1.3 Motivation for the proposed new filling station

The purpose of the application is to develop a public garage and related / ancillary land uses on part of the application site, in addition to the existing industrial land uses and zoning, in order to provide a service to the transient traffic travelling to and from the east on the R33 to Stoffberg, Tafelkop, Motetema, Monsterlus, etc. as well as to the local traffic generated by Groblersdal Central Business District (CBD) and surrounding industrial area. It will also provide quick access to essential food stuffs at the convenience store.

Despite the potential negative impacts identified, the proposed construction of the filling station in the area east of Groblersdal will also have positive impacts. These positive impacts include the following:

- The provision of an easy access to fuel for the commuters travelling to and from the east of Groblersdal. At present, commuters have to travel into the congested town centre for fuel;
- The convenience store associated with the filling station will contribute to the accessibility of basic food which will be made available at the store;
- The proposed development will result in making the land manageable and easier to monitor since it will be operating according to the Environmental Management Plan (EMP) which will be made available during the EIA phase; and
- It will contribute to maximising the value of the land by maximising the value of infrastructure in the Groblersdal Extension 11 area.

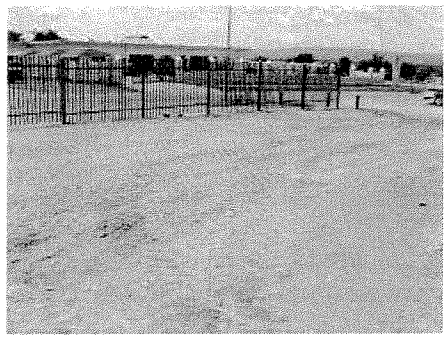
1.4 Description of the proposed new filling station

The proposed Groblersdal X 11 filling station will entail the construction of the following:

- Underground storage tanks for diesel, low sulphur diesel, lead replacement petrol (LRP), unleaded petrol 93 unleaded petrol 95;
- Pumps and pump islands;
- A canopy covering an area;
- Access road widening on Jan van Riebeeck Street;
- Parking bays;
- Toilet facilities;
- Car wash facility;
- Place of refreshment and take-away facility;
- Service facilities;
- Automatic teller machine; and
- Convenience Store of 300m^2

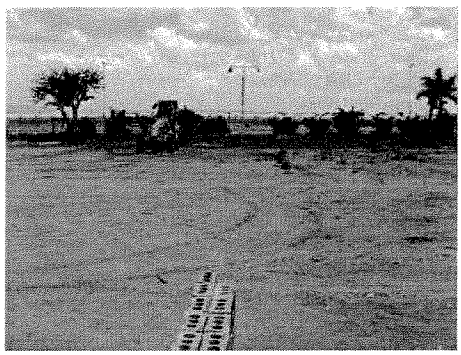
The site is zoned "Industrial 3" (non-noxious industries) permitting industry, warehouses, commercial, services industry. Uses permitted only with consent include a public garage, place of refreshment for own employees only, scrap yard, dwelling unit related to, but subordinate to the main use and special use.

To the immediate west there is a cemetery on land zoned municipal. Further to the west, north and eastern sides of the site, there is an industrial area and to the north and south agricultural development. The proposed filling station will be erected on the northern side of the road, and is primarily intended to attract eastbound traffic from the CBD heading towards Motetema, Tafelkop or Stoffberg. Table 1 summarises the surrounding land-uses and infrastructure.

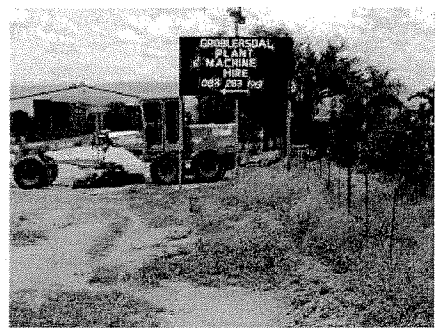


Site view to the North

Site view to the West



Site view to the South



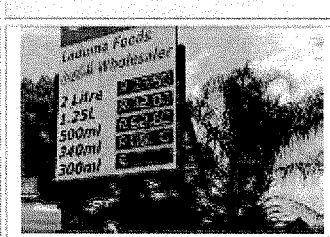
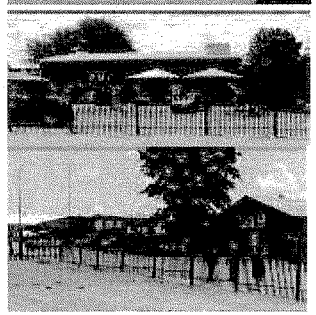
Site view to the East

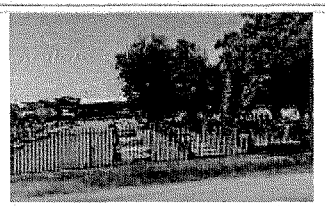
Photo plate 2: Depicting the surrounding area

Services infrastructure associated with the construction of the proposed new filling station will include, but not limited to, the following services:

- **Water Supply:** An existing municipal water pipe with a diameter of 150 mm runs along Jan van Riebeeck Street. Water to the site will be provided through a water meter connected to the municipal pipe.
- **Sewage:** An existing municipal sewer pipe with a diameter of 160 mm runs along Jan van Riebeeck Street. An internal sewer network will collect sewerage and discharge it through a single point into the municipal pipe.
- **Electricity:** The proposed filling station is located in an established industrial area with an existing electrical network. The site will be serviced by the existing network.
- **Access road:** A new access is proposed from Jan van Riebeeck Street that will include dedicated slipways on both sides of the carriageway.
- **Storm Water Management:** An existing municipal storm water channel runs along Jan van Riebeeck Street. All storm water will be collected by an internal storm water network and discharged into the municipal channel. To accommodate the storm water flow along Jan van Riebeeck Street the proposed access road will include a 600 mm pipe that will act as a culvert beneath the access road.

Table 1: Surrounding land uses

Direction	Property	Land-use	Description	Distance	
North	Klipbank 26 / RE	Agricultural	Agricultural	100m	
	Erf 744	Industrial 3	Laduma Biscuits	250m	
	Erf 745		Laduma Warehouses	100m	
	Erf 743		Martins Funeral Parlour	100m	
North-west	Erf 742		Transport facilities / warehouses	100m	
	Erf 741		Warehouses	150m	
West	Erf 732		Storage warehouses	250m	
	Erf 731		Steel frames and steel works	250m	
	Erf 775		Gear Spares / Insurance company / Funeral Home	150m	
	Erf 751		Afrovert	100m	
	Erf 752		Motor Spares / Battery Centre / Duroc Foods	150m	
	Erf 753	Business 1	Steel Works	200m	
	Erf 1 / 739	Industrial 3	Coffin Manufacturers	200m	
	Erf 739		Wood Works	200m	

	Erf 1 / 740	Industrial 3	Lifestyle Interior	200m	 
	Erf 740		Lifestyle Interior	200m	
	Erf 741		Warehouses	150m	
	Erf 35	Business 1	MICA	300m	
	Erf 34	Business 2	Fruit and Veg City	300m	
	Erf 25	Business 1	Art zone	300m	
	Erf 1 / 755	Special	Glass Fit	150m	
	Portion 10	Municipal	Cemetery and CTM	100m	
East	Erf 758	Industrial 3	Engineering Works	100m	
	Erf 759		SAB	100m	
	Erf 802	Industrial 1	Depot	100m	
	Erf 853		Warehousing and Brick Manufacturers	150m	
	Erf 852		Agripack	200m	
South	Klipbank 26 / RE	Agricultural	Jan van Riebeeck Street (R33)	100m	
			Agricultural	100m	

1.5 Project alternatives

The Intergraded Environmental Management (IEM) procedure stipulates that the environmental investigation needs to consider feasible alternatives for any proposed development. Therefore, a number of possible proposals or alternatives for accomplishing the same objectives should be identified and investigated. The various alternatives will be assessed in terms of both environmental acceptability as well as economical feasibility. The SEIA will however assess each alternative in terms of the social and economic impacts on the surrounding environment. The following alternatives have been identified, and will be discussed in more detail:

- Demand / Supply alternatives;
- Scheduling alternatives; and
- Status quo / no-go alternatives

Demand / Supply Alternatives
The proposed filling station is to be located in the eastern areas of Groblersdal along an identified movement corridor between Groblersdal and towns and settlements to the east. There are currently no filling stations located on the eastern edge of Groblersdal. Motorists must travel into the town centre for fuel, adding to the time and distance required to complete the trips between Groblersdal and destinations in the east. According to the EMLM Spatial Development Framework (SDF), there is an anticipated growth in the number of motorists and trips as development takes place, which could lead to the demand for a filling station located to the east of Groblersdal.

Scheduling Alternatives
It is recommended that construction takes place during the drier winter months to avoid any complications in wet weather. No detailed information regarding the proposed timeframe for the project is yet available. However, it is anticipated that construction will start as soon as all the necessary approvals are obtained.

Status Quo / No-Go Alternative
The no-go option implies the consequences of not constructing the proposed filling station and its implications on sustainable development.

1.6 Terms of reference of the socio-economic impact assessment (SEIA)

The Terms of Reference of the SEIA require the following:

- Define and describe the receiving environment (footprint, local and regional) from an socio-economic perspective, and identify, analyse and in detail assess the opportunities and constraints arising from or potentially limiting the proposed new filling station;
- Investigate the potential socio-economic benefits of the proposed new filling station in order to ensure maximum benefit to the local community and associated structures;
- Assess the development impact of the proposed new filling station on the economy of the local area, which will form an important component for establishing the overall feasibility of the project; and
- Quantify the impact of the proposed new filling station on new business sales, employment, income generation; loss of resources, personal income, etc.

The analysis includes a baseline study describing the socio-economic characteristics of the affected population, as well as the cultural and socio-political dynamics in the broader project area. In addition, the assessment identifies relevant socio-economic aspects and predicts the anticipated impacts associated with the proposed project. The assessment of positive and negative social and economic impacts includes the identification of viable mitigation measures and project related benefits.

1.7 Scope and objectives

The aim of this SEIA is to investigate and describe the socio-economic environment[8] surrounding the proposed development, to assess the anticipated social and economic impacts of the proposed new filling station and to identify appropriate mitigation measures to mitigate adverse impacts and enhance positive impacts. This task was undertaken in consultation with the affected communities in order to assess local concerns; protect local rights and develop local capacity.

This SEIA is meant to assist the decision-making authorities to decide whether the development will be socially, environmentally and economically sustainable.

In terms of the scope of work for the SEIA, the study aims to:

a) Understand the baseline socio-economic conditions within the project area, and how this relates to the local and sub-regional area;
b) Identify social and economic issues and aspects which may become problematic if not adequately addressed, and predict the anticipated social and economic impacts resulting from these aspects; and
c) Identify mitigation measures to manage the social and economic impacts resulting from the proposed development.

1.8 Report structure

This report discusses the findings of the SEIA and is organised according to the following sections:

Section 1	Introduction
Section 2	Study approach and methodology
Section 3	Legal requirements
Section 4	Baseline description of the socio-economic environment
Section 5	Competitor site analyses
Section 6	Social change processes
Section 7	Assessment of social change processes and / socio-economic impacts
Section 8	Economic impact analysis
Section 9	Conclusions and recommendations

1.9 Assumptions and limitations

It is essential that the SEIA should be based on current and accurate project information. Similarly, the geographic extent of the SEIA is influenced by project design and overall planning processes. The SEIA report is based on current information received while

[8] The socio-economic environment consists of an all encompassing social and economic network with systems that are potentially impacted on by the proposed development.

compiling the SEIA, and the report therefore takes into consideration project information relating to planning and design, implementation and infrastructure placement available to the SEIA team during the compilation of this report in July to September 2010. The following assumptions are therefore made:

- It is assumed that local employment will be a priority for all operations;
- It is assumed that the 2001 Census data is not entirely accurate, but it provides a broad reflection of the socio-economic environment. Where possible, data from the 2007 Statistics South Africa Community Survey (CS, 2007) were utilised; and
- It is assumed that the information obtained during the Public Participation Process (PPP) was accurate and also informed the study.

The following data limitations / omissions and model constraints should be noted:

1) Job counts have two major limitations:
   a) They do not necessary reflect the quality of employment opportunities, and
   b) They cannot be easily compared to the public costs of attracting those jobs (through subsidies, tax breaks or public investments).

2) The main constraints in the process of modelling the turnover were:
   a) The data collection process for the supply analysis was based on entering private premises. Data availability was thus reliant on the willingness of the owners of existing filling stations to cooperate;
   b) Accurate number of litres filled up in each automobile is unknown;
   c) The exact amount of money spent in the convenience shop is unknown;
   d) The exact number of automobiles that visited the filling stations during other days and times that was not observed is unknown;
   e) Differences between sales per month is unknown;
   f) The model does not include any factors that focus on customer behaviour when it comes to fuel purchases but it is known that it is influenced by the following factors:
      - Ease of access to the filling station,
      - Quality of the service; and
      - Current fuel price.

In spite of the limitations of input-output modelling[9], it is an empirical, internationally recognised econometric technique that has been, and still is, widely applied in South Africa as well as in the rest of the world.

While every effort has been made to ensure that the information contained in this document is accurate and up to date within the parameters specified, inadvertent errors may nevertheless be present for which SEF or Kayamandi accepts no responsibility.

Any decision based on the contents of this report remains the sole responsibility of the decision maker.

SEF or Kayamandi accepts no responsibility for any loss or damage suffered as a result of the use of, or reliance placed on the contents of this report.

[9] The econometric Input-Output Model is the instrument most commonly used to estimate and forecast the impacts of development investments.

2 STUDY APPROACH AND METHODOLOGY

2.1 Introduction to social impact assessment

The International Association for Impact Assessment (IAIA) (2003) states that SIA includes the processes of analysing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by these interventions. Its primary purpose is to bring about a more sustainable and equitable biophysical and human environment. The Inter-organisational Committee on Principles and Guidelines for Social Impact Assessment (2003:231) defines SIA in terms of *"efforts to assess, appraise or estimate, in advance, the social consequences that are likely to follow from proposed actions".*

On the other hand, social change processes are set in motion by project activities or policies. Change has a way of creating other changes. Social change processes can lead to several other, second-order social change processes. Depending on the characteristics of the local social setting and mitigation processes that are put in place, social change processes can lead to social impacts (Vanclay, 2002:192). Social change processes relevant to the project will be discussed before the potential impacts will be investigated and mitigation measures proposed.

'SIA is concerned with analysing, monitoring and managing the social consequences of development". SIA is a methodology used by SIA practitioners to assess the social impacts of planned interventions or events, and to develop strategies for the ongoing monitoring and management of those impacts" (IAIA, 2003).

SIA introduces knowledge about the social implications of an activity, into the planning, decision-making and management process associated with the activity. A social impact is something that is experienced or felt. It can be positive or negative. In social sciences, one can distinguish between two types of social impacts:

Subjective social impacts - i.e. Impacts that occur "in the imaginations" or emotions of people, such as negative public attitudes, psychological stress or reduced quality of life. This kind of impact is much more difficult to identify and describe, as one cannot readily quantify perceptions or emotions.

Objective social impacts – i.e. Impacts that can be quantified and verified by independent observers, such as changes in population size or composition, in employment patterns, in standard of living or in health and safety. This can typically be quantified.

Social scientists should not refrain from including subjective social impacts, as these can have far-reaching consequences in the form of opposition to, and social mobilisation against the project (Du Preez and Perold, 2005: v).

For the purpose of this SEIA, the following categories of impact were investigated:

- Health and social well-being;
- Quality of the living environment;
- Economic impacts and material well-being;
- Cultural impacts;
- Family and community impacts;
- Institutional, legal, political and equity impacts; and
- Gender impacts.

Relevant criteria for selecting significant social impacts included the following:

- Probability of the event occurring;
- Number of people that will be affected;
- Duration of the impact;
- Value of benefits or costs to the impacted group;
- Extent to which identified social impacts are reversible or can be mitigated;
- Likelihood that an identified impact will lead to secondary or cumulative impacts;
- Relevance for present and future policy decisions;
- Uncertainty over possible effects; and
- Presence or absence of controversy over the issue.

2.1.1 *Public consultation*

A crucial component of best practice in public consultation is the importance of full transparency about stakeholders' comments. It is important for credibility of the consultation process and for the responsiveness of the project to its stakeholders, that all sides of the story be told fully and honestly when reporting on consultations. When opinion is negative or mixed about a project or a specific activity, it needs to be reported that way. One of the key benefits of this process is that it helps foster genuine relationships with mutual respect, shared concerns and objectives between the company pursing the development project and the community.

The PPP lends the environmental practitioners the opportunity to obtain local information from community members, which will ultimately enhance their understanding of the receiving environment. Together, they are able to produce better decisions and mitigation measures than they would have, had they acted independently. Not only the environmental practitioners, but especially the social practitioners can benefit from this local knowledge, and therefore it is important to incorporate the information obtained during the PPP in the SEIA.

When conducting a SEIA, one should be aware of the fact, and take into consideration that human beings are the objects of study, which will confront one with unique ethical problems. These questions typically include the fact that every individual has the right to privacy. It is the individual's right to decide when, where, to whom, and to what extent his or her attitudes, beliefs and behaviour will be revealed (Strydom, 2002:67). Individuals interviewed for the purposes of this report have been assured, that although the information disclosed will be used to inform the SEIA, their names will not be disclosed. To protect those who were consulted with and in order to maintain confidentiality, the people interviewed for the SEIA will not be named in the report. Confidential records of the interviews have been kept.

2.1.2 *Participatory approach*

Traditionally, there are two approaches to conducting a SIA, i.e. a technical approach or a participatory approach.

A technical approach entails that a scientist remains a neutral observer of social phenomena. The role of the scientist is to identify indicators, obtain objective measures relevant to the situation and provide an expert assessment and prediction on how the system will change (Becker, Harris, Nielsen and McLaughlin, 2004:178). A participatory approach uses the knowledge and experiences of individuals most affected by the proposed changes as the basis for projecting impacts. In this case the role of the scientist is a facilitator of knowledge sharing, interpretation and reporting of impacts (Becker *et al*, 2004:178).

It must be emphasised, however, that the research conducted for the SIA component of the report was mainly of a qualitative nature. Qualitative research can be described as an inquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants and which is conducted in a natural setting (Sogunro, 2001:3). The qualitative approach is concerned with understanding social life and the meaning that people attach to everyday life (Fouché and Delport, 2002:79). Using a qualitative approach, social scientists are able to address issues such as human perception and behaviour, regardless of how realistic it may be.

In contrast, the quantitative approach aims to measure the social world objectively, to test hypothesis and to predict and control human behaviour (Hoyle, Harris and Judd, 2002:394). Quantitative research can be described as an inquiry into a social or human problem, based on a theory composed of variables, measured with numbers, and analysed with statistical procedures, in order to determine whether the predictive generalisations of the theory hold true (Sogunro, 2001:3). The economic impact assessment would typically rely more heavily on quantitative data than the SIA.

For the purpose of the SIA however, a participatory approach was followed. The impact assessment was therefore conducted based on qualitative information and a participatory approach, which by its nature, gives it a subjective slant.

2.1.3 *Introduction to economic impact assessment*

Economic impacts are those impacts that affect the level of economic activity in a region either positively or negatively. For instance, they directly affect the economic well-being of residents and businesses in an area by changing employment levels and retail expenditures. An economic impact assessment traces spending through an economy and measures the cumulative effects of that spending. The impact region is determined by the nature of the proposal and can include the entire country, province, an individual municipality or a combination of municipalities. In this case, the impact will mostly be felt in the EMLM.

Estimating the economic impact of a project or development is very helpful in understanding the potential benefits of various forms of growth. It should be noted, however, that the

means of estimating these benefits are more useful in understanding the likely order of magnitude of impacts rather than specific amounts.

Economic impact assessment generates an estimate of the economic consequences of a particular project on the local economy. However, this provides only one component in a broader evaluation or decision-making process. For example, there may be social benefits and ecological consequences that need to be taken into account, which would require a different methodology.

2.1.4 *Input-output modelling technique and terminology*

The instrument most commonly used to estimate and forecast the impacts of development investments is the econometric Input-Output (I/O) Model. I/O Models contain information on inter-sector relations, including tables that describe, for each sector included in the model, the amount of input the sector requires from other sectors to produce one unit of output. Using such purchase and sales data, multipliers are calculated to forecast impacts such as how the Rand (R) spent on a development investment ripples through the economy. Measures of input also take into account imports and exports, to and from, the specific geographic area.

The I/O technique provides a snapshot of economic production at a given time and as such has numerous application possibilities. The most prominent application of this technique involves modelling the impact of changing production functions on general economic equilibrium.

In instances where it is impossible to quantify the economic impacts, the option utilised is the application of a significance rating approach, which will be discussed in more detail below.

2.2 Methodology and processes

The purpose of this section is to provide a short overview of the methodology applied and the processes followed.

The methodology for the economic impact assessment entailed the following four steps:

Step 1 Inception and delineation of the study area
Step 2 Baseline study - Economic development overview
Step 3 Filling station supply and demand analysis
Step 4 Data analysis economic impact assessment

2.1.1 Step one: Inception and delineation of study area

This step entailed contacting relevant role-players as well as the client to obtain relevant background information, results from previous studies as well as data collection in accordance with the proposed new filling station and associated infrastructure.

Furthermore, the study area and areas of impact were divided into primary, secondary and tertiary areas of investigation.

2.1.2 *Step two: Baseline study (Economic development overview)*

Step two entailed an overview of the economic environment to determine the key economic problems, issues and trends of the community as well as the other affected areas, towns, etc. This was undertaken by evaluating future planning aspects and involved the compilation of an economic status and profile of the study area as well as the areas of impact.

The studies / policies regarding the development objectives and future plans in the region; e.g. the Spatial Development Frameworks, the Integrated Development Plan (IDP), the regional objectives, planned initiatives for the area, economic studies and property evaluation studies were obtained and utilised in the undertaking of this study.

Furthermore, this step entailed the development of a baseline understanding of the trends, issues and dynamics of the study area in terms of its micro and macro context and enabled the analysis of the study area in terms of its suitability for an additional filling station. The existing data and previous studies undertaken for the region were incorporated into this step.

The profile of the broader catchment and surrounding areas thus entailed determining desktop economic characteristics such as:

- Employment and unemployment;
- Economic sector structure and trends;
- Income levels; and
- Gross Geographic Product (GGP)[10].

The profile of the area was compiled by utilising existing data, such as Census (2001) and Community Survey (2007), various economic studies, as well as the review of issues and concerns raised during the public participation process. This step also entailed a site visit to obtain an overview of the area directly affected by the proposed new filling station and the existing surrounding filling stations in a 3 km radius (please refer to Table 4).

2.1.3 *Step three: Filling station supply and demand analysis*

This step entailed ensuring that all the potential activities (externalities), spin-offs and other issues are taken into consideration. The project was thus investigated in a holistic context with due reference to the developmental impact of physical works, employment changes, etc. Step three furthermore involved the undertaking of a site visit to filling stations within the catchment area (within a 3 km radius op the proposed site) and subsequent economic location analysis.

Primary and secondary data collection was undertaken at the filling stations in terms of market trends, issues and dynamics.

Supply analysis data gathering included:

- A tally of the number of cars and trucks that enter a filling station;
- Recording the type of purchase (Petrol / Diesel);

[10] GGP refers to the value of all final goods and products produced during a one-year period within the boundaries of a specific area.

- Recording the number of customers that entered the convenience shop;
- Observing the condition of the filling station and the convenience shop;
- Counting the number of nozzles available at each filling station site;
- Interviewing the filling station managers / owners;
- Counting / observing in and outbound passing traffic to Groblersdal CBD; and
- Random pumps reading to determine average fill.

Site visits were undertaken to all the identified competitor sites and were conducted in order to observe and to obtain a firsthand understanding of the current filling station market. The sample data that was collected for fuel sales estimation included the actual counting of the number of vehicles that enter a filling station over a certain period of time, and on randomly selected days.

In addition, the focus of the supply analysis was to identify relevant competition and to assess specific performance criteria including, inter alia, the following:

- Geographic location and distribution patterns;
- Nature, size and quality of facilities and services provided (filling station, motor retailing, shops, car wash, take-aways, etc);
- Turnover analysis;
- Supply analysis;
- Capacity;
- Traffic flows;
- Sales;
- Accessibility;
- Visibility;
- Local economic development trends; and
- Site growth potential.

It should be noted that the data collection process for the supply analysis was based on entering private premises. Data availability was thus reliant on the willingness of the owners of existing filling stations to cooperate.

2.1.4 Step four: Data analysis economic impact assessment

Once the baseline data was gathered, a detailed analysis and economic impact assessment ensued. The purpose of this step was two-fold:

a) To determine the economic impact of the proposed new filling station on the economy; and
b) To determine the impact of the proposed new filling station on other filling stations in the study area.

