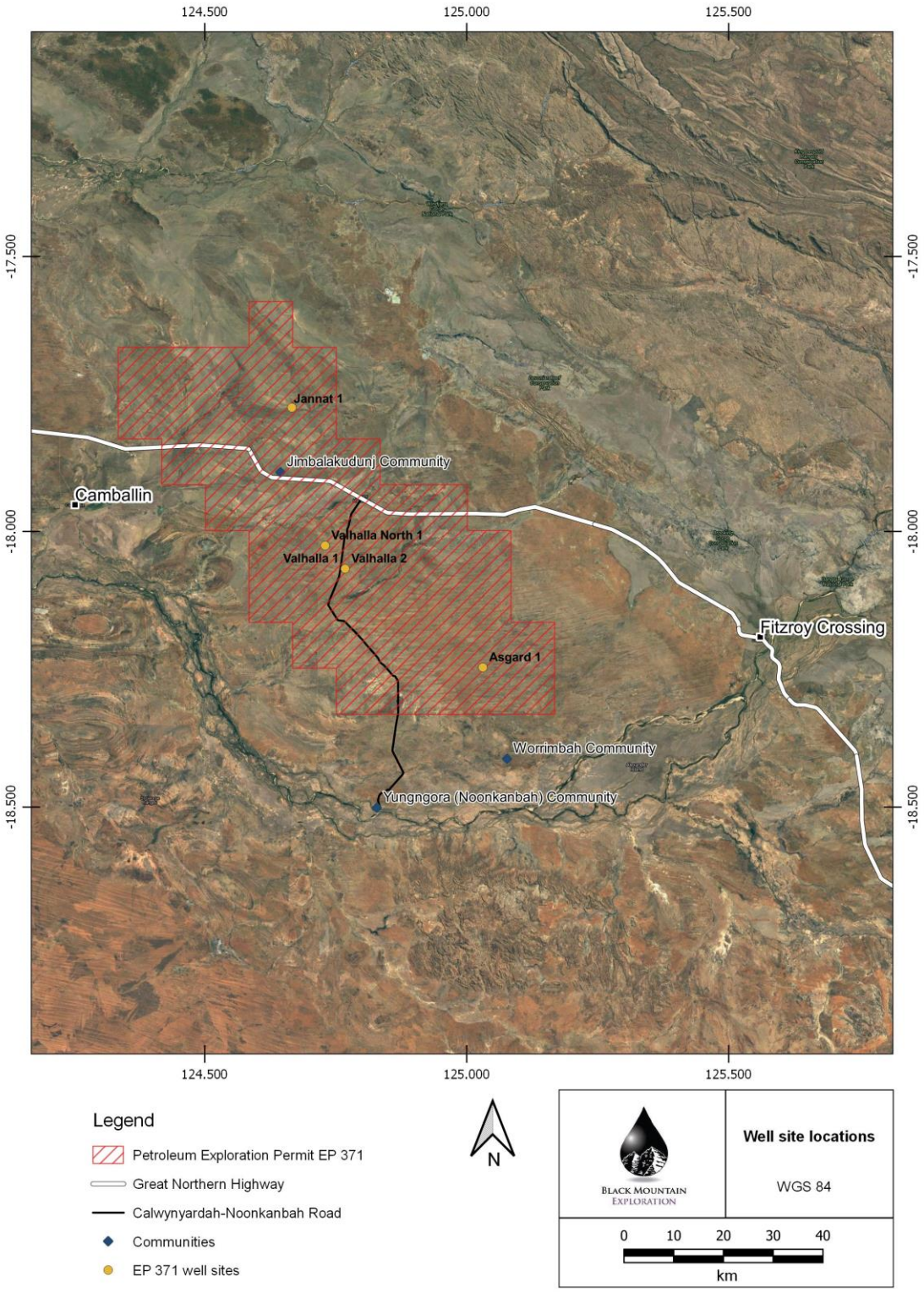

Figure 2-1: EP 371 well site locations

2.2 Timeframes

The time required to complete the activities will depend on the design and details of the activities' specific operations. Table 2-2 below outlines the expected timing and typical estimated duration for each of the care and maintenance activities.

Table 2-2: Planned timeframes of care and maintenance activities

Activities	Typical Operations	Timing
Inspections	BNR Inspection of all infrastructure	6-monthly
	BNR Checklist inspections (including inspection of all lined ponds)	Monthly
	Security Inspections	Weekly
Maintenance and Repair	Infrastructure maintenance and repair	Annual, or as required
	Pond liner maintenance removal	Not expected
	Wellhead maintenance	As required
	Civil works	As required
Downhole well operations	Well Intervention	As needed basis
	Well Workover	As needed basis
	Integrity Tests	Annual

2.3 Overview of Activities

2.3.1 Inspection, Maintenance and Repair

To ensure the integrity of the assets is maintained, a variety of inspection, maintenance and repair activities may be undertaken for those assets described in the EP for the duration of the EP. inspection, maintenance and repair activities include the following:

- Site inspection:
  - BNR inspections of site infrastructure and access tracks,
  - Security inspections, and
  - Well integrity inspections and testing.
- Maintenance and repair:
  - Infrastructure maintenance, repair and replacement,
  - Pond liner maintenance / removal,
  - Wellhead maintenance, and
  - Well site and access track maintenance and repair.
- Downhole well operations:
  - Well intervention activities, and
  - Well workover operations.

