mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT FOR THE SUBSTITUTION OF AN ENVIRONMENTAL MANAGEMENT PROGRAMME (ENVIRONMENTAL AUTHORISATION), AN APPLICATION IN TERMS OF SECTION 102 OF THE MINERAL AND PETROLEUM RESOURCE DEVELOPMENT ACT, 28 OF 2002

FOR LISTED ACTIVITIES ASSOCIATED WITH MINING RIGHT AND/OR BULK SAMPLING ACTIVITIES INCLUDING TRENCHING IN CASES OF ALLUVIAL DIAMOND PROSPECTING.

SUBMITTED FOR ENVIRONMENTAL AUTHORIZATIONS IN TERMS OF THE NATIONAL ENVIRONMENTAL MANAGEMENT ACT, 1998 AND THE NATIONAL ENVIRONMENTAL MANAGEMENT WASTE ACT, 2008 IN RESPECT OF LISTED ACTIVITIES THAT HAVE BEEN TRIGGERED BY APPLICATIONS IN TERMS OF THE MINERAL AND PETROLEUM RESOURCES DEVELOPMENT ACT, 2002 (MPRDA) (AS AMENDED).[1]

NAME OF APPLICANT:	**Synchroplex (Pty) Ltd (2009/006022/07)**
TEL NO:	**083 945 0448**
FAX NO:	**086 510 7120**
POSTAL ADDRESS:	**PO Box 1690** **Montana Park** **0148**
PHYSICAL ADDRESS:	**42 Honey Suckle** **Johannesburg** **2040**

FILE REFERENCE NUMBER SAMRAD: **(NC) 30/5/1/1/2/2222 PR**
RENEWAL (NC) 30/5/1/1/2/11895 PR

[1] Section 102 Application in terms of the Mineral and Petroleum Resources Development Act, 28 of 2002.

IMPORANT NOTICE

In terms of the Mineral and Petroleum Resources Development Act (Act 28 of 2002 as amended), the Minister must grant a prospecting or mining right if among others the mining "*will not result in unacceptable pollution, ecological degradation or damage to the environment*".

Unless an Environmental Authorisation can be granted following the evaluation of an Environmental Impact Assessment and an Environmental Management Programme Report in terms of the National Environmental Management Act (Act 107 of 1998) (NEMA), it cannot be concluded that the said activities will not result in unacceptable pollution, ecological degradation or damage to the environment.

In terms of Section 16(3)(b) of the EIA Regulations, 2014, any report submitted as part of an application must be prepared in a format that may be determined by the Competent Authority and in terms of Section 17(1)(c) the Competent Authority must check whether the application has taken into account any minimum requirements applicable or instructions or guidance provided by the Competent Authority to the submission of applications.

It is therefore an instruction that the prescribed reports required in respect of applications for an environmental authorisation for listed activities triggered by an application for a right or permit are submitted in the exact format of, and provide all the information required in terms of, this template. Furthermore please be advised that failure to submit the information required in the format provided in this template will be regarded as a failure to meet the requirements of the Regulation and will lead to the Environmental Authorisation being refused.

It is furthermore an instruction that the Environmental Assessment Practitioner must process and interpret his/her research and analysis and use the findings thereof to compile the information required herein. (Unprocessed supporting information may be attached as appendices.) The EAP must ensure that the information required is placed correctly in the relevant sections of the Report, in the order, and under the provided headings as set out below, and ensure that the report is not cluttered with un-interpreted information and that it unambiguously represents the interpretation of the applicant.

OBJECTIVE OF THE SCOPING PROCESS

1) The objective of the scoping process is to, through a consultative process:-
   a) identify the relevant policies and legislation relevant to the activity;
   b) motivate the need and desirability of the proposed activity, including the need and desirability of the activity in the context of the preferred location;
   c) identify and confirm the preferred activity and technology alternative through an impact and risk assessment and ranking process;
   d) identify and confirm the preferred site, through a detailed site selection process, which includes an impact and risk assessment process inclusive of cumulative impacts and a ranking process of all the identified alternatives focusing on the geographical, physical, biological, social, economic, and cultural aspects of the environment;
   e) identify the key issues to be addressed in the assessment phase;
   f) agree on the level of assessment to be undertaken, including the methodology to be applied, the expertise required as well as the extent of further consultation to be undertaken to determine the impacts and risks the activity will impose on the preferred site through the life of the activity, including the nature, significance, consequence, extent, duration and probability of the impacts to inform the location of the development footprint within the preferred site; and
   g) identify suitable measures to avoid, manage, or mitigate identified impacts and to determine the extent of the residual risks that need to be managed and monitored.

SCOPING REPORT

2) Contact Person and correspondence address:

a) Details of:

i) The EAP who prepared the report:

Name of the Practitioner:	Roelien Oosthuizen
Tel No.:	084 208 9088
Fax No. :	086 510 7120
e-mail address:	roosthuizen950@gmail.com
Physical Address:	4 Mullin Street, Hadisonpark 8301
Postal Address:	P O Box 110823, Hadisonpark 8306

ii) Expertise of the EAP:

(1) The qualifications of the EAP:
(With evidence attached as Appendix 1)

Masters in Environmental Management (UFS)
B-Comm in Human and Industrial- Psychology (NWU)

(2) Summary of the EAP's past experience:
(Attach the EAP's curriculum vitae as Appendix 2)

Relevant past experiences in carrying out the Environmental Impact Assessment Procedures include Environmental Impact Assessments, Environmental Management Plans/Programmes/ Reports, Performance assessments, Rehabilitation progress assessments, Environmental Liability assessments, Environmental compliance monitoring, Scoping Reports, etc.
See attached CV.

b) Description of the property:

Farm Name:	Farm Name and No: Areachap 426 RL Subdivision : Farm Magisterial District: Gordonia Province: Northern Cape Extent: 19 653.0822 ha Title Deed No: T704/1973 Owner: Areachap Plase (Pty) Ltd
Application area (Ha)	19 653.0822 ha (Nineteen Thousand six hundred and fifty three comma zero eight two two) hectares
Magisterial district:	Gordonia
Distance and direction from nearest town	The farm is situated ± 28 km north west of Upington in the Gordonia District.
21 digit Surveyor General Code for each farm portion	C02800000000042600000

c) Locality Map:

(show nearest town, scale not smaller than 1:250 000 attached as Appendix 3)

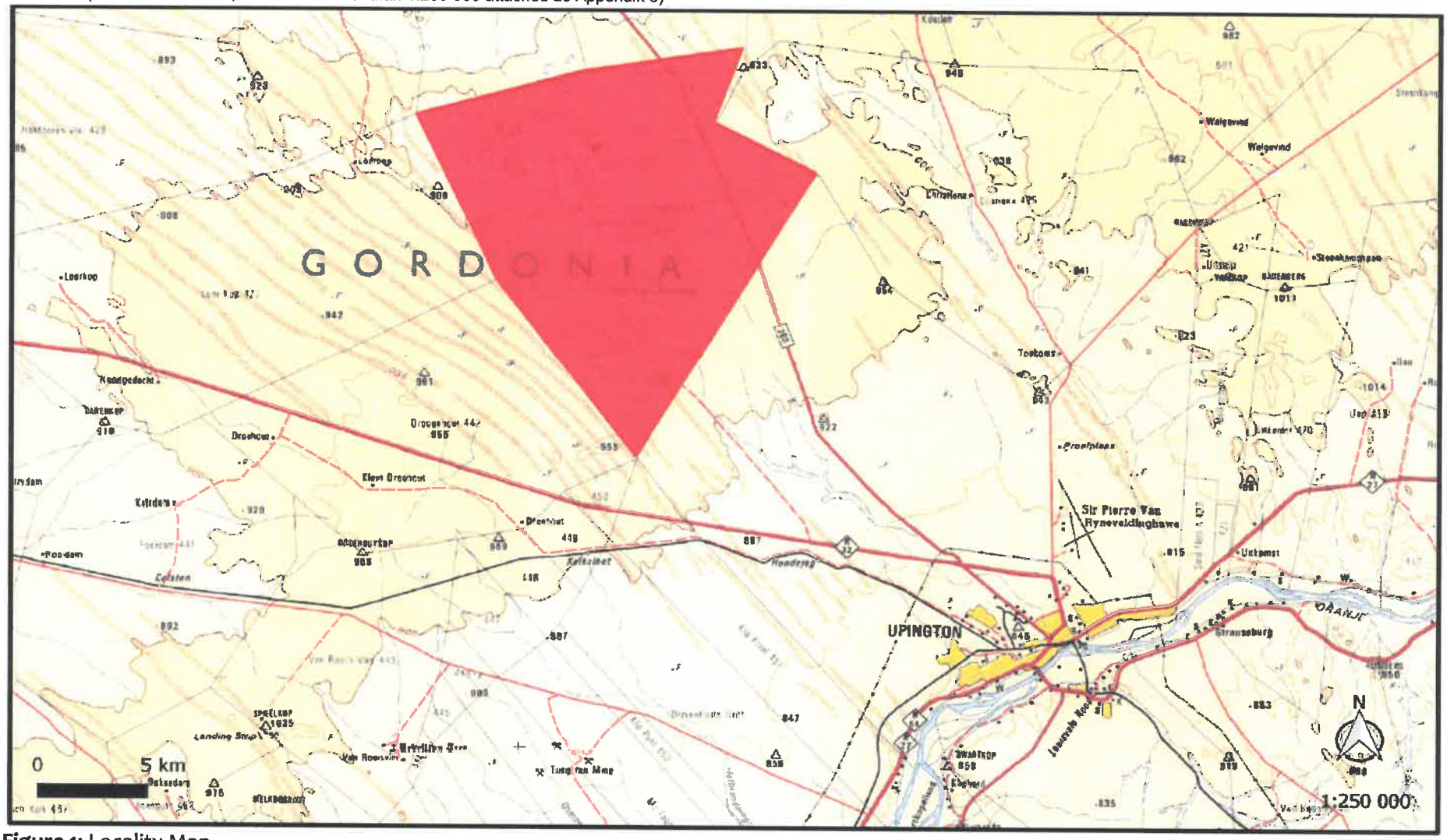

Figure 1: Locality Map

d) Description of the scope of the proposed overall activity:

i) Listed and specified activities:

(Provide a plan drawn to a scale acceptable to the competent authority but not less than 1:10 000 that shows the location, and area (hectares) of all the aforesaid main and listed activities, and infrastructure to be placed on site and attach as Appendix 4)

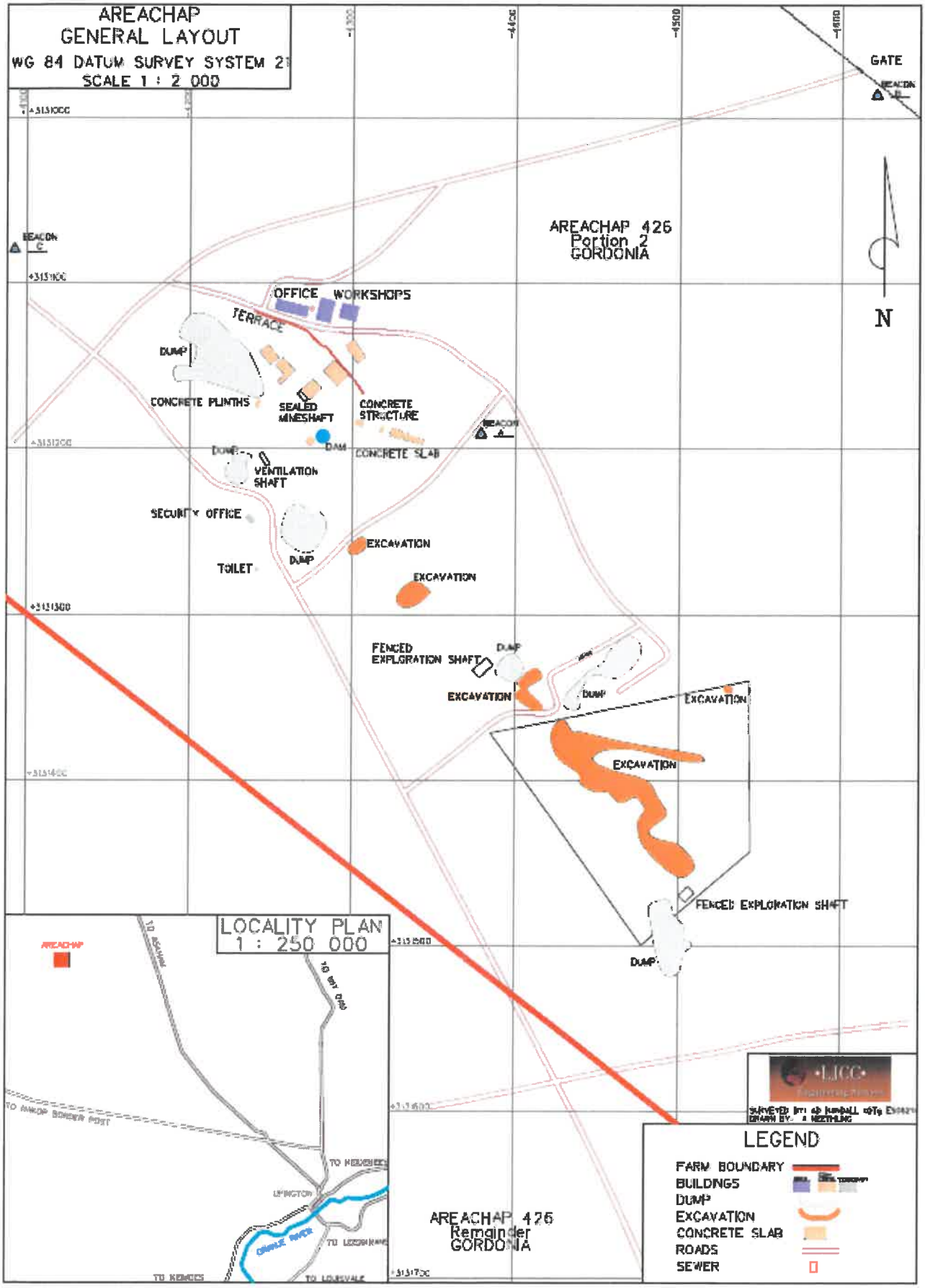

Figure 2: Infrastructure site layout plan

Listed and specified activities

Table 1: Listed and Specified Activities

Name of activity (e.g. Excavations, blasting, stockpiles, discard dumps or dams, loading, hauling and transport, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc ..etc...etc.)	Aerial extent of the activity (Ha or m²)	Listed Activity (mark with an X where applicable or affected)	Applicable Listing Notice (GNR544, GNR545 or GNR546 / Not listed GNR327, GNR325, GNR324/ Not listed)
Activity 12: "The development of— The development of- (i) dams of weirs, where the dam or weir, including infrastructure and water surface area, exceeds 100 square metres; or ii) Infrastructure or structures with a physical footprint of 100 square metres or more; where such development occurs— (a) within a watercourse; (b) in front of a development setback; or (c) if no development setback exists, within 32 metres of a watercourse, measured from the edge of a watercourse;- Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities)	Clean and dirty water system It is anticipated that the operation will establish storm water control berms and trenches to separate clean and dirty water on the prospecting site.	X	NEMA: LN1 (GNR327)
Activity 20: The Synchroplex operation directly relates to prospecting of a mineral resource (iron, silver, zinc, copper, and sulphur ore) and requires a prospecting right in terms of section 16 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including- (a) associated infrastructure, structures and earthworks, directly related to prospecting of a mineral resource; or (b) the primary processing of a mineral resource including winning, extraction, classifying, concentrating, crushing, screening or washing; But excluding the secondary processing of a mineral resource, including the smelting, beneficiation, reduction, refining, calcining or gasification of the mineral resource in which case activity 6 in Listing Notice 2 applies.	19 653.0822 ha Although the total area will never be prospected and the footprint with the drilling and bulk sampling is calculated to be ±119 ha. - Infill drilling as per geologist request 10 drill holes to 350 m. - Trench of 150m X 20m X 20m deep as per AAPS drilling campaign 60 000m³. - Underground sampling 70m to 90 m by 10.5m width with 200 m strike trough existing exploration shaft 42 000m³.	X	NEMA: LN1 (GNR327)
Activity 27: The clearance of an area of 20 hectares or more of indigenous vegetation, excluding where such clearance of indigenous vegetation is required for – (i) the undertaking of a linear activity; or (ii) maintenance purposes undertaken in accordance with a maintenance management plan.	119ha		NEMA: LN2 (GNR325)
Activity 19: The operation directly relates to prospecting of a mineral resource (iron, silver, zinc, copper, and sulphur ore) and requires permission in terms of Section 20 (MPRDA), for the removal and disposal of bulk samples of any minerals.	19 653.0822 ha Although the total area will never be prospected and the footprint with the drilling and bulk sampling is calculated to be ±119 ha. • Infill drilling as per geologist request 10 drill holes to 350 m. • Trench of 150m X 20m X 20m deep as per AAPS drilling campaign 60 000m³. • Underground sampling 70m to 90 m by 10.5m width with 200 m strike trough existing exploration shaft 42 000m³.	X	NEMA: LN2 (GNR325)
Activity 4: The development of access roads 6 m in width with no reserve. Roads (both access and haulage road on the mine site): Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the mining operation will create an additional 5 km of roads, with a width of 6 meter.	3ha	X	NEMA: LN3 (GNR324)
Activity 10: The development of infrastructure for the storage and handling of dangerous goods (fuel) in containers with a combined capacity of between 30m³ and 80m³.	±80m³	X	NEMA: LN3 (GNR324)
Activity 15: The establishment of residue deposits resulting from activities which require a prospecting right.	0.3ha		NEMWA: Category A (GNR 633)
Temporary Office complexes Temporary workshop facilities Storage facilities Concrete bund walls and diesel depots Ablution facilities Topsoil stockpiles Overburden stockpiles Water tanks	± 200 m2 ± 300 m2 ± 1 000 m2 ± 250 m2 ± 30 m2 ± 500 m2 5 000 m2 3m x 3m = 9m² each		Not Listed

Waste disposal site (domestic and industrial waste): It is anticipated that the operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area: • Small amounts of low level hazardous waste in suitable receptacles. • Domestic waste. • Industrial waste.	15m x 30m = 450m² per site		Not Listed

ii) **Description of the activities to be undertaken:**

(Describe methodology or technology to be employed, and for a linear activity, a description of the route of the activity.)

The prospecting operation is based on copper-zinc volcanic hosted massive sulphide (VHMS) deposits. The Cu-Zn-S-Ag-Fe ore will primarily be extracted from an opencast trench, but also from an existing underground shaft. Furthermore, exploration boreholes to a depth of 350 m are planned. An estimated total volume of 102 000 m3 will be produced over four years.

Prospecting activities will primarily make use of existing roads and infrastructure, but additional roads will be created in order to access working and exploration areas. The full extent of all planned infrastructure and activities are not currently known, but existing features include an office and workshop complex, a series of shafts, mine dumps, excavations, ablutions, water storage, concrete surfaces and fence lines (Figure 2).

Excavation and processing will take place within the limits of the prospecting area. All samples will be analysed at a South African laboratory, which laboratory will be identified and contracted upon commencement of phase 2 of the prospecting operation.

- Trench of 150m X 20m X 20m deep as per AAPS drilling campaign 60 000m³.
- Underground sampling 70m to 90 m by 10.5m width with 200 m strike trough existing exploration shaft 42 000m³.
- Infill drilling as per geologist request 10 drill holes to 350 m.

The trenches will assist in determining the location of the in-situ deposits and will be sampled to determine the quantity and quality of the mineralisation found.

Excavation, hauling and stockpiling will be done using earthmoving equipment.

The Trench and underground sampling cuttings will be mapped as well as sampled.

Material excavated from the trench and underground cuttings will be selected and processed through a crush-and-screen processing plant.

Mineralized material will be delivered to the plant area a point within 50m from the front end of the mobile plant. The material is then fed with earthmoving equipment into the mobile plant's vibrating feeder bin which then feeds a crusher. The crusher crushes the ore down to smaller fractions. This material is then fed into the mobile plant's multiple deck screen. The screen separates different size fractions which are then temporarily stockpiled.

Throughout the bulk sampling process, material is sampled and analysed in order to maintain the correct grade and also the correct ratio both of which are crucial economic factors.

Any waste created by the screening and crushing plant is then backfilled into the open excavation. The purpose of the bulk sampling phase is to determine material quality and various metallurgical and economic factors.

Rehabilitation of trenching and underground cuttings will be done immediately as each excavation is completed. Depending on the results and an possible application for a Mining Right. Once bulk sampling is completed the processing site will also be rehabilitated. Access road rehabilitation is carried out when all prospecting phases are completed at the end of the bulk sampling phase. Rehabilitated sites will be monitored to ensure vegetation growth re-occurs.

ii. Infrastructure

No infrastructure except farm roads will be affected by prospecting activities.

All temporary infrastructures, equipment and other items used during the proposed prospecting period will be removed from the site.

Waste Management

Proper sanitation facilities will be provided for employees. No person will pollute the workings with faeces or urine, misuse the facilities provided or inappropriately foul the surrounding environment with faeces or urine. Acceptable hygienic and aesthetic practices will be adhered to. Non-biodegradable refuse such as glass bottles, plastic bags, etc. will be sorted and stored in separate lockable containers at a central point. It will be disposed of at a recognised disposal facility twice a month. Biodegradable refuse will either be handled as indicated, or be buried in a pit excavated for that purpose and covered with layers of soil when almost full. A final 0,5m thick layer of topsoil will be incorporated where practicable. Provision will be made for the future subsidence of the covering. Refuse will not be dumped in the vicinity of the prospecting area. Waste material with regard to vehicle repairs will be kept in 200 litres steel containers in the maintenance/farmstead area. This material will be disposed of at a recognised disposal facility once a month.

Access Roads

The prospecting right area is located within the Gordonia District Municipality of the Northern Cape Province and lies 30 km north-west of the town Upington on the R360 (Figure 1). The total extent of the prospecting right area is 19 653.0822 ha. Activities associated with the Prospecting operation that is expected to make use of these roads include:-

- The transportation of prospecting personnel to and from the site;
- Delivery of supplies and materials;
- The transportation of the product for the market.

These transport operations will make use of passenger vehicles, light delivery vehicles and very limited heavy vehicles.

Haul Roads

There will be one Haul road to the plant area and one haul road to the prospecting bulk sampling site. No other haul roads will be constructed. Main haul roads will have a minimum width of 6m. No roads will be wider than 6m. Existing roads will be used as far as practically possible.

e) **Policy and Legislative Context:**

Applicable Legislation and Guidelines used to compile the report (a description of the policy and legislative context within which the development is proposed including an identification of all legislation, policies, plans, guidelines, spatial tools, municipal development planning frameworks and instruments that are applicable to this activity and are to be considered in the assessment process.)	Reference where applied	HOW DOES THIS DEVELOPMENT COMPLY WITH AND RESPOND TO THE POLICY AND LEGISLATIVE CONTEXT (E.g In terms of the National Water Act:-Water Use License has/has not been applied for).
Conservation of Agricultural Resources Act (Act 43 of 1983) and Regulations (CARA)	- Section 5: Implementation of control measures for alien and invasive plant species; - Section 6: Control measures. - Regulation GN R1048, published on 25 May 1984, in terms of CARA	- Control measures are to be implemented upon the approval of the EMPR.
Constitution of South Africa (Act 108 of 1996)	- Section 24: Environmental right - Section 25: Rights in Property - Section 27: Water and sanitation right	- To be implemented upon the approval of the EMPR.
Environment Conservation Act (Act 73 of 1989) and Regulations (ECA)	- Sections 21, 22, 25, 26 and 28: EIA Regulations, including listed activities that still relate to the existing section of ECA. - Section 28A: Exemptions.	- To be implemented upon the approval of the EMPR.
Fencing Act (Act 31 of 1963)	- Section 17: States that any person erecting a boundary fence may clean any bush along the line of the fence up to 1.5m on each side thereof and remove any tree standing in the immediate line of the fence. However, this provision must be read in conjunction with the environmental legal provisions relevant to protection of flora.	- Control measures are to be implemented upon the approval of the EMPR.
Hazardous Substances Act (Act 15 of 1973) and Regulations read together with NEMA and NEMWA	- Definition, classification, use, operation, modification, disposal or dumping of hazardous substances.	- Noted and Considered measures are to be implemented upon the approval of the EMPR.

Intergovernmental Relations Act (Act 13 of 2005)	- This Act establishes a framework for the National, Provincial and Local Governments to promote and facilitate intergovernmental relations.	
Mine, Health and Safety Act (Act 29 of 1996) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Mineral and Petroleum Resources Development Act (Act 28 of 2002) and Regulations as amended	- Entire Act. - Regulations GN R527	- A Prospecting Right has been applied for (NC) 30/5/1/1/2/2222 PR and NC 11895 PR renewal. - Rights and obligations to be adhered to.
National Environmental Management Act (Act 107 of 1998) and Regulations as amended	- Section 2: Strategic environmental management principles, goals and objectives. - Section 24: Foundation for Environmental Management frameworks. - Section 24N: - Section 24O: - Section 28: The developer has a general duty to care for the environment and to institute such measures to demonstrate such care. - Regulations GN R547, more specifically Chapters 5 and 7, where applicable (the remainder was repealed) published on 18 June 2010 in terms of NEMA (Environmental Management Framework Regulations) - Regulations GN R982 to R985, published on 4 December 2014 in terms of NEMA (Listed Activities) - Regulations GN R993, published on 8 December 2014 in terms of NEMA (Appeal) - Regulations GN R994, published on 8 December 2014 in terms of NEMA (exemption)	- Control measures are to be implemented upon the approval of the EMPR.

	- Regulations GN R205, published on 12 March 2015 in terms of NEMA (National appeal Amendment Regulations) - Regulations GN R1147, published on 20 November 2015 in terms of NEMA (Financial Provision)	
National Environmental Management: Air Quality Act (Act 39 of 2004)	- Section 32: Control of dust - Section 34: Control of noise - Section 35: Control of offensive odours - Regulation GN R551, published on 12 June 2015 (amended Categories 1 to 5 of GN 983) in terms of NEM:AQA (Atmospheric emission which have a significant detrimental effect on the environment) - Regulation GN R283, published on 2 April 2015 in terms of NEM:AQA (National Atmospheric Emissions Reporting Regulations) (Group C-Mines)	- Control measures are to be implemented upon the approval of the EMPR. - This is also legislated by Mine Health and Safety from DMR and is to be adhered to.
National Environmental Management: Biodiversity Act (Act 10 of 2004)	- Section 52 of The National Environmental Management Act: Biodiversity Act (NEMBA) (Act 10 of 2004) states that the MEC/Minister is to list ecosystems that are threatened and in need of protection. - Section 53 states that the Minister may identify any process or activity in such a listed ecosystem as a threatening process. - A list of threatened and protected species has been published in terms of Section 56(1) GG 29657 GNR 151 and GNR 152, Threatened or Protected Species Regulations. Commencement of Threatened or Protected Species Regulations 2007 : 1 June 2007 GNR 150/GG 29657/23-02-2007	- A permit application regarding protected plant species need to be lodged with DENC if any protected species is encountered.

	Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 * Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 * - Sections 65 – 69: These sections deal with restricted activities involving alien species; restricted activities involving certain alien species totally prohibited; and duty of care relating to alien species. - Sections 71 and 73: These sections deal with restricted activities involving listed invasive species and duty of care relating to listed invasive species. - Regulation GN R151, published on 23 February 2007 (List fo Critically Endangered, Vulnerable and Protected Species, 2007) in terms of NEM: BA - Regulation GN R152, published on 23 February 2007 (TOPS) in terms of NEM:BA - Regulations GN R507 to 509 of 2013 and GN 599 of 2014 in terms of NEM:BA (Alien Species)	
The National Environmental Management Act: Protected Areas Act (NEMPAA) (Act 57 of 2003) provides for the protection of ecologically viable areas that are representative of South Africa"s natural biodiversity and its landscapes and seascapes.	- Chapter 2 lists all protected areas.	- Not applicable. The prospecting right operation does not fall within any protected area.
National Environmental	- Chapter 4: Waste management activities	- To be implemented upon the

Management: Waste Management Act (Act 59 of 2008)	- Regulations GN R634 published on 23 August 2013 in terms of NEM:WA (Waste Classification and Management Regulations) - Regulations GN R921 published on 29 November 2013 in terms of NEM:WA (Categories A to C – Listed activities) - National Norms and Standards for the Remediation of contaminated Land and Soil Quality published on 2 May 2014 in terms of NEM:WA (Contaminated land regulations) - Regulations GN R634 published on 23 August 2013 in terms of NEM: WA (Waste Classification and Management Regulations) - Regulations GN R632 published on 24 July 2015 in terms of NEM: WA (Planning and Management of Mineral Residue Deposits and Mineral Residue Stockpiles) - Regulations GN R633 published on 24 July 2015 in terms of NEM: WA (Amendments to the waste management activities list published under GN921)	approval of the EMPR.
National Forest Act (Act 84 of 1998) and Regulations	- Section 15: No person may cut, disturb, damage, destroy or remove any protected tree; or collect, remove, transport, export, purchase, sell, donate or in any other manner acquire or dispose of any protected tree, except under a licence granted by the Minister.	- A permit application regarding protected tree species need to be lodged with DAFF if necessary.
National Heritage Resources Act (Act 25 of 1999) and Regulations	- Section 34: No person may alter or demolish any structure or part of a structure which is older than 60 years without a permit issued by the relevant provincial heritage resources authority. - Section 35: No person may, without a permit	- Control measures are to be implemented upon the approval of the EMPR.

	issued by the responsible heritage resources authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site. - Section 36: No person may, without a permit issued by SAHRA or a provincial heritage resources authority destroy, damage, alter, exhume, remove from its original position or otherwise disturb any grave or burial ground older than 60 years which is situated outside a forma cemetery administered by a local authority. - Section 38: This section provides for HIA which are not already covered under the ECA. Where they are covered under the ECA the provincial heritage resources authorities must be notified of a proposed project and must be consulted during HIA process. - Regulation GN R548 published on 2 June 2000 in terms of NHRA	
National Water Act (Act 36 of 1998) and regulations as amended, *inter alia* Government Notice No. 704 of 1999	- Section 4: Use of water and licensing. - Section 19: Prevention and remedying the effects of pollution. - Section 20: Control of emergency incidents. - Section 21: Water uses In terms of Section 21 a licence is required for: (a) taking water from a water resource; (b) storing water; (c) impeding or diverting the flow of water in a watercourse; (f) Waste discharge related water use; (g) disposing of waste in a manner which may detrimentally impact on a water resource;	- No water use application will be applicable as no water is envisaged to be used for the operation. - Control measures are to be implemented upon the approval of the EMPR.