This assessment involved a qualitative and quantitative approach. Emphasis was placed on the fact that the impact assessment was undertaken for the various phases of the project development, namely during construction as well as operation of the proposed project. The envisaged outputs were utilised to determine the potential future impacts of the venture on different activities.

The impacts on the local and regional economies were provided by way of so-called multiplier effects in the economy. The multipliers were used to quantify the implications that a change in output level in one economic sector will have on the output level of the other

sectors, and ultimately the total effect on the aggregate economy. The impacts were described in terms of certain economic variables such as: impact on micro economy, creation and / or loss of additional employment and income opportunities created and sustained (direct, indirect and temporary and permanent), etc.

The net effective demand (from the previous step), was interpreted in terms of the current market capacity and future growth. This in turn informed recommendations regarding market entry and timing of the development. In other words the impact on feasibility of existing filling stations was included. The location of the proposed development was interpreted in terms of suitability in the context of potential preferences, accessibility of the site with regard to places of employment and supporting services and amenities such as shops, post office, schools, etc. Impacts on purchasing power and consumer trends in the area were also included.

The results of the impact analysis was utilised to indicate the economic benefit / costs of the project. The findings and analysis are contained in this report, addressing the key qualitative and quantitative impacts of the project as well as interpretation of the main issues.

2.3 Impact assessment phases

The SEIA was conducted for the following phases:

▪ **Prior to construction**	The period from when the construction of the proposed new filling station was first mentioned to the public, up until the start of the construction phase;
▪ **Construction phase**	The construction phase is estimated to take about four months;
▪ **Operational phase**	The existence of the filling station is assumed to be long term.

2.4 Significance rating approach for the economic impacts

The significance of the identified impacts on the various economic components was determined using the approach outlined below.

Occurrence	Probability
	Duration of occurrence
Severity	Magnitude of impact
	Extent of impact

In order to assess each of these factors, the following ranking scales are used:

Table 2: Ranking scales for the Economic Impact Assessment

Probability	Duration	Scale	Magnitude
5 - Definite	5- Permanent	5- International	10 - Very high
4 - High probable	4 - Long term	4- National	8 - High
3 - Medium probability	3 - Medium term (2 - 5 years)	3 - Regional	6 - Moderate
2 - Low probability	2 - Short term (1 - 2years)	2 - Local	4 - Low
1 - Improbable	1 - Immediate	1 - Site	2 -Minor
0 - None			0 - None

Once the above factors are ranked for each impact, the economic significance is assessed using the following formula:

Significance rating (SR) = (probability + duration + scale) x magnitude

Effects are rated as either of High, Moderate or Low based on the following:

- SR>75 Indicates High economic significance
- SR 50 75 Indicates moderate economic significance
- SR<50 Indicates low economic significance.

2.5 Significance rating approach for social impacts

The criteria for the description and assessment of environmental, economic and social impacts were drawn from the EIA Regulations, published by the then Department of Environmental Affairs and Tourism (DEAT) (April 1998) in terms of the Environment Conservation Act, 1989 (Act No. 73 of 1989) (ECA).

The level of detail as depicted in the EIA regulations was modified by assigning specific values to each impact. In order to establish a coherent framework within which all impacts could be objectively assessed, it was necessary to establish a rating system, which is applied consistently throughout all criteria. For such purposes, each aspect was assigned a value (refer to Figure 2), ranging from 1 to 5, depending on its definition.

This is an appraisal of the type of effect the proposed activity can impose on the affected environmental and / social component. Its description should include what is affected and how it is affected.

2.6 Assessment weighting

Each aspect within an impact description was assigned a series of quantitative criteria. Such criteria are likely to differ during the different stages of the project's life cycle. In order to establish a defined base upon which it becomes feasible to make an informed decision, it was necessary to weigh and rank all the criteria.

Simply, such a weighting factor is indicative of the importance of the impact in terms of the potential effect that it could have on the surrounding environment. An explanation of the impact assessment criteria follows.

2.6.1 Extent

The physical and spatial scale of the impact is classified as:

Description	Explanation	Value
Footprint	The impacted area extends only as far as the activity, such as footprint occurring within the total site area.	1
Site	The impact could affect the whole, or a significant portion of the site.	2
Regional	The impact could affect the area around the site including neighbouring farms, transport routes and adjoining towns.	3
National	The impact could have an effect that expands throughout the country (South Africa).	4
International	The impact has international ramifications that go beyond the boundaries of South Africa	5

2.6.2 Intensity

The intensity of the impact is considered by examining whether the impact is destructive or benign, whether it destroys the impacted social environment, alters its functioning, or slightly alters it. These are rated as:

Description	Explanation	Value
Low (L)	The impact alters the affected social environment in such a way that the natural processes or functions are not affected.	1
Medium (M)	The affected social environment is altered, but functions and processes continue, albeit in a modified way.	2
High (H)	Function or process of the affected social environment is disturbed to the extent where the function or process temporarily or permanently ceases.	3

This will be a relative evaluation within the context of all the activities and the other impacts within the framework of the project.

2.6.3 Duration

The lifetime of the impact, which is measured in relation to the lifetime of the proposed development, is indicated as:

Description	Explanation	Value
Short-term	The impact will either disappear with mitigation or will be mitigated through a natural process in a period shorter than any of the development phases.	1
Short to medium-term	The impact will be relevant through to the end of the construction phase.	2
Medium-term	The impact will last up to the end of the phases, where after it will be entirely negated.	3
Long-term	The impact will continue or last for the entire operational lifetime of the development, but will be mitigated by direct human action or by natural processes thereafter.	4
Permanent	This is the only class of impact that will be non-transitory. Mitigation either by man or natural process will not occur in such a way or in such a time span that the impact can be considered transient	5

2.6.4 Probability

This describes the likelihood of the impacts actually occurring. The impact may occur for any length of time during the lifecycle of the activity, and not at any given time. The classes are rated as follows:

Description	Explanation	Value
Improbable	The possibility of the impact occurring is none, due either to the circumstances, design or experience. The chance of this impact occurring is thus zero (0%).	1
Possible	The possibility of the impact occurring is very low, either due to the circumstances, design or experience. The chances of this impact occurring is defined as 25%.	2
Likely	There is a possibility that the impact will occur to the extent that provisions must therefore be made. The chances of this impact occurring is defined as 50%.	3
Highly likely	It is most likely that the impacts will occur at some stage of the Development. Plans must be drawn up before carrying out the activity. The chances of this impact occurring is defined as 75%.	4
Definite	The impact will take place regardless of any prevention plans, and only mitigation actions or contingency plans to contain the effect can be relied upon. The chance of this impact occurring is defined as 100%.	5

2.6.5 Mitigation

The impacts that are generated by the development can be minimised if measures are put in place to reduce them. These measures are mitigation measures to ensure that the development takes into consideration the social environment and the impacts that are predicted so that development can co-exist with the social environment as a basis for planning.

Determination of significance – without mitigation

Significance is determined through a synthesis of impact characteristics as described in the above paragraphs. It provides an indication of the importance of the impact in terms of both tangible and intangible characteristics. The significance of the impact "without mitigation" is the prime determinant of the nature and degree of mitigation required. Where the impact is positive, significance is noted as "positive" (indicated as +). Significance is rated on the following scale:

Description	Explanation
Low (L)	The impact is not substantial and does not require any mitigation.
Low to medium (LM)	The impact is of little importance, but may require limited mitigation.
Medium (M)	The impact is of importance and is therefore considered to have an impact. Mitigation is required to reduce the negative impacts to acceptable levels.
Medium to high (MH)	The impact is of great importance. Mitigation of the impact is essential.
High (H)	The impact is of major importance, and should mitigation not be applied, it is considered to be a fatal flaw in the project proposal. This could render the entire development option or entire project proposal unacceptable.

Determination of significance – with mitigation

Determination of significance refers to the foreseeable significance of the impact after the successful implementation of the necessary mitigation measures. Significance with mitigation is rated on the following scale:

Description	Explanation
Low (L)	The impact will be mitigated to the point where it is of limited importance.
Low to medium (LM)	The impact is of importance, however, through the implementation of the correct mitigation measures such potential impacts can be reduced to acceptable levels.
Medium (M)	Notwithstanding the successful implementation of the mitigation measures, to reduce the negative impacts to acceptable levels, the negative impact will remain of significance. However, taken within the overall context of the project, the persistent impact does not constitute a fatal flaw.
Medium to high (MH)	The impact is of major importance but through the implementation of the correct mitigation measures, the negative impacts will be reduced to acceptable levels.
High (H)	The impact is of major importance. Mitigation of the impact is not possible on a cost-effective basis. The impact continues to be of major importance, and, taken within the overall context of the project, is considered to be a fatal flaw in the project proposal. This could render the entire development option or entire project proposal unacceptable.

2.6.6 Assessment of significance

Each aspect within an impact description was assigned a series of quantitative values. Such criteria are likely to differ during the different stages of the project's life cycle.

The allocation of a rating is a result of the efficiency and effectiveness, as identified through professional experience and empirical evidence of how effectively the proposed mitigation measures will reduce the significance of the impact.

Thus, the lower the assigned value, the greater the effectiveness of proposed mitigation measures and subsequently, the lower the significance of impacts with mitigation.

The efficiency of the mitigation measure determines the eventual significance of the impact. The level of impact is therefore seen holistically with all considerations taken into account.

Extent	Duration	Intensity	Probability	Significance Rating (SR)	Mitigation Efficiency (ME)	Significance Following Mitigation (SFM)
Footprint 1	Short term 1	Low 1	Probable 1	Low	High	Low
Site 2	Short to medium 2		Possible 2	Low to medium	Medium to high	Low to medium
Regional 3	Medium term 3	Medium 3	Likely 3	Medium	Medium	Medium
National 4	Long term 4		Highly Likely 4	Medium to high	Low to medium	Medium to high
International 5	Permanent 5	High 6	Definite 5	High	Low	High

Figure 2: Description of assessment parameters for social impacts

The rating scale is colour co-ordinated. Low negative impacts are marked as green, where as, low positive impacts are marked as red, and vice versa.

Rating scale

NEGATIVE IMPACT (-)		POSITIVE IMPACT (+)	
L	Low impact	L	Low impact
LM	Low to medium impact	LM	Low to medium impact
M	Medium impact	M	Medium impact
MH	Medium to high impact	MH	Medium to high impact
H	High impact	H	High impact

3 LEGAL REQUIREMENTS

There are several Acts of Parliament that regulates the way in which organisations, such as filling stations, conduct their day to day business. These acts apply to the whole of South Africa and address the following key issues:

- Health and Safety (Occupational Health and Safety (OHS) Act (Act 85 of 1993));
- Compensation for Occupational Injuries and Diseases (COID) Act (Act 130 of 1993); and
- Environment (National Water Act (Act 36 of 1998 as amended) and NEMA).

The construction of a filling station, including associated structures and infrastructures, as well as any facility for the underground storage of dangerous goods, is listed as activity number 3 under Government Notice Number Regulation (GNR). 387 of 2006 in terms of the NEMA, as amended and the Environmental Impact Assessment Regulations, 2006 (Version 1), as promulgated by the DEAT. Activity 3 is described as:

- The construction of filling stations, including associated structures and infrastructure, or any other facility for the underground storage of dangerous goods, including petrol, diesel, liquid petroleum gas or paraffin.

The proposed development may require road widening and access roads in excess of 30 m in length within Jan van Riebeeck Street which is listed as activity number 15 in terms of Government Notice R. 386 (Basic Assessment process) of the EIA Regulations of 2006. Activity 15 is described as:

- The construction of a road that is wider than 4 m or that has a reserve wider than 6 m, excluding roads that fall within the ambit of another listed activity or which are access roads of less than 30 m long.

In view of the fact that the proposed development includes activities falling within the ambit of Scoping and EIA processes, this application is being conducted as a Scoping and Environmental Impact Assessment (EIA) application as per the listed activities of the Government Notice Regulation No. 387 of 2006.

In addition to NEMA, the following key legislation and guidelines are also relevant to the process:

- Atmospheric Pollution Prevention Act (Act 45 of 1965);
- Environment Conservation Act (ECA) (Act 73 of 1989);
- Environment Conservation Amendment Act (Act 50 of 2003);
- Hazardous Substances Act (Act 15 of 1973);
- Heritage Resources Act (Act 25 of 1999);
- National Building Regulations and Standards Act No. 103 of 1997;
- National Environmental Management: Biodiversity Act, 2004 (Act No. 10 of 2004);
- National Heritage Resources Act, 1999 (Act No. 25 of 1999);
- National Water Act (Act 36 of 1998 as amended);
- National Environmental Management: Air Quality Act (Act 39 of 2004);
- Occupational Health and Safety (OHS) Act (Act 85 of 1993);
- Promotion of Access to Information Act, 2000 (Act No. 2 of 2000);
- DEAT Guideline 3: General Guideline to the Environmental Impact Assessment Regulations (2006);
- DEAT Guideline 4: Public Participation (2006); and
- DEAT Guideline 5: Assessment of Alternatives and Impacts (2006).

Provincial authorities (Limpopo Department of Economic Development, Environment and Tourism (LEDET)) also have their own regulations for carrying out EIAs. There may also be municipal by-laws that may include regulations for the quality of effluent water and smoke control.

Furthermore, the proposed activity is to comply with all relevant engineering standards as dictated by the SABS and Oil Company Standards, which include:

- SABS 0131 (1977): The storage and Handling of Liquid Fuel. Part 1: Small Consumer Installations;
- SABS 0131(1979): The storage and Handling of Liquid Fuel. Part 11: Larger Consumer Installations;
- SABS 0131 (1982): The storage and Handling of Liquid Fuel. Part 111: Bulk-flash-point fuel storage and allied facilities at large consumer installations;
- SABS 0131 (1999): The petroleum industry. Part 3: The installation of underground storage tanks, pumps / dispensers and pipe work at service stations and consumer installations;
- SANS 10089 – 3 (1999): The petroleum industry Part 3: The installation of underground storage tanks, pumps / dispensers and pipe work at filling stations and consumer installations;
- SANS 10089 – 2 (2002): The petroleum industry Part 2: Electrical installations in the distribution and marketing sector;
- SANS 10108 (2002): The classification of hazardous locations and the selection of apparatus for use in such locations;
- SANS 10400 (1990): The application of the National Building Regulations;
- SANS 1186 -1 (2003): Symbolic safety signs Part 1: Standard signs and general requirements;
- SANS 10142 - 1 (2003): The wiring of premises Part 1: Low-voltage installations; and
- SANS 1535 (2003): Glass-reinforced polyester-coated steel tanks for the underground storage of hydrocarbons and oxygenated solvents and intended for burial horizontally.

As a guideline, the Gauteng Department of Agriculture and Rural Development (GDARD), previously the Gauteng Department of Agriculture Conservation and Environment (GDACE) further requires that their EIA Administrative Guideline for the Construction and Upgrade of Filling Stations and Associated Tank Installations (March 2002), be taken into consideration.

In terms of the guidelines, filling stations can have significant social impacts on the environment, which may detrimentally affect the social well-being of citizens, which include:

- Noise impacts;
- Reduction in land value and real estate properties in proximity of filling stations;
- Visual impact and "sense of place";
- Impact on the safety and security of an area and specifically adjacent properties;
- Potential impacts on health as a result of volatile organic compound (VOC) emissions;
- Impacts associated with fire;
- Impact on the feasibility of filling stations in close proximity, i.e. the financial security of existing filling station owners, job-security of his / her employees; and
- The necessity for rehabilitating the land.

4 BASELINE DESCRIPTION OF THE SOCIO-ECONOMIC ENVIRONMENT

In order to determine the socio-economic impacts of the proposed new filling station, this section provides a brief status quo, pertaining to the demographic and economic variables of the study area and also outlines the status quo for service delivery in each area. A brief introduction to the status quo situation in the Greater Sekhukhune District Municipality (GSDM), EMLM and Groblersdal will be provided.

This section will also delineate the trade area for the proposed new filling station, as well as provide a brief overview of the local consumer market. The following aspects play a significant role in the economic profile of the area:

- Trade area delineation and population size;
- Age profile;
- Employment and unemployment;
- Income levels; and
- Economy.

4.1 Regional context

When conceptualising the social environment being impacted upon, the anticipated social and environmental impacts are generally broad and not limited to one specific area or town. The proposed new filling station falls within the boundaries of Ward 13, under the jurisdiction of the EMLM, GSDM, in the Limpopo Province.

It is important to determine the social, economic and environmental impacts on the receiving environment as a result of the proposed project, and this will mostly include Ward 13 of the EMLM, which includes Groblersdal. However, in order to assess the potential impact of the proposed new filling station, it is important to consider the municipality and town in a holistic way. The baseline study will therefore include an analysis of the socio-economic factors in the GSDM, EMLM as well as Ward 13 and Groblersdal.

It is acknowledged that the socio-economic environment for Groblersdal Ext 11 may be slightly different to that of other suburbs included within the boundaries of Ward 13. Therefore, where relevant, extreme variations to the status quo of Ward 13, will be highlighted under Section 4.2.1.

4.1.1 *Greater Sekhukhuni District Municipality*

The GSDM is a new district municipality that was established in December 2000. The area measures approximately 1 326 437 ha in extent. It is located on the north-west portion of the Mpumalanga Province and the southern part of the Limpopo Province, making it a cross-boundary municipality. In 2005, following a Constitutional amendment disestablishing cross-border municipalities, the GSDM was wholly incorporated into the Limpopo Province. The GSDM forms part of Olifants River Basin and is largely rural and located outside major towns and cities (www.nra.co.za). The main urban centres are Groblersdal, Marble Hall, Burgersfort, Jane Furse, Ohrigstad, Steelpoort and Driekop. Outside these major towns,

there are approximately 600 villages, which are generally sparsely populated and dispersed throughout the district (GSDM IDP, 2009/10).

During 2001, the President and the cabinet declared 13 nodal areas in South Africa as specific areas for accelerated development. These are rural areas in extreme poverty, with a serious lack of skills and services and were therefore identified within the framework of the rural development strategy.

According to the GSDM IDP (2009/10) the current population size for the municipality is 1 090 424 people, with a total of 217 172 households. Sekhukhune is 94% rural and 5.3% urban. According to the IDP, nearly half the population of the GSDM is aged below 18 years. A striking characteristic of the Sekhukhune population is the high levels of male absenteeism in the district. When considering the male / female ratio, females represent 60% of the population in the working age group and more than 68% in the senior age group. This could imply that approximately 123 759 men have alternative residence away from the GSDM for employment purposes (GSDM IDP 2009/10).

The GSDM has a high illiteracy level, with almost 28% of the population having no formal school education whatsoever. Only 1% of the population has obtained tertiary educational qualifications. According to the Limpopo, Growth and Development Strategy (as used by www.nra.co.za), the GSDM had the least amount of highly skilled individuals in the province. This in turn reduces the GSDM's ability to innovate and to be economically productive

Waste removal is still provided only in economic centres such as Marble Hall, Groblersdal and Burgersfort. Fetakgomo and Makhuduthamaga are areas that still do not have any form of refuse removal (www.nra.co.za).

The provincial growth development strategy on information supplied by the department of safety, security and liaison indicates that assault, grievously bodily harm, common assault, burglary on both business and residence and robbery with aggravating circumstances are the main form of crime in the province (www.nra.co.za).

Legislative standards require that the communities should have access to at least 20-30 litres of clean water per person per day within 200m of all households. A total of 49.9% of the GSDM population is receiving water service that is below the basic RDP level (www.nra.co.za).

Only 36.8% of the people living within the GSDM have access to full electricity supply, whilst the rest depend on other forms of energy, such as paraffin and gas. This lack of access to electricity increases the chances of an unsustainable use of resources (www.nra.co.za).

There is a fair road network that links most areas in the district with major highways of South Africa. The quality of these roads is, however, of a poor standard, which places a burden on all development activities within the district, as accessibility is hampered (www.nra.co.za).

The largest and most important economic activity within the district, in terms of GGP contribution in the province, is mining (Tubatse). Other economic activities include housing and construction, trade and retail and a growing tourism industry due to the cultural diversity of the district. Although agricultural activities should contribute more to the economy, most farming is done on a subsistence basis and only 30% of the district's land is used for

commercial farming. One of the biggest constrains within the GSDM is the scarcity of water, which is why investment in irrigation schemes and projects are one of the biggest priorities for local government. A further reason for the lack of farming activities within the region is the fact that three quarters of the district is under land claim disputes that still need to be resolved (www.nra.co.za).

There are four common sources of income for Sekhukhune households, (1) Government-provided old-age pensions (33%); (2) Child support grants (33%), (3) Remitted income from migrant workers (31%), and (4) Income from regular wage employment (27%). There is, therefore, a considerable dependence on government grants (GSDM IDP 2009/10). At 69.4% (in 2003), the district had the highest unemployment rate in the Limpopo Province.

4.1.2 *Elias Motsoaledi[11] Local Municipality*

The EMLM lies to the south and southwest of the Greater Sekhukhune District Municipality (GSDM), on the western banks of the Olifants River. The town of the Groblersdal lies north east of Pretoria and is situated approximately 32 km from Loskop Dam. The EMLM represents one of five local municipalities located within the GSDM and incorporates Hlogotlou Trans Local Council (TLC), Moutse TLC, Groblersdal administrative unit, Middleburg TLC and the Groblersdal Town Council. The EMLM is predominantly rural in nature with a high unemployment rate, which results in high poverty levels (IDP, 2008/9).

The EMLM is similar to that of many South African towns, with spatial planning dictating the economic segregation of various communities. The municipality comprises a dualistic socio-economic system characterised by a formal, well-developed which co-exists with an extensive, poorly developed range of rural areas on the periphery.

The poorest part of the community lives in the denser settlements in the western (Moutse) and northern (Nebo) margins of the municipality. These two areas are least developed, since the bulk of economic activity is concentrated around the commercial farms in the vicinity of Groblersdal (IDP, 2008/9).

The Moutse and Nebo areas are the former homeland areas of Lebowa (north) and KwaNdebele (west). The population in these two areas tend to concentrate in the large cluster settlements of Nebo and Dennilton respectively, as well as in the numerous small settlements (many with less than 1 000 people) that are dispersed around these areas (IDP, 2008/9).

For the purpose of this study, the market area for a filling station in Groblersdal includes the entire municipal area of Elias Motsoaledi Local Municipality. According to the Spatial Development Framework 2007, the municipality comprises of the following main land use features:

- Groblersdal Town, which is a formal town with a designated residential component, a Central Business District, and an Industrial Area.
- Various rural residential towns and settlements (mostly informal) concentrated to the west and central northern part of the municipal area. None of these towns/villages

[11] Elias Motsoaledi was born in Nebo and was later sentenced to life imprisonment as part of the Rivonia treason trial. He spent 26 years in prison on Robben Island until his release in 1989.

have any significant economic base.
- Four fairly large proclaimed nature reserves.
- High intensity crop farming along the river drainage system of the Steelpoort River, Bloed River, Olifants River and Moses River and the irrigation canals system along the Olifants and Moses Rivers.
- Extensive cattle and game farming in the mountainous eastern and south-eastern parts of the municipality.
- A few isolated mining activities towards the south-east and south-west.
- A fairly extensive road network linking the municipal area in all directions.
- A freight railway line towards the east linking the mining activities at Roossenekal towards the south.

Although the population of Groblersdal is relatively small, the town fulfils a regional function, providing higher order goods and services to the surrounding towns and settlements. The town has for this reason been identified as a provincial growth point (PGP) (Limpopo Spatial Rationale, 2005). The Elias Motsoaledi Local Municipality Spatial Development Framework describes a PGP as:

"The highest order in the hierarchy and therefore also the most important type of growth point. All the PGP's have a sizable economic sector providing jobs to many local residents. They have a regional and some a provincial service function, and usually also a large number of social facilities (e.g. hospitals, tertiary educational institutions). All of them have institutional facilities such as government offices as well as local and / or district municipal offices. The majority of these provincial growth points also have a large number of people."

Demographic analysis

Due to Groblersdal fulfilling a regional function for the surrounding settlements, economic statistics are provided for both the town and the municipality. The greater municipal area is seen as the major market for the filling stations. Table 1 represents the population and household statistics in the local market area. The local market area was informed by; inter alia, the market which the proposed filling station will mainly serve.