- Reinstatement and progressive rehabilitation:
  - Removal of redundant equipment and infrastructure for recycling or disposal at a licensed waste facility,
  - Removal of pond liners offsite for disposal at a licensed waste facility,
  - Sampling of soil beneath retention pond liners following their removal,
  - Infilling of open excavations,
  - Respreading of topsoil and stockpiled vegetation,
  - Recovering gravel for reuse, as appropriate,
  - Ripping of over-compacted soils,
  - Contouring of sites (as required), and
  - Direct reseeding.

3 Description of the Environment

3.1 Climate and Weather

The climate of the Canning Basin varies from semi-arid to dry tropical with distinct wet and dry periods. From April to November a pronounced dry-season occurs with on average, a total of 20 mm of rain. A summer wet season generally occurs between December and March in which approximately 85% of the annual rainfall occurs.

Rainfall events exceeding 150 mm in 24 hours have been recorded at Broome during the wet season. These intense rain periods may occur with tropical cyclones or severe lows. The northwest Australian coastline between Broome and Exmouth is the most cyclone-prone region of the entire Australian coastline, having the highest frequency of coastal crossings. On average about five tropical cyclones occur during each tropical cyclone season over the warm ocean waters off the northwest coast between 105°E and 125°E (BoM 2020).

3.2 Physical Environment

3.2.1 Landforms and Soils

The sites within EP 371 are located within the 331 – North Fitzroy Plain Zone, ranging 17,925 km^2 (Tille 2006). The North Fitzroy Plain Zone is comprised of floodplains and sandplains (with alluvial plains and undulating plains) on Permian sedimentary rocks of the Canning Basin with self-mulching cracking clays, Red deep sands, Red sandy earths and Red / brown non-cracking clays. The locality surrounding the sites falls within five soil landscape systems which are described by the Government of Western Australia (2020a) as:

- 331Cm: Camelgooda System: Sandplains, swales and linear sand dunes supporting low pindan woodlands of acacias and low woodlands of bauhinia and bloodwood with curly spinifex and ribbon grass (Government of Western Australia 2020a),
- 331Cy: Calwynyardah System: Alluvial plains with scalded tracts downslope from lateritic remnants with yellowish loamy soils supporting patchy beefwood-bauhinia low woodlands with curly spinifex and ribbon grass; also minor hard spinifex grasslands (Government of Western Australia 2020a),
- 331Dj: Djada System: Active floodplains with levees and levee back slopes supporting ghost gum open woodlands with frontage grasses, and cracking clay back plains supporting ribbon grass-blue grass and Mitchell grass grasslands (Government of Western Australia 2020a),
- 331Wa: Wanganut System: Sandplains and linear dunes supporting pindan woodlands with acacias and bloodwoods and curly spinifex - ribbon grass, and broad low-lying swales supporting bloodwood-grey box woodlands with curly spinifex-ribbon grass (Government of Western Australia 2020a), and
- 331Eg: Egan System: Outcrop plains with low lateritic rises supporting mixed low woodlands with curly spinifex-ribbon grass, also minor cracking clay plains with Mitchell grass grasslands (Government of Western Australia 2020a).

3.2.2 Surface Water

The well sites are located within two surface water catchments: the Fitzroy River and Lennard River catchments. The majority of the well sites are located greater than 3 km from the closest surface water body as shown in Figure 3-1.

