



mineral resources

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Mineral Resources
REPUBLIC OF SOUTH AFRICA

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Reference:
Date:

EC30/5/1/1/3/2/1/0158EM
16 August 2010

South African Heritage Resources Agency
P.O. Box 758
GRAHAMSTOWN
6140

caseid: 2156

ATTENTION: MR. T. LUNGILE

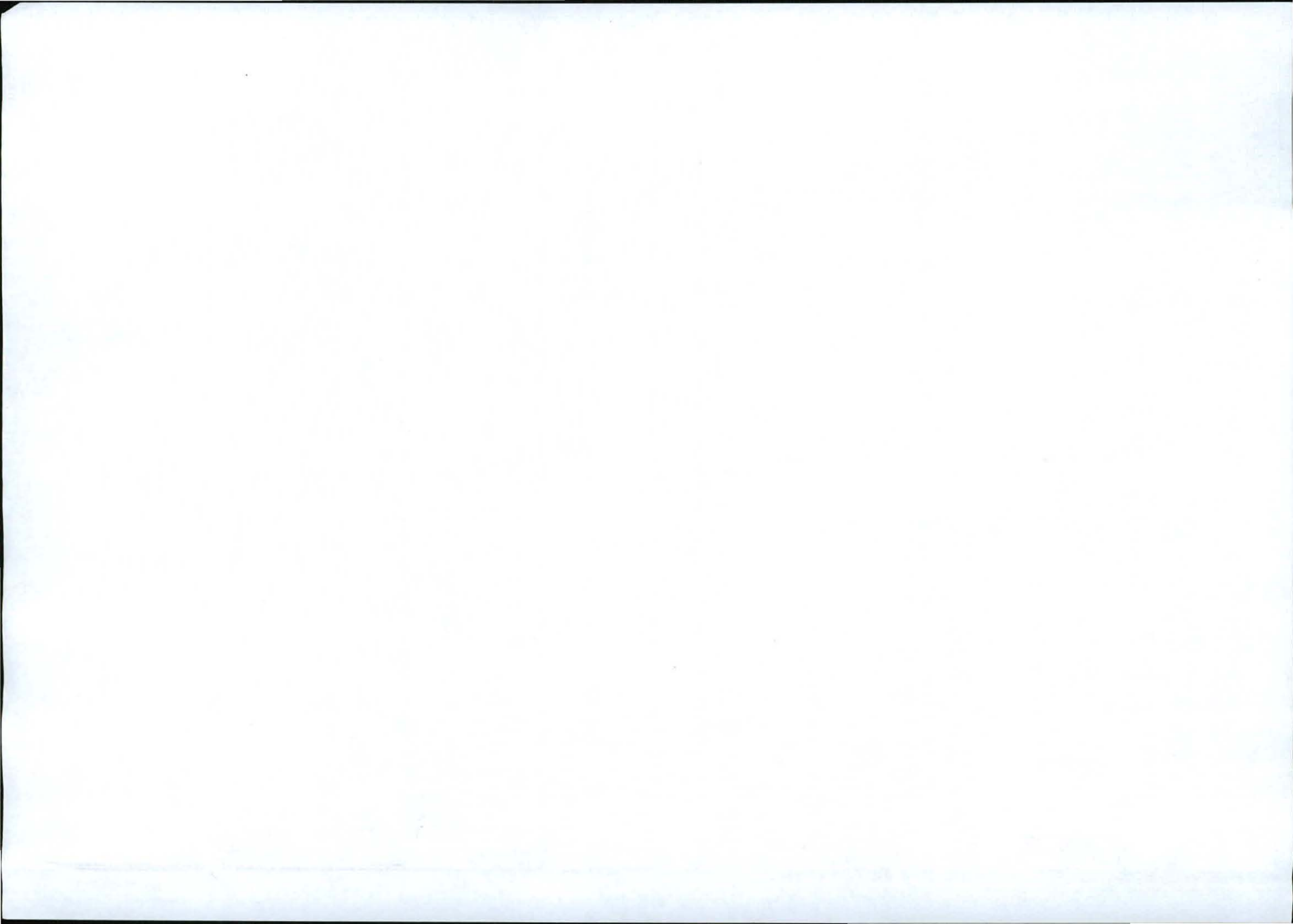
Sir

CONSULTATION IN TERMS OF SECTION 40 OF THE MPRDA OF 2002: ENVIRONMENTAL MANAGEMENT PLAN, PROSPECTING FOR COAL; VARIOUS FARMS IN THE DIVISION OF ALBERT AND MOLTENO

1. Attached herewith, please find a copy of a preliminary Heritage Impact assessment for your comments.
2. Any written comments or requirements your department may have in this regard can be forwarded to this office no later than **5 October 2010**. Failure to do so, will lead to the assumption that your department has no objection(s) or comments with regard to the said documents. Comments may be submitted at your earliest convenience in order to reduce the turnaround time for the application process.
3. Consultation in this regard has also been initiated with other relevant State Departments.
4. Kindly quote the relevant file reference number in all correspondence.

Yours faithfully

**REGIONAL MANAGER
EASTERN CAPE**





STELLENRYCK ENVIRONMENTAL SOLUTIONS

PRELIMINARY HERITAGE IMPACT ASSESSMENT FOR PROSPECTING FOR COAL IN THE MOLTENO & ALBERT DISTRICTS

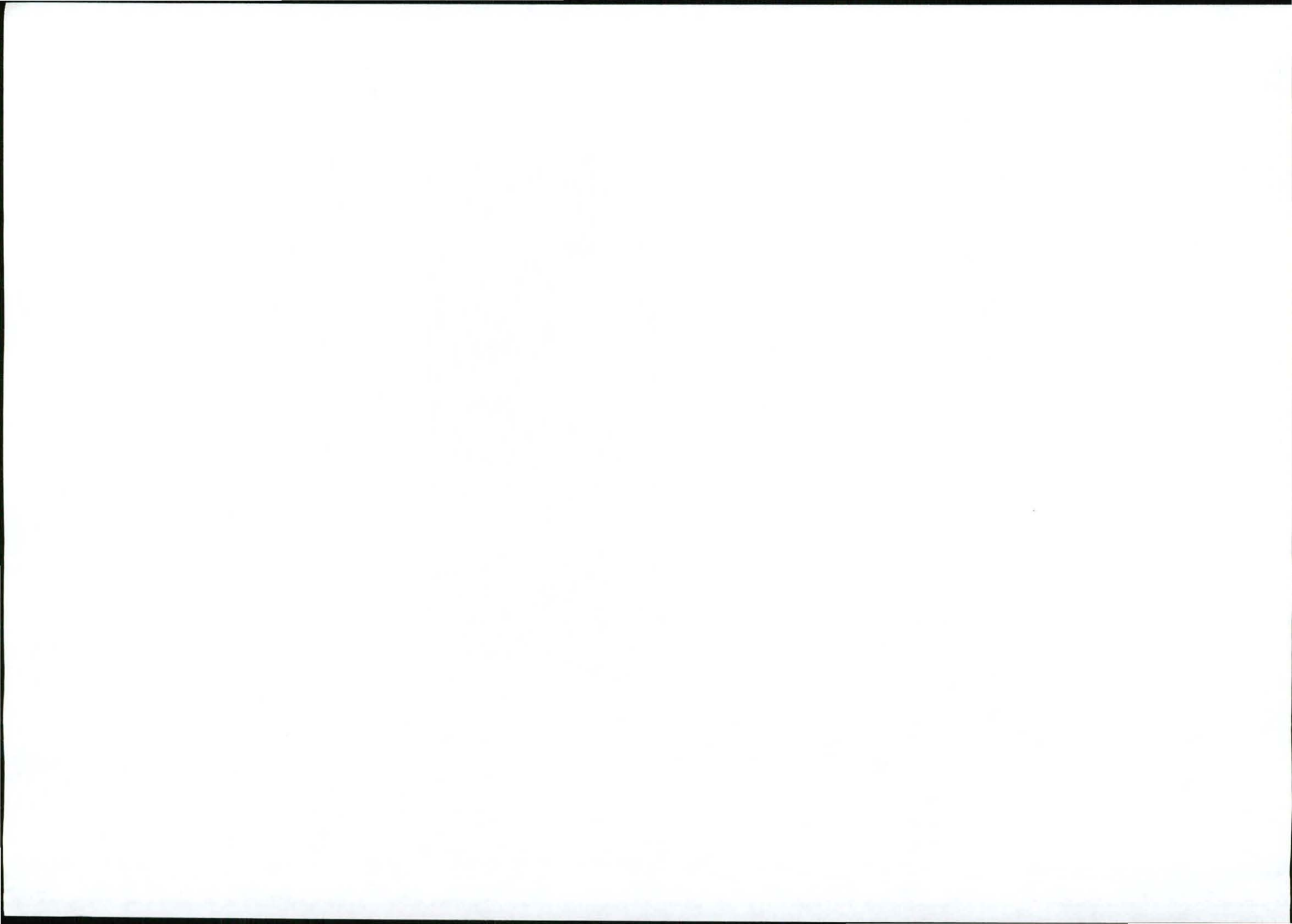


PREPARED FOR:

**OSHO EC Exploration (Pty) Ltd
International Business Getaway
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AUGUST 2010

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Member: J. A. van As: B.Sc (Botany & Zoology), B.Sc (Hons) (Eco-Physiology), M.Sc (Plant Physiology)



INTRODUCTION

The OSHO Group of Companies are developers of mineral resources and commodity-related business processes, including mining, beneficiation, processing, power generation, trading, logistics and Afro-Asian Shipping specifically mineral resources to India and other Asian markets. The most recent foray of the group has been in the Oil and Gas E & P sector. The OSHO Group of Companies has a presence in several African countries including South Africa, Mozambique, Malawi, Namibia, Swaziland, and Madagascar, etc.

The Group has a very well established client base in Asia for mineral resources particularly coal, combined with strong logistical network and capabilities. For the last few years, the Group has been focusing on investments in the mining sector in Southern Africa with a view to secure and supply resources in a long term and sustainable manner to the established Asian market.

The SADC region has high quality coking and thermal coal reserves, high mining feasibility, a long coast line with developed infrastructure, deep water ports, open investment policies specifically in the mining, minerals and energy sector, proximity to the Asia market and well established mining standards. These factors have led to increased investments in Southern Africa within the Group's total investment portfolio.

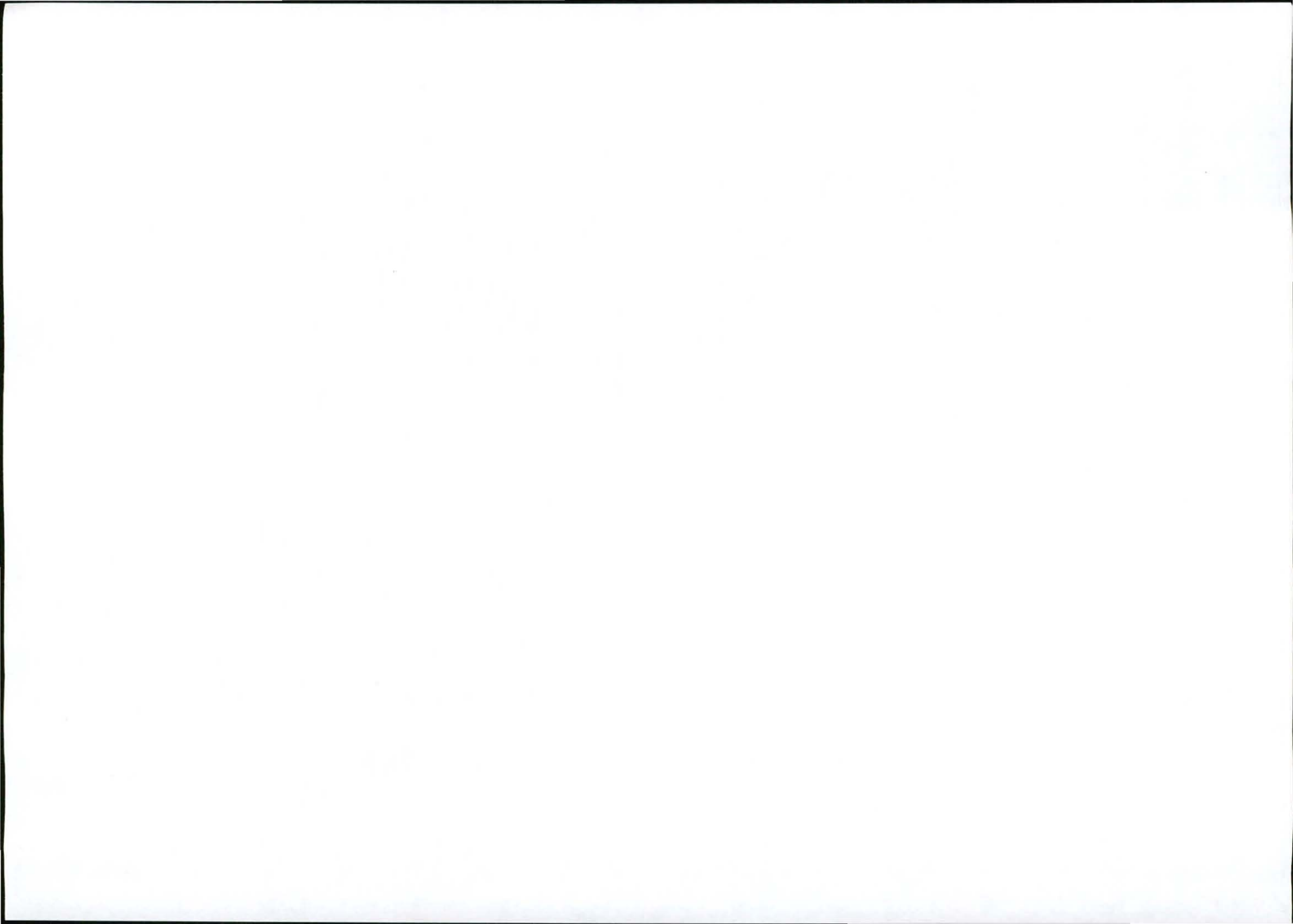
The Group is also very bullish on power generation in Southern Africa and is accordingly bidding for merchant power plants in SADC on Build-Own-Operate basis, on availability of bankable power purchase agreement. Spurred by the acute power shortage currently surfacing in Southern Africa, this sector could be a key revenue driver for the Group going forward.

Osho Group's subsidiaries in Southern Africa have been allotted numerous exclusive prospecting rights which include licenses for coal. The mineral exploration division of the Group has acquired state of the art equipment including 10 Atlas Copco core drilling and RC drilling rigs and a highly skilled team for carrying out its exploration program. The Group on some of its projects works in partnership with various leading business houses from India.

In order to extend the Group's interest in South Africa and more specifically in the Eastern Cape, attention was directed to the remaining coal reserves in the Molteno and Burgersdorp area. Due to the vast reserves of high grade coal in the former Transvaal, Free State and Natal, not much interest was given to the Eastern Cape Coal fields due to the erratic consistency of the coal seam in terms of occurrence and quality. However, the unavailability of coal in some countries abroad and the availability of new energy producing technologies, potential markets for low grade coal have emerged and form the basis for OSHO EC Exploration's prospecting application. Due to the extensive shortage of power in South Africa there is the further possibility that coal could also be distributed locally to future power stations and coal gasification plants.

The Molteno coal field was historical extensively researched and therefore extensive data is available on the profile and quality of the coal seams, which could potentially reduce the extent of the prospecting activities and environmental impact on the prospecting footprint. The main objective is therefore to confirm previous prospecting results, prior to any detail prospecting investigations. Where bulk sampling is deemed essential, it will be done under cover of an amendment to this environmental management programme.

As the Prospecting Right footprint covers an extensive area of about 48000 ha, invasive prospecting will be conducted in a number sub-phases to ensure concurrent rehabilitation is taking place and to reduce the time spent on each individual farm. Currently, detailed planning for the prospecting area has not been completed and drilling grids are therefore not available. Once this planning has been completed details of such future drilling programmes will be made available and dissemination of details to the DMR and landowners will take place.

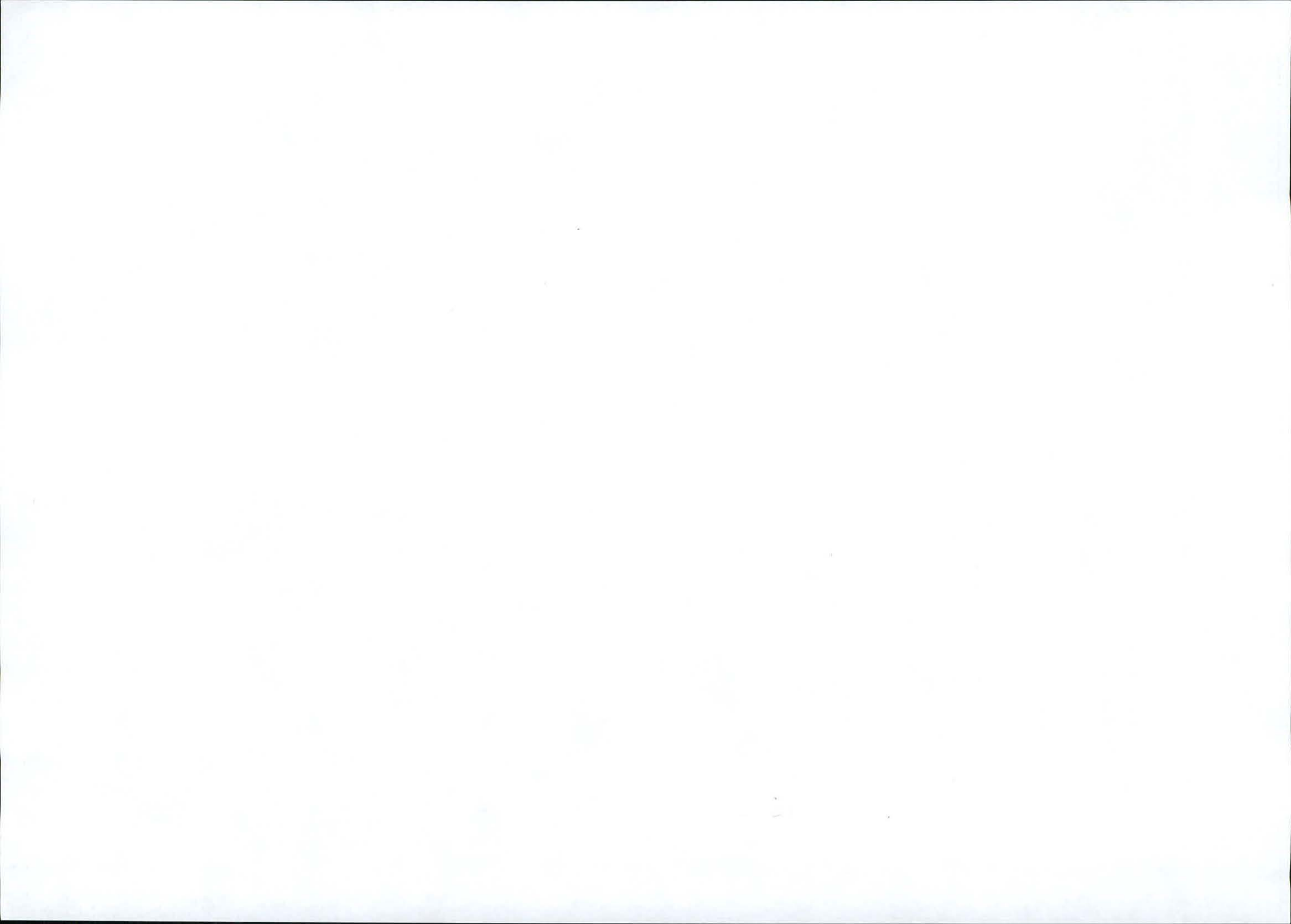


The EMP will be made available for public review as part of the public participation process associated with the Mine Environmental Management Process. The EMP will be distributed to identified representatives as decided at the recent meetings held with affected landowners to ensure that they are kept informed of the process being undertaken by OSHO Exploration (Pty) Ltd.

The timeframes for this Prospecting Right application under this submission are as follows:

- Acceptance of Prospecting Right application by the DMR: August 2009
- Submission of draft EMP to the DMR: 9 November 2009
- Distribution of Draft EMP report to registered/interested I&APs: December 2009
- Final date for comments from I&AP's & Affected State Departments: January 2010
- Submission of final EMP to the DMR: Start of February 2010
- Legislated submission finalization by the DMR: March 2010
- Granting of Prospecting Right: May 2010

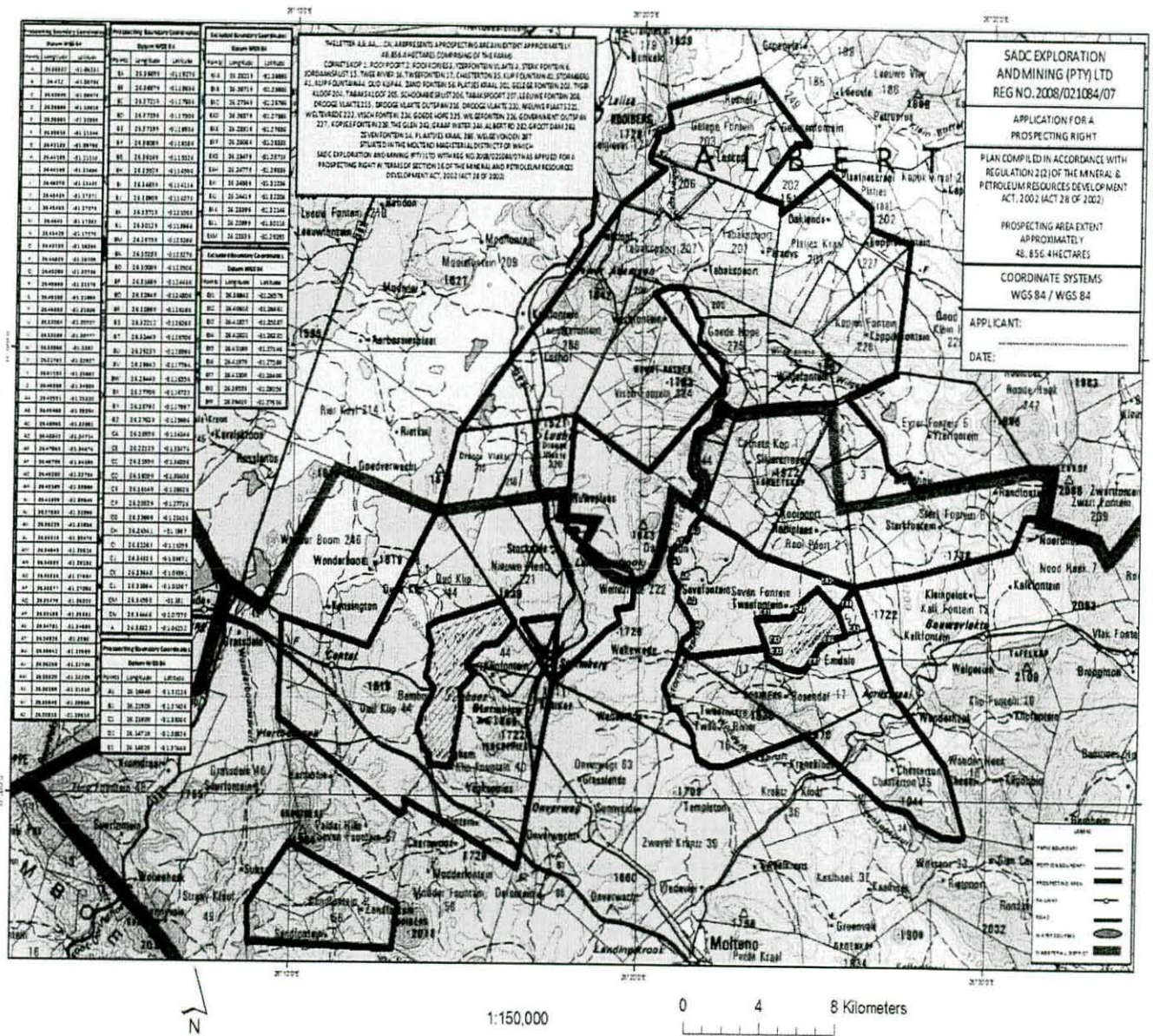
The plan showing the prospecting areas relating to the prospecting footprint is included hereunder.

