PROSPECTIVITY FOR COKING COAL:

UNIVERSAL ANNEX and MOPANE PROJECTS

in the

MOPANE SECTOR of the SOUTPANSBERG COALFIELD

Prepared for:

SIGNET COKING COAL LIMITED

by

PC MEYER CONSULTING

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1.0 GENERAL

1.1 Purpose of Report.

PC Meyer Consulting was commissioned by **SIGNET COKING COAL LIMITED** (hereafter: Signet) to prepare a report on the prospectivity for **coking** coal on 12 farms covered by a Prospecting Right. All of the properties fall within the Soutpansberg Coalfield, Limpopo Province of the Republic of South Africa.

This report is written using information provided by Signet and other relevant information in the public domain and open sources. There is currently no borehole logs for any of the farms. Therefore, interpretations and conclusions are based on the general regional geology, published information of the Geological Society of South Africa, the publication named *Mineral Deposits of Southern Africa* and the knowledge of the other coking coal projects in the region.

It is neither the purpose nor the aim of this report to present a definite conclusion on resource tonnes and coking coal qualities for the project areas but merely to suggest exploration potential based on the current knowledge of the coking coal in the region and the successes of other companies in the area.

1.2 Project Outline.

The two projects consist of two Prospecting Right's (PR) made up by 12 farms, most contiguous. The details for the PR's are as follows:

a) UNIVERSAL ANNEX PROJECT

PR Reference No: LP/5/1/1/2/1594 PR.
Farms: Vrienden 589 MS, Gruisfontein 368 MS, Renfrew 620 MS, Riebelton 488 MS, Thurso 619 MS and Mansfield 356 MS.
Rights Holder: Exotic Coal Exploration (Pty) Ltd.
Executed: June 2011.
Section 11: 18th January 2012.

a) MOPANE PROJECT

PR Reference No: LP/5/1/1/2/1685 PR.
Farms: Kaal Kraal 100 MS, Icon 95 MS, Hartz 233 MS, Kilgour 176 MS, Mirrior 111 MS and Rietfontein 109 MS.
Rights Holder: Exotic Coal Exploration (Pty) Ltd.
Executed: June 2011.
Section 11: 18th January 2012.

Both the UNIVERSAL ANNEX and MOPANE projects are located in the Soutpansberg Coalfield, which is divided into three separate sectors named from west to east as Mopane, Tshipise and Pafuri.

Within the Mopane Sector is the Coal of Africa Limited (CoAL) "Chapudi" project and the Universal Coal "Berenice" Project. All of these projects involve two grades of coal, a Semi soft coking coal and Thermal coal proportion.

Coal of Africa Limited's "Mt Stuart" project and Signet's "Tshipise 2" project lie within the Tshipise sector.

Exxaro's "Tshikondeni" colliery is in the Pafuri sector, Exxaro have the only operating Premium Hard Coking coal (HCC) colliery within South Africa.

The twelve farms making up the project are located in the Mopane sector, which forms the western part of the Soutpansberg Coalfield. Coal of Africa Limited have been granted a mining license for their Vele Project which is located in the Limpopo Coalfield, located to the north of the project area. Figure *(0.0)* illustrates the location of other projects in the vicinity of the UNIVERSAL ANNEX and MOPANE projects.

