ENVIRONMENTAL IMPACT ASSESSMENT

of the

TREKKOPJE URANIUM PROJECT

SPECIALIST CONTRIBUTION: VEGETATION

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1. TERMS OF REFERENCE AND OBJECTIVES

The Namib Desert harbours numerous endemic and near endemic plant species, of which many are of restricted distribution or habitat. This makes them extremely vulnerable to disturbance. The floral specialist study aims to:

- By means a field reconnaissance survey and review of relevant information, identify the plant species that occur or are thought to occur on the site, with emphasis on those that are valuable from a biodiversity and/or ecological point of view.
- Classify the area into broad habitat zones according to vulnerability, ecological and scientific value.
- Identify and assess the potential impacts on the flora resulting from the proposed mining activities during both development and operational phases. It is important to note that the location of the various facilities have not been determined yet. It was therefore assumed that mining activities will be concentrated in the zone of the deposit (Appendix 1).
- Suggest mitigating measures to avoid or minimise impacts. The vegetation was to be considered regarding sensitivity to disturbance created by both direct and indirect impacts.

2. APPROACH

- Review of the PEA and other relevant information, including known plant species distribution according to the National Herbarium Database (SPMNDB) as well as species and area conservation status.
- Site visit and field survey (29 April to 1 May 2006).
- Preparation of report.

Nomenclature largely follows Craven (Ed.) 1999. All voucher specimens collected will be lodged at the National Herbarium of the National Botanical Research Institute, in Windhoek.

3. LEGAL AND POLICY REQUIREMENTS

3.1 Acts and ordinances

Plant species are protected by various mechanisms in Namibia, including Nature Conservation Ordinance No. 4 of 1975, including amendments, and Forestry Act No. 72 of 1968.

3.2 Namibian commitment to international standards and/or guidelines

Namibia is a signatory to the Convention on Biodiversity, committing it to the preservation of species, particularly rare and endemic species, within its boundaries.

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As a signatory also to the Convention to Combat Desertification it is also bound to prevent excessive land degradation that may threaten livelihoods.

4. DESCRIPTION OF SURVEYED AREAS AND RECOMMENDATIONS

4.1 General location

The Trekkopje uranium project area is situated in the central Namib Desert, in the Erongo Region of Namibia, approximately 65 km north-east of Swakopmund. It covers an area of about 37,368 ha. Most of the area is State Land, but a portion of the farm Trekkopje 120 is included. It does not lie within a formally protected area (i.e. a national park), but is situated just west of the National West Coast Recreation Area.

The central Namib lies between the ephemeral Ugab and Kuiseb rivers, and is bounded by the Atlantic Ocean in the west and the escarpment in the east. It falls into the Desert Biome of southern Africa (Rutherford & Westfall 1986) and the Desert Biome of Irish (1994).

4.2 Climate

4.2.1 Temperature

Average daily temperatures vary between a minimum of 10° C in the coldest month and a maximum of 32° C in the warmest month in the area (Mendelsohn et al. 2002). Due to coastal proximity frost is probably rare.

4.2.2 Wind

Southerly, westerly and south-westerly winds are prevalent, and are usually strongest between late afternoon and early evening (Mendelsohn et al. 2002).

4.2.3 Moisture

Rainfall in the Namib Desert is highly variable, unpredictable, and patchy. It varies from 0 to approximately 100 mm p.a. (Mendelsohn et al. 2002), increasing from west to east. In the west, where precipitation from rain is lowest, fog that is carried inland by wind passing over the cold Benguela current of the Atlantic Ocean is a vital source of moisture for many desert organisms. The number of fog days p.a. decreases eastwards (Olivier 1995), but fog does reach the study area and probably provides a large proportion of the moisture available in the western reaches.

4.3 Topography

The area consists largely of gravel plains dissected by ephemeral watercourses and washes that trend north-east \rightarrow south-west. As indicated in Appendix 1, there is also a higher-lying area of gravel plain interspersed with rocky patches in the north-central zone and number of linear boulder-strewn ridges concentrated along the southern border and north-western corner of the area.

The area may thus broadly be divided into four zones, of which two may be further subdivided. Table 1 summarises these zones, their characters, species of conservation concern and suggested mitigation measures. They are discussed in detail later.

