

URANIUM MINING IN NAMIBIA

The mystery behind 'low level radiation'



Researched and compiled by
Hilma Shirindoda-Mate

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Labour Resource and Research Institute

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Abbreviations

AIDS	Acquired Immune Deficiency Syndrome
BON	Bank of Namibia
CAF	Canadian Ambassador's Fund
COM	Chamber of Mines
CBNRM	Community Based Natural Resource Management
GDP	Gross Domestic Product
HIES	Household Income and Expenditure Survey
HIV	Human Immune Virus
EPL	Exclusive Prospecting License
EIA	Environmental Impact Assessment
EMA	Environmental Management Act
EWT	Endangered Wildlife Trust
EMP	Environmental Management Plan
MET	The Ministry of Environment and Tourism
MME	Ministry of Mines and Energy
MUN	Mine Workers Union of Namibia
NIMT	Namibian Institute of Mining and Technology
NAMDEB	Namibia Diamonds Co-operation Limited
NGO	Non-governmental Organisations
NLFS	Namibia Labour Force Survey
LaRRI	Labour Resource and Research Institute
SADC	Southern African Development Community
SOMO	Centre for Research on Multinational Corporations

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Many thanks are extended to the current and former Rössing workers who were interviewed for this study. We thank them very much for sacrificing their precious time and telling us about their work and life experiences. We sincerely hope that their testimonies will lead to some action regarding the promotion and protection of the rights of mine workers. Through these findings, we trust that our policy makers, mining companies, community organizations, community leaders, and trade unions, will find common ground on how to tackle the difficulties facing mine workers and the challenges associated with uranium mining.

Executive summary

Between July and October 2008, LaRRI conducted a study on uranium mining in Namibia. The study sought to understand the nature of uranium mining in Namibia and its possible social and economic implications. Information was gathered from the Ministry of Mines and Energy as well as the Ministry of Environment and Tourism. Additional data was collected through interviews with some officials of Rössing uranium mine. Current and former workers of Rössing uranium and trade union representatives were also interviewed. The major findings were:

- That Namibia is about to become one of the leading producer and exporter of uranium mining in the world; as a result uranium mining will become a central feature of the Namibian economy
- In Africa, Namibia might soon become number one producer of uranium after Niger
- Although more than 40 Exclusive Prospecting Licenses and about 12 mining licenses have been issued by the Ministry of Mines and Energy, only two uranium mines are currently in operation: the Rössing Uranium Mine and the Langer Heinrich Uranium Mine (LHU)
- Currently, all uranium explorations and mining activities are taking place in the Erongo region of Namibia through open-pit mining
- The current legislative frame work on mining is not sufficient to address the delicate nature of uranium mining and hence the Ministry of Mines is busy finalizing a new law to address this obvious shortcoming
- The renewed interest in Namibian uranium is linked to the notion that nuclear power might fill current energy gaps
- The major importers of Namibia's uranium are Japan (41% in 2006 and 28% in 2007), North America (28% in 2006 and 30% in 2007), Europe (17% in 2006 and 13% in 2007) and Asia excluding Japan 14 % in 2006 and 29% in 2007

- Namibia's uranium oxide is exported in raw form and is enriched in countries with uranium converters such as France, USA, Canada and China
- In March 2008, the government of Namibia granted permission to the Ministry of Mines to pursue plans for the nuclear generation plant and beneficiation programs

Interviews with former and current workers revealed that:

- Even if Namibia has no law on national minimum wage, Rössing uranium pays above-average wages
- Wages were viewed to be extremely attractive and competitive and accompanied by good benefits
- Rössing's safety programmes were of an acceptable standard and basic information about safety was widespread at the mine; however the content of the documents were not known to many workers
- Workers also argued that the company does not provide satisfactory information about the link between exposure to radiation and possible occupational diseases
- Many workers were exposed to dust and inhale radon gas on a daily basis, and therefore some current and former workers have contracted health problems such as TB as well as lung cancer
- Workers no longer trusted the opinion of the medical personnel at Rössing because they believe the true nature of their health problems is concealed
- The real impact of uranium mining on the health of workers and surrounding community is yet unknown and therefore
- Workers called for the assistance of outside experts to provide independent opinion on their health status as many; especially those who have worked for more than 10 years believe they were already suffering from occupational diseases linked to exposure to radiation

The Socio-economic impact:

- The increase in uranium mining projects will certainly lead to more employment opportunities for Namibia and for the Erongo region in particular and there will be potential inflow of migrants into Erongo. Based on conversations with some residents of Arandis a number of people have already moved into Arandis after the opening of the Langer Heinrich Uranium mine and other exploration projects taking place in the area
- The pressure on the provision of facilities and services such as housing, schools, and hospitals will increase. It is therefore expected that the national

and regional government expect companies to assist in improving existing basic services and setting up additional infrastructures as part of the conditions for investment

- On the other hand, despite its contribution to GDP, mining has short-term benefits, but long-term consequences
- Our findings reveal that the negative effects on the health and social organization of the community of Arandis are already astonishing
- Namibia therefore needs a clear strategy to evaluate the sustainability, ethics and responsibility of external investment in the extractive sectors. With the support of civil society and the community, the government should be able to develop the capacity to design appropriate strategies on how to deal with uranium as a mineral resource

1. Introduction

This report is the result of a project on uranium mining in Namibia commissioned by the Centre for Research on Multinational Corporations (SOMO). The findings are based on secondary literature drawn mainly from the writings of Earthlife Namibia and empirical data collected by LaRRI. Many of the issues raised in the report are meant to trigger debate on uranium mining and its social, economic and environmental repercussions.

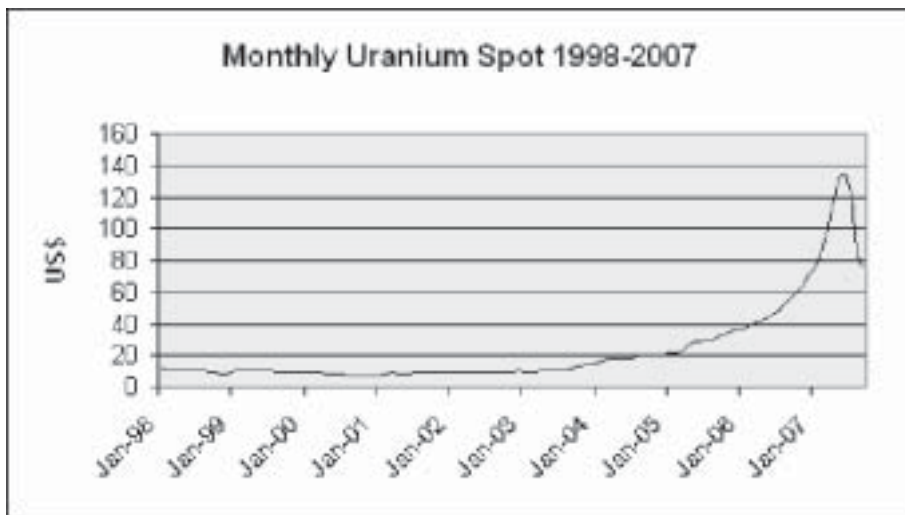
This research was conducted at a time when the price of uranium was substantially higher than it was by the time of drafting the report. Consequently, this was also the time when many investors were still considering Namibia as a potential supplier of uranium for world markets. The report should therefore be of interest to all parties interested in uranium mining, both locally, regionally and internationally. Suggestions put forward in this report are meant to steer the future direction of uranium mining in Namibia toward more sustainable policies and practices.

We hope that this document will contribute to a better understanding of uranium mining in Namibia and stimulate action regarding the protection of the health of workers, their families and their surroundings. Our hope is for this report to be regarded as an information resource and used as an advocacy tool. The findings of this report can be used to contribute to the behavioural changes of uranium companies currently in existence and those who want to invest in future. The report should therefore appeal to a number of stakeholders, including government, mining companies, the chamber of mines, trade unions, researchers, academics, investors and civil society.

1.1. Background and purpose of the study

Uranium production is making a comeback after decades of decline which occurred especially after the Chernobyl disaster of 1986. Rapid climate change and pollution created by fossil fuels, accompanied by high oil prices, are contributing factors to the increase in uranium prices. Hence, price of uranium has moved from less than US\$10 per pound to a current high of about US\$92 per pound.

Warning by international energy experts that fossil fuels like oil, gas and coal will be depleted in about three decades have sent uranium prices skyrocketing. At US\$10 per pound of U_3O_8 the price of uranium remained relatively stable for many years. It however reached a high of US\$135 during mid 2007 and then declined to US\$64.50 in July 2008 (www.uxc.com/review). It then dropped to a low of US\$75.00/lb in October to recover towards the end of the year to US\$90.00/lb. By September 2008, the spot prices leveled at US\$82.00 (Weidlich, 2008). Indications were that by October 2008, the price has dropped substantially to US\$45.00 (accessed from http://www.com/review/uxc_Prices.aspx on 21 October). Nevertheless the recent increase in uranium exploration and mining in Namibia is partly attributed to the increasing worldwide demand for uranium.



Source: (www.uxc.com/review).

In spite of the tight uranium market, world uranium production decreased by 5% to 39,655 tons of uranium in 2006, due to various problems at existing mines and because of the long time-spans required for the development of new mines. Production continued to be lower than the actual demand, but the balance was made up through various stockholdings. Worldwide, the number of uranium mining and exploration companies increased by 65% from 570 to 940 during 2007 (Fig, 2008).

For these reasons, this study aimed to identify where and under what conditions uranium is being mined in Namibia. The specific objectives included:

- Identifying the licensing of potential uranium sites and explorations taking place in the country
- Understanding the country's mining laws and general legal framework informing uranium mining in Namibia
- Collecting information on the destination of Namibia's uranium
- Determining the type of contracts between government and the companies

Achieving these aims involved exploring the environmental, labour and human rights conditions of the site, workers and surrounding communities, understanding the general safety conditions at the uranium mines and finally, raising awareness of the impact and dangers associated with uranium mining.

1.2. Research design

Our data collection consisted of a combination of secondary and primary data. Much of the secondary material was obtained from the Ministry of Mines and Energy, Earthlife Namibia publications as well as publications of Rössing Uranium. The primary data was collected through face to face interviews with officials of the Ministry of Mines and Energy and the Ministry of Environment and Tourism. These officials shared information regarding sites where uranium mining is taking place or where it is planned to take place, the number of licenses issued and how many applications were being received. We also asked questions regarding the demand for uranium exploration in Namibia as well as the legal framework informing these applications.

We conducted interviews with the management of Rössing as well as with 50 current and former Rössing workers. We tried on more than two occasions to secure an appointment with the management at Langer Heinrich mine with no success. Instead they referred us to Dr. Wouten Swieggers of the Swakopmund Chamber of Mines. Much of the information is thus based on data derived from and about Rössing uranium. All interviews with workers were treated as confidential in order to protect them from possible repercussions.

