



mineral resources

Department:
Mineral Resources
REPUBLIC OF SOUTH AFRICA

SCOPING REPORT

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).

NAME OF APPLICANT: ANNESLEY SALT (PTY) LTD

TEL NO: 054 3375500

FAX NO: 086 510 7120

POSTAL ADDRESS: Private Bag X6009
Upington
8800

PHYSICAL ADDRESS: 40 Karakoel Street
Upington
8801

FILE REFERENCE NUMBER SAMRAD: (NC) 30/5/1/2/2/10141 MR

IMPORTANT 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.
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SCOPING REPORT

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 Millin Street, Hadisonpark 8301

Postal Address: P O Box 110823, Hadisonpark 8306

ii) **Appointed by:**

Annesley Salt (Pty) Ltd

Contact Person: Mrs. Pearl van Wyk

Mobile: 082 706 3079 (Pearl)

Email: mining@blaauwsgroup.co.za

Postal Address: Private Bag X6009

Uppington

8800

iii) **Expertise of the EAP**

(1) **The qualifications of the EAP**

Masters in Environmental Management (UFS)

B-Comm in Human and Industrial- Psychology (NWU)

(With evidence attached as **Appendix 1**)

(2) **Summary of the EAP's past experience**

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.

(Attach the EAP's curriculum vitae as **Appendix 2**)

b) **Description of the property**

Farm Name:	Remainder of the Farm Annesley 338, Gordonia Farm No.: 338 Portions: 0 Farm Name: Annesley Magisterial District: Gordonia Province: Northern Cape Title Deed No's: T 2128/2008
Application area (Ha)	100,3481 (One Hundred comma Three four eight one) hectares
Magisterial district:	Gordonia
Distance and direction from nearest town	The proposed salt mine is situated on a portion of the farm known as the Remainder of the Farm Annesley no. 338, which is located approximately 120 km north of Upington, and approximately 35 km southwest of Noenieput, in the Northern Cape Province.
21 digit Surveyor General Code for each farm portion	C02800000000033800000

c) Locality map
(show nearest town, scale not smaller than 1:250000)

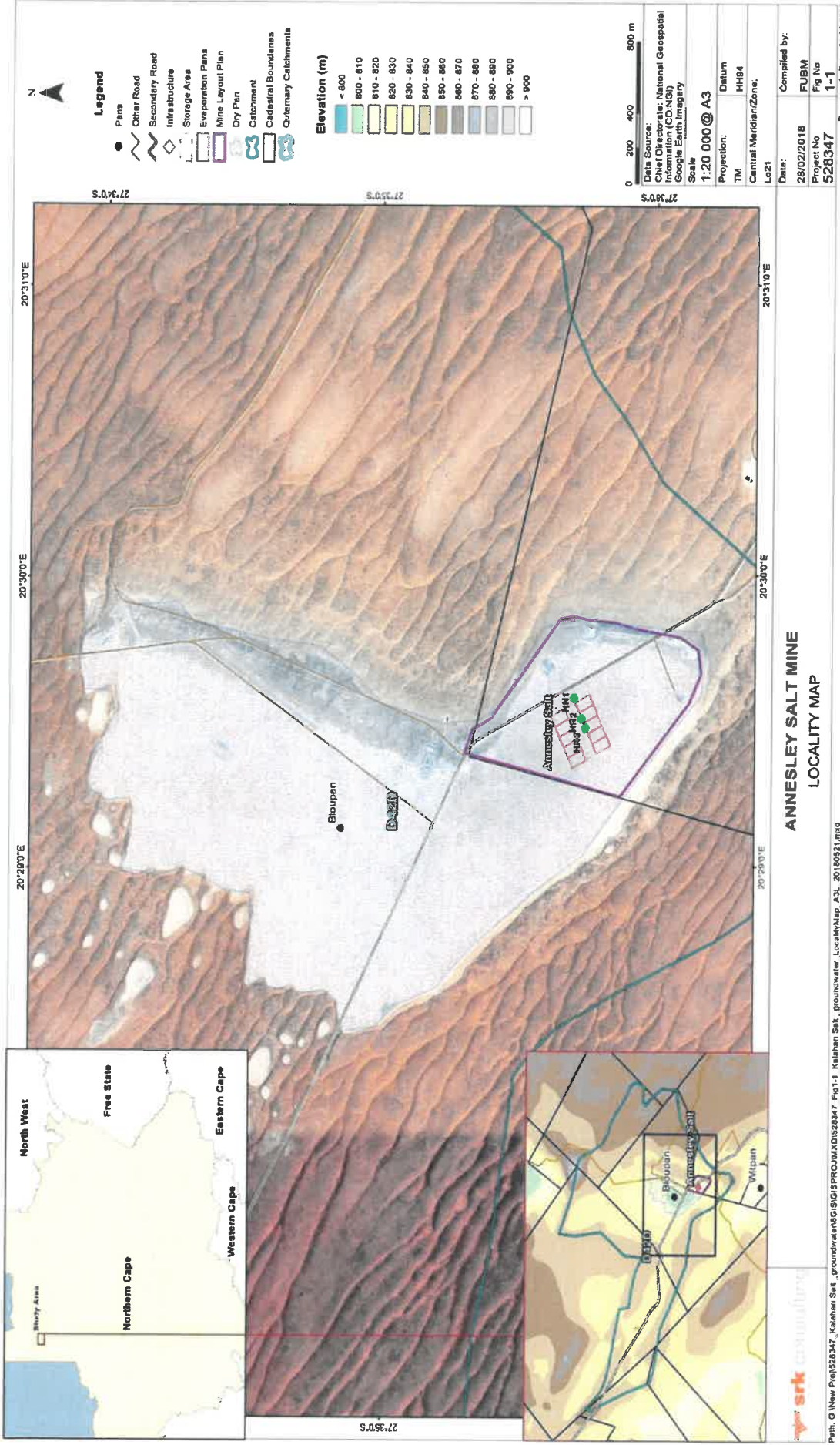


Figure 1: Locality Map

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.

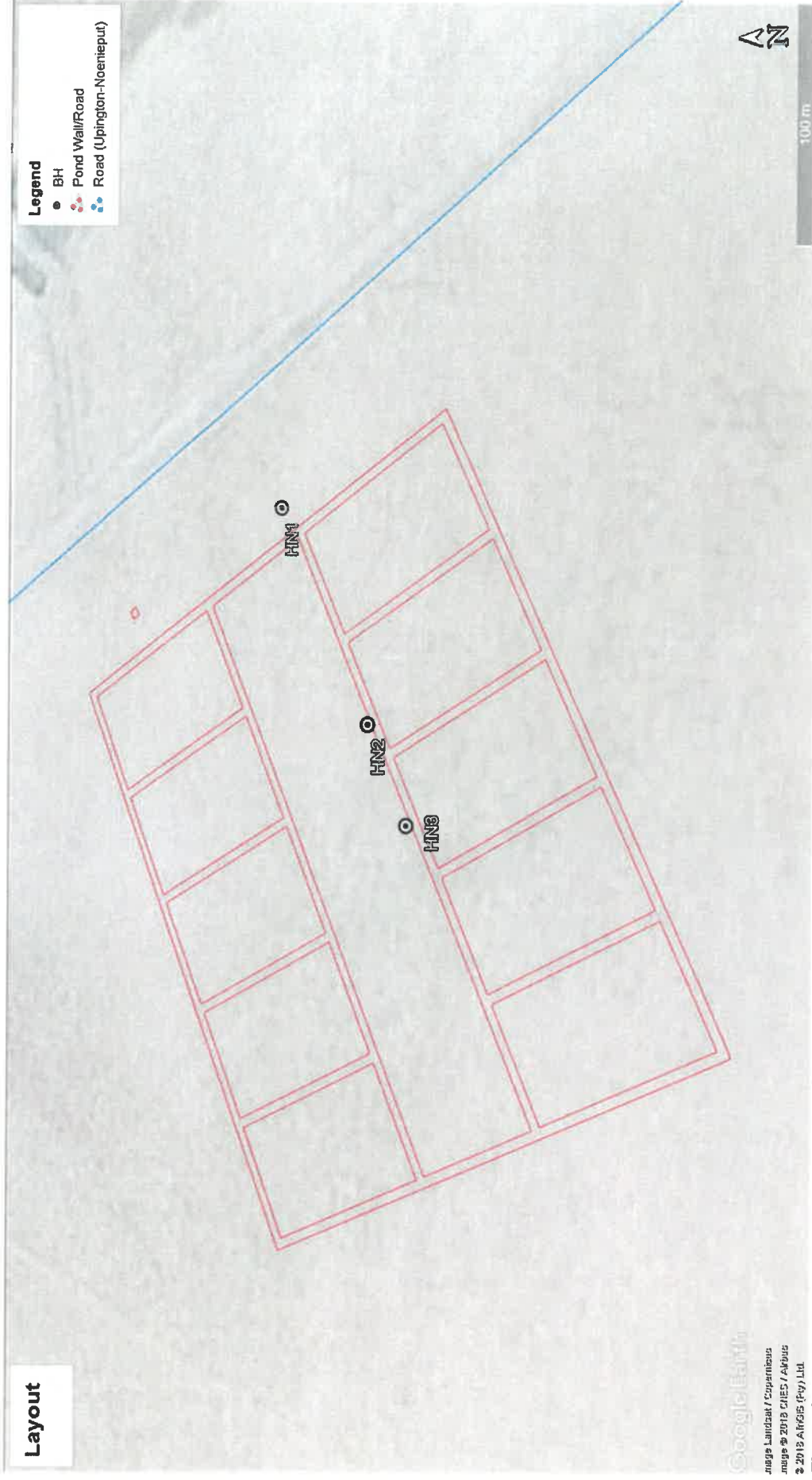


Figure 2: A plan indicating the overall location and extent of listed activities and main infrastructure on the mining site

Table 1: Listed and specified activities

NAME OF ACTIVITY (E.g. for prospecting – drill site, site camp, ablation facility, accommodation, equipment storage, sample storage, site office, access route, etc. ... etc. ... etc. E.g. for mining – excavations, blasting, stockpiles, discard dumps or dams, Loading, hauling and transport, Water supply dams and boreholes, accommodation, offices, ablation, stores, workshops, processing plant, storm water control, berms, roads, pipelines, power lines, conveyors, etc. ... etc. ... etc.)	Aerial extent of the Activity Ha or m ²	LISTED ACTIVITY (Mark with an X where applicable or affected).	APPLICABLE LISTING NOTICE (GNR 544, GNR 545 or GNR 546)	WASTE MANAGEMENT AUTHORISATION (Indicate whether an authorisation is required in terms of the Waste Management Act). (Mark with an X)
Activity 9: "The development of infrastructure exceeding 1000 metres in length for the bulk transportation of water or storm water- (vii) with an internal diameter of 0.36 metres or more; or (viii) with a peak throughput of 120 litres per second or more;	Water Pipelines distribution	X	GNR 983	
Activity 12 of NEMA Listing notice 1 "The development of— (i) canals exceeding 100 square metres in size; (ii) channels exceeding 100 square metres in size; (iii) bridges exceeding 100 square metres in size; (iv) dams, where the dam, including infrastructure and water surface area, exceeds 100 square metres in size; (v) weirs, where the weir, including infrastructure and water surface area, exceeds 100 square metres in size; (vi) bulk storm water outlet structures exceeding 100 square metres in size; (x) buildings exceeding 100 square metres in size; or	60 X 100m for each evaporation dam 10 evaporation ponds is planned for this operation 60 000m ²	X	GNR 983	

<p>(xii) 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) GNR984; Activity 17 Consideration of GN704 – Water Act</p>				
<p>(Activity 17 of Listing Notice 2) Any activity including the operation of that activity which requires a mining right as contemplated in section 22 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002), including associated infrastructure, structures and earthworks, directly related to the extraction of a mineral resource, including activities for which an exemption has been issued in terms of section 106 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).</p>	<p>100, 3481 ha</p>	<p>X</p>	<p>GNR 984</p>	
<p>Activity 21 of NEMA Listing Notice 2 Any activity including the operation of that activity associated with the primary processing of a mineral resource including winning, reduction, extraction, classifying, concentrating, crushing, screening and washing but excluding the smelting, beneficiation, refining, calcining or gasification of the mineral resource in which case activity 6</p>	<p>6 ha will be used for the evaporation ponds for the salt mining</p>	<p>X</p>	<p>GNR 984</p>	

in this Notice applies.					
Activity 24(ii) of NEMA Listing Notice 1	±5 000m ² on the Area.	X	GNR983		
The development of haul roads 15m wide with no reserve					
Activity 56(ii) of NEMA Listing Notice 1	±5 000m ² on the Area.	X	GNR983		
The continuous lengthening (and rehabilitation) of haul roads 15m wide with no reserve.					
Activity 15 of NEMA Listing Notice 2	A total of 6 hectares will be physically disturbed where the evaporation ponds will be made as well as areas for stockpiling and workshops as well as other infrastructure	X	GNR984		
"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."					
Activity 10 of NEMA Listing Notice 3: "The development of facilities or infrastructure for the storage, or storage and handling of a dangerous good, where such storage good, where such storage occurs in containers with a combined capacity of 30 but not exceeding 80 cubic meters."	250m ²	X	GNR985		
Activity 15 of Category A under the National Environmental Management: Waste Act 59 of 2008	4 550m ²		GNR 633		X
The continuous establishment and reclamation of temporary stockpiles resulting from activities which require a mining right.					

OTHER ACTIVITIES (Associated infrastructure not considered to be listed activities)				
Temporary Workshop Facilities and washbay	±450m ²			
Storage Facilities	±3000m ²			
Concrete Bund walls and diesel Depots	±250m ²			
Four Family housing units pre-fabricated houses and Ablution Facilities	±240m ²			
Topsoil Stockpiles	±2 000m ²			
Overburden Stockpiles	±2 000m ²			
Generator Site within a concrete floor and bundwall	25m ²			

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)

Mining Method

The salt resources are confined to the underground brines which are of secondary origin, having leached from salt-bearing sediments i.e. Dwyka Formation sediments. These particular sediments are mainly the shales and tillites of Dwyka Formation. The potential source of salt is unlimited, and the leaching of these sediments will continue as long as water finds its way through the sediments.

The proposed abstraction will be fractionally divided between the three boreholes depending on the yield, i.e. abstraction of c.14 m³/h from boreholes HN1 and HN2, and 4.5 m³/h from borehole HN3.

Salt pans, more often, do occur on surface; therefore mining must be designed to penetrate the surface to reach the source of the salt underground.

Construction and implementation phases**Phase 1. (Implementation)**

There are no existing structures or buildings on the mining application area. The property will be leased by Annesley Salt (Pty) Ltd from the owner, which lease agreement has already been successfully negotiated, subject to the approval and granting of a mining right by the Department of Mineral Resources to Annesley Salt (Pty) Ltd.

Phase 1 will consist of the erection of the first two family housing units which will be pre-fabricated houses, a dedicated workshop and washbay area, diesel tank within a concrete floor and bundwall area and a dedicated generator site within a concrete floor and bundwall area on the mining site. Electricity supply for all housing units will be from renewable energy sources, in this case solar energy. This phase will commence as soon as a mining right have been granted to Annesley Salt (Pty) Ltd.

At the same time the construction of 10 salt evaporation dams will commence together with the installation of the three borehole pumps and pipe network which will distribute the brine from the boreholes to the salt evaporation dams.

Once the boreholes are drilled, the identified area would then be opened up by digging evaporation dams 10 X (100m x 60m x0.6m dams). The dams will be opened up to the clay level (300 mm deep below natural ground level) and dams buildt to 600mm from the floor formed by the hardened sulphates (floor 150mm thick) up to 450 mm above natural ground level to compensate for the 1 in 50 year flood level. Brine from the boreholes is pumped into the dams, allowing water to evaporate. The brine water is harrowed periodically depending on the speed of evaporation. Thus helping the forming of salt crystals and keeping salt from forming a base that cannot be cultivated. The salt crystals are collected as coarse salt and stock piled.

Phase 2. (Expansion)

After the first year that the mining right is granted Annesley Salt (Pty) Ltd plans to erect the last two pre- fabricated family housing units.

Rehabilitation

The brine dams and acres will be ripped and potentially filled with material used and stored as the bench material. The roads on the mining area will be ripped and levelled to encourage germination of seedlings. Any remaining stockpiles will be removed and the hardened platforms removed. This will be sold in the end as Klipsalt. All infrastructures on site will be removed unless otherwise instructed by the Regional Manager (DMR).

Associated Infrastructure

There are no existing structures or buildings on the mining application area. The property will be leased by Annesley Salt (Pty) Ltd from the owner, which lease agreement has already been successfully negotiated, subject to the approval and granting of a mining right by the Department of Mineral Resources to Annesley Salt (Pty) Ltd.

Water

Surface Water

The nearest water body to the proposed project is the salt pan in which the project will be located. Other salt pans (nearest is about 3 km from the project) are also located in the area. No rivers or streams were observed on satellite images (Google earth).

Floodline determination is beyond the scope of the current project, and is not necessary for determining impacts as the project is clearly within a pan that may be inundated occasionally. Nonetheless, it can be stated that the floodline is likely to lie very close to the salt pan or possibly be contained within it given the evaporative, non-draining conditions.

No true riparian habitat exists, as water in the salt pan is extremely intermittent and saline. For example, during a 1 in 2 year, 24 hour storm event, only 35.5 mm of rain are likely in the pan itself and little runoff is expected from the catchment. (Taken out of the Hydrogeological and Hydrological Impact Assessment for Annesley Salt Mine by SRK Consulting, June 2018).

No stream morphology is described as no streams or rivers were observed. The salt pan on the other hand is seen as a water body and a seasonal/partial wetland.

A few short, localised drainage channels (possibly natural erosion lines) were observed on the slopes around the salt pan (what would be the banks in a typical pan). These small channels indicate that water probably periodically flows into the salt pan from the immediate surrounds. The pan is likely to become inundated in times of intense rainfall events during the summer months. Thereafter, water will slowly evaporate leaving any salts behind.

Other hydrological losses are not expected to be significant because the pan is the lowest point in the landscape and thus water cannot flow downstream and seepage through the bed of the pan will be very low (the most likely reason why the pan exists in this location at all, and also the reason that salts naturally concentrate in the pan with time).

The morphology of the salt pan is shown in Photo 3-1 – a depression with a bed that is flat and hardened with crystallised salts on the surface. It is

underlain by clay and weathered tillite with very low permeability. (Taken out of the Hydrogeological and Hydrological Impact Assessment for Annesley Salt Mine by SRK Consulting, June 2018).

Ground Water

Information on existing boreholes for a 10 km radius around the site was downloaded from the DWS National Groundwater Archives (NGA). The information for these boreholes is summarised, and their positions are shown in the geohydrology report attached. All seven NGA boreholes are listed as abandoned.

Annesley Salt is planning to use three existing boreholes in their mining area on the salt pan to abstract 105 300 m³/a of brine from the Dwyka Aquifer for the proposed new salt mine. The details for these three boreholes are summarised in Table 2 and their positions shown in the attached report. (Taken out of the Hydrogeological and Hydrological Impact Assessment for Annesley Salt Mine by SRK Consulting, June 2018).

Table 2: Summary of available information for the Annesley Salt boreholes

Borehole ID	Latitude	Longitude	Depth (m)	Casing	Collar Height (magl)	Rest Water Level (mbgl)	Notes
Bloupan-HN1	S27.595694°	E20.491222°	26.8	uPVC		1.90	Existing borehole
Bloupan-HN2	S27.595461°	E20.491748°	35.5	uPVC		1.88	Existing borehole
Bloupan-HN3	S27.595417°	E20.494722°	46.6	uPVC		2.13	Existing borehole

The water table below the mine site is shallow, ranging from 1.88 to 2.13 mbgl. Seasonal water level variation (particularly during high rainfall periods) at the site is unknown (Taken out of the Hydrogeological and Hydrological Impact Assessment for Annesley Salt Mine by SRK Consulting, June 2018).