	(i) altering the bed, banks, course or characteristics of a watercourse; (j) removing, discharging or disposing of water found underground if it is necessary for the efficient continuation of an activity or for the safety of people; and; - Regulation GN R704, published on 4 June 1999 in terms of the National Water Act (Use of water for mining and related activities) - Regulation GN R1352, published on 12 November 1999 in terms of the National Water Act (Water use to be registered) - Regulation GN R139, published on 24 February 2012 in terms of the National Water Act (Safety of Dams) - Regulation GN R398, published on 26 March 2004 in terms of the National Water Act (Section 21 (j)) - Regulation GN R399, published on 26 March 2004 in terms of the National Water Act (Section 21 (a) and (b)) - Regulation GN R1198, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i) – rehabilitation of wetlands) - Regulations GN R1199, published on 18 December 2009 in terms of the National Water Act (Section 21 (c) and (i)) - Regulations GN R665, published on 6 September 2013 in terms of the National Water Act (Amended GN 398 and 399 – Section 21 (e), (f), (h), (g), (j))	
Nature Conservation Ordinance (Ord 19 of 1974)	- Chapters 2, 3, 4 and 6: Nature reserves, miscellaneous conservation measures, protection of wild animals other than fish, protection of	- Control measures are to be implemented upon the approval of the EMPR.

	Flora.	
Northern Cape Nature Conservation Act (Act 9 of 2009)	- Addresses protected species in the Northern Cape and the permit application process related thereto.	- A permit application regarding provincially protected plant species as well as for large-scale harvesting of indigenous flora need to be lodged with DENC if necessary. - Control measures are to be implemented upon the approval of the EMPR.
Occupational Health and Safety Act (Act 85 of 1993) and Regulations	- Section 8: General duties of employers to their employees. - Section 9: General duties of employers and self-employed persons to persons other than their employees.	- Control measures are to be implemented upon the approval of the EMPR.
Road Traffic Act (Act 93 of 1997) and Regulations	- Entire Act.	- Control measures are to be implemented upon the approval of the EMPR.
Water Services Amendment Act (Act 30 of 2007)	- It serves to provide the right to basic water and sanitation to the citizens of South Africa (giving effect to section 27 of the Constitution).	- Control measures are to be implemented upon the approval of the EMPR.
National Land Transport Act, (Act 5 of 1998)		- To take note.
Northern Cape Planning and Development Act (Act 7 of 1998)	- To control planning and development	- To be implemented upon the approval of the EMPR.
Spatial Planning and Land Use Management (Act 16 of 2013 (SPLUMA) and regulations	- To provide a framework for spatial planning and land use management in the Republic; - To specify the relationship between the spatial planning and the land use management, amongst others - Regulations GN R239 published on 23 March 2015 in terms of SPLUMA	- To be implemented upon the approval of the EMPR.
Subdivision of Agricultural Land Act,	- Regulations GN R373 published on 9 March 1979	- To take note.

70 of 1970 and regulations	in terms of Subdivision of Agricultural Land	
Basic Conditions of Employment Act (Act 3 of 1997)) as amended	- To regulate employment aspects	- To be implemented upon the approval of the EMPR
Community Development (Act 3 of 1966)	- To promote community development	- To be implemented upon the approval of the EMPR
Development Facilitation (Act 67 of 1995) and regulations	- To provide for planning and development	- To take note.
Development Facilitation (GN24, PG329, 24/07/1998)	- Regulations re Northern Cape LDO's	- To take note.
Development Facilitation (GNR1, GG20775, 07/01/2000)	- Regulations re application rules S26, S46, S59	- To take note.
Development Facilitation (GN732, GG14765, 30/04/2004)	- Determines amount, see S7(b)(ii)	- To take note.
Land Survey Act (Act 8 of 1997)) and regulations, more specifically GN R1130	- To control land surveying, beacons etc. and the like; - Agriculture, land survey S10	- To take note.
National Veld and Forest Fire Act (Act 101 of 1998)) and regulations, more specifically GN R1775	- To regulate law on veld and forest fires - (Draft regulations s21)	- To be implemented upon approval of the EMPR
Municipal Ordinance, 20/1974	- To control pollution, sewers etc.	- To be implemented upon approval of the EMPR
Municipal Ordinance, PN955, 29/08/1975	- Nature conservation Regulations	- To be implemented upon approval of the EMPR
Cape Land Use Planning Ordinance, 15/85	- To control land use planning	- To take note.
Cape Land Use Planning Ordinance, PN1050, 05/12/1988	- Land use planning Regulations	- To take note.

f) Need and desirability of the proposed activities:

(Motivate the need and desirability of the proposed development including the need and desirability of the activity in the context of the preferred location.)

This section has been compiled by using various historical information including Iscor Exploration work and Anglo American Services exploration and reports.

History

The mine was mined during the period 1906 to 1917 mainly for copper. During the sixties Iscor (now EXXARO) started further exploration mainly to see whether the Sulphur will be economic viable for utilisation in the production of sulphuric acid. In the seventies Anglo did additional exploration. The initial drilling was done up to 90 meters and has later been extended to 200 meters. In the seventies Anglo extended the drilling campaign to 750 meters.

The mine is situated 30km from Upington in the Gordonia district in the Northern Cape. It comprises of 119.4 hecatres of land and has 2 main mineral deposits namely the North Western deposit and the South Eastern deposit. These deposits are very similar in form and lie out and can nearly be seen as parallel twins. A shaft has been sunk and capped. The shaft is 200 meters deep with stations at 91, 122, 152 and 183 meters respectively. The shaft is not equipped.

There is no equipment on the mine other than the capped shaft. A huge part of the operations can be done as an open cast operation initially. This mine has a 25 to 30 year life.

North Western deposit

The ore body can be seen in 4 different levels, where the level up to 91 meters an average thickness of 10.9 meter, thereafter to a depth of it increases to a maximum strike length of 600 meter to a depth of 300 meters, and decreases gradually from there and is best developed below 500 meters. The body has not been drilled or explored below 750 meters.

South Eastern deposit.

The body is not as well developed as the North Western Body but is also best developed below 500 meters. Limited exploration has been done on the south eastern body.

Bulk sampling done by Iscor has shown that the sulphur, copper and zinc can be mined economically in a floatation process.

Sulphuric acid is the main driver of the project for leeching and there is ample Sulphur in the ore body, up to 35% Sulphur which make it an excellent opportunity as the savings in the purchase of sulphuric acid is vast. Sulphur has also got a sales value of USD$ 250 per ton where by the excess sulphuric acid can be sold.

The mineralization is mainly pyrite and pyrhotite. There is an oxide ore body in the upper levels (up to 90 meters) that is estimated to be around 400 000 tons and this ore body can be mined directly to leaching with sulphuric acid.
The pyrite ore body which is the bulk of the ore reserve will have a different mining process as the bulk of the Sulphur will have to be roasted of and be captured in gas form

from wher it is to be utilized in a sulphuric acid plant. The leeching process will follow the roasting process.

Ore Mass and Grade

The combined ore reserves for both deposits inclusive of massive and disseminated ore are as follows:
The massive sulphide ore on the 290 foot level average copper content of 3.5% Cu, Zinc at 2.1% and sulphur at an average of 35%. Recovery on the bulk sample was in the 80% but for valuation purposes we accept a recovery rate of 80%.

Minute traces of gold and silver are present and whatever of that is recoverable is saleable, but it is not included as income or part of the valuation.

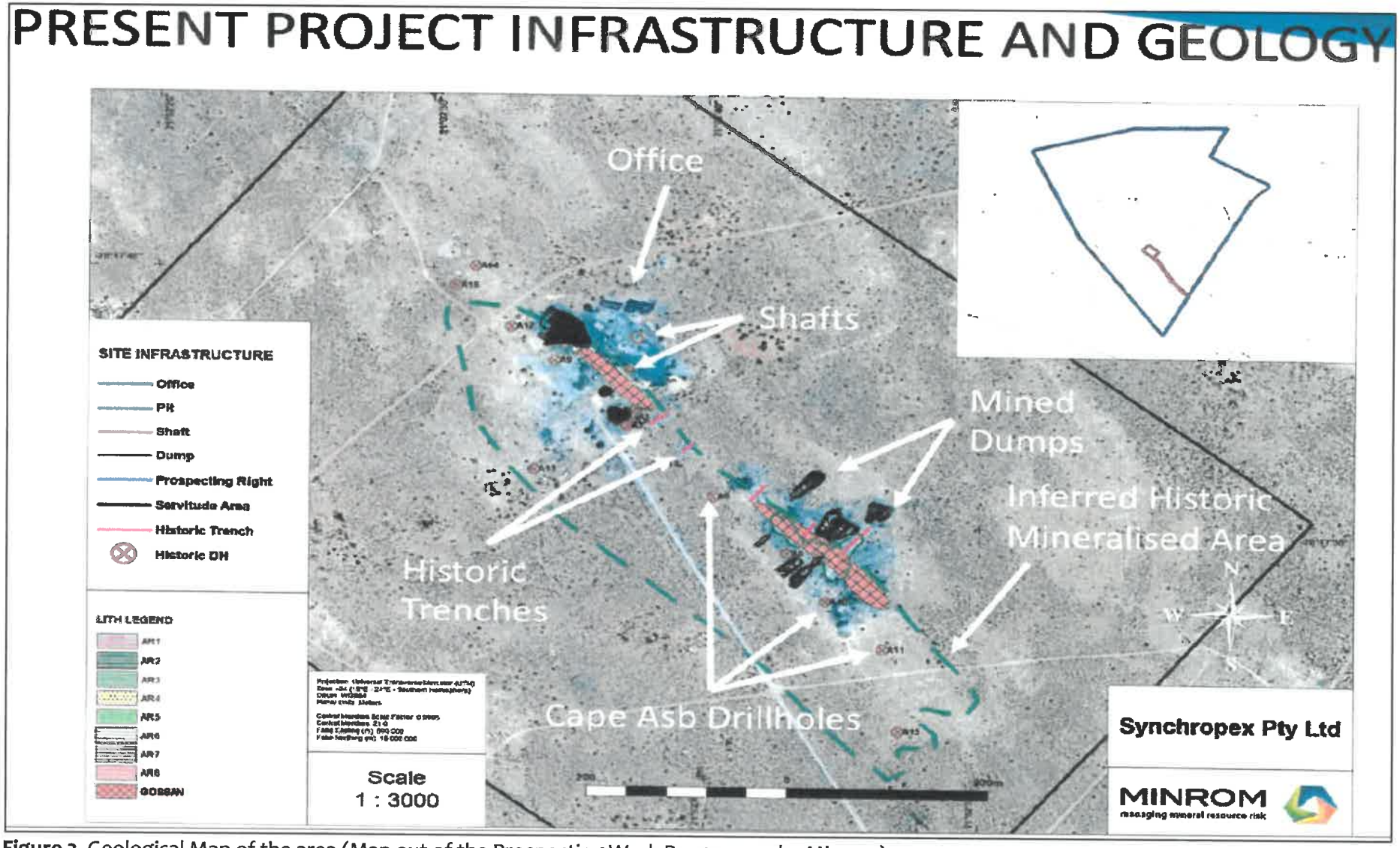

Figure 3. Geological Map of the area (Map out of the Prospecting Work Programme by Minrom).

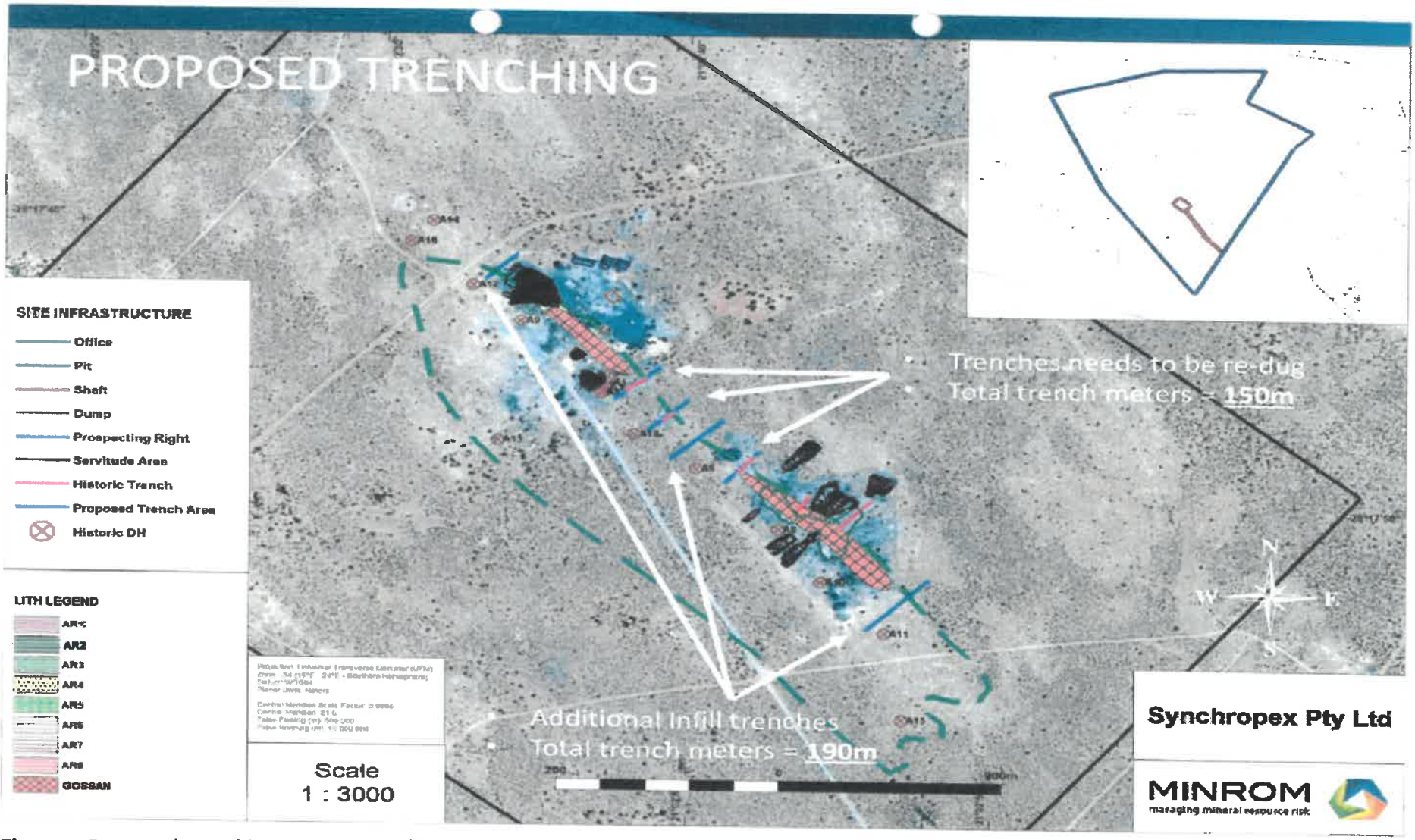

Figure 4. Proposed Trenching on Areachap (Map out of the Prospecting Work Programme by Minrom).

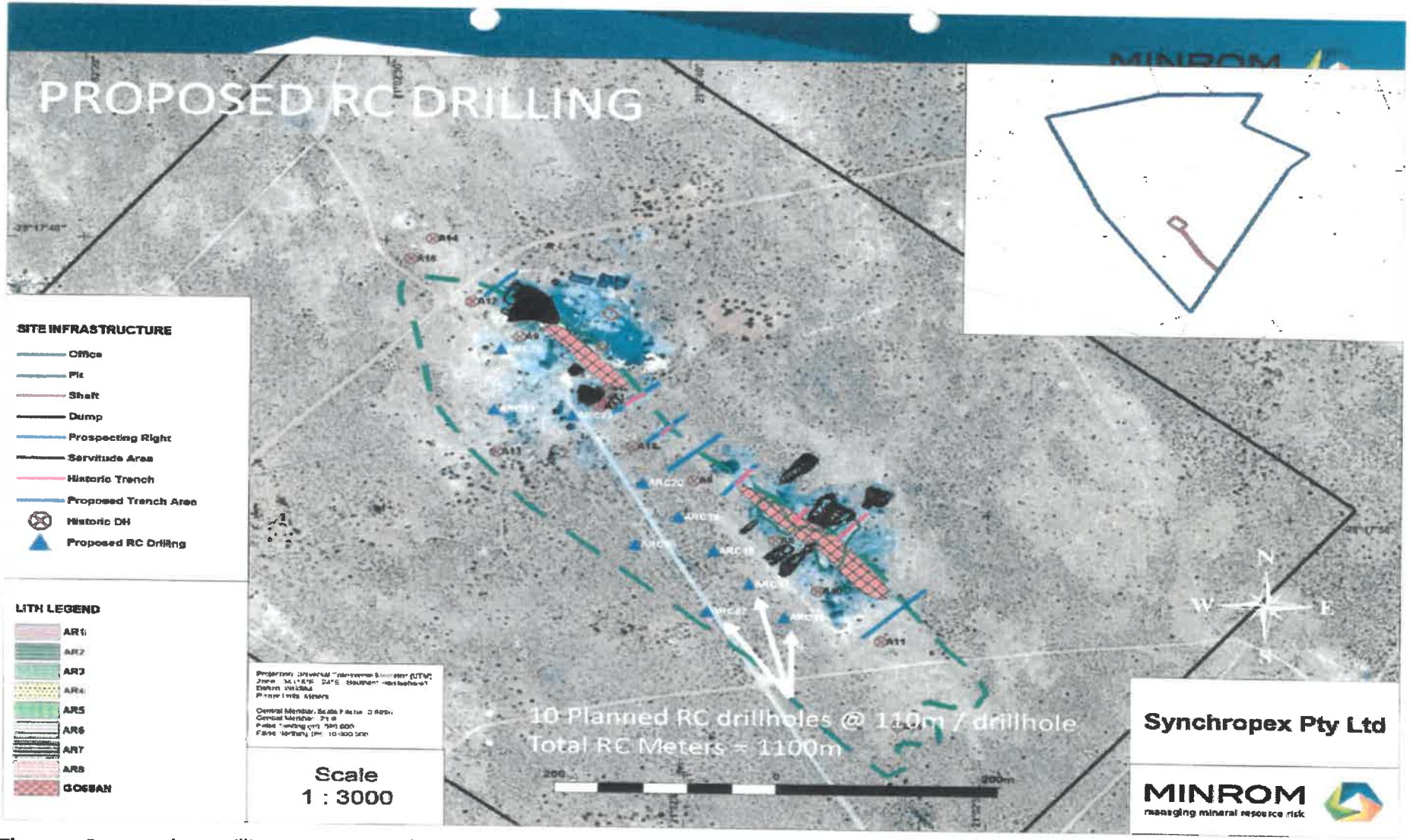

Figure 5. Proposed RC Drilling on Areachap (Map out of the Prospecting Work Programme by Minrom).

g) Period for which the environmental authorisation is required:

5 years. Thus the period required is for the Life of Mine of the prospecting right.

h) Description of the process followed to reach the proposed preferred site:

(NB!! – This section is not about the impact assessment itself; it is about the determination of the specific site layout having taken into consideration (1) the comparison of the originally proposed site plan, the comparison of that plan with the plan of environmental features and current land uses, the issued raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.)

(i) Details of all alternatives considered:

With reference to the site plan provided as Appendix 4 and the location of the individual activities on site, provide details of the alternatives considered with respect to:
(a) the property on which or location where it is proposed to undertake the activity;
(b) the type of activity to be undertaken;
(c) the design or layout of the activity;
(d) the technology to be used in the activity;
(e) the operational aspects of the activity; and
(f) the option of not implementing the activity.

(a) The property on which or location where it is proposed to undertake the activity:

(b) The property on which or location where it is proposed to undertake the activity:

The registered description of the land to which the Prospecting Right application relates:

Farm Name	Title Deed	In Extent
Farm Name and No: Areachap 426 RL Subdivision : Farm Magisterial District: Gordonia Province: Northern Cape Owner: Areachap Plase (Pty) Ltd	T704/1973	19 653.0822 ha

The property on which the Prospecting Right was applied for is determined by the geological location of the mineral resource. Therefore, there are no alternatives for the location of the activity, except for not proceeding with the operation. This will however cause the underutilisation of a national economic resource.

The area is accessible via gravel roads from different directions.

Infrastructure in the Gordonia area is well developed with good road and rail networks, electricity grid and water. Experienced labour is available in the area as is an extensive network of secondary industries geared towards small and large-scale mining.

Alternatives considered:-

As the area covered under the Prospecting Right had been selected based on the assumption of (iron, silver, zinc, copper, and sulphur ore), it will not be viable to consider an alternative site for the prospecting right application. Alternatives for land are thus not

available, as the prospecting right application cannot be considered over another area.

Therefore there are no alternatives to the area.

(c) The type of activity to be undertaken:

The prospecting operation is based on copper-zinc volcanic hosted massive sulphide (VHMS) deposits. The Cu-Zn-S-Ag-Fe ore will primarily be extracted from an opencast trench, but also from an existing underground shaft. Furthermore, exploration boreholes to a depth of 350 m are planned. An estimated total volume of 102 000 m3 will be produced over four years.
Prospecting activities will primarily make use of existing roads and infrastructure, but additional roads will be created in order to access working and exploration areas. The full extent of all planned infrastructure and activities are not currently known, but existing features include an office and workshop complex, a series of shafts, mine dumps, excavations, ablutions, water storage, concrete surfaces and fence lines (Figure 2).

Alternatives considered:-

The only alternative land use is grazing; however the applicant's main economic activity is prospecting / mining and for this reason does not favour any other alternative land use.

(d) The design or layout of the activity:

The site infrastructure will need to be strategically placed by incorporating prospecting project demands and environmental sensitivities identified during the Environmental Impact Assessment process. Thus, the site layout will primarily be based on proximity to the nearby access roads, proximity to the areas earmarked for prospecting as well as limited additional impact on the environmental (wind direction), heritage resources and discussions with the relevant Departments.

The following infrastructure will be established and will be associated with the prospecting operation with permission of the relevant Departments and surface owners:

- Trench of 150m X 20m X 20m deep as per AAPS drilling campaign
- Underground sampling 70m to 90 m by 10.5m width with 200 m strike trough existing exploration shaft
- Infill drilling as per geologist request 10 drill holes to 350 m Drilling minimum 30 surface drillholes – 6 months.

- Processing Plant

- Fuel Storage facility (Concrete Bund walls and Diesel tanks):
  It is anticipated that the operation will utilize 2 x 23 000 litre diesel tanks. These tanks must be placed in bund walls, with a capacity of 1.5 times the volume of the diesel tanks. A concrete floor must be established where the re-fuelling will take place.

- Concrete bund walls and diesel depots ± 250 m2

- The establishment of residue deposits resulting from activities which require a prospecting right. 0.3ha
  Topsoil stockpiles ± 500 m2
  Overburden stockpiles 5 000 m2
  Product Stockpile area.

- Office complexes ± 200 m2
- Temporary workshop facilities ± 300 m2
- Storage facilities ± 2 000 m2

- Ablution Facilities: In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.
  Ablution facilities ± 30 m2

- Clean & Dirty water system: Berms
  It is anticipated that the operation will establish stormwater control berms and trenches to separate clean and dirty water on the mine site.

- Roads (both access and haulage road on the mine site):
  Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the prospecting operation will create an additional 2 - 4 km of roads, with a width of 6 meters.

    - Salvage yard (Storage and laydown area).

    - Waste disposal site

- The operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area:

    - Small amounts of low level hazardous waste in suitable receptacles;

    - Domestic waste;

    - Industrial waste.

    - Temporary Workshop Facilities and Wash bay.

- Water distribution Pipeline.

- Water tank:
- It is anticipated that the operation will establish 1 x 10 000 litre water tank with purifiers for potable water. Water tanks 3m x 3m = 9m² each

Alternatives considered:-

Alternatives for fuel storage include surface storage, underground storage and the storage of fuel in mobile tanks with a metal bund wall. Underground storage has an adverse negative pollution potential, because it is not easy to monitor leakages. Remediation measures are also not as effective as compared to surface storage tanks. Mobile tanks are a viable option for infield screening activities, but the best viable long term option is the instalment of fuel tanks within a concrete bund wall. The final location of the fuel storage tanks will be determined based on proximity to site operations.

In terms of power generation the options available was for Generators or ESKOM power. All of the electricity needs for the operations will be generated by a diesel generator and in some cases if and where possible the Eskom Electricity Grid.

In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.

(e) The technology to be used in the activity:

Technique and technology

Excavation and processing will take place within the limits of the prospecting area. All samples will be analysed at a South African laboratory, which laboratory will be identified and contracted upon commencement of phase 2 of the prospecting operation.

- Trench of 150m X 20m X 20m deep as per AAPS drilling campaign 60 000m³.

- Underground sampling 70m to 90 m by 10.5m width with 200 m strike trough existing exploration shaft 42 000m³.

- Infill drilling as per geologist request 10 drill holes to 350 m.

The trenches will assist in determining the location of the in-situ deposits and will be sampled to determine the quantity and quality of the mineralisation found.

Excavation, hauling and stockpiling will be done using earthmoving equipment.

The Trench and underground sampling cuttings will be mapped as well as sampled.

Material excavated from the trench and underground cuttings will be selected and processed through a crush-and-screen processing plant.

Mineralized material will be delivered to the plant area a point within 50m from the front end of the mobile plant. The material is then fed with earthmoving equipment into the mobile plant's vibrating feeder bin which then feeds a crusher. The crusher crushes the ore down to smaller fractions. This material is then fed into the mobile plant's multiple deck screen. The screen separates different size fractions which are then temporarily stockpiled.

Throughout the bulk sampling process, material is sampled and analysed in order to maintain the correct grade and also the correct ratio both of which are crucial economic factors.

Any waste created by the screening and crushing plant is then backfilled into the open excavation. The purpose of the bulk sampling phase is to determine material quality and various metallurgical and economic factors.

Rehabilitation of trenching and underground cuttings will be done immediately as each excavation is completed. Depending on the results and an possible application for a Mining Right. Once bulk sampling is completed the processing site will also be rehabilitated. Access road rehabilitation is carried out when all prospecting phases are completed at the end of the bulk sampling phase. Rehabilitated sites will be monitored to ensure vegetation growth re-occurs.

Alternatives considered:-

The planned prospecting activities include (trenching and underground cuttings). The operation is also associated with processing techniques that make use of modern technologies. These are the most economic viable method currently being used by the (iron, silver, zinc, copper, and sulphur ore) fraternity. There is no other feasible, alternative prospecting method for the prospecting and extraction of the target minerals.

(f) The operational aspects of the activity:

Mineralized material will be delivered to the plant area a point within 50m from the front end of the mobile plant. The material is then fed with earthmoving equipment into the mobile plant's vibrating feeder bin which then feeds a crusher. The crusher crushes the ore down to smaller fractions. This material is then fed into the mobile plant's multiple deck screen. The screen separates different size fractions which are then temporarily stockpiled.

Throughout the bulk sampling process, material is sampled and analysed in order to maintain the correct grade and also the correct ratio both of which are crucial economic factors.

Any waste created by the screening and crushing plant is then backfilled into the open excavation. The purpose of the bulk sampling phase is to determine material quality and various metallurgical and economic factors. The expected lifespan of the prospecting operation is 5 years.

Prospecting activities will primarily make use of existing roads created by previous mining activities, but there is a possibility for additional roads that could be created.

Alternatives considered:-

The conventional opencast load-haul-mining method has been proven to be the most economic viable method currently being used by the (iron, silver, zinc, copper, and sulphur ore) fraternity. There is no other feasible, alternative prospecting method for the prospecting and extraction of (iron, silver, zinc, copper, and sulphur ore).

(g) The option of not implementing the activity:

Potential land use includes grazing and mining. The majority of the area is classified to have low to moderate potential for grazing land and not suitable for crop yield. Apart from the (iron, silver, zinc, copper, and sulphur ore) deposits, this prospecting / mining activity are believed to be the most economically beneficial option for the area. The farming of livestock will only be able to continue in areas not affected by prospecting operations. The most significant impacts associated with grazing activities include the provision of water. These are not expected to have a serious impact on the existing groundwater features. Cumulative impacts associated to grazing include overgrazing and destruction of natural vegetation, but the cumulative effect of prospecting/mining activities on the property are expected to outweigh any potential negative effects that agriculture might have.

Mining forms an integrated part of the social and economic growth of South Africa and more specifically the Northern Cape Province.

Socio-Economy

The operation will make provision for 7- 15 job opportunities. This will be lost if the project does not proceed. Substantial tax benefits to the State and Local Government will also be lost.

(ii) Details of the Public Participation Process Followed:

(Describe the process undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings. Information to be provided to affected parties must include sufficient detail of the intended operation to enable them to assess what impact the activities will have on them or on the use of their land.)

The process to be followed will include a substitution of the current Environmental Management Programme in terms of section 102 of the Mineral and Petroleum Resources Development Act, 28 of 2002 and the process to be followed is in terms of sections 31 and 32 of the National Environmental Management Act, 107 of 1998.

The process as described by NEMA for Environmental Authorisation was followed. See table below for the identification of Interested and Affected Parties to be consulted with. The landowner is Areachap Plase (Pty) Ltd.

Notices were placed at the gate of the farm and at the public library in Upington to make all parties aware of the Section 102 application to amend the existing Environmental Authorization.

The Scoping Report was made available to all Departments and the surface owner for any comments or concerns. The letters were send out on 27 February 2019. The Scoping Report was also placed at the public library in Upington and a Notice was placed in the Gemsbok newspaper on 27 February 2019. The existing Standard EMP document had been revised in totality to make provision for the new NEMA template scoping report as prescribed.

Consultation process:

Proof of consultation (notification letters, notices and response forms) is attached as Appendix 3. The consultation process is still ongoing.

(iii) Summary of issues raised by I&AP's

(Complete the table summarising comments and issues raised, and reaction to those responses.)

