



## 1 INTRODUCTION

Statoil successfully drilled the OzBeta-1 exploration well in May 2014 to 1,442m MD. The well site is located in EP 127 in the South Georgina Basin in the eastern part of the Northern Territory approximately 385 km north east of Alice Springs. Co-ordinates for the well site are: 753776mE, 7487651mS (UTM, Zone 53). A map of the location is contained in Appendix 2.

In August 2014 Statoil will hydraulically fracture and test the OzBeta-1 well. The Thornton and Basal Arthur Creek formations will be targeted to determine the potential for hydrocarbon production. The planned single stage stimulation operation in the vertical well will result in a predictable and relatively small fracture requiring a relatively low amount of fracturing fluids.

The operations will involve the following stages:

1. Well preparation including Diagnostic Fracture Injection Test (DFIT)
2. Perforation and pumping
3. Testing
4. Down hole abandonment

The addendum to the EMP for drilling includes the hydraulic fracturing and testing operation. It details the water monitoring program involving the sampling and testing of local water bores. The addendum to the EMP lists chemicals to be used during the fracture stimulation and the relevant Safety Data Sheets (**SDS**) are included in an appendix. Well integrity schematics (well barrier diagrams) for the hydraulic fracturing operation are included in the Stimulation, Testing, and Abandonment Program.

After the operations Statoil will permanently plug and abandon the OzBeta-1 well and carry out remediation works in consultation with the pastoral lessee and according to the rehabilitation actions in the EMP.

## 2 MANAGEMENT APPROACH

Statoil employs highly skilled and experienced engineers and consultants to ensure that the environmental risks from its operations are as low as reasonably practicable. Statoil acknowledges the importance of the sustainable development to secure its future and to ensure the ongoing relationship with all stakeholders.

Operations at the OzBeta-1 have been planned based on the following principles:

---

- Minimise interference with the use of the land by other persons;
- Prevent unnecessary disturbance of flora, fauna and other natural resources;
- Avoid pollution of soil, water or the atmosphere;
- Minimise the incidence and effects of soil erosion.

### 3 PROJECT DESCRIPTION

The core activities involved in the OzBeta-1 project involve well preparation, perforation, pumping, testing and permanent abandonment.

After diagnostic testing, the well will undergo a casing pressure test and a cement evaluation log will be recorded. Provided the tests validate the well's integrity, the well will be hydraulically fractured. Once stimulated, the well will be production tested for approximately 10 days.

After the production test, cement plugs will be placed in the well to isolate all hydrocarbon bearing zones in accordance with an approved technical program.

The site is scheduled for rehabilitation in the final quarter of 2014.

### 4 ENVIRONMENT DESCRIPTION

OzBeta-1 lies on gently sloping plains with soils of a calcareous sandy loam. The ground cover is made up of small pebbles and rocks with minimal vegetation cover.

The site is within the Toko Plains Interim Biogeographic Regionalisation of Australia (IBRA) subregion of the Channel Country IBRA region. It is characterised by extensive *Acacia georginae* (Gidgee) plains and low rolling hills with minor relief provided by the Tarlton and Toko Ranges.

The Channel Country IBRA region lies over the Georgina Basin on sedimentary rocks overlain by massive earths and shallow sandy soils. OzBeta-1 is within the land system Ninmaroo, which is described as undulating to rolling plains and rises, lithosols and red earths, sparse shrubland of *Cassia spp.* and low open woodland of Gidgee.

The region is mainly pastoral leasehold, with the dominant land use being cattle grazing. There are a number of protected areas within the Channel Country IBRA region, however, none of these are within the Toko Plains IBRA subregion.

A search of the NT Parks and Wildlife Fauna Atlas for the area within a 50km radius of the OzBeta-1 site identified eight data deficient, ten near threatened, three not evaluated and one vulnerable flora species. The search also identified one data deficient and five near threatened fauna species. The implementation of environmental management techniques will ensure minimal impacts to these species.

Rainfall data from Tarlton Downs Station (70km west) shows mean annual rainfall is 248mm. Mean monthly rainfall ranges from 4.0mm in August to 52mm in February.

The OzBeta-1 site is located in the Georgina River Basin. The major rivers in the catchment are the Georgina and Hamilton Rivers and Eyre Creek and major drainages include the Sandover and Field Rivers and Horse Creek. The catchment flows into Lake Eyre. The closest watercourses to OzBeta-1 are tributaries of Horse Creek, (0.8km west and 0.9km northeast). Marqua Creek is the largest ephemeral water course in the vicinity (15m south). There are also tributaries of Marqua Creek, Horse Creek and minor drainage lines in the area. There are two water holes in close proximity, Treacle Waterhole (7km southwest) and Bismarch Waterhole (6.4km southwest).

