

1 context

south africa

north west province

moses kotane local municipality

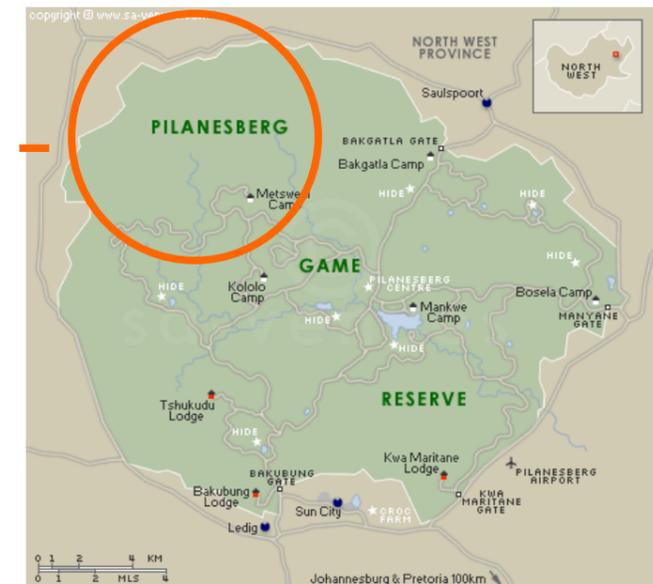


Fig 3 context

This falls within the the North West Province in the Bonjala Municipality. The proposed study area falls under the jurisdiction of the Moses Kotane Local Municipality (MKLM) area.

As per Fig 4, the study area is approximately 10 000 hectares and is north of the Pilanesburg National Park. This was determined by a 15km radius around one and/or all of the proposed mining zones.

The Moses Kotane Local Municipality was enacted on the 5 December 2001 in terms of the 1996 – Census results. It is bordered by the Northern Province in the north and the north-east; madibeng Muniaplaity in the east; Rustenburg Local Municipality in the south; and Botswana in the the west.

The Moses Kotane Local Municipality (MKLM) is made up of 30 dispersed villgaes, characterised by a combination of mining and substitence farming practices.

Distance and direction to nearest towns:

The proposed Kruindfontein Mining project to located between 2km and 5km north of the following rural settlements, which lie on the northern slopes of the Pilanesburg Range and in an east west direction

- Lekutung
- Ga – Masilela
- Ga – Raphiri
- Boriteng and
- Bohula

The nearest town Saulspoor is about 12km south-east of the Kruindfontein project.²

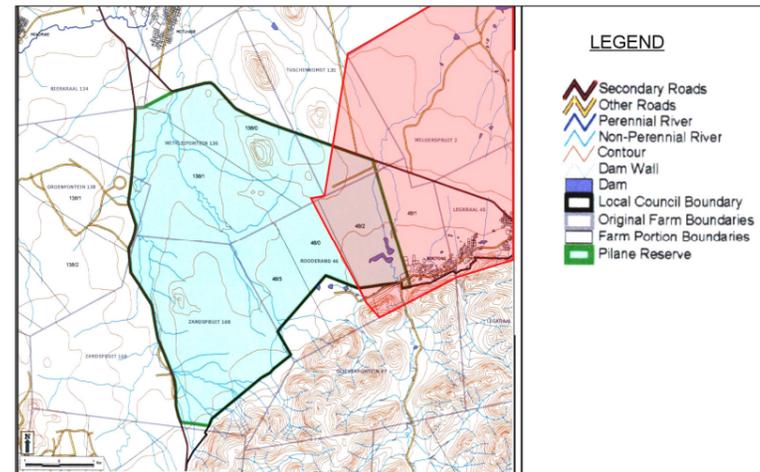


Fig 4: Regional Locality map³

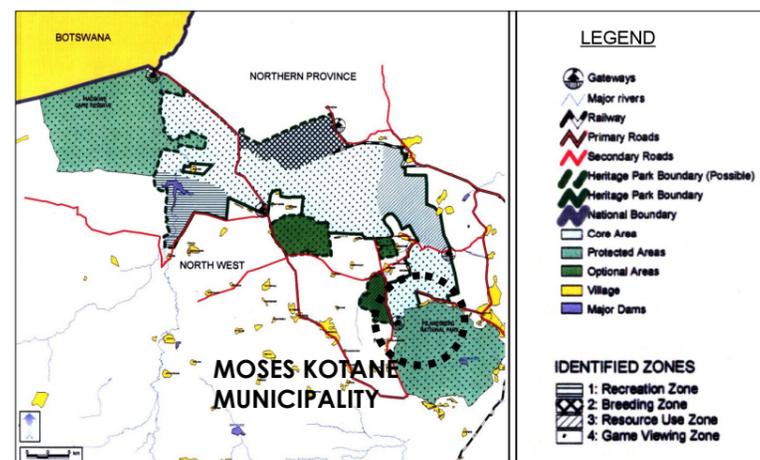


Fig 5: Municipal Locality map⁴

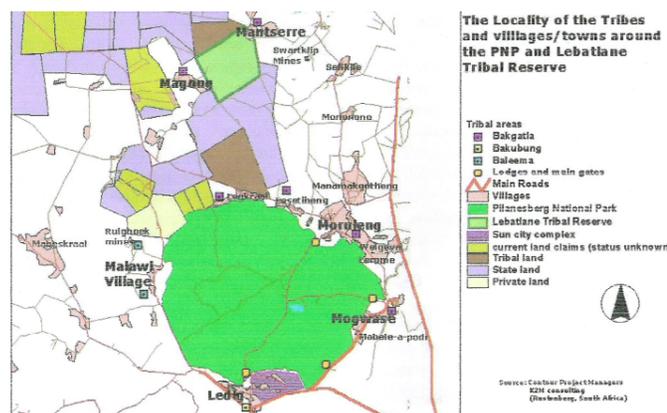


Fig 6: Locality map of the three different tribes in the PNP area ⁵

² Strategic Environmental Focus, Kruindfontein Project Impact Assessment prepared for AngloPlatinum, 2001:pg B-12, C-8

³ Strategic Environmental Focus, Kruindfontein Project Impact Assessment prepared for AngloPlatinum, 2001:pg A-2

⁴ Strategic Environmental Focus, Kruindfontein Project Impact Assessment prepared for AngloPlatinum, 2002:pg C-9

⁵ Strategic Environmental Focus, Kruindfontein Project Impact Assessment prepared for AngloPlatinum, 2001:pg C-8



Fig 8 Map after State Aerial Photograph 2528CA of Saulspoor: showing the urban fabric within the town of Saulspoor¹⁰

¹⁰ Burger, LeRoux & Tumubwaine, 2006

With the need to integrate and relate the MINE to the nearest community, the proposed intervention seems best done within an existing community. The closest of which is the town of Saulspoor:.

Looking at the town of Saulspoor as a combination of the economic, social, cultural and recreational opportunities and facilities; which are and can be generated through the physical agglomeration of large numbers of people¹¹.

The scenario being investigated focuses on the daily life of the people of Saulspoor. With the emphasis on the spaces where people gather, interact and work. The impacts of which are felt on a political, economical and cultural tribulations, indicative of the life in Saulspoor.¹² While attempting to strategize and select a space that accommodates the above several factors have been considered. These include:

Access

All urban inhabitants should enjoy relatively easy and equitable access to urban opportunities. In the scenario suggested the need for both visual and physical access is paramount in conceptualizing a space that is multi-lateral in its layout, function and perception. The spatial implication of the concern with ease of access is the primary physical barrier of cost to overcome the friction¹³ created between the built and physical environment.

Promotion of collective activities and contact

The places of greatest interactions in cities and this case the town of Saulspoor, are the places of greatest opportunity¹⁴. In the case of Saulspoor bearing in mind the cultural dynamics prevalent in the area this would be the gathering spaces and the points of transport interchange.

Needs

These include physical needs: shelter food, social needs; opportunities for interaction, psychological needs; security identity. Sensory needs; visual accessibility textures a sense of place. By investigating a suitable design approach in the town of Saulspoor this thesis attempt to satisfy those needs. In addressing and allowing for qualities that provide a critical base from which urban policies, plans and physical actions can be evaluated¹⁵.

Balance

Balance; balance between society and the cosmos concerning matters like traditions culture and the prevailing social dynamics; with the design as an expression of wholeness; recognition, celebration of the natural, cultural and historical uniqueness of different places and times.

