



## **1 INTRODUCTION**

Statoil has planned an exploration drilling program of up to five wells to be carried out in 2014. Site and access construction are scheduled for late February 2014 with the OzAlpha-1 exploration well scheduled to be drilled in April 2014.

The well site is located in EP 104 in the Georgina Basin in the eastern part of the Northern Territory approximately 410 km north east of Alice Springs. Co-ordinates for the well site are: 768840mE, 7518300mN (UTM, Zone 53). A map of the location is contained in Appendix 2.

After the operations Statoil will permanently plug and abandon the OzAlpha-1 well and carry out remediation works in consultation with the pastoral lessee.

## **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.

The drilling of OzAlpha-1 has 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 OzAlpha-1 project involve access and site construction, drilling and site rehabilitation.

Access and site construction involve upgrading 12km of existing tracks, clearing a site approximately 100m x 100m for the well site and 80m x 80m for the camp site. A water well will be drilled on the well site to supply the operations and enable Statoil to effectively monitor the ground water. The well site construction will also include a lined sump 20m x 10m, lined turkeys nest 36m x 26m and flare pit 6m x 3m.

After completion of the civil construction phase a Schramm 200 drilling rig will be mobilised to the site along with a camp and support facilities.

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OzAlpha-1 will then be drilled vertically to approximately 1300 metres over an estimated time of 28 days. The well will target the Arthur Creek “hot shale” and the Thornton Limestone formations (described by GeoScience Australia as the Hay River Formation) as unconventional prospects.

Core will be extracted and wireline logging conducted to evaluate the potential for hydrocarbons. The well will then be cased and suspended pending completion operations.

In July Statoil will return to OzAlpha-1 to perform 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. The site is scheduled for rehabilitation in the final quarter of 2014.

#### **4 ENVIRONMENT DESCRIPTION**

OzAlpha-1 lies on a bench in low chert and calcrete rolling hills with red loam soils. Topographically, it lies on a level area below the bottom of a rocky outcrop and receives rainfall run-on.

The site is on the edge of 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 undulating ranges and sandplains 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. OzAlpha-1 site is described as sedimentary: sandstone, shale, dolostone. The area is described as gently undulating plains and rises with red earths and low open woodland, it has low sparse tussock grassland of *Fimbristylis dichotoma* and *Tripogon loliiformis*.

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 OzAlpha-1 site identified 714 records of 126 fauna species.

Rainfall data from Tobermorey Station (10.8km east) shows mean annual rainfall is 249mm. Mean monthly rainfall ranges from 2.3mm in August to 67.8mm in January. Rainfall data from Urandangi (91.9km northeast) shows mean annual rainfall of 304.5mm. Mean monthly rainfall ranges from 4.4mm in August to 66.3mm in February.

The OzAlpha-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 OzAlpha-1 are Horse Creek, (4km south) Thingua Creek (22km north), and Marqua Creek (48km southeast). There are also

tributaries of Horse Creek and minor drainage lines in the area. The Field River is the most easterly river of those that flow directly to the Simpson Desert. The Field River catchment is in the Toko Ranges, its major tributary is Marqua Creek.

## 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.

The OzAlpha-1 site is not within any protected areas or wetlands of national or international importance. The vegetation community surrounding the OzAlpha-1 site is relatively common and widespread in the area. Vegetation communities in the vicinity of the OzAlpha-1 site are dominated by *Triodia spp.* grassland and Acacia tall open-shrubland, with occasional large *Chenopodium auricomum* (Bluebush) swamps. 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 OzAlpha-1 site will avoid removal of established trees such as *Hakea sp.*, *Corymbia opaca* (Desert Bloodwoods) and *Acacia estrophiolata* (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 dust environmentally accepted suppression techniques will mitigate dust generation and erosion. The work at OzAlpha-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 OzAlpha-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 campsite 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 OzAlpha-1 site and associated access tracks.

The NT Flora Atlas identified records of seven introduced flora species within the 50 km buffer of the OzAlpha-1 site. No introduced species flora species were identified during the February and October 2013 on-ground surveys.

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). All 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 OzAlpha-1 well has been received from the Central Land Council after a sacred site clearance survey of the affected 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)

Appendix 1 - Environmental Hazards and Risk Treatment Table



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.
			SSCC issued by the CLC
			Site induction to cover local cultural sensitivities

Hazard / Risk	Cause	Consequence	Risk Treatment
Water quality	Contamination of water source while drilling surface interval	<ul style="list-style-type: none"> <li>Contamination</li> </ul>	Well integrity through cement returns to surface and setting casing depth prior to any hydrocarbon bearing zone 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.
Drilling cuttings	<ul style="list-style-type: none"> <li>Unplanned release of drilling cuttings outside of disposal sump</li> </ul>	<ul style="list-style-type: none"> <li>Physical or chemical impacts on flora, fauna, soil, surface water or groundwater from released cuttings</li> </ul>	Sump constructed for the disposal of cuttings and associated muds. Sump to be fenced while left to dry Well site is not located within sensitive environments.
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> </ul>	Blow out preventers in use Blow out preventers tested

Hazard / Risk	Cause	Consequence	Risk Treatment
		<ul style="list-style-type: none"> <li>• Destruction of fauna habitat</li> <li>• Soil contamination</li> </ul>	Drills to ensure preparedness for blow out event
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.

Hazard / Risk	Cause	Consequence	Risk Treatment
Uncontrolled fires	<ul style="list-style-type: none"> <li>Ignition sources (e.g. vehicle exhaust, smokers)</li> <li>Grass fires and bush fires in uncleared areas from sources of ignition</li> </ul>	<ul style="list-style-type: none"> <li>Loss of vegetation and native fauna</li> </ul>	<ul style="list-style-type: none"> <li>Adequate fire equipment located on-site and personnel suitably trained.</li> <li>Only diesel vehicles used in operations.</li> <li>Smoking restricted to designated areas.</li> <li>No open fires.</li> </ul>
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>	<ul style="list-style-type: none"> <li>Fuel, oil and chemical storage areas appropriately segregated, labelled and bunded, as required.</li> <li>Containers inspected for leaks or potential leaks.</li> <li>Personnel trained in the correct procedures for use of materials, including refuelling and clean-up and spill management procedures.</li> <li>Well site not located within a sensitive environment.</li> <li>Drip trays used while refuelling</li> <li>Portable fuel cans to be stored in bunded containers or trailers capable of holding at least 2.5 times the volume of stored fuel</li> <li>Emergency Response Plan and Oil Spill Contingency Plan in place and personnel trained in their implementation.</li> <li>Spill kits available in all relevant areas.</li> <li>Dust suppressant non-toxic and environmentally friendly</li> </ul>
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>	<ul style="list-style-type: none"> <li>Limit vehicle activities to daylight hours when fauna are more visible and avoid driving at night.</li> <li>Limit vehicle speeds to road conditions on access tracks</li> <li>Vehicle inspected to ensure they have working lights and/or spotlights.</li> <li>Vehicles to remain on designated access tracks.</li> </ul>