Table 3: Local Area Population Indicators, 2001

Area	Year	Population Total	Number of households
Groblersdal	2001[1]	954	227
	2010[2]	5259	1103
Municipal area	2001[1]	221655	48951
	2010[2]	285185	59813

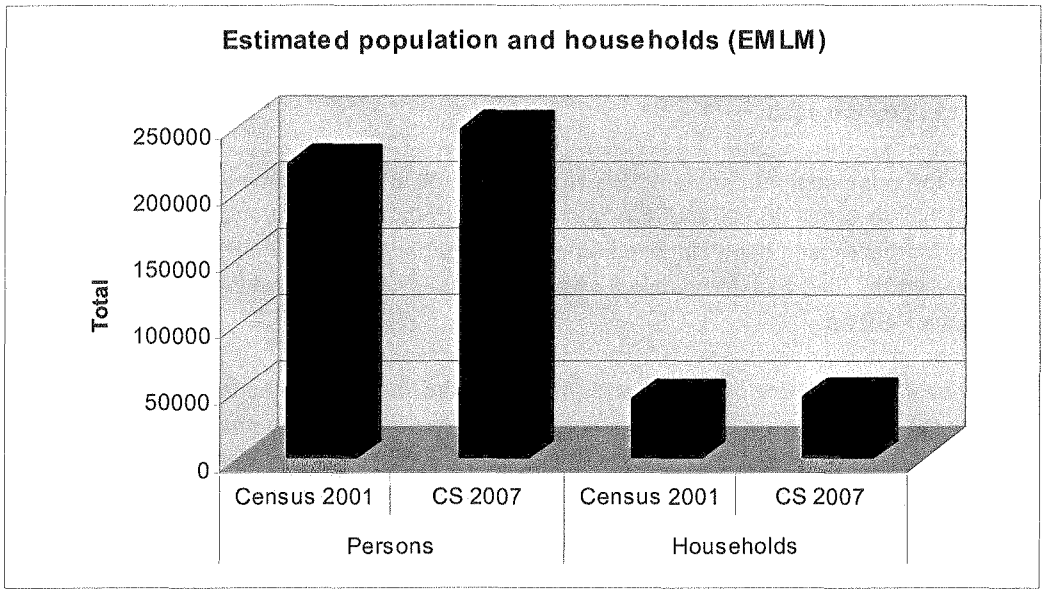
1 Census, 2001; 2 DWA, 2010

The population of Groblersdal, as well as the population of EMLM have increased significantly over the past nine years and are expected to continue to grow in the future.

According to Statistics SA data (2007), the population size of the EMLM is approximately 247488, representing a 10.44% growth from 2001 (Figure 3). The EMLM IDP (2009/10) ascribes the growth to natural growth, the creation of job opportunities associated with the

growth in economic activities within the municipality. This growth has been evidenced by the establishment of shopping malls and new housing developments.

Statistics SA data (2001) further suggests that the EMLM population is mainly black (98.93%), with statistically insignificant numbers of Whites (0.91%), Indians or Asians (0.06%) and Coloured (0.10%).



Statistics SA, 2007

Figure 3: Estimated population and households (EMLM)

Based on information obtained from Statistics SA (2001), the following conclusion is made:

- 53.6% of the population in Groblersdal are within the potentially economic active population, indicating a relatively high number of people who could be absorbed in to the labour market; and
- The figures indicates that there is an significant number of people below 14 years, while a small portion of 6.1% of the population are 65 years and older.

Economic profile

Economic growth is a precursor to improving the quality of life of local communities and forms the basis to improved service delivery.

The structure of the local economy of the three magisterial districts (Groblersdal, Moutse and Nebo) which partly comprises the EMLM indicates that the community, social and personal services sector is the major contributor to Gross Value Added (GVA) in all three of these magisterial districts. The size of the Moutse Magisterial District economy is fairly small and dominated by the community, social and personal services sector. The wholesale and retail trade sector (including components of the tourism sector) is the second largest economic sector in all three magisterial districts (EMLM IDP 2009/10).

The Groblersdal Magisterial District plays an important role in the local economy of the municipality in terms of the agricultural and manufacturing sectors. The total GVA of these two sectors in the Groblersdal Magisterial District is significantly higher than that of the Nebo and Moutse Magisterial Districts (EMLM IDP 2009/10).

Employment status

The economic stance of a household is imperatively indicated by employment. Population with low unemployment rate is less depended on government grants; thus, it is assumed that more households have an income and could therefore meet their basic needs and provide some luxuries.

Statistics SA (2001), data indicates that 17% of the economically active population for the EMLM is employed, while 20% is unemployed. Approximately 63% of the labour force is not economically active. The latter category includes scholars, homemakers or housewives, individuals who cannot work due to disability, individuals who do not choose to work, as well as seasonal workers.

Income levels

Household income is an imperative indicator when assessing the level of socio-economic development in an area. From assessing the data (Statistics SA, 2001), the following findings are highlighted:

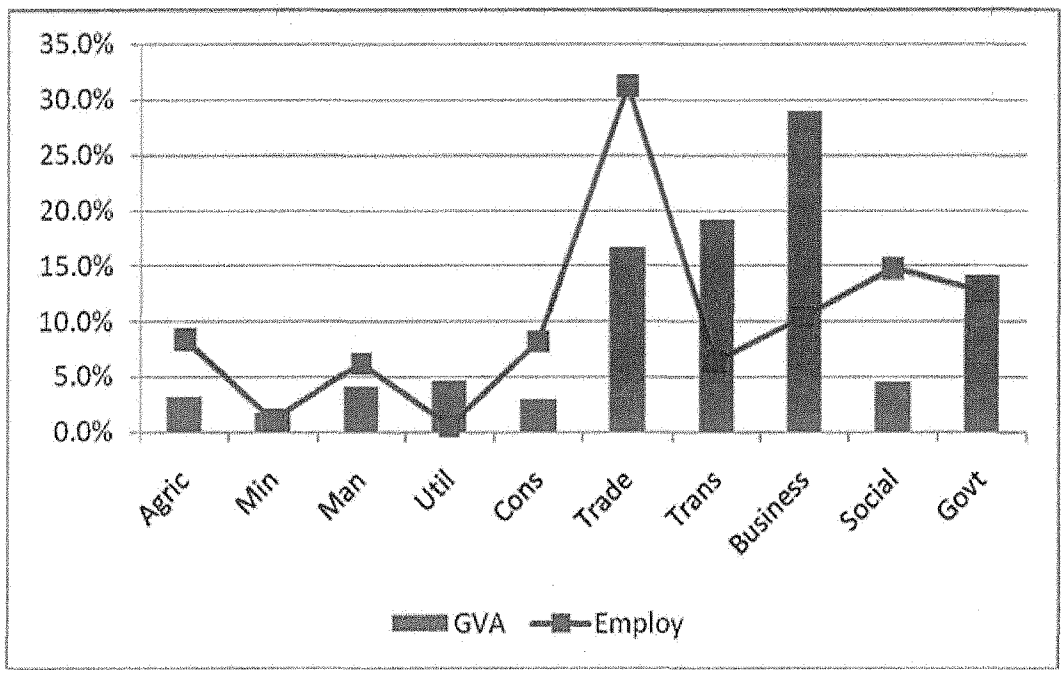
- A significant number (37.9%) of the population have no income, while another significant number (24.14%) earns between R4 801 and R9 600 per annum;
- About 9.6% of the population earns between R1 and R4 800 per annum, whereas 7.4% earns between R19 201 and R38 400 per annum; and
- A very small percentage of the population earns in excess of R76 801.

Gross Geographic Product

To have a more comprehensive indication of the sectoral contribution to the local economy, the GGP of an area is analysed. The GGP of a particular area amounts to the total income or payment received by the production factors – (land, labour, capital, and entrepreneurship) – for their participation in the production within that area. Positive changes in the local economy can have a positive impact on GGP. It is important to take note that when it comes to analysing the GGP; it is best to work with constant prices in view of the fact that the current prices may lead to misinterpretation of the data.

To have a more comprehensive indication of the sectoral contribution to the local economy, the GVA of an area is analysed. The GVA of a particular area amounts to the total income or payment received by the production factors – (land, labour, capital, and entrepreneurship) – for their participation in the production within that area. Positive changes in the local economy can have a positive impact on GVA. It is important to take note that when it comes to analysing the GGP; it is best to work with constant prices in view of the fact that the current prices may lead to misinterpretation of the data.

The study area is a regional economic centre for the local municipality with majority of economic activity taking place in the area. The local market area comprise of some of the well known retail, financial brands and some other small / informal businesses. Figure 4 indicates the contribution of each sector to the total GVA of EMLM as well as the contribution of employment.



Quantec 2010

Figure 4: GVA and employment contribution (percentage distribution, 2008)

Groblersdal is the main economic hub in EMLM and thus contributes immensely to the municipal GVA. From the preceding figure, the following findings are highlighted:

- In terms of the economy, the tertiary sector is predominant, which is located in the urban area;
- The predominant sectors in order of decreasing importance are business services, transport, trade and government; and
- Sectors that make a larger contribution in terms of employment than GVA are agriculture, manufacturing, construction, trade and social services which indicate that they are more labour intensive.

Development implications

Based on the preceding statistical analysis, Groblersdal can be classified as a middle to high income area and is the main employment and economic centre for the municipality and surrounding rural settlements. As the surrounding settlements are predominantly dormitory settlements with little economic activity, movement to Groblersdal occurs on a regular basis, from daily to weekly to monthly visits. The predominant focus of the proposed filling station is Groblersdal, but more specifically the large amount of traffic to the settlements to the north and east of the town.

Services

Social service delivery centres on the provision of health, education and community development facilities and services. The concept of service delivery also comprises various elements such as affordability, quality, efficiency and access.

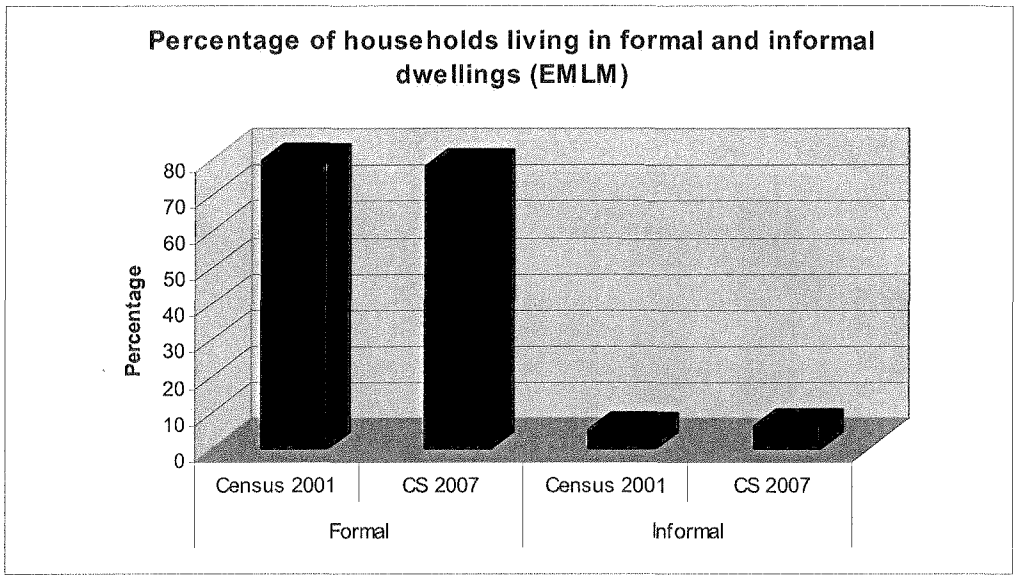
The Millennium Declaration, which was adopted by the United Nations (UN) member states in the year 2000 contains eight Millennium Development Goals (MDG), ranging from poverty reduction, health, and gender equality to education and environmental sustainability. South

Africa's progress and challenges will be assesses with respect to South Africa's sustainable development by examining trends in socio-economic development and policy-making. Cross cutting issues that can be discussed in the context of South African settlements are:

- Poverty eradication;
- Changing unsustainable patterns of production and consumption;
- Health and sustainable development;
- Means of implementation;
- Gender equality; and
- Sustainable development in a globalising world.

"Sustainable human settlements are settlements that work. They are settlements in which people live, in which they shop, seek entertainment, care for their children, and socialize and celebrate important holidays or events with their friends and neighbours. Sustainable human settlements are settlements in which people access social amenities such as healthcare clinics, libraries, schools, and so on. Sustainable human settlements are also settlements in which people vote and express their opinions freely; in which they work and pay taxes; and in which all of these things are possible without putting undue stress on the community, the family, the individual, the economy, or the environment." (Shisaka Development Management Services 2004, as used in Ekurhuleni Integrated Development Plan 2007-2011).

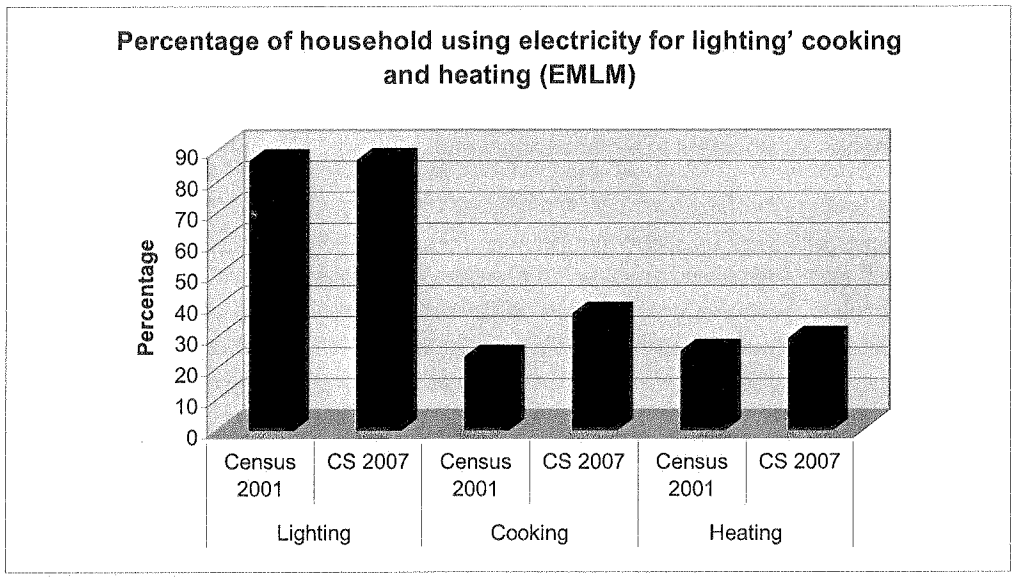
The majority of the EMLM population resides in formal housing. However, Figure 5 indicates that the number of households living in informal dwellings have increased by 1.3% over the span of 6 years (CS, 2007). In the period of 2002-2005, the EMLM had delivered 273 houses. In the second quarter of the 2007 / 2008 financial year, the municipality reported to have completed 24 foundations and 14 houses at the wall plate level against a target of 500 housing units (EMLM IDP 2009/10). This indicates the urgent need for the municipality to develop a housing strategy that would accelerate housing delivery in an integrated manner.



Statistics SA, 2007

Figure 5: Percentage of households living in formal and informal dwellings (EMLM)

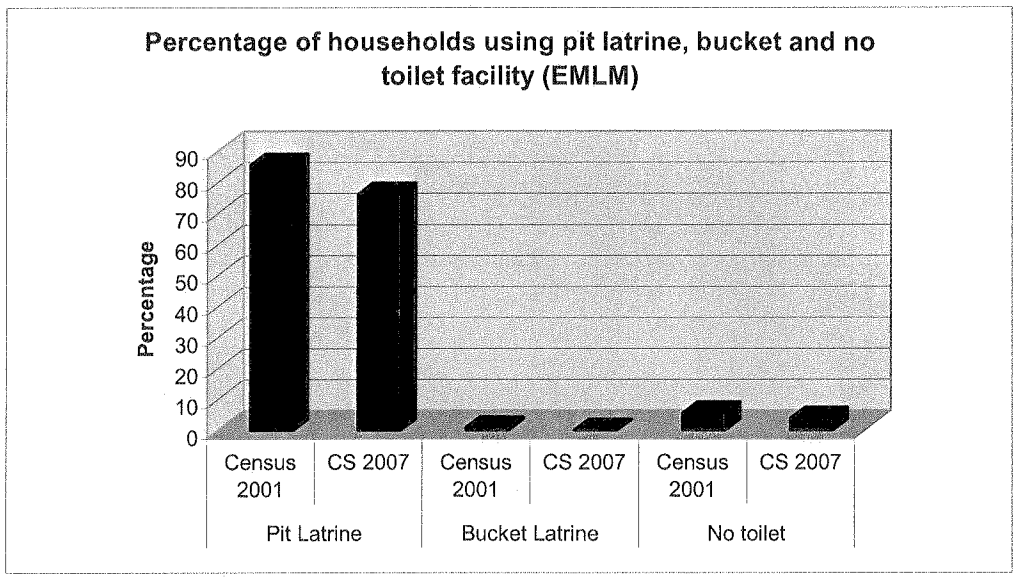
The percentage of households within the EMLM using electricity for lighting has increased by only 0.3% since 2001 (CS, 2007). The use of electricity for cooking has however increased by 14% (Figure 6).



Statistics SA, 2007

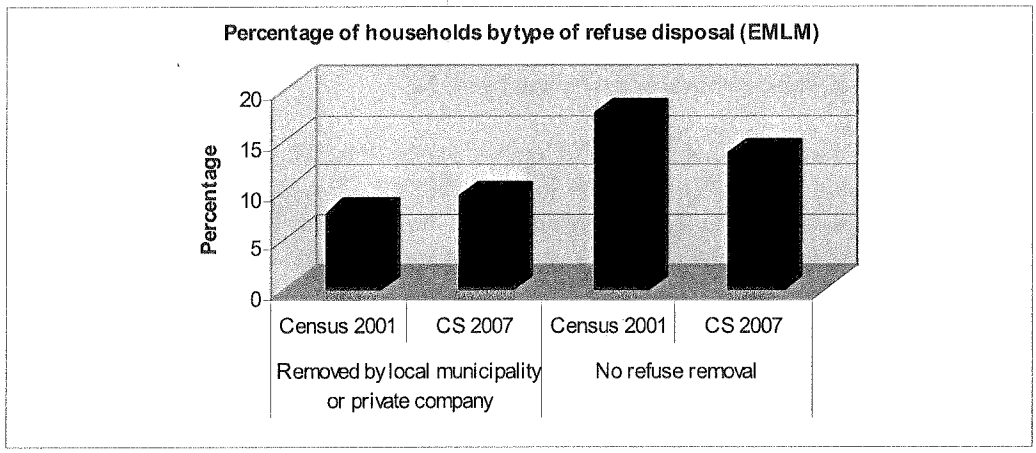
Figure 6: Percentage of household using electricity for lighting, cooking and heating (EMLM)

Figure 7 indicates that the percentage of households relying on pit latrines has reduced significantly (9.3%) since 2001. The number of households using the bucket latrine system has been reduced to zero. Statistics also show a declining percentage (3.8%) of households who does not have access to toilets (CS, 2007).



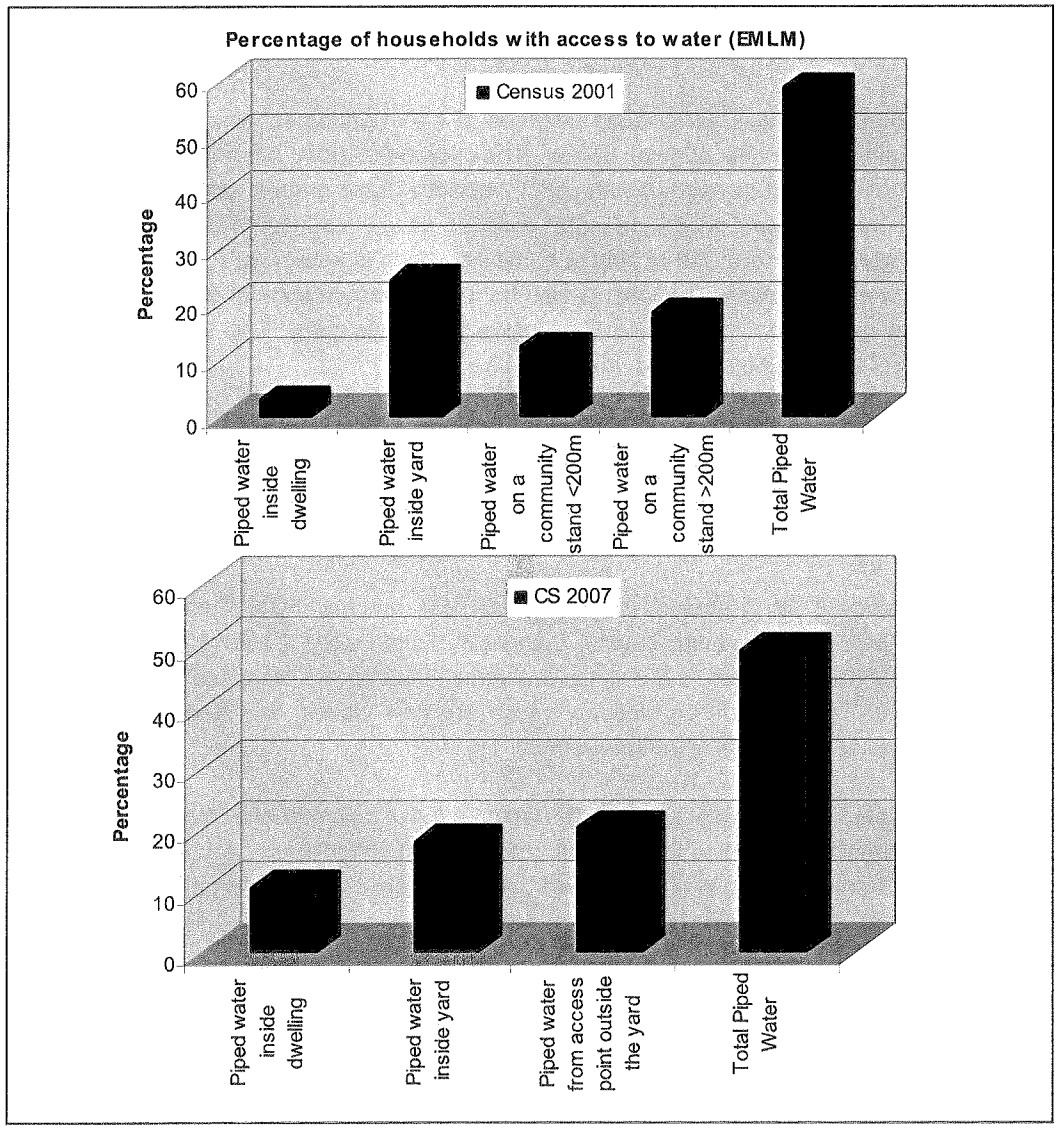
Statistics SA, 2007

Figure 7: Percentage of households using pit latrine, bucket and no toilet facility (EMLM)



Statistics SA, 2007

Figure 8: Percentage of households by type of refuse disposal (EMLM)



Statistics SA, 2007

Figure 9: Percentage of households with access to water (EMLM)

It is apparent from Figure 8 that the EMLM removed refuse for a lightly larger percentage of households in 2007, as compared to 2001 (Statistics SA, 2007). The percentage of households with no refuse removal has declined by 4.1%.

Figure 9 indicates that the total amount of households within the EMLM with access to piped water has decreased with 9.6% from 2001 to 2007 (Statistics SA, 2007). Households with access to piped water inside their dwellings have however increased with 7.6% and households with access to water inside the yard, decreased by 6.4%.

4.2 Local market profile and social context

This section aims at presenting a site specific analysis of the social and economic environment. This section attempts to delineate the trade area for the proposed new filling station, provide a brief overview of the local consumer market, as well as provide a demographic description of the receiving communities.