2. Namibia: social and economic profile

Namibia is a vast country inhabited by a population of less than two million. At 825,418km² (318,700 mi²), Namibia is the world's thirty-fourth largest country. After Mongolia, Namibia is the least densely populated country in the world (2.5 inhabitants per km² (6.5/mi²)). Most of the vegetation is semi-arid to arid with very low and unpredictable rain falls. Namibia gained independence from South Africa in 1990. Partly due to the two countries shared history, Namibia and South Africa's economies remain closely tied. Most of the imports in Namibia are of South African origin. Consequently, the Namibian economy remains firmly in the hands of South African capital-characterised by South African commercial banks such as First National Bank, Standard Bank and NedBank and South African clothing, furniture and retail food chain shops such as Shoprite, Edgars, Woolworths, Identity, Ellerinness, and Game amongst many others.

Blessed with an abundance of natural resources, Namibia is one of the wealthiest countries in Africa with a Gross Domestic Product estimated at US\$15960 million in 2005. Namibia is also classified as a lower middle-income country, based on the annual average per capita of US\$ 2990 in 2006. Although per capita GDP is about five times the per capita GDP of Africa's poorest countries, the majority of Namibians relies on subsistence farming for survival. As a consequence of apartheid and partly due to lack wealth redistribution, Namibia has one of the highest levels of income disparities in the world. The huge discrepancies in population incomes translate into a Gini coefficient of 0.7. The latest Household Income and Expenditure Survey of 2004 claimed a reduction in the Gini coefficient of 0.6. On average, medium income countries have a Gini coefficient of 0.43.

This inequality is also due in part to the historical apartheid legacy. Many black Namibians were relegated to rural and informal economies whilst the white minority was concentrated in the formal urban economy. The GDP per capita figures that gave rise to Namibia being classified as middle-income country is therefore grossly misleading. Due to this classification, the international donor assistance to the country has declined as many donors have either reduced or totally discontinued their assistance to Namibia.

2.1. Employment and unemployment

The bulk of Namibian households depend on formal employment for survival. More than 30% of Namibians are employed in the primary industries such as agriculture, forestry, fish processing, mining and quarrying. However, this sector showed the worst decline in recent years. Available national figures for 2007 show a decline of 16.2% in the growth of fishing and fish processing on board. Growth in the mining and quarrying sector stood at around 15% in 2006 and 2007. Secondary industries such as manufacturing, recorded a decline of 18.2% in 2007 (BON, 2007). This was due to external factors such as the rising fuel prices as well as factory closures in Namibia.

In the secondary sector, construction grew at the rate of 28.6% in 2006 compared to 3.9% in 2005. National accounts figures indicate a 32.9% growth in 2007. However, growth in this sub-sector is more likely to increase the number of jobs of temporary, casual and low skills categories. There was also a slowdown in the growth of tertiary industries such as finance, wholesale, retail trade, hospitality, transport, real estate and other services. Real growth in this sector was 4.5% in 2006 (BON, 2007).

Although Namibia has experienced economic growth in recent years, this growth was not accompanied by an increase in job opportunities. Currently, about 40% Namibians are unemployed. In order to understand just how many people in Namibia are without work will depend on the definition of unemployment. The Namibian government's unemployment definition is based on three criteria, namely: *being without work*, *being available for work*, and *seeking work* (NLFS, 2004).

The 'strict definition' of unemployment excludes those individuals (15-65 years old) who are without jobs and available for work, but who are **not** actively seeking work. The 'broad definition' of unemployment on the other hand regards every person who is 15-65 years of age and without work but available for work as being unemployed, whether he/she is looking for work or not. According to the 2004 labour force survey unemployment in Namibia according to the 'broad definition' stood at 36.7%, whilst the 'strict definition' resulted in an unemployment rate of 21.9%. When you add under-employment the current estimates are 42 percent (NLFS, 2004)

Using the 'strict definition' of unemployment in the context of the Namibian labour market is problematic. The criterion 'actively seeking work' for classifying the unemployed may not be accurate, as many unemployed people may have stopped looking for work, not because they do not want to work, but simply because they may be demoralised and have given up hope of finding a job. Others may not bother to seek work as they witness the fruitless efforts of their friends and relatives. Thus, the criterion 'not seeking work' may not be relevant in a labour market that is characterised by mass unemployment.

3. Mining industry in Namibia

The Namibian economy is heavily dependent on the extraction and processing of natural resources such as minerals. Namibia has five major mining operations. These are NAMDEB, Rosh Pinah, Rössing, Tsumeb Corporation and Navachab. These operations generate more than 95% of the mining income. NAMDEB, a diamond mine located in the Sperrgebiet, is jointly owned by the Namibian government and by De Beers Centenary. Rössing is the fifth largest uranium mine in the world and is located just east of Swakopmund. The Skorpion zinc mine which was opened in 2003 by Anglo American cost N\$454 million to build and is projected to produce 12,500 tons of pure zinc per month. Copper and other base metals are mined and smelted at Tsumeb, whilst Gold is mined at Navachab near Karibib.

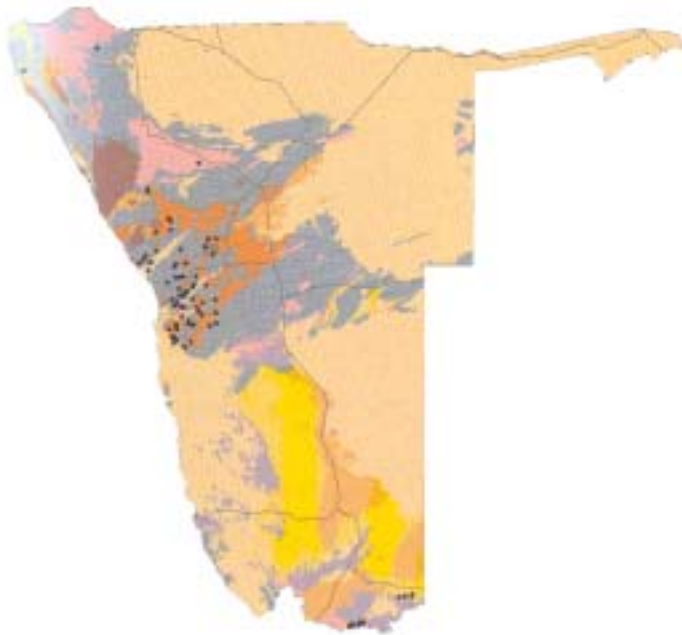
A significant amount of revenue for the Namibian government is yielded from mining activities contributing about 10% of GDP and 30-40% in export earnings. In 2006 alone, De Beers Marine Namibia produced over 1 million carats, contributing to about 7% of government revenue. In 2006, the mining industry generated N\$11.4 billion (BON, 2007), confirming that the mining industry continues to be the backdrop of the Namibian economy.

Although diamonds and uranium currently account for the bulk of the country's total export sales, Namibia is rich in a variety of minerals with 30 different commodities being produced from approximately 40 formal mining operations. In addition to the deposits of gold and silver, Namibia is rich in base metals such as copper, lead and zinc, and industrial minerals such as salt, graphite, marble, fluorspar and limestone. The semi-precious stones such as rose quartz, amethyst, agate and tourmaline and the dimension stones such as granite and marble can also be found.

One of the main challenges facing Namibia relates to the fact that in most cases the minerals are exported in raw form and value addition is by no means done in Namibia.

3.1. Uranium mining in Namibia

Uranium mining in Namibia started in the late 1970s, but for many years only one mine was operational. The second uranium mine started operating at the beginning of 2007. In recent years however, the Ministry of Mines and Energy issued more than 40 Exclusive Prospecting Licences (EPLs) for exploration and prospective licences to (potential) investors. Twelve more mining licences were issued in the last couple of years (Weidlich, 2007). It is therefore clear that many uranium mines will be operating in Namibia in the years to come.



Locations where uranium mining is taking place in Namibia-Source-www.mme.gov.na

In Namibia, the exploration and export of uranium is changing. The ever increasing global demand to fuel uranium nuclear power has made Namibia an attractive destination for uranium exploration. Namibia is the fourth largest exporter of non-fuel minerals in Africa and the world's fifth largest producer of uranium. There has been significant investment in uranium mining and Namibia is set to become the largest exporter of uranium by 2015. Currently, Namibia is the world's 5th largest uranium producer and is said to be supplying 8% of the

annual world demand. The government has responded to the rising uranium prices with excitement:

Namibia should consider exploiting its uranium ore reserves in the light of rising world uranium prices' (Mines and Energy Minister, Erkki Nghimtina).

Although for a long time only diamond mining visibly contributed to GDP, for the first time in 2006, non-diamond mining activities contributed to revenue significantly. These non-diamond activities increased from a low of 4.5 % in 2005 to a high of 51% in 2006. It was therefore not surprising that the former President of the Chamber of Mines, Mark Dawe, was quoted in an English daily newspaper in 2007 as having said:

The increased diversification of Namibia's mining sector away from diamonds is a very healthy development for the future of our country (New Era, 24 April, 2007).



Highest daily production achieved at Rössing

According to the Bank of Namibia *2008 quarterly report*, by mid-2008, uranium mines have already produced more than 1000 tons. Uranium has also earned Namibia close to N\$1 billion in export earnings during the first half of 2008 (Njini, 2008). As echoed by the words of Minister Nghtina, the Namibian economy is expected to be anchored by uranium mining in due course.

In Namibia uranium deposits are mined in open pits, as this practice is arguably more cost effective than underground mining. The definition of a open pit mine is 'an excavation or cut made at the surface of the ground for the purpose of extracting ore and which is open to the surface for the duration of the mine's life'. To expose and mine the ore, it is generally necessary to excavate and relocate large quantities of waste rock (accessed from <http://www/mineengineers.com>).

It is however argued that open pit mining is risky for people's health and the environment because of dust residue. Most uranium resources contain only a fraction of uranium: 1,000 kg of ore which leads to about 500 grams of usable uranium. The mined uranium ore is crushed and then leached to dissolve the uranium, which is then separated and precipitated as a concentrate containing 90% or more uranium oxide (U_3O_8). This granular concentrate is generally referred to as yellow cake. The remains called tailings are still radioactive and are usually disposed into the pits. There is the possibility that uranium and chemicals used during the leaching process are washed into the ground and surface which can contaminate in such a way that underground water cannot be safely utilised (Earthlife Namibia, 2008).

3.2. Laws governing mining activities in Namibia

After independence, the government of Namibia enacted some pieces of legislation to govern Namibia's minerals, even though much of the legislation is not tailored to address the mining of specific minerals such as uranium. Progressively, the Namibian constitution addresses conservation and protection of natural resources. Article 95 (l) states:

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 utilization of living 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.

The mining industry is governed by the '**prospecting and mining Act (Act no 33) of 1992**'. This Act does not make provision for environmental assessment. The Act also does not deal with uranium mining as a special category. In light of high demand for uranium the Act is being reviewed. In this regard, Mr. Erasmus Shivolo of the Ministry of Mines and Energy noted:

In the very near future, Namibia could become the 3rd largest uranium producer in the world. The minerals and prospecting Act of 1992 covers all prospecting and mining of all minerals. We realized that uranium is a strategic resource that we need to closely regulate. We therefore thought of giving it the importance that it deserves. World wide the producers of uranium have separate legislations covering those activities. In the past we only had one uranium mine and it was easy to look at it in terms of the minerals Act.

There is another piece of legislation that governs minerals in Namibia, called the **minerals policy of Namibia**. In the executive summary, the policy is justified as follows:

Globally, environmental issues in mining have gained prominence. All minerals (sic) producers have begun to pay attention to environmental concerns as poor practices deter investment. Government will ensure that the development of the Namibian mining sector is environmentally acceptable and includes consideration of the health and safety of people (Mineral Policy of Namibia, 2002: IV).