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 mining 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 property is accessed via the R360 Upington, Noenieput tar road and a gravel road, as well as farm tracks on the mine property. Activities associated with the Annesley mine that is expected to make use of these roads include:-

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

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

Haul Roads

Access to the site will mostly be via existing roads, with the district gravel road to Noenieput running along the site. A small 5 m wide access road (not paved) links the operations to this road.

Mining Schedule

The salt resources are confined to the underground brines which are of secondary origin, having leached from salt-bearing sediments i.e. Dwyka Formation sediments. These particular sediments are mainly shales and tillites of Dwyka Formation. The potential source of salt is unlimited, and the leaching of these sediments will continue as long as water finds its way through the sediments. The mining will continue on the same evaporation pans throughout the life of mine. As long as the mine does not stop to pump sustainably and cause the groundwater to dilute the growing of salt on the pan will continue.

Mining Procedures

There is no infrastructure on Annesley, in the District of Gordonia except for the natural pan with a road that runs through the natural pan. There are no existing structures or buildings on the mining application area.

The property will be leased by Annesley Salt (Pty) Ltd from the owner, which lease agreement has already been successfully negotiated, subject to the approval and granting of a mining right by the Department of Mineral Resources to Annesley Salt (Pty) Ltd.

Phase 1 will consist of the erection of the first two family housing units which will be pre-fabricated houses, a dedicated workshop and washbay area, diesel tank within a concrete floor and bundwall area and a dedicated generator site within a concrete floor and bundwall area on the mining site. Electricity supply for all housing units will be from renewable energy sources, in this case solar energy. This phase will commence as soon as a mining right have been granted to Annesley Salt (Pty) Ltd.

At the same time the construction of 10 salt evaporation dams will commence together with the installation of the three borehole pumps and pipe network which will distribute the brine from the boreholes to the salt evaporation dams.

Phase 2. (Expansion)

After the first year that the mining right is granted Annesley Salt (Pty) Ltd plans to erect the last two pre-fabricated family housing units.

Evaporation dams 10 X (100m x 60m x 0.6m dams) will be constructed. The dams will be opened up to the clay level and dams formed to 60cm from the floor, formed by the hardened sulphates.

The operational phase will consist of the mining of salt by means of crystallization of salt brine in large, shallow crystallization pans and the subsequent harvesting thereof through scrapping it into heaps for stockpiling outside the salt pan and then loading on trucks.

In the mining of salt, if the resource is managed sustainable, which means that the pumping of brine will only be done according to the resource of brine water available there will be no decline period. The annual rain fall in this area replenishes the underground water brine and therefore the resource is sustainable and indefinite.

e) Policy and Legislative Context

Table 3: 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)	<ul style="list-style-type: none"> - 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 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.
Constitution of South Africa (Act 108 of 1996)	<ul style="list-style-type: none"> - Section 24: Environmental right - Section 25: Rights in Property - Section 27: Water and sanitation right 	<ul style="list-style-type: none"> - To be implemented upon the approval of the EMPR.
Environment Conservation Act (Act 73 of 1989) and Regulations (ECA)	<ul style="list-style-type: none"> - Sections 21, 22, 25, 26 and 28: EIA Regulations, including listed activities that still relate to the existing section of ECA. - Section 28A: Exemptions. 	<ul style="list-style-type: none"> - To be implemented upon the approval of the EMPR.
Fencing Act (Act 31 of 1963)	<ul style="list-style-type: none"> - 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. 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.
Hazardous Substances Act (Act 15 of 1973) and Regulations read together	<ul style="list-style-type: none"> - Definition, classification, use, operation, modification, disposal or dumping of hazardous 	<ul style="list-style-type: none"> - Noted and Considered measures are to be implemented upon the

with NEMA and NEMWA Intergovernmental Relations Act (Act 13 of 2005)	substances.	approval of the EMPR.
Mine, Health and Safety Act (Act 29 of 1996) and Regulations	<ul style="list-style-type: none"> - Entire Act. 	<ul style="list-style-type: none"> - 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	<ul style="list-style-type: none"> - Entire Act. - Regulations GN R527 	<ul style="list-style-type: none"> - A Mining Right has been applied for ((NC) 30/5/12/2/10141 MR). - Rights and obligations to be adhered to.
National Environmental Management Act (Act 107 of 1998) and Regulations as amended	<ul style="list-style-type: none"> - 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) 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.

	<ul style="list-style-type: none"> - 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) 	
<p>National Environmental Management: Air Quality Act (Act 39 of 2004)</p>	<ul style="list-style-type: none"> - 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) 	<ul style="list-style-type: none"> - 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.
<p>National Environmental Management: Biodiversity Act (Act 10 of 2004)</p>	<ul style="list-style-type: none"> - 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. 	<ul style="list-style-type: none"> - A permit application regarding protected plant species need to be lodged with DENC if any protected species is encountered.
	<p>Commencement of Threatened or Protected Species Regulations 2007 : 1 June 2007</p>	

	<p>GNR 150/GG 29657/23-02-2007</p> <p>Publication of lists of critically endangered, vulnerable and protected species GNR 151/GG 29657/23-02-2007 *</p> <p>Threatened or Protected Species Regulations GNR 152/GG 296547/23-02-2007 *</p> <ul style="list-style-type: none"> - 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) - Chapter 2 lists all protected areas. 	
<p>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.</p> <p>National Environmental</p>	<p>Chapter 4: Waste management activities</p>	<p>If any protected vegetation is identified the necessary permit application will be done.</p> <p>- To be implemented upon the</p>

<p>Management: Waste Management Act (Act 59 of 2008)</p>	<ul style="list-style-type: none"> - 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) 	<p>approval of the EMPR.</p>
<p>National Forest Act (Act 84 of 1998) and Regulations</p>	<ul style="list-style-type: none"> - 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. 	<ul style="list-style-type: none"> - A permit application regarding protected tree species need to be lodged with DAFF if necessary.
<p>National Heritage Resources Act (Act 25 of 1999) and Regulations</p>	<ul style="list-style-type: none"> - 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 issued by the responsible heritage resources 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.

	<p>authority destroy, damage, excavate, alter, deface or otherwise disturb any archaeological or paleontological site.</p> <ul style="list-style-type: none"> - 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 	
<p>National Water Act (Act 36 of 1998) and regulations as amended, <i>inter alia</i> Government Notice No. 704 of 1999</p>	<ul style="list-style-type: none"> - 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 <p>In terms of Section 21 a licence is required for:</p> <ul style="list-style-type: none"> (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; (i) altering the bed, banks, course or characteristics of a watercourse; 	<ul style="list-style-type: none"> - A water use application is in the process of preparation and will be lodged with Department of Water and Sanitation (DWS). - Control measures are to be implemented upon the approval of the EMPR.

	<p>(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;</p> <ul style="list-style-type: none"> - 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)	<ul style="list-style-type: none"> - Chapters 2, 3, 4 and 6: Nature reserves, miscellaneous conservation measures, protection of wild animals other than fish, protection of Flora.
Northern Cape Nature Conservation Act (Act 9 of 2009)	<ul style="list-style-type: none"> - Addresses protected species in the Northern Cape and the permit application process related
	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR. - A permit application regarding provincially protected plant species

	thereto.	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	<ul style="list-style-type: none"> - 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. - Entire Act. 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.
Road Traffic Act (Act 93 of 1997) and Regulations		<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR.
Water Services Amendment Act (Act 30 of 2007)	<ul style="list-style-type: none"> - 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). 	<ul style="list-style-type: none"> - Control measures are to be implemented upon the approval of the EMPR. - To take note.
National Land Transport Act, (Act 5 of 1998)		
Northern Cape Planning and Development Act (Act 7 of 1998)	<ul style="list-style-type: none"> - To control planning and development 	<ul style="list-style-type: none"> - To be implemented upon the approval of the EMPR.
Spatial Planning and Land Use Management (Act 16 of 2013 (SPLUMA) and regulations	<ul style="list-style-type: none"> - 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 	<ul style="list-style-type: none"> - To be implemented upon the approval of the EMPR.
Subdivision of Agricultural Land Act, 70 of 1970 and regulations	<ul style="list-style-type: none"> - Regulations GN R373 published on 9 March 1979 in terms of Subdivision of Agricultural Land 	<ul style="list-style-type: none"> - To take note.
Basic Conditions of Employment Act	<ul style="list-style-type: none"> - To regulate employment aspects 	<ul style="list-style-type: none"> - To be implemented upon the

(Act 3 of 1997) as amended			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).

Taking into consideration all the information captured in this report, the most appropriate procedure for planning and developing the proposed mining operation will involve the following:

(a) Mining Method

Mining salt by means of the method described, with the understanding that the formulation of an effective Environmental Management Programme and the implementation thereof, as well as the obtainment of an authorisation for the abstraction of water from a resource for mining purposes from the Department of Water and Sanitation in terms of the National Water Act, 1998 (Act No. 36 of 1998, is an inseparable part of the proposed operation.

(b) Labour Force

Employing people who originate from within the boundaries of Dawid Kruiper Municipality. This will guarantee benefits such as a positive contribution to the local economy; a decrease in local unemployment figures; a decrease in the social phenomena normally associated with unemployment, such as crime and alcohol abuse; and a positive contribution to cultural cohabitation.

(c) Rehabilitation

Making financial provision for the implementation of a rehabilitation strategy as is required by Section 41 of the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002).

(d) Environmental Monitoring

Carrying out environmental monitoring on a regular basis, as is required by Regulation 55 of the Regulations published in Government Notice No. 26275 under the Mineral and Petroleum Resources Development Act, 2002 (Act No. 28 of 2002) amended as well as NEMA.

(e) General

Being open to possible comments, suggestions and complaints received from neighbouring farmers, farm workers or members of the general public that might result from the implementation of the proposed mining operation.

g) Period for which the environmental authorisation is required

30 years dependant on the granting of the Mining Right for 30 years.

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 issues raised by interested and affected parties, and the consideration of alternatives to the initially proposed site layout as a result.

- It is a naturally occurring salt pan, no other site can be used for the growing of the salt.
- The realistic production forecast for Annesley as per the Mining Works Programme is 12000 tons per annum.
- The reaping of salt is an unlimited resource if managed to be sustainable and the water is not dewatered to fast from the source. If it is not managed sustainably salt content will decrease and the water will become too fresh to use to grow salt crystals.
- Heavy rains and dust storms are the two factors that mostly effect the production of salt negatively.
- Production of salt varies according to the seasons e.g. more evaporation during summer, more salt crystals formed, more production.

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.

ALTERNATIVE MINING METHODS

The mining method of evaporation ponds with continued reaping of salt crystals is the only economic viable method currently being used by the salt fraternity. No alternative mining method can be considered at this stage.

CONSEQUENCE IF NOT PROCEEDING WITH THE OPERATION

The operation will make provision for 5 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.

Brine from the underground water is pumped onto the evaporation dams allowing water to evaporate. Thus helping the formation of salt crystals and keeping salt from forming a base that cannot be cultivated. The salt crystals are collected as coarse salt and stockpiled.

The reaping of salt is an unlimited resource if managed to be sustainable and the water is not dewatered to fast from the source. If it is not managed sustainably salt content will decrease and the water will become too fresh to use to grow salt crystals.

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.

- (a) The consultation process with interested and affected parties (neighbouring farmers and land owners) has been done with personal visits especially to neighbours. The applicant had already entered into an agreement for lease of the land with the farm owner (Annesley Trust) and the agreement is attached to the public participation documents.
- (b) Regular contact sessions will be held with the neighbouring farmers and land owners which will be affected by the mining operations.
- (c) Records will be kept of the complaints and the mitigatory measures have already been implemented.
- (d) Correspondence of the proposed Mining Right application has been forwarded per registered post on 20 September 2018 to all identified interested and affected parties to inform them of the company's application and background information on the application for the Mining Right was attached.
- (e) The process as described by NEMA for Environmental Authorization was followed. See table below for the identification of Interested and affected Parties to be consulted with. The landowner, and or occupants and direct neighbours were consulted personally and through a letter that was given to them with registered post. A site notice was placed at the Khara Hais Library In Upington, at the Municipal Offices of the Dawid Kruiper Local Municipality, on the road to Noenieput, on the gravel road towards the pan and at the entrance to the pan. Please also see google map with position of notices indicated that was put up at the salt pan. With this site notice all passers-by are requested to submit any written comments to be forwarded to the consultant. See photo's attached and proof of consultation.
- (f) An Advert (Notice) was placed 21 September 2018 in the Gemsbok to notify all other interested parties and affected parties of the application for a mining right and to invite any person that might be interested and or affected to register.

iii) Summary of issues raised by I&APs

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

Table 4: Summary of issues raised by I & AP's

Interested and Affected Parties		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
List the names of persons consulted in this column, and Mark with an X where those who must be consulted were in fact consulted					
AFFECTED PARTIES					
Landowner/s	X				
Annesley Trust 13 Kooperasie Straat Upington 8801	X 20 September 2018 mailed registered letter with BID document.	An agreement was reached with the farm owner in January 2018 already.			
Lawful occupier/s of the land					
Landowners or lawful occupiers on adjacent properties	X				
Upington Super Sout (Pty) Ltd Private Bag X6009 Upington 8800	X 20 September 2018 mailed registered letter with BID document				
Municipal Councillor	X				
Municipality	X				
Dawid Kruiper Local Municipality Private Bag X6003	X 20 September 2018 mailed	04 October 2018	Registration as an Interested party Disclose interest-	Thank you very much for the registration, you will be kept up to	

Upington 8800	registered letter with BID document.	business, personal, financial or other interest w.r.t application.	date with developments on the project and all documents will be provided to your offices.	
ZF Mgcawu District Municipality Private Bag X6039 Upington 8800	X 20 September 2018 mailed registered letter with BID document.			
Organs of State (Responsible for infrastructure that may be affected Roads Department, Eskom, Telkom, DWA				
ESKOM Environmental Division P O Box 356 Bloemfontein 9300 Ms A van Gensen	X 20 September 2018 mailed registered letter with BID document.			
ESKOM Holdings SOC Limited Northern Cape Operating Unit: Land Development PO Box 606 Kimberley 8300	X 20 September 2018 mailed registered letter with BID document.			
SANRAL	X 20 September 2018 mailed registered letter with BID			

Transnet PO Box 32696 Braamfontein 2017	document X 20 September 2018 mailed registered letter with BID document.			
NC Department of Roads and Public Works PO Box 3132 Squirehill Park Kimberley 8300	X 20 September 2018 mailed registered letter with BID document.			
Communities				
No Communities				
Dept. Land Affairs				
Department of Rural Development and Land Reform Private Bag X 5007 Kimberley 8300	X 20 September 2018 mailed registered letter with BID document.			
Traditional Leaders				
No Traditional Leaders				
Dept. Environmental Affairs				
Northern Department of Environment and Nature Conservation Private Bag X6102 Kimberley 8300	X 20 September 2018 mailed registered letter with BID document.			

<p>Tel: 053 807 7430 Fax: 053 831 3530</p>	<p>Other Competent Authorities affected</p>	<p>Department of Water and Sanitation Private Bag X6101 Kimberley 8300</p>	<p>X 20 September 2018 registered letter with BID document.</p>	<p>An intent to apply for a WULA had been lodged at the DWS on 19 September 2018</p>		
<p>SAHRA P.O. Box 4637 Cape Town 8000</p>		<p>X 20 September 2018 registered letter with BID document.</p>				
<p>Dept. of Agriculture, Land Reform & Rural Development Private Bag X5108 Kimberley 8300</p>		<p>X 20 September 2018 registered letter with BID document.</p>				
<p>National Dept. of Public Works Private Bag X5002 Kimberley 8300</p>		<p>X 20 September 2018 registered letter with BID document.</p>				
<p>Department of Agriculture, Forestry and Fisheries Attention: Jacoline</p>		<p>X 20 September 2018 registered</p>				

<p>Mans Tel: 054 – 338 5909 Fax: 054 – 334 0030 Web: www.daff.gov.za e-mail: JacolineMa@daff.gov.za</p>	<p>letter with BID document.</p>					
OTHER AFFECTED PARTIES						
None						
INTERESTED PARTIES						
<p>EnviroAfrica Vivienne@enviroafrica.co.za</p>	<p>In response to the notice in the Gemsbok</p>	<p>5 October 2018</p>	<p>Please register as the contact person for the above proposed development of the MPRDA, NEMA and NWA processes.</p>	<p>Thank you very much for the registration, you will be kept up to date with all developments on the project and all documents will be provided to your offices.</p>		

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).

1.1 Geology

Bedrock at the site consists of tillite and shale of the Dwyka Group, belonging to the Karoo Supergroup (Council for Geoscience, 1988). The rocks of the Dwyka Group are covered by calcrete and dune sand of the Gordonia Formation of the Kalahari Group.

Groundwater is found in the weathered fractured-rock aquifers of the Dwyka Group tillite and shale (Dwyka Aquifer). According to the Department of Water and Sanitation's (DWS) 1:500 000 geohydrological map sheet 2718, Upington/Alexander Bay, the site's median borehole yield is classified as B3, where between 0.5 and 2.0 L/s can be expected (Hydrogeological & Hydrological Impact Assessment for Annesley Salt Mine, by SRK Consulting Pty Ltd, June 2018).

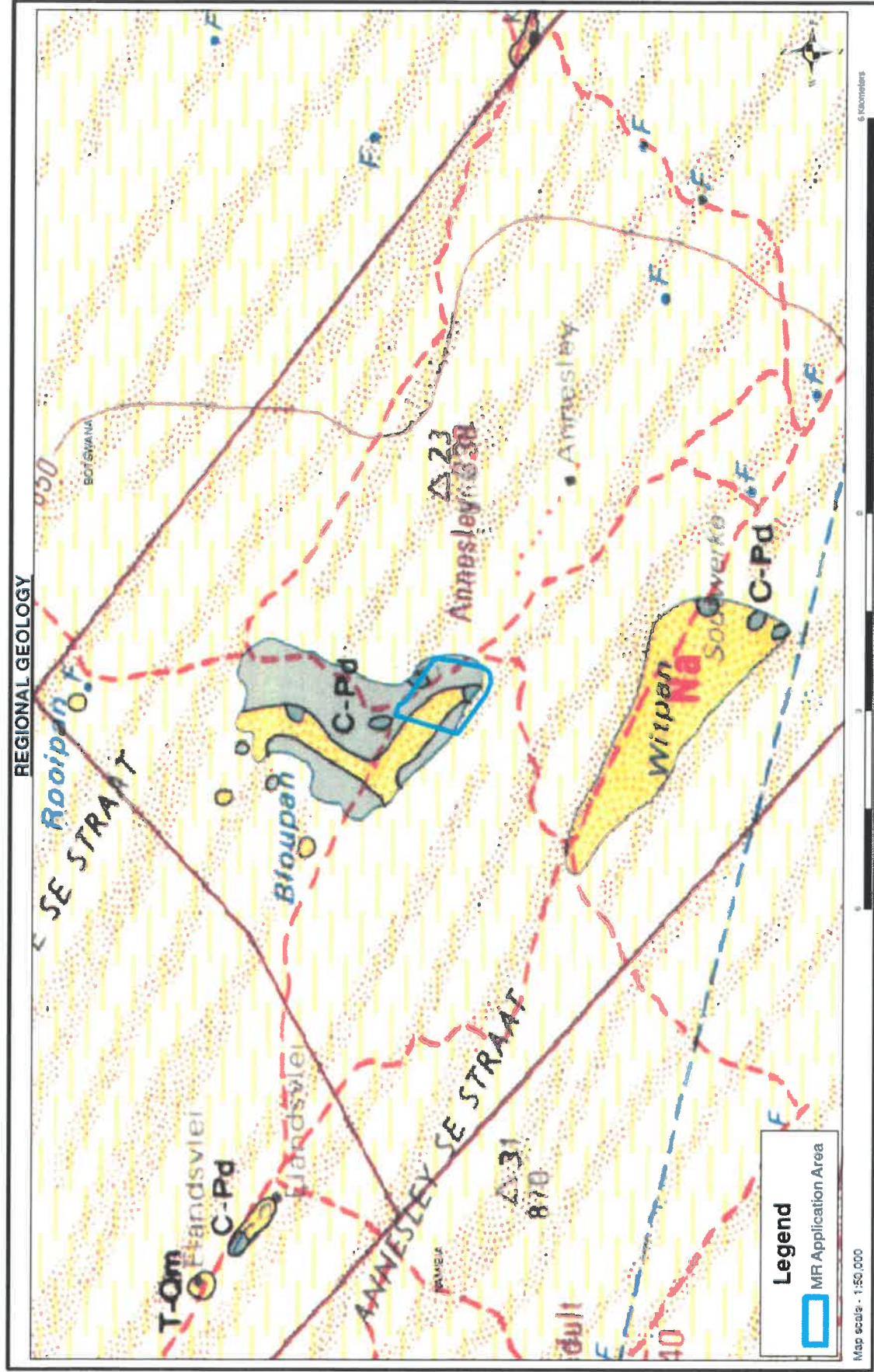


Figure 3: A schematic geological map of the application area.