¹¹ Dewar, South African Cities: A Manifesto for Change, 1991: pg16

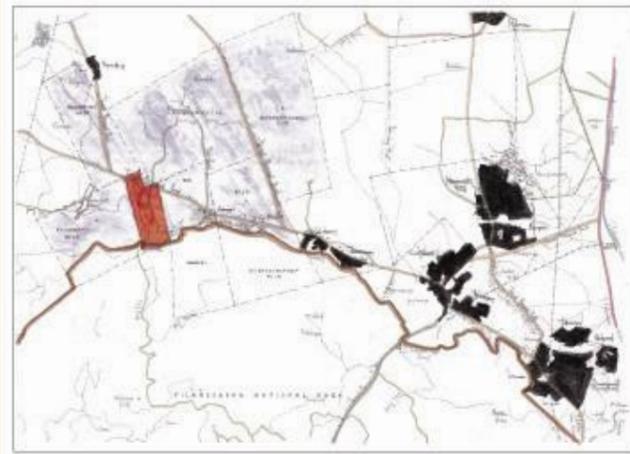
¹² Gooding, Song of the Earth, 2002:20

¹³ Dewar, South African Cities: A Manifesto for Change, 1991: pg16

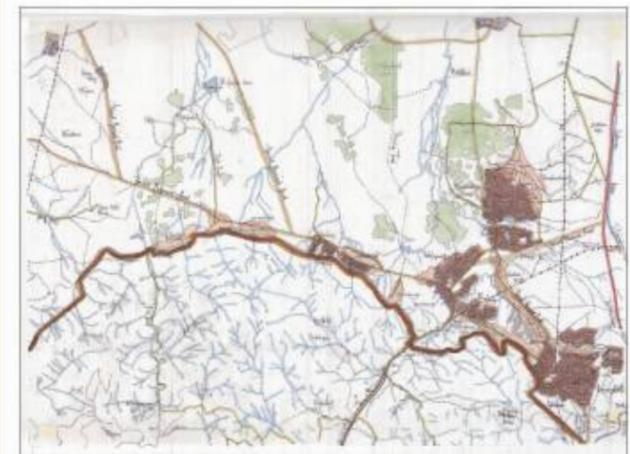
¹⁴ IBID, 1991: pg17

¹⁵ IBID, 1991: pg18

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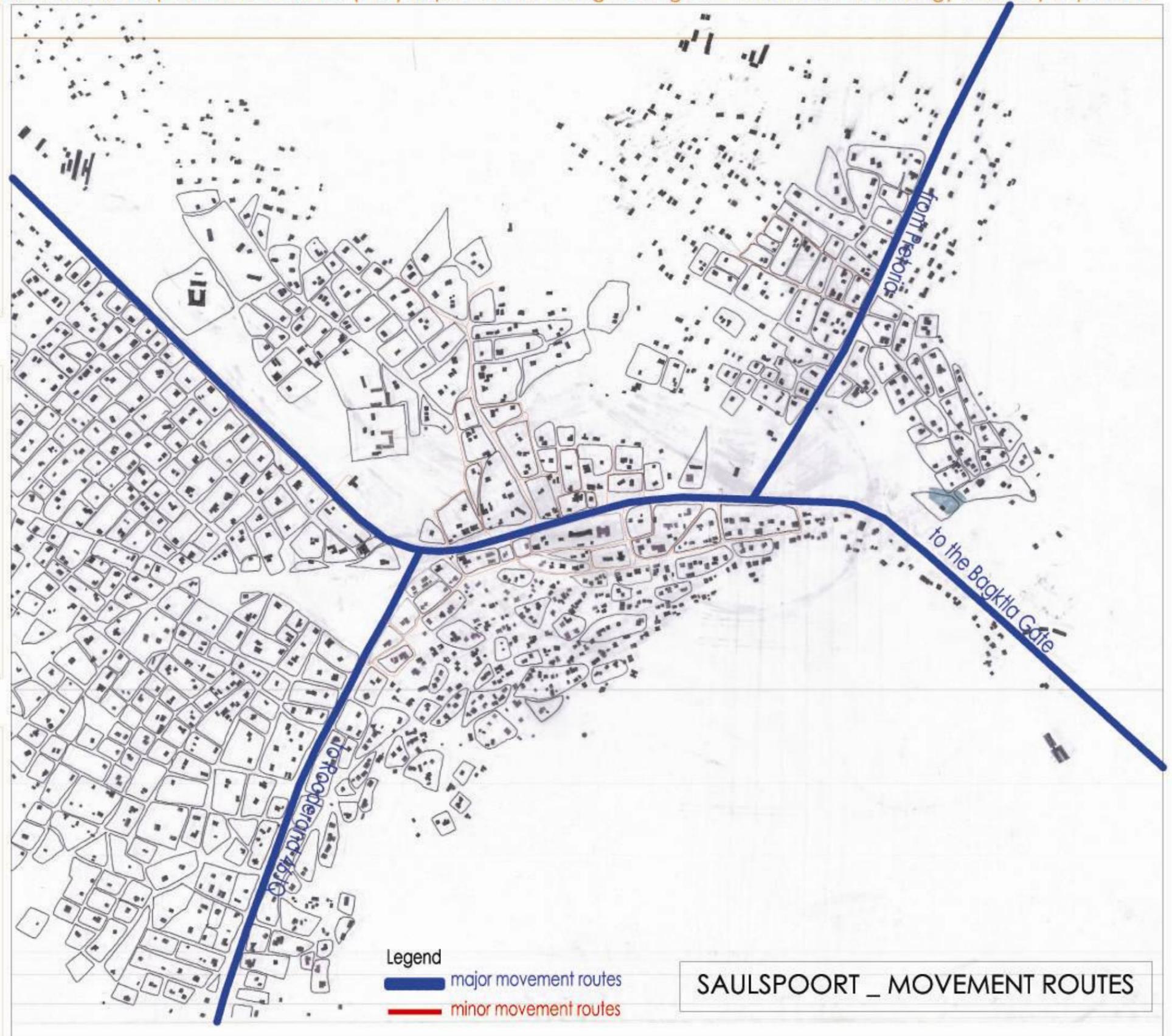
moses kokane municipality urban fabric



moses kokane municipality bio-physical analysis

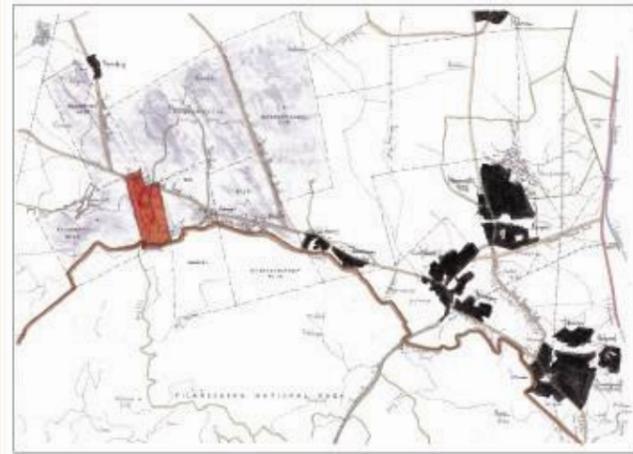


aerial view_SAUUSPOORT TOWN

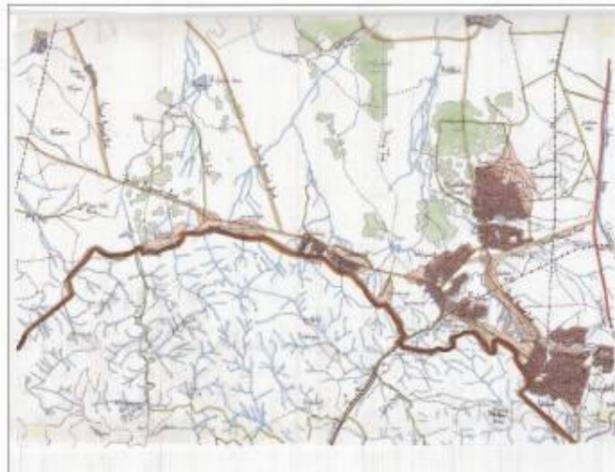


counter-point scenarios.intergration of mine infrastructure in a community.counter-point scenarios.intergration of mine infrastructure in a community