Zone Description		Subdivision		Species of conservation concern	Suggested mitigation measures
А	Gravel plains	1	Eragrostis nindensis grassy plains of the north-east	none	general
		2	Central Stipagrostis plains	Larryleachia marlothii, Lithops sp.	Assessment of Lithops population. Possible rescue mission (NBRI)
		3	Lichen plains of the south-west	Lichens	Strict control of vehicle tracks
В	Drainage lines	1	Large drainage lines	Commiphora saxicola, C. dinteri, Blepharis gigantea, several more protected, endemic and near-endemic species	Preserve large drainage lines in north-central zone. If possible avoid all large drainage lines. No collection of firewood.
		2	Washes	Zygophyllum cylindrifolium, Monechma genistifolium, several more endemic and near-endemic species	Preserve washes outside the deposit zone.
С	Rocky/gravelly outcrop			Commiphora saxicola, C. dinteri, Blepharis gigantea, B. grossa, Larryleachia marlothii, Ornithogalum stapfii, several more endemic and near-	Set aside, prevent vehicle access (outside of deposit zone)

Table 1: Vegetation zones in the study area.

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		endemic spec	cies	
D	Boulder ridges/koppies	Sarcocaulon marlothii, Commiphora virgata, saxicola, namibensis others	C. Aloe and	Avoid if possible, otherwise a rescue mission by NBRI

4.4 Vegetation

While approximately 17% of the Namibian flora as a whole is thought to consist of endemic species (Barnard 1998), over 30% of plants that occur in the Namibian section of the Desert Biome are believed to be endemic to that area. This is a remarkably high figure, but in the context of the Trekkopje project it is important to note that the areas of highest plant endemicity in the Namib are the Kaokoveld and the southern Namib, both regarded as major centres of endemicity in Namibia (Maggs et al. 1998). Levels of plant endemicity are comparatively lower in the central Namib. This notwithstanding, the proportion of endemic plants found in the general Trekkopje area is very high, at 25%. The total proportion of endemic and near-endemic species is 37% (Appendix 2). Not all the plants listed in Appendix 2 will be present in the study area because the list is generated from the database of the National Herbarium, which is based on quarter-degree squares, as well as from observations and collections during this study. Nevertheless it is indicative of the sensitivity of this area and the necessity to minimise the extent of impacts as far as possible.

4.4.1 Zone A. Gravel plains

As indicated in Appendix 1, the majority of the area, particularly where the uranium deposits are concentrated, consists of gravel plains, which are extremely sensitive to vehicle tracks. These plains change in their species composition from east to west, although no distinct zones can be demarcated without a detailed mapping exercise. The zones may be described as follows:

A.1. Eragrostis nindensis grassy plains of the north-east

These plains are dominated by Eragrostis nindensis (Figure 1). Stipagrostis ciliata is also present, as well as a number of annual herbs, including Cleome angustifolia subsp. diandra, Limeum argute-carinatum, the near-endemic Blepharis grossa (Figure 2) and the endemic Hermannia solaniflora. Perennial herbs present include two endemics - Monechma genistifolium subsp. genistifolium and Zygophyllum cylindrifolium and Petalidium lanatum, which is very common on the plains and in the washes of the north-eastern reaches of the area.

Although this zone carries a number of endemic species, none of high conservation concern was recorded. As a large proportion of the zone lies outside the deposit area no special mitigation measures are needed beyond the general recommendations (Section 5).

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Figure 1: Zone A1. Eragrostis nindensis dominates the grassy plains in the north-east of the study area. Arrow indicates remains of Blepharis grossa.

Figure 2: Blepharis grossa, a common near-endemic found on plains and in drainage lines in the study area.

A.2. Central Stipagrostis plains

The central gravel plains are dominated by *Stipagrostis* spp. (Figure 3). *Indigofera auricoma* and *Anticharis senegalensis* are quite common, and the endemics *Anticharis ebracteata*, *Ornithogalum stapfii* and *Heliotropium oliveranum* also occur. *Zygophyllum cylindrifolium*, *Hermannia complicata* and *Forsskaeolea hereoensis* (all endemic) as well as *Forsskaeolea candida* are found in the vicinity of wash edges. In this zone the near-endemic succulent *Larryleachia marlothii* occasionally occurs (Figure 4). An unidentified Lithops species was observed and the exact locality recorded. As it was not flowering it could not be identified. *Lithops* species known to occur in this general area are not Red Data species, but all *Lithops* species are protected by Nature Conservation legislation.