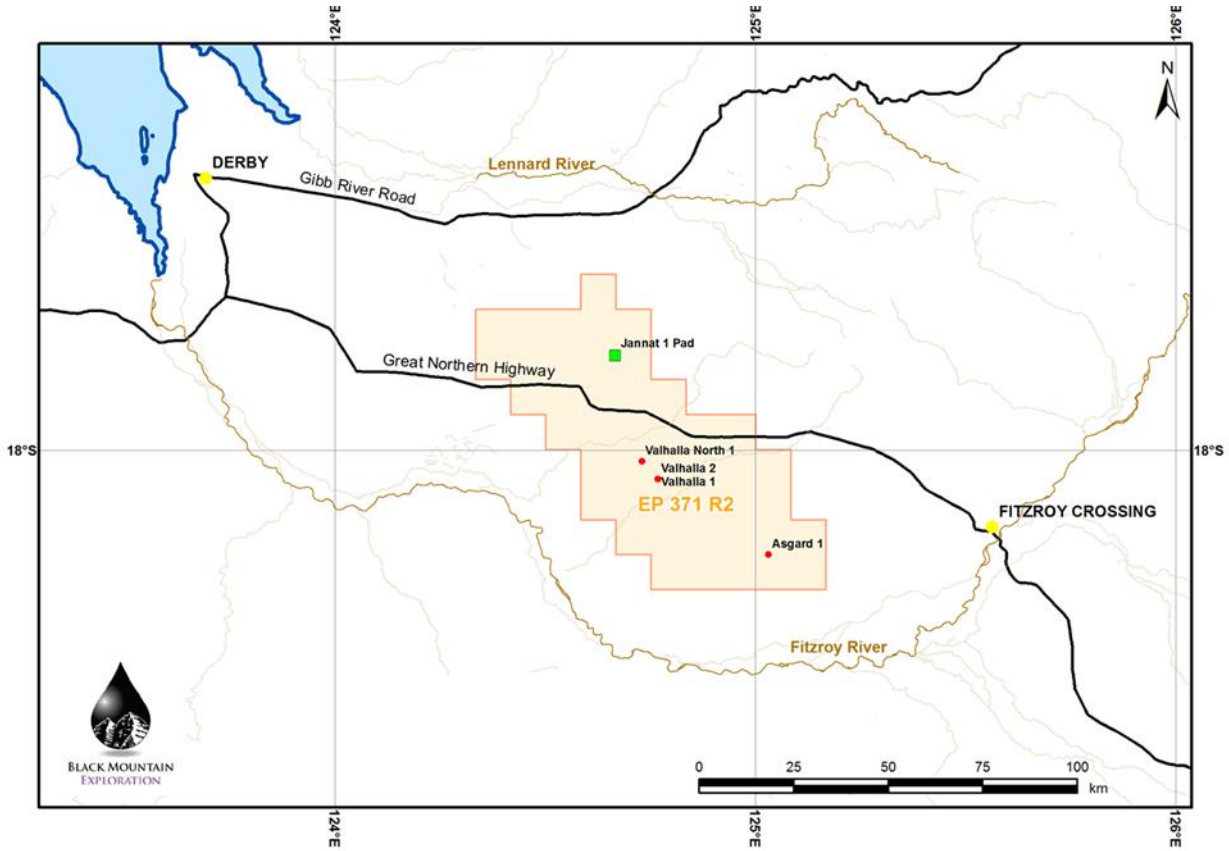

Figure 3-1: EP 371 location to Surface Water Catchments

The Fitzroy River catchment, which extends from near Halls Creek in the east, downstream to the coast near Derby in the west, spans almost 94,000 km^2 which covers more than 20% of the Kimberley region. The Fitzroy River itself is on the Commonwealth National Heritage list as part of the West Kimberley National Heritage Place.

Annual river discharge measured at Fitzroy Crossing varies from 300 gigalitres (in 1992) to 25,000 gigalitres (in 2000). The average flow is 8,000 gigalitres, which is the largest of any river in Western Australia. As of March 2018, around 3.3 gigalitres of groundwater and 6.1 gigalitres of surface water is allocated under water licences for commercial and public purposes (DWER 2019).

3.2.3 Groundwater

The major regional aquifer systems in the Canning Basin are (in order of decreasing age) the Grant Formation, Liveringa Formation, Wallal Sandstone and Broome Sandstone. These sandstone aquifers have very large stores of fresh to saline groundwater with variable total dissolved solids (TDS) content.

3.2.3.1 Surficial aquifer

The surficial (unconfined) aquifer in the Canning Basin is the Liveringa Aquifer, or Formation. The Liveringa Formation consists of interbedded sandstones, siltstones with lenses and minor beds of claystone and shale, varying in thickness between 320 m to 900 m (Harrington and Harrington 2015). Salinities, where recorded in the Department of Water and Environmental Regulation (DWER) Water Information Reporting (WIR) database and by the previous operator, are generally less than 1,000 mg/L TDS in the Liveringa Formation, but range from 500 to 12,400 mg/L TDS (Rockwater 2016). Salinities for water bores within EP 371 that are screened in the Liveringa Formation range from 450 to 1,600 mg/L TDS. Monitored groundwater levels in the region surrounding the well sites indicate predominantly stable trends, suggesting that the groundwater system is in dynamic equilibrium. Seasonal variations in recorded water levels are observed within a 2-metre amplitude

around a stable trend. Water table depths were recorded to be 30 m at Valhalla North and 36 m at Valhalla 1 (Rockwater 2016).

Groundwater recharge to the surficial Liveringa Group is believed to be mainly from rainfall on outcrop areas (Lindsay and Commander 2005). Monitoring of the Liveringia Aquifer and surface alluvial waters associated to the Fitzroy River indicated a strong connection between the river and the aquifer. In particular, a groundwater response to high river flow events was observed. This, and comparatively low groundwater salinities measured in these piezometers compared with other regional bores, suggests some recharge to the aquifer by floodwaters.

Infiltration to the Liveringia Group (and subsequent aquifers) from rainfall will be retarded by clay, shale and siltstone layers, both above and below the water table. Water is likely to take between 70 and 300 days to travel from the ground surface to the water table (Rockwater 2016).

3.2.3.2 Other aquifers and formations

Below the surficial Liveringa Formation are found a series of other aquifers, illustrated in Figure 3-2.