Table 2

Interested and Affected Parties **List the names of persons consulted in this column, and** **Mark with an X where those who must be consulted were in fact consulted**		**Date Comments Received**	**Issues Raised**	**EAPs response to issues as mandated by the applicant**	**Section and paragraph reference in this report where the issues and or response were incorporated**
AFFECTED PARTIES					
Landowner/s	**X**				
Areachap Plase (Pty) Ltd Mr. D Barnard P.O. Box 588 Upington 8800 divbarnard@gmail.com	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties	X				
Mrs. Elizabeth van der Westhuizen PO Box 2567 Durbanville 7551 Stevevdw128@gmail.com	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
Allepad Boerdery (Edms Bpk) Mnr AP van Schalkwyk en Me AG van Schalkwyk PO Box 746 Upington 8800 Strydam_boerdery@lantic.net	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
Municipal Councillor	X				
Municipality	X				

Dawid Kruiper Local Municipality Private Bag X6003 Upington 8800	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
ZF Mgcawu District Municipality Private Bag X6039 Upington 8800	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
Organs of State (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA					
The Regional Manager Department of Mineral Resources Private Bag X6093 Kimberley 8300	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
ESKOM Holdings SOC Ltd, NC Operating Unit Land Development P O Box 606 Kimberley 8300	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
Eskom Environmental Division PO Box 356 Bloemfontein 9300	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
SANRAL P.O. Box 415	X Registered Letter were				

Pretoria 0001	sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
Northern Cape Department of Roads and Public Works The Head of Department PO Box 3132 Squarehill Park Kimberley 8300	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
Transnet PO Box 72501 Parkview 2122	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
Dept. of Agriculture, Land Reform & Rural Development Private Bag X5018 Kimberley 8300	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
Department of Rural Development and Land Reform Po Box 5026 Kimberley 8300	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
Dept. of Agriculture, Forestry & Fisheries Directorate: Forestry Management P.O. Box 2782 Upington 8800	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
Department of Environment & Nature Conservation Private Bag X6102 Kimberley 8300	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the				

	Scoping Report.				
Department of Water & Sanitation Private Bag X6101 Kimberley 8300	X Registered Letter were sent on 30 November 2018 on the Section 102 application and EIA EMP.	.			
Department of Public Works Private Bag X 5002 Kimberley 8300	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
SAHRA P.O. Box 4637 Cape Town 8000	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				
Communities					
Town of Upington is closest to operation					
Traditional Leaders					
No Traditional Leaders					
Other Competent Authorities affected					
OTHER AFFECTED PARTIES					
INTERESTED PARTIES					
Ilenergy Bauhinia Singel 43 Vredekloof Brackenfell 7560 ian@ilenergysa.com	X Registered Letter were sent on 27 February 2019 on the Section 102 application with the Scoping Report.				

* Note: The contents of this table have been recorded up to 27 February 2019 as the process of public participation is an ongoing process.

(iv) The Environmental attributes associated with the sites:

(1) Baseline Environment:

(a) Type of environment affected by the proposed activity:
(its current geographical, physical, biological, socio-economic and cultural character.)

(a) Type of environment affected by the proposed activity
(its current geographical, physical, biological, socio-economic, and cultural character)

(1) ***GEOLOGY:***

According to Steyn (1988) the geological features on Areachap mainly comprise quaternary and carboniferous deposits. The site is primarily associated with shale and tillite from the Dwyka Formation of the Karoo Supergroup. Red-brown, wind-blown sand and dunes from the Gordonia Formation of the Kalahari Group occur scattered in the north, but is more prominent in the south (Figure 6). The Cu-Zn-S-Ag-Fe resource is associated with the amphibolite, biotite gneiss, politic gneisses and lenses of calc-silicate rocks from the Jannelspan Formation of the Areachap Group.

The site is closely associated with the Ae10d, Ae112a, Af2g, Af8a and Af8b landtypes. Here, red-yellow apedal, freely drained soils, as well as red with a high base status and a depth of more than 300 mm are found. The region is characterised by dune hills (parallel crests) and lowlands, with altitudes ranging between 920 m above sea level in the north and 940 m in the south. The terrain is indicated by a very gentle slope of 0.4 %.

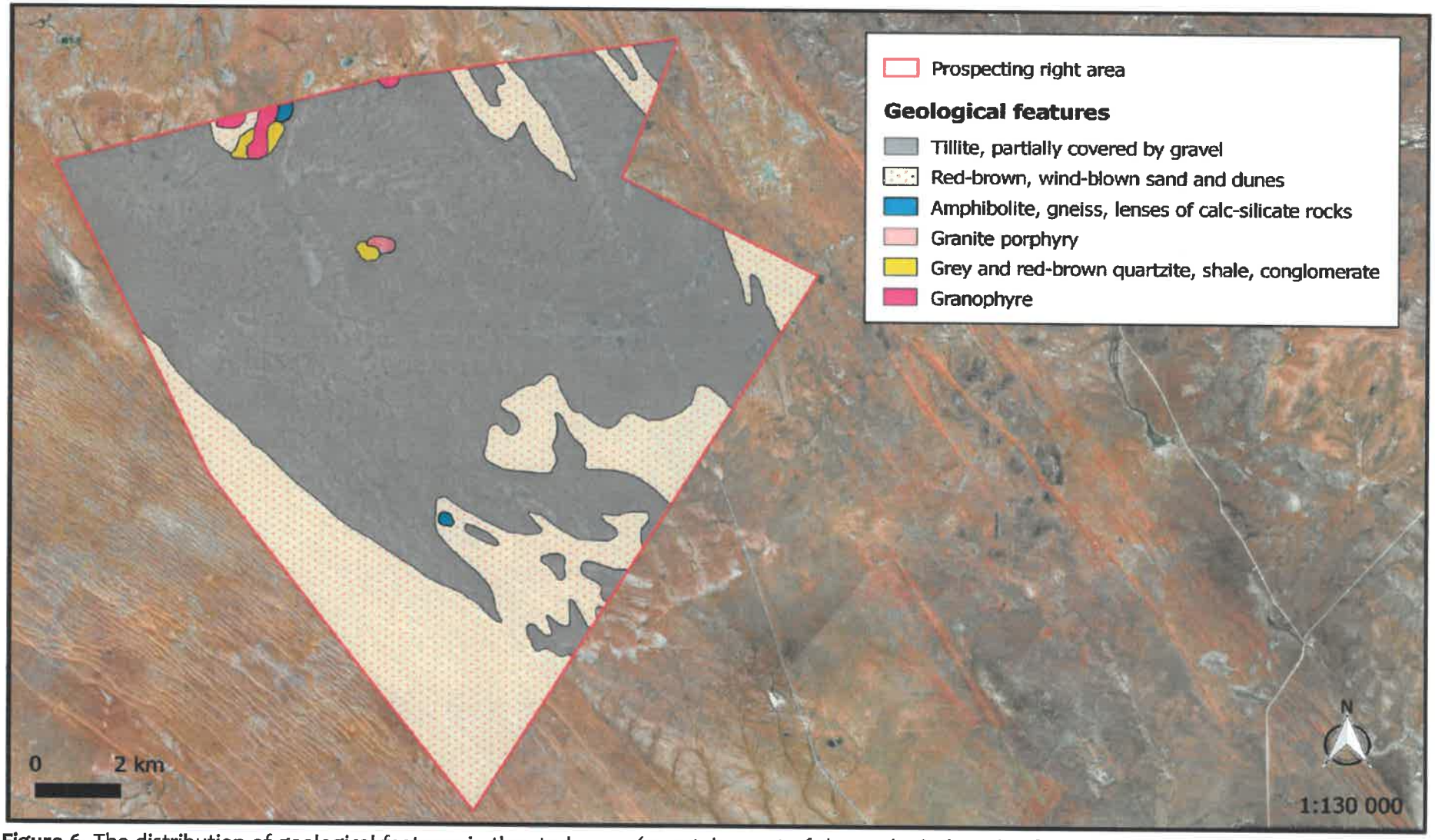

Figure 6. The distribution of geological features in the study area (map taken out of the Ecological Study of Boscia Ecological Consulting, November 2018).

(2) ***CLIMATE:***

Regional Climate

The mine is located in a semi-arid region, receiving on average about 250 mm of rain in the west to 500 mm on its eastern boundary. The rainfall is largely due to showers and thunderstorms falling in the summer months October to March. The peak of the rainy season is normally March or February. The summers are very hot with cool winters. The nearest weather station to the mine is at Upington but due to the limited range of information available from this station and the number of periods with broken records, the data from the weather stations at Kimberley will also be used.

Rainfall

Average monthly and annual rainfall for the site and number of days per month with measureable precipitation is presented in the table 3 below:

MONTH	60 MINUTES	24 HOURS	24 HOURS IN 50 YEARS	24 HOURS IN 100 YEARS
January	35.8	57	65.1	73.8
February	70.1	82	58.9	66.5
March	63.7	67.8	72.1	81.4
April	25.7	51.6	65.9	75.2
May	14.6	54.6	36.8	42.4
June	19.1	67.5	26	30.4
July	12	26.7	26.6	31
August	17	58.2	23.4	27.3
September	16.3	26.7	24.1	28
October	37.6	59.2	53.8	61.8
November	25.2	60.1	41.2	46.7
December	59.9	64.5	70.7	80.9

Source: Directorate: Climatology South African Weather Bureau – Station 0290468:- Kimberley 1970 – 2003

Temperature

The average monthly maximum and minimum temperatures are presented in the table 4 below:

MONTH	DAILY MAXIMUM °C	DAILY MINIMUM °C
January	32.8	17.9
February	31	17.3
March	28.8	15.2
April	24.8	10.9
May	21.4	6.5
June	18.2	3.2
July	18.8	2.8
August	21.3	4.9
September	25.5	8.9
October	27.8	11.9
November	30.2	14.6
December	32.1	16.6
YEAR	**26.1**	**10.9**

Source: Directorate: Climatology South African Weather Bureau © 2000 – Station 0290468:- Kimberley 1960 – 2000

Wind

The prevailing wind direction for the area is north to north-north-west for the months of January to September and changing from north to sometimes westerly winds during October to December averaging 3.5 m/s (Kimberley 01/01/1990 – 31/08/200, Station 0290468).

Humidity and evaporation

The average monthly humidity is presented in the table 5 below:

MONTH	AVERAGE (%)	MAXIMUM (%)	MINIMUM (%)
January	47	91	8
February	54	94	12
March	57	96	15
April	60	96	16
May	56	96	16
June	54	97	15
July	49	97	13
August	42	94	10
September	36	91	8
October	39	89	8
November	42	92	8
December	43	90	7
YEAR	**48**	**94**	**11**

Source: Directorate: Climatology South African Weather Bureau © – Station 0290468:- Kimberley 1960 – 2000

The average monthly evaporation is presented in the table 6 below:

MONTH	EVAPORATION IN mm
SYMONSPAN	
January	365.6
February	279.1
March	235.8
April	169.1
May	135.1
June	108.6
July	130.1
August	181.2
September	252.6
October	314.8
November	345.5
December	378.6
YEAR	**2896**

Source: South African Weather Bureau – Station 0290468:- Kimberley 1957 – 1987

Incidents of Extreme Weather Conditions

- **Hail**

  Hail is sometimes associated with thunderstorms and mainly occurs in early to late summer (November to February). It occurs on average three times a year and although these storms may sometimes be severe and cause much damage, they usually impact on a relatively small area.

- **Frost**
  The period during which frost can be expected lasts for about 120 days (May to August). With extreme minimum temperatures to below -8°C at night in the winter, frost development can be severe.

- **Droughts**
  Droughts are common and may vary from mild to severe. During these periods dust storms sometimes occur, depending mainly on denudation of the surface.

- **Wind**
  High winds are unusual but when the do occur can uproot trees and take off roofs.

3) **Topography:**

The region is characterised by dune hills (parallel crests) and lowlands, with altitudes ranging between 920 m above sea level in the north and 940 m in the south. The terrain is indicated by a very gentle slope of 0.4 %.

(4) ***SOILS:***

According to Steyn (1988) the geological features on Areachap mainly comprise quaternary and carboniferous deposits. The site is primarily associated with shale and tillite from the Dwyka Formation of the Karoo Supergroup. Red-brown, wind-blown sand and dunes from the Gordonia Formation of the Kalahari Group occur scattered in the north, but is more prominent in the south (Figure 7). The Cu-Zn-S-Ag-Fe resource is associated with the amphibolite, biotite gneiss, politic gneisses and lenses of calc-silicate rocks from the Jannelspan Formation of the Areachap Group.

The site is closely associated with the Ae10d, Ae112a, Af2g, Af8a and Af8b landtypes. Here, red-yellow apedal, freely drained soils, as well as red with a high base status and a depth of more than 300 mm are found.

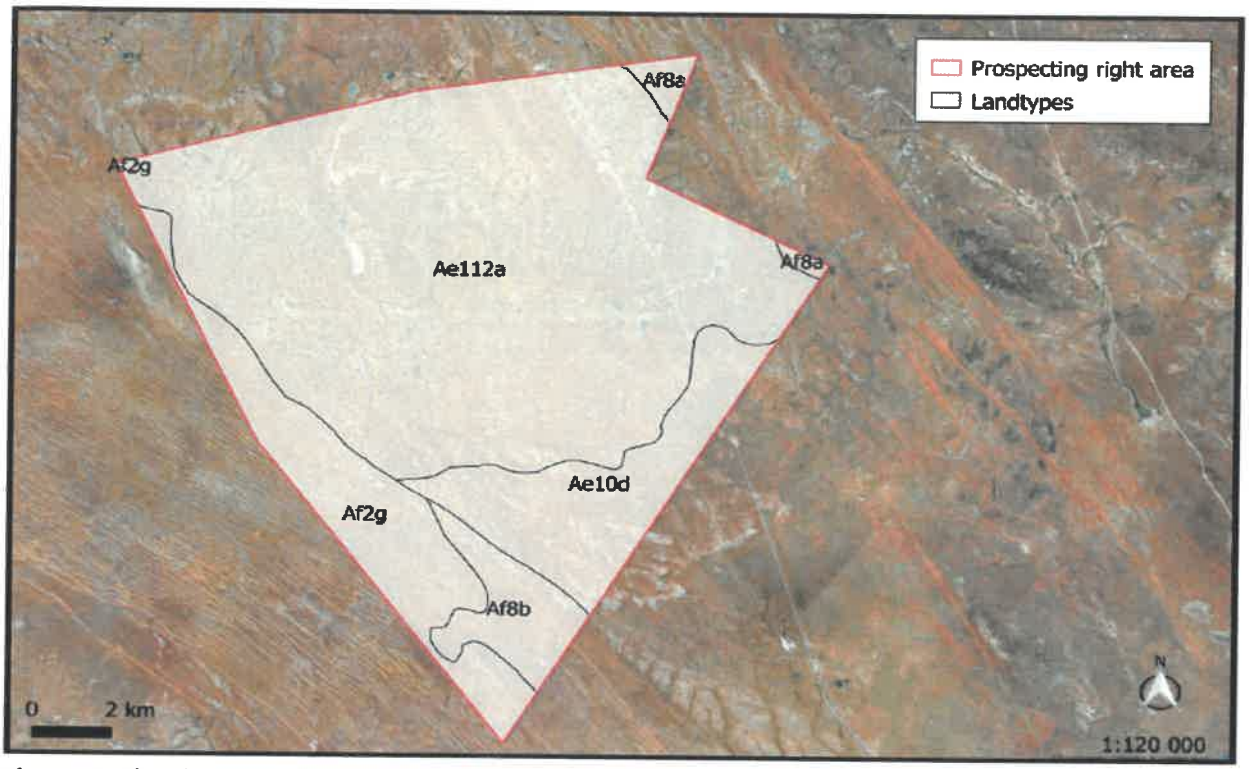

Figure 7. The dominant land types found in the study area (Map taken out of the ecological study of Boscia Ecological Consulting, August 2016).

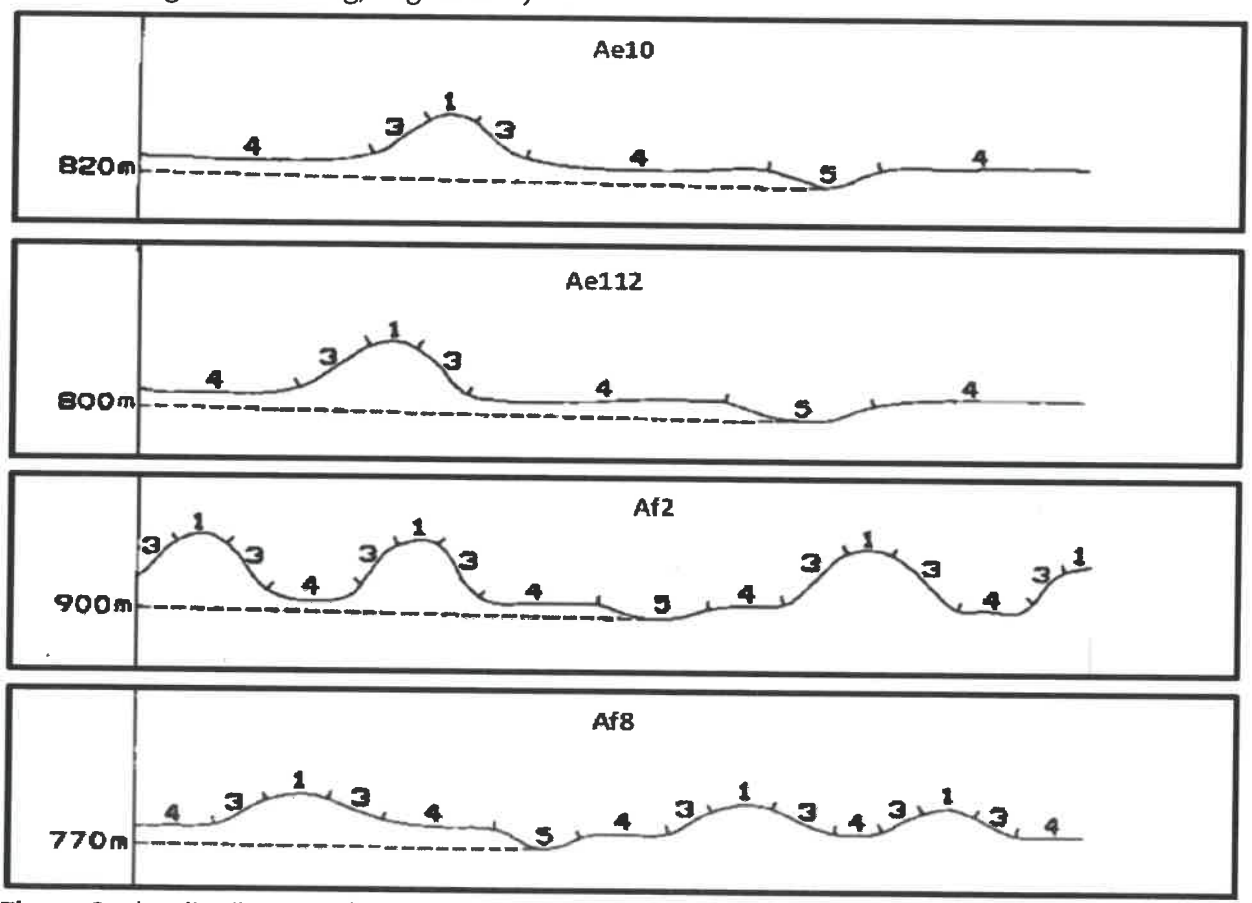

Figure 8. The distribution of landtypes on Areachap (top), and their terrain form sketches (bottom). (map taken out of the Ecological Study of Boscia Ecological Consulting, November 2018).

(5) ***LAND CAPABILITY AND LAND USE:***

The major land uses in the region are livestock and game farming. The site is classified as non-arable land with low potential for grazing. The main agricultural enterprise in the region is sheep, with a proposed stocking rate of 28 Ha per large stock unit. The area is not suited for cultivation. Apart from the current prospecting activities by Synchroplex, historic diggings took place during the period of 1909 to 1917. Later, in the 1960's Iscor started exploration work at the same site. In 1971 Cape Asbestos, in a joint venture with Anglo American, obtained exploration rights but relinquished them back to Iscor in 1977 after they had failed to locate additional deposits. The farm is currently used for livestock farming and a public road (R360) which connects Upington with the Rietfontein border post to Namibia also traverses the property (Figure 1).

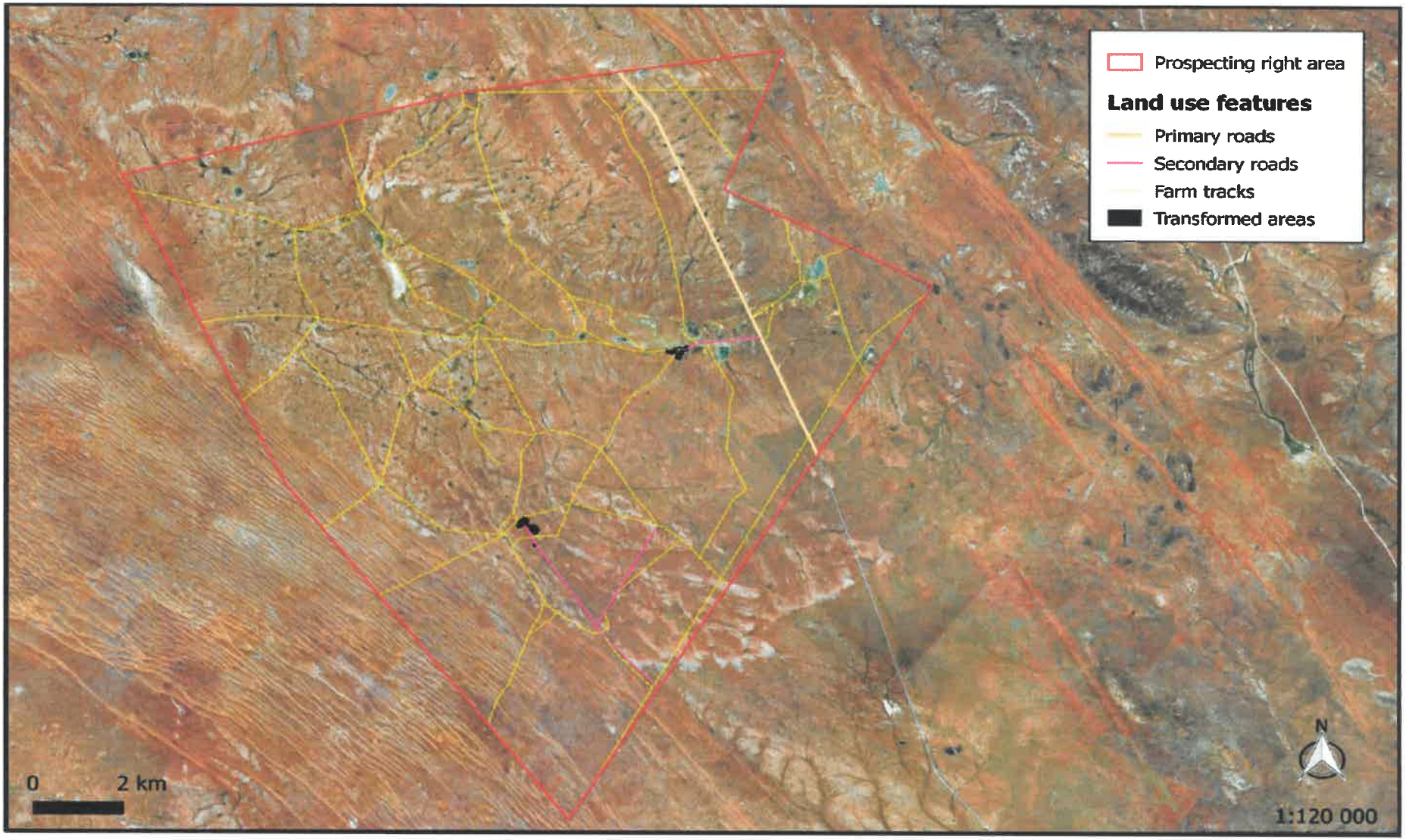

Figure 9. Current and Historic land use features of the area. (map taken out of the Ecological Study of Boscia Ecological Consulting, November 2018).

(6) ***NATURAL FAUNA:***

Boscia Ecological Consulting CC has been appointed by Synchroplex (Pty) Ltd to provide an Ecological assessment in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area. (The Complete study will be appended as **Appendix 4** to the EIA/EMP document).

The Scope of Study

The specific terms of reference for the study include the following:

- conduct a desktop study and field investigation in order to identify and describe different ecological habitats and provide an inventory of communities/species/taxa and associated species of conservation concern within the environment that may be affected by the proposed activity;
- identify the relative ecological sensitivity of the project area;
- produce an ecological assessment report that:
  - indicates identified habitats and fauna and flora species,
  - determines the potential impacts of the project on the ecological integrity,
  - provides mitigation measures and recommendations to limit project impacts,
  - indicates ecological responsibilities pertaining to relevant conservation legislation.

Data collection

The study comprised a combination of field and desktop surveys for data collection on fauna and flora in order to obtain the most comprehensive data set for the assessment. The fieldwork component was conducted on 27 October 2018 and most data for the desktop component was obtained from the quarter degree squares that include the study area (2820BB, 2820BD, 2821AA and 2821AC).

Desktop survey

A desktop survey was undertaken to obtain lists of mammals, reptiles, amphibians, birds and invertebrates which are likely to occur in the study area. These were derived based on distribution records from the literature, including Friedmann and Daly (2004) and Stuart and Stuart (2015) for mammals, Alexander and Marais (2007) and Bates et al. (2014) for reptiles, Du Preez and Carruthers (2009) for amphibians, Gibbon (2006) for birds and Picker et al. (2004) and Griffiths et al. (2015) for invertebrates. Additional information on faunal distribution

was extracted from the various databases hosted by the ADU web portal, http://adu.org.za. A map of important bird areas (BirdLifeSA 2015) was also consulted. The faunal species lists provided are based on species which are known to occur in the broad geographical area, as well as a preliminary assessment of the availability and quality of suitable habitat at the site.

The likelihood of Red Data species occurring on site has been determined using the distribution maps in the Red Data reference books (Friedmann and Daly 2004; Bates et al. 2014; Taylor et al. 2015; ADU 2016) and comparing their habitat preferences with the habitat described from the field survey. The conservation status of each species is also listed, based on the IUCN Red List Categories and Criteria (IUCN 2015) and/or the various red data books for the respective taxa.

Field survey

The faunal field survey was conducted concurrent with the vegetation survey. Habitats on site were assessed to compare with the habitat requirements of Red Data species. The presence of faunal species was determined using the following methods:

- Identification by visual observation,
- Identification of bird and mammal calls,
- Identification of signs (spoor, faeces, burrows and nests).

Sensitivity mapping and assessment

An ecological sensitivity map of the site was produced by integrating the information collected on site with the available ecological and biodiversity information available in the literature and various spatial databases.

Assumptions and limitations

Due to the brief duration of the survey and the lack of seasonal coverage, the species list obtained during the site visit cannot be regarded as comprehensive. Ideally, a site should be visited several times during different seasons to ensure that the full complement of plant and animal species present is captured. However, this is rarely possible due to time and cost constraints. The survey was nevertheless conducted in such a manner to ensure all representative communities are included.

The site visit for the study took place during early summer, which is generally not a favourable time of the year for vegetation surveys; unless some early spring rain occurred. The best time to evaluate vegetation in the study area is after at least some summer rain when the vegetation has responded and is in an actively growing state. This

was however not the case during this survey, so grasses, annuals and other flowering plants were not in the most suitable condition for the survey. The results presented here can therefore only reflect the condition of the vegetation. It is expected that some species of conservation concern were not visible during the time of sampling. Therefore, the timing of the site visit is considered to be a limiting factor. Nevertheless, most of the common and significant species encountered were identifiable.

Faunal communities

According to Section 3(a) and 4(a) of the Northern Cape Nature Conservation (NCNCA) Act No. 9 of 2009, no person may, without a permit by any means hunt, kill, poison, capture, disturb, or injure any protected or specially protected animals. Furthermore, Section 12 (1) of NCNCA states that no person may, on a land of which he or she is not the owner, hunt a wild animal without the written permission from the landowner. The landscape features on Areachap does not provide a particularly diverse habitat opportunity to faunal communities, but those likely to be found in the study area are discussed in their respective faunal groups below.

Mammals

As many as 59 terrestrial mammals and five bat species have been recorded in the region (see Appendix 2 of the study) of the ecological study. Virtually all mammals of the study area are protected; either according to Schedule 1, 2 or 3 of NCNCA (see Appendix 2 of the study) of the ecological study. Twenty one mammal species of conservation concern potentially occur in the area, of which fifteen are listed either in the IUCN or South African Red Data Book and an additional six species are specially protected according to Schedule 1 of NCNCA.
The protected bat species, Bushveld Gerbil, Bushveld Sengi, Lesser Red Musk Shrew, Littledale's Whistling Rat, Aardvark, Aardwolf, African Wild Cat, Cape Fox, Bat-eared Fox, African Striped Weasel, Honey Badger and Striped Polecat all have a high chance of occurring in the core area, given their wide habitat tolerances or preference for the savannah habitat found here.

Ground Pangolin, South African Hedgehog and Black-footed cat may potentially occur on site on account of their preferences for arid areas. They are however rather skittish and therefore they will most likely occur very seldomly. The Brown Hyaena might be present, but has a low potential to be found on site mainly based on the fact that farm fences are restricting their occurrences across their natural distribution range.

Cheetah, Leopard and Spotted Hyaena have a very low chance to be found on site. Although they all have a wide habitat tolerance and the site occurs within their current known distribution range, these species are very seldomly seen outside nature reserves or national parks. In general, impacts on mammals arising from the prospecting activities will primarily be restricted to the core site, where most of the infrastructure and activities are planned.

Reptiles

The Areachap prospecting area lies within the distribution range of at least 30 reptile species (see Appendix 2) of the ecological study of which the western ground agama was encountered several times during the field survey. No listed species are known to occur in the area, but most reptiles of the study area are protected either according to Schedule 2 or 3 of NCNCA (see Appendix 2) of the ecological study. Impacts on reptiles from the prospecting activities will primarily be restricted to the shrubland on sandy, rocky soil and will be very local.

Amphibians

Eight amphibian species are known from the region (Appendix 2) of the ecological study, indicating that the site does not potentially have a diverse frog community. This is however normal for an arid area. No natural permanent water was observed on site that would represent suitable breeding habitats for most of these species, but the ephemeral pan will be important during periods of inundation. As a result, only those species which are relatively independent of water are likely to occur regularly in the area.