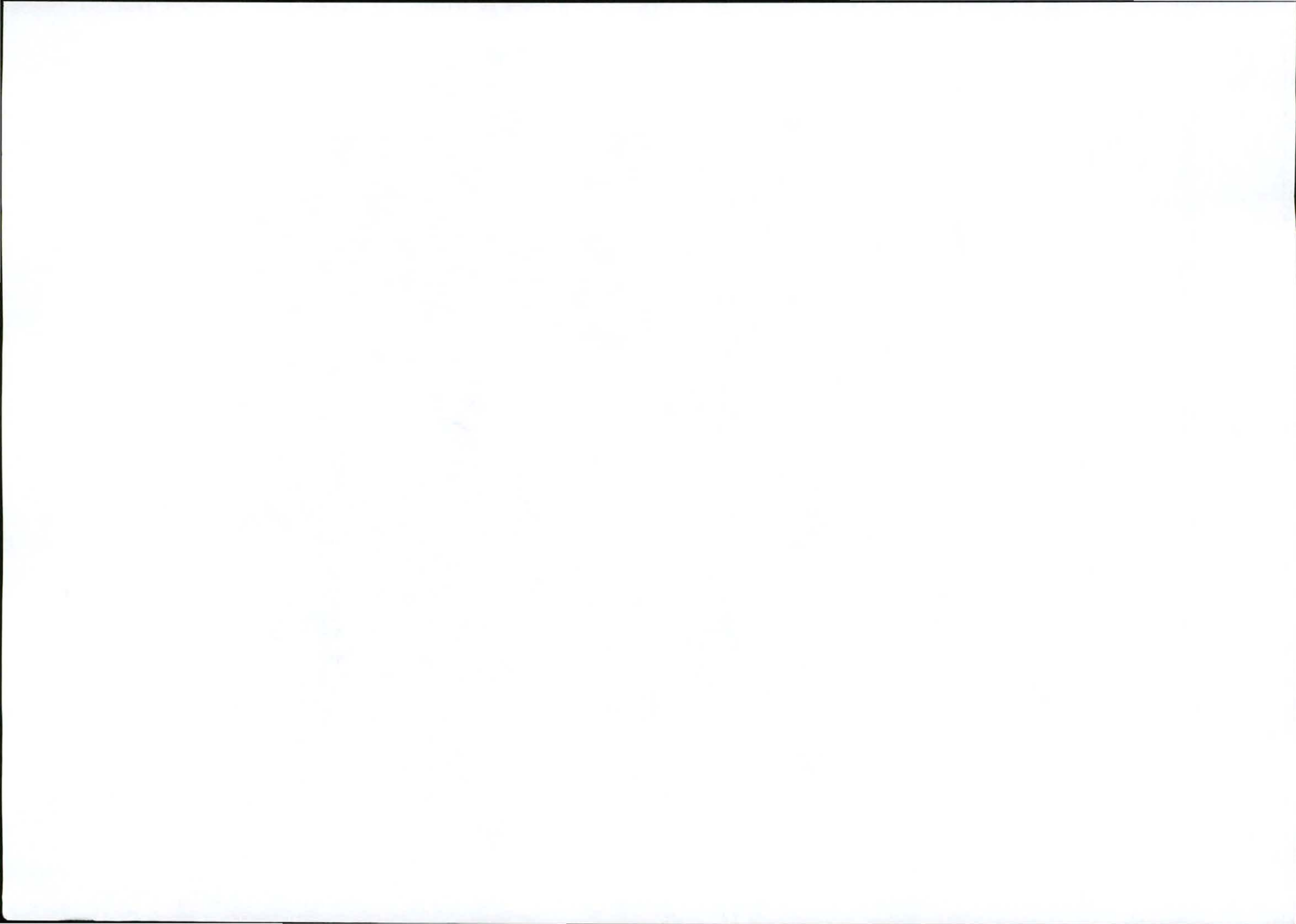


AFFECTED FARMS

All subdivisions of farms Albert Rd 282(M), Drooge Vlakte 215, Drooge Vlakte 220, Drooge Vlakte Outspan 216, Gelege Fontein 203, Goede Hope 225, Government Outspan 227, Graaffwater 244(M), Groot Dam 223, Kopjes Fontein 228, Leeuwe Fontein 208, Nieuwe Plaats 221(M), Plaatjies Kraal 286, Platjes Kraal 201, Schoombies Rust 206, Tabaks Kloof 205, Tabakspoort, 207, The Glen 243(M), Tyger Kloof 204, Visch Fontein 224, Welgevonden 287, Weltevrede 222(M), Wilgefontein 226, Chasterton 35(M), Cornets Kop 1(M), Jordaansrus 15(M), Klip Fountain 40(M), Klip Fountain 44(M), Oud Klip 44(M), Rooi Kopjes 3, Rooipoort 2(M), Sterk Fontein 6(M), Stormberg 41(M), Twee Rivier 16(M), Tweefontein 17(M), Yzerfontein Vlakte 4, Zand Fontein 56(M), Zeven Fontein 14(M) within the demarcated study area.

*(M) = Molteno Magisterial District; other farms in the Albert Magisterial District





CONTACT DETAILS

Applicant

OSHO Exploration (Pty) Ltd with Registration Number 2001/002173/07 is represented by Messrs. Sumit Agrawal and Sundil Ramluggan with contact details as follow:

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PROPOSED PROSPECTING METHOD

Non-invasive prospecting activities

A significant amount of prospecting scientific investigation work has been carried out within the north-eastern Cape Coalfield and surrounds to date. Previous prospecting methods included core drilling, coal core sampling and trenching on outcrops across the site. Since non-invasive prospecting activities are not adequate to determine the distribution of the coal resource in the area of interest, it will be followed by an invasive prospecting programme. The non-invasive prospecting programme will entail geological mapping of the area, as well as ground magnetics and possibly airborne magnetics to define the nature of the sediments and igneous rock of the area in order to determine possible future mining procedures and exclusion zones. The appointed geologist may use a hand carried Geotron instrument for ground magnetics. Final decisions in this regard will be made once detailed planning for the prospecting area has been concluded and any decision in this regard will be communicated to the



affected landowners and the DMR timeously.

In terms of this application, non-invasive prospecting activities may be carried out by OSHO Exploration (Pty) Ltd on any of the privately or State owned properties within the Prospecting study area once the right has been approved. Access to land will, however, be discussed with the affected landowners to maintain reasonability between landowner and the rights of OSHO Exploration (Pty) Ltd under the MPRDA legislation.

Invasive prospecting activities

Core Drilling

The prospecting application includes an invasive core-drilling programme comprising between 160 and 450 boreholes, starting off with 3-4 boreholes per farm. Depending on the size of the farms, this amount may be reduced or increased. Should major infill drilling be anticipated, detail in this regard will be made available to the landowners and the DMR over the next few years. It is important to note that the general borehole drilling strategy for the Molteno/Burgersdorp area is conceptual. Final borehole positions will, however, depend on the data extrapolated from previous borehole data obtained during historic prospecting programmes.

Diamond core drilling will be carried out during the prospecting exercise. It should be noted that invasive prospecting should not pose any environmental challenges and degradation of the natural environment, since drilling will be restricted to more or less flat areas to prevent incurring excessive rehabilitation costs associated with road construction on steeper slopes. OSHO EC Exploration (Pty) Ltd will commence with the drilling programme within approximately 6 months of the granting of the Prospecting Right by the DMR. The contractor to conclude the drilling programme has not been appointed, but once appointed; the contractor will be bound by all EMP guidelines by means of a written undertaking to comply with these guidelines. More than one drilling rig might be stationed at each farm, which will shorten the prospecting period on each farm.

Each borehole will be drilled down to between 40 and 100 metres below surface. The depth of each borehole will be dictated by the depth and thickness of the overlying sediments and coal seam, which needs to be intersected and sampled for further analysis. Diamond core drilling will be carried out during the invasive prospecting exercise and will include the following:

- The drilling will follow a broad pattern to establish most suitable coal reserves in the study area.
- Borehole densities and drilling patterns will be revised in areas where significant coal reserves are determined.
- Boreholes will average about 60 metres in depth
- At this stage OSHO EC Exploration (Pty) Ltd will regard the drilling programme for the entire

Molteno/Burgersdorp footprint as one overall phase. However, as stated above, an effort will be made to conclude drilling on one particular farm to accommodate the requirements of the landowners, but the applicant will have the right to return to any area to perform further drilling, should a need arise for such drilling.

Pitting

If surface outcrops are identified, pits with footprint of approximately 2m x 2m x 3m might be excavated manually or with TLB/Excavator.



Trenching

If surface outcrops are identified, trenches with footprint of approximately 2m x 10-100m x 3m might be excavated with TLB/Excavator.

Bulk sampling

If preceding coal analysis and reserve mapping requires, bulk samples could be extracted over areas ranging from 20m x 50 x 3-5m to 100m x 50m x 3-5m.

The exploration drills to be deployed will be drawn by a medium size truck and are easily movable over rough terrain and do not require the establishment of large drilling platforms which would preclude bulldozing drilling platforms that could pose rehabilitation challenges. Existing access roads will be used as far as possible and all new access roads will be of temporary nature and planned in conjunction with the land owners of each specific area. It is essential that landowners make themselves available for such discussion on short notice, failing which the company will proceed with drilling not to interrupt the prospecting process since standing time would be costly to the applicant.

The drilling rigs are diesel powered hence neither Eskom power nor freestanding generators will be required. In order to prevent hydrocarbon spills during drilling or refuelling, plastic liners will be positioned underneath the drilling rigs. Water, for cooling down the drill bits, will be stored in 5000L JoJo PVC tanks and will be filled from water sources still to be negotiated by means of a water bowser. Water circulated from the boreholes is pumped into three silt traps, the one flowing into the other to facilitate the settlement of fines before it is being re-used. This reduces water use substantially and is in line with general environmental principles. Approximately 1500-2000 litres of water will be required for each borehole, but this estimate is dependent on geological features.

At each drill site a caravan will be parked for storage of limited equipment for the drilling rig, resting facility where meals can be enjoyed and for use by the night-watchman. To ensure that the venture is compliant with Mine Health and Safety Regulations, a chemical toilet will be positioned next to the drill site.

The boreholes will be drilled using TNW diameter (60 mm) diamond core drill bits. Drill orientations will be mostly vertical to near-vertical. The boreholes will be drilled within the broad grid pattern where coal reserves are expected. Coal samples will be removed and analysed offsite during the prospecting operation. Outcome of such result might lead to infill drilling or abandonment of a farm.

Once the prospecting borehole has been stopped, the core will be removed and packaged and the borehole will be capped with a steel plate to obsolete the drill casing. The casing will be wedged into the borehole with locking pins and finally capped with a concrete beacon, which will include the relevant borehole number. Although the release of methane gas by this coal deposit is not anticipated, but if it occurs, such borehole will be plugged with concrete mix before fixing the steel plates to prevent ignition and possible fire hazard.

Sampling and Analysis

All borehole coal cores will be removed from the prospecting area and be taken to OSHO EC Exploration (Pty) Ltd's offices and core sheds in Molteno/Burgersdorp where the data will be logged and assessed before being transported to an accredited coal laboratory for analysis. Rock cores will be stored in core yards within the prospecting area and once the data has been logged, these cores will either be stored within a shed in Molteno/Burgersdorp, or be returned to the prospecting holes.



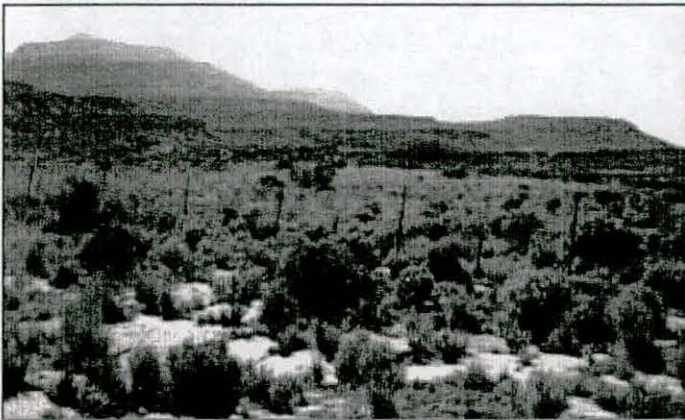
Possible outlay of the drilling area





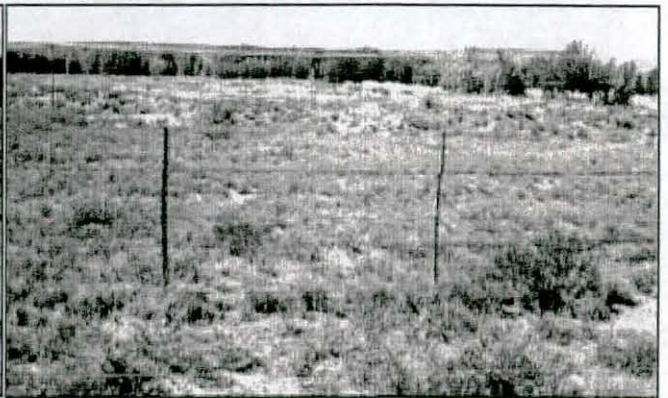
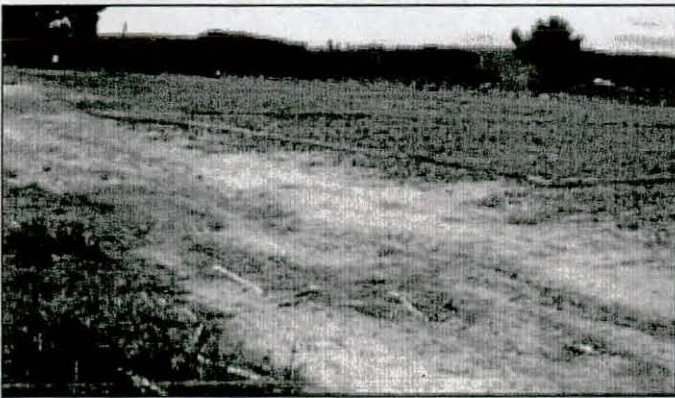
PICTORIAL RECORD OF GENERAL VELD CONDITIONS AND INFRASTRUCTURE OF THE PROSPECTING FOOTPRINT

1. Geyer farm (lower farm)– Along Graaffwater Road



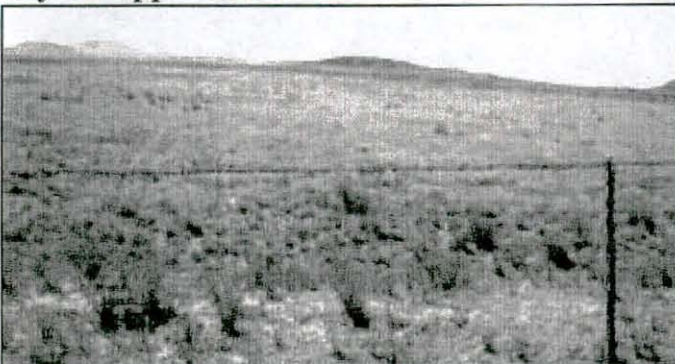
All cultivation areas will be excluded

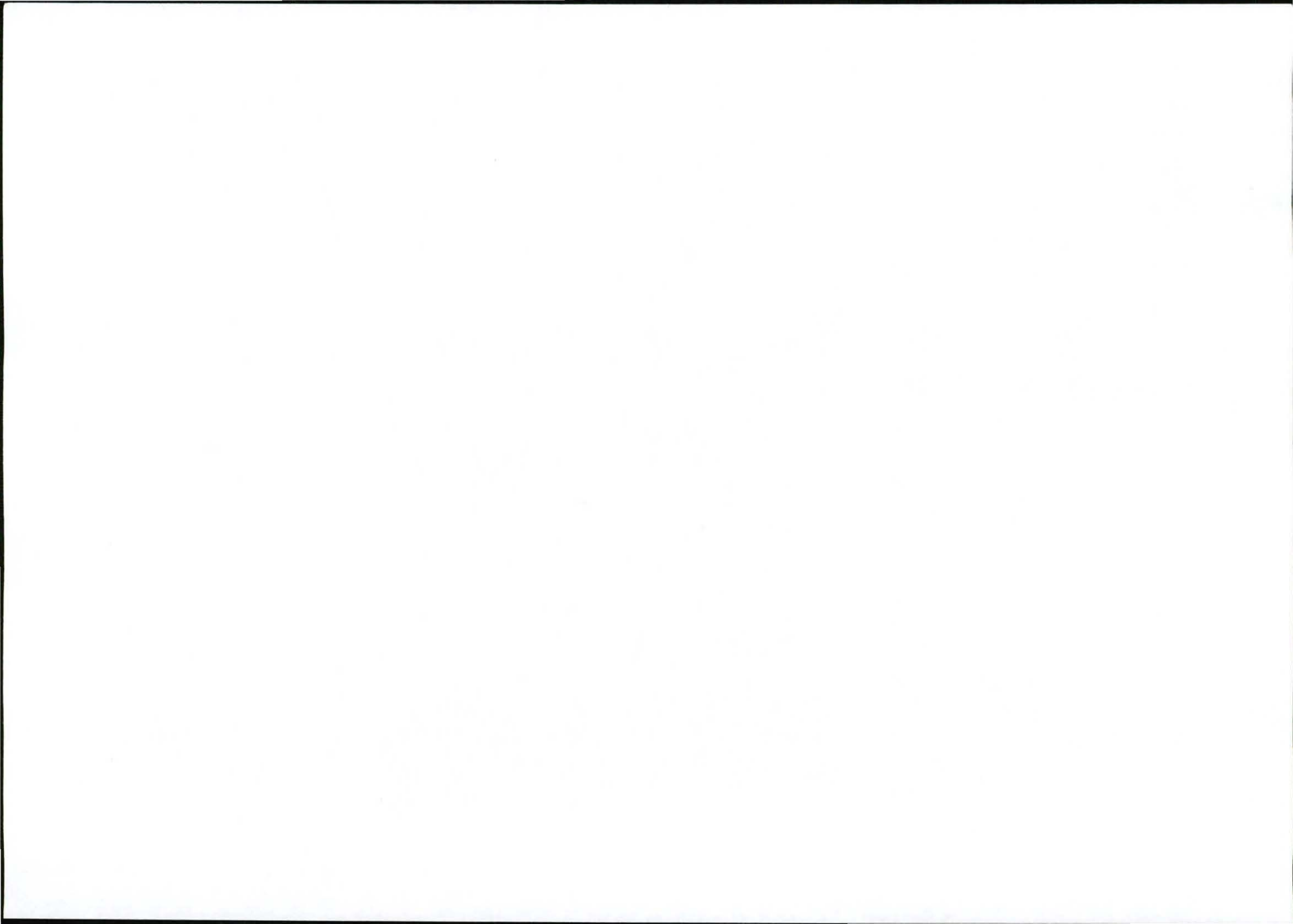
Erosion on farm



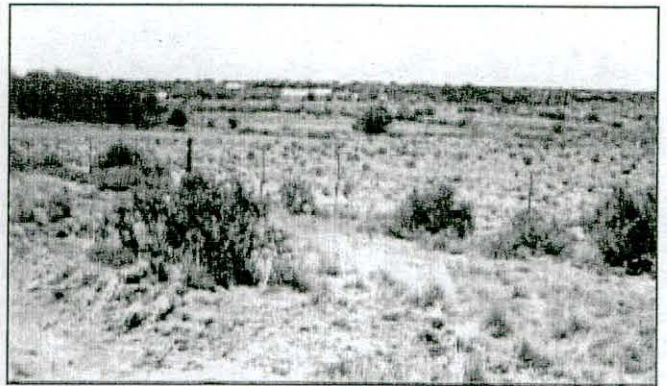
Geyer - Upper farm

Stock watering facilities will be excluded

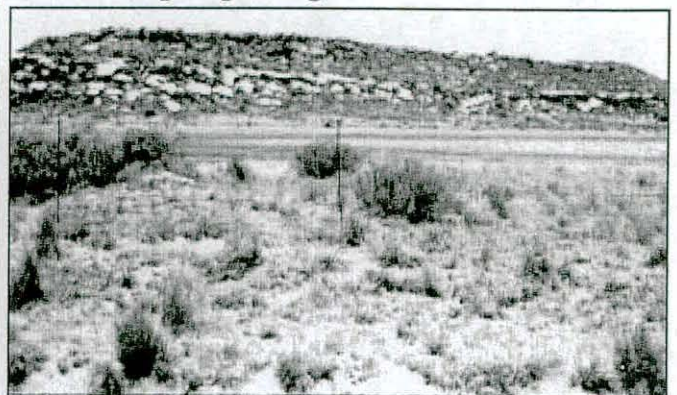
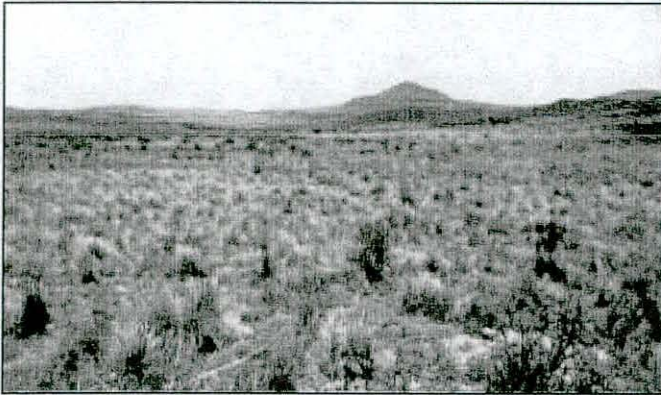




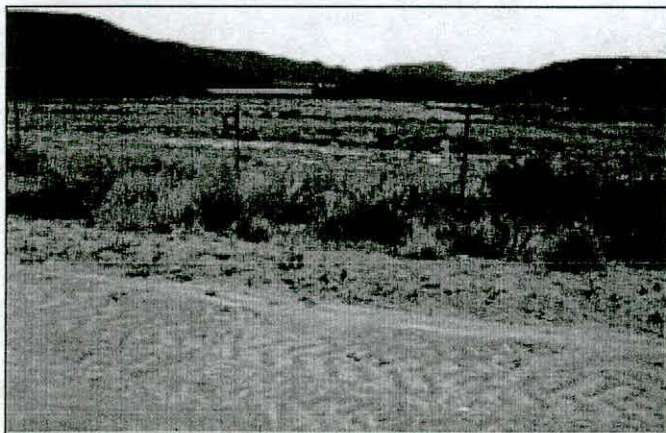
2. Venter – Goodhope farm



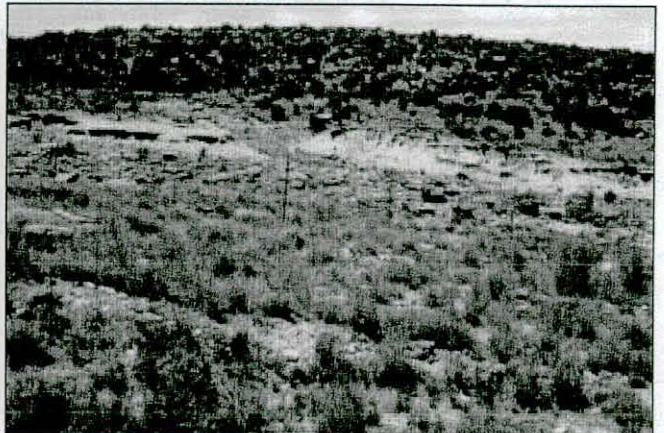
Hill areas to be excluded from prospecting



