



HAIB COPPER ENVIRONMENTAL STUDIES

AUDIT OF ENVIRONMENTAL CLEARANCE CERTIFICATE AND UPDATED ENVIRONMENTAL MANAGEMENT PLAN (EMP) FOR RENEWAL

Prepared for: Haib Minerals (Pty) Ltd.
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AUDIT OF ENVIRONMENTAL CLEARANCE

CERTIFICATE AND UPDATED ENVIRONMENTAL

MANAGEMENT PLAN FOR RENEWAL

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PREAMBLE

Mr. Joseph Mülders, Senior Environmental Scientist at Knight Piésold (Pty) Ltd, and Dr. Lima Maartens T/A LM Environmental Consulting have been appointed by Haib Minerals (Pty) Ltd as the independent Environmental Assessment Practitioners (EAPs) to undertake the Environmental Management Plan (EMP) audit and update. The results will be submitted to the Ministry of Environment, Forestry and Tourism (MEFT) for their review and approval for the renewal of the Environmental Clearance Certificate (ECC)- 01233 for Exclusive Prospecting License (EPL) 3140.

This document represents:

- 1) The audit of ECC-01233 as per requirements of ECC renewal for submission the MEFT for review and approval.
- 2) The reviewed and updated EMP for ECC-01233.

This will likely be the final renewal of ECC-01233.

Haib Minerals (Pty) Ltd is currently in the process of developing an Environmental and Social Impact Assessment towards application of an ECC, expected submission end of 2024, towards a Mining License (ML) through competent authority Ministry of Mines and Energy (MME).

The report is presented in the following sections:

1. Section 1: Introduction
2. Section 2: Regulatory Framework
3. Section 3: Activities and Site Description
4. Section 4: Audit of Environmental Management Plan
5. Section 5: Revised Environmental Management Plan
6. Section 6: Conclusions

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ABBREVIATIONS

| | |
|----------|--|
| AIDS | Acquired Immunodeficiency Syndrome |
| CEDAW | Convention on the Elimination of All Forms of Discrimination against Women |
| CEO | Chief Executive Officer |
| COO | Chief Operating Officer |
| DCS | Drilling Contractor Supervisor |
| EAP | Environmental Assessment Practitioner |
| EAPAN | Environmental Assessment Professionals of Namibia |
| EBRD | European Bank for Reconstruction and Development |
| ECC | Environmental Clearance Certificate |
| EES | Excellence in Environmental Stewardship |
| EHS | Environmental Health and Safety |
| EIA | Environmental Impact Assessment |
| EMP | Environmental Management Plan |
| EPL | Exclusive Prospecting License |
| ESIA | Environment and Social Impact Assessment |
| FP | Feldspar Porphyry |
| GEF | Global Environmental Facility |
| GFM | Great Fitzroy Mines |
| GN | General Notice |
| HIV | Human Immunodeficiency Virus |
| HMCM | Haib Minerals Country Manager |
| HMSS | Haib Minerals Site Supervisor |
| ICCPR | International Covenant on Civil and Political Rights |
| ICESCR | International Covenant on Economic, Social and Cultural Rights |
| IEMA | Institute of Environmental Management and Assessment |
| IFC | International Finance Corporation |
| KIRLUP | Karas Integrated Regional Land Use Plan |
| LAC | Legal Assistance Centre |
| Masl | Meters above sea level |
| MAWLR | Ministry Agriculture, Water and Land Reform |
| MEFT | Ministry Environment, Forestry and Tourism |
| MET | Ministry Environment and Tourism |
| MFMR | Namibian Ministry of Fisheries and Marine Resources |
| ML | Mining License |
| MME | Ministry of Mines and Energy |
| NCE | Namibia Chamber of Environment |
| NCJV | Namibian Copper Joint Venture |
| NGA | National Groundwater Archive |
| ORASECOM | Orange-Senqu River Commission |
| PDAC | Prospectors and Developers Association of Canada |
| PPP | Public Participation Process |
| QBP | Quartz Biotite Porphyry event; and |
| QFP | Quartz Feldspar Porphyry |
| RTZ | Rio Tinto Zink (Pty) Ltd |
| SA | South Africa |
| SADC | Southern African Development Community |

Haib Minerals (Pty) Ltd.

Haib Copper Environmental Studies

Audit of Environmental Clearance Certificate and Updated Environmental Management Plan for renewal

| | |
|--------------|---|
| SEA | Strategic Environmental Assessment |
| TB..... | Tuberculosis |
| UK | United Kingdom |
| UNAM..... | University of Namibia |
| UNFCCC | United Nations Framework Convention on Climate Change |
| uPVC | Unplasticized Polyvinyl Chloride |
| WDPA..... | World Database of Protected Areas |
| WHO..... | World Health organisation |
| XP..... | X-Porphyr |

1. INTRODUCTION

1.1 BACKGROUND

The Haib copper deposit has been the target of exploration and small-scale mining since late 1800s and early 1900s. In 1945 the first recorded copper was produced and from then various prospecting companies continued to show an interest in the deposit and furthered prospecting activities throughout the 1900s.

Rio Tinto Zinc (RTZ) conducted the first extensive and systematic investigation of the Haib deposit during the 1970s. RTZ relinquished their prospecting rights in 1975 and more companies showed interest in the Haib deposit and in the 1990s Great Fitzroy Mines NL (GFM) acquired the deposit and continued with exploration activities until late 1990s. Namibian Copper Joint Venture (NCJV) ran investigations from mid to late 1990's. In 2003, 100% of the mineral rights were vested in the Namibian Government (See Section 1.2) for additional history of the Haib copper deposit).

1.1.1 HISTORY OF EPL 3140

In 2004, the EPL 3140 (Figure 1), inclusive of the entire Haib deposit and a large surrounding area was granted to Koryx Copper Inc (formerly Deep South Mining (Pty) Ltd), subsequently renewed in 2007, 2009, 2011, 2013, 2015, 2017, 2019 and 2023.

In 2021, the submitted renewal application was refused by the Ministry of Mines and Energy (MME), however after legal intervention the application was reopened and EPL 3140 was approved on 07 July 2023 (valid till 06 July 2025).

Haib Minerals are currently investigating the structure of the deposit but also methodologies to maximise feasibility of a project. Clarity has been received and Haib Minerals are looking at the core body (Figure 2) in a different manner which was previously thought to be a porphyry deposit but is now thought to be otherwise. Exploration activities are now to focus on gradient exploration and economic feasibility is unlocked through bio-heap leaching methodologies.

1.1.2 HISTORY OF ECC

In 2013, the mineral licence was transferred to the holding company Haib Minerals (Pty) Ltd. In 2014, an Environmental Management Plan (EMP) for Haib Minerals Namibia's exploration activities in the current EPL 3140 was prepared and approved by the, then, Ministry of Environment and Tourism (MET). Exploration activities were implemented in terms of this EMP. The exploration programme starting in 2014 at the Haib site included the following:

- Recon mapping and logging of the historic core
- Large geophysical (gradient array IP) surveys
- Diamond drilling a total of 32 holes spread over four different target areas
- Re-sampling of 14 holes of historic core
- Soil and stream sediment sampling
- Re-evaluating the geological model of the deposit.

In 2017, Haib Minerals renewed the ECC (issued 09 August 2017) and amended the exploration drilling programme to include additional drilling at 10 target sites within the EPL. During this period however no exploration or drilling activities were undertaken in EPL 3140.

In 2020, Haib Minerals furthermore renewed the ECC (issued 15 February 2021) and amended the exploration drilling programme to include the following focussed within a key resource target area (Figure 3):

- Diamond drilling 20 holes for both metallurgical tests and geo-tech holes on three target area within identified 10 sites
- Excavation of 4 representative trenches, ± 20 meters long and ± 1 meter deep in the above-mentioned target areas
- Extraction of water from the Orange River for drilling purposes (as per previous EMP).

The activities above were initiated however were halted due to the non-renewal of EPL 3140.

All existing drill holes and/ or boreholes developed to date on EPL 3140 are presented in Figure 3.

The 2020 EMP, audited in this report, is therefore inclusive of management of all exploration activities proposed in the 2014 ECC application and the 2017 and 2020 ECC renewals. This consolidation of the EMP is a requirement for ECC renewal and all updates must be revised and/or audited towards auditing ongoing exploration activities.

1.1.3 ECC RENEWAL

The review and updating of the EMP (represented in this report) is a requirement of the ECC renewal application (Appendix D). The exploration drilling activities included in this renewal include the following:

- Operation of vehicles and drilling machinery
- Drilling of 5 000 m, approximately 25 holes within the target area
- Abstraction of surface water from the Orange River for drilling purposes (up to 20 000 Liters per day)
- Resource mapping
- Refining the resource model
- Employees and contractors on site during daytime hours;
- Maintenance of access roads
- Storage and transport of vehicle and machinery fuel (hydrocarbons) (approx. 500 liters).

This will likely be the final EMP for the ECC under EPL 3140. Haib Minerals (Pty) Ltd is currently in the process of developing an Environmental and Social Impact Assessment (ESIA) towards application of an ECC, expected end of 2024, towards a Mining License (ML) through the Ministry of Mining and Energy (MME).

The current updated EMP (presented within this report) is inclusive of all activities proposed and conducted to date under the 2014, 2017, 2020 and 2024 ECC applications. The consolidation of the EMP in this way is a requirement of ECC renewal.

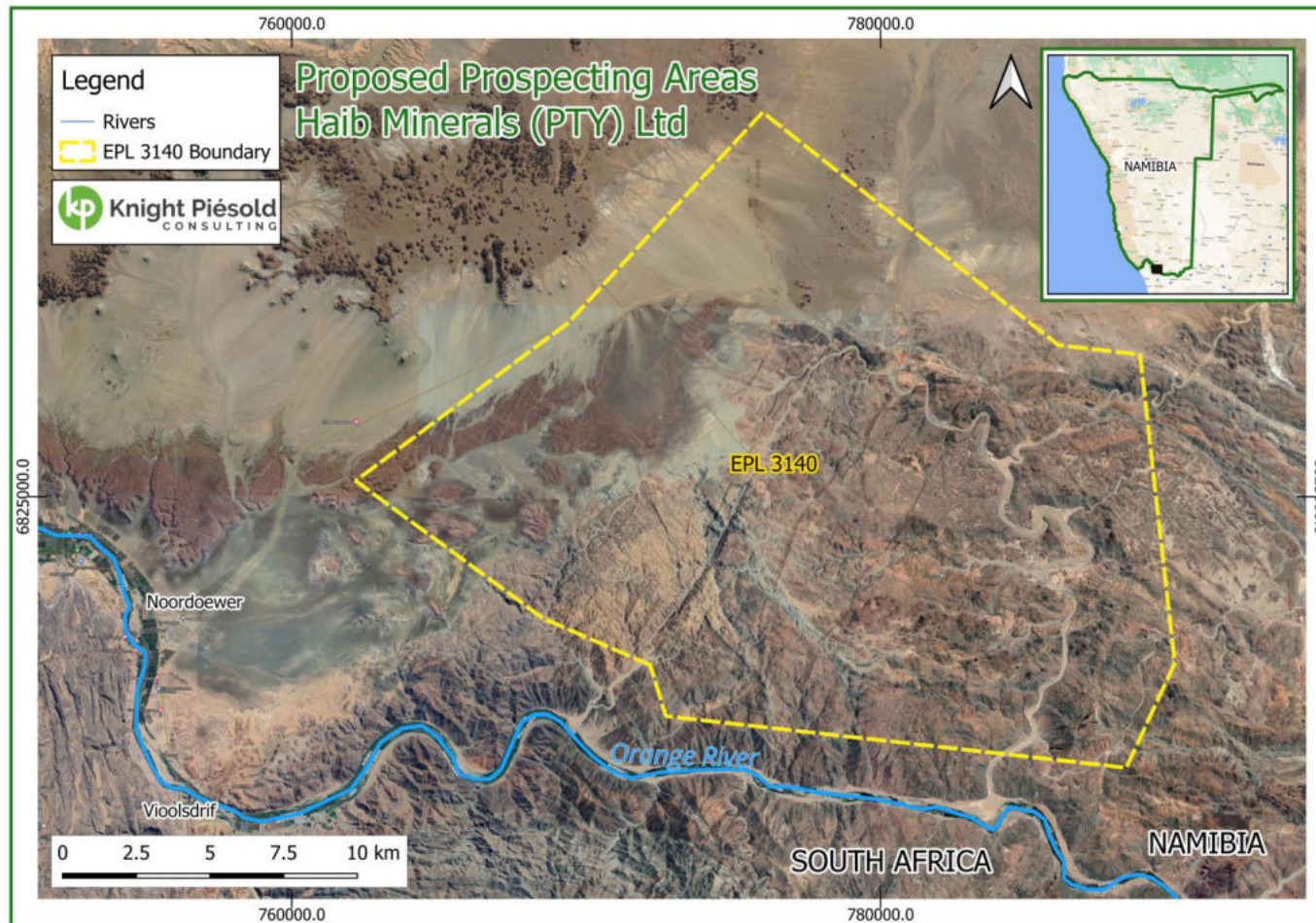


Figure 1: Location of Exclusive Prospecting License (EPL) 3140

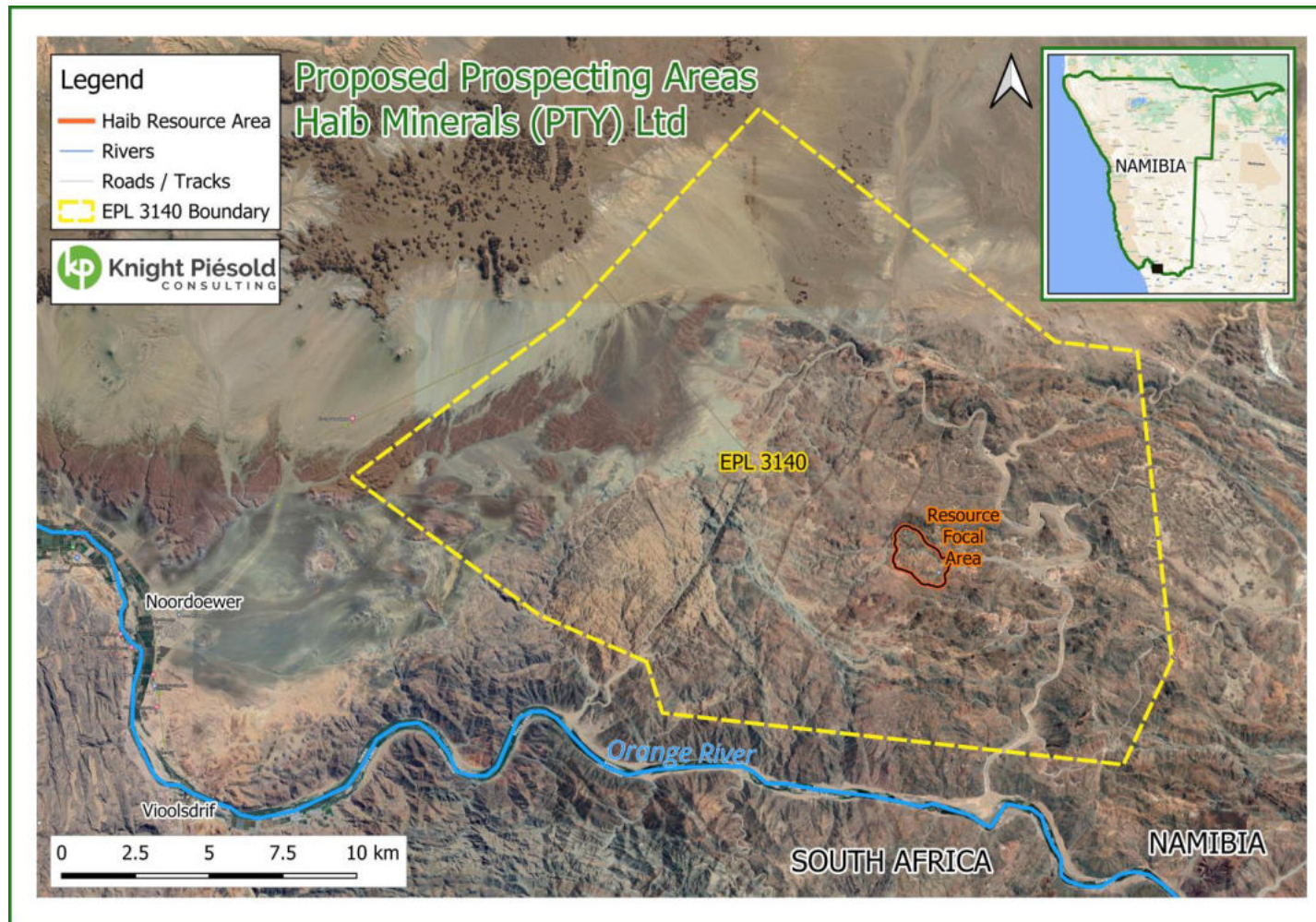


Figure 2: Locality of the Resource Focal Area within Exclusive Prospecting License (EPL) 3140

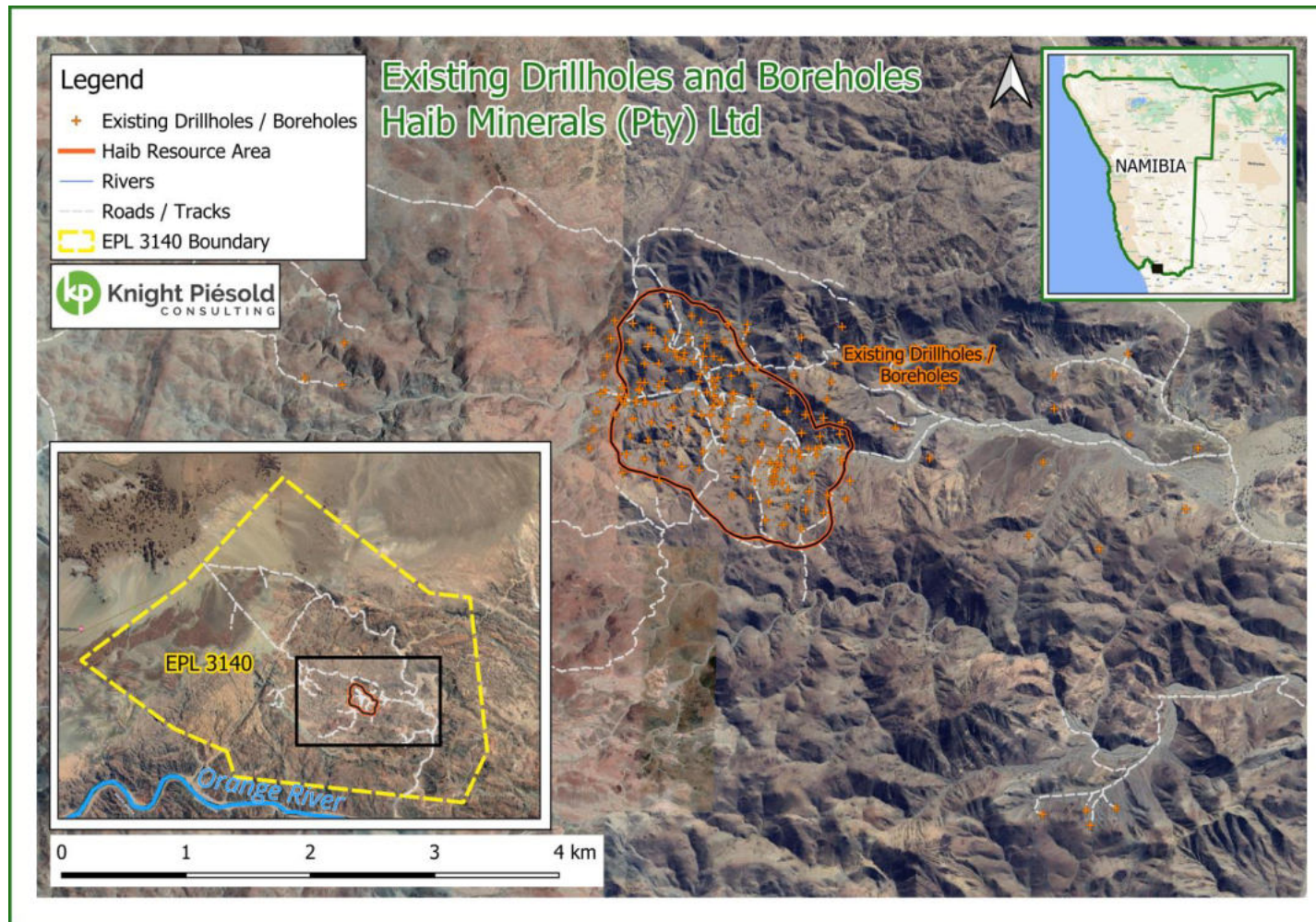


Figure 3: Locality of all existing exploration drillholes within Exclusive Prospecting License (EPL) 3140

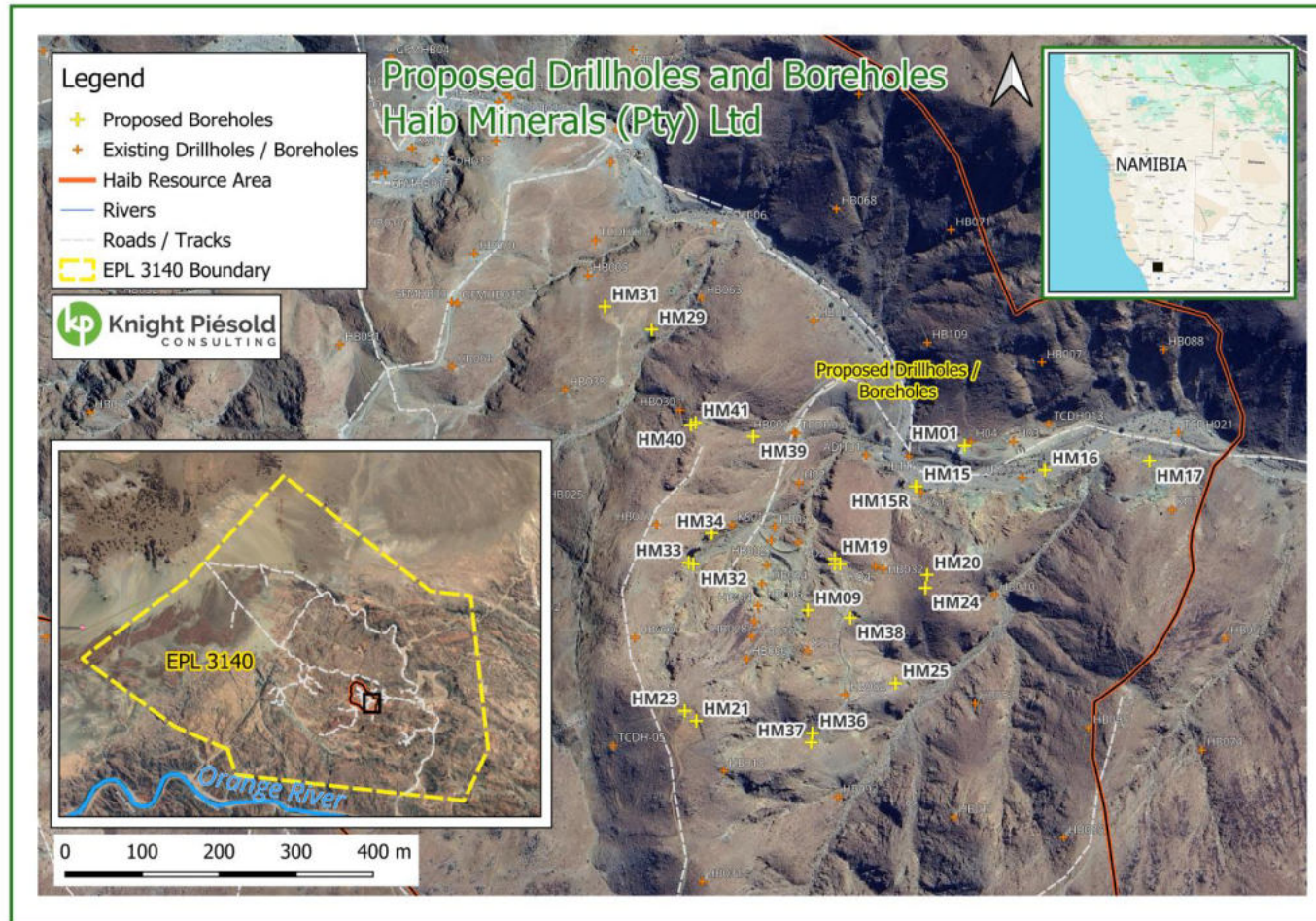


Figure 4: Locality proposed drillholes within Exclusive Prospecting License (EPL) 3140

1.2 HISTORY OF THE HAIB COPPER DEPOSIT

A brief history of the Haib copper deposit as it relates to Haib Minerals (Pty) Ltd is presented in Table 1.

Table 1: Brief timeline and history of the Haib copper deposit

| Date | Activity |
|-------------------------|---|
| Late 1800s/ early 1900s | Copper at Haib was first discovered |
| Post 1945 | Small-scale mining by George Swanson and production of up to 18 % copper |
| 1970-1975 | Rio Tinto Zinc (RTZ) conducted the first extensive and systematic investigation of the Haib deposit |
| 1995-1999 | Namibian Copper Joint Venture (NCJV) ran investigations (Geotech, infill holes, excavation, bulk sampling, metallurgy) |
| 1997 | Variety of specialist studies conducted |
| 1999-2010 | Various mining groups conducted drilling and exploration activities |
| 21 April 2004 | EPL 3140 awarded to Deep South Mining Company (Pty) Ltd |
| 2005-2007 | Metallurgical studies |
| 22 April 2007 | EPL 3140 renewed to Deep South Mining Company (Pty) Ltd |
| 2008 | JV agreement between Deep South Mining Company (Pty) Ltd (30 %) and Teck Resources Limited (70 %) |
| 22 April 2009 | EPL 3140 renewed to Deep South Mining Company (Pty) Ltd |
| 2010-2016 | Teck Namibia Ltd (Teck Resources Limited) conducted exploration activities |
| 22 April 2011 | EPL 3140 renewed to Deep South Mining Company (Pty) Ltd |
| 22 April 2013 | EPL 3140 renewed to Deep South Mining Company (Pty) Ltd |
| 2014 | Environmental Management Plan (EMP); approved by the Ministry of Environment and Tourism (MET) (now Ministry of Environment, Forestry and Tourism (MEFT)) |
| 2014 | Environmental Clearance Certificate (ECC) issued (MET; now MEFT) |
| 22 April 2015 | EPL 3140 renewed to Deep South Mining Company (Pty) Ltd |
| September 2016 | Deep South Mining Company (Pty) Ltd became 100% shareholder in Haib Minerals (Pty) Ltd |
| January 2017 | EMP for the proposed amendment of additional exploration activities on Haib Minerals (Pty) Ltd EPL 3140 |
| 22 April 2017 | EPL 3140 renewed to Deep South Mining Company (Pty) Ltd |
| May 2017 | Haib Minerals (Pty) Ltd became a wholly owned subsidiary of Deep South Resources |
| August 2017 | ECC issued (MET; now MEFT) |
| 22 April 2019 | EPL 3140 renewed to Deep South Mining Company (Pty) Ltd |
| 2020 | EMP for the proposed amendment of additional exploration activities on Haib Minerals (Pty) Ltd EPL 3140; |
| 15 February 2021 | ECC issued (MEFT; ECC-01233) |
| April 2021 | Application for renewal of EPL 3140 declined by the Ministry of Mines and Energy (MME) |
| 10 March 2023 | High Court Judgment in favour of Haib Minerals (Pty) Ltd |
| 06 July 2023 | Preparedness to grant the EPL 3140 |
| 07 July 2023 | EPL 3140 awarded to Deep South Mining Company (Pty) Ltd Valid: 6 July 2025 |

| | | | |
|--|---------------------|--|---------|
| | Ownership timeline | | EPL Gap |
| | EPL awards timeline | | Other |
| | ECC awards timeline | | |

1.3 TERMS OF REFERENCE

Mr. Joseph Mülders, Senior Environmental Scientist at Knight Piésold (Pty) Ltd., and Dr. Lima Maartens T/A LM Environmental Consulting have been appointed by Haib Minerals as the independent Environmental Assessment Practitioners (EAPs) to conduct the following (Appendix A and Appendix B appointment letter and details of EAP's):

1. Renew ECC on EPL 3140 (end 2023)
2. Support ongoing compliance with existing ECC's (throughout 2024)
3. Develop comprehensive requirements (including Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP) and Public Participation Process (PPP)) to make submission for required authorisations and licenses including ECC and Mining Licence (ML) (expected end 2024).

The first step in the appointment is the renewal of ECC on EPL 3140 which includes the Environmental Management Plan (EMP) audit, update and submission to the Ministry of Environment, Forestry and Tourism (MEFT) for their review and approval.

1.4 ENVIRONMENTAL ASSESSMENT PRACTITIONER

The authors of this report are Mr. Joseph Mülders and Dr Lima Maartens (Appendix B for CV's).

Mr. Joseph Mülders has 10 years of experience in the environmental services industry and is a registered Professional Natural Scientist (Environmental Science). Joseph has been involved in social and environmental risk, safeguards assessments and monitoring, spatial classification of socio-economic and environmental systems. He was appointed by the South African National Department of Environmental Affairs where he was responsible for developing and implementing the Social and Environmental Risk Management Program for a large 5-year multi-stakeholder Global Environmental Facility (GEF) funded project. He specialises in environmental due diligence, impact assessments and risk analysis, environmental monitoring, rehabilitation and offset quantification and design, stakeholder consultation, environmental monitoring and compliance. Joseph has experience in various African countries in terms of delivering projects to international best practice standards focusing on socio-economically sustainable development and management of natural resources.

Dr Lima Maartens who has more than 30 years' experience in natural resource management (she gained her doctorate (Ph.D.) in Fisheries Science from Rhodes University, South Africa (SA) while working for the Namibian Ministry of Fisheries and Marine Resources (MFMR) in 2000), lecturing (University of Namibia (UNAM)), environmental science and management (De Beers Marine Namibia and the Canadian Forsys Metals Corp), and consulting. Dr Maartens is registered as a Lead Practitioner and Reviewer with the Environmental Assessment Professionals of Namibia (EAPAN) (she served on the Executive Committee during 2016/17), an Associate Member and Environmental Auditor with the Institute of Environmental Management and Assessment (IEMA) in the United Kingdom (UK), a Full Member of the Namibia Chamber of Environment (NCE), and a Member of the Namibia Scientific Society.

1.5 ECC RENEWAL

1.5.1 BACKGROUND

The ECC renewal process is regulated by the MEFT in terms of the Environmental Management Act, 2007 (Government Gazette No. 3966, 27 December 2007) and Environmental Impact Assessment (EIA) Regulations (Government Gazette No. 4878) promulgated on 06 February 2012.

The requirements relating to the ECC renewal application as per the EIA Regulations is as follows:

- The renewal of the ECC is part of the conditions of approval of any application.
- The ECC is valid for period of three (3) years, from the date of issue unless withdrawn by the Office of the Environmental Commissioner.
- The date of expiry and renewal will be indicated on the ECC. On expiry of the ECC, the proponent is required to submit within a period not exceeding one month, and in the prescribed form and manner an application to the Office of the Environmental Commissioner for the renewal of the ECC.
- The proponent is required, from the date of commencing implementation of project activities, to compile and submit environmental monitoring reports (on project progress and the environmental management profile) on a bi-annual basis to Office of Environmental Commissioner.
- An application form for an ECC “Form 1” including supporting appendices must be completed and submitted to MEFT for renewal of ECC.
- Failure to renew an expired ECC shall result in permanent termination of the ECC.

1.5.2 AUDIT PERIOD AND APPROACH

Haib Minerals’ previous EPL expired 21 April 2021. Haib Minerals currently holds EPL 3140 valid 07 July 2023 to 06 July 2025. There is thus a period (22 April 2021 to 6 July 2023) that Haib Minerals was inactive due to lack of EPL and this period of inactivity will be highlighted in the audit findings.

The current ECC for EPL 3140 is valid 15 February 2021 to 15 February 2024.

During this period bi-annual environmental monitoring reports have not been compiled, and no submissions have been made to MEFT as required in terms of the ECC. This is due to non-renewal of EPL 3140, 2 months into the ECC period and activities halting. As the EPL is currently in place, Haib Minerals are set to recommence exploration activities late-November 2023.

As part of the ECC renewal for EPL 3140, an environmental compliance audit of the current EMP (2020) is undertaken (this report). The period of review covers the period of the existing ECC 15 February 2021 to 15 February 2024.

Towards compiling relevant documentation for the renewal of the ECC, Knight Piésold Consulting (KP) have conducted the following:

1. Environmental compliance audit of the current EMP (this report);
2. Site visit and investigation (30 October 2023);
3. Compile ECC renewal application forms; and
4. Update EMP for exploration activities proposed at EPL 3140.

1.5.3 THE ENVIRONMENTAL COMPLIANCE AUDIT

The approved 2020 EMP developed for Haib Minerals forms the basis of this audit undertaken by Knight Piésold Consulting. During the process, previous EMP’s including 2014 and 2017 were considered to ensure a comprehensive audit. The scope of the environmental compliance audit included the following:

- A site investigation at EPL 3140 to inspect the current status of the environment, activities and infrastructure specific to activities proposed in the ECC
- Assess, verify and confirm through document analysis and review, evidence, records and observations the implementation of management and mitigation measures required by the latest 2020 EMP.

Knight Piésold conducted a site visit to EPL 3140 on the 30th of October 2023 where the audit was undertaken. The audit included Haib Minerals' COO, Jean-Luc Roy, and exploration geologist Vivian Stuart Williams as the auditees. The EMP checklist was utilised to guide discussions and relevant target sites including exploration target sites were observed. At time of audit no activities were ongoing however drilling activities, as per ECC were set to commence the 15th of November 2023.

It must be noted a dedicated site supervisor, Mr. Emmanuel Tutu Tugamena Shilongo was appointed by Haib Minerals in early January 2024 of which responsibilities include the implementation and ongoing compliance with the EMP and conditions of the ECC.

The findings of the audit are presented in Section 4.0.

2.0 REGULATORY FRAMEWORK

The most pertinent legislation (Ruppel and Ruppel-Schlichting, 2022; and Legal Assistance Centre (LAC), 2023a, b), with the aim of informing Haib Minerals (Pty) Ltd of the legal requirements pertaining to the exploration for base and rare metals and precious metals within EPL 3140, //Kharas Region, Namibia, is listed in Table 2.

Table 2: Regulatory framework for the exploration for base and rare metals and precious metals by Haib Minerals (Pty) Ltd within Exclusive Prospecting License (EPL) 3140, //Kharas Region, Namibia.

| National Law |
|--|
| Acts of Parliament, Regulations, Ordinances, Proclamations |
| The Constitution of the Republic of Namibia 1990 (and First Amendment Act 34 of 1998, Second Amendment Act 7 of 2010, and Third Amendment Act 8 of 2014) |
| Employees' Compensation Act 30 of 1941 (as amended in South Africa prior to Namibian independence) (Amendment Act 5 of 1995 amends the Act substantially and changes its name from the Workmen's Compensation Act to the Employees' Compensation Act) (and the General Regulations 1961 (as amended)) |
| Burial Place Ordinance 27 of 1966 |
| Soil Conservation Act 76 of 1969 (as amended; Section 13 is amended by the Forest Act 12 of 2001) (and the Regulations 1973) |
| Mountain Catchment Areas Act 63 of 1970 |
| Hazardous Substance Ordinance 14 of 1974 (and the General Regulations 1979; no post-independence regulations have been promulgated) |
| International Health Regulations Act 28 of 1974 (as amended to December 1977); the International Health Regulations were replaced in turn by the International Health Regulations, 2005, which entered into force internationally on 15 June 2007 (<i>Source: World Health Organisation (WHO)</i>). Namibia is bound by these 2005 Regulations from that date in accordance with Articles 21(a) and 22 of the WHO Constitution. |
| Nature Conservation Ordinance 4 of 1975 (and the Regulations Relating to Nature Conservation 1976 and the amended Regulations) |
| Atmospheric Pollution Prevention Ordinance 11 of 1976 (Regulations are authorised by several sections of the Act; no post-independence regulations have been promulgated) |
| Petroleum Products and Energy Act 13 of 1990 (as amended by the Petroleum Products and Energy Amendment Act 29 of 1994, Act 3 of 2000, and Act 16 of 2003) (and the Regulations relating to the purchase, sale, supply, acquisition, possession, disposal, storage, transportation, recovery and re-refinement of used mineral oil 1991, Petroleum Products Regulations 2000 (amended in 2002 and 2016), Regulations for arbitration procedures 2003, Regulations on funding of approved agencies 2004 (withdrawn 2005) (GN 247/2013 purports to amend the regulations in GN 230/2004, leaving the correct text of these regulations uncertain), and the Regulations relating to the reselling price of petrol and petrol products (issued frequently, with each one revoking or replacing the previous one) |
| Foreign Investment Act 27 of 1990 (and amendment Act 24 of 1993) (and the Regulations 1992) |
| Regional Councils Act 22 of 1992 (and Amendment Acts 17 of 1997, 30 of 2000, 12 of 2002, 12 of 2010, 16 of 2010, and 7 of 2017) (and the Regulations: Commercialisation Regulations 2001; Joint Business Venture Regulations 2001; and Tender Board Regulations 2001) |
| Local Authorities Act 23 of 1992 (and amendments) (and the Model Pound Regulations 1994, the Model Electricity Supply Regulations 1996, Model Water Supply Regulations 1996, Model Sewerage and Drainage Regulations 1996, Model Regulations for the Control of Dogs in Local Authority Areas 2008, Commercialisation Regulations 2001 (amended in 2007), Joint Business Venture Regulations 2001 (amended in 2007), and Tender Board Regulations 2001 (replaced in 2011), and Recruitment and Selection Regulations for Local Authority Councils 2019) |

| |
|--|
| Minerals (Prospecting and Mining) Act 33 of 1992 (and Minerals (Prospecting and Mining) Amendment Act 8 of 2008) |
| Social Security Act 34 of 1994 (as amended by the State-owned Enterprises Governance Act 2 of 2006/ Public Enterprises Governance Act 2 of 2006, and the Labour Act 11 of 2007 (and the General Regulations 1995, and amendments)) |
| Namibia Water Corporation Act 12 of 1997 (and amendments: Namibia Water Corporation Amendment Act 17 of 2001; Water Resources Management Act 24 of 2004 (it never came into force and has been repealed by the Water Resources Management Act 11 of 2013); State-owned Enterprises Governance Act 2 of 2006 (re-named the Public Enterprises Governance Act 2 of 2006); and the Water Resources Management Act 11 of 2013) |
| Affirmative Action (Employment) Act 29 of 1998 (as amended by Act 6 of 2007 and the Labour Act 11 of 2007) (and the General Regulations 1999) |
| Road Traffic and Transport Act 22 of 1999 (as amended by the Road Traffic and Transport Amendment Act 6 of 2008) (and the Road Traffic and Transport Regulations 2001) |
| Forest Act 12 of 2001 (as amended by the Forest Amendment Act 13 of 2005) (and the Forest Regulations 2015) |
| Inland Fisheries Resources Act 1 of 2003 (and the Regulations) |
| National Heritage Act 27 of 2004 (as amended by the State-owned Enterprises Governance Act 2 of 2006/Public Enterprises Governance Act 2 of 2006) (and the National Heritage Regulations 2005) |
| Environmental Management Act 7 of 2007 (and the Environmental Impact Assessment Regulations 2012) |
| Labour Act 11 of 2007 (and the Labour Amendment Act 2 of 2012) (and the Regulations relating to the Health and Safety of Employees at Work 1997, the Labour General Regulations 2008, and the Regulations relating to Domestic Workers 2017) |
| Tobacco Products Control Act 1 of 2010 (and the Regulations 2014) |
| Disaster Risk Management Act 10 of 2012 (and the Disaster Risk Management Regulations 2013) |
| Water Resources Management Act 11 of 2013 and the Water Resources Management Regulations 2023 |
| Public and Environmental Health Act 1 of 2015 (and section 20(1) of the National Health Act 2 of 2015) (and the Public Health Covid-19 General Regulations 2021) (and amendments) |
| Policies, Guidelines, National Strategies & Action Plans |
| Policies |
| Conservation of Biotic Diversity and Habitat Protection 1994 |
| Namibia: National Code on HIV/AIDS in Employment 2000 |
| National Water Policy White Paper - Policy Framework for Equitable, Efficient, and Sustainable Water Resources Management and Water Services 2000 |
| Minerals Policy of Namibia 2002 |
| Namibia's <i>Draft</i> Wetland Policy 2004 |
| National Policy on HIV/AIDS 2007 |
| National Gender Policy 2010 - 2020 |
| National Health Policy Framework 2010-2020 - "towards quality health and social welfare services" |
| National Policy on Climate Change for Namibia 2011 |
| Revised National Policy on Human Wildlife Conflict Management 2018-2027 |
| Guidelines |
| Excellence In Environmental Stewardship Toolkit (EES) 2009 |
| National Strategies & Action Plans |
| Namibia's Green Plan 1992 |
| Vision 2030 2004 |
| National Climate Change Strategy & Action Plan (2013 – 2020) |
| Namibia's Second National Biodiversity Strategy and Action Plan (NBSAP 2) (2013 – 2022) |
| Third national action programme for the Namibia to implement the United Nations Convention to Combat Desertification and Land Degradation (2014 – 2024) |
| Namibia's 5th National Development Plan (NDP5) – Working together towards prosperity (2017/18 – 2021/22) |
| National Solid Waste Management Strategy 2018 |
| National Parks Environmental Management Plans (EMPs) |

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|--|
| N/A |
| Town Planning Schemes, Structure Plans, & Land Use Plans |
| Karas Integrated Regional Land Use Plan (KIRLUP) 2011 - 2016 |
| Strategic Environmental Assessments (SEAs) |
| Strategic Environmental Assessment (SEA) for the Karas Integrated Regional Land Use Plan (KIRLUP) |
| Good Industry Practice |
| Best Practice Guide. Environmental Principles for Mining in Namibia 2019 |
| International Law |
| African Union (AU) |
| African Charter on Human and Peoples' Rights (Banjul Charter) 1981 and the Protocol to the African Charter for Human and Peoples' Rights on the Rights of Women in Africa (Maputo Protocol) 2003 |
| Agreement between the Governments of the Republic of Botswana, the Kingdom of Lesotho, the Republic of Namibia and the Republic of South Africa on the Establishment of the Orange-Sengu River Commission (ORASECOM) 2000 |
| African Convention on the Conservation of Nature and Natural Resources (Revised Version) 2003 (non-binding) |
| Agreement for the Establishment of the Africa Institute for the Environmentally Sound Management of Hazardous and Other Wastes Agreement 2004 |
| African Road Safety Charter 2016 (not yet binding on Namibia) |
| Southern African Development Community (SADC) |
| Treaty of the Southern African Development Community (SADC) 1992 (and six amendments: Agreement Amending the Treaty 2001; Agreement Amending Article 22 of the Treaty 2007; Agreement Amending the Treaty 2008; Agreement Amending the Treaty 2009 (DES); Agreement Amending the Treaty 2009 (ORGAN); and Agreement Amending the Treaty 2015) (and Protocol to the Treaty establishing SADC on Immunities and Privileges 1992) |
| SADC Protocol on Mining 1997 |
| Protocol on Health 1999 |
| Revised Protocol on Shared Watercourse Systems in the SADC 2000 |
| Charter of Fundamental Social Rights in SADC 2003 |
| SADC Protocol on Gender and Development 2008 (and an Agreement Amending the SADC Protocol on Gender and Development 2016) |
| SADC Protocol on Environmental Management for Sustainable Development 2014 (not yet binding) |
| SADC Protocol on Employment and Labour 2014 (not yet binding) |
| United Nations (UN) / International Conventions |
| Constitution of the International Labour Organization (ILO) 1919 (as amended), and *Instrument of Amendment of the ILO Constitution, 1986 (not yet binding), and the Instrument of Amendment of the ILO Constitution 1997 |
| Constitution of the World Health Organization (WHO) 1946 (and *Amendment to Article 7 of the Constitution of the World Health Organization 1965 (not yet binding); *Amendment to Article 74 of the Constitution of the World Health Organization 1978 (not yet binding); Amendments to Articles 24 and 25 of the Constitution of the World Health Organization 1986; and Amendments to Articles 24 and 25 of the Constitution of the World Health Organization 1998) |
| International Plant Protection Convention 1951 (as revised in 1979 and 1997) |
| ILO Convention concerning Discrimination in Respect of Employment and Occupation (No. 111) 1958 (and including the Forced Labour Convention 1930 (No. 29); Abolition of Forced Labour Convention 1957 (No. 105); Freedom of Association and Protection of the Right to Organise Convention 1948 (No. 87); Right to Organise and Collective Bargaining Convention, 1949 (No. 98); Equal Remuneration Convention 1951 (No. 100); Discrimination (Employment and Occupation) Convention 1958 (No. 111); Minimum Age Convention 1973 (No. 138); and Worst Forms of Child Labour Convention 1999 (No. 182)) |
| International Convention on the Elimination of All Forms of Racial Discrimination 1966 |
| International Covenant on Civil and Political Rights (ICCPR) 1966 (and the Optional Protocol to the International Covenant on Civil and Political Rights 1966 and the Second Optional Protocol to the International Covenant on Civil and Political Rights, aiming at the Abolition of the Death Penalty 1989) |
| International Covenant on Economic, Social and Cultural Rights (ICESCR) 1966 |

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| Convention on Wetlands of International Importance, especially as Waterfowl Habitat (Ramsar Convention) 1971 (and Protocol to amend the Convention on Wetlands of International Importance especially Waterfowl Habitat 1982, and Amendments to Article 6 and 7 of the Convention on Wetlands of International Importance especially Waterfowl Habitat 1987) |
| Convention Concerning the Protection of the World Cultural and Natural Heritage 1972 |
| Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) 1979 and the Optional Protocol to the Convention on the Elimination of all Forms of Discrimination against Women 1999 |
| Vienna Convention for the Protection of the Ozone Layer 1985 and the Montreal Protocol on Substances that Deplete the Ozone Layer 1987 (and Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, adopted by the Second Meeting of the Parties at London on 29 June 1990 (London Amendment); Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, adopted by the Fourth Meeting of the Parties at Copenhagen on 25 November 1992 (Copenhagen Amendment); Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, adopted by the Ninth Meeting of the Parties at Montreal on 17 September 1997 (Montreal Amendment); Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, adopted by the Eleventh Meeting of the Parties at Beijing on 3 December 1999 (Beijing Amendment); and Amendment to the Montreal Protocol on Substances that Deplete the Ozone Layer, adopted by the Twenty-Eighth Meeting of the Parties at Kigali from 10 to 15 October 2016 (Kigali Amendment)) |
| Convention on Biological Diversity (Biodiversity Convention) 1992, the Cartagena Protocol on Biosafety to the Convention on Biological Diversity, Montreal 2000, and the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity 2010 |
| United Nations Framework Convention on Climate Change (UNFCCC) 1992, the Kyoto Protocol to the UN Framework Convention on Climate Change 1997 (and the not yet binding Doha Amendment to the Kyoto Protocol to the United Nations Framework Convention on Climate Change 2012), and the Paris Agreement 2015 |
| United Nations Convention to Combat Desertification in those Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa 1994 |
| Convention on the Law of the Non-Navigational Uses of International Watercourses 1997 |
| Convention for the Safeguarding of the Intangible Cultural Heritage 2003 |
| Convention on the Protection and Promotion of the Diversity of Cultural Expressions 2005 |
| International Best Practice |
| The Vermillion Accord on Human Remains 1989 |
| International Finance Corporation (IFC) Environmental Health and Safety (EHS) Guidelines 2007 and the EHS Guidelines for Mining 2007 |
| Workers' accommodation: process and standards (IFC and European Bank for Reconstruction and Development (EBRD), 2009) |
| International Organizations |
| Prospectors and Developers Association of Canada (PDAC) |

3.0 ACTIVITIES AND SITE DESCRIPTION

3.1 INFRASTRUCTURE AND ACTIVITIES

3.1.1 INFRASTRUCTURE

All roads and infrastructure remain the same as those described in EMP 2017 and 2020 and no new infrastructure has been developed. Much of the infrastructure dates pre-Haib Copper exploration of the region. Infrastructure thus includes the following:

Access tracks:

- Access routes to drill rig laydown areas
- Access tracks to the historic boreholes.

Access to all exploration activities sites is still via the already established routes which are maintained by Haib Minerals.

Exploration Camp- established by RTZ in the 1970s but heavily dilapidated through severe looting:

- The exploration camp houses (dilapidated)
- The exploration camp infrastructure includes:
 - Various small buildings/houses (destroyed)
 - Air strip (existing)
 - Tennis court (dilapidated)
 - Storerooms (for samples)
 - Toilets and sewerage tanks (dilapidated)
 - Redundant buried gasoline/diesel fuel tanks and remains of the former filling station.

Remains of historical infrastructure:

- Tsams Farmhouse (dilapidated)
- Old mine infrastructure and leach tanks.

