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REPORT

Compiled for
REPTILE URANIUM NAMIBIA (PTY) LTD

SCOPING REPORT FOR THE
OMAHOLA PROJECT

Report No RUNSCOREP/2010/01
11 October 2010
SCOPING REPORT FOR THE OMAHOLA PROJECT

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Date: 11 October 2010

File No: RUNSCOREP2010.01.DOC

Report No: RUNSCOREP/2010/01

Order No: RUN2010/01

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EXECUTIVE SUMMARY

Reptile Uranium Namibia (Pty) Ltd intends to submit applications for three mining licences on EPL 3496 in the Namib-Naukluft Park to the competent Namibian authorities for the extraction of uranium, iron and associated minerals (cumulatively known as the Omahola project). Before any mining licence can be granted, an environmental impact assessment process must be undertaken by the relevant applicant and authorised by the Ministry of Environment and Tourism. The compilation of this scoping report is a requirement of the draft environmental assessment regulations.

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APPENDIX A - PUBLIC PARTICIPATION PROCESS 1

A.1 Letters to MME and MET.
A.2 30 November meeting minutes.
A.3 23 March meeting summary

APPENDIX B - PUBLIC PARTICIPATION PROCESS 2

B.1 Forwarding letters to owners and occupiers of land adjacent to the site.
B.2 Forwarding letters to government authorities.

APPENDIX C - REGISTER OF INTERESTED AND AFFECTED PARTIES
1. INTRODUCTION

Deep Yellow Limited (DYL) is an Australian-based uranium company with extensive operations in Namibia and Australia. DYL’s principal exploration and development activity is in Namibia through its 100% owned subsidiary Reptile Uranium Namibia (Pty) Ltd (RUN), with its main development focus being the Omahola project situated on exclusive prospecting licence (EPL) 3496.

1.1 Omahola project outline
The Omahola project consists of the INCA uranium and magnetite, Tubas Red Sands (TRS) uranium and Shiyela magnetite deposits.

The INCA primary uranium deposit has moderate grade at 400 ppm U$_3$O$_8$ and is best described as metasomatic introduction of uranium and iron into a northeast plunging syncline. It also contains substantial quantities of magnetite, which can potentially be separated from the other ore material during processing for possible sale as a by-product. In addition, drilling at INCA has identified areas of magnetite without uranium mineralisation that could be suitable for a saleable magnetite product as well.

The TRS deposit consists of secondary uranium mineralisation (carnotite) in well-sorted aeolian (windblown) sand that occurs immediately south of the Tubas palaeochannel. The justification for the lower cut-off grade of the TRS deposit is based on unique aspects of the deposit. Firstly, the deposit is very near surface, with only minimal cover of wind-blown materials and gravel-gypcrete-calcrete of 1 - 2 metres. Secondly, TRS is predominately free-flowing to loosely consolidated sandy material. The combination makes the deposit amenable to simple and low cost (free-digging) mining techniques. Thirdly, TRS material tests positively to relatively simple physical beneficiation consisting of attritioning, scrubbing with ball loading, followed by screening; which results in a substantial upgrading in the contained uranium.

The Shiyela deposit is a substantial area of magnetite mineralisation without any uranium. The receipt and initial assessment of positive test results on magnetite bearing core samples from a 500 m vertical diamond drill hole into a regional aeromagnetic anomaly (M62) highlighted the potential of the M62 and M63 magnetic bodies to generate high quality magnetite concentrate and underpin a possible magnetite ‘iron-ore’ mining operation. Present core sample testing yields a high-grade magnetite concentrate with very low silica, no deleterious elements (SiO$_2$, Al$_2$O$_3$, P, S, TiO$_2$) and uranium content of less than 10 ppm U$_3$O$_8$.

1.2 Environmental impact assessment
RUN intends to submit applications for three mining licences on EPL 3496 in the Namib-Naukluft Park to the competent Namibian authorities for the extraction of uranium, iron and associated minerals. However, before any mining licence can be granted, an environmental impact assessment (EIA) process must be undertaken by the relevant applicant and authorised by the Ministry of Environment and Tourism (MET, 2009). In terms of Section 8 of the draft environmental assessment (EA) regulations (MET, 2009), RUN appointed Softchem as its environmental assessment practitioner (EAP) for this environmental impact assessment process and to compile this scoping report as a requirement in terms of Sections 19 and 26 of the draft EA regulations.

1.3 Scoping report structure
The EIA process followed for the Omahola project, based on the Namibian Environmental Assessment Policy of 1995 and the draft EA regulations of 2009, is illustrated in Figure 1.1 (Tarr and Figueira, 1999; SAIEA, 2003; MET, 2009; SAIEA, 2010). In terms of Section 26 of the draft EIA regulations the components of this scoping report are set out below, with references to the relevant sections within this report (MET, 2009):
- details of the EAP who prepared this report (Section 11),
- a description of the proposed activity (Section 3) and of any feasible and reasonable alternatives that have been identified (Section 5),
- a description of the property on which the activity is to be undertaken and the location of the activity on the property (Section 2),
- a description of the environment that may be affected by the activity (Section 6) and the manner in which the physical, biological, social, economic and cultural aspects of the environment may be affected by the proposed activity (Sections 4 and 8),
- an identification of laws and guidelines that have been considered in the preparation of the scoping report (Section 7),
- a description of environmental issues and potential impacts, including cumulative impacts, that have been identified (Section 8),
- information on the methodology to be adopted in assessing the potential impacts that have been identified, including any specialist studies or specialised processes to be undertaken (Section 8),
- details of the public participation process (Section 9),
- a terms of reference for environmental assessment that sets out the proposed approach to the environmental impact assessment of the application (Section 10), and
- any specific information required by the competent authority (Section 12).
Figure 1.1 The environmental assessment process for projects in Namibia.
2. PROPERTY DESCRIPTION

2.1 Regional setting
 RUN's Omahola project is located in the west of central Namibia, Southern Africa; situated approximately 40 km east of the major deepwater seaport at Walvis Bay and east-southeast of the coastal town of Swakopmund. The location of the project in relation to the mentioned towns, as well as mining operations in the area, is shown in Figure 2.1. The regional setting in terms of climate, land cover and other regional characteristics is described in Section 6.

![Figure 2.1 Location of the INCA, TRS and Shiyela deposits on EPL 3496.](image)

2.2 Proposed mining areas
 The proposed mining licence areas are illustrated in Figure 2.2 and the coordinates of these areas given in Tables 2.1 to 2.3.

Table 2.1 Coordinates of the INCA mineral deposit area.

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Table 2.2 Coordinates of the TRS mineral deposit area.

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Table 2.3 Coordinates of the Shiyela mineral deposit area.

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2.3 Land use

The proposed Omahola project is contained within the Namib Naukluft Park, which is used primarily for tourism. However, mineral exploration, drilling campaigns and mining operations have previously been undertaken either on or near the proposed project site intermittently during earlier ownerships (see Figures 2.3 and 2.4). According to SAIEA (2010), by the end of December 2009 four mining licences had been granted in the central Namib - two mines were operational, a third was undertaking trial mining, and the fourth was beginning construction. Illustrative examples of mining and other activities within the Namib Naukluft Park are given in Figures 2.5 and 2.6.
Figure 2.2 Location of the three Omahola project areas on EPL 3496.
Figure 2.3  Previous magnetite mining on EPL 3496.

Figure 2.4  Active gypsum mining on EPL 3496.
Figure 2.5 Example of a mining operation within the Namib Naukluft Park.

Figure 2.6 Example of a stone quarry within the Namib Naukluft Park.
3. DESCRIPTION OF THE PROPOSED ACTIVITY

The activities for the proposed Omahola project include, *inter alia*, construction of mining infrastructure, open cast mining, loading and hauling, processing of ore, tailings storage facility, the transport of U₃O₈ product, the disposal of waste rock, continuous rehabilitation and ultimately mine closure and final rehabilitation.

3.1 Resource INCA deposit

On 28 July 2010 Deep Yellow Limited (DYL) announced an update of the mineral resource estimate in accordance with the JORC Code* by the MSA Group of South Africa, for the main resource area at INCA. This resource update increased total indicated and inferred resources at INCA by 17% and increased grade by 9% with the updated resource totalling 17.1 million tonnes at 436 ppm eU₃O₈ for 7,429 tonnes (16.4 Mlbs) of U₃O₈ at 200 ppm U₃O₈ cut-off. In addition, total indicated resources doubled to 10 million lbs U₃O₈.

(DYL, 2010a)

* The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the ‘JORC Code’ or ‘the Code’) sets out minimum standards, recommendations and guidelines for public reporting in Australasia of exploration results, mineral resources and ore reserves. The Joint Ore Reserves Committee (‘JORC’) was established in 1971 and published several reports containing recommendations on the classification and public reporting of ore reserves prior to the release of the first edition of the JORC Code in 1989. Figure 3.1 sets out the framework for classifying tonnage and grade estimates to reflect different levels of geological confidence and different degrees of technical and economic evaluation. (AUSIMM, 2004)

Since the 28 July announcement, resource work has continued at INCA. In July DYL engaged Coffey Mining (Perth) to complete a further update of the mineral resource estimate, which will incorporate the INCA extension areas of mineralisation directly to the east and to the north (see Figure 3.2), and will include sections of deeper but higher grade mineralisation to the northeast. Coffey’s scope of work was expanded by DYL to incorporate the previously published INCA resource estimate by MSA into a new total resource estimate for the expanded area. This was done to ensure consistency with the updated estimate and to bring the entire resource estimate under a single JORC Competent Person’s review. (DYL, 2010a)

![Figure 3.1](image-url)

*Figure 3.1* General relationship between exploration results, mineral resources and ore reserves.
Figure 3.2  INCA drill hole map showing INCA main resource area relative to mineralised extensions.
3.2 Tubas Red Sands deposit

The Tubas Red Sands (TRS) deposit is part of the greater Tubas palaeochannel prospect where a large amount of historical work was completed by Anglo American Prospecting Services (AAPS) during the late 1970s. Geomine Consulting Namibia (Geomine) was commissioned by RUN to carry out a review and audit of the AAPS data, which resulted in Geomine declaring a JORC Code compliant inferred resource for the overall Tubas Project of 77Mt grading 228 ppm U₃O₈ at a cut-off grade of 100 ppm U₃O₈ in November 2007. (DYL, 2010b)

During 2007 RUN completed a reverse circulation (RC) drilling programme over part of the AAPS resource area centred on the main Tubas palaeochannel with the objective of providing information to supplement the Geomine resource estimate. Several holes from this programme intersected highly mineralised fine-grained red sand.