Cultivation areas to be mainly excluded



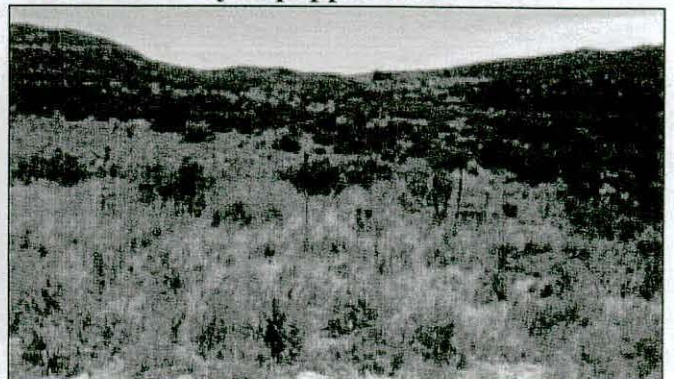
Extensive sheet erosion

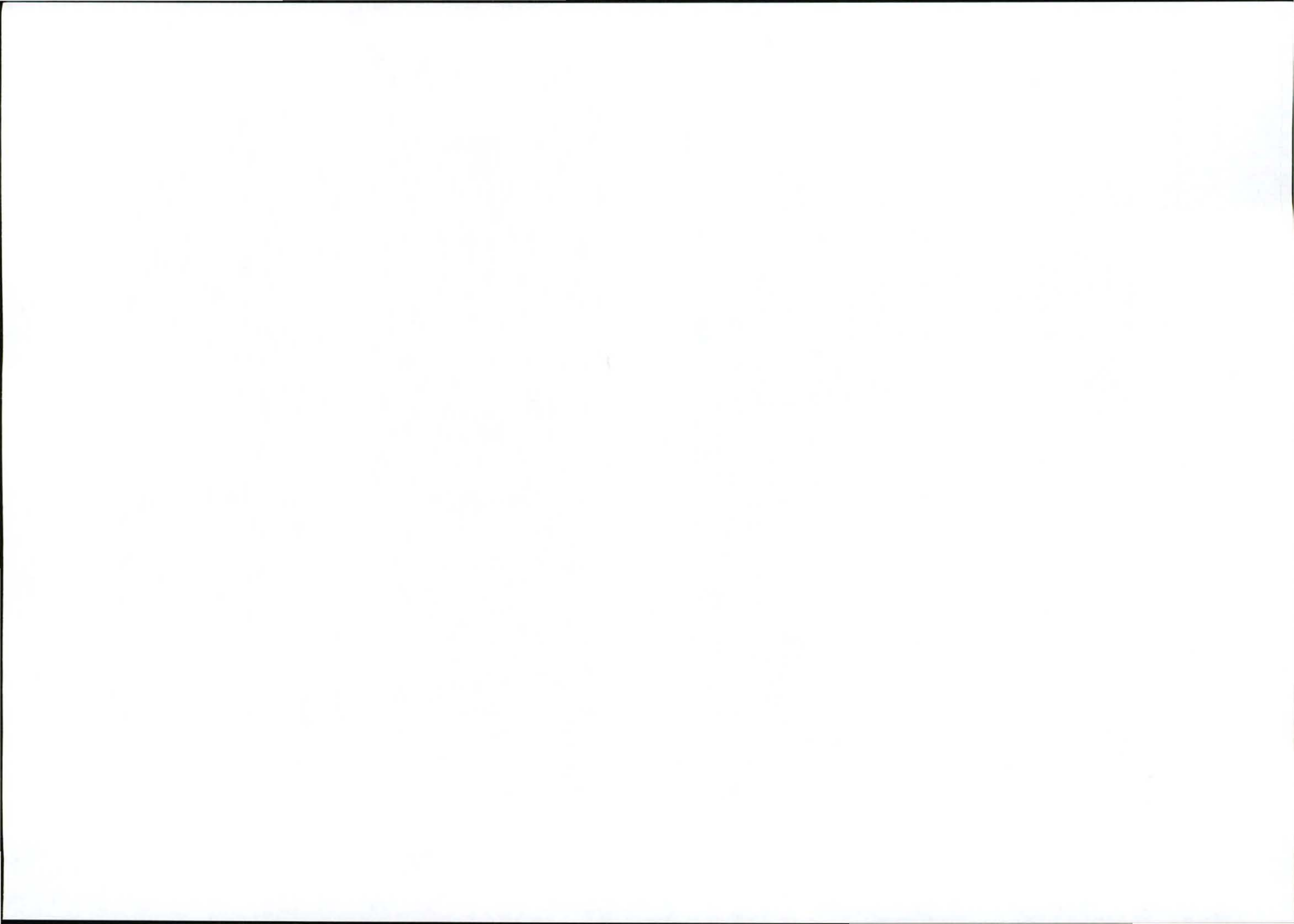


Smith – Weltevrede farm

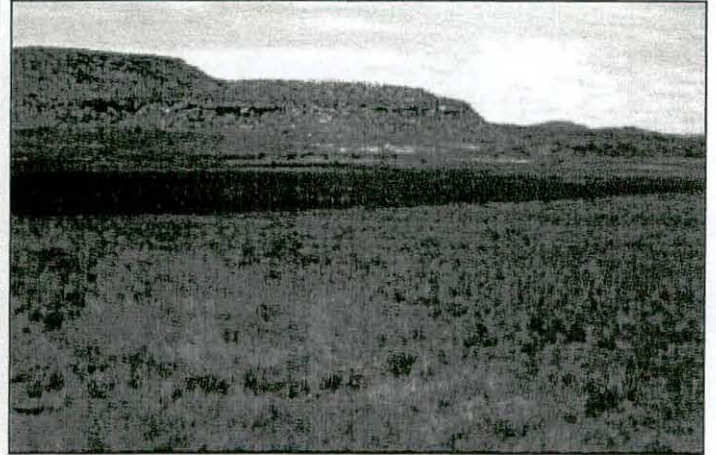


Passerina & Elytropappus veld

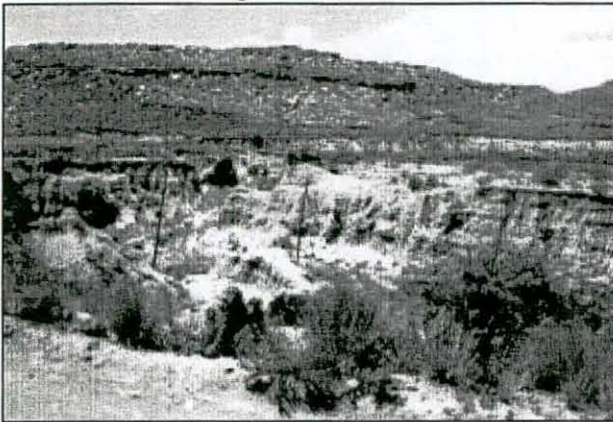




Viljoen – more fertile soils in valley areas being used for maize cultivation



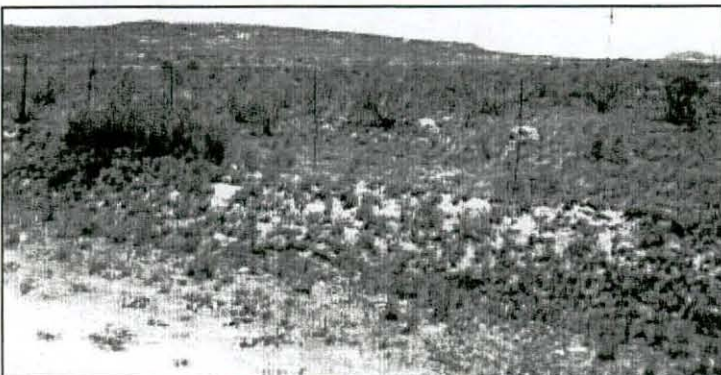
Extensive drainage channel erosion

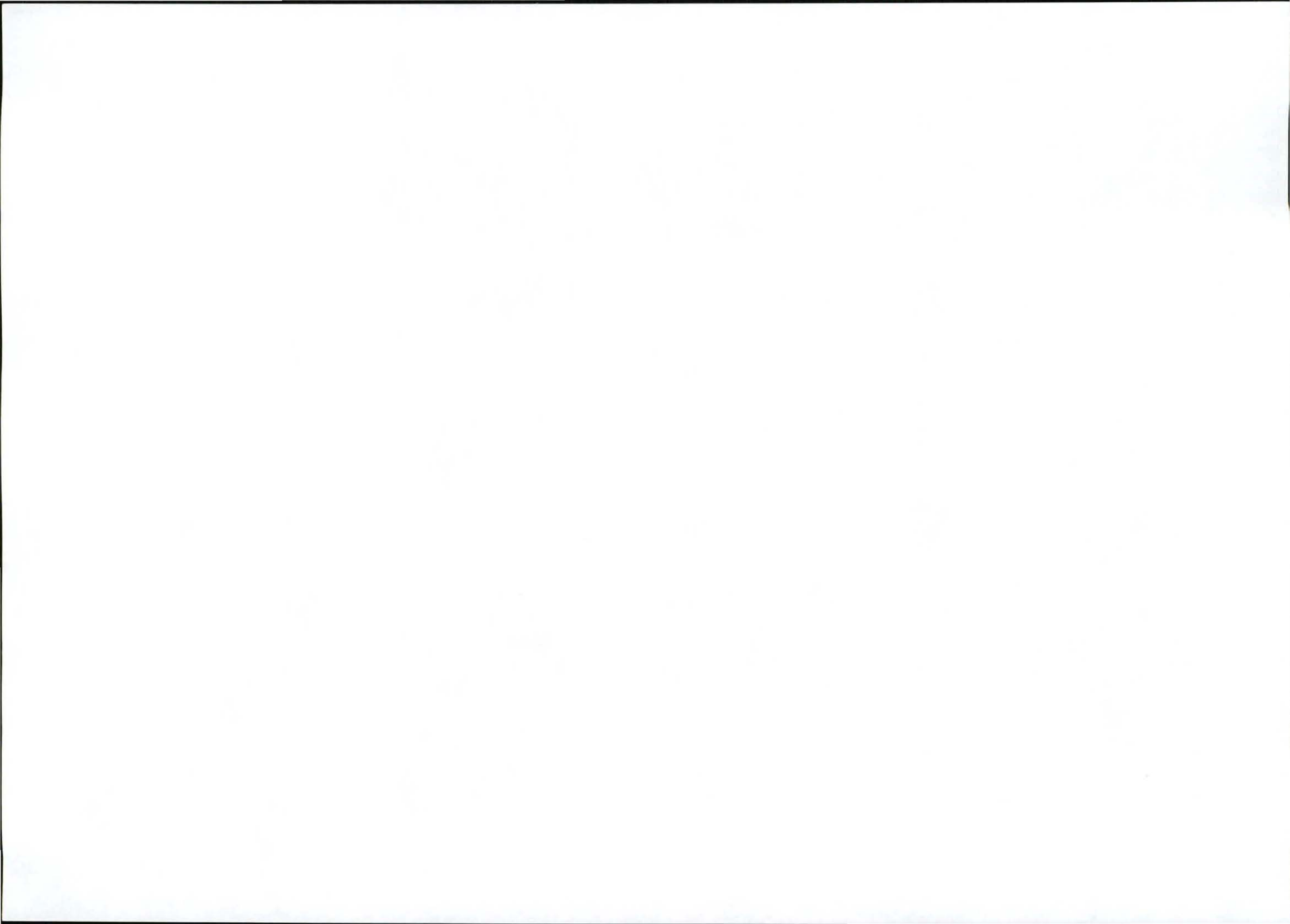


Maize cultivation in distance

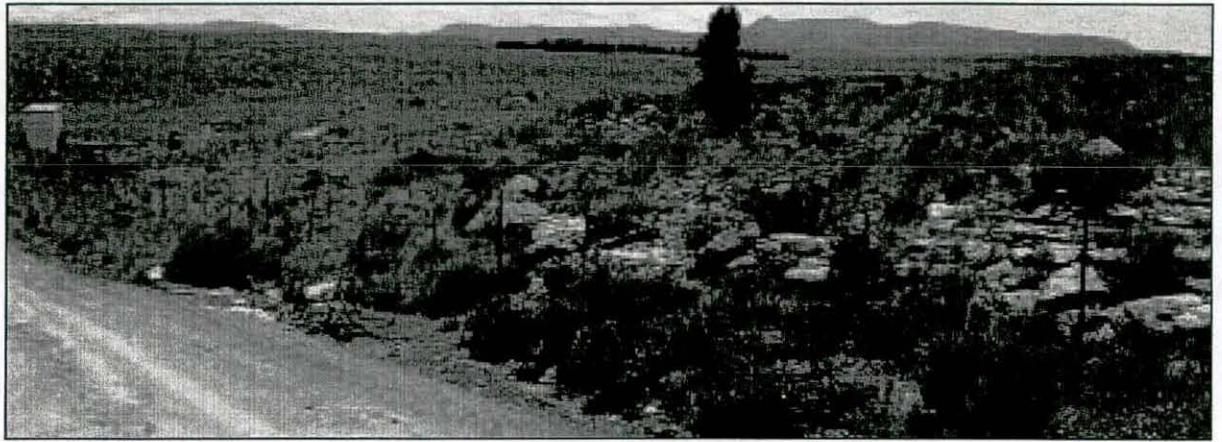
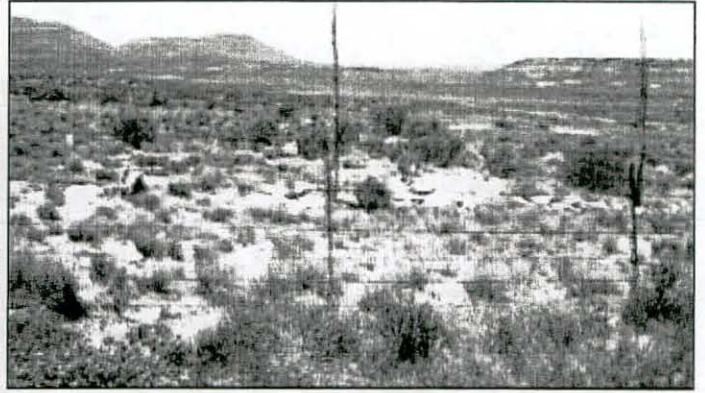
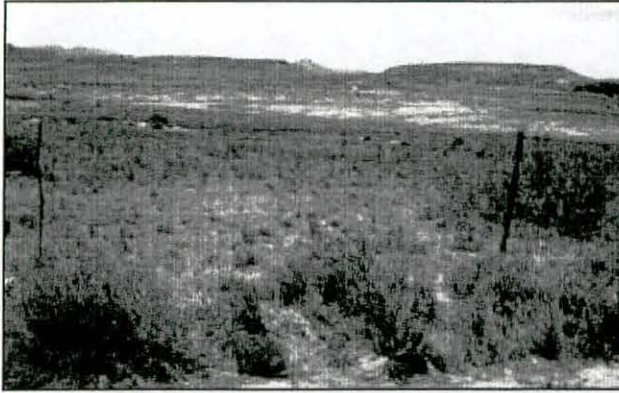


Cloete - Weltevrede

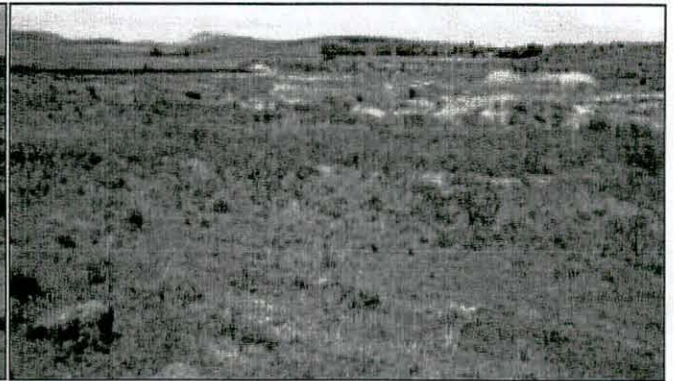
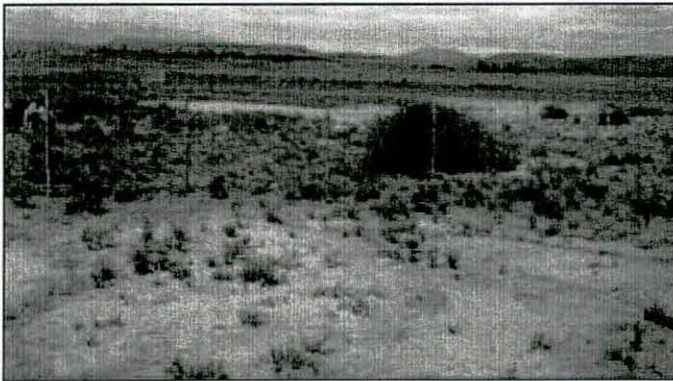




Van Straaten farm – Previously utilized as game farm



Soil erosion

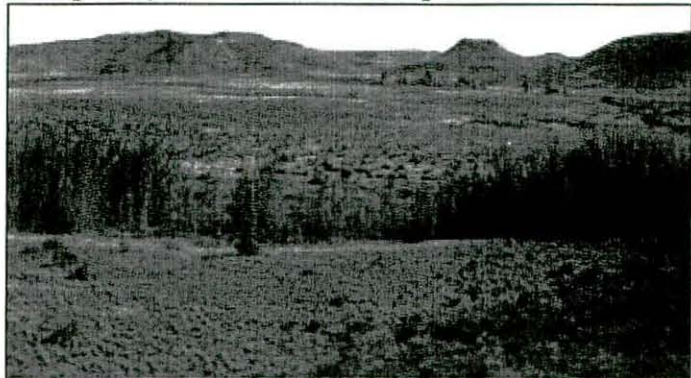


Paul farmland along Stormberg River





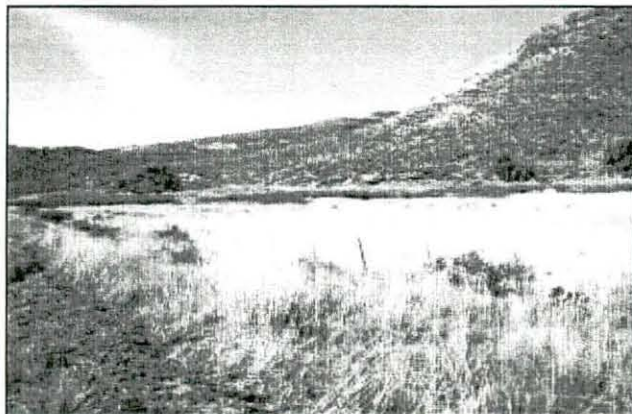
Completely transformed floodplain



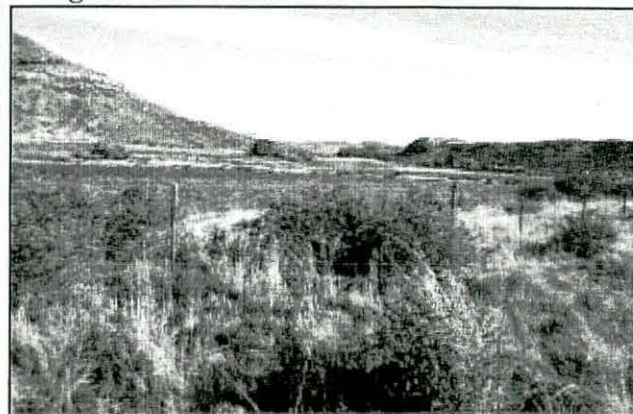
Stormberg River with wetland behind weir



P.A. Venter



Large Lucerne lands

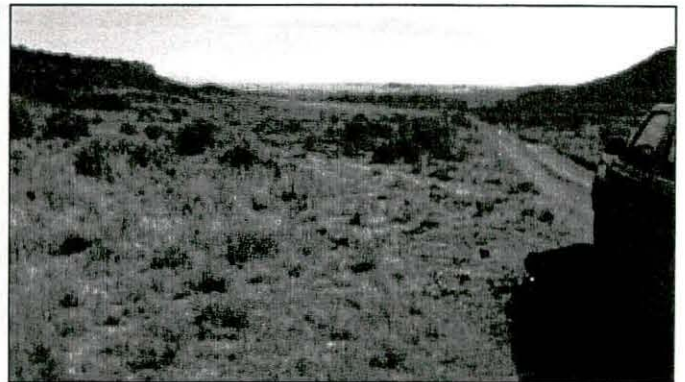
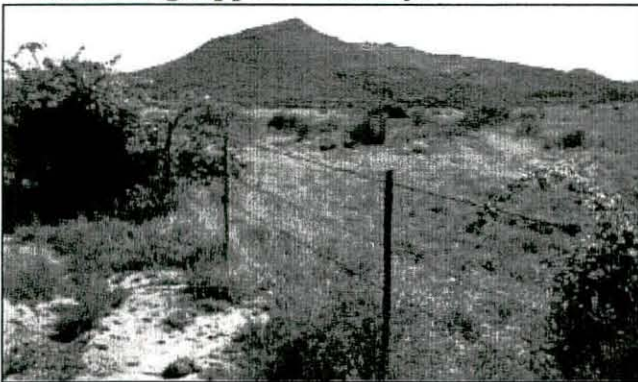




Farm Rooipoort



Farm Vegkoppies – Van Zyl

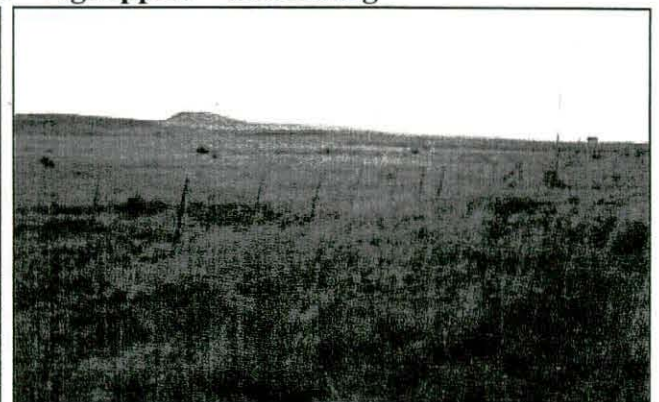
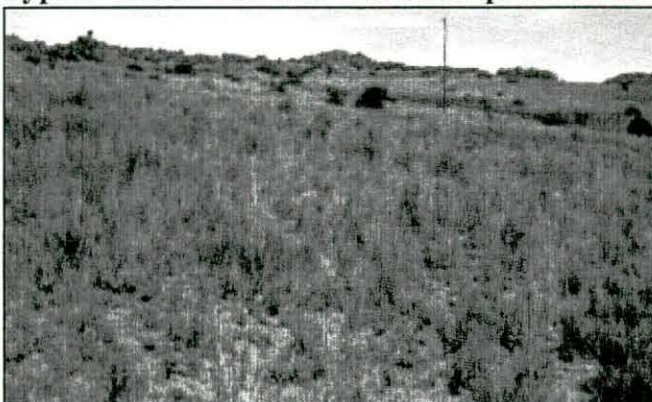