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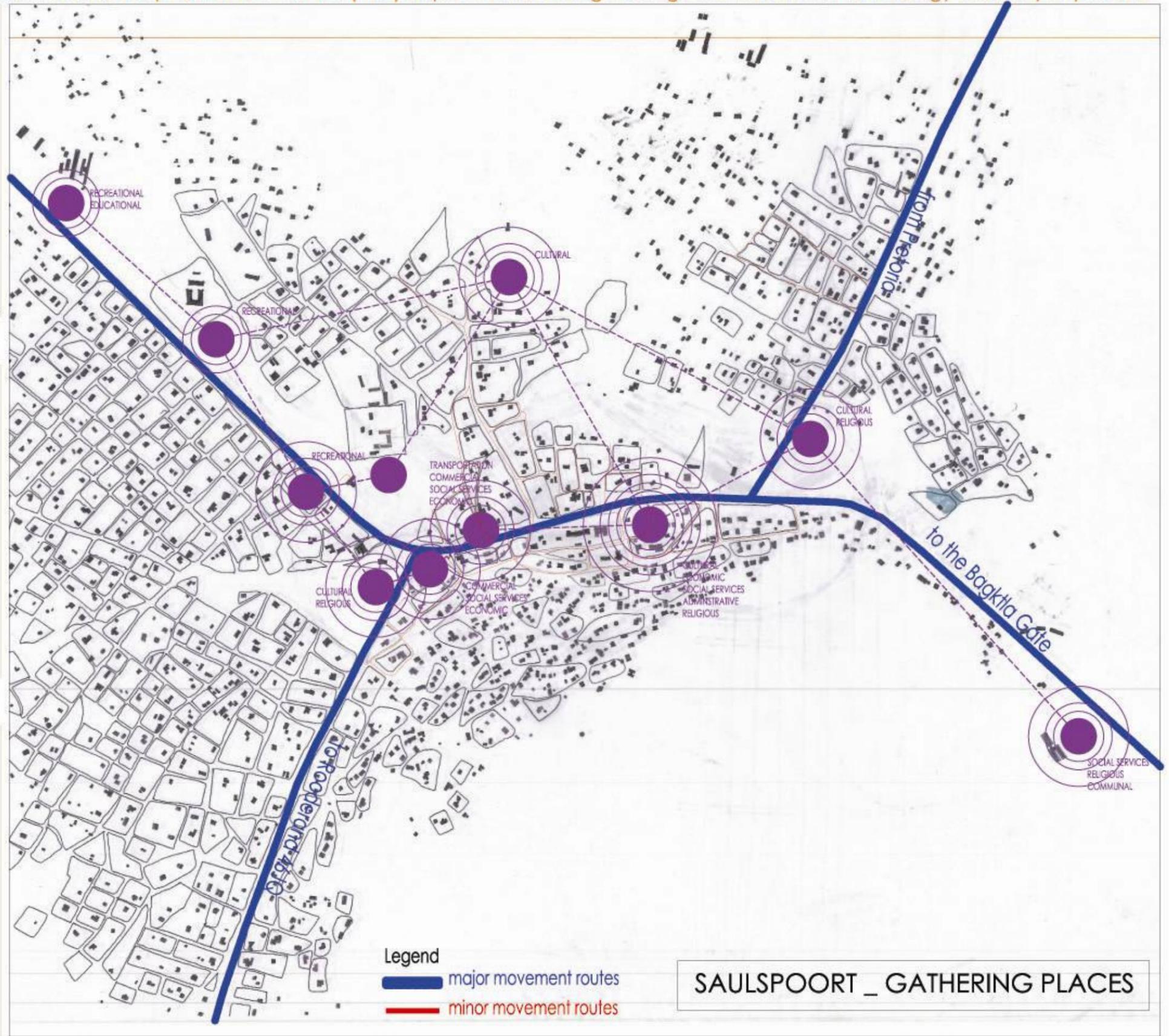
moses kokane municipality urban fabric



moses kokane municipality bio-physical analysis



aerial view_SAUUSPOORT TOWN



counter-point scenarios.intergration of mine infrastructure in a community.counter-point scenarios.intergration of mine infrastructure in a community

The second is the balance between society and nature. Allowing people to be part of the totality of the place in which they live. The third is the concept of balance in the relationship between people as expressed through urban activities. By the creation of spaces that serve as a platform on which activity can occur. Arguably the urban environment is made up of created activity and not just a platform. Where the activity is part of the design before the spaces created are planned around their planned activities. A place therefore designed around the activity is much more than just a place that is designed waiting for spontaneous commotion¹⁶.

Intensity, diversity and necessary complexity: A variety of overlapping conditions and activities provides for the spontaneous and unexpected to occur. Here again suggested with the multi-lateral use and function of the proposed spaces.

Integration: Communities can benefit from a greater range of opportunities and facilities than can be generated by their operating in isolation. Again as stated previously spaces and buildings should be multifunctional¹⁷.

Community: The sense of identity, and belonging; this is largely dependant on interaction and communication and cannot be artificially forced. Identity is largely dependant on an assortment of complex forms of social organization and institutions operating over many different scales¹⁸.

Idea context and programme

Idea: identifies spatial relationships, which contribute to the meeting of need: it has form but not yet design.

Context: the application of idea to place: it gives reality to the idea and is the design response to the particularities of place. The design process is not a linear process but a cyclical one: understandings gained in one stage feed back into and lead to adjustments in the others¹⁹

Programme: develops out of need. It establishes some of the constraints within which the idea must be developed and reflects an expression of the nature of environments within which urban life must be lived (Dewar 1991: 15).

With the above factors in mind, five scenarios were identified within the town of Saulspoor that embodies all if not three of the discussed elements.

¹⁶ Gooding, Song of the Earth, 2002: pg16-21
¹⁷ Dewar, South African Cities: A Manifesto for Change, 1991: pg 20
¹⁸ IBID, 1991: pg 21
¹⁹ IBID, 1991: pg 14

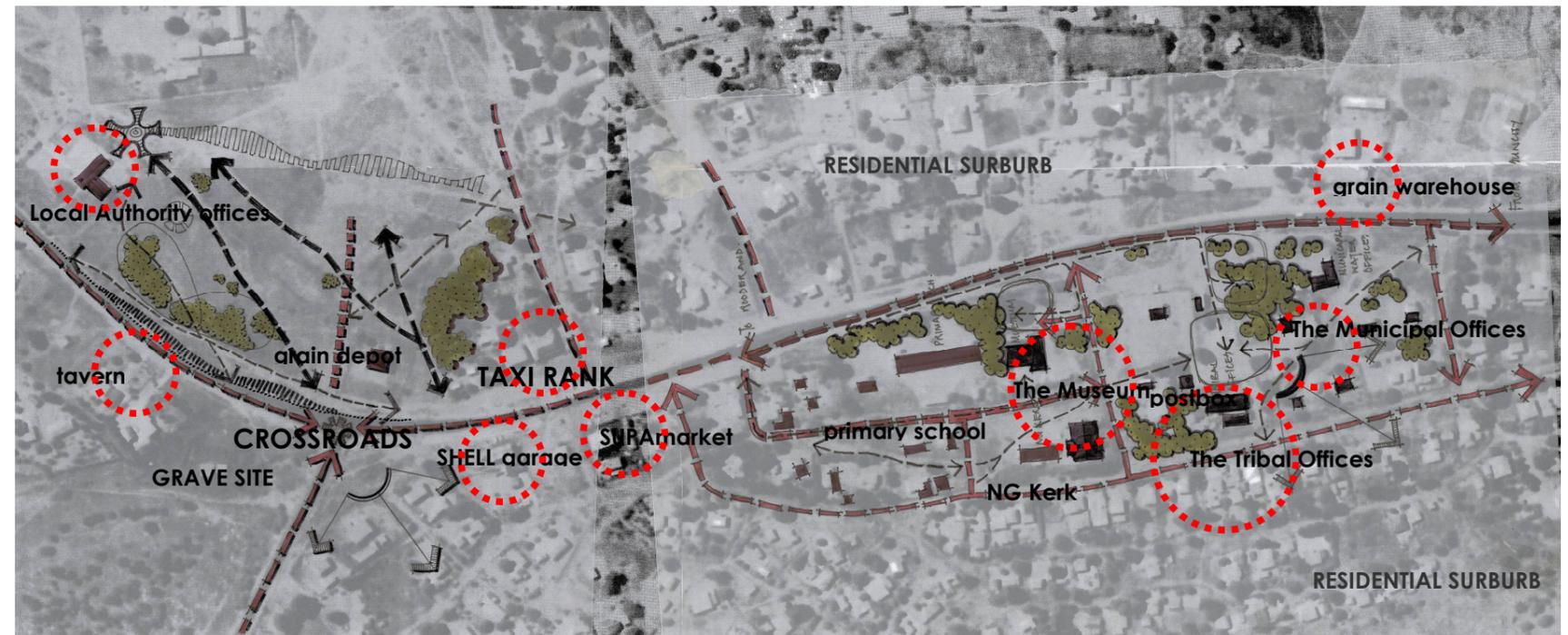


Fig 9: Map after State Aerial Photograph showing Saulspoor: the site and adjacent urban blocks²⁰

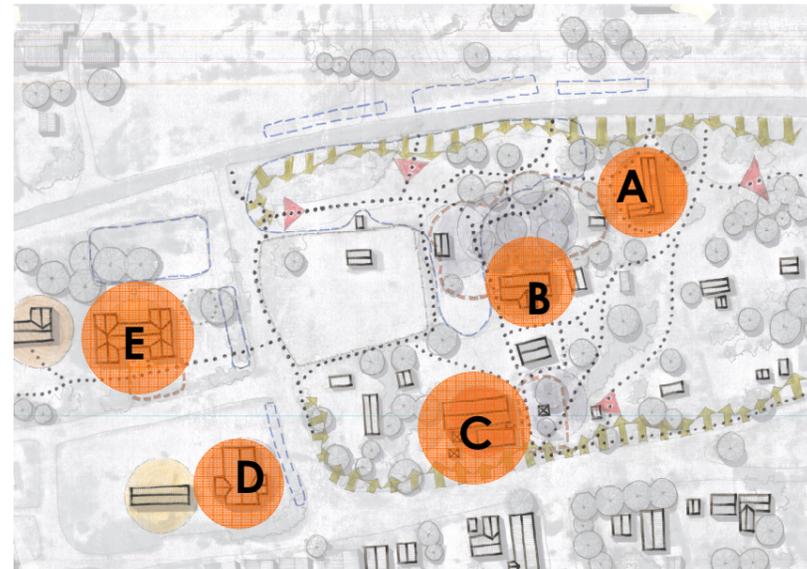


Fig 10: Map after State Aerial Photograph 2528 CA showing Saulspoor: nuclei points on the site²¹

context

A: Municipal Office
 The Rand Water Offices, which are fenced off and removed from the dynamic's on the site

B: Dental Surgery
 A place that encourages gathering on the site, making this a focal point on the site

C: The Tribal Office Complex
 Place of authority, within the town of Saulspoor. This complex is the largest contributor to pedestrian movement and interaction on site. This building(s) represents the cultural and social make-up of Saulspoor

D: NG Kerk
 In spite of the strong traditional culture in Saulspoor, there is still a big influence of Christianity within Saulspoor. A combination of a Western idea into the traditional beliefs and culture.