Uranium mineralisation at TRS comprises carnotite in aeolian (wind-blown) red sand located immediately south of the Tubas palaeochannel system. The sand deposit as drilled is up to 18 m thick and contains visible organic carbon that would have acted as a reductant to precipitate the uranium. The sand is free-digging and occurs over wide areas although only one grid area of about 1 by 1.4 km was drilled out for JORC Code resources. The low concentrations of carbonate (calcrete) in the sand also mean it will be amenable to either acid or alkaline extraction of uranium.

A decision was made to excavate a N-S trench (Figure 3.3) centred on one of these holes namely B2,800 7,500 (UTM 491605E 7467751N) which returned an average assay of 1,638 ppm U₃O₈ over 10 m from surface. Four other RC holes were drilled at 5 m spacings with two either side of this hole so the results from the trench wall channel samples can be compared back to the holes' chemical assays and radiometric logging equivalent uranium results. The trench was 20 m long at its planned terminal depth of 11 m ending in a hard undulating calcrete base. The walls of each cut and its floor were channel sampled on one metre block patterns (Figure 3.4).

Some 4,300 one metre channel samples were collected from the 12 m deep trench and chemically assayed. The results included exceptionally high concentrations of up to 2.4% U₃O₈. Of note is that the average assay value for the complete trench section is 1,296 ppm U₃O₈ over 10 m from surface using no cut-off. Applying a 100 ppm cut-off this value becomes 1,430 ppm U₃O₈ over 9 m. Applying a 200 ppm cut-off this value becomes 1,590 ppm U₃O₈, which represents the sand section only.

A close spaced 718 holes for a total of 8,942 m aircore drilling programme commencing on 20 metre spaced N-S lines and 10 m centres was undertaken by RUN with the trench as the centre point. Grid spacing was later increased to 20 m by 20 m and towards the end of the programme to 40 m by 40 m, as depicted in Figure 3.5.

MSA based the TRS modelling and JORC Code mineral resource estimate of 13,846,700 tonnes at 160 ppm eU₃O₈ for 2,217 tonnes (4.9 Mlbs) eU₃O₈ at 100 ppm U₃O₈ cut-off on data generated from RUN's drilling and trenching campaigns completed in 2007 and 2008 only. Data from the AAPS phase was excluded from this study.

As a consequence of the very positive physical beneficiation test results and free-digging nature of the TRS from surface, it is highly likely much lower grades of contained uranium can be economically mined. For example, initial testing indicates 150 ppm U₃O₈ run-of-mine material can be potentially upgraded to +500 ppm U₃O₈ for processing at the Omahola (INCA) processing plant.
Figure 3.3 Initial stages of Tubas trench excavation.

Figure 3.4 Final trench profile.
3.3 Shiyela deposit
Follow-on drilling began in late June 2010 in the vicinity of the M62 magnetic anomaly (Figure 3.6) where core samples from a RUN diamond drill hole completed in 2008 and now renamed SHID1 were recently reevaluated and found to produce a high-grade, low-impurity magnetite concentrate product. A series of lines of 60 degree angle reverse circulation (RC) drill holes spaced at 50 m are being drilled across strike in close proximity to the original diamond drill hole SHID1. Results on a section of Line 1 is illustrated in Figure 3.7 showing a plot of down hole magnetic susceptibility together with a visual estimate of magnetite content for each hole that indicates wide high-grade concentrations of magnetite that could sustain a large open-pit mining operation if continuity along strike is persistent. (DYL, 2010c)

A contract has been signed with Promet Engineers (Perth) to assist with engineering to completion of scoping study. Additional samples have been sent to Ammtec (Perth) for physical characteristic testing. Assaying and Davis Tube Recovery (DTR) will be done by ALS on a total of 66 samples (160 kg) selected from DC holes SHID2 and 3 (M62), and 4 (M63) to represent the 3 ore types namely hematite altered rock; fine grained material; and coarse grained material. Results will be used to develop a test work programme to determine the optimum DTR method; provide an analytical method for the RUN laboratory (and others) to follow; investigate the potential for dry magnetic separation to provide a sinter feed product; and preliminary engineering data.

The magnetite mineralisation is hosted by steeply dipping, fine-grained magnetite-rich metasediments; granite containing coarse magnetite; and, semi-massive to massive magnetite within a predominately granite and gneissic metasedimentary sequence. Photographs of these lithologies are shown in Figure 3.8. (DYL, 2010c)
Figure 3.6 Total magnetite intensity image showing local extent of interpreted "high magnetite terrain" in red at Shiyela.
Figure 3.7  West to east section on Line 1 looking north with histograms of magnetic susceptibility and visual estimate of magnetite content.
Figure 3.8  Reverse circulation drill chips from hole SHIR3 showing zones of massive magnetite.

3.4 Omahola process description
The proposed site layout for the Omahola project is given in Figure 3.9. An isomeric view of the proposed overall plant area is presented in Figure 3.10, with the site plan in Figure 3.11 and site sections of the overall plant area in Figure 3.12. A brief description of the proposed process is given below.
Figure 3.9  Site layout for the Omahola project.
3.4.1 INCA process plant

INCA run-of-mine ore will be crushed in a primary open circuit jaw crusher, which ensures a reasonable top size to the plant, and the resulting coarse ore stored in a covered stockpile that buffers production from the mine. The ore will be ground in a two-stage milling circuit to produce the required grind size. Process development test work indicated that the optimal grind for uranium recovery is between 150 to 300 µm. A coarser grind results in a lower uranium recovery due to large uranium “nuggets”, found in the ore, that are not liberated enough to leach. A finer grind results in an increase in acid consumption without any significant increase in uranium recovery.

A flotation circuit follows where pyrite will be recovered in a small mass pull. Some of the uranium will also concentrate with the pyrite. The concentrate will be thickened prior to being treated in a pressure oxidation process that produces sulphuric acid, ferric sulphate and heat. Any uranium that follows the pyrite will also be leached. As a rule, complex and refractory uranium floats very similar to sulphides. Highly oxidised, uranium silicates and other secondary uranium species do not float well. They do, however, leach well in a standard agitated atmospheric leach circuit. The process will therefore naturally route the refractory uranium to the very intensive pressure leach, while the non-refractory uranium is treated in a mild atmospheric leach.

The pressure oxidation circuit feed will be stored in the autoclave surge tanks. This surge is essential to ensure that the autoclave operates with the minimal amount of interruption. Slurry from the surge tank will be pumped into the autoclave via positive displacement high pressure feed pumps. Oxygen and steam (during start-up) will be added directly into the autoclaves to enable the leach reactions to start taking place. Once operating temperature is reached, the heat generated by the oxidation of pyrite will be enough to maintain temperature.

The autoclave will be a 6-stage mechanically agitated horizontal pressure vessel rated for operation at 28 bar and 210 °C. Mechanical features of the autoclaves include: a mild steel pressure vessel with organic lining for protection against acid attack, and brick lined, to prevent abrasion of the organic membrane by the process slurry. Solid titanium agitators, baffles and clave internals are used.

After leaching, the slurry from the autoclave will be let down through a flash vessel where steam will be produced for use in a direct contact (“splash”) heater that is used to heat up the flotation tails. The hot autoclave discharge will also be introduced into the atmospheric leach section as a source of further heat, acid and oxidising agent. The autoclave circuit has the following benefits:

- it halves the sulphuric acid consumption;
- produces heat that increases the uranium atmospheric leach circuit temperature;
- it produces ferric sulphate, an oxidation agent that is required during the uranium leach process - no additional oxidation agent like pyrolusite is therefore required; and
- it significantly increases the overall uranium recovery, due to the very high uranium leach efficiency inside the autoclave.

The uranium atmospheric and pressure leach products will be fed into the uranium leach reactor train. The train will consist of a number of large carbon steel rubber lined tanks with slurry cascading from one tank to the other. Additional sulphuric acid will be added to the leach reactors, if required, to maintain a target acid concentration in the leach discharge. This additional sulphuric acid required will be imported as concentrated acid and stored in two large tanks.
Figure 3.10 Isomeric view of the proposed overall plant area.
The pregnant leach solution (PLS) containing the uranium will be separated from the solids with the use of vacuum belt filters. The PLS will then be treated in a clarifier and routed to a direct solvent extraction plant. The remaining solids will be washed counter currently on the filter to remove all uranium and acid and the resulting weakly acidic uranium solution recycled back to the atmospheric leach section to capture the reagents and uranium.

Clarified PLS from the pin bed clarifier plant will be fed to two extraction columns in parallel, each operating at an aqueous to organic ratio of approximately 14:1. Barren solution from the extraction columns will be fed back to the autoclave feed and secondary milling circuits, where the acid will be neutralised by the carbonates contained in the ore. In order to prevent accumulation of other elements solubilised in the leach, a bleed stream from the raffinate inventory will be taken to the effluent section. All the excess acid not neutralised by the carbonates in the ore, will be neutralised with the use of limestone and lime.

Loaded solvent will be fed to the 4-stage mixer-settler-scrubbing section. The scrubbing step will remove impurities such as iron, chlorides and fluorides from the solvent to produce a pure uranium product. Scrub liquor will be returned to the extraction feed tank, as it will/may contain some uranium.

Stripping will be done in a pulsed column, using ammonium sulphate from the ammonium diuranate (ADU) precipitation plant and ammonium hydroxide from the SX Utilities section. The stripped solvent will be periodically regenerated with caustic and soda ash in a single mixer-settler regeneration stage. The SX Utilities section will also include an ammonium hydroxide make-up section, demineralised water generation, regeneration solution make-up and a cooling water circuit.

The rich strip solution from the SX plant will be fed into the first of three precipitation tanks connected in series. Here the pH will be adjusted upwards by sparging of gaseous ammonia. ADU will precipitate out and the resulting slurry fed to a small thickener. The thickener overflow will be pumped back to the SX plant, as strip liquor, via a polishing filter.

Thickener underflow will be pumped to the first of two wash centrifuges where the ADU slurry will be dewatered to about 40% (w/w) solids, and washed with clean demineralised water. ADU cake from the first centrifuge will be re-pulped with clean water and the process repeated in a second centrifuge. Clean ADU cake will be transferred to the ADU storage tank prior to being filtered. The filtered ADU will be dried in an indirect closed drier and then calcined to produce dry uranium oxide powder, which will be drummed as the plant final product.