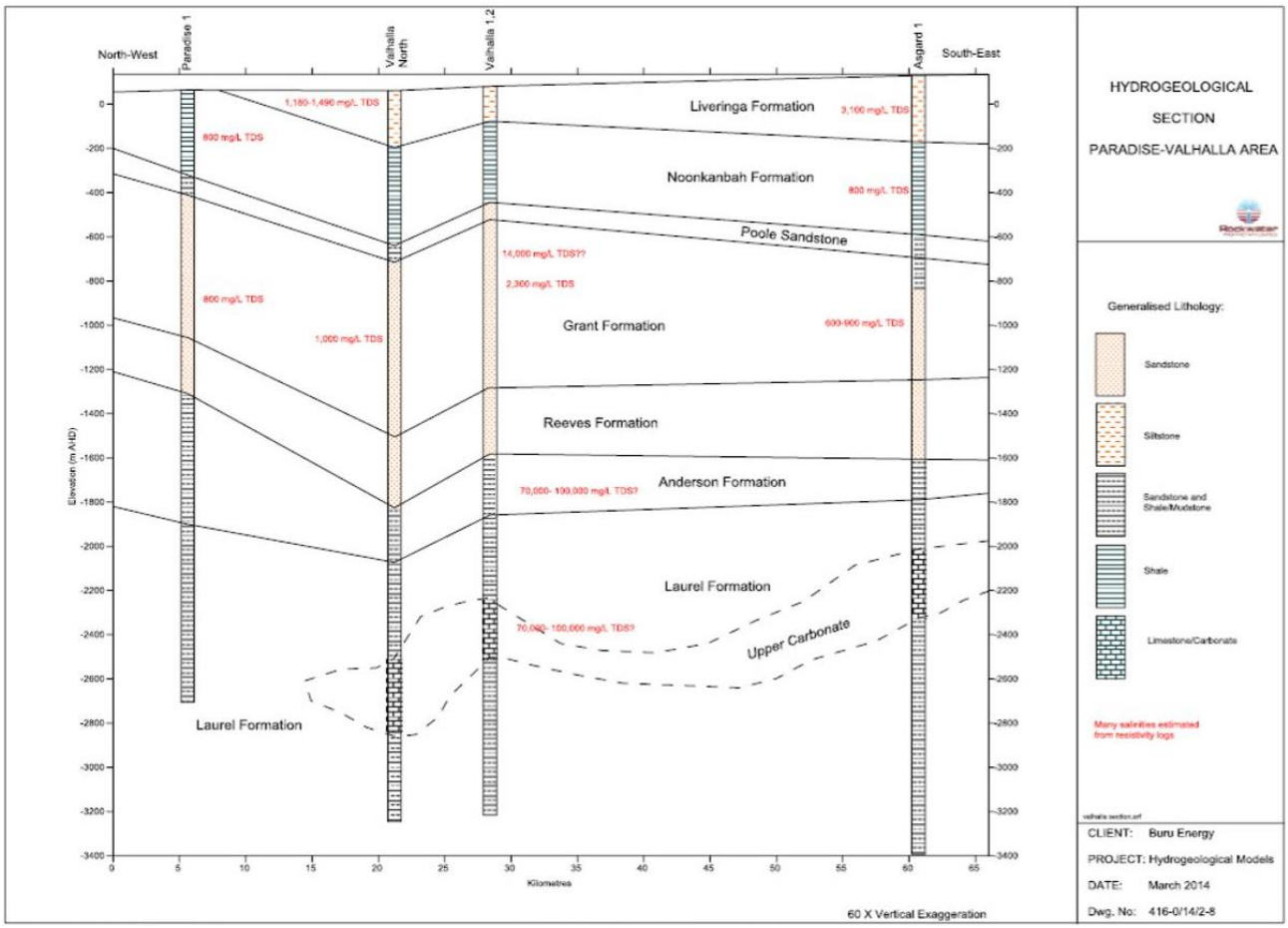

Figure 3-2: Hydrogeological cross section for the Asgard / Valhalla area

3.3 Biological Environment

3.3.1 Flora

Based upon Beard (1979) and Shepherd *et al.* (2002), the well sites are located within three broadscale vegetation communities (predominant vegetation systems) (Government of Western Australia 2020b). These are detailed below:

- North Fitzroy_64 - Grasslands, tall bunch grass savannah with low trees; Boabs (*Adansonia gregorii*), Bauhinia (*Bauhinia cunninghamii*) and Beefwood (*Grevillea striata*) over Ribbon Grass (*Chrysopogon species*),
- North Fitzroy_699 - Shrublands, pindan; *Acacia eriopoda* shrubland with scattered low Bloodwoods (*Corymbia* spp.) over Soft Spinifex (*Triodia pungens*) and Curly Spinifex (*Triodia bitextura*) on sandplain, and
- North Fitzroy_700 - Shrublands, pindan; *Acacia eripoda* shrubland with scattered low bloodwood and *Eucalyptus setosa* over soft and curly spinifex between dunes.

Flora and vegetation surveys conducted within and in proximity to the well sites between 2007 and 2019 revealed that no Threatened or Declared Rare flora species were identified. However, the surveys recorded five Priority flora taxa:

- *Goodenia byrnesii* (P3),
- *Goodenia sepalosa* var. *glandulosa* (P3),
- *Goodenia virgata* (P2),
- *Trianthema kimberleyi* (P1), and
- *Triodia acutispicula* (P3).

3.3.2 Environmentally Sensitive Areas

The nearest Environmentally Sensitive Area (ESA) to the sites is the Camballin Floodplain, located ~40 km west of Valhalla North 1, which is associated to a Nationally Important Wetland, Le Lievre Swamp (Iljamalkarda) (DEC 2009). The wetland area is a major breeding area for water birds as well as a migration stop-over area for shorebirds. The floodplain is contiguous with the Fitzroy River floodplain.

Flora and vegetation surveys undertaken within the well sites and their surrounding regions have not identified the presence of any Declared Rare Flora (DRF) or TEC to date within on or around the well sites.