Exploration and drilling sites:

- Disturbance is as per footprint area of the previous exploration activities, including access route to the site and laydown area for drill rig (approx. 25 m²)
- Various capped drill holes.

3.1.2 PLANNED ACTIVITIES AND INFRASTRUCTURE

In previous years, exploration activities involved the exploration workforce residing on the EPL 3140 site. This brought with it a range of activities relating to domestic use of the area (i.e. water provision, establishing residential camps, domestic waste, sanitation, power supply, etc.). As the work force will be residing within Noordoewer for the duration of exploration activities, the extent of these activities will be significantly reduced if not lost altogether.

The nature and magnitude of proposed exploration activities within the ECC period is described below:

3.1.2.1 EXPLORATION ACTIVITIES

Exploration activities will target the resource focal area as per Figure 2 and will include the following activities:

- Operation of vehicles and drilling (see Figure 5) machinery (2 x drill rigs)
- Drilling (Diamond Core) of 5 000m, approximately 25 holes spread across the target area
 - Annular diamond-impregnated drill bit attached to the end of hollow drill rods to cut a cylindrical core of solid rock
 - Holes within the bit allow water to be delivered to the cutting face providing three essential functions of lubrication, cooling, and removal of drill cuttings from the hole
- Abstraction of surface water from the Orange River for drilling purposes (up to 20 000 liters per day)
- Resource mapping
- Refining the resource model
- Employees and contractors on site during daytime hours;
- Maintenance of access roads
- Storage and transport of vehicle and machinery fuel (hydrocarbons) (approx. 500 liters).

Where possible, existing drilling pads or drill areas will be used. Typical drilling pad/areas will consist of the following:

- A drill-rig
- An area where the drill core and geological samples can be stored
- A storage area for drill equipment, fuel and lubricants.

The area will be cordoned off and access will be limited to only the exploration team. The drilling pad/area will be cleared and levelled and is approximately 10 m x 10 m. All drill-water will be collected in drill-sumps, which will be managed to prevent overflows.

As drilling is expected to extend into the water table, a Borehole Licence will be obtained, in line with the Water Resource Management Act, 2013 (Act No. 11 of 2013) and the Water Resources Management Regulations 2023.



Figure 5: Example of a drill rig used on site (established in previous years at the Haib site)

3.1.2.2 EMPLOYMENT AND HOUSING

All employees (Haib Minerals and drillers) reside in Noordoewer (off site) and will commute daily.

3.1.2.3 WASTE MANAGEMENT

The following types of waste will be generated during the exploration activities, in relatively small volumes:

- Domestic waste (non-hazardous) that is produced will be disposed of at the Noordoewer waste landfill site
- Biodegradable and non-toxic drill fluids/additives will be used; however if non-degradable or toxic drill additives are used, the drill-mud will be discarded to the municipal waste dump (Windhoek) when the drill-site is rehabilitated
- Potential hydrocarbon spills from vehicles and drilling equipment might lead to soil contamination and would need to be treated as a hazardous waste if not bio-remediated.

3.1.2.4 SANITATION

A long drop toilet is installed on site. Personnel are not permitted to relieve themselves in the surrounding environment.

3.1.2.5 WATER SUPPLY

Drinking water is brought in daily from Noordoewer. No water for domestic purposes is required.

The water for the drilling will be abstracted and placed in 15 000-liter bowsers and trucked to the drilling rigs. Up to 20 000 litres of water will be required for the drilling operations on a daily basis.

A water abstraction license for abstracting water from the Orange River will be obtained, in line with the Water Resource Management Act, 2013 (Act No. 11 of 2013) and the Water Resources Management Regulations 2023. Abstraction of water will be limited to permit specifications. An alternative will be abstraction from groundwater resources. In this case the appropriate permits/licenses will be obtained.

The abstraction period is approximately 19 weeks with maximum water abstraction estimated at 2 090 000 l/annum = 2.09 Ml/annum = 2 090 m³/annum.

3.1.2.6 POWER SUPPLY

No electricity supply will be available. All drill rigs' water pumps and all vehicles are powered by engines. As described above, vehicle and machinery fuel will be transported and stored in tanks with a volume of approximately 500 liters.

3.1.2.7 ACCESS ROADS

The existing access roads (Figure 6) are used as far as possible. No new access roads are anticipated to be constructed and where required, mitigation measures will apply



Figure 6: Example of an access road already established at the Haib site

3.2 BASELINE RECEIVING ENVIRONMENT

The context and status of the bio-physical environment and receiving exploration sites is provided. Information is based on Haib project baseline condition reports ((Ecosun, 1997) (Burke, 1997) (Griffen, 1997) (Kinahan, 1997)), Preliminary Economic Assessment (METS, 2020), Engineering scoping studies ((KP, 2023)), previous EMPs (SLR Consultants, 2014), (SLR Consultants, 2017), (SLR Consultants, 2020)), and the site visit conducted on 30 October 2023.

3.2.1 LOCATION AND ENVIRONMENTAL SETTING

EPL 3140 covers an area of approximately 36,656 ha and is located in the south of Namibia, approximately 9 km (from the south-western boundary) from the town Noordoewer. The B1 Road forms the north-western boundary of the EPL. The Orange River runs immediately to the south of the EPL and a number of farms surround the EPL. The biggest portion of EPL 3140 lies on state land. The

eastern part of the EPL is located on an abandoned farm (Name of Farm: Tsams). Withoek Farm is located on the north-eastern boundary of the EPL.

The topography is varied (see Figure 6) and characterised by relatively flat gradients in the West and extensive hills with prominent dolerite sills in the East within the Gomkab Basin and with elevations varying from 200m to 700m metres above sea level (masl) (Figure 7). The topography for most of the proposed exploration drilling sites is rocky with undulating hills that has gentle rises and dips.



Relatively flat expanses of the Karoo Supergroup (Characteristic of West Haib)



Dolerite sills characteristic of granodiorite outcrops (Characteristic of Eastern Haib)

Figure 7: Images of topographic variation within EPL 3140

The resource focal area is located towards the Eastern side of the EPL (Figure 2). The proposed additional exploration drilling will be undertaken in the same target area.

3.2.1.1 METEOROLOGICAL CONDITIONS

Temperatures range from as high as mid 40°C in the summer months to as low as 0°C in the winter months (METS Engineering Group, 2020). The average annual rainfall is 25-50 mm. Rainfall in winter is generally soft and with occasional intense rainfall. In summer, the rainfall is associated with occasional thunderstorms with short duration, and heavy intensity. All the streams within the area are ephemeral but can flow very strongly after summer storm rainfall (Parkman, 1997).

3.2.1.2 SITE GEOLOGY

The Haib deposit is located within part of the Namaqua-Natal Province called the Richtersveld geological sub-province which is further subdivided into a volcano-sedimentary sequence (locally, the Haib Subgroup), the Orange River Group, and the intrusive Vioolsdrift suite. The deposit was previously thought to be hosted in a porphyry system older than the Jurassic made up predominantly of disseminated sulphides with veins locally important. This understanding is being questioned under the current exploration regime.

The lithology of the site geology is composed of the following:

- Feldspar Porphyry (FP) – Andesitic volcanic and sub-volcanic intrusions
- Quartz Feldspar Porphyry (QFP) - Sub-porphyritic granodiorite
- Quartz Feldspar Porphyry 2 (QFP2) - Porphyritic granodiorite
- Quartz Biotite Porphyry (QBP) - Associated with main alteration-mineralisation event
- X-Porphyry (XP) - Late, dacitic porphyry with its own hydrothermal breccias.

Generally, the rock formation within the Haib project site is hard and competent with both flat and steeply dipping joint sets being well developed.

3.2.1.3 BIODIVERSITY

EPL 3140 remains unchanged.

Flora

The site is situated within the vegetation biome of the Nama Karoo with the vegetation in the study area dominated by dwarf and succulent shrubs which are well adapted to the arid environment. None of the vegetation types occur only within the mining area. Various protected Quiver trees remain scattered across the EPL. Floral specialist studies completed in 1997 (Burke) reported that, none of the Namibian and South African endemics and protected species are threatened or rare within their distribution range. Although outside EPL 3140, extensive *Prosopis* outcrops are present along the Orange River to the south of the site (Figure 8).

Avifauna

Species composition of birds reflected the dry open habitat of the Karoo and riparian vegetation. In a 1997 study (Simmons, 1997), a total of 102 species were recorded from the area, making it depauperate compared with other riverine areas in Namibia. The report showed the area was rich in raptors (15 species recorded), including rare Booted Eagles. Five Red Data species were found: The Peregrine Falcon, African Fish Eagle, and the “endangered” Black Stork, each with breeding sites along the Orange River downstream of the Haib River mouth. The “vulnerable” Cape Eagle Owl was apparent in the pipeline gorge and the tropical White-backed Night Heron recorded near Haibmond (Haib River mouth).

Fauna

Fauna observed over the years by Haib Minerals employees include: Klipspringer; Blackback Jackal, various snakes (Puff adders and Cobras), various scorpions, Kudu, Porcupine, Leopard and Chacma baboons. Only Klipspringer and Chacma baboon (see Figure 9) were observed at the time of the Audit. Results of a Faunal assessment done on site in 1997 (Griffen) showed species of interest in the RTZ gorge to include clicking stream frog, Namaqua stream frog, Western Cape gecko, Namaqua plated lizard, Cape house snake, cross-marked sand snake, common mole rat, Barbour’s rock mouse and Cape rock elephant shrew.

Aquatic Ecosystems

Due to the dry climate and limited rainfall events, aquatic ecosystems are limited to the Orange River outside the southern border of EPL 3140 (Figure 10). Two fish species of conservation concern include *Pseudobarbus hospes*, previously named *Barbus hospes* and *Austroglanis sclateri*. *P. hospes* is endemic to the Lower Orange River. Other vulnerable species, under the system’s degree of river regulation and catchment utilisation at the time of the survey in 1997 (Ecosun, 1997), included *Labeobarbus kimberleyensis*, *Enteromius trimaculatus* and *Labeo umbratus*.

Historic and current exploration activities over the years in the EPL have led to development of access routes and drill rig laydown areas but other than that there has not been any significant change to biodiversity in the EPL.



Dwarf and succulent shrubs characteristic of the Haib site



Mesembryanthemum crystallinum L. (Common Ice plant)



Aloidendron dichotomum (Quiver Tree)



Boscia foetida (Stink Sheperd's Tree)



Invasive *Prosopis* spp. on the banks of the Orange River

Figure 8: Images of floral assemblages present on EPL 3140



Figure 9: Chacma Baboon (Papio ursinus) spoor



Figure 10: View of the Orange River from outside EPL 3140.

Protected areas

The protected status of the region is characteristic of areas within both Namibia and South Africa including (IUCN 2020):

- The Gamsberg Communal Conservancy, within Namibia approximately 40 km from the Haib Site
- The Nabaniep Nature Reserve, within South Africa approximately 30 km from the Haib Site
- The Ais-Ais Hot Springs National Park (directly North and surrounding Aussenkehr in Namibia)
- Richtersveld National Park in South Africa.

The latter two together form the Ais-Ais Richtersveld Transfrontier Park, with the Orange River dissecting the two.

3.2.1.4 WATER RESOURCES

The Haib deposit straddles the Volstruis River, a tributary of the Haib River, which is an ephemeral tributary of the Orange River located approximately 15 km south of the deposit area. Water resources are limited to the Orange River and limited groundwater resources.

The Orange River is a shared watercourse, between Lesotho, South Africa, Botswana and Namibia. To align the member states of the shared watercourse, the Orange-Senqu River Commission (ORASECOM) was established in 2000. The aim of ORASECOM is to develop and manage a comprehensive basin perspective, determine water use and plan for future use and intervention, as well as to determine flow monitoring requirements, and to conduct flood management (ORASECOM, 2020). A provision for the Haib project water demand is included in the water supply plan of the Orange River Scheme.

A weir is located upstream of the Noordoweiver/Vioolsdrift irrigation areas, which supports the Vioolsdrift irrigation area via a canal on the South African side of the Orange River, and the Namibian irrigators abstract directly from the Orange River. The average daily flow rate at the Vioolsdrift Weir is shown in Figure 11. The weir was constructed in 1935 with data still being recoded to date. There are known data quality issues with the record, however a very clear trend emerges, indicating that the average flows have reduced significantly after the construction of two upstream dams namely, Gariep and Vanderkloof dams, in 1971 and 1976. Releases are regulated from the Vanderkloof Dam to support the Lower Orange during dry periods and to generate hydropower, if the Vanderkloof storage curve is above the pre-determined operating curve.

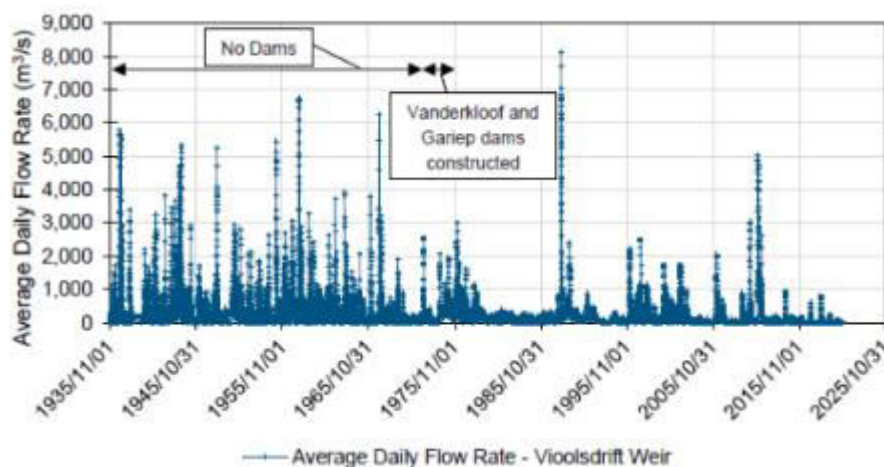


Figure 11: Average Daily Flow Rate at the Vioolsdrift Weir

According to the Groundwater Division of the Department of Water Affairs, and National Groundwater Archive (NGA) database, the Haib project is located within the Namibian hydrogeological zone characterised by very low and limited groundwater potential. This is associated with groundwater occurrence within fractures and potential yields of 0 - 0.1 l/s. The fractured zones are poorer aquifers probably due to low connectivity between the individual fractures and the decreasing fracture aperture with depth. The fresh rock units are usually characterised by very low hydraulic conductivity.

According to NGA, borehole yield data show and support the characterisation of Haib site as being located in a low yielding aquifer. The yields range from 0 to 2.7 l/s within the 35 km range of the project site.

3.2.1.5 SOCIAL

Two major settlements in the sub-region are Noordoewer and Aussenkehr with respective populations of approximately 2 000 and 4 500 in 2011. The region is predominantly characterised of irrigation supported agricultural activities with numerous farms situated along the Orange River. Principal crops include grapes, but also lucerne and vegetables.

Aussenkehr, the larger of the two, is situated approximately 60 km to the west of Noordoewer. The broader agricultural complex has been expanded over the past 20 years, growing from 381 ha under irrigation in 1985 to 1 385 ha in 2018. The primary agricultural activity is the production of table grapes for export.

3.2.1.6 ARCHAEOLOGY

Several old features from the farm and project's past are still present on site. The following two are of heritage significance:

- The old farmhouse, which was vacated in the 1960s
- The stone structured tank leaching operations which were used to mine copper for the World War II effort.

An Archaeological field survey was undertaken in 1997 (Kinahan, 1997) which found approximately 48 sites of significance.

4.0 AUDIT OF ENVIRONMENTAL MANAGEMENT PLAN

4.1 INTRODUCTION

As part of the EMP Performance Review / Update, the following actions were carried out to inform the audit:

- Review of the following documents made available to the EAPs:
 - EMP 2014 (SLR Consultants, 2014)
 - EMP 2017 (SLR Consultants, 2020)
 - EMP 2020 (SLR Consultants, 2020)
- Review of the following permits made available to EAPs
 - ECC, MEFT, 2021 / EPL 3140, 15 February 2021
 - ECC, MEFT, 2017 / EPL 3140, 09 August 2017
 - ECC, MEFT, 2014 / EPL 3140, 21 April 2014
- The following meetings and correspondence
 - MS Teams with Mr. Timoteus Mufeti, Environmental Commissioner MEFT on the 22 April 2021, Mrs. Tania Oosthuizen from Knight Piésold Consulting to introduce activities.
 - In person at MEFT offices with Ms Saima Angula (Deputy Director - EAIWPCI) and Ms Rikka Shikongo (Senior Conservation Scientist) MEFT on 26 October 2023;
 - MS Teams and in person with Mr. Jean-Luc Roy (Director and COO) and Mr. Pierre Leveille (Director and CEO) of Haib Minerals (PTY) Ltd on 12 October 2023 and 25th October 2023;
 - Site assessment conducted 30 October 2023 to EPL 3140 together with the Haib Minerals Chief Operations Officer (Mr Jean-Luc Roy) and principal Geologist (Mr Vivian Stuart-Williams).
 - Numerous ongoing discussions with the Haib Minerals Site Supervisor Mr Emmanuel Tutu Tugamena Shilongo between January and February 2024,

4.2 COMPLIANCE: ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) as per ECC 2021 for EPL 3140 was audited against compliance and results of the audit are presented in Table 3.

It must be noted a site supervisor is appointed by Haib Minerals of which responsibilities include the implementation and ongoing compliance with the EMP and conditions of the ECC.

Compliance with the 2020 EMP has been colour coded to demonstrate compliance with the 2020 EMP as per legend below:

| | | | |
|--|-----------------------------------|--|------------------------------|
| | Compliance/ Completed | | Changes made to existing EMP |
| | In Progress/ Ongoing | | Unknown |
| | Non-compliance/partial compliance | | Not audited |
| | Not (currently) Applicable | | |

Table 3: Audit results of the Environmental Management Plan (EMP 2020) (SLR Consultants, 2020) for the 2021 ECC for EPL 3140

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|--|---|---|---|
| Hydrocarbons and associated spills management | | | |
| The objective of the mitigation measures is to handle and store hydrocarbons in such a way as to prevent spills. Where spills do occur, to ensure the spill is contained and the contamination cleaned-up and contaminated material disposed of responsibly. | | | |
| Storage of Hydrocarbons (i.e. diesel bowser, oil, drums, etc.) | <ul style="list-style-type: none"> In all areas where there is storage of hydrocarbons, there will be containment of spillages on impermeable floors and bund walls that can contain 110 % of the volume of the hazardous substances Regular inspection of hazardous storage area is required Regular environmental awareness should include potential risks associated with hydrocarbons | <ul style="list-style-type: none"> Based on activities Feb-April 2021 and since 15 Nov 2023 Currently there are no hydrocarbons stored on site – pers correspondence Vivian Williams, site inspection and Mr. Emmanuel Shilongo No monitoring or incident reports available | <ul style="list-style-type: none"> Monitor storage of hydrocarbons |
| Vehicles, machinery, generators and equipment | <ul style="list-style-type: none"> Establish and maintain impermeable bunded areas around diesel generators Vehicles, machinery and equipment shall be kept in good working condition to ensure they do not leak oil/diesel Vehicles and machinery will be serviced off site as far as possible. However, in the event where machinery needs to be repaired/serviced on site all care shall be taken to prevent spillage of oil/diesel by performing the work on impermeable surfaces or proper placement of drip trays All used parts from vehicles and machinery (which may include, but not limited to, oil filter, pipes, rags, | <ul style="list-style-type: none"> Based on activities Feb-April 2021 and since 15 Nov 2023 Vehicles are not serviced on site, Diesel generators and petrol power genset used for welding is stored on an impervious plastic liner (Plate 1) Drip trays are installed under all drill rigs, parked excavators and TLBs (Plate 2). Refueling of vehicles or equipment occurs in Noordoever – pers correspondence Vivian Williams, | <ul style="list-style-type: none"> Record all maintenance of vehicles (on or off site) |

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|-------------------------|--|---|--|
| | <p>cans) will be collected and removed from site and disposed of in an appropriate manner</p> <ul style="list-style-type: none"> All refuelling of vehicles will take place on impermeable surfaces Pollution will be prevented through basic infrastructure design and through maintenance of equipment | <p>site inspection and Mr. Emmanuel Shilongo</p> <ul style="list-style-type: none"> No monitoring or maintenance reports available. | |
| General (spills) | <ul style="list-style-type: none"> Any spills will be contained and cleaned up immediately Spill kits will be readily available on site. Employees and/or contractors will be shown how to use the spill kits to enable containment and remediation of pollution incidents Haib Minerals will establish environmental awareness in employees and contractors Soil contaminated with hydrocarbons shall be excavated and stored in a safe place at the camp site, until such time when it shall be disposed of at the Hazardous waste disposal facility in Windhoek | <ul style="list-style-type: none"> Based on activities Feb-April 2021 and since 15 Nov 2023 Spill kits are available at each drill site (Mr. Emmanuel Shilongo) (Plate 3) Spills training has been undertaken (Mr. Emmanuel Shilongo and record of training 17/02/2024) No visual evidence of spills occurring (Site visit) The protocol dictates drill contractors to provide evidence upon disposal of contaminated soils (Ferrodrill namibia (Pty)Ltd Oil Spillage procedure provided) Evidence provided of waste manifest/ Safe Disposal Certificate provided from Windhoek hazardous waste disposal facility (Dated 16 Feb 2024) | <ul style="list-style-type: none"> None |
| Waste Management | | | |

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|---|---|---|--|
| The objective of the management measures is to ensure proper storage, removal, transportation and disposal/recycling of hazardous and non-hazardous (i.e. domestic) waste | | | |
| General | <ul style="list-style-type: none"> Waste shall be separated and recycled / re-used where possible | <ul style="list-style-type: none"> Waste generation is negligible and is managed on a personal basis. The opinion of the assessor, at the time of audit, that it is not viable to undertake recycling at this small scale | <ul style="list-style-type: none"> None |
| | <ul style="list-style-type: none"> No burning or burying of waste material will be allowed on site | <ul style="list-style-type: none"> No evidence of burning or burying of waste | <ul style="list-style-type: none"> None |
| | <ul style="list-style-type: none"> Employees and contractors will be shown the importance of correct waste disposal as well as waste minimisation and recycling | <ul style="list-style-type: none"> Importance of correct waste disposal has been discussed with the current employees and contractors Contractors are aware of the importance of correct waste disposal as well as waste minimisation and recycling (As per induction training) | <ul style="list-style-type: none"> Continued maintenance and evidence of training |
| Collection and storage of waste | <ul style="list-style-type: none"> Suitable receptacles with lids for waste disposal will be provided at appropriate locations on site. These receptacles will be clearly marked for different waste types | <ul style="list-style-type: none"> Waste bins are in place at each drill site (Plate 4). No litter was observed likely due to limited personnel having been on site in the past 18 months | <ul style="list-style-type: none"> None |
| Disposal of non-hazardous (domestic) waste | <ul style="list-style-type: none"> Dispose of waste at the Noordoewer landfill site | <ul style="list-style-type: none"> Limited domestic waste is generated as no residence on site. Waste is disposed of in | <ul style="list-style-type: none"> Record evidence when necessary |

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|--|--|--|--|
| | | Noordoewer at the lodge where it eventually is disposed of at the municipal site | |
| Recyclables | <ul style="list-style-type: none"> Recyclable material shall be taken to Windhoek for recycling at an identified recycling company | <ul style="list-style-type: none"> Waste generation is negligible and is managed on a personal basis. The opinion of the assessor that it is not viable to undertake recycling at this small scale | <ul style="list-style-type: none"> None |
| Disposal of hazardous waste | <ul style="list-style-type: none"> Hazardous waste (including hydrocarbon contaminated material/soil) will be disposed of at the Windhoek hazardous waste disposal facility | <ul style="list-style-type: none"> Drill contractors are aware of the requirement to dispose of hazardous waste (contaminated soil). Evidence of disposal of industrial waste manifest/ Safe Disposal Certificate provided from Windhoek hazardous waste disposal facility (Dated 16 Feb 2024) | <ul style="list-style-type: none"> None |
| Medical waste | <ul style="list-style-type: none"> Medical waste shall be disposed of at the Noordoewer medical waste facility | <ul style="list-style-type: none"> No medical waste generated No records of medical waste production available | <ul style="list-style-type: none"> None |
| Disposal records (domestic and industrial) | <ul style="list-style-type: none"> Written evidence of safe disposal of waste will be kept | <ul style="list-style-type: none"> Limited domestic waste is generated as no residence on site Low volumes of waste given the nature and scale of activities. As the site becomes more develop this will become more important. | <ul style="list-style-type: none"> None |

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|---|--|---|--|
| | | <ul style="list-style-type: none"> Evidence of disposal of industrial waste manifest/ Safe Disposal Certificate provided from Windhoek hazardous waste disposal facility (Dated 16 Feb 2024) | |
| Biodiversity and Land Use | | | |
| The objective of the mitigation measures is to limit the destruction and general disturbance of biodiversity. | | | |
| Vehicles and machinery | <ul style="list-style-type: none"> Earth moving machinery and vehicles will follow designated paths and roads | <ul style="list-style-type: none"> Track discipline is communicated to all employees and contractors. Measures for ensuring designated paths and roads are followed are in place (Plate 5) Old tracks are under rehabilitated (Plate 6) | <ul style="list-style-type: none"> None |
| Clearing new areas and develop drill pads, new access tracks | <ul style="list-style-type: none"> The footprint of the area to be disturbed will be minimised as far as is practically possible. In this regard, use existing access roads and previously disturbed areas (i.e. drill pads, etc.) as far as practically possible. (Minimize the creation of new access tracks) Strip topsoil from new areas to be cleared (depending on availability) Temporarily stockpile the topsoil for the duration of activities and replace once the excavations have been filled | <ul style="list-style-type: none"> New tracks are kept to the minimum required. Where required old tracks are rehabilitated to reduce total track footprint (Plate 6) Erosion management measures installed on steep tracks (Mr Emmanuel Shilongo) (Plate 9) Pers correspondence results in no loss of quiver trees on site -Vivian Williams, site inspection No records clearing or vegetation removal available | <ul style="list-style-type: none"> None |

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|---------------------|--|---|---|
| | <ul style="list-style-type: none"> No Quiver trees or other indigenous or protected trees/vegetation will be harmed (or removed) in any way. Permits will be required for the removal of protected tree species | <ul style="list-style-type: none"> Where tracks discipline has been weak in the past (evidence of numerous tracks in the Haib riverbed) these are currently being rehabilitated (Plate 7). Erosion control measures constructed on steep tracks and roads to prevent velocity and accumulation of runoff. | |
| Drilling | <ul style="list-style-type: none"> All drill holes shall have suitable casing to prevent collapse and secure capping to prevent small mammals or insects falling into the drill hole Open water should be fenced off and preferably covered during night to avoid attraction of bees and wildlife Implement prevention and mitigation measures according to the standard Haib Minerals drilling procedures, following international drill-regulations to prevent and mitigate the spillage of drill-mud | <ul style="list-style-type: none"> All drill holes observed had suitable casings (Site visit) Approximately 10% of boreholes did not have caps. However, all new boreholes are capped (Site visit and discussions with Mr. Emmanuel Shilongo) No open water available on site All drilling chemicals used by Ferrodrill Namibia are non-hazardous and environmentally friendly (Mr. Emmanuel Shilongo) and drilling materials used are handled in accordance with the guidance provided in the associated Materials Safety Data Sheet (MSDS). | <ul style="list-style-type: none"> Cap all boreholes |
| Trenching | <ul style="list-style-type: none"> Backfill the trenches as soon as possible after sampling is completed, preferably all excavations | <ul style="list-style-type: none"> Not currently applicable | <ul style="list-style-type: none"> N/A |

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|---------------------|---|--|--|
| | <p>will be opened and closed on the same day, or temporary fenced off in order to limit this risk of animals falling into trenches</p> <ul style="list-style-type: none"> • Create ramps on the edges of the trenches for smaller animals to get out • The footprint of the area to be disturbed will be minimized as far as is practically possible • Position the trenches in such a way to avoid harming/removing Quiver trees or other indigenous or protected trees/vegetation • Strip topsoil from trenches to be excavated (depending on availability) • Temporarily stockpile for the duration of activities and replace once the excavations have been filled | <ul style="list-style-type: none"> • No trenching has occurred or will occur within the exploration period- Pers. Corr. with Vivian Williams | |
| General | <ul style="list-style-type: none"> • All vehicles and moving machinery will follow designated routes • Haib Minerals will implement a zero tolerance policy with regards to the killing or collecting of any biodiversity. This applies to people directly employed by Haib Minerals as well as any contractors working on their behalf • Employees and contractors will be shown the value of biodiversity and the need to conserve the species and systems that occur within the project area • No open fires will be permitted on site • Appropriate ablution facilities will be provided for employees. These facilities must be maintained | <ul style="list-style-type: none"> • Vehicles were observed to be using existing routes. Where track discipline has been weak in the past, these zones are currently being rehabilitated (Plate 5 Plate 6 Plate 7) • No events of the collection or deaths, injury, removal of biodiversity (Site visit, Mr. Emmanuel Shilongo) • No evidence of open fires • Long drop toilet facilities are available on site- Plan to upgrade | <ul style="list-style-type: none"> • None |

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|---|--|---|---|
| | <ul style="list-style-type: none"> Speed limits will be enforced to promote road safety, and prevent corrugation and road kills Include these rules in the environmental awareness programme | <p>to chemical abluions in process (Plate 10)</p> <ul style="list-style-type: none"> Environmental awareness programme being implemented on all employees and contractors via Haib site EMP training (Mr. Emmanuel Shilongo and record of training 17/02/2024) Speed limits are communicated at 60 km/hr. Signposts have been erected (Plate 8) | |
| Archaeology | | | |
| The objective of the mitigation measures is to prevent the disturbance/loss of heritage resources that may be caused by the exploration activities. | | | |
| Old mining infrastructure and the redundant Tsams Farmhouse | <ul style="list-style-type: none"> The old mining infrastructure in the Volstruis River and the redundant Tsams Farmhouse shall be left undisturbed No Haib Minerals Employee or contractor shall be allowed to move/remove any of the above mentioned infrastructures Employees and contractors will be educated on the possible heritage value of the said structures and the need to conserve this | <ul style="list-style-type: none"> Old mining infrastructure observed to be undisturbed (Site Visit) No removal of infrastructure conducted – Pers. Corr. Vivian Williams Limited activities on site since April 2021 and starting 15 November 2023 drastically reduce risk of impact The value of heritage is communicated to employees and contractors through Haib site EMP induction training (Mr. Emmanuel | <ul style="list-style-type: none"> Ongoing awareness to ensure all new contractors are aware of heritage value |

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|---|--|---|--|
| | | Shilongo and record of training 17/02/2024) | |
| General (Clearing new areas and trenching) | <ul style="list-style-type: none"> • The area of disturbance will be limited as far as practically possible • Avoid disturbance to areas outside the approved mining and construction area • Limit employee access to operation/ exploration areas only • Limit vehicle access to designated routes only | <ul style="list-style-type: none"> • To date 2 additional drill sites have been cleared and contractors and employees have been trained in the requirements of the EMP (Mr Emmanuel Shilongo) | <ul style="list-style-type: none"> • None |
| Chance Find procedure | <ul style="list-style-type: none"> • The contractors and employees should look out for the following types of archaeological features/items, as part of a 'chance find' requirements: <ul style="list-style-type: none"> ○ Site and artifacts relating to colonial era military activities ○ Unmarked burial grounds ○ Structural remains (storage pits, wells, foundations etc) ○ Rock paintings and artifacts ○ Miscellaneous archaeological finds • If new heritage and/or cultural and/or paleontological resources are discovered, the following process needs to be followed: <ul style="list-style-type: none"> ○ work at the find will be stopped to prevent damage ○ an appropriate heritage specialist will be appointed to assess the find and related impacts | <ul style="list-style-type: none"> • Based on activities Feb-April 2021 and since 15 Nov 2023 • Contractors and employees are aware of the details within the chance find procedure via Haib site EMP training (Mr. Emmanuel Shilongo and record of training 17/02/2024) • No new heritage and/or cultural and/or paleontological resources discovered to date • No new graves discovered-existing graves are known to contractors and employees and are not disturbed. | <ul style="list-style-type: none"> • Ongoing awareness to ensure all new contractors are aware of chance find procedure |

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|---|--|---|---|
| | <ul style="list-style-type: none"> ○ permitting applications will be made to the relevant authority, if required • If any graves are discovered during operations, prior to damaging or destroying any identified graves, permission for the exhumation and relocation of graves must be obtained from the relevant descendants (if known) and the relevant local and provincial authorities. | | |
| Water Quality and Use | | | |
| The objective of the mitigation measures is to prevent negative impacts associated with water quality | | | |
| Ablution facilities | <ul style="list-style-type: none"> • Ensure that sewerage tanks at the main camp are managed properly • Provide chemical toilets for contractor's camp site and each drilling site • Ensure that toilets are working properly and are cleaned at least weekly, so they do not pollute the surrounding environment or create hygiene problems • All sewerage from the chemical toilets and tanks will be pumped out by a contractor when required • Personnel may not relieve themselves in the surrounding bush | <ul style="list-style-type: none"> • Based on activities Feb-April 2021 and since 15 Nov 2023 • Long drop toilets are available onsite- plan to upgrade to chemical toilets in process • Employees and contractors are aware it is a non-compliance with the ECC to relieve oneself in the surrounding bush (Mr. Emmanuel Shilongo and record of training 17/02/2024) • No sewerage tanks at the main camp (not applicable) | <ul style="list-style-type: none"> • Conduct and record site inspections to ensure sewerage is managed appropriately |
| Water usage and control | <ul style="list-style-type: none"> • Check for water spills and ensure repairs are made immediately to prevent water spillages • Obtain a water abstraction license for abstracting water from the Orange River in line with the | <ul style="list-style-type: none"> • Based on activities Feb-April 2021 and since 15 Nov 2023 • No evidence of a Water Abstraction License | <ul style="list-style-type: none"> • Obtain water abstraction licence once forms are available from MAWLR |

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|---|---|--|---|
| | <p>Promulgation of Water Resource Management Act, 2013 (Act No. 11 of 2013) and the Water Resources Management Regulations 2023</p> <ul style="list-style-type: none"> All drill-water will be collected in PVC lined drill-sumps, which will be managed to prevent overflows Any spills will be contained and cleaned up immediately | <ul style="list-style-type: none"> Water abstraction license application forms were not available between November 2023 and February 2024 and thus it was not possible to apply (Discussions with MAWLR) Haib Minerals declared their intent to abstract water from the Orange River to MAWLR in a letter to Ms. Ndiyakupi Nghituwamata dated 8 November 2023 (See Appendix E) The forms became available 9 Feb 2024 and Haib minerals are in the process of making the submission (expected submission within February 2024). Since the availability of new application forms, the borehole license as required by Water Resource Management Act, 2013 (Act No. 11 of 2013) and the Water Resources Management Regulations 2023 has been applied for. | |
| Contamination of groundwater/ surface water | <ul style="list-style-type: none"> Refer to “Hydrocarbon and associated spills Management Action plan” Non-toxic and biodegradable drilling lubricant shall be used | <ul style="list-style-type: none"> Based on activities Feb-April 2021 and since 15 Nov 2023 All drilling chemicals used by Ferrodrill Namibia are non- | <ul style="list-style-type: none"> Ensure completion, implementation and continued availability of Hydrocarbon and |

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|--|--|--|--|
| | <ul style="list-style-type: none"> Implement prevention and mitigation measures according to the standard Haib Minerals drilling procedures, following international drill-regulations to prevent and mitigate the spillage of drill-mud The drill-mud is discarded to the municipal waste dump (Noordoewer) when the drill-site is rehabilitated | <p>hazardous and environmentally friendly (Mr. Emmanuel Shilongo) and drilling materials used are handled in accordance with the guidance provided in the associated Materials Safety Data Sheet (MSDS). No evidence of drill mud being discarded yet however sites are still to be rehabilitated.</p> <ul style="list-style-type: none"> Hydrocarbon and associated spills Management Action plan currently under development however Ferrodrill Namibia currently operate within their Environmental Policy Statement | <p>associated spills Management Action plan</p> |
| Social Issues and Training | | | |
| The objective of the mitigation measures is to prevent negative social impacts associated with people staying in the hostel on site. | | | |
| Employees – social issues | <ul style="list-style-type: none"> Have zero tolerance to alcohol in the workplace. Establish a HIV / AIDS / TB workplace policy and wellness programme Only People working for Haib Minerals or their contractors will be allowed to stay at the on-site accommodation A paramedic and ambulance will be on site during the drilling phase to supply First Aid in case of an accident | <ul style="list-style-type: none"> Based on activities Feb-April 2021 and since 15 Nov 2023 There is zero tolerance of alcohol in the workplace (Mr. Emmanuel Shilongo and record of training 17/02/2024), A breathalyser has been sourced to ensure ongoing compliance. No HIV / AIDS / TB workplace policy and wellness programme. | <ul style="list-style-type: none"> Ensure as the site develop that an HIV / AIDS / TB workplace policy and wellness programme is in place |

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|---|---|--|--|
| | | <p>The omission is likely due to the small scale of current operations.</p> <ul style="list-style-type: none"> No paramedic and ambulance support is on site however the site has an emergency response plan in place (Mr Emmanuel Shilongo and record of training 17/02/2024). This is seen as sufficient by the auditor. | |
| Training & Awareness | <ul style="list-style-type: none"> All individuals who work on, or visit, the sites are aware of the contents of the EMP | <ul style="list-style-type: none"> All employees and contractors are aware and trained in the contents of the Haib Site EMP (Mr Emmanuel Shilongo and record of training 17/02/2024) | <ul style="list-style-type: none"> None |
| Rehabilitation | | | |
| The objective of the measures is to rehabilitate the drill sites, camp site and tracks to as close an approximation of the pristine state as is technically, financially and reasonably possible. | | | |
| Rehabilitation | <ul style="list-style-type: none"> All drill sites, trenches and new (unlikely) access tracks should be photographed (1) before commencement, (2) after completion and (3) after rehabilitation At completion of the exploration programme, and in consultation with MME, the following rehabilitation works is recommended: <ul style="list-style-type: none"> All drill mud and cores will be removed from site All litter from the site will be taken to an appropriate disposal site | <ul style="list-style-type: none"> Rehabilitation has not yet started as exploration activities are still underway. Photographs of pre-drill sites and access tracks are being implemented. All developers are aware of a 3-photo rule (before after and after rehab). Historical photographs, pre 2024 were not collected. | <ul style="list-style-type: none"> Ensure evidence is available specifically as it relates to pre and post drill site photographs |

| Activity / Facility | Mitigation | Compliance and Comments | Recommendation |
|---------------------|---|-------------------------|----------------|
| | <ul style="list-style-type: none"> ○ All debris, scrap metal, etc. will be removed ○ All camp infrastructure will be dismantled and removed and either sold as scrap metal or disposed of at appropriate waste disposal site ○ All water tanks and sewerage tanks will be dismantled and removed ○ All sumps and trenches will be covered and contoured. Rehabilitate all pit and trench sites by infilling and topsoil replacement ○ All the tracks to and at the sites will be rehabilitated ○ Various trials will be conducted on one or more sections of roads that will not be used ○ These trials should include at least the following: leave one section of the road as is; one section to be ripped; and one section to be covered with loose rock from the surrounding environment ● Monitor the rehabilitation success over time on all the trial sections for future implementation. ● The old mining infrastructure in the Volstruis River and the redundant Tsams Farmhouse shall be left undisturbed. | | |

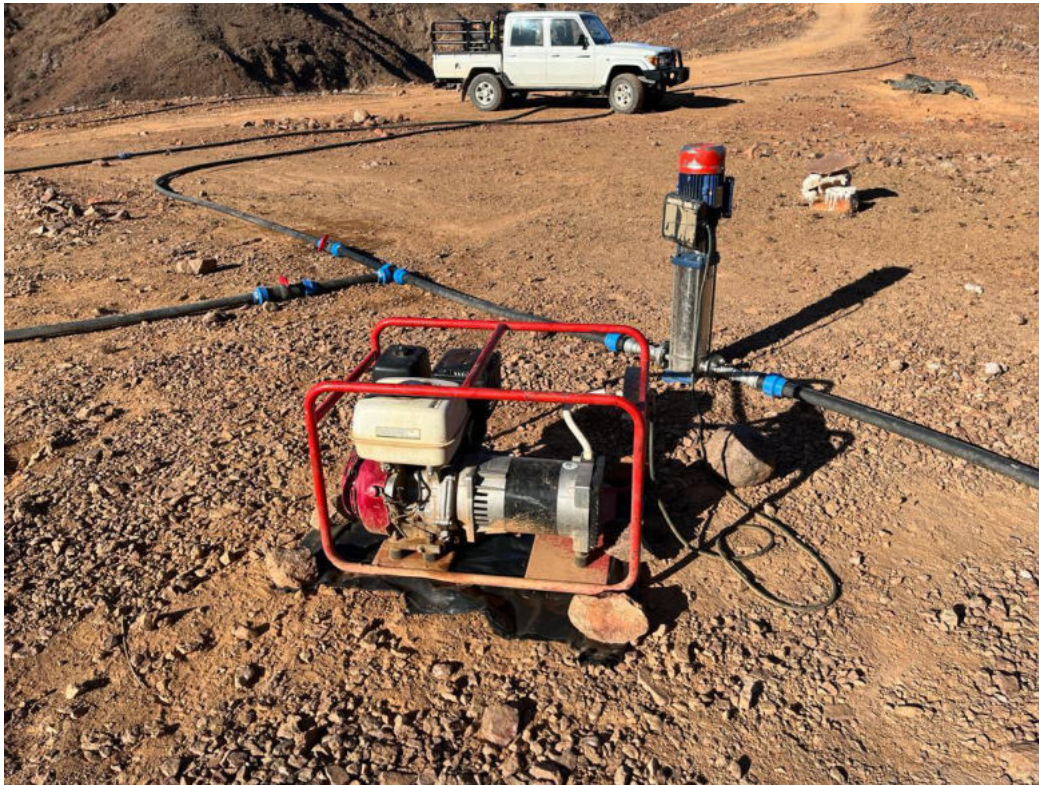


Plate 1 : Example of hydrocarbon and contaminant management - Generators stored and managed on impervious liners

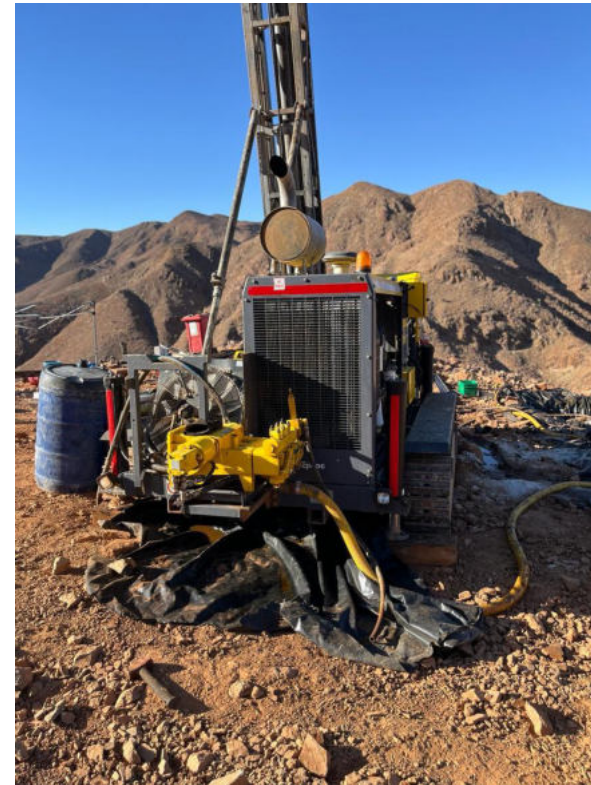


Plate 2 : Impervious liners utilised under drill rigs and parked vehicles



Plate 3 : Spill kits available at drill sites



Plate 4 : Waste bins installed at various locations on site



Plate 5 : Measures to prevent off roading and improve track discipline



Plate 6 : Rehabilitation of old tracks



Plate 7 : Measures to prevent off roading and improve track discipline in the Haib River



Plate 8 : Signage erected to manage vehicle speed



Plate 9 : Physical measures to prevent erosion on steep roads



Plate 10 : Ablution facilities installed

4.3 COMPLIANCE: MONITORING AND REPORTING

Current monitoring requirements as per ECC 2021 for EPL 3140 conditions and results of the audit are presented in Table 4.

Table 4: Audit results of monitoring and reporting requirements for 2021 ECC for EPL 3140

| Type | Parameter | Frequency | Compliance (2023) |
|-------------------------|---|----------------|--|
| Bi-Annual EMP Reporting | Environmental performance / corrective measures to be taken as or when required | Every 6 months | No bi-annual reports developed. Activities occurred on site for two (2) months (Feb - April 2021) when the EPL renewal was declined, and then activities commenced 15 November 2023. This renewal was assumed to be sufficient an audit of compliance. |

5.0 CONCLUSION OF 2020 EMP AUDIT

As part of the ECC renewal for EPL 3140, Knight Piésold conducted an environmental compliance audit of the current approved EMP (2020). The period of review covers the period of the existing ECC 15 February 2021 to 15 February 2024.

Haib Minerals' previous EPL expired 21 April 2021. Haib Minerals currently holds EPL 3140 valid 07 July 2023 to 06 July 2025. There is thus a period (22 April 2021 to 6 July 2023) that Haib Minerals was inactive due to lack of EPL and this period of inactivity are highlighted in the audit findings above.

Knight Piésold conducted a site visit to EPL 3140 on the 30th of October 2023 where the audit was undertaken. The audit included Haib Minerals' COO, Jean-Luc Roy, and exploration geologist Vivian Stuart Williams as the auditees. The EMP checklist was utilised to guide discussions and relevant target sites including exploration target sites were observed. At time of audit no activities were ongoing however drilling activities, as per ECC were set to commence the 15th of November 2023. Ongoing discussions with the site supervisor Mr. Emmanuel Shilongo has maintained feedback on the status of the site to date to inform audit results.

The scope of the environmental compliance audit included the following:

- A site investigation at EPL 3140 to inspect the current status of the environment, activities and infrastructure specific to activities proposed in the ECC
- Assess, verify and confirm through document analysis and review, evidence, records and observations the implementation of management and mitigation measures required by the latest 2020 EMP.

Hydrocarbons and associated spills management

- Evidence shows full compliance however additional records of implementation of EMP are recommended

Waste Management

- Evidence shows waste management complies with EMP requirements

Biodiversity and Land Use

- Evidence shows that although all new boreholes are capped, it was observed that only 10% of historical boreholes are capped. Recommendations to cap all boreholes and maintain records of all environmental training.

Archaeology

- Evidence shows the EMP is complied with under Archaeology requirements.

Water Quality and Use

- There is no evidence of a Water Abstraction License in line with the Promulgation of Water Resource Management Act, 2013 (Act No. 11 of 2013) and the Water Resources Management Regulations 2023. Water abstraction license application forms were not available between November 2023 and February 2024 and thus it was not possible to apply (Discussions with MAWLR). Haib Minerals declared their intent to abstract water from the Orange River to MAWLR in a letter to Ms. Ndiyakupi Nghituwamata dated 8 November 2023. (See Appendix E)
- The forms became available 9 Feb 2024 and Haib minerals are in the process of making the submission (expected within February 2024).

Social Issues and Training

- There is no HIV / AIDS / TB workplace policy and wellness programme in place. The omission is likely due to the small scale of current operations however it has been recommended to ensure this inclusion in ongoing operations.

Rehabilitation

- Although rehabilitation has not yet started due to the initial phase of exploration, photographic evidence is being collected for all new developments on site to ensure effective rehabilitation of sites. Historical photographs prior to 2024 are not available.

During this period bi-annual environmental monitoring reports have not been compiled, and no submissions have been made to MEFT as required in terms of the ECC. This is due to non-renewal of EPL 3140, 2 months into the ECC period and activities halting. As the EPL is currently in place, Haib Minerals recommenced exploration activities late-November 2023 as such this audit represents a status update on compliance of the site EMP.

6.0 REVISED ENVIRONMENTAL MANAGEMENT PLAN

6.1 INTRODUCTION

The (updated) EMP represents the culmination of all EMPs developed for EPL 3140 to date including EMP 2014 (SLR Consultants, 2014), 2017 (SLR Consultants, 2017), and 2020 (SLR Consultants, 2020).