Waste streams, along with the raffinate bleed, will be routed to an effluent treatment section. This section will have four reactors where the pH of the solution will be adjusted with limestone, followed by milk of lime. The resulting metal hydroxides and gypsum solids will be thickened to produce a small concentrated slurry stream that will be disposed off with the tailings. The thickener overflow (referred to as high pH process water) will be used on the final belt filter wash stage in the tails filtration section. Limestone will be supplied from sources locally and will be crushed, milled and classified on site. Milk of lime will be generated by slaking burnt lime.
Figure 3.11 Site plan of the proposed overall plant area.
3.4.2 Plant utilities
Other plant utilities will include, inter alia, air compressors, a diesel fired boiler to start the autoclave up, high pressure flush and cooling water, and an autoclave seal water system. The compressors will generate compressed air for distribution as plant air, with some air dried with the use of a refrigerant drier and then distributed as instrument air via a receiver. High pressure seal water and flush water for the pressure leach area will be situated close to the autoclave.

Water will be supplied from the mining pit or from water production boreholes. The water will be filtered and treated in a reverse osmosis (RO) plant. A portion of the water will be treated for the production of potable water and fire water to the plant. The remainder of the RO water will supply process water and gland seal water.

The process water will be stored in a dam next to the high pH process water dam. The fire water system will consist of a jockey pump, main electrical pump on emergency power and a diesel powered pump.

3.4.3 Satellite TRS plant
A satellite plant that will be referred to as the TRS plant, will treat Tubas Red Sand as feed. This plant will be approximately 14 km away from the main plant. At this plant an uranium concentrate will be produced by scrubbing the feed and by size classification. Local saline underground water will be used for this plant using a local wellfield system. The fines fraction that contains the uranium will be transferred to the main plant and fed into the atmospheric leach section. The barren oversize material will be de-watered and backfilled into the opencast pit area. Due to the secondary nature of the uranium in the concentrate, a shorter and milder leach will suffice. This feed will increase the PLS (SX feed) uranium concentration.

3.4.4 Iron recovery plant
An iron recovery plant will also be constructed for the recovery of magnetite from the uranium plant tails. The tails, that will contain very little uranium, will be re-slurried and subjected to three stages of low intensity magnetic separation (LIMS). The resulting magnetic concentrate that will contain very high levels of iron, will then be filtered and supplied in bulk to customers as a secondary plant product. The final plant tails, now containing less magnetite, will be filtered once again and disposed of as a solid final plant residue.

3.5 Other site infrastructure/requirements
Due to the closeness of EPL 3496, the proposed activity area, to the towns of Swakopmund and Walvis Bay; it is envisaged that no employees will be housed on site during either the construction or operational phase of the proposed project. Access to site will be principally via the existing district road from Swakopmund (C28).

No external water requirements for the proposed mine with its auxiliary services are foreseen at present. As discussed in Section 3.4.2, water supply will be obtained from underground resources and treated on site for use within the process and for ablution and human consumption requirements. At this stage sufficient underground resources are believed to be available for desalination on site, as can be seen from the gusher exiting a hole 150 m away from where air pressure was applied to another drill hole in Figure 3.13.

With regard to power requirements, discussions with NamPower are still ongoing and at this stage it looks feasible to make use of the servitude supplying the existing Langer Heinrich Uranium operation.

The supply of telecommunications facilities to the site is being investigated at present, with once again the possibility of making use of existing infrastructure and servitudes.
Figure 3.12 Site sections of the proposed overall plant area.
Figure 3.13 Water gusher exiting a drill hole illustrating the extent of the required pit de-watering.
4. NEED AND DESIRABILITY OF THE PROPOSED ACTIVITY

4.1 Demand for uranium

Uranium is used for peaceful purposes in the nuclear industry for the production of electricity. Nuclear power currently represents 15% of electricity generated worldwide, with the balance produced by coal 41%, hydro 16%, gas 20%, oil 6% and wind and other sources 2%. Sixteen countries depend on nuclear power for at least a quarter of their electricity, with France obtaining around three quarters of their power supply from nuclear energy. Countries like Belgium, Bulgaria, Czech Republic, Hungary, Slovakia, South Korea, Sweden, Switzerland, Slovenia and the Ukraine get one third or more of their electricity demands from nuclear power. (WNA, 2010a)

The countries with the largest nuclear power generating capacities are the United States (101,229 MW), France (63,236 W), Japan (47,348 MW), Russia (23,084 MW), Germany (20,339 MW), South Korea (17,716 MW), Ukraine (13,168 MW), Canada (12,679 MW), United Kingdom (10,962 MW) and China (10,234 MW) (WNA, 2010b). There is minimal growth in nuclear generation capacity in the major developed countries, with most anticipated growth emanating from countries in the East (WNA, 2010b), for example China (182 reactors either under construction, planned or proposed) and India (64 reactors under construction, planned and proposed). Today, the world produces as much electricity from nuclear energy as it did from all sources combined in 1960, see also Figure 4.1 (WNA, 2010a).

![Nuclear Electricity Production and Share of Total Electricity Production](image)

**Figure 4.1** Nuclear electricity production and share of total electricity production.

There are at present 441 nuclear reactors in operation across the world (installed capacity of 376,313 MW), with a further 547 either presently under construction, planned or proposed (WNA, 2010b). The required uranium to supply these reactors is estimated at 68,646 t U₃O₈ per year (WNA, 2010b).
4.2 Supply of uranium
Uranium is ubiquitous on the earth and a constituent of most rocks and even of the sea. It is a metal approximately as common as tin or zinc, with some typical concentrations given in Table 4.1 (WNA, 2010c).

Table 4.1 Typical uranium concentrations.

<table>
<thead>
<tr>
<th>Location</th>
<th>Concentration ppm U</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very high grade ore - 20% uranium</td>
<td>200,000</td>
</tr>
<tr>
<td>High grade ore – 2% uranium</td>
<td>20,000</td>
</tr>
<tr>
<td>Low grade ore – 0.1% uranium</td>
<td>1,000</td>
</tr>
<tr>
<td>Very low grade ore - 0.01% uranium</td>
<td>100</td>
</tr>
<tr>
<td>Granite</td>
<td>4 - 5</td>
</tr>
<tr>
<td>Sedimentary rock</td>
<td>2</td>
</tr>
<tr>
<td>Earth’s continental crust (average)</td>
<td>2.8</td>
</tr>
<tr>
<td>Seawater</td>
<td>0.003</td>
</tr>
</tbody>
</table>

An orebody is, by definition, an occurrence of mineralisation from which a metal is economically recoverable. It is therefore relative to both costs of extraction and market prices. At present, neither the oceans nor any granites are orebodies, but conceivably either could become so if prices were to rise sufficiently. Measured resources of uranium, the amount known to be economically recoverable from orebodies, are thus also relative to costs and prices. They are also dependent on the intensity of past exploration effort. Changes in costs or prices, or further exploration, may alter measured resource figures markedly. At ten times the current price, seawater becomes a potential source of vast amounts of uranium. Thus any predictions of the future availability of any mineral, including uranium, which are based on current cost and price data and current geological knowledge, are likely to be extremely conservative. Table 4.2 gives some idea on the present understanding of uranium resources. (WNA, 2010c)

Table 4.2 Known recoverable resources of uranium (2009).

<table>
<thead>
<tr>
<th>Country</th>
<th>Uranium (tonne)</th>
<th>Percentage of world</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>1,673,000</td>
<td>31</td>
</tr>
<tr>
<td>Kazakhstan</td>
<td>651,000</td>
<td>12</td>
</tr>
<tr>
<td>Canada</td>
<td>485,000</td>
<td>9</td>
</tr>
<tr>
<td>Russia</td>
<td>480,000</td>
<td>9</td>
</tr>
<tr>
<td>South Africa</td>
<td>295,000</td>
<td>5</td>
</tr>
<tr>
<td>Namibia</td>
<td>284,000</td>
<td>5</td>
</tr>
<tr>
<td>Brazil</td>
<td>279,000</td>
<td>5</td>
</tr>
<tr>
<td>Niger</td>
<td>272,000</td>
<td>5</td>
</tr>
<tr>
<td>United States</td>
<td>207,000</td>
<td>4</td>
</tr>
<tr>
<td>China</td>
<td>171,000</td>
<td>3</td>
</tr>
<tr>
<td>Jordan</td>
<td>112,000</td>
<td>2</td>
</tr>
<tr>
<td>Uzbekistan</td>
<td>111,000</td>
<td>2</td>
</tr>
<tr>
<td>Ukraine</td>
<td>105,000</td>
<td>2</td>
</tr>
<tr>
<td>India</td>
<td>80,000</td>
<td>1.5</td>
</tr>
<tr>
<td>Mongolia</td>
<td>49,000</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>150,000</td>
<td>3</td>
</tr>
<tr>
<td>World total</td>
<td>5,404,000</td>
<td>-</td>
</tr>
</tbody>
</table>
Albeit that present demands for uranium are augmented by nuclear weapons stockpiles (for example, from 2000 the dilution of 30 t of military high-enriched uranium has been displacing about 10,600 t of uranium oxide per year from mines, WNA, 2010c; and overall 500 t of Russian weapons high-enriched uranium will result in about 15,000 t of low-enriched uranium fuel for power reactors over 20 years, WNA, 2010d), the majority of these demands have to be met by mining. For 2009 the total world production from mining was 50,772 t uranium (59,875 t U\(_3\)O\(_8\)), with Kazakhstan having the largest share of uranium from mines at 27% (of world supply from mines), followed by Canada with 20% and Australia at 16% (WNA, 2010e). Consolidation in the uranium production industry since the early 1990s has resulted in ten mining companies accounting for 89% of the world's uranium mine production, as shown in Table 4.3 (WNA, 2010e). The largest producing Western world uranium mines in 2009 are given in Table 4.4, with production from these countries contrasted against reactor requirements for the period 1945 to 2004 in Figure 4.2 (WNA, 2010e).