1.2 Climate

Rainfall

The rainfall in the area is low. The two closest stations (which are 26.8 km and 38.9 km away) indicated the following:

- 128 mm mean annual rainfall at Vrouenspan station; and
- 147 mm at the Noenieput (Pol) station.

This data was verified by SRK using available weather station data. The daily rainfall data for the closest station (Vrouenspan) have been summarized to represent the average monthly rainfall, which is graphically presented in Figure 5 below.

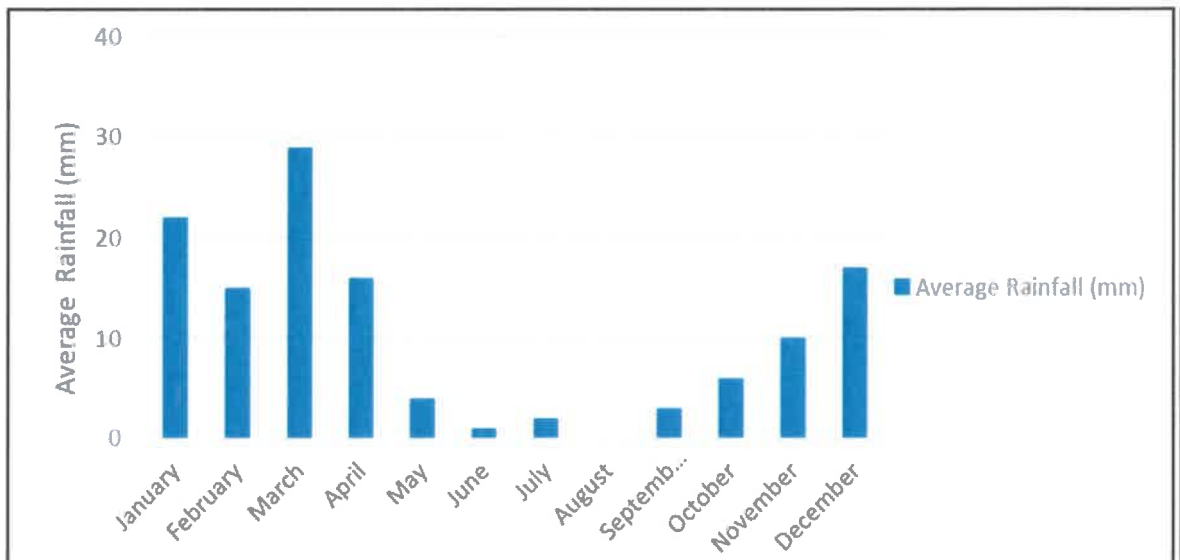


Figure 5: Average rainfall per month at the nearest rainfall station (Vrouenspan).

Although the rainfall is low, it occurs as short-lived but intense isolated or scattered thunderstorms during the summer months. The rainfall station details of Vrouenspan, along with five other rainfall stations considered in the hydrological assessment are provided in Table 5.

Table 5: Rainfall stations in the vicinity of Annesley Farm 338.

Station name	Station number	Distance from site (km)	Record available (years)	Mean annual precipitation (mm)
Vrouenspan	0351708_W	26.8	44	128
Noenieput (Pol)	0387240_W	38.9	70	147
Zwartmodder	0316061_W	47.4	54	155
Witdraai (Pol)	0424357_W	72.3	52	171
Askham	0424509_W	73.3	50	181
Witdraai (Gemsbok) (Pol)	0424354_W	76.9	32	186

The rainfall intensity data (also known as design rainfall data) for the site are in Table 6. Design rainfall data were extracted from the Design Rainfall estimation software (Gorven, 2002).

Table 6: Design rainfall values for Annesley Farm 338

Design Rainfall Data (mm) interpolated from six closest stations							
Mean annual rainfall	112	mm	Latitude	-27.58887	degrees		
Altitude	826	mamsl	Longitude	20.48974	degrees		
Storm duration	Return Period (Years)						
	2	5	10	20	50	100	200
5 minutes	6.3	9.9	12.5	15.3	19.2	22.5	25.9
15 minutes	11.9	18.7	23.6	28.8	36.2	42.3	48.8
1 hour	17.9	28.1	35.6	43.4	54.5	63.7	73.5
1.5 hours	20.2	31.7	40.1	49	61.5	71.8	82.9
2 hours	22	34.5	43.7	53.3	66.9	78.2	90.3
8 hours	28.7	45	57	69.6	87.4	102.1	117.8
24 hours	35.5	55.6	70.5	86	107.9	126.1	145.6

Evaporation

Evaporation far exceeds rainfall at the site. Although no records are available from the nearest station, the estimated evaporation is above 2 600 mm per annum according to the S-pan and A-pan methods (WR, 2012).

Wind

The prevailing wind direction for the area is north to north-north-west for the months January to September and changing from north to sometimes westerly winds during October to December averaging 3.5 m/s (Kimberley 01/01/1990 - 31/08/2000, Station 0290468).

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 they do occur can uproot trees and take off roads.

1.3 **Topography**

The landscape of the area and surrounds comprises gently undulating plains, with pans scattered throughout. Altitudes vary between 900 and 1 000m above sea level. The Salt pan is on altitude 866m above sea level.

1.4 **Soils**

Soil Types

The areas surrounding the pans are mostly covered by Kalahari sands. This is confirmed by Van Rooyen and Bredenkamp (1998), who describe the soils of this area as “*deep Aeolian sandy soils, underlain by calcrete*”. The soils of the dunes surrounding the pans can be classified under Kalahari soil family, belonging to the Namib form. Soils of this family consist of red regic sands that is non-calcareous within 1 500mm of the soil surface (Soil Classification Group 1991). As verified by a general soil type map of South Africa that was drawn up by the Institute for Soil, Climate and Water, South Africa the soils of the study area can generally be classified as “sands”.

Soil Fertility, Depth and Erosion Potential

The topsoil (Kalahari sands) on dune covered areas surrounding the pans can be several metres deep, whereas the topsoil in the pan areas can be up to 1m deep.

Neither the Kalahari sands found in the surrounding dune covered areas, nor the clayey soils found in the pans, have a high erodibility as a result of a combination of the following factors:

- a) Its texture: dune sands contain a high percentage of coarse sand, while pan soils contain a high percentage of clay, both of which are less prone to erosion than fine sand or silt;
- b) The permeability of dune sands; and
- c) Soil structure: soils with a granular structure (e.g. Kalahari sands) are less prone to erosion than soils with a coarse blockey or platy structure.

Neither the Kalahari sands found on dunes nor the clayey soils found in the pans have a high fertility.

1.5 Pre-mining Land Capability

As a result of a combination of the climate non-rich soils; the topography of the area; and the distance to the nearest surface water, the land lends itself to an activity such as livestock farming.

1.6 Land Use

Land Use Prior to Mining

Prior to the first mining activities conducted on the farm, the area was utilised mainly for livestock farming.

Historical Agricultural Activities

No record of historical agricultural activities in the study area exists.

Evidence of Abuse

Some erosion ditches are visible in the Kalahari sands.
No signs of overgrazing occur in the area.

Existing Structures

There are no existing structures or buildings on the mining application area. The property will be leased by Annesley Salt (Pty) Ltd from the owner, which lease agreement has already been successfully negotiated, subject to the approval and granting of a mining right by the Department of Mineral Resources to Annesley Salt (Pty) Ltd.

1.7 Natural Fauna

The Great Karoo used to support a large variety of antelope (particularly the springbok), the quagga and other large game, especially on the grassy flats in the east. Francois Le Vaillant, the famous French explorer, naturalist and ornithologist, who traveled through the Great Karoo in the 1780s, killed a hippopotamus in the Great Fish River in the Karoo (and ate its foot for breakfast). He also recorded that he saw the spoor of a rhinoceros near Cranemere, in the Camdeboo Plains (eastern Lower Karoo). Elephant tusks have been found by farmers in the Camdeboo district, but there are no records of any having been seen alive in that region. The quagga roamed the Karoo in great numbers together with wildebeest and ostriches, who always seemed to accompany them. These quagga seemed gentle and easy to domesticate. (A pair of quagga was used to draw a horse-carriage through London, more for curiosity than for any superiority the quagga might have had over a horse.) They were consequently also easy prey for hunters, who hunted them for sport rather than their meat. By the middle of the 1800s they were almost extinct, and in 1883 the last one died in an Amsterdam Zoo.

Painting of a quagga stallion in Louis XVI's menagerie at Versailles by Nicolas Marechal, 1793 Probably the strangest and most puzzling

zoological phenomenon in the Great Karoo was the periodic, unpredictable appearance of massive springbok migrations. These migrations always came from the north, and could either go west towards Namaqualand and the sea, south-west through towns such as Beaufort West, or south through the Camdeboo district. These vast herds moved steadily and inexorably across the plains, trampling all before them, including their own kind. Le Vaillant gave the first eye-witness account of such a migration in 1782. He rode through the herd filling the Plains of Camdeboo, seeing neither the beginning nor end of the moving mass.

A springbok, one of Southern Africa's most well known antelopes or gazelles. In 1849 a massive herd of springbok, amongst whom were intermingled wildebeest, blesbok, quagga, and eland, moved through Beaufort West. Early one morning the town was awakened to a sound like that of a strong wind, and suddenly the town was filled with animals. They devoured every sprig of foliage in the town and surrounding countryside. It took three days before the last of the continuously moving herd left the town to disappear towards the west. The Karoo looked as if a fire had swept through it. During these migrations the plains and hillsides on every side were thickly covered by one vast mass of springbok, packed like sheep in a fold. As far as the eye could see, the landscape was alive with them.

During these migrations the springbok never ran or trotted. On the whole, they were silent, except for the shudder of their stamping hoofs. Nothing could divert them, and hunters could ride amongst them, shooting them at random, without apparently causing alarm. People could move amongst them and kill them with sticks, or cripple them by seizing a leg and breaking it. It was not only people who followed these herds for the easy meat they provided, but also lions, leopards, cheetahs, African wild dogs, hyenas, and jackals.

No one knew how, why or where these migrations started, nor where they ended. Nor did anyone know if these animals every returned to where they had started from. The migrations were always unidirectional, from north of the Great Karoo.

Great locust swarms also frequently invaded or arose in the Great Karoo, and still occur from time to time today.

The introduction of the windpump to tap the Great Karoo's underground water resources in the late 1800s made permanent human habitation and sheep farming possible over large parts of the Great Karoo for the first time. As a result, the teeming number of large antelope in the Karoo has dwindled into insignificance, and, with them, the large carnivores have all but disappeared. Today the caracal (7–19 kg), black-backed jackal (6–10 kg), Verreaux's eagle (3.0–5.8 kg) and the martial eagle (3.0–6.2 kg) are arguably the largest predators likely to be seen in the Great Karoo today. Leopards (20–90 kg) do occur, especially in the mountains, but are very secretive, and therefore rarely seen. Many of the animals that formerly inhabited the Karoo in large numbers, including lions, have been re-introduced to the area in nature reserves and game farms.

Common Species

The fauna listed below are common species that have previously been found, or have the potential to occur in the mining area.

- **Birds**

An extensive bird life can be found on the mine and specifically on the hills and small valleys with dense vegetation growth. A list of birds that have been spotted or are known to occur in the mining area, are listed in the table below.

BIRD LIST	
English Name	Scientific Name
Feral Pigeon	<i>Columba livia</i>
Rock Pigeon	<i>Columba guinea</i>
Redeyed Pigeon	<i>Streptopelia semitorquata</i>
Cape Turtledove	<i>Streptopelia capicola</i>
Laughing Dove	<i>Streptopelia senegalenses</i>
Namaqua Dove	<i>Oena capensis</i>
Diederik Cuckoo	<i>Chrysococcyx caprius</i>
Redchested Cuckoo	<i>Cuculus solitaries</i>
Barn Owl	<i>Tyto alba</i>
Pearlspotted Owl	<i>Glaucidiumperiatum</i>
Spotted Eagle Owl	<i>Bubo africanus</i>
Whiterumped Swift	<i>Apus caffer</i>
Little Swift	<i>Apus affinis</i>
Whitebacked Mousebird	<i>Colius colius</i>
Redfaced Mousebird	<i>Urocolius indicus</i>
Brownhooded Kingfisher	<i>Halcyon albiventris</i>
Lilacbreasted Roller	<i>Coracias coudata</i>
Purple Roller	<i>Coracias naevia</i>
Hoopoo	<i>Upupa epops</i>
Scimitarbilld Woodhoopoo	<i>Rhino omastus cyanomelas</i>
Grey Hornbill	<i>Tockus nasutus</i>
Pied Barbet	<i>Tricholaema leucomelas</i>
Crested Barbet	<i>Tricholaema leucomelas</i>
Rufousnaped Lark	<i>Mirafta africana</i>
Clapper Lark	<i>Mirafta apiata</i>
Fawncoloured Lark	<i>Mirafta africanoides</i>
Chestnutbacked Finchlark	<i>Eremopterix verticallis</i>
European Swallow	<i>Hirundo rustica</i>
Greater Striped Swallow	<i>Hirundo cucullata</i>
Forktailed Drongo	<i>Dicrurus adsimilis</i>
Black Crow	<i>Corvus capensis</i>
Pied Crow	<i>Corvus album</i>
Ashy Tit	<i>Parus cinerascens</i>
Pied Babbler	<i>Turdoides bicolor</i>
Redeyed Bulbul	<i>Pycnonotus nigricans</i>
Groundscraper Thrush	<i>Turdus litsitsirupa</i>
Familiar Chat	<i>Cercomelafamiliaris</i>
Anteating Chat	<i>Myrmecocichlaformicivora</i>
Stonechat	<i>Saxicolaporquata</i>
Cape Robin	<i>Cossypha caffta</i>
Kalahari Robin	<i>Erythropygia paeon</i>
Titbabbler	<i>Parisoma subcaeruleum</i>
Fantailed Cisticola	<i>Cisticolajuncididis</i>
Desert Cisticola	<i>Cisticola aridula</i>
Spotted Flycatcher	<i>Muscicapa striata</i>
Chat Flycatcher	<i>Melaenornis infuscatus</i>

Fiscal Flycatcher	<i>Sigelus silens</i>
Cape Wagtail	<i>Motacilla capensis</i>
Orange Striated Langclaw	<i>Macronyx capensis</i>
Lesser Grey Shrike	<i>Lanius minor</i>
Grassveld Pip	<i>Anthus cinnamomeus</i>
Fiscal Shrike	<i>Lanius collaris</i>
Glossy Starling	<i>Lamprotornis nitens</i>
Cape White Eye	<i>Zosterops pallidus</i>
Whitebrowed Sparrowweaver	<i>Plocepasser mahali</i>
House Sparrow	<i>Passer</i>
Great Sparrow	<i>Passer motitensis</i>
Masked Weaver	<i>Ploceus velatus</i>
Redbilled Quelea	<i>Quelea quelea</i>
Red Bishop	<i>Euplectes orix</i>
Longtailed Widow	<i>Euplectes progne</i>
Melba Finch	<i>Amdina erythrocephala</i>
Quail Finch	<i>Ortygospiza atricollis</i>
Pintailed Whydah	<i>Vidua macroura</i>
Shafttailed Whydah	<i>Vidua regia</i>
Blackthroated Canary	<i>Merops hirundineus</i>
Yellow Canary	<i>Serinus flaviventris</i>
Kalahari Robins	<i>Erythropygia paeana</i>
Dusky Sunbird	<i>Nectarinia fusca</i>
Common Quail	<i>Coturnix coturnix</i>
Cardinal Woodpecker	<i>Denropicos fuscescens</i>
White-breasted Cormorant	<i>Phalacrocorax carbo</i>
Grey Heron	<i>Ardea cinerea</i>
Black Headed Heron	<i>Ardea melanocephala</i>
Cattle Egret	<i>Bulbulcus ibis</i>
Hammerkop	<i>Scopus umretta</i>
Hadedda Ibis	<i>Bostrychia hagedash</i>
Whitefaced Duck	<i>Dendrocygna viduata</i>
Egyptian Goose	<i>Alopochen aegyptiacus</i>
Yellowbilled Duck	<i>Anas undulate</i>
Redbilled Teal	<i>Anas erythrorhyncha</i>
Spurwinged Goose	<i>Plectropterus gambensis</i>
Secretary Bird	<i>Sagittarius serpentarius</i>
Black-breasted Snake Eagle	<i>Circaetus pectoralis</i>
Steppe Buzzard	<i>Buteo buteo</i>
Lanner Falcon	<i>Falco biarmicus</i>
Greater Kestrel	<i>Falco rupicoloides</i>
Lesser Kestrel	<i>Falco naumanni</i>
Orange River Francolin	<i>Francolinus levaillantoides</i>
Helmeted Guinea fowl	<i>Numida meleagris</i>
Redknobbed Coot	<i>Fulica cristata</i>
Whitewinged Black Korhaan	<i>Eupodotis aftaoides</i>
Crowned Plover	<i>Vanellus armatus</i>
Blacksmith Plover	<i>Vanellus coronatus</i>
Common Sandpiper	<i>Actitis hypoleucos</i>
Spotted Dikkop	<i>Birhinus capensis</i>
Doublehanded Courser	<i>Smutornus africanus</i>
Temmink's Courser	<i>Cursorius temminckii</i>
Whitewinged Tem	<i>Childonias leucopterus</i>
Burhell's Sandgro	<i>Ptercoles burchilli</i>

▪ **Mammals**

A list of all the fauna likely to be found at the Annesley Mine is presented in the table below:

MAMMAL LIST	
Scientific Name	Common Name
<i>Suncus infintesimus</i>	Least Dwarf Shrew
<i>Crocidura cyanea</i>	Reddish-grey Musk Shrew
<i>Chlorotohpha sclater</i>	Golden Mole
<i>Tadarida aegyptiaca</i>	Egyptian Free-tailed Bat
<i>Eptesicus capensis</i>	Cape Serotine Bat
<i>Nucleris thebaica</i>	Common Slit-faced Bat
<i>Rhinolophus clivosus</i>	Geoffroy's Horseshoe Bat
<i>Papio ursinus</i>	Chacma Baboon
<i>Tatera lencogaster</i>	Bushveld Gerbil
<i>Gerbillurus paeba</i>	Hairy-footed Gerbil
<i>Desmodillus aricularis</i>	Short-tailed Gerbil
<i>Mus musculus</i>	Domestic Mouse
<i>Rhabilomys pumilio</i>	Striped Field-Mouse
<i>Saccostomus capestris</i>	Pouched Mouse
<i>Malacothrix typical</i>	Large-eared Mouse (on calcrete)
<i>Graphiuurs ocularis</i>	Spectacled dormouse
<i>Mus minutoides</i>	Pygmy Mouse
<i>Aethomys namaquaensis</i>	Namaqua Rock Mouse
<i>Parotomys brontsii</i>	Bront's Whistling Rat
<i>Otomys unisulcatus</i>	Karoo Bushrat
<i>Thallomys nigricauda</i>	Black-tailed Tree Rat (camel-thorn)
<i>Cryptomys hottentotus</i>	Common Mole Rat
<i>Rattus rattus</i>	Domestic Rat
<i>Lepus capensis</i>	Cape Hare
<i>Lepus saxatilis</i>	Shrub Hare
<i>Pedetes capensis</i>	Springhare
<i>Pronologus ruperstris</i>	Smith's Red Rock Rabbit
<i>Helogale parvula</i>	Dwarf Mongoose
<i>Cynictis penicillata</i>	Yellow Mongoose
<i>Atilax paludinosus</i>	Water Mongoose
<i>Galerella sanguinea</i>	Slender Mongoose
<i>Ictonyx striatus</i>	Striped Polecat
<i>Genetta genetta</i>	Small Spotted Genet
<i>Xerus inauris</i>	Ground Squirrel
<i>Funisciurus congicus</i>	Striped Ground Squirrel
<i>Atelerix frontalis</i>	Cape Hedgehog
<i>Felis caracal</i>	Caracal
<i>Felis lybica</i>	African Wild Cat
<i>Felis nigripes</i>	Small Spotted Cat
<i>Otocyan megalotis</i>	Bat-eared Fox
<i>Vulpes charma</i>	Cape Fox
<i>Canis mesomelas</i>	Black-backed Jackal
<i>Hystrix africanaustralis</i>	Porcupine
<i>Orycteropus afer</i>	Aardvark
<i>Phacochoerus aethiopicus</i>	Warthog
<i>Manis temniinckii</i>	Cape Pangolin
<i>Suricata suricatta</i>	Meerkat
<i>Sylvicapra grimmia</i>	Common Duiker
<i>Raphicerus campestris</i>	Steenbok
<i>Tragelaphus strepsiceros</i>	Kudu

Endangered Species

The fauna listed below are endangered species that are most likely to occur in the area according to the Red Data Book – Birds (Barnes, Keith N, 2000) and the Red Data Book – Mammals (Smithers 1989 & Branch 1988). The following definitions apply:

Vulnerable

Taxa of which all or most populations are decreasing because of: over exploitation, extensive destruction or degradation of their habitat, or other environmental disturbances. This means that the species is considered to be facing a high risk of extinction in the wild.