Revising the EMP utilised the following as inputs:

- Existing Documentation:
 - Aquatic Specialist Study (Ecosun, 1997)
 - Archaeological Specialist Study (Kinahan, 1997)
 - Avifaunal Specialist Study (Simmons, 1997)
 - EMP 2014 (SLR Consultants, 2014)
 - EMP 2017 (SLR Consultants, 2017)
 - EMP 2020 (SLR Consultants, 2020)
 - Engineering Scoping Study (KP, 2023)
 - Faunal Specialist Study (Griffen, 1997)
 - Floral Specialist Study (Burke, 1997)
 - Preliminary Economic Assessment (METS, 2020)
- Rapid review of the following permits made available to EAPs:
 - ECC, MEFT, 2021 / EPL 3140, 15 February 2021
 - ECC, MEFT, 2017 / EPL 3140, 09 August 2017
 - ECC, MEFT, 2014 / EPL 3140, 21 April 2014
- The following meetings:
 - MS Teams with Mr. Timoteus Mufeti, Environmental Commissioner MEFT on the 22 April 2021
 - In person at MEFT offices with Me Saima Angula (Deputy Director - EAIWPCI) and Me Rikka Shikongo (Senior Conservation Scientist) MEFT on 26 October 2023
 - MS Teams and in person with Mr. Jean-Luc Roy (Director and COO) and Mr. Pierre Leveille (Director and CEO) of Haib Minerals (PTY) Ltd on 12 October 2023 and 25th October 2023
 - Site assessment conducted 30 October 2023 to EPL 3140 together with the Haib Minerals Chief Operations Officer and principal Geologist
 - Letter sent to Ms. Ndiyakupi Nghituwamata, Executive Director Ministry of Agriculture, Water and Land Reform (MAWLR) requesting advice on the relevant licenses as per the Water Resources Management Act (No. 11 of 2013) and Water Resources Management Regulations 2023 for exploration drilling (and water abstraction) purposes.

6.2 REVISED ENVIRONMENTAL MANAGEMENT PLAN

The revised Environmental Management Plan (EMP) is presented in Table 5. Please note **highlighted sections** refer to specific updates from the previous version.

Table 5: Revised Environmental Management Plan for ECC-01233 on EPL 3140

| Activity / Facility | Mitigation | Management Plan | |
|--|--|-----------------|---|
| | | Frequency | Responsibility |
| Hydrocarbons and associated spills management | | | |
| The objective of the mitigation measures is to handle and store hydrocarbons in such a way as to prevent spills. Where spills do occur, to ensure the spill is contained and the contamination cleaned-up and contaminated material disposed of responsibly. | | | |
| Storage of Hydrocarbons (i.e. diesel bowser, oil, drums, etc.) | <ul style="list-style-type: none"> In all areas where there is storage of hydrocarbons, there will be containment of spillages on impermeable floors and bund walls that can contain 110 % of the volume of the hazardous substances Regular inspection of hazardous storage area is required Regular environmental awareness should include potential risks associated with hydrocarbons. | Continuous | Haib Minerals Site Supervisor (HMSS) and Drilling Contractor Supervisor (DCS) |
| Vehicles, machinery, generators and equipment | <ul style="list-style-type: none"> Establish and maintain impermeable bunded areas around diesel generators Vehicles, machinery and equipment shall be kept in good working condition to ensure they do not leak oil/diesel Vehicles and machinery will be serviced off site as far as possible. However, in the event where machinery needs to be repaired/serviced on site all care shall be taken to | Continuous | HMSS and DCS |

| Activity / Facility | Mitigation | Management Plan | |
|---------------------|---|--|---|
| | | Frequency | Responsibility |
| | <p>prevent spillage of oil/diesel by performing the work on impermeable surfaces or proper placement of drip trays</p> <ul style="list-style-type: none"> • All generators on site to be placed on a tarpaulin sail. Tarpaulin should have bunded edges to keep spillages within the sail • Oil traps to be installed in appropriate places to collect potential toxic materials • Ensure the availability of absorbent pads and/or spill kits and ensure that personnel are trained in their use • All used parts from vehicles and machinery (which may include, but not limited to, oil filter, pipes, rags, cans) will be collected and removed from site and disposed of in an appropriate manner • All refuelling of vehicles will take place on impermeable surfaces • Pollution will be prevented through basic infrastructure design and through maintenance of equipment. | | |
| General (spills) | <ul style="list-style-type: none"> • Any spills will be contained and cleaned up immediately • Immediately report and clean up any accidental hydrocarbon spill: Sunisorb, Drizit, Peatsorb can be used to clean up small spills; in case of larger spills, the spill together with the polluted soil should be removed and disposed of at hazardous waste sites • Spill kits will be readily available on site. Employees and/or contractors will be shown how to use the spill kits to enable containment and remediation of pollution incidents | <p>Once off when needed</p> <p>Once off when needed</p> <p>Initial set up then continuous implementation</p> <p>Initial set up then continuous</p> | <p>HMSS and DCS</p> <p>HMSS and DCS</p> <p>HMSS and DCS</p> <p>HMSS</p> |

| Activity / Facility | Mitigation | Management Plan | |
|---|---|-------------------------------|----------------|
| | | Frequency | Responsibility |
| | <ul style="list-style-type: none"> Haib Minerals will establish environmental awareness in employees and contractors Soil contaminated with hydrocarbons shall be excavated and stored in a safe place at the camp site, until such time when it shall be disposed of at a Hazardous waste disposal facility. | As and when is needed | HMSS and DCS |
| Waste Management | | | |
| The objective of the management measures is to ensure proper storage, removal, transportation and disposal/recycling of hazardous and non-hazardous (i.e. domestic) waste | | | |
| General | <ul style="list-style-type: none"> Waste shall be separated and recycled / re-used where possible. | Continuous | HMSS and DCS |
| | <ul style="list-style-type: none"> No burning or burying of waste material will be allowed on site. | Continuous | HMSS |
| | <ul style="list-style-type: none"> Employees and contractors will be shown the importance of correct waste disposal as well as waste minimisation and recycling. | During initiation | HMSS |
| Collection and storage of waste | <ul style="list-style-type: none"> Suitable receptacles with lids for waste disposal will be provided at appropriate locations on site. These receptacles will be clearly marked for different waste types. | During exploration initiation | HMSS and DCS |
| Disposal of non-hazardous (domestic) waste | <ul style="list-style-type: none"> Use biodegradable and non-toxic drill fluids/additives | Continuous/ when needed | HMSS and DCS |
| Recyclables | <ul style="list-style-type: none"> Where appropriate, recyclable material shall be taken to Windhoek for recycling at an identified recycling facility. | Continuous/ When needed | HMSS |

| Activity / Facility | Mitigation | Management Plan | |
|---|--|--------------------------------|----------------|
| | | Frequency | Responsibility |
| Disposal of Hazardous Waste | <ul style="list-style-type: none"> If non-degradable or toxic drill additives are used, the drill-mud should be discarded to the municipal waste dump (Windhoek) when the drill-site is rehabilitated Hazardous waste (including hydrocarbon contaminated material/soil) will be disposed of at an appropriate hazardous waste disposal facility. | Continuous/ When needed | HMSS and DCS |
| Medical waste | <ul style="list-style-type: none"> Medical waste shall be disposed of at the appropriate medical waste facility. | Continuous/ When needed | HMSS |
| Disposal records (domestic and industrial) | <ul style="list-style-type: none"> Written evidence of safe disposal of waste will be kept. | Continuous/ When needed | HMSS |
| Biodiversity and Land Use | | | |
| The objective of the mitigation measures is to limit the destruction and general disturbance of biodiversity. | | | |
| Vehicles and machinery | <ul style="list-style-type: none"> Earth moving machinery and vehicles will follow designated paths and roads. | Continuous/ When needed | HMSS and DCS |
| Clearing new areas and develop drill pads, new access tracks | <ul style="list-style-type: none"> The footprint of the area to be disturbed will be minimised as far as is practically possible. In this regard, use existing access roads and previously disturbed areas (i.e. drill pads, etc.) as far as practically possible. (Limit the creation of new access tracks) Strip topsoil from new areas to be cleared (depending on availability) Temporarily stockpile the topsoil for the duration of activities and replace once the excavations have been filled No Quiver trees or other indigenous or protected trees/vegetation will be harmed (or removed) in any way. | Prior to clearing of new areas | HMSS and DCS |

| Activity / Facility | Mitigation | Management Plan | |
|---|---|---------------------------------|----------------|
| | | Frequency | Responsibility |
| Archaeology | | | |
| The objective of the mitigation measures is to prevent the disturbance/loss of heritage resources that may be caused by the exploration activities. | | | |
| Old mining Infrastructure and the redundant Tsams Farmhouse | <ul style="list-style-type: none"> The old mining infrastructure in the Volstruis River and the redundant Tsams Farmhouse shall be left undisturbed. No Haib Minerals Employee or contractor shall be allowed to move/remove any of the above-mentioned infrastructures. Employees and contractors will be educated on the possible heritage value of the said structures and the need to conserve this. | Continuous / as and when needed | HMSS and DCS |
| General (Clearing new areas and trenching) | <ul style="list-style-type: none"> The area of disturbance will be limited as far as practically possible Avoid disturbance to areas outside the approved mining and construction area Limit employee access to operation/ exploration areas only Limit vehicle access to designated routes only. | Continuous / as and when needed | HMSS and DCS |
| Chance Find procedure | <ul style="list-style-type: none"> The contractors and employees should look out for the following types of archaeological features/items, as part of a 'chance find' requirements: <ul style="list-style-type: none"> Site and artifacts relating to colonial era military activities Unmarked burial grounds Structural remains (storage pits, wells, foundations etc) Rock paintings and artifacts Miscellaneous archaeological finds | Continuous / as and when needed | HMSS and DCS |

| Activity / Facility | Mitigation | Management Plan | |
|---|---|--|--|
| | | Frequency | Responsibility |
| | <ul style="list-style-type: none"> • In the event that new heritage and/or cultural and/or paleontological resources are discovered, the following process needs to be followed: <ul style="list-style-type: none"> ○ work at the find will be stopped to prevent damage ○ an appropriate heritage specialist will be appointed to assess the find and related impacts ○ permitting applications will be made to the relevant authority, if required. • In the event that any graves are discovered during operations, prior to damaging or destroying any identified graves, permission for the exhumation and relocation of graves must be obtained from the relevant descendants (if known) and the relevant local and provincial authorities. | | |
| Water Quality and Use | | | |
| The objective of the mitigation measures is to prevent negative impacts associated with water quality | | | |
| Ablution facilities | <ul style="list-style-type: none"> • Ensure that sewerage tanks at the main camp are managed properly. • Provide chemical toilets or long drop toilets for contractors at an appropriate site. • Ensure that toilets are working properly and are cleaned at least weekly, so they do not pollute the surrounding environment or create hygiene problems. • All sewerage from the chemical toilets and tanks will be pumped out by a contractor when required. | Continuous During initiation phase Weekly As required | HMSS HMSS and DCS HMSS and DCS HMSS |

| Activity / Facility | Mitigation | Management Plan | |
|--|--|---|-------------------------|
| | | Frequency | Responsibility |
| | <ul style="list-style-type: none"> Personnel may not relieve themselves in the surrounding bush. | Continuous | HMSS and DCS |
| Water usage and control | <ul style="list-style-type: none"> Check for water spills and ensure repairs are made immediately to prevent water spillages All drill-water will be collected in PVC lined drill-sumps, which will be managed to prevent overflows Any spills will be contained and cleaned up immediately. <p>Obtain a water abstraction license for abstracting water from the Orange River in line with the Promulgation of Water Resource Management Act, 2013 (Act No. 11 of 2013) and the Water Resources Management Regulations 2023.</p> | <p>Continuous</p> <p>Prior to water abstraction</p> | <p>HMSS</p> <p>HMSS</p> |
| Contamination of groundwater/ surface water | <ul style="list-style-type: none"> Refer to “Hydrocarbon and associated spills Management Action plan” Non-toxic and biodegradable drilling lubricant shall be used Implement prevention and mitigation measures according to the standard Haib Minerals drilling procedures, following international drill-regulations to prevent and mitigate the spillage of drill-mud The drill-mud (if hazardous) is discarded to the municipal waste dump (Windhoek) when the drill-site is rehabilitated. | Continuous | HMSS and DCS |
| Social Issues and Training | | | |
| The objective of the mitigation measures is to prevent negative social impacts associated with people staying in the hostel on site. | | | |
| Employees – social issues | <ul style="list-style-type: none"> Have zero tolerance to alcohol in the workplace. Establish a HIV / AIDS / TB workplace policy and wellness programme | Initial set up then continuous | HMSS |

| Activity / Facility | Mitigation | Management Plan | |
|---|--|---|---|
| | | Frequency | Responsibility |
| | <ul style="list-style-type: none"> Only People working for Haib Minerals or their contractors will be allowed to stay at the on-site accommodation A paramedic and/or ambulance will be on site during the drilling phase to supply First Aid in case of an accident. | implementation / As and when needed | |
| Training & Awareness | <ul style="list-style-type: none"> All individuals who work on, or visit, the sites are aware of the contents of the EMP. | During initiation phase | HMSS |
| Rehabilitation | | | |
| The objective of the measures is to rehabilitate the drill sites, camp site and tracks to as close an approximation of the pristine state as is technically, financially and reasonably possible. | | | |
| Rehabilitation | <ul style="list-style-type: none"> All drill sites, trenches and new (unlikely) access tracks should be photographed (1) before commencement, (2) after completion and (3) after rehabilitation At completion of the exploration programme, and in consultation with MME, the following rehabilitation works is recommended: <ul style="list-style-type: none"> All drill mud and cores will be removed from site; All litter from the site will be taken to an appropriate disposal site All debris, scrap metal, etc. will be removed. All camp infrastructure will be dismantled and removed and either sold as scrap metal or disposed of at appropriate waste disposal site All water tanks and sewerage tanks will be dismantled and removed All sumps and trenches will be covered and contoured | As indicated and after completion of exploration programme and consultation with MME. | HMSS and DCS and Haib Minerals Country Manager (HMCM) |

| Activity / Facility | Mitigation | Management Plan | |
|---------------------|--|-----------------|----------------|
| | | Frequency | Responsibility |
| | <ul style="list-style-type: none"> ○ Rehabilitate all pit and trench sites by infilling and topsoil replacement ○ All the tracks to and at the sites will be rehabilitated ○ Various trials will be conducted on one or more sections of roads that will not be used. These trials should include at least the following: leave one section of the road as is; one section to be ripped; and one section to be covered with loose rock from the surrounding environment ● Monitor the rehabilitation success over time on all the trial sections for future implementation. ● The old mining infrastructure in the Volstruis River and the redundant Tsams Farmhouse shall be left undisturbed. | | |

6.3 MONITORING AND REPORTING

The monitoring and reporting requirements as per revised EMP is presented in Table 6.

Table 6: Monitoring and reporting requirements as per revised Environmental Management Plan (EMP) for -0233 on EPL 3140

| Requirement | Description | Action Plan | |
|---|--|-------------------------|--|
| | | Frequency | Responsible |
| Bi-Annual EMP Reporting | Auditing compliance of Haib Minerals to this EMP and any other relevant legal requirements e.g. licenses, authorisations, Haib Minerals drilling procedures etc. | Every 6 months | Site Manager and Haib Minerals Country Manager or external party |
| Drilling Contractor Audit | Auditing compliance of the drilling contractor to this EMP and any other legal requirements e.g. licenses, authorisations, Haib Minerals drilling procedures etc. | Monthly | Site Manager or external party |
| Training and Awareness | Maintenance of records for all training and awareness specifically relating to: <ul style="list-style-type: none"> • Environment • Heritage • EMP • HIV / AIDS / TB in the workplace awareness. | Ongoing / As it happens | Site Manager |
| Incidence recording and adaptive management | The recording of incidences and non-compliances with EMP and appropriate management to be included in bi-annual reporting including such as, not limited to: <ul style="list-style-type: none"> • Non-compliances with EMP • Species death/injury • Spills • New roads/ infrastructure • Damage to sites of heritage importance • Employee injury etc. | Ongoing / As it happens | Site Manager |
| Maintenance of records | Maintenance of records as per the EMP including, not limited to: <ul style="list-style-type: none"> • Rehabilitation photographic records • Safe disposal of waste • Volumes of water abstracted for use | Ongoing / As it happens | Site Manager |

6.4 RESPONSIBILITIES FOR IMPLEMENTATION OF THE EMP

The roles and responsibilities for implementing the different parts of the EMP are presented below:

6.4.1 HAIB MINERALS – COUNTRY MANAGER (HMCM)

The Haib Minerals Country Manager is responsible for the following:

- Overall responsibility for environmental management on the exploration activities and all related activities and for:
 - Ensuring this EMP is implemented
 - Ensure all persons involved with the exploration activities comply with this EMP.

6.4.2 HAIB MINERALS SITE SUPERVISOR (HMSS)

The Haib Minerals Site Supervisor will be responsible for assisting the Haib Minerals Country Manager in all environmental issues, and specifically to ensure that the commitments as set out in this EMP are implemented for the duration of the exploration and rehabilitation activities.

Responsibilities related to compliance of this EMP:

- Regular inspections and auditing compliance to this EMP and any other relevant legal requirements e.g. licenses, authorisations, Haib Minerals drilling procedures etc...
- Include environmental awareness, EMP, heritage training and HIV / AIDS / TB in the workplace during induction and on an *ad hoc* basis thereafter.
- Ensure compliance to this EMP and permits and authorisations issued to Haib Minerals by relevant authorities.
- Ensure responsibilities and target dates are developed for each one of the commitments in this EMP.
- Manage the storage and handling of hydrocarbons and other materials via the Hydrocarbon and associated spills Management Action plan
- Monitor for biodiversity losses and implement control measures if necessary.
- Implement a waste management strategy and reports.
- Monitoring and maintenance of equipment and machinery.
- Ensure the provision of adequate sanitation facilities.
- Implement Chance Find procedure
- Implement HIV / AIDS / TB workplace policy and wellness programme.

6.4.3 DRILLING CONTRACTOR SUPERVISOR (DCS)

The Drilling Contractor Supervisor will be required to comply with the various commitments in this EMP as supported by the Haib Minerals Site Supervisor.

The Haib Minerals Site Supervisor and the Drilling Contractor Supervisor will conduct daily informal inspections at contractor areas. Non-compliances will be recorded and action plans developed in conjunction with the contractor that contravened the commitment(s) of the EMP.

Contractors will be formally audited on a monthly basis through internal or external parties in order to determine compliance with the EMP. In the event of non-conformances, the contractor will be required to take corrective action according to the requirements of Haib Minerals and the EMP commitments.

7.0 CONCLUSIONS AND RECOMMENDATIONS

Haib Minerals (PTY) Ltd is currently in the process of developing an Environmental and Social Impact Assessment towards application of an Environmental Clearance Certificate (ECC) towards a Mining License (ML) through the Ministry of Mines and Energy (MME). Until this application is made, it is advised that:

- Haib Minerals (Pty) Ltd implement and observe the Environmental Management Plan on an ongoing basis. Environmental performance should be regularly monitored and assessed, with corrective measures taken as or when required
- Provision is made for adequate financial and human resources to implement the Environmental Management Plan
- Bi-annual environmental monitoring reports need to be submitted to MEFT as a compulsory compliance requirement.

Key updates to the 2021 EMP include the following:

1. Improved hydrocarbon and spills management including:
 1. Vehicles, machinery, generators and equipment
 2. General spills management and approach to cleanus
2. Waste Management
 1. The use of biodegradable and non-toxic drill fluids/additives
 2. Disposal of Hazardous Waste
3. Biodiversity and land use
 1. Specific changes to drilling aspect including:
 1. Improved management of drill mud and drill hole management
 2. Obtain a borehole license for drilling into the water table in line with the Promulgation of Water Resource Management Act, 2013 (Act No. 11 of 2013) and the Water Resources Management Regulations (2023)

8.0 REFERENCES

- Burke, A. (1997). *Flora and Vegetation of the Haib Copper Mine Area*.
- ECC. (2019). *Best Practice Guide. Environmental Principles for Mining in Namibia*. Environmental Compliance Consultancy (ECC).
- Ecosun. (1997). *Haib Mining Development. Aquatic Ecosystem Study*. Ecosun Report.
- Griffen. (1997). *Baseline survey of the Haib Mine Area: Preliminary assessment of the conservation status of amphibians, reptiles, and mammals*.
- IFC. (2007a). *World Bank Group. 2007a. Environmental, Health, and Safety General Guidelines*. International Finance Corporation (IFC).
- IFC. (2007b). *World Bank Group. 2007b. Environmental, Health, and Safety General Guidelines for Mining*. International Finance Corporation IFC.
- IGF. (2018). *IGF Mining Policy Framework Assessment: Namibia*. Winnipeg: IISD. 55 pp. Intergovernmental Forum on Mining, Minerals, Metals and Sustainable Development (IGF).
- IUCN, U.-W. a. (2020). *Protected Planet: The World Database on Protected Areas (WDPA)/The Global Database on Protected Areas Management Effectiveness (GD-PAME)] [On-line]*, Cambridge, UK: UNEP-WCMC and IUCN. Available at: www.protectedplanet.net.
- Kinahan, J. (1997). *Haib Copper Mine Project. Environmental Impact Study/ Archaeological Survey*.
- Koch, M. P. (2011). *Strategic Environmental Assessment (SEA) for the Karas Integrated Regional Land Use Plan (KIRLUP)*.
- KP. (2023). *Haib Copper Project: Environment, Water, Power and Heap Leaching Scoping Studies*. Knight Piésold Consulting Report.
- LAC. (2023). *1 February 2023 Update. Information current to 1 February 2023*. Legal Assistance Centre.
- LAC. (2023a). *NAMLEX Index to the Laws of Namibia, Legal Assistance Centre*,. Legal Assistance Centre.
- METS. (2020). *Haib Copper Project: Preliminary Economic Assessment*. METS Engineering Study.
- ORASECOM. (2020). *Orange-Senqu River Commission (ORASECOM). 2020. ORASECOM Website*.
- Parkman. (1997). *The Hydrogeological Aspects of the Environmental Impact Assessment Study*.
- PDAC. (2009). *Excellence in Environmental Stewardship e-toolkit (EES) Version-01*. Prospectors and Developers Association of Canada.
- Ruppel, O. a.-S. (2022). *Environmental Law and Policy in Namibia Towards Making Africa the Tree of Life. Fourth Fully Revised Edition*. . John Meinert Printing (Pty) Ltd.
- Simmons, R. E. (1997). *Haib River - Orange River. Bird Diversity and Bird Densities. Assessing avifauna in the vicinity of the proposed Haib Copper Mine*.
- SLR Consultants. (2014). *Environmental Management Plan for Teck Namibia Limited's exploration activities on EPL 3140*. unpublished Teck Namibia Limited Report.
- SLR Consultants. (2017). *Environmental Management Plan for the proposed amendment of additional exploration activities on Haib Minerals (Pty) Ltd EPL 3140*. Unpublished Haib Minerals (Pty) Ltd Report.
- SLR Consultants. (2020). *Environmental Management Plan for the proposed amendment of additional exploration activities on Haib Minerals (Pty) Ltd EPL 3140*. Unpublished Haib Minerals (Pty) Ltd Report.
- SPC. (2011). *Karas Integrated Regional Land Use Plan (KIRLUP) 2011 – 2016*. Prepared for Ministry of Lands and Resettlement by Stubenrauch Planning Consultants.

9.0 CERTIFICATION

This report was prepared and reviewed by the undersigned.

Prepared:



Mr Kieona Sewack (Pr.Sci.Nat.)
Marketing & Operations Coordinator
Knight Piésold Consulting

Reviewed:



Lloyd Lynch (Pr.Sci.Nat.)
Marketing & Operations Coordinator
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APPENDIX A

ESIA TOR AND APPOINTMENT LETTER

27 July 2023

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File No.: WI301-00906/05-P.01
Cont. Number: WI23-00195

Dear Jean-Luc,

Re: Proposal for Environmental Impact Assessment for the Haib Copper Project

1.0 INTRODUCTION

Knight Piésold Consulting (Pty) Ltd (KP) was appointed by Deep-South Resources in 2021 to undertake a scoping assessment for the proposed Haib Copper Project. The proposed facility is situated in the //Kharas region of Southern Namibia, near the Orange River which borders South Africa.

KP completed the draft scoping assessment in 2021 inclusive of the following:

- Environmental Reconnaissance and Roadmap to Environmental Authorisation
- Water Supply Options Study
- Power Supply Options Study
- Heap Leach Pad Conceptual Assessment

South Deep Resources requested a proposal for the further environmental studies recommended during the scoping assessment. This letter presents our intended approach and provides a detailed budget estimate for the Environmental and Social Impact Assessment (ESIA).

The SoW discussed comprises environmental and hydrogeological feasibility studies and a public participation programme required for assessing overall feasibility of proposed project and obtaining the necessary authorisations. Required authorisations include an Environmental Clearance Certificate (ECC) from the Ministry of Environment, Forestry and Tourism (MEFT), a Mining Licence from the Ministry of Mines and Energy (MME) and Water Abstraction Permit from the Ministry of Agriculture, Water and Land Reform (MAWLR). Exploration activities on EPL 3140, Noordoewer, //Karas Region are currently authorised under the existing ECC valid from 15 February 2021 to 15 February 2024.

2.0 APPROACH

The SoW has been divided into 7 main tasks as follows:

- Task 100 – Project Management
- Task 200 – Baseline Studies
- Task 300 – Consultations
- Task 400 – Scoping and EIA
- Task 500 – Water Permits

- Task 600 – Mining Licenses
- Task 700 – Closure Planning.

The tasks culminate in the development of a project level Environmental Management Programme (EMPr) and submissions for the necessary authorisations described above.

The project will be initiated upon receipt of a purchase order from Deep-South Resources. KP is ISO 9001, 14001, and 45001 certified and therefore we will adhere to these standards in the project management of all aspects of the work.

Specialist studies are undertaken by the KP team members and various sub contractors of which are discussed more detail below.

3.0 UNDERSTANDING OF THE PROJECT

The Project involves the development of feasibility studies for the Haib Copper Project towards development of a project level Environmental Management Programme (EMPr) and submissions for the necessary authorisations.

The Project comprises a large copper resource to be mined from an open pit and processed through a heap leaching facility at a mined throughput of 20 million tonnes per annum (Mtpa). Life of mine is approximately 22 years and a total of 400 million tonnes (Mt). The Haib copper deposit is in the //Kharas region, near the Orange River at the border with South Africa, approximately 780 km by road South of Windhoek, the capital of Namibia. Proposed project infrastructure includes the following:

- an open pit (made up of three pits which will eventually form one mega pit),
- a crushing and agglomeration circuit,
- a heap leach processing facility and
- a solvent extraction plant to recover the copper.

Ancillary components include:

- Water abstraction pipeline or groundwater abstraction infrastructure (depending on outcomes of feasibility)
- Power lines and substation
- Access roads.

A locality map of the proposed Project site is shown in Figure 1.

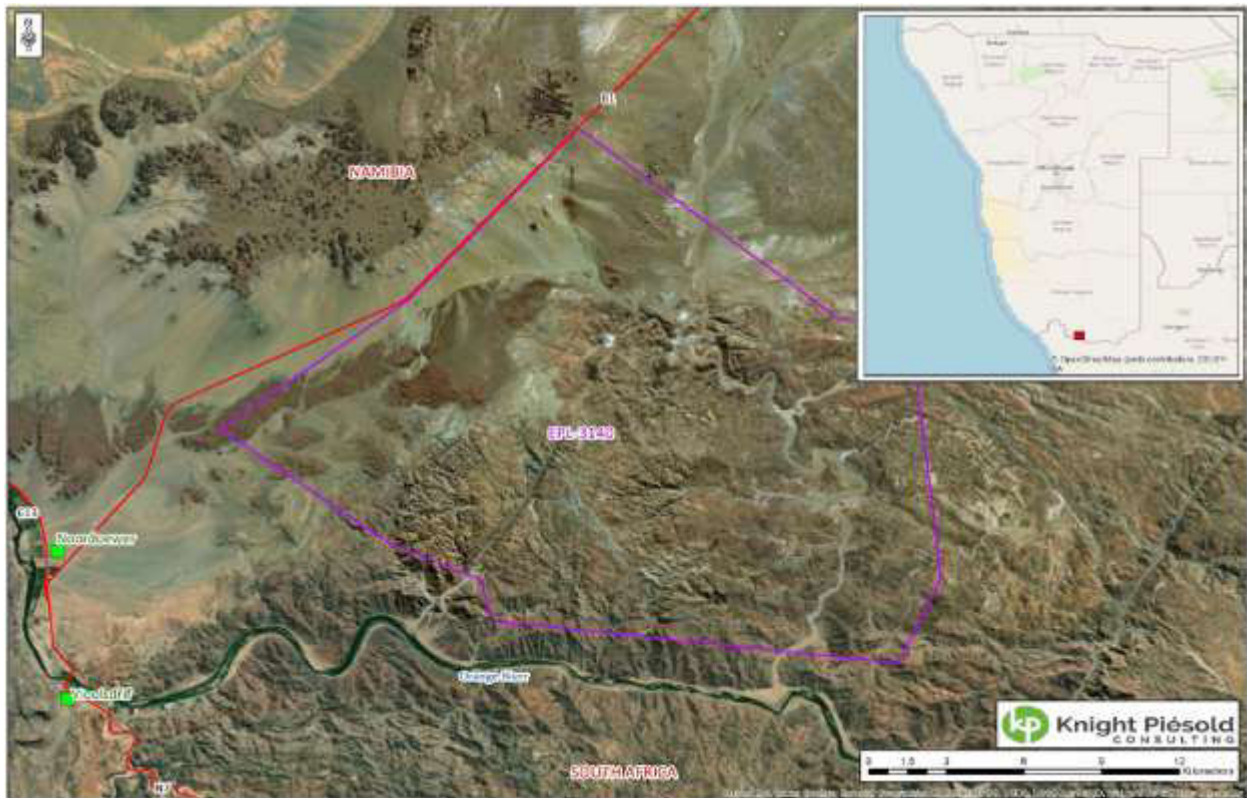


Figure 1: The Haib Copper Deposit and EPL3140 in Namibia along the Orange River

4.0 SCOPE OF WORK

| Description | Methodology / notes on scope assumptions |
|--|---|
| Task 100 - PROJECT MANAGEMENT | |
| Project set up and inception meeting via Teams | Knight Piésold is ISO 9001 accredited globally and our projects are managed using a web-based project management system to track tasks, deliverable due dates and budget. Project management will entail: <ol style="list-style-type: none"> 1. Conduct inception meeting with the client and project team to initiate the project 2. Review design documents and project specifications and finalise timelines and project milestones 3. Continuous liaison with client providing progress feedback and requests for clarity/ data/ information. 4. Continuous liaison with project team and sub-consultants 5. Ongoing financial management and administration |
| Project management and financial management | |
| Client, team and sub-consultant liaison | |
| TASK 200 - BASELINE STUDIES | |
| Biodiversity Specialist Study | |

| Description | Methodology / notes on scope assumptions |
|----------------------------------|---|
| | <p>Objective: To determine the effect that the proposed Haib Copper Project developments may have on the terrestrial bio-physical environment (vertebrate fauna & flora) within the development area and immediate surroundings (Noordoewer area).</p> <p>This will be done through implementing the following methodology:</p> <ol style="list-style-type: none"> 1. Phase 1: Literature review <ol style="list-style-type: none"> a. A literature study will be conducted on existing as well as “recent” relevant publications as well as the vertebrate fauna & flora known or expected to occur in the general area. This would include rare & endangered (R&E), threatened, protected, endemic, etc. species as determined by the Namibian and International legal status for such species. 2. Phase 2: Site Visit & Fieldwork <ol style="list-style-type: none"> a. A visit to the proposed Haib Copper Project area (area of interest portions only) will be conducted to determine the actual biodiversity at the proposed development site will be conducted during the same period and will include: <ol style="list-style-type: none"> i. Small mammal transects to determine small mammal diversity in the area ii. Larger mammal presence will be determined in the area iii. Reptile & amphibian transects (diurnal & nocturnal) to determine reptile & amphibian diversity in the area iv. Bird transects to determine avian diversity in the area v. Flora transects to determine plant diversity in the area 3. Phase 3: Report <ol style="list-style-type: none"> a. Results (literature study and fieldwork) of the bio-physical issues for the proposed Haib Copper Project including other general issues for the proposed development area will be presented. b. Possible adverse effects of potential development on the vertebrate fauna & flora (i.e., endemic, endangered, etc. species) will be presented. c. Impact assessment & practical mitigation measures will be included. d. This report will be finalised within the time scale of the proposed EIA study. |
| Aquatics Specialist Study | |
| | <p>Objective: To determine the effect that the proposed Haib Copper Project developments may have on the aquatic bio-physical environment within the development area and immediate surroundings.</p> <p>The objective will be achieved through the following:</p> <ol style="list-style-type: none"> 1. Phase 1: Literature Review <ol style="list-style-type: none"> a. Review previous studies b. Review applicable legislation and standards c. Consult available ecological databases, aerial imagery, topographical maps and identify target areas for survey d. Review species distribution lists to identify Species of Conservation Concern (SCC) 2. Phase 2: Field work <ol style="list-style-type: none"> a. Two seasonal (dry and wet season) field investigations conducting the following aquatic biodiversity analysis: <ol style="list-style-type: none"> i. Water quality (SANS241), ii. diatoms, iii. fish and iv. macro-invertebrates’ assessments |

| Description | Methodology / notes on scope assumptions |
|--|--|
| <p>3. Phase 3: Reporting</p> <ol style="list-style-type: none"> a. Analyse all site data and compile species lists b. Review results of water quality analysis and compare to Namibia and international standards c. Evaluate baseline data and provide aquatic ecological sensitivity maps with detail on the ecological aspects of concern d. Conduct an impact assessment, taking the mitigation hierarchy into account e. Provide mitigation / management measures and monitoring requirements | |
| <p>Hydrogeology Specialist Study</p> <p>Objective: Undertake a hydrogeological study to determine effect that the proposed Haib Copper Project developments may have on groundwater resources and determine the quality and availability of groundwater to augment the proposed main surface water supply which is proposed to be sourced from the Orange River.</p> <p>The objective will be achieved through the following:</p> <ol style="list-style-type: none"> 1. Task 1: Project Management <ol style="list-style-type: none"> a. A kick-off meeting will be held using Microsoft Teams (or similar) within 1 week of award of the contract. During the kick-off-meeting the following details will be discussed/agreed: <ol style="list-style-type: none"> i. Contact details for various members of staff. ii. Confirmation of staff members roles and responsibilities. iii. Confirmation of mutual understanding of the Scope of Work. iv. Details as to how to access any data room that may exist. v. Agreement on style of weekly project updates. vi. Agreement on timelines. vii. Confirming goals and objectives of the site visit and assessing availability of mine site staff to facilitate the site visit. viii. Financial management details including invoice processing procedures. 2. Task 2: <ol style="list-style-type: none"> a. Hydrocensus <ol style="list-style-type: none"> i. KP have allowed for conducting a site walkover and hydrocensus. The site walkover will be used to allow the visiting Hydrogeologist to become acquainted with the site. We shall: <ol style="list-style-type: none"> 1. Undertake a site walkover and identify various hydrogeological/hydrological features and make observations with respect to possible historical surface water flow. 2. Visit boreholes to determine in-situ groundwater quality parameters and to determine water levels. 3. Take measurement of in-situ surface water quality parameters (if present). 4. Identify areas of waste deposition/accumulation. 5. Produce an annotated map of areas of potential concern and identify sampling locations. 6. Obtain up to five bailed groundwater samples of groundwater for subsequent chemical analysis. 7. Water field parameters, including pH; electrical conductivity, and oxidation-reduction potential (ORP) will be monitored prior to sampling using calibrated portable hand-held equipment. | |

| Description | Methodology / notes on scope assumptions | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------------------------------|--|-------------------------|------|-------------|------|----|---|-----------------|------|-------------------------|------|----------------|------|------------------------|------|--------------|------|------------------------|------|--------------------|------|------------------|------|-----------------|------|-----------------|------|------------|------|-----------------|------|------------------|------|------------------------------|------|-------------------------|------|---------------|------|---------------|------|----------------------------|------|---------------|------|------------------------------|------|------------|------|--------------------------|------|--------------|------|---------------|------|--|--|
| | <p>ii. Photographs will be taken and a technical memo recording the event with be produced.</p> <p>b. Aquifer Testing</p> <p>i. Opportunistic aquifer testing will be undertaken at existing boreholes and, if available, recently drilled geotechnical boreholes. Aquifer testing will be undertaken using a combination of the following methods:</p> <ol style="list-style-type: none"> 1. Falling Head: <ol style="list-style-type: none"> a. The hole is filled with water and the change (decrease) in the water level in the hole over time is observed until the equilibrium position is reached (corresponding to the groundwater table in the vicinity). 2. Rising Head: <ol style="list-style-type: none"> a. The water in the borehole is pumped or bailed to a level lower than the groundwater table in the vicinity and the change (increase) in water level in the borehole over time is observed until the equilibrium position is reached. 3. Constant Head: <ol style="list-style-type: none"> a. The hole is filled with water and the (constant) flow rate required to maintain the water level in the hole is measured. <p>c. Geophysical Survey</p> <p>i. If after review of the available site-specific information it is considered that a geophysical survey is required to further inform understanding of the site, development of the Conceptual Hydrogeological Model (CHM) and improved construction of the Numerical Hydrogeological Model (NHM) then KP will inform the client of this recommendation. Currently, we have allowed for 1 week of site supervision for a geophysical survey; however, we have not allowed for third party contractor costs for conducting such a survey.</p> <p>d. Chemical Analysis</p> <p>i. Ground water samples will be submitted to a South African National Accredited System (SANAS) accredited laboratory for the suite of analysis shown below:</p> <p style="text-align: center;">Table 1-1: Proposed Chemical Analysis for Water Samples</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="background-color: #76b82a; color: white;">Determinand</th> <th style="background-color: #76b82a; color: white;">Unit</th> <th style="background-color: #76b82a; color: white;">Determinand</th> <th style="background-color: #76b82a; color: white;">Unit</th> </tr> </thead> <tbody> <tr> <td>pH</td> <td>-</td> <td>Magnesium as Mg</td> <td>mg/L</td> </tr> <tr> <td>Electrical Conductivity</td> <td>mS/m</td> <td>Potassium as K</td> <td>mg/L</td> </tr> <tr> <td>Total Dissolved Solids</td> <td>mg/L</td> <td>Sodium as Na</td> <td>mg/L</td> </tr> <tr> <td>Total Suspended Solids</td> <td>mg/L</td> <td>Phenolic compounds</td> <td>mg/L</td> </tr> <tr> <td>Total Alkalinity</td> <td>mg/L</td> <td>Manganese as Mn</td> <td>mg/L</td> </tr> <tr> <td>Chemical Oxygen</td> <td>mg/L</td> <td>Boron as B</td> <td>mg/L</td> </tr> <tr> <td>Chlorides as Cl</td> <td>mg/L</td> <td>Chrome Total and</td> <td>mg/L</td> </tr> <tr> <td>Ammonia (NH₃-N)</td> <td>mg/L</td> <td>Copper as Cu</td> <td>mg/L</td> </tr> <tr> <td>Fluoride as F</td> <td>mg/L</td> <td>Cadmium as Cd</td> <td>mg/L</td> </tr> <tr> <td>Nitrate as NO₃</td> <td>mg/L</td> <td>Cyanide as CN</td> <td>mg/L</td> </tr> <tr> <td>Sulphates as SO₄</td> <td>mg/L</td> <td>Lead as Pb</td> <td>mg/L</td> </tr> <tr> <td>Total Inorganic Nitrogen</td> <td>mg/L</td> <td>Mercury (Hg)</td> <td>mg/L</td> </tr> <tr> <td>Calcium as Ca</td> <td>mg/L</td> <td></td> <td></td> </tr> </tbody> </table> <p>3. Task 3: Reporting and Modelling</p> <p>a. Document Review</p> <p>i. KP will review all existing information made available and/or that is accessible in the public domain. It is envisaged that this information will include, but not necessarily be limited to the following:</p> <ol style="list-style-type: none"> 1. Borehole drilling logs. | Determinand | Unit | Determinand | Unit | pH | - | Magnesium as Mg | mg/L | Electrical Conductivity | mS/m | Potassium as K | mg/L | Total Dissolved Solids | mg/L | Sodium as Na | mg/L | Total Suspended Solids | mg/L | Phenolic compounds | mg/L | Total Alkalinity | mg/L | Manganese as Mn | mg/L | Chemical Oxygen | mg/L | Boron as B | mg/L | Chlorides as Cl | mg/L | Chrome Total and | mg/L | Ammonia (NH ₃ -N) | mg/L | Copper as Cu | mg/L | Fluoride as F | mg/L | Cadmium as Cd | mg/L | Nitrate as NO ₃ | mg/L | Cyanide as CN | mg/L | Sulphates as SO ₄ | mg/L | Lead as Pb | mg/L | Total Inorganic Nitrogen | mg/L | Mercury (Hg) | mg/L | Calcium as Ca | mg/L | | |
| Determinand | Unit | Determinand | Unit | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| pH | - | Magnesium as Mg | mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Electrical Conductivity | mS/m | Potassium as K | mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Dissolved Solids | mg/L | Sodium as Na | mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Suspended Solids | mg/L | Phenolic compounds | mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Alkalinity | mg/L | Manganese as Mn | mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chemical Oxygen | mg/L | Boron as B | mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Chlorides as Cl | mg/L | Chrome Total and | mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Ammonia (NH ₃ -N) | mg/L | Copper as Cu | mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Fluoride as F | mg/L | Cadmium as Cd | mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Nitrate as NO ₃ | mg/L | Cyanide as CN | mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Sulphates as SO ₄ | mg/L | Lead as Pb | mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Total Inorganic Nitrogen | mg/L | Mercury (Hg) | mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| Calcium as Ca | mg/L | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

| Description | Methodology / notes on scope assumptions |
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| | <ol style="list-style-type: none"> 2. Drilling specifications. 3. Pumping test data. 4. Pump specifications. 5. Piezometric maps. 6. Records of borehole abstraction rates. 7. Borehole licence data. 8. Regional and local geological maps. 9. Geological memoirs and geological studies. 10. Groundwater level monitoring records. 11. Previous Numerical Modelling reports and modelling files. <p>ii. The purpose of the document review is to assess the appropriateness of data collection and modelling undertaken for the site and to inform the subsequent field activities. KP will produce a record of the information reviewed and identify possible data gaps.</p> <p>b. Modelling</p> <ol style="list-style-type: none"> i. It is proposed to develop a Conceptual Hydrological Model (CHM) for the site. The CHM will be informed following review of available geological, hydrogeological and topographical data. The CHM will be further updated with any new data acquired from the proposed geotechnical fieldwork and possible geophysical survey and developed as a regional 3D Hydrostratigraphic Model using Leapfrog Works®. Available data will be imported and analysed in Leapfrog Works®; this will include structural and geotechnical information, subject to availability. ii. The 3D Hydrostratigraphic Model will be used as the basis for the Numerical Hydrological Model (NHM) (produced in FEFLOW) which will be updated to quantify the available resource of the aquifer, the extent of the drawdown cone associated with groundwater abstraction from boreholes and though open pit mining, potential for water supply, and impact on identified receptors. iii. Compilation of a comprehensive conceptual and numerical model will be used to simulate the following scenarios and will be supported with information from the Geochemical Assessment: <ol style="list-style-type: none"> 1. Steady-state calibration based on water levels. 2. High-level groundwater flow and mass migration of key parameters to estimate the potential plume migration from key mining infrastructure and to determine the impact the mining may have on groundwater quality for Life of Mine (LOM). 3. High-level post-closure understanding of the groundwater rebound and continued mass loading and plume migration over time. iv. There is only limited information available to support construction of the NHM. All assumptions made in constructing the model and associated limitations of the model will be recorded <p>c. Hydrological Reporting</p> <ol style="list-style-type: none"> i. A hydrogeological assessment report will be produced which will include the following sections: <ol style="list-style-type: none"> 1. Introduction to the Project. 2. Scope of Work and Objectives 3. Documents Reviewed. 4. Site Setting 5. Fieldworks Undertaken |

| Description | Methodology / notes on scope assumptions |
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| | 6. Conceptual Hydrogeological Model 7. Numerical Hydrogeological Model 8. Risk Assessment 9. Conclusions with respect to the hydrogeological characterisation of the site. 10. Recommendations for further site assessment, if required. |
| Geochemical Specialist Study | |
| <p>Objective: Undertake geochemical testing to assess the potential of geochemical risk of acid rock drainage and metal leaching for potential mine waste and stockpiles that may be generated at the mine.</p> <p>The objective will be achieved through the following:</p> <ol style="list-style-type: none"> 1. Task 1: Project Management <ol style="list-style-type: none"> a. On initiation of the project, a virtual kick-off meeting will be held between the project team and the Client. This will enable: <ol style="list-style-type: none"> i. Establishment of focal points/communication lines between the project team. ii. Confirmation of the scope of work. iii. Agreement on the procedures and guidelines to be used for the project. iv. Provision of project data. v. Provision of any other information required to successfully undertake the project. b. Attend project meetings when required or deemed necessary, in addition to ongoing email communication related to information or issues. Issue a monthly memo summarising the works undertaken to date. 2. Task 2: Sampling and Chemical Analysis <ol style="list-style-type: none"> a. Sampling <ol style="list-style-type: none"> i. KP proposes that a KP Geochemist from Windhoek or Sandton offices visit the site and collect up to 6 samples of material (3 to 5 kg per sample) of various material types. One day on site should be sufficient for all fieldwork. The samples will then be submitted to a South African National Accredited System (SANAS) accredited laboratory with the results used to characterise the long-term acid generation potential of the samples. b. Chemical Analysis <ol style="list-style-type: none"> i. Samples representative of potential waste type will be selected for analysis and mineral characterisation. Waste rock samples will undergo laboratory and chemical analysis determine the acid generating potential and leaching of waste rock, as follows: <ol style="list-style-type: none"> 1. Acid Base Accounting (ABA) <ol style="list-style-type: none"> a. Modified Sobek NP, paste pH, Total Sulphur, Sulphate Sulphur, Sulphide Sulphur, Carbonated Carbon and Neutralization Potential 2. Minerology <ol style="list-style-type: none"> a. X-Ray Diffraction (XRD) analysis 3. Geochemical Source tests (leaching potential) <ol style="list-style-type: none"> a. Synthetic Precipitation Leaching Procedure (SPLP, EPA method 1312) 4. Net Acid Generation (NAG) test <ol style="list-style-type: none"> a. Modified Sobek method 3. Task 3: Assessment and Reporting | |

| Description | Methodology / notes on scope assumptions |
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| | <ul style="list-style-type: none"> a. Data Review and Assessment <ul style="list-style-type: none"> i. Upon receipt of the data requested, KP will undertake a desktop study to collate and analyse the data received and identify any data gaps. The required data will include, but not limited to: <ul style="list-style-type: none"> 1. Available literature i.e., existing geochemical characterisation and hydrogeological reports 2. EIA/baseline study of the proposed mine (If available) 3. Overview of geological model of the mine 4. Groundwater monitoring data and information 5. Any concept mine pit and Waste Rock Dump (WRD) plans 6. Existing geochemical rock mineral characterisation data 7. Extract of geological drill database ii. The data review and gap analysis will aid in planning the geochemical characterisation assessment in terms of additional data needed, planned sample locations and sample-collection procedures during the assessment. b. Reporting <ul style="list-style-type: none"> i. Field Report <ul style="list-style-type: none"> 1. Following completion of the fieldwork a Field Report Technical Memo will be produced summarising the field works undertaken, field measurements obtained, and details of samples gathered in the field. The Field Report Technical Memo will be issued within five working days of departure from site. ii. Comprehensive Report <ul style="list-style-type: none"> 1. A comprehensive report will be produced outlining a high level acidic and metalliferous risk profile for each satellite deposit with recommendations. Based on the static results, the report will outline recommended kinetic testing program to be conducted. The report will include the following: <ul style="list-style-type: none"> a. Introduction to the Project b. Scope of Work and Objectives c. Fieldwork Undertaken d. Documents Reviewed 2. Chemical Analysis undertaken 3. Data Assessment 4. Conclusions with respect to the geochemical characterisation assessment 5. Recommendations for further testing, if required iii. The comprehensive report will also include several drawings, specifically: <ul style="list-style-type: none"> 1. Site Location 2. Sampling Locations 3. Conceptual Site Model |
| Archaeological Specialist Study | |
| Objective: To determine the effect that the proposed Haib Copper Project developments may have on the archaeological components within the development area and immediate surroundings. | |
| This will be done through implementing the following methodology: <ul style="list-style-type: none"> 1. Review of existing archaeological records 2. Carry out detailed site survey on foot 3. Document all archaeological materials according to standard procedures 4. Assess archaeological significance and vulnerability of any sites found | |