### Table 4.3 The ten main uranium mining companies in 2009.

<table>
<thead>
<tr>
<th>Company</th>
<th>Uranium (tonne)</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Areva</td>
<td>8,623</td>
<td>17</td>
</tr>
<tr>
<td>Cameco</td>
<td>8,000</td>
<td>16</td>
</tr>
<tr>
<td>Rio Tinto</td>
<td>7,963</td>
<td>16</td>
</tr>
<tr>
<td>KazAtomProm</td>
<td>7,467</td>
<td>15</td>
</tr>
<tr>
<td>ARMZ</td>
<td>4,624</td>
<td>9</td>
</tr>
<tr>
<td>BHP Billiton</td>
<td>2,955</td>
<td>6</td>
</tr>
<tr>
<td>Navoi</td>
<td>2,429</td>
<td>5</td>
</tr>
<tr>
<td>Uranium One</td>
<td>1,368</td>
<td>3</td>
</tr>
<tr>
<td>Paladin</td>
<td>1,210</td>
<td>2</td>
</tr>
<tr>
<td>GA/Heathgate</td>
<td>583</td>
<td>1</td>
</tr>
<tr>
<td>Other</td>
<td>5,550</td>
<td>11</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>50,772</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

### Table 4.4 The largest producing Western world uranium mines in 2009.

<table>
<thead>
<tr>
<th>Mine</th>
<th>Country</th>
<th>Main owner</th>
<th>Type</th>
<th>Production (tonne U)</th>
<th>% of world</th>
</tr>
</thead>
<tbody>
<tr>
<td>McArthur River</td>
<td>Canada</td>
<td>Cameco</td>
<td>underground</td>
<td>7,339</td>
<td>15</td>
</tr>
<tr>
<td>Ranger</td>
<td>Australia</td>
<td>ERA (Rio Tinto 68%)</td>
<td>open pit</td>
<td>4,444</td>
<td>9</td>
</tr>
<tr>
<td>Rössing</td>
<td>Namibia</td>
<td>Rio Tinto (69%)</td>
<td>open pit</td>
<td>3,520</td>
<td>7</td>
</tr>
<tr>
<td>Kraznokamensk</td>
<td>Russia</td>
<td>ARMZ</td>
<td>underground</td>
<td>3,004</td>
<td>6</td>
</tr>
<tr>
<td>Olympic Dam</td>
<td>Australia</td>
<td>BHP Billiton</td>
<td>by-product/uground</td>
<td>2,955</td>
<td>6</td>
</tr>
<tr>
<td>Tortkuduk</td>
<td>Kazakhstan</td>
<td>Areva/Kazatomprom</td>
<td>in-situ leaching</td>
<td>2,272</td>
<td>4</td>
</tr>
<tr>
<td>Arlit</td>
<td>Niger</td>
<td>Areva/Onarem</td>
<td>open pit</td>
<td>1,808</td>
<td>4</td>
</tr>
<tr>
<td>Rabbit Lake</td>
<td>Canada</td>
<td>Cameco</td>
<td>underground</td>
<td>1,447</td>
<td>3</td>
</tr>
<tr>
<td>Akouta</td>
<td>Niger</td>
<td>Areva/Onarem</td>
<td>underground</td>
<td>1,435</td>
<td>3</td>
</tr>
<tr>
<td>Budenovskoye 2</td>
<td>Kazakhstan</td>
<td>Kazatomprom</td>
<td>in-situ leaching</td>
<td>1,415</td>
<td>3</td>
</tr>
<tr>
<td><strong>Top ten total</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>29,638</strong></td>
<td><strong>59</strong></td>
</tr>
</tbody>
</table>
4.3 Uranium oxide prices
Uranium oxide prices fluctuate like most commodities, dependent on supply and demand trends. As of 27 September 2010 the weekly spot price is $46.50/lb U₃O₈ (UXCC, 2010a). The price fluctuations for U₃O₈ between 1989 and September 2010 are illustrated in Figure 4.3 (UXCC, 2010b). Financial modelling for the proposed Omahola project indicates that the project is capable of producing satisfactory returns.

4.4 Relevance of economic viability
Uncertainties or substantial fluctuations in production levels, or the actual failure of resource projects, potentially create adverse social and environmental impacts. This is particularly so in the case of large scale projects involving major supporting physical and social infrastructure. Therefore the analysis of the broad economic viability of a project forms a relevant important component of an environmental impact assessment.

Figure 4.2 Western world uranium production and demand, 1945 to 2004.

Figure 4.3 Price fluctuations for U₃O₈ between 1989 and September 2010.
In the case of the proposed Omahola project, assessing economic viability involves consideration of the forecast demand for mined uranium, and its anticipated price relative to the proposed investment in its production. However, for this project fluctuations in the rate of production will have only a minor impact on the socio-economic structure of the region, compared with larger resource projects that involve the establishment of townships and the provisions of a wide range of support services. The proposed project places minimal demands on government services and the interaction with the local community will be relative modest and predominantly beneficial.

4.5 Economic and non-economic benefits and costs
Social and economic impacts of the proposed Omahola project will form part of the environmental impact assessment to be undertaken for the project. Naturally new job opportunities will be created at the proposed mine, coupled with economic benefits to the Namibian government and the Swakopmund/Walvis Bay regional community through direct and indirect taxes, and purchases and acquired services in the Swakopmund/Walvis Bay regional area.

Economic costs to the regional community will be minimal, particularly with regard to infrastructure, as dedicated power infrastructure will be developed as part of the proposed project in conjunction with the relevant authorities, water infrastructure for the project will be developed on site, and additional transportation infrastructure costs beyond the Namibian regional road system will be borne by Reptile Uranium Limited.

Significant non-economic benefits can be expected to emanate from increased employment opportunities in skilled and semi-skilled jobs, including the associated training and experience, in the Swakopmund/Walvis Bay regional community, including social upliftment programmes and through an employment multiplier of about 200 percent.
5. ALTERNATIVES

5.1 Ecologically sustainable development
The goal of ecologically sustainable development (ESD) is to achieve development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends (EPA, 1995a). The objectives of ESD are to (EPA, 1995a):

- enhance the individual and community wellbeing and welfare by following a path of economic development that safeguards the welfare of future generations;
- provide for equity within and between generations; and
- protect biological diversity and maintain essential ecological processes and life support systems.

The challenge for governments and the mining industry is to develop further the mining industry and efficiently manage the renewable and non-renewable resources on which it depends, in accordance with the principles of ESD. Governments are committed to achieving this by pursuing a number of strategic approaches and initiatives to ensure that sound environmental practices are used and promoted throughout all key sectors of the mining industry. (EPA, 1995a)

The precautionary principle is a major principle of ESD that underlines Reptile Uranium Namibia's environment protection approach to efficient management of the renewable and non-renewable resources on which it depends. The principle states that (EPA, 1995a):

where there are threats of serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

In the application of the precautionary principle, public and private decisions should be guided by (EPA, 1995a):

- careful evaluation to avoid, where practicable, serious or irreversible damage to the environment; and
- an assessment of the risk-weighted consequences of various options.

The specific designs, approaches and locations used for the proposed development in Section 3, are largely dependent on the physical, biological and social environments impacting on, and being impacted upon, the proposed development. However, ESD principles guided the approaches used to design the Omahola project's processing facilities, the manner in which mining will proceed and strategies for rehabilitation. These principles are as follows (EPA, 1995a):

- adoption of external and internal code of practice, guidelines, standards and principles for exploration, environmental management, rehabilitation and community relations activities;
- comprehensive study, planning, evaluation and development of project proposals;
- extensive consultation with government, landowners and community groups;
- objective and comprehensive environmental impact and risk assessment of projects;
- comprehensive environmental management systems;
- research and development programmes;
industry environmental review, education and knowledge-sharing networks;
integration of long-term economic, environmental, social and equity goals in policies, actions and activities;
ensuring that environmental assets are appropriately valued;
involving communities in decisions and actions on issues that affect them;
developing environmentally sound international competitiveness and an economy that can enhance environment protection; and
recognising the global dimension of the environment and impacts on it.

5.2 Assessment of alternatives
In terms of Section 26(1)(b) of the draft environmental assessment regulations it is a requirement to provide a description of any feasible and reasonable alternatives that have been identified. Alternatives are different means of meeting the general purpose and need of a proposal (DEAT, 2006) and can be categorised into the following (DEAT, 1998):

- demand alternatives (for example, using energy more efficiently rather than building more generating capacity),
- activity alternatives (for example, providing public transport rather than increasing road capacity),
- location alternatives (for example, either for the entire proposal or for components of the proposal, like the location of a processing plant for a mine),
- process alternatives (for example, the re-use of process water in an industrial plant, waste minimising or energy efficient technology, different mining methods),
- scheduling alternatives (for example, staggering the travelling to and from a plant during off peak times), and
- input alternatives (for example, use of alternative raw materials or energy sources).

The no-go alternative is the option of not undertaking the proposed activity or any of its alternatives. The no-go alternative also provides the baseline against which the impacts of other alternatives should be compared. It should be noted that the no-go alternative may sometimes not be a "real" or "implementable" alternative (for example, where the capacity of a sewage pipeline has to be increased to cope with current demand). It should, however, remain the default option and must always be included to provide the baseline for assessment of the impacts of other alternatives and also to illustrate the implications of not authorising the activity. (DEAT, 2006)

With all the categorised alternatives, the location (site) alternative normally plays the biggest role in assessment of an activity and its related impacts. However, in the case of mining operations the location is seldom available for alternative selection as the proposed mineral for extraction is by its very nature of a particular project exactly at the particular selected site. It is thus imperative that alternatives in some of the other categories be investigated for mining operations, inclusive of alternative extraction methods and relevant processing operations. Scheduling and input alternatives can also be assessed for future benefits to the environment. These alternative options are at present being further evaluated and assessed as part of the overall design of the proposed mining operation.
5.3 Consequences of not proceeding
Failure of the proposed Omahola project to proceed may not significantly affect world markets in the longer term (in excess of 20 years), but will certainly benefit Namibia’s competitors in the shorter term. The proposed Omahola development is cost effective and capable of producing $U_3O_8$ product at competitive prices.

The construction phase of the proposed Omahola project will create some 300 to 350 jobs in Namibia. During the actual operational phase, approximately 120 employment opportunities will exist at the mine. Although much of these newly created job opportunities will occur in the mining industry, additional job creation effects will take place in various other sectors as well; for example, personal services, transport and equipment manufacturing. There will be no employment benefit if the mine does not proceed. (Friend et al., 2005)

The proposed Omahola development will generate new income opportunities for the Namibian government and to the Swakopmund/Walvis Bay regional communities. These income derived sources will include:

- indirect government taxes,
- licence fees and charges,
- pay as you earn (PAYE) taxes, and
- company taxes paid to government.