The Giant Bull Frog (Pyxicephalus adspersus) is listed as Near Threatened and is protected according to Schedule 1 of the NCNCA. They prefer seasonal shallow grassy pans, vleis and other rain-filled depressions in open flat areas of grassland or savanna, but mainly remain buried up to 1 m underground until conditions become favourable. The site lies within the known distribution of this species and the ephemeral pans on Areachap could therefore potentially provide the ideal habitat for it. Its presence will however only be confirmed after a good rainfall event causes inundation of the pans. All other amphibians of the study area are protected according to Schedule 2 of NCNCA (see Appendix 2) of the ecological study.
In general, impacts on amphibians arising from the Areachap prospecting activities will primarily be restricted to the core site.

Avifauna

The study site does not fall within or near; i.e. within 70 km, of any of the Important Bird Areas (IBA) defined by Birdlife South Africa. A total number of 176 bird species have been recorded from the region and all of these species are protected either according to Schedule 1, 2 or 3 of NCNCA (see Appendix 2 of the ecological study).

As many as 18 listed bird species are known from the region, all of which are classified as Vulnerable, Near Threatened, Endangered or Critically Endangered. All birds are protected either according to Schedule 1, 2 or 3 of NCNCA (see Appendix 2) of the ecological study. Those that are specially protected (Schedule 1) are also listed in Table 8 of the ecological study. The ephemeral pans will potentially attract protected water birds, such as Chestnut-banded Plover, Black Stork, Marabou Stork, Lesser Flamingo and Greater Flamingo when inundated. The remaining species of conservation concern are expected to occur in the core prospecting area by residing on site or by occasionally passing over the area.

Invertebrates

Invertebrates dominate inland habitats and play a significant role in the overall function of the ecosystem (Kremen et al. 1993; Weisser and Siemann 2004). Their immense species diversity makes it almost impossible to list all species that may possibly occur on site. Nevertheless, key morphospecies as well as species of conservation concern are discussed here.

Eight invertebrate species of the Northern Cape appear on the IUCN Red Data list of threatened species and are listed in Table 9 of the ecological study, along with species that are specially protected according to Schedule 1 of the NCNCA. All other invertebrates from the class Insecta and Arachnida are protected either according to Schedule 2 or 3 of the NCNCA.

Two major habitats delimit possible invertebrate communities on site, i.e. the ephemeral pans and a variety of terrestrial habitats collectively classified as Bushveld and Karoo vegetation for insect preference, according to Picker et al. (2004).

Ephemeral pans

Ephemeral pans host species specifically adapted to ephemerality. Crustaceans in particular are specialists of these pans and dominate them. Their eggs lie dormant in the soil until the pans are inundated. Not much is known about the species distribution or conservation status of species in the Northern Cape, but typical taxa to be expected in the pans of Areachap include Notostraca, Anostraca, Cladocera,

Copepoda, Ostracoda and Conchostraca. Within a few days after the pans are wet these species will hatch out and attract a number of wetland birds. Therefore, these pans also act as important breeding and feeding links to birds in terms of connectivity, by providing stepping-stone corridors in an arid landscape. The disturbance or destruction of these pans will not only impact the specialised pan invertebrate communities locally, but will also have a regional and landscape-level effect.

Terrestrial habitats

Bushveld vegetation

The sand dunes and shrubland on sandy, rocky soil are included in the bushveld vegetation. Invertebrate communities associated with this habitat are widely distributed and extremely diverse. Therefore, it is not possible to list specialised communities that occur here. However, those species of conservation concern listed in Table 9 of the ecological study are most likely to be associated with this habitat. Of all invertebrates on Areachap, those occurring in the bushveld vegetation are likely to be most affected, because the core activities will take place here. The most profound impacts will be in the form of habitat loss and the inevitable death of those that occur in the path of prospecting activities. These impacts are however expected to be largely local.

Karoo vegetation

The Calcrete Plateau represents Karoo vegetation. Invertebrate communities associated with this habitat represent unique species assemblages, with an above-average representation of beetles, grasshoppers, flies, wasps and lacewings. Insects in general are widely distributed and extremely diverse. Therefore, it is not possible to list specialised communities that occur here without a dedicated study. Those species of conservation concern listed in Table 10 of the ecological study is likely to be associated with this invertebrate habitat, but it has not been earmarked for the Areachap operation.

(7) NATURAL VEGETATION:

Boscia Ecological Consulting CC has been appointed by Synchroplex (Pty) Ltd to provide an Ecological assessment in order to highlight the ecological characteristics of the proposed prospecting area, and to determine the possible impact of prospecting on the diversity and ecological status of the application area. (The complete study will be appended as **Appendix 4** to the EIA/EMP Document).

The Scope of Study

The specific terms of reference for the study include the following:

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  - indicates ecological responsibilities pertaining to relevant conservation legislation.

Data collection

The study comprised a combination of field and desktop surveys for data collection on fauna and flora in order to obtain the most comprehensive data set for the assessment. The fieldwork component was conducted on 27 October 2018 and most data for the desktop component was obtained from the quarter degree squares that include the study area (2820BB, 2820BD, 2821AA and 2821AC).

Field survey

For the field work component, satellite images were used to identify homogenous vegetation units within the proposed prospecting area. Representative sampling plots were allocated in these units and sampled with the aid of a GPS in order to characterise the species composition. The following quantitative data was collected:

- Species composition
- Species percentage cover
- Amount of bare soil and rock cover
- Presence of biotic and anthropogenic disturbances

Additional checklists of plant species were compiled during the surveys by traversing a linear route and recording species as they were encountered in each unit.

Desktop survey

For the desktop component, the South African National Vegetation Map (Mucina and Rutherford 2006) was used to obtain data on broad scale vegetation types and their conservation status. The South African

National Biodiversity Institute's (SANBI) BGIS database was also consulted to obtain information on biodiversity information for the //Khara Hais Municipality (NC083), in which the study area falls.

Further searches were undertaken specifically for Red List plant species within the current study area. Historical occurrences of Red List plant species were obtained from the SANBI:

POSA database for the quarter degree squares that include the study area. The IUCN conservation status of plants in the species list was also extracted from the SANBI database and is based on the Threatened Species Programme (SANBI 2017).

Assumptions and limitations

Due to the brief duration of the survey and the lack of seasonal coverage, the species list obtained during the site visit cannot be regarded as comprehensive. Ideally, a site should be visited several times during different seasons to ensure that the full complement of plant and animal species present is captured. However, this is rarely possible due to time and cost constraints. The survey was nevertheless conducted in such a manner to ensure all representative communities are included.

The site visit for the study took place during early summer, which is generally not a favourable time of the year for vegetation surveys; unless some early spring rain occurred. The best time to evaluate vegetation in the study area is after at least some summer rain when the vegetation has responded and is in an actively growing state. This was however not the case during this survey, so grasses, annuals and other flowering plants were not in the most suitable condition for the survey. The results presented here can therefore only reflect the condition of the vegetation. It is expected that some species of conservation concern were not visible during the time of sampling. Therefore, the timing of the site visit is considered to be a limiting factor. Nevertheless, most of the common and significant species encountered were identifiable.

Broad-scale vegetation patterns

The study area falls within the Savanna, Nama-Karoo and Azonal Vegetation biomes (Mucina and Rutherford 2006). According to the vegetation map of Mucina and Rutherford (2012), three broad-scale vegetation units are present on site (Figure 10), i.e. Gordonia Duneveld, Kalahari Karroid Shrubland and Southern Kalahari Salt Pans. This vegetation map however does not reflect the true character of the site, because it has not been mapped at a very fine scale.

Gordonia Duneveld is found in the Northern Cape at altitudes between 800 and 1 200 m. It comprises the largest part of the South African side of the Kgalagadi Transfrontier Park, is found south of the Molopo River border with Botswana (west of Van Zylsrus), interleaving the Kalahari Karroid Shrubland in the west (south of Rietfontein to the Orange River) and in the south (around Upington and north of Groblershoop). It also occurs as a number of loose dune cordons south of the Orange River near Keimoes and between Upington and Putsonderwater. The topography typically comprises parallel dunes about 3 – 8 m above the plains.

The vegetation occurs mainly as open shrubland with ridges of grassland dominated by Stipagrostis amabilis on the dune crests, Vachellia haematoxylon on the dune slopes, Senegalia mellifera on lower slopes and Rhigozum trichotomum in the interdune straaten. The geology and soil comprise aeolian sand underlain by superficial silcretes and calcretes of the Cenozoic Kalahari Group. The unit is classified as least threatened, with 14% being conserved in the Kgalagadi Transfrontier Park. Very little of this unit has been transformed and erosion is generally low. However, the destabilisation of normally vegetated dunes does occur in some areas due to local overstocking. Important taxa include those endemic to the Kalahari region, but none are limited to this unit.

Kalahari Karroid Shrubland is found in the Northern Cape, typically forming belts alternating with belts of Gordonia Duneveld on plains north-west of Upington through Lutzputs and Noenieput to the Rietfontein/Mier area in the north. Other patches occur around Kakamas and north of Groblershoop. The unit is also found in neighbouring Namibia. Altitudes vary between 700 and 1 100 m. The vegetation occurs mainly as low karroid shrubland on flat, gravel plains, with transitions to the Kalahari region and sandy soils. The geology and soil comprise Cenozoic Kalahari Group sands and small patches also on calcrete outcrops and screes on scarps of intermittent rivers. In places, Dwyka Group tillites outcrop. The soils are deep (>300 mm), red-yellow apedal, freely drained, with a high base status; which is typical of the Ae land type. The unit is classified as least threatened, with very little being conserved in the Augrabies Falls National Park. Very little of this unit has been transformed. However, this unit was preferred routes for early roads, which promoted the introduction of alien plants; about a quarter of this unit has scattered Prosopis spp. Erosion is very low. Important taxa include the grass Dinebra retroflexa.

Southern Kalahari Salt Pans are distributed in the Northern Cape and North-West Provinces as well as neighbouring Kalahari regions of

Botswana and Namibia at altitudes between 800 and 1 500 m. The largest concentration of these pans in South Africa is found near Groot-Mier in western Gordonia. Although many of the pans are devoid of vegetation, the vegetation is typically presented as low grasslands on pan bottoms, dominated by Sporobolus sp. A mixture of dwarf shrubs dominated by Lycium and/or Rhigozum usually forms the outer belt in the salt pan zonation system. Most of the pans formed on the sandy sediments of the Cenozoic Kalahari Group, but in the south-east some formed on the dolomites of the Campbell Group (Vaalian-age Griqualand Wes Supergroup) and in the west some formed on diamictites of the Dwyka Group (Karoo Supergroup).

The pan soil consist of white (washed) sand in shallow pans, rocky soils on calcrete outcrops and most typically of clays and sandy clays rich in Na, K and Mg. These soils are usually characterised by a high pH of 9. The pan bottoms are exposed for most of the year and carry shallow pools for a short time only after very good rains. The unit is classified as being least threatened, with about 8 % being statutorily conserved in the Kgalagadi Transfrontier Park. The vegetation on the pans is subject to natural degradation controlled by concentration of grazing animals. No endemic species are known from this unit.

Fine-scale vegetation patterns

The plant communities within the study area are delineated according to plant species correspondences, change in soil structure, topographical changes and disturbance regimes. The vegetation on site can be divided into four distinct units (Figure 11) and are described below. A complete plant species list, including those species likely to occur in the area is presented in Appendix 1 of the ecological study.

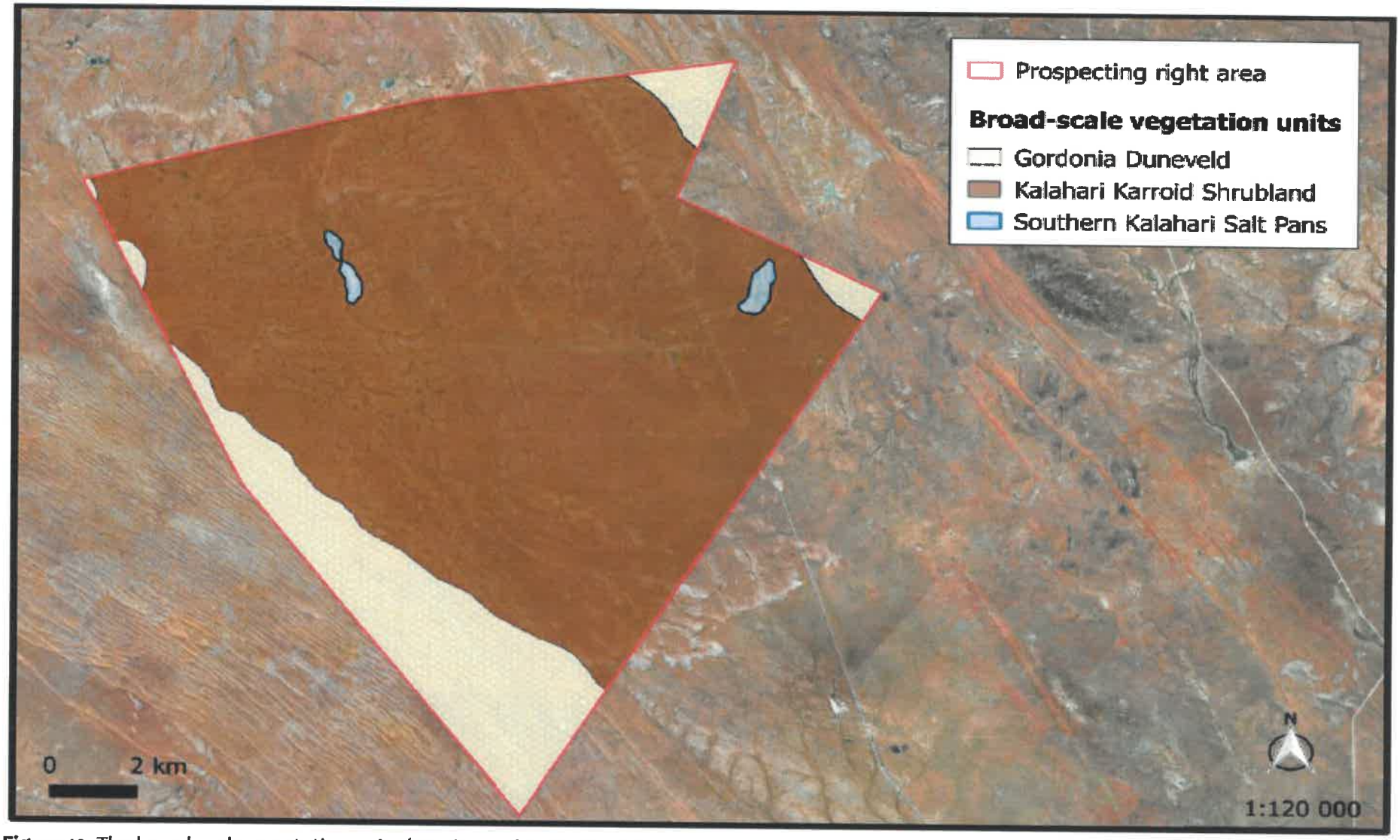


Figure 10. The broad-scale vegetation units (Mucina and Rutherford 2012) present in the study area.

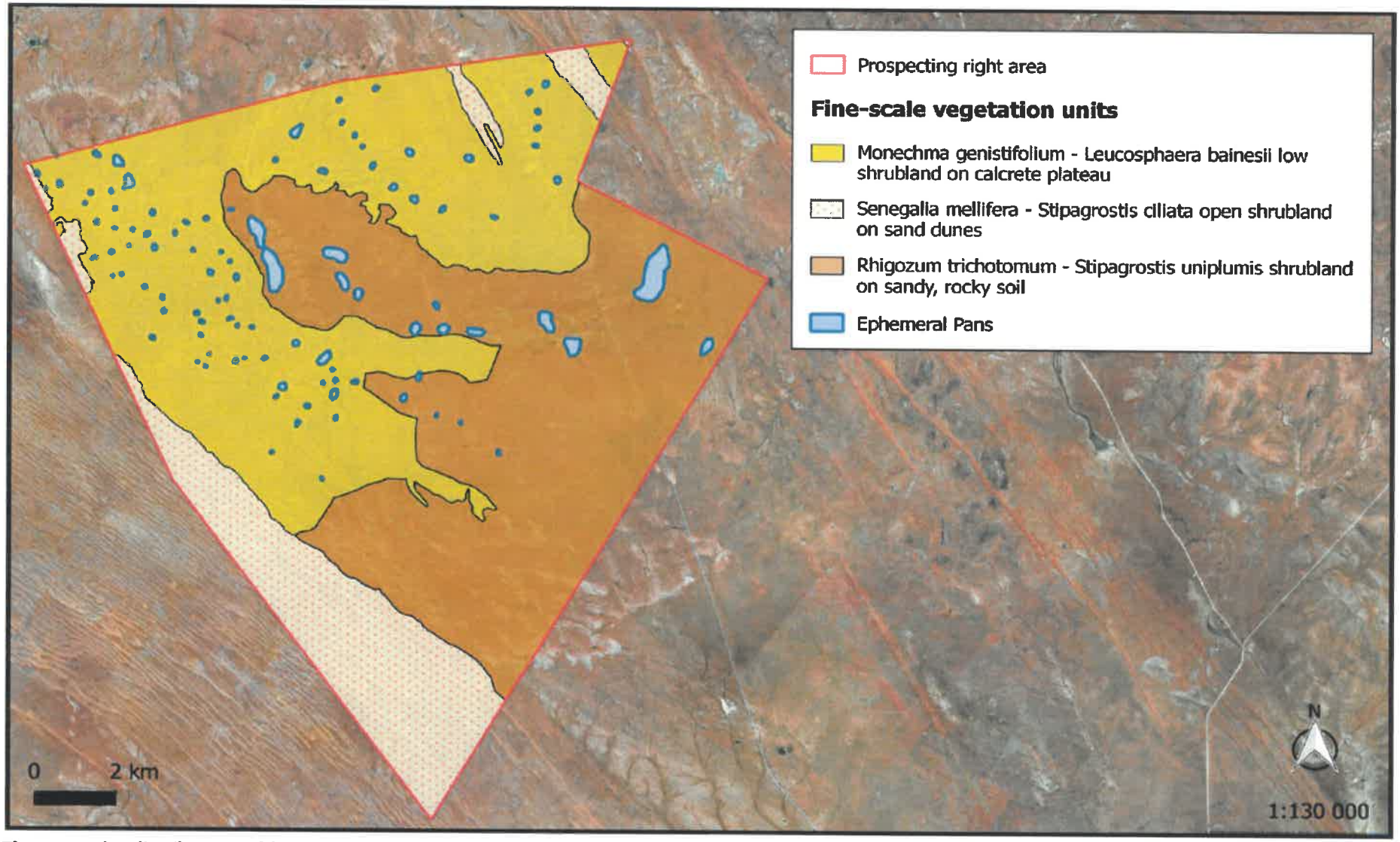


Figure 11. The distribution of fine-scale plant communities in the study area.

(8) *SURFACE WATER*

The study area falls primarily within the Nossob-Molopo quaternary catchments D42E of the Lower Orange Water Management Area, but small sections in the east and south of the site extends into the Neusberg (D73E and D73F) catchments (Figure 12). These quaternary catchments have all been allocated a Present Ecological State (PES) of 'Moderately Modified' (C) by (Smook et al. 2002). Information regarding mean annual rainfall, evaporation potential and runoff for these catchments are provided in Table 7 below. Watercourses on the study site that have been formally mapped include numerous ephemeral pans and drainage lines (Figure 13).

Table 7. Catchment characteristics for the quaternary catchments, as presented by Smook et al. (2002).

Quaternary catchment	Catchment Area (km^2)	Mean Annual Rainfall (mm)	Mean Annual Evaporation (mm)	Mean Annual Runoff ($10^6 m^3$)
D42E	4 208	148	2 750	0.28
D73E	3 867	183	2 650	13.29
D73F	4 630	158	2 650	9.62

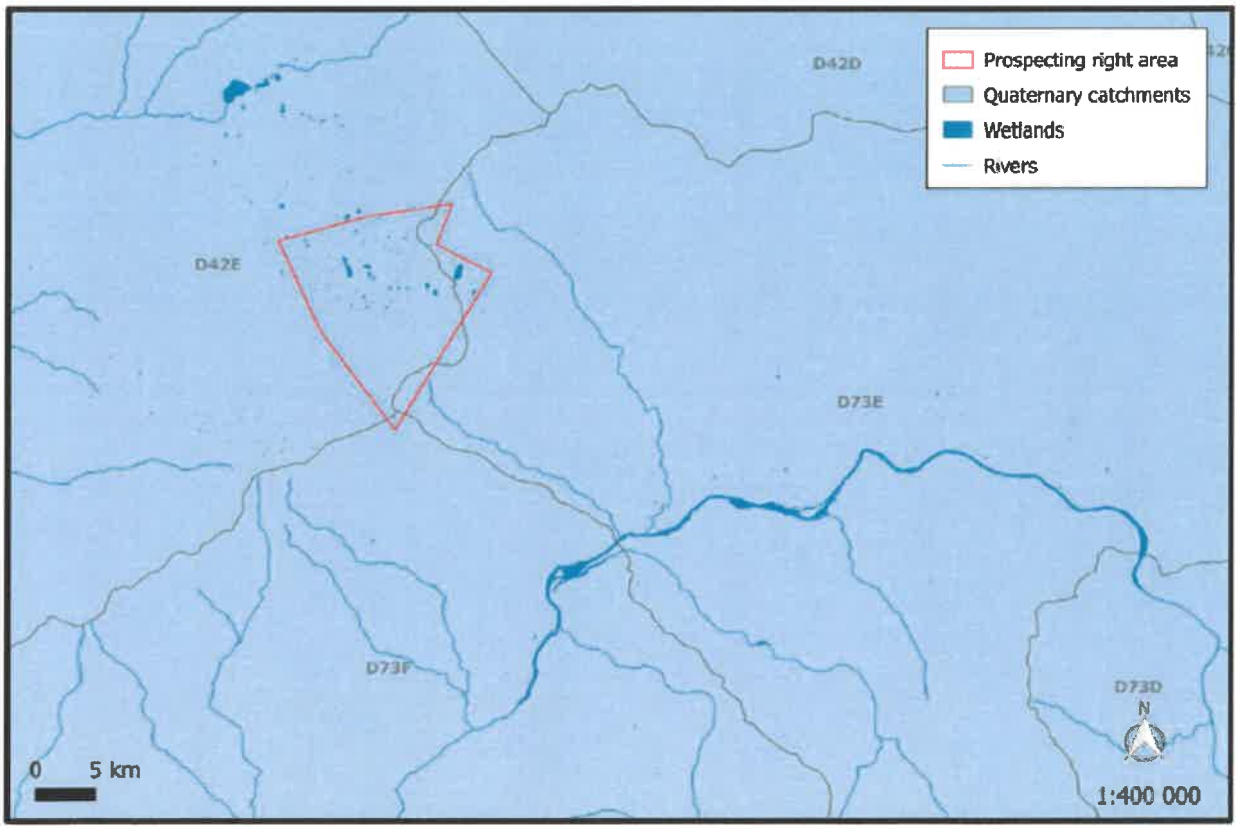


Figure 12. The locality of the proposed prospecting area in relation to the quaternary catchments of the Lower Orange Water Management Area.

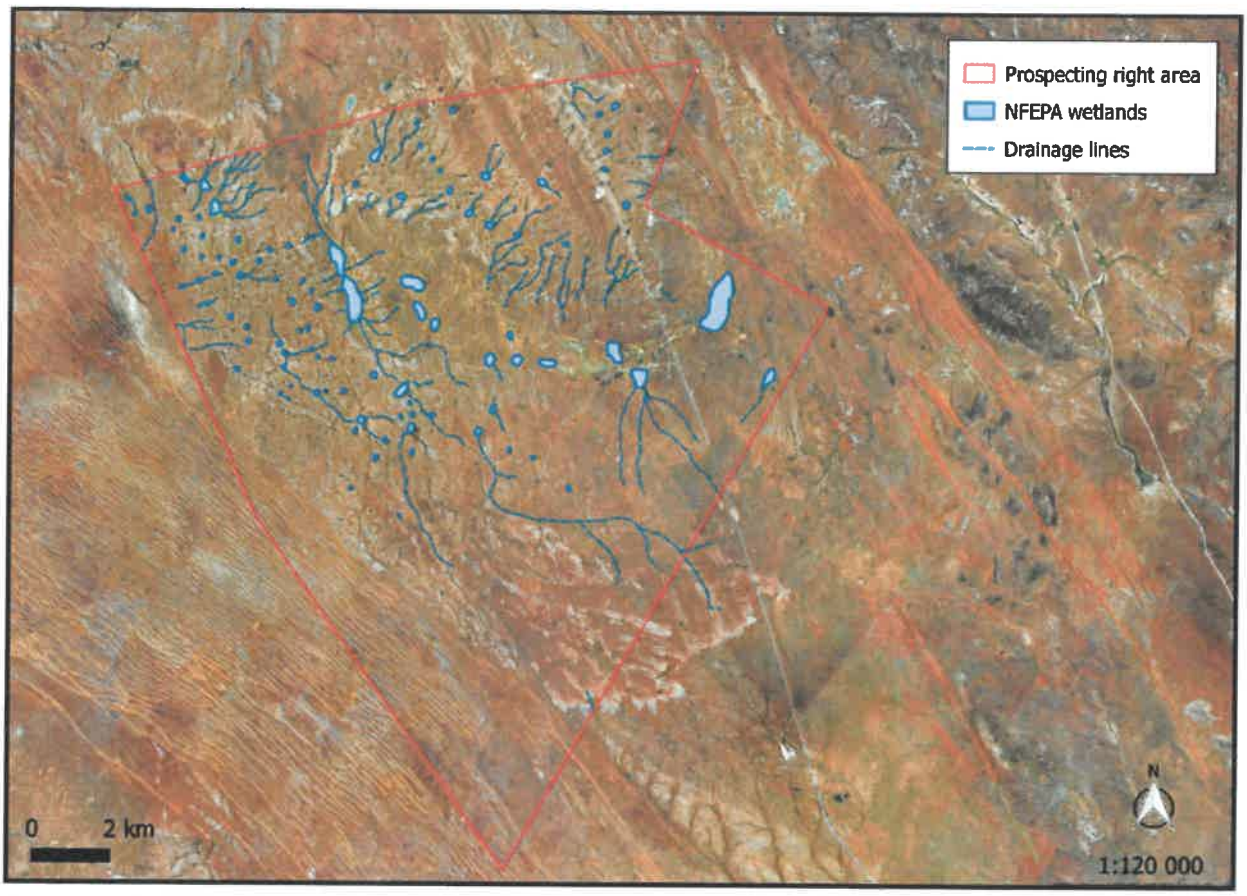


Figure 13. The location of formally mapped watercourses on the proposed prospecting right area.

(9) ***GROUND WATER:***

Depth of water-table(s):
Groundwater flow would follow the topography and the surface drainage direction from the higher areas towards the lower areas.

Ground-water zone:
The bulk sampling and drilling does not affect the quality of the ground water in any manner. There are no harmful or toxic properties in the materials being sampled.

(10) ***AIR QUALITY AND NOISE:***

With reference to the Scheduled Processes under the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965), no scheduled process relates to any proposed prospecting activity.

The current source of air pollution in the area stems from vehicles travelling on the gravel roads of the area. No farming activities related to dust generation, such as ploughing, are known to occur in the area.

The potential source of air pollution on Areachap will be nuisance dust generated by the drilling machine as well as from the movement of vehicles on the site roads. Gas emissions from the drill rig will be negligible and within legal limits. Generated dust will be visible from the secondary gravel road and to local farm residents. Any potential fall-out dust will impact those who reside on the farm.

Noise on site will be generated by the drill rig. Although these activities do generate noise, the overall impact can be described as negligible. The most susceptible receptors of noise will be the local farm residents.

(11) *VISUAL ASPECTS:*

The prospecting site is not at all visible from any main tourist route or main route. The prospecting operation will also not be visible to the neighbour since it is located within a rural landscape. The negative visual impacts associated with bulk sampling operations. There is however no method of reducing the impact during prospecting operations (operational phase), it can only be mitigation by doing concurrent rehabilitation of open bulk sampling as prospecting progress in the bulk sampling stage.

(12) Site Sensitivity & *BROAD-SCALE ECOLOGICAL PROCESSES:*

The proposed prospecting site does not fall within any formally protected area or within a National Protected Areas Expansion Strategy Focus Area. Furthermore, the broad-scale vegetation units of the study area are all classified as least threatened and therefore no formal fine-scale conservation planning has been conducted. However, the site does contain a number of Ecological Support Areas in relation to the Northern Cape Critical Biodiversity Areas Map (Figure 14). These are all formally mapped ephemeral pans in the northern half of the study area. Furthermore, the Dawid Kruiper Spatial Development Framework also promotes the conservation of wetland areas as ecological corridors within the district.

The Mining and Biodiversity Guidelines (DENC et al. 2013) classifies the majority of the study area to have no Biodiversity Importance. However, a small portion in the southern corner is classified as having Highest Biodiversity Importance, which constitutes the highest risk for mining (Figure 15). These guidelines were developed to identify and categorize biodiversity priority areas sensitive to the impacts of mining

in order to support mainstreaming of biodiversity issues in decision making in the mining sector.

All of the ephemeral pans of the study area have been classified by the Wetland Freshwater Priority Areas project as wetlands with a Present Ecological State (PES) of "AB", which means that the pans are in a Natural or Good condition. Furthermore, none of the pans have been identified as significant wetlands in terms of Ramsar sites, IUCN Frog localities, threatened water bird localities or Crane breeding grounds.

The prospecting operation itself is expected to cause habitat transformation at a very small scale if the activities are confined to its current proposed footprint. Therefore, the operation is not expected to contribute significantly to cumulative habitat loss and the disruption of the broad-scale landscape connectivity in the region.

Site sensitivity

The sensitivity map for the Areachap prospecting operation is illustrated in Figure 16. The ephemeral pans and drainage lines are considered to be of very high sensitivity due to their vital ecological and hydrological functionality and significance. All watercourses in the study area are also unique habitats protected in terms of the National Water Act (Act No 36 of 1998). These units are essentially no-go areas.

The calcrete plateau is considered to be of high sensitivity. Although this area is not earmarked for prospecting activities its high sensitivity is attributable to the karst topography and association with ephemeral pans and drainage lines as well as listed species that have been found here, i.e. Hoodia gordonii.