Rare

Taxa with small population sizes, which are not permanently endangered or vulnerable; but are potentially at risk.

▪ **Endangered Mammals**

Scientific Name	Common Name	Status
<i>Aonyx capensis</i>	Cape Clawless Otter	Unknown
<i>Felis lybica cafra</i>	African Wild Cat	Vulnerable
<i>Manis temminckii</i>	Cape Pangolin	Vulnerable
<i>Orycteropus afer</i>	Antbear	Vulnerable
<i>Atelerix frontalis</i>	Cape Hedgehog	Rare
<i>Naja nigricollis woodi</i>	Black Spitting Cobra	Rare
<i>Proteles cristatus cristatus</i>	Aardwolf	Rare
<i>Felis nigripes nigripes</i>	Small Spotted Cat	Rare

▪ **Endangered Birds**

Scientific Name	Common Name	Status
<i>Gyps coprotheres</i>	Cape Vulture	Vulnerable
<i>Gyps africanus</i>	African Whitebacked Vulture	Vulnerable
<i>Torgos tracheliotos</i>	Lappetfaced Vultures	Vulnerable
<i>Aquila rapax</i>	Tawny Eagle	Vulnerable
<i>Polemactus bellicosus</i>	Martial Eagle	Vulnerable
<i>Anthropoides paradiseus</i>	Blue Crane	Vulnerable
<i>Ardeotis kori</i>	Kori Bustard	Vulnerable
<i>Neotis ludwigii</i>	Ludwig's Bustard	Vulnerable

1.8 **Natural Vegetation**

The study area falls within the Savannah Biome. The Savannah Biome is the largest biome in Southern Africa, occupying 46% of its area, and over one-third the area of South Africa. It is well developed over the low veldt and Kalahari region of South Africa and is also the dominant vegetation in Botswana, Namibia and Zimbabwe.

It is characterised by a grassy ground layer and a distinct upper layer of woody plants.

Where this upper layer is relatively low, this vegetation type is often referred to as Shrub veldt. Dense areas are often referred to as Woodland, and the intermediate stages are known as Bush veldt. A major factor that determines the distribution of this biome is low rainfall which prevents the upper layer from dominating. The grass layer prospers where the growing season is hot and moist. Most of the savannah vegetation types are suitable for grazing.

Gordonia Duneveld

This type consists of loose to partially stabilised sand dunes with very sparse vegetation that occur primarily at the footslopes of such dunes. There are no known endemics in this vegetation and at national scale this vegetation type has not been transformed.

Although none of this vegetation is conserved, it is not considered to be a threatened vegetation type. It contains protected tree species such as Camel Thorn (*Acacia erioloba*) and Sheppards Tree (*Boscia albitrunca*).

The *Gordonia* Duneveld vegetation type is regarded as “Least Threatened” because almost 14% of the type is statutorily conserved in the Kgalagadi Transfrontier Park.

Southern Kalahari Salt Pans

This type occurs as low grasslands on pan bottoms (these are often devoid of vegetation) often dominated by *Sporobolus* species, with a mixture of dwarf shrubs. The low shrubland dominated by *Lycium* and or *Rhigozum* usually forms part of the outer belt in the salt pan zonation systems.

The Vegetation map of South Africa by Mucina, Rutherford & Powrie 2005 groups the salt pans of this area north of Upington into their own Vegetation Unit namely Southern Kalahari Salt Pans (refer to Figure 6 below). The surface of salt pans is normally so brack that no vegetation can grow there (Leistner 1967). The vegetation only occurs in some instances on the marginal zone of the pan and is characterized by a higher number of plants, mainly mesembs and a few grasses.

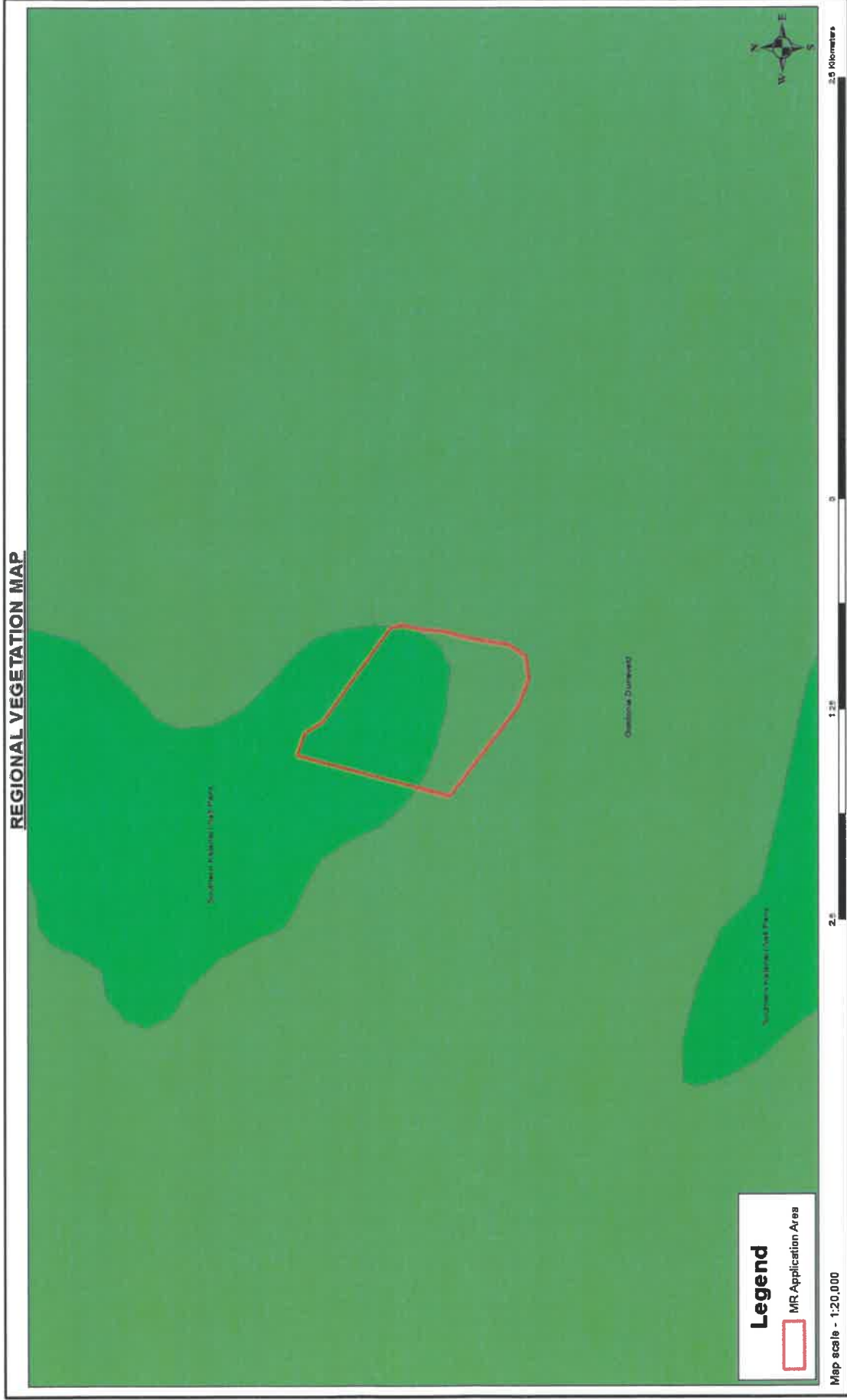


Figure 6: vegetation map of Annesley 338

1.9 Surface Water

All information under this section is taken out of the Hydrogeological & Hydrological Impact Assessment for Annesley Salt Mine by SRK Consulting (Pty) Ltd, June 2018 and attached as Appendix 4.

Water Resource Sensitivity

The nearest water body to the proposed project is the salt pan in which the project will be located. Other salt pans (nearest is about 3 km from the project) are also located in the area. No rivers or streams were observed on satellite images (Google earth).

Floodline determination is beyond the scope of the current project, and is not necessary for determining impacts as the project is clearly within a pan that may be inundated occasionally. Nonetheless, it can be stated that the floodline is likely to lie very close to the salt pan or possibly be contained within it given the evaporative, non-draining conditions.

No true riparian habitat exists, as water in the salt pan is extremely intermittent and saline. For example, during a 1 in 2 year, 24 hour storm event, only 35.5 mm of rain are likely in the pan itself and little runoff is expected from the catchment.

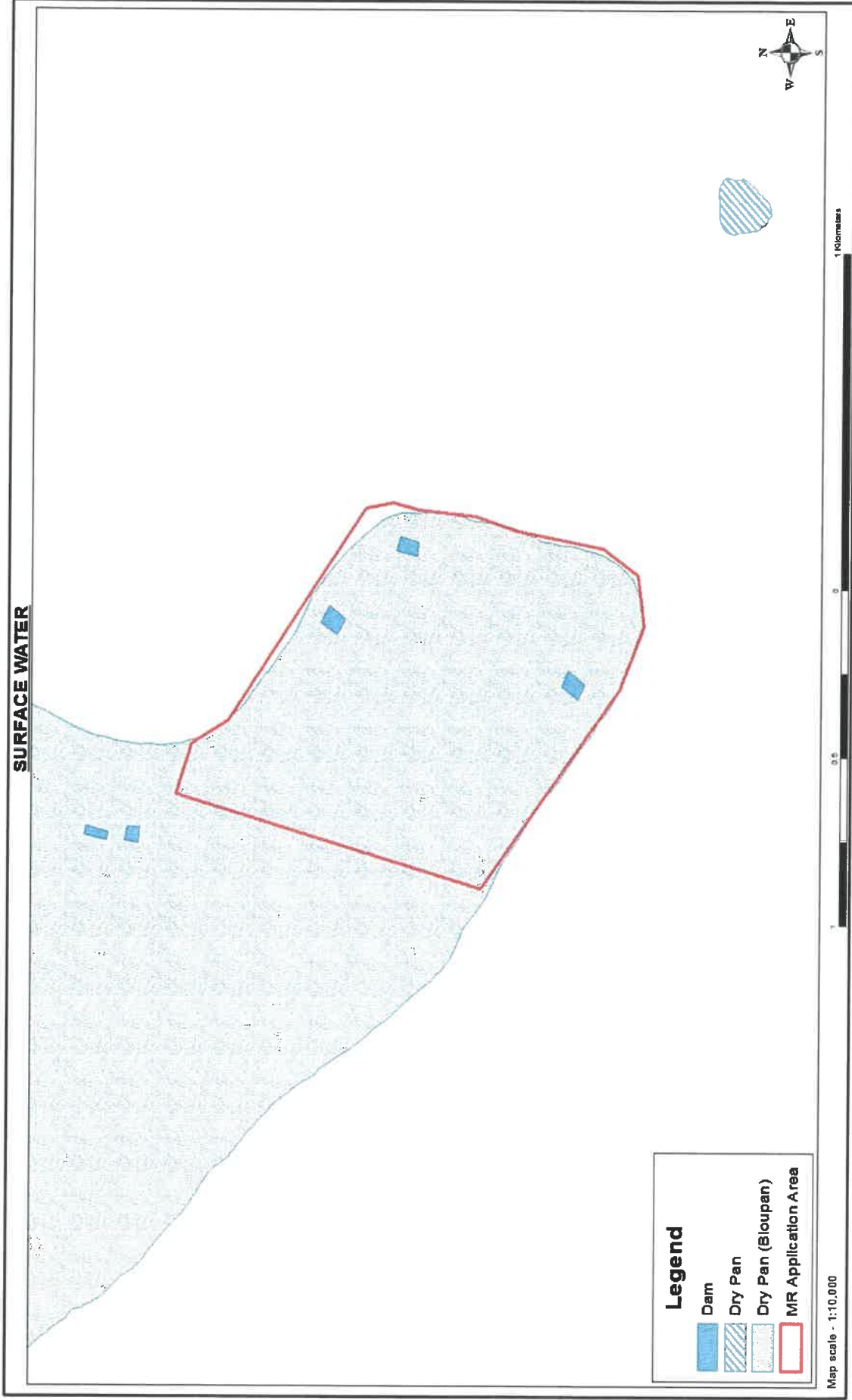


Figure 7: Surface water features in the mining application area

Water Quality

Surface water quality

It is not possible to collect surface water samples for quality analysis at the site, as standing surface water is such a rare occurrence.

Wetlands

No stream morphology is described as no streams or rivers were observed. The salt pan on the other hand is seen as a water body and a seasonal/partial wetland.

A few short, localised drainage channels (possibly natural erosion lines) were observed on the slopes around the salt pan (what would be the banks in a typical pan). These small channels indicate that water probably periodically flows into the salt pan from the immediate surrounds. The pan is likely to become inundated in times of intense rainfall events during the summer months. Thereafter, water will slowly evaporate leaving any salts behind.

Other hydrological losses are not expected to be significant because the pan is the lowest point in the landscape and thus water cannot flow downstream and seepage through the bed of the pan will be very low (the most likely reason why the pan exists in this location at all, and also the reason that salts naturally concentrate in the pan with time).

The morphology of the salt pan is shown in a depression with a bed that is flat and hardened with crystallised salts on the surface. It is underlain by clay and weathered tillite with very low permeability.

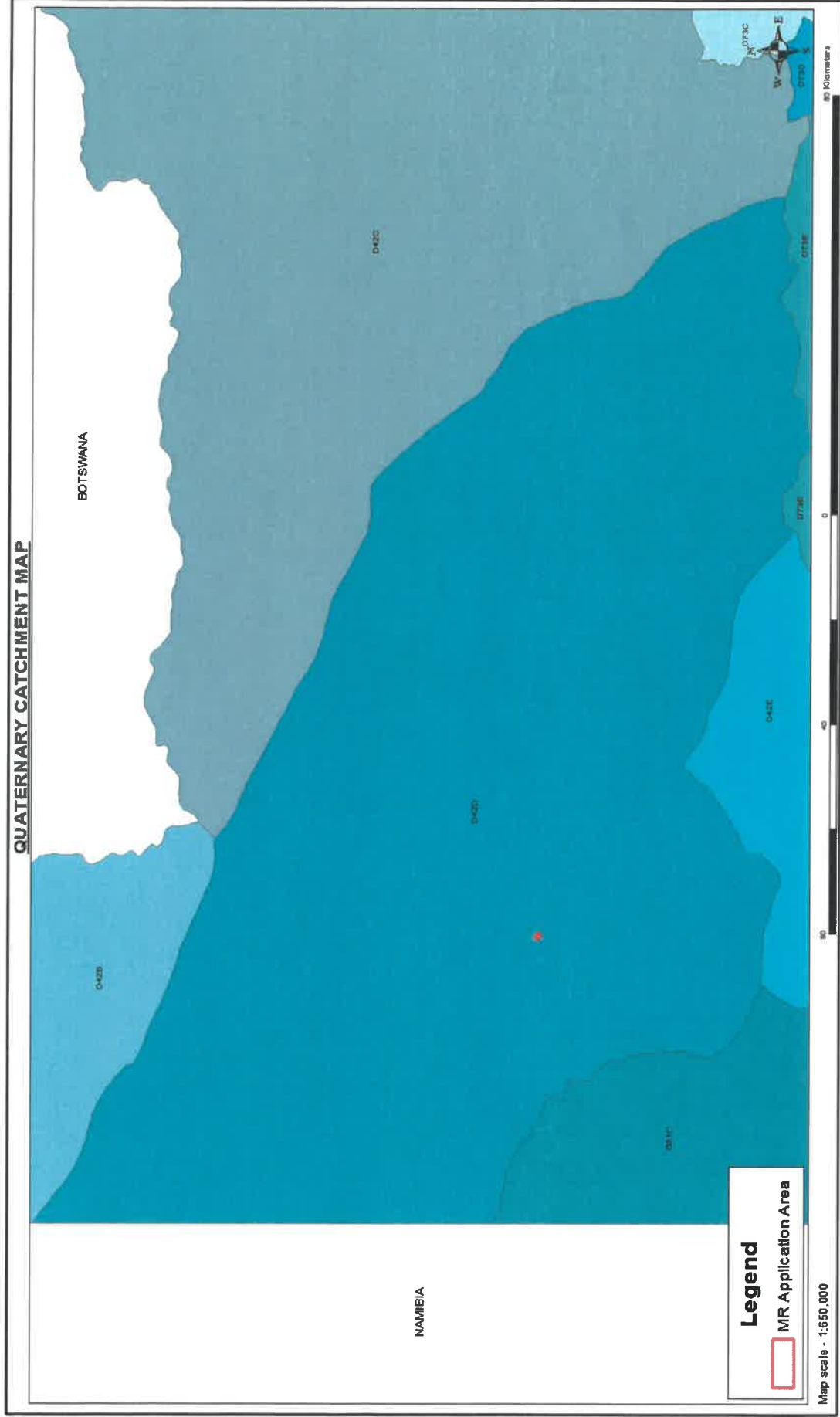


Figure 8: Quaternary Catchment Map

1.10 Ground Water

Underlying Aquifers

Catchment and Process Water Demands

The site is located within Quaternary catchment D42D. This catchment is listed under Zone A of the Groundwater Taking Zones in the Revision of General Authorisations (GA) in Terms of Section 39 of the National Water Act, 1998 (DWAf 2004 & 2012). For Zone A, no water may be taken under GA except as set out under Schedule 11 (DWS, 2016).

Operation Demand

The groundwater storage and resource potential of Quaternary catchment D42D was derived from the DWS, national groundwater resource assessment phase 2 (GRA2) dataset (DWAf, 2005). As boreholes cannot harvest all the available recharge in an area, an exploitability factor (DWA IF, 2005) was used to calculate the volume of groundwater that can actually be abstracted from boreholes (i.e. the utilisable exploitation potential). Reported abstraction was subtracted from this calculated value to determine the utilisable groundwater exploitation potential of the catchment. These calculated values are summarised in Table 7.

Table 7: Groundwater storage and resource potential of Quaternary catchment D42D

Drainage Region	Extent (km ²)	Volume of Water stored in Aquifer (m ³)	5m Drawdown Storage Volume (m ³)	Est. Abstraction (m ³ /a)	Mean Potential Recharge (m ³ /a)	Mean Groundwater Resource Potential (m ³ /a)	Mean Utilisable Groundwater Exploitation Potential (m ³ /a)
D42D	16 209	6 089 570 000	317 942 000	789 589	12 296 920	15 119 884	15 010 500

The GRA2 data indicates that Quaternary catchment D42D has an estimated mean potential recharge of approximately c.12.3 million cubic metres per annum (Mm³/a) and an utilisable groundwater exploitation potential (UGEP) of c.15 Mm³/a. The potential volume of water stored in the D42D aquifers is estimated at c.6 089.6 Mm³.