The proposed development will also contribute to regional development in Namibia, through sourcing of materials, services and labour. Recent estimates indicate that, when fully operational, direct and indirect taxes to the Namibian government will be in the order of N$ 70 to 100 million per year. This income will be foregone if the mine does not proceed. (Friend et al., 2005)

Purchases and acquired services in the Swakopmund/Walvis Bay regional area, associated with full operation, are estimated to be approximately N$ 20 million per year, and in the rest of Namibia, approaching N$ 10 million per year. During the construction phase of approximately 12 months, an estimated N$ 300 million will be spent on the project, of which at least 30% will be locally sourced. These purchases will not be made if the mine does not proceed. (Friend et al., 2005)

Benefits for not proceeding with the project can be summarised as the following primary benefits:

- the resource will remain in place for possible future development,
- there will be no further visual impact of development,
- there will be no disruption to local communities arising from construction and operation, and
- there will be no alteration to local biodiversity arising from construction and operation.
6. DESCRIPTION OF THE ENVIRONMENT

In this part of the scoping report a brief description of the environment that may be affected by the activity is provided in accordance to Section 26(1)(d) of the draft environmental assessment regulations (MET, 2009). Based on the terms of reference developed for this proposed activity in Section 10, detailed information on the affected environment will be accessible after completion of the various aspect and specialist studies.

6.1 Climate

6.1.1 Temperature
The Namib Desert near the coast has a temperature range that is moderated by proximity to the sea. As distance increases from the coast the temperature range rapidly becomes more extreme. The hottest month is February, when maximum air temperatures can reach 40°C but the average maximum is 25°C - 30°C. The coldest month is August, when the average minimum temperatures are between 8°C and 12°C depending on distance from the coast. (Christian, 2006)

6.1.2 Precipitation
The average annual rainfall ranges from about 15 mm at the coast to about 35 mm further inland and can best be described as extremely variable, patchy and unreliable. A given location can go for years without any rain. However, the project area receives significant amounts of moisture from fog or dew, particularly near the coast. This fog is sufficient to support at least two species of lichens and many other plants in the project area. (Christian, 2006)

6.1.3 Wind
Near the coast strong southerly winds prevail, but westerly to south westerly winds are also frequent. With increasing distance from the coast the wind speed generally decreases and its direction becomes more variable. Warm easterly winds from the interior blow for typically between 7 and 14 days per year. These “berg winds” are hot dry winds caused by air descending from the interior. As the air descends it is compressed, causing a rapid increase in temperature. These winds can cause serious sandstorms, particularly in winter and spring. (Christian, 2006)

6.2 Geology
Mineralisation at INCA has characteristics of both metasomatic and magnetite (calc-silicate) skarn types that is distinct and different from the known lower grade alaskite hosted uranium mineralisation being mined at other projects in the district. The mineralisation appears to be at least partly structurally controlled and occurs within a partly overturned fold or syncline. There is a 20 to 70 metre thick crystalline marble unit within the metamorphic package which, for all intent, is totally unaffected by the alteration associated with the uranium and iron mineralisation and occurs below the mineralisation (see Figure 6.1).

The TRS resource area is dominated by surficial sediments and more recent sediments belonging to the westerly flowing Tubas River drainage. Swakop Group carbonates, red granites and Proterozoic gneisses outcrop/subcrop along the south-western parts of the resource area. The TRS uranium mineralisation is associated with a loosely packed, stratiform sand horizon that can be broadly classified as an aeolianite. The sand is fine to medium grained, with medium to well rounded quartz grains, containing occasional organic material. Carnotite mineralisation (see Figure 6.2) can be seen disseminated throughout the sand, primarily forming the matrix of the sand horizon and probably associated with a finer clay fraction that also acts as a matrix to the sand.
Figure 6.1  South to north section showing main rock types, alteration and mineralisation at INCA.

Figure 6.2  Carnotite cementing red sand at Tubas Red Sands.
A calcrete horizon forms the natural footwall to the sand unit and is generally not well mineralised. The footwall to the sand is generally defined by gypcrete and calcrete along with the more recent gravels associated with the present-day Tubas River drainage.

At Shiyela initial investigations indicate steeply dipping magnetite gneiss, fine grained magnetite-rich metasediments, granite containing coarse magnetite and massive magnetite. A preliminary geological evaluation at Shiyela outlined a broad zone, approximately 100 m wide, characterised by southwest orientated, narrow lenses of massive magnetite (see Figure 6.3).

![Figure 6.3 Outcrop of massive magnetite band.](image)

6.3 Topography
The proposed project area consists of a wide variety of granitic rocks that occur in the mountainous areas to the east and low-lying gravel plains that are generally fairly flat, except where they have been incised by rivers (erosion cycles, leading to shifts in the horizontal and vertical alignments of watercourses, resulted in the formation of old river terraces that now stand at elevations of several metres higher than the present watercourses). (Christian, 2006)

6.4 Soils
The soils of the Namib Desert are formed by various processes, both mechanical and chemical. Nearer the coast, fog, which contains salts and hydrogen sulphide, intensifies chemical processes and soil genesis. The various types of soils found in the area consists of gypsum soils near the coast; further inland the broken crusts found on the surface are more likely to be calcrete (often covered by a layer of quartz pebbles, which may support lichens) and underlying the grassy plains are hard substrates comprised of coarse sandy material, which is probably stabilised by carbonates but not to the extent that hard crusts are formed. (Christian, 2006)
6.5 Natural vegetation
The Central Namib along the west coast of Namibia is contained in the Desert Biome and geographically covers the area between the Kuiseb River in the south and the Huab River in the north. A number of rare, protected and endemic plant species have been identified at the project area, such as *Welwitschia mirabilis* (Figure 6.4), *Hoodia cf currorii*, *Acacia erioloba*, *Acanthosicyos horridus*, *Aloe asperifolia* (Figure 6.5), *Arthraerua leubnitziae*, *Capparis hereroensis*, *Commiphora saxicola* and *Euphorbia lignosa*. There are no Red Data plant species recorded for the project area, however, six species are protected according to the Namibia Forest Act, three species under the Namibia Nature Conservation Ordinance and six species are listed under CITES. Two restricted endemic, seven endemic and 12 near-endemic plant species are recorded for the project area. (Van Rooyen, 2010)

6.6 Fauna
For fauna in the project area overall terrestrial diversity and endemism (all species) are classified as “low” and “average” respectively in the western coastal part of Namibia, with the overall mammal diversity in the general Swakopmund area estimated at between 16 - 30 species with 3 - 4 species being endemic to the area (Mendelsohn *et al.* 2002). At least 31 species of mammals are known and/or expected to occur in the general Swakopmund area of which 9 species (29%) are classified as endemic. (Cunningham, 2010)

6.7 Archaeological sites
Archaeological sites are scattered throughout the Namib Desert, and may occur in the project area. These may be associated with places that either provided shelter, water, or stone circles used as hunting blinds by the San people. Once again this can only be determined once a specialist study of the project area has been conducted. (Christian, 2006)

![Figure 6.4 Welwitschia mirabilis.](image)
Figure 6.5  Aloe asperifolia.
7. APPLICABLE LEGISLATION

The management and regulation of mining activities falls within the jurisdiction of the Ministry of Mines and Energy (MME); with environmental regulations guided and implemented by the Directorate of Environmental Affairs (DEA), within the Ministry of Environment and Tourism (MET).

The Omahola project lies within the existing Namib Naukluft Park. Since establishment of the park, numerous prospecting and mining activities have been conducted within it. Environmentally irresponsible behaviour by some operating companies, resulting in long-lasting damage, has led to the establishment of the Policy for prospecting and mining in protected areas and national monuments in 1999 (the term ‘protected areas’ includes national parks and game reserves). This policy document outlined the procedures to be followed before government takes a decision if a prospecting or mining activity may commence.

Since then various legislation have been drafted, with some already promulgated and in force. The draft regulations for environmental assessment (MET, 2009) have not yet been promulgated but provides the basis of the environmental assessment process followed for the Omahola project, as has been the case with various other project proposals currently in progress, and has been recommended as such by representatives of the Ministry of Environment and Tourism (MET) during an information exchange meeting held at their offices in Windhoek on 23 March 2010. In addition, any proposed mining project should also have to adhere to the following 13 principles of environmental management (SAIEA, 2003; Friend et al., 2005):

- renewable resources shall be utilised on a sustainable basis for the benefit of current and future generations of Namibians,
- community involvement in natural resource management and sharing in the benefits arising there from shall be promoted and facilitated,
- public participation in decision making affecting the environment shall be promoted,
- fair and equitable access to natural resources shall be promoted,
- equitable access to sufficient water of acceptable quality and adequate sanitation shall be promoted and the water needs of ecological systems shall be fulfilled to ensure the sustainability of such systems,
- the precautionary principle and the principle of preventative action shall be applied,
- there shall be prior environmental assessment of projects and proposals which may significantly affect the environment or use of natural resources,
- sustainable development shall be promoted in land use planning,
- Namibia’s movable and immovable cultural and natural heritage including its biodiversity shall be protected and respected for the benefit of current and future generations,
- generators of waste and polluting substances shall adopt the best practicable environmental option to reduce such generation at source,
- the polluter pays principle shall be applied,
- reduction, re-use and recycling shall be promoted, and
- there shall be no importation of waste into Namibia.
The legislation of the Namibian government that have been considered in the preparation of the scoping report, in terms of Section 26(1)(e) of the draft environmental assessment regulations (MET, 2009), are presented below. (These referenced documents will be included in Reptile Uranium Namibia's legal register and reviewed on a continuous basis to ensure compliance with current legislation and environmental management best practices.)

**Constitution of the Republic of Namibia (1990)**

*Administrative body:* various ministries of the Namibian government.

*Main objectives*

Article 95 of the Constitution of the Republic of Namibia states that “the State shall actively promote and maintain the welfare of the people by adopting, *inter alia*, policies aimed at … maintenance of ecosystems, essential ecological processes and biological diversity of Namibia and utilisation of natural resources on a sustainable basis for the benefit of all Namibians both present and future; in particular the Government shall provide measures against the dumping or recycling of foreign nuclear and toxic waste on Namibian Territory.”

Article 101 further states that the principles embodied within the constitution “shall not of and by themselves be legally enforceable by any court, but shall nevertheless guide the Government in making and applying laws. … The courts are entitled to have regard to the said principles in interpreting any laws based on them.”

**Electricity Act (No 2 of 2000)**


*Main objectives*

The act provides for the establishment and function of the Electricity Control Board. It replaces the Electric Power Proclamation 4 of 1922. The Electricity Regulations (administrative) are contained in Government Gazette 2371.

**Environmental Assessment Policy (1995)**

*Administrative body:* Environmental Assessment Unit, Department of Environmental Affairs, Ministry of Environment and Tourism.