3.3.3 Introduced and Invasive Species

The Department of Agriculture, Water and the Environment Protected Matters Search Tool (PMST) desktop search identified that weed species may be present, listing three weeds as potentially occurring within a 5 km buffer around the well sites, being:

- *Cenchrus ciliaris* (Buffel Grass),
- *Jatropha gossypifolia* (Cotton-leaved Physic-nut, Bellyache Bush), and
- *Parkinsonia aculeata* (Parkinsonia, Jerusalem Thorn).

The previous on-ground flora surveys undertaken in the Valhalla province identified several introduced species as being present within the surroundings the well sites, being:

- *Stylosanthes spp*. (*S. hamata* and S*. scabra*),
- *Calotropis procera* (Rubber Bush),
- *Sida cordifolia* (Flannel Weed),
- *Cucumis* spp. (*C. argenteus* and *C.? melo*),
- *Parkinsonia aculeata*, and
- *Cenchrus ciliaris*.

3.3.4 Fauna

Fauna presence around the Activity areas is well understood given the numerous surveys that have been conducted for previous petroleum activities in EP 371. Previous studies and their outcomes are presented in Table 3-1.

Table 3-1: Baseline studies - Terrestrial fauna

Year	Consultant	Survey Name	Location	Survey Outcomes
2011	Low Ecological Services	Low Ecological Services (2011a). Valhalla East-1 Exploration Well: Flora and Fauna Survey. September 2011. Report prepared for Buru Energy.	EP 371 691813m E 8002857m N (GDA 94, Zone 51).	• The only sign of fauna of conservation significance was the Australian Bustard (*Ardeotis australis*, P4)[2], • Habitat at the proposed well site has the potential to support other species of conservation significance, but no signs of these species were present.
2011	Low Ecological Services	Low Ecological Services (2011b). Flora and Vegetation Survey: Valhalla North. October 2011. Report prepared for Buru Energy.	EP 371 683112m E 8006107m N (GDA 94, Zone 51)	• There was no evidence of utilisation (diggings, dung or prints) of the site by listed mammals such as the Bilby (*Macrotus lagotis*) (Threatened under the Biodiversity Conservation Act [BC Act], and Vulnerable under the Environment Protection and Biodiversity Conservation Act 1999 [EPBC Act]), • The Rainbow Bee-Eater (*Merops ornatus*), listed as a migratory[3] bird species under JAMBA, was observed at Valhalla North-1.
2012	Low Ecological Services	Low Ecological Services (2012a). Asgard-1 Exploration Well: Flora, Vegetation and Fauna Survey. Report prepared for Buru Energy.	EP 371 714726m E 7981294m N (GDA 94, Zone 51)	• No species of conservation significance were recorded at the Asgard-1 well site. Diggings were identified at the well site location, but these were identified as originating from a non-listed species (*Varanus* sp.).
2012	Low Ecological Services	Low Ecological Services (2012b). Asgard 2D Seismic Survey: Flora, Vegetation and Fauna Survey. Report prepared for Buru Energy.	EP 371 -18.255566, 125.055461 -18.284348, 125.135494 -18.104218, 125.044064	• Two species of conservation significance were recorded during the survey; the Australian Bustard (*Ardeotis australis*, P4)[2], and the Rainbow Bee-eater (*Merops ornatus*) listed as a migratory[3] and marine species under the EPBC Act 1999, • A burrow observed with similar characteristics to that of a Greater Bilby (*Macrotis lagotis*) burrow. This could not be confirmed, as diggings scats or tracks were not observed in the surrounding area,

[2] At the time of writing the EP, the Australian Bustard (*Ardeotis australis*) is no longer listed as a Priority species.
[3] At the time of writing the EP, the Rainbow Bee-Eater (*Merops ornatus*) is no longer listed as a Migratory species. It is now only listed as a Marine species under the EPBC Act.

Year	Consultant	Survey Name	Location	Survey Outcomes
			-18.145749, 124.951130 - 18.110725, 124.809457 - 18.332103, 124981419 - 18.321484, 124.951740 - 18.295856, 124.906641 - 18.290406, 124.895847 - 18.247001, 125.030820 (GDA 94, Zone 51)	• Signs of non-native animals were widespread. As the project area was located on a pastoral station, cattle and their impact were present and widespread throughout area, especially near water sources. Horse, camel and dogs / dingo tracks were also observed, • Within the project area, ten different vegetation types and the Calwynyardah-Noonkanbah Road were surveyed. This covered the majority of the habitat types in the area, missing only potential microhabitats that were not noted from the air, • The habitats visited had the potential to support other species of conservation significance, but no signs of other fauna of conservation significance were present.
2014	Buru Energy and Outback Ecology	Buru Energy and Outback Ecology (2014). Ophir, Paradise, Valhalla, Eden and Ellendale Flora, Vegetation and Fauna Survey Report. August 2014.	EP 371 681471m E 8003803m N 681532m E 8000656m N 686496m E 8004817m N 686141m E 8001639m N 695595m E 8003148m N 690276m E 7999424m N (GDA 94, Zone 51)	• Two conservation significant birds were recorded during the on-ground survey, Ardeotis australis (Australian Bustard (P4)[2]) and Merops ornatus (Rainbow Bee-eater (Migratory)[3]), • Three introduced fauna species were recorded during the on-ground survey: *Bos taurus* (Cattle), *Felis catus* (Domestic Cat) and *Camelus dromedarius* (Dromedary camel), • Five broad fauna habitats occur within the survey area. The habitats are widespread regionally and it is unlikely that conservation significant fauna is specifically reliant on habitats within the survey area.
2016	Eco Logical Australia	Eco Logical Australia (2016). Level 1 Vegetation, Flora and Fauna Survey of Kurrajong, Yakka Munga and Valhalla Central Well Sites. Prepared for Buru Energy limited.	EP 371 Valhalla Central: 694310m E 7992800m N and 8 km access track (GDA 94, Zone 51)	• No Threatened or Priority fauna species were recorded from the study sites. One migratory[3] bird species, *Merops ornatus* (Rainbow Bee-eater), was recorded at Valhalla Central well site. This species was observed opportunistically foraging at these sites, • One introduced fauna species was recorded during the field survey, Bos Taurus (Cattle), • Three major fauna habitats were described across the Valhalla Central site: ◦ *Corymbia* and *Adansonia* low open woodland over *Hakea* tall open shrubland over scattered *Triodia* hummock grassland and open tussock grassland on sand sheet / plain, ◦ *Corymbia* low trees over *Bauhinia* and *Acacia* tall shrubland over tussock grassland on dunes,