| Description | Methodology / notes on scope assumptions |
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| 5. Compile assessment and impact report. The study includes an assessment of heritage as a requirement by the provisions of the Heritage Act. | |
| Social Specialist Study | |
| Objective: To determine the effect that the proposed Haib Copper Project developments may have on the socio-economic conditions within the development area and immediate surroundings and propose mitigation measures. | |
| The social specialist study is designed around four objectives namely: <ol style="list-style-type: none"> 1. to understand the socio-economic conditions prevailing in the area that will “receive” the proposed project and prepare a socio-economic profile 2. to anticipate the potential positive and negative impacts the project may have on the receiving environment and the people that reside there 3. to assess the impacts and suggest avoidance or mitigation measures for negative impacts and enhancement measures for potential positive impacts 4. to assess the options related to the ability of surrounding towns to accommodate incoming staff and determine the requirements for town planning to design and service the required land for residential and ancillary services to accommodate the impact of the proposed mine | |
| Key elements of the social study will be conducted through close collaboration with the project Environmental Assessment Team. | |
| To facilitate proper control and management, the assignment is divided into four phases as follows: | |
| <ol style="list-style-type: none"> 1. Phase 1 deals with the familiarisation of the team with the situation on site in Noordoewer and to meet with and brief the authorities and key stakeholders about the assessment. The phase objectives are: <ol style="list-style-type: none"> a. To procure a base map of the study area at local and regional scale b. To do a reconnaissance site visit and meet with the Karas Regional Council, Noordoewer Settlement Office and other direct stakeholders c. To contribute to the stakeholders database d. To review and finalise the methodology after the site visit | |
| <ol style="list-style-type: none"> 2. Phase 2 deals with the public consultation and data collection process. The objectives of this phase are to: <ol style="list-style-type: none"> a. Do a stakeholder analysis and prepare a stakeholder engagement plan b. Together with the Environmental Assessment team, prepare a Background Information Document (BID) and presentation c. Together with the Environmental Assessment team hold a public meeting where the project is presented and where stakeholders are afforded the opportunity to seek clarification and identify the potential positive and negative issues and impacts of the proposed mine | |
| <ol style="list-style-type: none"> 3. Phase 3 comprise the social and town planning studies and the assessment of socio-economic and planning impacts. The first part of the phase entails the compilation of socio-economic background information which is required to understand the environment within which the project will take place which includes the following: <ol style="list-style-type: none"> a. Provide general social and economic information about the site and its surrounds. The “surrounds” include the village of Noordoewer and the farming, tourism and conservation activities taking place in the area. Grunau is located about 140 km by road from the mine | |

| Description | Methodology / notes on scope assumptions |
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| | <p>site. Karasburg is even further (166 km) while Aussenkehr is 52 km away, but this settlement is not planned and has major issues related to accommodating permanent and seasonal workers. It therefore seems logical to concentrate on Noordoewer as the “service centre” for the mine and also the most likely source of accommodation for mine personnel and other support services.</p> <ul style="list-style-type: none"> b. Provide a demographic profile of the people residing in Noordoewer as well as the Karasburg Constituency as the sub region within which the project is located c. Understand the planning context surrounding the project. Noordoewer is a declared settlement and is managed by the Regional Council through a Control Administrative Officer at the Settlement Office. Planning and development of the settlement is largely done from the regional office in Keetmanshoop. However, the current status of planning and the availability of serviced land for various land uses that may be required by the mining activities is unknown <p>The second part of the phase is the preparation of a social impact assessment. The objectives of this part of the phase are to:</p> <ul style="list-style-type: none"> a. Assess the issues and impacts objectively and identify mitigation and management actions that would either avoid or lessen the negative impacts and enhance the positive impacts b. Contribute the key actions required to the Environmental Management Programme (EMPr) to be used during the implementation and operations phases of the project <p>4. Phase 4 rounds off the public consultation process in the form of formal public feedback and the finalisation of the assessment for inclusion into the EIA. The objectives of this Phase are to:</p> <ul style="list-style-type: none"> a. Ensure that the draft EIA report is accessible to all registered stakeholders through the provision of digital copies b. Allow a final input from stakeholders c. Finalise the reports for submission |
| <p>Air Quality and Noise Specialist Study</p> | |
| <p>Objective: To determine the effect that the proposed Haib Copper Project developments may have on noise and air quality within the development area and immediate surroundings.</p> <p>This will be achieved through conducting baseline surveys, quantitative modelling and impact assessments for noise and air quality.</p> <ul style="list-style-type: none"> 1. Task 1: Baseline Surveys <ul style="list-style-type: none"> a. Baseline Noise Surveys <ul style="list-style-type: none"> i. The noise survey will comprise measurements collected at 10 locations on and around the concession area (20-minute measurements). Night-time boundary measurements can be conducted where it is anticipated that noise levels will substantially deviate from daytime levels, and where security is available ii. Noise monitoring will be conducted through the use of a type 1 fully integrating noise meter, capable of measuring all of the necessary noise parameters. The sound level meter will be calibrated prior to use with a portable certified acoustical calibrator. The sound level meter shall be set to record noise levels in terms of the following parameters: <ul style="list-style-type: none"> 1. LAeq The equivalent continuous sound level, normally measured on an A-weighted decibel scale | |

| Description | Methodology / notes on scope assumptions |
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| | <ol style="list-style-type: none"> 2. LAmax The maximum sound pressure level of a noise event, normally measured on an A-weighted decibel scale 3. LA90 This parameter indicates the noise levels the receiving environment is exposed to 90% of the time 4. LA10 This parameter indicates the noise levels that the receiving environment will be exposed to 10% of the time <ol style="list-style-type: none"> iii. Noise monitoring will be undertaken using a sound level meter and methodologies which complies with the SANS or other internationally recognised guidelines which in turn are in line with international best practice. <ol style="list-style-type: none"> b. Baseline Air Quality Survey <ol style="list-style-type: none"> i. Passive Sampling of NO₂ and SO₂ <ol style="list-style-type: none"> 1. The most appropriate and cost-effective means of collecting air quality data for SO₂ and NO₂ will be through the use of diffusion tubes. This allows a long-term characterisation of the air quality conditions with reasonable spatial resolution. The use of diffusion tubes for ambient characterisation is advocated by the World Health Organisation (WHO), which is in turn recognised by the International Finance Corporation (IFC). During the site visit and monitoring campaign, WKC will deploy diffusion tubes at 10 locations on-site, which shall be collected by the site staff 2 weeks after deployment, and sent back to South Africa for analysis. ii. Active Sampling of PM <ol style="list-style-type: none"> 1. In order to quantify particulate matter (PM including PM_{2.5}, PM₁₀ and TSP), it is proposed that a real-time particulate matter analyser (Turnkey Instruments™ Osiris) be deployed at a strategic locations (with a potential of 2 to 3 additional locations covering the most critical boundary areas if required) on site or at the nearest receptors based on the proposed density of mining operations and proximity to the concession boundary and sensitive receptors. <ol style="list-style-type: none"> 2. Task 2: Dispersal Modelling <ol style="list-style-type: none"> a. The dispersion modelling will be undertaken using the US EPA endorsed AERMOD software. AERMOD is a straight-line, steady-state Gaussian plume model that can model the dispersion of pollutants over rural and urban areas, flat and complex terrain. AERMOD considers surface and elevated releases, and multiple sources (including point, area and volume sources) to determine ground level pollutant concentrations at specified receptor points. The table below outlines our approach to the modelling assessment. A tabulated data request will be provided to the Client, which will be returned completed and used to inform the study parameters for ADM. 3. Task 3: Noise Modelling <ol style="list-style-type: none"> a. In order to predict operational noise levels, the internationally recognised noise modelling software, SoundPLAN, will be utilised. A noise model for the project will be developed using project noise limits and background ambient noise measurements to determine compliance with environmental noise standards. b. The Noise Study Report will include the following: <ol style="list-style-type: none"> i. Noise contour maps illustrating the Project noise contribution in the surrounding environment ii. Tabulated assessment of noise levels at sensitive receptors iii. A summary showing to what extent project noise requirements are being met |
| TASK 300 - CONSULTATIONS | |

| Description | Methodology / notes on scope assumptions |
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| Develop Database of IAP's | <p>Task 300 will conduct a comprehensive Public Participation Process (PPP). This task will be accomplished through collaboration with the Social Specialist Study described above. The PPP will be implemented through the following actions:</p> <ol style="list-style-type: none"> 1. Review and establishment of policy, legal and administrative requirements in Namibia 2. Phase 1 of the Public Participation Process: <ol style="list-style-type: none"> a. Identify and establish a database of Interested and Affected Parties (IAPs) b. Together with the Social Specialist, prepare a Background Information Document (BID) and presentation. c. Notify IAPs of project proposal through email, in newspapers (drafting and placing of advertisements in 2 Namibian newspapers for 1 week each) distributing bulk SMS's and posters on site. 3. Phase 2 of the Public Participation Process: <ol style="list-style-type: none"> a. Inform IAPs and relevant stakeholders of Draft Scoping Report (draft letter, email correspondence) and make this available for comment. b. Notify IAP's of where to access the scoping report and location and time for public meeting. This will be done through emailing all registered IAP's and running a second-round advert for 1 week in 2 Namibian newspapers. c. In collaboration with the Social Specialist hold a public meeting where the project is presented, and stakeholders are afforded the opportunity to seek clarification and identify the potential positive and negative issues and impacts of the proposed mine. 4. Incorporate comments, considerations and suggestions from IAPs into the Draft EIA |
| Plan and Set up Stakeholder Appointments / Consultations | |
| Prepare Background Information Document | |
| Consultations | |
| Consultation Report | |
| TASK 400 – SCOPING AND EIA | |
| Project Description and Baseline | <p>Task 400 involves initiating the Environmental Clearance Certificate (ECC) application process, developing the Scoping Report (required for PPP), compiling the Environmental Impact Assessment (EIA) Report and Environmental Management Programme (EMPr) (for submission).</p> <p>The task includes three key phases:</p> <p>The Application Initiation Phase will provide a high-level project description including preliminary baselines, maps of the project area, focal specialist studies, expected impacts and listed activities for the purposes of initiating the ECC application. Feedback received from Ministry of Environment, Forestry and Tourism (MEFT) will be taken forward into the scoping phase.</p> |
| Legal Framework | |
| Risk Assessment | |
| Environmental Management Programme | |
| Application/ Submission | |

| Description | Methodology / notes on scope assumptions |
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| | <p>The Scoping Phase will include the development of the Scoping Report which includes the following:</p> <ol style="list-style-type: none"> 1. Project description and baseline (inclusive of specialist baselines where possible) 2. Develop representative site maps 3. Legal review and list of triggered activities 4. Identification of alternatives and fatal flaws 5. Review of legal framework 6. Compile description of project using information received from the project developers 7. Collect baseline information for the area 8. Assess and evaluate impacts 9. Compile Draft Scoping Report and Draft Environmental Management Programme (draft SR and draft EMPr) <p>The Draft SR and Draft EMPr will be presented to IAPs during the public consultation process for inputs.</p> <p>The EIA Phase will involve the development of the EIA report and finalisation of the EMPr. The following activities are included:</p> <ol style="list-style-type: none"> 1. Incorporate findings, outcomes and recommendations of specialist studies. 2. Integrate considerations and outputs of public consultations 3. Conduct comprehensive impact assessment and design mitigation measures in line with the mitigation hierarchy 4. Integrate findings into final Environmental Management Programme (EMPr) 5. A summarised version of the EIA will be developed (maximum of 90 pages as per MEFT requirements) for the purposes of the submission. <p>The finalisation of the task will be to submit final EIA to MEFT. The decision by MEFT is expected to take approximately 6 weeks from date of submission.</p> |
| TASK 500 – WATER PERMITS | |
| Collation of documentation | Task 500 focusses on developing and initiating the application for required Water Permits to the Ministry of Agriculture, Water and Land Reform (MAWLR). |
| Application, submission and presentations | <p>The task will include the following:</p> <ol style="list-style-type: none"> 1. Compile documentation required for the application for Water Permits 2. Submission to MAWLR. |

| Description | Methodology / notes on scope assumptions |
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| TASK 600 - MINING LICENSES | |
| Collation of documentation | Task 600 focusses on developing and initiating the application for required Mining Licence from the Ministry of Mines and Energy (MME). The task will include the following: <ol style="list-style-type: none"> 1. Compile documentation required for the application for Water Permits 2. Submission to MME. |
| Application, submission and presentations | |
| TASK 700 – CLOSURE PLANNING | |
| Closure component of prelim design report | Task 700 focusses on the development of the mine closure component in the preliminary design report. The task will involve the following: <ul style="list-style-type: none"> • Formulation of closure objectives • Identification of closure land uses • Identification of closure-related risks and opportunities • Closure concepts for the major landforms (to enable design with closure in mind) • High-level / first order closure cost estimates for major landforms. |

5.0 PROJECT SCHEDULE

| Task s | Description | Month 1 | Month 2 | Month 3 | Month 4 | Month 5 | Month 6 | Month 7 | Month 8 | Month 9 | Month |
|--------|--|---------|---------|---------|---------|---------|---------|---------|---------|---------|-------|
| 101 | Project set up and inception meeting via Teams | | | | | | | | | | |
| 102 | Project management and financial management | | | | | | | | | | |
| 103 | Client, team and sub-consultant liaison | | | | | | | | | | |
| 200 | BASELINE STUDIES | | | | | | | | | | |
| 201 | Biodiversity Specialist Study | | | | | | | | | | |
| 202 | Aquatic Specialist Study | | | | | | | | | | |
| 203 | Hydrogeology and Geochemistry Specialist Study | | | | | | | | | | |
| 204 | Geochemistry Specialist Study | | | | | | | | | | |
| 205 | Archaeological Specialist Study | | | | | | | | | | |
| 206 | Social Specialist Study | | | | | | | | | | |
| 207 | Air Quality and Noise Specialist Study | | | | | | | | | | |
| 208 | Surface Water Impacts | | | | | | | | | | |
| 300 | CONSULTATION | | | | | | | | | | |
| 301 | Develop Database of IAPs | | | | | | | | | | |
| 302 | Plan and Set up Stakeholder Appointments / Consultations | | | | | | | | | | |
| 303 | Prepare Background Information Document | | | | | | | | | | |
| 304 | Consultations | | | | | | | | | | |
| 305 | Consultation Report | | | | | | | | | | |
| 400 | SCOPING AND EIA | | | | | | | | | | |
| 402 | Project Description and Baseline | | | | | | | | | | |
| 403 | Legal Framework | | | | | | | | | | |
| 404 | Risk Assessment | | | | | | | | | | |
| 405 | Management Plan | | | | | | | | | | |
| 406 | Application/ Submission | | | | | | | | | | |
| 500 | WATER LICENCE | | | | | | | | | | |
| 501 | Collation of documentation | | | | | | | | | | |
| 502 | Application, submission and presentations | | | | | | | | | | |
| 600 | MINING LICENCE | | | | | | | | | | |
| 601 | Collation of documentation | | | | | | | | | | |
| 602 | Application, submission and presentations | | | | | | | | | | |
| 700 | CLOSURE PLANNING | | | | | | | | | | |
| 701 | Closure prelim design report | | | | | | | | | | |

| | |
|--|--------------------|
| | KP Tasks |
| | Specialist Studies |
| | Client Review |

6.0 BUDGET ESTIMATE

Knight Piésold proposes to develop Environmental Impact Assessment and Environmental Management Programme and compile and submit the application for Environmental Clearance, Water Permits and Mining Licence for N\$ (excl. VAT). The quotation is calculated on a time cost basis, based on an estimation of hours required to perform each task and are summarised below.

| Tasks | Description | Hours | Professional Fees | Disbursements | Sub-Total |
|-------|---------------------------|-------|-------------------|---------------|-----------|
| 100 | PROJECT MANAGEMENT | | | | |
| 200 | BASELINE STUDIES | | | | |
| 300 | CONSULTATION | | | | |
| 400 | SCOPING AND ESIA | | | | |
| 500 | WATER ABSTRACTION LICENCE | | | | |
| 600 | MINING LICENCE | | | | |
| 700 | CLOSURE PLANNING | | | | |
| | TOTALS | | | | |

More detailed costing is provided in [Appendix A](#).

6.1 ASSUMPTIONS AND LIMITATIONS

The table below summarises Knight Piésold's assumptions in defining the scope and cost for this project. We are available for discussions on scope and price should our understanding differ materially from the Client's expectations.

| Project Component | Assumption |
|----------------------------------|--|
| Scope Flexibility | The cost proposal is based on information provided by Knight Piésold at the time of drafting the proposal. |
| | Any change in scope and/or budget will be agreed upon and approved by the client before being undertaken. For this project, Knight Piésold will provide immediate notification of any changes or deviations to our anticipated budget due to delays and/or out-of-scope activities. If any of these situations occur, we will seek approval from the client before proceeding. Any additional works, if required, can be undertaken upon receipt of an agreed variation order. |
| Specialist Investigations | Specialist costs are estimates based on a high-level understanding of the scope. The exact range, scope and price of specialist investigations will be confirmed after project inception and based on input from MEFT. |
| Travel to site | It is assumed that all site access permissions and permits will be arranged by the Client. The Client is to provide unhindered access to site and ensure that it is safe for work. |
| | No allowance was made for any medical assessment or inductions or required trainings. |

| Project Component | Assumption |
|---------------------------------|--|
| | Where relevant to the services, the Client shall give KP and our specialists adequate notice of any danger or hazard of which the Client ought reasonably to be aware and have foreseen. |
| Data Availability | A design freeze will be provided prior to the implementation of the EIA phase to allow for finalisation of baseline and scoping reports |
| | Project specific information will be provided by the Client and all data will be provided at the Client's own costs. |
| | The Client will make the latest survey available (if available). |
| Resettlement | No provision for a Resettlement Action Plan has been included. Should a Resettlement Action Plan be required, a costing thereof will be provided. |
| Stakeholder Consultation | Newspaper advertisements costs have been estimated. Actual costs will be reimbursed from the client. |
| | Provision for 1 round of stakeholder consultation has been included. This includes notification, advertising and a public meeting. |
| Project Management | <p>Our scope and cost makes provision for:</p> <p>3 project progress meetings and reports and 10 months of project management.</p> <p>3 updates of the project schedule.</p> <p>3 meetings with the technical team.</p> |
| Meetings | No inclusion has been provided for on-site meetings. |
| | Client meetings will be held via telephone, WebEx, Skype or Microsoft Teams. |
| | No authorities' meetings have been included. |
| | Key decisions will be recorded and distributed as meeting minutes. |
| Aquatics | Two seasonal surveys, one wet and one dry season survey, will be undertaken. |
| | The quotation is based on 4 aquatic bio-monitoring sites. Additional sites will incur additional costs. |
| | It is assumed there is currently no discharge point on the Orange River |
| | In the event that a site is deemed hazardous during the time of the survey, either due to weather or safety conditions, aquatic bio-monitoring will not be performed. |
| | Site access is to be arranged with landowners prior to site surveys by the Client. |
| Hydrogeology | We have not allowed for the cost of a geophysical survey. However, we have allowed a period of 1 week for supervising a geophysical survey. Should a geophysical survey be required then the scope of this will be defined and a |

| Project Component | Assumption |
|--------------------|---|
| | price for the third-party works will be obtained. It is assumed that the third-party contractor will be appointed either directedly by the Client or by KP following receipt of a Variation Order for the works |
| Payment | Please note that our terms of payment are strictly 30 days from date of invoice. |
| | A project initiation invoice will be issued upfront to cover anticipated laboratory costs and mobilisation of specialists to site. |
| | Should the project be put on hold for whichever reason, an invoice will be submitted for all work undertaken and project expenditure up to the time of receipt of the stop works order. |
| | Provisions of N\$ 5 300 has been made for anticipated application fees. Should additional application fee be by a relevant authority be applicable to the project, this will be paid directly by the client. |
| Reports | All reports will be provided in electronic format and uploaded onto Knight Piésold's online file management system (Fulcrum) for record purposes. |
| | Hard copies of reports are excluded other than those required for the application process. |
| | All reports will be submitted as drafts to the Client for review prior to issuing the final reports. |
| Translation | The deliverable drafts will be reviewed by KP and Deep South Resources in English only. |
| Validity | This cost proposal is valid for a period of 30 days. |
| | Our professional fee rates are valid until August 2024, where after an escalation will apply. KP cannot provide a fixed fee with no escalation, as Deep-South Resources' projects may be delayed due to factors beyond the control of KP. |

7.0 PROJECT TEAM

The sections below provide background and describe the expertise of KP and our project team.

7.1 KNIGHT PIÉSOLD

Knight Piésold is a global consulting firm that provides specialised services to the mining, power, water resources and infrastructure industries. We are engineers, environmental scientists, geoscientists and technologists who focus on creating value at every stage of a project through quality driven, sustainable solutions.

Established in 1921 in South Africa, we have expanded throughout the world, with 30 offices in 14 countries. At Knight Piésold, we work as one team, mobilising local and global resources to meet the needs of each client.

We work closely with our clients, understanding unique project characteristics within the context of today's global business environment. With a commitment to safety, quality and technical excellence, Knight Piésold specialises in creating customised solutions at every stage of a project life cycle, while delivering sustainable, bottom-line results. We have led numerous award-winning projects to completion and have fostered many long-term client relationships that hold strong today.

Our environmental team specialises in mining and large infrastructure projects and have successfully completed numerous EIAs in complex regulatory environments. Our objective is to provide you with quality deliverables that are “fit for purpose” for both local permitting and international financing requirements.

7.2 PROJECT TEAM

The assignment will be managed through KP Namibia's Windhoek office with additional specialist support being provided from KP offices in South Africa. Knight Piésold will assign the following staff to ensure successful completion of the project within the time schedule.

- Amelia Briel – Section Manager: Environment (KP South Africa) – Technical review
- Veronique Daigle – Director: Mining (KP Namibia) – Project Director
- Joseph Mulders – Senior Environmental Scientist (KP South Africa) – Project Manager
- Diana Duthe – Geochemist and Hydrogeologist Section Manager (KP South Africa)
- Lima Maartens – Environmental Assessment Practitioner (EAP)
- Lloyd Lunch – Environmental Scientist (KP South Africa)
- Amina Mukasa – Junior Environmental Scientist (KP)
- Theo Oosthuizen – Senior GIS Specialist (KP South Africa)
- Bianca Eiasen – Administrative Assistant (KP Namibia)
- Marc Blanche – Air quality and noise specialist
- Ashley Meyer – Air quality and noise specialist
- Peter Cunningham – Biodiversity Specialist
- John Kinahan – Archaeological Specialist
- Ernst Simon - Social Specialist
- Heidri Estellè Bindemann-Nel – Social Specialist.

The table below provides a summary of the complete project team. CVs are attached in [Appendix B](#), and qualifications can be provided on request.

Table 1: Summary of project team, qualifications, and experience

| Name | Qualifications and experience |
|------------------|---|
| Veronique Daigle | 2006 B.Sc. Eng. Coop, Civil Engineering, Université de Sherbrooke, Canada Engineering Professional Association in Canada, Reg No: OIQ143 749) Engineering Council of Namibia (ECN), Pr Eng, Reg No (PE2017-19) 17 years' experience |

| Name | Qualifications and experience |
|------------------------------|--|
| Amelia Briel | 2001 MSc (Environmental Toxicology), University of Johannesburg Professional Natural Scientist (RSA), <i>Pr.Sci.Nat.</i> 114335 >19 years' experience |
| Diana Duthe | 1990 M.Sc. (Hydrogeology), University of Neuchatel, Switzerland Professional Natural Scientist (RSA), <i>Pr.Sci.Nat.</i> 400091/01 >30 years' experience |
| Lima Maartens | 2000 Ph.D. (Fisheries Science), Rhodes University, South Africa Environmental Assessment Professionals of Namibia (EAPAN) >30 years' experience |
| Joseph Mulders | 2015 MSc (Environmental Management), University of Pretoria, South Africa Professional Natural Scientist (RSA) <i>Pr.Sci.Nat.</i> 118063 9 years' experience |
| Lloyd Lynch | 2014 MSc (Aquatic Health), University of Johannesburg, South Africa Professional Natural Scientist (RSA) <i>Pr.Sci.Nat.</i> 116026 7 years' experience |
| Amina Mukasa | 2022 BSc, Environmental Sciences, Université Nouveaux Horizons 1 year experience |
| Theo Oosthuizen | 1995 M.Sc. (Environmental Management), University of Johannesburg, South Africa Professional Natural Scientist, <i>Pr.Sci.Nat.</i> 400304/05 >25 years' experience |
| Marc Blanche | 2005 M.Sc. Applied Environmental Sciences, University of KwaZulu-Natal Professional Natural Scientist (RSA) <i>Pr.Sci.Nat.</i> 400163/11 >20 years' experience |
| Ashley Meyer | 2012 B.Eng. Mechanical Engineering, University of Pretoria 12 years' experience |
| Peter Cunningham | 1996 M.Sc. Nature Conservation, University of Stellenbosch, South Africa >20 years' experience |
| John Kinahan | 1989 Ph.D. Archaeology and Environmental Studies, University of the Witwatersrand. >30 years' experience |
| Ernst Simon | 1986 M. TRP, University of the Free State, South Africa Corporate Member of the Namibia Institute of Town and Regional Planners >30 years' experience |
| Heidri Estellè Bindemann-Nel | 2014, M. TRP, University of Pretoria, South Africa Member of the Namibia Council of Town and Regional Planners, Namibia Institute of Town and Regional Planners, Environmental Assessment Professionals of Namibia 11 years' experience |

8.0 PAYMENT TERMS

Please note that in the event we are appointed to undertake this work, our terms of payment are 30 days from date of invoice.

9.0 LIABILITY

In accordance with Knight Piésold's Professional Indemnity Insurers, we limit the maximum amount of compensation payable by Knight Piésold in respect of liability for this scope of work as an amount equal to twice the total fee payable for a period of 3 years from the day of issuing the report.

In the even that we are appointed to undertake this work, we would require that Interwaste indemnifies Knight Piésold against all claims by third parties which arise out of or in connection with the services which exceed the maximum amount of compensation and for the full amount of any such claims after the liability period stated in the agreement.

We would also require that Deep-South Resources indemnifies Knight Piésold against any claim which may be made against us by any party arising from the use for other purposes of documentation submitted to Deep-South Resources in rendition of this appointment.

10.0 WAIVER

We reserve the right to re-negotiate the above proposal should the scope of work change from the above.

11.0 CONCLUSION

The project team presented by Knight Piésold will provide a high level of international experience and in-country expertise. The scope of the environmental and social programmes presented in this proposal is intended to fully address Deep-South Resources' requirements. The scope of work and deliverables may be negotiated and adjusted based on client needs.

We trust that the Scope of Work described in this proposal will support Deep-South Resources well and we look forward to advancing the project together with your team.

Yours Sincerely,

Knight Piésold Consulting (Pty) LTD.

Prepared:



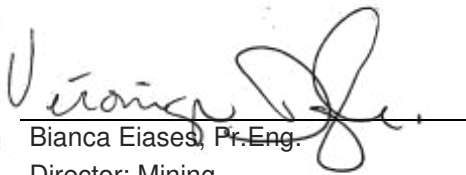
Joseph Mülders, Pr.Sci.Nat.
Senior Environmental Scientist

Reviewed:



Amelia Briel, Pr.Sci.Nat
Section Manager: Environmental

Approved:


Bianca Eiases, Pr.Eng.
Director: Mining

Approval that this document adheres to Knight Piésold Quality Systems:

AB

Attachments:

Appendix A: Detailed Cost

Appendix B: CVs

1.0 APPENDIX B: CV'S

VERONIQUE DAIGLE (Pr Eng)

DIRECTOR - MINING

Veronique is a lead civil engineer with over 17 years of experience, at Knight Piésold's Windhoek office. She has a Civil Engineering degree (Cooperative Program) with specialization in environmental geotechnics and hydraulics from the Université de Sherbrooke, Canada. She joined Knight Piésold Ltd. (Canada) in 2007 and worked in the mining and renewable energy sectors. Her experience includes projects in the Canadian Arctic, North and South America, the Caribbean as well as Western and Southern Africa. Veronique joined Knight Piésold Consulting (Pty) Ltd in Namibia in 2013 and is assisting Knight Piésold's services to the mining and power industry. She has been involved in dam safety inspection, environmental studies, geotechnical assessments as well as tailings and water management systems for over 13 years.



**Knight Piésold
Consulting (Pty) Ltd.
Namibia**

REGISTRATIONS / CERTIFICATIONS

- Ordre des Ingénieurs du Québec, Engineering Professional Association in Canada, Reg No: OIQ143 749)
- Engineering Council of Namibia (ECN), Pr Eng, Reg No (PE2017-19)
- Member of South African National Committee on Large Dams (SANCOLD) and Canadian Dam Association (CDA).
- Certified Verification Service Provider (VSP) for the Towards Sustainable Mining (TSM) initiative from the Mining Association of Canada (MAC) and Lead ISO Auditor (9001)

SPECIFIC RELEVANT EXPERIENCE

- **Twin Hills Gold Project:** Surface and Groundwater Studies for preliminary and pre-feasibility designs.
- **Otjikoto Gold Mine, B2 Gold, Namibia:** 2016 and 2020 Tailings Storage Facility third party audit, risk assessment and recommendations for a thickened ring dyke cycloned tailings disposal, inclusive of a preliminary review and gap analysis for the MAC TSM initiative.
- **Matsa Minas de Agua Teñidas, Trafigura, Spain:** 2020 and 2021 audit of the Paste Tailings Deposition system, review of regional and international guidelines, risk assessment and recommendations.
- **Skorpion Zinc Mine, Vedenta, Namibia:** 2016 and 2019 TSF Audit for a filtered tailings storage facility.
- **Okorusu Graphite Project, Imerys, Namibia:** Design of the tailings storage facility extension and surface water diversion system, audits and design re-appraisal.
- **Rosh Pinah Zinc Project, Trevali, Namibia:** Pre-feasibility studies for TSF life extension, including geotechnical investigation, tailings physical and geochemistry testing.
- **Rössing Uranium Project, Rio Tinto, Namibia:** 2013 independent review of the water and waste facilities, representative of the design engineer for the 2017 TSF review, stability assessments review and recommendations for future operation and design.
- **Yanqul Copper Project, Oman:** Feasibility study for a filtered tailings facility.
- **Dordabis Project Namibia:** High level concept study for a co-disposal filtered tailings/waste facility.
- **Karibib Lithium Project, Lepidico, Namibia:** Feasibility study for waste and water management infrastructure, including a filtered tailings co-disposal facility.
- **Von Bach Dam, Namwater, Namibia:** Investigation of the concrete-asphaltic upstream seal layer for a water reservoir dam, alternative assessment for remediation, inputs to final report.
- **Ruacana power station, Van Eck power station and Brakwater Depot, Nampower, Namibia:** Site inspection, water quality monitoring assessment and recommendations.
- **Husab Uranium Project, CGN, Namibia:** Peer review audit of the Husab Tailings Storage Facility design with specific attention to commissioning, operations and closure.
- **Tsumeb Copper Smelter, Dundee Precious Metals, Namibia:** Dam safety inspection, tailings management optimisation and recommendations, piezocone (CPTu) geotechnical site investigation.
- **Tschudi Copper Heap Leach Facility, Weatherly, Namibia:** Geotechnical site investigation (CPTu and lab testing) of the leached ore, interpretation and lift design.

EDUCATION

- BSc. Eng. Coop, Civil Engineering, Université de Sherbrooke Canada, 2006
- Diploma, International Relations, Université de Sherbrooke Canada, 2002

SPECIALIZATIONS

- Dam Safety Inspection
- Geotechnical and Environmental Site Investigations
- Heap leach pad and solution ponds design
- Hydrology/Hydraulics
- Mine Tailings Disposal
- Permitting of Water and Waste Infrastructures
- Probabilistic Water Balances
- Project Management
- Slurry and Water Pipeline System

COUNTRIES OF WORK EXPERIENCE

- Burkina Faso
- Canada
- Ghana
- Mexico
- Namibia
- Oman
- Spain
- Peru

VERONIQUE DAIGLE (Pr Eng)

DIRECTOR - MINING

- **Various projects, Mexico:** Pre-feasibility and feasibility studies, environmental support and permitting, geotechnical site investigations and construction monitoring for dams, tailings and heap leaching facilities.
- **Cantung Tungsten Project, NWT, Canada:** Annual Inspection of tailings and water facilities for a Tungsten mine and construction supervision of annual raise.
- **Mount Milligan Copper-Gold Project, Canada:** Construction and QA services.
- **Inata Gold Mine, Burkina Faso:** Construction supervision and QA/QC for a tailings pipeline causeway and lined emergency pond.
- **Tarkwa and Damang Gold Mines, Goldfields, Ghana:** Tailings and water management facilities inspection, heap leaching facility water balance, water management and water balance review and various engineering services.
- **Various Gold Mines, Ghana:** Environmental and Engineering Services, Dam Inspection and Water Management Engineering.
- **Mary River Iron Ore Project, Baffinland, Canada:** Alternative Renewable Energy Assessment and geotechnical studies.

WORK HISTORY

| Company Name | Position | Dates |
|---|--|-------------|
| Knight Piésold Consulting (Pty) Ltd, Namibia | Director | 2022 - Date |
| Knight Piésold Consulting (Pty) Ltd, Namibia | Senior Engineer, Namibia | 2013 - 2021 |
| Knight Piésold (Ghana) Ltd (Internal Transfer) | Project Engineer, Ghana | 2009 - 2010 |
| Knight Piésold, (Pty) Ltd | Project Engineer, Canada | 2007 - 2013 |
| Northwest Territory Construction (Colas Group), Canada | Student Coop Program | 2006 |
| Groupe de Collaboration International de l'Université de Sherbrooke, QC, Canada | General Manager / Student Coop Program | 2005 |
| Ministère des Transport du Québec, QC, Canada | Student Engineer, Student Coop Program | 2004 - 2005 |

AMELIA BRIEL (Pr. Sci. Nat.)

SECTION MANAGER : ENVIRONMENTAL

Amelia Briel is the Manager for the Environmental Section of Kni'ght Piésold South Africa and oversees all projects at a strategic level. She has 19 years' experience in Environmental Management and ESG (Environmental, Social and Governance). She is a registered Professional Natural Scientist (Environmental Science). She previously worked for a government agency responsible for regulatory approvals and was involved in large scale as well as small scale mining authorisations, environmental impact assessments, closure applications and performance audits. She specialises in large-scale Environmental and Social Impact Assessments, Stakeholder Consultation, Feasibility Studies, Renewable energy projects, Mine Closure Plans, Environmental Monitoring and Compliance. Amelia has experience in various African countries in terms of delivering regulatory approvals in line with local requirements and also in delivering projects to international best practice standards.



**Knight Piésold (Pty) Ltd.
South Africa**

REGISTRATIONS / CERTIFICATIONS

- South African Council for Natural Scientific Professions, (SACNASP), Professional Natural Scientist (Pr.Sci.Nat.), Reg No. 114335

SPECIFIC RELEVANT EXPERIENCE

- **Mutanda Mining, DRC:** Conceptual Closure Plan and Cost Model
- **Nickel project, Tanzania:** Environmental and Social Due Diligence
- **Hawiah Gold Project, Saudi Arabia:** Project manager for Environmental and Social Impact Assessment
- **Closure Plan for mine residue facilities, Zambia:** Risk assessment, land use planning and closure planning
- **Iduapriem Gold Mine, Ghana:** Environmental, Social and Health Impact Assessment
- **Bisha Mining Share Company, Eritrea:** Detailed Mine Closure Plan and cost model
- **Anglo American PLC, Global:** Assessment of the environmental pollution risks associated with all Mine Residue Facilities in the Anglo-American global operations
- **Nevsun Resources, Bisha Gold Mine, Eritrea:** Conceptual Mine Closure Plan and Closure Cost Model
- **MMG Kinsevere, Kinsevere Copper Mine, DRC:** Environmental and Social Impact Assessment (ESIA) for Stage 2 of the Copper Mine and various follow-up assignments, including a Biodiversity Action Plan, Mine Closure Plan and closure cost model, update of the Environmental Impact Study, ESIA for the Primary Copper Project and various environmental monitoring projects
- **Anglogold Ashanti, Siguri Gold Mine, Guinea:** Environmental feasibility study and Environmental Impact Notice for the Combination Plant Project
- **Anvil Mining / MMG, Mutoshi Copper Project, DRC:** Artisanal Mining Survey, Environmental and Social Baseline Survey and stakeholder consultation
- **Anglogold Ashanti, Mongwalu Gold Project, DRC:** Management plans for the mine's ISO 14001 Environmental Management System, including waste, biodiversity, heritage, soil and land use, noise, air quality, an emergency and contingency response plan
- **Sedibelo Platinum Project, South Africa:** Finalisation of the EIA and EMP process, Integrated Water Use License Application (IWULA) and public participation processes

WORK HISTORY

| Company Name | Position | Dates |
|---|---|-----------------|
| Knight Piésold (Pty) Ltd | Environmental Unit Manager / Senior Environmental Scientist / Environmental Scientist | Aug 2007 - Date |
| Gauteng Department of Agriculture, Conservation and Environment | Assistant Director / Principal Environment Officer / Environment Officer | 2003 - 2007 |

EDUCATION

- MSc (Environmental Toxicology), RAU (now the University of Johannesburg), South Africa, 2001
- BSc (Hons) (Zoology), RAU, South Africa, 1998
- BSc (Biological Science), RAU, South Africa, 1997

SPECIALISATIONS

- Large-scale ESIA's
- Stakeholder Consultation
- Closure Plans
- Environmental Monitoring and Compliance
- Project management

COUNTRIES OF WORK EXPERIENCE

- South Africa
- Namibia
- Eswatini
- Democratic Republic of Congo
- Zambia
- Ghana
- Guinea
- Eritrea
- Tanzania

DIANA M DUTHE, (Pr.Sci.Nat.)**LEAD: HYDROGEOLOGY**

Diana Duthe is a Principal Hydrogeologist with expertise in Mining Hydrogeology and Hydrogeochemistry. Diana qualified with a BSc Hons Geology from WITS and a MSc Hydrogeology from University of Neuchatel, Switzerland. Her prior role was that of Principal Hydrogeologist/General Manager at ITASCA Africa Pty Ltd since 2015. Before joining ITASCA Africa, she was with SRK Consulting for 13 years of her career as Principal Hydrogeologist and Head of Groundwater. Diana brings with her over 30 years of experience in Mining Hydrology and has worked throughout Africa for key clients.



**Knight Piésold (Pty) Ltd.
South Africa**

REGISTRATIONS / CERTIFICATIONS

- Registered Professional Natural Scientist (Geological Sciences), South Africa
- Member: International Association of Hydrogeologists (IAH)
- Member: International Mine Water Association (IMWA)
- Introduction to Toxicology (2004) University of Witwatersrand
- Strategic Business Management (2015) University of Cape Town
- Business Sustainability Management (2017) University of Cambridge

SPECIFIC RELEVANT EXPERIENCE

- **Boto Gold Project Senegal** Groundwater characterisation for input to numerical flow model for dewatering design and pore pressure distributions
- **FG Landfill** Groundwater specialist study including isotope characterisation around landfill and input to EIA
- **Lubambe Copper Mine Zambia** Due Diligence, predictions of requirements and design of dewatering system for current mine and future planned underground operations in Zambian Copper Belt.
- **Metalkol DRC** Groundwater site assessment and data analysis for ESIA. Currently design and ongoing support for sustainable groundwater water supply to the tailings retreatment operations and processing plant.
- **Mogalakwena Platinum Mine South Africa** Geochemical waste characterisation and field investigations for contaminant transport, input to environmental permitting and water use licence applications.
- **Otjikoto Gold Mine Namibia** Due Diligence, field investigations including aquifer testing, dewatering design and input to geotechnical studies for slope stability and transition to underground mining, annual groundwater monitoring report.
- **Umbogintwini Industrial Complex South Africa** Contaminant characterisation, site assessment reports, Tier 2 risk assessment, remediation design of complex mixed DNAPL sources.
- **Witwatersrand Gold Mines Acid Mine Drainage, South Africa** Geohydrology Team Leader for Long Term Solution Feasibility Study for DWA.

EDUCATION

- M.Sc. (Hydrogeology), University of Neuchatel, Switzerland, 1990
- B.Sc. Hons. (Geology), University of Witwatersrand, Johannesburg, South Africa, 1984
- B.Sc. (Geology Major, Biochemistry Botany), University of Witwatersrand, Johannesburg, South Africa, 1983

SPECIALIZATIONS

- Mining Hydrogeology
- Tailings Hydrogeology
- Hydrogeochemistry
- Waste Classification and Management
- Remediation
- Due Diligence

WORK HISTORY

| Company Name | Position | Dates |
|---|---|-------------|
| Knight Piésold Consulting, Johannesburg, South Africa | Lead: Hydrogeology | 2021 - Date |
| Itasca Africa,(Pty) Ltd., Johannesburg, South Africa | Principal Hydrogeologist/General Manager/Director | 2015 - 2020 |
| SRK Consulting (Pty) Ltd, South Africa | Principal Hydrogeologist/Partner | 2002 - 2015 |
| KLM Consulting (Pty) Ltd, South Africa | Senior Hydrogeologist | 2001 - 2002 |
| SRK Consulting (Pty) Ltd, South Africa | Senior Hydrogeologist | 2000 |

COUNTRIES OF WORK EXPERIENCE

- South Africa
- Madagascar
- Iran
- Sierra Leone
- Ethiopia
- Eritrea
- DRC
- Namibia
- Botswana
- Angola

DIANA M DUTHE, (Pr.Sci.Nat.)**LEAD: HYDROGEOLOGY**

| | | |
|--|--|-----------|
| MBA Pty Ltd, South Africa GEOS Consulting Engineers (Swiss) | Independent Hydrogeological Consultant | 1993-1999 |
| Swiss Institute of Technology (EPFL) Switzerland | Research Assistant for Protection of Peatlands (WWF Project) | 1991-1992 |
| SRK Consulting (Pty) Ltd, South Africa | Student (MSc project) Nitrate contamination in Venda | 1990 |
| ISCOR Ltd, Pretoria, South Africa | Exploration and Mine Geologist at Thabazimbi Iron Ore | 1985-1988 |

- Lesotho
- Senegal

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+264 81 2458790
Windhoek, Namibia

Skills

Environmental Scoping
Environmental Impact Assessments
Environmental Management Plans
Environmental Auditing
Environmental and Social Due
Diligence & Legal Compliance
Technical Reviews & Proofreading
Project Management
Research & Monitoring

Education And Training

2000

Ph.D.: Fisheries Science

Rhodes University

Grahamstown, South Africa

1992

B.Sc. Hons: Animal Physiology

Stellenbosch University

Stellenbosch, South Africa

1991

B.Sc.: Zoology and Physiology

Stellenbosch University

Stellenbosch, South Africa

1987

Senior Certificate

Windhoek High School

Windhoek, Namibia

Languages

Afrikaans: First Language

English: Proficient

Membership in Professional Bodies

Associate Membership and
Associate Environmental Auditor -
Institute of Environmental
Management & Assessment
(IEMA), United Kingdom
Lead Practitioner, Practitioner,
Reviewer - Environmental
Assessment Professionals of
Namibia (EAPAN)
Full Member - Namibian Chamber
of Environment (NCE)
Member - Namibia Scientific
Society

Lima Maartens

Summary

I have 30 years' experience in natural resource management, lecturing, environmental science and management, and consulting. Sectors that I worked in as an Environmental Assessment Practitioner include: exploration (including offshore oil and gas); mining and quarrying; renewable energy (solar and wind); tourism; manufacturing; agriculture; aqua- and mariculture; township, property (including medicine storage facilities) and waterfront developments, transport (rail and road), and infrastructure.

Employment Record

LM Environmental Consulting – Environmental Assessment Practitioner

10/2009 – Current; Windhoek, Namibia

Valencia Uranium (Pty) Ltd – Environmental Manager

09/2006 – 09/2009; Windhoek, Namibia

De Beers Marine Namibia (Pty) Ltd – Senior Environmental Scientist

01/2004 – 08/2006, Windhoek, Namibia

Simonis Storm Securities – Analyst

09/2002 – 12/2003, Windhoek, Namibia

University of Namibia – Lecturer

10/2000 – 06/2002, Windhoek, Namibia

Ministry of Fisheries and Marine Resources – Fisheries Biologist

01/1993 – 09/2000, Swakopmund, Namibia

Additional Skills

Oxford Climate Society, Oxford School of Climate Change: *Completion of the nine-week School of Climate Change* (2022)

SHEilds Ltd., United Kingdom: *NEBOSH Certificate in Environmental Management* (2018)

NOSA, Windhoek, Namibia: *Applying SHE (Safety, Health, Environment) Principles and Procedures* (2012)

Centre for Environmental Management, Potchefstroom, South Africa: *Introduction to Integrated Waste Management for Environmental Managers* (2009)

The Chamber of Mines of Namibia, Uranium Stewardship Committee, Namibia: *Radiation Course for Senior Supervisors* (2009)

Prospectors and Developers Association of Canada (PDAC): *From theory to practice: Corporate social responsibility and sustainable development in mineral exploration* (2007)

Crystal Clear, South Africa: *IEMA Approved Foundation Environmental Auditor* (2006)

Centre for Environmental Management, Potchefstroom, South Africa: *Implementing Environmental Management Systems (ISO 14001:2004)* (2005)

University of Stellenbosch Executive Development: *Project Management* (2004)

Publications

I have published five peer-reviewed scientific research articles (and three as co-author), six popular articles (and one as co-author), one book chapter (and one book chapter as co-author), 147 technical reports (LM Environmental Consulting), three technical reports (for De Beers Marine Namibia), and one conference paper.

JOSEPH MÜLDERS (Pr.Sci.Nat.)

SENIOR ENVIRONMENTAL SCIENTIST

Joseph Mülders is Senior Environmental Scientist based at Knight Piésold's Sandton office. He has 9 years of experience in the environmental services industry and is a registered Professional Natural Scientist (Environmental Science). Joseph has been involved in social and environmental risk, safeguards assessments and monitoring, spatial classification of socio-economic and environmental systems. He was appointed by the South African National Department of Environmental Affairs where he was responsible for developing and implementing the Social and Environmental Risk Management Program for a large 5 year multi-stakeholder GEF funded project. He specialises in environmental due diligence, impact assessments and risk analysis, environmental monitoring, rehabilitation and offset quantification and design, stakeholder consultation, environmental monitoring and compliance. Joseph has experience in various African countries in terms of delivering projects to international best practice standards focusing on socio-economically sustainable development and management of natural resources.



Knight Piésold (Pty) Ltd.
South Africa

REGISTRATIONS / CERTIFICATIONS

- South African Council for Natural Scientific Professions (SACNASP), Pr.Sci.Nat. Reg No. 115316

SPECIFIC RELEVANT EXPERIENCE

- **DFFE/UNDP/GEF6 Fill Sized Project, South Africa:** Developed and implemented the Social and Environmental Risk Management Program, designed and implemented the project wide integrated monitoring and evaluation plan. Acting Project Manager for 4 months
- **DFFE/IUCN/GEF7 Full sized Project, South Africa:** Project design and developed the Environmental and Social Management Plan (ESMP)
- **uThukela Water Resource Classification System (WRCS), South Africa:** Coordinated the classification and quantification of socio-economic impacts to communities as linked to changing water allocation scenarios
- **Loulo, Gounkoto and Morila Gold Mines, Mali:** Biodiversity Offset (Quantifying residual impacts and proposing mechanisms for internalising costs of impacts back into the biodiversity capital value of Mali)
- **Kibali Gold Mine, DRC:** Biodiversity Offset (Develop a biodiversity offset based on the past, current and future biodiversity impacts and benefits since the start of operations)
- **Makuya Nature Reserve, South Africa:** Park Management Plan (Systems ecologist and spatial planner)
- **Kusile Power Station, South Africa:** Scoping and Basic Assessment, including public consultation and environmental specifications (EAP)
- **Kusile Power Station, South Africa:** Wetland Rehabilitation Strategy (Baseline assessment, condition analysis and strategic design)
- **Kusile Power Station, South Africa:** Wetland Offset Strategy (baseline assessment, stakeholder engagement, offset quantification and strategy design)
- **Kusile Power Station, South Africa:** Turbidity Management Strategy - monthly and quarterly water quality sampling, analysis and reporting

WORK HISTORY

| Company Name | Position | Dates |
|--|--------------------------------|------------------|
| Knight Piésold (Pty) Ltd | Senior Environmental Scientist | July 2023 - Date |
| South African National Department of Forestry, Fisheries and Environment | Deputy Director | 2021 - 2023 |
| Prime Africa Consult | Systems Ecologist | 2014 - 2021 |

EDUCATION

- MSc, Environmental Management, University of Pretoria, South Africa, 2015
- BSc (Hons) Environmental Management and Analysis, University of Pretoria, South Africa, 2009
- BSc, Zoology, University of Pretoria, South Africa, 2008

SPECIALISATIONS

- Environmental monitoring
- Rehabilitation and offset quantification design
- Stakeholder Consultation
- Environmental due diligence
- Impact assessments and risk analysis
- Project management

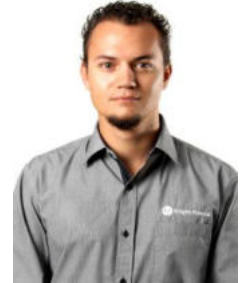
COUNTRIES OF WORK EXPERIENCE

- Malawi
- Mali
- Mozambique
- South Africa
- Uganda

LLOYD LYNCH (Pr.Sci.Nat)

ENVIRONMENTAL SCIENTIST

Lloyd has worked for Knight Piésold as an Environmental Scientist for seven years with a focus on aquatic science. He is a registered professional scientist and an accredited DWS: SASS version 5 practitioner. During his career, Lloyd has conducted aquatic specialist assessments across South Africa, both for stand-alone assessments as well as scheduled bio-monitoring, making use of both SASS and FAIL. He has also assisted with a variety of other tasks ranging from public participation consultations, ESIA baseline input, both air and water quality reporting and project management.