In comparison, the annual water demand of Annesley Salt proposed salt mine is 105 300 m³/a, which equates to c.0.7 % of UGEP and <0.002 % of aquifer storage. This demand will be obtained from three existing boreholes located in the salt mining area, with abstraction spreading over six harvest cycles (six weeks each) during the warmer months of the year, i.e. pumping for approximately nine months per annum, with an average abstraction of c.14 m³/h from NH1 and NH2, and c.4.5 m³/h from borehole NH3.

A total 258 859 m³/a of groundwater is registered on the DWS 2database by 14 water users in Quaternary catchment D42D, which equates to c.1.7 % of UGEP and c.0.004 % of aquifer storage (see

Appendix A for information received from the DWS). Of this registered amount, 254 359 m³/a is registered for mining use, presumably for salt mining.

Should a WUL be granted to Annesley Salt for the proposed abstraction, the combined abstraction from the brine aquifer in Quaternary catchment D42D will amount to c.364 159 m³/a, which equates to 2.43 % of UGEP and c.0.006 % of aquifer storage.

Based on the available groundwater information, and the above comparisons, it can be concluded that there is more than adequate brine/groundwater available in the Quaternary catchment D42D aquifers to satisfy the water demand of the existing registered users and Annesley Salt's proposed new salt mine at Bloupan.

Ground Water Quality

Water samples were collected at the end of each pumping test and submitted to Talbot Laboratories after completion of all three of the pumping tests in April 2018. The analysis results are summarised in Table 2-8 of the geohydrological report. The groundwater from all three boreholes indicates an EC of more than 31 000 mS/m. The TDS of the three boreholes exceeds 225 000 mg/L, which is more than 6 times higher than that for seawater. This hypersaline (brine) groundwater cannot be used for human or animal consumption, or for irrigation purposes. The only practical use is source water supply for evaporative salt mining. The analysis certificates are in Appendix C.

On the hydrogeological map of the region, the groundwater EC is indicated as >1 000 mS/m in the study area (DWAF, 2001), whilst an EC of 5 410 mS/m is reported in the NGA for borehole 2720BD00003. This highly saline groundwater also cannot be used for human or animal consumption, or for irrigation purposes.

1.11 Cultural and Heritage Resources

No areas of cultural, historical or archaeological interest were identified. A Archaeologist will be contacted to do a phase 1 assessment to confirm this.

1.12 Air Quality

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 mining activity.

Existing Sources

The current source of air pollution in the area stems from numerous gravel roads and from vehicles travelling on the gravel roads of the area.

No other significant sources of air- or dust pollution currently exist in the study area. Negligible amounts of exhaust fumes are emitted by the mining machinery and vehicles used on the farm. A small

amount of dust pollution is furthermore caused by the trucks transporting salt to the markets.

New Source

The growing of salt is a wet process and therefore would not add to dust. The source of air pollution on the farm will be nuisance dust generated by the movement of trucks and vehicles on the mining roads. Gas emissions from machinery will be within legal limits.

Areas of Impact

As the prevailing wind direction for the area is north to north-west for the months January to September and changing from north to sometimes westerly winds during October to December, there is negligible a potential for fall-out dust to impact on the surrounding farm properties, which can be described as the nearest potential area of impact. The dust management programme recommended should include daily dosing of access roads and stockpile areas.

1.13 Noise

No significant sources of noise are evident in the study area. The access to the mine will be from the R360 Upington, Noenieput tar road and a gravel road, as well as farm tracks on the mine property. The tar road R360 that forms the one boundary of the application area and the traffic would be the most prominent source of noise.

1.14 Visual Aspects

The mining area is not visible from the tar road R360 between Upington and Noenieput. The mining area is reached via a gravel road that transects the application area and farm tracks. There are no residential areas within the surrounding area. The mine is not located on any tourist route and will not be visible to the average tourist.

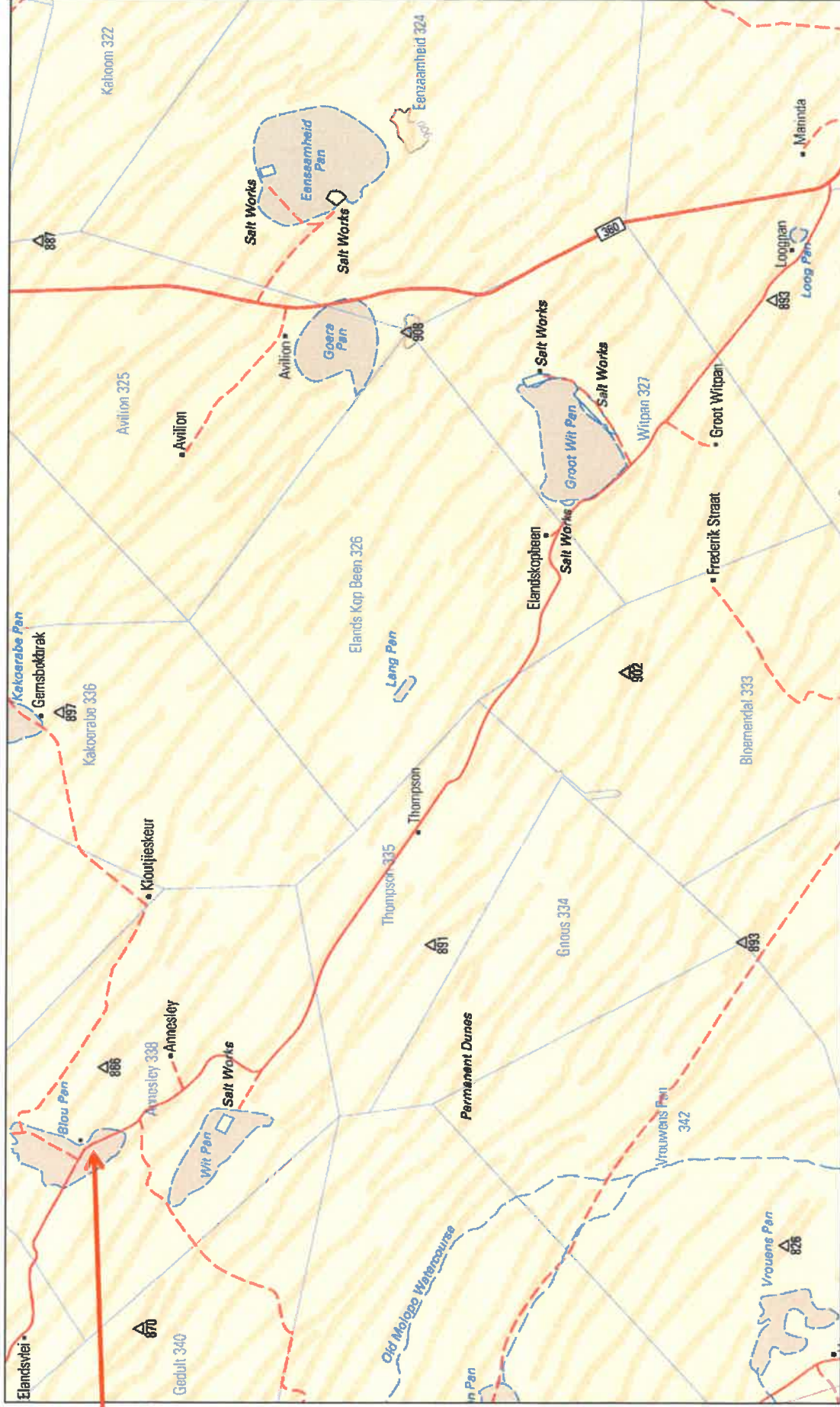


Figure 9: Showing all roads to Annesley 338 (indicated with a red arrow) on the 2720 Noenieput 1:250 000 Topocadastral Map

1.15 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.

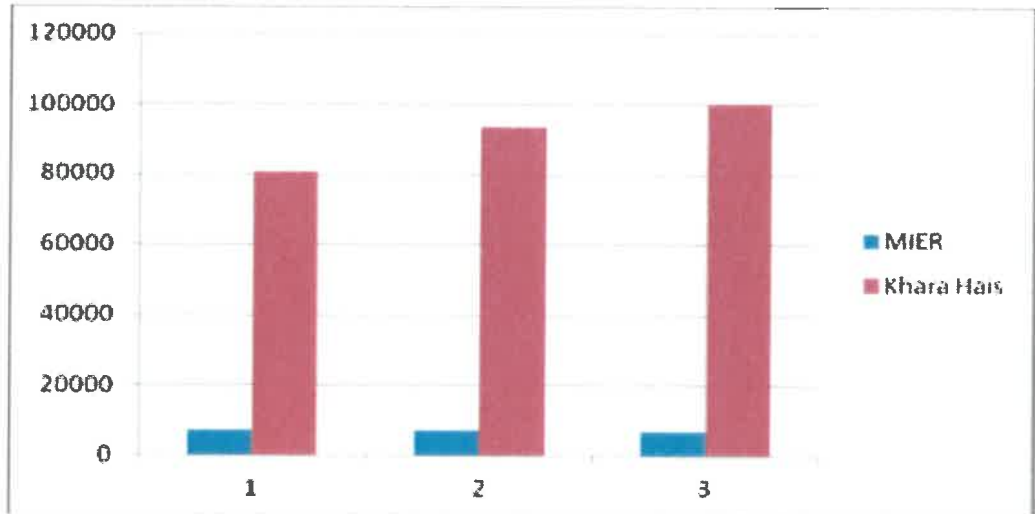
Description	2001	2011
Total population	77,919	93,494
Young (0-14)	31,7%	29,8%
Working Age (15-64)	63,0%	64,6%
Elderly (65+)	5,3%	5,5%
Dependency ratio	58,7%	54,7%
Sex ratio	95,5	97
Growth rate	-0,73% (2001-2011)	1,82% (2001-2011)
Unemployment rate	34%	22,1%
Youth unemployment rate	42,3%	29%
No schooling 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

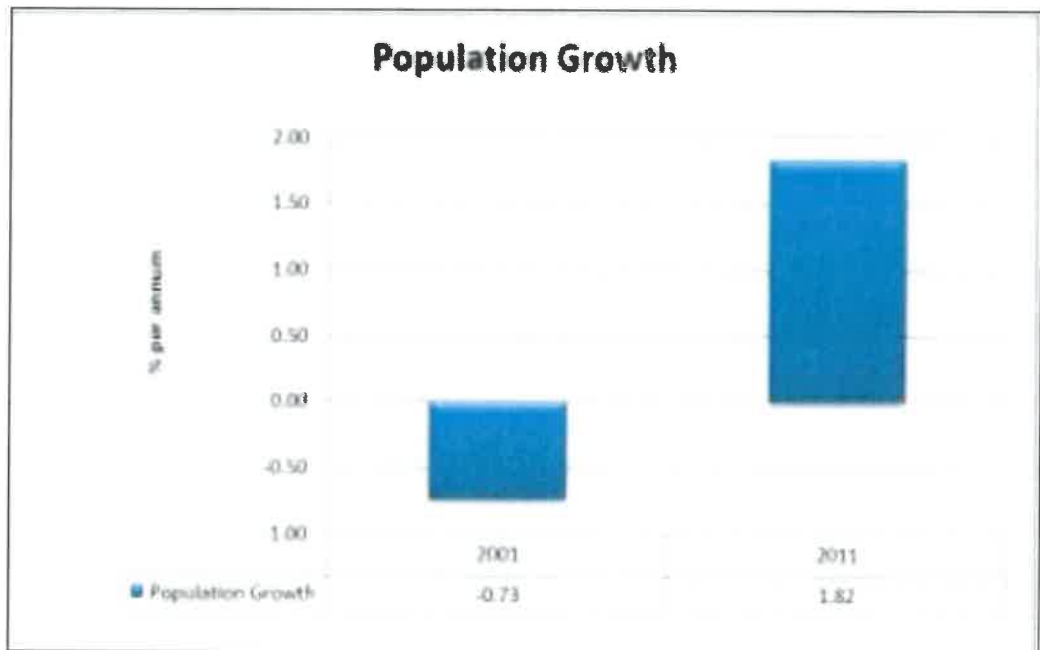
Table 8, indicates that the Khara Hais area, population was 100 497 in 2011. This reflects an overall population growth of 1.82% between 2001 and 2011. Dawid Kruiper Local Municipality is the most populous municipality in ZF Mcgawu District.

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 jurisdiction.



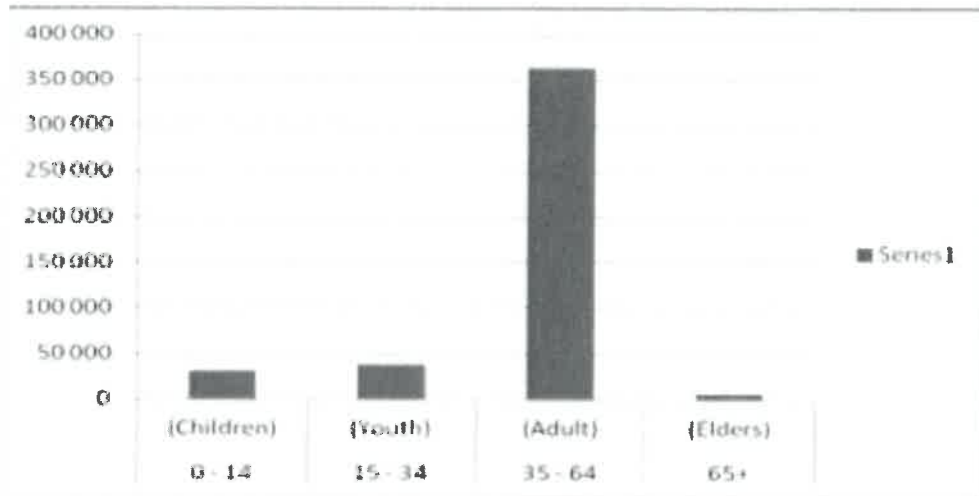
	1996	2011	2016
Mier	7026	7003	6879
Khara Hais	80 823	93494	100 282

Graph 1: Population (Source – Stats SA)



Graph 2: Population Growth (Source – Stats SA)

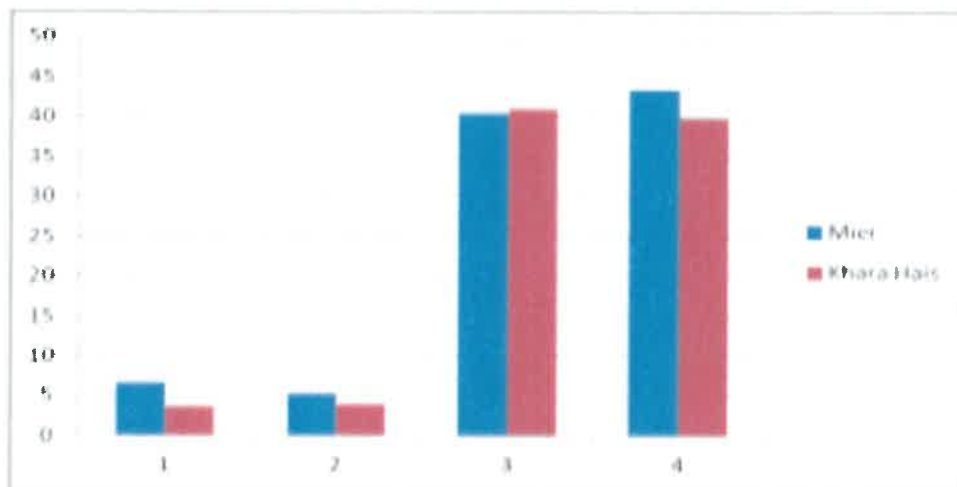
The fertility rate in Dawid Kruiper has declined significantly over time. As a result children aged 0–15, decline with 1.9% since 2001. (From 31.7% in 2001, to 29.8% in 2011.)



30677	38149	32316	6019
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Graph 3: Age Structure (Source – Stats SA)

The working age population steadily grew over the 10 year period to 64.6% 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: Dependency 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 9 below.

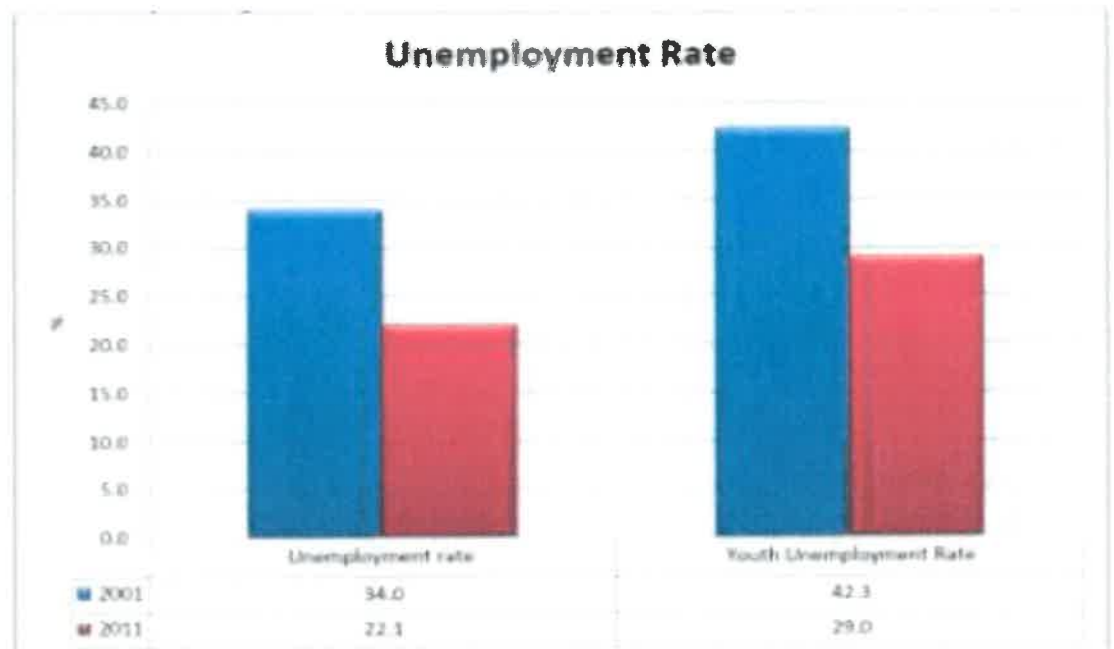
Sex	Percentage
Female	50,7%
Male	49,3%

Table 9 – Gender (Source: Stats SA)

UNEMPLOYMENT RATE AND EDUCATION

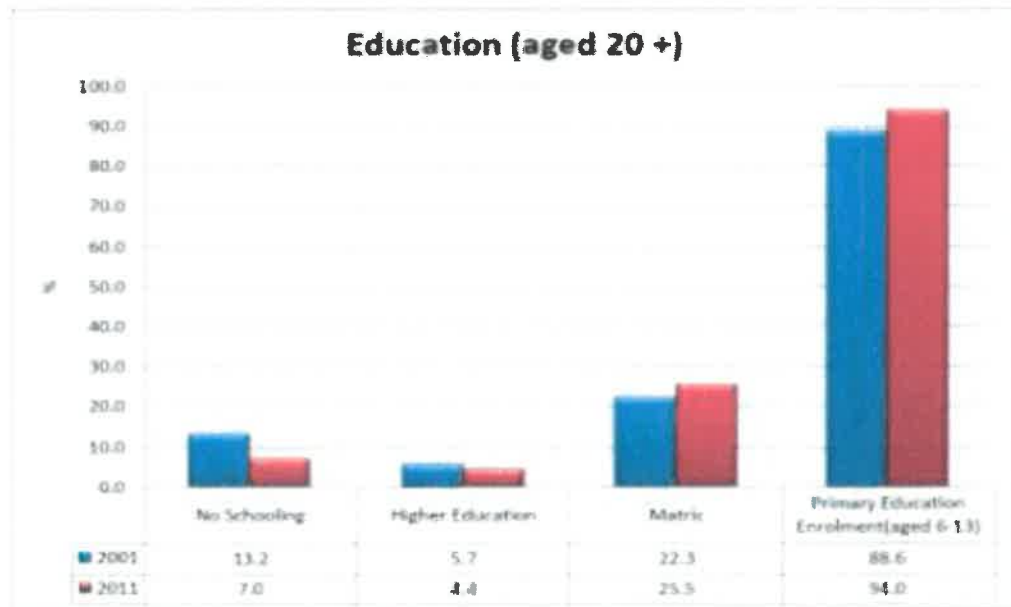
The unemployment rate decreases significantly from 34% in 2001 to 22.1% in 2011.