The policy is written in an introspective manner. The writers highlighted most of the shortcomings of how the environment is being damaged and currently managed by mining companies. The Ministry also realizes the importance of a coordinated effort between the different stakeholders such as the Ministry of Mines and Energy, Ministry of Environment and Tourism, Ministry of Health and Social Services and the mining companies. There is however not much

emphasis placed on the cooperation between the different stakeholders and people living in the areas where mining is taking place.

3.2.1. Namibia's environmental laws

In 1994, the Ministry introduced a **policy on environmental assessment**. The guidelines state that assessments need to be undertaken by the developer of any mining or beneficiation projects. ***'The mandate to oversee these practices emanates from legislation that has yet to be passed; as such, currently the policy in its strictest sense has no legislative base'*** (Fig, 2008).

Teofilus Ngitila of the Ministry of Mines and Energy revealed that the government has a number of procedures in place regarding environmental management. These are procedures that have to be followed when setting up a mine. According to Ngitila, these procedures are particularly applied in the case of uranium mining.

One of the most important pieces of legislation for the mining industry is the **'mining and prospecting in a protected areas and national monument policy'**. This document outlines procedures that an applicant has to fulfill when they are given an EPL in a protected area. It also states that an Environmental Impact Assessment (EIA) has to be conducted. The EIA has to be accompanied by an Environmental Management Plan (EMP). Conducting the EIA is the responsibility of the company which has to appoint a 'competent professional or team' to carry out the EIA. The legislation also states that it should be:

A consultative process including all the stakeholders and all the affected and interested parties have to be consulted and they have to be informed about the development as part of the process of EIA. We consider the EIA incomplete in the absence of the full consultation (Ngitila).

Once the EIA is completed, it is then submitted to the Ministry of Environment for registration. The Ministry is expected to study the terms of reference. The

people responsible will comment on the draft and thereafter the Minister will review the report:

If we feel we do not have competencies to review a specific report then we subject that report to external review at the cost of the proponent. We inform the proponent that we are going subject your report to an external reviewer and we will submit the invoice to them. That is the requirement. We don't pay for the external review and that will also be the same when the new law comes into operation (Ngitila).

There is also a new law called the '**Environmental Management Act 7 of 2007**'. The Ministry is busy developing instruments for the implementation of the new legislation. By the time of writing, most of the instruments were already submitted to the Attorney General's Office.

'Hopefully, everything would be in place by the end of the year and by early next year we will be able to implement that particular act. This act gives power to the policy that I mentioned earlier' (Ngitila).

The new Act is expected to be more progressive. Unlike in the past, it will be mandatory for companies to carry out EIA for any listed activities. This list is part of the regulations which will include mineral exploration, mining, setting up factories, construction of new roads and so on.

... ' and we are looking forward to the implementation of the act because we will feel more empowered' (Ngitila).

The Act also makes provision for the establishment of an Environmental Commission office as well as a Sustainable Development Advisory Council. The new act will put more emphasis on administration of EIA and much broader on environmental management. The new law outlines the environmental management principles and also makes provision for the Minister responsible for the environment to develop good relations with stakeholders. For a long time the Ministry of Environment lacked capacity in the area of monitoring for

compliance. The Ministry therefore intends to employ more environmental officers who will monitor compliance.

It will no longer be just a matter of submitting a report; there will be a follow up. There are mandatory report requirements and there will be checks and balances. This will be to find out if what you are reporting is what is happening. (Ngitila).

The Ministry of Environment is also drafting a ‘**bill on pollution and waste management**’. The intention of the bill is to bring waste management and pollution control into one stop type of action. The EMA is the outcome of the environmental law reform, which will include a bill on pollution and waste management.

All these points to the fact that Namibia’s environmental legislation is outdated to a large extent and the Ministry has embarked on a process of reform. Due to this lack of coordination, the government need to work on one umbrella policy as a matter of urgency.

There has been some criticism labeled against the government’s lack of legislative action and policies on nuclear fuels. For example, Earthlife has, on several occasions, suggested that the continued treatment of uranium mining similar to any other mining activity is problematic. The far-reaching implications associated with uranium mining need separate attention. Researcher David Fig argues that the government is taking too long to act on what is stated in the Constitution. He commented:

It would seem that the Constitution insists that the state protect the Namibian environment. Nevertheless, environmental legislation has been elusive. It took seventeen years after independence for the Environmental Management Bill, many years in preparation, to be submitted to the Namibian parliament in December 2007. Technically the Act still remains to be promulgated in June 2008. As a result, it is not yet in effect. Instead, a number of the Acts of the apartheid South African parliament and ordinances of the colonial administration still apply in Namibia, even though within South Africa successor bodies have long repealed or rewritten these laws (2008: 6).

3.2.2. The need for a new law on uranium mining

The Ministry of Mines and Energy is currently drafting a new law to be tailor made for uranium mining. The minerals and prospecting Act of 1992 covers all prospecting and mining of all minerals and does not address uranium as a special kind of mineral.

The new law is to develop clear regulations to guide the industry as Namibia is currently experiencing an increase in the number of mines: Mr. Shivolo stated:

We realised that uranium is a strategic resource that need closer regulation. We thought of giving it the importance that it deserves. World wide the producers of uranium have separate legislations covering those activities. In the past we only had one uranium mine and it was easy to look at it in terms of the minerals act.

As of September 2007, the Commonwealth special advisers from the Economic and Legal Section Secretariat's external link Special Advisory Services Division was tasked to undertake a review of Namibian law as it relates to uranium mining. The team will review the current Minerals Act, especially to point out any loopholes in the existing law. They will also have to advise government on the new provisions to be included (**obtained from <http://www.thecommonwealth.org/news>, accessed 23 September 23, 2008**).

We did not obtain a copy of the new legislation because it was still to be reviewed by the Minister before it becomes public. Nevertheless, Ms. Itamba, said the new policy is expected to be an encompassing piece of legislation that will also include clauses on radioactive waste and environment protection. She said:

... The draft policy will provide for the implementation of the treaties that Namibia has signed with the International Atomic Energy Agency and the protocols that we have entered into especially the safeguards agreements under which uranium is treated. It will also make provision for the exploration of uranium mining as well as the radio active waste management and protection of the environment against uranium mining. It will also include a section on how we can add value to our uranium.

With regard to value addition, in March this year, the government granted permission to the Ministry of Mines to pursue plans for the nuclear generation plant and beneficiation programs. ***'Cabinet granted approval to the Ministry of Mines and Energy to develop a Nuclear Regulatory Framework and to pursue the nuclear power and uranium beneficiation strategy'*** (New Era, March 3, 2008).

We were assured that a consultative process will take place before the bill is passed. When asked which stakeholders will be consulted, Mr. Shivolo stated:

It will be a combination of government institutions, the Chamber of mines, NGO's, and the public. A number of workshops with the public will also be held.

We are therefore hoping that this report will be useful in the formulation of the new law.

3.2.3. The role of the Chamber of Mines of Namibia

Another important body is **the Chamber of Mines of Namibia** (CoM). This body was established to promote, encourage, protect and foster the mining industry. Currently the Chamber has some sixty two members, ranging from the major mining houses through to smaller individual mining operations, plus a category for exploration and prospecting companies and an associate membership class. In addition to the Council of the Chamber, which acts as its Board of Directors, the Chamber has identified a number of fields of special interest and has, accordingly, formed Committees to deal with relevant issues (Namibia Trade Directory, 2008: 88).

In 2007, the CoM opened a branch in Swakopmund. This branch is tasked with dealing with radiation protection issues in the uranium industry and will help with the development of best-practice standards for occupational health and environmental management for uranium mines. Its principal adviser on health and environment, Dr. Wouten Swiegers said:

...from the Chamber of Mine point of view, we are the champions for mining and we want to do it in a responsible manner. What we do is we strategically guide the industry based on principles and values and we manage that through forming committees on certain

projects. So we decided to have transparent consultations with everyone, we had plenty of consultations and through that process we established various forums.

3.4. International conventions on mining

There are a number of international instruments that informs mining in general. Namibia has ratified some such as the:

- **SADC Protocol on Mining.** This protocol adopted in 1997, intent to foster cooperation and coordination in the effort to attract more investment and increased production of the mining sector in the SADC region. Namibia has rectified this protocol (accessed from <http://www.sadc.int>, on 22 July).
- **The Atomic Energy and Radiation Protection Act.** Namibia assented to this Act in 2005 but will only commence on a date that the authorities will decide on. Only section 44 came into effect on 16 May 2005

Namibia did not ratify the following:

- **Radiation Protection Convention, 1960.** This convention has adopted certain principals to protect workers against ionizing radiations. Article 2 (1) of this convention states that: 'this convention applies to all activities involving exposure of workers to ionizing radiations in the course of their work'
- **Occupational Cancer Convention, 1974.** This convention was adopted as a measure to prevent and control occupational hazards caused by carcinogenic substances and agents
- The **Working Environment (air pollution, noise and vibration convention, 1977)** concerns the protection of workers against occupational hazards in the working environment due to pollution, noise and vibration
- The **Occupational Safety and Health Convention, 1981** is concerned with occupational safety and health and the working environment. In Article 4 (2) it is stated that 'the aim of the policy is to prevent accidents and injury to health arising out of, linked with or occurring in the course of work, by minimizing, so far as is reasonably practicable, the causes of hazards inherent in the working environment
- The **Occupational Health Services Convention, 1985** is concerned with occupational health services. Article 1(i) refers to 'the requirements for establishing and maintaining a safe and healthy working environment which will facilitate optimal physical and mental health in relation to work. Sub-

article (ii) refers to 'the adaptation of work to the capabilities of workers in the light of their state of physical and mental health. All these with the exception of the first two have not been ratified by Namibia (www.ILO.org, accessed June 2008).

3.5. Procedures to acquire a mining license in Namibia

3.5.1. Exclusive Prospecting License (EPL) and Mining license

Before a mine opens, exploration has to take place to determine if there are sufficient deposits which warrant mining activities. Exploration activities have to be approved by the commissioner responsible for mining. This process should be channeled through the ministry of mines to the ministry of environment for consideration. The Ministry has to be satisfied that the company has fulfilled all the requirements before issuing what is called '**the environmental clearance certificate**'. The prospector can then apply for a mining license. The Ministry of Mines would not issue a license without having obtained an approved environmental assessment or without an **environment clearance certificate** from the ministry of environment.

The mining license is not even approved by the Ministry of Mines and Energy alone; it is approved by the committee which recommends to the Ministry of Mines for approval. The committee has to cross check if all the requirements are in place for them to make that recommendation. If the proponent submit their proposal for mining license and is not accompanied by an approved environmental assessment, then it will not be approved. It will be considered as incomplete (Ngitila).

The Exclusive Prospecting License fee for up to 20 000 hectares land size cost a minimal fee about US\$250 or N\$2000. It is for that reason that the Ministry is receiving a lot of applications on a daily basis. The number of applications can exceed 1000 per month. This is partly due to the fact that the current Act does not limit the number of applications. Mr. Shivolo commented:

We are... overwhelmed with applications because any one can risk N\$2000 to see if they can find anything. ...On a good day or bad day we can receive more than 50 applications.... The Act of 1992 does not provide for limitations to the number of prospecting

licenses. We have thought about it but the industry sometimes feels that it's a disincentive to investment. We have recently thought of limiting the number of licenses that can be granted to an individual particularly to the new entrants who are not known to us.