E: The Mpebatho Place-Dome Museum
 Exhibits of what indigenous Tswana culture consisted of are the key points of focus on display in this Museum. Also incorporated into this complex are various social activities like the only Restaurant in Saulspoor, and a computer training centre.

BIO-PHYSICAL ANALYSIS

Climate

The Kruidfontein Project falls within an area with warm to hot summer and mild to cold winter months. Climate is considered under the following parameters:

Rainfall
Evaporation
Wind
Temperature

Rainfall

The Kruidfontein project falls within the Highveld climatic zone, where mean annual precipitation for the region can be expected to vary from 500mm to 700mm. Most of the rainfall results from showers and thunderstorms of short duration.²²

Evaporation

Evaporation is expected to be between 1700mm and 2000mm per annum.²³

Wind

Fine condition with little or no rainfall, and light variable with a Northerly component occur over the region. The dominant direction of the prevailing surface winds is in a North-Westerly and North-Easterly direction. In late winter fresh to strong Westerly winds sometimes occur. Wind erosion is unlikely due to low average wind speed of 11 km/h.²⁴

Temperature

The average temperature in the region for a whole year is approximately 18.6 °C. The daily temperatures are higher than 32.5 °C and lower than 14.5 °C during the summer months that are seldom. The hottest months are December to February. The coldest months are June and July.²⁵

Geological and mineral resources

The geological source of Anglo Platinum's current production is the Bushveld Complex of South Africa, the largest known layered igneous complex of its type in the world. Extending 350 kilometers from east to west and 250 kilometres from north to south it is roughly saucer-shaped. Unique to the Bushveld is the presence of two strataform deposits that can be traced for hundreds of kilometers along the rim, containing economically exploitable

quantities of PGMs.²⁶

Reef Types

Merensky Reef:

Since mining first began in the 1920s, the uppermost of the two layers, the Merensky Reef, has been the most important PGM source; it is especially rich in platinum, which makes up some 60% of the 4E grades quoted by Anglo Platinum.

UG2 Chromitite:

At a vertical distance of 16 and 400 metres below the Merensky Reef, depending on location, the second PGM-bearing layer known as the UG2 chromitite can be found. This has become an important alternative source of PGMs in recent years.

Platreef:

On the Northern Limb of the Bushveld, the UG2 is not developed on Anglo Platinum's properties. A layer known as the Platreef, which is substantially thicker than the Merensky and UG2 reefs, occurs and can support open-pit mining operations to depths in excess of 200 metres.²⁷

Topography

Slope angles are generally shallow indicating a gently undulating topography across the whole site. The lowest point in the study area is 1043m above mean sea level. The Pilanesberg an oval series of concentric hill ranges and valleys composed of a unique suite of alkaline volcanic rocks, with the outer most rings of mountains rising abruptly 300m to 600m above the surrounding plains. The valleys of streams in the area are mainly broad; some narrow, open, and exhibit rather low gradients. The Bierspruit, Wilgespruit and Lesele non-perennial streams drain the area.²⁸

Soils Landform

Description of soil-landform resources:

Two broad soil-landform uses can be distinguished, each related to geology, topography and age. The northern flat plains with underlying grabbo of the Bushveld Complex are covered by a black-red clay soil association, whereas the foot slopes of the Pilanesberg, in the southern part of the project area, constitute of loamy and clayey, cutanic soils derived from alkali rocks of the Pilanesberg Complex, and are of relatively younger age than the black-red association.²⁹



Fig 12: Images of the Saulspoort area landscape ³⁰

²² Strategic Environmental Focus, Kruidfontein Project Impact Assessment prepared for AngloPlatinum, 2001:pg D-5

²³ IBID, 2001:pg D-8

²⁴ IBID, 2001:pg D-10

²⁵ IBID, 2001:pg D-11

²⁶ Strategic Environmental Focus, Kruidfontein Project Impact Assessment prepared for AngloPlatinum, 2001:pg A-14

²⁷ IBID, 2001:pg B-7

²⁸ IBID, 2001:pg D-18

²⁹ IBID, 2001:pg D-21

³⁰ Burger, LeRoux & Tumubweinee, 2006

Identification of sensitive areas

Soil Erosion:

The natural water erosion hazard of the soil-landform is low; however, if plant cover is removed or the land surface abused the erosion susceptibility increases appreciable. Cattle and human trials are also responsible for sediment production.

Dustiness:

No sensitive sites are expected due to the low potential dust qualities of the soils in the project area.

Soil Compaction

A very hard, compacted soil will limit the ease of landscaping and plant growth as well as increase water runoff. Further more, the soils of the Shortlands, Hutton, Valsrivier and Oakleaf forms have a moderately to high compaction potential in the topsoil.

Soil-landform stability

With regard to the soil-landform, the stability of the landscape is mainly moderate to high for the more level laying soils. However, rock falls, slides and soil creep may occur on steeper slopes.

Land capability and use

The turf soils are naturally fertile and if well managed it can be productive. Crops commonly produced on these soils include sunflowers, maize and sorghum. Livestock farming, under normal circumstances, is also constrained by low rainfall and the low carrying capacity of the surrounding Veld.³¹

Three classes of land capability have been identified:

- Medium to low potential arable land.
- Grazing land. The Veld is capable of supporting a stand of indigenous grass species and is utilized by domesticated livestock.
- Wilderness land/open savannah patches; and watercourses

The current use of the land of the Kruidfontein Project study area is mainly for grazing and some agricultural purposes. The land uses in the study areas as follows:

Agriculture – not a predominant land use per say but to some extent a part of the economic generation in the region.

Mining – is to date a prominent activity in the regional context with platinum, chrome, gold and diamonds mines in the region.

Urban development and settlement – economic opportunities created by mining development in the region has encouraged to a large extent the growth of villages, towns and settlements in the region.

Mine related industry – secondary and tertiary industries have developed to support the mining industry.

³¹ Strategic Environmental Focus, Kruidfontein Project Impact Assessment prepared for Anglo Platinum, 2001:pg D-41



Fig 13: Images of the Saulspoor³²



Fig 14: Images of the Saulspoor³³

³² Burger, LeRoux & Tumubweinee, 2006

³³ IBID, 2006

Vegetation

The Kruidfontein Project study area is located within the savanna biome, which consists of scattered trees and shrubs and a continuous ground layer dominated by grass species. Fire plays an important role in this environment as it aids in the regulation of the density of the woody component. The study area lies within the Sourish Mixed Bushveld, which is found in a narrow east-west belt surrounding the Pilanesberg.

The black turf soils of the area are rich in clay and plant nutrients and support a dense bushveld, which is dominated by *Acacia* species such as *A. mellifera* (Black Thorn), *A. tortillis* (Umbrella Thorn), *A. niJotica* (Scented Thorn) and *A. caffra* (Common Hook-thorn). Large stands of *Dichorstachys cinerea* (Sickle bush) occur and are indicative of over-grazing. Grasses are 'soft' and fibrous and retain much of their nutritive value and palatability after flowering and through the dry season. Grass species include *Ischaemum afrum* (Turf Grass), *Sehima galpinii*, (Deck Grass) and *Setaria incrassata* (Canary Millet).³⁴

Animal life

The occurrence of flora in any area depends on habitat. Since the area has already been altered by human activities, most natural wildlife habitats have been disturbed. The only animal in the study area is common bird's reptiles and small rodents.³⁵

Water resource

The proposed Kruidfontein Project is located in Sub-Catchments A24E (Surface Water Resources of South Africa, Volume 2, 1990: Drainage Regions A and B, WRC Report No. 298/2.1/94), which forms part of the Crocodile River Catchments.

The more important hydrological parameters of the Sub-Catchments are:

- Rainfall Area A2G: 500 mm to 700 mm mean annual precipitation (MAP).
- Evaporation Area 2B: 1 700 mm to 1 800 mm mean annual S-Pan evaporation (MAE).
- Runoff Area Q: 10 mm to 20 mm mean annual runoff (MAR)³⁶

³⁴ Strategic Environmental Focus, Kruidfontein Project Impact Assessment prepared for Anglo Platinum, 2001:pg D-46

³⁵ IBID, 2001:pg D-57

³⁶ IBID, 2001:pg D-15

SOCIAL ANALYSIS

According to the 1996 Census data the total population in the Moses Kotane Local Municipality area is estimated at 229 992. The more densely populated towns in the area include the town of Saulspoor and Moruleng.

The educational levels in this area are significantly low, in spite of the physical presence of a number of schools in the Saulspoor and Moruleng area. This lends itself to the deduction that the schools are not functioning to full capacity and are either under-resourced or mismanaged and in some instance non-functional. A very small percentage of the population has tertiary education.³⁷

The towns of Moruleng and Saulspoor are made up of family units that compose by far a large part of the urban dynamic and fabric. There appears to be strong relationship between these family units and this is demonstrated in the knowledge and understanding exhibited by the community's interaction with each other.