The open shrubland on dunes as well as the shrubland on sandy, rocky soil are considered to be of medium sensitivity. The open shrubland on dunes is not expected to be affected by the prospecting operation, but the shrubland on sandy, rocky soil is earmarked for core activities. This area hosts a number of species of conservation concern, i.e. Prenia tetragona, Psilocaulon subnodosum, Boscia foetida and Euphorbia spinea, but a high density of the encroaching Rhigozum trichotomum and Senegalia mellifera is also found in places. Impacts are likely to be largely local. Activities within this area can proceed with relatively little ecological impact provided that appropriate mitigation measures are taken.

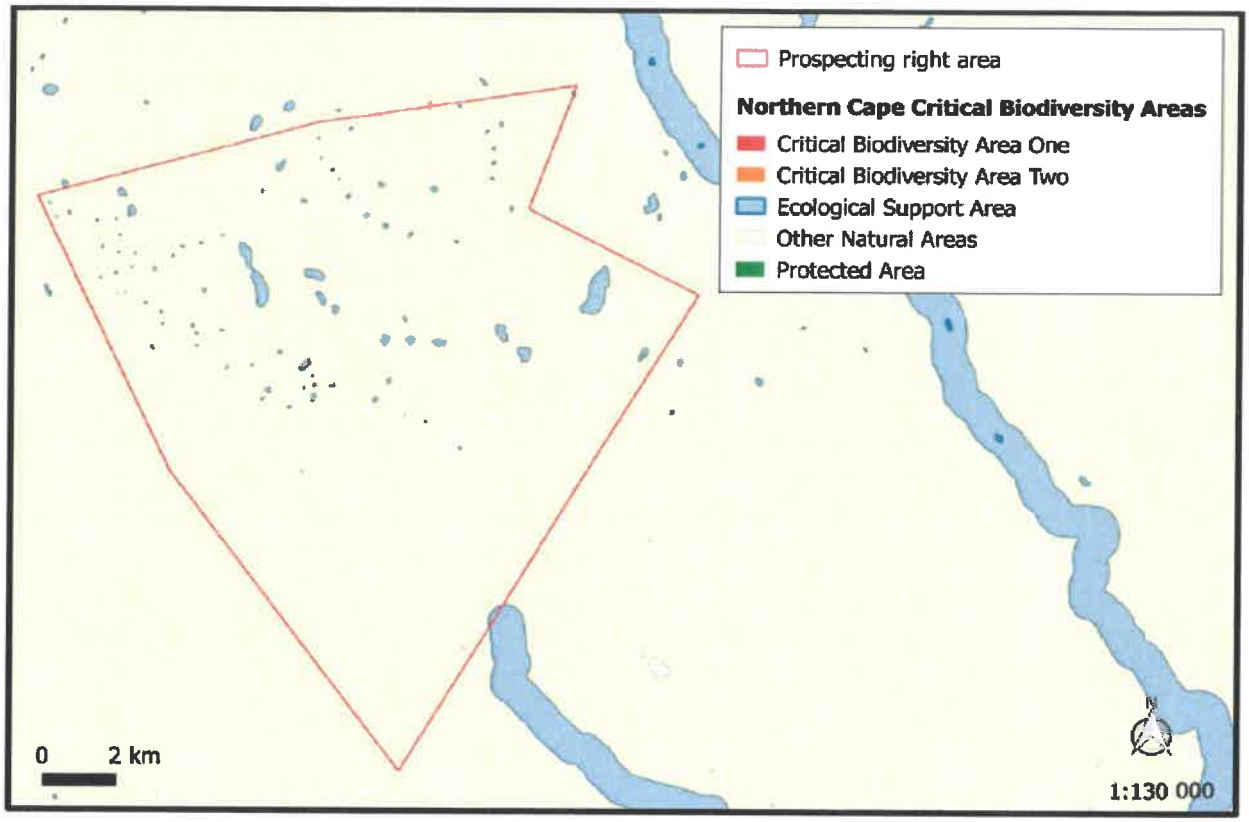


Figure 14. The study area in relation to the Northern Cape Critical Biodiversity areas.

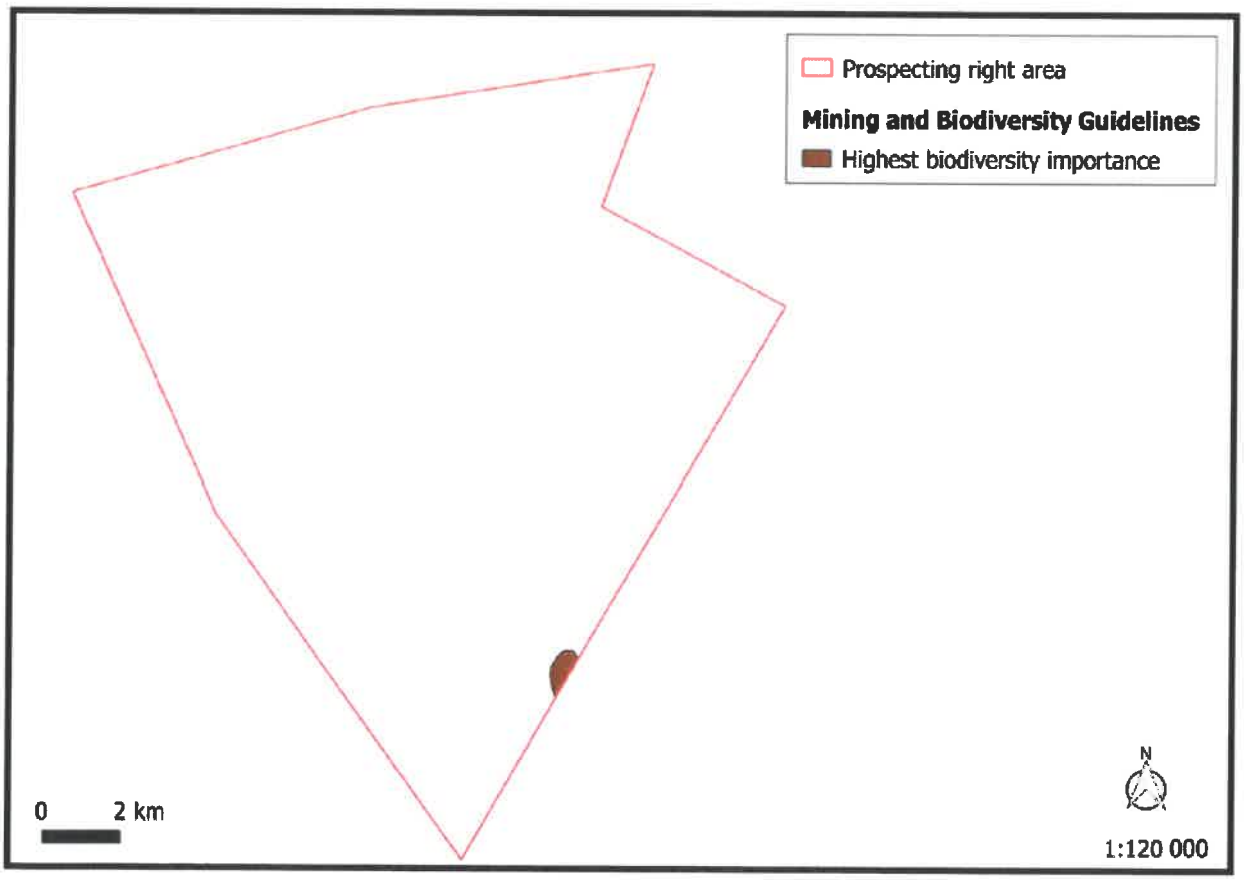


Figure 15. The study area in relation to the Mining and Biodiversity Guidelines.

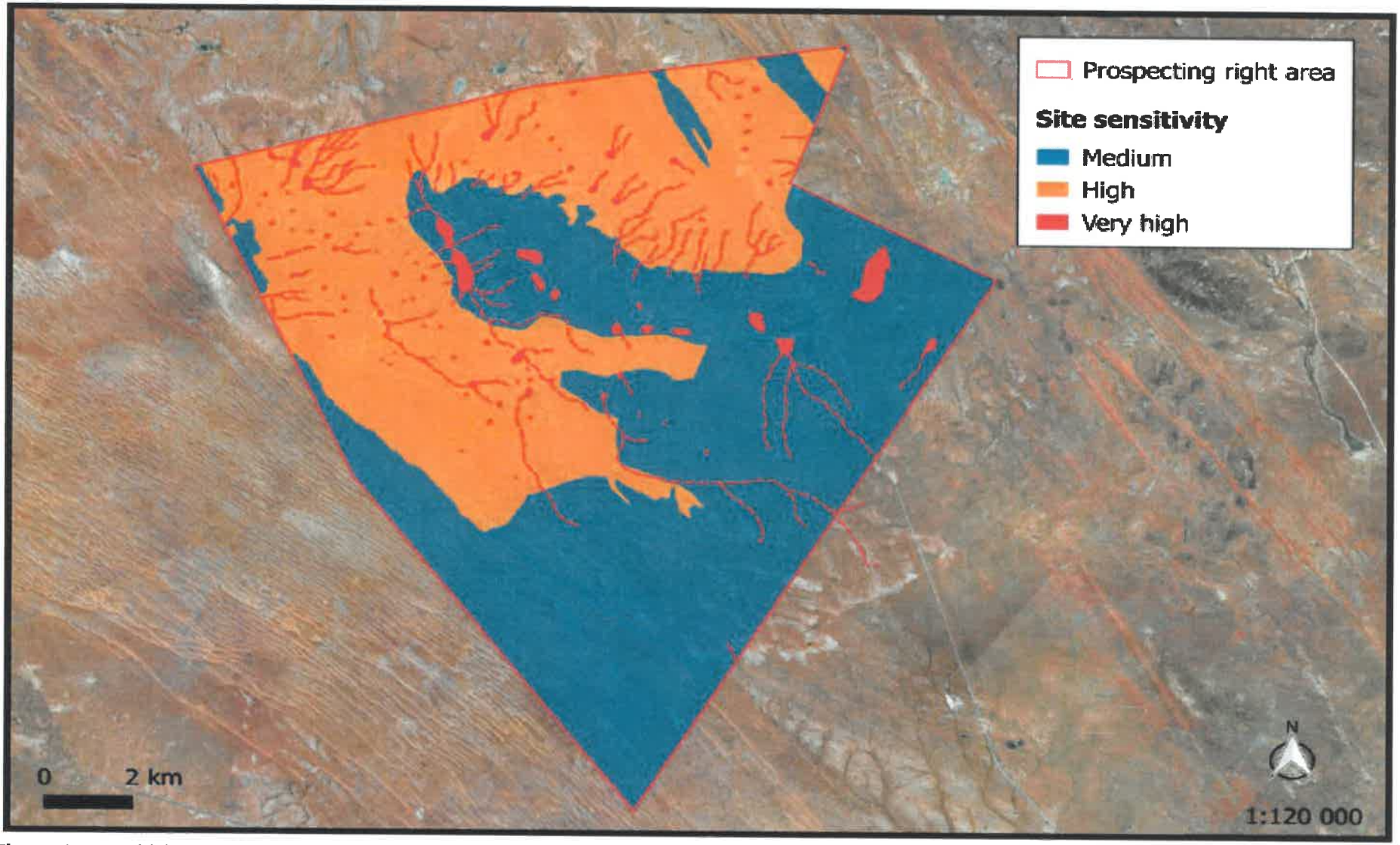


Figure 16. A sensitivity map for the proposed prospecting area. (map taken out of the Ecological Study of Boscia Ecological Consulting).

(13) *SOCIO-ECONOMIC STRUCTURE OF THE REGION:*

All information in this section is taken out of the DAWID KRUIPER MUNICIPALITY: INTEGRATED DEVELOPMENT PLAN – 2017 – 2022.

The demographic information provided below indicates the state of population and the development since the last Census in 2001.

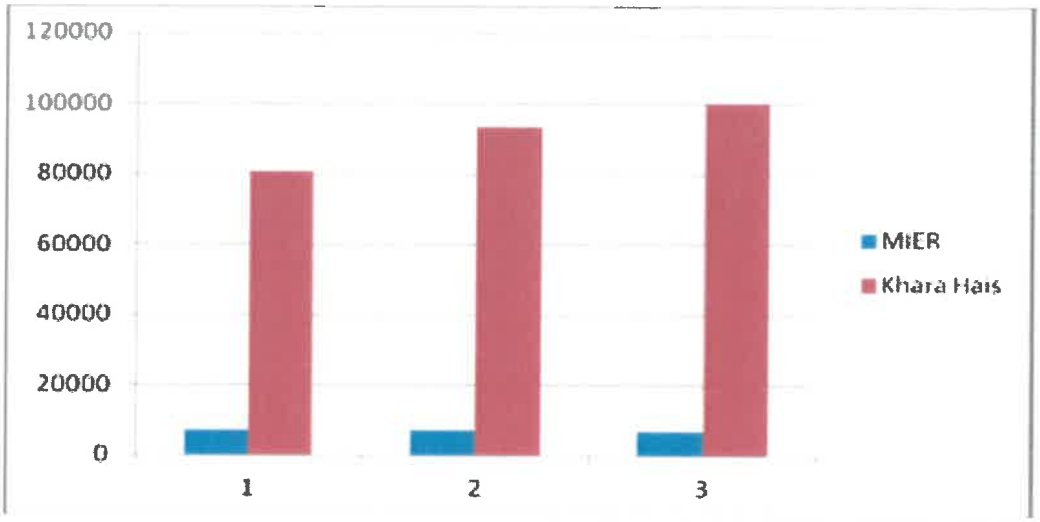
Description	2001	2011
Total population	77,919	93,494
Young (0-14)	31,7%	29,8%
Working Age (15-64)	63,0%	64,6%
Elderly (65+)	5,3%	5,5%
Dependency ratio	58,7%	54,7%
Sex ratio	95,5	97
Growth rate	-0,73% (2001-2011)	1,82% (2001-2011)
Unemployment rate	34%	22,1%
Youth unemployment rate	42,3%	29%
No schooling aged 20+	13,6%	7,1%
Higher education aged 20+	5,9%	7,8%
Matric aged 20+	20,9%	26%
Number of households	17,934	23,245
Average household size	4,1	3,9
Female headed households	34,1%	40,5%
Formal dwellings	81,2%	75,2%
Flush toilet connected to sewerage	68,6%	68,3%
Weekly refuse removal	79,3%	87,2%
Piped water inside dwelling	38,7%	56%
Electricity for lighting	73,6%	91,1%

Table 8 – Key Statistics (Source Stats SA)

POPULATION AND POPULATION GROWTH

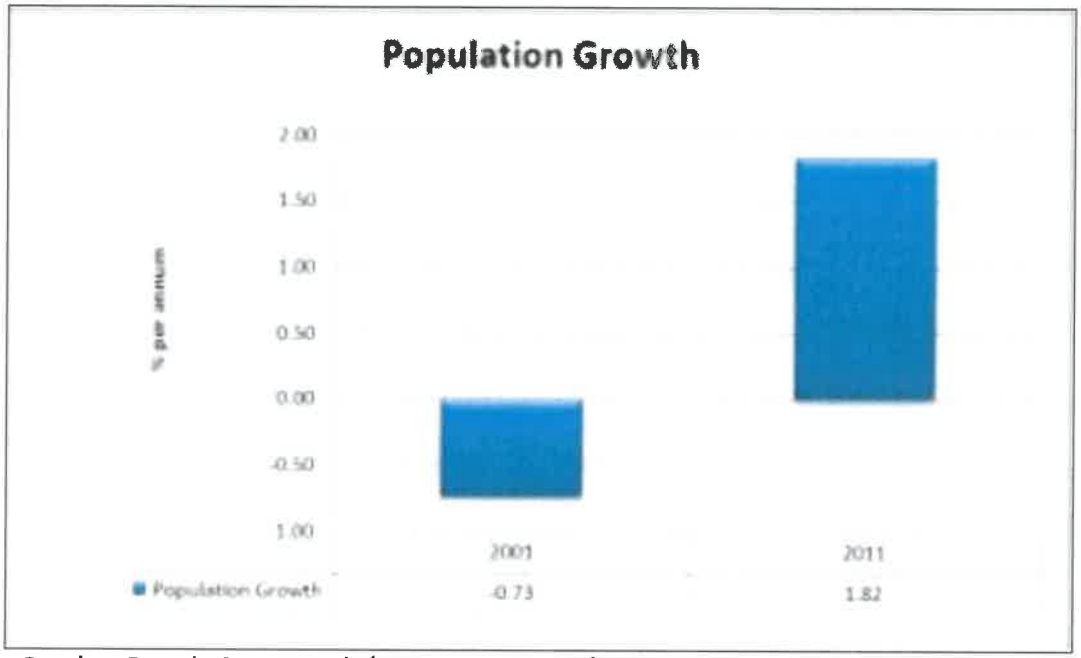
Table 9, indicates that the Khara Hais area, population was 100 497 in 2011. This reflects an overall population growth of 1.82% between 2001 and 2011. Dawid Kruiper Local Municipality is the most populous municipality in ZF Mcgawu District.

The graph below indicates that there is currently 6 879 people within the Mier area which in terms of the demographic spread are scattered compared to the 100 282 within the Khara Hais/Upington area, which bring the total population at 107 162 within the Dawid Kruiper jurisdiuction.



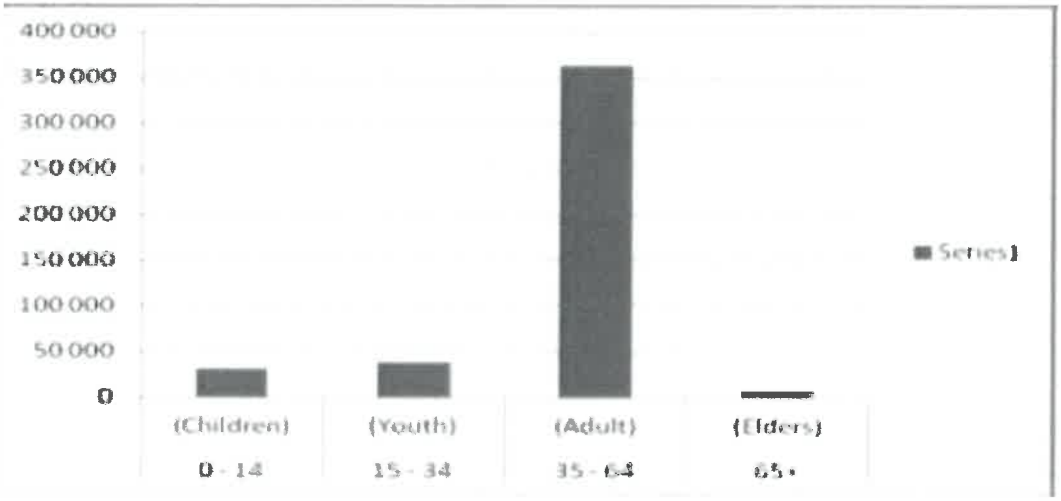
	1996	2011	2016
Mier	7026	7003	6879
Khara Hais	80 823	93494	100 282

Graph 1: Population (Source – Stats SA)



Graph 2: Population Growth (Source – Stats SA)

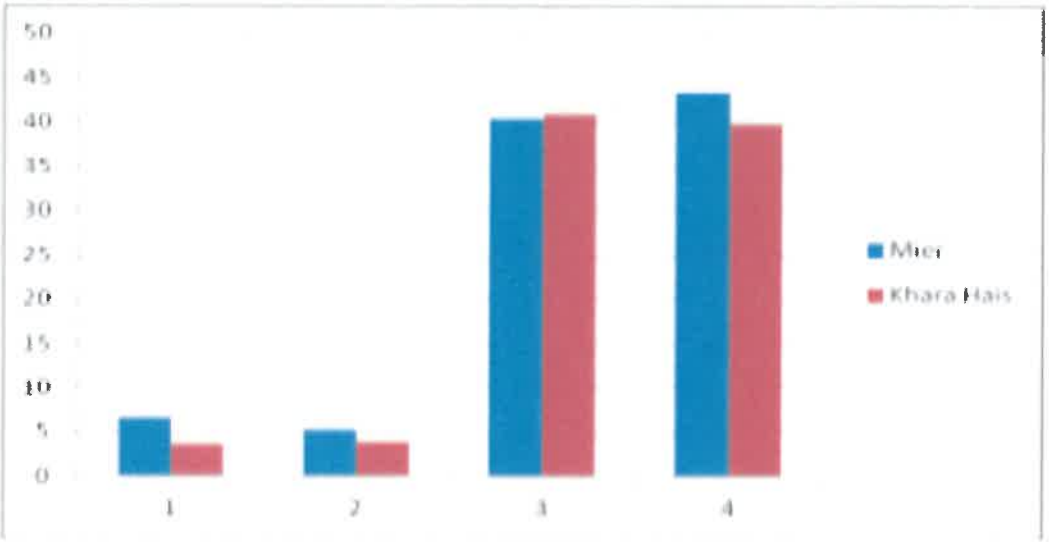
The fertility rate in Dawid Kruiper has declined significantly over time. As a result children aged 0–15, decline with 1.9% since 2001. (From 31.7% in 2001, to 29.8% in2011.)



30677	38149	32316	6019

Graph 3: Age Structure (Source – Stats SA)

The working age population stadily grew over the 10 year period to 64.6% in of the total population in 2011. Other age categories, particularly the proportion of older persons (older than 65) has slightly grown with 0.2% from 5, 3% in 2001 to 5.5% in 2011.



Graph 4: Dependancy Rate (Source – STAT SA)

The dependency rate declined from 54.7 in 2011 to 20.6 within the old KharaHais area and still remains high within the Mier area at 77.6. This implies that there is still a large number of residents that dependant on government pensions, implying that a large part of the residents of Dawid Kruiper earn less than R 1 280-00 per month and that in itself has a negative influence on the payment of services. The percentage of households earning less then 2x old age grants per month, amounts to 28,8%. In total 14 486 households are subsidized by the services subsidy scheme. Only 26, 9% of the inhabitants are economically active.

SEX RATIO AND GENDER

The sex ratio is one of the key measures of sex composition. It gives the number of males for every 100 females. If it is above 100, it shows the predominance of males over females; conversely when it is lower than 100, the reverse is true. Generally, sex ratios at birth are high and decrease gradually as age increases.
Overall, data suggest that the population is predominantly of female population. On average, the population consists of 49.9% of male population and 51.1 % of female population.

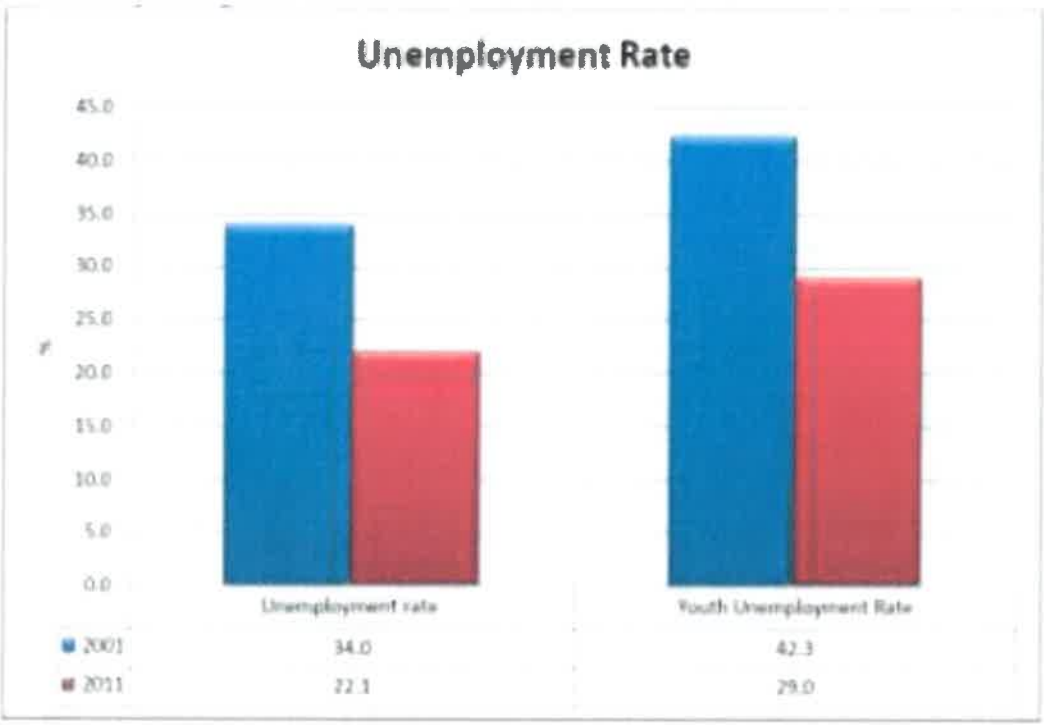
On average, Dawid Kruiper had a sex ratio of 97 (97 males per 100 females) which is an increase of 1.5 since the 2001 Census.
There is an almost fifty percent split between males and females
As indicated on table 10 below.

Sex	Percentage
Female	50,7%
Male	49,3%

Table 10 – Gender (Source: Stats SA)

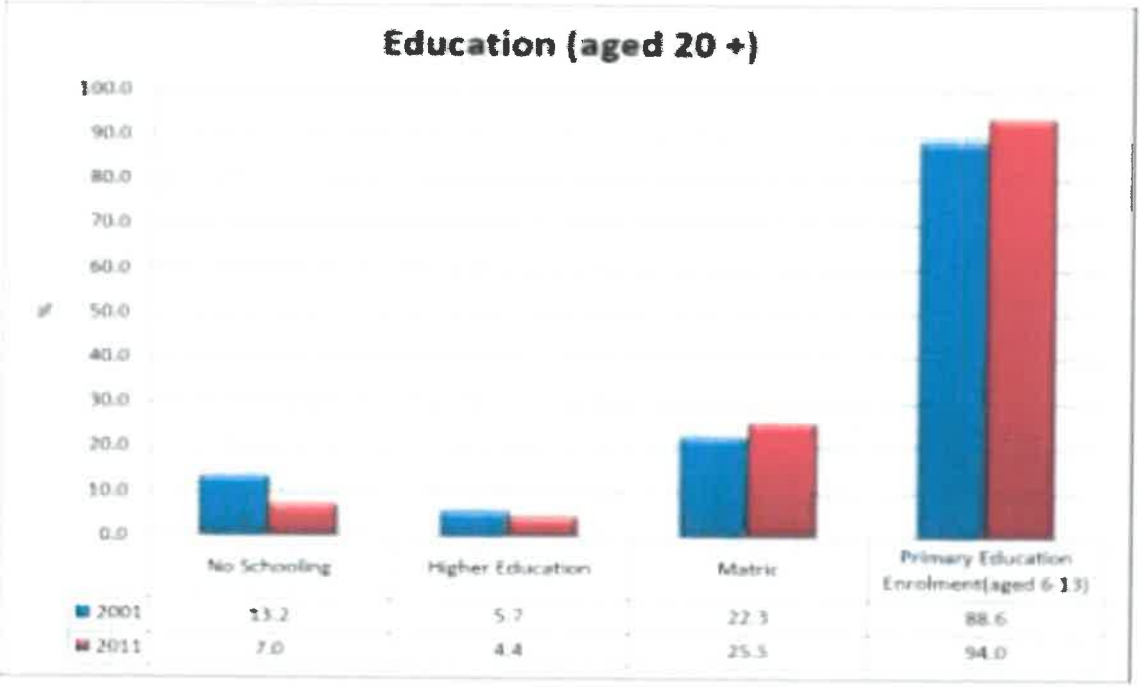
UNEMPLOYMENT RATE AND EDUCATION

The unemployment rate decreases significantly from 34% in 2001 to 22.1% in 2011.
There was a huge decline in the youth unemployment rate too from 42.3% in 2001 to 29% in 2011 but the youth unemployment rate is still very high in comparison with the overall unemployment rate of the municipality. Although about 44.7% of theDawid Kruiper population are between14 and 35 years old, youths remains relatively marginalised.



Graph 5: Unemployment Rate (Source – Stats SA)

An increase of 5.1% (20.9% in 2001 to 26% in 2011) of people living in Dawid Kruiper over the age of twenty years have completed the 12th grade while there was a significant decline of 6.5% (13.6 in 2001 to 7.1% in 2011) in people that had no schooling at all. Higher education increases from 20.9% in 2001 to 26% in 2011.



Graph 6: Education (Sourse – Stats SA)

HOUSEHOLDS

There were 28 704 households in the Dawid Kruiper Municipal area in 2016, which is a significant increase since 2011 when there were only 25 029 households. This creates a larger demand for household-based services such as housing, water, electricity and sewerage.

Graph 7: Households (Source – Stats SA)

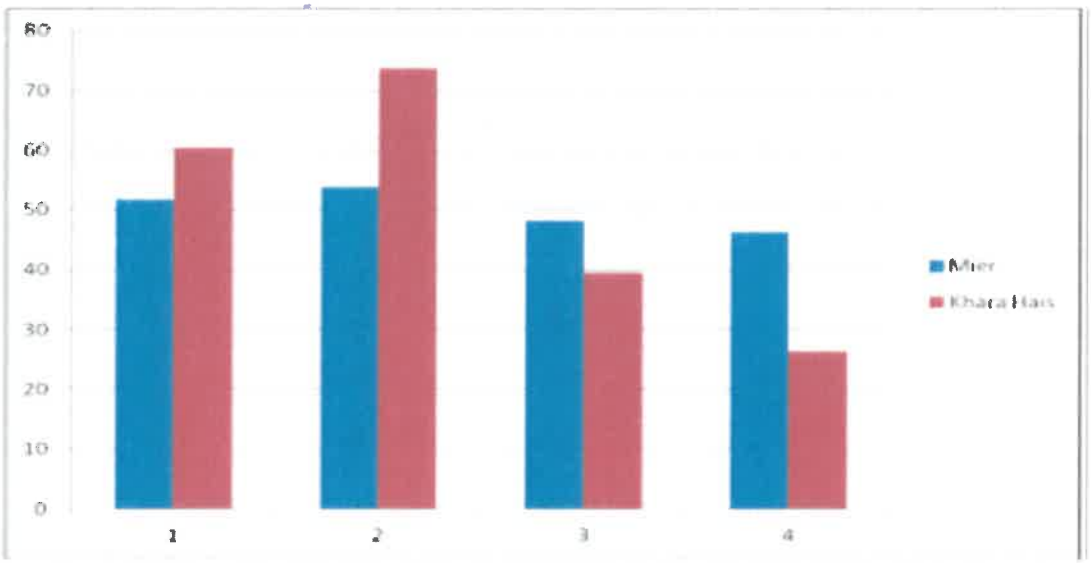
HOUSEHOLD DYNAMICS

Female headed households increases from 34.1% in 2001 to 40.5% in 2011. Which is worrying because families headed by single parents (usually women), and households headed by women are more likely to be poor than male-headedhouse holds. Programs that empower women should be implemented across all spheres of government to assist the vulneralble.
Formal dwellings decrease from 81.2% in 2001 to 75.2% in 2011. This could be contributed to establish of more informal settlements and the slow delivery of subsidised houses.