Exploration is an activity that is sometimes funded through the stock exchange even before any mineral deposits are found. Potential investors can start buying shares even before the operation starts. The Ministry therefore does not rule out the possibility that there are some people who might simply apply in the hope of making money on different stock markets in the world. Consider the following statement by Mr. Shivolo:

When there is a boom you expect to have genuine applicants and speculators in the mix. I believe we receive credible applicants but also applicants who are trying to raise money on the stock exchange but will never 100% end up being used for explorations activities on the ground.

The Ministry had to find ways to make sure companies invest in the country as they usually promise in their application forms. In the past, applicants promised that they would invest certain amounts of money, just to entice those who would process the application. Once the license is granted, there was no way to prove if the amounts of money promised were really invested locally.

We have in the last couple of years also included a condition to try and force companies who are listed to bring money into Namibia. The money that they have proposed in the exploration program to bank it with a financial institution here. If we really want to follow up to see if they brought in money that is actually flowing down for payment of the exploration program then we will be able to establish so (Shivolo).

Our findings reveal that there are a number of procedures to be followed in order to acquire a mining license in Namibia. Firstly, all mineral rights/licenses are granted in terms of the Minerals Prospecting and Mining Act of 1992. The conditions are set out as per Minerals Act from Section 67 onwards.

- For the application to be considered, the applicant has to prove that he/she has the technical and the financial resources to undertake the exploration project. Thereafter, a background check is done on the applicant (s).
- All applications are displayed on the GIS map to see which areas are under licensed. If there is already a license granted for that area, the applicant has to identify an alternative location. This is done in the cartography office
- Once the application form is completed it is submitted to the mining commissioner who passes it on to the clerks to issue the receipts and enter it on the system. The applicant is given a receipt and a number is allocated to the application. The next step is to wait for mediation. The commissioner summarizes the content of the application and submits the summary to the Minister. The commissioner also has to pass his judgment on the application when submitting the application to the Minister.
- The Ministry notifies the applicant in writing that it is ready to grant a license. Once the minister grants the license the applicant then has to follow the program as per application form. As part of the notice some standard conditions extracted from the Act as well as specific conditions that the Minister would want the applicant to adhere to are expressed. Shivolo added: ***'if the area is environmentally sensitive there may be additional conditions on how you treat the area'***.
- Once the license is granted, the applicant is expected to start with the exploration program as indicated in the application form. The exploration program can be changed as long as the Ministry is duly informed.
- An application can be rejected if it does not meet the requirements stipulated in the Act. A second application by a company that is already engaged in exploration can also be rejected if the applicant is already contravening some of the sections of the Act.
- The Ministry has a customer charter that informs the work of the directorate of mines. The charter states that applicants should receive a response from the office of the Minister within 3 months (120 days). The Ministry however acknowledges that this is not always achieved due to the fact that the Ministry is understaffed. Although Namibia generally is faced with a shortage of specialized skills, staff retention is a challenge in the industry. It is clear that there is a demand for experienced staff in the mining industry given the boom in uranium mining in Namibia. It is possible that some mining companies are also poaching skilled staff from the Ministry of Mines. Mr. Shivolo echoed these sentiments: ***'...we had staff but they were taken away by the industries that pay more'***.

The Ministry also recognized the fact that some Namibian companies want to enter the mining sector without having the necessary financial resources or the technical knowledge. In that case Namibian companies enter into joint-ventures with the foreign companies who fulfill all the necessary requirements.

There are instances where we don't fully comply with those requirements because there are Namibians who would like to get into the mining industry knowing the limitations to Namibians. These are technical and financial limitations; we don't have enough geologists to undertake the proper explorations program. We do sometimes give licenses to Namibians who do not meet these two major criteria's although with conditions that in a specified period of time they would have concluded a joint venture agreement with somebody with those capacities (Shivolo,).

4. Uranium companies (operating) in Namibia

Although a number of licenses have been issued in recent years, only two uranium mines are currently in operation in Namibia: the Rössing Uranium Mine located in the Namib Desert in the western part of Namibia and the Langer Heinrich Uranium Mine (LHU). Below follows a historical brief of each mine.

4.1. Rio Tinto Zinc-Rössing Uranium

During the 1970s, licenses were granted by the South African administration for the mining of uranium by Rio Tinto Zinc, in conjunction with some South African investors. The mine is located in the Namib Desert close to the town of Arandis, 65 km inland from Swakopmund. Mining began at Rössing, some 100km east of Swakopmund, in 1976. The mine eventually became the world's largest open-pit uranium mine, currently providing almost 8% of global demand for uranium.

Business contracts were entered into, inter alia, with Britain, France Japan, the Soviet Union, and the US. The shareholders of Rössing are: Rio Tinto (UK) 69 %, government of Iran 15%, Industrial Development Corporation (IDC) of South Africa 10%, 13 local individual shareholders 3% and the government of Namibia 3%. Even if the government of Namibia's share seems negligible, it has a 51% voting rights (Rössing stakeholder report, 2006: 1).



Moto Rössing

Entry to Rössing Uranium mine



The contribution of Rössing to the economy is enormous. In the year 2006 alone, Rössing contributed N\$158 (close to US\$ 20) million to government coffers through tax revenues. Production at this site makes up about 3% of the Gross Domestic Product of Namibia (GDP) and 10% of the country's foreign exports. The mine has committed itself in August 2007 to a N\$784 million (US\$112 million) lifespan extension project that will see the mine through to 2022. This extension is due to the demand for uranium worldwide.

By the end of 2007, the mine recorded a staff contingent of 1175 permanent employees. Due to the nature of the mining industry, there were more male than female workers. The ratio of male to female is 8 to 1. Two hundred and eighty-seven new employees were recruited in 2007 (Rössing report to stakeholders, 2007: 6). According to the Manager of External Affairs, Jerome Mutumba, *the majority of the workforce is Namibian. A few expatriates are brought in to fill the gap in terms of critical skills. Most expatriates are sourced from Zimbabwe, while others hail from the USA, Australia and the UK.*

Rössing did not conduct an EIA before starting operations. However, the company has taken some steps to address some environmental issues. This was confirmed by their External officer Mr. Alwyn Lubbe when he said:

At the time when the mine planning and construction started no formal legislation were in place for EIA studies. In fact, it was not even a well-know concept. In the case of Rössing various studies and related actions were taken in terms of identified environmental

issues taken up in an environmental management plan. For example, at the time of construction of the mine it was decided to install boreholes around the tailings dam to monitor water flow. Another action taken is that all quiver trees and other plants were rescued where the open pit was excavated. These plants were then relocated to the Botanical Gardens in Windhoek where they can still be seen today (e-mail response August 2008).

4.2. Paladin Resources Ltd- Langer Heinrich

Langer Heinrich is the second uranium mine to be operating in Namibia, but its presence is already being felt in the Namibian mining industry. The mine was officially opened by the President of Namibia on March 14, 2007. The mother company is Paladin Resources Ltd., a Perth, Australia-based mining company, and is listed on the Australian and Toronto Stock Exchanges. In addition to Namibia, Paladin has operations in Australia and Malawi. The mine is located in the west of central Namibia in the protected Namib Naukluft Park 85 km east of Swakopmund and is expected to stay in operation until 2023.

The Langer Heinrich deposit is very close to the surface and therefore relatively easy to mine. It occupies a length of 15km and a width between 50-1100 metres. From this deposit the expected yield of uranium oxide is 1.1 million tonnes each year for a period of at least ten years. LHU now produces 2.6Mlb of U_3O_8 through processing 1.5Mt of calcrete ore per year to take place over a 15-year period. By January 2003 it had developed a proposal for a bankable feasibility study (BFS) which was undertaken by a Johannesburg-based engineering firm GRD Manproc from February to November 2004. Much of the work for the BFS was broadly consistent with the prior conclusions of the Gencor and Acclaim research. Namibian mining legislation obliged Paladin to conduct an environmental assessment (EA). The EA report was accepted, despite the concerns relating to the validity of the report raised by the environmental lobby group Earthlife Namibia (Fig, 2008).

A further prospecting license was granted in November 2006 to Paladin to explore an area of 30km² adjacent to the western boundary of the original concession. First production was scheduled to commence in September 2006, but the mine was only opened formally in March 2007. The ceremony was attended by the Namibian state President Hifikepunye Pohamba, the Australian

High Commissioner Philip Green and other dignitaries. Pohamba stressed the Namibian government's strong support for foreign investment. Soon after the ceremony the first shipment of 10 tonnes of U3O8 went to US firm Converdne, which converts uranium oxide to uranium hexafluoride for enrichment purposes.(Fig, 2008).

The fact that Langer Heinrich mine is in the protected Namib Naukluft Park worries the environmental lobby groups. The issue of water availability and usage is of concern to Earthlife Namibia. Earthlife Namibia appealed to government to stop mining operations at Langer Heinrich because mining uranium would not only pose health hazards but also environmental concerns such as loss of biodiversity and possible ground and surface water contamination. According to Earthlife these issues were not addressed properly in the draft EIA. The Germany-based Öko-Institute concluded that the Langer Heinrich EIA underestimates the radiation doses by a factor of four and that the proposed tailings management concept was flawed (Earthlife Namibia, 2008).

4.2.1. Problems with Paladin in Malawi

Paladin has suffered a blow. In Malawi the company faced court action by a coalition of NGOs that challenged irregularities in Paladin's environmental assessment of the Kayelekera uranium mine. The intervention of the civil society coalition forced concessions out of Paladin. The company was forced to provide a number of social provisions to affected communities in the Karonga district. However, these concessions split civil society, one section of which remained opposed to the mine for environmental reasons (Presentation by Rafiq Hajat to meeting on SADC natural resources, Ekurhuleni, South Africa, 17 March 2008).

4.3. Export and import of Namibia's uranium

The major importers of Namibia's uranium are Japan (41% in 2006 and 28% in 2007), North America (28% in 2006 and 30% in 2007), Europe (17% in 2006 and 13% in 2007) and Asia, excluding Japan 14 % in 2006 and 29% in 2007. (Mutumba, 2008). We did not obtain further information with regard to the individual countries to which uranium is exported as such information is classified. According to Lubbe (2008), ***'The Company has customer confidentiality clauses in our sales contracts, thus we cannot reveal this information'***.

What stood out from the Rössing company report was the increase in the amount of uranium exported to Asia in 2007. This can be explained by the demand from China and India. The director of mines also mentioned that most of the investors were from Australia, Canada, South Africa, Namibia, China, France, United Kingdom and recently Russia. He elaborated:

What Australia has done which is different from other countries is that they have graduated a number of junior companies into medium exploration companies which basically discover ore bodies and sells them to major companies for development. In that process several geologist and mining engineers have formed their own companies to look for deposits all over the world so that they can sell them to major companies to develop. These ore bodies are sold to any one in the world.