## 5 ENVIRONMENTAL IMPACT

The impact on the environment will be temporary and minimised wherever practicable. The main impacts will be to fauna and flora from the clearing of the well site and camp site, however given the small size of the affected area, the impact will be relatively insignificant.

OzBeta-1 is not within any Site of Bioregional Significance, protected areas or wetlands of national or international importance. The vegetation community surrounding OzBeta-1 is relatively common and widespread within the surrounding areas. Care will be taken in clearing of the well site, camp site and associated access tracks to avoid removal of established trees such as *Hakea sp*, *Corymbia opaca* (Desert Bloodwoods) and *Acacia estrophiolata* (Ironwoods) where possible, as these trees may provide significant habitat for native fauna. Best practice techniques will be employed to minimise vegetation loss and the operations will have little impact on the larger flora species (>2 m tall).

There will be localised loss of flora and habitat for fauna where the removal of small shrubs is required to allow for access of vehicles and site works. Site works can also result in the removal of topsoil and the formation of windrows. Windrows which channel water will be constructed to avoid erosion. Top soil will be stockpiled where vegetation is removed to protect loss resulting from the wind and water process.

Exploration will indirectly impact on the local fauna through increased noise, vibration, dust, lights, roads and human activity, however this is unlikely to have any long term negative impact.

## 6 MANAGEMENT OF ENVIRONMENTAL RISKS

The clearing of the OzBeta-1 site will avoid removal of established trees such as Desert Bloodwoods and Ironwoods where possible, as these trees provide significant habitat for native fauna.

Watering and compacting the cleared soil surface at the well and camp site and the use of other environmentally accepted dust suppression techniques will mitigate dust generation and erosion. The work at OzBeta-1 will be commenced during the dry season and therefore destruction of soil under wet conditions is not anticipated.

Any topsoil or sub-soil removed during land clearing will be stockpiled separately to maximise rehabilitation success by maintaining soil seed banks. Soil and vegetation stockpiles will be placed in low windrows around the boundary of the well and camp sites to form bunding to mitigate surface water run-on in the event of rain. Early measures to maximise rehabilitation success will aid in erosion mitigation at the site. The stockpiled soil will be re-spread over the cleared area to promote the growth of plants, which will help

hold the soil in place. Changes to the topography of the area will be minimised to prevent erosion and changes to drainage patterns.

All personnel will undergo an environmental and cultural induction prior to commencing work at the OzBeta-1 site to enable them to identify flora and fauna of conservation significance. All land clearing and operations will be contained within the well and camp site dimensions and all personnel will be made aware of the boundaries.

Vehicle speed limits will be imposed and night driving will only occur in an emergency to reduce the risk to fauna collision and fauna fatality.

Clearing of vegetation can promote the spread of weeds into an area. Weed hygiene measures, such as vehicle wash-downs prior to mobilisation to the site will be enforced. Where possible, access roads will divert around any areas of weed infestation to minimise the risk of spread. All designated weeds of the Northern Territory have been identified. The growth and spread of these weeds will be controlled within the OzBeta-1 site and associated access tracks.

All domestic and putrescible wastes generated on site are to be disposed of in covered receptacles or covered landfill (in the case of organic wastes). Standing water will be fenced appropriately to reduce the presence of native and introduced fauna, including cattle.

Appendix 1 sets out each major risk to the environment and the associated measure taken to reduce the risk to an acceptable level.

## **7 CONSULTATION**

Approval for the OzBeta-1 well was received from the Central Land Council after a sacred site clearance survey of the area. Statoil has also provided detailed information regarding the operations to the pastoral lease holder.