Graph 8: Household Dynamics (Source – Stats SA)

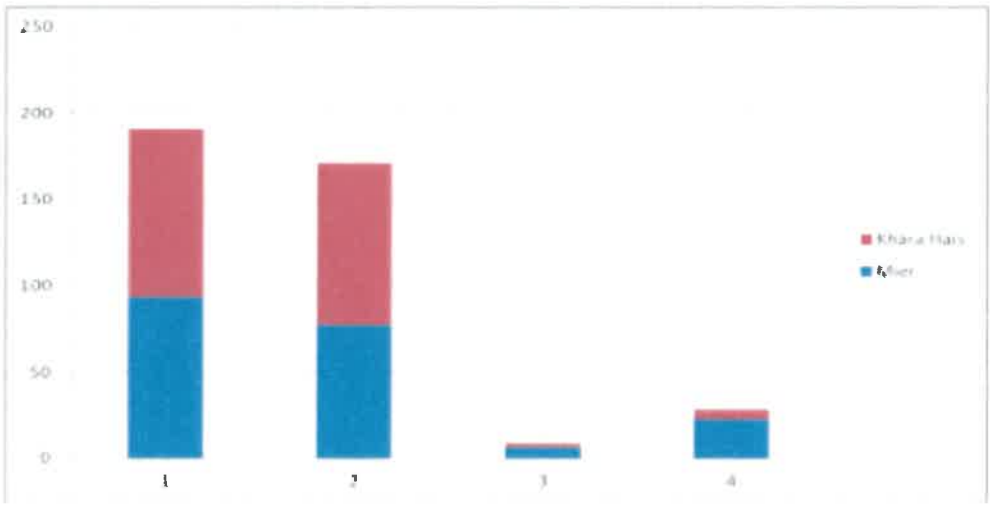
HOUSEHOLD SERVICES

All municipal services except sewerage increased since 2001 with electricity for lighting increased with to 94.% within the Khara Hais/Upington area and up to 64 % in 2016 within the Mier area respectively The percentage of household whose refuse is removed by local authority weekly, increased consistently from 79.3% in Census 2001 to 87.2%in Census 2011.



Graph 9: Household Services - Access to Improved Sanitation (Source – Stats SA)

The proportion of households that have flush toilets connected to the sewage system decrease slightly from to 68.3% to in 2011 to 73.7% within the Khara Hais/Upington area and to 53.8 within the Mier area.



Graph10: Household Services - Access to Improved Piped Water (Source – Stats SA)

Access to piped water in the dwelling or yard has increased significantly since 2001 when only 38.7% of households reported access compared to 56% in 2011, and further increased to 94.1% within the KharaHais/Upington area and to 97.3 % within the Mier area.

POPULATION GROUPS

The coloured population is in the majority, followed by Africans and then the white population. The most commonly spoken language is Afrikaans, spoken by 85% of the residents as indicated by tables 11 and 12 below.

GROUP	PERCENTAGE
Black African	23,1%
Coloured	65,2%
Indian/Asian	0,7%
White	9,9%
Other	1,2%

Table 11 – Population group (Source: Stats SA)

LANGUAGES SPEAK

The table below shows that Afrikaans is the most dominant language in Dawid Kruiper with 85.2% of the population indicating that this was the language most often spoken in the home. This is followed by IsiXhosa at 5% and Setswana at 3.5%.

LANGUAGE	PERCENTAGE
Afrikaans	85,2%
English	1,9%
IsiNdebele	0,2%
IsiXhosa	5%
IsiZulu	0,3%
Sepedi	0,2%
Sesotho	0,9%
Setswana	3,5%
Sign Language	0,3%
SiSwati	0%
Tshivenda	0,1%
Xitsonga	0%
Other	0.8%
Not Applicable	1,5%

Table 12 – Language (Source: Stats SA)

CONCLUSION

The demographic statistics indicates that Dawid Kruiper Municipality in cojunction with other spheres of government worked hard to improve the conditions of local the communities in Dawid Kruiper the past ten years.

(15) ARCHAEOLOGICAL

Cultural Resources Management Impact Assessment: (PORTION OF) AREACHAP 426, UPINGTON DISTRICT, NORTHERN CAPE, SOUTH AFRICA PREPARED BY – KAREN VAN RYNEVELD McGREGOR MUSEUM, ARCHAEOLOGY DEPARTMENT, CRM UNIT, 2005

The assessment focussed on the identification of cultural heritage resources, inclusive of archaeological deposits and their significance, built structures older than 60 years, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict and cultural landscapes or viewscapes as protected by the NHRA (1999).

No cultural heritage resources as defined and protected by the NHRA (1999) will be impacted on by the proposed localised mining development (inclusive of prospecting and mining impact on demarcated area ARC 1 and upgrading and use of the access road).

(b) Description of the current land uses

(1) *Land Use before Mining:*

The major land uses in the region are livestock and game farming. The site is classified as non-arable land with low potential for grazing. The main agricultural enterprise in the region is sheep, with a proposed stocking rate of 28 Ha per large stock unit. The area is not suited for cultivation. Apart from the current prospecting activities by Synchroplex, historic diggings took place during the period of 1909 to 1917. Later, in the 1960's Iscor started exploration work at the same site. In 1971 Cape Asbestos, in a joint venture with Anglo American, obtained exploration rights but relinquished them back to Iscor in 1977 after they had failed to locate additional deposits. The farm is currently used for livestock farming and a public road (R360) which connects Upington with the Rietfontein border post to Namibia also traverses the property (Figure 1).

(2) Evidence of Disturbance:-

Apart from the current prospecting activities by Synchroplex, historic diggings took place during the period of 1909 to 1917. Later, in the 1960's Iscor started exploration work at the same site. In 1971 Cape Asbestos, in a joint venture with Anglo American, obtained exploration rights but relinquished them back to Iscor in 1977 after they had failed to locate additional deposits.

(3) Existing Structures:-

The developer has applied for a prospecting / right for an approximate 120 ha area (ARC 1). The proposed development will thus be localised and impact restricted to the access road and ARC 1. Material will be processed on site and existing on site buildings (dating to the opening of the mine in the late 1960's, early 1970's) will be upgraded for use during the course of development.

(c) Description of specific environmental features and infrastructure on the site

The infrastructure on site is comprehensively discussed in section d(ii) as part of the mining methodology discussion, as well as in section g as part of the mine footprint description. Furthermore, a comprehensive description of the environment was presented in section g (iv) (A) as part of the baseline report.

(d) Environmental and current land use map
(Show all environmental, and current land use features)

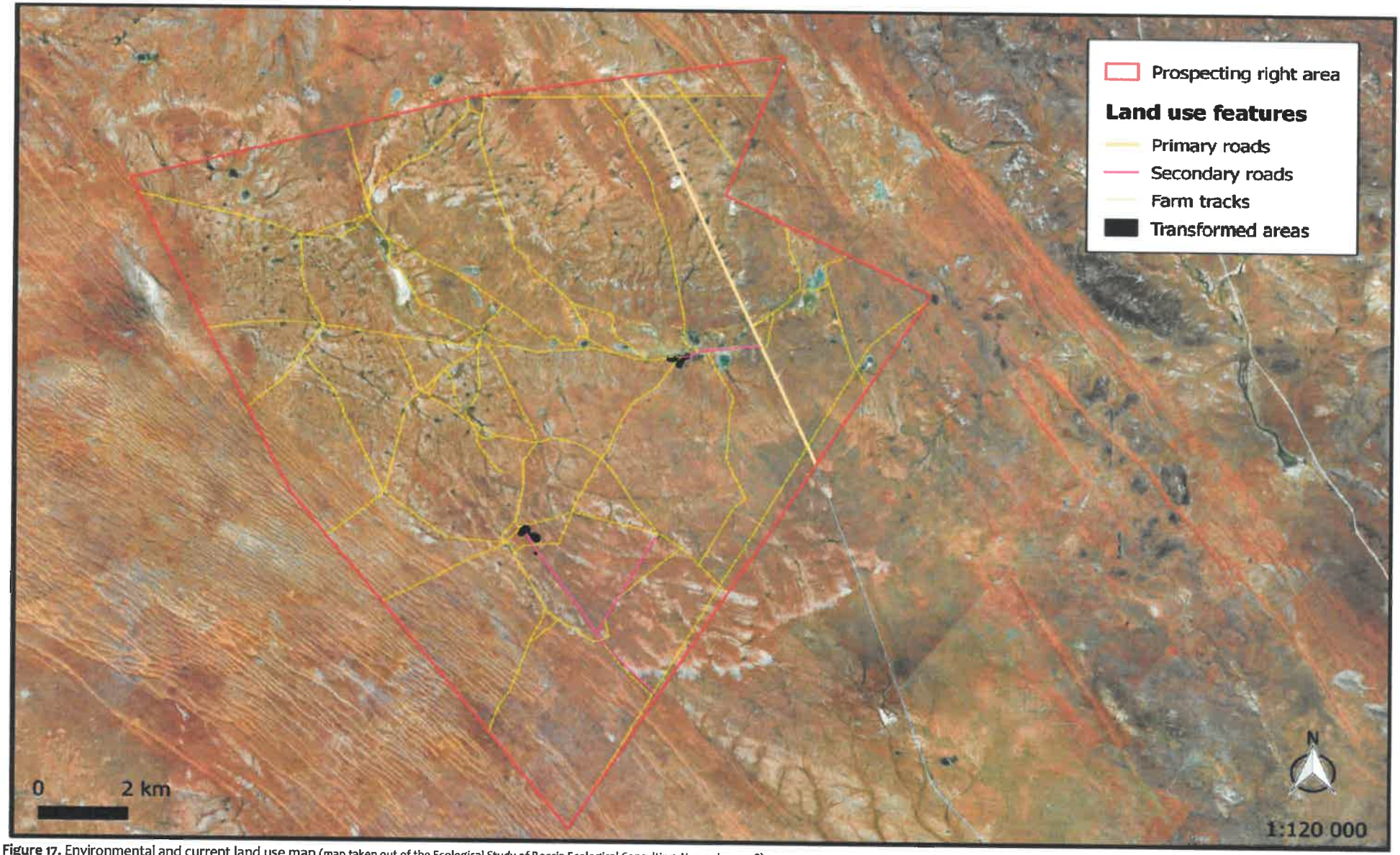


Figure 17. Environmental and current land use map (map taken out of the Ecological Study of Boscia Ecological Consulting, November 2018).

(v) Impacts identified:

(Provide a list of the potential impacts identified of the activities described in the initial site layout that will be undertaken, as informed by both the typical known impacts of such activities, and as informed by the consultations with affected parties together with the significance, probability and duration of the impacts.)

Environmental Factor	Nature of Impact	Significance	Probability	Duration
		PHYSICAL		
Geology and Mineral Resource	Sterilisation of mineral resources	Very low	Highly unlikely	Operational and Decommissioning
Topography	Changes to surface topography Development of infrastructure; and residue deposits.	Medium	High	Construction and Operational
Soils	**Soil Erosion** Infrastructure; excavations; alterations of the beds and banks of the watercourses. Vegetation will be stripped in preparation for placement of infrastructure and excavations, and therefore the areas will be bare and susceptible to erosion. Topsoil and overburden that is stripped and piled on surrounding areas can be eroded by wind, rain and flooding. The soil/sediments	Medium	Possible infrequently	Decommissioning

	will be carried away during runoff. The affected areas will be rehabilitated, but full restoration might only occur over a number of years, subsequent to the re-establishment of vegetation.			
	Nature of Impact	Significance	Probability	Duration
	Loss of soil fertility During the removal of topsoil; stockpiling. Improper stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.	Low-Medium	Possible for life of operation	Residual
	Nature of Impact	Significance	Probability	Duration
	Soil pollution Spillage of hazardous material; runoff.	Low-Medium	Possible for life of operation	Construction and Operational
Land Capability	Loss of land capability through topsoil removal, disturbances and loss of fertility.	Very Low	Possible	Short term
Land use	Loss of land use due to poor placement of surface infrastructure and ineffective rehabilitation	Very low	Possible	Short term
Ground Water Quantity	Nature of Impact	Significance	Probability	Duration
	Hydrocarbon Spills	Medium	Possible	Construction

	Hydrocarbon spills from construction vehicles and fuel storage areas may contaminate the groundwater resource locally			
Environmental Factor	Nature of Impact	Significance	Probability	Duration
Surface Water	• Ground works and stripping of vegetation resulting in a changed land profile. • Runoff from stockpiled soil and vegetation may contain high levels of silt.	Medium to Low	Possible	Construction
	• Spillages that may occur on access and haul roads may impact negatively on surface water quality. • A high potential of soil erosion exists due to an increased percentage of bare surfaces.	Medium	Possible	Operational
	• Possible leaching of polluted soil through infiltration and runoff resulting in surface water pollution. • Removal of vegetation could lead to erosion and sediment transportation. • Significant dust levels will emanate from the use of heavy construction vehicles.	Moderate to High	Possible	Closure
Environmental Factor	Nature of Impact	Significance	Probability	Duration

Indigenous Flora	**Loss of and disturbance to indigenous vegetation** Construction of roads and other necessary infrastructure; the placement of stockpiles; and the clearing of vegetation for excavations, materials storage and topsoil stockpiles; vehicular movement. Construction and prospecting activities on site will reduce the natural habitat for ecological systems to continue their operation. It is not expected that the areas of high ecological function will rehabilitate fully following disturbance events. Vehicle traffic generates lots of dust which can reduce the growth success and seed dispersal of many small plant species.	Medium	Certain but infrequent	Decommissioning
	Loss of flora with conservation concern Removal of listed or protected plant species; during the construction of roads and other necessary infrastructure; the placement of stockpiles; and the clearing of vegetation for	Medium	Possible but infrequent	Residual

	excavations. There are a number of protected species present in the core prospecting area, such Boscia foetida, Euphorbia spinea, Prenia tetragona and Psilocaulon subnodosum. It is highly likely that some of these species might be damaged or removed during the operation. Furthermore, any illegal fire wood collection or illegal harvesting of the protected plants that occur in the other parts of the study area plants for trade or medicinal use by staff, contractors or secondary land users could potentially have a negative impact on the population of these species. It is possible that prospecting activities will destroy protected species and other species of conservation concern.			
	Proliferation of alien vegetation Clearing of vegetation; prospecting activities. The extent of alien invasive species in the area is fairly low. However, while general clearing	Medium	Possible for life of operation	Residual

	of the area and excavation activities destroy natural vegetation, invasive plants such as Prosopis spp. can increase due to their opportunistic nature in disturbed areas. If invasive plants establish in disturbed areas, it may cause an impact beyond the boundaries of the prospecting site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity and ecological value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.			
	Encouragement of bush encroachment Clearing of vegetation; disturbances through prospecting activities. The extent of bush encroaching species on site shows the possible	Medium	Possible for life of operation	Residual

	moderate level of past disturbance interference in the natural ecosystem, primarily through grazing practises. While general clearing of the area and prospecting activities destroy natural vegetation, bush encroaching plants can increase due to their opportunistic nature in disturbed areas. If encroaching plants establish in disturbed areas, it may the lower potential for future land use and decrease biodiversity. With proper mitigation, the impacts can be substantially reduced.			
Fauna	**Loss, damage and fragmentation of natural habitats** Clearance of vegetation; prospecting activities Prospecting activities and associated infrastructure will result in the loss of connectivity and fragmentation of natural habitat. Fragmentation of habitat will lead to the loss of migration corridors, in turn resulting in degeneration of the affected population's genetic make-up.	Medium	Possible for life of operation	Decommissioning

	This results in a subsequent loss of genetic variability between meta-populations occurring within the study site. Pockets of fragmented natural habitats hinder the growth and development of populations. Although this impact will be most profound if the ephemeral pans are disturbed, it is not expected that the prospecting operation will take place in or near these pans.			
	Disturbance, displacement and killing of fauna Vegetation clearing; increase in noise and vibration; human and vehicular movement on site resulting from prospecting activities. The transformation of natural habitats will result in the loss of habitat, affecting individual species and ecological processes. This will result in the displacement of faunal species that depend on such habitats. Increased noise and vibration will also disturb and possibly displace birds and other	Medium	Possible for life of operation	Decommissioning

	wildlife. Fast moving vehicles cause road kills of small mammals, birds, reptiles, amphibians and a large number of invertebrates. Intentional killing of snakes, reptiles, vultures and owls will negatively affect the local populations.			
Broad Scale Ecological processes **Compromise of ecological processes**	The construction of roads, prospecting site, as well as other necessary infrastructure; the clearing of vegetation for excavations; alterations of the beds and banks of the watercourses. Transformation of intact habitat on a cumulative basis would contribute to the fragmentation of the landscape and would potentially disrupt the connectivity of the landscape for fauna and flora and impair their ability to respond to environmental fluctuations. Any fragmentation of the watercourses will destroy connectivity of vital ecological and aquatic linkages. It is however not expected that any watercourses will be affected and	High	Low likelihood infrequent	Residual

	transformation of natural habitats in the region is very low. Therefore the cumulative impact of the proposed prospecting operation is also insignificant.			
Air Quality	Sources of atmospheric emission associated with the prospecting operation are likely to include fugitive dust from materials handling operations, wind erosion of stockpiles, and vehicle entrainment of road dust.	Low	Certain	Decommissioning
SOCIAL SURROUNDINGS				
Environmental Factor	Nature of Impact	Significance	Probability	Duration
Noise Impacts	Clearing of footprint areas, stripping of stockpiling of topsoil	Medium	Possible	Pre- Construction and Construction
	Construction of internal Roads	Medium	Possible	Pre- Construction and Construction
	Building activities Noise increase at the boundary of the mine footprint.	Medium	Possible	Pre- Construction and Construction
	Hauling of building material to and from the specific areas.	Medium	Possible	Pre- Construction and Construction
	Construction of the Mine Residue dump, soil stock pile and material stock pile.	Medium	Possible	Pre- Construction and Construction

	Noise increase at the boundary of the mine footprint.			
	Clearing of new open cast prospecting areas, stripping and stockpiling of topsoil. Noise increase at the boundary of the mine footprint.	Medium	Possible	Operational
	Diesel generators Noise increase at the boundary of the mine footprint.	Medium	Possible	Operational to closure
	Additional traffic to and from the mine	Medium	Possible	Operational to closure
	Prospecting activities	Medium	Possible	Operational to closure
	Maintenance activities at the site.	Medium	Possible	Operational to closure
	Back fill of mine footprint area	Medium	Possible	Decommissioning
	Planting of grass and vegetation at the rehabilitated areas	Medium	Possible	Decommissioning
	Removal of infra-structure	Medium	Possible	Decommissioning
Visual impacts	Potential visual impact	Medium	Certain	Construction, Operation and Decommissioning
	Potential Visual Impact on the surrounding land users.	Medium Local	Likely	Construction, Operation and Decommissioning
	Potential visual impact of the proposed development on the construction phase of the surrounding land users.	Medium Local	Likely	Construction

	Potential visual impact of the proposed development on the operational phase of the surrounding land users.	Medium Local	Likely	Operational
Traffic	Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low	Low likelihood	Decommissioning
Environmental Factor	Nature of Impact	Significance	Probability	Duration
Socio-Economic	**Population Impacts** Employment Opportunities and skills Inequities	Medium Positive	Probable	Start-up
	Safety and Security Risks	Low Negative	Highly Probable	Construction
	Health Impacts	Low Negative	Highly probable	Construction
Interested and Affected Parties	Loss of trust and a good standing relationship between the IAP's and the prospecting company.	Low to medium	Possible	Construction, Operational and Decommissioning

(vi) Methodology used in determining the significance of environmental impacts:

(Describe how the significance, probability and duration of the aforesaid identified impacts that were identified through the consultation process were determined in order to decide the extent to which the initial site layout needs revision.)

Methodology used in determining and ranking the nature, severity, consequences, extent, duration and probability of potential environmental impacts and risks

The Different environmental components on which the project (can) have an impact are:

1. Geology
2. Topography
3. Soil
4. Land Capability
5. Land Use
6. Flora (Vegetation)
7. Fauna
8. Surface Water
9. Ground Water
10. Air Quality
11. Noise and vibration
12. Archaeological and Cultural Sites
13. Sensitive Landscapes
14. Visual Aspects
15. Socio-Economic Structures
16. Interested and Affected Parties

Impact Assessment

Before the impact assessment could be done the different project Activities/infrastructure components were identified.

1	Processing Plant : Material excavated from the trenches and historical dump cuttings will be selected and processed through a crush-and-screen processing plant. The product will be further tested in a laboratory.
2	Ablution Facilities: In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.
3	Clean & Dirty water system: Berms It is anticipated that the operation will establish stormwater control berms and trenches to separate clean and dirty water on the mine site.
4	Fuel Storage facility (Concrete Bund walls and Diesel tanks): It is anticipated that the operation will utilize 2 x 23 000 litre diesel tanks. These tanks must be placed in bund walls, with a capacity of 1.5 times the volume of the diesel tanks. A concrete floor must be established where the re-fuelling will take place.
5	Prospecting Area (Areachap): Prospecting for iron, silver, zinc, copper and sulphur ore.
6	Salvage yard (Storage and laydown area).
7	Product Stockpile area.
8	Waste disposal site The operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area: o Small amounts of low level hazardous waste in suitable receptacles; o Domestic waste; o Industrial waste.
9	Roads (both access and haulage road on the mine site): Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the prospecting operation will create an additional 2 - 4 km of roads, with a width of 6 meters.
10	Temporary Workshop Facilities and Wash bay.
11	Water distribution Pipeline.
12	Water tank : It is anticipated that the operation will establish 1 x 10 000 litre water tanks with purifiers for potable water.

The criteria used to assess the significance of the impacts are shown in the table 13 below/overleaf. The limits were defined in relation to prospecting characteristics. Those for probability, intensity/severity and significance are

subjective, based on rule-of-thumb and experience. Natural and existing mitigation measures were considered. These natural mitigation measures were defined as natural conditions, conditions inherent in the project design and existing management measures, which alleviate impacts. The significance of the impacts was calculated by using the following formula:

(Severity + Extent + Duration) x Probability weighting

For the impact assessment, the different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts.

Table 13: Significance of impacts is defined as follows.

SIGNIFICANCE				
Colour Code	**Significance rating**	**Rating**	**Negative Impact**	**Positive Impact**
	Very low	3 -16	Acceptable/Not serious	Marginally Positive
	Low	17 - 22	Acceptable/Not serious	Marginally Positive
	Medium-Low	23 -33	Acceptable/Not desirable	Moderately Positive
	Medium	34 - 48	Generally undesirable	Beneficial
	Medium-High	49 - 56	Generally unacceptable	Important
	High	57 - 70	Not Acceptable	Important
	Very High	90 - 102	Totally unacceptable	Critically Important

Significance of impacts is defined as follows:

Very Low - Impact would be negligible. Almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple.

Low - Impact would have little real effect. Mitigation and/or remedial activity would be either easily achieved or little would be required or both.

Medium Low- Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and fairly easily possible.

Medium - Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be feasible and possible.

Medium High- Impact would be real but could be substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and possible but may be difficult and or costly.

High - Impacts of substantial order. Mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these.

Before any assessment can made the following evaluation criteria need to be described.

Table 14: Explanation of **PROBABILITY** of impact occurrence

Weight	Probability of Impact Occurrence	Explanation of Probability
1	Improbable	<20% sure of particular fact or likelihood of impact occurring
2	Low Probability Possible	20 – 39% sure of particular fact or likelihood of impact occurring
3	Probable /Likely	40 – 65% sure of particular fact or likelihood of impact occurring
4	Highly Probable /Likely	66 – 85% sure of particular fact or likelihood of impact occurring
5	Definite	86% - 100% sure of particular fact or likelihood of impact occurring

Table 15: Explanation of **EXTENT** of impact

Weight	Extent of Impact	Explanation of Extent
1	Footprint	Direct and Indirect impacts limited to the activity, such as footprint occurring within the total site area of impact only.
2	Surrounding Area **Site**	Direct and Indirect impacts affecting environmental elements **within 2 km of site**
3	Local Municipality **Local**	Direct and Indirect impacts affecting environmental elements within the Upington **area**
4	Regional/District **Regional**	Direct and Indirect impacts affecting environmental elements within District (**Upington District**)
5	**Provincial**	Direct and Indirect impacts affecting environmental elements in the **Northern Cape Province**

Table 16: Explanation of **DURATION** of impact

Weight	Duration of Impact	Explanation of Duration
1	Temporary (Very Short)	Less than 1 year
2	Short term	1 to 5 years
3	Medium term	6 to 15 years
4	Long term (Life of project)	16 to 50 years
5	Very Long term	Longer than 50 years
6	Permanent	Permanent

Table 17: Explanation of **SEVERITY** of the impact

Weight	Impact Severity	Explanation of Severity
1	No Impact	There will be no impact at all – not even a very low impact on the system or any of its parts.
2	Very Low	Impact would be negligible. In the cast of negative impacts,

		almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple. In the case of positive impacts alternative means would almost all likely to be better, if one or a number of ways, then this means of achieving the benefit.
3	Low	Impact would be of a low order and with little real effect. In the case of negative impacts, mitigation and/or remedial activity would be either easily achieved or little would be required or both. In the case of positive impacts alternative means for achieving this benefit would be easier, cheaper, more effective, less time-consuming, or some combination of these.
4	Moderately Severe	Impact would be real but not substantial within the bounds of those which could occur. In the case of negative impacts, mitigation and/or remedial activity would be both feasible and fairly easily possible. In the case of positive impacts other means other means of covering these benefits would be about equal in cost and effort.
5	High Severance	Impacts of substantial order. In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these. In the case of positive impacts other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
6	Very High Severity	Of the highest order possible within the bounds of impacts which could occur, in the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted. In the case of positive impacts there is no real alternative to achieving the benefit.

(vii) The positive and negative impacts that the proposed activity (in terms of the initial site layout) and alternatives will have on the environment and the community that may be affected:

(Provide a discussion in terms of advantages and disadvantages of the initial site layout compared to alternative layout options to accommodate concerns raised by affected parties.)

During the operational stages of the prospecting operation, there is a possibility of sterilisation of the mineral reserves and resources due to improper placement of infrastructure. The infrastructure and excavations /dumps will alter the topography by adding features to the landscape. Removal of iron, silver, zinc, copper and sulphur ore will unearth the current topography. The construction of infrastructure and various facilities in the prospecting area can also result in loss of soil due to erosion. Vegetation will be stripped in preparation for placement of infrastructure and making excavations, and therefore the areas will be bare and susceptible to erosion.

The topsoil that is stripped and piled on surrounding areas can be eroded by wind and rain. The soil will be carried away during runoff. The cleared areas will be rehabilitated, but full restoration of soils might only occur over a number of years, subsequent to the re-establishment of vegetation. Furthermore, improper

stockpiling and soil compaction can result in soil sterilisation. Leaching can also occur, resulting in the loss of nutrients.

There is also a possibility that equipment might leak oil, thus causing surface spillages. The hydrocarbon soil contamination will render the soil useless unless they are decontaminated. The storage of fuels on site might have an impact on soil if the tanks that are available on site are not properly monitored and maintained to avoid leakages. Then there is the potential that contaminated soil can be carried through runoff to contaminate water resources and soil stockpiled for rehabilitation. Soil pollution is therefore possible, but through mitigation it can be minimised.

The loss of land capability and land use can occur in two ways. Firstly, through topsoil removal, disturbances and loss of soil fertility; and secondly through the improper placement of infrastructure. Most of the site has a land capability for grazing, but the area has been converted due to the dumping of the sample material and excavations with the dolomite pinnacles with proper rehabilitation the land capabilities and land use potential can be restored.

Groundwater could be affected, if any oil and fuel spillages occur during these scenarios and activities, then groundwater will be directly contaminated. Similarly, hazardous surface spillages will seep into the underlying aquifers and contaminate ground water. Improper handling of hazardous material will cause contamination of nearby surface water resources during runoff episodes. Lack of storm control structures will lead to erosion of stockpiles during heavy rains and runoff will carry suspended solids into the downstream environment. This might cause high silt load and affect stream flow. If no, or inadequate ablution facilities are available then workers might feel the need to use the veld for this purpose, which can contaminate natural resources.

Prospecting activities on site will reduce the natural habitat for ecological systems to continue their operation. While general clearing of the area and prospecting activities destroy natural vegetation, invasive plants can increase due to their opportunistic nature in disturbed areas. If invasive plants establish in disturbed areas, it may cause an impact beyond the boundaries of the prospecting site. These alien invasive species are thus a threat to surrounding natural vegetation and can result in the decrease of biodiversity and ecological value of the area. Therefore, if alien invasive species are not controlled and managed, their propagation into new areas could have a high impact on the surrounding natural vegetation in the long term. With proper mitigation, the impacts can be substantially reduced.

During the operation the abovementioned activities have potential for dust generation. It is anticipated that the extent of dust emissions would vary substantially from day to day depending on the level of activity and the specific operations. The operation will typically have low to moderate levels of noise, along with man-influenced sounds such as traffic on the secondary road and very occasional air traffic. The proposed operation will add a certain amount of noise to the existing noise in the area.

The impact of site generated trips on the traffic and infrastructure of the existing roads is expected to be moderate. Furthermore, if road safety is not administered it can have a high impact on the safety of fellow road users.

The activities on site have the potential to impact upon heritage resources. Heritage sites are fixed features in the environment, occurring within specific spatial confines. Any impact upon these resources will be permanent and irreversible. Any movement of vehicles, equipment or personnel through areas containing these artefacts could result in the permanent destruction of the artefacts and loss of heritage resources.

The operation will create a number of new employment opportunities and uplift the local community. The magnitude of this impact will depend on the number of people that will be employed and the number of contractors sourced. An influx of people into the area could possibly impact on safety and security of local residents. During the decommissioning and at closure of the site, staff will most likely be retrenched, resulting in people being unable to find new employment for a long period of time.

It is likely, however that there will be residual positive economic impacts that are not fully reversed with the closure of the site, and that the economy will not decline to its original level prior to the development of this project. This is because the operation will generate substantial income for the regional and local economy, both directly and indirectly, during its life.