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Figure 3: Zone A2. Central gravel plains, dominated by Stipagrostis spp.



Figure 4: Larryleachia marlothii.

This zone lies largely within the area of the deposit and is thus likely to be totally destroyed. Although no species of very high conservation concern were recorded the presence of *Larryleachia marlothii* and *Lithops* (both protected species) necessitates some action. It is recommended that the National Botanical Research Institute (NBRI)(contact person: Sonja Loots) be requested to visit the site to assess the *Lithops* population. The NBRI should be offered the opportunity to rescue individuals of *Larryleachia marlothii*, *Lithops* and others as they deem fit. This will be discussed further under general recommendations (section 5).

A.3. Lichen plains of the south-west

In the south-west of the study area the gravel plains are largely free of plants, and are dominated by lichens. This area is probably delimited by the extent of the fog zone. In some areas there are patches of the endemic leaf succulent Zygophyllum stapfii and Salsola sp.

Lichens are not plants, and thus do not fall into the scope of this report. However it may be useful to mention that the lichen plains of the Namib are known for their high diversity and are thought to harbour many undiscovered species (Barnard 1998). Lichens are excessively slow-growing and vehicle damage to a lichen field may basically be regarded as permanent. The lichen field that falls into this zone extends beyond it to the west and a part of it falls outside the deposit zone in the north and south of the study area. Strict control of collateral damage will minimise the extent of the inevitable destruction of part of the lichen field should this part of the deposit be mined.

Zygophyllum stapfii, although endemic, is reasonably widely distributed. It colonises disturbed ground quite readily, and is therefore not of high concern.

Destruction of this zone will be virtually total should the entire deposit be mined. The most important mitigating action that can be taken is to ensure from the outset that roads and turning points are clearly demarcated during all phases of the operation, from exploration through construction to operation. This will ensure that no damage will be done to non-deposit areas as well as areas that might, for one reason or another, not be mined in future even although the intention at present is that they will be. The main existing road through this zone is already becoming wider and wider due to it being washed away after being graded and due to corrugations. This creation of new, parallel, tracks is unacceptable is should be stopped forthwith. It was also noted that there are at least four access tracks off of the main license area access road to the first trench. This is typical of uncontrolled driving and is unacceptable. It does not appear to have occurred excessively elsewhere and should be strictly prevented in future. The issue of tracks is discussed further in section 5.

4.4.2 Zone B. Drainage lines

The drainage lines in the area originate in the Spitzkoppe area, and drain from northeast to south-west.

B.1. Large drainage lines

These are typified by the scattered occurrence of trees and shrubs (Figure 5) as well as a far more diverse plant community than on the plains. The most important large drainage lines are in the west and the north-central of the study area, and there are several more (Appendix 1).

Typical woody species found are Boscia foetida, Acacia reficiens, Euclea pseudebenus (protected), Acacia erioloba (protected), Zygophyllum stapfii, Commiphora saxicola, C. dinteri (Figure 6) and Blepharis gigantea (Figure 7) (all endemic). Many more species occur, including Ipomoea adenioides, Cryptolepis decidua, Blepharis grossa, Brachiaria glomerata, Cleome foliosa, Codon schenckii,

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Indigofera auricoma, I. heterotricha, Kohautia spp., Monechma cleomoides, M. genistifolium, Stipagrostis damarensis, Petalidium lanatum, Zygophyllum cylindrifolium and many others. Many of these species are endemic or near-endemic (see Appendix 2). In the western reaches Arthraerua leubnitziae and Zygophyllum stapfii (endemic) as well as Brownanthus kuntzei (near-endemic) are common.



Figure 5: Various large woody species characterise the large drainage lines.





Figure 7: Blepharis gigantea

Clearly the occurrence of so many endemic, near-endemic and protected species makes it undesirable to destroy this zone completely, and preferable to avoid mining it as far as possible. In particular the *Commiphora* species are slow-growing and have a limited area of occurrence. The large woody species are also an important food and shelter resource for animals. However, the upper reaches of the large drainage lines north-west and east of the temporary base camp are out of the license area and can be expected to recolonise the lower reaches should there be any suitable habitat after mining activities cease.

It is recommended that at least the large drainage lines in the north-central area be left as pristine as possible, as they appear to lie predominantly outside the deposit zone.