If the Permanent Secretary is satisfied that the uranium will only be used for peaceful purposes, he gives his recommendation to the Minister, and then an export permit is issued. The sales agreement makes provision for the quantities, origin, deliverables, warranty, and the sales price. The price is pre-fixed between the buyer and the company. The price cannot be amended without the Minister's consent. If the company wishes to change the price, they have to apply again for the price clause to be changed in the sales agreement. Mr. Shivolo concluded:

This is done for security reasons so that what ever leaves Namibia is only used for that particular purpose because in the agreement- the use of uranium by a specific buyer is mentioned. If this was not done the companies can change the agreements and the uranium may be used for any other dangerous purposes (Shivolo).

In all agreements a 'safeguard' clause has to be included. This is a clause that restricts the use of Namibia's uranium to peaceful purposes. The export permits are valid for one year. If the company wants to increase or decrease the quantity of exports it needs to obtain permission from the Minister. The sales agreement also stipulates the number of years the company will be exporting to a certain buyer. Most of the agreements are long term. The Ministry does not restrict the quantity exported in any given year. The Ministry of mines reports Namibia's uranium exports to the Atomic Agency through the Ministry of Health and Social Services.

It is clear that Namibia's uranium oxide is exported in raw form. It is sent to countries that have converters and where it is enriched. This was also confirmed by Ms. Itamba of the Ministry of Mines. ***It goes to countries with uranium converters; these are France, USA, Canada and China (Ms. Itamba).*** The Ministry maintains that before any uranium is exported, the company provides a sales agreement to the directorate of mines for evaluation.

4.4. Rössing physical and social investments

The Rössing Foundation is very well known by many urbanites in Namibia. Rössing has used the Rössing foundation as an instrument through which social and financial support is offered to a number people, communities and organizations. The Rössing foundation has four main objectives:

- 1. To further the education of all Namibians in order to achieve greater national productivity and to enhance lifelong learning;***
- 2. Encourage the creation of and or to create opportunities for people to use their education;***
- 3. To promote the advancement of the living standards of all people in Namibia;***
- 4. and to do any act or thing which, in the opinion of trustees, will benefit Namibia or any or all of its inhabitants (Rössing stakeholder report, 2006: 19).***

Rössing Uranium has made a significant contribution to skills development in Namibia. Rössing offered US\$ 750 000 (N\$6 million) to the Namibian government at independence to assist with the establishment of the Namibian Institute of Mining and Technology (NIMT) in Arandis.



Part of NIMT

The Institute provides training for all industries including fishing, manufacturing, agriculture, oil exploration and the motor assembly industries. Rössing's training focuses on company-specific practical management development aimed at all frontline supervisory staff. It offers bursary awards, and adult education in addition to the vocational skills training in electrical and mechanical engineering (*Reviewing Rössing*, 1996). This financial support to some NGOs made them dependent on the mining company. It is against this background that Fig (2008) argued:

As the NGO sector became increasingly dependent on the Foundation's philanthropy, much of the public criticism of the company's poor health and environmental practices and the unregulated illegal trade in uranium abated. The Mineworkers' Union of Namibia (MUN) was too fragile, especially after the crushing of a major strike in 1978-9, to contest the dangerous working conditions at Rössing, although in clandestine meetings with the author in 1987, some workers revealed their awareness of significant malpractices (also see Rogers, 1980).

The town of Arandis was built by Rössing for its workers. After independence, the town was handed over to the Namibian government.



Sign at the entry of Arandis town

Many other infrastructures in the town of Swakopmund such as the Cottage Clinic were built by Rössing.

4.5. Effects on water and electricity supply

In semi-arid countries such as Namibia, access to water is a major challenge for the development of uranium mine projects. Uranium mining relies on large volumes of water for production. In 2006 alone, Rössing used 3.3 million m³ of water. This translates into 28% of the total coastal water usage. Electricity consumption at Rössing totaled 205,614 MWh in 2006, which translates into 6% of all electricity used in Namibia (Rössing stakeholder report, 2006: 1).

Namibia's local water supplier NamWater is not able to supply enough water to all the mines. They can only provide enough the water required for Paladin's newly opened Langer Heinrich mine, which uses 1.5 million m³ per annum. Further uranium mines have to build desalination plants at the coast to meet their fresh water demand. In the case of Trekkopje, national utility NamWater admitted in April 2007 that it cannot supply sufficient quantities of water for the mining project (Earthlife Namibia, 2008).

The projected demand of 25 million m³ of water per annum for Uramin's Trekkopje mine project alone is higher than that of all consumers in the area combined. Concerns were raised about the impacts of the project's desalination plant on sea life, and of the impacts of the pipeline on the unique lichen fields in the area, among others.

4.6. Forthcoming uranium projects in Namibia

Paladin was granted permission to mine uranium inside the Namib-Naukluft Park. Three other companies based in Western Australia have also begun to prospect within the boundaries of the protected area. Husab Extract Resources is trying to commercialise the Ida Dome area within Husab property. On 19 October 2007, it announced the success of its preliminary scoping study, although no substantial exploration to confirm the presence of mineral resources took place (Earthlife Namibia, 2008).

The second Australian prospector is Goanikonte Bannerman Resources, which began exploration in 2005. In September 2007 it tabled the results of a detailed scoping study into the economic viability of its Namibian operation. The company

mentions the possibilities of a strong cash margin and indicated that the starting date for mine will be 2010 (Earthlife Namibia, 2008).

The third Australian company is Tubas Reptile Uranium Namibia (Pty) Ltd. This company is exploring a site along the adjacent sites of Tumas, Ripnes and Aussinanis. The company is fully owned by Deep Yellow, of which Paladin (the operator of Langer Heinrich) is an 11% shareholder. Tubas was formerly owned by Anglo American. In addition, two sites north of the park are being exploited: Trekkopje and Valencia (Earthlife Namibia, 2008).

On the other hand, Canadian-owned UraMin Inc. is expected to build a desalination plant of the capacity of 15 million m³ per year near Wlotzasbaken on the coast (Allgemeine Zeitung, 5 April 2007). More recently the company has been bought by the French state nuclear utility, Areva, and has offered 35% of its uranium output to Chinese buyers. Valencia, run by Forsys, another Canadian company, intends to mine 90 million tonnes over eleven years, starting in 2008-9 (The Namibian, 27 April 2007).

The Korea Electric Power Company entered into discussions with Forsys about future joint ventures, including Valencia on November 1, 2007. The company received permission in February 2008 to extract water from boreholes in the subterranean Khan River and a 'palaeo channel'. The owners of a tourism establishment located 5 km from the Valencia site immediately challenged this permission in court, arguing that their operations would be negatively impacted should most local water be used for the operations of the mine. Permission had been granted without any conduct of empirical studies on the amount of water available in the Khan River and the 'palaeo channel' (Menges, 2008).

The court turned down the application of the tourist establishment, and an appeal has been filed (Earthlife Namibia, 2008). However, in the interim, the government has accepted the Environmental Impact Assessment and the management plan for the mine (Namibian Economist, 8 June 2008). Russian and Japanese firms have also expressed interest in investing in Namibian uranium mining projects (WISE, 2007:1). Two Russian companies, Renova and state-run export bank Vneshtorgbank, possess licenses for uranium extraction in Namibia (Fig, 2008). However, in April 2007, Minister Erkkie Nghimtina announced a moratorium on further applications (Allgemeine Zeitung, 25 April 2007). In this regard, The Permanent Secretary in the Ministry of Mines

was quoted as saying: *'It's a matter of regulating the issue of licenses. Everyone is running to Namibia for uranium, and we don't want every Jack and Jill mining uranium'* (*The Namibian*, 14 February 2007).

4.7. Should Namibia invest in nuclear power?

The renewed interest in Namibian uranium is linked to the notion that nuclear power might fill current energy gaps. According to the Director of Mines in the Ministry of Mines:

Last year or two years ago, Cabinet mandated our Minister to look at the possibility of nuclear energy generation. In that respect if you don't have a legislation that looks into those issues it would be impossible. How do you build and operate a nuclear energy generation plant if you don't have the law that governs it? With all the above we found the need to have a policy legislation and regulation in regard to the uranium and nuclear industry (Shivolo).

The deputy director of mines stated that nuclear energy ***'is a possibility given the current trends in power supply. If it is the only option we have to go then we have to'*** (*Itamba*).

Dr. Wouten Swiegers reinforced the view that we need alternative energy source in the form of nuclear power. He argued:

...When you talk about uranium you must see it in a bigger context and the bigger context is that the world is getting involved and oil is getting more expensive and we must go for a better alternative. So, uranium is good for nothing except for power.

Despite being blessed with a lot of potential for solar and wind power, Namibia is investigating the possibility of using nuclear power as an energy source. Early in 2006, the Namibian government announced that it was considering its own nuclear power supply (Dentlinger 2006). This was confirmed during a media briefing in February 2008 wherein Cabinet announced that Namibia intended to build a nuclear power station and a uranium processing plant as a medium term plan to fight the energy crisis currently facing the SADC region.

In pursuing this option, the Namibian government is engaged in talks with both Russia and South Africa. It is noted that Prime Minister Nahas Angula has entered discussions with Russian nuclear energy officials regarding the potential use of Russian nuclear energy technology. Namibia is concerned about the energy deficit resulting from cutbacks of electricity imports from South Africa. Currently, Namibia heavily relies on the import of electricity from the South African grid (Fig 2005a). When outages are experienced as a result of problems at the Koeberg nuclear power station outside Cape Town, exports to Namibia are limited. Still, the projected energy deficit is 300 megawatts, far less than the output of a conventional nuclear reactor.

David Fig however warns that the nuclear energy industry is much more complicated than we might think. The state will have to invest a lot of money whilst the industry will bring very little into the government coffers.

The industry is inevitably linked with intractable technical and security problems such as the disposal of high-level waste and the possibilities of the proliferation of nuclear weapons. The insurance industry is entirely allergic to nuclear power, so that the risk is entirely borne by its consumers (2008: 19).

As a source of energy, nuclear power is one of the more expensive options. It takes many years for a new plant to start operating. Furthermore, the industry is notorious for cost overruns and for not meeting construction deadlines. Uranium as a fuel only accounts for approximately 6% of the cost of operating a reactor, depending on the spot uranium price. Even if prices remain constant, they are not likely to be the only reason for reactor project cancellations. Factors such as too many sources of uranium emerging at the same time can lead to a drop in the spot price (Fig, 2008: 5).

5. The views and experiences of uranium mine workers

5.1. Working at Rössing

The workers interviewed for this study were employed by Rössing for different lengths of time ranging from 2-31 years. They worked in different sections of the mine. Some mentioned that they have worked at almost all the plants in the mine. Almost all workers interviewed regarded Rössing as a 'good company' with regard to job security and working conditions. Even in the absence of a national minimum wage in Namibia, Rössing Uranium pays above-average wages. Wages were said to be extremely attractive with competitive remuneration packages inclusive of pension and medical schemes, generous annual and sick leave and generally some form of housing benefits. Many reported that Rössing offered some of the best pay packages in the market.

Rössing has a lucrative package and who can say no to that. I was actually asked by my foreman to come back and train others and I came back because other offers could not match Rössing (current worker).



**Rössing
workers
getting off the
company bus
in Arandis**

The Mine Workers Union of Namibia (MUN) is a recognized bargaining agent for mine workers in Namibia. The MUN is also the only sole bargaining agent on behalf of workers at Rössing.