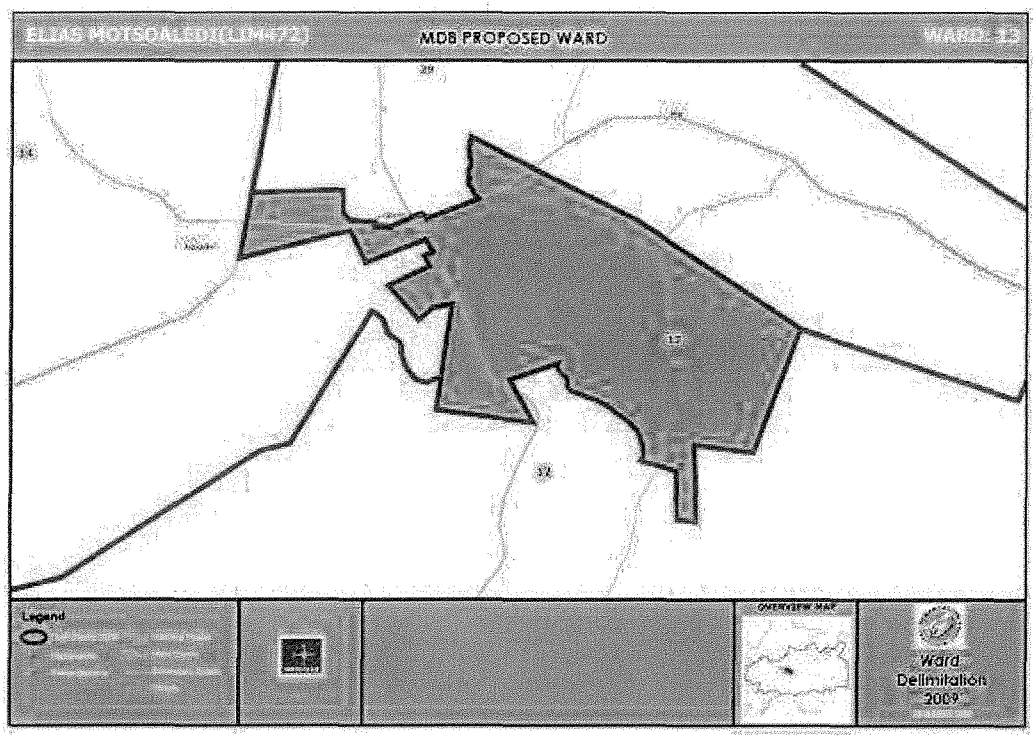
4.2.1 *Groblersdal (Ward 13)*

The town of Groblersdal was established because of the irrigation scheme of the Loskop Dam and is named after the original owner of the Klipbank farm, Mr WJ Grobler. The agricultural industry is well developed with cotton, tobacco, table grapes, citrus fruit, maize, wheat, vegetables, sunflower seeds, peanuts, peaches as well as lucerne being produced. Groblersdal is also well known for its Ndebele culture, which is known for its vibrant house painting, bead work and crafts. The town is also home to an abundance of game farms and angling is quiet popular on the Loskop Dam (www.sa-venues.com). The study area falls within Ward 13 of the EMLM, as shown in Figure 10.

Groblersdal is the principal economic hub within the Elias Motsoaledi Local Municipality, servicing the surrounding smaller towns and rural settlements in southern Limpopo and northern Mpumalanga provinces. It is also an important economic centre and seat of Sekhukhune District Municipality.

There are currently 8 filling stations within Groblersdal ,namely, FCM Total, Brake and Clutch Caltex, Ener-Gi, Panorama, Loskop Valley BP, Total Valley, Caltex Hereford street and Excel. Out of the 8 garages, 5 are within the same street as the proposed filling station. Total Obaro, and Total Gaz filling stations, which are now closed, are small specialised stations that were selling diesel to select clients.

Three main streets in Groblersdal serve as the entry and exit points to and from other towns / areas namely Hereford Street to Marble Hall, Voortrekker to Middleburg, Jan van Riebeeck Street west to Bronkhorstspruit / Pretoria and Jan van Riebeeck Street east to Motetema and Tafelkop.



www.demarcation.org.za

Figure 10: Ward 13 locality map

Groblersdal constitutes a typical rural community, providing services mainly to the farming community but also to the industrial- and commercial communities. Due to the abundance of water and the five irrigation schemes which covers an area of 28 800 ha, Groblersdal is one of the most ideal agricultural areas (www.groblersdal.com).

Demographic analysis

Population size

According to Statistics SA data (2001), Ward 13's population, which includes Groblersdal, has a population of 3 808 and 1 282 households. Households have an average of 3 persons per household.

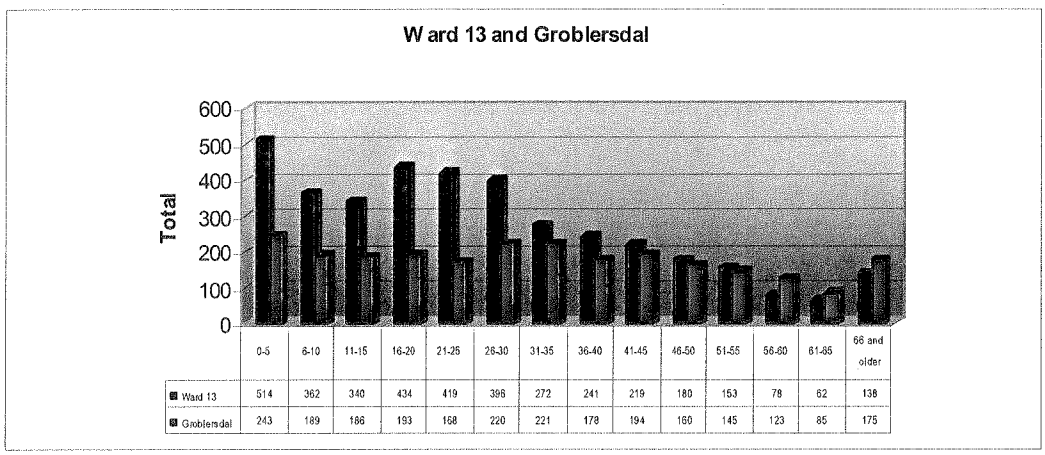
Age

It is important to assess the age distribution of persons in order to determine both the current and future needs of a town. Age is an important indicator as it relates to education, skills and dependency. A young population may require an improved educational system, whereas an older society may need an accented focus on healthcare.

The Ward 13 population is very young, with the 64.73% of the population being aged younger than 31 years (Figure 11). Nearly 32% of the population is younger than 16 years old, indicating that they do not form part of the economically active population (EAP)[12] of the area. The majority (64.44%) of the population do however comprise the EAP of Ward 13 (Statistics SA, 2001). Groblersdal has a normal age distribution with fewer persons

[12] The economically active population (EAP) is defined as the number of people between the ages of 15 and 65 who are able and willing to work. It includes both employed and unemployed people.

(48.35%) aged younger than 31 years and slightly more (68.02%) persons comprising of the EAP

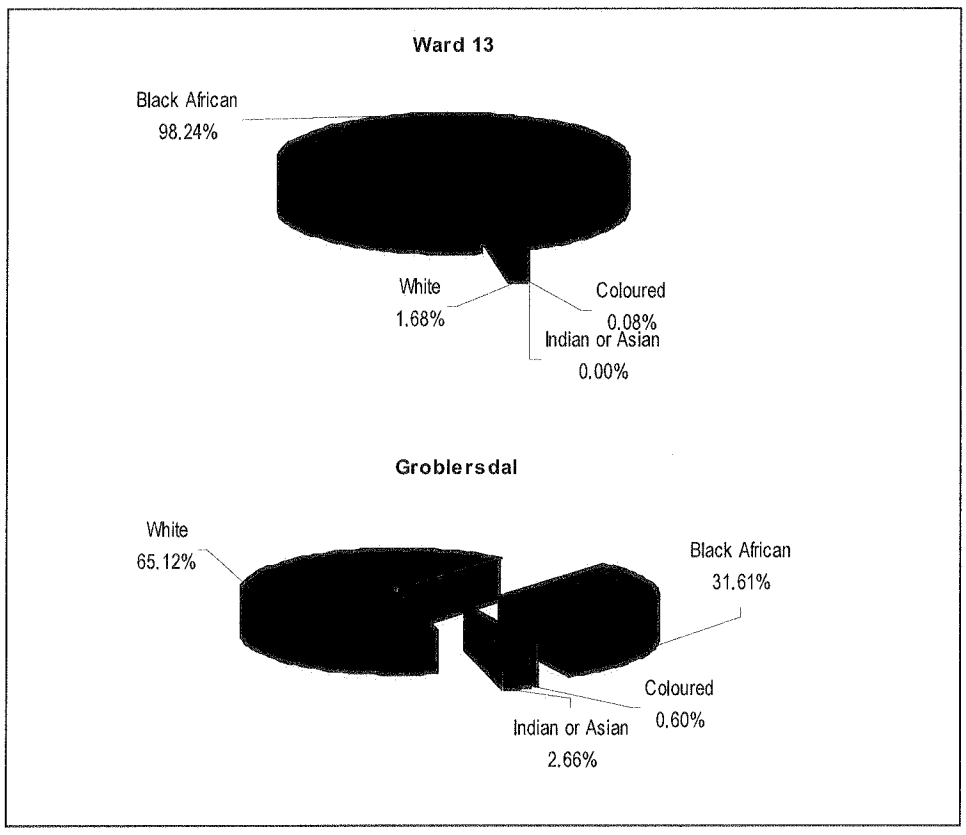


Statistics SA, 2001

Figure 11: Age

Population group

Statistics SA data (2001) indicates that the Ward 13 population are composed out of mostly (98.24%) Black African persons, whereas Groblersdal, a historically "white area", houses 65.12% white persons and only 31.61% Black African persons (Figure 12).

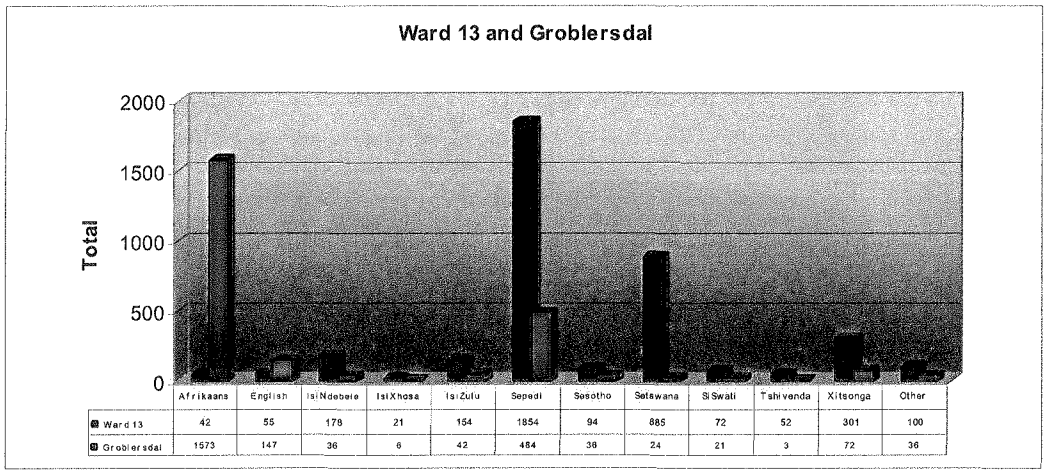


Statistics SA, 2001

Figure 12: Population group

Language

Closely linked with population group demographics is language. Figure 13 (Statistics SA, 2001) indicates that the majority (48.69%) of the population speak Sepedi and Setswana (23.24%). In Groblersdal, however, 63.43% of the population spoke Afrikaans, with 19.52% speaking Sepedi.



	Afrikaans	English	IsiNdebele	IsiXhosa	IsiZulu	Sepedi	Sesotho	Setswana	SiSwati	Tshivenda	Xitsonga	Other
Ward 13	42	55	178	21	154	1854	94	885	72	52	301	100
Groblersdal	1573	147	36	6	42	484	38	24	21	3	72	36

Statistics SA, 2001

Figure 13: Language

Economic profile

Employment

In a socio-economic assessment of an environment, the employment status of the population has a variety of important implications. Economically active and employed persons can contribute to the overall welfare of a specific community by paying their taxes, looking after the youth and aged and by stimulating the economy. However, should a community have a large number of economically inactive and / or unemployed persons the burden on the economically active population (EAP) of that community are amplified.

The economically active population (EAP) is defined as the number of people between the ages of 15 and 65 who are able and willing to work. It includes both employed and unemployed people. The expanded definition of EAP includes those people who consider themselves unemployed and have not taken active steps recently to find employment. The EAP is measured at the place of residence.

Barker (2003) defines unemployment as a situation where members of the labour force are without work (not employed) and are currently available for work, and are seeking work.

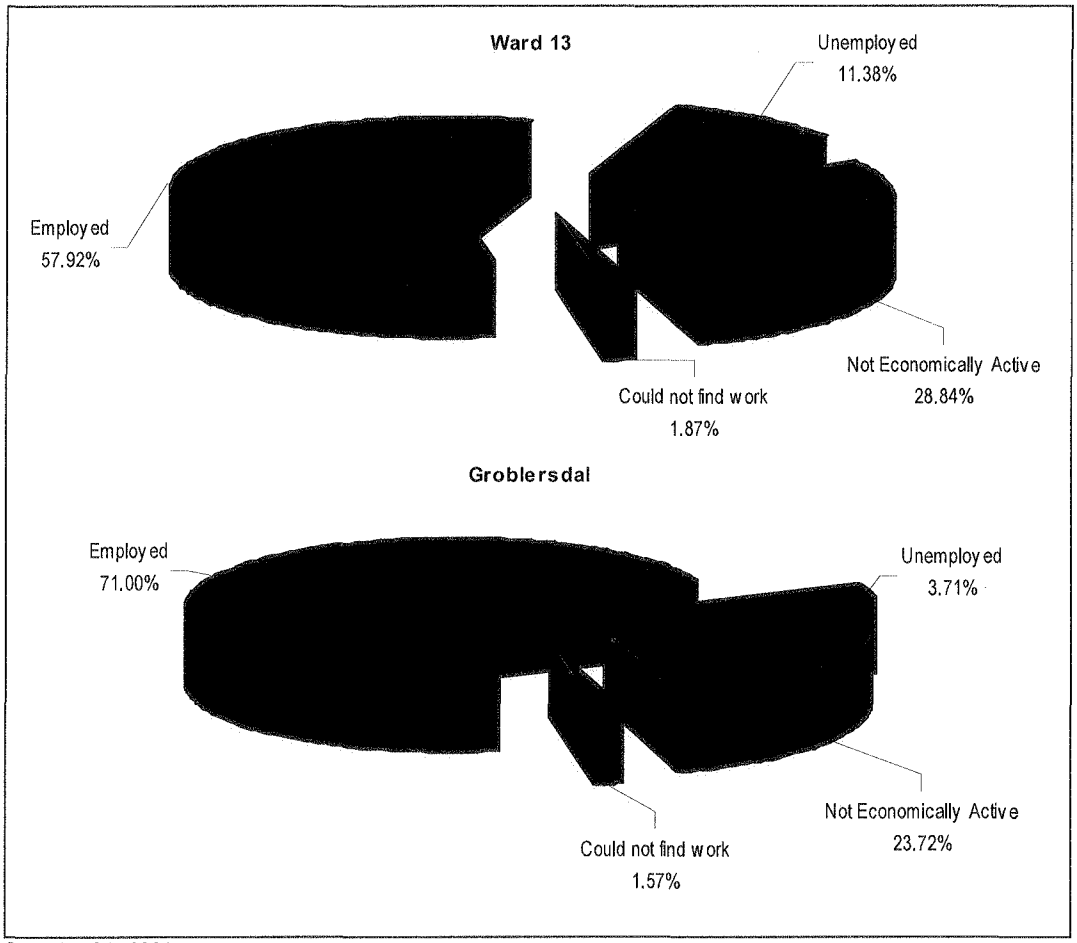
According to the definition of unemployment, as used by Statistics SA, the unemployed are economically active people who:

(a) do not currently work,
(b) want to work and are available to start work, and
(c) have taken active steps to look for work or to start some form of self-employment.

The employment status of the community is an imperative indicator of the economic stance of the households. A population with a low unemployment rate is less reliant on government

grants, thus it can be said that more households have a source of income that allows them to meet basic needs and provide for some luxuries.

Unemployment is an estimated at 11.38% in Ward 13. Figure 14 illustrates that 57.92% of the ward's population is employed with another 28.84% not economically active. Groblersdal has a very low unemployment rate, at 3.71% with 71% of the population being employed and 23.72% not economically active (Statistics SA, 2001).



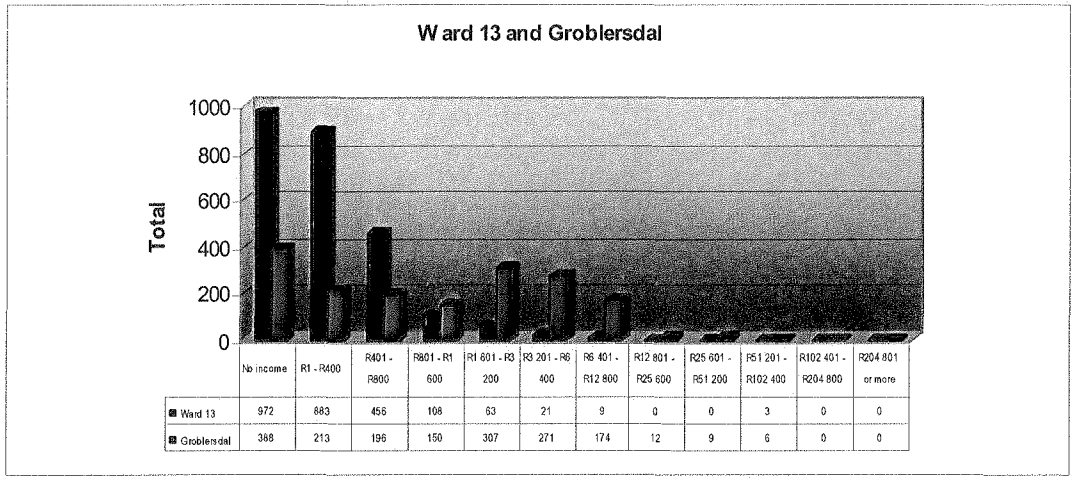
Statistics SA, 2001

Figure 14: Employment status

Income

Household income level serves as an imperative tool, when assessing the local area's level of socio-economic development.

A large portion of the Ward 13 population do not receive a regular monthly income (38.65%), with the majority of individuals (57.53%) earning between R1 and R1 600 per month (Statistics SA, 2001). Only a small portion of the population (0.12%) earns more than R12 800 per month indicating that the wealth of the community is distributed among an elite few (Figure 15). The income brackets in Groblersdal shows an upward shift, with the majority of the individuals earning between R1 600 and R12 800 per month (Statistics SA, 2001). This suggests that the individuals living within the boundaries of Groblersdal are, on average, more affluent than the majority of the Ward 13 individuals.



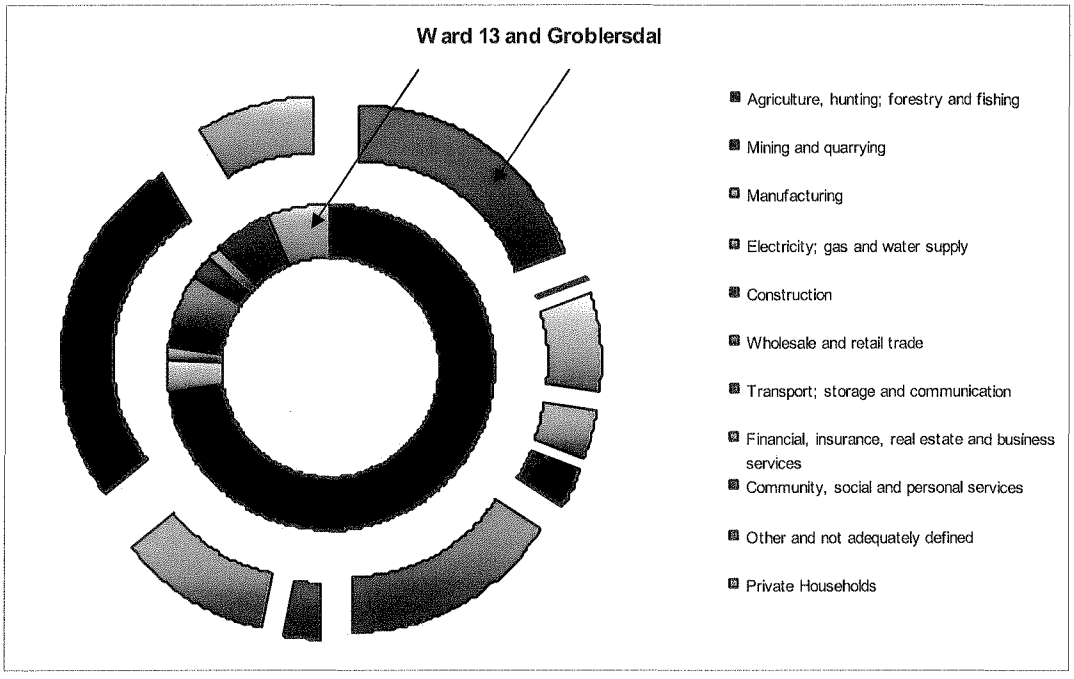
	No income	R1 - R400	R401 - R800	R801 - R1 600	R1 601 - R3 200	R3 201 - R6 400	R6 401 - R12 800	R12 801 - R25 600	R25 601 - R51 200	R51 201 - R102 400	R102 401 - R204 800	R204 801 or more
Ward 13	972	883	456	108	63	21	9	0	0	3	0	0
Groblersdal	388	213	196	150	307	271	174	12	9	6	0	0

Statistics SA, 2001

Figure 15: Personal monthly income

Industry

Statistics SA data (2001) indicates that the majority of the EAP of Ward 13 is employed in the agriculture, hunting; forestry and fishing services 72.40%) (Figure 16). Groblersdal, being a business hub for the surrounding rural areas, has a wider representation of services. The biggest industry is the community, social and personal services industry (26.76%), followed by the agriculture, hunting; forestry and fishing services (19.63%) and wholesale and retail trade (16.41%).



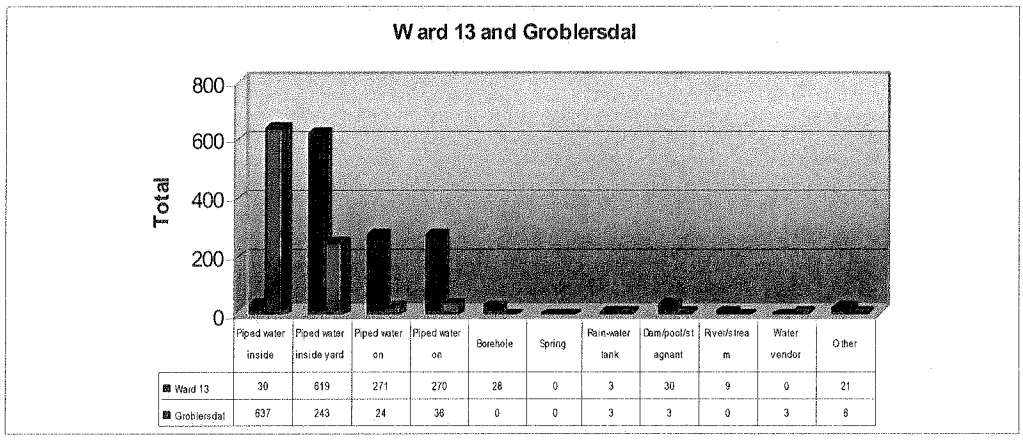
Statistics SA, 2001

Figure 16: Industry

Household services

Water and sanitation

According to Statistics SA data (2001), a comparatively smaller portion (71.82%) of the Ward 13 population has access to water inside a 200 m radius of their dwelling, as compared to the 98.43% for Groblersdal (Figure 17). The majority of households within Groblersdal have access to piped water within their dwelling or yard (92.15%).

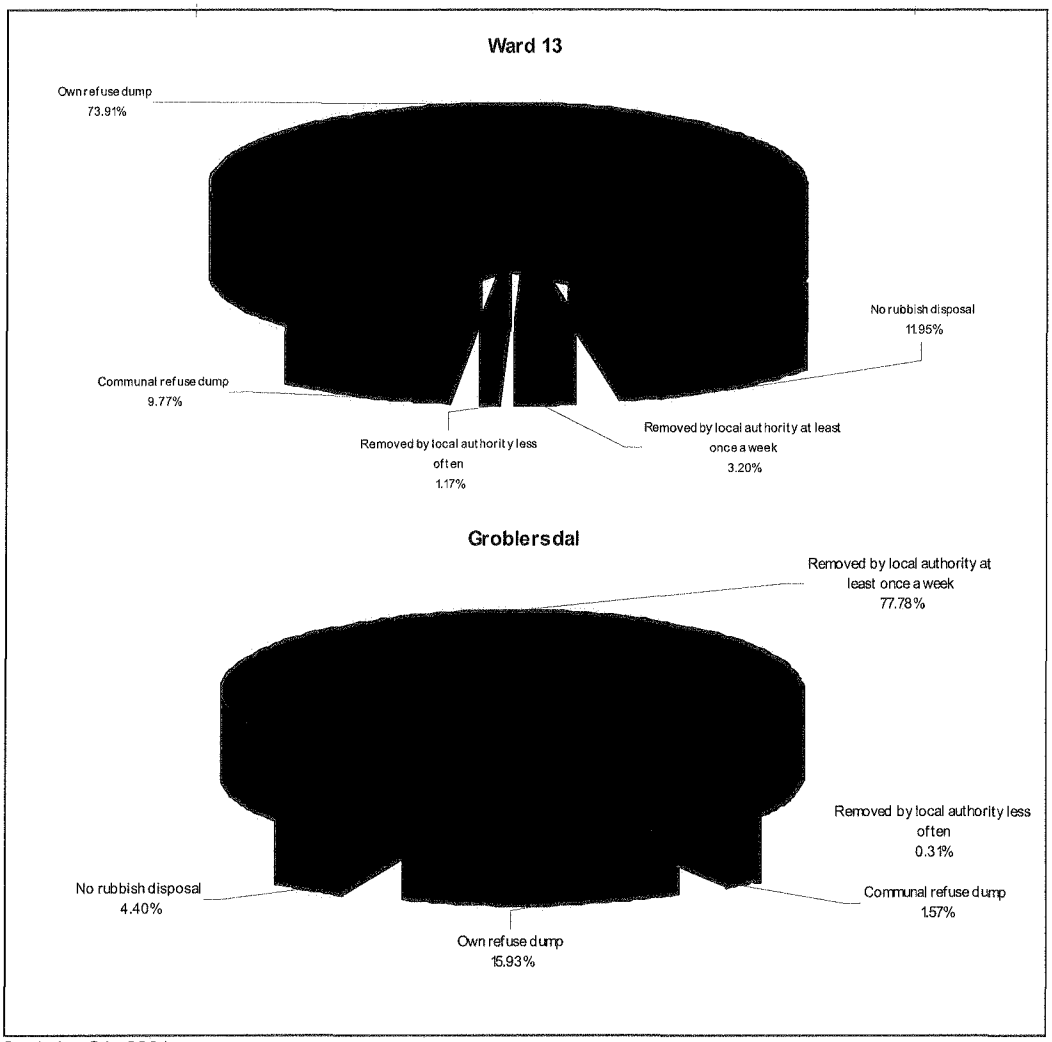


Statistics SA, 2001

Figure 17: Water

Refuse

With reference to Figure 18, it is noticeable that the majority (95.63%) of the Ward 13 households has no rubbish disposal or either a communal or private dump (Statistics SA, 2001). In Groblersdal, however, 77.78% of the households have their refuse removed by the local municipality at least once a week. There are however still a large portion of the community (15.93%) that has to rely on their own refuse dump.