B.2. Washes

The smaller drainage lines ('washes') are dominated by Zygophyllum cylindrifolium and Monechma genistifolium (Figure 8), and also harbour many of the smaller species that characterise the large drainage lines. Large woody species are rare in these washes.



Figure 8: Wash, dominated by Zygophyllum cylindrifolium and Monechma genistifolium.

No mitigation can reasonably be suggested for these washes because they are so numerous. The species they harbour occur in the washes outside the deposit zone and those washes should be preserved in the hope of later recolonisation of any suitable areas after mining ceases.

4.4.3 Zone C. Rocky/gravelly outcrop

In the north-central zone of the study area there is a section that lies outside the deposit area where the substrate is a collage of high-lying gravel plains with a very fragile crust and rocky patches and slopes (dark area on satellite image, Appendix 1, Figures 9, 10 and 11). This area harbours many of the species of concern listed for Zones A and B. It *includes Eragrostis nindensis* plains, large drainage lines and washes.





EIA Proposed Trekkopje Uranium Project



Figure 10: Zone C, rocky area.



Figure 11: Zone C, large drainage line.

Setting aside this area would preserve a reasonably representative portion of the habitats and flora of the license area as a whole. The fragile crust on sections of the gravel plain makes it very susceptible to vehicle damage, so vehicles should be excluded if possible.

4.4.4 Zone D. Boulder ridges/koppies

At the eastern, south-central and north-western verges of the license area there are several boulder ridges/koppies (Appendix 1). These are characterised by the occurrence of Commiphora virgata (Figure 12), Sarcocaulon marlothii (Figure 13), Aloe namibensis,, C. saxicola, Psilocaulon salicornioides, Hermannia complicata (all endemic), S. patersonii and Adenolobus pechuelii (near-endemics) and harbour many other species.





Figure 13: Zone D: Sarcocaulon marlothii (endemic).

Due to the endemic and near-endemic plant species found in this zone it would be preferable to avoid it if at all possible. However, none of the species is of excessively limited occurrence in the national sense (although obviously they are in the global sense). The Commiphoras are slow-growing and would be unlikely to re-establish

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except in the extremely long term and then only if the area was rehabilitated considerably. In addition to this there are quite extensive areas of similar habitat outside the license area where these species would continue to grow.

5. GENERAL DISCUSSION AND RECOMMENDATIONS

5.1 Damage limitation and restoration

Mining is not a sustainable activity. It usually causes permanent damage, albeit to a limited area, and in the past has already disturbed part of this site. In order to ensure that the area damaged is as limited as possible it should be emphasized that impacts such as clearing for roads and other structures on any remaining pristine or less disturbed vegetation in the direct surrounds and outside the limits of the deposit should be minimized in the hope of later recolonisation of the habitat.

5.1.1 Location of temporary and permanent infrastructure

It is recommended that areas that are already disturbed be utilised for any temporary camps or construction laydown. If possible construction teams should live off-site (e.g. in Arandis).

5.1.2 Firewood

No collection of firewood should be permitted during any phase of the project.

5.1.3 Tracks

Although some effort has clearly been made to control off-road driving it is essential that a grid of roads with demarcated turning points be established within the deposit area, and that driving outside the deposit area be limited to certain tracks also. Limiting of tracks within the potential mining area is necessary because generally it cannot be predicted with any certainty that a given area will be mined and may therefore be regarded as sacrificial and unnecessary to protect.

Some thought must be given to the type of road that is to be established, and to the maintenance of such. The main graded track long the middle of the deposit has washed away quite severely, indicating that this will probably always occur with east-west tracks. People are already making new tracks next to this one, thus creating what can become, and usually does become, an ever-wider strip of damage.

The main access road into the area is obviously also prone to washing away in depressions. Grader operators maintaining this road must understand clearly that they should re-use existing scrapes and borrow-pits and not create new ones ad lib.

If possible and economically feasible the area to be mined should be fenced to prevent damage to the remaining area.

5.1.4 Restoration

Without knowing what the extent of the damage will be it is difficult to make detailed recommendations. The following are general suggestions.

Exploration trenches where no mining will occur should be filled and contoured.

Any levelling or filling of artificially created hills or pits to restore reasonably natural contours (i.e. virtually flat or gently rounded in most cases here) may be expected to favour re-establishment of the original status quo regarding vegetation, and should be undertaken if economically feasible.