MUN office in Arandis

5.2. Safety at Rössing

Workers were able to compare the safety standards at Rössing now and in the 1970s when the company started operations. The majority who started work in the 1970s confirmed that safety at Rössing was not good. However, they said that over the years the safety has improved greatly. This is how a former trade union leader at Rössing summed up the safety conditions and occupational health measurers at the mine during the early days of operations:

Safety was chaos at that time. Occupational health protection was always reactive rather than pro-active. There were very little preventive measures in place. There were no acid proof overalls, dust prevention was also not sufficient.

Workers who started work at Rössing later on found better protective measures in place, as captured in the extracts below:

For the kind of work I do, we wear two two-piece overalls, t-shirt, socks, safety boots, ear plucks for ear protection, safety glasses. When we go to areas where it is dusty, we wear a dust mask (Current worker).

...different areas require different protective clothing. If you are going to the open-pit you will need an additional dust mask. Other safety clothing includes safety helmets, gloves, glasses and shoes (Current worker).

Over the years, there have been several accidents at the mine falling into different categories of accidents and incidents. There are 'reportable accidents, incidents and fatalities' such as spillages and injuries that must be reported within a specified period of time. All these must be reported to be investigated. The Ministry of Mines also investigates reported accidents:

We do our internal investigations at the mines but our inspector of mines must also investigate the accident upon which he must submit a report to the Prosecutor General for decision whether to prosecute or not. This happens when a fatal accident happens at a mine.

The image shows a yellow safety sign for Rössing Mine. At the top, it features a globe icon and the slogan "Safety a way of life...". Below this is a table with safety statistics. The table has four columns: the first column lists categories of incidents, the second column shows the number of incidents, the third column shows the number of workers affected, and the fourth column shows the number of days lost. The data is as follows:

Category	Number of Incidents	Number of Workers Affected	Number of Days Lost
Reportable Accidents	83		
Lost Time Incidents	0	7	0.58 YTD
			0.75 YTD
	3	3	0.25 YTD
	0	30	2.59 YTD
		18	

Safety record at Rössing



**Rössing's
OHSE and Risk
Training
Centre**

5.3. Safety over health protection

While Rössing workers noted that safety standards and procedures were satisfactory at the mine, they expressed concern that more efforts were not put into the protection of the health of workers. Many workers indicated that they were told about how to protect themselves against inhalation of dust and other residues of mining activities. In essence, workers know of the existence of the health and safety policies of Rössing, but most do not know nor do they understand the content. In fact, the workers who were most knowledgeable about the health and safety policy were the shop stewards. The following extracts from conversations with workers reflected the fact that workers did not know much about the content of the health and safety policies:

...nobody really seems to know the content of the policy, especially the workers at the mine who do the basic work. You hear a lot about safety issues but very little about the health part. I believe that these things should be explained and made clear to all the workers when workers take up employment. But when they have not been made clear to me, maybe I will pick it up through the years by myself. All you hear about is wear your safety shoes, do this and its all about safety and the company but very little about the workers' health (Current worker).

...I was never made aware by the company of the dangers associated with uranium mining. We only had the safety introduction courses where we were told how to work safely and wear the protective clothing. I was never made aware of the health risks involved in terms of the possible deterioration in my health (Current worker).

A worker commented:

When I started in 1978, the company used to give us film batches to monitor the level of radiation we have been exposed to. But we never received reports to tell us how many degrees of radiation we have picked up (former worker).

The majority of workers emphasized that they were in danger of picking up health problems. This is supported by research in other parts of the world. For instance, a research organization Profundo in the Netherlands concluded: 'collectively, all uranium miners suffer the highest radiation doses of all workers in the nuclear fuel chain (apart from accident cleanup crews)' (Profundo, 2008: 9). One worker at Rössing commented:

I see a difference in my health especially in my chest I have a problem. Especially in the open pit we are exposed to too much dust. I work in the open pit for most of my day (8am to 4pm) this place is full of dust. Sometimes you don't see the dust but you are exposed to it (Current worker).

Workers concerns about health are not a new phenomenon at Rössing. Concerns were raised in 1992 in a publication by Greg Dropkin and David Clark. In that publication, Arthur Pickering, a former Rössing worker, was asked about his experiences as a Rössing worker. The words of Mr. Pickering could be regarded as an embodiment of what is happening to workers at the moment.

...I started in June 1978 and by November and December I had developed a chest [sic]. I was coughing a great deal and I went to the medical officer at the place they have at the mine. I went there on several occasions for a X-rays and once they actually said that

I had a spot on my lung. There was a possibility of TB. Then I moved in December from the E camp, where I live, to Tamariskia and this condition continued. But eventually I went to a medical practitioner there and he prescribed something and the condition improved a bit. But I think it will affect especially the black workers, and eventually I think all the workers (Dropkin and Clark, 1992: 4).

The government and the company reacted to Dropkin and Clark's report by seeking assistance from the International Atomic Energy Agency. The team of experts admitted that there were some grievances lodged by workers regarding illnesses. '*Grievances exist about some cases of illnesses, including lung cancer, which is thought to be related to occupational radiation exposure. However, such cases can only be addressed in comparison to national vital statistics, which do not seem to exist in Namibia at the present moment*' (Report of the IAEA technical co-operation mission, 1992: 12). Workers interviewed for this study criticized the approach used by the IAEA's team of experts:

The experts who came in had too little time. We feel they did not do it well. They were to come in with their own equipments, but instead they relied heavily on the company data to compile their own report. On that basis workers rejected the report of the International Atomic Energy Agency. I was full-time shop steward and I was with them all the time. I kept telling them they are not going about it the right way. They never collected dust. They just took company data. They did not interview workers. They did not interview me as a full-time shop steward representing workers (former Rössing full-time shop steward).

Mine workers and others in the surrounding communities inhale dust and radon gas. The radon gas exposes the body to alpha radiation, which is destructive. Exposure to radiation is most often associated with cancer, but it can also have other harmful effects. Low level radiation can contribute to birth defects, high infant mortality and chronic lung, eye, skin and reproductive illnesses (Profundo, 2008: 9).

Many workers appreciate the annual health checks, but they believe conducting the test will not serve much purpose if the doctors are not telling them the truth

about the dangers they are exposed to:

Yes, there is a test but we have problem with it. You enter, you get your pre-test, you get your exist medical test. In our experience most people who go through the medical examination for exist only to hear after two or three months later that they have been detected in the advanced stage. We are questioning the credibility of the test (current worker).

Another worker stated:

After the test, I believe it should be standard procedure for me to be called in and to be told that this is where you were last year and this is were you are in terms of your health and also to be told that this is getting too much in case of dust exposure and what can be done. But this does not happen. I have never heard of anything like that, after my test I was never called in. If they don't call me in, then I should believe that I am fine. In most cases the results do not come and that is the problem for several people. When they go to have test done independently outside they are found to have serious problems. Now I don't understand how these serious problems could not be detected by the mine and are detected by independent doctors (outside) if you are going for annual health check-up (current worker).

Workers were worried about the fact that some of their colleagues (current and former) were suffering from cancer. Workers want to understand the possible health problems that can be picked up if they are working in a uranium mine. Consider the view of the union representative below:

From the union point of view, we are asking why people who were working here are having cancer. And that is the dispute. What is the cause of cancer? The workers are saying that they are sick, but the doctors here say that you are fine. It is only when workers go to outside doctor that cancer is sometimes detected. The Rössing doctors or those doctors that Rössing refer us to never tell us that we have cancer picked up from working at the mine (Rössing worker).

This is how strongly one worker stated it:

When you are 55 years the company will force you to go on early retirement. This is not a direct force and therefore the union is also involved. But you don't know that you are sick; only the company knows. At that age they go through your medical records and assess your health status if your health status has been deteriorating then only do they approach you with early retirement options. A couple of months later when the people leave you hear that the person was diagnosed with cancer by a different doctor.

One of the most telling findings is that the Mine workers union has records of names of workers who have complained about health problems. The dilemma that faces workers is to prove scientifically that the worker's illnesses were indeed linked to exposure to radiation. The former union representative said:

There are reported cases where the people have complained and they are still complaining. Their names are there and even Rössing knows about these people. Rössing needs proof that the company affected them, but this is hard for workers to prove. Since 2000 one worker has been on sick leave just because the company says give proof. The company's occupational health and safety policies only deal with injuries, but do not touch on radiation.

Meanwhile, the manager of external affairs at Rössing maintained that the annual health checks conducted by the company were credible. Through the health checks, the company claims to trace the health conditions of their workers and therefore *'the company cannot take responsibility if a person gets sick after leaving the employment of Rössing, because regular annual health checks are performed'*. Workers nevertheless claimed that many times, their colleagues were laid off when the company knew their health had deteriorated.



Former worker showing his swollen legs and feet

Due to the increasing unemployment rates (currently just below 40% in Namibia), and widespread retrenchments in the mining sector, job opportunities at the mines might be perceived as more important than their own health. A worker explained: ‘...***we keep the job as a security measure, your heart is telling you to work but your mind is telling you to go*** (mine worker).

5.4. Loss of trust in Rössing medical personnel?

It was disturbing to learn that workers no longer trusted the company doctors. Some have opted to consult private doctors. Some workers said they even avoid consulting the doctors that the company doctors recommend in fear of not being told the truth about the true nature of their health status. The following quote highlights the concerns:

...I consult private doctors annually to keep track of my health status because I don't trust the mine doctor. ...It's only when workers have left Rössing; gone to private doctors that they are told the true reflection of their health status in terms of illnesses which means the mine doctor is gambling with the health of the workers and manipulating their files (current worker).



Rössing's outsourced medical centre

Workers were concerned about the link between exposure to radiation and diseases such as respiratory problems such as Tuberculosis (TB). Workers claim that the some of their colleagues complain about TB. Others have died from cancer-related diseases. This is despite the fact that for many years they were shown a clean bill of health. They were always told they were healthy when even if they did not feel healthy. The extract from a conversation with a Rössing worker makes the point:

What I found strange is that for 20 years the Rössing doctors declared me fit to work. Every year, they told me I was medically fit. Even upon exit, they declared me fit. I know in 1978, they said there was something on my lungs, but it was not clear what it was. In January 2008, I went for a biopsy in Cape Town. The doctor discovered that I had a very rare type of cancer that can only be detected through radiation or asbestos (former worker).

Workers also realised that the effects of exposure to radiation in a uranium mine take a long time to become visible. This is because some of their colleagues were declared healthy and 'fit to work' for many years, however, just before retirement some health problem such as cancer or TB was detected. Some of them died within six months after being laid off on 'disability'. We found that there were many former Rössing workers who were laid off through the company's 'medical separation' policy or 'disability'. The majority were those workers who started working for the mine in the 1970s. Many left the company before they reached pensionable age. Some workers were therefore calling for additional enforcement clauses in government regulation to control possible exposure to uranium:

... All of us are here for the bread... but if the government knew the consequences of uranium they should have put some measurement in place such as the law that a person must not work more than twenty years in the uranium mine (current worker).

Workers also said that often when the company realized that a worker was exposed to too much radiation, the worker will be shifted from that particular position. This strategy is to reduce radiation levels. The workers appreciated

this process of being shifted, but they were often not told the truth. The following remark was common:

... They won't tell you that you are being shifted due to your radiation levels; they will come up with an excuse. Some of the reasons used are that it's cross training and staff development. They never shift you back to your original department because they know your health capacity and don't want to run risks.