There is a high level of unemployment with an estimated percentage of 48% unemployed. This is also attributed to the fact that due to the limited employment opportunities in the area most of the economically active people are employed outside the area. Allowing for a gap whereby the MINE can have a significant impact on the employment levels in the area.³⁸

The Mphe batho Place-Dome Cultural Museum

Located in Moruleng Saulspoor, this museum is the heart and the showcase for the Tswana, Bakgatla culture in the area. It is found in a building that was the second school to be built in the entire Municipality by the then MaKgosi of the Bakgatla-ba-Kgafala, Kgosi Ofantse.³⁹ Restored and upgraded on the 24 September 1998 by the Place-Dome mining group the Museum is still in need of further restoration and upgrade. It is currently being run by volunteers from within the community of Saulspoor and serves as the initial contact with the culture and social structure in the area.

The Mphe batho Place-Dome Museum exhibition includes:

- Pictures of the Ama Kgosi in the 1899 – 1902 AngloBoer War
- Pots and pottery, which formed an integral and symbolic part of a traditional Tswana household.
- Medicinal plants, with explanations on how these were used.
- Artworks
- Recreations of the traditional dress of the Bakgatla
- Trophies and photographs from the colonial and apartheid era



Fig 15: Decorative wall patterns, the Mphe batho Place-Dome Cultural Museum⁴⁰



Fig 16: Images showing pot making process⁴¹

a part of the beliefs and culture in the area. This is done through the use of color. These are:

- Grey – on the walls and columns. This is the color of the totem monkey of the Bakgatla
- Orange – door and window frames. The color on the tip of the totem monkey.
- Blue – on the roof. A representation of the sky and the heavens.
- Purple – as a band along the base of the walls. A color representing the Earth.

The walls are decorated with patterns representative of the patterns that would have been used by the Bakgatla to adorn their dwellings. These patterns are smeared onto the walls by the women in the community, although today the traditional mixture of earth and cow dung is mixed with an adhesive for durability.

In contrast to the two NG Kerk Churches to the back of the Museum that does not in anyway reflect the ideals or culture of the Bakgatla ba Kgafelo. Rather they stand out in the landscape symbols of a colonial past.

On the same site stand the Tribal offices, a primary school and the NG Kerk. The school was constructed under the supervision and initiative of the then chief Kgosi Ofaste in 1937.

In a recreation of what used to be an important hierarchical system of spaces in urban Tswana citadels that culminated in a kgotla.

Further towards the Bakgatla Gate Resort is the George Stegman Hospital that is still in operation to date as the only hospital in Saulspoor

The rain – making site, situated within the urban context though undefined also constitutes itself as cultural nucleus within the town of Saulspoor.

Pottery is a very important facet of the Bakgatla culture. Though not formally established the people of Saulspoor exhibit great skill in pottery making. This part of their culture has attracted a great deal of interest especially from the foreign tourists that come through, as they are given an opportunity to interact with the potters and given a culture tour centred around this.

³⁷ Strategic Environmental Focus, Kruidfontein Project Impact Assessment prepared for AngloPlatinum, 2001:pg D-159

³⁸ IBID, 2001:pg D-160 - 162

³⁹ Lesego, Interview 5 April 2006

Painted in the Tswana traditional, the Museum attempts to depict

⁴⁰ Burger, LeRoux & Tumubwaine, 2006

⁴¹ IBID, 2006

INFRASTRUCTURAL ANALYSIS

This includes:

- The George Stegman Hospital
- The Mphe batho Place-Dome Cultural Museum
- A taxi rank
- The NG Kerk church complex. Made up of two structures, where the older structure was put up in 1888 by the Dutch Reformed missionaries. This contrasts the newer modern church adjacent to it, giving an insight into the layers of history that are con-existent in the area.
- The Bakgathla Gate Resort.
- 63 schools in 30 villages, each of which is named after a Makgosi, tree or mountain.
- The Tribal office complex.
- A tarred road connecting the resort to the town and through to SunCity
- The Local Municipal offices
- A central grain collection and storage central
- A tavern
- Convenience stores
- A Shell garage
- Two grave-sites
- Dental surgery
- Mechanic workshop
- Post box
- Eskom sub-station
- Informal trade along the main road
- Secondary dirt roads
- Rand water offices

The built environment in Saulspoor is predominantly made up of small residential dwellings with a few roundavels. There is an in-existent presence of shack and/or temporary presence. Meaning that the settlement patterns in Saulspoor are formalized and the residents are more or less "indigenous" and/or permanent residents in the area.

Urban fabric

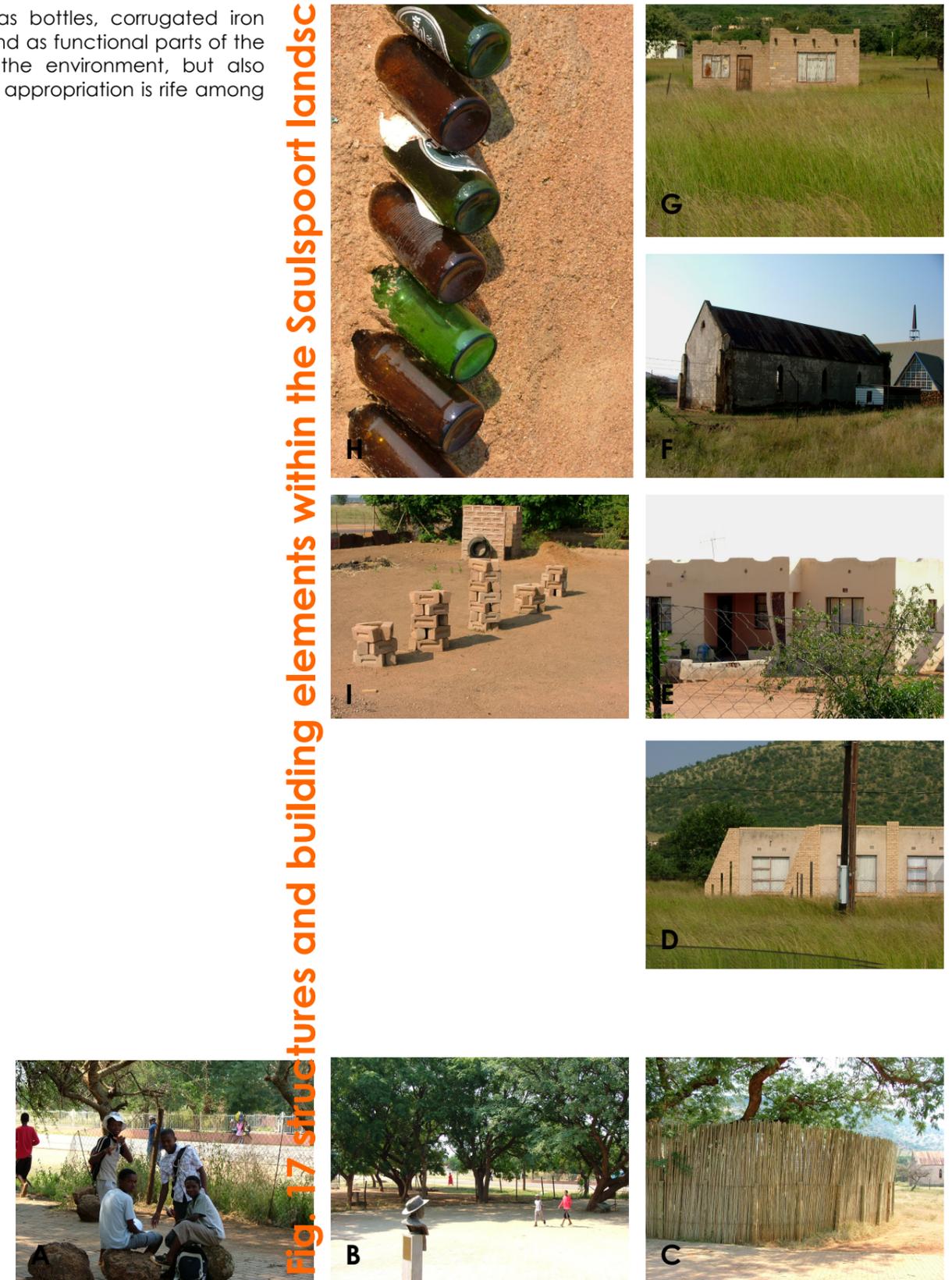
The urban fabric in the town of Saulspoor is made up of individual houses on plots. Grouped together to define and create the spaces that define Saulspoor. Aside from the main tarred road, the secondary access routes are defined by the plot boundaries, creating a cell like urban typology that is organic in its nature and feel.

Building typology

The buildings in Saulspoor are of a small scale with an absence of any building over one storey. The building both commercial and residential exhibit a unique aesthetic quality, where by the walls have been castellated and slanted, an indication of the attention and pride of the community to their built environment.

The use of ordinary elements such as bottles, corrugated iron sheeting, and plastic bags to adorn and as functional parts of the building also indicates sensitivity to the environment, but also shows that the concept of re-use and appropriation is rife among the residents of Saulspoor.

Fig. 17 structures and building elements within the Saulspoor landscape



ECONOMIC ANALYSIS

Tourism and mining are the two predominant industries that provide for economic empowerment with the community of Saulspoor.