Year	Consultant	Survey Name	Location	Survey Outcomes
				◦ *Adansonia* scattered low trees over mixed shrubland over *Triodia* hummock grassland and scattered tussock grasses on sheet flood fans.
2017	Buru and Dawson S.J (Murdoch University PhD project)	Dawson, S.J. (2017). Disturbance of ecology of the Greater Bilby (*Macrotis lagotis*). PhD Thesis, School of Veterinary and Life Sciences, Murdoch University. A preliminary unpublished report was additionally prepared for Buru in 2016: Murdoch University. (2016). Targeted Bilby survey of proposed well site 'Valhalla Central' and immediate area. Report prepared by Murdoch University, September 2016.	EP 371 694310m E 7992800m N (GDA 94, Zone 51)	• Within the Valhalla Central survey area, no sign of recent bilby activity was recorded, • One burrow resembled an old bilby burrow (>2 years since used), which has since been occupied by a *Varanus panoptes* (Yellow-spotted monitor), • Habitat is potentially suitable for bilbies, based on other surveys of bilby habitat in the West Kimberley.
2018	Eco Logical Australia	Eco Logical (2018). Valhalla Central 4: Flora and Fauna Survey. Report prepared for Buru Energy Limited. August 2018.	EP 371 689310m E 7998098m N	• No Threatened or Priority fauna species were recorded, • One introduced fauna species, *Bos Taurus* (Cattle), was recorded as occurring throughout the study area, • One broad fauna habitat type was recorded in the study area: *Eucalyptus coolabah* and *Corymbia greeniana* open woodland over mixed sparse shrubland over *Triodia ?schinzii* open hummock grassland over *Sorghum stipoideum* and *Eriachne obtusa* tussock grassland on floodplain (not frequently active) with light brown sand-clay.
2019	Low Ecological Services	Low Ecological Services (2020). Flora and Fauna Assessment – Odin 2D and 3D seismic survey, Fitzroy Basin, Western Australia. Report prepared for Bennett Resources Pty Ltd. March 2020.	EP 371 17 sites relevant to the location of the well sites.	• A range of animal tracks, scats, diggings, burrows, and remains were recorded, and identified with the help of a Traditional Owner, • Potential Greater Bilby foraging excavation could not be confirmed. Northern Quoll scats could not be confirmed, • Observations of non-native species (and scats and tracks) were of mainly of cattle and feral cats, but some evidence of camel, dogs and / or dingoes was also recorded.

3.3.4.1 Pest vertebrate fauna

A Department of Agriculture, Water and the Environment (DAWE) Protected Matters Search Tool (PMST) search lists the following pest species as likely to occur within a 5 km radius of the site locations:

- *Canis lupus familiaris* (Domestic dog),
- *Equus asinus* (Donkey, Ass),

- *Felis catus* (Domestic cat),
- *Sus scrofa* (Pig), and
- *Vulpes* (Red fox).

All of these species have been declared under state legislation.

Bos taurus (Cattle) has also been recorded in many of the on-ground surveys. Given the location of the sites in pastoral stations, with lands used for cattle grazing, cattle are likely to be present within and surrounding the sites.

3.4 Socio-Economic Environment

3.4.1 Land use

The Canning Basin is covered by rangeland ecosystems, with cattle grazing the dominant land use. Most rangeland grazing properties are managed as pastoral leases on government owned land (crown land). The average size of cattle stations in the Kimberley is 230,406 ha (2,304 km^2) (DPIRD 2019), with cattle typically grazing on native and introduced vegetation that is rarely cleared for pasture or cropping.

The sites overlay two pastoral stations. The land is currently used for agricultural grazing purposes, which is largely leased by the Noonkanbah and Blina pastoral stations.

All sites are remotely located from residential developments, local tourist attractions and main roads. The closest receptors to the sites include a few station homesteads and Aboriginal Communities (Figure 2-1). Table 3-2 below provides information on well site location in relation to social and cultural areas in EP 371.