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 the Dawid Kruiper population are between 14 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 (Source – 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.

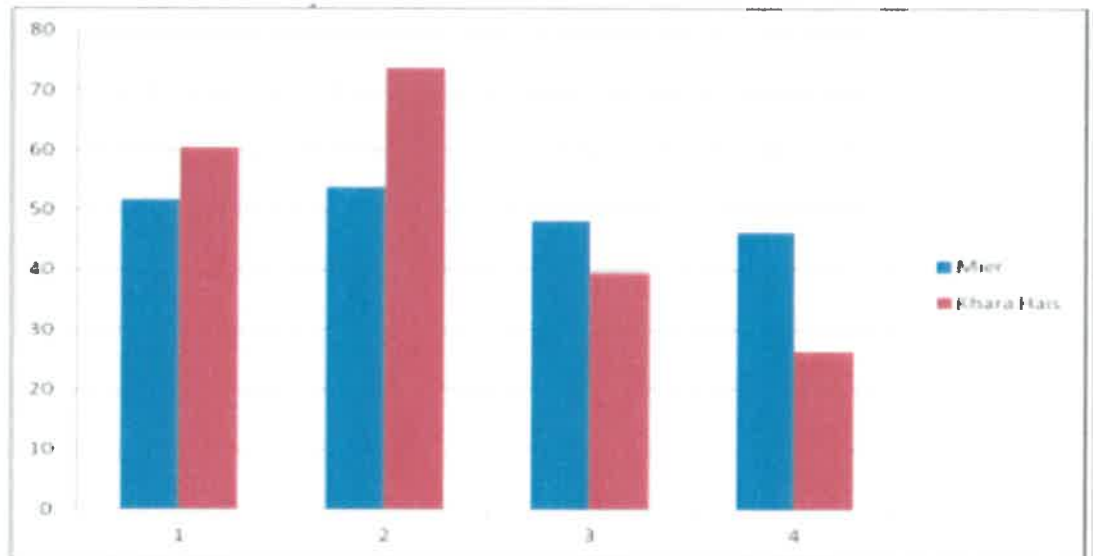
Formal dwellings decrease from 81.2% in 2001 to 75.2% in 2011. This could be contributed to establish of more informal settlements and the slow delivery of subsidised houses.



Graph 8: Household Dynamics (Source – Stats SA)

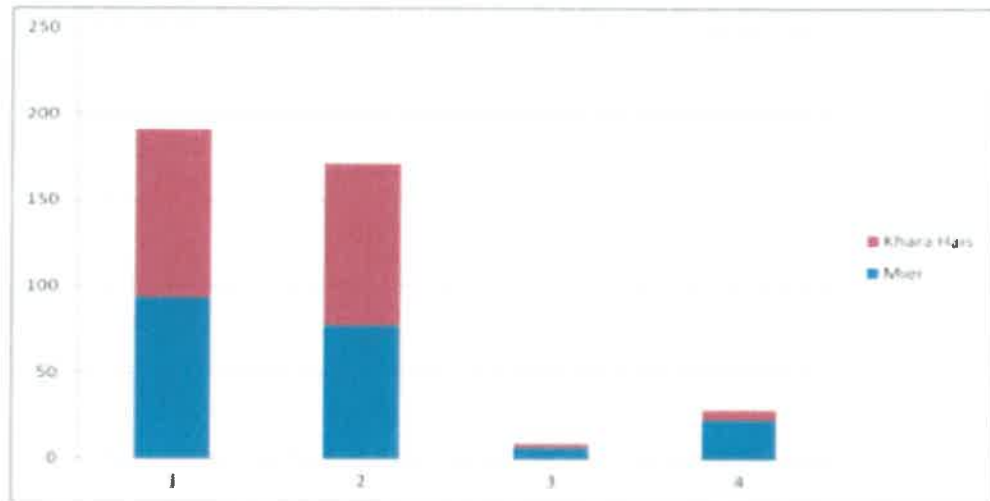
HOUSEHOLD SERVICES

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 10 and 11 below.

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

Table 10 – 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 11 – Language (Source: Stats SA)

CONCLUSION

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

1.17 Sensitive Landscapes

“Sensitive Environments” that have statutory protection are the following:-

1. Limited development areas (Section 23 of the Environmental Conservation Act, 1989 (Act 73 of 1989).
2. Protected natural environments and national heritage sites.
3. National, provincial, municipal and private nature reserves.
4. Conservation areas and sites of conservation significance.
5. National monuments and gardens of remembrance.
6. Archaeological and palaeontological sites.
7. Graves and burial sites.
8. Lake areas, offshore islands and the admiralty reserve.
9. Estuaries, lagoons, wetlands and lakes.
10. Streams and river channels and their banks.
11. Dunes and beaches.
12. Caves and sites of geological significance.
13. Battle and burial sites.
14. Habitat and/or breeding sites of Red Data Book species.
15. Areas or sites of outstanding natural beauty.
16. Areas or sites of special scientific interest.
17. Areas or sites of special social, cultural or historical interest.
18. Declared national heritage sites.
19. Mountain catchment areas.
20. Areas with eco-tourism potential.

(b) Description of the Current Land Uses

Please see Baseline Description above.

(c) Description of Specific Environmental Features and Infrastructure on the Site

Please see Baseline Description above.

(d) Environmental and Current Land Use Map

(Show all environmental, and current land use features)

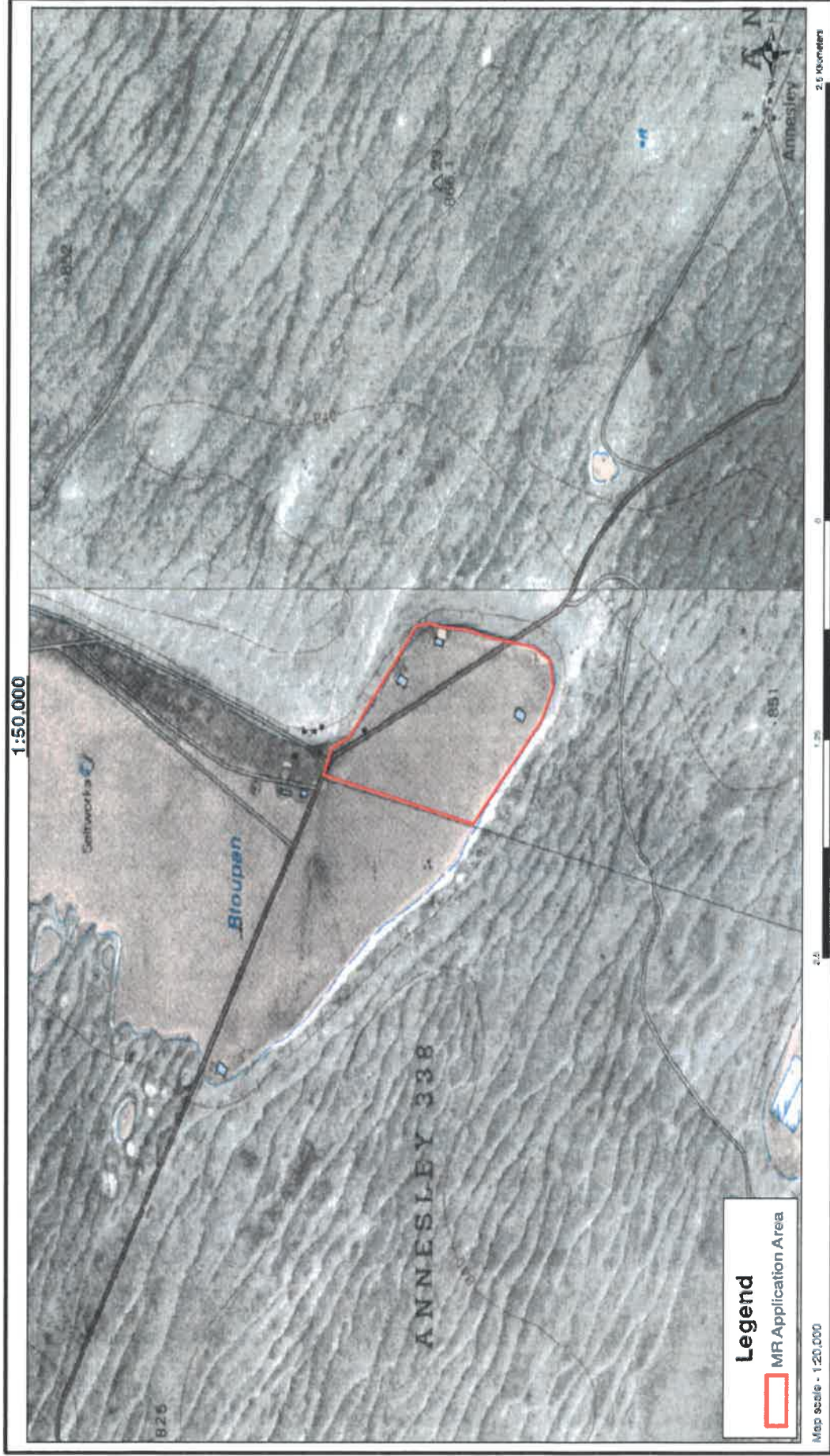


Figure 10 : Show all environmental, and current land use features

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)

Table 12: Impacts Identified

Environmental Factor	Nature of Impact	Significance	Probability	Duration	Consequence	Management
PHYSICAL						
Geology and mineral resource	Sterilisation of mineral resources.	Very low	Highly unlikely	Decommissioning	Insignificant	Ensure that optimal use is made of the available mineral resource.
Topography	Changes to surface topography due to construction of evaporation ponds, topsoil removal, placement of infrastructure.	Low to medium	Certain	Post-closure	Moderate	Employ effective rehabilitation strategies to restore surface topography of evaporation ponds.
Soils	Soil erosion by water and wind on disturbed and exposed soils; potential for dust production and soil microbial degradation; potential contamination of soils due to spillages.	Low	Possible	Life of operation	Minimal	Employ appropriate management strategies to preserve all resources.
Land Capability	Loss of land capability through topsoil removal, disturbances and loss of soil fertility.	Very low	Possible	Short term	Minimal	Employ appropriate rehabilitation strategies to restore land capability.
Land use	Loss of land use due to poor placement of surface infrastructure and ineffective rehabilitation.	Very low	Possible	Short term	Minimal	Carefully plan the placement of infrastructure and employ rehabilitation strategies to restore land capability.
Ground water	Pollution of underground water sources.	Low	Possible	Decommissioning	Minimal	Construction measures to prevent seepage into the groundwater by biological and engineering means. Implementation of the necessary management programs to ensure the integrity of ground water resources.
Surface water	Deterioration in water quality through spillages.	Low	Certain	Decommissioning	Critical	Prevention of overspill of mine associated activities into the surrounding environment.

								Implementation of the necessary management programs to ensure the integrity of run off surface water resources.
Indigenous flora	The clearance of vegetation; potential loss of floral species with conservation value; potential loss of ecosystem function.	Low to medium	Certain	Life of operation	Major	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection and rehabilitation strategies.		
Alien invasive plants	Proliferation of alien invasive plant species.	Low to medium	Certain	Decommissioning	High	Eradicate and control the spread of alien invasive species.		
Fauna	Displacement of faunal species.	Low	Possible	Life of operation	Minimal	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection strategies.		
Habitat	The loss, damage and fragmentation of floral and faunal habitats; potential loss of ecosystem function.	Low to medium	Certain	Residual	Critical	Prevention of overspill of mine associated activities onto the surrounding ecological environment. Employ proper protection strategies.		
Air quality	Sources of atmospheric emission associated with the mining operation are likely to include fugitive dust from gravel roads, wind erosion of stockpiles and vehicle entrainment of road dust.	Minimal	Certain	Decommissioning	Minimal	Effective soil management; identification of the required control efficiencies in order to maintain dust generation within acceptable levels.		
SOCIAL SURROUNDINGS								
Noise and vibration	Increase in continuous noise levels; the disruption of current ambient noise levels; and the disruption of sensitive receptors by means of increased noise and vibration.	Low	Certain	Decommissioning	Minimal	Minimise the generation of excessive noise and vibration; ensure all vehicles and equipment is in a good working order.		
Visual impacts	Visual impacts of the mine infrastructure, evaporation ponds ; visibility of dust.	Low	Possible	Decommissioning	Minimal	Effective planning of the location of infrastructure and operations to minimise visual impact.		
Traffic	Potential negative impacts on traffic safety and deterioration of the existing road networks.	Low	Low likelihood	Decommissioning	Minimal	Utilise existing access roads, where applicable; implement measures that ensure adherence to traffic rules.		

Heritage resources	The deterioration of sites of cultural and heritage importance.	Low to medium	Certain	Residual	Major	Preservation and protection of heritage and cultural resources identified within a no go zone; further resources uncovered during mining activities need to be reported to a suitably qualified archaeologist.
Socio-economic	<u>Negative:</u> Loss of agricultural potential; influx of workers to the area increases health risks and loitering (resulting in lack of security and safety); negative impact of employment loss during mine closure.	Low and low to medium	Certain	Short-term and closure	High and major	Application of commitments made in the Social and Labour Plan; implementation of community development programmes.
Interested and affected parties	Loss of trust and a good standing relationship between the IAPs and the mining company.	Low to medium	Possible	Decommissioning	High	Ensure continuous and transparent communication with IAPs.

Environment likely to be affected by the alternative land use

Mining will not be new land use over this area. The areas that will be used for evaporation ponds makes up about $\pm 8\%$ of the total area being applied for. The area will not be enlarged as the mining of salt is dependent on the groundwater availability and it will not be pumped excessively as the mine's life will then be shortened.

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 was 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**
 - **Pan**
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.

Construction and implementation phases**Phase 1. (Implementation)**

There are no existing structures or buildings on the mining application area. The property will be leased by Annesley Salt (Pty) Ltd from the owner, which lease agreement has already been successfully negotiated, subject to the approval and granting of a mining right by the Department of Mineral Resources to Annesley Salt (Pty) Ltd.

Phase 1 will consist of the erection of the first two family housing units which will be pre-fabricated houses, a dedicated workshop and washbay area, diesel tank within a concrete floor and bundwall area and a dedicated generator site within a concrete floor and bundwall area on the mining site. Electricity supply for all housing units will be from renewable energy sources, in this case solar energy. This phase will commence as soon as a mining right have been granted to Annesley Salt (Pty) Ltd.

At the same time the construction of 10 salt evaporation dams will commence together with the installation of the three borehole pumps and pipe network which will distribute the brine from the boreholes to the salt evaporation dams.

Once the boreholes are drilled, the identified area would then be opened up by digging evaporation dams 10 X (100m x 60m x 0.6m dams). The dams will be opened up to the clay level (300 mm deep below natural ground level) and dams built to 600mm from the floor formed by the hardened sulphates (floor 150mm thick) up to 450 mm above natural ground level to compensate for the 1 in 50 year flood level. Brine from the boreholes is pumped into the dams, allowing water to evaporate. The brine water is harrowed periodically depending on the speed of evaporation. Thus helping the forming of salt crystals and keeping salt from forming a base that cannot be cultivated. The salt crystals are collected as coarse salt and stock piled.

Phase 2. (Expansion)

After the first year that the mining right is granted Annesley Salt (Pty) Ltd plans to erect the last two pre- fabricated family housing units.

The criteria used to assess the significance of the impacts are shown in the table 23 below/overleaf. 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:

$$(Severity + Extent + Duration) \times Probability \text{ weighting}$$

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 23: 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 be made the following evaluation criteria need to be described.

Table 24: 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 25: 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 Dawid Kruiper area
4	Regional/District Regional	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 26: 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 27: 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)

Alternatives

1. The option of not proceeding with the proposed mining operation

Not proceeding with the proposed mining operation will have the following positive and negative consequences:-

Positive:

The roads leading to the study area will not be damaged as a result of frequent use by trucks transporting salt to markets.

Negative:

- ✚ 5 Employees of who originate from within the boundaries of the Dawid Kruiper Local Municipality will be left unemployed, thereby contributing to the unemployment rate of this municipal area.
- ✚ 5 Households will be left without any source of income.
- ✚ A probable increase in the social phenomena normally associated with unemployment, namely crime, alcohol abuse, etc. may occur.
- ✚ An opportunity to uplift and positively impact on the lifestyles of 5 individuals, through various initiatives will be missed; and
- ✚ An opportunity for contributing to cultural cohabitation will be missed.

It clear from above that the benefits of proceeding with the proposed mining operation far outweigh the disadvantages thereof.

2. Alternative mining method

No alternative to the mining method used by the applicant was considered as a result of the nature of the resource.

3. Land-use alternatives

Livestock and game farming

As a result of the climate of the area; non-rich soils; the topography of the area and the distance to the nearest surface water, is that the land lends itself to an activity such as livestock farming.

These activities can, however, be successfully practiced in combination with the mining of salt. This is therefore not an “either-or” situation, the activities which the land lends itself to can be successfully practiced in tandem with the proposed mining operation. If practised in an environmentally sustainable way, the applicant and the farm owner can continue with their activities, neither of the mentioned activities need to have a detrimental effect on the other.

Utilising the study area and surrounding areas exclusively for livestock farming purposes would have the following positive and negative consequences:-

Positive:

The roads leading to the study area will not be damaged as a result of frequent use by truck transporting salt to the markets.

Negative:

- ✚ Downscaling in terms of the number of employees as a result of the fact that livestock and game farming are less labour intensive than salt mining.
- ✚ An increase in the unemployment rate of the Dawid Kruiper municipal area.
- ✚ Several households will be left without any source of income.

- ⬇ A probable increase in social phenomena normally associated with unemployment, namely crime, alcohol abuse, etc. may occur.
- ⬇ A positive contributor to the local economy will be removed.

Ecotourism

Utilising the study area and surrounding areas exclusively for ecotourism purposes would have the following anticipated positive and negative consequences:-

Positive:

- ⬇ The roads leading to the study area will not be damaged as a result of frequent use by trucks transporting salt to the markets; and
- ⬇ A positive impact on the local economy through money spent by tourists in local areas.

Negative:

- ⬇ Downscaling in terms of the number of employees.
- ⬇ An increase in the unemployment rate of the Dawid Kruiper municipal area.
- ⬇ Several households will be left without any source of income.
- ⬇ A probable increase in the social phenomena normally associated with unemployment, namely crime, alcohol abuse, etc. may occur.
- ⬇ An increase in traffic on local gravel roads.
- ⬇ A positive contributor to the local economy will be removed.

4. Alternative location

No alternative location for the proposed mining operation was considered, as the mining of salt is very specific in terms of the location of the salt pan or resource (in terms of the location of brine and pans) specific.

5. Alternatives suggested by interested and/or affected parties

No suggestions for alternatives regarding any of the aspects of the proposed mining operation were received from interested and/or affected parties yet and will therefore be considered in planning of the proposed mining operation.

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 pumping of the brine water should be done with sustainability in mind not to create a situation where the brine water is diluted and cannot be used for growing of salt crystals any more.

Topography

Level of risk: Low

Mitigation measures

- Employ effective rehabilitation strategies to restore surface topography of evaporation ponds and stockpile site.
- Stabilise the pan surface.
- All temporary infrastructures will be demolished during closure.

Soil Erosion

Level of risk: Very low

Mitigation measures

- At no point may plant cover be removed within the no-development areas.
- All attempts must be made to avoid exposure of dispersive soils.
- 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, wherever possible.
- Construction that requires the clearing of large areas of vegetation and evaporation ponds should ideally occur during the dry season only.
- Construction during the rainy season (November to March) should be closely monitored and controlled.
- The run-off from the exposed ground should be controlled with the careful placement of flow retarding carriers.
- The soil that is excavated during construction should be stock-piled in layers and protected by berms to prevent erosion.
- Audits must be carried out at regular intervals to identify areas where erosion is occurring.
- Appropriate remedial action, including the rehabilitation of eroded areas, must occur.
- Dust suppression must take place, without compromising the water balance of the area.
- 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.