REGISTRATIONS / CERTIFICATIONS

- SACNASP, South African Council for Natural Scientific Professions, Pr.Sci.Nat, Reg No. 116026
- Department of Water and Sanitation: SASS 5 Accredited Practitioner, 2017, 2020

SPECIFIC RELEVANT EXPERIENCE

- **Johannesburg Water Aquatic Monitoring of Wastewater Treatment Works:** Conducted bi-annual aquatic bio-monitoring for six WWTW within the City of Johannesburg municipality.
- **Kinsevere Copper Mine, DRC:** Responsible for the design and implementation of an extensive groundwater and potable water monitoring programme, including analysis of laboratory results, reporting, air quality monitoring, biodiversity assessments and the establishment of rehabilitation trials.
- **ERWAT Aquatic Monitoring:** Conducted quarterly aquatic monitoring including toxicity and diatom analysis at 19 water care works within the Ekurhuleni area.
- **Palabora Copper – Water Use License Audits:** Compilation of audit checklists, undertaking the audits on site and compilation of the WUL audit reports.
- **Two Rivers Platinum Aquatic Biomonitoring:** Conducted routine aquatic biomonitoring surveys in the Klein, Groot and Dwars rivers.
- **Two Rivers Platinum Financial Provisioning:** Undertook annual reviews of the rehabilitation, monitoring and closure costs associated with the mine and determined annual shortfalls.
- **Tembo Nickel Project Due Diligence:** Undertook a due diligence assessment in line with the IFC Performance Standards for a potential nickel mine in Tanzania.

WORK HISTORY

| Company Name | Position | Dates |
|----------------------------|--------------------------------|-------------|
| Knight Piésold (Pty) Ltd | Environmental Scientist | 2021 - Date |
| Knight Piésold (Pty) Ltd | Aquatic Scientist | 2019 - 2020 |
| Knight Piésold (Pty) Ltd | Junior Environmental Scientist | 2016 - 2019 |
| University of Johannesburg | Contract Lecturer | 2015 |

Knight Piésold (Pty) Ltd.
South Africa

EDUCATION

- MSc Aquatic Health, University of Johannesburg, 2014
- BSc Honours, Zoology, University of Johannesburg, 2012
- BSc Zoology and Botany, University of Johannesburg, 2011

SPECIALIZATIONS

- SACNASP, South African Council for Natural Scientific Professions, Pr.Sci.Nat. Reg No. 116026
- Department of Water and Sanitation: SASS 5 Accredited Practitioner

COUNTRIES OF WORK EXPERIENCE

- South Africa
- Democratic Republic of Congo
- Swaziland

NATACHA AMINA MUKASA

JUNIOR ENVIRONMENTAL SCIENTIST

Natacha Amina Mukasa is a Junior Environmental Scientist at Knight Piésold's Lubumbashi office in the Democratic Republic of Congo (DRC). She is currently completing her MSc in Environmental Sciences. Amina is fluent in French, Swahili and English and is therefore a vital link between local communities and the international specialists from Knight Piésold that work on projects in DRC. Amina is gaining experience in various aspects of environmental management such as baseline data collection stakeholder consultation and environmental monitoring.

SPECIFIC RELEVANT EXPERIENCE

- **Mutanda Mining SARL, MUMI, DRC:** Undertook social-baseline studies, ensuring data integrity and reviewing reports. The field work consisted of the sensitization meetings with traditional leaders and community members, management of the data collection process. Performed quality control of field data and reports and was responsible for the review and elaboration of the archeological and heritage reports.
- **MMG Kinsevere, Kinsevere Copper Mine, DRC:** Proceeding of the in-situ quarterly water quality monitoring. Water quality sampling, including quality assurance / quality control of procedures data analysis and reporting.
- **Mutanda Mining SARL, MUMI, DRC:** Screening-level site visit to inform site selection as part of an ESIA for the Sulphide Expansion Project at MUMI.

WORK HISTORY

| Company Name | Position | Dates |
|---|--------------------------------|-------------|
| Knight Piésold Consulting, RDC SARL | Junior Environmental Scientist | 2022 - Date |
| Observatoire Congolais de l'Environnement | Chief redactor of the magazine | 2022 |
| Office Congolais de Contrôle (OCC) | Intern | 2020 |
| MMG Kinsevere | Intern | 2019 |



**Knight Piésold Consulting,
RDC SARL**

EDUCATION

- BSc, Environmental Sciences, Université Nouveaux Horizons (2022)

SPECIALIZATIONS

- Pollution and remediation
- Environmental monitoring
- Social data collection

COUNTRIES OF WORK EXPERIENCE

- DRC

THEO OOSTHUIZEN (Pr.Sci.Nat.)

SENIOR GIS ANALYST

Theo Oosthuizen is a GIS Analyst based in Knight Piésold's Sandton office. He has over 27 years of experience in GIS data management, hydrology support, volume calculations, 3D modelling, closure costing support and 3D visualizations in Mining, water and environmental projects in Africa, South America, the Middle East and Europe. His recent assignments include the provision of GIS support for the Kinsevere, MUMI and KCC projects in the DRC, the Sibanye Gold & Platinum operations in South Africa and the TD11 reporting for Mopani Copper in Zambia. 3D visualisation, volumetric calculations, spatial data manipulation and survey processing of drone and LiDAR data are other areas of GIS support.



Knight Piésold (Pty) Ltd.
South Africa

REGISTRATIONS /CERTIFICATIONS

- South African Council for Natural Scientific Professions (SACNASP), Pr.Sci.Nat, Reg No. 400304/05

SPECIFIC RELEVANT EXPERIENCE

- **Two Rivers Platinum:** GIS support Dam Break Analyses. Detailed hydrology and creation of DEM inputs and Mapping. New TSF Facility for TRP - South Africa
- **KAZ Minerals:** GIS support Zone of Influence calculations. DEM creation and ZOI Mapping. Existing Copper facilities in Orlovsky, Nikolaevsky, Belousovsky & Aktogay - KP London, Kazakhstan
- **Tulu Kapi Copper Project:** GIS support for new Tailings Facility and two dams. Projections, DEMS, Modelling and mapping including a new TSF Facility - Lycopodium, Ethiopia
- **Sibanye Gold:** GIS support Dam Break Analyses (Driefontein, Leeudoorn, Beatrix) and Quarterly Reporting - South Africa
- **Tarkwa Gold Mine:** GIS support for Quarterly reporting. RIFT modelling TSF5. TSF Facility - Goldfields, Ghana
- **Palabora Mining Company:** Spatial modelling in support of the Mining Division on various aspects of historical and planned tailings management. Volume calculations, capacity curves and support on Hydrological modelling - PMC, South Africa.
- **Kinsevere Project:** GIS support for environmental and hydrogeology sectors. Borehole supervision and hydrogeology - MMG, DRC
- **Lesedi Power** GIS support and Floodlines - South Africa
- **Kareerand TSF:** GIS survey support, quarterly reporting and mapping - Harmony, South Africa
- **Ambatovy TMF:** GIS support, mapping and modelling for the Tailings Management Facility. Modelling using RIFT, Geotech Testpit mapping and borrowpit volumes - Madagascar
- **BRPM & Maseve TSF's:** GIS support and mapping for quarterly reporting including survey processing - RBPlats, South Africa
- **Sibanye Platinum** GIS support Dam Break Analyses (Paardekraal, Kroondal, Marikana & Hoedspruit) including Quarterly Reporting - South Africa
- **Iduapriem Project:** Design Criteria and Risk Analyses Mapping - AGA, Ghana

EDUCATION

- MSc (Environmental Management), RAU (Now University of Johannesburg), South Africa, 1995
- BSc (Hons) Mineral Economics, RAU (Now University of Johannesburg), South Africa, 1989
- BSc Earth Sciences (geology/Geography), RAU (Now University of Johannesburg), South Africa, 1988

SPECIALIZATIONS

- Mapping
- Data conversion
- Modelling
- 3D Visualization

COUNTRIES OF WORK EXPERIENCE

- South Africa
- Namibia
- Swaziland
- Zambia
- DRC

WORK HISTORY

| Company Name | Position | Dates |
|--|------------------------|-------------|
| Knight Piésold (Pty) Ltd | GIS Analyst | 1999 - Date |
| Geographic Information Management Systems (GIMS) | GIS Specialist | 1997 - 1999 |
| AngloGold - Tautona Mine | Staff Geologist | 1996 - 1997 |
| Council on Mineral Technology (MINTEK), South Africa | Information Specialist | 1993 - 1996 |

Marc Blanché

BSc. (Hons), MSc.

Partner



Marc is a Partner at WKC Group, an international consultancy that specialises in technical services and has particular focus on the oil and gas, power and mining industries. Marc has over 15 years' experience as an Environmental Scientist and is well versed in the environmental laws and regulations pertaining to the countries within which his projects were based. Marc currently manages WKC 's air quality team comprising of engineers and scientists with a core focus on air quality and noise impact assessment and mitigation.

Marc started his career as an Environmental Impact Assessment Practitioner in 2005 and began his specialisation as an Air Quality Consultant in 2008 for a well-known multinational company. In 2010, Marc joined WKC Group as an air quality specialist where he has primarily worked on Equator Principal Financial Institution (EPFI) compliant environmental assessments, with particular emphasis on the International Finance Corporation (IFC) Performance Standard 3 and the General Environmental, Health and Safety (EHS) Guidelines.

EDUCATION

- MSc. Applied Environmental Sciences (2005, 1st Class Cum Laude).
- BSc. (Hons) Applied Environmental Sciences (2002)

COUNTRIES OF WORK EXPERIENCE

United Arab Emirates, Oman, Iraq, Egypt, Jordan, Lebanon, Saudi Arabia, Qatar, Mozambique, Democratic Republic of Congo, Kenya, Tanzania, Namibia, Nigeria, Ghana, Zambia, Rwanda, Libya and South Africa and South Korea

LANGUAGES

English, Afrikaans and basic isiZulu

CAREER SUMMARY

- 2015 onwards
Partner, WKC Group
- 2012 – 2015
Principal Consultant, WKC Group
- 2010 – 2012
Senior Consultant, WKC Group
- 2008 – 2009
Air Quality Consultant, WSP Environment and Energy
- 2006 – 2008
Junior/Environmental Consultant, Knight Piésold Consulting
- 2005 – 2006
Construction Projects Manager (Environmental), JB Projects

FIELDS OF SPECIAL COMPETENCE

- Air Quality Impact Assessment
- Carbon Foot-printing (World Resources Institute)
- EIA / HSEIA for International Oil, Gas and Power Developments
- Atmospheric Dispersion Modelling and Screening Assessments (AERMOD, Screen 3, ADMS, DMRB, Caline 4)
- Ambient Air and Noise Monitoring
- Geographical Information Systems (ArcGIS)
- Impact Assessment for Bank Financed Projects

POST NOMINAL TITLES

- Pr Sci Nat. Awarded post-nominal title of Professional Natural Scientist (Pr Sci Nat) in terms of Section 20(3) of the Natural Scientific Professions Act, 2003 as regulated by the South African Council for Natural Scientific Professions
- MIEnvSci. Awarded membership to the UK Institution of Environmental Sciences
- MIAQM Awarded membership to the UK Institution of Air Quality Management

KEY EXPERIENCE

Air Quality

- Jazan Economic City(JEC), Saudi Arabia. Marc led the city wide regional scale, detailed modelling assessment of JEC utilising the US EPA regulatory dispersion model, CALPUFF. The study incorporated in excess of 170 point sources in addition to area and line sources located within a 128 x 128 km model domain. The aim of the assessment was to determine, in principle, whether the industrial city can be developed in such a way that air quality impacts to community health and the environment can be avoided, acknowledging:
 - The range of industrial tenants (existing, proposed and currently undefined);
 - The regulatory framework within which existing and future tenants will be regulated;
 - The intensity and distribution of road traffic;
 - The prevailing meteorological conditions; and
 - The orientation of City zoning with regards to residential and other ecologically sensitive areas.
- Project Manager for the Maputo Port Upgrade Project, Mozambique, which entailed baseline data collection (air quality and noise) and predictive modelling (air quality and noise) for future port expansion plans to the year 2030. In addition, the project included a detailed dust management plan for bulk handling operations.
- Project Manager for the Zambese Coal Mine Project (Mozambique), this project entailed air quality and noise baseline data collection, predictive modelling of mining related impacts (air quality and noise), and associated impact assessment.
- Project Manager for the Machipanda Railway (Mozambique) Air Quality and Noise Scoping Phase Assessments
- Project Manager for the Shell Bonga South West / Aparo Field Development Project, Nigeria. Undertook dispersion modelling and impact assessment of the Floating Production, Storage and Offloading (FPSO) unit as part of the ESIA.
- Project Manager for the Aje Field Development Plan, offshore Lagos, Nigeria. Undertook air dispersion modeling and impact assessment for the FPSO unit and offshore assets as part of the ESIA.
- Project Manager for the Brass Liquefied Natural Gas (LNG) Facility Air Quality and Noise Impact Assessments, Delta State Nigeria. The Project has a reputed capital value of over 20 Billion US dollars and will entail a two train 10 million metric tonne per year facility.
- Project Manager for the Okoro Full Field Development Offshore Nigeria. Managed the team that undertook the air dispersion modelling and impact assessment for the mobile offshore production unit (MOPU).
- Natref Clean Fuels II Project South Africa. Project Managed the NATREF Clean Fuels II Project which entailed a refinery wide Air Dispersion Model and air quality impact assessment.
- Abu Dhabi Dubai Highway Project – Undertook the Construction and Operation Phase Air Quality Impact Assessment Using USEPA AERMOD and Caline 4 Roads model

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Karasburg
Namibia

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E-mail: pckkwrc@yahoo.co.uk

PETER CUNNINGHAM

EDUCATION

1996 University of Stellenbosch, South Africa

Masters of Science in Nature Conservation (MSc)

- Research thesis: Prospects for Sustained Harvesting of Mopane (*Colophospermum mopane*) on the Venetia Limpopo Nature Reserve and its Implications for Browsing Ungulates.
- Financial support: De Beers Consolidated Mines & University of Stellenbosch.

1992 University of Stellenbosch, South Africa

Honours Bachelors of Science in Nature Conservation (BSc Hons)

- Research project: Time Allocation and Spatial Distribution of Blesbok (*Damaliscus dorcas phillipsi*) and Springbok (*Antidorcas marsupialis*) on an Enclosed Area in the South Western Cape.

1989 University of Stellenbosch, South Africa

Bachelors of Science in Nature Conservation (BSc)

- Management plan: Sasolburg Municipality 1985-1986.

1982 De Aar High School, South Africa

Grade 12

- Subjects: English First Language, Afrikaans First Language, Geography, Biology, Mathematics, and Accountancy.
- Graduated with matriculation exemption.

OTHER QUALIFICATIONS

2001 University of Natal & Centre for Environmental Development, South Africa
Certificate in Wilderness Concepts and Practice (Basic Course)

2018 FSC Auditing to ISO19011 certificate

2018 FSC Forest Management certificate

Soil Association & Forest Stewardship Council (FSC)

- Head of Department – Curator – for mammals.
- Ensured the provision and maintenance of habitat for all mammals.
- Ensured the health, good nutrition and general well being of all mammals.
- Provided and implemented solutions to enable the successful breeding of all endangered mammals.
- Conducted applied research.

LECTURER
Polytechnic of Namibia

YEARS EMPLOYED: 1996 TO 1998
Windhoek, Namibia

- Lecturer.
- Responsible for: Animal Studies II, Animal Studies III, Game Farm Management, Veld Management.
- Curriculum development of the above mentioned courses.
- Other duties included: applied research, practical demonstrations, student excursions, setting & marking papers & assignments, moderating papers and taking minutes during Departmental meetings.

TEMPORARY RESEARCH ASSISTANT
University of Stellenbosch

YEARS EMPLOYED: 1994
Stellenbosch, South Africa

- Conducted research towards MSc degree on the Venetia Limpopo Nature Reserve, South Africa.

GAME RANCH MANAGER
Verdwaal Wildlife Sanctuary

YEARS EMPLOYED: 1989 TO 1990; 1992
Windhoek District, Namibia

- Manager.
- General farm management and overall maintenance of installations and equipment (e.g. vehicles, pumps, water installations, fences, roads, etc), culling of game, overall wildlife management, soil and vegetation management.

ENVIRONMENTAL AWARDS

1. Sheikh Mubarak bin Mohammed Natural History Prize – 2001.

“Individual contribution towards the conservation of the United Arab Emirate’s (UAE) environment and wildlife.”

2. Certificate of recognition as **Best Researcher** in the School of Natural Resources & Tourism, Polytechnic of Namibia during the academic year 2002.

3. National Science Awards of Namibia: Biologist of the Year – 2004.

“In recognition of his numerous studies of Namibian fauna, most notably its reptiles, and also his work in training research students. His work in the popularisation of science is acknowledged; as editor of Roan News, as author of a variety of popular articles and in numerous lectures to the lay community.”

EXPERIENCE: ENVIRONMENTAL CONSULTING

2023

- *Environam* – Hope & Goreb Mine Project, EPL 5796 (Homeb area) – specialist report (**Vertebrate Fauna & Flora**).
- *SLR* – Osino Water Supply i.e., Dam & Pipelines (Karibib area) – specialist report (**Ecology, Vertebrate Fauna & Flora**)
- *FAO/i-dealX* – Bush thinning in certain communal areas: Kavango East: Livayi & Dosa; Etosha Landscape: Omuthiya & Oshivelo – specialist report (**Resource assessment**)
- *GIZ/i-dealX* – Charcoal potential in certain communal areas: Otjinene, Okakarara, Otjituuo, Nkurenkuru, Oshivelo – specialist report (**Resource assessment**)
- *NamPower* – Ecology and flora associated with Auas-Kokerboom 400kV transmission line – specialist report (**Ecology & Flora**).
- *Excel Dynamics Solutions* – City of Windhoek SEA (Windhoek town lands) – specialist report (**Vertebrate Fauna & Flora**).
- *Urban Green Town & Environmental Planning* – Trekpoort Solar PV Project (Rosh Pinah area) – specialist report (**Vertebrate Fauna & Flora**).
- *Environmental Compliance Consultancy* – Craton ML197 Copper Project (Hoshveld/Steinhausen) – specialist report (**Vertebrate Fauna & Flora**).
- *Soil Association, UK* – FSC audit Carbo Namibia Charcoal, Grootfontein area (**Charcoal Audit**).
- *Risk-Based Solutions CC* – PEL 73 Well Sites D1-6 & G1-6 (Kavango East Area) – specialist report (**ID, Plot & Mark Protected tree species**).

2022

- *Soil Association, UK* – FSC audit Carbo Namibia Charcoal, Grootfontein area (**Charcoal Audit**).
- *Nanci & GIZ* – Devil's claw Standard field test (Zambezi Region & Otjiwarongo) – field test the draft DC Standard (**Devil's claw**).
- *Risk-Based Solutions CC* – PEL 73 Well Sites D1-6 & G1-6 (Kavango East Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Soil Association, UK* – FSC audit Jumbo Charcoal, Gobabis/Hochveld/Okahandja areas (**Charcoal Audit**).
- *Excel Dynamics Solutions* – EPL's 7646, 7907 & 8084 – base metals (Arandis area) – specialist report (**Vertebrate Fauna & Flora**).
- *Lana Environmental Consulting* – Omdel-Wlotzkasbaken Pipeline Replacement Project (Wlotzkasbaken area) – specialist report (**Vertebrate Fauna**).
- *Knight Piésold* – Meob Bay Tourism Development Project - update (Meob Bay area) – specialist report (**Vertebrate Fauna & Flora**).
- *SRK* – Green Hydrogen Demonstration Project (Walvis Bay) – specialist report (**Vertebrate Fauna & Flora**).
- *Nanci & GIZ* – Devil's claw training (Kavango & Zambezi Regions) – training resource assessments (**Devil's claw**).
- *Environmental Compliance Consultancy* – Navachab Gold Mine TSF3 Project (Karibib) – specialist report (**Vertebrate Fauna & Flora**).
- *NamPower* – Ecology and flora associated with various central, coastal & northern Namibia transmission lines (Khan-Lithops, Khan-Rössing, Rössing-Lithops, Lithops-Walmund, Lithops-Kuiseb, Walmund-Kuiseb, Walmund-Ruby, Kuiseb-Langer Heinrich, Walmund-Swakopmund, Khan-Henties Bay, Khan-Trekopie, Trekkopie-Wlotzkasbaken, Kuiseb-Walvis, Lithops-Husab, Otjikoto-Tsumeb, Otjikoto-Tschudi, Otjikoto-Copper, Marble-Khan, Marble, Karibib, Marble-Navachab, Omatando-Efundja, Efundja-Onjiva, Okapyia-Oshakati, Okapyia-Efundja, Omatando-Oshakati, Etunda-Baobab, Etunda-Calueque, Etunda-Ruacana, Gerus-Whale Rock, Gerus-Electrode 1&2, Marble-Khan, Marble-Navachab, Marble-Karibib, Omaere-Buitepos; Various Retics: Buitepos, Talismanis, Gobabis, Witvlei, Ombotozu, Swakoppoort, Osona, Okahandja Army Base, Ongeama Retic, Hochfeld Retic, Abbatoir Retic, Kunene-Omatando, Airport Retic, Otjihase, Brakwater, Otjihavera, Brakwater, Döbra, Nubuamis, Kutako, Von Bach Base 1-Poultry, Von Bach Base 2-Poultry, Groot Aub, Dordabis, Aris, Leutwein, Nauaspoort, Matchless, Gollschau, Klein Aub, Seës North, Otjivero, Hoachnas, Oanob, Tsumis) specialist reports (**Ecology & Flora**).

- *Urban Green Town & Environmental Planning* – Kransberg-Tsumeb Rail Link Upgrade (Kransberg-Omaruru-Otjiwarongo-Tsumeb-Grootfontein) – specialist report (**Vertebrate Fauna & Flora**).
- *NamPower* – Biodiversity presentations (Namibia wide) – presentations (**Important habitats, protected tree species**).
- *LM Consulting* – Otavifontein No. 794, O&L Fresh Produce Pty (Ltd) – Agriculture & PV Project (Otavi Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Excel Dynamics Solutions* – EPL’s 7167, 8115 & 8531 – base/rare/precious metals, dimension stone, nuclear fuels, industrial minerals (Arandis area) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – PEL 73 Well Sites P23, P32, P33 & 3.4 & Gcana 2.7 (Kavango East Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – PEL 93 Seismic lines (Oshikoto Region) – specialist report (**Vertebrate Fauna & Flora**).
- *Environmental Compliance Consultancy* – Uis Tin Project (Uis) – specialist report – dry & wet season comparisons (**Vertebrate Fauna & Flora**).
- *Nanci & GIZ* – Devil’s claw Pilot Resource Assessment (Zambezi Region) – Resource Assessment (**Devil’s claw**).
- *Urban Green Town & Environmental Planning* – Emesco Solar PV Projects: Farm Schonau (Warmbad) and Kokerboom (Keetmanshoop) – specialist report (**Vertebrate Fauna & Flora**).

2021

- *Soil Association, UK* – FSC audit Carbo Namibia, Grootfontein (Charcoal Audit).
- *Environmental Management Consultants* – Opuwo-Okangwati-Epupa-Baynes HPP Road Upgrade Project (Opuwo-Epupa) – specialist report (**Vertebrate Fauna, Flora & Ecology**).
- *Environmental Compliance Consultancy* – Farm Gai Kaisa No.159 33kV Transmission Line Project (Kombat) – specialist report (**Vertebrate Fauna & Flora**).
- *Excel Dynamics Solutions* – EPL’s 7989-7995 – dimension stone (Aus-Helmeringhausen) – specialist report (**Vertebrate Fauna & Flora**).
- *ASEC CC* – Bannerman Water Supply Pipeline Project (Swakopmund) – specialist report (**Vertebrate Fauna**).
- *Lund Consulting Engineers* – Review NamPower Otjikoto Biomass Plant Documents (FSC Group Scheme & Biomass Fuel Supply/Harvesting Study) and assist with templates for Monitoring + Aftercare (Tsumeb) – Review reports and develop templates (**Biomass**).
- *Environmental Compliance Consultancy* – Uis Tin Project (Uis) – specialist report (**Vertebrate Fauna & Flora**).
- *Soil Association, UK* – FSC core Labour Requirements – CoC (Namibia wide) – updated CoC country requirements (**CoC Labour Requirements**).
- *Environmental Compliance Consultancy* – Osino Gold Project (Karibib) – updated infrastructure layout specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – Seismic line extensions & Firebreaks (Kavango East Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Excel Dynamics Solutions* – City of Windhoek SEA -Phase 1 (Windhoek town lands) – specialist report (**Vertebrate Fauna & Flora**).
- *Nanci & GIZ* – Devil’s claw GACP+ Standard Development (Namibia wide) – Standard development (**Devil’s claw**).
- *Environmental Compliance Consultancy* – Osino Gold Project (Karibib) – specialist report – summer & winter 2021 (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – PEL 73 Well Sites 3.4 & 5.2 (Kavango East Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Deep Yellow/Reptile Uranium* – Tumas Development Project - Phase 2 (Swakopmund Area) – specialist report (**Vertebrate Fauna**).
- *Urban Green Town & Environmental Planning* – Rosh Pinah Solar PV Project & 66kV Transmission Line (Rosh Pinah area) – specialist report (**Vertebrate Fauna & Flora**).
- *Zutari* – MET Mast sites (Oranjemund area) – specialist report (**Vertebrate Fauna & Flora**).
- *Excel Dynamics Solutions* – EPL 7720 – base metals (Karibib) – specialist report

(Vertebrate Fauna & Flora).

- *Excel Dynamics Solutions* – EPL 7874 – precious stones (Lüderitz) – specialist report **(Vertebrate Fauna & Flora)**.
- *NNF/NamPower* – Ecology and flora associated with various southern Namibia transmission lines (Lüderitz-Namib; Lüderitz-Kolmanskop; Namib-E-Bay; Obib-Scorpion; Obib-Lorelei; Spitskop-Lorelei; Lorelei-Aurus; Aurus-Zincum; Zincum-Sendelings Drift; Lorelei-Orange River; Mariental-Hardap; Hardap-Stampriet; Stampriet-Aranos; Konkiep-Bethanie; Schlangkopf-Weir; Schlangkopf-Dam; Schlangkopf-T/Off; Keetmanshoop-Keetmanshoop; Keetmanshoop-Kokerboom; Keetmanshoop-Naute; Aussenkehr-Aussenkehr; Khurub-Noordoewer; Khurub-Aussenkehr; Harib-Schonau; Harib-Aggeneis; Harib-Khurub; Karas T/Off-Grünau; Karas T/Off-Karasburg; Ariamsvlei-Rock; Rock-Stolzenfels; Harib-Rock; Kokerboom-Aries; Kokerboom-Hardap; Kokerboom-Harib; Kokerboom-Nabas; Kokerboom-Tses; Nabas-Aroab; Nabas-Koës; Nabas-Rietfontein; Koichab Pan; Aus; Namib-Lorelei; Kokerboom-Obib; Kokerboom-Namib) specialist reports **(Ecology & Flora)**.
- *Environmental Compliance Consultancy* – Osino Gold Project (Karibib) – specialist report – summer 2021 **(Vertebrate Fauna & Flora)**.
- *Namibian Environmental Consultants* – Otjikoto-Masivi 220kV Transmission Line (Tsumeb-Rundu Area) – specialist report **(Avifauna & Vegetation Impacts)**.

2020

- *Risk-Based Solutions CC* – PEL 73 Seismic Survey (Kavango East Area) – specialist report **(Vertebrate Fauna & Flora)**.
- *Environmental Compliance Consultancy* – Farm Gai Kaisa No.159 Mechanical Harvesting Developments (Kombat) – specialist report **(Vertebrate Fauna & Flora)**.
- *Urban Green Town & Environmental Planning* – Ongos 66kV transmission line (Windhoek area) – specialist report **(Avifauna)**.
- *Urban Green Town & Environmental Planning* – Timbila Lodge Developments (Kalkveld area) – specialist report **(Vertebrate Fauna, Flora & Ecology)**.
- *NNF/NamPower* – Presentations & Booklet – habitats and transmission lines **(Habitats)**.
- *Risk-Based Solutions CC* – Uranium Project Wings: Leonardville Mine (Leonardville Area) – specialist report **(Vertebrate Fauna & Flora)**.
- *Risk-Based Solutions CC* – Uranium Project Wings: Gobabis Sulphuric Acid Plant & Transmission Line (Gobabis/Leonardville Area) – specialist report **(Vertebrate Fauna & Flora)**.
- *Deep Yellow/Reptile Uranium* – Tumas Mining License (Swakopmund Area) – specialist report **(Vertebrate Fauna)**.
- *Risk-Based Solutions CC* – Erongo Waste Disposal Site (Arandis Area) – specialist report **(Vertebrate Fauna & Flora)**.
- *Risk-Based Solutions CC* – 66kV Desert Lion Transmission Line (Karibib Area) – specialist report **(Vertebrate Fauna & Flora)**.
- *NNF/NamPower* – Bush thickening problems associated with various Transmission lines (Van Eck-Auas, Van Eck-Kuiseb, Van Eck-Finke, Finke-Bismark, Finke-Otjihase, Bismark-Rehoboth, Rehoboth-Klein Aub, Rehoboth-Blumfelde, Osona-Von Bach Booster, Osona-Okahandja, Omatako Booster-Omatako Base, Omatako T/Off-Omatako Booster, Omaeke-Witvlei, Gobabis-Witvlei, Gobabis-Omaere) specialist reports **(Flora & Herbicides)**.

2019

- *Soil Association/SABS* – FSC Charcoal Audits –Carbo Namibia (Grootfontein, Tsumeb areas) as auditor/specialist **(Woodland Management Issues)**.
- *LM Consulting* – Desert Fresh Foods (Pty) Ltd – Aquaponics Project (Swakopmund Area) – specialist report **(Vertebrate Fauna & Flora)**.
- *NNF/NamPower* – Bush thickening problems associated with various Transmission lines (Gerus-Matemba, Gerus-Ombika, Gerus-Otjiwarongo, Gerus-Paresis, Gerus-Platveld, Gerus-Welwitchia, Gerus-Zambezi, Gobabis-Kroonster; Gobabis-Otjinene; Windhoek-Naruchas; Windhoek-Kokerboom; Mariental-Gibeon; Mariental-Maltahohe; Omburu-Gerus; Omburu-Khan; Omburu-Marble; Omburu-Uis; Otjikoto-Berg Aukas; Otjikoto-Asis West; Rundu-Mahangu, Stampriet-Glave-Gochas, Welwitchia-Kamanjab, Zambezi-Katima, Zambezi HVDC) specialist reports **(Flora & Herbicides)**.

- *Knight Piésold – Meob Bay Tourism Development Project* (Meob Bay area) – specialist report (**Vertebrate Fauna & Flora**).
- *Urban Green Town & Environmental Planning – Kuiseb Delta Water Supply Project* (Walvis Bay area) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – Oranjemund Airport Upgrade* (Oranjemund Area) – specialist report (**Vertebrate Fauna & Flora**).
- *GIZ/FSC/NCA – Namibian Standard for forest products development* (National) specialist section (**Ecology**).
- *Aurecon – ANNA (Angola-Namibia) 400KV_a Powerline Project* (Lubango-Ruacana) specialist report (**Vertebrate Fauna & Flora**).
- *Mutchler Consulting Services – GET FiT Bush-To-Electricity Programme for Namibia* (Tsumeb Area) – specialist report (**Vertebrate Fauna & Flora**).

2018

- *Aurecon – ANNA (Angola-Namibia) 400KV_a Powerline Project* (Lubango-Ruacana) specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – PEL 73 – Oil & Gas* (Kavango East Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – Namib Naukluft Park EPL 3600 – Base & Rare metals, Nuclear fuels* (NNP Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Mutchler Consulting Services – GET FiT Bush-To-Electricity Programme for Namibia* (Tsumeb Area) – specialist report (**Vertebrate Fauna & Flora**).
- *GIZ/FSC/NCA – Namibian Standard for forest products* (National) field test draft National Standard – field visit (**Assist with Auditing the Draft National Standard**).
- *LM Consulting – Sandverhaar-Buchholzbrunn Rail Link* (Goageb Area) – specialist report (**Vertebrate Fauna, Flora & Ecology**).
- *Risk-Based Solutions CC – Hoachanas/Kalkrand EPL’s 5353, 5354 & 5358 - Lithium* (Hoachanas/Kalkrand Area) – specialist report (**Vertebrate Fauna & Flora**).
- *South African Bureau of Standards (SABS) – FSC Timber Audits* – (SAPPI Group & Main Scheme, KwaZulu-Natal; TWK Group/Main Schemes, Mpumalanga; Merensky: Singisi Forest Products & Northern Timbers, Eastern Cape/KwaZulu-Natal & Limpopo) as auditor/specialist (**Plantation Management Issues**).
- *Soil Association/Woodmark UK – FSC Charcoal Audits –Carbo, CMO, Direct Charcoal, Etosha Charcoal, Friedheim Timbers, Jumbo Charcoal* (Gobabis, Grootfontein, Hochveld, Okahandja, Otjiwarongo, Outjo, Tsumeb areas) as auditor/specialist (**Woodland Management Issues**).
- *LM Consulting – NNDC ML 156/EPL 2633 Kunene River* (Kunene River mouth) – specialist report (**Vertebrate fauna & Estuary ecology**).
- *GIZ/FSC/NCA – Namibian Standard for forest products development* (National) specialist section (**Ecology**).

2017

- *Risk-Based Solutions CC – Karibib Marble Mine ML/EPL 5536* (Karibib Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Nam-Geo Enviro Solutions – ML24a (EPL4388)* (Uis/Khorixas Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – 132kV Powerline project between Whale Rock Cement Plant and Gerus Substation* (Otjiwarongo Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – ML82(a-f) Project - salt* (Cape Cross Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Environmental Compliance Consultancy – Okangwati Pipeline & Powerline Developments* (Okangwati) – specialist report (**Vertebrate Fauna & Flora**).
- *GIZ/FSC/NCA – Namibian Standard for forest products* (National) specialist section (**Ecology**).
- *Urban Green Town & Environmental Planning – Eastern National Water Carrier Powerlines* (Waterberg area) – specialist section (**Ecology**).
- *Aurecon – Walvis Bay Waste Water Treatment Works* (Walvis Bay/Dune 7 area) specialist report; pipeline & powerline issues (**Vertebrate Fauna & Flora**).
- *Urban Green Town & Environmental Planning – EPL 5235 – granite* (Aus-Rosh Pinah

- area) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – Helikon & Rubicon Lithium Project – lithium (Karibib Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Aurecon* – Shepherd’s Lodge Powerline (Oranjemund) specialist report; vegetation & bird management plans (**Vertebrate Fauna & Flora**)
- *South African Bureau of Standards (SABS) & Woodmark* – FSC Charcoal Audits – Carbo Namibia, Friedheim Timbers, Jumbo Charcoal, Direct Charcoal (Grootfontein, Hochveld, Okahandja, Otjiwarongo areas) as auditor/specialist (**Woodland Management Issues**).
- *Risk-Based Solutions CC* – EPL 6271 – precious stones (Lüderitz Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Environmental Compliance Consultancy* – Fibre Optic Cable Developments (Katima Mulilo to Ngoma) – specialist report (**Vertebrate Fauna & Flora**).
- *Environmental Compliance Consultancy* – B2Gold (Otjikoto Mine) PV Solar Developments (Otjiwarongo/Otavi) – specialist report (**Vertebrate Fauna & Flora**).
- *South African Bureau of Standards (SABS) & Woodmark* – FSC Timber Audits – (Merensky Timber, Limpopo, SAPPI Group & Main, Mpumalanga & KwaZulu Natal, TWK, Mpumalanga & Swaziland) as auditor/specialist (**Plantation Management Issues**).
- *Environmental Compliance Consultancy* – Otjiwarongo Urban Developments (Extensions 10-15) (Otjiwarongo) – specialist report (**Vertebrate Fauna & Flora**).
- *Environmental Compliance Consultancy* – Fibre Optic Cable Developments (Buitepos to Walvis Bay) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – Bird Monitoring: E-Bay 150-500MW Wind Farm (Elizabeth Bay) – specialist report No 4 (**Bird monitoring**).

2016

- *Risk-Based Solutions CC* – EPL’s 3738, 3739, 5117, 5196, 5439, 5649 (Karibib); EPL 5880 (Usakos) & EPL 5678 (Omaruru) (Karibib/Usakos/Omaruru Areas) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – Whale Rock Cement Plant (Otjiwarongo Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Gecko/SLR* – Gecko Salt Aggregate Quarry (Wlotzkasbaken) – specialist report (**Vertebrate Fauna & Flora**).
- *Aurecon* – Kalkveld Water Supply Extension (Kalkveld) specialist report (**Pylon & Pipeline issues**).
- *Risk-Based Solutions CC* – WindNam 400kV Pylon (Rosh Pinah/Keetmanshoop to Elizabeth Bay) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – Bird Monitoring: E-Bay 150-500MW Wind Farm (Elizabeth Bay) – specialist reports No’s 1 to 3 (**Bird monitoring**).
- *South African Bureau of Standards (SABS) & Woodmark* – FSC Charcoal Audits – Carbo Namibia; Direct Charcoal; Etosha Charcoal; Friedheim Timbers; Jumbo Charcoal & Makkara Charcoal (Gobabis, Grootfontein, Hochveld, Kalkveld, Okahandja, Otjiwarongo areas) as auditor/specialist (**Woodland Management Issues**).
- *Aurecon* – Devils Fork to Collector 2 Reservoir Pipeline (Rooibank/Walvis Bay Area) specialist report (**Vertebrate Fauna & Flora**)
- *Risk-Based Solutions CC* – E-Bay 150-500MW Wind Farm (Elizabeth Bay) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – Namdeb 8-10MW Wind Farm (Elizabeth Bay) – specialist report (**Vertebrate Fauna & Flora**).
- *EcoCore Environmental Consultants* – Kongola-Singoveka Water Supply Phase 3 (Kongola Area) – specialist report (**Vertebrate Fauna & Flora**).
- *South African Bureau of Standards (SABS) & Woodmark* – FSC Timber Audit – (TWK Main & Group, Piet Retief, South Africa; Usutu Timber Products, Bunya, Swaziland) as auditor/specialist (**Plantation Management Issues**).
- *Aurecon* – Kupferberg Landfill Development (Windhoek) specialist report (**Vertebrate fauna; Flora & Habitat survey**).
- *Risk-Based Solutions CC* – EPL 4590 prospecting (Maltahöhe Area) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – EPL 4589 prospecting (Fransfontein Area) – specialist report

(Vertebrate Fauna & Flora).

- *Urban Green Town & Environmental Planning – Farm Nordland Urban Developments* (Otavi area) specialist section (**Ecology**).

2015

- *South African Bureau of Standards (SABS) & Woodmark – FSC Charcoal Audits – Etosha & Direct Charcoal* (Outjo, Grootfontein & Otjiwarongo areas) as auditor/specialist (**Woodland Management Issues**).
- *EcoCore Environmental Consultants – Rehoboth to Windhoek Commuter Train Service Route* (Rehoboth-Windhoek) – specialist report (**Vertebrate Fauna & Flora**).
- *South African Bureau of Standards (SABS) & Woodmark – FSC Timber Audit* – (Merensky, Tzaneen, South Africa; Sappi, Ixopo, South Africa; Shiselweni, Swaziland) as auditor/specialist (**Plantation Management Issues**).
- *Urban Green Town & Environmental Planning – Leonardville Urban Developments* (Leonardville) specialist section (**Ecology**).
- *Risk-Based Solutions CC – Outjo, Otavi, Tsumeb 3 & 5MW Solar PV Power Plants* (Outjo, Otavi, Tsumeb) – specialist reports (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – Aquaculture Development* (Walvis Bay) – specialist report (**Vertebrate Fauna & Flora**).
- *South African Bureau of Standards (SABS) & Woodmark – FSC Charcoal Audits – Friedheim Timber & Jumbo Charcoal* (Otjiwarongo & Hochveld areas) as auditor/specialist (**Woodland Management Issues**).
- *Urban Green Town & Environmental Planning – Kuiseb Estate Urban Developments* (Friedenhau Dam area) specialist section (**Ecology**).
- *Urban Green Town & Environmental Planning – Ncaute BTS MTC Site* (Ncaute) specialist section (**Ecology**).
- *Urban Green Town & Environmental Planning – Oanob BTS MYC Site* (Oanob Dam) specialist section (**Ecology**).
- *NamPower – Ruacana Airport Problems* (Ruacana) specialist report (**Flora & Herbicides**).
- *South African Bureau of Standards (SABS) & Woodmark – FSC Timber Audit* (Merensky, Kokstad, South Africa & NHR Investments; Swaziland) as auditor/specialist (**Plantation Management Issues**).
- *Africa Planning Forum CC – Ondangwa Urban Developments – Portion 30 & Erf X (Portion 7)* (Ondangwa) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – PET No. 68 – Blocks 2219 & 2319 Petroleum Exploration* (Aranos to Gobabis area) – specialist report (**Vertebrate Fauna & Flora**).
- *Africa Planning Forum CC – Otjiwarongo Truck Port* (Otjiwarongo) – specialist report (**Vertebrate Fauna & Flora**).
- *NamPower – Bush thickening problems associated with various Transmission lines* (Otjikoto-Ohorongo; Otjikoto-Rundu; Otjikoto-Okatope; Rundu-Mpasi; Okatope-Okongo; Omatando-Ruacana; Ruacana-Opuwo; Ruacana-Omburu) specialist reports (**Flora & Herbicides**).
- *South African Bureau of Standards (SABS) & Woodmark – FSC Charcoal Audits – Jumbo Charcoal* (Hochveld area; Grootfontein/Otavi area) as auditor/specialist (**Woodland Management Issues**).
- *Urban Green Town & Environmental Planning – Oranjemund Quarry Site C* (Oranjemund) specialist report (**Flora & Habitat survey**).
- *Risk-Based Solutions CC – Grootfontein & Otjozondjupa 5MW Solar PV Power Plants* (Grootfontein) – specialist report (**Vertebrate Fauna & Flora**).
- *Turnix Environmental Consulting CC – Oanob Dam Lifestyle Village* (Rehoboth) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – Blocks 1718 & 1818 prospecting* (Etosha Basin – Kavango Region) – specialist report (**Vertebrate Fauna & Flora**).

2014

- *Risk-Based Solutions CC – Noordoewer/Ramansdrif EPL 3822* (Noordoewer area) – specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – Sinclair EPL's 4202, 4203, 4822* (Helmeringhausen area) – specialist report (**Vertebrate Fauna & Flora**).

- *NEHC (National Environmental Health Consultants) – Namib Plaas exploration (Arandis-Usakos Area) (Reptiles & Avifauna).*
- *Risk-Based Solutions CC – Otjiwarongo 5MW Solar PV Power Plant (Otjiwarongo) – specialist report (Vertebrate Fauna & Flora).*
- *Aurecon – Auasblick Residential Development (Windhoek) specialist report (Vertebrate Fauna & Flora)*
- *ERM (Environmental Resources Management Pty (Ltd) Southern Africa) – Baynes Hydropower Project: Linear and Associated Infrastructure (Walvis Bay to Baynes Dam area) (Biophysical Issues).*
- *South African Bureau of Standards (SABS) & Woodmark – FSC Charcoal Audits – Direct; Friedheim & Etosha Charcoal (Grootfontein; Hochveld; Otjiwarongo & Outjo areas) as auditor/specialist (Woodland Management Issues).*
- *South African Bureau of Standards (SABS) & Woodmark – FSC Timber Audit (BedRock, Tzaneen; Masonite, Pietermaritzburg; TWK, Piet Retief – South Africa) as auditor/specialist (Plantation Management Issues).*
- *Aurecon – Amas-Karasburg Transfer Pipeline Project (Karasburg area) specialist report (Vertebrate Fauna & Flora)*
- *Risk-Based Solutions CC – Tobacco & Maize Developments (Katima Mulilo area) – specialist report (Vertebrate Fauna & Flora).*
- *Aurecon – Swakopmund Base Station to C14 Pipeline: Eastern Route (Swakopmund-Walvis Bay) specialist report (Vertebrate Fauna & Flora)*
- *Urban Green Town & Environmental Planning – Oranjemund Quarry Sites A & B (Oranjemund) specialist report (Vertebrate Fauna & Flora; Construction & Operational Management Plan; Rehabilitation Plan).*
- *NEHC (National Environmental Health Consultants) – Desert Rose Urban Development (Swakopmund-Walvis Bay Area) (Vertebrate Fauna & Flora).*
- *LM Environmental Consulting – Eiseb River EPL's 4640, 4641, 4642, 4644 & 4646 (Otjinene Area) specialist report (Vertebrate Fauna & Flora)*
- *Risk-Based Solutions CC – Lüderitz Wind Farms – Penguin & Seal (Lüderitz area) – specialist report (Vertebrate Fauna & Flora).*
- *Risk-Based Solutions CC – Lorelei EPL 4234 (Rosh Pinah area) – specialist report (Vertebrate Fauna & Flora).*
- *EcoCore Environmental Consultants – Omuthiya to Ongwediva Road Upgrade (Oshakati area) specialist report (Vegetation Assessment)*
- *South African Bureau of Standards (SABS) & Woodmark – FSC Timber Audit (Sappi; Piet Retief area, South Africa) as auditor/specialist (Plantation Management Issues).*
- *South African Bureau of Standards (SABS) & Woodmark – FSC Charcoal Audit (Grootfontein, Otjiwarongo areas) as auditor/local specialist (Woodland Management Issues).*
- *Aurecon – Solar PV project (Gross Barmen; Mariental & Omaruru areas) specialist report (Vertebrate Fauna & Flora)*
- *Risk-Based Solutions CC – LAM TM470 Flight wreckage recovery operation (Bwabwata NP area) – specialist report (Vertebrate Fauna & Flora).*
- *Aurecon – Swakopmund to Mile 7 Water Supply Phase 2 (Swakopmund-Walvis Bay) specialist report (Vertebrate Fauna & Flora)*
- *EcoCore Environmental Consultants – Okahao Township Developments (Okahao) specialist report (Vertebrate Fauna & Flora)*

2013

- *Marenica Energy Namibia – Review of Environmental Reports (Spitzkoppe area) – status report (Environmental & Status Report)*
- *Risk-Based Solutions CC – Solar Power Plant (Gross Barmen area) – specialist report & site visit (Vertebrate Fauna & Flora).*
- *Aurecon – Orange Falls Hydro Electric Power (Onseepkans area) – specialist report (Vertebrate Fauna & Flora)*
- *Namdeb – Aris Drif & Auchas Lower (Oranjemund area) – vertebrate fauna baseline survey (Vertebrate Fauna).*
- *EcoCore Environmental Consultants – Oshikuku Township Developments (Oshikuku) specialist report (Vertebrate Fauna & Flora)*

- *South African Bureau of Standards (SABS) & Woodmark – FSC Forestry Audit* (Hazyview & White River areas – Bedrock Fiber Resources, South Africa) as environmental auditor (**Plantation Management Issues**).
- *South African Bureau of Standards (SABS) & Woodmark – FSC Charcoal Audit* (Hochveld, Otjiwarongo, Outjo, Tsumeb areas) as auditor/local specialist (**Woodland Management Issues**).
- *Risk-Based Solutions CC – Karibib Lithium* (Karibib area) specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – EPL’s 4323 & 4324* (Conception to St Francis Bay area) specialist report (**Vertebrate Fauna & Flora**).
- *Urban Green Town & Environmental Planning – Various MTC BTS Towers* (Kapani; Mata-Mata; Omatako Valley, Onawa; Onkombula; Otjiyarwa) specialist reports (**Vertebrate Fauna & Flora**).
- *CENR CC – Mudumu Solid Waste Disposal Site (Caprivi)* specialist report (**Vertebrate Fauna & Flora**).
- *LM Environmental Consulting – Jimmey Northern Industrial/Business Park (Urban Development)* (Windhoek) specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – EPL 4688* (Witvlei area) specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – EPL 4742* (Dobra/Brakwater area) specialist report (**Vertebrate Fauna & Flora**).
- *NamPower – Bush thickening problems associated with various Transmission lines* (Van Eck-Omburu 1 & 2; Auas-Omaere; Gerus-Otjikoto & Aranos/Stampriet area) specialist reports (**Flora & Herbicides**).
- *LM Environmental Consulting – Otjosondo EPL 4704 (Manganese) Prospecting* (Hochveld Area) vegetation & habitat assessment (**Flora**).
- *Risk-Based Solutions CC – Elbe EPL 4232 (Zinc/Copper/Gold/Lead)* (Okahandja Area) specialist report (**Vertebrate Fauna & Flora**).
- *Namdeb – Karingarab EPL 3749 (Rare Earth Elements)* (Oranjemund area) – vertebrate fauna baseline survey (**Vertebrate Fauna**).
- *SLR – Walvis Bay Salt Works extension* (Walvis Bay) avifauna specialist report (**Avifauna**).
- *Urban Green Town & Environmental Planning – Aus Sewerage Works Project* (Aus) site assessment (**Flora**) and specialist report (**Vertebrate Fauna & Flora**).
- *Urban Green Town & Environmental Planning – Ujams Sewerage Works Project* (Windhoek) site assessment & pre-construction report (**Flora**).
- *Enviro Management Consultants Namibia (EMC Namibia) – Grootfontein-Otjinene Road Link Project* (eastern Namibia) specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – Offshore ML 0010 Blocks 1910A, 1911 & 2011A (Oil)* (Henties Bay to Kunene River) specialist report (**Vertebrate Fauna & Flora**).
- *EnviroSolutions – Erongo Red Power Lines - Walmund* (Swakopmund Area) specialist report (**Vertebrate Fauna & Flora**).
- *Aurecon – Kalkveld Water Supply Extension* (Kalkveld Area) specialist report (**Vertebrate Fauna & Flora**).
- *Softchem & Reptile Uranium Namibia – EPL Ongolo & Tumas (Uranium) mining development* (Swakopmund area) specialist report (**Vertebrate Fauna & Flora**).