For any further information contact Vegard Lyngmo, Statoil leader in safety and sustainability at [vly@statoil.com](mailto:vly@statoil.com)

Hazard / Risk	Cause	Consequence	Risk Treatment
Removal of native vegetation and potential fauna habitat	<ul style="list-style-type: none"> <li>Onsite flora and fauna not previously determined during ecological assessments</li> <li>Off-road driving</li> </ul>	<ul style="list-style-type: none"> <li>Loss of native vegetation</li> <li>Loss of declared rare flora or priority species</li> <li>Destruction of fauna habitat</li> </ul>	Desktop review of botanic surveys undertaken to ensure well site, camp site and access tracks avoid listed flora species.
			Existing access tracks used where possible to minimise the area cleared of native vegetation.
			Larger and mature vegetation will be avoided where possible.
			Vehicles and personnel restricted to existing access tracks, camp site and well site.
			Access tracks sighted to avoid native fauna burrows and habitat.
			Create designated turn around points to minimise disturbance to native vegetation.
Soil disturbance	<ul style="list-style-type: none"> <li>Poor drainage control over cleared areas and topsoil/spoil stockpiles</li> <li>Light compaction required for rig stability</li> <li>Unstable subsoils</li> <li>Poor stormwater / surface flow management</li> </ul>	<ul style="list-style-type: none"> <li>Erosion and sedimentation</li> <li>Compaction</li> <li>Subsidence</li> <li>Dust emissions</li> </ul>	Drainage controls implemented during operations (e.g. erosion berms and silt barriers).
			Topsoil and spoil stockpiled separately.
			Stockpiles constructed with low profile and away from drainage lines to reduce erosion potential.
			Implement dust-control measures (e.g. water spraying, dust suppressant).
			Sites rehabilitated as soon as practicable after the completion of operations to minimise potential for erosion.
			Following the first wet season after rig release, the project area will be inspected to determine whether any soil disturbance issues persist and remediation actions initiated where required.
Disturbance of indigenous heritage site(s)	<ul style="list-style-type: none"> <li>Onsite indigenous heritage sites not previously determined during ethnographic study</li> <li>Personnel straying from access track, camp site and well site</li> </ul>	<ul style="list-style-type: none"> <li>Damage to indigenous heritage sites</li> </ul>	Sites located to avoid indigenous cultural areas.
			Sacred Site Clearance Certificate issued by the Central Land Council
			Site induction to cover local cultural sensitivities

Hazard / Risk	Cause	Consequence	Risk Treatment
Water quality	<ul style="list-style-type: none"> <li>Fractures contacting water source</li> </ul>	<ul style="list-style-type: none"> <li>Contamination</li> </ul>	Well integrity established through pressure test and cement bond log
			Fracture modelling shows 500 metres between maximum fracture height and relevant water source
			Water well monitoring program to provide early identification of any contamination
Well control event	<ul style="list-style-type: none"> <li>Release of liquid hydrocarbons to the environment</li> <li>Release of gaseous hydrocarbons to the atmosphere</li> </ul>	<ul style="list-style-type: none"> <li>Contaminated soil, surface water and/or ground water</li> <li>Uncontrolled fire</li> <li>Air pollution</li> </ul>	Blow out preventer used during operations from when the surface casing is set through to when the well is plugged and abandoned or when the wellhead is installed.
			Oil Spill Contingency Plan in place.
			Emergency Response Plan in place
			Emergency response drills conducted regularly.
Noise	<ul style="list-style-type: none"> <li>Noise generated during operations</li> </ul>	<ul style="list-style-type: none"> <li>Disturbance to local residents, wildlife or adjacent activities</li> </ul>	Area has very low population density
Disturbance or damage to infrastructure and services	<ul style="list-style-type: none"> <li>Unknown infrastructure located in the planned drilling</li> <li>Human error</li> </ul>	<ul style="list-style-type: none"> <li>Disruption of services to local residents e.g. power, telecommunication</li> <li>Damage to fence lines and farm gates</li> </ul>	Area has very low population density and no infrastructure that will be used during the operations
			Repair all fences and affected infrastructure to pre-operation condition as agreed with the relevant pastoralists.
Gas venting	<ul style="list-style-type: none"> <li>Venting during operations</li> </ul>	<ul style="list-style-type: none"> <li>Explosions</li> <li>Fire</li> <li>Loss of vegetation or fauna</li> <li>Destruction of fauna habitat</li> </ul>	Gaseous wastes are flared
			Combustible materials cleared from the area surrounding the flare pit
			Adequate fire equipment located on-site and personnel suitably trained.
			Bushfires NT advised of flaring
Blowout during well drilling or testing	<ul style="list-style-type: none"> <li>Unexpected over-pressured or under-pressured formation</li> </ul>	<ul style="list-style-type: none"> <li>Loss of vegetation or fauna</li> <li>Destruction of fauna habitat</li> <li>Soil contamination</li> </ul>	Blow out preventers in use
			Blow out preventers tested
			Drills to ensure preparedness for blow out event