*Main objectives*

The policy requires that a proponent follows the integrated environmental management procedure set out in the policy. In terms of this, a detailed environmental assessment is required to be submitted to the Ministry of Environment and Tourism (MET) for any mining, mineral extraction and mineral beneficiation activity.

**Environmental Investment Fund of Namibia Act (No 13 of 2001)**

*Administrative body:* Directorate of Environmental Affairs, Ministry of Environment and Tourism.

*Main objectives*

The act provides for the establishment of the Environmental Investment Fund of Namibia to support sustainable environmental and natural resources management in the country and for a mechanism to turn environmental crimes into positive protection for the environment (SAIEA, 2010). Fines paid in terms of the Environmental Management Act, and money made from the sale of property which is forfeited in connection with such crimes, will be paid into the Environmental Investment Fund (SAIEA, 2010). The money in the fund could be used for (SAIEA, 2010):
• sustainable use and management of natural resources,
• maintenance of the natural resource base and ecological processes,
• maintenance of biological diversity and ecosystems, and
• economic improvements in the use of natural resources for sustainable rural and urban development.

**Environmental Management Act (No 7 of 2007)**

*Administrative body:* Directorate of Environmental Affairs, Ministry of Environment and Tourism.

*Main objectives*

The act is not yet in force, but it will give legislative effect to the EIA policy, enable the establishment of the Sustainable Development Advisory Council and the appointment of the Environmental Commissioner and environmental officers. It is expected that these institutions will improve the management of impact assessment in Namibia. The act requires government agencies to work with a unity of purpose in ensuring sustainable resource management. Beyond this, it commands developers to gain clearance from the Environmental Commissioner (not yet appointed) before proceeding with plans. Criminal penalties for violating the conditions of a granted environmental clearance are stiff. (SAIEA, 2010)

**Forest Act (No 12 of 2001)**

*Administrative body:* Ministry of Agriculture, Water and Forestry.

*Main objectives*

The act makes provision for the declaration of protected areas for the purposes of soil protection, water resources protection, protection of plants and other elements of biological diversity. The Minister may also declare any plant or species of any plant a protected plant and impose conditions under which it shall be conserved, cultivated, used or destroyed by any person. The act further requires a permit before clearing any living vegetation within 100 metres of a river or stream. (SAIEA, 2010)

**Labour Act (No 6 of 1992)**

*Administrative body:* Ministry of Labour.

*Main objectives*

The act regulates the conditions of employees and addresses:

• unfair dismissals and disciplinary actions;
• termination of contracts of employment;
• registration, rights and duties of trade unions and employers’ organisations;
• settlement of disputes between employees or trade unions and employers or employers’ organisations;
• appointments, powers, duties and functions of the Labour Commissioner and inspectors;
• the establishment of a Labour Advisory Council, a Labour Court, district labour courts and a Wages Commission; and
• the health, safety and welfare of employees.
A number of regulations have been gazetted since 1992, dealing with various aspects related to employer and employees rights, including the Regulations relating to the health and safety of employees at work, promulgated in terms of the Labour Act (Government Gazette 1617 of 1 August 1997). The administration of these regulations is assigned to various ministers by Proclamation 10/1997, as published in Government Gazette 1615.

**Minerals (Prospecting and Mining) Act (No 33 of 1992)**

*Administrative body:* Department of Mines, Ministry of Mines and Energy.

*Main objectives*

This act regulates reconnaissance, prospecting and mining of minerals. Various licence types, and their implications, are stipulated. The act details reporting requirements for monitoring of activities and compliance to environmental performance, such as disposal methods. The Mining Commissioner, appointed by the Minister, is responsible for implementing these regulations. A Mineral Board has also been established, the functions of which are to advise the Minister and cooperate with other ministries.

Several explicit references to the environment and its protection are contained in the act, which provides for environmental impact assessments, rehabilitation of prospecting and mining areas and minimising or preventing pollution.

Section 91(f) requires that an application for a mining licence contains particulars of:

- the condition of the existing environment;
- an estimate of the impacts and the proposed mitigation measures; and
- details regarding pollution control, waste management, rehabilitation and minimisation of impacts on adjoining land.

**Namibian Water Corporation Act (No 12 of 1997)**

*Administrative body:* Ministry of Agriculture, Water and Rural Development.

*Main objectives*

The main functions addressed in this act are to:

- establish the Namibian Water Corporation limited;
- regulate its power, duties and functions;
- provide for efficient use and control of water resources; and
- provide for incidental matters.

**National Heritage Act (No 27 of 2004)**

*Administrative body:* Ministry of Culture.

*Main objectives*

This act provides for the protection and conservation of places and objects of heritage significance. All archaeological and paleontological objects belong to the state and once an artefact or fossil has been discovered, all mining operations must cease, the area must be cordoned off, and the National Heritage Council needs to be notified. A person who removes, demolishes, damages, despoils, develops, alters or excavates, all or any part of a protected place is liable to a fine of up to N$100,000 or to imprisonment for up to 5 years, or to both the fine and imprisonment. If damage is caused to a heritage place or object as a result of failure to comply with the act, the person responsible must remedy the damage, failing which the Council may itself take the necessary action and recover the cost from that person. (SAIEA, 2010)
Parks and Wildlife Management Bill of 2009

Administrative body: Directorate of Parks and Wildlife Management, Ministry of Environment and Tourism

Main objectives

This bill is still in preparation and aims "to provide a legal framework to provide for and promote the maintenance of ecosystems, essential ecological processes and the biological diversity of Namibia, and the utilisation of living natural resources on a sustainable basis for the benefit of Namibians, both present and future, and to promote the mutually beneficial co-existence of humans with wildlife, to give effect to Namibia's obligations under relevant international legal instruments, and to repeal the Nature Conservation Ordinance 4 of 1975." The bill allows the Ministries of Environment and Tourism and Mines and Energy to agree to withdraw certain areas within parks from mining. Apart from these "no go" areas, mining within parks would only be permitted with written authorisation from the Minister of Environment and Tourism. (SAIEA, 2010)

Water Act (No 54 of 1956)

Administrative body: Department of Water Affairs, Ministry of Agriculture, Water and Rural Development.

Main objectives

This act was inherited from South Africa and will be replaced by the National Water Resources Act (No 24 of 2004). The current act makes provision for a number of functions pertaining to control and use of water resources, water supply and protection of water resources. The Department of Water Affairs is responsible for conservation and utilisation of these resources. A distinction is made between private and public water in terms of ownership, control and use. The act does not recognise the natural environment as a water user, nor does it specifically address environmental sustainability (and is thus considered not consistent with the constitution).

Sections 21 and 22 deals explicitly with the prevention of water pollution.

Water Resources Management Act (No 24 of 2004)

Administrative body: Department of Water Affairs, Ministry of Agriculture, Water and Rural Development.

Main objectives

The act has been passed and published, but is not yet in force. Once promulgated it will replace the Water Act (No 54 of 1956). The act provides more specific procedures for water abstraction permitting that are much more tailored to Namibia's climate and geohydrology than the Water Act of 1956. (SAIEA, 2010)
8. ENVIRONMENTAL IMPACTS AND ASSESSMENT METHODOLOGY

The objective of the assessment of impacts is to identify and assess all the significant impacts that may arise from the undertaking of an activity and the findings used to inform the competent authority’s decision as to whether the activity should be either authorised, authorised subject to conditions that will mitigate the impacts to within acceptable levels, or should be refused (DEAT, 2006). In this sense impacts are defined by DEAT (2006) as the changes in an environmental parameter that result from undertaking an activity. These changes are the difference between effects on an environmental parameter where the activity is undertaken compared to that where the activity is not undertaken, and occur over a specific period and within a defined area (DEAT, 2006).

8.1 Impact types
Different types of impacts may occur from the undertaking of an activity, which may be positive or negative, and can be categorised as being either direct (primary), indirect (secondary) or cumulative impacts. Direct impacts are impacts that are caused directly by the activity and generally occur at the same time and at the place of the activity (for example, dust generated by blasting operations on the site of the activity). These impacts are usually associated with the construction, operation or maintenance of an activity and are generally obvious and quantifiable. However, indirect impacts are induced changes that may occur as a result of the activity (for example, the use of water from a natural source at the activity will reduce the capacity for supply to other users). These types of impacts include all the potential impacts that either do not manifest immediately when the activity is undertaken, or which occur at a different place as a result of the activity. (Jain et al., 1993; Fuggle and Rabie, 1994; DEAT, 2006)

Cumulative impacts are impacts that result from the incremental impact of the proposed activity on a common resource when added to the impacts of other past, present or reasonably foreseeable future activities (for example, removal of vegetation may cause soil erosion, leading to excessive sediments in a receiving stream, leading to reduced sunlight penetrating the water and thus reducing dissolved oxygen in the water and adversely affecting aquatic life and water quality). Cumulative impacts can occur from the collective impacts of individual minor actions over a period of time and can include both direct and indirect impacts. (Jain et al., 1993; DEAT, 2006)

8.2 Identification of impacts
The identification of the potential impacts of an activity on the environment should include impacts that may occur during the start/construction, operation and decommissioning/rehabilitation phases of an activity (DEAT, 2006). The process of identification and assessment of impacts includes, inter alia, the (Jain et al., 1993; DEAT, 2006):

- determination of current environmental conditions in sufficient detail so that there is a baseline against which impacts can be identified and measured;
- determination of future changes to the environment that will occur if the proposed activity does not take place;
- understanding of the activity in sufficient detail to understand its consequences; and
- identification of significant impacts that are likely to occur if the activity is undertaken.

8.3 Impact mitigation
Once impacts have been identified and predicted for a particular activity, appropriate mitigation measures need to be established (DEAT, 2006). Mitigation measures are the modification of certain activities in such a way as to reduce the impacts on the environment (Jain et al., 1993). The objectives of mitigation are to (DEAT, 2006):
find more environmentally sound ways of doing things;
enhance the environmental benefits of a proposed activity;
avoid, minimise or remedy negative impacts; and
ensure that residual negative impacts are within acceptable levels.

When mitigation is considered for (certain) impacts, it should be organised in a hierarchy of actions, namely (DEAT, 2006):

• avoid negative impacts as far as possible through the use of preventative measures,
• minimise or reduce negative impacts to "as low as practicable" levels, and
• remedy or compensate for negative residual impacts that are unavoidable and cannot be reduced further.