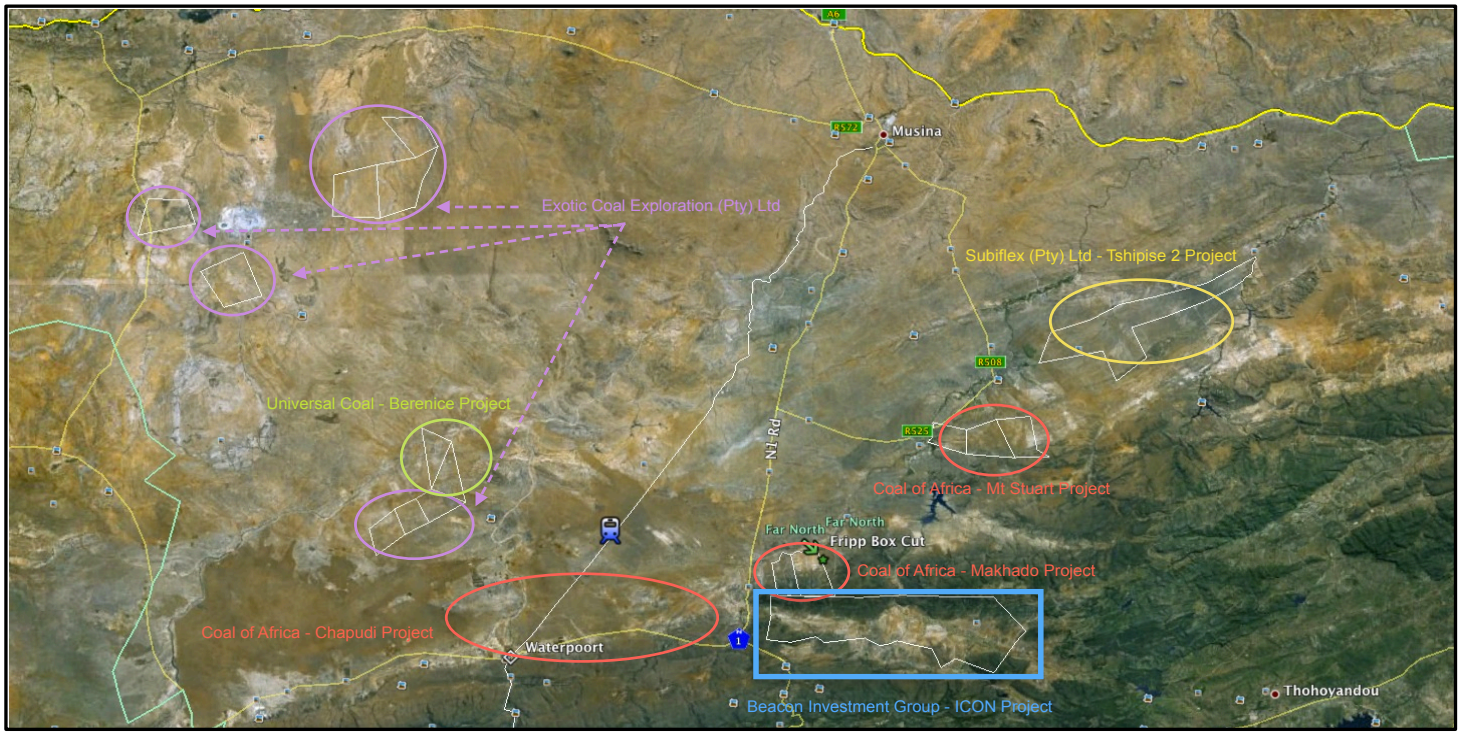


Fig 0.0 – Project locality and other surrounding projects.

1.3 Legal Aspects and Tenure.

One company holds legal Prospecting Right's for coal over the 12 farms composing the Universal Annex and Mopane projects. Signet entered into an agreement with the rights holder to explore the properties for coking coal.

The Mineral Right details are as follows:

b) UNIVERSAL ANNEX PROJECT

PR Reference No: LP/5/1/1/2/1594 PR.
Farms: Vrienden 589 MS, Gruisfontein 368 MS, Renfrew 620 MS, Riebelton 488 MS, Thurso 619 MS and Mansfield 356 MS.
Rights Holder: Exotic Coal Exploration (Pty) Ltd.
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Land ownership and surface rights belong to private individuals. The surface is mainly used for farming while in the area some limited surface magnesite mining is taking place. Access onto the properties can be negotiated with the surface owners.

The following aspects should be adhered to during the exploration activities:

- All prospecting should be conducted within the rules and regulations of the Mineral and Petroleum Resources Development Act (28/2002).
- Strict standards should be in place to ensure that the work was done within the Health and Safety Act as well as the Environmental Conservation Act.

All annual returns and reports must be submitted to the Department of Mineral Resources (DMR) in Polokwane.

1.4 General Geology. *(SRK Dec. 2009)*

The Soutpansberg Coalfield occupies an area stretching from the Mogolakwena River valley, West of Alldays in Limpopo Province, to Wylies Poort in the East.

The Pafuri-Venda Coalfield was previously regarded as an isolated eastward extension of Soutpansberg Coalfield, but is now regarded as a separate coalfield in its own right.

The coal occurrences in the Soutpansberg and Pafuri-Venda Coalfields are found regionally across the Northern part of South Africa.

Coal-bearing strata are inconsistently developed within this area with the coal occurrences being typically bright coal/carbonaceous mudstone associations, forming composite coal 'seams' (*Fig 1.1*).

A number of coal resource "blocks" or sectors have been defined by drilling in the area northwards from Waterpoort.