2012

- *LM Environmental Consulting – Otjosondo EPL 4704 (Manganese) Prospecting* (Hochveld Area) specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – Key Fauna & Flora in Protected Areas Network, Namibia* (Namibia) specialist report (**Key Vertebrate Fauna & Flora spp.**).
- *Namdeb – Reptile & Small Mammal Capture & Relocation Operation* (Sendelingsdrift area) (**Capture & Removal**).
- *Elmarie Du Toit Town Planning Consultant – Baumgartsbrunn Township Development* (Windhoek Area) specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC – Rainbow Salt Works* (Wlotzkasbaken Area) specialist report (**Vertebrate Fauna & Flora**).
- *NamPower – Kunene Transmission Substation Development* (Ruacana area) specialist

- report (**Vertebrate Fauna & Flora**).
- *South African Bureau of Standards (SABS) & Woodmark – FSC Charcoal Audit (Grootfontein, Hochveld, Otjiwarongo & Outjo areas) as auditor/local specialist (**Woodland Management Issues**).*
 - *Enviro Management Consultants Namibia (EMC Namibia) – Aus/Bethanie-Solitaire-Walvis Bay Road Link Project (western Namibia) specialist report (**Vertebrate Fauna & Flora**).*
 - *Urban Green Town & Environmental Planning – Namibian Crocodile Project (Kongola, Caprivi) specialist report (**Vertebrate Fauna & Flora**).*
 - *Urban Green Town & Environmental Planning – Bowker Hill MTC developments & CEMP (Windhoek area) specialist report (**Site assessment; construction monitoring; Construction EMP [CEMP]; Rehabilitation Management & Monitoring Plans**).*
 - *Risk-Based Solutions CC – Solar Power Plants (Keetmanshoop, Mariental & Omaruru areas) specialist report & site visit (**Vertebrate Fauna & Flora**).*
 - *South African Bureau of Standards (SABS) & Woodmark – FSC closeout Audit (Okahandja area) as auditor/local specialist (**Woodland Management Issues**).*
 - *Urban Green Town & Environmental Planning – Elisenheim bulk services developments (Windhoek area) specialist report (**Status Report**).*
 - *Caprivi Parks Consultants (CPC) & MET – Design & present a Savannah Ecology Training Course for MET staff (Northeast Parks) (**Ecology Course**).*
 - *Urban Green Town & Environmental Planning – Erf Re 3/2/49 Farm Dobra rezoning: residential to industrial - Brakwater (Windhoek area) specialist report (**Flora**).*
 - *Risk-Based Solutions CC – Coal Bed Methane (CBM) Prospecting – Block 2418 (Aranos Basin) specialist report (**Vertebrate Fauna & Flora**).*
 - *Risk-Based Solutions CC – Coal Bed Methane (CBM) Prospecting – Block 2114 (Huab Basin) specialist report (**Vertebrate Fauna & Flora**).*
 - *Risk-Based Solutions CC – Diaz Point Phosphate Plant (Lüderitz) specialist report (**Vertebrate Fauna & Flora**).*
 - *Strengthening Protected Areas Namibia (SPAN) & Ministry of Environment & Tourism (MET) – Alignment & completion of Park Management Plans (Sperrgebiet, Waterberg, /Ai-/Ais & Mangetti National Parks) (**Management Plans**).*
 - *Risk-Based Solutions CC – Lüderitz Basin Offshore Exploration (petroleum) (Lüderitz to Walvis Bay area) specialist report (**Vertebrate Fauna & Flora**).*
 - *Risk-Based Solutions CC – Orange Basin Offshore Exploration (petroleum) (Oranjemund to Lüderitz area) specialist report (**Vertebrate Fauna & Flora**).*

2011

- *South African Bureau of Standards (SABS) & Woodmark – FSC Charcoal Audit (Outjo, Otjiwarongo, Tsumeb areas) as auditor/local specialist (**Woodland Management Issues**).*
- *Risk-Based Solutions CC – Khorixas EPL 4174 (copper & iron) (Khorixas area) specialist report (**Vertebrate Fauna & Flora**).*
- *Urban Green Town & Environmental Planning – Sewerage Works (Omitara & Warmbad) specialist report (**Vertebrate Fauna & Flora**).*
- *Urban Green Town & Environmental Planning – Elisenheim Urban Development (Windhoek) specialist report (**Status Report**).*
- *Risk-Based Solutions CC – Lüderitz Phosphate Plant (Lüderitz) specialist report (**Vertebrate Fauna & Flora**).*
- *Urban Green Town & Environmental Planning – Lodge & Nature Estate developments (Kamanjab area) specialist report (**Flora**).*
- *Risk-Based Solutions CC – Wlotzkasbaken Salt Works (Wlotzkasbaken area) specialist report (**Vertebrate Fauna & Flora**).*
- *Risk-Based Solutions CC – Coastal/Offshore Block 1811 (oil & gas) prospecting (Angra Fria area) specialist report (**Vertebrate Fauna & Flora**).*
- *Risk-Based Solutions CC – Aus EPL 4425 (dimension stone) mining development (Aus area) specialist report (**Vertebrate Fauna & Flora**).*
- *Enviro Dynamics & Namwater – Swakop South Pipeline (Swakopmund area) (**Vertebrate Fauna Movement**).*
- *University Central Consultancy Bureau (UCCB) – Tourism development in the Kuiseb*

- Delta and Dune Belt area (Walvis Bay & Swakopmund areas) specialist report (**Vertebrate Fauna & Flora**).
- African Wilderness Restoration (AWR) & Okorusu Fluorspar Mine – Okorusu Fluorspar Mine (Otjiwarongo area) specialist report (**Flora Survey, Ecology, Waste Rock Dump Site Selection**).
 - Enviro Dynamics – NBC Towers site location effect on amphibians, reptiles & mammals (throughout Namibia) (**Sensitivity Ratings**).
 - Urban Green Town & Environmental Planning – MR 125 road upgrading between Kongola-Liselo-Singalamwe (Caprivi region) specialist report (**Vertebrate Fauna & Flora**).
 - Urban Green Town & Environmental Planning – Daan Viljoen Game Park luxury suites (Windhoek) specialist report (**Flora**).
 - Urban Green Town & Environmental Planning – Amusement Park (Windhoek) specialist report (**Vertebrate fauna & Flora**).
 - Urban Green Town & Environmental Planning – Erf Re 137/48 rezoning: residential to industrial - Brakwater (Windhoek area) specialist report (**Flora**).
 - Urban Green Town & Environmental Planning – Erf Re 13/48 rezoning: residential to industrial - Brakwater (Windhoek area) specialist report (**Flora**).
 - Urban Green Town & Environmental Planning – Erf Re 486 subdivision – Kapps Farm (Windhoek area) specialist report (**Flora**).
 - Urban Green Town & Environmental Planning – Otjimbingwe water/pipeline provision (Otjimbingwe) specialist report (**Vertebrate Fauna & Flora**).
 - Urban Green Town & Environmental Planning – Erf Re 35 rezoning: residential to industrial - Brakwater (Windhoek area) specialist report (**Flora**).
 - Geo Pollution Technologies – EPL (gas & oil) mining development (Huab Block - Damaraland) specialist report (**Vertebrate Fauna & Flora**).
 - Enviro Dynamics & Navachab Gold Mine – Navachab Biodiversity Inventory (Karibib) (**Vertebrate Fauna**).

2010

- Urban Green Town & Environmental Planning – MTC Hoffnung cell phone tower (Windhoek area) specialist report (**Vertebrate Fauna & Flora**).
- NEMRU, Gobabeb & Swakop Uranium – Rapid habitat and basic ecological assessment of the Husab Sand Lizard (*Pedioplanis husabensis*) at the Husab Uranium Mine (Swakopmund area) (**Reptile study**).
- Risk-Based Solutions CC – Mwale Mwiya Park urban development (Katima Mulilo) specialist report (**Vertebrate Fauna & Flora**).
- Risk-Based Solutions CC – Zhonghe EPL (uranium) mining development (Arandis/Swakopmund area) specialist report (**Vertebrate Fauna & Flora**).
- Risk-Based Solutions CC – EPL (gold) mining development (Okahandja/Gross Barmen area) specialist report (**Vertebrate Fauna & Flora**).
- LM Environmental Consulting – Desert Star Studios Phase 1 development (Ariamsvlei/Orange River) specialist report (**Vertebrate Fauna & Flora**).
- Geo Pollution Technologies – SABMiller breweries development (Okahandja) specialist report (**Flora**).
- Softchem & Reptile Uranium Namibia – EPL (uranium) mining development (Swakopmund area) specialist report (**Vertebrate Fauna & Flora**).
- Risk-Based Solutions CC – EPL (copper) mining development (Rehoboth area) specialist report (**Vertebrate Fauna & Flora**).
- LM Environmental Consulting & International Development Consultancy (IDC) – Housing development – Finkenstein (Windhoek) specialist report (**Vertebrate Fauna & Flora**).
- Risk-Based Solutions CC – EPL (semi precious stones) mining development (Brandberg area) specialist report (**Vertebrate Fauna & Flora**).
- Risk-Based Solutions CC – EPL (copper) mining development (Rosh Pinah area) specialist report (**Vertebrate Fauna & Flora**).
- ERM & Enviro Dynamics on: Baynes Hydroelectric Dam project (Epupa area) specialist report (**Small Mammals & Avifauna**).
- CSIR & Enviro Dynamics on: Sendelingsdrif diamond mining, Namdeb (Oranjemund)

- area) specialist report (**Reptiles & Small Mammals**).
- *SGS* on: CCF Bushblok audit (Otjiwarongo area) as auditor/specialist (**Woodland management issues**).
- *Urban Green Town & Environmental Planning* on: Goreangab Waterfront development (Goreangab Dam - Windhoek area) specialist report (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – Wind Energy Facility development (Walvis Bay area) specialist report (**Vertebrate Fauna & Flora**).
- *Urban Green Town & Environmental Planning* on: Site monitoring of biophysical issues (**Monitoring & Rehabilitation**) for MTC cell phone towers in Windhoek.
- *Urban Green Town & Environmental Planning* on: Water Treatment Plant development (Ujams - Windhoek area) specialist report (**Vertebrate Fauna & Flora**).

2009

- *Enviro Dynamics* – Amphibian, reptile & mammal biodiversity in Windhoek for City of Windhoek: specialist report, literature review (**Fauna**).
- *Urban Green Town & Environmental Planning* on: Biophysical issues (**Vertebrate Fauna & Flora**) & Namatanga Conservancy issues for SUNGATE Development, Windhoek Area.
- *Urban Green Town & Environmental Planning* on: Rapid Assessment: Biophysical issues (**Vertebrate Fauna & Flora**) for King Nahale Gate Lodge, Etosha National Park area.
- *Risk-Based Solutions CC* – Glass factory development (Rehoboth area) literature review (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – Small mining development (Karibib area) literature review (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – Clay-Pottery development (Kavango River area) literature review (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – Clay-Pottery development (Zambezi River area) literature review (**Vertebrate Fauna & Flora**).
- *Urban Green Town & Environmental Planning* on: Rapid Assessment: Biophysical issues (**Vertebrate Fauna & Flora**) for MTC cell phone towers in Windhoek.

2008

- *Urban Green Town & Environmental Planning* on: Rapid Assessment: Biophysical issues (**Vertebrate Fauna & Flora**) for the Farm Detmont urban development, Windhoek (Khomas Hochland) Area.
- *Urban Green Town & Environmental Planning* on: Rapid Assessment: Biophysical issues (**Vertebrate Fauna & Flora**) for the Farm Sonnleiten urban development, Windhoek (Khomas Hochland) Area.
- *Enviro Dynamics* – 220kV Transmission Line [Omburu/Khan/Kuiseb] for NamPower: specialist report, literature review (**Vertebrate Fauna**).

2007

- *Risk-Based Solutions CC* – Copper Deposits in central western Namibia (Klein Aub area) literature review (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – Supply Base & Landfill Site (Walvis Bay area) literature review (**Vertebrate Fauna & Flora**).
- *Risk-Based Solutions CC* – Oil Exploration (Kunene River Mouth area) literature review (**Vertebrate Fauna & Flora**).
- *Digby Wells & Associates* – Uranium mining (Valencia Uranium Mine, Westport Resources) (**Reptile Fauna**).
- *Risk-Based Solutions CC* – Base Metal Exploration (Goageb/Konkiep River area – EPL 3698) literature review (**Vertebrate Fauna & Flora**).
- *International Development Consultancy (IDC) PTY LTD* on: Rapid Assessment: Biophysical issues (**Vertebrate Fauna & Flora**) for the Farm Rooisand urban development, Windhoek (Khomas Hochland) Area.

2006

- *International Development Consultants/Aigams Professional Services cc. & Lithon Project Consultants* on: Phase 2: IEE (Initial Environmental Examination) for Staff accommodation for a Hospital Facility in Lubango, Angola.
- *AgriBank Namibia* – Implementation & training towards the Environmental Policy.

- *Enviro Dynamics* – Trekkopje Uranium prospecting: specialist report (**Vertebrate Fauna**).
- *Risk-Based Solutions CC* – Cement factory & quarry: specialist report (**Vertebrate Fauna & Flora**).
- *International Development Consultancy (IDC) PTY LTD* on: Rapid Assessment: Biophysical issues (**Vertebrate Fauna & Flora**) for the Farm Aris urban development Portion No 8, Windhoek Area.
- *International Development Consultancy (IDC) PTY LTD* on: Rapid Assessment: Biophysical issues (**Vertebrate Fauna & Flora**) for the Farm Finkenstein urban development, Windhoek Area.
- *Risk-Based Solutions CC* – Coal Deposits in southeastern Namibia (Aranos area) literature review (**Vertebrate Fauna & Flora**).

2005

- *International Development Consultants/Aigams Professional Services cc. & Lithon Project Consultants* on: Phase 1: IEE (Initial Environmental Examination) for a Hospital Facility in Lubango, Angola.
- *SGS* regarding a Forest Management Certification Audit – Savannah Charcoal, Outjo, Namibia.
- *AgriBank Namibia* – Environmental Policy – 2005/6.
- *SGS* regarding a Forest Management Certification Audit – Cheetah Conservation Fund, Otjiwarongo, Namibia.

2004

- *Namibian National Commission for UNESCO* on: proclaiming Twyfelfontein a World Heritage Site (Namibia) – **Reptiles & mammals** (Technical Committee).
- *International Development Consultants/Aigams Professional Services cc.* on: the Potential Environmental Impacts of establishing a Pharmaceutical Factory at Okahandja.
- *International Development Consultants/Aigams Professional Services cc. & Entheos Aquaculture Enterprises (Pty) Ltd* on: the Potential Environmental Impacts of establishing a Fish Farm in the Olushandja Dam area in Namibia.
- *International Development Consultants/Aigams Professional Services cc.* on: Assessment & Development of Northern Communal Areas in Namibia - environmental impacts of establishing Small-scale Commercial Farms in communal areas.

2003

- *WildHorus Ltd.* on Miombo Production Management – **Aging & Growth Rates** of Miombo – in Tanzania, Kilombero Valley area, Ifakara.

2002

- *Waldeck Farm* (Udo Stritter). Determining **Carrying Capacity** for game and veld condition assessment.
- *Anchor Environmental Consultants CC* at NAMDEB on: the influence of the Wet Overburden Mining System (WOMS) on **Reptile & Small Mammal** diversity.

1990's

- *International Development Consultants/Aigams Professional Services cc.* on **Bush Thickening** and the potential of utilising this wood for charcoal production in Namibia - 1996.
- *Erongo Mining & Exploration Company Ltd* - Navachab Gold Mine (Karabib) on the **Rehabilitation** of the slimes and mine dumps - 1997.
- *International Development Consultants/Aigams Professional Services cc.* on the impact of Bush Control Measures on the ecological environment (biodiversity, habitat diversity and landscape considerations) in Namibia - 1997.

EXPERIENCE: OTHER ACTIVITIES

GUEST LECTURE

- Contract Lecturer in Desert Ecology at the University of Namibia (Zoology II) - 1997.
- Facilitator in environmental education workshop (!Nara workshop) for NGO trainees during 1997.
- Facilitator – Rangers Induction course for the Ministry of Environment and Tourism – Habitat & Animal Identification during 2001, 2002 & 2003.
- Presented a course on “Snakes” to the Namibian Academy of Tourism & Hospitality (NATH) during June 2003, March 2004, May 2005 & February 2006.

PUBLIC PRESENTATIONS

TALKS – GUEST SPEAKER FOR:

- Development Fund of Namibia – Bush thickening in Namibia, 1997.
- Namibian Wildlife Society – Baboons as problem animals, 1998.
- Presented talks for radio series on mammals of Namibia for the NBC, 1997-1998.
- Nature Conservation students at the University of Stellenbosch – Fauna of Arabia, 1999.
- Al Ain Natural History Group – Mammals of the UAE and Gulf States, 1999.
- Abu Dhabi Natural History Group – Desert Adaptations of Mammals & Reptiles, UAE & Gulf States, 2000.
- Dubai Natural History Group – Desert Adaptations of Mammals & Reptiles, UAE, 2000.
- Al Ain Natural History Group – Amphibians, Fish and Reptiles of the UAE, 2001.
- Namibian Wildlife Society – Natural History of the UAE, 2001.
- Al Ain Natural History Group – Spiny-tail Lizard ecology in the UAE, 2002.
- Al Ain Natural History Group – Namibia, 2003.
- Namibian Wildlife Society – Alien Invasive Species to Namibia with special reference to Fountain Grass (Joubert & Cunningham) 2004.
- Namibian Wildlife Society – Tortoises of Namibia, June 2005.
- St Paul’s College – Tortoises & Research possibilities, July 2007.
- Book Den – “Stemme agter die penne” – Tortoises, September 2007.
- St Paul’s College – Tortoises of Namibia, January 2010.
- SABS – Protected Tree Species in Namibia, July 2012.

MEDIA

TELEVISION

- NBC – Presentation on tortoise research in Namibia for the Namibian Broadcasting Corporation – April 2005.
- BBC – Presentation on the endemic Nama Padloper tortoise for the British Broadcasting Corporation “Wild in Africa” series – 2006.
- SABC – Interview on Nature Programme “50/50” (South African Broadcasting Corporation) regarding seal culling in Namibia – October 2006.
- NBC – Interview on “Good Morning Namibia” regarding NEWS & Gecko Vision Industrial Park – September 2011
- NBC – Interview on “Good Morning Namibia” regarding NEWS & rhino poaching + SRT activities – July 2012
- NBC – Interview on “Open File” regarding snakes and perceived problems with snakes around Rehoboth – February 2013

RADIO

- NBC – Presented a range of talks on wildlife issues (e.g. baboons as problem animals, Namibian ungulates, etc.) in Namibia for the Namibian Broadcasting Corporation – 1997.
- Radio 99 – Interview on tortoises of Namibia – August 2007.
- Radio Kudu – Interview on baboons as peri-urban problem animals – April 2013.
- Hit Radio Namibia – Statement regarding poaching in Etosha National Park – June 2013.
- Radio Kosmos – Statement regarding the culling of springbok in National Parks (August 2013); poisoning of elephants in Hwange National Park, Zimbabwe (September 2013); illegal logging issues (October 2013); ivory poaching issues (December 2013); whaling issues (January 2014); mining in protected areas (February 2014); world conservation (March 2014); hunting issues/ivory trade/protected species (April 2014); greenhouse emissions/rhino

poaching (June 2014); energy issues (July 2014); Baines Hydropower issues (August 2014); poaching in Africa (September 2014); Benguela ecology (October 2014); climate change (November 2014); rhino issues (December 2014); baboon problems (January 2015); cheetah issues (February 2015); deforestation (March 2015); poaching in Etosha (May 2015); wild dog issues (August 2015); fire ecology (October 2015); baboon problems (Feb 2016); suricate trade & rhino poaching (April 2016); cetacean capture in Walvis Bay & ivory trade (Sep 2016); global warming (November 2016); kudu/rabies (May 2017); gorilla issues (July 2017); sungazer lizard (August 2017); rhino poaching (October 2017); general poaching issues (November 2017); blue crane decline (December 2017); climate change, poaching, biodiversity issues (October 2018); species extinctions & wildlife trade (May 2019); sustainable utilisation issues (June 2019); captive elephants (August 2019); climate change (September 2019); greenhouse gas, elephant conflict, arctic ice, oil (November 2019); elephant problems (December 2019); ducks as bio-control (February 2020); wildlife markets (March 2020); COVID 19 + wildlife & bees (May 2020); dehorning rhino (June 2020); bees (July 2020); rhino poaching (August 2020); climate change, leopard attack, black rhino's (September 2020); economy & environment; plant extinction; fires; leopards (October 2020); USA elections & environment; farming with rhino horn (November 2020); MSC/FSC; live elephant sales; canned lion hunting (December 2020); wildlife & Covid; flamingos (January 2021); wetlands, climate change, beetles, Darwin (February 2021); greenhouse gasses, Earth Day (March 2021); Khorixas earthquake, Earth Day (April 2021); oceans', KAZA TFBP, honeybees, pesticides (May 2021); environment day, water (June 2021); global warming, sulphuric acid spill (July 2021); pangolin, climate change; EIA's; dams/evaporation (August 2021); climate change; ozone layer (September 2021); whale beaching; brown hyena/seals in Swakopmund (October 2021); KAZA elephant survey (November 2021); offshore oil drilling impacts; pollution issues; green energy (December 2021); climate change (January 2022); wetlands; tourist attitudes (February 2022); earth day (March 2022); mopane worms, WHO Earth Day (April 2022), COP 2022; quelea problems (May 2022); earth day, HWC (June 2022); poaching, carbon credits (July 2022); phosphate mining, climate change (August 2022); geology/biodiversity (September 2022); fire & rainfall; timber harvest (October 2022); COP27; water; green hydrogen (November 2022); steel industry; climate change (December 2022); sulphur spill (January 2023).

SCIENTIFIC PUBLICATIONS

SCIENTIFIC PAPERS

PEER REVIEWED (PAPERS, SHORT COMMUNICATIONS & NOTES)

2020

110. **Cunningham, P.L.** & Van Rooyen, J. 2020. First confirmed record of green turtle (*Chelonia mydas*) nesting along the Namibian coast. *Namibian Journal of Environment 4, Section B: 16-18.*

2019

109. **Cunningham, P.L.** 2019. Do swing gates prevent black-backed jackal from entering commercial sheep farms? *Namibian Journal of Environment 3, Section B: 1-7.*

108. **Cunningham, P.L.** & Thomas, C. 2019. Boomslang (*Dispholidus typus viridis*) diet. *African Herp News 70: 24-28.*

2018

107. **Cunningham, P.L.** 2018. *Trachylepis occidentalis* (Peters 1867). Western three-striped skink. Avian Predation. *African Herp News 67: 32-34.*

106. **Cunningham, P.L.**, Maartens, L. & Prickett, M. 2018. A contribution to the reptiles of the Kunene River mouth area. *Namibian Journal of Environment 2, Section B: 1-8.*

2017

105. **Cunningham, P.L.** & Detering, F. 2017. Determining age, growth rate and regrowth for a few tree species causing bush thickening in north-central Namibia. *Namibian Journal of*

Environment 1, Section A: 72-76.

2016

104. **Cunningham, P.L.** 2016. Encounters with common warthogs along the B1 highway in north-central Namibia. *Suiform Soundings* 14(2): 32-37.

2014

103. **Cunningham, P.L.** 2014. *Psammobates oculiferus* – dormancy. *African Herp News* 61: 19.

102. **Cunningham, P.L.** 2014. Bush thickening in Namibia – a historic perspective. *Journal of the Scientific Society of Namibia* 62: 164-185.

2013

101. **Cunningham, P.L.** 2013. *Meroles ctenodactylus* (Smith, 1838); Smith's Desert Lizard – Diet. *African Herp News* 60: 22-23.

100. **Cunningham, P.L.** 2013. *Psammophis namibensis* (Broadley, 1975); Namib Sand Snake – Predation. *African Herp News* 60: 24-25.

99. **Cunningham, P.L.** 2013. *Pachydactylus rangei* (Anderson, 1908) Web-footed Gecko – Distribution. *African Herp News* 59: 56-59.

2012

98. **Cunningham, P.L.** 2012. Plants included in the diet of Arabian Sand Gazelle (Reem) from Saudi Arabia. *Journal of King Saud University (Science)* DOI: 10.1016/j.jksus.2012.10.002

97. Hanssen, L. & **Cunningham, P.L.** 2012. Leopard Tortoise *Stigmochelys pardalis*, Bell 1928 –Predation. *African Herp News* 57: 10-11.

96. Schulz, E., Fraas, S., Kaiser, T.M., **Cunningham, P.L.**, Ishmail, K. & Wronski, T. 2012. Food preferences and tooth wear in the sand gazelle (*Gazella marica*). *Mammalian Biology* doi.org/10.1016/j.mambio.2012.04.006

95. **Cunningham, P.L.**, Wassenaar, T. & Henschel, J. 2012. Notes on some aspects of the ecology of the Husab Sand Lizard, *Pedioplanis husabensis*, from Namibia. *African Herp News* 56: 1-11.

94. Cornelius, A., Marais, A. & **Cunningham, P.L.** 2012. *Agama hispida* – distribution. *African Herp News* 56: 35-37.

93. Wronski, T., Bierbach, D., Czupala, L.M., Lerp, H., Ziege, M., **Cunningham, P.L.** & Plath, M. 2012. Rival presence leads to reversible changes in male mate choice of a desert dwelling ungulate. *Behavioural Ecology* doi:10.1093/beheco/arr223

2011

92. **Cunningham, P.L.** 2011. *Agama planiceps* – diet. *African Herp News* 55: 19-20.

91. **Cunningham, P.L.** 2011. *Trachylepis spilogaster* – predation. *African Herp News* 55: 18-19.

90. **Cunningham, P.L.** & Wronski, T. 2011. Sex ratios of Arabian Sand Gazelle *Gazella subgutturosa marica* Thomas, 1897 in the Mahazat as-Sayd protected area, Saudi Arabia. *Mammalia* 75: 243-248.

89. **Cunningham, P.L.**, Sandoka, M. & Wronski, T. 2011. Some morphological

characteristics of Arabian Sand Gazelle *Gazella subgutturosa marica* and its implications for management. *European Journal of Wildlife Research* doi: 10.1007/s10344-011-0498-x

88. **Cunningham, P.L.** & Wronski, T. 2011. Population structure of Farasan gazelle. *Mammalia* 75:157-161.

87. **Cunningham, P.L.** 2011. Wedge-snouted skink, *Trachylepis acutilabris* Peters, 1862: Diet. *African Herp News* 53: 48.

86. **Cunningham, P.L.** & Wronski, T. 2011. Twenty years of monitoring of the vulnerable Farasan gazelle *Gazella gazella farasani*, on the Farasan Islands, Saudi Arabia: an overview. *Oryx* 45(1): 50-55.

85. **Cunningham, P.L.** & Wronski, T. 2011. Seasonal changes in group size and composition of Arabian Sand Gazelle *Gazella subgutturosa marica* Thomas, 1897 during a period of drought in central western Saudi Arabia. *Current Zoology* 57(1): 36-42.

2010

84. **Cunningham, P.L.** & Wronski, T. 2010. Bufonidae, *Bufo dhufarensis* Parker 1931, Dhofar Toad: Geographical Distributions. *African Herp News* 52: 20-21.

83. Wronski, T., Sandouka, M., Plath, M. & **Cunningham, P.L.** 2010. Differences in sexual dimorphism among four gazelle taxa (*Gazella* spp.) in the Middle East. *Animal Biology* 60: 395-412.

82. **Cunningham, P.L.** & van der Waal, C. 2010. *Naja nigricollis nigricincta* (Western Barred Spitting Cobra or Zebra Snake): Diet. *African Herp News* 51: 9-10.

81. **Cunningham, P.L.** & Cunningham, J. 2010. *Varanus albigularis* – diet. *African Herp News* 51: 18-19.

80. **Cunningham, P.L.** & Wronski, T. 2010. Distribution update of the Arabian wolf (*Canis lupus pallipes*) from Saudi Arabia. *Canid Biology & Conservation* 13.1: 1-6 [online]

79. Simang, A., **Cunningham, P.L.** & Henan, B. 2010. Colour selection of juvenile Leopard Tortoises (*Stigmochelys pardalis*) in Namibia. *Journal of Herpetology* 44(2): 328-332.

78. **Cunningham, P.L.** 2010. Checklist of terrestrial reptiles in three Protected Areas in the Kingdom of Saudi Arabia. *Herpetological Review* 41(1): 25-28.

77. **Cunningham, P.L.** 2010. A contribution to the reptiles of the Farasan Islands, Saudi Arabia. *African Herp News* 50: 21-24.

76. **Cunningham, P.L.** 2010. Arabian oryx monitoring in Saudi Arabia: Uruq Bani Ma'arid and Mahazat as-Sayd Protected Areas – 2008 update. *Gnusletter* 28(2): 17-19.

75. Wronski, T. & **Cunningham, P.L.** 2010. The island gazelle: News from the largest known idmi population on the Arabian Peninsula. *Gnusletter* 28(2): 19-22.

2009

74. **Cunningham, P.L.** 2009. Gekkonidae, *Cyrtopodion scabrum* Heyden, 1827 (Keeled Rock Gecko): Predation. *African Herp News* 49:19-20.

73. **Cunningham, P.L.** 2009. Nesting tree utilisation by Brown-necked ravens *Corvus ruficollis* in west central Saudi Arabia. *Sandgrouse* 31: 68-72.

72. Warren, Y., **Cunningham, P.L.**, Mbangi, A. & Tujavi, V. 2009. Preliminary observations of the diet of the black mongoose (*Galerella nigrata*, Thomas, 1928) in the

Erongo Mountains, Namibia. *African Journal of Ecology* [DOI 10.1111/j.1365-2028.2008.10128.x]

71. **Cunningham, P.L.** 2009. Observations of the seasonal dietary preference of male *Gazella subgutturosa marica* Thomas 1897 along foraging trails from central Saudi Arabia. *Journal of Threatened Taxa* 9(1): 445-449.

70. **Cunningham, P.L.** & Watcher, T. 2009. Changes in the distribution, abundance and status of Arabian Sand Gazelle (*Gazella subgutturosa marica*) in Saudi Arabia: A review. *Mammalia* 73: 203-210.

69. **Cunningham, P.L.** 2009. Foraging behaviour of the Egyptian Spiny-tailed Lizard *Uromastyx aegyptia* (Forskål 1775). *Herpetozoa* 22(1/2): 91.

68. **Cunningham, P.L.** & Wronski, T. 2009. Blanford's fox confirmed in the At-Tubaiq Protected Area (northern Saudi Arabia) and the Ibex Reserve (central Saudi Arabia). *Canid Biology & Conservation* 12.4 [online]: 1-7.

67. **Cunningham, P.L.** 2009. Persecution of Rüppell's fox in central Saudi Arabia. *Canid Biology & Conservation* 12.3 [Online]: 1-5.

66. **Cunningham, P.L.** 2009. Seasonal variation in daily activity pattern in a population of Spiny-tailed Lizard, *Uromastyx aegyptius microlepis*, from the United Arab Emirates. *Russian Journal of Herpetology* 16(1): 6-10.

2008

65. Shihepo, F.G., Eiseb, S. & **Cunningham, P.L.** 2008. Fleas (Insecta: Siphonaptera) associated with small mammals in selected areas in Northern Namibia. *Journal of the Scientific Society of Namibia* 56: 5-23.

64. **Cunningham, P.L.** 2008. AGAMIDAE, *Uromastyx aegyptius microlepis* (Blanford, 1874), Egyptian Spiny-tailed Lizard – Prey. *African Herp News* 46: 12-15.

63. **Cunningham, P.L.** & Simang, A. 2008. Ecology of the Bushmanland Tent Tortoise (*Psammobates tentorius verroxii*) in southern Namibia. *Chelonian Conservation & Biology* 7(1): 119-124.

62. **Cunningham, P.L.**, Sher Shah, M., Ul-Islam, Z., Robinson, R. & Boug, A. 2008. Adaptive management a prerequisite for re-introduction of sand gazelle in Saudi Arabia. *Gnusletter* 27(1): 19-21.

61. **Cunningham, P.L.** 2008. Group structure and condition assessment for *Gazella subgutturosa marica* (Reem) during spring 2008 in the Mahazat as-Sayd Protected Area, Saudi Arabia. *Gnusletter* 27(1): 21-23.

60. **Cunningham, P.L.** 2008. GEKKONIDAE, *Ptyodactylus hasselquistii*, Egyptian fan-footed gecko, Donndortt 1789 – Diet. *African Herp News* 45: 6-8.

59. **Cunningham, P.L.** 2008. GEKKONIDAE, *Pristurus gasperetti gasperetti*, Gasperetti's Semaphore Gecko, Arnold 1986 – Distribution. *African Herp News* 45: 16-17.

58. **Cunningham, P.L.** 2008. AGAMIDAE, *Trapelus pallidus agnetae*, Pale Agama, Werner 1929 – Distribution. *African Herp News* 45: 18-20.

57. **Cunningham, P.L.** 2008. SCINCIDAE, *Trachylepis septemtaeniata*, Golden Skink, Reuss 1834 (formerly *Mabuya aurata* Linnaeus 1758) – Distribution. *African Herp News* 45: 21-23.

56. Sher Shah, M. & **Cunningham, P.L.** 2008. Fences as a threat to Sand Cats, *Felis margarita* Loche, 1858, in Saudi Arabia. *Zoology in the Middle East* 44: 104-106.

55. Shapaka, T., Joubert, D.F. & **Cunningham, P.L.** 2008. Alien invasive plants in the Daan Viljoen Game Park. *Dinteria* 30: 19-32.

54. **Cunningham, P.L.** 2008. *Tecoma stans* as a potential alien invasive in Namibia. *Dinteria* 30: 33-39.

2007

53. Menge, L., Diekmann, M., **Cunningham, P.L.** & Joubert, D.F. 2007. Bone intake by vultures in Namibia. *Vulture News* 57: 17-23.

52. **Cunningham, P.L.** & Cunningham, N. 2007. Chameleonidae, *Chamaeleo dilepis* mortality. *African Herp News* 43: 19-20.

51. **Cunningham, P.L.** 2007. Morphological characteristics of the Spiny-tailed Lizard, *Uromastyx aegyptius microlepis* (Agamidae), from the United Arab Emirates. *Zoology in the Middle East* 40: 105-107.

50. **Cunningham, P.L.** & Joubert, D.F. 2007. Cooperative hunting of Gabar Goshawk in Namibia. *Gabar* 18(1): 31-33.

49. **Cunningham, P.L.** & Simang, A. 2007. Some aspects of ecology and behavior of *Homopus* sp. from southwestern Namibia. *Herpetozoa* 19(3/4): 129-134.

2006

48. **Cunningham, P.L.** & Simang, A. 2006. *Psammobates oculiferus* (Kuhl, 1820). Serrated or Kalahari Tent Tortoise - Lying-up places. *African Herp News* 41: 17.

47. **Cunningham, P.L.**, Simang, A. & Ndara, L. 2006. A dietary comparison of two Sympatric tortoises in the Highland Savanna Biome from central Namibia. *Journal of the Scientific Society of Namibia* 54: 19-29.

2005

46. **Cunningham, P.L.** & Strauss, N. 2005. Electrocution of reptiles. *Herpetozoa* 18(3/4): 190.

45. Cowley, T.E., **Cunningham, P.L.** & Joubert, D.F. 2005. Notes on the drinking behaviour of the Double-banded Sandgrouse, *Pterocles bicinctus*, from southern Namibia. *Journal of the Scientific Society of Namibia* 53: 27-36.

44. **Cunningham, P.L.** & Nicholas, A. 2005. *Geochelone pardalis* Bell, 1828. Leopard Tortoise. Prey. *African Herp News* 38: 23-24.

43. **Cunningham, P.L.** & Adank, W. 2005. *Chamaeleo dilepis* Leach, 1819. Flap-neck Chameleon. Prey. *African Herp News* 38: 19-20.

42. **Cunningham, P.L.** & Cunningham, A.I. 2005. A first record of *Coluber smithii* (Boulenger, 1895) from Tanzania. *Herpetozoa* 18(1/2): 91-92.

2004

41. **Cunningham, P.L.** 2004. Checklist of the terrestrial mammals from the United Arab Emirates. *Zoology in the Middle East* 33: 7-20.

40. **Cunningham, P.L.**, Simang, A. & Schleicher, A. 2004. Testudinidae: *Psammobates tentorius verroxii* (Bushmanland Tent Tortoise): Clutch size. *African Herp News* 37: 19-20.

39. **Cunningham, P.L.**, Joubert, D.F. & Adank, W. 2004. *Dodonaea angustifolia* – an alien invasive to Auas Mountains in Namibia? *Dinteria* 29: 11-18.

38. **Cunningham, P.L.**, Adank, W. & Esterhuizen, A. 2004. Notes on some aspects of the ecology of *Kirkia dewinteri* Merxm. & Heine (Kaoko Syringa) from the Kunene Region, Namibia. *Dinteria* 29: 19-26.

37. Hengari, G.M., **Cunningham, P.L.** & Adank, W. 2004. The use of vultures by traditional healers in Namibia. *Vulture News* 50: 23-28.

36. Cowley, T. & **Cunningham, P.L.** 2004. *Agama planiceps* Peters, 1862 as prey item for Black Mongoose *Garella (sanguinea) nigrata*. *Herpetozoa* 17(1/2): 86.

35. Jansen, J. & **Cunningham, P.L.** 2004. *Python natalensis* Smith, 1833 preys on South African Porcupine *Hystrix africaeaustralis*. *Herpetozoa* 17(1/2): 86-87.

2003

34. **Cunningham, P.L.** & Adank, W. 2003. Testudinidae: *Geochelone pardalis* (Leopard Tortoise): Fire avoidance. *African Herp News* 36: 9-10.

33. **Cunningham, P.L.** & Adank, W. 2003. Gekkonidae: *Pachydactylus turneri* (Turner's Thick-toed Gecko): Diet. *African Herp News* 36: 10-11.

32. Esterhuizen, A., Esterhuizen, W., Esterhuizen, J., **Cunningham, P.L.** & Haacke, W. 2003. Varanidae: *Varanus albigularis* (Rock or White-throated Monitor): Distribution. *African Herp News* 36: 16-19.

31. Cowley, T.E., **Cunningham, P.L.** & Joubert, D.F. 2003. The drinking frequency of wing-tagged Namaqua Sandgrouse, *Pterocles namaqua*, at a Namib Desert waterhole. *Journal of the Scientific Society of Namibia* 51: 7-14.

30. **Cunningham, P.L.** 2003. Blackbreasted snake eagle preying on Rüppell's korhaan. *Gabar* 14(1): 27-28

2002

29. **Cunningham, P.L.** & Howarth, B. 2002. Notes on the distribution and diet of Blandford's Fox, *Vulpes cana* Blandford, 1877 from the United Arab Emirates. *Zoology in the Middle East* 27: 21-28.

28. Hebbard, S. & **Cunningham, P.L.** 2002. *Python anchietae* (Angola or Anchieta's Dwarf Python): Reproduction. *African Herp News* 35: 8-9.

27. **Cunningham, P.L.** & Shilongo, K. 2002. *Naja nigricollis nigricincta* (Western Barred Spitting Cobra or Zebra Snake): Diet. *African Herp News* 35: 12-13.

26. **Cunningham, P.L.** 2002. Vultures declining in the United Arab Emirates. *Vulture News* 46: 8-10.

25. **Cunningham, P.L.** 2002. Review of the False Horned Viper *Pseudocerastes persicus* (DUMÉRIL, BIBRON & DUMÉRIL, 1854) from the UAE & northern Oman, including a first record for Jebel Hafit. *Tribulus* 12(1): 26-27.

24. **Cunningham, P.L.** 2002. An inland record of *Chalcides ocellatus* from the UAE. *Tribulus* 12(1): 28.

23. **Cunningham, P.L.** 2002. Status of the Sand Cat, *Felis margarita*, from the United Arab Emirates. *Zoology in the Middle East* 25: 9-14.

22. **Cunningham, P.L.** 2002. Confirmed breeding of the Lichtenstein Sandgrouse *Pterocles lichtensteinii* from the United Arab Emirates. *Zoology in the Middle East* 25:15-18.

21. Joubert, D.F. & **Cunningham, P.L.** 2002. The distribution and invasive potential of Fountain Grass, *Pennisetum setaceum*, in Namibia. *Dinteria* 27: 37-47.

20. **Cunningham, P.L.** 2002. Tadpoles included in the diet of *Coluber rhodorachis* (Jan, 1865). *Herpetozoa* 14(3/4): 173.

19. **Cunningham, P.L.** 2002. *Coluber rhodorachis* (Wadi/Cliff Racer). Diet. *Herpetological Review*. 33 (2): 138.

18. **Cunningham, P.L.** 2002. *Lamprophis fuliginosus* (Brown House-Snake): Foraging. *African Herp News* 34: 28-29.

2001

17. **Cunningham, P.L.**, Feulner, G.R, Couldrey, B. 2001. Chukar nests in the Musandam Peninsula: A first report from Arabia. *The Phoenix* 18: 3-5.

16. **Cunningham, P.L.** & Feulner, G.R. 2001. Notes on the distribution and ecology of the Dhofar toad, *Bufo dhufarensis* Parker 1931, in the Musandam Peninsula (Sultanate of Oman). *Tribulus* 11(2): 9-13.

15. **Cunningham, P.L.** & Aspinall, S. 2001. The diet of Little Owl, *Athene noctua*, in the UAE, with notes on Barn Owl, *Tyto alba*, and Desert Eagle Owl, *Bubo (b.) ascalaphus*. *Tribulus* 11(2): 13-17.

14. **Cunningham, P.L.** 2001. Spiny-tail Lizard *Uromastix aegyptius microlepis* diet – a study in the United Arab Emirates. *Tribulus* 11(2): 28-29.

13. **Cunningham, P.L.** 2001. Notes on the diet, survival rate, and burrow specifics of *Uromastix aegyptius microlepis* from the United Arab Emirates. *Asiatic Herpetological Research*. 9: 30-33.

12. **Cunningham, P.L.** 2001. On the distribution and status of the Arabian Tahr *Hemitragus jayakari*, in the United Arab Emirates and northern Oman. *Zoology in the Middle East* 23: 13-16.

11. **Cunningham, P.L.** 2001. Notes on some aspects of the ecology of *Acanthodactylus ophiodurus* ARNOLD 1980, from the United Arab Emirates. *Herpetozoa* 14(1/2): 15-20.

2000

10. **Cunningham, P.L.** 2000. Summer time budget comparisons for a population of Spiny-tailed Lizard *Uromastix aegyptius microlepis* (Blanford 1874), from the Al Ain region, UAE. *Tribulus* 10(2): 28-30.

9. **Cunningham, P.L.** 2000. Nest construction and building material used by Purple Sunbird in the UAE. *The Phoenix* 17: 12-13.

8. **Cunningham, P.L.** 2000. Daily activity pattern and diet of a population of the Spiny-Tailed Lizard, *Uromastix aegyptius microlepis* (Blanford 1874), during summer in the United Arab Emirates. *Zoology in the Middle East* 21: 37-46.

7. **Cunningham, P.L.** 2000. Cannibalism in a captive *Coluber rhodorachis* (Jan, 1865). *Herpetozoa* 13 (3/4): 192.

6. **Cunningham, P.L.** 2000. The use of burrows by Hoopoe Lark (*Alaemon alaudipes* Desfontaines 1789). *Tribulus* 10(1): 21.

5. **Cunningham, P.L.** & Gross, C. 2000. Reproduction and development of the Arabian Leopard, *Panthera pardus nimr*, in captivity. *Zoology in the Middle East* 20: 9-14.
4. **Cunningham, P.L.** & Thompson, K. 2000. Tick-host Relationships as determined from wildlife in the UAE (Acarina, Fam. Ixodidae) – A Preliminary Study. *Tribulus* 10(1): 16-17.
3. Handley, D.L. & **Cunningham, P.L.** 2000. Sand Snake *Psammodphis schokari* (Forskål 1775): an arboreal hunter. *Tribulus* 10(2): 27-28.
2. Feulner, G.R. & **Cunningham, P.L.** 2000. The Freshwater Goby (*Awaous aeneofuscus*) in the Wadi Hatta watershed (UAE/Oman). *Tribulus* 10(1): 12-15.
1. **Cunningham, P.L.** 1999. A Population of Rock Hyrax (*Procapra capensis*) on Jebel Hafit UAE. *Tribulus* 9(2): 29.

NOT PEER REVIEWED (PAPERS & SHORT COMMUNICATIONS)

43. **Cunningham, P.L.** 2023. Verreaux's eagle scavenges on spotted eagle owl. *Lanioturdus* 56(2): 19-20.
42. **Cunningham, P.L.** & Cunningham, P.L. 2023. Prey items of southern fiscal *Lanius collaris* in southern Namibia. *Biodiversity Observations* 13: 98-105.
41. **Cunningham, P.L.** 2021. Speckled pigeon targeted by pale chanting goshawk and booted eagle in southern Namibia. *Lanioturdus* 54(4): 6-7.
40. **Cunningham, P.L.** 2021. Pied crow preys on adult Namaqua sandgrouse. *Lanioturdus* 54(2): 9-10.
39. **Cunningham, P.L.** (Snr) & Cunningham, P.L. (Jnr) 2021. Southern fiscal prey on tenebrionid beetles and black-eared sparrow-lark in southern Namibia. *Lanioturdus* 54(1): 6-9.
38. **Cunningham, P.L.** 2020. A comparison of black-eared sparrow-lark and grey-backed sparrow-lark nest data from southern Namibia. *Lanioturdus* 53(4): 22-30.
37. **Cunningham, P.L.**, Maartens, L. & Prickett, M. 2019. A review of the birds of the Kunene River mouth area, Namibia. *Lanioturdus* 52(4): 21-37.
36. **Cunningham, P.L.** 2019. Tractrac chat nest data from southern Namibia. *Lanioturdus* 52(4): 10-13.
35. **Cunningham, P.L.** (Snr), Cunningham, P.L. (Jnr) & Cunningham, J. 2019. Some notes on Namaqua sandgrouse (*Pterocles namaqua*) nests from southern Namibia. *Lanioturdus* 52(1): 20-24.
34. **Cunningham, P.L.** 2018. Booted eagle preys on four-striped grass mouse. *Lanioturdus* 51(3): 19-20.
33. **Cunningham, P.L.** 2016. Observations of Karoo long-billed lark feeding associations with some mammals. *Lanioturdus* 49(4): 8-9.
32. **Cunningham, P.L.** 2016. Is Namibia on the brink of being invaded by common starling *Sturnus vulgaris*? *Biodiversity Observations* 7.76: 1-2
31. **Cunningham, P.L.** & Thomson, N. 2016. Southern Double-collared Sunbird *Cinnyris chalybeus* and Malachite Sunbird *Nectarinia famosa* presence in southern Namibia. *Biodiversity Observations* 7.14: 1-4.