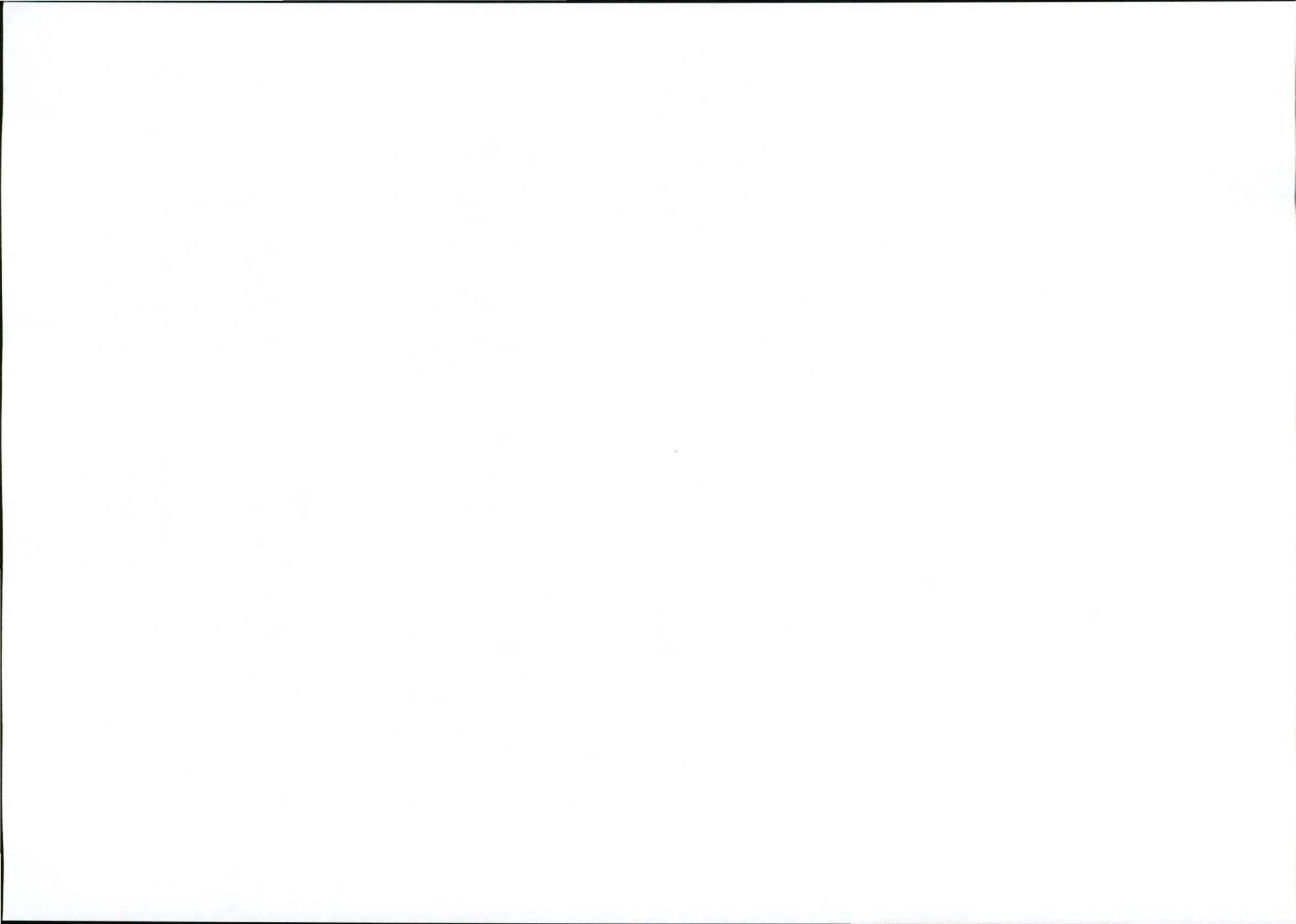
Renosterbos veld with sandstone outcrop and cultivation areas

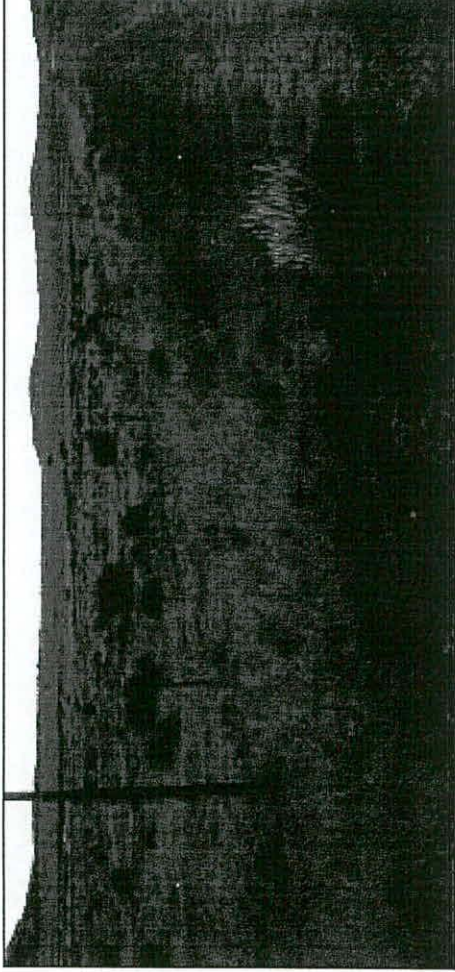


Erica canina

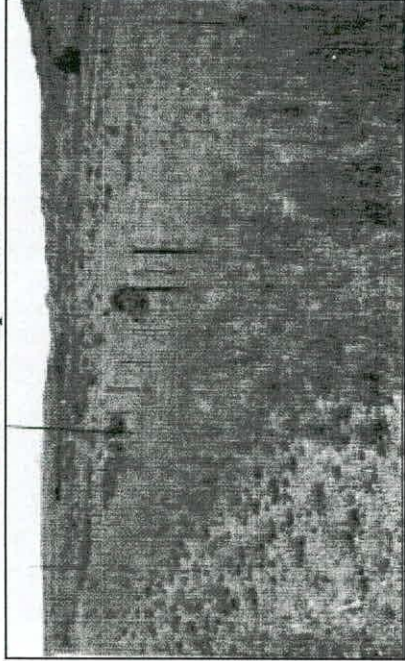
Typical Karoo veld with bush clumps near house Vegkoppies - Stormberg



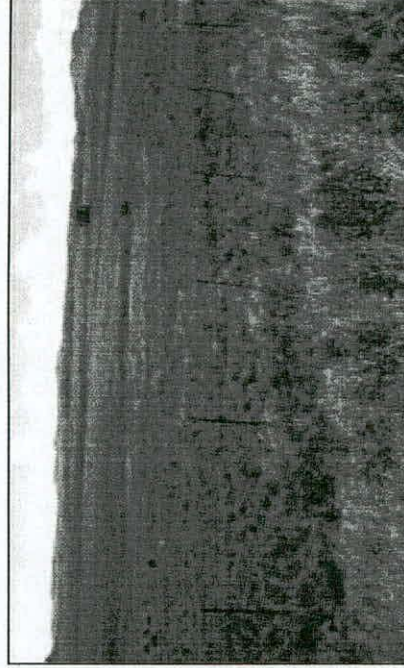
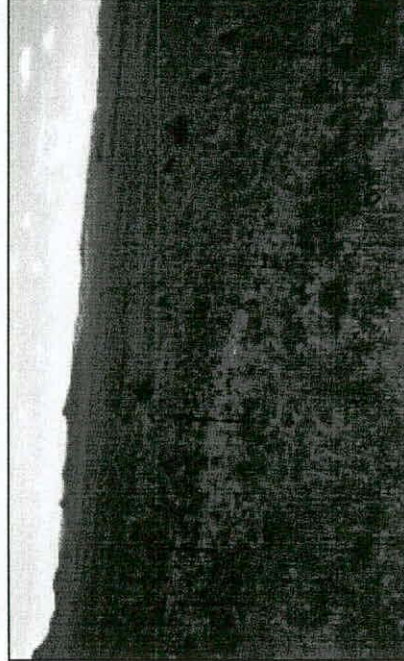
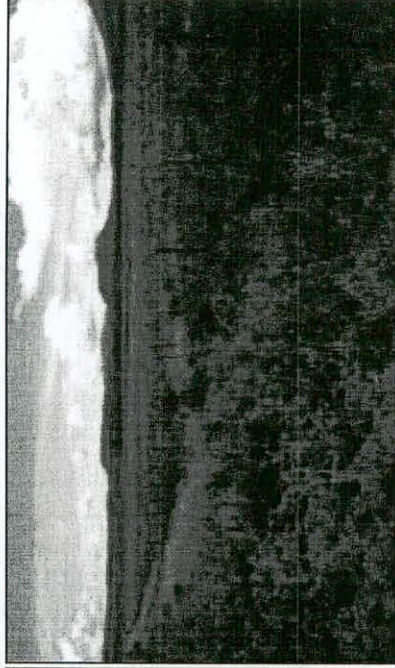
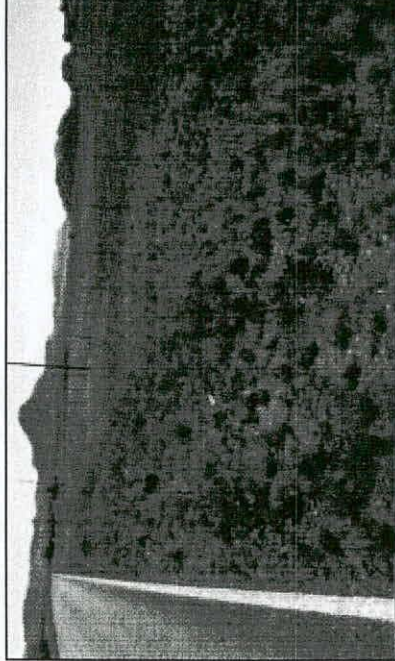
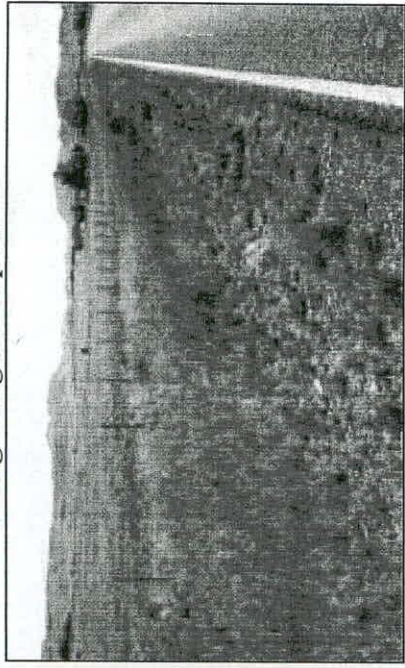




Farm Oud Klip – North-west

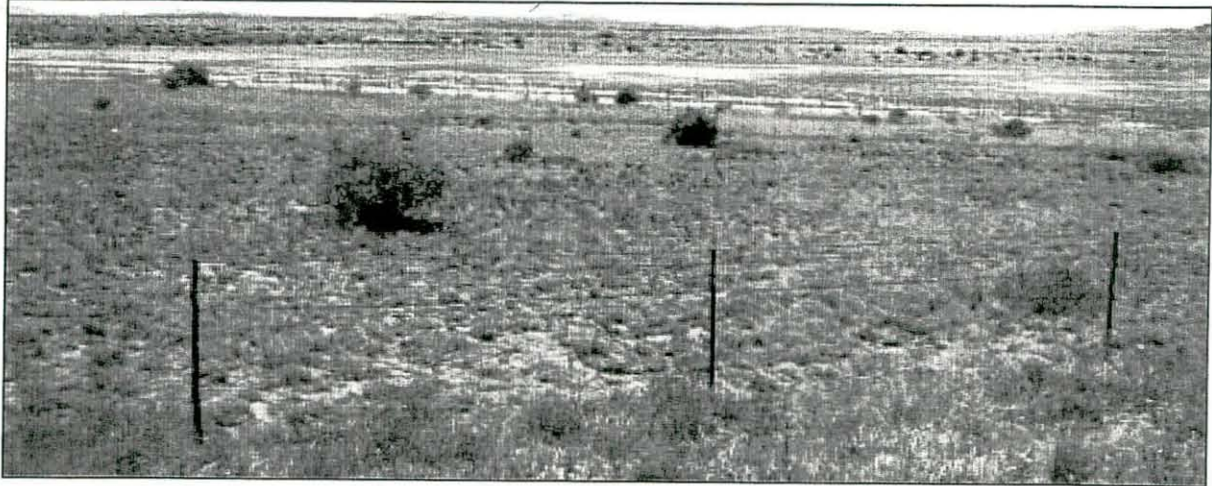


Along Burgersdorp Road

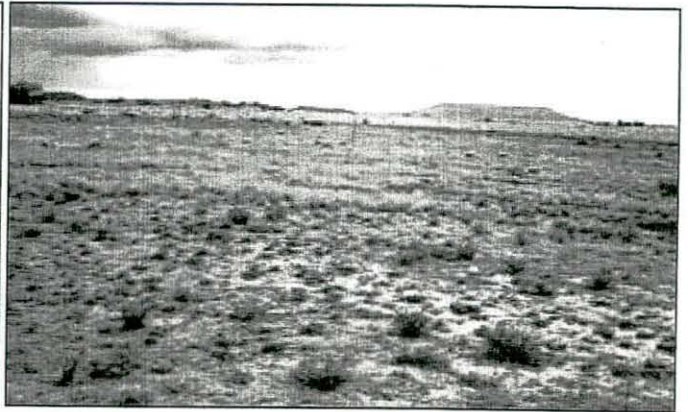




Oud Klip cultivation areas



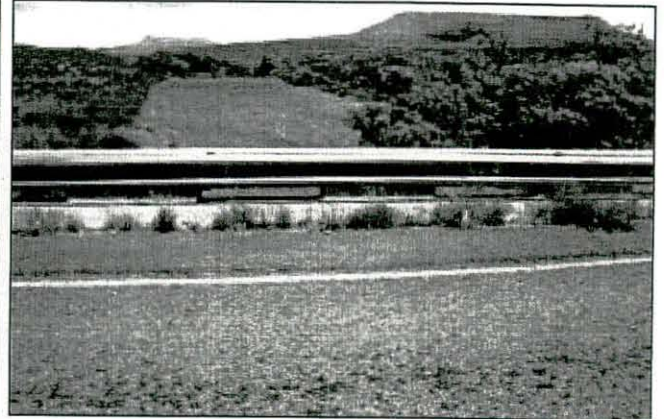
Oudklip – South-east



Farm Collingham

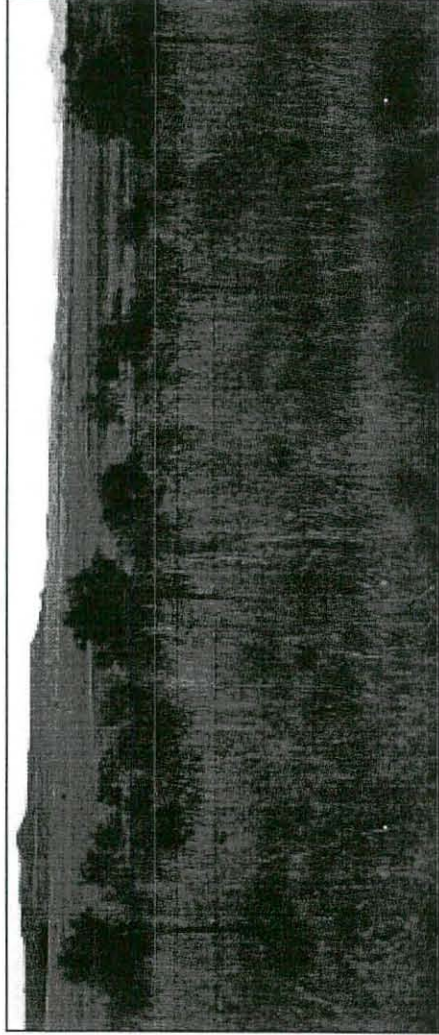
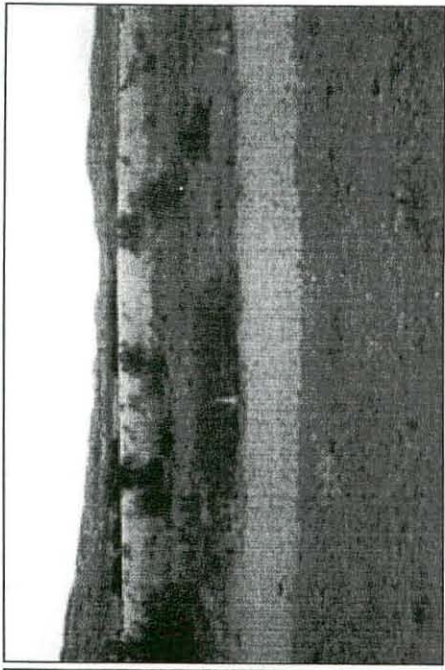
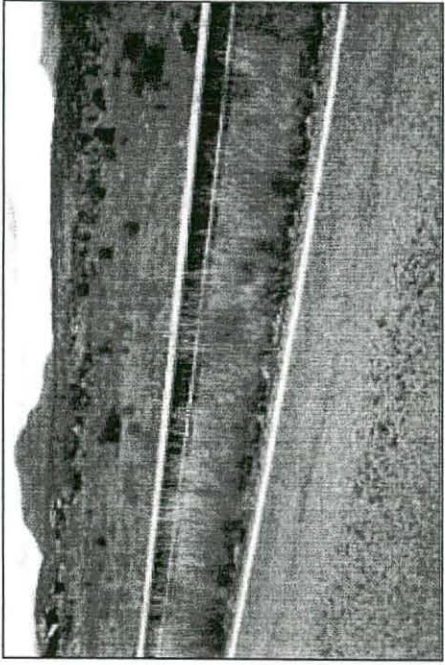


Bamboes Spruit with cultivation areas





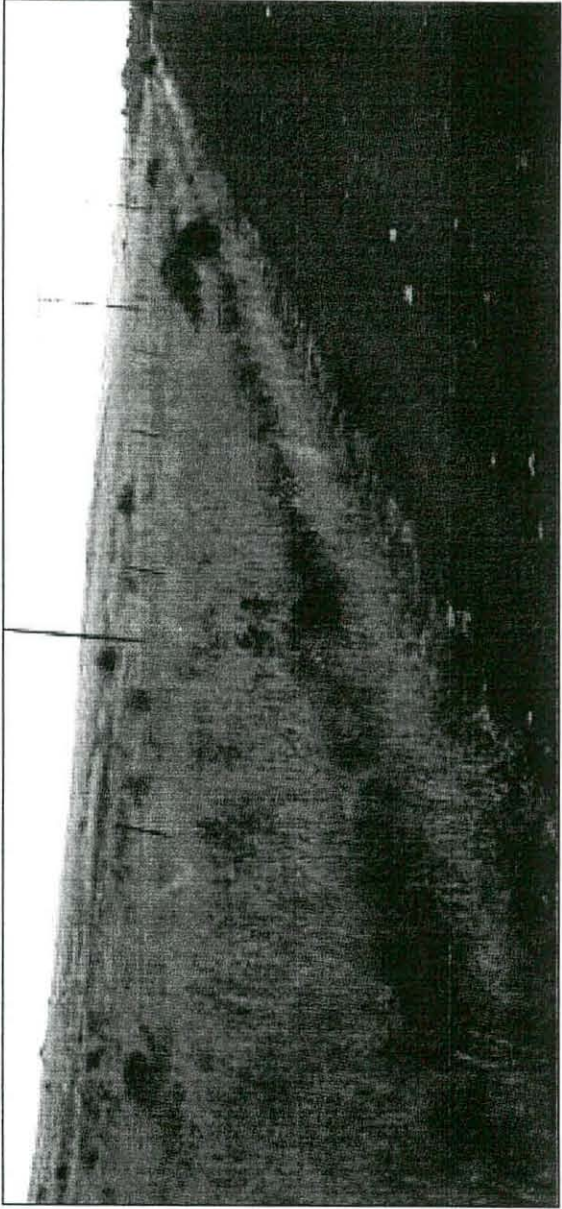
OSHO Exploration EC



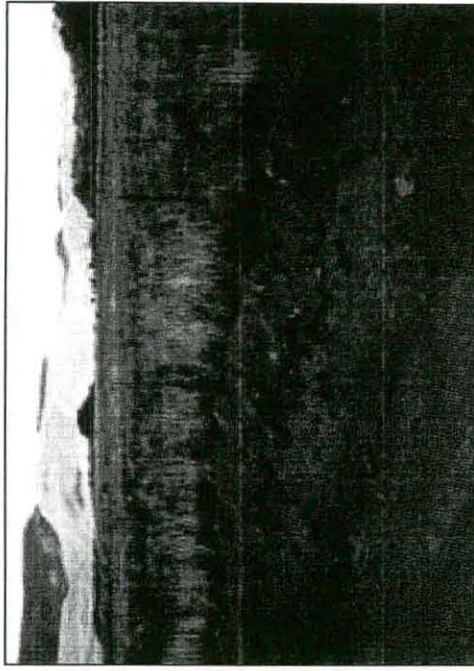
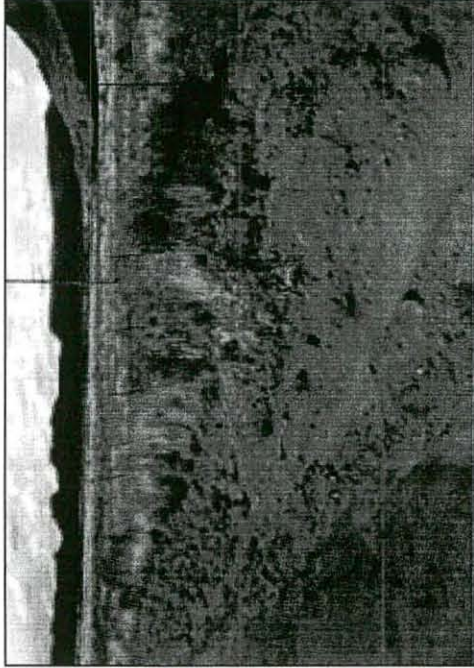
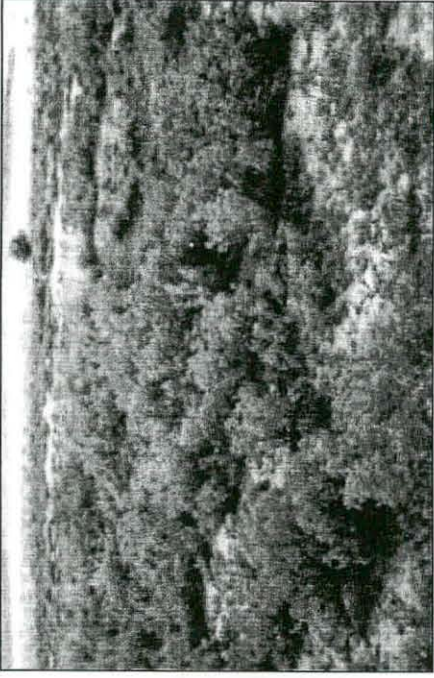
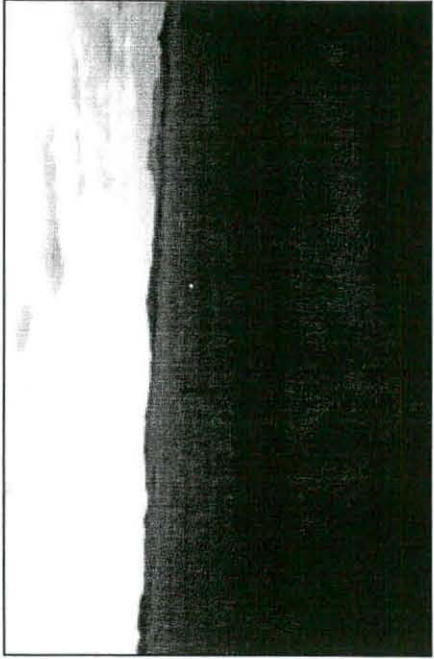
Terburgh - Farm Drooge Vlakte