Table 3-2: Pastoral station, native title area and closest community to the sites

Well Name	Pastoral Station	Native Title Area	Closest Town or Community
Asgard 1	Noonkanbah	Noonkanbah	55 km E Fitzroy Crossing town
Jannat 1	Blina	Bunuba #2	17 km SW Jimbalakudunj Community 49 km SW Camballin town
Valhalla North 1		Warlangurru	15-20 km NW Jimbalakudunj Community 51-56 km W Camballin town
Valhalla 1			
Valhalla 2			

3.4.2 Natural heritage

A search of the InHerit Western Australia database did not identify any natural heritage sites within or adjacent to the sites (Heritage Council 2020). No sites listed on the National Heritage List occur within EP 371 (DAWE 2020). The nearest National Heritage List site is the West Kimberley (Heritage Place no. 18769) and is located approximately 25 km south of Asgard 1 well site. The West Kimberley is important due to its great biological richness and contains important geological and fossil evidence of Australia's evolutionary history. Given its distance to the sites, this heritage place has not been considered further.

3.4.3 World and Commonwealth Heritage

No World Heritage Sites or Commonwealth Heritage Sites occur within EP 371 (DAWE 2020). One European site is the Heritage Place no. 4440 Walgidee Hills, located in Noonkanbah Pastoral Station, ~20 km south west

of the Asgard 1 well site. Although it possesses no statutory heritage listing, the site is classified by the National Trust.

3.4.4 Indigenous and non-Indigenous cultural heritage

3.4.4.1 Native Title

The sites are overlapped by three registered Native Title groups. These are the Warlangurru People (claim application WAD509/2015, also known as the Warlangurru 1 Claim), the Yungngora (Noonkanbah) People (determination application WAD6229/1998, also known as the Yungngora Native Title Determination) and the Bunuba People (claim application WAD535/2018, also known as the Bunuba #2 Claim).

3.4.4.2 Archaeology and ethnology

A search of the Aboriginal Heritage Inquiry System (AHIS) (DPLH 2020) identified one registered Aboriginal heritage site; the Calwynyardah Prison Tree (historical site 12515); located ~2 km north west of the Valhalla North 1 well site. Two heritage surveys were recorded within the Activity area by the Aboriginal Heritage Inquiry System (DPLH 2020) (Table 3-3).

Table 3-3: AHIS recorded surveys

Year	Survey Name	Location	Survey Outcomes
1981	A Catalogue of Ethnographic and Archaeological Sites found during Exploration in Permits 97,101,102 & 103. 1981 [OWE]. Report author: Mike Capelle.	Across the Jannat 1, Valhalla North 1, Valhalla 1 and 2 well site locations.	Unavailable
1991	Heritage Survey Area 17341 (1) The Bunuba Perspective. Aug. 1991. Report author: S. Hawke.	Across the Jannat 1 well site location.	Unavailable

4 Environmental Management Strategies

A risk assessment of the aspects that will and may occur during operations was undertaken using BNR's risk assessment methodology which follows Australian Standard AS/NZS ISO 31000:2009: Risk Management – Principles and Guidelines. Hazards, their associated aspects and their associated management and mitigation measures are detailed bellow in Table 4-1.

Table 4-1: Activity aspect scoping matrix

Aspect	Hazard	Management and Mitigation Measures
Physical Interaction – Soil and Vegetation	• Spreading of non-indigenous species (weeds), • Unplanned disturbance to vegetation, and • Damage to heritage sites / artefacts.	• No clearing of previously undisturbed vegetation, • Hygiene management requirements, • Weed identification cheat sheets, • Fill verified as having low weed risk, • Induction, and • Heritage artefact disturbance procedure.
Atmospheric Emissions	• Disturbance to sensitive fauna / relevant stakeholders.	• Emissions are monitored and reported, and • Management of Complaints.
Extraction of Groundwater	• Damage to vegetation due to drawdown of shallow groundwater.	• Ground water licences, and • Meter calibration and monitoring.
Physical Interaction – Fauna	• Injury or fatality to terrestrial fauna.	• Fauna exclusion and egress, • Site inspections, • Speed limits, and • Induction.
Fire	• Habitat and vegetation loss, • Fauna injury / fatality, and • Contamination (in the event petroleum wells are damaged).	• Emergency Response Plan, • Permit to Work, • Induction, • Consultation, • Maintain cleared areas, and • Maintain firefighting equipment on site.
Erosion from Surface Water	• Unplanned disturbance to vegetation, and • Inadequate rehabilitation.	• HSE inspection and erosion management measures – well sites and access tracks, • HSE inspection and erosion management measures – progressive rehabilitation, • Water retention pond design, and • Monitoring of Rehabilitation.
Accidental Release of Solid Waste	• Attraction and / or injury of protected fauna species within the vicinity of the sites.	• Appropriate rubbish bins and waste segregation, • Appropriately licensed waste contractor, • Emissions and Discharges Register, and • Induction.

Aspect	Hazard	Management and Mitigation Measures
Accidental Release of Hydrocarbons or Hazardous Materials	• Contamination of soil / groundwater, and • Contamination and subsequent toxic effects to vegetation.	• Rig inspection, • Site will be manned 24 hours a day, • BNR's Refuelling Procedure, • Chemical and hazardous liquid material storage, • Chemical disclosure, • Groundwater sampling, • Induction, • Spill kits, • Oil Spill Contingency Plan, and • Emergency Response Plan.
Accidental Release of Hydrocarbons – Loss of Well Control (LOWC)	• Atmospheric emissions, • Contamination of soil / groundwater, and • Contamination and subsequent toxic effects to vegetation.	• Well Management Plan, • Groundwater sampling, • Induction, • Spill kits, • Oil Spill Contingency Plan, • Blow out control equipment and expertise. • Emergency Response Plan.