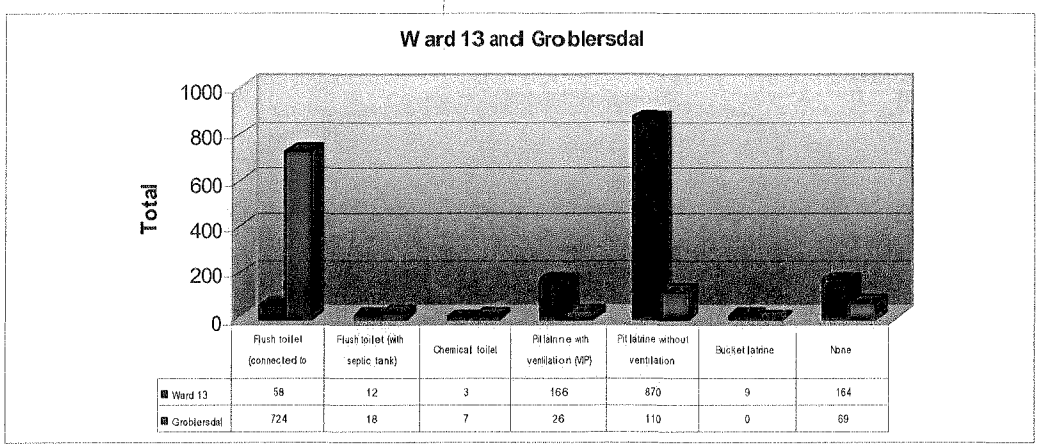


Statistics SA, 2001

Figure 18: Refuse

Sanitation

It is apparent from Figure 19 that the majority of the households within Ward 13 (67.86%) rely on a pit latrine without ventilation. This is in stark contrast with the 75.89% of households in Groblersdal who have access to a flush toilet connected to a sewer system.



Statistics SA, 2001

Figure 19: Sanitation

Energy

It is clear from Figure 20 that the majority of the Ward 13 households make use of electricity (70.34%) for their cooking, heating and lighting needs. Paraffin is mostly used for cooking and heating, whereas candles (27.79%) are used for lighting. The majority of households within Groblersdal (91.41%) use electricity (Statistics SA, 2001).

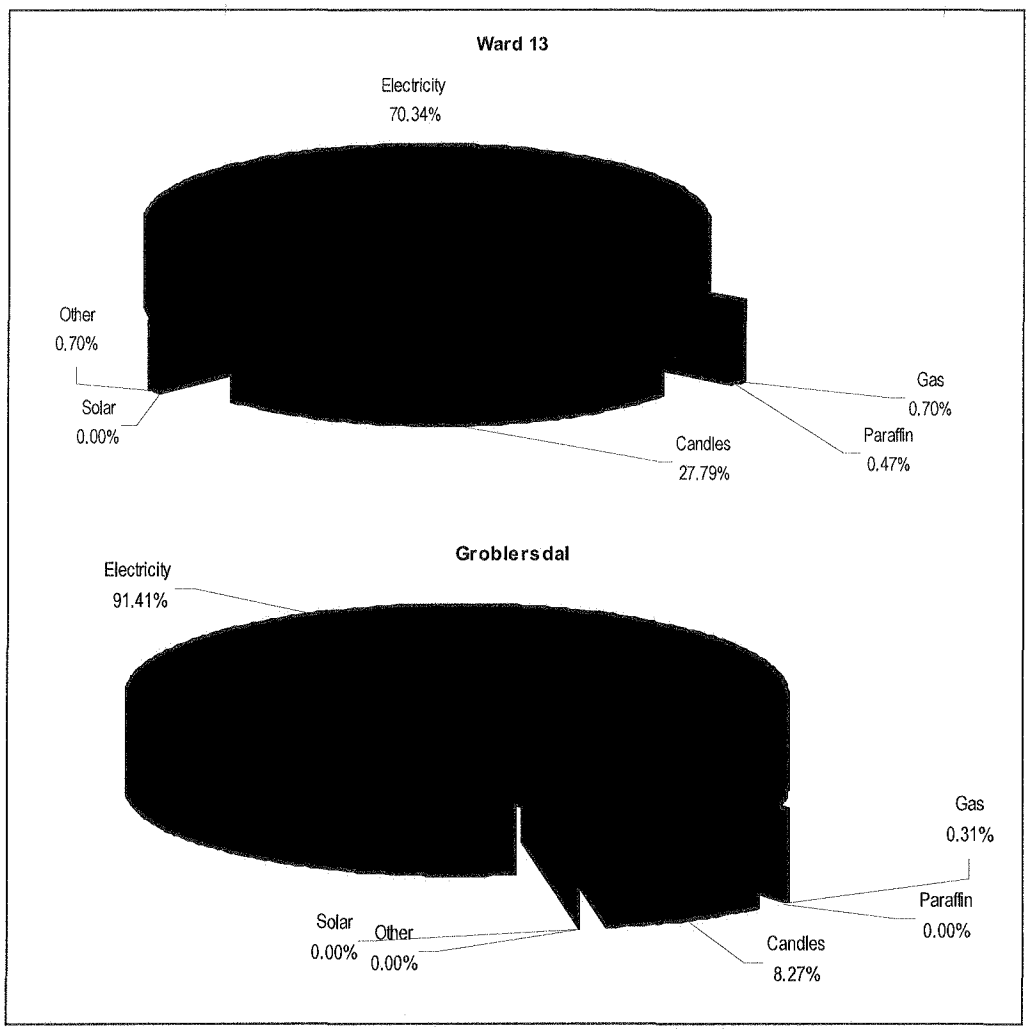
Transportation

The population residing in the study area falls within the low to middle income group. People working in this area rely mainly on taxis, and to a lesser extent buses, to reach the workplace. Figure 21 indicates that the largest portion of the Ward 13 population travel by foot (85.77%), whereas the residents of Groblersdal travel mainly by car, either as a driver (30.98%) or as a passenger (22.71%). Out of a hundred persons living in Groblersdal, 58 travel by car, motorcycle or taxi (Statistics SA, 2001).

The proposed site is located within 2 km of Groblersdal CBD which is located to the west. Groblersdal is an important hub of activity for all the rural settlements of northern Mpumalanga - and southern Limpopo Province. As a result, a number of important arterials run through Groblersdal that connects it to other towns and cities. The following arterials run through Groblersdal that connects it to other towns and cities:

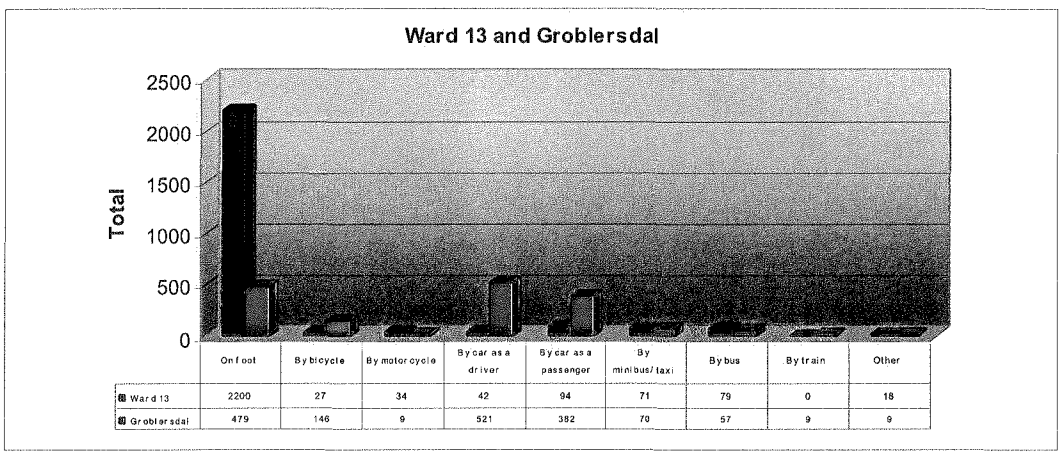
- Pretoria Road (R25) creates a link between Groblersdal and Bronkhorstspruit from the west. Pretoria Road becomes Jan van Riebeeck Street as it enters Groblersdal. The R25 splits approximately 3 km outside Groblersdal to create a link to Marble Hall;
- Jan van Riebeeck Street (R33) is an activity corridor that runs through Groblersdal to link with the rural settlements of Stoffberg to the east; and
- The N11 from Middleburg in the south links with Groblersdal crosses Jan van Riebeeck Street and continues north to Marble Hall.

Figure 22 indicates that there is a strong correlation between income and car ownership. Nearly 60% of households earning more per than R 3 000 per month owns at least one car. With a mean number of cars per household at 0.9, as compared to the 0.1 (R 0 – R 500), 0.1 (R 501 – R 1 000) and 0.2 (R 1 100 – R 3 000) income categories.



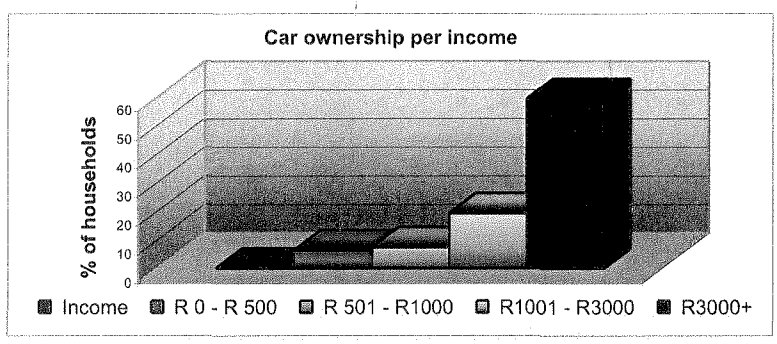
Statistics SA, 2001

Figure 20: Energy



Statistics SA, 2001

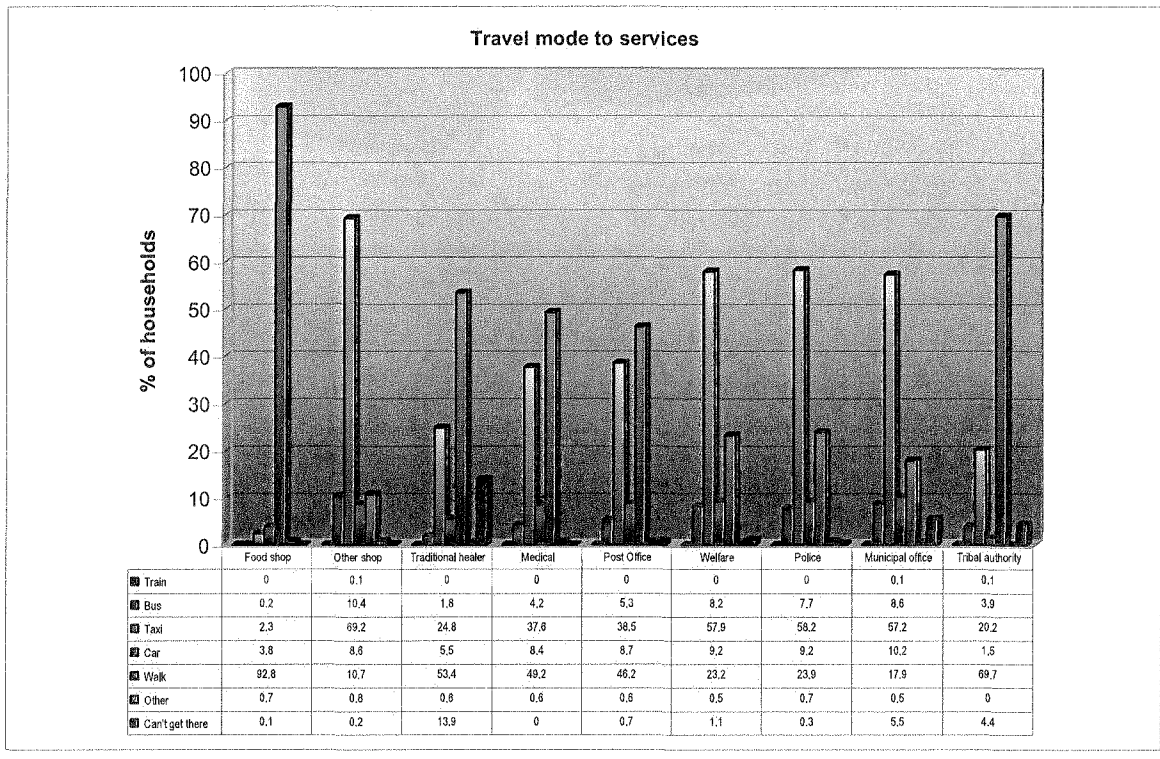
Figure 21: Mode of transportation



Source: National Household Travel Survey, 2007

Figure 22: Car ownership per income category

According to the National Household Travel Survey (2007), the majority (92.8%) of the households within the Limpopo province walks to shops in order to buy food. When frequenting other types of shops, taxis (69.2%) are by far the most preferred mode of travel. Taxis are also the most often used when traveling to a welfare office, municipal office or police station. Trains are hardly ever utilized, with bus services being used by only 5.56% of households. Cars are also not very frequently used when accessing services (7.23%). This indicates that taxis are by far the most preferred mode of travel, with an overall percentage of 40.65% of households making use of it.

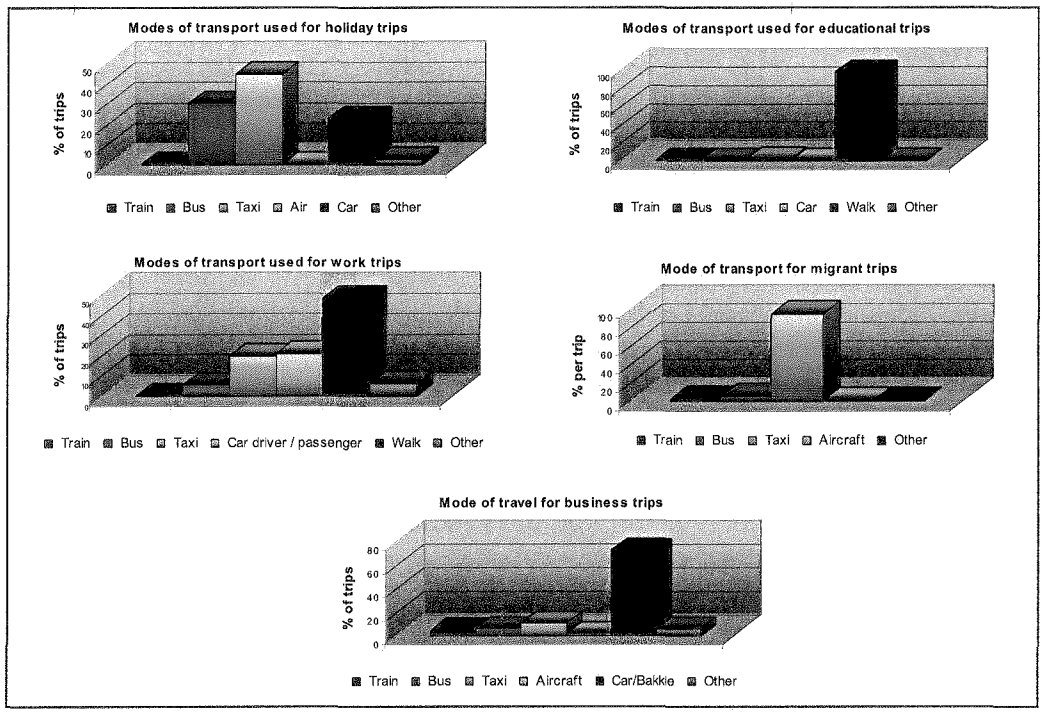


	Food shop	Other shop	Traditional healer	Medical	Post Office	Welfare	Police	Municipal office	Tribal authority
Train	0	0.1	0	0	0	0	0	0.1	0.1
Bus	0.2	10.4	1.8	4.2	5.3	8.2	7.7	8.6	3.9
Taxi	2.3	69.2	24.8	37.6	38.5	57.9	58.2	57.2	20.2
Car	3.8	8.8	5.5	8.4	8.7	9.2	9.2	10.2	1.5
Walk	92.8	10.7	53.4	49.2	46.2	23.2	23.9	17.9	69.7
Other	0.7	0.8	0.8	0.6	0.8	0.5	0.7	0.5	0
Can't get there	0.1	0.2	13.9	0	0.7	1.1	0.3	5.5	4.4

Source: National Household Travel Survey, 2007

Figure 23: Travel mode to important services

Figure 24 indicates that taxis are also the most preferred way of travel for holiday or migrant trips within the Limpopo Province.



Source: National Household Travel Survey, 2007

Figure 24: Mode of travel versus destination

Most people, within the Limpopo Province, walk to work or school, whereas cars are most frequently used for business trips (National Household Travel Survey, 2007).

5 COMPETITOR SITE ANALYSES

In order to determine the economic impact of the proposed new filling station, this section provides descriptive information about the existing filling stations that may be impacted on by the new site. These filling stations are located within a 3 km radius from the proposed site. In addition it includes discussion of how the location, the size, accessibility and the facilities available on the site may play a role when customer attraction and sales volume is considered. Some of these factors include (WSP, Traffic Impact Assessment, 2010):

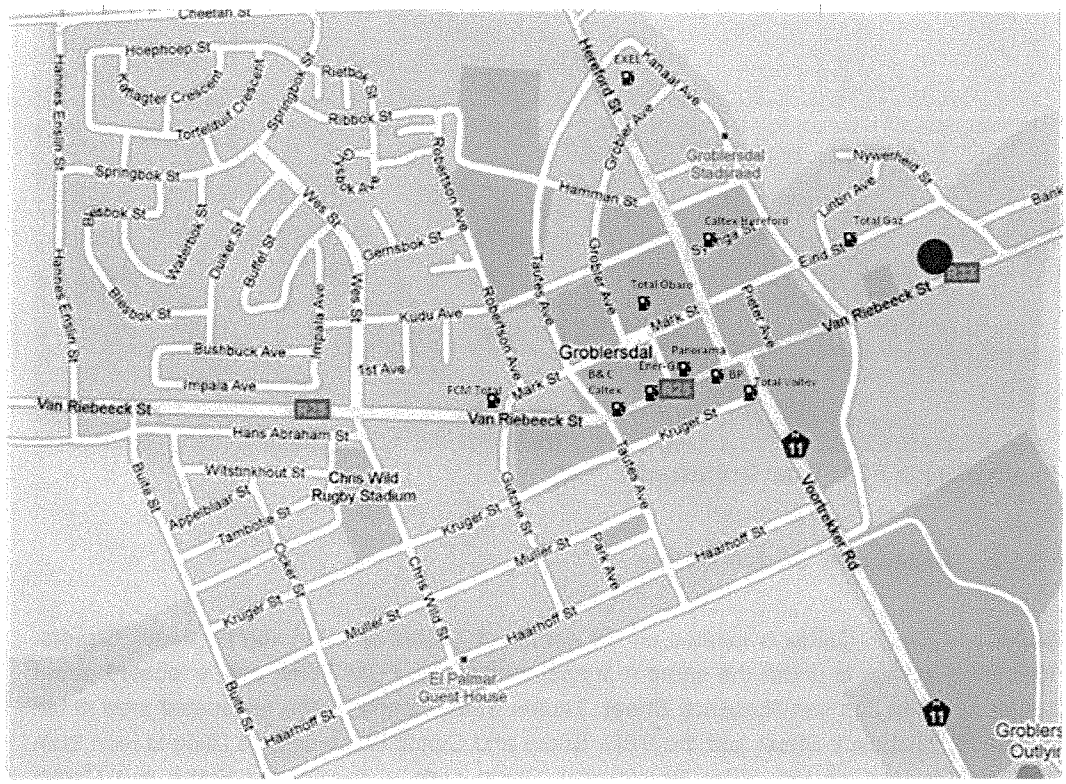
- Convenience (clean new facility and easily accessible);
- Visibility (amount of time to decide whether to use the facility or not);
- The amount of passer-by traffic;
- Type of traffic (transient, commuter and residential);
- Other nearby filling stations (competitor sites);
- Service provided to public (car wash, convenience shop, Automatic Teller Machine (ATM), gas, etc);
- Good accesses (proper deceleration and acceleration lanes);
- Location (homebound and work bound); and
- Site layout (large enough to have proper site circulation).

Please refer to Table 3 for a description of the existing filling stations. Also refer to Figure 25 for the exact location of the existing filling stations from the proposed site.

Table 4: Location of the existing filling stations

Name	Operator	Address	Distance from the proposed site by road	Actual distance from proposed site
FCM Total Groblersdal	Total	24 Jan van Riebeeck Street	1.6 km	1.61734 km
Brake & Clutch Caltex	Caltex	C/o Tautes and Jan van Riebeeck Street (22)	1 km	1.08349 km
Ener-Gi	Ener-Gi	18 Jan van Riebeeck Street	900 m	938.628 m
Panorama	Sasol	Jan van Riebeeck Street	850 m	847.279 m
Loskop Valley BP	BP	Jan van Riebeeck Street	700 m	726.238 m
Total Valley	Total	5 Voortrekker Street	1.1 km	726.180 m
Caltex Hereford Street	Caltex	C/o Syringa and Hereford Street	959 m	757.201 m
Excel Hereford Street	Sasol	C/o Hereford- and Tautes Street	1.5 km	1.14781 km

Source: Google Maps



Kayamandi and Google map, 2010

Figure 25: Competitor site layout

5.1 Characteristics of the competitor sites

The purpose of this subsection is to summarise the findings of the filling station supply assessment within the market area.

5.1.1 *FCM Total Groblersdal*

This filling station is located on Jan Van Riebeeck Street / R25 and is the first filling station you encounter as you enter Groblersdal from the west. This filling station is located about 1.6 km from the proposed site. This filling station is accessible from both traffic directions (Photo plate 3).

The filling station is surrounded by a shopping centre which includes a liquor store, a cafe, and a vehicle service centre, all of which are not part of the filling station. The filling station itself does not have any convenience store or other associated infrastructure, except for a car wash facility. The filling station site attracts a lot of traffic, however, not all vehicles that enter the site use the filling station. Vehicles mostly visit other businesses behind the filling station. FCM Total is one of 2 filling stations with a car wash facility within Groblersdal.