(viii) The possible mitigation measures that could be applied and the level of risk:

(With regard to the issues and concerns raised by affected parties provide a list of the issues raised and an assessment / discussion of the mitigations or site layout alternatives available to accommodate or address their concerns, together with an assessment of the impacts or risks associated with the mitigation or alternatives considered.)

Geology and mineral resource

Level of risk: Very low

Mitigation measures

- Ensure that optimal use is made of the available mineral resource through proper planning.
- The prospecting of iron, silver, zinc, copper and sulphur ore should be well planned and all infrastructure positions should be selected with the main aim of avoiding sterilization of future resources.
- No dumping of materials prior to approval by mine manager.

Topography

Level of risk: Low

Mitigation measures

- Prospecting of iron, silver, zinc, copper and sulphur ore continuously if possible, otherwise when they become available;
- Employ effective rehabilitation strategies to restore surface topography of and controlled backfilling at excavations and plant site;

- Stabilise the mine residue deposit;
- All temporary infrastructures should be demolished during closure.

Soil erosion

Level of risk: Low-Medium

Mitigation measures

- Re-establishment of plant cover on disturbed areas must take place as soon as possible, once activities in the area have ceased.
- Ground exposure should be minimised in terms of the surface area and duration.
- The operation must co-ordinate different activities in order to optimise the excavated trenches and thereby prevent repeated and unnecessary excavations.
- Construction/excavations during the rainy season (November to March) should be monitored and controlled.
- Run-off from exposed ground should be controlled with flow retarding barriers.
- All stockpiles must be kept as small as possible, with gentle slopes (18 degrees) in order to avoid excessive erosional induced losses.
- Excavated and stockpiled soil material are to be stored on the higher lying areas of the footprint area and not in any storm water run-off channels or any other areas where it is likely to cause erosion, or where water would naturally accumulate.
- Regular audits carried out to identify areas where erosion is occurring (incl. linear activities such as roads and pipelines); followed by appropriate remedial actions.

Loss of Soil fertility

Level of risk: Low

Mitigation measures

- Topsoil stockpiles must be kept as small as possible in order to prevent compaction and the formation of anaerobic conditions.
- Topsoil must be stockpiled for the shortest possible timeframes in order to ensure that the quality of the topsoil is not impaired.
- Topsoil must not be handled when the moisture content exceeds 12 %.
- Topsoil stockpiles must be kept separate from sub-soils.
- The topsoil should be replaced as soon as possible on to the backfilled areas, thereby allowing for the re-growth of the seed bank contained within the topsoil.

Land capability and land use

Level of risk: Low

Mitigation measures

- Ensure that optimal use is made of the available land through consultation with land owner and proper planning of prospecting activities.
- Employ effective rehabilitation strategies to restore land capability and land use potential of the site.
- All activities to be restricted within the demarcated areas.

Ground water

Level of risk: Low

Mitigation measures

- Training and awareness
    - Make all employees aware of water conservation/water demand management, water pollution avoidance and minimization measures reporting procedure and registry of incidents.
    - Train all employees to reduce water consumption.
    - Make one (1) individual person at a management level responsible for the management of the overall mine water balance. Train employees in the managing of water balance, water pollution and water conservation within their sectors.
    - Train all employees in the implementation of standard operating procedures (SOP's) (e.g. hydrocarbon management, sewerage plant management, monitoring and record keeping).
- Minimise and manage the loss in water resource
- Allow for a safe working environment

Surface water

Level of risk: Low - Medium

Mitigation measures

- Sufficient care must be taken when handling hazardous materials to prevent pollution.
- If servicing and washing of the vehicles occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil traps to contain any spillages.
- A walled concrete platform, dedicated store with adequate flooring or bermed area and ventilation must be used to accommodate chemicals such as fuels, oils, paints, herbicide and insecticides.
- Oil residue shall be treated with oil absorbent and this material removed to an approved waste site.
- Spill kits must be easily accessible and workers must undergo induction regarding the use thereof.
- At all times care should be taken not to contaminate surface water resources.

- Provide bins for staff at appropriate locations, particularly where food is consumed.
- The prospecting site should be cleaned daily and litter removed.
- Conduct ongoing staff awareness programmes in order to reinforce the need to avoid littering, which can contribute to surface water pollution.
- Only environmental friendly materials must be used during the construction phase to minimize pollution of surface water runoff and/or underground water resources.
- Proper clean and dirty water separation techniques must be used to ensure uncontaminated water returning to the environment.
- Non prospecting waste i.e. grease, lubricants, paints, flammable liquids, garbage, historical machinery and other combustible materials generated during activities should be placed and stored in a controlled manner in a proper designed area.
- The topography of rehabilitation disturbed areas must be rehabilitated in such a manner that the rehabilitated area blends in naturally with the surrounding natural area. This will reduce soil erosion and improve natural re-vegetation.

Indigenous flora

Level of risk: Low to medium

Mitigation measures

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of excavated areas, by effective backfilling.
- Encourage the growth of natural plant species by sowing indigenous seeds or by planting seedlings.
- Ensure measures for the adherence to the speed limit to minimise dust plumes.

Loss of Red data and/or protected species

Level of risk:

Mitigation measures

- Footprint areas of the prospecting activities must be scanned for Red Listed and protected plant species prior to excavations.
- It is recommended that these plants are identified and marked prior to intended activity.
- These plants should, where possible, be incorporated into the design layout and left in situ.
- However, if threatened by destruction, these plants should be removed (with the relevant permits from DAFF and/or DENC) and relocated if possible.
- A management plan should be implemented to ensure proper establishment of ex situ individuals, and should include a monitoring programme for at least two years after re-establishment in order to ensure successful translocation.

- The appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. The environmental induction should occur in the appropriate languages for the workers who may require translation.
- All those working on site must be educated about the conservation importance of the flora occurring on site.

Alien invasive plants

Level of risk: Low to medium

Mitigation measures

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of excavated areas.
- Encourage the growth of natural plant species.
- Mechanical methods of control to be implemented extensively.
- Annual follow-up operations to be implemented.

Encouraging bush encroachment

Level of risk:

Mitigation measures

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of disturbed areas.
- Encourage the growth of a diverse selection of natural plant species.
- Mechanical methods of control to be implemented selectively.
- Annual follow-up monitoring to be implemented.

Fauna

Level of risk: Medium - high

Mitigation measures

- Careful planning of the operation is needed in order to avoid the destruction of pristine habitats and minimise the overall disturbance footprint.
- The extent of the prospecting activities should be demarcated on site layout plans, and no personnel or vehicles may leave the demarcated area except if authorised to do so. Areas surrounding the earmarked site that are not part of the demarcated area should be considered as a no go zone.
- A full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance.
- Everyone on site must undergo environmental induction for awareness on not harming or collecting species that are often persecuted out of superstition and to be educated about the conservation importance of the fauna occurring on site.

- Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert.
- Employ measures that ensure adherence to the speed limit.

Habitat

Level of risk: Medium - High

Mitigation measures

- All activities associated with the prospecting operation must be planned, where possible in order to encourage faunal dispersal and should minimise dissection or fragmentation of any important faunal habitat type.
- The extent of the earmarked area should be demarcated on site layout plans. No staff, contractors or vehicles may leave the demarcated area except those authorised to do so.
- Those pristine areas surrounding the earmarked area that are not part of the demarcated area should be considered as a no go zone for employees, machinery or even visitors.

Broad Scale ecological processes

Level of risk: Low-Medium

Mitigation measures

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of affected areas.
- Encourage the growth of natural plant species.
- Employ sound rehabilitation measures to restore the characteristics of the affected watercourses.

Air quality

Level of risk: Low-Medium

Mitigation measures

- Vegetation must be removed when soil stripping is required only. These areas should be limited to include those areas required for prospecting only, hereby reducing the surface area exposed to wind erosion. Adequate demarcation of these areas should be undertaken.
- Control options pertaining to topsoil removal, loading and dumping are generally limited to wet suppression.
- Where it is logistically possible, control methods for gravel roads should be utilised to reduce the re-suspension of particulates. Feasible methods include wet suppression, avoidance of unnecessary traffic, speed control and avoidance of track-on of material onto paved and treated roads.
- The length of time where open areas are exposed should be restricted. Prospecting should not be delayed after vegetation has been cleared and topsoil removed.
- Dust suppression methods should, where logistically possible, must be implemented at all areas that may / are exposed for long periods of time.

- For all prospecting activities management should undertake to implement health measures in terms of personal dust exposure, for all its employees:
    - Speed limits;
    - Spraying of surfaces with water;
    - Prospecting of iron, silver, zinc, copper and sulphur ore and rehabilitation of disturbed areas; and

Noise and vibration

Level of risk: Medium

Mitigation measures

- Machinery with low noise levels which complies with the manufacturer's specifications to be used.
- Noise monitoring on a quarterly basis.
- Vehicles to comply with manufacturers' specifications and any activity which will exceed 90.0dBA to be done during daytime only.
- Emergency generators to be placed in such a manner that it is away from any residential area.
- Haul roads to be levelled on a regular basis to avoid the formation of potholes.
- Actively manage the process and the noise management plan must be used to ensure compliance to the noise regulations and/or standards. The levels to be evaluated in terms of the baseline noise levels.
- Actively manage the process and noise and vibration impact assessment to determine compliance to the noise regulations and/or vibration standards. The levels to be evaluated in terms of the baseline noise levels.

Visual impacts

Level of risk: Low Medium

Mitigation measures

Mitigation measures may be considered in two categories:

Primary measures that intrinsically comprise part of the development design through an iterative process. Mitigation measures are more effective if they are implemented from project inception when alternatives are being considered; and

Secondary measures designed to specifically address the remaining negative effects of the final development proposals:

- Primary measures that will be implemented should mainly be measures that minimise the visual impact by softening the visibility of the prospecting activities, by "blending" with the surrounding areas. Such measures will include rehabilitation of the disturbed area, such as the excavations by re-

vegetation of the area and using an aesthetically pleasing design for the proposed development.

- During the construction phase the following mitigation measures should be implemented to minimise the visual impact.
- Ensure that rubble, litter and disused construction materials are managed and removed regularly.
- Ensure that all infrastructure and the site and general surrounds are maintained in a neat and appealing way.
- Reduce and control construction dust emitting activities through the use of approved dust suppression techniques; and
- During operational phase, the following mitigation measures should be implemented to minimise the visual impact.
- Ensure that all infrastructure and the site and general surroundings are maintained in a neat and appealing way;
- Rehabilitation of disturbed areas and re-establishment of vegetation;

Traffic and road safety

Level of risk: Low

Mitigation measures

- Implement measures that ensure the adherence to traffic rules.

Heritage resources

Level of risk: Low

Mitigation measures

- The heritage and cultural resources (e.g. stone age sites and Mining Heritage etc.) must be protected and preserved by the delineation of a no go zone.
- Should any further heritage or cultural resources be disturbed, exposed or uncovered during site preparations, these should immediately be reported to an accredited archaeologist.

Socio-economic

Level of risk: Low-Medium

Mitigation measures

In order to ensure that negative impacts are minimised and positives are enhanced, the following is recommended:

- Implement the mitigation measures as proposed in this report.
- Synchroplex (Pty) Ltd should assist their employees to find suitable housing in the towns surrounding the prospecting area to limit additional impacts on the provision of services and infrastructure by the SPM.
- Possible SMME links to the mine should be pursued to maximise local business benefits;
- Synchroplex (Pty) Ltd should communicate and present their involvement in the community (goodwill, social responsibility, capacity building programmes,

skills development, general development support and so forth) to obtain community support.

Interested and affected parties

Level of risk: Low

Mitigation measures

- Maintain active communication with IAPs.
- Ensure transparent communication with IAPs at all times.
- IAPs must be kept up to date on any changes in the prospecting operation.
- A complaints management system should be maintained by the mine to ensure that all issues raised by any interested and affected parties are followed up and addressed appropriately.

(ix) The outcome of the site selection Matrix:- Final site layout plan:

(Provide a final site layout plan as informed by the process of consultation with interested and affected parties.)

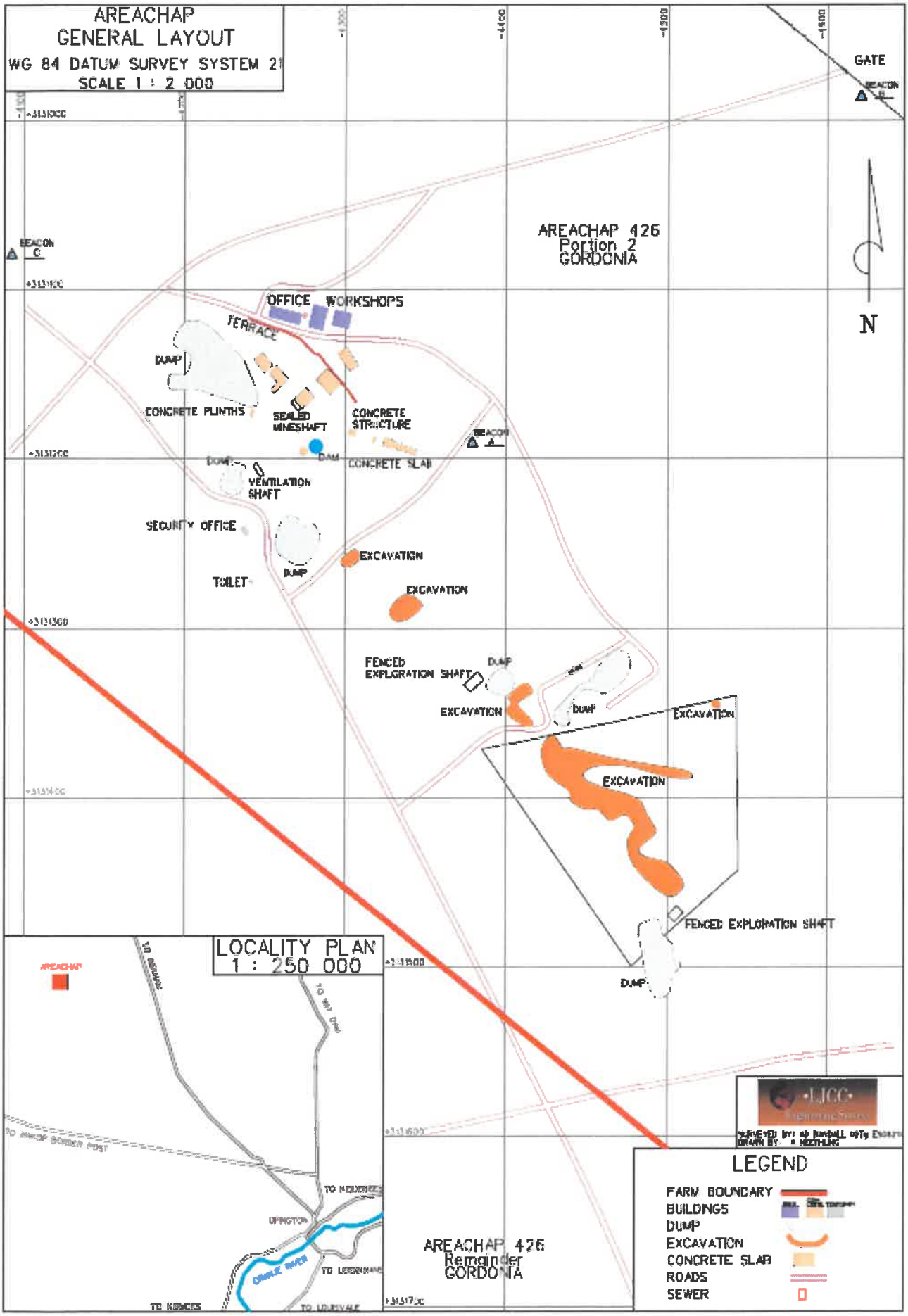


Figure 18. Conceptual site layout plan.

(x) Motivation where no alternative sites were considered:

- The property on which the Prospecting Right was applied for is determined by the geological location of the mineral resource. Therefore, there are no alternatives for the location of the activity, except for not proceeding with the operation. This will however cause the underutilisation of a national economic resource.
- The final locality of the above infrastructure was decided upon after taking into account of the following:-
  - Locality of the ore bodies;
  - Topography of the area;
  - Environmental features;

(xi) Statement motivating the preferred site:
(Provide a statement motivating the final site layout that is proposed.)

The site was firstly determined as Syncroplex has an existing Prospecting Right over the property. The final site layout was determined by taking into account all positive and negative environmental impacts, inputs from the surface owner and all operational requirements.

i) Plan of study for the Environmental Impact Assessment process:

(i) Description of alternatives to be considered including the option of not going ahead with the activity:

- Land use development alternatives:
  The site layout may vary, depending on the operational requirements. However the final design and layout of the infrastructure have been planned and decided upon by the geologist appointed by the mine and in consultation with the Prospecting Right Holder on the grounds of reserves, and placement of infrastructure based on hauling distance, environmental features such as wind direction, heritage findings, protected species, and stormwater management on the mine.

- No-go option:
  The following positive impacts will be lost if the proposed mining project is not developed:
  - TAX and VAT obligations to SARS as well as Royalties;
  - CAPEX spent locally and regionally;
  - Employment opportunities;
  - Payroll income;
  - Operating expenditure and maintenance (OPEX);
  - Revenue.

(ii) Description of the aspects to be assessed as part of the environmental impact assessment process:

(The EAP must undertake to assess the aspects affected by each individual mining activity whether listed or not, including activities such as blasting, loading, hauling and transport, and mining activities such as excavations, stockpiles, discard dumps or dams, water supply dams and boreholes, accommodation, offices, ablution, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc...etc...etc...)

The following infrastructure will be established and will be associated with the prospecting operation with permission of the relevant Departments and surface owners:

- Trench of 150m X 20m X 20m deep as per AAPS drilling campaign
- Underground sampling 70m to 90 m by 10.5m width with 200 m strike trough existing exploration shaft
- Infill drilling as per geologist request 10 drill holes to 350 m Drilling minimum 30 surface drillholes – 6 months.
- Processing Plant
- Fuel Storage facility (Concrete Bund walls and Diesel tanks):
  It is anticipated that the operation will utilize 2 x 23 000 litre diesel tanks. These tanks must be placed in bund walls, with a capacity of 1.5 times the volume of the diesel tanks. A concrete floor must be established where the re-fuelling will take place.
- Concrete bund walls and diesel depots ± 250 m2
- The establishment of residue deposits resulting from activities which require a prospecting right. 0.3ha
  Topsoil stockpiles ± 500 m2
  Overburden stockpiles 5 000 m2
  Product Stockpile area.
- Office complexes ± 200 m2
- Temporary workshop facilities ± 300 m2
- Storage facilities ± 2 000 m2
- Ablution Facilities: In terms of sewage the decision was made to use chemical toilets which can be serviced regularly by the service provider.
  Ablution facilities ± 30 m2

- Clean & Dirty water system: Berms
  It is anticipated that the operation will establish stormwater control berms and trenches to separate clean and dirty water on the mine site.
- Roads (both access and haulage road on the mine site):

Although it is recommended that the operation utilize existing roads as far as possible, it is anticipated that the prospecting operation will create an additional 2 - 4 km of roads, with a width of 6 meters.

- Salvage yard (Storage and laydown area).
- Waste disposal site
  The operation will establish a dedicated, fenced waste disposal site with a concrete floor and bund wall. The following types of waste will be disposed of in this area:
  - Small amounts of low level hazardous waste in suitable receptacles;
  - Domestic waste;
  - Industrial waste.
- Temporary Workshop Facilities and Wash bay.
- Water distribution Pipeline.
- Water tank:
  It is anticipated that the operation will establish 1 x 10 000 litre water tank with purifiers for potable water. Water tanks 3m x 3m = 9m² each

(iii) Description of aspects to be assessed by specialists:

Most specialist studies are needed in order to investigate the potential environmental impacts associated with the prospecting activities, while other more technical specialists are needed to provide strategies and technical specifications for infrastructure that could potentially alleviate impact the environment. Terms of reference for each of these studies are unique but include the identification and delineation of respective environmental attributes, assessing the state of these attributes, identifying potential impacts relating to these attributes and making recommendations regarding mitigation measures and legal requirements. The following specialists studies will be completed:

- Archaeology, cultural & heritage;
- Fauna;
- Flora;
- Surface water;
- Wetland & Aquatic assessment and
- Soil.

(iv) Proposed method of assessing the environmental aspects including the proposed method of assessing alternatives:

The receiving environment will be determined using a combination of on-site observations, spatial information, project description, site layout and previous

studies currently available to the EAP. Based on the EAPs knowledge and experience, the receiving environment will include geological features, topography, land use, archaeological and historical sites, surface water, groundwater, terrestrial ecology, air quality, noise, etc.

The identification of potential impacts of the prospecting activity will be based on the legal requirements; the nature of the proposed activity; the nature of the receiving environment; and issues raised during the public participation process. Considering the factors listed above and based on the EAPs knowledge and experience, environmental impacts that could potentially result from the prospecting activities include impacts on air quality, noise, fauna, flora, ground water, surface water, terrestrial ecology, heritage resources, socio-economy and visuals.

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the proposed project. In order to ensure that the proposed project enables sustainable prospecting, a number of feasible options will be explored. The various alternatives in terms of land use, project infrastructure, prospecting method and proceeding without the prospecting operation will be assessed in terms of logistical practicality, environmental acceptability and economic feasibility. Alternatives for the locality of the prospecting operation will however not form part of this consideration, as the location of the prospecting site is determined by the geological location of the mineral resource.

(v) The proposed method of assessing duration significance:

The lifetime of the impact will be measured in the context of the lifetime of the proposed phase or activity.

Weight	Duration of Impact	Explanation of Duration
1	Very Short	Less than 1 year
2	Short	1 to 5 years
3	Medium	6 to 15 years
4	Long term (Life of project)	16 to 50 years
5	Very Long term	Longer than 50 years
6	Permanent	Permanent

- **Short term**
  The impact will either disappear with mitigation or will be mitigated through natural process in a short time period.
- **Medium term**
  The impact will last up to the end of the mining period, where after it will be entirely negated.
- **Long term**
  The impact will continue or last for the entire operational life of the mine, but will be mitigated by direct human action or by natural processes thereafter.
- **Permanent**

The only class of impact, which will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient.

(vi) The stages at which the Competent Authority will be consulted:

Consultation with the Competent Authority will take place throughout the application process, however more specifically; consultation will take place before submission of the Scoping Report and again before submission of the EIA/EMPR Report and the Section 102 application.

The process that was proposed is as follows:

- The amendment should be an application in terms of Part 2, Section 31, of the EIA Regulations (2014) and the process to be followed should be in terms of Section 32 of same;
- The application for the amendment will be done in a form of a letter, as there is no specific form for Section 31 amendment in terms of the said regulations;

The application for amendment should be submitted, along with the environmental authorization application (NEMA) and in terms of Section 102 of the Mineral and Petroleum and Resources Development Act.

(vii) Particulars of the public participation process with regard to the Impact Assessment process that will conducted:

1. Steps to be taken to notify interested and affected parties:
(These steps must include the steps that will be taken to ensure consultation with the affected parties identified in (h)(ii) herein.)

The process to be followed will include a substitution of the current Environmental Management Programme in terms of section 102 of the Mineral and Petroleum Resources Development Act, 28 of 2002 and the process to be followed is in terms of sections 31 and 32 of the National Environmental Management Act, 107 of 1998.

The process as described by NEMA for Environmental Authorisation was followed. See table below for the identification of Interested and Affected Parties to be consulted with. The landowner is Areachap Plase (Pty) Ltd.

Notices were placed at the gate of the farm and at the public library in Upington to make all parties aware of the Section 102 application to amend the existing Environmental Authorization.

The Scoping Report was made available to all Departments and the surface owner for any comments or concerns. The letters were send out on 27 February 2019. The Scoping Report was also placed at the public library in Upington and a Notice was placed in the Gemsbok newspaper on 27 February 2019. The existing Standard EMP document had been revised in totality to make provision for the new NEMA template scoping report as prescribed.

Consultation process:

Proof of consultation (notification letters, notices and response forms) is attached as **Appendix 3**. The consultation process is still ongoing.

2. Details of the engagement process to be followed:

(Describe the process to be undertaken to consult interested and affected parties including public meetings and one on one consultation. NB the affected parties must be specifically consulted regardless of whether or not they attended public meetings and record of such consultation will be required in the EIA at a later stage.)

- The process to be followed will include a substitution of the current Environmental Management Programme in terms of section 102 of the Mineral and Petroleum Resources Development Act, 28 of 2002 and the process to be followed is in terms of sections 31 and 32 of the National Environmental Management Act, 107 of 1998.

- The process as described by NEMA for Environmental Authorisation was followed. The landowner is Areachap Plase (Pty) Ltd.

3. Description of the information to be provided to Interested and Affected Parties:

(Information to be provided must include the initial site plan and sufficient detail of the intended operation and the typical impacts of each activity, to enable them to assess what impact the activities will have on them or on the use of their land.)

The following information will be provided to IAPs:

- The site plan;
- List of activities to be authorised;
- Scale and extent of activities to be authorised;
- Typical impacts of activities to be authorised;
- The duration of the activity.

The following information will be requested from the IAPs:

- To provide information on how they consider that the proposed activities will impact on them or their socio-economic conditions;
- To provide written responses stating their suggestions to mitigate the anticipated impacts of each activity;
- To provide information on current land uses and their location within the area under consideration;
- To provide information on the location of environmental features on site to make proposals as to how and to what standard the impacts on site can be remedied. They will be requested to make written proposals;
- To mitigate the potential impacts on their socio economic conditions to make proposals as to how the potential impacts on their infrastructure can be managed, avoided or remedied).

(viii) Description of the tasks that will be undertaken during the environmental impact assessment process:

Determining environmental attributes

The receiving environment will be determined using a combination of on-site observations, spatial information, project description, site layout and previous studies currently available to the EAP. Based on the EAPs knowledge and experience, the receiving environment will include geological features, topography, land use, archaeological and historical sites, surface water, groundwater, terrestrial ecology, air quality, noise, etc.

Identification of impacts and risks

The identification of potential impacts of the mining activity will be based on the legal requirements; the nature of the proposed activity; the nature of the receiving environment; and issues raised during the public participation process.

Considering the factors listed above and based on the EAPs knowledge and experience, environmental impacts that could potentially result from the prospecting activities include impacts on air quality, noise, fauna, flora, ground water, surface water, terrestrial ecology, heritage resources, socio-economy, visuals, stormwater and erosion.

Consideration of alternatives

The consideration of alternatives is a critical component of the EIA process, where an appropriate range of alternatives require consideration whilst achieving the desired objective of the prospecting project. In order to ensure that the proposed project enables sustainable mining, a number of feasible options will be explored. The various alternatives in terms of land use, project infrastructure, mining method and proceeding without the mining operation will be assessed in terms of logistical practicality, environmental acceptability and economic feasibility.

Alternatives for the locality of the prospecting operation will however not form part of this consideration, as the location of the prospecting site is determined by the geological location of the mineral resource.

Process to assess and rank impacts

Before any assessment can made the following evaluation criteria need to be described.

Table 18: Explanation of PROBABILITY of impact occurrence

Weight	Probability of Impact Occurrence	Explanation of Probability
1	Very Low	<20% sure of particular fact or likelihood of impact occurring
2	Low	20 – 39% sure of particular fact or likelihood of impact occurring
3	Moderate	40 – 59% sure of particular fact or likelihood of impact occurring
4	High	60 – 79% sure of particular fact or likelihood of impact occurring
5	Very High	80 – 99% sure of particular fact or likelihood of impact occurring
6	Definite	100% sure of particular fact or likelihood of impact occurring

Table 19: Explanation of EXTENT of impact

Weight	Extent of Impact	Explanation of Extent
1	Site Specific	Direct and Indirect impacts limited to site of impact only
2	Surrounding Area	Direct and Indirect impacts affecting environmental elements within 2 km of site
3	Local Municipality	Direct and Indirect impacts affecting environmental elements within the Upington / Gordonia area
4	Regional/District	Direct and Indirect impacts affecting environmental elements within District (ZF-Mgcawu District)
5	Provincial	Direct and Indirect impacts affecting environmental elements in the Northern Cape Province

Table 20: Explanation of DURATION of impact

Weight	Duration of Impact	Explanation of Duration
1	Very Short	Less than 1 year
2	Short	1 to 5 years
3	Medium	6 to 15 years
4	Long term (Life of project)	16 to 50 years
5	Very Long term	Longer than 50 years
6	Permanent	Permanent

Table 21: Explanation of SEVERITY of the impact

Weight	Impact Severity	Explanation of Severity
1	No Impact	There will be no impact at all – not even a very low impact on the system or any of its parts.
2	Very Low	Impact would be negligible. In the cast of negative impacts, almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple. In the case of positive impacts alternative means would almost all likely to be better, if one or a number of ways, then this means of achieving the benefit.
3	Low	Impact would be of a low order and with little real

		effect. In the case of negative impacts, mitigation and/or remedial activity would be either easily achieved or little would be required or both. In the case of positive impacts alternative means for achieving this benefit would be easier, cheaper, more effective, less time-consuming, or some combination of these.
4	Moderately Severe	Impact would be real but not substantial within the bounds of those which could occur. In the case of negative impacts, mitigation and/or remedial activity would be both feasible and fairly easily possible. In the case of positive impacts other means other means of covering these benefits would be about equal in cost and effort.
5	High Severance	Impacts of substantial order. In the case of negative impacts, mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these. In the case of positive impacts other means of achieving this benefit would be feasible, but these would be more difficult, expensive, time-consuming or some combination of these.
6	Very High Severity	Of the highest order possible within the bounds of impacts which could occur, in the case of negative impacts, there would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted. In the case of positive impacts there is no real alternative to achieving the benefit.

Methodology used in determining and ranking the nature, severity, consequences, extent, duration and probability of potential environmental impacts and risks

The criteria used to assess the significance of the impacts are shown in the table below. The limits were defined in relation to mining characteristics. Those for probability, intensity/severity and significance are subjective, based on rule-of-thumb and experience. Natural and existing mitigation measures were considered. These natural mitigation measures were defined as natural conditions, conditions inherent in the project design and existing management measures, which alleviate impacts. The significance of the impacts was calculated by using the following formula:

(Severity + Extent + Duration) x Probability weighting

For the impact assessment, the different project activities and associated infrastructure were identified and considered in order to identify and analyse the various possible impacts.