5 Implementation Strategy

To meet the requirements of Regulation 15(1) of the Petroleum and Geothermal Energy Resources (Environment) Regulations 2012, 'Implementation Strategy for Environment Plan', this section describes the implementation strategy - the systems, practices, and procedures used to ensure that the environmental impacts and risks of the activities are continuously reduced to 'As Low As Reasonably Possible', and the environmental performance objectives and standards are achieved. BNR will operate under its management system.

5.1 Management System Overview

BNR has implemented an integrated Health, Safety and Environment Management System (HSE Management System). This management system ensures a sound approach to risk management and compliance and includes a process of planning, implementation and review to ensure risks associated with operational activities, including environmental risks, are appropriately controlled, reported and monitored. This includes the development and implementation of standards, procedures and plans appropriate to the location and type of operations undertaken by BNR.

The HSE Management System establishes clear guidelines for personnel involved in these activities to achieve and maintain the standards set out in the EP. Further to this, BNR have implemented a Safety Management System (SMS) that specifically sets out the framework for the management of the health and safety aspects for planned well care and maintenance activities.

5.2 Oil Spill Contingency Plan

In accordance with Regulation 15(10) of the PGER(E)R, BNR's Oil Spill Contingency Plan (OSCP) (BNR_HSE_MP_007) has been implemented as part of BNR's implementation strategy. The OSCP considers the four key aspects of prevention, preparedness, response and recovery of an unplanned hydrocarbon or chemical spill that has occurred as a result of care and maintenance activities conducted on EP 371 sites. The OSCP will manage the potential impacts and risks identified by the EP and cover loss of containment from well sites, loss of chemicals and diesel from storage and refuelling.

5.3 Environment Plan Review

Regulation 18 of the PGER(E)R requires that BNR submit a proposed revision of the accepted EP:

- Before the commencement of a new activity,
- Or any significant modification, change of a new stage of an existing activity, and
- Before, or as soon as practicable after, the occurrence of any significant new environmental impact or risk, or significant increase in an existing environmental impact or risk which occurred or is to occur.

Additionally, prior to downhole well operations commencing, BNR will update the EP with the full chemical disclosure of the completion fluids to be used downhole, and submit the EP to the Department of Mines, Industry Regulation and Safety (DMIRS).

Regulation 20 of PGER(E)R requires that BNR submit a proposed revision of the EP five years from the date when the EP is accepted by the Minister.

6 Consultation

Minimising and mitigating the potential environmental impacts associated with the care and maintenance activities for the sites and access tracks is assisted by the engagement of key stakeholders to ensure all issues are identified and addressed. BNR completed a scoping exercise to determine which authorities, persons and organisations were considered to be relevant.

Given the isolated location of the sites, limited stakeholders were identified and include:

- Department of Mines, Industry Regulation and Safety,
- Shire of Derby-West Kimberley,
- Buru Energy,
- Noonkanbah Traditional Owners and station pastoralists (YAC – Yungngora Aboriginal Corporation),
- Bunuba #2 Traditional Owners,
- Warlangurru #1 Traditional Owners (WAC – Warlangurru Aboriginal Corporation),
- Blina station pastoralists,
- Kimberley Pilbara Cattlemen's Association,
- KRED Enterprises, and
- Main Roads WA.

Table 6-1 provides a summary of the consultation undertaken specific to activities covered under the EP.

6.1 Ongoing Consultation

BNR will continue to engage with identified key stakeholders for the duration of the care and maintenance activities.

Table 6-1: Summary of Stakeholder Consultation Undertaken

Stakeholder	Date	Method	Matters discussed	Questions, comments or concerns raised	BNR response	Close out of issues (if any)
DMIRS	10/12/19	In Person	EP and SMS submission approach	Bridging documentation Well Integrity monitoring	Ongoing consultation	
CEO of Ndurra PBC Chairperson of KRED	23/01/20	In Person	Introduction and discussion of Ranger Program.	Engagement regarding the ranger program for potential rollout on Noonkanbah land.	Continual	
Kimberley Pilbara Cattlemen's Association	24/01/20	In Person	Registration of BNR to Association.	Arranging formal meeting with Bunuba PBC	Continual engagement	
Buru Energy	28/01/20	In Person	Rehabilitation and Water use at EP 371	Jannat 1 Rehab and access Rehab cost provisioning for well sites Water bores and meters P&A considerations	Ongoing consultation and consideration	
Noonkanbah Traditional Owners and pastoral station	17/02/20	In Person	Discussion on upcoming seismic plan. Discuss importance of working with local community Presentation of football jerseys	Question asked on SPA works regarding the extent of the lease. BNR provided maps of EP371 and SPA. Asked that we inform WAC and YAC members about any contractors prior to arriving or working on site.	Agreed and continual engagement	

Stakeholder	Date	Method	Matters discussed	Questions, comments or concerns raised	BNR response	Close out of issues (if any)
Shire of Derby-West Kimberley	18/02/20	In Person	Kimberly art prize sponsorship potential Youth Advisory Council for Youth Engagement Community engagement	Organize for sponsorship or endorsement of Noonkanbah artists to enter art.	Continual Engagement	

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