Where possible topsoil should be stockpiled for use during restoration.

5.1.5 Assessment and rescue missions – the role of the NBRI

Assessment of populations and losses of populations is an integral part of the Plant Red Data Assessment process. It is therefore very important that the NBRI be invited to assess the *Lithops* population occurring in the license area so that any new applications for the area can be assessed in the light of previous population losses.

It is also recommended that the NBRI be invited to undertake a rescue mission for protected species such as Lithops, Larryleachia, Sarcocaulon and Commiphora at their discretion.

Funding should be made available for travel and S & T expenses for NBRI staff in order to carry out these functions. At present they are undertaking similar work near Rössing.

No rescue missions should be undertaken until it is firmly established exactly what areas will be affected to prevent removal of plants that would, in fact, not be affected by project activities.

5.2 Environmental responsibility

5.2.1 Monitoring

The role of environmental manager/monitor should not be undertaken by a member of the exploration, construction or mining staff, because these roles are mutually exclusive. An outside person or one dedicated to the environmental role is necessary. At present it would seem that a knowledgeable, part-time, outside person (e.g. the consultant who did the photographic baseline damage assessment) doing regular checks would be the best, to be replaced by a permanent environmental officer once operations begin.

5.2.2 Penalties

During all phases of the project, but particularly during construction (when many contractors and subcontractors are usually involved), there should be contracturally

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set penalties in place for environmental transgressions. At all times the main contractor should be held responsible for damages, regardless of whether the damage was done by a subcontractor, in order to avoid passing of the buck.

6. SUMMARY OF PROJECT IMPACT ON VEGETATION

The project will have a negative impact on vegetation, and will affect populations of protected, endemic and near-endemic species. There will be contraventions of Nature Conservation Ordinance No. 4 of 1975, including amendments, and Forestry Act No. 72 of 1968. Strictly speaking permits would be required to destroy protected species, but in fact once an EIA has been passed and permission given for a project to proceed there have thus far been no repercussions in this regard when permits have not been sought.

6.1 Mined area

It is presently assumed that the entire deposit will be mined. Within the mined zone all plants will certainly be completely destroyed, and thus there will be a negative environmental impact. However this destruction should be limited to the deposit zone only, and should thus be very localised and affect only part of the license area. On a regional scale and higher it is a localised and limited impact.

Due to the nature of the activity the impact will be extremely high, and the damage will virtually be permanent unless restoration measures are taken. Even then the localised damage will be long-term.

Providing that:

- Strict measures are taken to limit the area damaged as far as possible, to preserve the rest of the license area and to facilitate rescue of species of conservation concern.
- Serious consideration be given to landscape restoration.

the broader significance of the impact is low, and should not influence the decision to go ahead with the project.

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DESTRUCTION OF VEGETATION	CONSTRUCTION		OPERATION	
	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Extent	LIM	LIM	LIM	LIM
Duration	Р	LT	Р	LT
Intensity	Н	М	VH	VH
Probability	D	D	D	D
Significance	М	L	М	L
Status	_	_	_	_
Degreeofconfidenceinpredictions	95%	95%	95%	95%

6.2 Construction and permanent infrastructure sites

Plants in peripheral areas such as temporary construction laydown sites and sites for permanent structures will probably also be severely damaged or lost completely, resulting in a negative environmental impact.

The extent of damage will depend upon the efforts made to restrict the area affected. The area affected could be extremely limited and localised if sufficient control is imposed. On a regional scale and higher it is a localised and limited impact.

Due to the nature of the activity the impact will be high. The damage to temporary sites will be relatively short-term while that to permanent sites will virtually be permanent unless restoration measures are taken.

Providing that:

- Strict measures are taken to limit the area damaged as far as possible, to preserve the rest of the license area and to facilitate rescue of species of conservation concern.
- Serious consideration be given to landscape restoration.

the broader significance of the impact is low, and should not influence the decision to go ahead with the project.