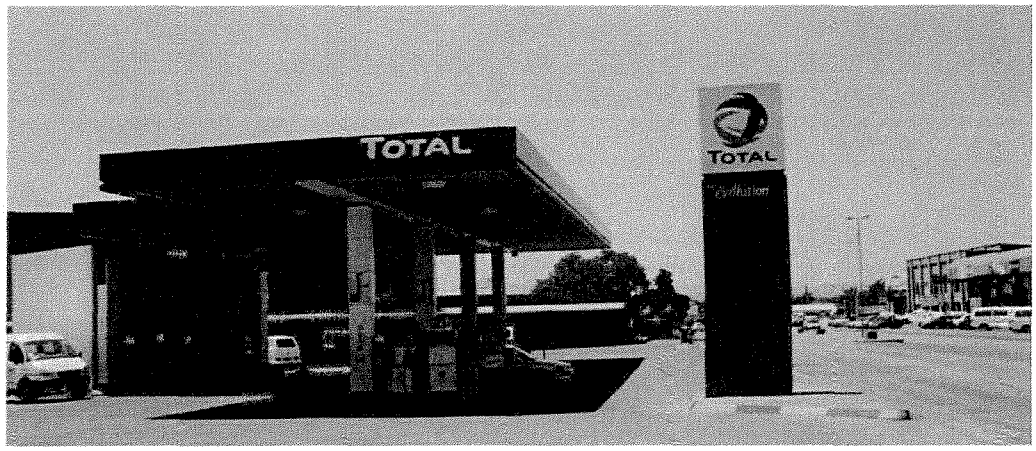


Photo plate 3: FCM Total Groblersdal

5.1.2 *Brake and Clutch Caltex*

Brake and Clutch Caltex is located on the corner of Tautes and Jan van Riebeeck Streets. This filling station is under the same management as the FCM Total, and is located about 100 m apart on Jan van Riebeeck Street. Tautes Street connects the residential area south of Jan van Riebeeck Street and the CBD. Brake and Clutch is the second filling station from the western side, as you enter Groblersdal. Photo plate 4 depicts the Brake and Clutch Caltex.

Photo plate 4: Brake and Clutch Caltex

The filling station has no convenience store, however, there is a cafe-like shop on site, which is not branded but clean. Brake and Clutch is the main office for the 2 filling stations, FCM Total and Brake and Clutch Caltex.

5.1.3 *Ener-Gi*

Ener-Gi filling station is located on Jan van Riebeeck Street and is surrounded by restaurants, supermarkets and a butchery across the street. There is an Auto Pedigree on site, which is not part of the filling station, and a convenience store which belongs to the filling station management.

The filling station is located approximately 50 m from Brake and Clutch Caltex and Panorama. Ener-Gi, captures traffic from both east and west. There are, however, 2 filling stations to the east and 1 to the west of this filling station. All these sites are located within a 100m radius of this filling station (Photo plate 5).

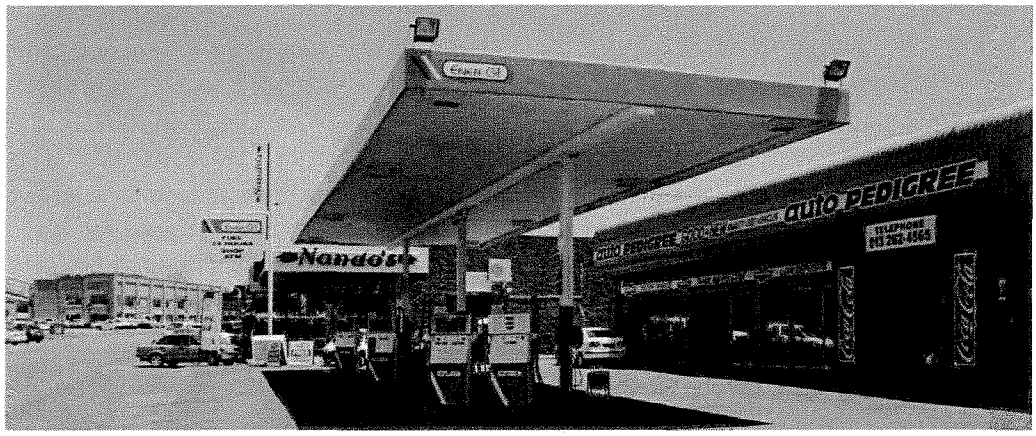


Photo plate 5: Ener-Gi

The convenience store for Ener-Gi is not branded, but is tidy, well organised and presentable, it also sells takeaways. Some vehicles use the parking bays at the filling station but do not use any of the services (e.g. Nandos customers from next door).

5.1.4 *Panorama*

Panorama, formerly known as Excel Jan van Riebeeck, is operated by Sasol and is located on the corner of Noord and Jan van Riebeeck Streets. Noord Street connects to the CBD north of Van Riebeeck, in particular the Shoprite centre. Panorama is located in close proximity to BP on the east of Jan van Riebeeck Street, and Ener-Gi to the west. The filling station is in the same vicinity as a retail store, butchery and financial services (Photo plate 6).

There is a supermarket on site which is under the management of the filling station. This filling station operates with 4 petrol and 2 diesel nozzles. The supermarket attracts more customers than the filling station. This filling station serves as an important stopover for long distance taxis from the west, Pretoria, Bronkhorstspruit, etc. As a result, the supermarket is utilised by passengers to get refreshments but not always by the taxi's to fills up.

Panorama is popularly utilised as a parking area for vehicles while the owners go shopping in town and also pedestrians use the toilets frequently. This trend negatively affects the operation of the filling station as not many of the vehicles parked there actually use any of the services rendered by Panorama.

Photo plate 6: Panorama

According to the owner, the filling station is not profitable. The only reason it is still operational is because of the successful supermarket business. If it had not been for the supermarket, the filling station would be closed. He further indicated that the filling station is busier on weekends than week days.

5.1.5 *Loskop Valley BP*

Loskop Valley BP is located on Jan van Riebeeck Street, slightly off the Jan van Riebeeck and Hereford Street intersection. The site is surrounded by retail stores and financial services on both sides of the road. This filling station could be considered the last or first filling station to / from the east on Van Riebeeck Street. The filling station is located about 700 m from the proposed site and is within a 150 m radius of Panorama, Ener-Gi and Brake and Clutch Caltex filling stations.

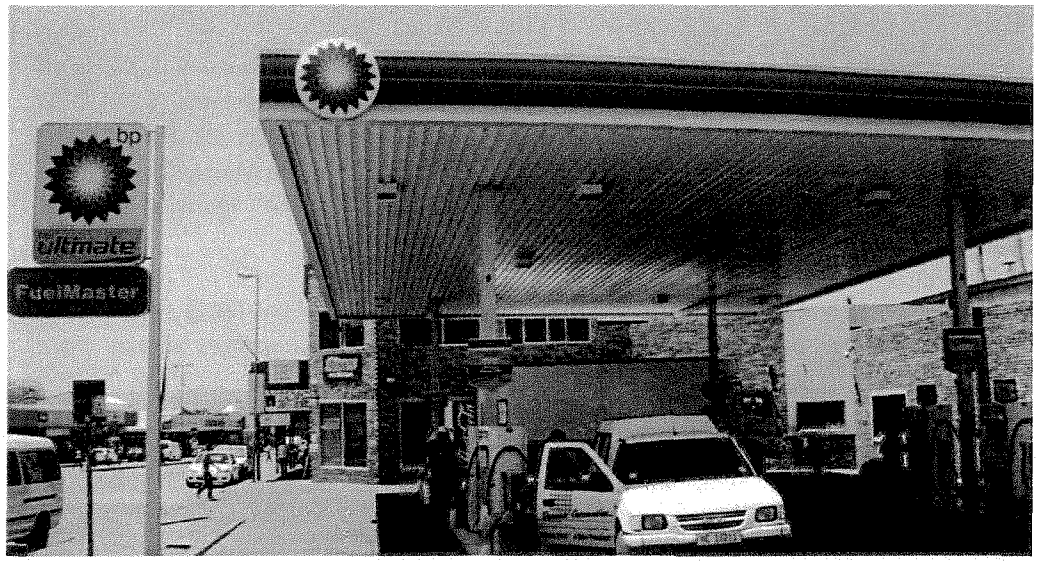


Photo plate 7: Loskop Valley BP

The filling station is easily accessible for both east and west bound traffic on Jan van Riebeeck Street, and traffic from the north via Hereford Street. This filling station is said to be the busiest on weekends.

There is a convenience store on site named BP Kiosk. Although not branded, the shop is tidy, presentable and operates 24 hours a day. There is also a restaurant / take away outlet, Steers on site (Photo plate 7).

5.1.6 *Total Valley*

Also known as Spaar Total, this filling station is located on Voortrekker Street (N11), less than 50 m from the Jan van Riebeeck and Voortrekker Street intersection. The filling station operates with 16 petrol and 2 diesel nozzles and a small cashier's office. The filling station is in the same vicinity as Boxer Supermarket, an Eskom outlet as well as a car service centre.

This filling station is strategically located to attract incoming traffic from the south, into the CBD. Its close proximity to the taxi rank is strategic in terms of sales volumes. Total Valley is the only filling station on Voortrekker Street and captures traffic from the southern residential areas and Middleburg. The filling station has no associated infrastructure and its business is strictly focused on fuel. Total Valley Operates 13 hours a day (6h00 to 19h00). Photo 8 depicts Total Valley filling station.

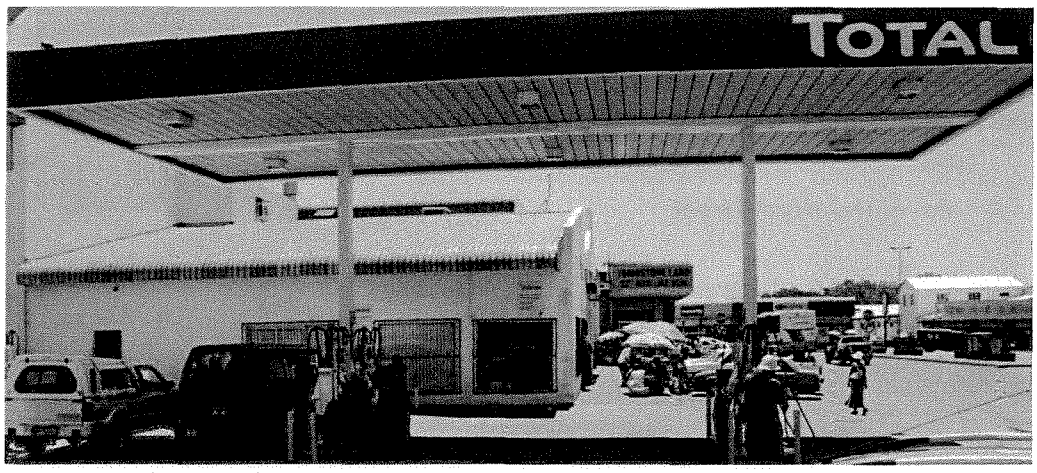


Photo plate 8: Total Valley

5.1.7 *Caltex Hereford Street*

Caltex Hereford Street is located at the corner of Hereford and Syringa Streets. Syringa Street is a small street linking to a primary school north of Hereford Street. Hereford Street links Groblersdal to Marble Hall to the north. The filling station is located next to a cafe-like shop, liquor store, as well as a Midas east of Syringa and Supa Quick south of Hereford Street. The filling station is nearby Kudu Avenue and Hereford Street intersection to the north.

The filling station is accessible from Syringa Street, the N11 / Hereford Street and from Kudu Avenue. The filling station is under the same management as the Nissan / GMW across the road.

Caltex Hereford Street is located within an approximate 250 m radius between Excel which is located further north, and Loskop Valley BP located nearby Jan van Riebeeck and Hereford Streets. This filling station is the first to be encountered from the CBD to the north, with Excel being the first from the northern side towards the CBD (Photo plate 9).

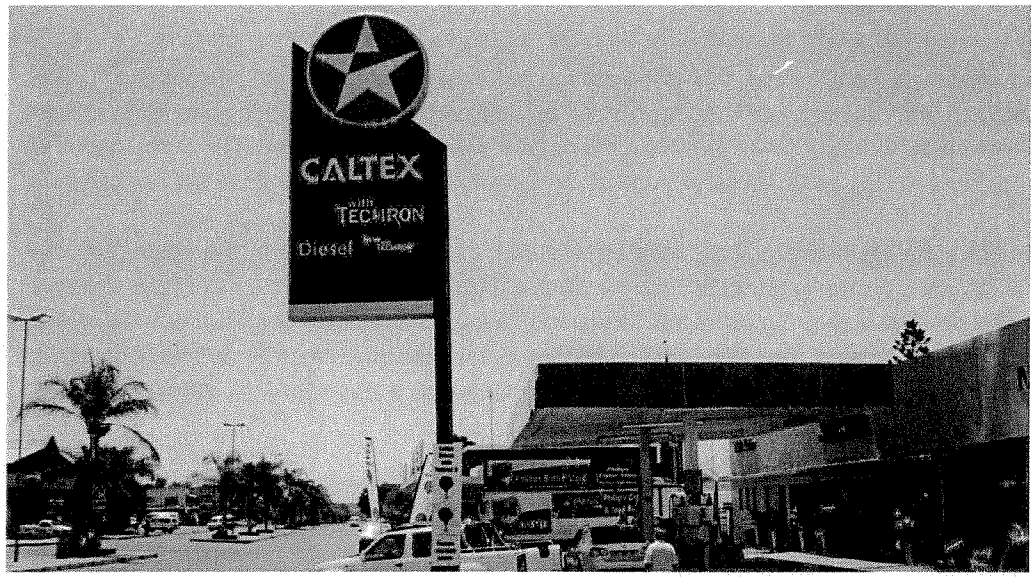


Photo plate 9: Caltex Hereford Street

5.1.8 *Excel Hereford Street*

Located on the corner of Hereford Street (R25) and Tautes Street, Excel is operated by Sasol and is the first filling station to be encountered from the northern side into Groblersdal.

Photo plate 10: Excel Hereford Street

The filling station is accessible from 3 access points, which captures traffic going in and out of town, as well as traffic from Tautes Street. This filling station is located about 1.1 km from the proposed filling station (Photo plate 10).

Fieldwork indicated that this filling station was busiest during week days. There is an unbranded convenience store, which operates for 14 hours (07h00-21h00) daily; the shop is tidy, and also has a takeaway outlet and provides sit-down eating facilities to customers.

5.1.9 *Total Grobler Street (Obaro)*

This filling station is located in Grobler Street, about 200 m from the Spar shopping centre on Barlow and Grobler Streets. The filling station is currently closed and it has been closed for a while. There is no sign of the filling station resuming operation in the new future. This filling station has therefore not been included in this analysis (Photo plate 11).

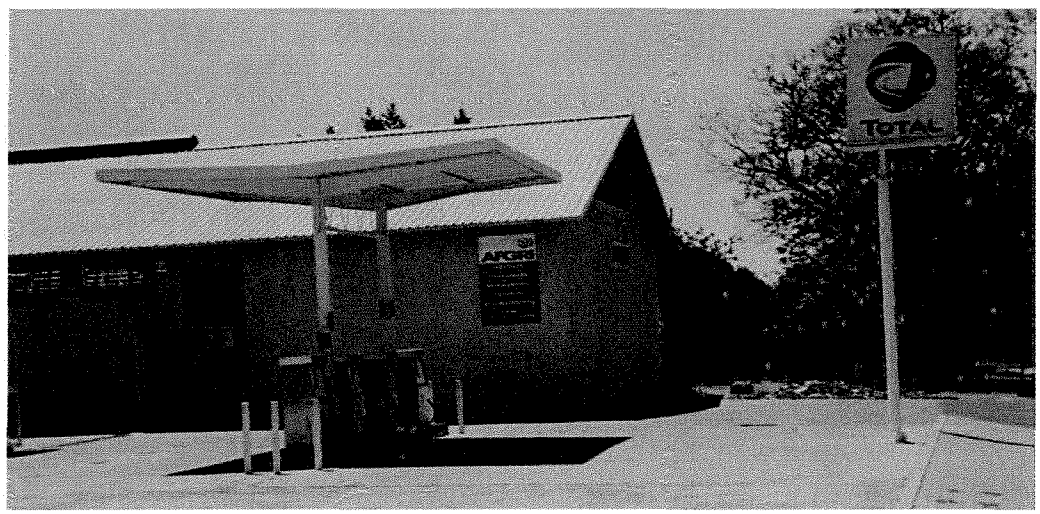


Photo plate 11: Total Grobler Street

5.1.10 *Total Gaz*

Total Gaz is located on Eind Street, less than 50 m from the proposed site on the Eind Street entrance. This filling station is located approximately 600 m from the proposed site, and it is also in the heart of the industrial area. However, this filling station caters for a different market; it specialises in gas, but also provides diesel, petrol and paraffin. The Department of Home Affairs is located opposite the filling station on Eind Street (Photo plate 12).

Total Gaz is currently closed. However, there are plans to resume operations sometime in the future. This filling station could be accessed from the small street, and another entrance on Eind Street. The site is fenced and does not operate 24 hours a day. Total Gaz is the only filling station in Groblersdal selling paraffin. There is no associated infrastructure on the site.

Photo plate 12: Total Gaz

5.2 Amenities of existing filling stations

Table 5 depicts the amenities found at each competitor site.

Table 5: Amenities of existing filling stations

Facilities	FCM Total	Brake and Clutch Caltex	Ener-Gi	Panorama	Loskop Valley BP	Total Valley	Caltex Hereford Str.	Excel Hereford Street
Petrol Attendants	8	3	8	5	10	7	6	13
Cashiers	1	1	4	2	3	2	1	3
Car Wash staff	5	0	0	0	0	0	4	0
Petrol Nozzles	10	10	6	5	10	16	4	8
Diesel Nozzles	2	2	2	1	2	2	1	5
Car Wash	✓	×	×	×	×	×	✓	×
Take Away	×	×	×	×	✓	×	×	×
Convenience shop	×	×	✓	✓	✓	×	×	✓
Workshop	×	✓	✓	×	×	×	✓	×
Ablutions	2	2	2	6	2	0	4	9
ATM	×	×	✓	×	×	×	×	✓
Parking bays	10	15	4	8	6	0	6	10

Based on the preceding table, the following conclusions could be highlighted

- Excel Hereford Street, followed by Loskop Valley has the most petrol attendants. It should be noted that FCM Total, Brake and Clutch Caltex and Ener-Gi were not cooperative, hence the figures recorded are based on observations;

- FCM Total and Caltex Hereford Street are the only filling stations in Groblersdal with car wash services; with both filling station employing 5 and 4 people respectively, to wash cars;
- Ener-Gi, Brake and Clutch Caltex as well as Caltex Hereford Street offer workshop services, with Caltex Hereford employing 9 people;
- Excel and Ener-Gi are the only filling stations with ATMs. Excel also has the most number of ablutions (9), followed by Panorama (6). The other filling stations have an average of 2 ablutions;
- Total Valley has the most number of petrol nozzles at 16, followed by FCM Total, Brake and Clutch Caltex and Loskop Valley BP all at 10;
- Loskop Valley BP is the only filling station offering a takeaway outlet, Steers. The other filling stations have convenience shops that also serve takeaways or sit down facilities, such as Excel and Ener-Gi. Out of the 10 filling stations, only Excel, Ener-Gi and BP have convenience stores that are under the same management as the filling station. Panorama has a supermarket on site, which is also under the filling station management. The other filling stations have cafe-like shops on site, which are not part of the filling station ownership.

Factors that play a major role when drivers decide at which filling station to fill up include the following:

- Ease of access- a well designed left in or right in access will be more frequently used than a right turn across conflicting traffic;
- The quality of the service plays a role in the selection of the filling station, especially more regular customers;
- Ancillary service such as a convenience shop, ATM, car wash and others increase the use of a filling station;
- The type of traffic, i.e. long distance traffic fills up at different locations compared to residential traffic. A site within a residential area will attract the same customers on a regular basis; and
- The number of filling stations in an area, closest to the main transit / arterial road in both directions. This determines the percentage impact of a new filling station on the existing filling stations. For instance; if there is only one filling station in the area, an extra filling station close to the existing one will take away a large percentage of its customers. If, however, there are 10 filling stations in the area, a new filling station will take away a much lesser percentage of the market of each of the existing filling stations.

5.3 Current Sales Volume

The purpose of this sub-section is to provide an over view of the current market conditions of the 8 filling station sites that are within a 3km radius from the proposed filling station site. Two filling stations have been excluded from the analysis as they are presently closed.

5.3.1 *Methodology*

Kayamandi Development Services (Pty) Ltd developed a model that uses primary data to estimate the number of litres that each filling station sells in a month. Two consecutive days (Tuesday and Wednesday) were used to record the number of vehicles entering the different filling stations, and the activities undertaken. The traffic counts were undertaken

between 06:00 and 18:00 each day. Assumptions are made to the model based on experience and discussions with owners and operators to estimate sales for the month, including average fill, fuel sales, etc.

Table 6: Estimated monthly sales in litres

Filling station	Sales Range (l)	Present Sales (l)
FCM Total Groblersdal	275 000 - 340 000	300 000
Brake & Clutch Caltex	380 000 - 450 000	420 000
Ener-Gi	200 000 - 250 000	230 000
Panorama	150 000 - 195 000	170 000
Loskop Valley BP	240 000- 260 000	250 000
Total Valley	240 000 - 280 000	260 000
Caltex Hereford Street	180 000 - 220 000	200 000
Excel Hereford Street	235 000 - 290 000	250 000
Total		**2 080 000**

Based on the modelling estimates, the sales ranges presented in Table 5 indicates the approximate level of sales of each of the respective filling stations. The present sales figures selected were informed by information gained from discussions with the filling station managers who were willing to participate and also by utilising Kayamandi estimates based on the modelling of movement and activities observed. The 2,08 million litres sold on average per month compares well with the estimates obtained from the Department of Minerals Resources (DMR). According to the DMR, there was an average of 3,64 million litres sold per month in the Groblersdal licensing district during 2009 (DMR, 2010). The only other significant town in this district is Marble Hall which is significantly smaller than Groblersdal. Based on the analysis, it is therefore estimated that the filling stations in Groblersdal sell approximately 57% of fuel within the district, and the remainder is sold by the filling stations in Marble Hall and the surrounding settlements.

Formula used

Total petrol sales in litres = number of cars x average petrol fill

Total diesel sales in litres = (number of cars x average diesel fill) + (number of trucks x average diesel fill)

5.3.2 *Turnover*

Break and Clutch Caltex has the highest sales in terms of litres sold per month (Table 5). To calculate the monthly turnover that is experienced by the filling stations respectively, the fuel prices regulated by the government is used for petrol for the period of July 2010 (Table 7). For diesel an average price charged by various dealers is used.

Table 7: Fuel prices

	Retail price per litre
Petrol	R8.27
Diesel	R8.28

Source: http://www.dme.gov.za/ (July 2010)

To simplify the calculation for the turnover generated by each filling station, the prices used do not differentiate between petrol or diesel. For shop sales, various methods were used to calculate the turnover generated, Table 8 indicates the range of monthly turnover.

Table 8: Estimated shop sales

Filling Station	Turnover from shop sales	Present shop sales
Excel	R 210 000-R 310 000	R 260 000
Panorama	R 400 000-R 550 000	R 430 000
Loskop Valley BP	R 140 000-R 310 000	R 230 000
Ener-Gi	R 140 000-R 290 000	R 210 000

The turnover generated was estimated based on the number of individuals who went into the shop and also by using various ratios of R/l generated by the filling station. The shop sales ranges, which are indicated in the Table 8, are based on the different methods used to estimate the shop turnover.

Table 9 indicates the estimated total turnover generated by the competitor sites respectively. The total turnover includes fuel sales, shop sales and car wash service.

Table 9: Total turnover

Filling Station	Fuel sales Turnover	Shop sales	Car wash	Estimated monthly turnover
FCM Total Groblersdal	2 481	0	67	2 548
Brake and Clutch Caltex	3 474	0	0	3 474
Ener-Gi	1 903	210	0	2 113
Panorama	1 406	430	0	1 836
Loskop Valley BP	2 068	230	113	2 411
Total Valley	2 151	0	0	2 151
Caltex Hereford Street	1 654	0	159	1 813
Excel Hereford Street	2 068	260	0	2 328

Table 10 indicates the estimated gross profit generated by the competitor sites respectively.

Table 10: Estimated gross profit (R'000)

Filling station	Estimated monthly Gross Profit
FCM Total Groblersdal	R285
Brake & Clutch Caltex	R306
Ener-Gi	R274
Panorama	R339
Loskop Valley BP	R342
Total Valley	R190
Caltex Hereford Street	R234
Excel Hereford Street	R314

5.3.3 *Model limitations and constraints*

The main constraints experienced in the process of modelling available data are:

- Accurate number of litres filled up by each automobile;
- Accurate amount spent by each customer in the convenience shop;
- The exact number of automobiles that visited the filling stations during other days and times that were not observed;
- Differences between sales per month; and
- The model does not include any factors that focus on customer behaviour when it comes to fuel purchases but it is known that it is influenced by the following factors:
  - Ease of access to the filling station;
  - Brand name; and
  - Quality of the service.

5.3.4 *Loss of sales*

It is expected that the filling stations that are located closest to the proposed site and also share the same traffic stream with the proposed new filling station, will experience a greater negative economic impact than the others, e.g. Loskop Valley BP, Total Valley, Ener-Gi, and Brake and Clutch Caltex. It should be clarified that the economic impact will differ for each of the various filling stations (based on location, branding, amenities etc.) and for this reason each filling station is dealt with separately.