The following sections of the coalfield and sectors may be recognised based on geographical and geological considerations:

Mabelebele section;

- Extreme western 'shallow coal' sector;
- Near Western 'deep coal' sector;
- Western sector;
- Central sector; and
- Waterpoort sector;

Mutamba section; and

- Mopane sector.

The Mutamba area is separated from the main Soutpansberg Coalfield (Mabelebele section) due to structural discontinuity. The coalfield is characterised by intensive faulting with the result that the original depositional basin has been 'sliced up' into a number of discrete structural "blocks".

Syn-depositional faulting has to some degree controlled the size of individual coal "blocks" and has affected coal distribution significantly. The result is the tendency for coal quality and thickness to vary markedly from place to place, due to varying local depositional environments.

The thickest coal zone in this region is to be found some distance to the east of Waterpoort, comprising up to nine composite seams separated by carbonaceous mudstone, over a stratigraphic interval of about 40 m.

A progressive rank increase eastwards across the coalfield is indicated.

In the western shallow sector and in the near-western deep sector of the Soutpansberg coalfield, coal occurrences are poorly to inconsistently developed.

In the Central Sector of the coalfield, as well as parts of the eastern sector, the "coal measures" occur at depth below a relatively full sequence of Karoo strata and in many places the coal zone is located at more than 300 m below surface in these localities.

The coal seams in the Mabelebela Sectors of the coalfield are correlated to the Volksrust Formation (formerly Upper Ecca stage) of the Ecca group strata. Beaufort Group strata are also present.

Five coal zones or composite seams can generally be identified, numbered from the base upwards, generally designated as Nos.1, 2, 3, 4 and 5 respectively. The better quality seams are present towards the top and base of the coal-bearing sequence. The lower most composite 'seam' is up to 4 m thick in places.

The Mopane sector is situated on both sides of the Musina (Messina) - Louis Trichardt (Makhado) railway line, to the northeast, north and especially northwest of Waterpoort. Rocks of the Karoo Supergroup strike east west, and dip towards the north at up to 12°. The area has been broken up into fault blocks by a number of strike faults.

Up to seven composite coal seams can be identified over a vertical interval of some 50 m. From the bottom upwards, these 'seams' have been designated the Nos. A, 1B, 2A, 2B, 3A, 3B and 4 seams.

The most explored part of the coalfield is the Mopane sector. Both CoAL (Makhado Project), Rio Tinto (Chapudi Project) and Universal Coal (Berenice Project) have conducted extensive exploration in this part of the coalfield.