30. **Cunningham, P.L.** 2015. It's not the Porsche that pulls the chicks, but real estate. *Lanioturdus* 48(1):19-23
29. **Cunningham, P.L.** 2014. Some notes on Long-billed Crombec nests in a Windhoek garden. *Laniotrudus* 47(3): 23-25.
28. **Cunningham, P.L.** 2014. A historic overview of giraffe distribution in Namibia – *Giraffid* 8(1): 8-13.
27. Orford, J., Orford, R., Orford, M. & **Cunningham, P.L.** 2013. Nest construction by Barred Wren Warbler in central Namibia. *Ornithological Observations* 4: 151-153.
26. **Cunningham, P.L.** 2013. Notes on the presence and nest construction of Chestnut Weavers in Windhoek. *Lanioturdus* 46(4): 8-10.
25. Ntinda, T., **Cunningham, P.L.**, Scott, A., Scott, M. & Versfeld, W. 2012. Are traditional healers contributing to the decline of Blue Cranes in Namibia? *Ornithological Observations* 3: 218-222.
24. Schubert, V., Orford, M., & **Cunningham, P.L.** 2012. Confirmation: Village Indigobird parasitizing Red-billed Firefinch in central Namibia. *Ornithological Observations* 3: 186-187.
23. **Cunningham, P.L.** 2012. Cape wagtail foot injuries – cause for concern? *Lanioturdus* 45(1): 16-17.
22. **Cunningham, P.L.** & Thomson, N. 2011. Notes on Red-billed Firefinch *Lagonosticta senegala* breeding in central Namibia. *Ornithological Observations* 2: 38-39.
21. **Cunningham, P.L.** & Wronski, T. 2010. Distribution update of Arabian wolf (*Canis lupus pallipes*) from Saudi Arabia. *Wildlife Middle East News* 5(3): 4.
20. **Cunningham, P.L.** & Cunningham, J. 2009. Red-billed Firefinch *Lagonosticta senegala* observed in a Windhoek garden. *Lanioturdus* 42(3): 7.
19. **Cunningham, P.L.** & Wachter, T. 2009. Changes in the distribution, abundance and status of the Arabian Sand Gazelle (*Gazella subgutturosa marica*) in Saudi Arabia: A review. *Wildlife Middle East News* 4(3): 5.
18. **Cunningham, P.L.**, Wronski, T. & Al Aqeel, K. 2009. Predators persecuted in the Asir Region, western Saudi Arabia. *Wildlife Middle East News* 4(1): 6.
17. **Cunningham, P.L.**, Sher Shah, M., Khoja, A.R., UI-Islam, Z. & Boug, A. 2008. Determining animal numbers an intricate task. *Wildlife Middle East News* 3(3): 2.
16. Hamukwaya, F. & **Cunningham, P.L.** 2007. Some notes on the breeding of the Crowned Cormorant, *Phalacrocorax coronatus*, from Bird Rock, Namibia. *Lanioturdus* 40(1): 6-8.
15. Brown, I., **Cunningham, P.L.** & De Klerk, M. 2006. A comparative study of wetland birds at two dams in central Namibia. *Lanioturdus* 39(1): 2-9.
14. Sivhute, V., **Cunningham, P.L.**, Adank, W. & Alberts, A. 2005. Wattled crane (*Grus carunculata*) numbers, habitat use and diet in Bushmanland. *Lanioturdus* 38(2): 13-19.
13. Lakay, A. & **Cunningham, P.L.** 2005. A Dietary study of the Bank Cormorant (*Phalacrocorax neglectus*) at Ichaboe and Mercury Islands. *Lanioturdus* 38(1): 6-11.
12. **Cunningham, P.L.** 2005. African Palm Swift distribution. *Lanioturdus* 38(1): 2.

11. **Cunningham, P.L.** 2005. African Green Pigeon distribution. *Lanioturdus* 38(1): 16.
10. **Cunningham, P.L.** & Strauss, N. 2004. Lappet-faced Vulture (*Torgos tracheliotus*) breeding in southern Namibia. *Lanioturdus* 37(3/4): 28-29.
9. Adank, W. & **Cunningham, P.L.** 2004. Melanism in a Laughing Dove (*Streptopelia senegalensis*). *Lanioturdus* 37(3/4): 27-28.
8. **Cunningham, P.L.** 2004. Hadedah Ibis, *Bostrychia hagedash*, sighting in the lower Orange River. *Lanioturdus* 37(2): 10-11.
7. **Cunningham, P.L.**, Adank, W., Mulisa, C. & Simataa, B. 2003. The diet of Barn Owl *Tyto alba* from the Otjivasando area, Etosha National Park. *Lanioturdus* 36(4): 7-11.
6. Theron, L., **Cunningham, P.L.** & Simataa, E. 2003. Notes on the breeding of White Pelicans (*Pelecanus onocrotalus*) at Hardap Dam, Namibia. *Lanioturdus* 36(4): 2-7.
5. **Cunningham, P.L.** 2003. Observations from Peter Cunningham. *Lanioturdus* 36(2): 20-21.
4. **Cunningham, P.L.** 2003. Why do Lappet-faced Vulture's favour smaller carcasses? *Lanioturdus* 36(1): 5-6.
3. **Cunningham, P.L.** & Adank, W. 2002. Notes on the breeding of the Redcrested Korhaan, *Eupodotis ruficrista*. *Lanioturdus* 35(3): 28-30.
2. **Cunningham, P.L.** & Cunningham, A.I. 1999. Observations of Vultures at Domestic Stock Lamb Carcasses. *Lanioturdus* 32(2/3/4): 7-9.
1. **Cunningham, P.L.** 1998. Potential Wood Biomass Suitable for Charcoal Production in Namibia. *Agri-Info* 4(5): 4-8.

PUBLICATIONS IN PROGRESS

In Prep:

1. The variability of bush densities for a few tree species causing bush thickening in central and north-central Namibia
2. Seasonal changes in herd size and time budget of springbok (*Antidorcas marsupialis*) in southern Namibia – African Journal of Ecology.
3. Diet of springbok (*Antidorcas marsupialis*) from southern Namibia
4. Status of *Harpagophyton zeyheri* (devils' claw) in the Zambezi Region, Namibia
5. *Chondrodactylus bibronii* (Bibron's gecko) – diet: cannibalism – Herpetological Review

BOOKS/CHAPTERS/BOOKLETS

6. Cunningham, P.L. 2021. Identifying protected flora, problem species and important habitats under NamPower transmission lines. NamPower/NNF Strategic Partnership, Windhoek, Namibia.
5. Cunningham, P.L. & Jankowitz, W. 2010. A review of fauna and flora associated with coastal and inland saline flats from Namibia with special reference to the Etosha Pan. *Sabkha Ecosystems Volume III: Africa and Southern Europe*. DOI: 10.1007/978-90-481-9673-9_2. Springer Science & Business Media.
4. Cunningham, P.L. 2008. Terrestrial Mammals of the United Arab Emirates with special reference to the Abu Dhabi Emirate. *Terrestrial Environment of Abu Dhabi Emirate*. pp 309 – 378.
3. Cunningham, P.L. 2006. A Guide to the Tortoises of Namibia. Department of Nature

Conservation, Polytechnic of Namibia, Windhoek.

2. Cunningham, P.L. & Feulner, G.R. 2005. Amphibians. *The Emirates – A Natural History*: pp 253-255. Trident Press, London, UK.

1. Loughland, R.A. & Cunningham, P.L. 2002. Vertebrate Fauna of Sabkhat from the Arabian Peninsula: A Review of Mammalia, Reptilia & Amphibia. *Sabkha Ecosystems. The Arabian Peninsula and Adjacent Countries. Volume I*: 255-266.

REPORTS

[All reports related to the various EIA's conducted are excluded here]

28. Cunningham, P.L. & Wronski, T. 2009. Determining Farasan gazelle (*Gazella gazella farasani*) numbers on Farasan Kebir & As Saqid Islands, 26 to 29 June 2009. Unpublished report, KKWRC, Thumamah.

27. Cunningham, P.L. 2009. Determining a sustainable stocking rate for *Gazella subgutturosa marica* (Reem) in the Mahazat as-Sayd Protected Area. Internal KKWRC report, Thumamah.

26. Cunningham, P.L. 2009. Feeding ecology of *Gazella subgutturosa marica* (Reem) in the Mahazat as-Sayd Protected Area: Seasonal comparisons. Internal KKWRC report, Thumamah.

25. Cunningham, P.L. 2009. Seasonal group structure and condition assessment comparisons for *Gazella subgutturosa marica* (Reem) in the Mahazat as-Sayd Protected Area. Internal KKWRC report, Thumamah.

24. Cunningham, P.L. 2009. Annotated checklist of the reptiles occurring in the Mahazat as-Sayd Protected Area. Internal KKWRC report, Thumamah.

23. Cunningham, P.L., Wronski, T. & Al Aqeel, K. 2009. Wadi Tarj-An Namas rapid site and biodiversity survey. Internal KKWRC report, Thumamah.

22. Cunningham, P.L. & Mubarak, S. 2009. Rawdat Khoraim – oryx mortalities & wildlife management recommendations. Unpublished Report, KKWRC, Thumamah, KSA.

21. Cunningham, P.L. 2008. Group structure and condition assessment comparisons for *Gazella subgutturosa marica* (reem) during spring and summer 2008 in the Mahazat as-Sayd Protected Area. Unpublished Report, KKWRC, Thumamah, KSA.

20. Cunningham, P.L. 2008. Comparative feeding ecology of *Gazella subgutturosa marica* (reem) during spring and summer 2008 in the Mahazat as-Sayd Protected Area. Unpublished Report, KKWRC, Thumamah, KSA.

19. Cunningham, P.L. 2008. Ibex mortalities related to wolves – Site visit to the Ibex Reserve. Unpublished Report, KKWRC, Thumamah, KSA.

18. Cunningham, P.L. 2008. Feeding ecology of *Gazella subgutturosa marica* (Reem) during spring 2008 in the Mahazat as-Sayd Protected Area. Unpublished Report, KKWRC, Thumamah, KSA.

17. Cunningham, P.L. 2008. Monitoring Results: Mahazat as-Sayd, July 2008. Unpublished Report, KKWRC, Thumamah, KSA.

16. Cunningham, P.L. 2008. Group structure and condition assessment for *Gazella subgutterosa marica* (Reem) during spring 2008 in the Mahazat as-Sayd Protected Area, June 2008. Unpublished Report, KKWRC, Thumamah, KSA.

15. Cunningham, P.L. 2008. Monitoring Results: Mahazat as-Sayd, May 2008. Unpublished Report, KKWRC, Thumamah, KSA.
14. Cunningham, P.L. 2008. Monitoring Results: Uruq Bani M'arid, March & May 2008. Unpublished Report, KKWRC, Thumamah, KSA.
13. Van Hensbergen, H.J. & Cunningham, P.L. 2004. Preliminary report on miombo growth in the Kilombero Valley. Unpublished Report, Wildhorus Ltd., UK.
12. Cunningham, P.L. & Joubert, D.F. 2003. An environmental impact assessment on bush control methods proposed under the bush encroachment research monitoring & management project. IDC, 9 July 2003.
11. Cunningham, P.L. 2002. Game Count Results as conducted at Midgard Lodge – Hans Grimm Game Camp. Unpublished Report, Midgard Lodge & Polytechnic of Namibia.
10. Cunningham, P.L. 2000. Reptile Recorders Report for the UAE. *Tribulus* 10.1: 22-23.
9. Joubert, D.F. & Cunningham, P.L. 1999. The Distribution and Invasive Potential of *Pennisetum setaceum* (Fountain grass) in Namibia. Internal report, Polytechnic of Namibia, Department of Natural Resource Management and Tourism, Windhoek.
8. Cunningham, P.L. 1998. Krumhuk Veld Evaluation According to the Step Point Method – Comparison between 1997 and 1998. Internal report, Polytechnic of Namibia, Department of Natural Resource Management and Tourism, Windhoek.
7. Cunningham, P.L. 1997. Drinking Times Observed for Different Species at Okaukuejo Water Hole, Etosha National Park. Internal report, Polytechnic of Namibia, Department of Natural Resource Management and Tourism, Windhoek.
6. Cunningham, P.L. 1997. Pilot Study to Determine Densities of Certain Species and the Potential Wood Biomass Suitable for Charcoal Production. Internal report, Polytechnic of Namibia, Department of Natural Resource Management and Tourism, Windhoek.
5. Cunningham, P.L. 1997. Ecological Consequences of Bush Thickening with Special Reference to Namibia. Internal report, Polytechnic of Namibia, Department of Natural Resource Management and Tourism, Windhoek.
4. Cunningham, P.L. 1997. Krumhuk Veld Evaluation According to the Step Point Method. Internal report, Polytechnic of Namibia, Department of Natural Resource Management and Tourism, Windhoek.
3. Cunningham, P.L. 1996. Drinking Times Observed for Different Species on the Cheetah Conservation Foundation. Internal report, Polytechnic of Namibia, Department of Natural Resource Management and Tourism, Windhoek.
2. Cunningham, P.L. 1996. Ongava Lodge Game Count Results. 24-Hour water point game census conducted on Ongava Lodge. Internal report, Polytechnic of Namibia, Department of Natural Resource Management and Tourism, Windhoek.
1. Cunningham, P.L. 1992. Time Budget and Spatial Distribution of Springbok and Blesbok on an Enclosed Area in the South Western Cape. Internal report, University of Stellenbosch, Department of Nature Conservation, Stellenbosch.

PROCEEDINGS

5. Cunningham, P.L. 2006. Preliminary results on the movement, home range and diet of *Geochelone pardalis* & *Psammobates tentorius verroxii* in Namibia. *Chelonii* Volume 4, March 2006, 112-114. 2ND International Congress on Chelonian Conservation, 18-22 June

2003, Saly, SENEGAL

4. Hengari, G.M., Cunningham, P.L. & Adank, W. 2005. Raptors and traditional healers in Namibia. Proceedings of a workshop held at a Namibia Birds of Prey Workshop, 18-19 February 2005, Waterberg Plateau Park, Namibia, *Lanioturdus* 38(3/4): 22-29.

3. Cunningham, P.L.1997. Prospects of sustained utilisation of mopane (*Colophospermum mopane*) for charcoal production in the Venetia Limpopo Nature Reserve in South Africa. Management of Mopane in Southern Africa. Proceedings of a workshop held at Ongongo Agricultural College, Namibia, 26-29 November 1996.

2. Van Hensbergen, H.J. & Cunningham, P.L.1996. Sustainable Use Management *Colophospermum mopane*. WMA Symposium on Sustainable Use of Wildlife, Cape Town 1996.

1. Van Hensbergen, H.J. & Cunningham, P.L.1994. Utilisation of Renosterveld by Two Ungulate Species on an Enclosed Area in the South Western Cape.

CONFERENCES & WORKSHOPS

AUGUST 2008 Workshop to minimise mass mortalities of reintroduced animals in Mahazat as-Sayd Protected Area, 2-7 August, Taif, Saudi Arabia.

JULY 2007 5th Annual Symposium on the Conservation and Biology of Tortoises and Freshwater Turtles, 24-28 July, Atlanta, Georgia, USA.
PAPER PRESENTED: Distribution, status and threats to the tortoises of Namibia.

FEBRUARY 2005 Namibia Birds of Prey Workshop, 18-19 February, Waterberg Plateau Park, NAMIBIA
PAPER PRESENTED: Raptors and traditional healers in Namibia.

JUNE 2003 2nd International Congress on Chelonian Conservation, 18-22 June, Saly, SENEGAL
PAPER PRESENTED: Preliminary results on the movement, home range and diet of *Geochelone pardalis* & *Psammobates tentorius verroxii* in Namibia.

DECEMBER 2001 4th World Conference in Herpetology, 2-9 December, Colombo, SRI LANKA
PAPER PRESENTED: Feeding ecology of Spiny-tail Lizard, *Uromastix aegyptius microlepis*, from the United Arab Emirates.

APRIL 2000 2nd Arab International Conference and Exhibition on Environmental Biotechnology (Coastal Habitats) Abu Dhabi, UNITED ARAB EMIRATES.

JANUARY 2000 First International Symposium on Arid Zone Environments: Research and Management Options for Protected Areas. Abu Dhabi, UNITED ARAB EMIRATES.

NOVEMBER 1996 Workshop on Mopane Management in Southern Africa. Ongongo College, NAMIBIA.
PAPER PRESENTED: Prospects for the sustained utilization of mopane, *Colophospermum mopane*, for charcoal production in the Venetia Limpopo Nature Reserve, South Africa.

POSTERS

AUGUST 2011 Foraging behaviour and dietary adaption of the Arabian Sand Gazelle (Schultz, E., Fraas, S., Kaiser, T.M., Cunningham, P.L., Ismail, K. & Wronski, T.)

| | |
|----------------|--|
| MAY 2011 | How vulnerable is the Husab Sand Lizard to mining? (Wassenaar, T., Henschel, J., Cunningham, P.L., Herrmann, H-W. & Wilson, T.) |
| MAY 2009 | Seasonal dietary preference of male <i>Gazella subgutturosa marica</i> Thomas 1897 along foraging trails from central Saudi Arabia (Cunningham, P.L.) |
| MAY 2009 | Group dynamics of <i>Gazella subgutturosa marica</i> from central western Saudi Arabia (Cunningham, P.L.) |
| MAY 2009 | Feeding ecology of <i>Gazella subgutturosa marica</i> from central western Saudi Arabia (Cunningham, P.L.) |
| SEPTEMBER 2007 | An invasive alien plant road count as a useful monitoring tool: a proposal and some preliminary results Arid Zone Forum, Sutherland, SOUTH AFRICA (Joubert, D.F., Cunningham, P.L., De Cauwer, V. & Robertson, A.) |
| MAY 2007 | Tortoises of Namibia (Information poster) (Cunningham, P.L.) |
| JANUARY 2000 | Invasive Fountain Grass in Namibia: Cause for Concern Grassland Congress, ZIMBABWE (Joubert, D.F. & Cunningham, P.L.) |

POPULAR PUBLICATIONS

53. Cunningham, P.L. 2020. Do swing gates keep jackals from entering commercial sheep farms? *AgriForum June 2020: 34-36.*
52. Cunningham, P.L. & Detering, F. 2017. Farming with trees – age, growth rate and regrowth of some bush thickening trees in Namibia? *AgriForum December 2017/January 2018: 42-44.*
51. Cunningham, P.L. & Detering, F. 2017. Farming with trees...is this the answer to bush thickening in Namibia? *AgriForum July: 48-52.*
50. Cunningham, P.L., Marais, A. & Van Zyl, N. 2015. Above-ground pipelines as wildlife barriers in the Namib Desert. *Roan News – Special edition on water 2015: 50-54.*
49. Cunningham, P.L. 2014. Prey selection of a domestic cat in a suburban Windhoek garden. *Newsletter of the Scientific Society of Namibia 55(1-4): 53-57.*
48. Cunningham, P.L. 2013. Warmbad – More than just a forgotten settlement. *Flamingo – April 2013: 36-37.*
47. Cunningham, P.L. 2012. Namibia's religious geological features. *Flamingo – February 2012: 42-43.*
46. Cunningham, P.L. & Joubert, D.F. 2011. Small birds favour small thorny shrubs. *Roan News – December 2011: 27-29.*
45. Cunningham, P.L. 2011. William Chapman - Reminiscences. *Flamingo – March 2011: 49.*
44. Cunningham, P.L. 2011. Otjimbingwe – the capital that never was. *Flamingo – March 2011: 44-45.*
43. Cunningham, P.L. 2010. Obituary: Ymke Warren, 1970-2010. *Roan News – December 2010: 6-8.*
42. Cunningham, P.L. 2010. Messages from Wlotoskabaken. *Flamingo – August 2010: 61.*

41. Cunningham, P.L. 2010. House names in Henties Bay – banal, balmy and mythological. *Flamingo* – July 2010: 41.
40. Cunningham, P.L. 2010. The intrepid people behind the names. *Flamingo* – January 2010: 52-53.
39. Cunningham, P.L. 2009. The Battle for Trekkopje – armoured cars doing battle in Namibia. *Flamingo* – June 2009.
38. Cunningham, P.L. 2009. River spotting. *Flamingo* – February 2009: 28-31.
37. Cunningham, P.L. 2009. Namibia’s own passion flower. *Flamingo* – January 2009: 46-47.
36. Cunningham, P.L. 2008. Fact versus Factoid. *Flamingo* – September 2008: 34-37.
35. Cunningham, P.L. 2008. Bountiful Bethanie. *Flamingo* – April 2008: 35-37.
34. Cunningham, P.L. 2007. Polytechnic Department of Nature Conservation – Annual Awards. *Travel News Namibia* 15(7): 29.
33. Sambu, J. & Cunningham, P.L. 2007. Use of Wildlife by Traditional Healers in the Caprivi Region. *Roan News* June 2007: 5-7.
32. Cunningham, P.L. 2007. Namibian stranglers. *Flamingo* – June 2007: 48-49.
31. Cunningham, P.L. 2007. Flightless birds of Windhoek. *Flamingo* – May 2007: 46-49.
30. Kuruseb, E. & Cunningham, P.L. 2006. Are we drowning our wildlife? *Roan News* (Issue 2): 12-13.
29. Kolberg, H., Brain, N., Cunningham, P.L., Kolberg, C., Scott, A., Scott, M., Shatumbu, G. & Shivute, B. 2006. Where have all the Blue Cranes gone? Second crane survey supplies more questions than answers. *Roan News* (Issue 2): 20-21.
28. Cunningham, P.L. 2006. Kunene Adventures. *Flamingo* – November 2006: 29-31.
27. Simmons, R., Brown, C.J., Cunningham, P.L., Kapofi, I., Kolberg, H., Scott, A., Scott, M. & Versveld, W. 2006. Etosha Blues - Cranes hang on in Namibia. *African Birds & Birding* August/September 2006 11(4): 51.
26. Cunningham, P.L. 2006. The next generation of conservators. *Conservation and the Environment in Namibia*. 2006/7: 46-47.
25. Cunningham, P.L. 2006. A wonderland of farm names. *Flamingo* – May 2006: 34-35.
24. Cunningham, P.L. 2005. Prey selection of a domestic cat in a suburban Windhoek garden. *Roan News* (Issue 2): 4-6.
23. Cunningham, P.L. 2005. Signs of the wild. *Flamingo* – November 2005: 40-41.
22. Cunningham, P.L. 2005. It’s all in a name. *Flamingo* – October 2005: 27.
21. Cunningham, P.L. & Cunningham, A.I. 2005. A Forgotten Time in the Spergebied. *Flamingo* – May 2005: 48-49.
20. Cunningham, P.L. 2005. The tortoise formation – a Roman battle tactic. *Flamingo* - March 2005: 24-25.

19. Cunningham, P.L. 2004. The elusive Nama Padloper. *Conservation and the Environment in Namibia*. 2004/5: 25.
18. Cunningham, P.L. 2004. The Wildlife Society's Roan News. *Travel News Namibia* 12(6): 9.
17. Cunningham, P.L. 2004. Do tortoises need to be saved? *Travel News Namibia* 12(5): 9.
16. Cunningham, P.L. 2004. Tortoise research in Namibia. *Newsletter of the Scientific Society of Namibia* 45(1-3): 10-14.
15. Cunningham, P.L. 2004. Researching the elusive Nama Padloper. *Travel News Namibia* 12(2): 8.
14. Cunningham, P.L. 2003. Preliminary results on the diet of two tortoise species from Namibia. *Roan News* (Issue 2): 19-22.
13. Cunningham, P.L. & Adank, W. 2003. Flap-neck chameleon breeds in Windhoek garden. *Roan News* (Issue 1): 15-16.
12. Cunningham, P.L. 2002. The amazing sand-diving lizards. *Roan News* (Issue 3/4): 18.
11. Cunningham, P.L. 2002. Problems Caused by Chacma Baboons (*Papio ursinus*) in Windhoek – Questionnaire Results. *Roan News* (Issue 3/4): 12-16.
10. Cunningham, P.L. 2002. Dates, camels, mosques and desert – my time in Arabia. *Newsletter of the Scientific Society of Namibia* 43(4-6): 34-38.
9. Cunningham, P.L. 2002. Domestic cats as a threat to the environment in Namibia. *Roan News* (Issue 1/2): 11-13.
8. Cunningham, P.L. 2002. Navachab, vultures and the restaurant – a Wildlife Society getaway weekend. *Roan News* (Issue 1/2): 17-19.
7. Cunningham, P.L. 2001. Critters and other Creepy Crawlies. Scorpions & Spiders in ADCO Fields. *Al Waha* – October 2001.
6. Cunningham, P.L. 2001. Vanishing Vipers. *Al Waha* – September 2001.
5. Joubert, D.F. & Cunningham, P.L. 2001. Fountain Grass in Namibia: Cause for concern? *Roan News* (Issue 2/3): 23-26.
4. Cunningham, P.L. 1999. Problems Caused by Chacma Baboons (*Papio ursinus*) in Windhoek – Questionnaire Results. *Newsletter of the Scientific Society of Namibia* 40(4-6): 10-14.
3. Cunningham, P.L. 1998. Dealing with Baboons. *Newsletter of the Scientific Society of Namibia* 39(1-3): 15-18.
2. Cunningham, P.L. 1998. Wetland waiting to be discovered. *Travel News Namibia* Dec 97/Jan 98: 13.
1. Cunningham, P.L. 1998. Baboon Problems. Information Pamphlets for the Windhoek Municipality, Namibian Wildlife Society and Polytechnic of Namibia.

PAPERS REVIEWED

1. *African Herp News*: Bauer, A. & Lamb, T. *Pachydactylus fasciatus* Boulenger 1888.

2. **Journal of the Scientific Society of Namibia:** Henchel *et al.* Vertebrate fauna in the Gobabeb area.
3. **Vulture News:** Beilis, N. & Esterhuizen, J. The potential impact on Cape griffon populations due to the trade in traditional medicine in Maseru, Lesotho.
4. **5th International Conference on Entrepreneurship & Innovation** (24-25 October 2007, Windhoek, Namibia). Blind review. Corporate citizenship without business ethics: student's perceptions.
5. **Biodiversity and Conservation:** Stein, A.B., Fuller, T.K. & Marker, L.L. Occurrence and relative abundance of mammals and birds in and adjoining Waterberg Plateau Park, north central Namibia.
6. **6th International Conference on Entrepreneurship & Innovation** (5-6 November 2008, Maputo, Mozambique). Blind review. Tourism entrepreneurship and poverty alleviation in the face of HIV/AIDS – the case of Botswana.
7. **Dinteria:** Nordenstam, B. A second species of the Namibian genus *Dauresia* (Asteraceae-Senecioneae).
8. **Dinteria:** Joubert, D.F. The effects of “pebble mulch” on *Acacia mellifera* seedling responses to rain.
9. **Herpetological Conservation & Biology:** Soorae, P.S., Al Quarqas, M. & Gardner, A.S. An overview and checklist of native and alien herpetofauna of the United Arab Emirates
10. **Journal of Horticulture & Forestry:** Anon. Specifying dry duration and its relation to pasture products of desert zones, Iran.
11. **Journal of Hospitality Management & Tourism:** Ogunjemite, B.G., Ashimi, T.A. & Okeyoyin, O.A. The chimpanzee community of German-Fort, and the potential for the development of tourism-based management of Gashaka-Gumti National park, Nigeria.
12. **Mammalia:** XIA Canjun, YANG Weikang, David Blank, XU Wenxuan, QIAO Jianfang, LIU Wei. Diurnal time budget of goitred gazelles (*Gazella subgutturosa* Gldenstaedt, 1780) in Xinjiang, China.
13. **African Herp News:** Bourqin, O. The terrestrial reptiles of Sir Bani Yas Island, UAE.
14. **Journal of Arid Environments:** Robinson, M.D. & Barrows, C.W. Namibian and North American sand diving lizards.
15. **Mammalia:** Blank, D. et al. Grouping pattern of Goitered gazelle *Gazella subgutturosa* (Artiodactyla: Bovidae) in Kazakhstan.
16. **Folia Zoologica:** Xu, W. et al. Diet of *Gazella subgutterosa* (Gldenstaedt, 1780) and food overlap with domestic sheep in Xinjiang, China.
17. **Ethology, Ecology & Evolution:** Blank, D. & Yang, W. The Social Organization of the Goitered gazelle (*Gazella subgutturosa* Guld, 1780).
18. **Acta Theriologica:** Blank, D. & Yang, W. Sex ratio in goitered gazelles (*Gazella subgutturosa* Guld, 1780).
19. **Zoology in the Middle East:** Wronski, T. Population development of Arabian Gazelles (*Gazella arabica*) on the Farasan Islands, Saudi Arabia.
20. **Behavioural Processes:** Xia, C. et al. The energy-maintenance strategy of goitered gazelle (*Gazella subgutturosa*) during rut.
21. **Zoology in the Middle East:** Mohammed et al. First record of sand cat from Iraq.
22. **Turkish Journal of Zoology:** Grlr et al. Some morphological characteristics and neonatal weights of re-introduced gazelle (*Gazella subgutturosa*) in Turkey.
23. **Canid News:** Eid et al. Additional knowledge regarding Blanford's fox *Vulpes cana* from Jordan.
24. **Mammalian Biology:** Wronski, T. & Schulz, E. The Farasan Gazelle – a frugivorous browser in an arid environment?
25. **Italian Journal of Zoology:** Akbari et al. Seasonal changes in group size and composition of Chinkara (*Gazella bennettii*) in central Iran.
26. **Journal of Arid Environments:** Welch et al. Somewhere to hide: Home range and habitat selection of cheetahs in an arid enclosed system.
27. **Mammal Research:** Blank, D. & Yang, W. Strategy of goitered gazelle suckling behaviour and its adaptation to the environment.
28. **Mammalia:** Abgar et al. Social organization and demography of reintroduced dorcas gazelle (*Gazella dorcas neglecta*) in North Ferlo Fauna Reserve, Senegal

29. **Mammalian Biology:** Wronski, T., Sun, P. & Plath, M. Resource availability predicts the distribution of Arabian gazelles (*Gazella arabica*) on Farasan Islands.
30. **Saudi Journal of Biological Sciences:** Anon. Conservation in Saudi Arabia; from strategy to practice.
31. **Behavioural Processes:** Blank, D. Mother-young recognition in goitered gazelle during hiding period.
32. **African Journal of Ecology:** El Alami, A. Confirmation of the presence of Cuvier's gazelle in the regions of Ait Tamlil and Anghomar, southern slope of the central high Atlas, Morocco.
33. **Namibian Journal of Environment:** Zimmerman, I. et al. The influence of two levels of debushing in Namibia's thornbush savannah on overall soil fertility measured through bioassays.
34. **Zoology:** Blank, D. Alarm signals in goitered gazelle with special reference to stotting, hissing and alarm urination-defecation.
35. **Behavioural Processes:** Blank, D. The use of tail-flagging and white-rump patch in alarm behaviour of goitered gazelles.
36. **Journal of Arid Environments:** Al-Sayegh, M.T. et al. Impact of anthropogenic disturbance and vegetation composition on ecophysiology and activity behavior of *Uromastyx aegyptia* (Forskål, 1775).
37. **Behavioural Processes:** Blank, D. Female-female aggression in goitered gazelles: the desire for loneliness.
38. **Mammalia:** Amed, S.A. & Al-Sheikhly, O.F. First record of Blanford's fox *Vulpes cana* (Blanford, 1877) from Iraq.
39. **Jordan Journal of Natural History:** Anon. Towards improving conservation strategies for the endangered Arabian wolf, *Canis lupus arabs*.
40. **Saudi Journal of Biological Sciences:** Anon. Thermoregulation and adaptation to oxidative stress in poikilothermic Dabb lizard, (*Uromastyx microlepis*): An experimental study.
41. **Behavioural Processes:** Blank, D. Activity behaviour of goitered gazelle in an arid environment.
42. **Journal of Threatened Taxa:** Anon. Mammal species detection in arid habitats.
43. **Journal of Arid Environments:** Blank, D. Ungulate adaptations to counteract overheating and water deficit in arid environment.

BOOKS REVIEWED

1. **Copeia: The Amphibians and Reptiles of Oman and the UAE:** Gardner, A.S. 2013. Edition Chimaira. ISBN 9783899734331.

NEWSPAPER ARTICLES

- Cunningham, P.L. 2006. Do Domestic Cats Harm the Local Fauna in Windhoek? Republikein 8 June 2006: 8.
- Cunningham, P.L. 2006. Are Traditional Healers Causing the Decline of Vultures in Namibia? Republikein 22 June 2006: 9.
- Cunningham, P.L. 2006. Do baboons cause significant problems in and around Windhoek? Republikein 20 July 2006: 9.
- Cunningham, P.L. 2006. Wanted: Dead or Alive. Are we drowning our wildlife? Republikein 17 August 2006: 9.
- Laubsher, N. 2007. Wildlewe besig on stryd te verloor. Republikein 7 May 2007: 7. [Info supplied for article]
- Laubsher, N. 2007. Studente aangemoedig om natuurbewaring by Politegnikum te studeer. Republikein 10 May 2007: 8. [Info supplied for article]
- Laubsher, N. 2007. Jakkalsdraad om kleinveekampe maai onder reptiele. Republikein 4 June 2007: 4. [Info supplied for article]
- Laubsher, N. 2007. VSA-studente leer oor bewaring in Kavango. Republikein 26 June 2007: 5. [Info supplied for article]
- Laubsher, N. 2007. Nama padloper enig in sy soort. Republikein 11 July 2007: 7. [Info supplied for article]

- Cunningham, P.L. 2007. Polytechnic Department honours IRDNC. Namibian 27 July 2007: 7.
- Laubsher, N. 2007. Suutjies trap help nie altyd. Republikein 17 August 2007: 5. [Info supplied for article]
- Mulder, S. 2009. Anglo-Boereoorlog-dagboeke ná 'n eeu weer uit en tuis. Volksblad 3 November 2009 [Info supplied for article]
- Cunningham, P.L. 2010. NEWS spreads the news. Namibian 29 July 2010: 8.
- Cunningham, P.L. 2011. Latest Roan News magazine out. Namibian 20 January 2011: 8.
- Cunningham, P.L. 2014. FSC charcoal certification the answer for Namibian producers. Die Boer, June 2014: 4-5.
- Cunningham, P.L. 2014. An historic look at bush thickening in Namibia – Anecdotal evidence from the past. Die Boer, July 2014: 10.

EDITORIAL ACTIVITIES

NAMIBIAN ENVIRONMENT & WILDLIFE SOCIETY (NEWS) MAGAZINE [ROAN NEWS] (EDITOR)

- Issue 3 & 4 – 2002; Issue 1 & 2 – 2003; Issue 1 & 2 – 2004; Issue 1 & 2 – 2005; Issue 1 & 2 – 2006; Issue 1 – 2007

NAMIBIAN ENVIRONMENT & WILDLIFE SOCIETY (NEWS) NEWSLETTER (EDITOR)

- Issues 1 to 5 – August to December 2007; Issues 1 to 10 – March to December 2010; Issues 1 to 12 – January to December 2011; Issues 1 to 12 January to December 2012; Issues 1 to 12 – January to December 2013; Issue 1 – January 2014

SCIENTIFIC SOCIETY OF NAMIBIA BOTANICAL JOURNAL - DINTERIA (EDITOR)

- Issue 30 – 2008; Issue 31 – 2010 (Co-editor); Issue 32 – 2012; Issue 33 – 2013; Issue 34 – 2014; Issue 35 – 2015

KING KHALID WILDLIFE RESEARCH CENTRE – QUARTERLY REPORT (COMPILE & EDIT)

- 2008: Issue 1 – January to March 2008; Issue 2 – April to June 2008; Issue 3 – July to September 2008
- 2009: Issue 1 – January to March 2009; Issue 2 – April to June 2009; Issue 3 – July to September 2009

ORGANISATIONS, GROUPS & MEMBERSHIPS

Namibia Environmental & Wildlife Society (NEWS)

- Committee Member (2002-2007; 2010-current), Vice Chairperson (2007) & Chairperson (2010-2014)
- Editor – Roan News (2002-2007 & 2014); Editor – NEWS-letter (2007, 2010 to January 2014)
- Member 2002 – 2007; 2010-current

Raptor Working Group - Namibia

- Involved with Raptor Road Counts throughout Namibia
- 2005 – 2007; 2010-2014

NANGOF Trust

- Trustee on NANGOF council
- November 2010-February 2013

ECO-Awards

- Assessor – lodges
- Lodges assessed: NamibRand Family Hideout; Kroone Camp (Wilderness Safaris); Namib Desert Lodge (Gondwana Collection); Dústernbrook Guest Farm; Ngepi Lodge, River Dance Lodge, Fish River Canyon Lodge; The Stiltz; Desert Breeze Lodge; Hakos Guest Farm; Heimat Guest Farm; Alte Kalköfen Guest Farm; Kulala Desert Lodge; Little

Kulala; Kulala Adventure Camp; Gondwana Canyon Lodge; Gondwana Canyon Village;
Gondwana Roadhouse.

- 2011-2017

Game Rangers Association – Namibian Chapter

- 2012-2021

Namibian Bird Club

- 2002 – current

Namibian Botanical Society

- 2002-2018

Emirates Natural History Group (ENHG)

- Committee Member – Al Ain Branch
- 1999-2003

Technical Committee: Implementation of the World Heritage Convention in Namibia:
Twyfelfontein Dossier

- Committee Member
- 2004-2007 (Twyfelfontein Proclaimed Namibia's 1st World Heritage Site)

National Inter-sectoral committee on the Okavango River Basin

- Committee Member
- 2005-2007

Crane Working Group - Namibia

- Involved with Blue Crane research in Etosha NP
- 2005-2007

Advisory Board – Fisheries Inspectors & Observers Course (FIOC), Ministry of Fisheries &
Marine Resources

- Advisory Board Committee member
- 2006-2007

Membership (past & present)

- Herpetological Association, Africa
- Environment and Wildlife Society, Namibia
- Game Rangers Association, Namibia
- Bird Club, Namibia
- Botanical Society, Namibia

COMPUTER LITERACY

General Computer Programmes

- Microsoft Office, Excel & Publisher

Other Programmes

- Statgraphics, Sigma Stat, Systat
- Integrated System for Plant Dynamics (ISPD)
- Biomass Estimate from Canopy Volume (BECVOL)
- Mopane harvesting programme (MOPHIN)

REFERENCES

Dr. E.R. Robinson (Director, KKWRC)

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Ashley Meyer

BEng.

Environmental Consultant



Ashley Meyer is a qualified Mechanical Engineer (BEng. Mech. Mechanical Engineering). His responsibilities include the management and execution of projects including environmental baseline assessments, engineering emissions inventory development, computational air dispersion modelling and noise modelling, and impact assessments for projects globally. Ashley's areas of expertise include industrial noise modelling and noise impact assessments, acoustically induced vibration and flow induced vibration. Ashley has been involved in projects across sectors including oil and gas, petrochemical, energy, manufacturing and mining. He has excellent knowledge of national and international laws, regulations and guidelines associated with environmental and occupational noise studies and assessments.

EDUCATION

- BEng: Mechanical Engineering (University of Pretoria), (2012)

COUNTRIES OF WORK EXPERIENCE

Africa: South Africa, Mozambique, Democratic Republic of Congo, Kenya, Zambia and Nigeria.

Asia: Indonesia, Malaysia, Oman, Iraq, Pakistan, Saudi Arabia, United Arab Emirates, Vietnam, and Turkmenistan.

LANGUAGES

English, Afrikaans

CAREER SUMMARY

- 2019 onwards
Senior Consultant, WKC Group
- 2013 – 2018
Environmental Engineer, WKC Group
- 2012 – 2013
Graduate Engineer, ACEND Consulting Engineers

FIELDS OF SPECIAL COMPETENCE

- Noise Impact Assessment
- Acoustically Induced Vibration Assessment
- Air Quality Impact Assessment

KEY EXPERIENCE

Noise Studies

- Final Noise Study for the EPC phase of the chemical and refining integrated Singapore project (CRISP) which involves the expansion of ExxonMobil's refinery in Singapore.
- Preliminary Noise Modelling Study for the Al-Zour Refinery in Kuwait owned by Kuwait Integrated Petro-chemical Industries Company's (KIPIC). The noise modelling study was undertaken using internationally recognised noise modelling software: SoundPLAN. Overall, the project entailed the complete noise model development, and assessment of occupational and environmental noise associated with five (5) separate Engineering, Procurement and Construction (EPC) packages.
- Preliminary Noise Modelling Study for the Refinery and Petrochemicals Integrated Development (RAPID) Package 3 Project, located in Indonesia. The study involved noise modelling and impact assessment of Hydrotreating units, Catalytic Reforming Unit, Hydrogen Production Units, Saturated Gas Plant, interconnection and flare for the Refinery.
- Preliminary Noise Modelling Study and AIV Assessment for the Satah Al-Razboot (SARB) Plant Facilities Project, owned by the Abu Dhabi National Oil Company (ADNOC), and located in the Arabian Gulf, UAE. The noise modelling assessment consisted of the noise model

development of the twin artificial islands (SARB-1 and SARB-2), and the Zirku island where the processing facility is located. The assessment included occupational and environmental noise, as well as an AIV assessment.

- Noise Modelling and impact assessment for the Garraf Simple Cycle Project – Power Generation Phase I for PETRONAS, forming part of the larger Garraf Operations in Iraq.
- Noise Modelling and Noise Impact Assessment for the Jazan Economic City (JEC) located in Jazan Saudi Arabia. The JEC is one of four economic cities currently under development in the Kingdom and is planned to be a large integrated city of over 150,000 residents, supporting over 78,500 jobs across various economic sectors and includes plans for residential areas, green space, light, medium and heavy industries as well as utilities provision.
- Noise modelling and impact assessment of the extension of the Green Line Red Line mass rapid transit (MRT) system in Dubai, UAE. (Green Line Red Line Expansion project)
- Noise baseline monitoring and Noise Impact Assessment of the proposed Advanced Water Treatment Demonstration Project located in Durban, South Africa. The project involves the construction of a demonstration plant, which combines seawater desalination by (means of reverse osmosis) and wastewater recycling. The assessment considered the construction and operations phases of the project.
- Noise baseline monitoring and Noise Impact Assessment of the proposed Floating Dry Dock Project located in Port of Richards Bay, South Africa. The assessment focused on the four phases of the construction of the supporting infrastructure including dredging, construction of a revetment, construction of mooring dolphins and jetty, and the construction of land-based facilities.
- Baseline noise monitoring and Noise Impact Assessment for the Primary Copper ESIA for the Kinsevere Copper Mine in the Democratic Republic of Congo. The assessment considered the extension of the mine and new processing facilities required to mine and process the sulphide ore.
- Noise baseline monitoring for the Northern Aqueduct Augmentation Project in Durban. The Project involved the development of the Phase 5 aqueduct from the Durban Heights to the Duffs Road connecting to the Phase 4 Northern Aqueduct.
- Preliminary Noise Modelling Study for the Karbala Refinery Project (KRP) located in Iraq. The study was undertaken for the EPC phase of the project which was awarded to the HDGSK Joint Venture (including HEC, GS E&C and SK E&C).
- Baseline noise monitoring and Noise Impact Assessment (including detail noise modelling) for Mamatwan Manganese Mine in the Northern Cape, South Africa. The assessment focused operational phase of the proposed new tailings dam and associated infrastructure.
- Final Noise Modelling Study for the Rabigh II Refining and Petrochemical Project CP 3/4 – Noise Modelling – Current
- Final Noise Modelling Study for the Attock Refinery Limited Upgrading Project in Morgah Rawalpindi, Pakistan – Noise Modelling
- Final Noise Modelling Study for the SADARA Isocyanates Projects in Jubail, Saudi Arabia – Noise Modelling.

KEY EXPERIENCE (Continued)

- Noise modelling and impact assessment of the Ba al Ghailam and Al Sader residential developments located in Abu Dhabi, UAE.
- Noise Impact Assessment for the Umgungundlovo Composting Facility in Pietermaritzburg, South Africa – Baseline Noise Measurements and Noise Modelling
- Preliminary Noise Modelling Study for the GASCO Early Nitrogen Rejection Units Project in Saudi Arabia – Noise Modelling
- Preliminary Noise Modelling Study for Rabigh II Refining and Petrochemical Project CP 2 – Noise Modelling
- Preliminary Noise Modelling Study for the Carbon Black Delayed Coker Project in the Ruwais Industrial Complex in the UAE – Noise Modelling.
- Preliminary Noise Modelling Study for the PTC Polysilicon Manufacturing Facility in Jubail, Saudi Arabia – Noise Modelling.
- Noise Impact Assessment for the proposed Corobrick Platforms in Durban North, South Africa – Baseline Noise Measurements.
- Preliminary Noise Modelling Study and AIV Assessment for the Turkmenistan GTPOGT Expansion and Modification Project in Turkmenistan – Noise Modelling and AIV Assessments
- Screening Noise Assessment for the Kinangop Wind Farm in Kenya
- Preliminary Noise Modelling Study for the Attock Refinery Limited Upgrading Project in Morgah Rawalpindi, Pakistan – Noise Modelling
- Noise Modelling Study for the Saudi Elastomers Project in Jubail, Saudi Arabia – Noise Modelling.
- Preliminary Modelling Noise Study for the Shell Majnoon First Commercial Production Project in Iraq – Noise Modelling of Flares, Central Processing Facility and Gas Processing Plants
- Biannual Environmental Noise Surveys over a period of four (4) years for the Kinsevere Copper Mine in the Democratic Republic of Congo – Environmental Noise Survey

AIV and FIV Studies

- AIV Assessment for the Satah Al-Razboot (SARB) Plant Facilities Project, owned by the Abu Dhabi National Oil Company (ADNOC), and located in the Arabian Gulf, UAE. The noise modelling assessment consisted of the noise model development of the twin artificial islands (SARB-1 and SARB-2), and the Zirku island where the processing facility is located.
- Project management of the Acoustic Induced Vibration (AIV) and Flow Induced Vibration (FIV) Assessment, Package 1 of the gas-oil separator plants (GOSP) located in the Marjan oil and gas fields off the eastern coast of Saudi Arabia - Conducted an acoustic induced vibration (AIV) assessment in order to identify potential sources of acoustic fatigue in the project.
- Acoustic Induced Vibration (AIV) and Flow Induced Vibration (FIV) Assessment, Package 4 of the gas-oil separator plants (GOSP) located in the Marjan oil and gas fields off the eastern coast of Saudi Arabia - Conducted an acoustic induced vibration (AIV) assessment in order to identify potential sources of acoustic fatigue in the project.
- Acoustic Induced Vibration (AIV) and Flow Induced Vibration (FIV) Assessment, EPIC for WHP-U08C topside, pipelines, umbilical & brownfield modification at ps1k (phase 5-1b).

Air Quality

- Air Quality Impact Assessment for the Block 3 & 4 Development Project in Oman. Aspects of the project assessed included modelling of the Power Plant, Central Processing Facility, and well test flaring at various sites throughout the field.
 - Air Quality Impact Assessment for the NEOM Saudi Arabian 'mega-city' development – NEOM. The assessments were carried out for the following components of the NEOM development:
 - NEOM Silver Beach
 - NEOM Airport
 - NEOM Contractor Support Areas
 - NEOM UAH Jetties Construction GHG Inventory
 - Air Quality Impact Assessment for the Etihad Rail Realignment Project in the UAE. The assessment included the air dispersion modelling of the proposed rail network stretching across the UAE from the Saudi Arabian border to the Oman in the east and to the north of the UAE.
 - Air Quality Impact Assessment for the Shahd Oil Field Development in Oman. Aspects of the Project included modelling remote early production facilities at various well locations, as well as the operation of the Saiwan permanent processing facilities.
 - Air Quality Impact Assessment for the Aje Field Development Plan off the coast of Nigeria. The study involved the assessment of the operation of a Floating Production, Storage and Offloading (FPSO) facility and the impact to onshore air quality.
 - Air Quality Impact Assessment for the Okoro Further Field Development Project off the coast of Nigeria. The study involved the assessment of the operation of a Mobile Offshore Production Unit and the impact to onshore air quality.
 - Air Quality Impact Assessment for the MPDC Maputo Port Development Project located in Maputo, Mozambique. The Project involves the upgrade of port facilities to accommodate the increased Port traffic. The Air Quality Impact Assessment included a baseline air quality campaign, and a specialist dust study.
 - Air Quality Assessment for the Nghi Son Refinery Project in Vietnam – Air Dispersion Modelling. Nghi Son refinery will have a designed capacity of 10 million tons of crude oil per year with possibility to increase the capacity to 20 million tons. The refinery project will also include petrochemical complex, energy facilities, pipeline and storage systems, and an informatics system. In addition to LPG, unleaded gasoline, kerosene, jet fuel, diesel and FO, the refinery is projected to produce bitumen, propylene and BTX as a raw material for the petrochemical industry.
 - Air Quality Monitoring for the Kinsevere Copper Mine in the Democratic Republic of Congo – Passive and Active Air Sampling
 - Air Quality Impact Assessment for the Primary Copper ESIA for the Kinsevere Copper Mine in the Democratic Republic of Congo.
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John Kinahan

Postal address: P.O. Box 22407, Windhoek, Namibia

Telephone: +264 61 236216 or +264 81 3320832

Email: jkinahan@iafrica.com.na

Qualifications: PhD, University of the Witwatersrand, 1989.

Affiliation: Adjunct Faculty Member, School of Evolution & Social Change, Arizona State University; Honorary Research Fellow, School of Geography, Archaeology and Environmental Studies, University of the Witwatersrand, South Africa; Honorary Curator of Archaeology, National Museum of Namibia; Advisory editorial board member *Southern African Field Archaeology*.

Professional profile: My primary research interest is in the archaeology of Holocene hunter-gatherer and nomadic pastoral adaptations to hyper-arid environments. I have worked in the Namib Desert since 1979 but have also worked in ten different African countries carrying out independent research as well as archaeological surveys and assessments for development projects, and also as a consultant to ICOMOS and IUCN, focusing on nomination and management of World Heritage sites.

Working in the field of contract archaeology, I have carried out over 350 field surveys and assessments of mining, infrastructure and related projects during the last twenty-five years. I have worked primarily in Namibia but have also worked in ten other African countries including Botswana, Malawi, Tanzania, Angola, Uganda and Ethiopia. I am familiar with all current international standards of archaeological assessment including those of the IFC (World Bank) and am also familiar with domestic heritage legislation and regulations in a range of African countries.