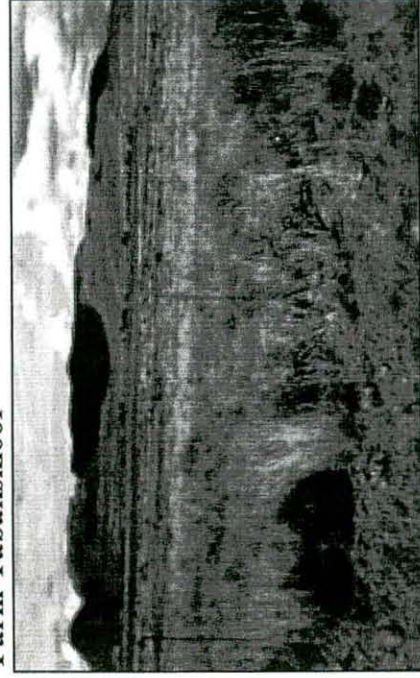
Koekemoer – Farm Lushof



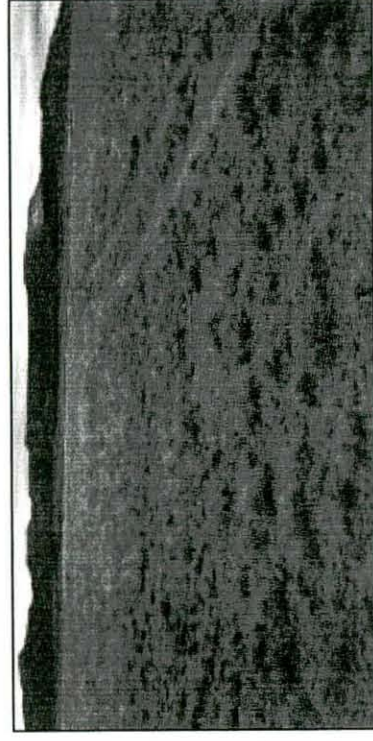
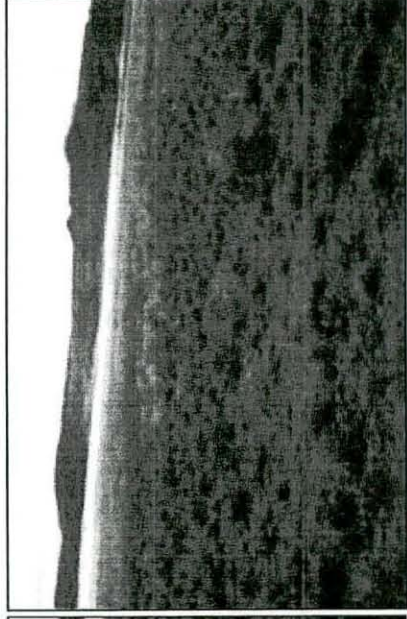
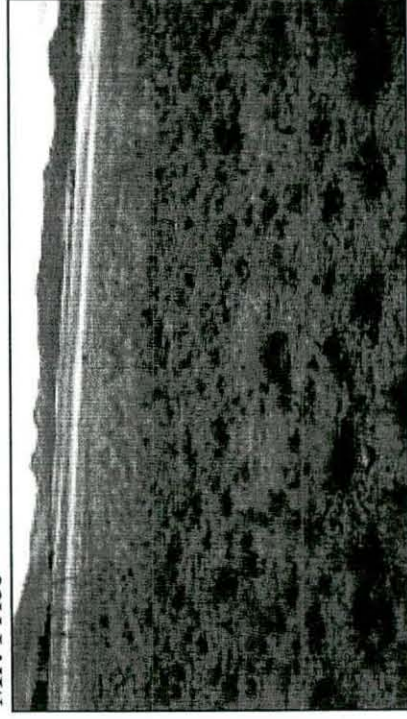


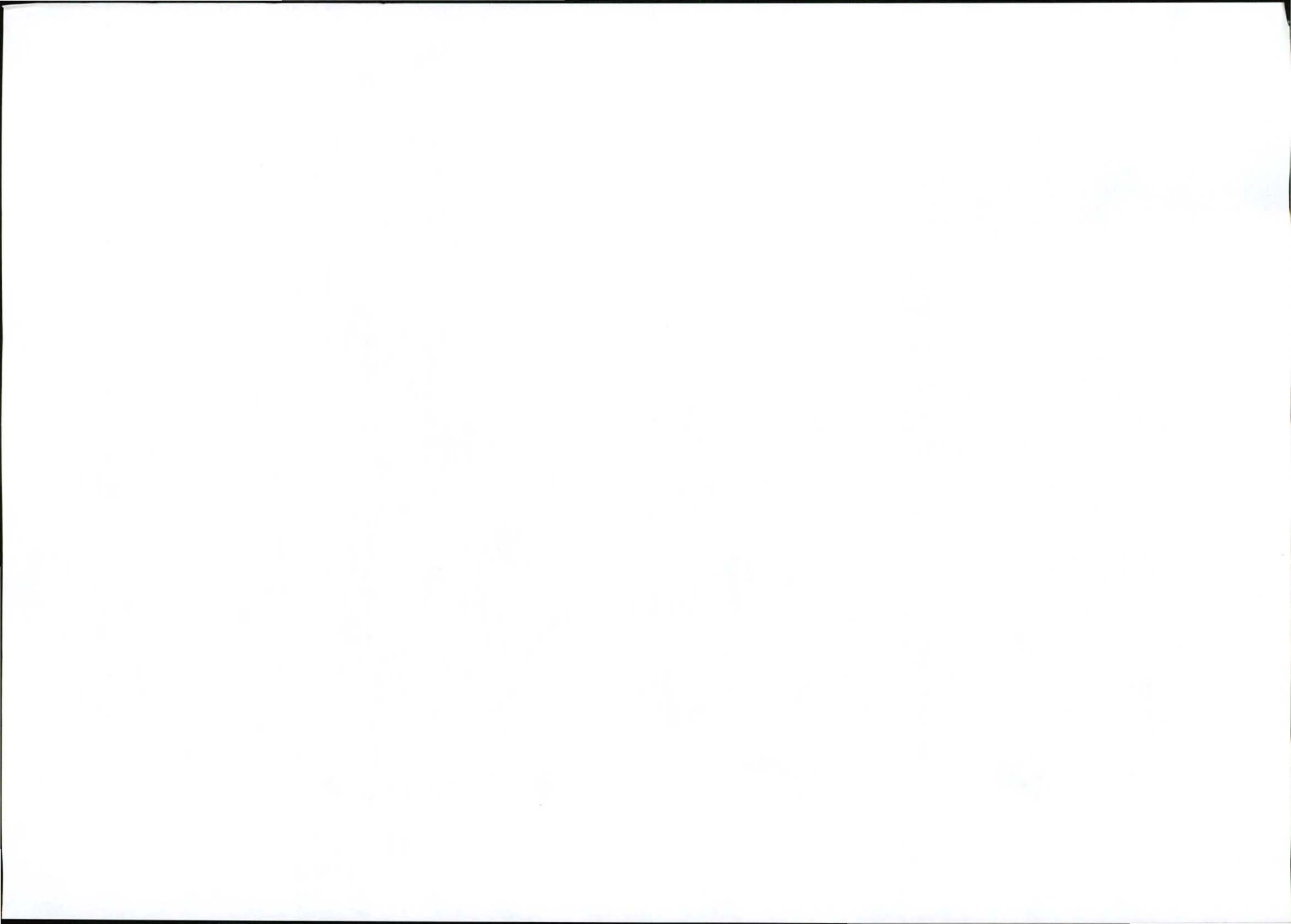


Farm Tabakskloof



Mr. Price

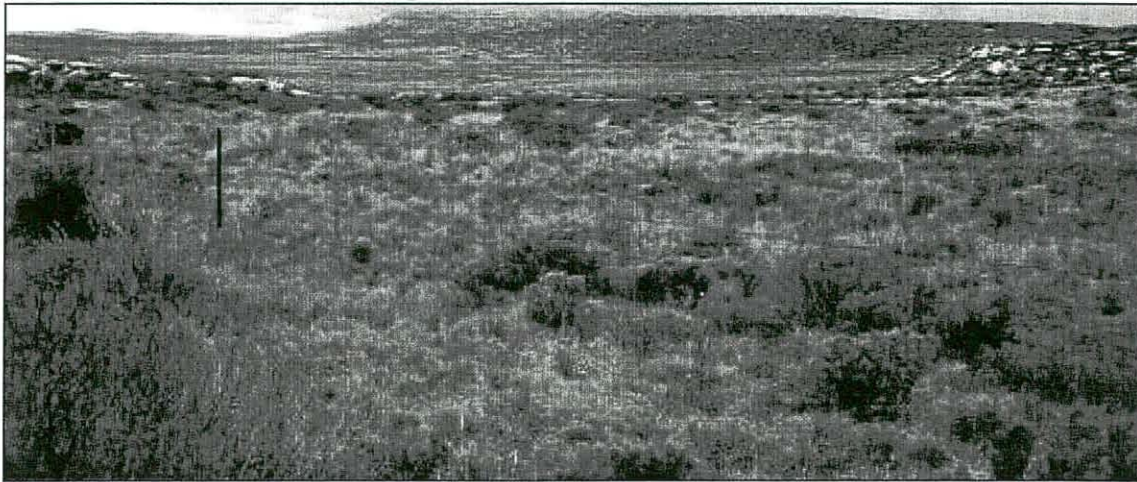




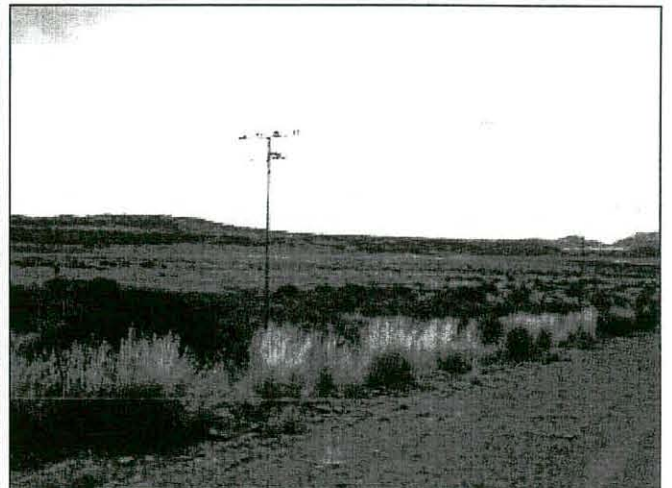
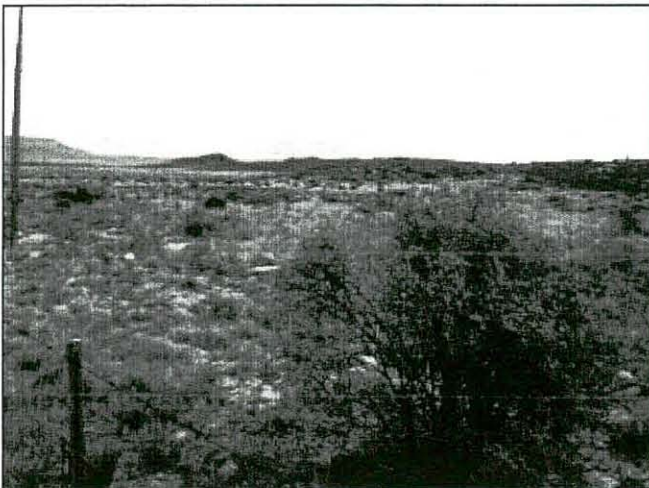
Extensive Lucerne and barley lands



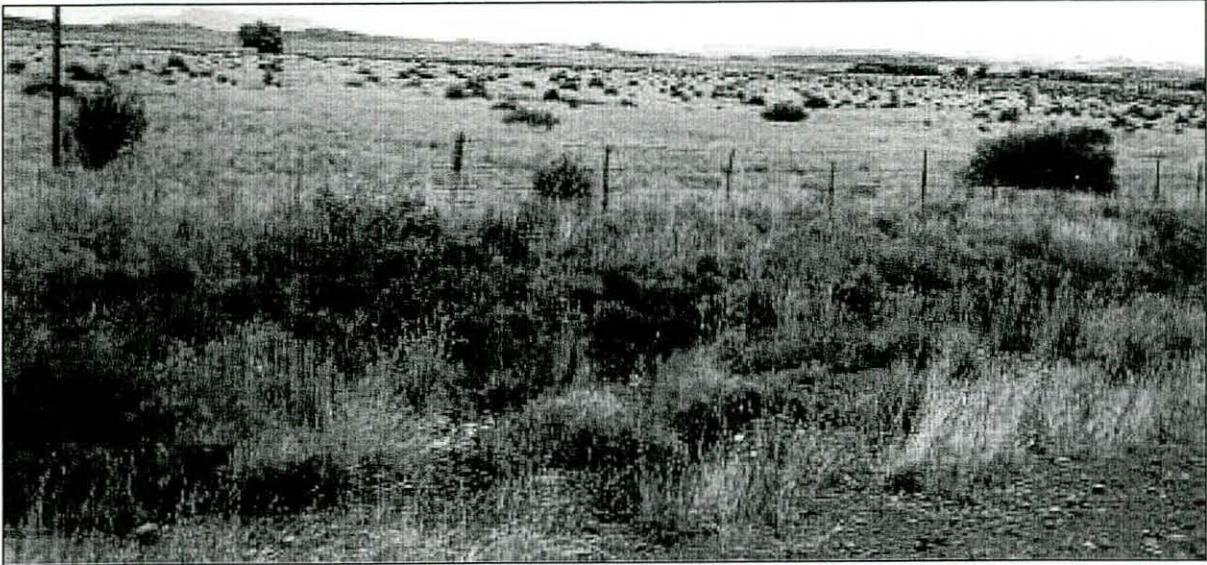
Farm Weltevrede : Stormberg



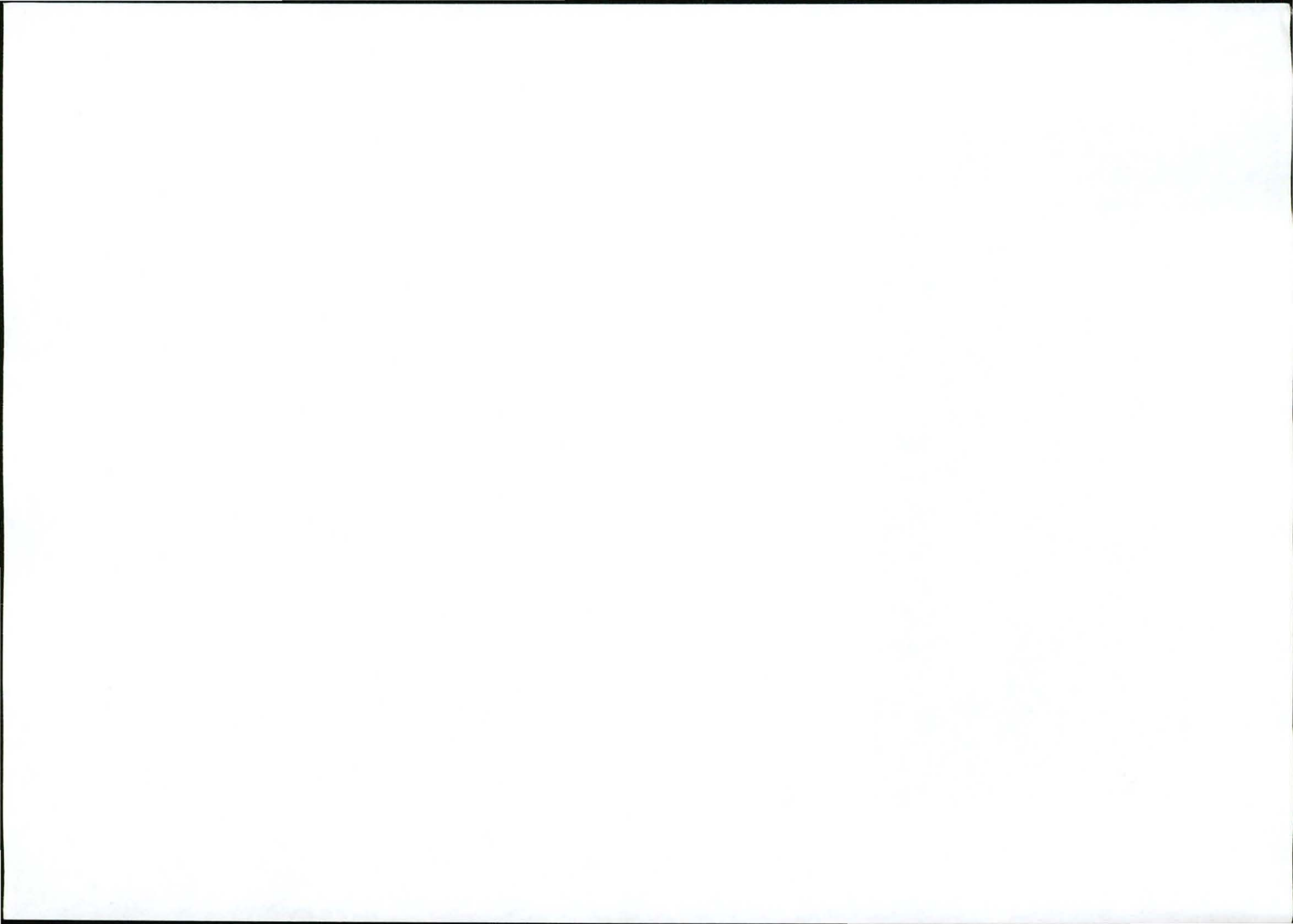
Farm Nieuwe Plaas







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REGIONAL GEOLOGY

According to the 1:250 000 geological map (3126 QUEENSTOWN) published by the Geological Survey of South Africa, the northern section of the study area is underlain by Late Triassic mudstone and sandstone of the Burgersdorp Formation and the southern section by the Molteno Formation, both of the Karoo Supergroup. The coal seams targeted by the prospecting right proposal are mostly associated with the latter formation. Mudstone and sandstone of the Burgersdorp Formation of the Beaufort Group underlie the Molteno Formation conformably and outcrop in the northern-western section of the study area. Mudstone and sandstone of the Elliot Formation of the Beaufort Group overlie the Molteno/Burgersdorp Formations conformably, and occur within the western section of the area of interest.

Numerous dolerite dykes and sills have intruded into these sedimentary rocks, with outcrop generally restricted to the higher-lying topography in the study area and more particularly along the alignment of the Stormberg Spruit. Alluvial cover material has been deposited along the low-lying areas with specific emphases on the Stormberg Spruit environ.

The proposed prospecting activities in an area traditionally referred to as the Molteno Coal Province by earlier geologists, will target all four of the main coal seams, based on geological field mapping and data obtained from previous geological drilling programmes conducted by Federale Mynbou and the Geological Survey of South Africa. The Molteno Coalfields have a long and rich history and the exploitation thereof dates back to the early 1800's. Data from previous exploration and mining companies will be included into the database of OSHO EC Exploration (Pty) Ltd Coal as far as practically possible. Some of this older data, however, is incomplete and therefore it is supplemented with recent exploration data gathered by OSHO Exploration (Pty) Ltd Coal. A broad overview of the geological formations and associated lithologies of interest within the study area is as follows:

Structural Geology

The strata are generally horizontal or dip at low angles less than 5° with the horizontal. Steeper dips are rare and only present closer to the dolerite intrusions. Faulting is relatively uncommon and those faults that do occur show very small displacements. Gentle basining has resulted in low (between 1° and 3°) regional northward dips.

Burgersdorp Formation

The Burgersdorp Formation of the Tarkastad Subgroup, Beaufort Group, of the Karoo Supergroup, generally comprises red and greenish-grey mudstone and sub-ordinate fine-grained sandstone. This formation attains a maximum thickness of about 950 metres south of Queenstown and thins rapidly northwards.

Terrestrial vertebrate fossils and plant remains are frequently encountered within the mudstone component of the Burgersdorp Formation. In the north-eastern interior of the Eastern Cape Province, the Burgersdorp Formation is conformably overlain by the Molteno Formation and conformably underlain by the Katberg Formation. Both of these formations are characterised by thick sandstone horizons.

Molteno Formation

The Molteno Formation was formed by large braided rivers flowing into one another and depositing sediment over a vast plain. These rivers supported lush riverine vegetation, on which numerous insects fed. Today, these deposits have formed the extensive fossil plant and insect assemblages of the Molteno



Formation. The rich plant deposits also formed coal, which were first mined around the town of Molteno during 1864.

The Molteno Formation was originally referred to as the "Coal Measures". This formation generally comprises alternating fine to coarse-grained sandstone, which is occasionally pebbly in places. Olive mudstone and dark grey shale, with abundant plant remains and coal seams, occur in places. The Molteno Formation attains a maximum thickness of about 600 metres in the south, thinning rapidly northwards to less than about 10 metres in the north-eastern part of the north-eastern Free State Province. The Molteno Formation is sub-divided into the Bamboesberg, Indwe Sandstone, Qiba, Tsomo and Loskop Members.

Elliot Formation

The Elliot Formation is generally regarded as a red and greenish-grey mudstone with subordinate sandstone. This formation ranges in thickness from a maximum of about 500 metres near Elliot, to under 70 metres in northern Lesotho, to a mere 20 metres near Harrismith. The Elliot Formation is conformably overlain by the Clarens Formation to the north and north-east. The Elliot Formation was referred to as the Red Beds and Barkly Pass Formation by previous geologists and is well represented as a collar around the Lesotho Highlands.

Dolerite

Dolerite intrusions along zones of weakness in sedimentary rocks characterised the end of the Karoo era between 150 and 190 million years ago. The present dolerite outcrops are remnants of this massive igneous suite. The magma forming the dolerite sills and dykes would have had an effect on the surrounding sedimentary rocks.