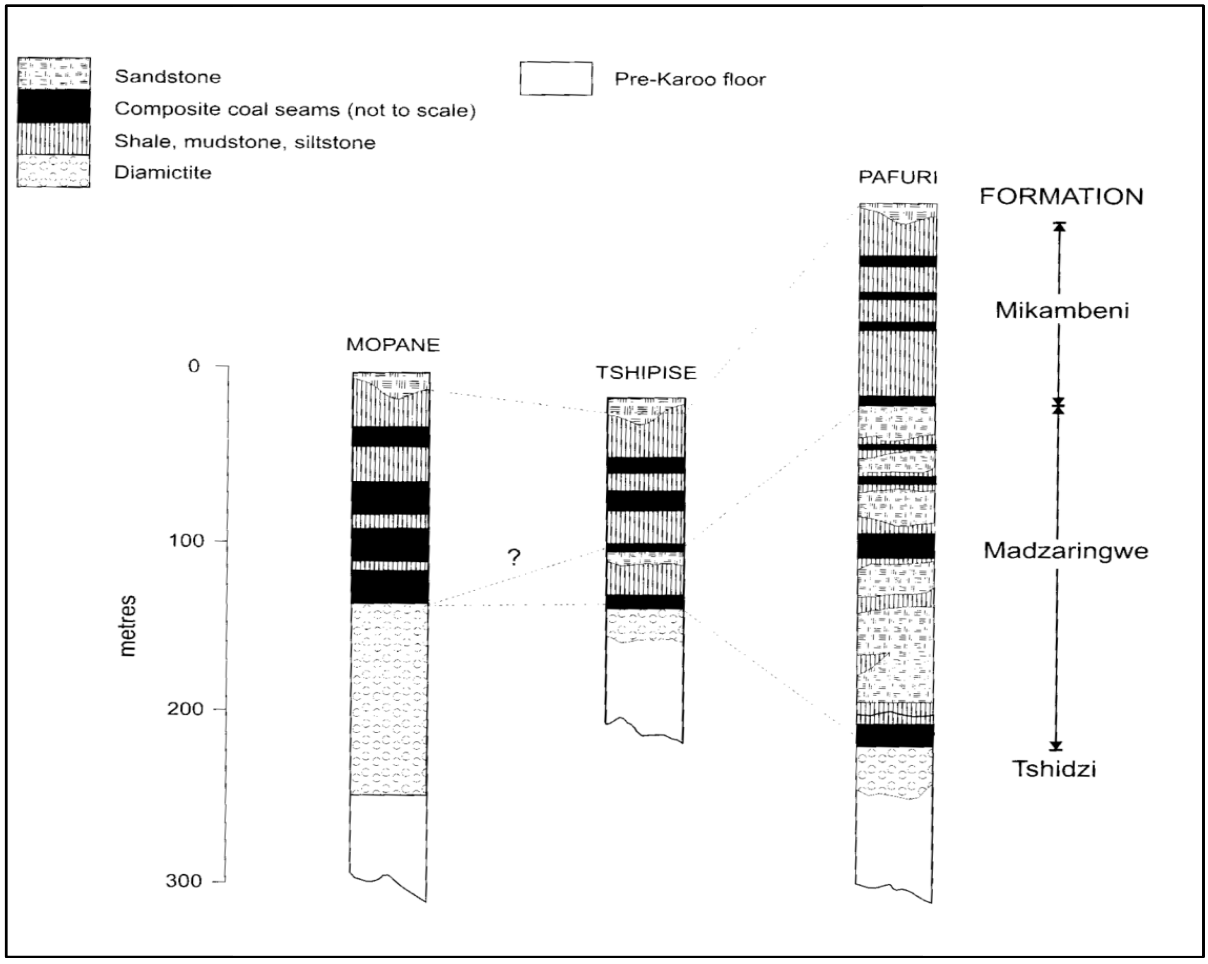


Fig 1.1 – Coal Seams of the Soutpansberg Coalfield (Source: Mineral Resources of South Africa).

1.5 Topography and Climate. *(Climate and Water Resources in the Limpopo Province – C.K. M'Marete: Department of Agriculture and Rural Engineering)*

Limpopo Province is one of South Africa's richest agricultural areas. It is a major producer of vegetables. The subtropical climate enjoyed by much of the province gives rise to the cultivation of tea, coffee and fruits, especially tropical fruits. Forestry makes a major contribution to the economy, as do tobacco, sunflower, wheat, cotton, maize, and groundnuts. Livestock farming includes cattle ranching and game. The abundance of orchards with various sub-tropical fruits and nuts form the basis of a thriving agro-industrial sector.

Extensive tea and coffee estates, which are found in the Lowveld areas like Thohoyandou and Tzaneen. Extensive plantations of forest cover the mountain slopes of the province especially in the Louis Trichardt and Tzaneen districts. Plantations of hard woods for furniture manufacturing have also been established.

Sunflowers, cotton, maize and peanuts are cultivated in the Warmbaths – Nylstroom area. Nylstroom is also known for its table grape crops. Tropical fruit, such as bananas, litchis, pineapples, mangoes and papaws, as well as a variety of nuts, are grown in the Tzaneen and Louis Trichardt areas. Zebediela, one of the largest citrus estates in the country, is situated south of Polokwane while the largest tomato farm in South Africa lies between Tzaneen and Louis Trichardt.

Limpopo Province is situated in a dry savannah sub-region, characterized by open grasslands with scattered trees and bushes. Elevation varies between 600 m and about 900 m above mean sea level (amsl). Along the northern edge of the Bushveld, the plains rise to a series of high plateaus and low mountain ranges, which form the southern edge of the Limpopo River Valley. These mountains include the Waterberg and in the far north, the Soutpansberg Mountains. The Soutpansberg range reaches an elevation of 1,700 m amsl before dropping off into the Limpopo River Valley and the border between South Africa and Zimbabwe. To the east, we have the high grounds of the Drakensberg. Therefore, the change in topography (altitude and relief) gives rise to varied climatic characteristics.