The following issues are taken into account when assessing the economic impact of the proposed site on the existing filling stations:

- The location, road function and access of proposed new filling station development;
- Traffic flow in the area together with shared traffic streams; and
- Market area, based on surrounding residential areas.

To assess and quantify the economic impact that the proposed new filling station would have on the existing filling stations; an evaluation of shared traffic streams is conducted.

Based on the delineated study area, it has been established that the greatest economic impact, in terms of loss of average monthly fuel sales, will be experienced by the Loskop Valley BP, Brake and Clutch Caltex and Ener-Gi filling stations on Van Riebeeck Street and Total Valley on Voortrekker Street. Based on the modelling for the proposed new filling station, it is estimated that it could sell approximately 220 000 litres of petrol and diesel per month, which would make it sustainable. The 220 000 litres would be expected to be lost from the existing competitor sites, at least in the short term.

Table 11: Expected sales

Filling station	Present sales	Expected New sales	Loss of Sales	Percentage of loss
FCM Total Groblersdal	300 000	266 500	33 500	11.17
Brake & Clutch Caltex	420 000	366 400	53 600	12.76
Ener-Gi	230 000	193 300	36 700	15.96
Panorama	170 000	145 300	24 700	14.53
Loskop Valley BP	250 000	225 800	24 200	9.68
Total Valley	260 000	235 100	24 900	9.58
Caltex Hereford Street	200 000	193 600	6 400	3.20
Excel Hereford Street	250 000	234 000	16 000	6.40
	2 080 000	**1 860 000**	**220 000**	**10.6**

The implication of the analysis, done in Table 11, is as follows:

- FCM Total Groblersdal is the first contact filling station into Groblersdal from the west, and it is targeted at incoming traffic, as well as local traffic from the residential area south of Jan van Riebeeck Street and the surrounds. It is expected that the proposed filling station development would have an impact on this filling station.
- Brake and Clutch Caltex is located on Tautes and Jan van Riebeeck Streets. The filling station targets traffic from the residential area along Tautes Street, as well as some of the incoming traffic from the west. This filling station would most probably be most impacted by the proposed filling station, but will still remain the most viable in the town.
- Ener-Gi is located approximately 50 m from Brake and Clutch Caltex, and its market is mainly traffic within the CBD. It is targeted at vehicles within the CBD. This filling station is located on the same side as the proposed filling station, and it would most likely share traffic stream with the proposed filling station. Ener-Gi is one of the filling stations that would be impacted by the development of the proposed filling station. The brand Ener-GI is not so popular, and it is located within well-known brands, which would also work to its disadvantage for customers deciding on a filling station.
- Panorama is located on a corner of Noord Street, which connects Jan van Riebeeck Street to the retail side of the CBD and Jan van Riebeeck Street, which is the main east-west transient in Groblersdal. This filling station captures the long distance taxi market, and a smaller portion of the local market. This filling station gets busier on weekends, more so on the last weekend of the

month. Panorama will be impacted by the development of the proposed new filling station.

- Loskop Valley BP is by far the closest filling station to the proposed site and would share most of its traffic with the proposed new site. This filling station serves traffic from the CBD and is also the first contact filling station from the east into Groblersdal. It is located adjacent to the Hereford Street and Jan van Riebeeck Street intersection and also surrounded by a commercial market. This filling station would be directly impacted by the development of the new filling station although it serves mainly traffic travelling in the opposite direction.
- Total Valley is closely located to the Voortrekker and Jan van Riebeeck Street intersection on Voortrekker Street, and captures most of the taxi market due to its close proximity to the taxi rank. This filling station also services the surrounding residential areas and incoming traffic from the N11. This filling station is most likely to retain its taxi market. However, it would still be impacted by the new filling station.
- Caltex Hereford Street is located north of the proposed new filling station site on Hereford Street and serves the CBD and local market. This filling station will not be directly impacted by the development of the proposed new filling station. Loss of sales that could be lost to the operation of the proposed new filling station will be minimal.
- Excel Hereford Street is the first contact filling station form the north to the CBD, It captures incoming traffic from the north and the surrounding suburbs. It is estimated that the operation of the proposed new filling station would have little impact on Excel.

5.3.5 *Future developments*

According to the Limpopo Spatial Rationale and the EMLM SDF, Groblersdal is identified as a provincial growth point. Therefore, relative to other settlements in the area, Groblersdal will attract more residential development with the implication that certain threshold values in population be reached to provide for higher levels of social, physical, institutional and economic services.

Based on the SDF, it is estimated that, in Groblersdal, approximately five hectares will be required for residential development and four hectares for social and business activities in the next five years. This future development will mean increased population and business to support the growth required for the development of the filling station market in the town. There is ample unoccupied land which could still be developed along the R33 and within the industrial area. The availability of a filling station in the vicinity would create more convenience to the local people in the long term when this area is developed.

5.3.6 *Proposed new filling station*

Based on the latest feasibilities of petrol companies, a new filling station would need to pump a minimum of 250 000 litres to make it viable for the petrol companies, based on the start up costs for studies, rights and infrastructure.

The above sales volumes are based on current market conditions. Any potential changes in the economy caused by various factors are not taken into consideration. The sales that will

be generated by the proposed site will be at some loss to the existing filling stations, but are expected to be balanced out by the future development growth of the area.

It is expected that a new filling station would pump between 210 000 and 230 000 litres per month in the first year of operation. A filling station business takes a couple of years to mature; however the new filling station is proposed in an economic hub. Potential for significant residential and business growth it is expected that the new filling station would increase sales to in excess of 250 000 litres per month within three to five years.

6 SOCIAL CHANGE PROCESSES[13]

The next objective of the SEIA is to consider and assess the probable socio-economic impacts of the proposed new filling station, followed by the identification of appropriate management measures to mitigate adverse impacts and optimise potential benefits and / or opportunities.

The purpose of this section is to describe anticipated social change processes that the proposed new filling station is likely to create. Within each phase of the project (i.e. planning, development, implementation and decommissioning), certain processes will also occur. Although they may not occur in every phase of the project, it is important to determine when the impact will occur and the potential impacts it may have on the social change process in that environment. Processes that will be investigated include:

- Demographic processes: those relating to the movement and composition of people in the region affected by the proposed project;
- Economic processes: those affecting economic activity in the region, including the way in which people make a living as well as macro-economic factors that affect society as a whole. It is anticipated that waged labour will have an impact on the communities within the affected area, mostly during the development and operational phase;
- Geographic processes: those that affect the land use patterns of a society;
- Institutional and legal processes: those processes that affect the efficiency and effectiveness of various organisations that are responsible for the supply of the goods and services on which people depend. These organisations include government agencies, non-government organisations and the business sector;
- Emancipatory and empowerment processes: those that lead to an increase in the ability of local people to contribute to the decision-making that affects their lives; and
- Socio-cultural processes: those that affect the culture of a society, that is, all aspects of the way that people live together.

Confusion in the SIA literature often relates to the lack of distinction between social change processes that are caused by development projects, and social impacts that are actually experienced. In this conceptualisation, an impact must be an experience (either real or perceived) of an individual, family or household or a community or society at large. Resettlement, for example, is not a social impact, but causes social impacts such as anxiety and stress, disruption to daily living as well as impacts such as homeliness.

It is important to appreciate that some impacts may be caused directly by an activity, while other impacts may be caused indirectly. Moreover, the experience of an impact can then cause other processes to take place, which then cause second order impacts. Because of people's dependency on the biophysical environment, changes to the biophysical environment can create social impacts, and social processes which are the direct result of a project, or the result of the experience of a social impact, can also cause changes to the biophysical environment (Vanclay, 1999).

[13] Social change processes are set in motion by project activities or policies. Depending on the characteristics of the local social setting and mitigation processes that are put in place, social change processes can lead to social impacts (Vanclay, 2003:192).

Social impacts do not occur in a vacuum, they occur within the context of human behaviour, which is often unpredictable, as well as varieties of cultures, traditions, political and religious beliefs. These social, cultural, political, economic and historic contexts are influenced by various perceptions. Therefore, it can be concluded that the mitigation measures proposed for the anticipated social impacts, can also not be made in a vacuum. Where the anticipated social impact is regarded as a direct consequence of the development, and it is possible for the applicant to mitigate it, it would be recommended in such a way. Sometimes the social impact is a result of a cumulative effect and can only be mitigated by the intervention of formal societal structures such as the local / district municipality or government. In such cases, it would be indicated as such.

It is important to consider that social impacts can be positive or negative. Community values may change over time, thus it is a complex task to determine whether an impact should be regarded as positive or negative. Deciding whether an impact is short term or long term, has its own set of complexities, as time scales are in most cases culturally and socially defined.

The impacts of the proposed new filling station will be examined and discussed according to the following four categories as indicated below:

- Social change processes originating prior to the construction of the proposed new filing station;
- Social change processes expected to set in during the construction phase;
- Social change processes expected during the operational phase; and
- Social change processes expected during the decommissioning phase, when it occurs.

It is important to remember that social change can be extremely subtle and the report will aim to describe the anticipated socio-economic impacts that the proposed new filling station is likely to effect.

7 ASSESSMENT OF SOCIAL CHANGE PROCESSES AND / SOCIO-ECONOMIC IMPACTS

7.1 Social Change Process: Demographic processes

Demographic processes are those relating to the movement and composition of people in the region affected by the proposed project.

7.1.1 Impact: In-migration

Phase at which impact is relevant: **Prior to construction**
Construction
Operation

Description of the impact

In-migration can be defined as population growth due to the permanent settlement of people from other areas. This process can be further subdivided into:

- Presence of (temporary) construction workers: Newcomers who are resident in the project area on a short term basis; and
- Presence of newcomers: The social impacts of in-migration are exacerbated when the newcomers are different from, or perceived as being different from the current residents.

The impact of in-migration is expected to occur on a minimal scale both prior and during the construction phases of the project. However, during the construction phase it is also expected that there will be in increase of (temporary) construction workers moving into the area.

Environments where employment opportunities are a scarce resource it is difficult to mitigate this impact, it is however advised that employment criteria, for both the construction crew as well as the operational crew, be made public in advance to deter unqualified job seekers from moving into the area. It is furthermore advised, that as far as possible, local labour be employed at each phase of the project, especially during the operational phase.

Significance of the impact

Impact Table 1: In-migration

Nature	Presence of newcomers	Impact status	-
Impact source(s)	In-migration		
Affected stakeholders	Local residents, construction workers, local authorities		
Magnitude	*Extent*	**Regional**	**3**
	Intensity	**Low**	**1**
	Duration	**Short-med term**	**2**
	Probability	**Possible**	**2**
Mitigation efficiency	High		H
Significance	Mitigation: *Yes* -		L
	Mitigation: *No* -		L

Proposed mitigation measures:

- Employment criteria should be communicated to the community in advance (e.g. in newspapers, community forum notice boards, etc); and
- Local labour should be employed as far as possible.

7.1.2 Impact: Effect of temporary workers on social dynamics

Phase at which impact is relevant: **Prior to construction**
Construction

Description of the impact

As was indicated above, there is a likelihood of job seekers moving into the study area. Even though it is not expected that the presence of temporary workers will have a major impact on the social dynamics of the area, it is worth briefly mentioning it here. In most cases, the potential in-migration of workers is likely to result in other cumulative impacts, such as conflict with existing community members, social inconveniences and or problems and pressures on existing infrastructure. This process of potential in-migration is not anticipated to have a major affect on the communities in close proximity to the proposed filling station.

Should these impacts take place, it is only anticipated to occur during the construction phase of the new filling station and the initial start-up period. It is therefore advised that construction workers who are already housed within Ward 13, be employed as opposed to establishing a temporary construction camp for workers. It is not advised that temporary workers assimilate with the local communities.

Significance of the impact

Impact Table 2: Effect of temporary workers on social dynamics

Nature	Presence of temporary workers	Impact status	-
Impact source(s)	Impact on social dynamics of informal areas		
Affected stakeholders	Local residents, construction workers, local authorities		
Magnitude	*Extent*	**Regional**	3
	Intensity	**Low**	1
	Duration	**Short-med term**	3
	Probability	**Possible**	2
Mitigation efficiency	Medium - High		MH
Significance	Mitigation: *Yes* -		L
	Mitigation: *No* -		L

Proposed mitigation measures:

- Employ local labour as far as possible (Ward 13); and
- Prevent the establishment of camps, hostels or temporary accommodation for construction workers.

7.2 Social Change Process: Economic processes

Economic processes are those that affect the economic activity in a region, including the way people make a living as well as macro-economic factors that affect the society as a whole.

7.2.1 Impact: Waged labour[14]

Phase at which impact is relevant: **Prior to construction**
Construction
Operation

Description of the impact

Waged labour can be defined by an impact that changes the number of available jobs in an area. It has been estimated that a number of approximately 30 jobs will be created locally during the construction phase (please refer to Section 8.2.3). It is estimated that a total number of 17 workers will be employed as a direct result of the construction activities. The exact number, however, depends on local circumstances. These jobs will only be for a period of approximately four months, the time it takes to construct a filling station. Service related job opportunities will be less extensive but will involve medium to long term employment.

Permanent employment that would be created when the filling station is at its operational phase would include the employment of fuel attendants, salesman for the shop, general

[14] Subject to change based on final development layout.

manager, etc. It is expected that an additional 34 permanent jobs will be created in the local economy.

The fact that there will be minimal job opportunities should motivate the developer to source only local labour and ensure that persons living within local communities receive skills development opportunities.

Experience in the field has shown that petrol attendants do not move between employers on a regular basis and only due to grievous concerns on their behalf. It is therefore not foreseen that the proposed new filing station will have any impact on the current filling stations and their ability to keep employing their employees. As petrol attendants receive a standard rate across the industry, there will be no motivation for the employees to move to another employer. As a cautionary measure, it is however advised that only untrained and unemployed persons be considered for emerging employment opportunities at the new proposed filling station.

Concern have however been expressed by existing filling station managers that should fuel sales decrease, they may need to operate for shorter hours, which will result in the retrenchment of some of their employees. Should more than one filling station wish to take that route, it could mean the potential loss of approximately six to twelve job opportunities. Considering the amount of new employment opportunities that will arise from the establishment of the proposed new filling station, as well as the positive knock-on effects for surrounding business operators, this impact is rated as low to medium.

Significance of the impact

Impact Table 3: Waged labour

Nature	Waged labour		Impact status	+
Impact source(s)	Availability of job opportunities			
Affected stakeholders	Labour (existing and potential)			
Magnitude	*Extent*		**Regional**	3
	Intensity		**Low-med**	2
	Duration		**Short-med term**	2
	Probability		**Possible**	2
Mitigation efficiency	Medium - High			**MH**
Significance	Mitigation	*Yes* +		**M**
		No -		**L**

Proposed mitigation measures:

- Unskilled and unemployed labour should be sourced from the surrounding local communities as far as possible,
- Employees at other filling stations in the area should preferably not be considered for employment, however, should they be retrenched, re-employment at the new filling station would be advised;
- Skills development opportunities should be granted to members from the surrounding local communities where possible; and

- Filling stations should consider all possible means of avoiding retrenchments and act according to the legal requirements of the Labour Relations Amendment Act, 2002 (12 of 2002).

7.2.2 *Social Impact Assessment Category: Economic impacts and material wellbeing*

This category relates to the wealth and prosperity of individuals and the community as a whole.

7.2.2.1 Impact: Employment

Phase at which impact is relevant: **Construction**
Operation

Description of the impact

During the construction phase, a maximum of 30 jobs for unskilled labourers will be available. In communities with high levels of unemployment there is immense competition amongst each other for job opportunities, and therefore, the presence of outsiders, could cause conflict. It is therefore preferable that these jobs be sourced from local communities. An added benefit would be that using local labour would obviate the need for temporary housing for construction workers.

Even though there will be small amounts of medium to long term employment opportunities available, there will be an opportunity for many indirect business opportunities to be created. Such businesses include catering and transportation services (taxi's), which will mainly flourish during the construction phase of the filling station, but with the necessary support, may grow their businesses into the operational phase of the filling station. It is suggested that these thriving businesses be advised on how best to obtain the necessary skills base and financial support to eventually create a more sustainable enterprise.

Significance of the impact

Impact Table 4: Employment

Nature	Creation of employment opportunities		Impact status	+
Impact source(s)	Limited permanent job opportunities			
Affected stakeholders	Local labour			
Magnitude	*Extent*		**Regional**	3
	Intensity		**Low**	1
	Duration		**Short-med term**	2
	Probability		**Likely**	3
Mitigation efficiency	Low - Medium			M
Significance	Mitigation	*Yes* +		L
		No -		M

Proposed mitigation measures:

- Source labour and resources from local communities;
- Where possible advise and assist, in liaison with the local ward committee, local business operators to establish and grow SMMEs; and
- Encourage, as far as possible, the support of local business and the use of their products and services.

7.3 Social Change Process: Geographic processes

Geographic processes are those that affect the way in which a society utilises land.

7.3.1 Impact: Conversion and diversification of land use

Phase at which impact is relevant: Construction
Operation

Description of the impact

Conversion and diversification of land use refers to the change in the way land is used, both in terms of the area of land appropriated for a particular activity, the intensity of the use of the land and whether there are areas of land not used for production, and in terms of the type of land use activities and the pattern or mix of those activities.

The land use patterns of the surrounding area are defined as industrial, commercial / business and agriculture. Currently, the site for development is vacant and neglected.

The proposed new filling station will be located on a portion of land currently zoned as Industrial 3, with agriculture being practised on the periphery of the light industrial area.

The construction of the new filling station will ensure that the vacant site be cleared, developed and used to enhance the local economic activity of the area. The filling station will also create a safe and secure environment, replacing the neglected and vacant site.

Significance of the impact

Impact Table 5: Conversion and diversification of land use

Nature	Conversion and diversification of land use		Impact status	+
Impact source(s)	Vacant land transformed into commercial land			
Affected stakeholders	Local residents and property owners			
Magnitude	*Extent*		**Site**	2
	Intensity		**Medium**	3
	Duration		**Medium-term**	3
	Probability		**Highly likely**	4
Mitigation efficiency	Medium			M
Significance	Mitigation	*Yes* +		M
		No -		L

Proposed mitigation measures:

- Assist landowners and residents in identifying ways to adapt to current and future land uses, to their own benefit; and
- Establish a memorandum of understanding with local business owners to ensure that their needs and preferences are taken into consideration.

7.3.2 Impact: Enhanced transport and accessibility
Phase at which impact is relevant: Operation

Description of the impact

Improvements in transport facilities result in increased accessibility, which results in various demographic changes.

It is anticipated that the construction of the new filling station will enhance the local businesses and residents' accessibility to fuel, which in turn will enhance their manoeuvrability in and around the area. Accessibility to a filling station and associated infrastructure (convenience shop, ATM, etc) will allow residents and business owners greater freedom of movement. The establishment of the proposed new filling station will ensure access to a safe and secure area to fill up with fuel and to purchase food items such as bread and milk.

Rural communities also travel to Groblersdal on a regular basis (mostly over weekends, either at the end of the week or the end of the month) to do their shopping. This results in a massive influx of people into the town, and thus an increase in taxis transporting these people into town. Currently, the existing filling stations are unable to manage the demand for fuel, which is placing a lot of pressure on the town's infrastructure and its residents.

It is possible that a new a filling station could have a negative impact on the traffic flow past a site. Therefore, a design manual, such as the Gautrans BB2[15] was compiled after proper research and input from various experienced traffic engineers to ensure that road safety is not negatively affected when establishing a site.

According to the TIA (WSP, 2010), the proposed site can comply with the minimum standards of the relevant design document. The necessary preceding decelerations lanes and turning lanes at the accesses ensure vehicle ingress and egress to the site will occur safely. The site is large enough to accommodate the required minimum distances as recommended in the documents. Sight distance, which is a key factor in determining traffic safety at any intersection, is good at the proposed sites due to the geometry of the existing roads.

The TIA therefore concluded that the impact of the site on the existing traffic past it will not be negatively affected by the proposed filling station traffic and that the safety of all road users (current and future) was thoroughly considered in the design of the filling station.

In order to enhance the safety of pedestrians in the area, this report however suggests that the road alignment does not make provision for access from the south bound traffic.

[15] GAUTRANS, 2002. BB2: Guidelines for Filling Stations Accesses. May 2002 Revised Draft Edition

Significance of the impact

Impact Table 6: Enhanced transport and accessibility

Nature	Enhanced transport and accessibility	Impact status	+
Impact source(s)	Relieving the pressure on town infrastructure		
Affected stakeholders	Local residents and property owners		
Magnitude	*Extent*	**Regional**	3
	Intensity	**Medium**	3
	Duration	**Long-term**	4
	Probability	**Likely**	3
Mitigation efficiency	Medium - High		MH
Significance	Mitigation: *Yes* +		M
	Mitigation: *No* +		L

Proposed mitigation measures:

- The proposed new filling station and convenience centre should attempt to satisfy the needs of the community in terms of amenities;
- The mitigation measures proposed by the TIA should be implemented; and
- The road alignment should not make provision for access from the south bound traffic.

7.4 Social Change Process: Socio-cultural processes

These processes affect the culture of a society, that is, all aspects of the way that people live together. This will typically include feelings in relation to the project, the health and social well-being of persons living in the area and people's aspirations for the future.

7.4.1 Impact: Unacceptable social behaviour

Phase at which impact is relevant: Construction
Operation

Description of the impact

This impact can be defined as types of social behaviour that might be considered deviant or antisocial, such as excessive alcohol consumption, illegal drug use, various types of risk-taking behaviours and vandalism. It is expected that this impact will, to some degree, occur during the construction and operational phases of the new filling station. There is a risk that the presence of "incoming" workers and or the influx of jobseekers can lead to deviant social behaviour in the communities they occupy.

During the construction phase it is possible that petty crime in the area could increase as a result of the influx of strangers into the area. It is strongly recommended that the existing Community Based Organisations and Non Government Organisations be used to monitor and assist with the management of the negative social effects of incoming job seekers. These organisations will in effect act as the "watchdog" in the area, ensuring that conditions stipulated by the EMP be fully complied with.

Significance of the impact

Impact Table 7: Unacceptable social behaviour

Nature	Unacceptable social behaviour	Impact status	
Impact source(s)	Newcomers		
Affected stakeholders	Local residents, construction workers, local authorities		
Magnitude	*Extent*	**Regional**	**3**
	Intensity	**Low**	**1**
	Duration	**Short-med term**	**2**
	Probability	**Probable**	**1**
Mitigation efficiency	Low - Medium		
Significance	Mitigation: *Yes*		L
	Mitigation: *No*		

Proposed mitigation measures:

- Establish a code of conduct for construction workers with strict control measures; and
- Liaise with existing forums in the community to communicate information to the community and to assist in the monitoring of compliance.

7.4.2 *Social Impact Assessment Category: Health and Social Wellbeing*

Health is an essential category of social impacts. Even though health impact assessment professionals use an extensive range of health indicators, it is important to note that in this report health impacts are included from a social perspective and will be expressed in non-medical terminology.

7.4.2.1 Impact: Feelings in relation to the project

Phase at which impact is relevant: **Prior to construction**
Construction
Operation

Description of the impact

Proposed projects and developments often generate uncertainty, anxiety or fear and sometimes, the impacts perceived in anticipation of the planned intervention can be greater than the impacts that ultimately result from the intervention (Burge and Vanclay, 1995).

These impacts include uncertainty, annoyance[16], dissatisfaction due to a failure of the project to deliver promised benefits and an experience of moral outrage, for example where a project leads to violation of deeply held moral or religious beliefs or requires (in extreme situations) households to relocate their houses to make way for the new project.

[16] A feeling/experience due to disruption of life, but which is not necessarily directed at the intervention itself.

The credibility or trust in government, as well as attitudes towards private companies, will affect a community's attitudes towards the process. If people have been promised things before by companies and politicians and have been disappointed, it is less likely that they will believe that benefits offered will actually be delivered. When offers to negotiate economic or other benefits become part of public consultation process, they can create serious internal tensions within communities and cultural groups or exacerbate ones already existing. The long term ramifications of these, especially when the tension tends to split generations, can be very serious and very negative for the social fabric of a community.

There may already be preconceived ideas of what the potential benefits of the project will be for themselves, their businesses and their families. These include quick and accessible access to fuel and a convenience store, a safer environment due to increased activity and lighting and an overall upliftment of the area.

On the other hand, institutional bodies such as the Petroleum Retailers Alignment Forum (PRAF) have expressed their concern about the proposed new filling station and its impact on economic viability of existing filling stations in the area. They have also raised concerns with regard to the biophysical impact that the proposed new filling station will have on the environment as well as safety concerns.

Other filling station operators interviewed as part of this process indicated that the construction of the proposed new filling station will have detrimental economic impacts on their businesses. They may be required to reduce their operating hours, since they will no longer be able to afford additional staff during the night shift. This could lead to possible retrenchments.