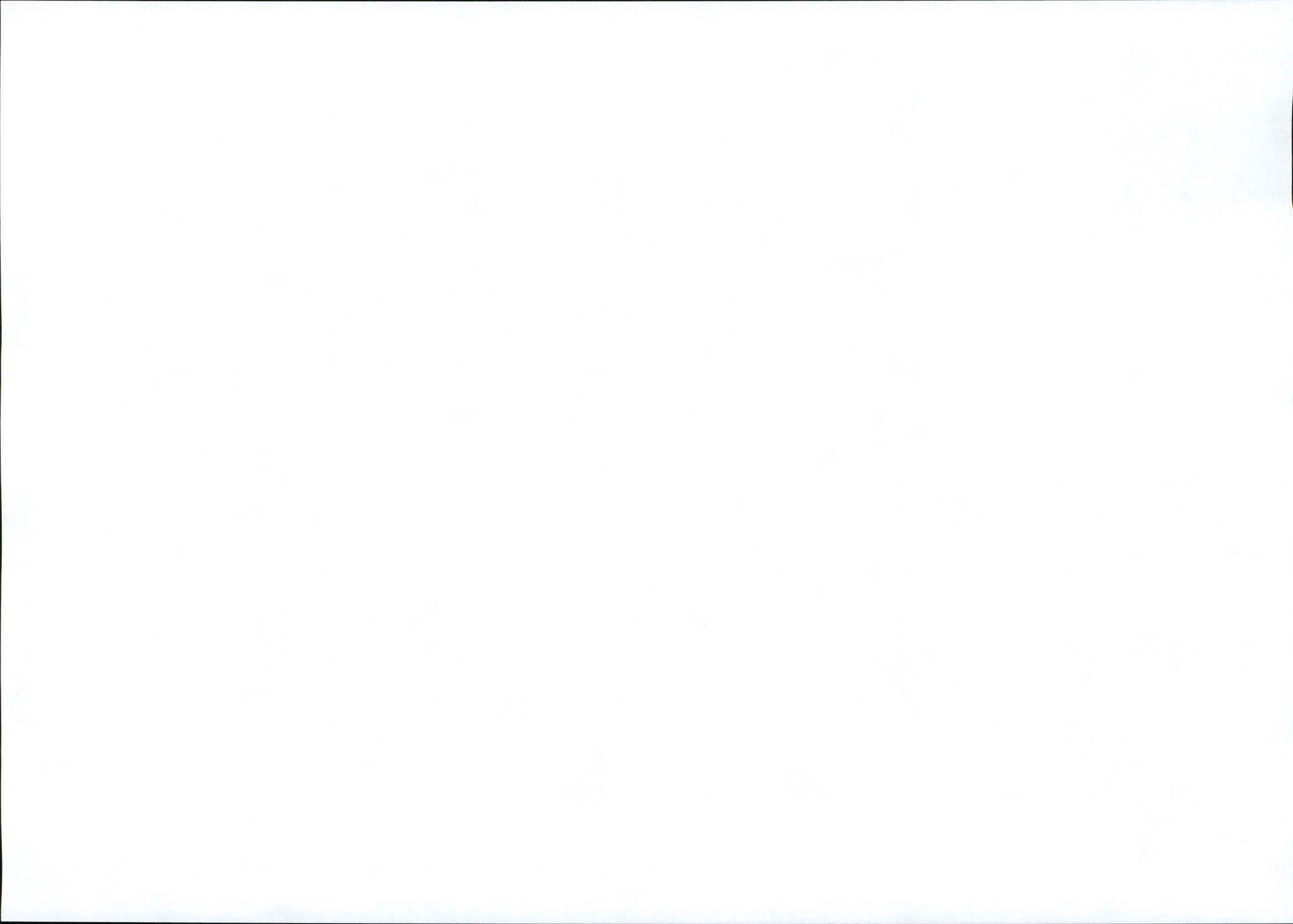
Thermal metamorphic changes, such as mudstone to hornfels, are common in the region. This metamorphic aureole is, however, usually only about one tenth the thickness of the doleritic intrusion. Prospecting data is expected to provide information on the affect that doleritic intrusion has had on orebody orientation (structural signature) and metamorphic imprint on the coal deposit (thermal alteration).

Alluvium

Fluvial sediments associated with the larger drainage channels such as the Stormberg Spruit in the centre of the study area, the Wilge Spruit to the west and Wonderhoek Spruit to the south-west and have been indicated on the published geological map. The alluvium is generally highly variable, both laterally and vertically as erosive and depositional forces are continually at work. The nature of the unconsolidated soil deposited by the drainage channels depends on the type of parent material. In this area alluvium would probably range from boulders to sand and clay.

Coal

The coal occurs in four main seams known as the Indwe, Guba, Molteno and Gubenxa seams. The Indwe is the lowest seam in the coal-bearing succession followed by the Guba, Molteno and Gubenxa respectively. It is a composite seam that exhibits considerable variation in seam structure and thickness within relatively short lateral distances. The bottom two (Indwe and Guba) coal seams are of main economic use and occur in the Bamboes Member of the Molteno Formation, which rests directly on the Beaufort Group. The Guba seam is located at the top of the Bamboes Member and is overlain directly by the Indwe Sandstone Member.

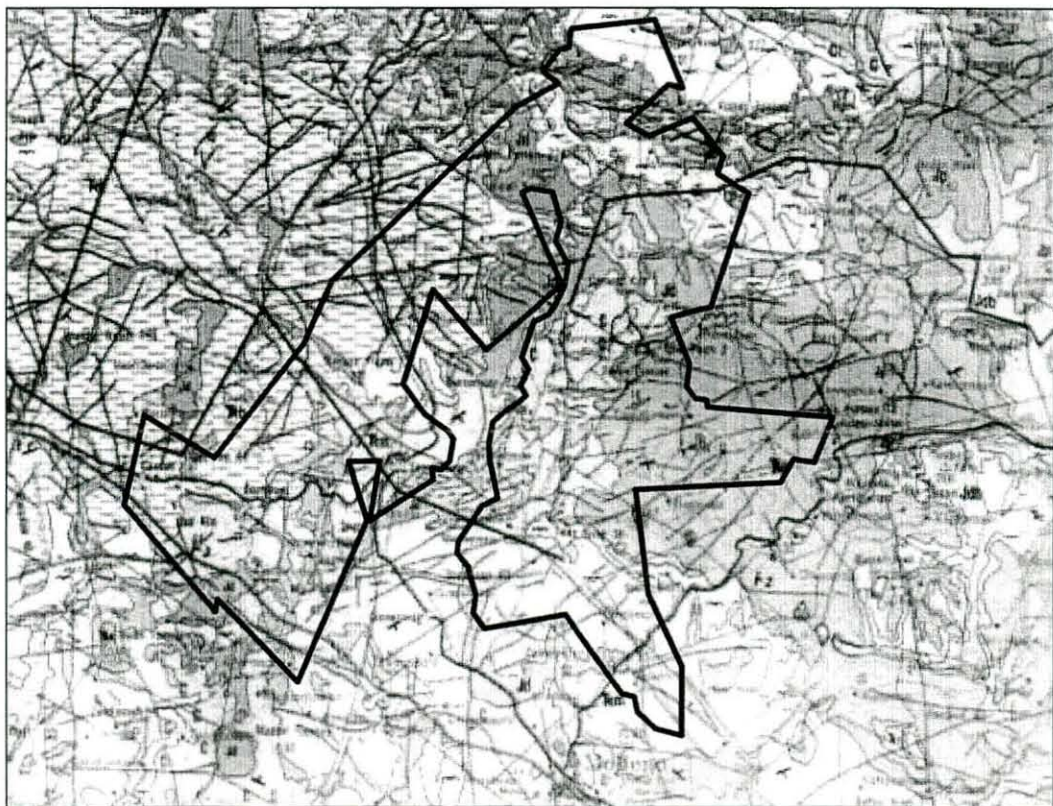


The Guba seam lies about 25m above the Indwe seam and is well developed with thicknesses varying between 28cm and 2,81m. The only discontinuities in the Guba seam are the eroded valleys from the surface topography. In such cases the Guba seam outcrops and is visible in the side of the mountain, or it is covered with transported or resident soils in the valleys. From an economic point of view the Guba seam is more suitable than the Indwe seam, as it contains fewer shale partings which are generally confined to the upper part of the seam.

Coal Classification

The Guba – and Indwe coal seams are of main economic use due to the geological characteristics. An initial comparison of these two coal seams reveals that the Guba seam generally has a smaller proportion of carbonaceous shale and shale waste strata within than the Indwe coal seam. This is mainly due to the contemporaneous erosion of the upper portion of the Guba coal seam. Devolatilisation of the Guba - and Indwe coal seams is the result of dolerite induced metamorphism and both seams generally have similar rank at the same locality. The rank of the coal is also influenced by the increasing density of separation of the coal seam material. The rank of these two coal seams vary from low volatile bituminous, through semi – anthracitic (lean coal), to full anthracitic. The main minerals occurring in the ash of these coal seams are silica, alumina, iron, phosphorous and clay minerals such as kaolinite, smectite - illite and chlorite.

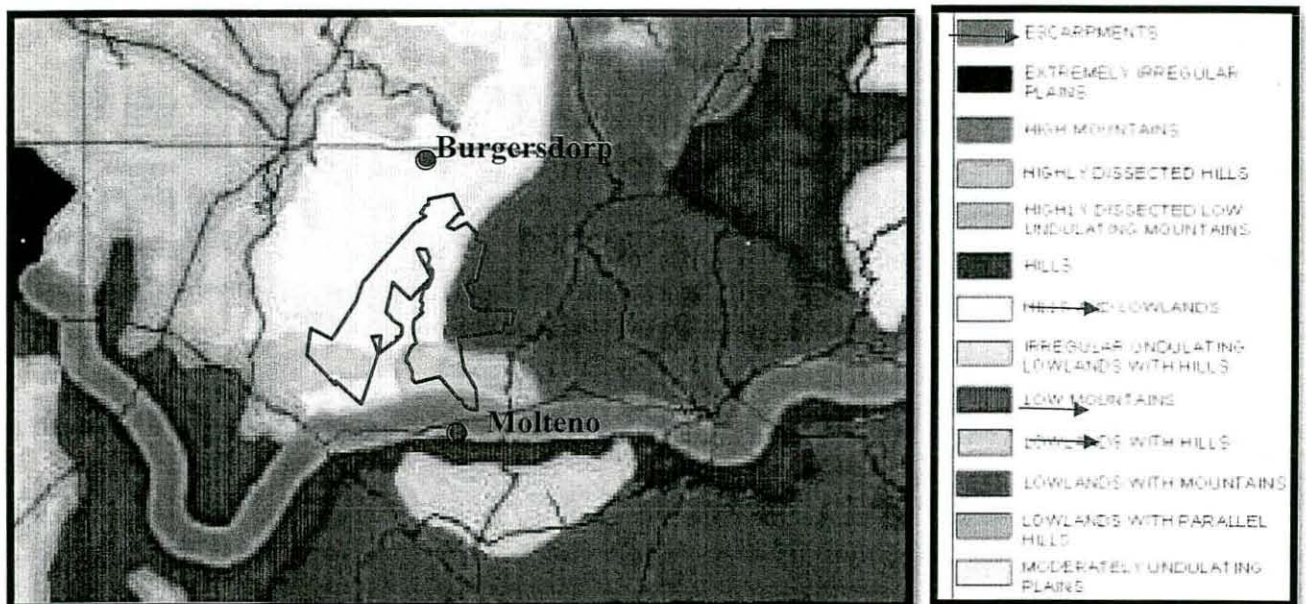
Geological Map: The area under investigation during the proposed OSHO prospecting programme generally falls within the area depicted in the map below. (Note Jd = dolerite, TRm = mudstone & sandstone of the Molteno Formation, TRb = mudstone & sandstone of the Burgersdorp Formation, TRe = mudstone & sandstone of the Elliot Formation).



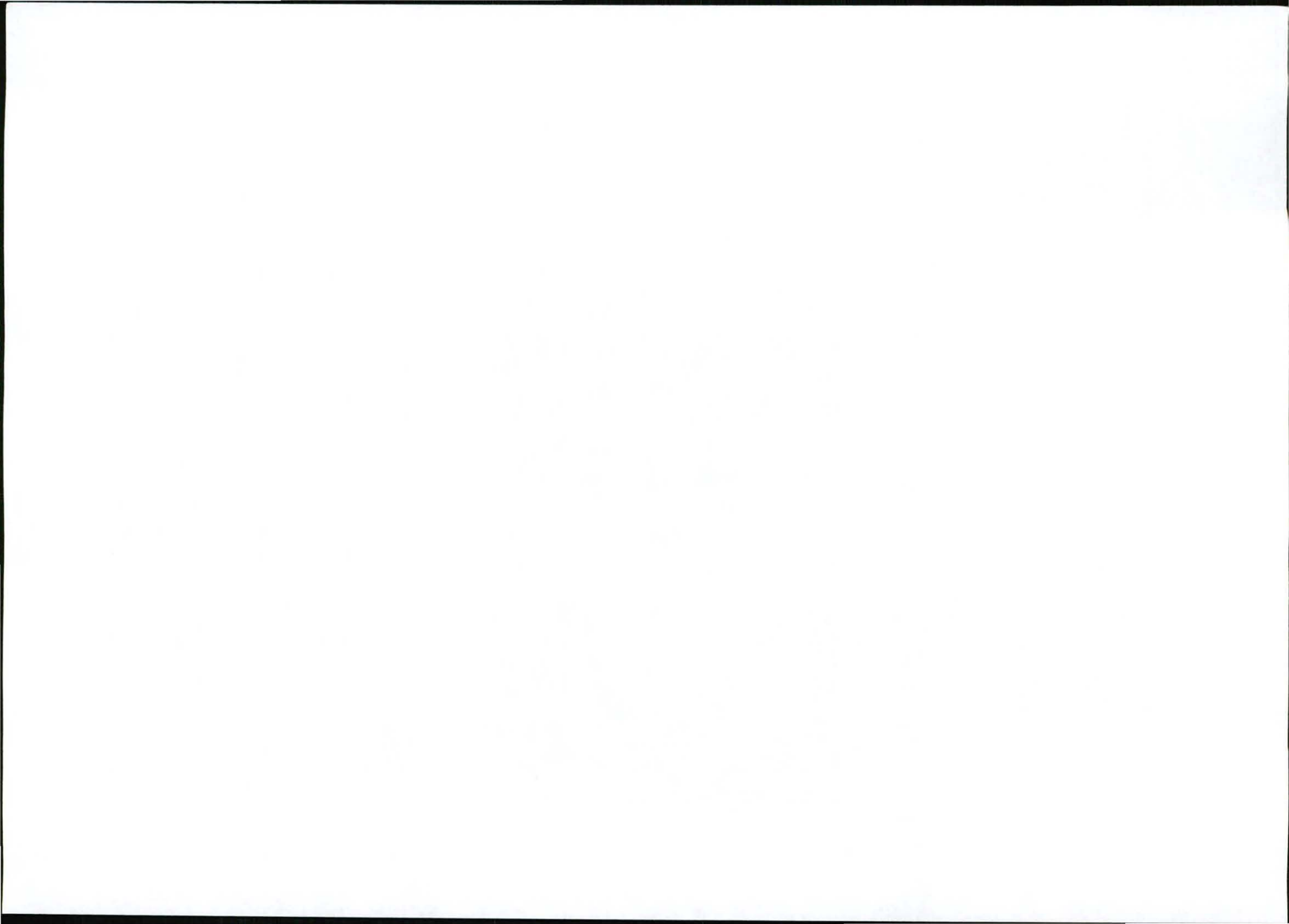


TOPOGRAPHY

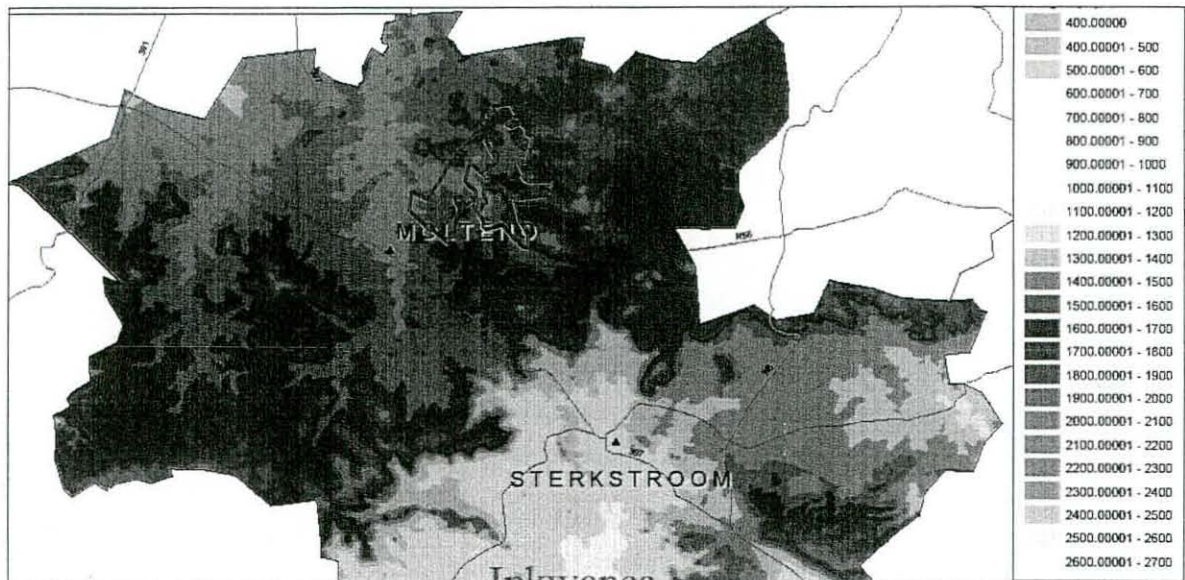
The broad terrain pattern is described as a mixture of interior plains, eastern plateau and mountains of the great escarp. The study area located to the north-west of Molteno comprises a mixture of lowlands with hills and hills with lowlands. The topography of the landscape around the first section of the Graaffwater Road, as well as the Burgersdorp Road and most of the Stormberg Road, can be described as lowlands with occasional hills and represents the typical Molteno plains. The landscape around northern section of Graaffwater, as well as Stormberg road, can be described as hills with occasional lowlands and represents the foothills of the Stormberg Mountain range located further north-west. In this area the plains turned into a rugged landscape and are characterised by the sandstone and dolerite capped hills. Where the slopes of these hills have been disturbed, extensive erosion was observed and the applicant has to take cognizance of this matter if any roads in this area are to be constructed. The area is characterized by ephemeral drainage channels hosting a number of small to medium size storage dams. The elevation levels vary from approximately 1600m.a.m.s.l on the high ground and 1300m.a.m.s. on the plains.



In general, the areas display four characteristic terrain morphological elements. Firstly, the areas with very steep slopes in excess of 15 degrees mainly represent the larger sandstone capped hills and Stormberg foothills to the north-west. Due to the steep inclines and thus operational costs involved, as well as lack of accessibility, it will mostly be excluded from the prospecting area. Secondly, the areas reflecting a slope less than 15 degrees are represented by small sandstone/dolerite hills and these areas will mostly be excluded from prospecting activities, unless it can be accessed without major environmental impact or incurring excessive road construction costs. In these areas many seeps and springs are found, especially after heavy and prolonged precipitation and should naturally be excluded from any invasive prospecting activity. Thirdly, most of the area along the Burgersdorp tar road and Stormberg Road displays gentle slopes below 5 degrees and would constitute the main target area for the OSHO prospecting venture and requires no landscape modification or very limited modification. In some of these areas runoff concentrates and results in the developing of temporary and semi-permanent wetland systems. These areas will be excluded from invasive prospecting. The plain area also reveals the typical Mesas and Buttes of the Molteno district and represents major focal points in the landscape. A fourth element is the floodplains of the Stormberg Spruit that reveal gradients of less than 3 degrees



and have mostly been transformed through agricultural activities and extensive erosion has been observed in this area, which has had a moderate impact on the topography of the landscape. From a land modification point of view, some areas have thus been moderately affected. There is a close correlation between vegetation types and the topography, which is discussed in the chapter on the floristic component of the study area.

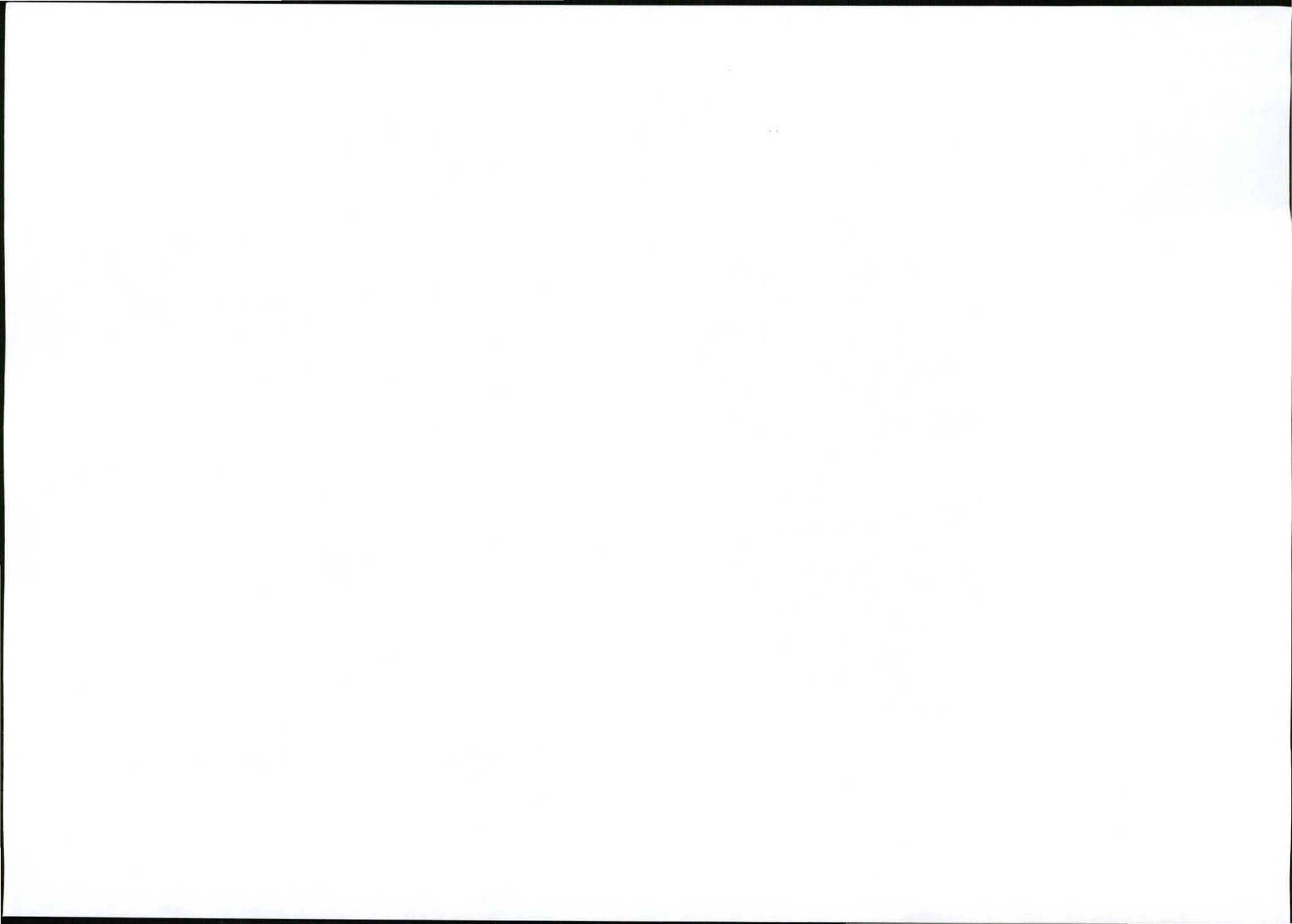


ARCHAEOLOGICAL ENVIRONMENT

The Chris Hani Municipal area is especially important, as it plays a key role in contemporary history because of the inclusion of the former independent Transkei Bantustan. Over 100 heritage sites were identified in the CHDM area, categorized according to their nature, namely whether they are human generated structures or natural artefacts. Several subcategories have been identified within each category. In general, the most serious threat facing almost all the sites is human generated in nature. Natural deterioration and ageing are far less serious threats, but should nevertheless be addressed, as over a period of time important artefacts could be lost due to natural progressive deterioration.