Mining:

The mines in and around this area include

- The Amandabault Mines
- Union Section Mines

The above mines provide majority economic opportunities for the peoples of Saulspoor who tend to commute to and from the town to work. This is also indicative of the tight and rooted attachment of the people in this area to their town and community.

Tourism:

The Bakgathla Gate Resort, within 10km from the centre of the town, this makes it another major economic player in Saulspoor.

SunCity though further away is also a source of economic opportunity in this region.

The Pilanesburg National Park, a major tourist destination this facility provides for employment opportunities such as supporting staff, tour guides and gamekeepers for the residents within the area. This Park as focal point allows for the movement of tourists in and out of Saulspoor, allowing for the creation of various platforms on which the local residents can establish small businesses that are supported by the tourism industry such as curio's, cultural tours and experiences and bead work. With the low employment levels in the area, this serves as a boost to the economic setup of Saulspoor.

A proposal for a Heritage Park Corridor is also in the pipeline for this area. The proposed Corridor links up with other regional projects such as Marakele, Thaba Tholo, Atherstones, and the Rhino Eco-Ranch to form a significant Conservation and Tourism Area. Developed as an initial discussion document this Heritage Corridor, is expected to significantly boost the economical status of the area through tourism and conservation. Providing a platform for an alternative secondary industry, that would also act as an economic catalyst during and after the Kruidfontein Mine life.⁴²

The other form of economic empowerment in Saulspoor comes from the foreign and local tourists that drive through the town as they head to the Pilanesburg National Park. This allows for the community to showcase its culture and in the sell of crafts and pottery.

⁴² Strategic Environmental Focus, Kruidfontein Project Impact Assessment prepared for AngloPlatinum, 2001:pg D-192

Another economic generator in Saulspoor is from the small and medium sized businesses that serve the town. These include:

- Grain depots
- Spaza shops
- Supa-markets
- Roadside semi-formalised trade
- Mechanical workshops
- Health care services
- The Shell garage
- Restaurant services
- Fruit and vegetables depot
- The Taxi Rank



Fig. 18 existing economic activities within the town of Saulspoor

HISTORIC ANALYSIS

The Kruidfontein project is located in an area that was part of what was referred to as Bophuthatswana homelands in the apartheid government.

The Bophuthatswana homelands predominantly made of Tswana people were governed by the indigenous Chiefs known as Ama Kgosi that were then overseen by the apartheid government. These Chiefs it is said were sent through from the Tswana royal house of the Bakgathla from what is known as the country of Botswana.

The Bakgathla chieftaincy came as a result of the Sotho – Tswana wave after a period of fission and secession from the original nucleus at Mmatau ⁴³

The Bakgathla in this area are known as the Bakgathla ba Kgafelo. Due to the fact that this area fell under the Bophuthatswana homeland the colonial influence though apparent did not completely erode the cultural values of the peoples inhabiting this area. Left behind is an interesting way of life that is still relatively rural and though not entrenched in tradition there are still traces of this.

This can be seen in the still existing Tribal Council that though curbed in terms of power and operation plays an important role in terms of dispute settlement and local governance.

Also in existent is the kgotla that fronts the Tribal Offices. In Tswana culture everything took place in the kgotla. The kgotla was the place of places, the village meeting place. In simpler terms it is where the chief Ama Kgosi had his residence and administration "offices". It was in this place that disputes were settled and contracts verified or nullified. Littered with big trees this was the heart of a Tswana settlement.⁴⁴

The kgotla stands for courtesy belonging and a sense of community. In Saulspoort this is still manifested in the way that the space in front of the Tribal Offices is used as such.

SETTLEMENT PATTERNS OF THE SOTHO - TSWANA

The later Iron – Age is characterized by stone walled sites reflective of Sotho – Tswana settlements⁴⁵ (Pistorius, 1992). These were laid out in Kraal complexes that though were separate were coherent geographical and spatial units each joined by primary and secondary enclosures.

The enclosures of the kraal and/or Kgotla complexes were generally more neatly stacked than the secondary walls of the dwellings or wards.

The Tswana people built villages that looked like this from above

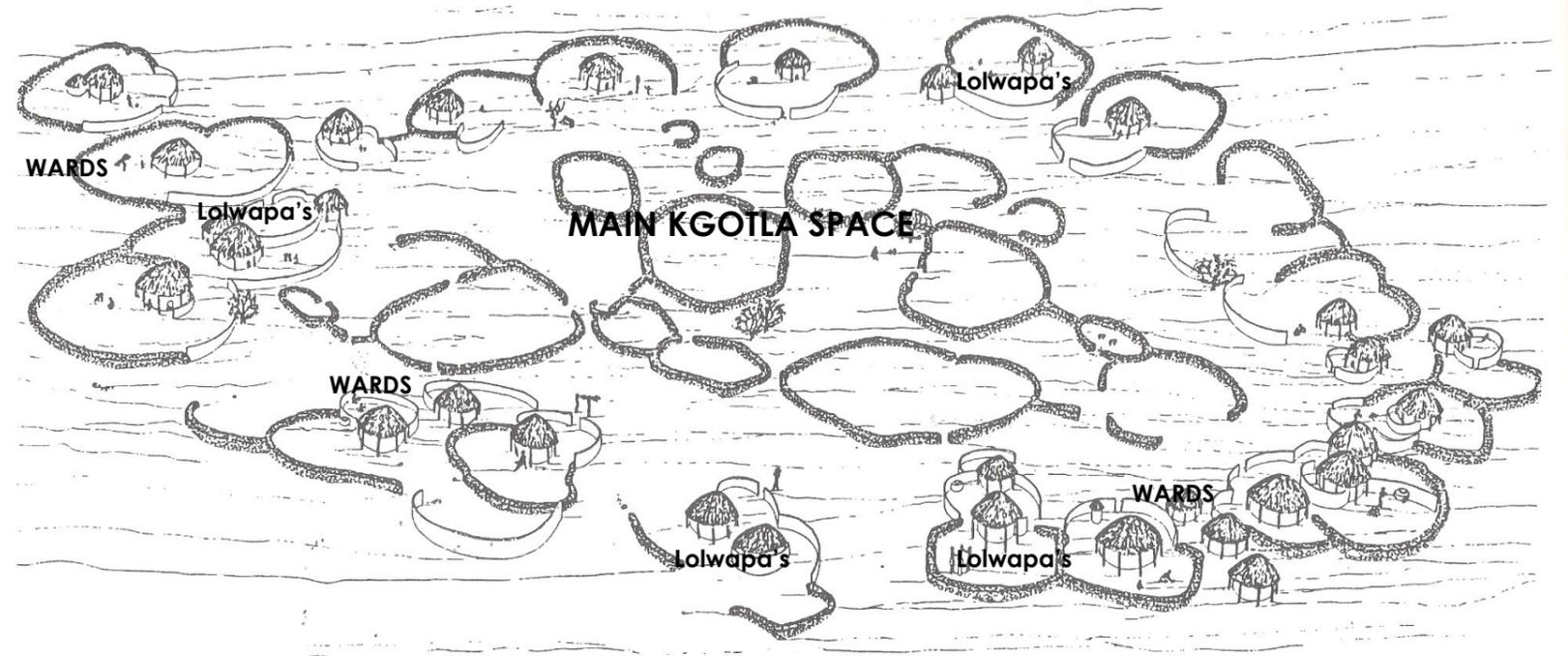


Fig 19: Image showing impression of a Traditional Tswana village ⁴⁶

Placement in relation to the Kgotla
The Kgotla

The internal organization of the Tswana settlements was not geometrically organized according to physical elements but its form was derived from the conceptual model of the social structure of the society.⁴⁷

A settlement started with the strategic placement of the main Kgotla. This is a large open space surrounded by stout poles and usually with a few big trees for shade. In this main Kgotla would be the cattle kraal that housed the community livestock and that of the chief, the Ama Kgosi.

Everything was then radiated hierarchically from the Kgotla. The chief Ama Kgosi would have his compound right off the main Kgotla and next to settle closest to him were his abasiimane. His "boys" or guards and after this the royal family settled.⁴⁸

The Ward

The pattern of settlement was by wards. This is a grouping of closely related kinsmen. Each ward was located by rank and position in relation to the physical head of the state the chief Ama Kgosi and the main kgotla. In spite of the movement and or growth of the village the proximity of the various wards remained the same. This system of proximity was carried through into the internal ward organization where each individual compound was placed in relation to the head of the ward.

Where the village formed a community, the ward formed another closer knit family unit. All compounds faced into the public space (secondary kgotla) that was used as a meeting place for any of the ward activities, from weddings funerals or dispute settlement among the ward members.⁴⁹

This secondary kgotla was less formal and was used by children in the ward as a play area. Also found in these smaller kgotla's were cattle pens for temporary livestock storage. Much like the main

⁴³ Breutz, The Tribes of Rustenburg and Pilanesburg Districts, 1953: pg81

⁴⁴ Tau, The Place of Culture in Architecture, 2001: pg 6

⁴⁵ Prstorius, Molokwane an Iron Age Bakwena Village 2001: pg

⁴⁶ Mason, Origins of the African People of the Johanesburg Area, 1987: pg 8

⁴⁷ Tau, The Place of Culture in Architecture, 2001: pg 6

⁴⁸ Tau, The Place of Culture in Architecture, 2001: pg 6

⁴⁹ Tau, The Place of Culture in Architecture, 2001: pg 11

kgotla the smaller kgotla's would also have a few large trees as its hearth.