I have published more than 70 peer-reviewed research articles (see most recent below); and have a current Google Scholar h-index rating of 20 (1819 citations in total, including 625 citations since 2018). A book publication (Wallace & Kinahan 2011 *A History of Namibia*, London: Hurst) was recognized with an Outstanding Academic Text (OAT) Award by the American Association of Libraries. My latest book *NAMIB: the Archaeology of an African Desert* was published by the University of Namibia Press, republished in the UK by James Currey, and in South Africa by Wits University Press in 2021. *Namib* was awarded the Society of Africanist Archaeologists book prize in 2023.

My current research focus is on the application of isotope chemistry to the reconstruction of social networks in the Namib Desert. This research seeks to determine variability within archaeological assemblages of pottery and ostrich eggshell beads from hunter-gatherer and nomadic pastoralist contexts spanning the last 5000 years. The bead isotope data are analysed against the background of a 60000km² isoscape based on vegetation samples. The research is carried out in collaboration with the Department of Geological Sciences at the University of Cape Town and funded by a National Science Foundation grant (Award #2018010) to Arizona State University.

I regularly present new research findings at international conferences, most recently in Spain, Chile and Australia. I will be presenting a paper entitled *Social networks among Namib Desert nomads: isotopic signatures of recent pottery assemblages* at the Society of Africanist Archaeologists conference in Houston, Texas in 2023. Together with Jill Kinahan I will be organizing the 6th *Southern Deserts Conference* to be held in Namibia in 2024. The Southern Deserts Group is an informal organization of archaeologists working in the deserts of South America, Australia and southern Africa.

Selected recent publications:

Kinahan, J. 2023. *Archaeology of the last 2000 years in Namibia*. *Oxford Research Encyclopedia, African History* (oxfordre.com/africanhistory). Oxford University Press.

Kinahan, J.H.A. and Kinahan, J. 2022. Constructed emptiness: The Namib Desert as terra nullius 1786-2018. In Brown, S. and Goetchus, C. eds. *Routledge Handbook on Cultural Landscape Practice*.

Kinahan, J. 2020. *Namib: the Archaeology of an African Desert*. Windhoek: University of Namibia Press.

Kinahan, J. 2019. The Origins and Spread of Pastoralism in Southern Africa. *Oxford Research Encyclopedia, African History* (oxfordre.com/africanhistory). Oxford University Press.

Kinahan, J. 2018. Holocene human adaptation in the Namib Desert: a model based on the concept of Holling's Loop. *Journal of Arid Environments* <https://doi.org/10.1016/j.jaridenv.2018.05.003>

Kinahan, J. 2018. A ritual assemblage from the third millennium BC in the Namib Desert, and its implications for the archaeology and rock art of shamanic performance. *Azania* vol 53

Kinahan, J. 2017. The dancing kudu: women's initiation in the Namib Desert during the second millennium AD. *Antiquity* 358: 1043-1057.

- Kinahan, J. 2017. The solitary shaman: itinerant healers and ritual seclusion in the Namib Desert during the second millennium AD. *Cambridge Archaeological Journal* 27 (3): 553-569.
- Kinahan, J. 2016. Human responses to climatic variation in the Namib Desert during the last one thousand years. *African Archaeological Review* 33 (2): 183-203.
- Kinahan, J. 2016. Archaeological evidence of domestic sheep in the Namib Desert during the first millennium AD. *Journal of African Archaeology* 14 (1): 7-17.
- Kinahan, J. 2014. Cattle paths and the choreography of late pre-colonial contact and trade on the Namib Desert coast. *South African Archaeological Bulletin* 69 (199): 96-102.
- Kinahan, J. 2013. The acquisition of ceramics by hunter-gatherers on the middle Zambezi in the first and second millennium AD. *Journal of African Archaeology* 11 (2): 197-207
- Kinahan, J. 2013. The sixteenth-century ritual precinct at Koticha Kesi in the Gilgel Gibe valley, southern Ethiopia. *Azania: Journal of the British Institute in Eastern Africa* 48 (2): 355-379.
- Kinahan, J. 2013. The use of skeletal and complementary evidence to estimate human stature and identify the presence of women in the recent archaeological record of the Namib Desert. *South African Archaeological Bulletin* 68 (197): 72-78.
- Kinahan, J. 2011. From the beginning: the archaeological evidence. In Wallace, M. and Kinahan J. *A history of Namibia: from the beginning to 1990*. London, Hurst & Co.
- Kinahan, J. & Kinahan, J.H.A. 2017. Post-Pleistocene archaeology and geomorphological processes on the Namib Desert coast of south-western Africa. *Journal of Island and Coastal Archaeology* 12 (1): 65-77.
- Kinahan, J. H. A. and Kinahan, J. 2009. "A thousand fine vessels are ploughing the main" : archaeological traces of the 19th century "Guano Rage" on the south-western coast of Africa. *Australasian Historical Archaeology* 27: 43-54.
- Kinahan, J. & Kinahan, J. 2006. Preliminary report on the late Holocene archaeology of the Awasi-Gorras Basin complex in the southern Namib Desert. *Studies in the African Past* 5: 1-14.
- Kinahan, J. 2005. Late Quaternary human ecology of the Namib Desert. In Smith, M. and Hesse, P. eds. *23rd: Archaeology and Environmental History of the Southern Deserts*. Canberra, National Museum of Australia.
- Kinahan, J. 2000. Fifteenth century agropastoral responses to a disequilibrium ecosystem in eastern Botswana. In Barker, G. and Gilbertson, D. eds *Living on the margins: the archaeology of drylands*. London: Routledge, pp 233- 251.



1. **Name of Consultant:** Ernst Arthur Simon
2. **Profession:** Town and Regional Planner
3. **Date of Birth:** 25 October 1959
4. **Nationality:** Namibian
5. **Membership of Professional Bodies:**

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| Past Chairperson – Namibia Council for Town and Regional Planners |
| Past President – Namibia Institute of Town and Regional Planners |
| Corporate Member of the Namibia Institute of Town and Regional Planners |
| Past Treasurer of the Namibia Council of Town and Regional Planners |

6. **Key Qualifications (relevant to the project):**

| <i>Selected Experience related to Local Economic Development and Strategic Structure Plans</i> | |
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| <i>Detailed Tasks Assigned</i> | <i>Relevant Projects</i> |
| Planner and Technical Team Leader | Preparation of an Urban Structure Plan for the City of Blantyre, Malawi. Blantyre City Council, 2023 - current |
| Planner and Technical Team Leader | Preparation of the Walvis Bay Urban Structure Plan 2022 to 2042, Municipality of Walvis Bay, 2022 - 2023 |
| Planner and Technical Team Leader | Preparation of the Windhoek Urban Structure Plan 2022 to 2042, City of Windhoek, 2020 - current |
| Planner and Spatial Specialist | Preparation of the Windhoek Local Economic Development Strategy as well as the Investment Incentives Strategy for the City of Windhoek, 2019 - 2020. |
| Project Director and Technical Team Leader | Preparation of the Urban Structure Plan for Kombat, 2018-2019 |
| Project Director and Technical Team Leader | Preparation of an Integrated Regional Land Use Plan for the Otjozondjupa Region, 2015 - 2017 |
| Urban Planner | Second five year revision of the 20 year Physical Development Plan for the Dukhan Oil Fields and QP Concession Area, Qatar. 2015 – 2016 |
| Project Director and Technical Team Leader | Preparation of an Integrated Urban Spatial Development Framework for Henties Bay, 2013 - 2015 |
| Sociologist | Preparation of the Integrated Urban Spatial Development Framework for Walvis Bay responsible for surveys and population projections for the plan period. 2011 - 2013 |
| Sociologist and Urban and Regional Planner | Part of the team for the preparation of the Walvis Bay Local Economic Development Strategy, 2009 - 2010 |
| Physical Planner and Technical Team Leader | First Five Year revision of the 20 year Physical Development Plan for the Dukhan Oil Fields, Qatar. 2008 - 2010 |
| Sociologist | Preparation of a Spatial Development Framework for Katima Mulilo, 2005 - 2007 |
| Physical Planner and Technical Team Leader | Preparation of a 20 year Physical Development Plan for the Mesaieed QP NGL Complex, Qatar. 2005 - 2006 |

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| Physical Planner and Technical Team Leader | Preparation of a 20 year Physical Development Plan for the Dukhan Oil Fields and the QP Concession Area, Qatar. 2002 - 2003 |
| Project Director and Technical Team Leader | Preparation of an Integrated Development Plan and a Structure Plan for Oshakati, 1999 - 2001 |
| Full time on site Urban Planner | Preparation of an Urban Structure Plan and Integrated Development Plan for the City of Blantyre, Malawi. 1998 - 1999 |
| <i>Selected Town Planning Experience related to Township Establishments</i> | |
| <i>Detailed Tasks Assigned</i> | <i>Relevant Projects</i> |
| • Project Supervisor | Layout design, Environmental Clearance and Township Establishment of Ongha, consisting of Proper and Ext 1 to 7, 2016 to current |
| • Project Supervisor | Layout design, Environmental Clearance and Township Establishment of Okahao Ext 8, 11 and 12, 2016 to current |
| • Town Planner and Project Supervisor | Layout design, Environmental Clearance and Township Establishment of 12 Extensions in the Oshitayi Area, Ondangwa, 2015 to 2017 |
| • Town Planner and Project Leader | Layout design, Environmental Clearance and Township Establishment of Onayena Ext 1, 2014 to 2016 |
| • Town Planner and Project leader | Layout design, Environmental Clearance and Township Establishment of Okahandja Extension 18 on consolidated portion 54 of Okahandja Town and Townlands no 277, 2015 to 2017 |
| • Town Planner and Project Leader | Layout design, Environmental Clearance and Township Establishment of Royal Gardens Project on Portion 105, Klein Windhoek Town and Townlands no 70 |
| • Project Coordinator (with A Anderson) | Layout design, Environmental Clearance and Township Establishment of Oshakati Extension 16, |
| • Project Coordinator (with J Opperman) | Layout design, Environmental Clearance and Township Establishment of Othingo Proper and Ext 1, , |
| • Project Coordinator (with J Opperman) | Layout design, Environmental Clearance and Township Establishment of Ompumbo Proper and Ext 1 to 6. |
| <i>Selected Experience related to Social Impact Assessments and Socio-Economic Research</i> | |
| <i>Detailed Tasks Assigned</i> | <i>Relevant Projects</i> |
| • Public Consultation Lead | Environmental and Social Impact Assessment for the 3D Seismic Surveys for Petroleum Exploration Licence area 82 and 83 (PEL82 and PEL 83) off the Namibian Coast, 2017 |
| • Project Director and Technical Team Leader | Evaluation of the socio-economic impact of the construction of three labour based roads in Northern Namibia. The project is a true impact evaluation with a counterfactual and before and after surveys. Roads Authority, 2011 – 2018 |
| • Technical team leader. | Both Qualitative and Quantitative studies for the impact evaluation of the Break the Chain HIV/AIDS campaign in Rehoboth, Oshikuku and Onandjokwe, 2011 |
| • EAP | Environmental Assessment Practitioner for the EIA's for township establishment projects for Ondangwa, Oshakati, Onesi, Onayena, Katwitwi, and Okalongo, 2012 – 2017 |
| • SIA Specialist | Social Impact Assessor for the feasibility study on the provision of bulk water supply to irrigation activities around Olushandja Dam, 2014 – 2016 |

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| • SIA Specialist | Social Impact Assessor for the SEA on the proposed extension of the Walvis Bay Harbour, Erongo Region, Namibia, 2014 – 2015. |
| • SIA Specialist | Social Impact Assessor for the proposed 400KV transmission line from Ruacana to Oshivelo, traversing the Omusati, Oshana and Oshikoto Regions, Namibia, 2014. |
| • SIA Specialist | Social Impact Assessor for the proposed construction of a 132KV transmission line from Rundu to the new Cuito Substation in the Kavango Region, Namibia, 2013 |
| • SIA Specialist | Independent Public Consultation Lead for the Research project on environmental flow requirements of the Fish River and the Orange-Senqu River Mouth, Orange-Senqu River Commission Secretariat, Governments of Botswana, Lesotho, Namibia and South Africa, 2012/13 |
| • SIA Specialist | Social Impact Assessment for the construction of the Kunene Transmission Station and 33kV line from Etoto to the transmission Station, 2012 |
| • SIA Specialist | Independent Facilitator for the public consultation process for the proposed construction of a Coal Fired Power station at Arandis in the Erongo Region, 2011 – 2012. |
| • SIA Specialist | Social Impact Assessor for the proposed construction of a freeway link between Windhoek and the Hosea Kutako International Airport, 2011 – 2012 |
| • Social Impact Assessor and public consultation lead | Environmental and Social Impact Assessment for the proposed Baynes Hydropower Scheme in the Kunene River on the border between Namibia and Angola, 2009 - 2011 |
| • SIA Specialist | Social Impact Assessor for the construction of a 132 kV transmission line from Onuno to Ondjiva, 2011 |
| • SIA Specialist | Social Impact Assessment for the proposed construction of the Neckartal Dam in the !Kharas Region, 2010 – 2011 |
| • SIA Specialist | Social Impact Assessor for the proposed construction of a dike and other flood mitigation measures at Oshakati in the Oshana region of Namibia, 2011 – 2012. |
| • SIA Specialist | Social Impact Assessor on the CSIR team for the EIA of the proposed development of a seawater desalination plant at mile 6 near Swakopmund. January 2009 to December 2010. |
| • Social and Environmental Lead | Preparation and negotiation of the MCA Namibia Compact which was agreed between the USA and Namibia with a programme value of US\$ 304 000 000. Member of the Government Negotiating team that negotiated the detail of the compact in Washington DC during July 2008. |
| • Sociologist | Execution of a Community Needs Assessment Survey for the Kuisebmond Community inclusive of the primary survey work and data analysis in Walvis Bay, Namibia. 2004 |
| • Sociologist | Walvis Bay Housing Demand and Affordability Study, comprising primary surveys, data analysis and reporting to determine the housing demand and affordability of households in Walvis Bay, (Population 40 000, sample size 2200), 1996 |
| • Sociologist | Windhoek Household Census – 1995 – Household |

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| | census for Windhoek together with the data analysis using Statistica Software with a sample size of more than 9000 households, 1995 |
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7. Education:

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| Institution | UOFS |
| Date: from (month/year) to (month/year) | 1983 |
| Degree(s) or Diploma (s) obtained | Hons. B.Soc.Sc (Sociology) Cum Laude |

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| Institution | UOFS |
| Date: from (month/year) to (month/year) | 1986 |
| Degree(s) or Diploma (s) obtained | M TRP (Town and Regional Planning) Cum Laude |
| Student Award: | Best Town and Regional Planning Student, 1986, awarded by the Free State Chapter of the South African Institute of Town and Regional Planning |

8. Employment Record

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| Date: from (month/year) - to (month/year) | From 1998 - Current |
| Employer | Urban Dynamics Africa (Pty) Ltd |
| Position(s) held | Director |

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| Date: from (month/year) - to (month/year) | 1993 - 1998 |
| Employer | TRP Associates |
| Position(s) held | Partner/ Town and Regional Planning Consultant |

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| Date: from (month/year) - to (month/year) | 1988 - 1992 |
| Employer | National Housing Enterprise |
| Position(s) held | Social Services/Assistant General Manager |

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| Date: from (month/year) - to (month/year) | 1985 - 1987 |
| Employer | UOFS |
| Position(s) held | Lecturer: Urban Development, Sociology and Research Methodology |

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|--|----------------------------|
| Date: from (month/year) - to (month/year) | 1984 |
| Employer | Potchefstroom University |
| Position(s) held | Junior Lecturer: Sociology |


9. Language Skills, excellent, good, fair, poor:

| Language | Reading | Speaking | Writing |
|-----------------|----------------|-----------------|----------------|
| English | Excellent | Good | Excellent |
| Afrikaans | Excellent | Excellent | Excellent |
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10 Certification

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications and experience.

Signature:



A handwritten signature in black ink, appearing to read 'Ernst Arthur Simon', is written over a horizontal line. The signature is stylized and cursive.

Ernst Arthur Simon

Date: 9/08/2022

Surname: *Heidri Estelle Bindemann-Nel*
Profession: *Environmentalist*
Date of Birth: *29 March 1977*
Nationality: *South African, PR number N6723/94*

Membership in Professional Bodies:

- *Member of the Namibia Council of Town and Regional Planners*
- *Member of the Namibia Institute of Town and Regional Planners*
- *Member of the Environmental Assessment Professionals of Namibia*

KEY QUALIFICATIONS: (RELEVANT TO THE PROJECT)

| SELECTED TOWN PLANNING EXPERIENCE RELATED TO ENVIRONMENTAL CLEARANCE | |
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| ENVIRONMENTAL CLEARANCE: | |
| DETAILED TASKS ASSIGNED: | RELEVANT PROJECTS: |
| SCOPING REPORTS FOR ENVIRONMENTAL CLEARANCE FROM THE MINISTRY OF ENVIRONMENTAL AND TOURISM: | <p>Environmental Clearance for Township Establishment at, Tungo within the Rundu Town and Townlands No. 1329 (approved 2014),</p> <p>Environmental Clearance for Township Establishment at, Ozondje within the Omaruru Town and Townlands No. 85 (approved 2014),</p> <p>Environmental Clearance for Township Establishment at Onesi Town and Townlands No. 992 (approved 2015),</p> <p>Environmental Clearance for Township Establishment at Onayena Town and Townlands No. 985 (approved 2015),</p> <p>Environmental Clearance for Township Establishment at Portion 154, within the Consolidated Farm Okahandja Town and Townlands No. 277 (approved 2015),</p> <p>Environmental Clearance for Townships Establishments for the development of 18 New Township Extensions in Oshitayi, within the Ondangwa Town and Townlands No.882 (approved 2016),</p> <p>Environmental Clearance for Township Establishment on Portion 1 of Farm 1115, within the Opuwo Townlands No. 876. (approved 2017),</p> <p>Environmental Clearance for creating a street on the Remainder of Erf 3093, Tsumeb, Extension 4 (approved 2017),</p> <p>Environmental Clearance for the Amendment of Conditions of Title from Residential to Industrial and the Existing Charcoal Storage and Packing Facility on Portion 149 (Randte), within the Remainder of Farm Outjo Townlands No. 193 (approved 2019),</p> <p>Environmental Clearance for the Rezoning of Erf 680, Swakopmund, From "General Residential 2" to "General Business" (approved 2019),</p> <p>Environmental Clearance for Odila Lodge within the Ohangwena Region" (approved 2019),</p> <p>Environmental Clearance for the Establishment of Townships at Okandjenedi South within the Remainder of Farm Oshakati Townlands No. 880 (approved 2019),</p> |

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| <p>SCOPING REPORTS FOR ENVIRONMENTAL CLEARANCE FROM THE MINISTRY OF ENVIRONMENTAL AND TOURISM:</p> | <p>Environmental Clearance for the creation of a street and construction and other activities within a watercourse floodline on the Remainder of Erf 3526, Extension 7, Katima Mulilo (approved 2019),</p> <p>Environmental Clearance for the Establishment of Land Hold Titles at Onawa, Oshakati – As defined by the Flexible Land Tenure Act, 2012 (Act 4 of 2012 (approved 2019),</p> <p>Environmental Clearance for the establishment of erven within existing Extension 1 and 2 Okalongo - Closure of public open spaces and portions of public open spaces, and Closure of public street and portions of public streets (approved 2019),</p> <p>Environmental Clearance for the Establishment of Townships at Okahao within the Remainder of Farm Okahao No. 989 and Okahao Extended Townlands No. 1213 (approved 2019),</p> <p>Renewal of Environmental Clearance for public roads created through the subdivision of Erf 1055, Oshakati Extension 3 Oshana Region (approved 2019),</p> <p>Renewal of Environmental Clearance for public roads created through the subdivision of Erf 3122, Oshakati, Extension 3, Oshana Region (approved 2020),</p> <p>Environmental Clearance for constructing and operating a water-based paint manufacturing plant on Erf 2, Nubu Industrial Park, Windhoek (approved 2020).</p> <p>Environmental Clearance for the Establishment of Brukaros Proper on Portion A of the Remainder of Keetmanshoop Town and Townlands No 150 within the //Kharas Region (approved 2021),</p> <p>Environmental Clearance to Establish Townships on Portion B of the Remainder of Farm Opuwo Townlands No. 1115 and Portion Y of the Remainder of Opuwo Townlands No. 876 (approved 2021),</p> <p>Renewal of the Environmental Clearance for the alignment and construction of public roads and infrastructure through Township Establishment at Ozondje (Extension 6 - 11), in Omaruru within the Erongo Region Client: Municipality of Omaruru (approved 2021),</p> <p>Environmental Clearance Application for Kubu & Kwena (approved 2021),</p> <p>Renewal of the Environmental Clearance to establish the Ongha Townlands within the Ohangwena Region (approved 2022),</p> <p>Renewal and transferring of ECC for a Charcoal Storage and Packing Facility on Portion 149 (Randte), within the Remainder of Farm Outjo Townlands No. 193 (approved 2023),</p> <p>Environmental Clearance for the Amendment of conditions of establishment at Eheke settlement in the Oshana Region (approved 2023),</p> <p>Environmental Clearance for Township Establishment at Onawa (to be known as Onawa Proper) in the Oshana Region (approved 2023),</p> |
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| FIELDWORK OR SURVEYS: | |
|------------------------------|--|
| COLLECTED AND ANALYSED DATA: | Field study for the development of 18 New Township Extensions in Oshitayi, within the Ondangwa Town and Townlands No.882 (2014), |
| COLLECTED DATA: | Field study at Portion 154, within the Consolidated Farm Okahandja Town and Townlands No. 277. (2015). |
| | Socio-Economic impact study on the DR 3670, DR 3671 and DR 3672. (2017), |
| | Socio-Economic Study for Okalongo (2020), |
| | Kavango West Feasibility Study (2020); and |
| | Kavango East Feasibility Study (2023). |

EDUCATION:

| INSTITUTION: | DATES ATTENDED: | DEGREES OBTAINED: |
|-------------------------|------------------------|---|
| Stellenbosch University | 2006 to 2008 | B.A in Environmental Studies |
| Stellenbosch University | 2009 to 2010 | Honours in Geography and Environment |
| University of Pretoria | 2012 to 2014 | Master's Degree in Town and Regional Planning |

EMPLOYMENT RECORD:

| | |
|-----------------------------------|---|
| JULY 2014 – CURRENT: | Urban Dynamics (Pty) Ltd - Windhoek-Namibia |
| | Position held: Environmental Practitioner and Town and Regional Planner in training. |
| | Responsibilities include Compiling Scoping Reports for Environmental Clearance, consolidations, subdivisions and drafting locality and site plans. |
| FEBRUARY 2013 – JULY 2014: | Bindemann Associates, Land Surveyors- Walvis Bay-Namibia |
| | Position held: Office Assistant. |
| | Responsibilities include: Compiled applications for consolidations and subdivisions and drafted locality and site plans. |
| MAY TO DECEMBER 2012: | Silberbauer Welman Design – Grabouw –South Africa |
| | Position held: Assisting draftsperson. |
| | Responsibilities include: I drafted house and site plans and submitted building plans and environmental clearance applications to the local governments regarding the Koberg Biosphere. Projects were located in Grabouw and Hermanus, South Africa. |

LANGUAGE:

| | Speaking | Reading | Writing |
|------------------|------------------|----------------|----------------|
| English | <i>Good</i> | <i>Good</i> | <i>Good</i> |
| Afrikaans | <i>Excellent</i> | <i>Good</i> | <i>Good</i> |

CERTIFICATION:

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications, and experience.

Date: 21 /06 /2023

Signed:



Heidri Estellè Bindemann-Nel

Cont. No.: WI23-00388
Our reference: WI301-00906/05

26 October 2023

The Environmental Commissioner
Ministry of Environment, Forestry and Tourism
Private Bag 13308
Windhoek
Namibia


Dear Mr. Timoteus Mufeti

RE APPOINTMENT OF ENVIRONMENTAL CONSULTANT (EPL 3140)

Haib Minerals (Pty) Ltd hereby confirms that Mr. Joseph Mülders, Senior Environmental Scientist at Knight Piésold and Dr. Lima Maartens T/A LM Environmental Consulting, have been appointed as the Environmental Assessment Practitioners for the Renewal of the Environmental Clearance Certificate for Exclusive Prospecting License Area EPL 3140.

Your assistance is highly appreciated.

Yours sincerely



Jean-Luc Roy
COO, Director

21/10/23

Date

APPENDIX B

**CV'S AND ID COPIES OF J MULDER AND L MAARTENS
FORM 1 - HAIB MINERALS
HAIB-MAP ECC**

JOSEPH MÜLDERS (Pr.Sci.Nat.)

SENIOR ENVIRONMENTAL SCIENTIST

Joseph Mülders is Senior Environmental Scientist based at Knight Piésold's Sandton office. He has 9 years of experience in the environmental services industry and is a registered Professional Natural Scientist (Environmental Science). Joseph has been involved in social and environmental risk, safeguards assessments and monitoring, spatial classification of socio-economic and environmental systems. He was appointed by the South African National Department of Environmental Affairs where he was responsible for developing and implementing the Social and Environmental Risk Management Program for a large 5 year multi-stakeholder GEF funded project. He specialises in environmental due diligence, impact assessments and risk analysis, environmental monitoring, rehabilitation and offset quantification and design, stakeholder consultation, environmental monitoring and compliance. Joseph has experience in various African countries in terms of delivering projects to international best practice standards focusing on socio-economically sustainable development and management of natural resources.



Knight Piésold (Pty) Ltd.
South Africa

REGISTRATIONS / CERTIFICATIONS

- South African Council for Natural Scientific Professions (SACNASP), Pr.Sci.Nat. Reg No. 115316

SPECIFIC RELEVANT EXPERIENCE

- **DFFE/UNDP/GEF6 Fill Sized Project, South Africa:** Developed and implemented the Social and Environmental Risk Management Program, designed and implemented the project wide integrated monitoring and evaluation plan. Acting Project Manager for 4 months
- **DFFE/IUCN/GEF7 Full sized Project, South Africa:** Project design and developed the Environmental and Social Management Plan (ESMP)
- **uThukela Water Resource Classification System (WRCS), South Africa:** Coordinated the classification and quantification of socio-economic impacts to communities as linked to changing water allocation scenarios
- **Loulo, Gounkoto and Morila Gold Mines, Mali:** Biodiversity Offset (Quantifying residual impacts and proposing mechanisms for internalising costs of impacts back into the biodiversity capital value of Mali)
- **Kibali Gold Mine, DRC:** Biodiversity Offset (Develop a biodiversity offset based on the past, current and future biodiversity impacts and benefits since the start of operations)
- **Makuya Nature Reserve, South Africa:** Park Management Plan (Systems ecologist and spatial planner)
- **Kusile Power Station, South Africa:** Scoping and Basic Assessment, including public consultation and environmental specifications (EAP)
- **Kusile Power Station, South Africa:** Wetland Rehabilitation Strategy (Baseline assessment, condition analysis and strategic design)
- **Kusile Power Station, South Africa:** Wetland Offset Strategy (baseline assessment, stakeholder engagement, offset quantification and strategy design)
- **Kusile Power Station, South Africa:** Turbidity Management Strategy - monthly and quarterly water quality sampling, analysis and reporting

WORK HISTORY

| Company Name | Position | Dates |
|--|--------------------------------|------------------|
| Knight Piésold (Pty) Ltd | Senior Environmental Scientist | July 2023 - Date |
| South African National Department of Forestry, Fisheries and Environment | Deputy Director | 2021 - 2023 |
| Prime Africa Consult | Systems Ecologist | 2014 - 2021 |

EDUCATION

- MSc, Environmental Management, University of Pretoria, South Africa, 2015
- BSc (Hons) Environmental Management and Analysis, University of Pretoria, South Africa, 2009
- BSc, Zoology, University of Pretoria, South Africa, 2008

SPECIALISATIONS

- Environmental monitoring
- Rehabilitation and offset quantification design
- Stakeholder Consultation
- Environmental due diligence
- Impact assessments and risk analysis
- Project management

COUNTRIES OF WORK EXPERIENCE

- Malawi
- Mali
- Mozambique
- South Africa
- Uganda

GEREGISTREEERDE WOON-EN POSADRES

1. Bewaar die bewys van u GEREGISTREEERDE WOON- EN POSADRES in hierdie sakkie.
2. Indien u van adres verander het, of indien besonderhede van u huidige adres, by straatnaam en/of -nommer, ens. verander het, moet die vorm KENNISGEWING VAN ADRESVERANDERING, wat in die sakkie agter in die identiteitsdokument is, gebruik word om die verandering aan te meld en moet dit ingedien word by of gepos word aan die naaste streek-/distrikkantoor van die DEPARTEMENT VAN BINNELANDSE SAKE.

REGISTERED RESIDENTIAL AND POSTAL ADDRESS

1. Keep the proof of your REGISTERED RESIDENTIAL AND POSTAL ADDRESS in this pocket.
2. If you have changed your address, or, if particulars of your present address, e.g. name of street and/or street number, etc., have been changed, the NOTICE OF CHANGE OF ADDRESS form in the pocket at the back of the identity document must be used to report the change and it must be handed in at or posted to the nearest regional/district office of the DEPARTMENT OF HOME AFFAIRS.

1

I.D.No. 860522 5111 08 5



S.A. BURGER/S.A. CITIZEN

VAN/SURNAME
MULDERS

VOORNAME/FORENAMES
JOSEPH ALEXANDER

GEBORTEDISTRIK OF-LAND/
DISTRICT OR COUNTRY OF BIRTH

SOUTH AFRICA



1986-05-22

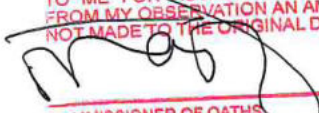
DATUM UITGEREIK
DATE ISSUED

2002-08-27

UITGEREIK OP GESAG VAN DIE
DIREKTEUR-GENERAAL
BINNELANDSE SAKE

ISSUED BY AUTHORITY OF THE
DIRECTOR-GENERAL
HOME AFFAIRS

CERTIFY THAT THIS DOCUMENT IS A TRUE REPRODUCTION (COPY) OF THE ORIGINAL DOCUMENT WHICH WAS HANDED TO ME FOR AUTHENTICATION. FURTHER CERTIFY THAT FROM MY OBSERVATION AN AMENDMENT OR CHANGE WAS NOT MADE TO THE ORIGINAL DOCUMENT


COMMISSIONER OF OATHS
TRUST MASHAW
POSTNET MENLYN
SHOP 33 WATERGLEN CENTRE
GARSFONTEIN ROAD
WATERKLOOF GLEN

4/11/19
DATE
REF NO 91/8/2 PRETORIA
2009/07/09

lima@iway.na
limamaartens@gmail.com
+264 61 255750
+264 81 2458790
Windhoek, Namibia

Skills

Environmental Scoping
Environmental Impact Assessments
Environmental Management Plans
Environmental Auditing
Environmental and Social Due
Diligence & Legal Compliance
Technical Reviews & Proofreading
Project Management
Research & Monitoring

Education And Training

2000

Ph.D.: Fisheries Science

Rhodes University

Grahamstown, South Africa

1992

B.Sc. Hons: Animal Physiology

Stellenbosch University

Stellenbosch, South Africa

1991

B.Sc.: Zoology and Physiology

Stellenbosch University

Stellenbosch, South Africa

1987

Senior Certificate

Windhoek High School

Windhoek, Namibia

Languages

Afrikaans: First Language

English: Proficient

Membership in Professional Bodies

Associate Membership and
Associate Environmental Auditor -
Institute of Environmental
Management & Assessment
(IEMA), United Kingdom
Lead Practitioner, Practitioner,
Reviewer - Environmental
Assessment Professionals of
Namibia (EAPAN)
Full Member - Namibian Chamber
of Environment (NCE)
Member - Namibia Scientific
Society

Lima Maartens

Summary

I have 30 years' experience in natural resource management, lecturing, environmental science and management, and consulting. Sectors that I worked in as an Environmental Assessment Practitioner include: exploration (including offshore oil and gas); mining and quarrying; renewable energy (solar and wind); tourism; manufacturing; agriculture; aqua- and mariculture; township, property (including medicine storage facilities) and waterfront developments, transport (rail and road), and infrastructure.

Employment Record

LM Environmental Consulting – Environmental Assessment Practitioner

10/2009 – Current; Windhoek, Namibia

Valencia Uranium (Pty) Ltd – Environmental Manager

09/2006 – 09/2009; Windhoek, Namibia

De Beers Marine Namibia (Pty) Ltd – Senior Environmental Scientist

01/2004 – 08/2006, Windhoek, Namibia

Simonis Storm Securities – Analyst

09/2002 – 12/2003, Windhoek, Namibia

University of Namibia – Lecturer

10/2000 – 06/2002, Windhoek, Namibia

Ministry of Fisheries and Marine Resources – Fisheries Biologist

01/1993 – 09/2000, Swakopmund, Namibia

Additional Skills

Oxford Climate Society, Oxford School of Climate Change: *Completion of the nine-week School of Climate Change* (2022)

SHEilds Ltd., United Kingdom: *NEBOSH Certificate in Environmental Management* (2018)

NOSA, Windhoek, Namibia: *Applying SHE (Safety, Health, Environment) Principles and Procedures* (2012)

Centre for Environmental Management, Potchefstroom, South Africa: *Introduction to Integrated Waste Management for Environmental Managers* (2009)

The Chamber of Mines of Namibia, Uranium Stewardship Committee, Namibia: *Radiation Course for Senior Supervisors* (2009)

Prospectors and Developers Association of Canada (PDAC): *From theory to practice: Corporate social responsibility and sustainable development in mineral exploration* (2007)

Crystal Clear, South Africa: *IEMA Approved Foundation Environmental Auditor* (2006)

Centre for Environmental Management, Potchefstroom, South Africa: *Implementing Environmental Management Systems (ISO 14001:2004)* (2005)

University of Stellenbosch Executive Development: *Project Management* (2004)

Publications

I have published five peer-reviewed scientific research articles (and three as co-author), six popular articles (and one as co-author), one book chapter (and one book chapter as co-author), 158 technical reports (LM Environmental Consulting), three technical reports (for De Beers Marine Namibia), and one conference paper.

REPUBLIC OF NAMIBIA
NATIONAL IDENTITY CARD



NO. 690715 0048 9



SURNAME
MAARTENS
FIRST NAME(S)
LIMA

Lima Maartens

DATE OF BIRTH
1969-07-15
PLACE/COUNTRY OF BIRTH
WINDHOEK

CITIZENSHIP
CITIZEN

GENDER HEIGHT/m
FEMALE 1,68

EYE COLOUR
BROWN

DATE OF ISSUE
1999-03-24

APPL.-NO.
K27075



69071500489

ANNEXURE 1
FORMS

Form 1

REPUBLIC OF NAMIBIA ENVIRONMENTAL**MANAGEMENT ACT, 2007 (Section 32)****APPLICATION FOR RENEWAL OF ENVIRONMENTAL CLEARANCE
CERTIFICATE****PART A: DETAILS OF APPLICANT****APPLICANT INFORMATION**

- | | |
|--|-------------------------|
| 1. Name: (person or business): | Haib Minerals (Pty) Ltd |
| 2. Business Registration / Identity No.: | 2011/0609 |
| 3. Correspondence Address: | P.O. Box 87186, Eros |
| 4. Name of Contact Person: | Mr Pierre Léveillé |
| 5. Position of Contact Person: | Managing Director |
| 6. Telephone No.: | + 1-819-340-0140 |
| 7. Fax No.: | None |
| 8. E-mail Address (if any): | pierre@koryxcopper.com |

PART B: SCOPE OF THE ENVIRONMENTAL CLEARANCE CERTIFICATE

1. The environmental clearance certificate is for:

Renewal of Proposed Additional Exploration Activities on EPL 3140, Noordoewer, //Karas Region

Note: The current ECC for EPL 3140 expires 15 Feb 2024. A full Environmental and Social Impact Study is currently underway towards applying for an ECC towards Mining License (ML) application end of 2024. The current renewal allows for compliance within this period prior to the application for the ECC for ML.

2. Details of the activity(s) covered by the environmental clearance certificate:

Title of Activity:

Proposed Additional Exploration Activities on EPL 3140, Noordoewer, //Karas Region

Nature of Activity:

Haib Minerals (Pty) Ltd has conducted a comprehensive exploration programme on EPL 3140 and would like to continue with the activities. The exploration programme includes the following:

- 1) Operation of vehicles and drilling machinery.
- 2) Drilling of 5 000m, approximately 25 holes spread across the target area
- 3) Abstraction of surface water from the orange river for drilling purposes (up to 20 000 Liters per day)
- 4) Resource mapping
- 5) Refining the resource model
- 6) Employees and contractors on site during daytime hours.
- 7) Maintenance of access roads
- 8) Storage and transport of vehicle and machinery fuel (hydrocarbons) (approx. 500 Liters)

The activities above trigger the following listed activities:

WASTE MANAGEMENT, TREATMENT, HANDLING AND DISPOSAL ACTIVITIES 2.3 The import, processing, use and recycling, temporary storage, transit or export of waste.

MINING AND QUARRYING ACTIVITIES 3.1 The construction of facilities for any process or activities which requires a licence, right or other form of authorisation, and the renewal of a licence, right or other form of authorisation, in terms of the Minerals (Prospecting and Mining Act), 1992.

WATER RESOURCE DEVELOPMENTS 8.1 The abstraction of ground or surface water for industrial or commercial purposes. 8.3 Any water abstraction from a river that forms an international boundary.

HAZARDOUS SUBSTANCE TREATMENT, HANDLING AND STORAGE 9.1 The ~~manufacturing~~ storage, handling or processing of a hazardous substance defined in the Hazardous Substances Ordinance, 1974.

Location of Activity:

EPL 3140 is located in the South of Namibia, approximately 9 km (from the South-Western boundary) from the town of Noordoewer. The B1 road forms the north-western boundary of the EPL. The Orange River runs immediately to the south of the EPL (Refer to Figure 1 for map and Table 1 for coordinates of boundary of EPL 3140)

Co-Ordinates: Lat: -28°39'42.88"S; Lon: 17°50'59.10"E

Area: 36 589 Hectares

Locality:

- Region: //Karas
- District: Karasburg
- Registration Division: V

Scale and Scope of Activity:

Exploration activities

PART C: DECLARATION BY APPLICANT

I hereby certify that the particulars given above are correct and true to the best of my knowledge and belief. I understand the environmental clearance certificate may be suspended, amended or cancelled if any information given above is false, misleading, wrong or incomplete.



Signature of Applicant

Pierre Léveillé

Full Name in Block Letters

Managing Director

Position

on behalf of

Haib Minerals (Pty) Ltd

Date: November 13, 2023

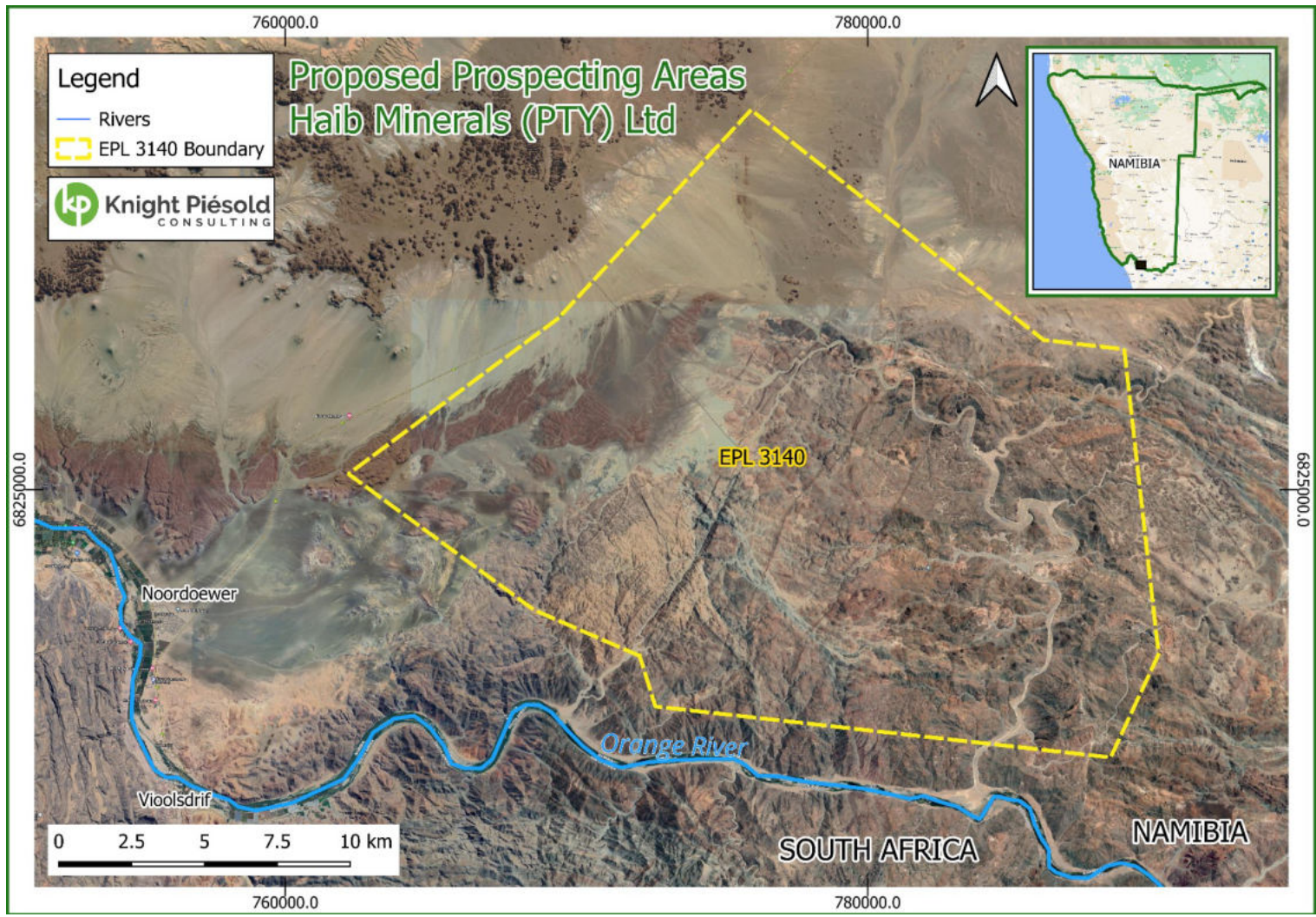


Figure 1: Location of EPL 3140



Table 1: Co-ordinates of boundary points for EPL 3140

| Order | Lat Deg | Lat Min | Lat Sec | | Long Deg | Long Min | Long Sec | |
|-------|---------|---------|---------|---|----------|----------|----------|---|
| 1 | -28 | 43 | 15.21 | S | 17 | 58 | 10.95 | E |
| 2 | -28 | 45 | 11.68 | S | 17 | 57 | 13.53 | E |
| 3 | -28 | 44 | 27.11 | S | 17 | 47 | 36.07 | E |
| 4 | -28 | 43 | 31.11 | S | 17 | 47 | 14.65 | E |
| 5 | -28 | 42 | 42.61 | S | 17 | 44 | 59.71 | E |
| 6 | -28 | 40 | 15.62 | S | 17 | 41 | 1.13 | E |
| 7 | -28 | 37 | 16.50 | S | 17 | 45 | 22.14 | E |
| 8 | -28 | 33 | 19.28 | S | 17 | 49 | 19.27 | E |
| 9 | -28 | 37 | 27.99 | S | 17 | 55 | 35.62 | E |
| 10 | -28 | 37 | 36.14 | S | 17 | 57 | 17.92 | E |
| 11 | -28 | 41 | 41.11 | S | 17 | 57 | 56.12 | E |

760000.0

780000.0

Legend

-  Rivers
-  EPL 3140 Boundary



Proposed Prospecting Areas Haib Minerals (PTY) Ltd



6825000.0

6825000.0

EPL 3140

Noordoewer

Orange River

Vioolsdrif

0 2.5 5 7.5 10 km



SOUTH AFRICA

NAMIBIA

760000.0

780000.0

APPENDIX C

DEEP-SOUTH RESOURCES - ECC 2021



REPUBLIC OF NAMIBIA
MINISTRY OF ENVIRONMENT, FORESTRY AND TOURISM

OFFICE OF THE ENVIRONMENTAL COMMISSIONER

ENVIRONMENTAL CLEARANCE CERTIFICATE

ISSUED

In accordance with Section 37(2) of the Environmental
Management Act (Act No. 7 of 2007)

TO

Haib Minerals (Pty)
P. O. Box 23096, Windhoek

TO UNDERTAKE THE FOLLOWING LISTED ACTIVITY

**Proposed Additional Exploration Activities on EPL 3140,
Noordoewer, //Karas Region**

Issued on the date: **2021-02-15**
Expires on this date: **2024-02-15**

(See conditions printed over leaf)



CONDITIONS OF APPROVAL

1. This environmental clearance is valid for a period of 3 (three) years, from the date of issue unless withdrawn by this office
2. This certificate does not in any way hold the Ministry of Environment and Tourism accountable for misleading information, nor any adverse effects that may arise from these activities. Instead, full accountability rests with the proponent and its consultants
3. This Ministry reserves the right to attach further legislative and regulatory conditions during the operational phase of the project
4. All applicable and required permits are obtained and mitigation measures stipulated in the EMP are applied particularly with respect to management of ecological impacts.
5. Strict compliance with national heritage guidelines and regulations is expected throughout the life-span of the proposed activity, therefore any new archaeological finds must be reported to the National Heritage Council for appropriate handling of such.
6. A six monthly report on project progress and environmental management profile, starting from date of commencement of operations, must be submitted by the Proponent to Office of Environmental Commissioner

APPENDIX D

SCREENING NOTICE

Joseph Mülders

From: Ministry of Environment and Tourism <noreply@meft.gov.na>
Sent: Tuesday, November 14, 2023 4:05 PM
To: Joseph Mülders
Subject: Your application is verified

[EXTERNAL EMAIL]



REPUBLIC OF NAMIBIA

Ministry of Environment, Forestry & Tourism

2023-11-14

Dear Joseph Mulders,

This email serves to inform you that your application **APP-002467** has been verified

Taking the following into considerations:

- Location of the project
- Pollution potential
- Scale of operation of the project

Please upload the following documents:

- Scoping Report
- EMP
- Consent letter or support doc from relevant Authority
- Proof of Consultation (Minutes, Newspaper adverts, etc)
- Confirmation of screening notice received (through email) in terms of assessment procedures (Section 35 (1)(a)(b) of the Environmental Management Act, No 7 of 2007)

- Preliminary Site Map with coordinates (decimal degrees) and a Legend
- CV of Environmental Assessment Practitioner (EAP)
- Consent from the National Heritage Council for protection of archaeological artefacts, paleontological and rare geological specimens, meteorites and any other object which holds cultural significance

Please login onto our portal to upload required documents, if any
<https://eia.met.gov.na>

NB- for the purpose of Section 38 of the Environmental Management Act, 2007 read with Regulation 4(d), kindly forward copies of all relevant documents i.e (application forms, EIA, Scoping reports, EMP etc) to the office of the Environmental Commissioner

Thank you

Phillip Troskie Bulding
P/Bag 13306, Windhoek | Tel: +264 61 284 2111 | DEA: +264 61 284 2701

Please do not reply directly to this email. It was sent from an unattended mailbox.
Correspondences can be done on the portal or please use
eia@met.gov.na

APPENDIX E

LETTER TO MAWLR - HAIB MINERALS

Wednesday, November 8, 2023

Executive Director (ED)
Ministry of Agriculture, Water and Land Reform (MAWLR)
Private Bag 13184
Windhoek
Namibia

Dear Ms. Ndiyakupi Nghituwamata

RE: **REQUIREMENTS OF ENVIRONMENTAL CLEARANCE TO ACQUIRE RELEVANT LICENSES AS PER THE WATER RESOURCES ACT (NO. 11 OF 2013) FOR EXPLORATION DRILLING PURPOSES.**

The Haib Copper project holds Environmental Clearance for the exploration activities at Exclusive Prospecting License (EPL) 3140 situated in Noordoewer //Karas Region, Namibia. See attached Environmental Clearance Certificate (ECC), EPL and map of EPL 3140 under Appendix A, B and C respectively.

Conditions set out in the ECC, via the site-specific Environmental Management Plan (EMP), is to obtain a Water Abstraction License prior to the abstraction of 20 000 liters per day for drilling purposes from the Orange River. Furthermore, as drilling activities are expected to extend into the water table (approximately 14 holes), the additional requirement as per The Water Resources Act (No. 11 of 2023), is to obtain a Borehole License.


Together with consultants Knight Piésold, Haib Minerals have been investigating the process for acquiring these licenses, to remain compliant with Namibian Law. The feedback from MAWLR (in-person discussion at head office 7 November 2023) is that at this current time the relevant application forms are not yet available and old forms will not be accepted.

Within the bounds of the existing ECC and EPL, Haib Minerals is set to start drilling on the 15th November 2023. In the absence of the required application forms, we assume that we may continue with exploration drilling and water abstraction activities and in-parallel apply for the required licenses once the relevant forms become available.

Please advise if you disagree with this approach and kindly provide an alternative, if applicable.

Our intention is to remain fully compliant with the law and we look forward to ongoing communication.

Yours sincerely


Jean-Luc Roy
COO, Director


Date