Archaeological interests are generally associated with rock faces and cliff environments, where rock art and anthropological artefacts may lie hidden from casual discovery. According to Mrs. A. De Wet, rock art is indeed found in close proximity to their farm which needs to be excluded from prospecting. It is not envisaged that any archaeological investigation will be done due to the extent of the prospecting area and no detrimental impacts are anticipated if prospecting activities do not take place in close proximity to potentially sensitive cliff/rock face environments. The areas that will be earmarked for prospect drilling will 80% of the time be positioned in the flat areas and when drilling occurs on any steeper area, the drilling rig will be positioned well away from such potentially sensitive environments. The rocky nature of such areas makes it rather impossible to access these sites; therefore no archaeological impacts are anticipated during the OSHO prospecting venture.

It was, however, noted that there are a large number of graves in the area, especially close to the farm residences. These areas will naturally be excluded from prospecting and will be placed on the agenda of the upfront meetings to be held between the prospecting manager and property owners before accessing



their farms to conduct prospecting activities. The grassland areas are deemed to be a non-sensitive environment in terms of Archaeological findings. The importance of this specific environmental parameter will be brought to the attention of all drilling crews in order to enable them to identify potential sites of concern and stay clear of them.

SOILS

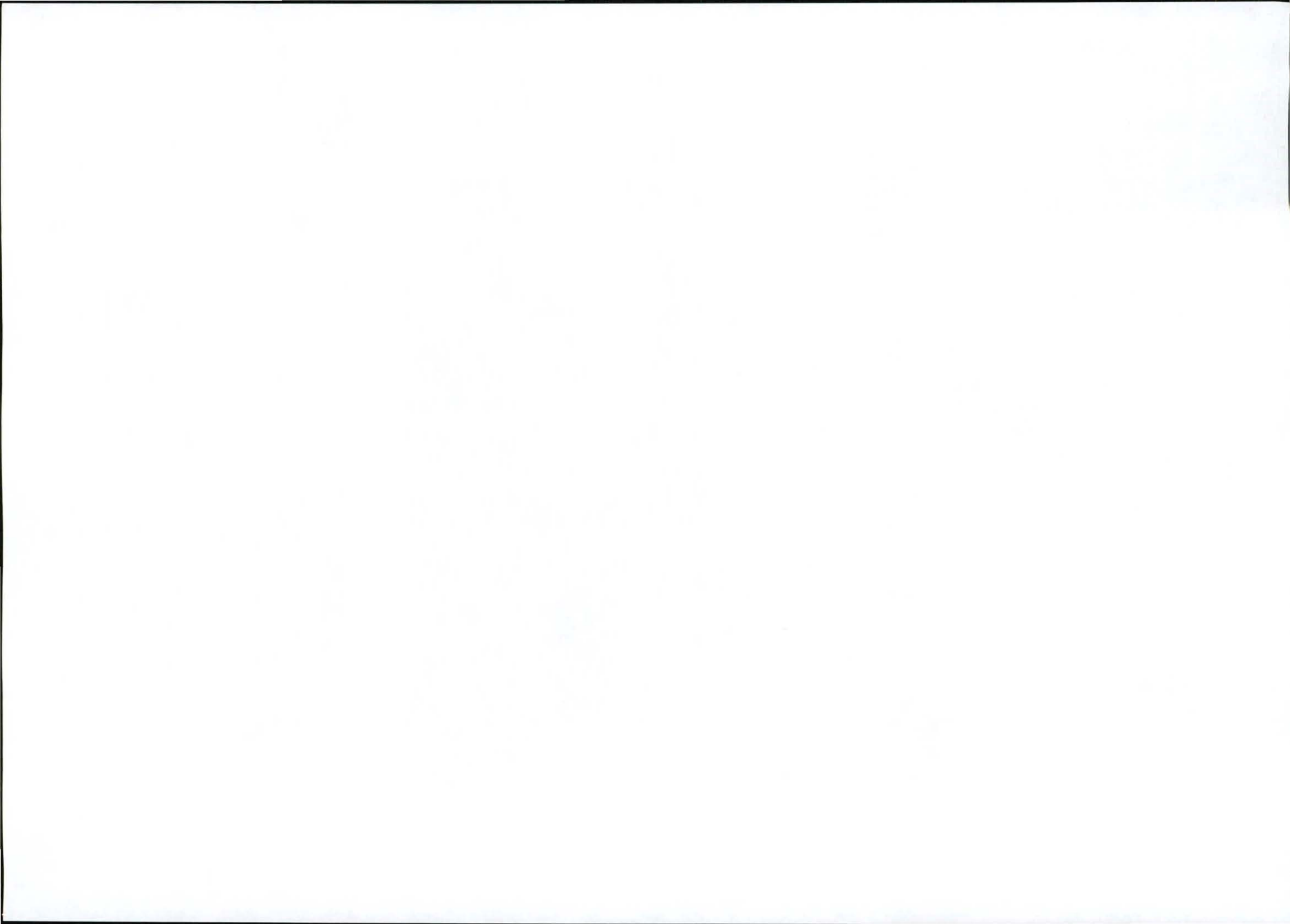
The soils of the Molteno/Sterkstroom area reflect the characteristics of the underlying parent material, topography and climatic conditions. A general soil description of the area is well structured non-reddish soils on the plains and in the undulating areas and in mountain ranges to the north-east soils are mostly poorly developed and not suitable for agriculture. In the valley areas of the grasslands, soils are deeper, more fertile and are used for crop production, mainly maize. In some areas to the north-east sandstone plates occur displaying no topsoil or with topsoil interspaced amongst the sandstone outcrops. In the valleys, especially in the floodplain areas of the Stormberg Spruit soils are deeper, better structured with increased clay and silt concentrations and are extensive cultivated. The floodplains typically reveal alluvium whilst the hill ranges and mountainous areas reflect sandstone or dolerite capping. From the dolerite parent material developed dark brown to black duplex and clay soils which are relatively erosion resistant. However, since it is positioned directly on top of solid rock, long-term impacts especially on steeper slopes could result in sheet erosion.

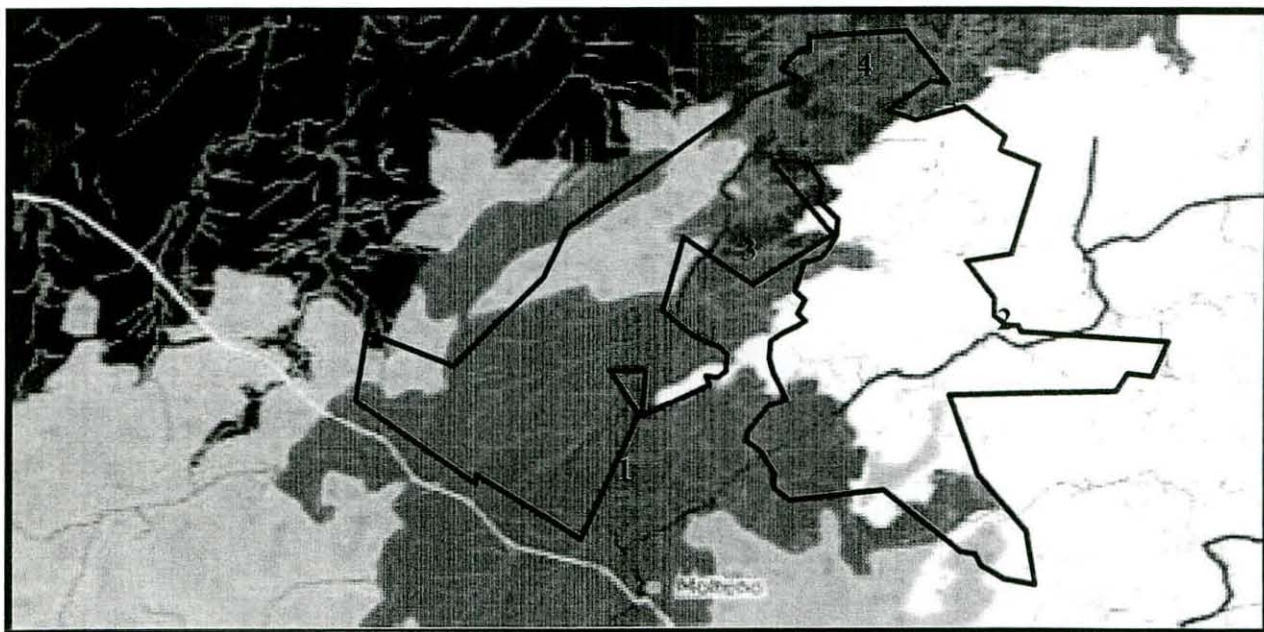
EMPAT: General soil description



From the map provided, it is evident that two broad soil types dominate the area namely clayey, well-structured soils in the northern half of the prospecting area and soils with minimum development mostly occurring in the southern half of the area. As pointed out previously, soils in the study area differ in composition and characteristics in the various geographical areas within the study area and a brief description is provided in this regard.

In order to link the various vegetation types with specific soil types, the maps and detail of each soil type are provided. Fb, Db and Da soil types in order of importance, characterise the study area. It is evident from the information provided that soils are lime sufficient in most flatland grassland and lime deficient in higher lying areas to the north and north-east. It is also evident that all soils are moderately to highly erodible and disturbances should be minimised and when disturbed, be re-vegetated as soon as possible and where necessary, protected against erosion.





1. Geology and soils: Alternating layers of mudstone and sandstone of the Tarkastad Subgroup dominate the undulating topography. In areas protected from erosion, a sandy layer also covers the clayey subsoils. About two thirds of the soils of the area are dominated by soils with diagnostic pedcutanic and prisma-cutanic (dark clayey) B-horizons of the Db land type. In this land type the dominant soil forms are Estcourt, Rensburg and Oakleaf forms. Dominant land type Db, followed by Da.

Erosion is moderate in 43% of the area, low in 34% of the area and high in 22% of the area.

1. Geology and Soils: Generally shallow soils (typical of Fb, Da and Db land types), with variable amounts of soil skeleton and overlying mudstones and sandstones of the Elliot Formation and in some areas also of the Molteno/Burgersdorp Formation (Stormberg Group, Karroo Supergroup).

Erosion moderate, high and low

2. Geology and Soils: Shallow soils typical of Ib, Fb and Fc land types on mudstones and sandstones of the Beaufort Group (Karoo Supergroup). Jurassic dolerite intrusions form ridges in the area.

Erosion moderate (49%) and high (42%).

3. Geology & Soils: Dolerite koppies and sills embedded within Karoo Supergroup sediments through extensive volcanic activity. On the slopes of hills, mesas and butts mixed soil types may occur due to the mixture of dolerite, sandstones and mudstones of the Ecca and Beaufort Groups. Fb land type covers almost 60% of the area followed by Ib.

Erosion moderate (68%), high (20%) and low (10%).

4. Geology & Soils: Mudstones and sandstones of the Beaufort Group supporting duplex soils with prisma-cutanic and/or pedcutanic diagnostic horizons dominant (Da land type) as well as some shallow Glenrosa and Mispa soils (Fb and Fc land types). In places, less prominent dolerites are found. Erosion is moderate (60%) and high (38%).



Soil analysis



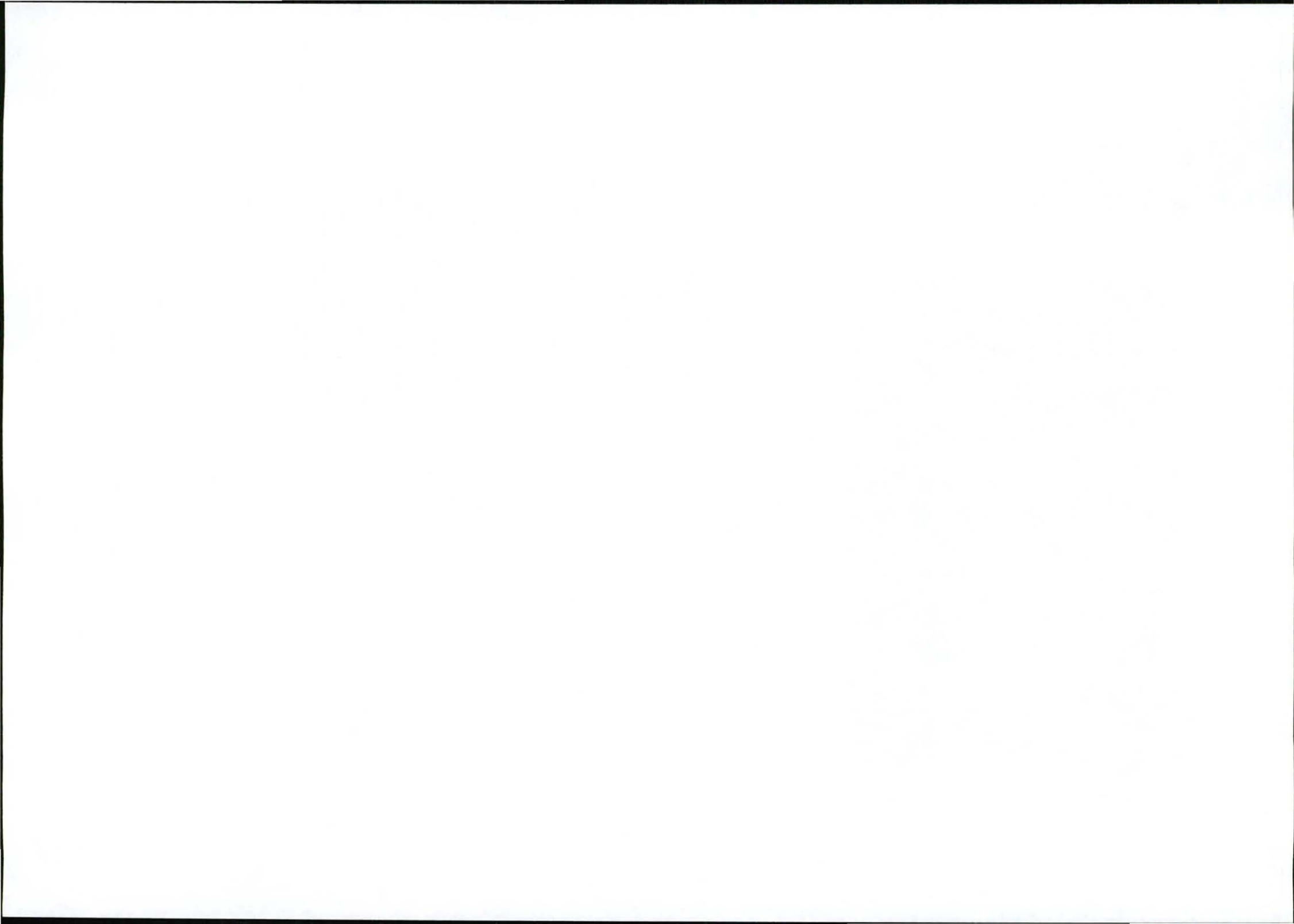
Prismacutanic and/or pedocutanic diagnostic/Glencunic horizon: dominant	
■	Da Red B horizons
■	Db B horizons not red
Glenrosa and/or mispah form (other soils may occur)	
■	Fb Lime rare or absent in upland soils but generally present in low-lying soils
Miscellaneous land classes	
■	Ib Rock areas with miscellaneous soils

■	Db	PRISMACUTANIC, PEDOCUTANIC AND/OR GLEYCUTANIC DIAGNOSTIC HORIZONS DOMINANT (Non-red B horizons)	These are soils where the non-red B-horizon (subsoil) has strong to very strongly developed structure, usually also with a high clay content. The soil is thus mostly imperfectly to poorly drained and the strong structure in the subsoil places a restriction on root development. Due to the fact that most of these soils have a sandier topsoil on a clay subsoil, they are usually sensitive to erosion if poor management practices are used, especially concerning overgrazing.
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■	Fb	GLENROSA AND/OR MISPAH FORMS (other soils may occur); lime rare or absent in upland soils but generally present in low-lying soils	Generally shallow soils consisting of a topsoil directly underlain by weathered rock (Glenrosa form) or hard rock (Mispah form), sometimes with surface rock on steep slopes. Found in drier areas than Broad So Pattern Fa, with lime in many of the lower-lying landscapes.
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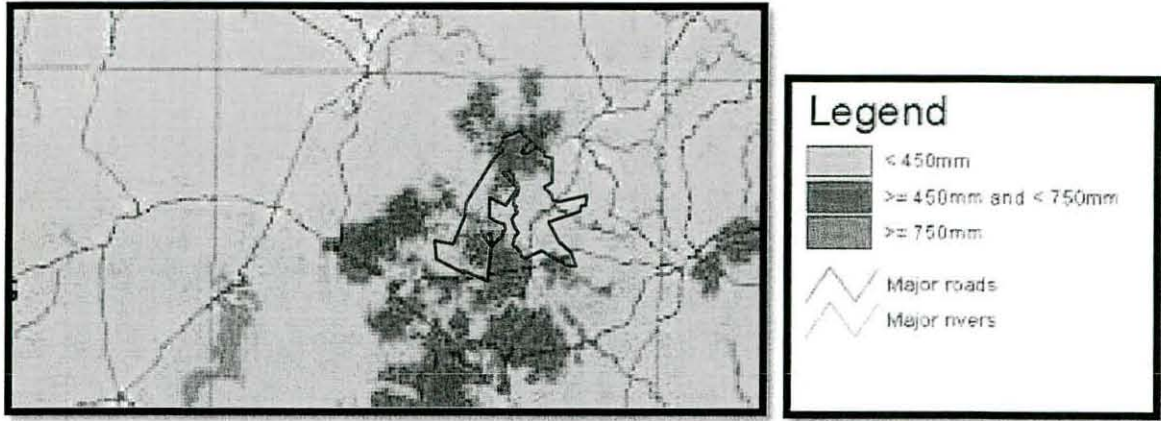
■	Da	PRISMACUTANIC, PEDOCUTANIC AND/OR GLEYCUTANIC DIAGNOSTIC HORIZONS DOMINANT (Red B horizons)	These are soils where the red B-horizon (subsoil) has strong to very strongly developed structure, usually also with a high clay content. The soil is thus mostly imperfectly to poorly drained and the strong structure in the subsoil places a restriction on root development. Due to the fact that most of these soils have a sandier topsoil on a clay subsoil, they are usually sensitive to erosion if poor management practices are used, especially concerning overgrazing.
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■	Ib	MISCELLANEOUS LAND CLASSES (Rock areas with miscellaneous soils)	Areas where 60-80% of the surface is occupied by exposed rock and stones/boulders and the slopes are usually steep. The rest of the area comprises of mostly shallow soils, directly underlain by hard or weathered rock.
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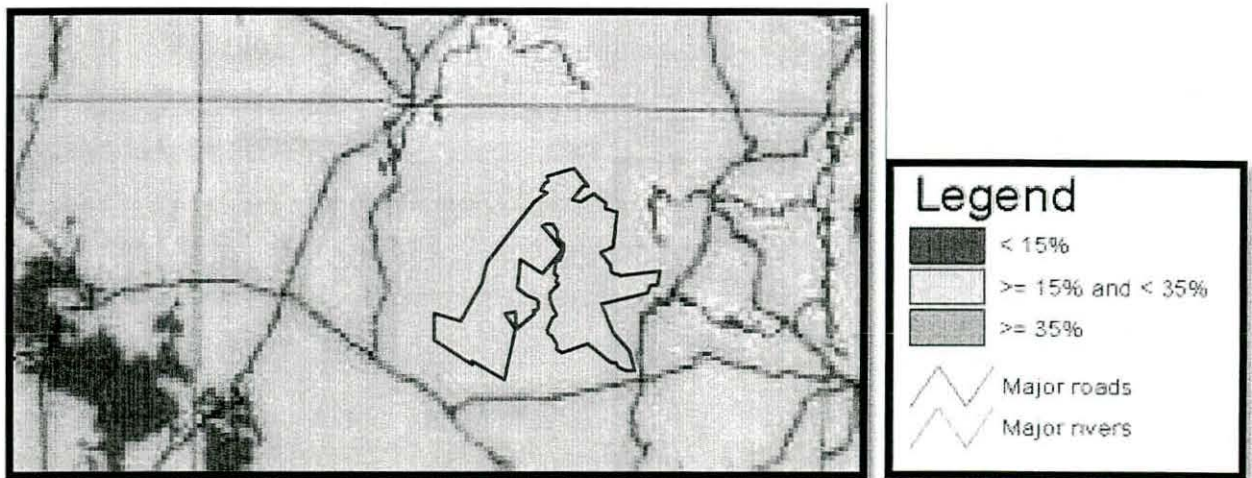
Soil depth

Soils to the north and north-west mostly dispose of shallow depth and will not facilitate an easy rehabilitation process. Soils to the south and south-east mostly dispose of adequate depth and should be amenable to rehabilitation and mostly reflect very gentle gradients. Valley areas dispose of a better soil depth and allow crop production.



Clay classes of topsoil

In general the soils in the study area dispose of average clay content and in an undisturbed state it will be relatively erosion resistant, which will assist the rehabilitation process, but once disturbed, it could result in excessive erosion due to higher silt content in certain soil layers.



ENVIRONMENTAL IMPACT ASSESSMENT

Impact assessment will be done on the basis of drilling between 3-4 boreholes on each average size farm, followed by drilling on a 2km grid (1borehole per 400ha) and if coal reserves are promising, a 1km grid (1borehole per 100ha). If reserves are worth further exploration or if anomalies are found in the geological strata which will necessitate a full investigation, infill drilling on a grid of 500m x 500m (1 borehole per 25ha) could be done. Although pitting is not anticipated for a very large portion of the area, outcrop areas could be exempted from drilling and pitting could be done instead. In such outcrop areas OSHO might want to perform a more detailed analysis and could establish trenches of a 100m in length and 1m wide and bulk samples could be taken for analysis.



Drilling will impact on 1 square meter of vegetation, whilst the establishment of silt traps could impact on 2 square meters of soil and vegetation. Each drilling site will thus impact on 3 square meters. Pitting in outcrop areas will also affect 4 square meters of soil and vegetation.