5.5. Radiation a threat to the inhabitants of Arandis

When uranium is extracted out of the ground, it is in the form of a rock. Through mechanical processing the rock material is transformed into sand, thus becoming easily dispersed by forces such as wind into the air. The radon gas which is a product of this process can easily travel through air to further a field. Since the milling process only extracts the uranium from the ore, all radioactive decay products that are associated with the uranium remain in the tailings. Among these are long-lived radio-nuclides such as thorium and radium. The latter is of specific concern, since it continuously decays to radon-222, which has quite a short half life of 3.8 days, but as a gas can easily escape from the tailings deposit. For the surrounding communities, radon gas presents a lung-cancer hazard when inhaled (Earthlife Namibia, 2008).

The mining of uranium is usually accompanied by bi-products of radio-nuclides of the uranium decay chain such as radium, radon, thorium and others. Radon gas, a radioactive daughter product of radium, is a threat to the health of people, especially workers and those living close to the mines. When inhaled, the gas can cause lung cancer and other forms of lung diseases. The mining of uranium should therefore be of concern not only to those who directly work with it (the mine workers), but also for the surrounding communities.

It is very difficult for us to scientifically confirm these experiences and views. However, the fact that many workers made reference to respiratory problems is worrying. These concerns need more elaborate investigation by independent experts. During our conversations with workers, we noticed that many were beginning to suspect that some of the health problems they experience in

Arandis might be due to extended exposure to low radiation. For instance one worker commented:

Many of Arandis' childrens' eyes are always red. There are also many children in Arandis who are having asthma pumps. Another problem we have in Arandis is allergies. Even our wives who have never worked on the mine suffer from allergies like some mine workers. How does one explain that?

It is thus not only the workers that may be at risk from radiation exposure, but also the residents of the towns in the nearby vicinity. We therefore need long-term studies to determine how much radiation the former and current residents of Arandis are exposed to, what type of diseases they have developed and what the risks are of extended exposure to low level radiation.

5.6. Workers demand the truth

Workers were not against uranium mining per se. They could not be regarded as 'anti-development', nor do they want to see themselves and their loved ones languishing in poverty. Many were delighted about the prospects of a number of investment projects taking place in Erongo. They believe it would bring needed development to their region, but most importantly it would be a form of job security for them and their families and that eventually the spill off effects will be felt country wide. However, workers want mining companies to put the health of workers and their families first. This is especially crucial if Namibia is to become one of the top uranium producers in the world. All eyes will be on Namibia, because an evaluation of a country's performance can be judged on how a country treats the most vulnerable.

'We need jobs, we will always work, but the truth is important to know if there is something going to happen to you' (current worker).

Workers want to be able to make informed decisions. They believe the companies know the truth about the dangers associated with uranium mining, but they do not share that because they are afraid that workers might seek compensation or will not take up employment. The reality is that many will not have a choice but to work for the uranium mines given the lack of other job opportunities. They are therefore calling for more honesty and transparency from the companies when engaging with them on issues of radiation. A few

would have probably declined the job offers if they were knowledgeable about the possible health effects. This choice would have been commendable because it would have been an outcome based on an informed assessment:

If they had told me about the dangers of working for a uranium mine, I would not have taken up employment with them. Now I hear about a lot of things, radiation and people getting sick. I am also starting to question how long I will be here. I am already looking at other employment opportunities currently. Many things are hidden from you, you are only told about the good things and the salary is good. At the end of the day you sit there retired and sick and don't have anything else (current worker).

The company keeps saying we are protected from radiation. What is radiation? Radiation is not something that you can protect yourself from with clothing. Radiation is a mixture of radio-active gases you cannot see it. They can say they measure it and therefore we are not in danger, but you cannot stop it from entering your body (trade union representative).

Workers do not have the resources to prove that their health problems were linked to their occupations. It is important for the company to be honest enough and accept the fact that radiation might only take effect after many years of exposure. The ideal situation would be for the company to be interested in the well-being of their workers even after they have left the employment of the company. This will be based on the assumption that the company care about their current, former and future workers. For now, this remains to be seen.

5.7. Workers demand compensation

Open-pit mining contributes to increased levels of dust containing radioactive particles. At the moment the impact on the people's health and the environment is not known. The company believes that at Rössing the nature of exposure to radiation is of low level. Dr. Swiggers of the Chamber of Mines told us that radiation at Rössing is below 100 millisievert¹ a year. Dr. Swieggers is pointing to an internationally accepted standard. *'In fact, at Rössing we have decided*

¹ Sievert is a description used by international bodies such as the IAEA to use as a measurement unit of radiation dose. It attempts to reflect the biological effects of radiation by weighting factors for tissue or organs. These factors are selected for the type and energy of the radiation which targets the body from the outside or radiates the body from within due to incorporated radionuclide (Lindemann, 2008: 1).

that it should even be lower than twenty'. He also argues that this level of exposure is lower than normal radiation that a person can be exposed to when in other parts of Namibia, such as Windhoek or when on a plane. However, Bertell (1994) argued that, 'There is no such thing as a safe dose of radiation. It is known that radiation kills, maims, causes mutations, is cumulative, causes leukaemia, cancer, and respiratory illnesses and attacks the immune system. In addition, Wunsch (1997) wrote:

...evidence now suggests that there is no such thing as a harmless dose of radiation.... Recent experiments indicate that low levels of radiation may not only cause more diseases than previously thought, but that this damage maybe genetic and show up only in future generations. This means millions of people now and in the future are potentially at risk from radiation exposure considered safe under current levels.

Some Mine Workers Union officials told us that they were hopeful that the company and the workers reach an agreement which addresses the needs of the people who have developed occupational health diseases. They expect at least a long-term compensation plan for occupational health diseases that are associated with uranium mining. The Mine Worker's Union representative at Rössing pleaded:

First of all what we want is to make a policy, a policy of after care. If a person has been detected with an occupational disease how should he be cared for from the company side and what type of compensation should he receive? Presently we do not have a policy on how to compensate people who have occupational diseases, the policy that we are having is only for disability (trade union representative).

We believe that it is vital to not capitalize on the workers' lack of knowledge about the possible link between exposure to radiation and health effects. The union has started to raise the issue of exposure with management. The union has also started to strive towards making workers aware of the dangers associated with exposure to radiation. Many workers feel that this might be already too late as some of them are already sick and others dead.

Most of my colleagues have died already. Many are sick. I know one of my colleagues died with one lung. Another one was diagnosed with silicosis and died from brain cancer within six months after leaving Rössing. Another one died a month ago, he had cancer. The other one died of heart attack. Many former workers living in Arandis, Swakopmund and Walvisbay are sick. Why is this happening? (Current worker).

It is a mammoth task to relate the delayed impact of the health of the workers to previous work in a uranium mine and to obtain scientific proof in order to receive compensation. Such a task will include an audit of the workers complete health records. These records should contain data of when the worker started through all the years he has been at the mine until he leaves the mine. It will also have to contain continuous monitoring of changes in the health of the worker. One worker who was laid off on medical separation explained his symptoms as follow:

I began suffering from high blood pressure. I became weak. I could not walk. I was confined to a wheelchair at some stage. The wheelchair is still at my house. My legs are still very weak and sometimes I risk falling when I try to walk. He concluded, 'I have not heard of any one who has worked for this mine for more than 20 years who is still in good health'.

All these statements points to the fact that there is an urgent need to publicise the symptoms that are related to exposure to radiation from uranium mine. This is to enable workers (current and former) to identify the symptoms and seek assistance before it was too late. While Rössing and the Chamber of Mines have accepted some minimum levels of radiation, we should not sit back and allow thousands of Namibians to be exposed when the long-term effects of such exposure is yet under-researched. The reality is that there is a need to acknowledge that many workers at uranium mines spent a lot of their working time exposed and at risk.

... if you look in the history there were guys who will go on leave for a month and after a month or two then he will die of cancer which means there are really questions regarding the medical check up we do annually whether they reflect the truth of what is happening in your body? (Current worker).

Many workers stated that they want the company accepting responsibility for their health condition and want the company to start a debate on and plans for compensation. The workers who are already sick simply want the company accepting the fact that they played a role in their ill-health. These were words of a worker who was laid off due to disability:

Rössing should give packages to those of us who are laid off due to disability or ill health. I just need money to secure the future of my wife and children. I have three children; two of them are in school. At the moment I am always stressed because of money. Sometimes I am forced to go to cash loans to solve my financial problems. I explain to Rössing all the time and the company does not want to listen. The company has money but we do not (Former worker).

6. Conclusion

Uranium is different from other minerals that are extracted from the ground. Uranium mining is associated with a number of health and environmental problems. As a waste product, uranium mining generates huge amounts of radioactive tailings. Most of what is mined contains little uranium. Therefore in order to get to the real uranium, large amounts of ore have to be milled and processed. These tailings can have negative implications by means of seepage of uranium which is not extracted from the ore and chemicals into the groundwater and through dust dispersion, if not covered properly.

Although the mine owners continue to deny the health risks associated with uranium mining, workers at mines are continuously exposed to some levels of radiation doses. They are exposed to contaminated dust and radon gas, which they consequently inhale. The negative impact of this exposure on worker's health is often evident only after many years or even decades, which makes it extremely difficult to prove the real source of the ill health. Long-term exposure to such dust and gasses can cause permanent bodily damage. Contamination is not only felt at the mine site itself, but people in the surrounding communities are also affected. In addition to cancer, other types of health problems such as birth defects, an increase in infant mortality and chronic lung, eye, skin and reproductive illnesses are also compounded by the exposure to uranium radiation (Lindemann, 2008).

It is common knowledge that mining contributes significantly to GDP. But to what extent do the communities around the mining areas benefit from their own resources? We need to find a win-win situation for both mining companies and communities. We need to find ways in which our natural resources can be beneficial to the workers and the surrounding communities. As a matter of urgency, the government, the mining companies and various stakeholders need to reconvene meetings to discuss issues of socio-economic development, emanating from our natural resources.

In Namibia general knowledge and awareness about the nuclear industry and its complex impact on humans and the environment is negligible. In order to make use of their democratic rights and influence development towards sustainability, people need to understand issues and problems related to the nuclear industry. Earthlife Namibia has started taking the lead in filling this gap

through education and awareness drives, targeting the general public. However, this activity needs to be intensified. The public campaigns are not meant to discredit any stakeholder, but to find ways to achieve the best possible practices for uranium mining.

In terms of legislation, indications are that Namibia is doing fairly well. The expected law on uranium mining is a progressive step. It is therefore important that the new legislation also put emphasis on monitoring compliance, which is inadequate at present. Companies took advantage of the absence of a coherent law. Mr. Shivolo's words were indeed telling in this regard:

...I remember one of my staff was chased at Stone Africa because by law we did not have any power. With the law we can enter anytime we prefer. We can issue order, the legislation will empower us to employ environmental officers who will actually monitor compliance, if the owner resists then the officer is empowered to go to the police. It is a powerful legislation which was not there before. Now we are equipped; you cannot just come and open a factory, which is in an environmentally sensitive area; you are compelled to do an EIA study because we would like to have a clean production.