The lolwapa

The lolwapa, the individual compound did not differ much from the spatial organization of the kgotla or the ward. This is the most intimate part of the settlement spatial organizations were the Tswana culture can be closely observed and experienced. In the lolwapa the varying degrees of privacy can be pointed out in the various gathering spaces.

After greeting one can then venture further into the lolwapa, the threshold into the hut or dwelling place.

Within the compound exist various degrees of privacy. The first threshold would be crossed at the compound enclosure, a place usually signified by a tree or natural feature. The second is the lolwapa that gives access to the hut and the third the entrance into the hut.⁵⁰

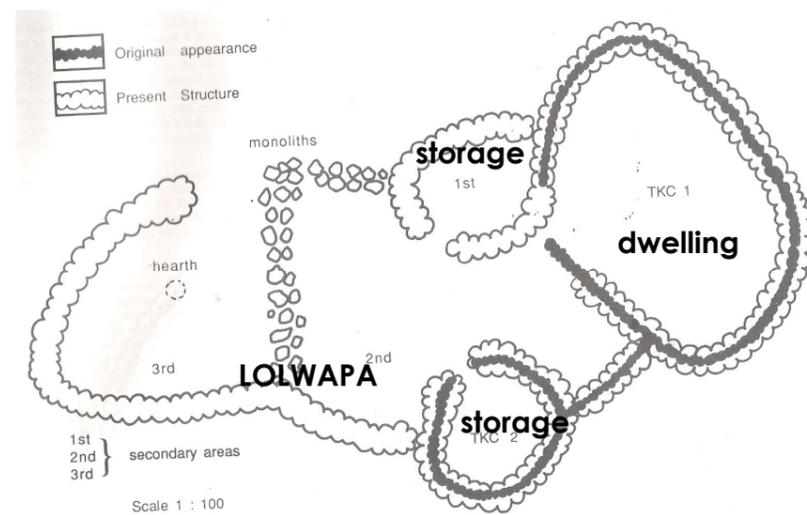


Fig 20: Image showing impression of a Traditional Tswana lolwapa⁵¹

The lolwapa is built upon a step to differentiate it from the outer parts of the compound. The raising of this gives it importance in the entire compound. This is the place where the family would gather for meals around a fire and get told stories by the elders. The lolwapa was an intimate part of the compound entered and used by only family and those close to it.

Other guests were attended to under a tree in the compound. To enter one's hut one steps down into. In itself a symbolic gesture, sensitizing the user to the fact that dwellings were built from the earth and were inherently a part of it and not dominating over it. Huts were made of adobe and strengthening using cow dung.

⁵⁰ Tau, *The Place of Culture in Architecture*, 2001: pg 11,13

⁵¹ Pistorious, *Molokwane An Iron Age Bakwena Village*, 1992: pg33

Sometimes patterns in various pigmentations were marked upon its surface and these usually had cultural connotations.

The walls of the hut are free standing and columns are placed on the outside of these walls to hold up the roof. A space was left in between the walls and the thatch roof to allow for air movements through the hut. Roof overhangs were wide and the overall height of the structure is low, so one bends as they enter it and then stretch out when inside.⁵² A ritual, signifying a crossing over: from one space into another. A definition of thresholds: That was as much a part of the physical building, as to the culture that governs the Tswana peoples.

⁵² Tau, *The Place of Culture in Architecture*, 2001: pg 13

MINING

Mining is one of the major industries that support the South African economies. With a role as important as this it should be looked on with a degree of importance and acknowledgment. This is however not the case. The attitude towards the mining industry is continually worsening as the evils that dog this industry grow.

Mining is in its nature unsustainable. The effects of this are felt more so as a mine approaches the end of its life. Leaving in its wake disempowered people, abandoned settlements. Not to mention the trail of devastation to the environment, inclusive of visually intrusive infrastructure much of which can not be disassembled and used elsewhere.

This project is a hypothetical exploration into the long-term land uses of a mining area. The aim is for it, an attempt at a plan and design for an end land use that can accommodate the mine as a temporary land use.

Rustenburg Platinum Mines, as part of the Anglo Platinum Group, investigates the possible development of a platinum mining operation, known as the Kruidfontein Project, in the North West Province, north of the Pilanesberg National Park, in the vicinity of the Saulspoor community. This area is known as the Western Limb.

This thesis attempts to propose a design model for future reference, which it is believed will endeavor to explain and investigate the idea that a paradigm shift in the perceptions that dog the mining industry can be changed.

The goal towards this shift would be the view of mining as a process and industry that is sustainable and benefits the greater community society and country. The values learnt here would culminate in a design model that will attempt to address the negative attitudes and effects that are wrought upon the landscape and communities as a result of the mining process. Where mining processes seen as a temporary land-use happens as a part of a broader end land-use.

A design models that allows for a scenario based solution to the long term planning rehabilitation and eventual appropriation of a mine its functions contributions and effects in a locality.

This thesis also acknowledges the planning methods that are being applied to date in the entire country and attempts to borrow and incorporate most aspects of this.

On most mine sites factory warehouse like facilities are designed to protect expensive equipment, protecting such from external elements like dust and rain, usually resulting in unsightly, elementary structures intruding in the landscape. Offices, change rooms, workshops, gathering spaces and so forth are designed to function well, but usually result in mundane, uninspiring spaces, contributing to the adverse visual impact of the site. The buildings are function-specific designed, with little or no sustainable

approach, no vision for the future, only erected to serve the immediate purpose of the mine for 30 to 50 years. This poses a problem when the mine eventually shuts down, as the buildings and layout are not suitable for any other use and or uses. Ultimately, the mining plant and associated components are dismantled after operation ceases estimated at a timeframe of 30 –50 years. Tailings Disposal Facilities, waste rock dumps and some infrastructure however remain.

Typical mining infrastructure that need not be disassembled after the mining operation ceases consists of the following:

- Offices: Fig. 21.1 (Burger, Le Roux, Tumubweinee, 2006)
- Changing rooms
- Parking: Fig. 21.4 (Burger, Le Roux, Tumubweinee, 2006)
- Storage facilities: Fig. 21.2 (Burger, Le Roux, Tumubweinee, 2006)
- Roads
- Electricity: Fig. 21.3 (Burger, Le Roux, Tumubweinee, 2006)
- Water storage and pipes
- Large warehouses: Fig. 21.6 (Burger, Le Roux, Tumubweinee, 2006)
- Temporary offices: Fig. 21.5 (Burger, Le Roux, Tumubweinee, 2006)
- Clinics

Another dilemma facing the mining industry is the influx of people and rapid growth of human settlement (mainly informal) as these people flock to the mining area in search of economic empowerment and employment. This does not happen in isolation as it concerns the environment, well being of the individual and the sense of ownership and belonging.



Life-of-mine

This can be categorized into three phases:

- Pre-mining
- Exploitation
- The "Closure concept"

This study is concerned with the pre-defined closure and end land use plan resulting in a long-term sustainable and productive land-use. Mining is an unsustainable practice because it is a linear process with a start date and finish date.

Government as much as Society accepts the fact that mining cannot continue into perpetuity even though the mining industry is largely accountable for the wealth of the country.



Fig 22: Life of a Mine⁵³

Environmental impacts and effects

It is very evident that industries like mining always have associated with it a negative impact on not only the environment but also the associated economy. Society and government are applying more

⁵³ Radameyer, Interview 3 March 2006

and more stringent measures to establish realistic and innovative end-land-use plans on different scales within the environmental legislation.

Air pollution

Tailings facilities and unvegetated areas are the largest contributors to air pollution in this industry. Other forms of air pollution can come from burning processes. The particles become airborne due to the wind and this dust can spread over the area for several kilometers. This can be particularly hazardous around residential areas and can be a major health risk.⁵⁴

Soil pollution

Leaching of through tailing facility is the greatest source of soil pollution. Often acid rock drainage occurs due to the chemical reactions taking place in the tailings. (Van den Berg, 2004: 3) Other forms of soil pollution occur where soil is compacted by heavy vehicles and frequent traffic, oil leaks, and faulty pipelines possibly resulting in a loss of agricultural potential and a loss of environmental capital.

Water Pollution

Mines require immense amounts of water. Recycling of water is implemented as far as possible. Water pollution in only the area of the mine influences the entire catchments area. Water pollution affects ground water and surface water and possible results of mismanagement of this resource are health risks, losses in agricultural potential and a loss of Environmental capital.⁵⁵

Aesthetic Pollution

This is where the main concern of this project should lay. To reuse the infrastructure that accommodates the mine in terms of the criteria laid out for the after closure land-use. The aesthetic pollution that a mine causes can have hazardous effects on the tourism industry.

Light Pollution

This type of pollution occurs at night where the mine needs to be illuminated. It can however have serious effects on animal life and on our human wellbeing.