8.4 Proposed activity environmental impacts
Certain impacts of the proposed activity on the environment can be identified during this scoping phase. These identified impacts will also provide an indication of the subsequent specialist studies required, as discussed in Section 10 of this report, and are as follows (note that although some mitigation measures are mentioned, more detailed measures will be presented during the environmental assessment phase and in many cases will negate listed impacts):

• possible loss of flora and fauna communities - mining activities will definitely have a negative impact on these environmental aspects; although through either rehabilitation efforts or off-set programmes these effects can be minimised;
• land use capabilities - as described in Section 2.3, at present the site can be suitable for tourism activities, although certain areas can no more be considered a green field based on previous mining and exploration activities;
• noise impacts - based on the type of activity proposed, namely mining, there exist the potential to generate noise in excess of acceptable ambient levels and mitigation measures, both through designed abatement methodologies and operational procedures, would be required to minimise and sometimes negate these impacts;
• air quality - mining operations will impact on this aspect with subsequent cumulative negative impacts on air quality;
• archaeological, heritage and cultural aspects - no immediate impacts are recognised at present, but these can only be confirmed once a specialist study has been completed as envisaged in Section 10.2;
• radiological issues - the type of mine proposed have the potential to contaminate various environmental aspects through ionising radiation, radon gas and other radionuclides; although these effects already exist in this environment due to the natural presence of uranium and its daughter products in the waters and soils;
• sensitive landscapes and visual aspects - within the Namib-Naukluft Park with its scenic beauty any mining operation will impact negatively on this impact, and sense of place (Barnard et al., 2006) issues should play a significant role;
• social environment - additional workforce during construction and operational phases of the proposed project will impact on the present social environment;
• water pollution - possible pollution of ground and surface water should be negated by adherence to present and proposed legislation with regard to water management principles; and
• economic impacts - positive impacts should result for the local community with the generation of more jobs in the area.
8.5 Impact assessment methodology
The concepts for environmental impact assessments in this report will relate to risk assessment (the process whereby certain impacts to the environment are identified), risk valuation (by using a stipulated assessment criteria whereby impacts are given a rating or weighting and obtaining an overall rating or significance of an impact) and risk management (relating directly to applicable mitigation measures to be implemented to manage a risk of an impact in the "best" interest of a society; Shogren, 1990). Such an assessment is also a requirement in terms of Sections 26(1)(g) and 26(1)(i)(iii) of the environmental assessment (EA) regulations (MET, 2009). The guideline criteria set out in Section 27(k) of the EA regulations, in conjunction with assessment criteria from DEAT (1998), Friend et al. (2005), DEAT (2006) and Friend and Van Rooyen (2009); will be followed in this report and are presented in the following sections.

8.5.1 Nature or status of the impact
An appraisal of the type of effect the activity would have on the affected environment; rated as either positive (beneficial impact on the environment), neutral (no impact on the environment), or negative (adverse impact on and at a cost to the environment).

8.5.2 Extent or scale of the impact
Indicates whether the impact will be either site specific (impacting within the boundaries of the site), local (within an area of 5 km of the site), regional (Namib-Naukluft Park area), on a national scale (Namibia) or across international borders (Southern Africa).

8.5.3 Duration of the impact
Indicates whether the lifetime of the impact will be either short term (0 - 5 years), medium term (5 - 15 years), long term (where the impact will cease after the operational life of the activity, either because of natural process or human intervention), or permanent (where mitigation either by natural process or human intervention will not occur in such a way or in such a time span that the impact can be considered transient).

8.5.4 Intensity or magnitude of the impact
Establishes whether the impact is destructive or benign and is indicated as either low (where the impact affects the environment in such a way that natural, cultural and social functions and processes are not affected), medium (where the affected environment is altered but natural, cultural and social functions and processes continue, albeit in a modified way), high (natural, cultural or social functions or processes are altered to the extent that it will temporarily cease); or very high (natural, cultural or social functions or processes are altered to the extent that it will permanently cease).

8.5.5 Probability of the impact
Describes the likelihood of the impact actually occurring and is indicated as either improbable (the possibility of the impact to materialise is very low, either because of design, historic experience or implementation of adequate corrective actions), probable (there is a distinct possibility that the impact will occur), highly probable (it is most likely that the impact will occur), or definite (the impact will occur regardless of any prevention or corrective actions).

8.5.6 Determination of significance
After assessment of an impact in accordance to the preceding five criteria, the significance of an impact can be determined through a synthesis of the aspects produced in terms of their nature, extent, duration, intensity and probability. In Table 8.1 various ratings are accorded to these criteria. These ratings are now used to calculate a significance (S) rating and is formulated by adding the sum of ratings given to the extent (E), duration (D) and intensity (I) and then multiplying the sum with the probability (P) of an impact as follows:
Significance (S) = (E + D + I) x P

The resultant ratings are now described as follows (see also Table 8.1):

- S < 25 implies a low impact (meaning this impact would not have a direct influence on the decision to develop in the area),
- S = (25 - 50) implies a medium impact (where the relevant impact could influence the decision to develop in the area unless it is effectively mitigated), and
- S > 50 implies a high impact (this impact must have an influence on the decision process to develop in the area).

**Table 8.1** Ratings used for determining impact significance.

<table>
<thead>
<tr>
<th>Nature of impact (N)</th>
<th>Extent of impact (E)</th>
<th>Duration of impact (D)</th>
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<tbody>
<tr>
<td>positive</td>
<td>site specific</td>
<td>short term</td>
</tr>
<tr>
<td>neutral</td>
<td>local</td>
<td>medium term</td>
</tr>
<tr>
<td>negative</td>
<td>regional</td>
<td>long term</td>
</tr>
<tr>
<td></td>
<td>national</td>
<td>permanent</td>
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<tr>
<td></td>
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</table>

<table>
<thead>
<tr>
<th>Intensity of impact (I)</th>
<th>Probability of impact (P)</th>
<th>Significance of impact (S)</th>
</tr>
</thead>
<tbody>
<tr>
<td>low</td>
<td>improbable</td>
<td>low</td>
</tr>
<tr>
<td>medium</td>
<td>probable</td>
<td>medium</td>
</tr>
<tr>
<td>high</td>
<td>highly probable</td>
<td>high</td>
</tr>
<tr>
<td>very high</td>
<td>definite</td>
<td>very high</td>
</tr>
</tbody>
</table>

### 8.5.7 Additional evaluation criteria

Apart from the assessment criteria presented in the preceding sections; impacts will also be evaluated and assessed based on cumulative impacts, relevant reversibility, potential for irrereplaceable loss of resources and level of confidence.

Cumulative impacts (see Table 8.2) can arise from one or more activities and can be defined as being either an additive impact, that is where it adds to the impact caused by other similar impacts; or an interactive impact, that is where a cumulative impact is caused by different impacts that combine to form a new impact. Interactive impacts may cause either countervailing (the nett adverse cumulative impact is less than the sum of the individual impacts), or synergistic (the nett adverse cumulative impact is greater than the sum of the individual impacts). (DEAT, 2006)

The reversibility of an impact simply indicates to what degree its influence on the relevant environment can be negated and is presented in Table 8.2. The potential for irrereplaceable loss of resources, based on a relevant impact, indicates the degree to which the impact may cause such loss and is presented in Table 8.2.

The level of confidence indicates the level of certainty that specialists have in the accuracy of their predictions with regard to a relevant assessment and its related determined significance. This will be based on any factors that could bring into doubt the accuracy of their relevant predictions, (for example, an investigation undertaken during a non-ideal season, key research data being unavailable) and thus compromise the level of confidence in the assessment of an impact. The levels of confidence used in this report are presented in Table 8.2 and for levels with either a medium or low level applicable, an additional explanation will be provided as to what the relevant impacting factors were.
Table 8.2 Additional assessment criteria.

<table>
<thead>
<tr>
<th>Cumulative impacts</th>
<th>Reversibility of impacts</th>
<th>Potential for resource loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>none expected</td>
<td>complete</td>
<td>will not take place</td>
</tr>
<tr>
<td>additive</td>
<td>intermediate</td>
<td>there is a possibility of</td>
</tr>
<tr>
<td></td>
<td>not possible</td>
<td>this happening</td>
</tr>
<tr>
<td>interactive countervailing</td>
<td>int cou</td>
<td>probably</td>
</tr>
<tr>
<td></td>
<td>int syn</td>
<td>this will definitely happen</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Level of confidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>No uncertainty is associated with the prediction of the impact and all necessary information was available.</td>
</tr>
<tr>
<td>The prediction was based on virtually all necessary information being available, with the exception of insignificant information that will not materially affect the outcome of the prediction.</td>
</tr>
<tr>
<td>Although the majority of the necessary information was available, there is some uncertainty associated with the impact predicted.</td>
</tr>
<tr>
<td>There is a high degree of uncertainty associated with the impact predicted as certain key information was unavailable at the time of the prediction.</td>
</tr>
</tbody>
</table>

8.5.8 Impact assessment presentation

All relevant impacts on the environment are rated and evaluated as set out in the preceding sections and presented via impact tables. It should be noted that impacts are evaluated after mitigation measures, where relevant and indicated as such in the impact tables, have been taken into account. The project impacts are further subdivided into the following three phases*, from which impacting activities can be identified (DEAT, 1998):

- construction phase – all activities on and off site, including the transport of material,
- operational phase – all activities, including operation and maintenance of structures, and
- decommissioning/rehabilitation phase – any activity related to the physical dismantling of the structures and/or restoring of process/mining land to some degree of its former state.

* note that while planning and design is recognised as a project phase, it is for this project and generally for most projects, of no negative impact significance.
9. PUBLIC PARTICIPATION PROCESS

In terms of Section 26(1)(h) of the draft EA regulations (MET, 2009), it is a requirement to provide details of the public participation process conducted in accordance with Section 32 of the draft EA regulations. Although the term stakeholder engagement is gaining acceptance worldwide as a replacement for the term public participation (DEAT, 2002), this is still the terminology used within the draft EA regulations and will be utilised throughout the report where relevant. Clarification of the term public versus stakeholder is provided in Figure 9.1 (DEAT, 2002).

![Figure 9.1 Clarification of the term "public" versus "stakeholder".](image)

Public participation forms an integral part of any present day environmental assessment process. The objectives of public participation can be summarised as follows (Lakhani, 2000):

- informing stakeholders;
- presentation of views, concerns and values;
- maximising benefits and minimising risks;
- influencing project design;
- obtaining local knowledge;
- increasing public confidence;
- better transparency and accountability in decision-making; and
- less conflict (decision-making through consensus).