Due to the energy crisis, some countries including Namibia have started placing nuclear energy on their agendas. Namibia is however a country blessed with enough sources of renewable energy such as solar and wind power. Nuclear power plants should therefore be the last option: David Fig recently advised:

...going nuclear would not be in Namibia's best interests. Given other more viable options, the nuclear path would entail massive expenditure, filling the deficit of highly-skilled operators, the need to set up a regulatory apparatus, the need for a nuclear waste management system, and the costs of decommissioning in the future. Not including the risk, the costs of such an enterprise would include relying on expensive outside expertise and burden the Namibian treasury and taxpayers for many years to come (2008: 19).

This report is by no means comprehensive. It should be read and regarded as a first step towards understanding uranium mining and the implications thereof

for Namibia. However, the results so far show that even in Namibia mining has short-term benefits, but long-term consequences. The negative effect on the health of the community is often subtle and unexpected. Sad but true, our findings shows that at the moment, many current and former Rössing workers and their families do not have much to show for their association with the company other than the short-term jobs and the devastating health problems they are facing. The looming health problems that are discernibly associated to uranium mining in Arandis are undermining the social organizations of the people.

Namibia therefore needs a clear strategy to evaluate the sustainability, ethics and responsibility of external investment in the extractive sectors. With the support of civil society and the community, the government can develop the capacity to design such strategies and accountably move towards responsible mining of our natural resources, including uranium.

List of references

7.1. Primary sources

- Erasmus Shivolo, Director of Mines, Ministry of Mines and Energy. 27 August 2008
- Helena Itamba, Deputy Director-Directorate of Mines, Ministry of Mines and Energy, 21 August 2008
- Teofilus Ngitila, Director, Environmental Affairs, Ministry of Environment and Tourism, 13 August 2008
- Dr. Wouten Swieggers, Principle Advisor, Chamber of Mines, Swakopmund, 1 August 2008
- Mr. Jerome Mutumba, Manager External Affairs, Rössing Uranium, 30 July 2008
- Mr. Always Lubbe, External Affairs Officer, Rössing Uranium, 29 July 2008
- Fifty (50) former and current Rössing Uranium workers interviewed between July and October 2008

7.2. Secondary data

Bank of Namibia (BON). 2007. *Annual report*. Bank of Namibia, Windhoek.

Bank of Namibia (BON). 2008. *Quarterly bulletin*. Bank of Namibia, Windhoek.

Bertell, R., *Health and Safety Implications of Nuclear Development*, South Africa Conference 1994).

Commonwealth Secretariat, 2007. 'Technical assistance on uranium mining in Namibia'. Accessed from; <http://www.thecommonwealth.org/news>. accessed 19 July 2008.

Fig, D. 2008. 'Governance and radioactivity: managing Namibia's uranium Resources'. *Southern Africa Resource Watch*.

Fig, David. 2005a. *Uranium Road: Questioning South Africa's Nuclear Direction*. Johannesburg: Jacana.

- Dentlinger, Lindsay. 2006. 'Namibia Considers Nuclear Power Option'. *The Namibian*, 31 January.
- Dropkin, Greg and David Clark. 1992. *Past Exposure: Revealing Health and Environmental Risks of Rössing Uranium*. London: Namibia Support Committee.
- Government of the Republic of Namibia (GRN). 2002. 'Minerals Policy of Namibia'. Ministry of Mines and Energy'. Windhoek
- Government of the Republic of Namibia. 1990. *The Constitution of the Republic of Namibia. Government of Namibia*.
- Government of the Republic of Namibia. Environmental assessment policy.
- Government of the Republic of Namibia. 1999. *Policy for Prospecting and Mining in Protected Areas and National Monument*.
- Government of the Republic of Namibia. 2008. *Namibia: a review of Namibian trade and industry: Trade directory 2008*. Ministry of Trade and Industry, Windhoek.
- Government of the Republic of Namibia. 1992. Minerals (Prospecting and Mining Act), Act 33 of 1992. Windhoek.
- Hartman, A. 2008. 'Namwater's grand desalination plans'. *The Namibian*, 13 August.
- International Atomic Energy Agency (IAEA), 1992. *Report of the IAEA technical co-operation mission to Namibia on the assessment of radiation safety at Rössing Uranium mine*. IAEA.
- Njini, F. 2008. 'Uranium to anchor Namibian in Future'. *Mining Weekly*, October
- Profundo, 2008. 'Mined U-financing of new uranium mines'. Profundo.

- Lindemann, I. 2008. 'Hazards of Uranium'. Paper presented at the workshops on uranium mining in Namibia, October 2008.
- The Namibian, 2008. 'Uranium stewardship committee established'. March 3.
- The Namibian, 2008. 'Battle for uranium resource hots up'. September 3.
- The Namibian, 2008. 'Mining conference in Perth Paladin on track with growth in Namibia's uranium mining'. September, 8.
- Tjaronda, W. 2007. 'Mining still number one' *New Era*, April 24, 2007.
- Tjatindi, C. 2008. 'Namibia: development of uranium mines puts 'strain' on country water supply'. *New Era*, 1 September.
- Stablum, A. 'Lack of power and water caps Namibia's uranium production'. The Namibian, September 10.
- Weidlich, B. 2008. 'Government plans to set up nuclear reactor' *The Namibia* March 3.
- Weidlich, B. 2007. 'All eyes on uranium mining in Namibia'. *The Namibia*, 11 May.
- Weidlich, B. 2008. 'Govt grants 25-year uranium license to Canada's Forsys' *The Namibia*, August 27.
- Weidlich, B. 2008. 'Nuclear giants target Namibia as their playground as companies line to the prospect and exploit Namibia's rich uranium endowment, the green lobby warns of detrimental effect to the ecology'. September, 12.
- Kaira, C. 2008. 'Cement becomes gold as uranium mines take shape'. *Namibia Economist*, July 18.

Data Collection Instruments

Uranium Mining in Namibia

LaRRI 2008

1. INTERVIEW GUIDE: MINISTRY OF MINES

Date:

Location:

1. When was the first license for uranium issued in Namibia?
2. How many licenses have been issued in the last 5 years?
3. In which (specific) locations are licenses being issued and why?
4. What is the profile of a typical prospecting license applicant?
5. Which countries do most of the applicants come from?
6. Under what conditions are prospecting licenses issued?
7. Under what conditions are they rejected?
8. After the license is issued, what is the next procedure?
9. What checks and balances are in place to ensure that mines adhere to EIA?
10. Can you shed more light on the type of contracts entered between the ministry and the uranium companies?
11. How often does mine inspectors visits the mines?
12. What kinds of accidents have been reported to happen on the mines?
13. How often does the Ministry receive reports about accidents on the mines?
14. What action is taken by the ministry when an accident happens?
15. Where does Namibia's uranium generally get exported to?
16. How much uranium is exported per year?
17. Under what conditions does the Ministry grant ground water permit?
18. Do all mines require these permits?
19. When do you expect to start enforcing the new law on uranium mining?
20. Why did the Ministry see the need to have a new law on uranium mining?
21. Which stakeholders gave input on the new law?

2. INTERVIEW GUIDE: MINISTRY OF TRADE AND INDUSTRY

Location:

Date:

1. How many uranium companies are registered with the Ministry of trade and industry?
2. Who are the owners?
3. Where are they operating from?

3. INTERVIEW GUIDE: MINISTRY OF ENVIRONMENT & TOURISM

Date:

Location:

1. What environmental policies do you have in place?
2. Do you conduct any sampling tests around uranium mines?
3. Have you ever received complaints from communities around the mines regarding effect of uranium mining in their areas?
4. Are there any reported cases of ground water contamination by the uranium mines?
5. What have you done about it?
6. How often do your inspectors go around the mining sites to identify any damages caused to the environment?

4. INTERVIEW GUIDE: MINE MANAGERS

Name of company:

Date:

Location:

1. Background of the company(year established, board members, ownership, membership of association)
2. How many workers do you employ including expatriates?
3. In which categories? (gender breakdown, permanent workers, contract)
4. Does the company make use of sub contractors? If so, for which operations and why?
5. What are the main activities that take place at the mine?
6. Has the company conducted an EIA before starting operations?

7. What were the main findings?
8. Where the findings disseminated? If so, to whom and what was the response?
9. Does the company have a health and safety policy? Can we have a copy?
10. Does the company have a health and safety committee? Who are the members?
11. Have you had any accidents /injuries on the mine so far?
12. What was the cause of the accident(s)?
13. What could have been done to avoid them?
14. Does the mine make provision for pre and post health check-ups?
15. How often are health check-up's conducted?
16. Does the mine provide protective clothing for the workers?
17. Does your office receive health related complaints from workers/retired/ previous workers in that they may have picked up while working at the mine?
18. On average how much uranium do you mine per year?
19. Where is most of the uranium exported to? Why those countries?
20. What are the dangers associated with uranium in general?
21. How do you dispose of your end product (tailings)?
22. What measures are in place to safeguard the environment?
23. What do you envisage the life span of the mine to be?
24. What measures are in place once the mine has reached its life span?

5. INTERVIEW GUIDE: SHOP STEWARDS

Date:

Place:

1. When did you start work at the mine?
2. Which union organizes at this mine?
3. Do you know if the mine conducted an EIA study before starting operations?
4. Were the results shared with the workers?
5. Does the mine have a health & safety policy?

6. Do you know the content of the health and safety policy?
7. Does the mine make provision for pre and post health check-ups?
8. How often is health check-ups conducted?
9. Have you had any accidents /injuries on the mine so far?
10. What were the causes of the accident(s)?
11. What could have been done to avoid them?
12. Does the mine provide protective clothing for the workers?
13. Does your office receive health related complaints from workers/retired/ previous workers that they may have picked up while working at the mine?
14. On average how much uranium do you mine per year?
15. Where is most of the uranium exported to? Why those countries?
16. How does the mine dispose the end product (tailings)?
17. What measures are in place to safeguard the environment?
18. What do you envisage the life span of the mine to be?
19. What measures are in place once the mine has reached its life span?
20. What problems do workers face at this mine?
21. Are workers generally made aware of the dangers associated with uranium mining?
22. What would you want to see changing at the mine?

6. INTERVIEW GUIDE: CURRENT WORKERS

Location:

Date:

1. How long have you been working at the mine?
2. What kind of work do you do?
3. Do you wear protective clothing? (What kind?)
4. Where you made aware of the dangers associated with uranium mining before taking up employment?
5. What do you think are the risks associated with the kind of work you do?
6. Were you required to take a pre health test before taking up employment?
7. Does the company send you for health tests? How often?
8. Does the mine have a health and safety (H&S) policy?
9. What is the content of the H&S policy?

10. Do you have a health and safety committee at the mine?
11. Do workers form part of the committee? (Mention members)
12. What issues are discussed by the committee?
13. Did you develop any health related problems since you started work at the mine?

7. INTERVIEW GUIDE: FORMER WORKERS

Date:

Location:

1. Name
2. Age
3. Sex
4. Which mine did you work for?
5. How long did you work for the mine?
6. What duties did you carry out at the mine?
7. When did you leave the mine?
8. Why did you leave the mine?
9. What health problems did you experience while working for the mine?
10. Did you go for a pre and post health check up?
11. If yes, what were the results? (both pre and post)
12. What happened after you left the mine?
13. Would you have worked at the mine if you knew the health implications of working there?



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