Soil Pollution

Level of risk: Very low

Mitigation measures

- 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 to 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.

Land Capability and Land Use

Level of risk: Very low

Mitigation measures

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

Ground Water

Level of risk: Very low

Mitigation measures

- Although the water (brine) abstracted from the pan that is used for salt mining purposed would not be suitable for e.g. domestic or livestock farming purposes as a result of its high Sodium and Chloride content, it should be kept in mind that brines are normally of secondary origin i.e. formed by the leaching of salt-bearing sediments.
- The same underground water resource could therefore, if abstracted at a different location within the same area, be suitable for domestic use.
- It is probable that the proposed mining operation will place additional pressure on the underground resources of the area. An authorisation for the abstraction of water from this resource for mining purposes will, however, be obtained from the Department of Water and Sanitation prior to the commencement of the proposed mining operation.
- 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.

Surface Water

Level of risk: Very low

Mitigation measures

- No source of perennial surface water can be found in or near the study area.
- No surface water will be used for the purpose of the proposed mining operation.
- No waste material of any description will be dumped or pumped into any source of surface water.
- Sufficient care must be taken when handling hazardous materials to prevent pollution.
- Under no circumstances any ablutions occur outside of the provided facilities.
- If servicing and washing of vehicles occur on site, there must be specific areas constructed for these activities, which must have concrete foundations, bunding as well as oil trips 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 approved waste site.
- Spill kits must be easily accessible and workers must undergo induction regarding the use thereof.
- Store all litter carefully to prevent it from washing away or blown into any of the water courses within the study area.
- Provide bins for staff at appropriate locations, particularly where food is consumed.
- The mining site should be cleaned daily and litter removed.
- Conduct ongoing staff awareness programmes in order to reinforce the need to avoid littering, which contributed to surface water pollution.

Indigenous Flora

Level of risk: Low to medium

Mitigation measures:

- The process of salt mining does therefore, in this instance, not entail the removal of topsoil and overburden and therewith the natural vegetation covering the surface area.

- Minimise the footprint of transformation.
- Encourage the growth of natural plant species.
- Ensure measures for the adherence to the speed limit.
- Footprint areas of the mining activities must be scanned for Red Listed and protected plant species prior to mining.
- It is recommended that these plants are identified and marked prior to mining.
- These plants should, where possible, be incorporated into the design layout and left in situ.
- However, if threatened and destruction by mining, these plants should be removed (with the relevant permits from DAFF and 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.
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.

Alien Invasive Plants

Level of risk: Very low

Mitigation measures

- Minimise the footprint of transformation.
- Encourage proper rehabilitation of evaporation ponds.
- Encourage the growth of natural plant species.
- Mechanical methods (hand-pulling) of control to be implemented extensively.
- Annual follow-up operations to be implemented.

Fauna

Level of risk: Very low

Mitigation measures

- The appointment of a full-time ECO must render guidance to the staff and contractors with respect to suitable areas for all related disturbance.
- The extent of the proposed mine should be demarcated on site layout plans and no construction personnel or vehicles may leave the demarcated area except those authorised 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.
- All those working on site must be educated about the conservation importance of the fauna and flora occurring on site.
- The ECO 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.
- 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: Low

Mitigation measures

- Mining 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 mining area should be demarcated on site layout plans (preferably on disturbed areas or those identified with low conservation importance). No construction personnel or vehicles may leave the demarcated area except those authorised to do so.

Air Quality

Level of risk: Very low

Mitigation measures

- Limited number of machinery to be used, as well as the remote location of the proposed operation.
- Limited amounts of exhaust fumes will be emitted by mining machinery and limited amount of dust will be produced by the trucks transporting salt to the markets.
- No blasting activities are planned as part of the proposed mining operation.
- In the past dust emitted as a result of the mining of salt in the study area was not even visible. The magnitude of this potential impact is therefore regarded as being limited to the site.
- No cumulative effect is anticipated with regard to air pollution, as a result of the remote location of the study area. Land-use in the areas surrounding the study area mostly consists of livestock and game farming, activities not normally classified as a major cause of air pollution.
- No residual impact is anticipated with regard to air pollution.

Noise and Vibration

Level of risk: Very low

Mitigation measures

- Restrict mining activities to daytime unless agreements obtained to do 24hr operations.
- Systematic maintenance of all forms of equipment, training of personnel to adhere to operational procedures that reduce the occurrence and magnitude of individual noisy event.
- Standardised noise measurements should be carried out on individual equipment at the delivery to site to construct a reference data-base and regular checks carried out to ensure that equipment is not deteriorating and to detect increases which could lead to increase in the noise impact over time and increased complaints.
- Environmental noise monitoring should be carried out at regularly to detect deviations from predicted noise levels and enable corrective measures to be taken where warranted.

Visual Impacts

Level of risk: Very low

- Where practical, protect existing vegetation clumps during in order to facilitate screening during the mining operation.
- Remove rubble and other building rubbish off site as soon as possible or place it in a container in order to keep the mining site free from additional slightly elements.
- Locate the salt stockpiles outside of the visual field of sensitive visual receptors.
- Dust suppression procedures should be implemented especially on windy days.
- Rehabilitation should aim to establish a diverse and self-sustaining surface cover that is visually and ecologically representative of naturally occurring vegetation species.
- Implement a management plan for the post-mining site in order to control the invasion of alien vegetation and to manage erosion, until the site is fully rehabilitated.

Traffic and Road Safety

Level of risk: Very low

Mitigation measures

- Implement measures that ensure the adherence to traffic rules.

Heritage Resources

Level of risk: Very low

Mitigation measures

- The heritage and cultural resources if any are encountered (e.g. graveyards, ruins, historic structures, etc.) must be protected and preserved by the delineation of a no-go zone.
- Stone tools should be avoided where possible and fresh exposures should be recorded before destruction. All stone tool artefacts should be recorded, mapped and collected before destruction.
- Should development necessitate impact on any building structures, the developer should apply for a SAHRA Site destruction permit prior to commencement of construction?

Socio-economic

Level of risk: Very low

Mitigation measures

- The mine must ensure that false expectations are not created regarding job creation.
- Jobs must be allocated as advertised and in so far as is possible to local inhabitants.
- Contractors and employees should not be permitted to wander outside the mining area.
- Uncontrolled settlement of contractors and workers outside of the site will be prevented.
- The expectations of what benefits can accrue to the community must be managed from the initiation of the project.
- Commitments as set out in the SLP must be attained.

Interested and Affected Parties

Level of risk: Very 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 mining operation.
- A complaints management system should be maintained by the mine to ensure that all issues raised by community members 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)

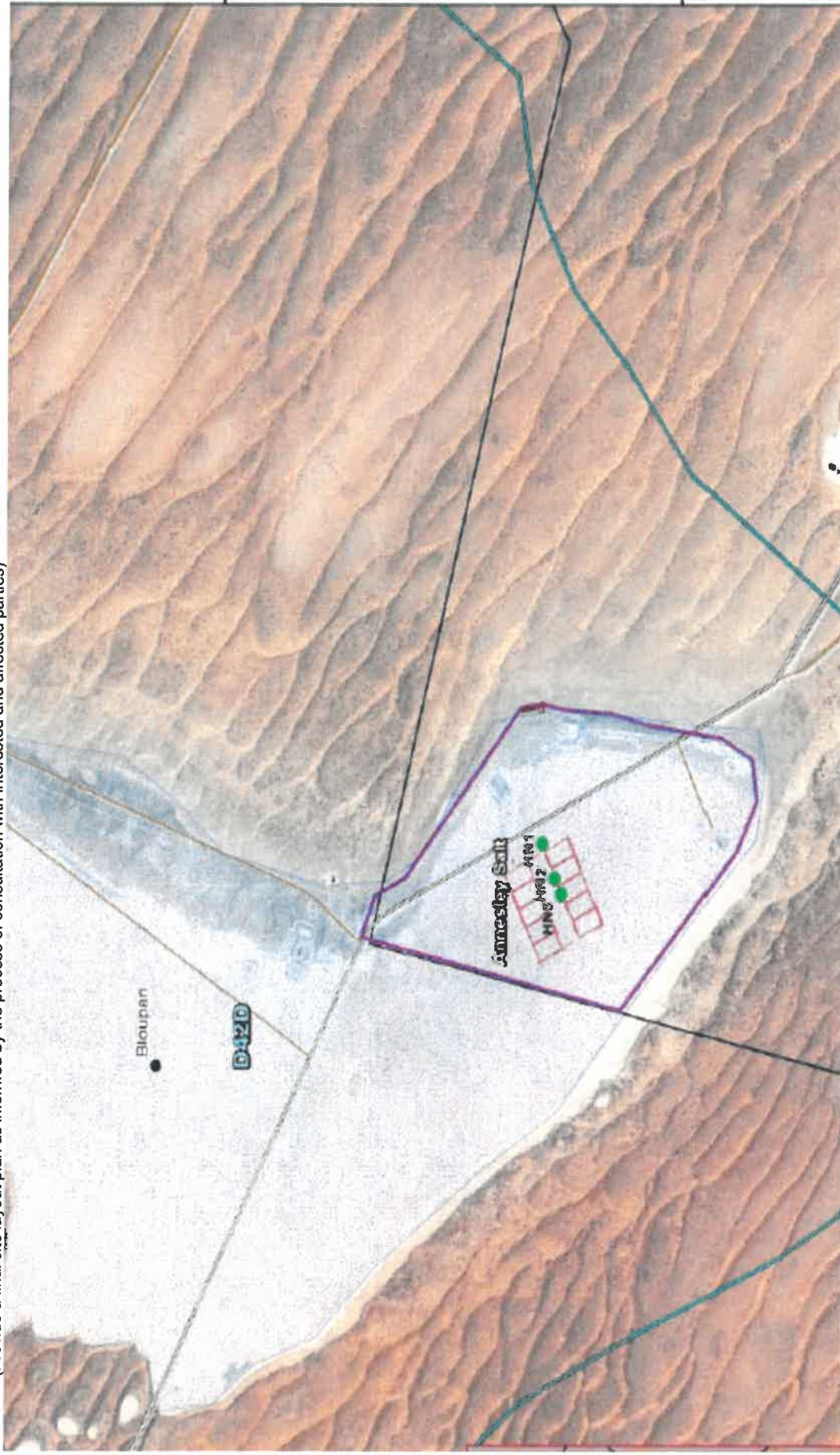


Figure 11: Final site layout plan

x) Motivation where no alternative sites were considered

No alternative location for the proposed mining operation was considered, as the mining of salt is very specific in terms of the location of the salt pan or resource (in terms of the location of brine and pans) specific. There is therefore no other alternative with regard to the overall operation footprint.

The location of the evaporation ponds for growing salt crystals and associated infrastructure is primarily based on proximity to the underground brine source. The mining activities and methodologies associated with salt mining is the only economic viable method currently being used by the salt fraternity. There is no alternative method for growing salt crystals.

xi) Statement motivating the preferred site

(Provide a statement motivation the final site layout that is proposed)

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

Not applicable. There is no alternative development location for the site.

(a) Plan of study for the Environmental Impact Assessment process

Land Use or Development Alternatives

Growing of salt are currently taking place by the surface owner for his own use. When salt mining is stopped in the area and once rehabilitated the land use can revert back to livestock farming.

Alternative Mining Methods

The mining method of evaporation ponds with continued reaping of salt crystals is the only economic viable method currently being used by the salt fraternity. No alternative mining method can be considered at this stage.

Consequence if not Proceeding with the Operation

The operation will make provision for 5 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.

Brine from the underground water is pumped onto the evaporation dams allowing water to evaporate. Thus helping the formation of salt crystals and keeping salt from forming a base that cannot be cultivated. The salt crystals are collected as coarse salt and stockpiled.

The reaping of salt is an unlimited resource if managed to be sustainable and the water is not dewatered to fast from the source. If it is not managed sustainably salt content will fall and the water will become too fresh to use to grow salt crystals.

(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.)

Table 13:

Name of Activity	Potential Impact	Aspects Affected	Phase	Significance	Mitigation Type	Significance
Roads	Air quality	Nuisance dust will be created by the mining machinery and vehicles used on the farm.	Construction	Medium	Dust control Water spraying Well maintained equipment	Low
	Fauna	Where new haulage roads will be created the natural habitat of the animals will be disturbed and/or destroyed.	Construction	Medium	Speed limits Environmental awareness	Low
	Flora	Where new haulage roads will be created the vegetation will be disturbed and/or destroyed.	Construction	Medium	Stripping of topsoil and concurrent rehabilitation	Low
	Ground water	No impact on ground water is expected from the roads that will be used by the planned mining operation.	Construction	No significance	Pollution control and good housekeeping practice	No significance
	Noise	Noise from the mining equipment on the haulage roads will be created.	Construction	Medium	Noise control Well maintained equipment	Low
	Soil	No impact to soil is expected from the roads that will be used by the planned mining operation.	Construction	No significance	Stripping of topsoil and concurrent rehabilitation	No significance
	Surface water	No impact to surface water is expected from the roads that will be used by the planned mining operation.	Construction	No significance	Pollution control and on-going housekeeping	No significance
Evaporation ponds Area	Topography	No impact to topography is expected from the roads that will be used by the planned mining operation.	Construction	No significance	Concurrent rehabilitation	No significance
	Visual	The haulage road will be visible to some extent from the immediate surroundings.	Construction	No significance	Concurrent rehabilitation	No significance
	Air quality	Nuisance dust will be created by the mining equipment.	Operational	Medium	Dust control Well maintained equipment	Medium
	Fauna	Where the evaporation ponds will be created the natural habitat of the animals will be disturbed and/or destroyed.	Operational	Medium	Speed limits Environmental Awareness	Low
	Flora	Where the evaporation ponds area will be disturbed and/or destroyed.	Operational	Medium	Stripping of topsoil and concurrent rehabilitation	Low
	Ground water	A impact to ground water is expected due to the pumping of the brine water for evaporation.	Operational	High to medium	Sustainable pumping methods and Pollution control and good housekeeping practice	Medium
	Noise	Noise from the vehicles will be created.	Operational	Medium	Noise control Well maintained equipment	Low
	Soil	The disturbance of the soil structure when the	Operational	Medium	Stripping of topsoil and concurrent	Low

		evaporation ponds is created.			rehabilitation	
	Surface water	No impact to surface water is expected.	Operational	No significance	Concurrent rehabilitation	No significance
	Topography	No impact to the topography is expected from the evaporation ponds .	Operational	No significance	Concurrent rehabilitation	No significance
	Visual	The evaporation ponds will be visible to some extent from the immediate surroundings.	Operational	No significance	Concurrent rehabilitation	No significance

(iii) Description of aspects to be assessed by specialists

List of Studies Undertaken	Recommendations of Specialist Reports	Specialist Recommendations that have been included in the EIA Report	Reference to Applicable Section of Report where Specialist Recommendations have been Included
<p>Hydrogeological & Hydro Assessment for Annesley Salt by SRK Consulting Pty Ltd, June 2018</p> <p>Appendix 4</p>	<p>Recommendations</p> <p>8.1 Hydrogeology</p> <p>The recommendations arising from the borehole investigations are:</p> <ol style="list-style-type: none"> 1. Bloupan-HN1 can be pumped at 3 L/s for a 24 h/day schedule, or at 4 L/s for a 12 h/day schedule. 2. Bloupan-HN2 can be pumped at 3 L/s for a 24 h/day schedule, or at 4 L/s for a 12 h/day schedule. 3. Bloupan-HN3 can be pumped at 1 L/s for a 24 h/day schedule, or at 1.4 L/s for a 12 h/day schedule 4. The minimum pump installation depth for Bloupan-HN1, HN2, and HN3 should be at 20 mbgl. 5. Expected pumped water levels for Bloupan-HN1, HN2 and HN3 to be approximately 15 mbgl. 6. A flow meter (preferably a magflow meter) to measure total water use should be installed at each borehole. 7. The water level in the boreholes should be measured and recorded at regular intervals by means of a dipmeter. Alternatively, automatic dataloggers may be installed in the boreholes to record the water level at pre-set intervals of (e.g. hourly). 8. A sample of the raw brine pumped from the boreholes should be collected annually, and submitted to an accredited laboratory for macro chemical, and trace metal analysis. 9. A low-level cut-off switch should be installed c.2 m above each pump intake. 10. A water use licence needs to be obtained from the DWS. <p>8.2 Hydrology</p> <p>The main recommendations arising from the hydrology study are as follows:</p>	<p>X</p>	

	<p>1. All non-essential infrastructure should be located outside of the salt pan to minimise disturbance to the bed and banks.</p> <p>2. Staff should access only the portions of the salt pan that it is necessary to access for operations, avoiding establishing multiple access routes/roads.</p> <p>Other recommendations, in summary, include:</p> <ol style="list-style-type: none"> 1. Onsite sanitation facilities are appropriately designed, are well maintained and serviced regularly during construction and operation. 2. Oil and fuel from storage, maintenance and handling (e.g. vehicles) and any hazardous substances are well managed such that spills and leaks do not contaminate the environment. 		
<p>Dr Betsie Milne has been appointed to do an ecological study with a wetland assessment</p>			
<p>Jan Engelbrecht (Ubique Heritage Consultants) has been appointed for the Archaeological and Heritage assessment</p>			

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

As mentioned before, the specific occurrence of salt in the area dictates the selection of the specific mining site and there are no alternatives in term of project location.

In terms of alternative land use, the proposed mining operation will be done in such a way that livestock farming will still be possible.

The mining operation will provide jobs and will also add to the increased economic activity and the area surrounding the farm.

Negative impacts on the area are expected to be temporary and can be mitigated to a large extent if the recommendations of the EMPR are adhered to e.g. rehabilitation.

(v) The stages at which the competent authority will be consulted

Consultation with all competent authorities will be done through DMR. Whereby all documentation will be submitted to DMR and they will be circulated to the other authorities for input and assessment.

Interested and affected party consultation letters was also send via the applicant to some of the competent authorities.

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

1. Steps to be taken to notify Interested and Affected parties

Correspondence of the proposed Mining Right application has been forwarded per registered post on 20 September 2018 to all identified interested and affected parties to inform them of the company's application and background information on the application for the Mining Right was attached.

The process as described by NEMA for Environmental Authorization was followed. See table below for the identification of Interested and affected Parties to be consulted with. The landowner, and or occupants and direct neighbours were consulted personally and through a letter that was given to them with registered post. A site notice was placed at the Khara Hais Library In Upington, at the Municipal Offices of the Dawid Kruiper Local Municipality, and on the road to Noenieput, on the gravel road towards the pan and at the entrance to the pan. Please also see google map with position of notices indicated that was put up at the salt pan in Appendix 3. With this site notice all passers-by are requested to submit any written comments to be forwarded to the consultant. See photo's attached and proof of consultation (All information and letters attached as Appendix 3).

An Advert (Notice) was placed 21 September 2018 in the Gemsbok to notify all other interested parties and affected parties of the application for a mining right and invite any person that might be interested or and affected to register.

2. Details of the engagement process to be followed

Please see table 4 above.

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

Please see table 4 above.

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

- To ensure efficient extraction of the salt resource.
- To limit the alteration of the surrounding topography.
- To manage and preserve sensitive soil types.
- To prevent the loss of land capability.
- To ensure the continuation of economically viable land use.
- To ensure the surrounding ground water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quality of ground water resources.
- To ensure that the surrounding surface water resources are not adversely affected to the detriment of the health and welfare of nearby communities; and to ensure suitable quantity and quality of ground water resources.
- To contain soils and materials within demarcated areas and prevent contamination of storm water runoff.
- To minimise the loss of natural vegetation.
- To prevent the proliferation of alien invasive plant species.
- To protect the wildlife and bird species.
- To protect the natural habitat of wildlife and bird species.
- To maintain visual integrity; and to minimise the extent of the generation of dust in order to minimise the aspect of nuisance and health impacts to sensitive receptors.
- To minimise noise and vibration to a level that disturbances felt by the communities are limited.
- To reduce the impact on visual quality due to intrusive mine infrastructure, activities and facilities.
- To ensure that all traffic generated by the proposed mining development does not negatively impact on existing road networks and infrastructure; and to ensure traffic safety.
- To preserve the historical and cultural artefacts located on site in compliance with the South African Heritage Resources Act, 1999 (Act No. 25 of 1999).
- To ensure that the current socio-economic status quo is improved.
- To be transparent and practise effective communication; in order to maintain good relationships with all interested and affected parties.