Table 22

SIGNIFICANCE				
Colour Code	**Significance rating**	**Rating**	**Negative Impact**	**Positive Impact**
	Very low	3 -16	Acceptable/Not serious	Marginally Positive
	Low	17 - 22	Acceptable/Not serious	Marginally Positive
	Medium-Low	23 -33	Acceptable/Not desirable	Moderately Positive
	Medium	34 - 48	Generally undesirable	Beneficial
	Medium-High	49 - 56	Generally unacceptable	Important
	High	57 - 70	Not Acceptable	Important
	Very High	90 - 102	Totally unacceptable	Critically Important

Significance of impacts is defined as follows:

Very Low - Impact would be negligible. Almost no mitigation and/or remedial activity would be needed, and any minor steps which might be needed would be easy, cheap and simple.

Low - Impact would have little real effect. Mitigation and/or remedial activity would be either easily achieved or little would be required or both.

Medium Low- Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and fairly easily possible.

Medium - Impact would be real but not substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be feasible and possible.

Medium High- Impact would be real but could be substantial within the bounds of those which could occur. Mitigation and/or remedial activity would be both feasible and possible but may be difficult and or costly.

High - Impacts of substantial order. Mitigation and/or remedial activity would be feasible but difficult, expensive, time consuming or some combination of these.

Very High - Of the highest order possible within the bounds of impacts which could occur. There would be no possible mitigation and/or remedial activity to offset the impact at the spatial or time scale for which was predicted.

(ix) Measures to avoid, reverse, mitigate, or manage identified impacts and to determine the extent of the residual risks that need to be managed and monitored:

ACTIVITY Whether listed or not listed.	**POTENTIAL IMPACT** (e.g. dust, noise, drainage surface disturbance, fly rock, surface water contamination, groundwater, contamination, air pollution)….	**ASPECTS AFFECTED**	**PHASE** In which impact is anticipated (e.g. construction, commissioning, operational, Decommissioning, closure, post closure)	**MITIGATION TYPE** (modify, remedy, control or stop) through (e.g. noise control measures, storm water control, dust control, rehabilitation, design measures, blasting controls, avoidance, relocation, alternative activity	**STANDARD TO BE ACHIEVED** (impact avoided, noise levels, dust levels, rehabilitation standards, end use objectives) etc.
Processing Plant Material excavated from the trenches and historical dump cuttings will be selected and processed through a crush-and-screen processing plant. The product will be further tested in a laboratory.	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Air Quality Fauna Flora Noise Soil Surface water Safety	Construction Commissioning Operational Decommissioning Closure	Access control Maintenance of processing plant Dust control and monitoring Noise and vibration control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Installing suitable mufflers on engine exhausts and compressor components; Installing vibration isolation for mechanical equipment; Re-locate noise sources to areas which are less noise sensitive, to take advantage	Safety ensured. Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

				of distance and natural shielding; Develop a mechanism to record and respond to complaints.	
Ablution facilities Chemical Toilets	Soil contamination Possible Groundwater contamination	Soil Groundwater	Construction Commissioning Operational Decommissioning Closure	Maintenance of sewage facilities on a regular basis. Removal of container on closure	Minimize the potential for a chemical spill on soil, which could infiltrate to groundwater.
Clean & Dirty water systems:	Surface disturbance Groundwater Contamination Soil contamination Surface water contamination	Soil Groundwater Surface Water	Construction Commissioning Operational Decommissioning Closure	The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away. Monitoring and maintenance of oil traps in relevant areas. Drip trays used. Immediately clean hydrocarbon spill. Linear infrastructure such as roads and pipelines will be inspected at least monthly to	Safety ensured. Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.

				check that the associated water management infrastructure is effective in controlling erosion.	
Fuel Storage facility (Diesel tanks)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Soil Groundwater Surface water	Construction Commissioning Operational Decommissioning Closure	Maintenance of Diesel tanks and bund walls. Oil traps Drip tray at re-fuelling point. Refuelling must take place in well demarcated areas and over suitable drip trays to prevent soil pollution. Spill kits to clean up accidental spills from earthmoving machinery must be well-marked and available on site. Workers must undergo induction to ensure that they are prepared for rapid clean-up procedures. All facilities where dangerous materials are stored must be contained in a bund wall. Vehicles and machinery should be regularly serviced and maintained.	Minimize potential for hydrocarbon spills to infiltrate into groundwater. Rehabilitation standards and closure objectives to be met.
Prospecting Area.	Dust Noise	Air quality Fauna Flora Groundwater	Commissioning Operational Decommissioning Closure	Access control Dust control and monitoring Noise and vibration control and monitoring	Safety ensured. Dust levels minimized Minimize potential for hydrocarbon spills to

	Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance Surface water contamination	Noise and vibration Soil Surface Water Topography Safety		Continuous rehabilitation Storm water run-off control Immediately clean hydrocarbon spill Drip trays Dump stability control and monitoring Erosion control Noise control Well maintained equipment Selecting equipment with lower sound power levels; Installing suitable mufflers on engine exhausts and compressor components; Installing vibration isolation for mechanical equipment; Develop a mechanism to record and respond to complaints. Prospecting activities must be planned, where possible in order to encourage (faunal dispersal) and should minimise dissection or fragmentation of any important faunal habitat type. The extent of the prospecting area should be demarcated on site layout	infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

				plans (preferably on disturbed areas or those identified with low conservation importance). No construction personnel or vehicles may leave the demarcated area except those authorized to do so. Those areas surrounding the mine site that are not part of the demarcated development area should be considered as a no go zone for employees, machinery or even visitors. Appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance, and must ensure that all contractors and workers undergo Environmental Induction prior to commencing with work on site. All those working on site must undergo environmental induction with regards to fauna and in particular awareness about not harming or collecting species	

				such as snakes, tortoises and owls which are often persecuted out of superstition. All those working on site must be educated about the conservation importance of the fauna and flora occurring on site. The environmental induction should occur in the appropriate languages for the workers who may require translation. Reptiles and amphibians that are exposed during the clearing operations should be captured for later release or translocation by a qualified expert. Employ measures that ensure adherence to the speed limit. Careful consideration is required when planning the placement for stockpiling topsoil and the creation of access routes in order to avoid the destruction of habitats and minimise the overall prospecting footprint. The Footprint areas of the	

				prospecting activities must be scanned for Red Listed and protected plant species prior to prospecting; Snares & traps removed and destroyed; and Maintenance of firebreaks. The re-vegetation of disturbed areas is important to prevent erosion and improve the rate of infiltration. Erosion channels that may develop before vegetation has established should be rehabilitated by filling, levelling and re-vegetation where topsoil is washed away.	
Salvage yard (Storage and laydown area)	Groundwater contamination Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Fauna Flora Groundwater Soil Surface Water	Construction Commissioning Operational Decommissioning Closure	Access Control Maintenance of fence Storm water run-off control Immediately clean hydrocarbon spill	Minimize potential for hydrocarbon spills to infiltrate into groundwater Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

	Surface water contamination				
Product Stockpile area	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Surface disturbance	Air Quality Fauna Flora Noise Soil Surface Water	Commissioning Operational Decommissioning Closure	Dust Control and monitoring Noise control and monitoring Drip trays Storm water run-off control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Installing suitable mufflers on engine exhausts and compressor components; Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural shielding; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints.	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Waste disposal	Groundwater	Groundwater	Construction	Storage of Waste within	Minimize potential for

site (domestic and industrial waste):	contamination Contamination of soil Surface water contamination	Soil Surface water	Commissioning Operational Decommissioning Closure	receptacles Storage of hazardous waste on concrete floor with bund wall Removal of waste on regular intervals	hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met.
Roads (both access and haulage road on the mine site):	Dust Noise Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination Surface disturbance	Air quality Fauna Flora Noise and vibration Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Maintenance of roads Dust control and monitoring Noise control and monitoring Speed limits Storm water run-off control Erosion control Immediately clean hydrocarbon spills Rip disturbed areas to allow re-growth of vegetation cover Noise control Well maintained equipment Selecting equipment with lower sound power levels; Installing suitable mufflers on engine exhausts and compressor components; Installing vibration isolation for mechanical equipment; Re-locate noise sources to areas which are less noise sensitive, to take advantage of distance and natural	Dust levels minimized Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives met. Erosion potential minimized.

				shielding; Taking advantage during the design stage of natural topography as a noise buffer; Develop a mechanism to record and respond to complaints. Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in controlling erosion.	
Workshop and Wash bay	Removal and disturbance of vegetation cover and natural habitat of fauna Soil contamination	Groundwater Soil Surface water	Construction Commissioning Operational Decommissioning Closure	Concrete floor with oil/water separator Storm water run-off control Immediately clean hydrocarbon spills	Minimize potential for hydrocarbon spills to infiltrate into groundwater Noise levels minimized Rehabilitation standards and closure objectives to be met. Erosion potential minimized.
Water distribution Pipeline	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Monitor pipeline for water leaks Maintenance of pipeline Linear infrastructure such as roads and pipelines will be inspected at least monthly to check that the associated water management infrastructure is effective in	Rehabilitation standards and closure objectives to be met. Erosion potential minimized.

				controlling erosion.	
Water tanks:	Surface disturbance	Fauna Flora Surface Water	Construction Commissioning Operational Decommissioning Closure	Maintain water tanks and structures	Safety ensured. Rehabilitation standards and closure objectives to be met.

(x) Other information required by the Competent Authority:

1. Compliance with the provisions of Sections 24(4)(a) and (b) read with Section 24(3)(a) and (7) of the National Environmental Management Act (Act 107 of 1998), the EIA report must include the:-

a. Impact on the socio-economic conditions of any directly affected person:

(Provide the results of investigation, assessment and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any directly affected parson including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as Appendix '7' and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herein.)

The socio-economic conditions of the local community could be affected in two ways:

- Negative impacts to the welfare of the local farm residents and workers through general nuisance, dust generation, damages to properties and any associated potential safety risks.
- Positive impacts through job creation and local business opportunities.
- The consultation with interested and affected parties is on-going and any issues, concerns or comments will be considered and included in the EIA report and control measures will be presented in the EMP report.

Impact on landowner and occupier:

- Positive: Compensation of land lost to mining/ prospecting.
- Negative: Temporary Loss of grazing land that will re-establish post prospecting with the correct mitigation measures put in place by Synchroplex.

b. Impact on any national estate referred to in Section 3(2) of the National Heritage Resources Act:

(Provide the results of investigation, assessment and evaluation of the impact of the mining, bulk sampling or alluvial diamond prospecting on any national estate referred to in Section 3(2) of the National Heritage Resources Act, 1999 (Act 25 of 1999) with the exception of the national estate contemplated in Section 3(2)(i)(vi) and (vii) of that Act, attach the investigation report as Appendix '8' and confirm that the applicable mitigation is reflected in 2.5.3, 2.11.6 and 2.12 herein.)

A Specialist study was conducted by McGREGOR MUSEUM, KIMBERLEY PREPARED BY – KAREN VAN RYNEVELD have conducted a study and completed a report on National Heritage sites on the identified area. The findings of this report will be included in the EIA/EMPR document **Appendix 5.**

The prospecting right area has been disturbed by previous mining activities.

Prospecting will impact on an area of approximately 120 ha. Any impact thereon or alteration thereto is covered by the MPRDA (2002), the NEMA (1989) and the NHRA (1999).

The development area is characterised by a low density artefact concentration identifiable within shallow calcrete outcrops. Calcrete outcrops are mantled by Hutton sands.

Formal artefact tool types are representative of the Middle Stone Age (MSA). General non-temporally identifiable artefacts include cores and flakes, associated with the MSA fossils directeurs. Artefact ratios (artefact: m^2) vary from 1: 25 – 4:1 throughout the number of recorded calcrete outcrops, with the highest recorded concentration ratio of 8.5:1 located on the south-western corner of the development area (FS 21). Find spot FS 21 however represent a lag deposit and scientific information relating to technological and typological stratigraphic sequencing and dating would not be possible due to the absence of adequate in situ context.

In general artefact concentrations are restricted to calcrete outcrops areas. The only two find spots located within Hutton sand contexts are FS 22 and FS 23, both with an artefact ratio of <1:1. Animal burrows in red sands provided a sub-surface interpretation of the deposit. In general soil from burrows seemed to be artefactually sterile with a low concentration of flakes detected in burrows along the northern and eastern part of ARC 1, supporting the observation that artefact concentrations are primarily restricted to calcrete outcrops.

On site structures were erected during the late 1960's, early 1970's. Buildings will be renovated for use during the mining operation. None of the structures are older than 60 years and as such protected by the NHRA (1999)

Conclusion

The assessment focussed on the identification of cultural heritage resources, inclusive of archaeological deposits and their significance, built structures older than 60 years, sites of cultural significance associated with oral histories, burial grounds and graves, graves of victims of conflict and cultural landscapes or viewscapes as protected by the NHRA (1999).

No cultural heritage resources as defined and protected by the NHRA (1999) will be impacted on by the proposed localised mining development (inclusive of prospecting and mining impact on demarcated area ARC 1 and upgrading and use of the access road).

Recommendations

I would recommend that development (prospecting and mining) continues as applied for.

(xi) Other matters required in terms of Sections 24(4)(a) and (b) of the Act:

(The EAP managing the application must provide the Competent Authority with details, written proof of an investigation as required by Section 24(4)(b)(i) of the Act and motivation if no reasonable or feasible alternatives, as contemplated in sub-regulation 22(2)(h), exist. The EAP must attach such motivation as Appendix '9'.)

There are no viable alternatives as synchroplex has a prospecting right over the property and over which the resources has been proven through drilling activities. This is also a Section 102 application to amend the previous Environmental Authorization document.

(xii) Undertaking regarding correctness of information:

I, RH Oosthuizen, ID number 7004180037082, herewith undertake that the information provided in the foregoing report is correct, and that the comments and inputs from stakeholders and Interested and Affected Parties has been correctly recorded in the report.

Signature of EAP

Date: 27 February 2019

(xiii) Undertaking regarding level of agreement:

I, RH Oosthuizen, ID number 7004180037082, herewith undertake that the information provided in the foregoing report is correct, and that the level of agreement with Interested and Affected Parties and stakeholders has been correctly recorded and reported herein.

Signature of EAP

Date: 27 February 2019

- END -

APPENDIX 1

DIE UNIVERSITEIT VAN DIE ORANJE-VRYSTAAT

THE UNIVERSITY OF THE ORANGE FREE STATE

HIERMEE WORD VERKLAAR DAT DIE GRAAD THIS IS TO CERTIFY THAT THE DEGREE

Magister in Omgewingsbestuur

Master in Environmental Management

TOEGEKEN IS AAN
HAS BEEN CONFERRED UPON

ROELINA HENRIËTTE OOSTHUIZEN

NADAT AAN DIE STATUTE EN REGULASIES VAN DIE UNIVERSITEIT VOLDOEN IS. AS BEWYS DAARVAN PLAAS ONS ONS ONDERSKEIE HANDTEKENINGE EN DIE SEëL VAN DIE UNIVERSITEIT HIERONDER.

IN ACCORDANCE WITH THE STATUTES AND REGULATIONS OF THE UNIVERSITY. AS WITNESS OUR RESPECTIVE SIGNATURES AND THE SEAL OF THE UNIVERSITY BELOW.

VISEKANSELIER/VICE-CHANCELLOR

DEKAAN/DEAN

REGISTRATEUR/REGISTRAR

BLOEMFONTEIN
2000 09 16

APPENDIX 2

CURRICULUM VITAE – RH OOSTHUIZEN

PERSONAL DETAILS

FULL NAMES AND SURNAME	:	**Roelina Henriëtte** Oosthuizen
DATE OF BIRTH	:	18 April 1970
I.D. NO	:	700418 0037 08 2
MARITAL STATUS	:	Married
CITIZENSHIP	:	**Republic of** South Africa
RESIDENTIAL ADDRESS	:	Farm Oberon Kimberley
POSTAL ADDRESS	:	P.O. Box 110823 Hadisonpark Kimberley 8306
E-MAIL ADDRESS	:	roosthuizen950@gmail .com
CEL NO	:	084 208 9088
DRIVER'S LICENCE	:	EB
LANGUAGES	:	Afrikaans (home language) English

QUALIFICATIONS

2000	**UNIVERSITY OF THE ORANGE FREE STATE** **Qualification: Master in Environmental Management.**
1991	**NORTH WEST UNIVERSITY** **Qualification: B – Comm: Industrial psychology.**
1988	**BRITSHIGH SCHOOL (BRITS)** **Qualification: Matric**

COURSES and Conferences ATTENDED

I have attended various mining and environmental conferences and seminars to stay abreast with the latest changes in legislation, legal compliance and policy positions in the sector.

August 1994	Junior Managers (Public Service Training Institute)
November 1994	Mineral Laws Administration (Public Service Training Institute)
October 1997	Mineral Laws Administration & Environmental Management (University of Pretoria)
July 2002	Project Management for Environmental Systems (University of the Orange Free State)
August 2004	Environmental and Sustainability in Mining Minerals and Energy Education and Training Institute (MEETI)
September 2005	Converting Old Order Rights to New Order Rights in Mining (International Quality & Productivity Centre Johannesburg)
November 2006	Mine waste disposal and Achievement of Mine Closure
February 2007	Introduction to ArcGis 1
April 2010	Mining Law Update Conference (IIR BV South Africa)
November 2010	Social Labour Plans for Mining Workshop (Melrose Training)
August 2011	Mineral Resources Compliance and Reporting (ITC)
May 2012	Enviro Mining Conference 2012 (Sustainability and Rehabilitation) (Spectacular Training Conferences)
August 2012	Mineral Resources Compliance and Reporting 4th Annual (ITC)
March 2013	1st Enviro Mining-Ensuring Environmental Compliance and reporting
March 2014	4th Annual Enviro Mining Conference
March 2015	5th Annual Enviro Mining Conference

CAREER HISTORY

Wadala Mining and Consulting (Pty) Ltd:

ADDRESS	:	**Farm Oberon** Kimberley 8301
PERIOD OF EMPLOYMENT	:	01 August 2013 - Part time
POSITION HELD		**Mineral Law Administration and Environmental Manager**

Diacor Closed Corporation:

ADDRESS	:	**6 Mullin Street** Hadisonpark Kimberley 8306
PERIOD OF EMPLOYMENT consultancy work	:	01 October 2013 – Present and part time
POSITION HELD **Environmental Manager**		**Mineral Law Administration and**

Mentor Trading and Investments 52 (Pty) Ltd:

ADDRESS	:	2 Kekewich Drive Monridge Office Park no 6 Monument Heights Kimberley 8301
PERIOD OF EMPLOYMENT	:	01 October 2012 – 01 October 2013
POSITION HELD		**Mineral Law Administration and Environmental Manager**

Rockwell Diamonds Inc:

ADDRESS	:	PO Box 251 BARKLY-WES

8375

PERIOD OF EMPLOYMENT : 01 March 2005 – 30 September 2012

POSITION HELD **Mineral Law Administration and Environmental Manager**

MAIN JOB FUNCTIONS

- Collect analyse and interpret information regarding the measurement of impacts of mining operations on the environment, the rehabilitation of land surfaces.
- The prevention, control and combating of pollution.
- Co-ordinate, investigate, audit and resolve environmental problems in conjunction with the Department of Water and Sanitation, Department of Agriculture and the provincial Department of Tourism, Environment and Conservation.
- Address complaints and inquiries received from the public and mining industry.
- Consult with relevant authorities and interested and affected people regarding the approval of Environmental Management Programmes.
- Ensuring that rehabilitation standards are applied.
- Ensuring that the requirements stated in Environmental Management Programme Reports are adhered to.
- Evaluate Mining Rights and Prospecting Right applications and recommend site-specific conditions according to legislative requirements.
- Constant liaison with the public, the mining industry and other government authorities on Environmental matters, legislation and agreements.
- Calculate and verify financial provision for outstanding rehabilitation.

DEPT OF MINERALS & ENERGY:

ADDRESS : 43 Chapel Street
Standard Bank Building
KIMBERLEY

PERIOD OF EMPLOYMENT : 01 April 1997 to 01 March 2005

POSITION HELD **Senior Environmentalist - Assistant Director Environment**

MAIN JOB FUNCTIONS :

- Collect analyse and interpret information regarding the measurement of impacts of mining operations on the environment, the rehabilitation of land surfaces.
- The prevention, control and combating of pollution.
- Co-ordinate and prioritise the rehabilitation of derelict and ownerless mines.
- Co-ordinate, investigate, audit and resolve environmental problems in conjunction with the Department of Water Affairs and Forestry, Department of Agriculture and the provincial Department of Tourism, Environment and Conservation.
- Address complaints and inquiries received from the public and mining industry.
- Consult with relevant authorities and interested and affected people regarding the approval of Environmental Management Programmes.
- Ensuring that rehabilitation standards are applied.
- Ensuring that the requirements stated in Environmental Management Programme Reports are adhered to.
- Conduct inspections and recommendations on mines that apply for closure.
- Evaluate mining licences and prospecting applications and recommend site-specific conditions according to legislative requirements.
- Constant liaison with the public, the mining industry and other government authorities on environmental matters, legislation and agreements.
- Influence new development processes through participation in the EMPR and EIA processes and give guidance through education and awareness programmes.
- Calculate and verify financial provision for outstanding rehabilitation.

DEPT. OF MINERALS AND ENERGY:

POSITION HELD : Assistant Mineral Laws Officer – Senior Mineral Laws Officer

PERIOD OF EMPLOYMENT : 01 November 1993 – March 1997

ADVISORY COMMISSION ON LAND ALLOCATION

POSITION HELD : Assistant Administrative Officer

PERIOD OF EMPLOYMENT : 10 February 1992 – October 1993

Experience Projects Completed

I am a dedicated professional Mineral Law Administration and Environmental Manager with 23 years extensive experience in the managing and mitigating of specifically mining related impacts. I started my career in 1993 in the Department of Minerals and Energy where I have done Environmental inspections with site visits on all mines in the Northern Cape. I have done Environmental Audits on operational and closed mining sites in collaboration with other Departments. I have also specifically looked at pollution control measures on mining sites and the effectiveness of these measures. I have evaluated submitted EIA /EMP documents and have worked closely with all other Departments and stakeholders to make sure that all environmental aspects have been dealt with adequately in submitted documents. I left the Department for the Private Sector in 2005. I have since worked for a Canadian Group of Companies in the Private Sector, started a consultancy where I provide various mining companies with professional advice and guidance on Mineral Law and Environmental Issues. I have also represented the South African Diamond Producers Organisation (SADPO) on the Environmental Policy Committee (EPC) at the Chamber of Mines between 2005 and 2011.

2005
Environmental Management Plan with an application for a Prospecting Right for diamonds on Portion 9 and 14 of the farm Lanyon Vale 376, Hay in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in August 2007 with the Prospecting Right
Client: HC van Wyk Diamonds Ltd

Environmental Management Plan with an application for a Prospecting Right for diamonds on Remainder of Portion 18 (a portion of Portion 10) of the farm Lanyon Vale 376, Hay in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in August 2007 with the Prospecting Right
Client: HC van Wyk Diamonds Ltd

Environmental Management Plan with an application for a Prospecting Right for diamonds on Remainder of Portion 1, Portion 2 (a Portion of Portion 1), Portion 3 and Portion 5 of the farm Zweet Fontein nr 76 and Remainder of Portion 1 and portion 3 of the farm Blaaubosch Drift nr 78, Herbert in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in August 2007 with the Prospecting Right
Client: HC van Wyk Diamonds Ltd

2006

Environmental Management Plan with an application for a Prospecting Right for Tin in Kakamas South Settlement, Kakamas in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in June 2011 with the Prospecting Right
Client: Douglas Mining and Exploration (Pty) Ltd

2007

Environmental Management Plan with an application for a Prospecting Right for diamonds on the Remaining Extent, Portion 1 and Portion 2 of Diamond Valley 29, Hopetown in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in April 2008 with the Prospecting Right
Client: HC van Wyk Diamonds Ltd

2008

Environmental Management Plan with an application for a Prospecting Right for diamonds on Portion 12, 13, 16, 24 & 25 Saxendrift 20 in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in June 2008 with the Prospecting Right
Client : HC van Wyk Diamonds Ltd

Environmental Management Plan with an application for a Prospecting Right for diamonds on Erf 1 Windsorton, Barkly-Wes in terms of Section 16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in February 2009 with the Prospecting Right
Client: HC van Wyk Diamonds Ltd

2009

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME
SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT CONVERSION IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) for Wouterspan Mine (The Farm Lanyon Vale 376, Hay)
EIA/EMP approved on 25/01/2010
Client: HC van Wyk Diamonds Ltd

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME
SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT CONVERSION IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) for GW Ziegler on Remainder, Remainder of portion 1 (Amantia) and portion 2 (a portion of

portion 1) of the farm Rietputs no. 15 and portion 1 (Spenceskop) of the farm Waterval no.14 in the district of Kimberley
EIA/EMP approved with conversion of the Mining Right
Client: GW Ziegler
2010

Basic Assessment Application
Application for authorisation in terms of the National Environmental Management Act, 1998 (Act No. 107 of 1998), as amended and the Environmental Impact Assessment Regulations, 2006
PROPOSED EXTENTION OF A ROOF OVER AN EXCISTING DECK WITH TWO WOOD PILLARS BY MEANS OF THE EXCAVATING OF 0.5m X 0.5m X 1m X 2 (½m²) OF SOIL WITHIN 100M OF THE HIGH WATER MARK OF THE SEA
Falls within general notes under activities that requires basic assessment
Positive Record of Decision (ROD) Granted.
Client: Dr. Petrus van der Walt Vermeulen

REVISION OF ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT CONVERSIONS IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) for HC VAN WYK DIAMONDS LTD (204 MRC) ON REMAINING EXTENT OF HOLPAN 161, BARKLY-WES
AND KLIPDAM DIAMOND MINING CO (003MRC) ON REMAINING EXTENT OF KLIPDAM 157, BARKLY-WES
Client: HC van Wyk Diamonds Ltd and Klipdam Diamond Mining Company Ltd

2011

APPLICATION FOR A LICENCE REGARDING PROTECTED TREES [SECTION 15(1) OF THE NATIONAL FORESTS ACT, 1998, AS AMENDED] on PORTION 1 (PAARDE PAN) OF THE FARM ANNEX SAXES DRIFT 21, HOPETOWN, NORTHERN CAPE for 14 Shephards tree (Boscia albitunca)
Licence issued on 24 September 2011
Client : Saxendrift Mine Pty Ltd

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME
SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT CONVERSION IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) on Portion 2 of the farm Good Hope 286, Barkly-Wes
EIA/EMP approved February 2013 by the Regional Manager
Client: Diacor CC

APPLICATION FOR CLOSURE CERTIFICATE [in terms of sections 43(3) of the Minerals and Petroleum Resources Development Act, 2002 (Act No 28 of 2002)] AND A CLOSURE PLAN FOR MINING ACTIVITIES PERFORMED BY HC VAN WYK DIAMONDS LTD ON THE

REMAINING EXTENT OF PORTION 1 (WILLOWBANK), PORTION 2 (A PORTION OF PORTION 1) (WILLOWBANK), PORTION 3 (A PORTION OF PORTION 1) (WILLOWBANK) OF KHOSOPSKRAAL 227 AND PORTION 5 (ROSCOMMON) AND PORTION 2 (BORDON) OF HARRISDALE 226 AND FARM 362, BARKLY-WES
CLOSURE WAS GRANTED IN JULY 2010
Client: HC VAN WYK DIAMONDS LTD

2012

APPLICATION FOR A LICENCE REGARDING PROTECTED TREES [SECTION 15(1) OF THE NATIONAL FORESTS ACT, 1998, AS AMENDED] on PORTION 1 OF THE FARM BRAKFONTEIN 276, HOPETOWN NORTHERN CAPE for 4Shephards tree (Boscia albitunca)
Licence NCU 2831112 issued in November 2012
Client: Jasper Mining Pty Ltd

2013

APPLICATION FOR A LICENCE REGARDING PROTECTED TREES [SECTION 15(1) OF THE NATIONAL FORESTS ACT, 1998, AS AMENDED] ON REMAINDER OF THE FARM NIEWEJAARSKRAAL NO 40, PRIESKA, NORTHERN CAPE. 30 SHEPPHARD'S TREES
Licence NCU 4290214 issued in February 2014
Client: Saxendrift Mine (Pty) Ltd (Niewejaarskraal Mine)

AMENDMENT OF ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME SUBMITTED FOR A SECTION 11 APPLICATION OF A MINING RIGHT CONVERSION IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) on The Farm Riets Drift no. 18, district
Client: Bo-Karoo Diamond Mining (Pty) Ltd to be ceded to Bondeo 140 CC.

2014

Application for a Water Users Licence Application in terms of Section 27 of the National Water Act no 36 of 1998 on the Farm Engelde Wilgeboomfontein 22, Prieska
Application still under review
Client: Thunderflex 78 (Pty) Ltd

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME
SUBMITTED FOR AN APPLICATION FOR A MINING RIGHT CONVERSION IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) on Portion 1 of the farm Brakfontein 276 district of Hopetown
EIA/EMP approved April 2015 by the Regional Manager
Client: Jasper Mining (Pty) Ltd

Environmental Management Plan with an application for a Prospecting Right for diamonds on REMAINING EXTENT OF THE FARM MARKSDRIFT 3, HOPETOWN in terms of Section

16(4) and Regulation 52 of the Minerals and Petroleum Resources Development Act, 2002 (Act 28 of 2002)
EMPlan was approved in April 2015 with the Prospecting Right
Client: BONDEO 140 CC

2015

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME
SUBMITTED FOR AN APPLICATION FOR A PROSPECTING RIGHT IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) on Portion 1 of the farm Speculatie 217 district of Boshof
EIA/EMP has been acceptedby the Regional Manager Free State Region
Client: Thaba Thafita Diamond Prospecting CC

ENVIRONMENTAL IMPACT ASSESSMENT & ENVIRONMENTAL MANAGEMENT PROGRAMME
SUBMITTED FOR AN APPLICATION FOR A PROSPECTING RIGHT IN TERMS OF SECTION 39 & OF REGULATION 50 & 51 OF THE MPRDA, 2002 (ACT NO. 28 OF 2002) on a Portion of Erf 1318, Galeshewe , and a Portion of the Remainder Erf 5336, Kimberley
EIA/EMP still under review by the Regional Manager Northern Cape Region
Client: Mystic Pearl 157 (Pty) Ltd

2016

ANNUAL REHABILITATION PLAN for Associated Manganese Mines of South Africa Ltd Glosam Prospecting Area
February 2016

REFERENCES

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