Noise pollution

This is kept to the minimum required levels but never the less influences the buildings and the people who occupy them as one nears the plant. This can also result in a health risk with continuous exposure.⁵⁶

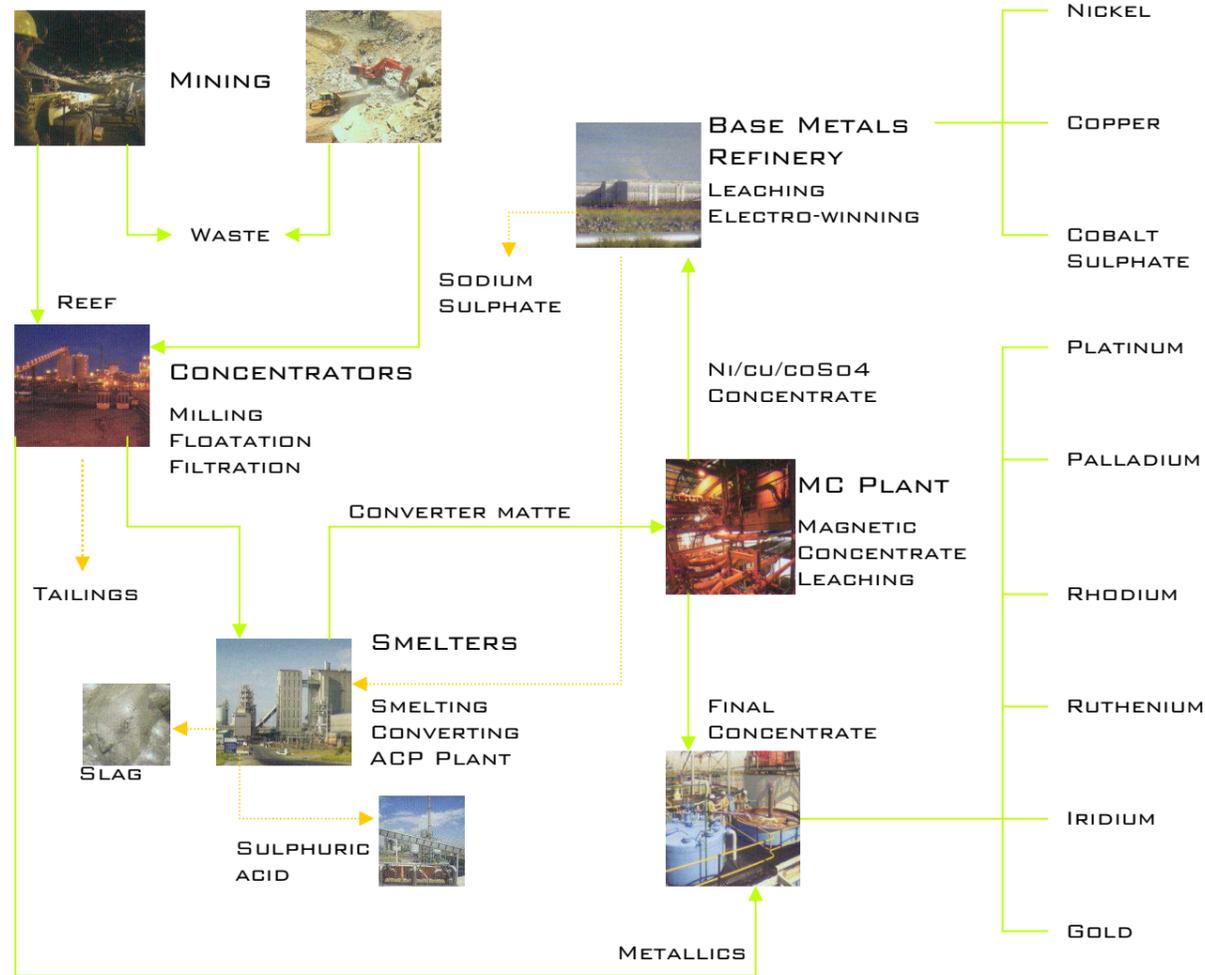


Fig 23 Mining processes that need to be accommodated in the temporary Land-use⁵⁷

⁵⁴Strategic Environmental Focus, Kruidfontein Project Impact Assessment prepared for AngloPlatinum, 2001:pg A-6

⁵⁵IBID, 2001:pg A-21, A-22

⁵⁶IBID, 2001:pg D-105

⁵⁷Burger, LeRoux & Tumubwaine, 2006

Problems faced by the MINE

This is split into two phases

- While the mine is in operation
- Post mine closure

The Mine in operation:

INFRASTRUCTURAL/BIOPHYSICAL

- Fragmentation of the urban fabric
- Lack of town/settlement planning
- The lack of adequate housing
- Uncontrolled urbanization
- Infrastructural needs in the town
- Negative visual impact of the mining infrastructure
- Exclusion of the mining infrastructure from the urban fabric
- Inadequate transportation system for the rapid urban growth
- Pollution of the water, air and the soil
- Vegetation loss
- Loss of arable land
- Loss of the species diversity
- Depletion of the natural resources

ECONOMIC

- Unemployment.
- Need for an economic activity other than the Mine that can accommodate the people that do not get employment from the Mine.
- The costs involved in laying water, electricity and sewerage facilities.
- Depletion of natural resources
- The negative impact of the Mine regarding the existing tourism industry in the Pilanesberg area.
- The job creation for the people that are already settled and from the area of the Pilanesberg area.

SOCIAL

- Resentment by the peoples to foreign investment as a result of previous sidelining.
- Influx of peoples into the area that leads to crime, sewerage issues and over crowding.
- Urban sprawl
- Informal settlements
- Unwanted occupations onto the land by migrants.
- HIV Aids
- Under development of the social facilities to accommodate the migration explosion.
- Morality
- Rules versus human needs.
- Working conditions in the Mine.
- Health and safety in the Mine and the community related to pollution.

- Privacy. Pertaining to the informal settlements
- A lack of appropriation by the community of the squalor that they live in.
- Family degeneration due to the migration of members of the family to the mining area, leading to broken/dysfunctional homes.
- A lack of a sense of community in the informal settlements
- A lack of flexibility in terms of the urban formations and settlements.

The Post –Closure phase:

INFRASTRUCTURAL/BIO –PHYSICAL

- Scarring of the landscape
- Unsightly infrastructure left behind after the Mine closes
- The lack of appropriate mining infrastructure planning before mining commences makes it difficult and expensive for rehabilitation
- TIME
- The death and decay of the urban fabric that grows as a result of the close of the Mine. This in turn leads to ruination of infrastructure and facilities that have grown as a result.
- Tailing dams
- Rock piles

Applicable legislation:

South African Minerals Legislation:

The Mineral and Petroleum Resources Development Act, No 28 of 2002 (MPRDA) came into effect on 1 May 2004. It brings about a radical departure from the common-law concept of privately owned mineral rights and provides for a system in which, as in most other countries, the state grants and regulates prospecting and mining rights. Among others, the objects of the Act are to:

- Promote equitable access of the nation's mineral and petroleum resources to all the people of South Africa;
- Expand opportunities for HDSAs to enter the mineral industry and to benefit from the exploitation of the nation's mineral resources.
- Promote economic growth and mineral development in the Republic;
- Promote employment and advance the social and economic welfare of all South Africans;
- Provide for security of tenure in respect of present prospecting, exploration, mining and production operations; and
- Ensure that holders of mining rights contribute towards the socio-economic development of the areas in which they operate.

The immediate challenge for Anglo Platinum is to convert its privately held mineral rights to those granted by the state under the MPRDA. Anglo Platinum complies with the legislative requirements for conversion and has already lodged application for conversion of some of its old rights in respect of its current operations for conversion. All old rights in respect of existing

operations remain in force for five years as from 1 May 2004. (Anglo Platinum annual report 2005:83)

The development of South Africa's new mineral rights regime

- 1998 to 2000: Government publishes a Green and White paper announcing a policy which foreshadows the vesting of private mineral rights in the people of South Africa and under the custodianship of the government; 2002: Draft legislation published to implement the policies with regard to the vestment of mineral rights and the 'use it or lose it principle';
- June 2002: The Minerals and Petroleum Resources Development Act No. 28 of 2002 (MPRDA) passed by parliament;
- July 2002: The Mining Charter, which sets out the guidelines according to which the government aims to achieve the so-called Broad-based Socio-economic Empowerment objectives of the MPRDA, was leaked to the media. The leaked charter proposed a 51 % transfer of ownership of South African mines to historically disadvantaged South Africans (HDSAs). This resulted in a significant loss of confidence in the future of the South African mining industry and caused an immediate sell-off of South African mining shares;
- July to October 2002: Negotiations between the Mining Industry, Department of Minerals and Energy and Labor on the provisions of the Mining Charter resulted in a settlement, which provides for, among others, a transfer of 15% of all South African mining assets to HDSAs within five years and 26% within ten years;
- March 2003: Publication of the Mineral and Petroleum Royalty Bill, which proposes a royalty of 4% of revenue derived from PGM sales;
- April 2004: Announcement that the publication of a new draft of a royalty bill is postponed to early 2005 and that the proposed new state royalties will not become payable before 2009;
- 1 May 2004: The MPRDA becomes effective which means the commencement of the five-year transition period for operating mines to convert from the present private mineral rights regime to state-issued mining rights. Also commencement of the five-year and ten-year periods for ownership transfer of mining assets provided for in the Mining Charter;
- 3_ April 2005: Last date for holders of unused old rights to apply for new rights under the MPRDA. Where no application has been made, these old rights will cease to exist on 1 May 2005 (Anglo Platinum annual report 2005:93).