(vii) 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 and Phase	Potential Impact	Size and Scale	Mitigation or Control Measures related to compliance with standards
ENVIRONMENTAL IMPACTS			
<p>Construction Activities</p> <p>Control measures are to be applied during the implementation of respective activities</p>	<p>Geology Sterilisation of mineral resources</p>	Local	<ul style="list-style-type: none"> - The Sustainable pumping of underground water brines.
	<p>Topography Changes to surface topography due to placement of infrastructure</p>	Local	<ul style="list-style-type: none"> - Prominent natural features will not be disturbed; - All temporary infrastructure will be demolished during closure; - Waste will be disposed of at Municipal waste disposal site; - All evaporation ponds areas will be rehabilitated.
	<p>Soils Loss of soil resources due to erosion Soil contamination due to hydrocarbon spillages</p>	Local	<ul style="list-style-type: none"> - All temporary infrastructures will be demolished during closure; - Waste will be disposed of at Municipal waste disposal site; - Agreement to use this site will be sought from the Municipality; - All disturbed areas will be cleaned and rehabilitated. - Topsoil will be stripped prior to placement of infrastructure; - Topsoil will be stripped according to the soil type and the available soil depth in the areas to be disturbed (up to 150mm) as per soil analysis of the area; - Soil will be stockpiled in windrows not higher than 2m with as little compaction as possible. - Stockpiling will be done as close as possible to areas where the soils will be replaced and single handling practiced; - Soil stockpiles will be kept in a weed-free condition; - Stockpiled soil will be used in ongoing rehabilitation of disturbed areas. - Rehabilitation will include:- <ul style="list-style-type: none"> ✓ removing of all debris, ✓ replacement of soil with as little compaction as possible, ✓ reshaping, ploughing or ripping to break compaction, and ✓ introduction of organic matter as necessary. - Soil contamination will be prevented through:- <ul style="list-style-type: none"> ✓ bunding of all above-ground storage facilities, ✓ construction of impervious floors for hazardous substances such as diesel, oil and chemicals, and ✓ regular inspection of equipment and vehicles for leaks. - Spillages of oil, grease and hydraulic fluids will be reported. The spillages will

		<p>be cleaned up by removing the soil and disposing such soil in a waste receptacle called soil farm. A dedicated person will be appointed to oversee the bioremediation farm.</p> <ul style="list-style-type: none"> - Contaminated soil will be removed taken to the bio remediation farm, where it will be treated with decontaminant. The treat soil samples will be taken to the laboratory to determine if this soil is suitable for placing back on the mine area. - Contractors, staff and drivers will be trained on how to deal with spillage of hydrocarbons and other potential contaminants. - All domestic and industrial waste generated on site will be contained in skips and appropriate receptacles, collected and if required sorted by the approved contractor and removed to approved waste disposal site. - 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. - All surface water management infrastructure constructed from soil (berms, canals and bunds) will be inspected at least monthly, with more frequent inspections during periods of high rainfall and other major rainfall events. - Any evaporation ponds or topsoils will be done such that the cleared area is also ripped and allow to re-vegetate.
		<ul style="list-style-type: none"> - All construction activities to be restricted within the demarcated areas. - Surface agreement to be signed with land owners. - Check, service and maintain construction vehicles and equipment to minimise the risk of hydrocarbon and chemical leakages and spillages. - Restrict construction activities to demarcated areas and consider all other areas as no-go areas to minimise loss of grazing land. - Do not disturb any heritage or cultural sites. - Ensure that land which is not used during construction is made available for grazing and farming activities.
Land Capability Loss of land capability	Local	<ul style="list-style-type: none"> - Service and maintain construction vehicles in order to reduce noise emissions. - Advise persons entering the site not to disturb or harm animals. - Implement a biodiversity action plan that is available as part of the Biodiversity specialist report. - Avoid sensitive areas, such as pans no-infrastructure within 100m of any road.
Land Use Fragmentation of farm land	Local	<ul style="list-style-type: none"> - Educate employees, contractors and visitors on biodiversity and land management principles. - Planning and Surveying Department to be provided with relevant buffer areas to incorporate in future planning. - Applicable Water Use Licences should be applied for disturbance of any pans.
Fauna and Flora Loss of habitat	Local and regional	<ul style="list-style-type: none"> - Mechanical and chemical methods will be implemented initially to bring about a quick reduction in these species that pose the greatest invasive threat to the
Pans and Wetlands Loss or disturbance of habitat through encroachment of mining related activities	Local	
Alien Species Contamination by chemical control	Local and regional	

	<p>agents (users need to be registered and certified for use of dangerous products).</p> <p>Large areas denuded of vegetation (small-scale rehabilitation of denuded areas to be implemented)</p>		<p>area.</p> <ul style="list-style-type: none"> - Mechanical (tree-felling) and chemical (stump treatment) methods to be implemented. Market for harvested wood to be investigated. - Mechanical methods (hand-pulling) of control to be implemented extensively in the early stages of establishment of the mine. - Annual follow-up operations to be implemented. - Control measures to be implemented on an opportunistic basis. - Landscaping and gardening to be based on the use of indigenous plants only. - Alien plants are to be removed whenever possible. - Conduct rehabilitation.
<p>Biodiversity Loss of biodiversity</p>		<p>Local, regional and national</p>	<ul style="list-style-type: none"> - Provide training in the identification of protected species. - Re-vegetate using mix of indigenous locally occurring species. - Re-establish tree species on the field away from the mining areas. - Set up fixed point monitoring sites to check progress of rehabilitation. - Fence off newly rehabilitated areas and protect from grazing until well established.
<p>Ground Water Contamination of ground water</p>		<p>Regional</p>	<ul style="list-style-type: none"> - Implement waste management plan for handling hazardous waste b) Conduct ground water monitoring as per the monitoring plan.
<p>Air Quality Deterioration of air quality</p>		<p>Regional</p>	<ul style="list-style-type: none"> - Rehabilitate and maintain disturbed surfaces that are not going to be utilised after construction. - Promote use PPE such as dust masks.
<p>Noise Increase in ambient noise level</p>		<p>Regional</p>	<ul style="list-style-type: none"> - Restrict construction activities to daytime - Service construction vehicles and equipment on a regular basis to ensure noise suppression mechanisms are functioning. - Construct enclosures/bunds and berms for pumps, generators and other noise generating equipment. - Equip vehicles with noise silencers. - Switch equipment off when not in use. - Demarcate and clearly mark noise zones. - Adhere to occupational health and safety noise limits. - Maintain occupational noise monitoring to determine noise levels from equipment as increased noise may indicate other issues. A noise monitoring programme and grievance procedure must be implemented.
<p>Visual Visual intrusion</p>		<p>Regional</p>	<ul style="list-style-type: none"> - Use natural colour tones for structures, roofs of buildings will be angled so as to not reflect sunlight and night lighting will be minimised. - Carry adjustments to the design of the project, the careful selection of finishes and colours, the use of earthworks (such as berms) and planting to provide visual screening, as well as dust control where required. Penalties for non-compliance should be considered. - Screen the site from the surrounding areas by planting fast growing indigenous

			<p>trees.</p> <ul style="list-style-type: none"> - Turn lights off using timer or occupancy sensor or manually when not needed. - Both on-site and off-site landscape rehabilitation of areas affected by the project should be considered. This may include re-instating landforms and natural vegetation, provision of landscaped open space, or other agreed upon facilities.
<p>Sensitive Areas Destruction of sensitive areas</p>	Local		<ul style="list-style-type: none"> - Avoid all identified wetlands and ensure that no activities take place within wetland areas. - Construct catchment dams in areas that drain towards streams and wetlands, in order to contain dirty water and reduce impacts on wetlands. - Conduct monitoring programme for water, soil and biodiversity. - Introduce a hydrocarbon management system to ensure that hydrocarbon pollution is minimised. - Commence with construction during the low flow or during low rainfall in the wet season. - Ensure that infrastructure is constructed outside the 100 year flood line and or within 100m from streams and pans in order to minimise impacts on water courses. - Comply with Regulation 704 of the National Water Act of 1998 for all designs of mine residue disposal infrastructure. - Minimise the removal of vegetation during stripping.
<p>Traffic and Safety</p>	Local		<ul style="list-style-type: none"> - Allocate and adhere to speed limits. - To reduce negative impacts of increased traffic on and around the site. - Restrict traffic to demarcated areas. - Public to be given right of way on public roads and truck contractors shall make use of approved methods to control the movement of vehicles so as not to constitute a road hazard. - Erect safety signs in the local languages to warn people of the danger on roads. - Keep in constant liaison with the local Department of Roads who will need to be aware of any proposed road plans and who may be able to assist in terms of making recommendations and road maintenance. - Ensure that site access points are clearly visible from the main road. - Ensure that all drivers employed are certified with appropriate training levels for the required vehicle. - Ensure that all vehicles entering and leaving the site use demarcated routes.
<p>Surface Water Contamination of surface water resources</p>	Regional		<ul style="list-style-type: none"> - Clean surfaces water or runoff will be prevented from entering dirty areas by diverting it around these area. - The discharge positions might also require additional reinforcement in the form of a suitably designed gabion or similar structure to prevent erosion at the discharge positions.

<p>Fauna and Flora Loss of natural vegetation and species of conservation areas</p> <p>Air Quality Deterioration in air quality</p>	<p>Local, regional and national</p> <p>Local</p>	<ul style="list-style-type: none"> - Ensure that vegetation is not unnecessarily removed. - Remove with care and relocate Red Data List species to avoid destruction. - Manage and control plant species declared as invasive and declared weeds. - Minimise the removal of vegetation in order to reduce the possibility of dust pollution. - Vegetate topsoil stockpiles as soon as possible to reduce dust and particulate emissions. - Locate topsoil stockpiles in order to reduce its exposure to wind, thereby reducing the likelihood of particle entertainment. - Spray road surfaces with water and treat it with dust binding agent to minimise emissions of fugitive dust. The type of dust-binding agent should determine the amount of watering.
<p>Topography Change in surface topography</p> <p>Land Capability Loss of land capability</p>	<p>Local</p> <p>Local</p>	<p>Engineer and environmental consultant should supervise vegetation and rehabilitation activities in accordance with post mining topographical plan.</p> <ul style="list-style-type: none"> - Plan all construction activities to prevent the incorrect stripping of topsoil which leads to the reduction in land capability. - Restrict all construction activities to demarcated areas.
<p>Soils Loss of soil fertility</p>	<p>Local</p>	<ul style="list-style-type: none"> - Vegetate soil stockpiles and berms to minimise the risk of erosion. - Implement erosion control measures, such as contour banks in an area prone to erosion, including slopes and uneven ground; c) Vegetate preferential flow paths of storm water runoff. - Remove soils in dryer months, due to their increased susceptibility to compaction and erosion during rains. - Separate topsoil (A horizon) and sub-soil (B horizon) where possible and stockpile separately. - Construct berms around soil stockpiles in order to divert water away from the stockpile to prevent erosion. - Restrict stockpile height to less than 3m and shape to reduce soil compaction. - Minimise the removal of topsoil in order to reduce dust and particulate emissions.
<p>Surface Water Deterioration in water quality</p>	<p>Regional</p>	<ul style="list-style-type: none"> - Ensure that construction activities are at least 100m from wetlands. - Stabilise soil stockpiles with vegetation in order to reduce exposure to erosion and minimise the effects of silt loading of surface water running over exposed soil.
<p>Surface Water Deterioration in a water resource</p> <p>Operational activities</p> <p>Control measures are to be applied during the implementation of respective activities</p>	<p>Regional</p>	<ul style="list-style-type: none"> - Measures to reduce the pressure on water resources include actions such as: <ul style="list-style-type: none"> ✓ Optimising the recycling and re-use of water; and ✓ Minimising losses. - These can be accomplished in many ways, but with the following aspects being recommended for this site: <ul style="list-style-type: none"> ✓ Maximum re-use of water from the return water dam.

	<p>Ground Water Contamination of ground water</p>	<p>Regional</p>	<ul style="list-style-type: none"> - Dispose of domestic and hazardous waste originating from temporary and permanent offices and workshops at an authorised landfill facility to minimise the risk of surface water pollutions. - Dispose of hazardous waste and effluent at an authorised landfill facility. - Check, service and maintain construction vehicles and equipment used during infrastructure construction to reduce the risk of hydrocarbon and chemical leakages and spillages. - Contain and remediate hydrocarbon or chemical leakages and spillages to prevent leaching into the ground water. - Develop an emergency spill response plan and train all construction contractors in the emergency spill response procedure.
	<p>Fauna and Flora Loss of natural vegetation and species of conservation value</p>	<p>Local, regional and national</p>	<ul style="list-style-type: none"> - Plan and construct evaporation ponds areas carefully to minimise the impact on flora species. - Avoid the unnecessary removal of vegetation. - Set and enforce speed limits to prevent accidental injury or death to animals. - Restrict vehicles to road and demarcated areas to prevent damage to vegetation. - Prevent disposal of waste in non-designated areas and the reputable clearing and disposal of any such waste, as these can cause harm to animals, particularly poisonous wastes and plastics.
	<p>Noise Noise disturbance</p>	<p>Local</p>	<ul style="list-style-type: none"> - Restrict operational activities to normal working hours. - Service vehicles and equipment on a regular basis to ensure noise suppression mechanisms are functioning. - Limit the speed of vehicles to 40km/h. - Train workers in safety and the use of personal protective equipment to prevent damage to their hearing.
<p>Construction, operational and decommissioning Control measures are to be applied during the implementation of respective activities</p>	<p>Socio-Economic Negative impacts on employment and loitering of people in the area resulting lack of security and safety</p>	<p>Local and regional</p>	<ul style="list-style-type: none"> - Where possible local service providers and workers will be recruited from the local area to increase employment opportunities during the construction phase. - Ad-hoc, informal recruitment at the gate or through other unapproved channels by setting up recruitment stands in built up areas will be prohibited. - As skills audit should also be undertaken to determine local skills available. - HIV/AIDS awareness programme/Voluntary Counselling & Testing Program will be introduced. - Relationships with local government through LED programmes should be developed. - Stakeholder database will be established to identify partners and develop collaborative networks. - Uncontrolled settlement of contractors outside of the site will be prevented. - The recruitment selection process to promote gender equality and the employment of women wherever possible.

			<ul style="list-style-type: none"> - SLP commitments will be implemented. - Reach agreement with the municipality regarding mandates and responsibility for issues relating to the upgrading of infrastructure and the allocation of land for housing. - Implementation of EMP recommendations, involvement of communities in LED initiatives, ongoing communication to provide feedback and updates. - IAPs must be kept up to date on any changes to transport routes and increase in truck frequency or of alternative routes. - A complaints management system should be maintained by the mine to ensure that all issues raised by community members are followed up and addressed appropriately.
	Interested and Affected Parties Lack of communication with stakeholders and loss of trust	Local and regional	<ul style="list-style-type: none"> - In the event that any major feature such as burial or cache of ostrich eggshell flasks is uncovered during mining operation, an archaeologist should be called in to evaluate the finds. - A buffer zone from all graves and grave yards close to construction activities will be established. - In the event of an archaeological artefact being unearthed, an accredited archaeologist will inspect the site and make recommendations. - Promote archaeological awareness and investigate sustainable initiatives with communities to promote the local culture.
	Heritage Resources Destruction of heritage resources	Local	<ul style="list-style-type: none"> - Incorporate an alien invasive eradication and control programme into the rehabilitation efforts. This programme should be formulated according to relevant legislation. - All temporary infrastructures will be demolished during closure.
	Land Use Loss of land use	Local	<ul style="list-style-type: none"> - Opportunities for additional resources and redeployment, integration of employees and communities into sustainable LED projects, equip suppliers, through mentorship and training.
	Proliferation of alien invasive species	Local and regional	<ul style="list-style-type: none"> - Increased employment opportunities during decommissioning for local contractors. - Where short term employment opportunities exist during decommissioning, local contractors and jobs seekers will receive preference.
	Employment Loss of jobs and employment	Local and regional	<ul style="list-style-type: none"> - The workforce should undergo multiple skills training during the operation of the mine so that can be productively absorbed into the local economy after mine closure. - Where retrenchments are unavoidable, they will be managed humanely according to legislative requirements. - There should be adherence to the objectives and management measures stated with the Social and Labour Plan. - The workforce should be empowered to develop skills that will equip them to obtain employment in other sectors of the economy.

			<ul style="list-style-type: none">- The LED plan should be implemented to assist local business development.- Local partners should be supported to diversify economy and decrease dependence on mining.- A strategy for saving jobs and management of downscaling and/or retrenchment should be implemented.- Assistance should be given for help with redeployment of retrenches in other operations or assistance with alternative livelihood strategies.- Identify and implement training needs and training programmes for decommissioning and closure.- Consultation with communities and local government on future uses for the infrastructure and facilities should be implemented.
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l) Other Information required by the competent Authority

i) 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:-

1. 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 person including the landowner, lawful occupier, or, where applicable, potential beneficiaries of any land restitution claim, attach the investigation report as **Appendix 2.19.1** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

The applicant has entered into an agreement with the farm owner. No other parties which has been consulted with has to date raise any concerns or comments. Interested and affected party mining is an ongoing process and all comments and concerns if any is received will be incorporated into the EIA EMP documents with the proof thereof.

2. 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 No. 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 2.19.2** and confirm that the applicable mitigation is reflected in 2.5.3; 2.11.6.and 2.12.herein).

A heritage specialist was contacted and a assessment will be done. The results will be incorporated into the EIA EMP document.

u) 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 detailed, 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 4**).

There are no alternatives, as the application area applied for is the area where the natural salt pan occurs and where the salt brine is encountered to grow salt.

v) UNDERTAKING REGARDING CORRECTNESS OF INFORMATION

I _____ 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 the EAP

DATE: _____

w) UNDERTAKING REGARDING LEVEL OF AGREEMENT

I _____ 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 the EAP

DATE: _____

-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 IN ACCORDANCE WITH THE STATUTES AND
DIE UNIVERSITEIT VOLDOEN IS. AS BEWYS REGULATIONS OF THE UNIVERSITY. AS
DAARVAN PLAAS ONS ONS ONDERSKEIE WITNESS OUR RESPECTIVE SIGNA-
HANDTEKENINGE EN DIE SEËL VAN DIE TURES AND THE SEAL OF THE
UNIVERSITEIT HIERONDER. UNIVERSITY BELOW.



.....
A-J Booitze

.....
VISEKANSelier/VICE-CHANCELLOR

.....
G. Nwanwyk

.....
DEKAN/DEAN

.....
[Signature]

.....
REGISTRATEUR/REGISTRAR

.....
PI ORANJEVRYSTAAT
2018 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 4 th Annual (ITC)
March 2013	1st Enviro Mining-Ensuring Environmental Compliance and reporting
March 2014	4 th Annual Enviro Mining Conference
March 2015	5 th 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 : 01 October 2013 – Present and part time
consultancy work

POSITION HELD : Mineral Law Administration and
Environmental Manager

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 BRAKFORTEIN 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 accepted by 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

WG (Bill) Bartholomew
PO Box 10034
OUDTSHOORN
6620
Tel: +27(0)44 272 3054
Mobile: +27(0)84 466 4411
Fax: +27(0)86 608 8411
email: bartholomew@telkomsa.net

Hennie van Wyk
Member : Diacor CC
Mobile: +27(0)828201879
Email : hennie@goodhopereserve.co.za

Name of the Practitioner: Dr Elizabeth (Betsie) Milne
Tel No.: 082 992 1261
Fax No.: N/A (No fax)
E-mail address: betsiemilne@gmail.com

The End