However, climatically, Limpopo Province is characterized by very hot summers and mild winters. Based on the foregoing, one can identify four climatological regions in the province, namely:

- *The arid far Northern;*
- *The arid to semi-arid – the Northern;*
- *The semi-arid – the Highveld; and*
- *The sub-humid – the Lowveld.*

Broadly, the province has a sub-tropical type of climate. Generally summers have a high number of sunshine hours with the occasional afternoon thunderstorms. Winters throughout the province are dry, mild and mostly frost- free. Hence, winters are usually characterized by pleasant weather during the day although early mornings and nights can be cool to chilly. The province receives 90% of its total annual rainfall during the summer period i.e. from October to March. Hail occurs periodically, rarely more than three days per year. The direction of wind changes from primarily easterly in the summer to westerly in the winter. However, cold fronts are mostly characterized by winds from the South.

RAINFALL

Most of the rain falls in the summer months between October and March. The average annual rainfall in the Province ranges between 300-400 and 600 mm. However, the mountain zone has an annual rainfall of about 2,000 mm and the dry Lowveld in the Kruger National Park about 400 mm. About 90% of the rain falls during the summer months. The Soutpansberg Mountains and the Drakensberg receive quite high amounts of rainfall. For example Levubu-Citimba station records an average rainfall of about 1329 mm.

Around the Waterberg mountain ranges near Thabazimbi, summers are hot but the area does not suffer from the stifling humidity so typical of the eastern Lowveld. The area is situated in the summer rainfall region and rainfall occurs in the form of heavy thunderstorms or soft rain. Winter is moderate with frost occurring in the

low-lying regions only. Mornings and nights can be cold, but day temperatures are pleasant. The rainfall in this area is between 500 – 700 mm per annum.

GROUNDWATER RESOURCES

Groundwater, despite its relatively small contribution to bulk water supply (13%), represents an important and strategic water resource in South Africa. Owing to the lack of perennial streams in the semi-desert to desert parts, two thirds of South Africa's surface area is largely dependent on groundwater. Although irrigation is the largest user, the supply to more than 300 towns and smaller settlements is also extremely important. Of the irrigatable land in South Africa, 24% is irrigated using groundwater supplies while surface water irrigates 76% (Dennis & Nell, 2002). Statistics from the Directorate of Water Services and Planning of the Department of Water Affairs and Forestry (DWAF) reports that 52.6 percent of the population of the Limpopo Province is totally reliant on groundwater for domestic use.

***Groundwater use in the four catchment management areas of the Limpopo Province** presented (Table 1.0) is shown below.*

USE	**Water Management Areas**								**LIMPOPO PROVINCE**	
	Limpopo		Letaba/levubu		Olifants		Crocodile (West)/Marico			
	M m^3	**%**	M m^3	**%**	M m^3	**%**	M m^3	**%**	M m^3	**%**
Irrigation	131.0	63.0	9.0	15.7	79.0	69.3	56.0	67.5	**275.0**	59.5
Livestock	3.0	1.4	0.2	0.3	2.0	1.8	3.0	3.6	**8.2**	1.8
Rural communities	53.0	25.5	38.0	66.4	20.0	17.5	6.0	7.2	**117.0**	25.3
Municipalities	12.0	5.8	8.0	14.0	2.0	1.8	8.0	9.6	**30.0**	6.5
Mining	9.0	4.3	2.0	3.5	11.0	9.6	10.0	12.0	**32.0**	6.9
TOTAL	**208.0**	100.0	**57.2**	100.0	**114.0**	100.0	**83.0**	100.0	**462.2**	100

Source: W.H. du Toit (2002)

REPLENISHMENT

A comparison of recharge and usage of groundwater in the study area and it can be seen that the use is less than the recharge. The groundwater balance is in excess of 60% in all the water management areas in the Limpopo Province. It is highest (81%) in the Letaba/Levubu Catchment area and lowest (64%) in the Crocodile (west) & Marico.

***Groundwater Use Versus Recharge in the four catchment management areas of the Limpopo Province** presented (Table 2.0) is shown below.*

Catchment Management Area	**Estimated Recharge**	***Total Use***		**Groundwater Balance**	
	(10^6 m^3/a)	**(M m^3/a)**	**(%)**	**(M m^3/a)**	**(%)**
Limpopo	702.0	208.0	28.0	503.0	72.0
Letaba & Levubu	291.0	57.2	19.0	236.0	81.0
Olifants	303.0	114.0	34.0	200.0	66.0
Crocodile (West) & Marico	137.0	83.0	53.0	64.0	64.0
Total for the province	**1433.0**	**462.2**	**32.0**	**971.0**	**68.0**

Source: W.H. du Toit (2002)