Hazard / Risk	Cause	Consequence	Risk Treatment
Hydrocarbon contamination of flare pit	<ul style="list-style-type: none"> <li>Loss of combustion in flare pit</li> <li>Failure to burn all fluids in flare pit</li> </ul>	<ul style="list-style-type: none"> <li>Physical or chemical impacts on flora, fauna, soil, surface water or groundwater from released fluids</li> </ul>	Measures to ensure flare pit does not lose combustion (e.g. pilot light, automatic sparker). Testing of soils in flare pit following operations followed by soil remediation (if required) Flare pit lined and filled with water to prevent soil contamination
Release of waste, chemicals or rubbish into the environment	<ul style="list-style-type: none"> <li>Improper disposal of wastes</li> </ul>	<ul style="list-style-type: none"> <li>Soil, surface water and groundwater contamination</li> <li>Mortality of flora and fauna arising from soil, surface and groundwater contamination</li> <li>Visual pollution from rubbish</li> <li>Increased vermin or scavenger numbers locally</li> </ul>	Use of licensed waste management contractor if required. Program in place to minimise the volume of wastes generated and recycling of materials wherever practical (e.g. recycling plastic bottles). Water-based drilling cuttings, muds and wastewater disposed to sump, evaporated, and the sump buried on site after all liquids have been evaporated. Solid wastes and litter segregated and stored in covered rubbish skips for offsite recycling or disposal by waste management contractor. Waste oils and chemicals labelled and stored appropriately for offsite disposal by licensed contractors at approved facilities. Food wastes disposed of in animal proof bins, covered skips or closed trailers. Site inspected at conclusion of operations. For camps of more than 10 people, sewage treated by aerobic/anaerobic treatment plant and by-products disposed of in an excavated hole away from watercourses and subsequently backfilled
Introduction of noxious weeds and vermin, exotic species, flora and animal diseases	<ul style="list-style-type: none"> <li>Weeds and contaminated soil on vehicles</li> </ul>	<ul style="list-style-type: none"> <li>Infection of soil with diseases and pathogens</li> <li>Infestation of weeds in cleared areas</li> <li>Loss of native flora and fauna</li> </ul>	Equipment and vehicles cleaned and inspected for soil, plant material and pest animal contamination prior to mobilisation to site.
Uncontrolled fires	<ul style="list-style-type: none"> <li>Ignition sources (e.g. vehicle exhaust, smokers)</li> <li>Grass fires and bush fires in</li> </ul>	<ul style="list-style-type: none"> <li>Loss of vegetation and native fauna</li> </ul>	Adequate fire equipment located on-site and personnel suitably trained. Only diesel vehicles used in operations.

Hazard / Risk	Cause	Consequence	Risk Treatment
	uncleared areas from sources of ignition		Smoking restricted to designated areas. No open fires.
Fuel, oil or chemical spills	<ul style="list-style-type: none"> <li>• Lack of appropriate bunding around storage and refuelling areas</li> <li>• Inappropriate storage of fuel, oil or chemical containers</li> <li>• Inappropriate handling of fuel, oil or chemicals during use</li> </ul>	<ul style="list-style-type: none"> <li>• Contamination of soil, surface water or groundwater</li> </ul>	Fuel, oil and chemical storage areas appropriately segregated, labelled and bunded, as required. Containers inspected for leaks or potential leaks. Personnel trained in the correct procedures for use of materials, including refuelling and clean-up and spill management procedures. Well site not located within a sensitive environment. Drip trays used while refuelling Portable fuel cans to be stored in bunded containers or trailers capable of holding at least 2.5 times the volume of stored fuel Emergency Response Plan and Oil Spill Contingency Plan in place and personnel trained in their implementation. Spill kits available in all relevant areas. Dust suppressant non-toxic and environmentally friendly
Vehicle collision with fauna	<ul style="list-style-type: none"> <li>• Unpredictable movement of animals</li> <li>• Vehicles travelling at high speeds</li> <li>• Vehicles travelling at dawn or dusk or in times of poor visibility</li> </ul>	<ul style="list-style-type: none"> <li>• Fauna death or injury</li> </ul>	Limit vehicle activities to daylight hours when fauna are more visible and avoid driving at night. Limit vehicle speeds to road conditions on access tracks Vehicle inspected to ensure they have working lights and/or spotlights. Vehicles to remain on designated access tracks.