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DESTRUCTION OF	CONSTRUCT	ION	OPERATION	
TEMPORARY SITES	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Extent	LIM	LIM		
Duration	ST	T		
Intensity	М	L		
Probability	D	D		
Significance	М	L	М	L
Status	_	_	_	_
Degreeofconfidenceinpredictions	95%	95%	95%	95%

DESTRUCTION OF	CONSTRUCT	ION	OPERATION	
PERMANENT SITES	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Extent	LIM	LIM	LIM	LIM
Duration	Р	LT	Р	LT
Intensity	VH	Н	VH	Н
Probability	D	D	D	D
Significance	М	L	М	L
Status	_	_	_	_
Degreeofconfidenceinpredictions	95%	95%	95%	95%

6.3 License area outside the deposit zone

Impact on vegetation outside the zone of the deposit will be greatly influenced by mitigation measures taken to control collateral damage, such as that caused by vehicles. It will also be affected by decisions upon where to locate infrastructure and roads.

If collateral damage is controlled and infrastructure is sited in previously damaged areas or the area of the deposit there will be almost zero impact.

Potential impacts include damage to gravel plains and vegetation due to uncontrolled vehicle activity, siting and construction of infrastructure and removal of or damage to plants for firewood or other (e.g. ornamental) purposes.

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DESTRUCTION OF VEGETATION IN	CONSTRUCTION		OPERATION	
NON-DEPOSIT AREAS	Before Mitigation	After Mitigation	Before Mitigation	After Mitigation
Extent	L	LIM	L	LIM
Duration	LT	none	LT	none
Intensity	М	none	М	none
Probability	U	U	U	U
Significance	М	L	М	L
Status	_	_	_	—
Degreeofconfidenceinpredictions	95%	95%	95%	95%

One possible though uncertain impact would be erosion due to runoff if there were a deep pit close by.

Description	The type of effect that a proposed activity will have on the environment. A narrative of the impact.
Extent	Geographic area. Whether the impact will be within a limited area (on site where construction is to take place, LIM)), locally (within the site; L), regionally (R), nationally (N) or internationally (I).
Duration	Whether the impact will be temporary (during construction only; T), short term (1-5 years; ST), medium term (5-10 years; MT), long term (longer than 10 years, but will cease after operation LT) or permanent (P).
Intensity	Quantify the magnitude of the impact and outline the method(s) used in the quantification process. Low (L) where no environmental functions and processes are affected, Moderate (M) where the environment continues to function but in a modified manner or High (H) (environmental functions and processes are altered) VH Environmental processes cease completely. May also be measured in accordance with International standards, applicable conventions, best practice policy, levels of social acceptance, etc.
Mitigation	Discusses mitigation options, and whether such options would lessen the impact to an acceptable level.
Frequency of occurrence	A description of any repetitive, continuous or time-linked characteristics of the impact(s). Continuous (C), Intermittent - occurring from time to time, without specific periodicity (I), Periodic – occurring at more or less regular intervals (P), Time-linked – occurring only or mostly at specific times of the day or week (T).
Probability	The probability that a certain impact will in fact realise; Uncertain (U), Improbable (I), Probable (P); Highly Probable (HP); Definite (D). If the probability is uncertain, then there is not sufficient information to determine its probability. Because the precautionary principle is followed, this increases the significance of the impact. Attempt to quantify the probability in statistical terms (e.g. >75% certain)

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Significance	Significance is given before and after mitigation. Low if the impact will not have an influence on the decision or require to be significantly accommodated in the project design, Medium if the impact could have an influence on the environment which will require modification of the project design or alternative mitigation (the route can be used, but with deviations or mitigation) High where it could have a "no-go" implication regardless of any possible mitigation (an alternative route should be used).
Status of the impact	A statement of whether the impact is positive (a benefit), negative (a cost), or neutral. Indicate in each case who is likely to benefit and who is likely to bear the costs of each impact.
Legal requirements	An identification and list of specific legislation and permit requirements related to the specialist study that potentially could be infringed upon by the proposed project or which is required to enable the project to proceed. Reference to the proper procedures required to obtain appropriate permits should also be provided.
Degree of confidence in predictions	A statement of the degree of confidence in the predictions, based on the availability of information and the specialist's knowledge and expertise.

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Figure 1: Zone 1A. *Eragrostis nindensis* dominates the grassy plains in the north-east of the study area.

Figure 2: Blepharis grossa, a common near-endemic found on plains and in drainage lines in the study area.

Figure 3: Zone A2. Central gravel plains, dominated by Stipagrostis spp.

Figure 4: Larryleachia marlothii.

Figure 5: Various large woody species characterise the large drainage lines.

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