Total areas to be affected:	2km grid	=	360 square meters	/	48000 ha
	1km grid	=	1440	“	“
	500m grid	=	1728	“	“
	Pitting	=	400	“	“

Total impact footprint = 3928 square meters

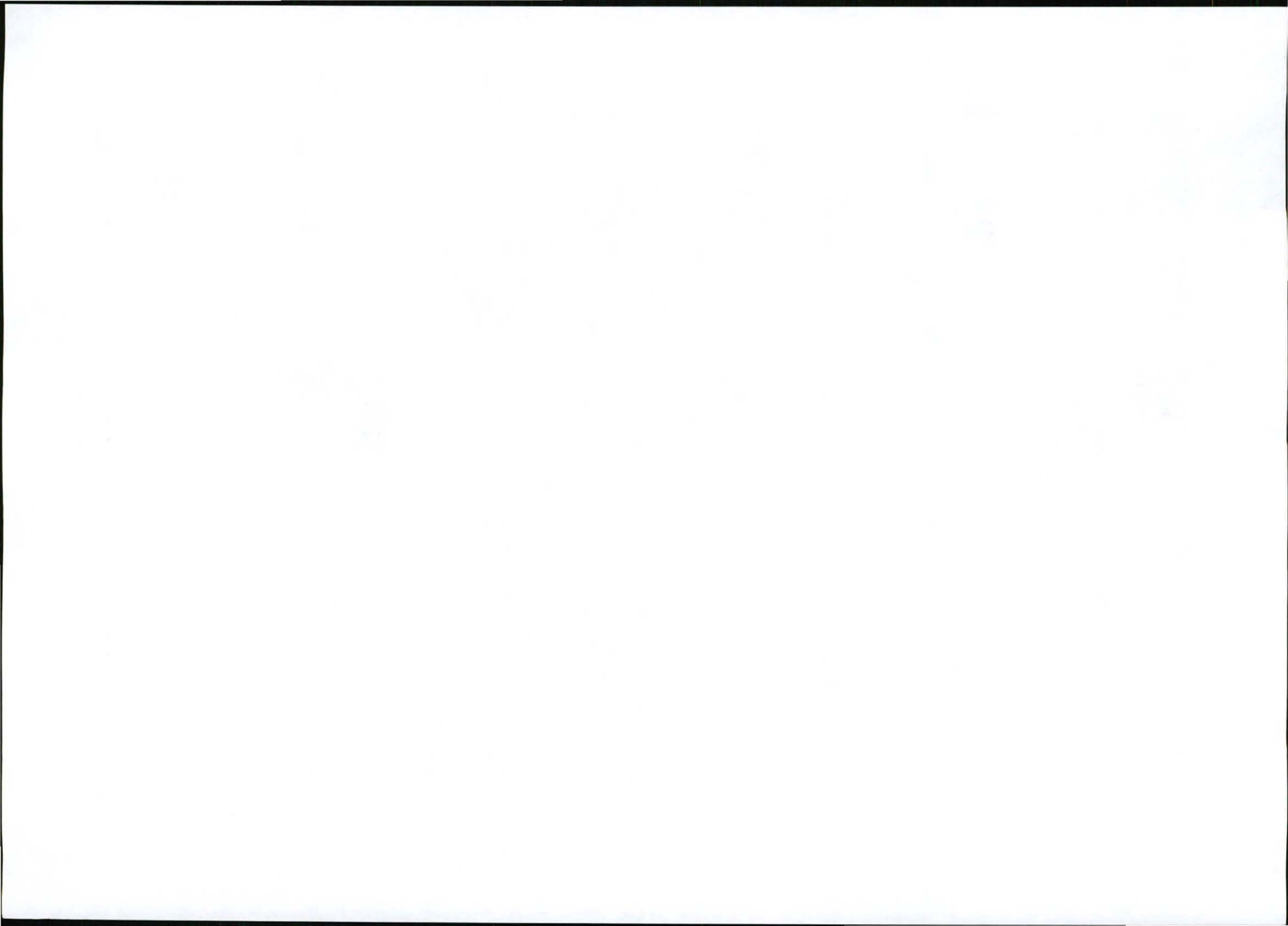
Not all areas will be subject to a 500m grid drilling programme and it is estimated that not more than 30% of the areas will be affected resulting in a potential impact footprint of 1728 square meters per 48000 ha. It is further anticipated that outcrop areas will be limited and provision is made for maximum of 100 pits with a resultant 400 square meters impact footprint.

It is proposed that a large wheel mounted TLB be used for pitting instead of a tracked excavator to limit impact on the veld and provide for easier relocation from one borehole to another.

The initial prospecting phase will only entail core drilling and possibly pitting, if coal outcrops are identified. At a later stage bulk sampling could take place in outcrop areas to determine quality of coal and geological profiles, but since the prospecting programme has not been detailed, this matter will only be dealt with in a superficial manner to provide interim guidelines and any such areas will be subject to additional assessment.

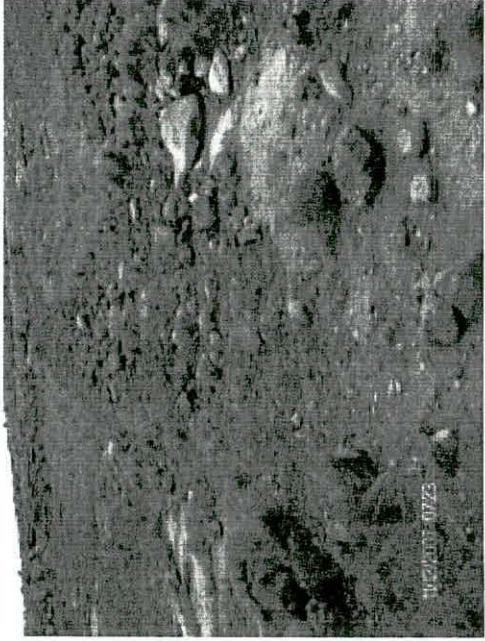
It is also not anticipated that formal road construction will form part of the prospecting activity, since most of the areas are easily accessible and that the larger hills will be mostly inaccessible to drilling rigs. Should any major road construction be anticipated, these areas must be identified timeously and must be addressed in amendment to the EMP which will also address bulk sampling areas.

It is proposed that drilling is done on a farm to farm basis and that a prospecting plan is concluded for each farm and a decision be made on whether any amendment of this EMP are required. Such documents must be submitted timeously to the DMR and activities must be discussed with the landowner.



REVIEW OF POSSIBLE IMPACT OF PROSPECTING ACTIVITIES ON SOILS AND VEGETATION

Early road rehabilitation

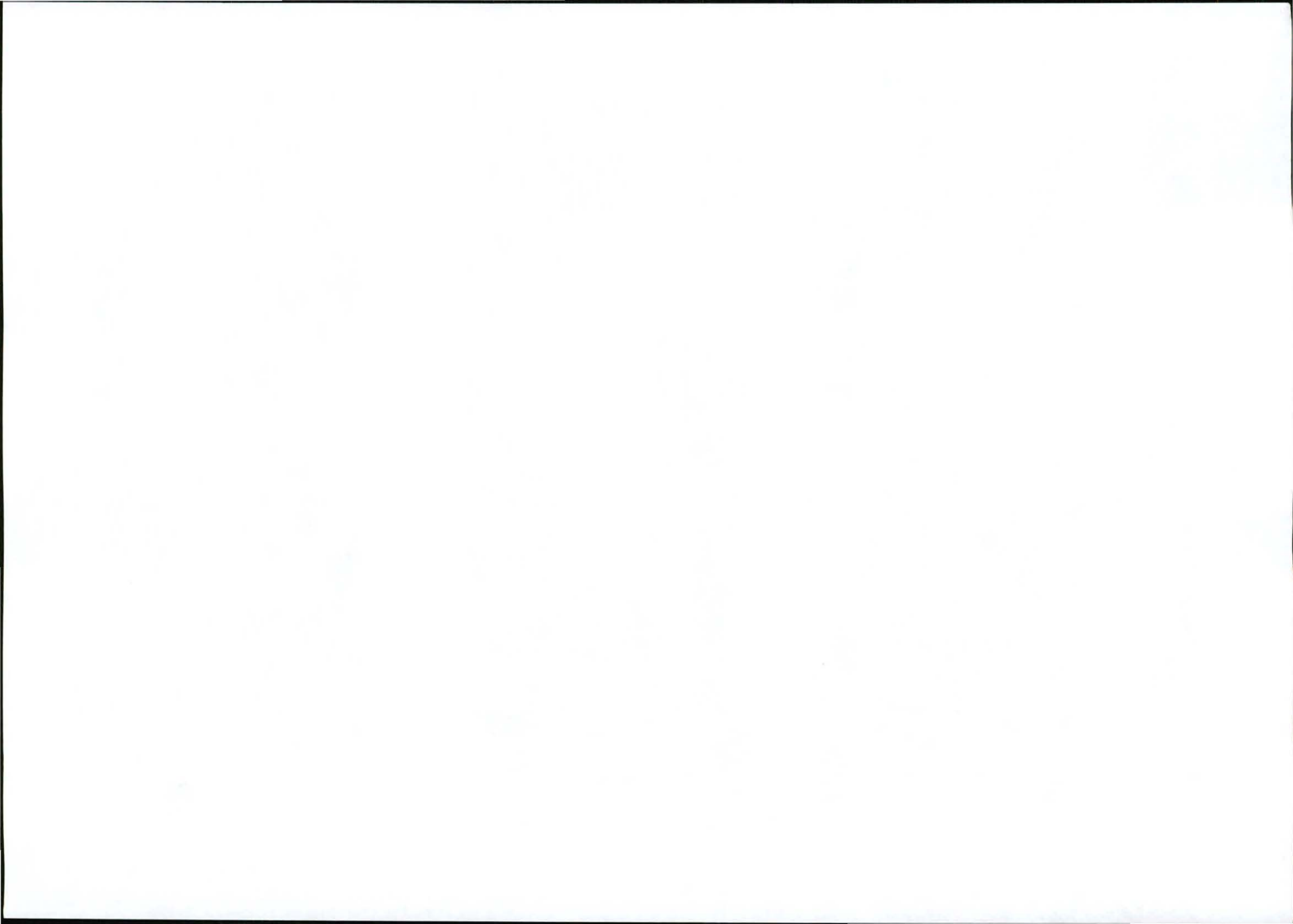


Complete road rehabilitation

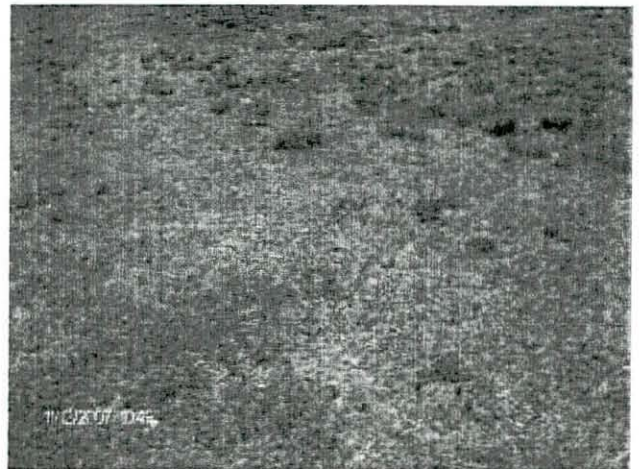
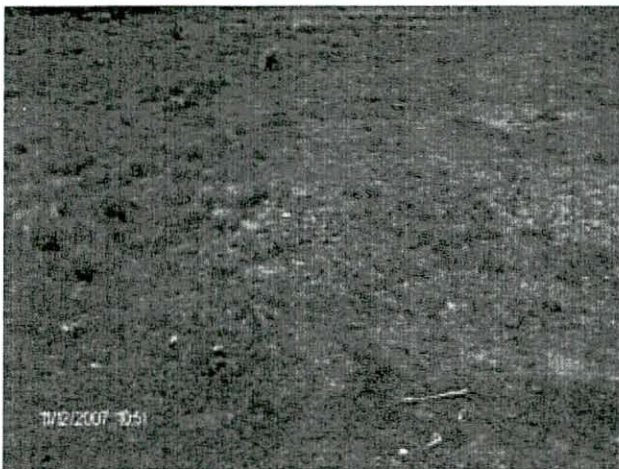


Early borehole rehabilitation

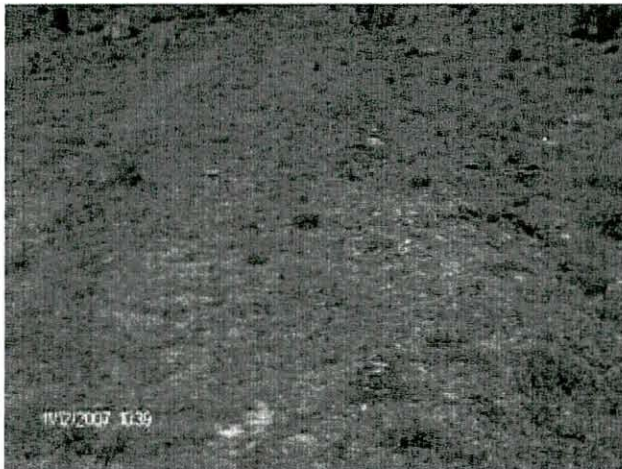


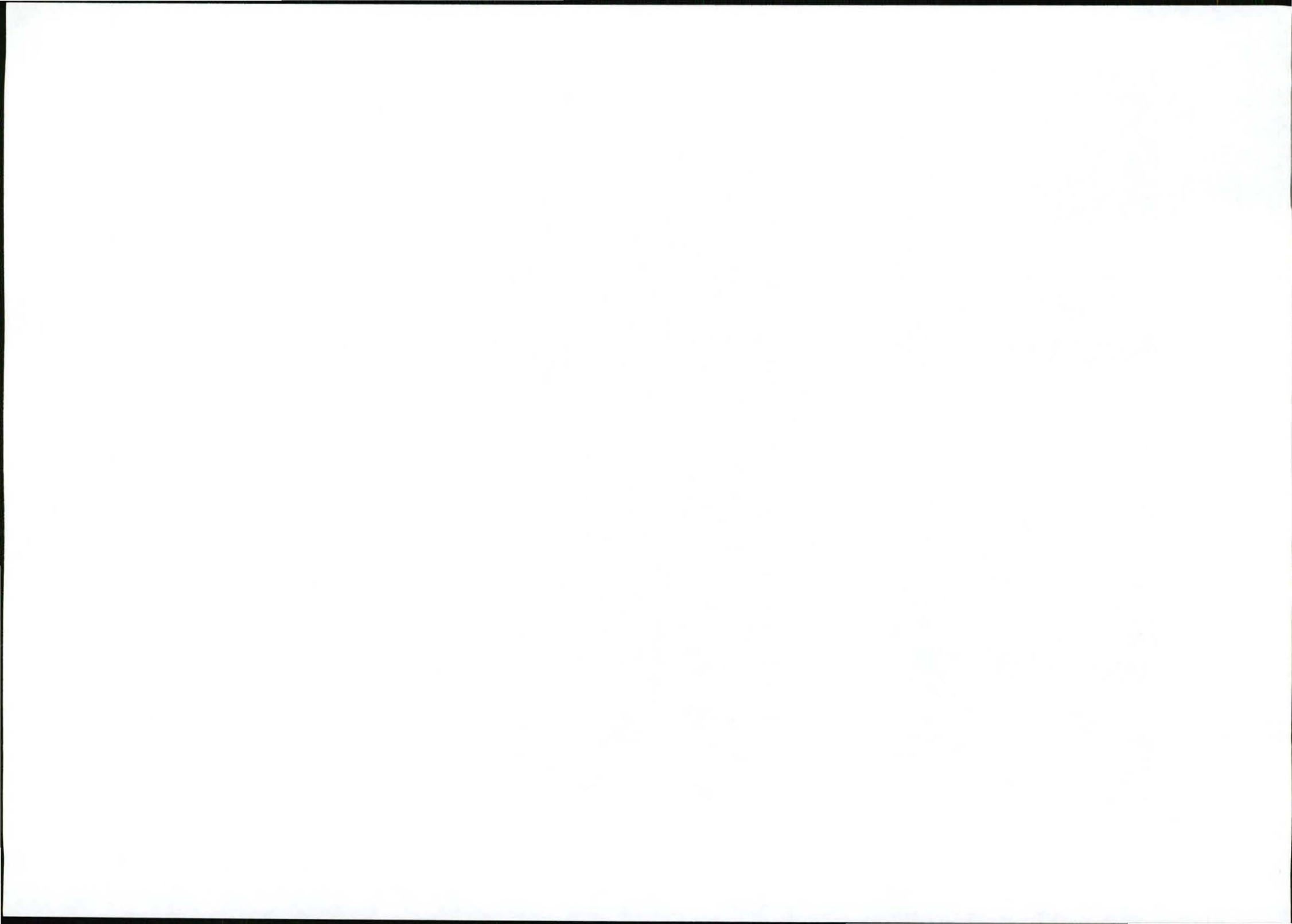


Complete borehole rehabilitation



Overland access tracks: No rehabilitation required





SITES OF CULTURAL/PALEONTOLOGICAL/HISTORICAL IMPORTANCE

It is well known that the Dordrecht-Molteno/Burgersdorp areas host many important sites in the form of old historic settlements, caves, stone age tools, middens, rock paintings, graves, stone kraals, and ruins of important structures related to Khoi and Xhosa people that lived in this area. Fossils associated with the Elliot mudstone sediments are also common. The Molteno/Burgersdorp coal sediments also represent an assemblage of riverine plant fossils and insect remains that once formed part of the inland lake of Gondwana land. According to Mrs. De Wet, rock art does occur on or close to their farm therefore prospecting managers must ascertain themselves of these areas of importance.

Drilling will disturb very small portions of land as previously indicated and since it is mostly restricted to open grassland and to soil surface which can be visually inspected, it is not anticipated to affect any important site. Pitting could potentially affect a small portion of any site of importance. However, these areas can be visually inspected to preclude any impact. It is not possible to inspect 48000 ha without excessive and unjustifiable costs. In terms of SAHRA legislation impact areas less than 5000 square meters do not require an assessment. Should disturbance of any site take place, such disturbance will be limited to not destroy the entire site, which will still render it possible to assess the findings and produce a scientific write up. As pointed out previously the entire impact footprint will be less than 0,5ha hence no report will be submitted. If any trenches, however, are to be excavated, such areas will be made subject to a phase 1 assessment done by Dr. Johan Binneman or any other archaeologist appointed by OSHO.

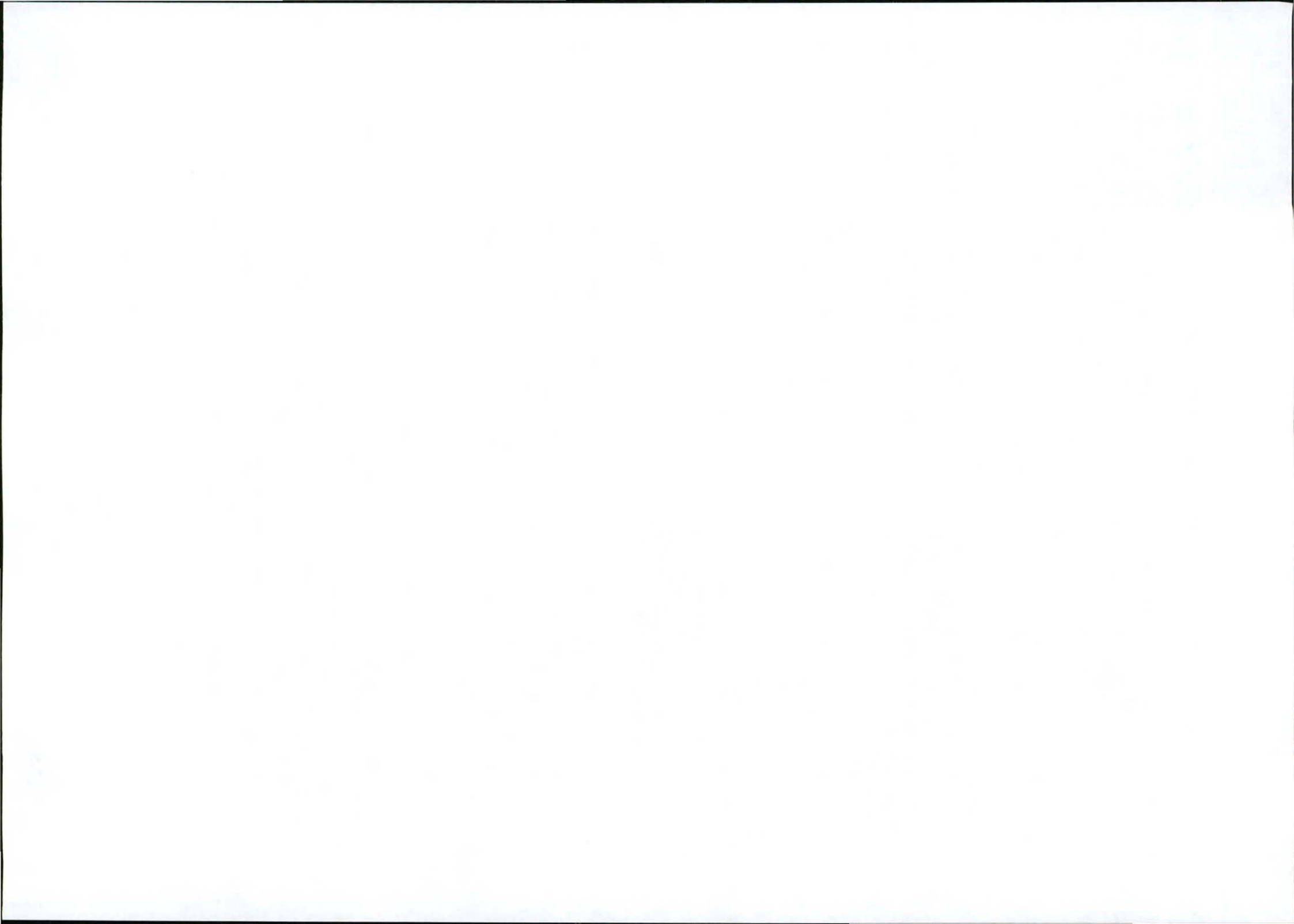
To reduce this potential impact no drilling will be done in rocky areas, near cliff faces, caves, burial sites or riverine environments.

Drilling through the coal seam will result in the loss of fossiliferous material, although not necessarily result in damage to such site due to the vast extent of this material.

The study area hosts numerous historic and new burial sites and this matter must be discussed with farm owners and long-time employees prior to commencement of drilling activities. These areas need to be pointed out to the prospecting manager and be marked to direct the attention of the drilling crew thereto. No drilling will take place within 50m of any such site. Sites located at farm residences will be protected by the 200m buffer area which is applicable to these areas. Considering the limited amount of boreholes and pits that will be established, the impact is rated very low.

Impact on archaeological sites

	OPERATIONAL (no mitigation)	WEIGHT	OPERATIONAL (with mitigation)	WEIGHT	CLOSURE	WEIGHT
Extent	Local	2	Local	2	Local	2
Duration	Long Term	3	Long Term	3	Long Term	3
Intensity	Low	1	Low	1	None	0
Probability	Unlikely	2	Unlikely	1	None	0
Status	Negative		Slightly Negative		Neutral	
Confidence	High		High		High	
Significance	Moderate	12	Low	6	Insignificant	0



ENVIRONMENTAL MANAGEMENT PROGRAMME

This operational Environmental Management Programme (EMP) contains guidelines, operating procedures and rehabilitation control requirements, which will be binding on OSHO Exploration (Pty) Ltd Coal (Pty) Ltd) after approval of the EMP.

It should be noted that broad generic recommendations are provided for the entire prospecting study area. Specific details, if needed, will be included in updated EMP's, but will mostly be restricted to trench areas, depending on the operational planning done by OSHO Exploration (Pty) Ltd. These specific details may change from area/farm to area/farm during future drilling activities within the overall study area.

The impacts identified and listed will be managed and controlled as set out in this EMP.

ARCHAEOLOGY & CULTURAL

- All geosites, grave yards, sacred areas to local inhabitants and areas used for cultural activities will be excluded from the prospecting and road construction areas and appropriate setback lines will be determined in conjunction with landowners/Municipal authorities in conjunction with the DMR/SAHRA/DEDEA.
- Findings of any historic tools, fossils, bone fragments, skulls and complete remains will be immediately reported to SAHRA & the DMR and no effort will be made to retrieve any object.
- Any potential archaeological site will be immediately fenced off and protected until officials from SAHRA have visited the site.
- The operators of drilling/trenching and road construction equipment will be informed of the applicant's obligation in the above regard and to inform management when anything of interest is noted on the site.
- Dr. Johan Binneman at the Albany Museum in Grahamstown and SAHRA office in East London will be contacted immediately if any object of importance is observed and all operations would be suspended immediately.