In order to address these objectives, information exchange meetings were held with the Ministries of Mines and Energy (MME) and Environment and Tourism (MET) on 30 November 2009 and on 23 March 2010. During these meetings representatives of Reptile Uranium Namibia and Softchem gave presentations of the proposed activity, and obtained feedback and suggestions from representatives of the MME and MET present at these meetings. Notification letters, minutes (30 November 2009 meeting) and meeting summary (23 March 2010) of these meetings are presented in Appendix A.

In addition to the above, the various other actions required for public participation, in terms of Section 32 of the draft EA regulations, are set out in the following sections.

9.1 Notification of potentially interested and affected parties

The requirements for the notification of potentially interested and affected parties of this application are set out in detail in Section 32(2)(b) of the draft EA regulations (MET, 2009). These requirements have been addressed and include, *inter alia*:

- forwarding letters to the owners and occupiers of land adjacent to the site (see Appendix B for copies of these letters);
• forwarding letters to government authorities (see Appendix B for copies of these letters);
• fixing of a notice board at a place conspicuous to the public; and
• placing of advertisements in at least one local newspaper.

9.2 Proof of notice boards and advertisements
Proof of the placement of a notice board is given in Figures 9.2 and 9.3. The advertisements placed in the Republikein newspaper on 10 September 2010, the Namibian newspaper on 13 September 2010, and The Southern Star newspaper on 17 - 23 September 2010 are shown in Figures 9.4, 9.5 and 9.6 respectively.

9.3 Register of interested and affected parties
An interested and affected parties register has been opened, as required in terms of Section 33(1) of the draft EA regulations (MET, 2009), and the present edition is presented in Appendix C.

9.4 Summary of issues raised by interested and affected parties
Apart from various parties forwarding their contact details and information for registration and placement on the IAP register, no other issues have been raised in writing thus far during the public participation process.

![Figure 9.2 Placement of notice board at entrance to EPL3496.](image-url)
Figure 9.3  Wording on notice board placed at entrance to EPL3496.

Figure 9.4  Advertisement published in the Republikein newspaper on 10 September 2010.
Figure 9.5 Advertisement published in the Namibian newspaper on 13 September 2010.

Figure 9.6 Advertisement published in The Southern Times newspaper on 17 - 23 September 2010.
10. TERMS OF REFERENCE (PLAN OF STUDY)

It is a requirement in terms of Section 26(1)(i) of the draft EA regulations (MET, 2009) to include a terms of reference (plan of study) for environmental assessment that sets out the proposed approach to the environmental assessment of the application. The terms of reference relevant to the Omahola project is presented in the following sections.

10.1 Description of tasks to be undertaken for environmental assessment process

A flow diagram of the environmental assessment process for projects in Namibia was presented in Section 1.3 and can be summarised in Stages A to G as follows:

- Appointment of EAP by the relevant applicant. [A]
- Confirmation of current/correct process to follow for the environmental assessment process through consultation with the competent Namibian authorities (Ministries of Environment and Tourism and Mines and Energy). [B]
- Completion of specialists team selections, initiation of public participation process, meeting with local authorities and scoping report. [C]
- Handing in of scoping report to relevant competent authorities and making available to the public and interested and affected parties in particular. [D]
- Receive comments from interested and affected parties and feedback/decision from competent authority on scoping report; and if scoping report has been accepted; continue with relevant specialist investigations; compilation of draft environmental assessment report and environmental management plan; and public participation process (through open days/meetings). [E]
- Based on specialist investigation reports, interested and affected parties' feedback, the environmental impact assessment report is completed and handed in to the competent authorities. [F]
- Receive feedback/decision from the competent authority with regard the environmental impact assessment report and, as in this particular case, mining licence applications. [G]

10.2 Investigations to be completed for environmental impact assessment

Use will be made of specialists to conduct a number of investigations. The various aspects that will be addressed for the environmental assessment to make an objective assessment of the proposed activity and any related alternatives, including the no-go option, are presented in Table 10.1.

10.3 Indication of the stages for competent authority consultation

During Stage B for confirmation of administrative detail, Stage C for discussions with local authorities as to the need for the proposal and other suggestions, Stage D during handing in of documentation (if required), Stage E during the authority's feedback (if required), and any other stage if so required by the competent authority.

10.4 Description of assessment methodology

The proposed method of assessing the environmental issues and alternatives, including the option of not proceeding with the activity, is set out in Section 8.5 of this report.

10.5 Particulars of the public participation process

The public participation process that will be conducted during the environmental assessment process will follow the requirements set out in Section 32 of the draft EA regulations, as well as the guidelines published as part of the Integrated Environmental Management Guideline Series (No 7) published on 18 June 2010. These will include, *inter alia*, (DEA, 2010):
• notification of potential interested and affected parties (IAPs) of the proposed activity and the publication of draft reports,
• placement of notice board and advertisements in local and regional newspapers,
• having an open day/meeting for IAPs,
• maintaining an interested and affected parties register, and
• informing IAPs of any new information forthcoming during the environmental impact assessment process.

The public participation process for this proposed activity has already started and was presented in Section 9. At present two open day public participation meetings are planned for 3 November 2010 in Windhoek and 5 November 2010 in Swakopmund.

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Organisation</th>
<th>Name(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>climate</td>
<td>Airshed Planning Professionals</td>
<td>Hanlie Liebenberg-Enslin</td>
</tr>
<tr>
<td>geology</td>
<td>Reptile Uranium Namibia</td>
<td>Dr Leon Pretorius</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Klaus Frielingsdorf</td>
</tr>
<tr>
<td>topography</td>
<td>Reptile Uranium Namibia</td>
<td>Dr Leon Pretorius</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Klaus Frielingsdorf</td>
</tr>
<tr>
<td>soils</td>
<td>Reptile Uranium Namibia</td>
<td>Dr Leon Pretorius</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Klaus Frielingsdorf</td>
</tr>
<tr>
<td>land use capabilities</td>
<td>Reptile Uranium Namibia</td>
<td>Dr Leon Pretorius</td>
</tr>
<tr>
<td></td>
<td>Softchem</td>
<td>Francois Friend</td>
</tr>
<tr>
<td>hydrology</td>
<td>Eco Aqua</td>
<td>Mark Stanton</td>
</tr>
<tr>
<td>air quality</td>
<td>Airshed Planning Professionals</td>
<td>Hanlie Liebenberg-Enslin</td>
</tr>
<tr>
<td>natural vegetation</td>
<td>Ekotrust</td>
<td>Dr Noel van Rooyen</td>
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<tr>
<td>animal life</td>
<td>Environmental and Wildlife</td>
<td>Peter Cunningham</td>
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<tr>
<td>Consulting Namibia</td>
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<tr>
<td>archaeological, heritage and</td>
<td>Quaternary Research Services</td>
<td>Dr John Kinahan</td>
</tr>
<tr>
<td>cultural aspects</td>
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<td>sensitive landscapes and visual aspects</td>
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<td>Dr Leon Pretorius</td>
</tr>
<tr>
<td></td>
<td>Softchem</td>
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<tr>
<td>noise</td>
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<tr>
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<td>Dr Detlof von Oertzen</td>
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<td>social and economic environment</td>
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<td></td>
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</tr>
<tr>
<td>occupational health and safety</td>
<td>National Environmental Health Consultants</td>
<td>Johan Cornelissen</td>
</tr>
<tr>
<td>process investigation and design</td>
<td>SNC-Lavalin</td>
<td>Craig de Jager</td>
</tr>
</tbody>
</table>

Table 10.1 Aspects to be addressed during environmental assessment and relevant parties involved in these studies.
11. DETAILS OF THE ENVIRONMENTAL ASSESSMENT PRACTITIONER

In terms of Section 26(1)(a) of the draft EA regulations (MET, 2009) it is a requirement to provide details of the environmental assessment practitioner (EAP) who prepared the report and the expertise of the EAP to carry out scoping procedures. This is provided in the following sections under general information, experience and related publications.

11.1 General information

**Name:** John Francois Curling Friend  
**Education:**  
BEng (Chem)  Pretoria  1986  
MSc (Eng)  Cape Town  1991  
Dip MktM  IMM  1995  
**Affiliations:**  
FSAIChe (Fellow, South African Institution of Chemical Engineers)  
FIChemE (Fellow, United Kingdom Institution of Chemical Engineers)  
FWISA (Fellow, Water Institute of South Africa)  
FIWM(SA) (Fellow, Institute of Waste Management of Southern Africa)  
**Registrations:**  
PrEng (Professional Engineer, Engineering Council of South Africa)  
CEng (Chartered Engineer, United Kingdom Engineering Council)  
**Specialisation:** Water management, treatment and recycling. Air quality and waste management. Environmental management, economics, assessments and auditing. Technical audits and effluent treatment. Specialised computer applications.

11.2 Experience

**1991 - Present**  
Softchem, founder member. Waste management (Eloptro), water management (Sasol Mining and Eskom), water treatment dedicated software (Anglo American Research Laboratories and Veolia Eau in France), functional specifications and operating manuals for water treatment plants (Saldanha Steel as subcontractor to DB Thermal), technical and environmental auditing (Eskom), environmental impact assessments (including public participation meetings) and evaluations (ABI/Coca-Cola, Necsa, Paladin Resources/Langer Heinrich Uranium and Gautrans), environmental management programme report (Eurocoal), environmental consulting and ISO 14001 environmental system implementation (Eskom, Midvaal Water Company and Vametco Alloys).

**2005 - Present**  
SI Analytics (Pty) Ltd., Director Operations and Projects. Supplying air monitoring equipment to industry and government.

**1997 - Present**  
Waterops (Pty) Ltd., Director: Operations and Marketing. Water treatment plant operations and troubleshooting, through Thermax representation supply of various chemicals and ion exchange resins.

**1998 - 2007**  
University of Pretoria, Department of Chemical Engineering, Senior Lecturer. Responsible for the Environmental Engineering Group lecturing environmental engineering and postgraduate courses in environmental management, air quality management, waste management, air pollution control and water management.

**1992 - 1998**  

**1990 - 1992**  
Eskom Chemical Engineering Division, Design Engineer. Water management studies at numerous power stations and external to Eskom, eg Soda Ash Botswana. Effluent treatment plant design.
1988 - 1990
Koeberg Nuclear Power Station, Engineer in Training. Water treatment plant operation and troubleshooting, sodium hypochlorite production, sewage treatment and water chlorination plants, ion exchange resins.

1985 - 1986

11.3 Related publications*


* additional publications available from the website www.softchem.co.za.
12. SPECIFIC INFORMATION REQUIRED BY COMPETENT AUTHORITY

At this stage no additional information is required by the competent authority.
13. REFERENCES