Significance of the impact

Impact Table 8: Feelings in relation to the project

Nature	Critical about the desirability of the project		Impact status	-
Impact source(s)	Health, safety, economic concerns			
Affected stakeholders	Local residents, property owners and local businesses			
Magnitude	*Extent*		**Regional**	3
	Intensity		**Medium**	3
	Duration		**Short-term**	1
	Probability		**Possible**	2
Mitigation efficiency	Medium			M
Significance	Mitigation	*Yes* -		L
		No -		M

Proposed mitigation measures:

- Continuous consultation with the affected communities should take place to keep them informed;
- Consultation with the PRAF should take place on a continuous basis to understand, assess and mitigate their concerns where appropriate; and

- The main traffic stream into Groblersdal should not be cut off by the proposed new filling station. It is suggested that the current alignment of Jan van Riebeeck Street remains as is.

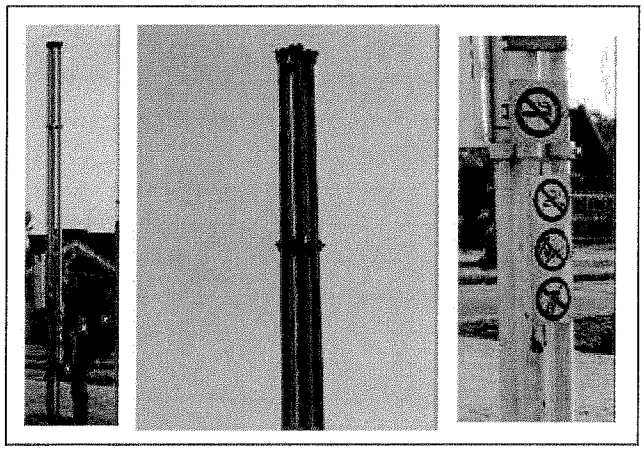
7.4.2.2 Impact: Actual health and fertility

Phase at which impact is relevant: **Prior to construction**
Construction
Operation

Description of the impact

This refers to the impact that the proposed new filling station will have on the health of the residents in the surrounding area. Nuisance factors such as noise, artificial light, VOC emissions and dust pollution should be taken into consideration. Even though the health impact of these factors may not be high (if mitigated), these factors still have a high psychological impact (refer to the impact on perceived health and quality of the living environment) on the residents and could, in turn, manifest in physiological symptoms. This impact is anticipated to occur primarily during the construction phase, but impacts such as light and noise pollution, due to motorist frequenting the filling station, will continue during its operational phase.

Fuel companies have already implemented various ways of mitigating and preventing these factors from occurring, by for example installing ventilation pipes, positioned away from buildings, carrying away any harmful VOC emissions. These ventilation pipes must terminate at least 3.5 m above the ground or 0.6 m above the building roof level. The pipe must be situated at least 3 m away from any source of ignition and must be earthed with a copper cable connected to a copper earth spike.



Fuel that permeates through soil and water resources could have detrimental impacts on the environment and human health issues. The safety of humans is therefore at risk at more subtle levels, such as when potable water supplies are contaminated. These occurrences are however closely monitored and procedures are in place to prevent it from happening.

Photo plate 13: Pipes carrying away harmful VOC emissions

It is also important to note that all petroleum products pose a health risk and it is critical that they be handled with precaution. Petrol contains Benzene, which can cause cancer through prolonged exposure. Although, scientists believed that exposure to low levels of petrol vapour are unlikely to be associated with cancer in humans. The ways in which fuels can enter the body can be through skin contact, vapour inhalation, ingestion and aspiration. This impact relates mostly to employees at the filling station and it is unlikely that customers will

be affected. It should however be noted that filling stations have to comply with strict health and safety regulations, as described earlier.

Significance of the impact

Impact Table 9: Actual health and fertility

Nature	Actual health and fertility	Impact status	-
Impact source(s)	Impact of filling station on health		
Affected stakeholders	Local residents		
Magnitude	*Extent*	**Regional**	**3**
	Intensity	**Low**	**1**
	Duration	**Long-term**	**4**
	Probability	**Possible**	**2**
Mitigation efficiency	High		H
Significance	Mitigation: *Yes* -		L
	Mitigation: *No* -		M

Proposed mitigation measures:

- Hazardous zones on site should be monitored and the prescribed prevention measures be put in place;
- Good health and hygiene practices should be put in place;
- Community members should be made aware of the fuel company's efforts in terms of preventing any serious harm nascent from VOC emissions, spillages or any other factor that may have a diverse effect on their health; and
- The fuel company should comply with all the relevant legislation, such as the OHS Act.

7.4.2.3 Impact: Perceived health

Phase at which impact is relevant: **Prior to construction**
Construction
Operation

Description of the impact

As was mentioned above, some impacts may be experienced on a psychological level, and these perceived impacts can often be greater than the actual impacts itself. Annoyance with impacts, such as noise, dust and artificial light pollution can cause individuals to create unnecessary and ungrounded fears in terms of their health. This impact may originate during the construction phase of the project and spill over into the operational phase of the project.

Unless these ungrounded fears are managed or addressed, the impact on the neighbouring business operators may escalate and grow into social conflict. It is therefore advised that precautionary measures be taken to educate and inform the immediate neighbours to the new filling station about the relevant health impacts and ways in which it will be managed.

Should this impact be properly mitigated, it is not anticipated that this impact will be long-term and these unrealistic fears should be dispelled on the short to medium term. The proper education of stakeholders can create a greater awareness and appreciation of the precautionary methods put in place to ensure a safe and healthy environment.

Significance of the impact

Impact Table 10: Perceived health

Nature	Perceived health	Impact status	-
Impact source(s)	Noise, light and nuisance impacts		
Affected stakeholders	Local residents		
Magnitude	*Extent*	**Regional**	**3**
	Intensity	**Low**	**1**
	Duration	**Short-term**	**1**
	Probability	**Possible**	**2**
Mitigation efficiency	High		H
Significance	Mitigation: *Yes* -		L
	Mitigation: *No* -		LM

Proposed mitigation measures:

- Community members should be made aware of the safety measures fuel companies implement to create a safe environment; and
- The fuel company should be monitored by the appropriate bodies (fire department and the Department of Water Affairs (DWA)) to ensure that these measures are complied and adhered to.

7.4.2.4 Impact: Aspirations for the future

Phase at which impact is relevant: **Prior to construction**
Construction
Operation

Description of the impact

The aspirations that residents and local business owners may have for their community's future development may differ from this proposal. This should be identified and managed in a proactive manner.

It is expected that this impact will occur both during the construction and operational phases of the project, but this impact could also be experienced prior to the construction phase. Should this impact be properly managed, it is not expected that this impact will last longer than the medium term of the operation.

The potential economic impacts that the proposed new filling station is likely to create will contribute substantially towards instilling a positive attitude in the affected communities.

Not everyone, however, will be equally positive about the proposed new filling station. Some filling station owners in the near vicinity may feel that the construction of a new filling station will negatively impact on the future viability of their businesses. Their aspirations for the future are negatively impacted on, and even though the exact economic impact can not be reliably determined (due to a lack of available supporting data), the source of this impact can not be denied.

The recent fluctuations in fuel prices also create an unstable economic environment for filling station owners to operate their businesses in. Consumer confidence has dropped and motorists are much more aware of their fuel consumption patterns than ever before. Should this situation continue into the foreseeable future, it could be a contributing factor in the downscaling of operations, to which the introduction of a new filling station in the vicinity, could be significant.

The existing filling stations in the area do however rely on existing traffic patterns to attract business. The flow of through-traffic on major through ways such as Jan Van Riebeeck Street is a key factor guiding consumer behaviour. Should the proposed filling station be located at the proposed site, it could potentially affect consumer behaviour, due to its convenience in terms of access and location to the industrial and commercial concerns in the vicinity of the site. The Brake and Clutch Caltex filling station is the most likely to be affected by the establishment of the new filling station.

Even though the construction of the new filling station may attract customers away from existing filling stations, the general feeling is however that fair competition, as promoted in the Constitution of the Republic of South Africa [No. 108 of 1996] and the Competition Act [No. 89 of 1998], are welcomed.

The purpose of the Competition Act is to promote and maintain competition in the Republic in order to:

- Promote the efficiency, adaptability and development of the economy;
- Provide consumers with competitive prices and product choices;
- Promote employment and advance the social and economic welfare of South Africans;
- Expand opportunities for South African participation in world markets and recognise the role of foreign competition in the republic;
- Ensure that small and medium-sized enterprises have an equitable opportunity to participate in the economy; and
- Promote a greater spread of ownership, in particular to increase the ownership stakes of historically disadvantaged persons.

The addition of a new filling station will motivate existing filling stations in the area to enhance their service to the community and to investigate new and more innovative ways in attracting business. Existing filling stations can use its niche markets, (e.g. car wash facility, workshop, fast food outlet), to attract different sectors of the market. This can ensure that each business is able to cater for a different market and to maintain sustainable sale levels.

Significance of the impact

Impact Table 11: Aspirations for the future

Nature	Fear of new competition (business)	Impact status	-
Impact source(s)	Loss of economic prosperity		
Affected stakeholders	Local business owners		
Magnitude	*Extent*	**Regional**	**3**
	Intensity	**Medium**	**3**
	Duration	**Medium term**	**3**
	Probability	**Possible**	**2**
Mitigation efficiency	Medium		M
Significance	Mitigation: *Yes*	-	
	Mitigation: *No*	-	H

Proposed mitigation measures:

- It is critical that the fuel company maintain a trusting relationship with the affected communities;
- The fuel company must be honest and transparent about the potential opportunities that the proposed filling station is likely to effect in these communities in order to manage any undue expectations; and
- Should the application for the filling station be granted, local business owners and other filling station owners should be aware of and implement measures to retain and maintain their current clients. This responsibility will lie with the affected parties themselves.

7.4.3 *Social Impact Assessment Category: Quality of the living environment*

The impacts related to the quality of the living environment refer to how appropriate, from a social point of view, the study area is to live in. These impacts relate directly to the biophysical environment and are accessed according to both a perceived and actual dimension.

Even though biophysical aspects are not assessed in the same detail as for example in an EIA, it is pertinent to pause and to discuss some of the main environmental concerns that have been raised.

Main environmental concerns

Although the assessment of environmental risks and concerns fall outside the scope of this SEIA, it is important to understand these issues as it pertains to the social environment.

Soil, Surface and Groundwater contamination

Contamination can occur as a result of spills and overfills and pipeline failure during the operation phase.

The degree of risk to groundwater posed by the release of fuel during these activities will depend on the engineering and operational control measures in place, and on the location of the facility.

The Geotechnical Report for the proposed new filling station recommended that, "due to the presence of a shallow perched water table at the site, the underground fuel storage tanks be placed in water proof brick or concrete containers that prevent access of the groundwater to the outside of the fuel storage tanks. On the inside the containers should be equipped with water table monitoring equipment and facilities to allow the installation of pumping equipment to measure the presence and level of any seepage fluids within the container and to allow these fluids to be pumped from the container. After placing the fuel storage tanks into the containers the space between the fuel tank and the container can be filled with sand or gravel material" (Blue Rock Consulting, 2010).

Ecological functioning

The clearing of vegetation and construction might have a major impact on the ecological systems.

Visual impact

This might result from the presence of the filling station (operational phase), as well as the clearing of vegetation and the presence of a construction camp during the construction phase.

Noise pollution

Filling stations are also a source of noise nuisance or disturbing noise, associated with motor cars and trucks braking and accelerating to and from such facilities. Other noise impacts, such as music playing over car radios or the public announcement system may also cause nuisance to surrounding business owners.

Air pollution

Petrol is a VOC which leads to ozone depletion at ground level and plays a role in photochemical smog. It has also been linked with respiratory disorders[17]. This could have a detrimental impact on individuals working and residing in the area of the proposed new filling station.

Waste

The main business activities of filling stations are the receipt, storage and dispensing of fuel on the forecourts to customers and the maintenance of equipment and the facilities thereof. These core responsibilities are often supported by either a car wash facility or a convenience shop, all of which generate waste. The type of waste generated by filling stations can be divided into two different waste types i.e. hazardous waste and non hazardous waste.

[17] VOC emissions contain carcinogens

- Hazardous waste are normally derived from maintenance activities of equipment and facilities (e.g. waste from separators, oil and oil / fuel rags, used oil cans, filters, polluted waste materials, cleaning fluid etc). This type of waste should be stored in containers dedicated and identified as hazardous waste, and should be stored in a bunded area or a wall enclosure to prevent seepage into soils and drains.

  The removal of hazardous waste from the filling station site should be controlled and should not be disposed of along with the general waste. It should be disposed of at licensed waste disposal sites by a service provider with a required permit or licence to do so. The site should be kept clean and free from any litter or waste that may cause a nuisance or be a threat to the health of persons.

- Non hazardous waste refers to your normal general waste such as kitchen refuse. Waste should be segregated in to streams such as plastics, metal, glass etc, for recycling. Wet and dry waste should also be separated.

7.4.3.1 Impact: Quality of the physical environment (actual and perceived)

Phase at which impact is relevant: **Construction**
Operation

Description of the impact

Social impacts experienced in the physical environment relates to exposure to dust, noise, risk, odour, vibration, artificial light etc. During the construction phase, it is expected that there will be a decrease in the quality of the physical environment. Noise levels and traffic volumes will increase as result of the construction activities.

There may also be concerns about the way in which contractors or filling station employees conduct themselves when on site, especially since the site is in such close proximity to businesses and commercial concerns. This impact also relates directly to the physical environment and closely relates to impacts on the health and social wellbeing of individuals, which has already been assessed.

Significance of the impact

Impact Table 12: Quality of the physical environment (actual and perceived)

Nature	Quality of the physical environment (actual and perceived)	Impact status	-
Impact source(s)	Noise, dust and nuisance impacts		
Affected stakeholders	Local residents and businesses, construction workers, local authorities		
Magnitude	*Extent*	**Regional**	**3**
	Intensity	**Medium**	**3**
	Duration	**Short-med term**	**2**
	Probability	**Possible**	**2**
Mitigation efficiency	Medium		**M**
Significance	Mitigation: *Yes* -		**LM**
	Mitigation: *No* -		**M**

Proposed mitigation measures:

- Existing community forums must serve as liaison between the affected stakeholders and the fuel company and can discuss traffic, dust, noise and construction related concerns with the fuel company,
- Construction traffic off peak times should be instated;
- With regards to the protection of the under ground water resources and soils, it is recommended that the mitigation measures proposed by the EIA Report and the Geotechnical Report be consulted and put into effect; and
- Adequate monitoring of the biophysical impacts should occur in order to address any unnecessary inconveniences to stakeholders.

7.4.3.2 Impact: Aesthetic quality

Phase at which impact is relevant: **Construction**
Operation

Description of the impact

This impact relates to the non-market, non-consumptive aesthetic and moral value ascribed to a location (impacts on outlook, vistas etc.) When assessing the impacts of a proposed new filling station, concerns regarding the effect of the project on the aesthetic value on the area are often raised.

During the construction phase, there may be a temporary drop in the visual appearance of the site and it is advised that all building rubble and construction material be removed to an authorised site for disposal as soon as possible.

In the long term, however, the presence of a new filling station will be aesthetically pleasing to the surrounding environment and it is envisioned that the filling station will add to the general development and upliftment of the area.

Significance of the impact

Impact Table 13: Aesthetic quality

Nature	Aesthetic quality		Impact status	-
Impact source(s)	Temporary decrease in the visual quality of the development site			
Affected stakeholders	Local communities and passers-by			
Magnitude	*Extent*		**Site**	**2**
	Intensity		**Low**	**1**
	Duration		**Short-term**	**1**
	Probability		**Probable**	**1**
Mitigation efficiency	Medium-High			**MH**
Significance	Mitigation	*Yes* -		**L**
		No -		**LM**

Proposed mitigation measures:

- The fuel company must ensure that the aesthetic quality of the environment are enhanced, rather than detracted from. Their corporate branding must be sensitive to the receiving environment;
- The fuel company, in liaison with the filling station owner must ensure that the filling station and its surrounds (forecourt, gardens, parking bays, building exterior) be maintained and kept neat and clean;
- Shrubs and bushes must be closely trimmed for aesthetical, as well as, security reasons; and
- In liaison with existing community forums, an attempt should be made to enhance the aesthetic quality of the surrounding environment.

7.4.3.3 Impact: Personal safety and hazard exposure (actual and perceived)

Phase at which impact is relevant: Construction
Operation

Description of the impact

It is common for concerns about personal safety and risk exposure to be raised when new filling stations are constructed. These concerns can be about actual risks, such as fire risks, or perceived risks, such as the attraction of undesirable people to the area.

The Occupational Health and Safety Act (Act 85 of 1993) Section 7, and in specific, GNR 859 of 2 September 2005, states that:

(1) The chief inspector may direct -
  (a) any employer in writing; and
  (b) any category of employers by notice in the Gazette,

to prepare a written policy concerning the protection of the health and safety of his employees at work, including a description of his organisation and the arrangements for carrying out and reviewing policy.

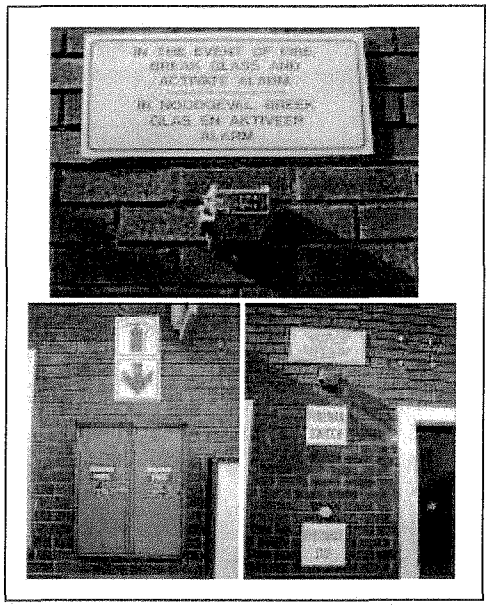
Fuel companies are responsible for implementing Health, Safety, Environment and Quality Policies and various ways of preventing major hazardous accidents from occurring. Hazardous zones have been classified by national standards authorities for filling station forecourts in order to set criteria for electrical equipment used and installed in theses zones.

Some actual concerns include the risk of flammable vapour, or fire, and are mitigated by minimising the amount of vapour emitted from the underground tank and piping systems other than from the vent. A second measure is to contain or restrict the movement of vapours, and the third measure is to eliminate sources of ignition. In order to prevent vapours from spreading, the installation of a gas break manhole is required. These manholes are filled with sand at all times and thereby acting as a barrier for fuel vapour movement.

The equipment for storage and handling of fuel on a forecourt consists essentially of underground storage tanks, fuel lines and pumps in various configurations. Installation standards have changed through the years with higher specifications, corrosion resistant materials with additional environmental protection measures such as secondary containment for fuel lines. Most of these improvements to installation standards have taken place underground in order to provide more environmental protection.

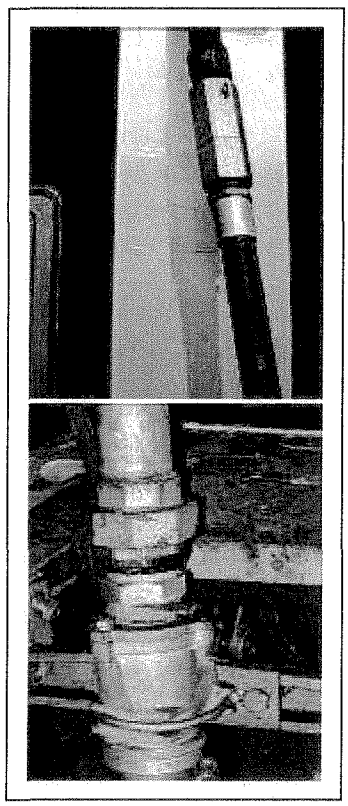
The images (Photo plate 14) below indicate general practices being employed in order to prevent any major spillages or fire hazards. Fuel dispensers are fitted with emergency shut-off (shear) valves in the event of the dispenser being knocked over by a vehicle. The images also illustrates an example of a pipe that can be disconnected without any spillage taking place, should a vehicle drive off with the fuel hose still in the tank of the vehicle.

Very strict fire control measures must be put in place, which includes signage, fire hydrants and the elimination of sources of ignition. It is of utmost importance that interested and affected parties be aware of the measurements put in place to protect their safety, as well as the overall safety of the filling station.

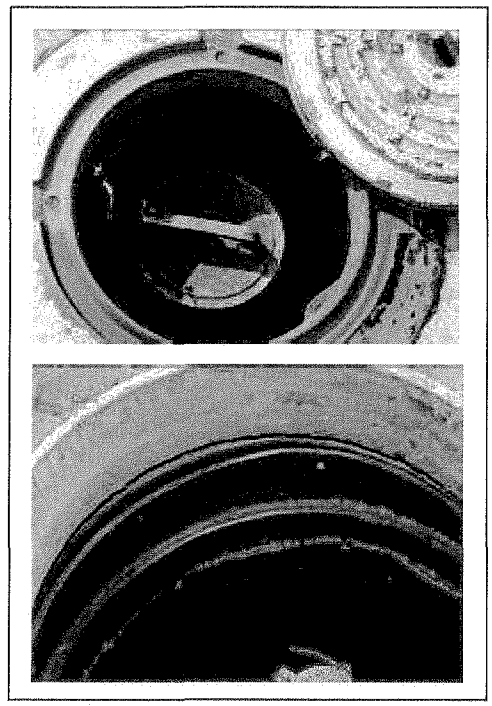


Fire hazard precautions

Warning signage



Emergency shut-off valves on fuel pumps to prevent spillages should accidents occur



Protection mechanisms against underground spillage

Photo plate 14: Safety measures employed at filling stations

Significance of the impact

Impact Table 14: Personal safety and hazard exposure (actual and perceived)

Nature	Safety and exposure to hazards	Impact status	-
Impact source(s)	Fuel, vehicles, crime		
Affected stakeholders	Construction workers, local residents and businesses, customers		
Magnitude	*Extent*	**Site**	**2**
	Intensity	**Medium**	**3**
	Duration	**Long-term**	**4**
	Probability	**Possible**	**2**
Mitigation efficiency	High		**MH**
Significance	Mitigation: *Yes* -		**LM**
	Mitigation: *No* -		**M**

Proposed mitigation measures:

- The fuel company must ensure that the filling station owner comply to all the requirements as stipulated by its health and safety policy; and
- Residents and business owners should be informed of these policies and must be able to report any irregularities to the relevant community forums.

7.4.3.4 Impact: Crime and violence (actual and perceived)

Phase at which impact is relevant: Construction
Operation

Description of the impact

The impact that newcomers or strangers will have to the safety and security of the surrounding residents and business owners should be considered.

The increase in the influx of potential jobseekers as well as the increase in movement and activity, as a result of the new filling station is likely to result in an increase in petty criminal activities.

Even though the proposed new filling station may provide a safe haven for motorist during night time, it is also anticipated that the presence of construction workers, new employees and the regular flow of motorist will impact on the actual crime and violence in the neighbourhood. Filling stations are notorious for attracting unlawful activities such as drug dealing, as it is perceived to be a safe public open space without the necessary vigilance of the police service. It is also accessible 24 hours a day. These activities, should they take root in the community, could be potentially upsetting.

Security concerns are not only relevant to community members and surrounding businesses, but may also affect the filling station owner and employees. Because of their visibility and vulnerability, filling stations have become easy and attractive targets for criminals. In recent times, numerous filling stations have been robbed and its employees have been attacked, seriously injured and on some occasions even killed.

It is important to train staff in terms of procedures to be followed in such situations, in order to protect the filling station and more importantly, their lives.

Significance of the impact

Impact Table 15: Crime and violence

Nature	Criminal activities		Impact status	
Impact source(s)	Fear for personal safety			
Affected stakeholders	Local residents and property owners			
Magnitude	*Extent*		**Regional**	3
	Intensity		**Medium**	3
	Duration		**Short-med term**	2
	Probability		**Likely**	3
Mitigation efficiency	Medium			M
Significance	Mitigation	*Yes*		L
		No		M

Proposed mitigation measures:

- It is advised that Closed Circuit Television (CCTV) be installed, as this serves to identify unauthorised activity. Signage, such as "all operations on these premises are monitored and recorded by CCTV" can act as a deterrent to potential criminals;
- Install proper lighting to assist customers and to deter criminals; and
- Train staff in order to assess emergency situations and act according to pre-set protocols in order to ensure their safety.

7.5 Social Change Process: Institutional and legal processes

Institutional and legal processes are those processes that affect the efficiency and effectiveness of various organisations that are responsible for the supply (and security of supply) of the goods and services on which people depend (fuel). These organisations include government agencies (DMR), non-government organisations (PRAF) and the commercial sector (filling station operators such as BP, Shell, Engen, etc). This process can be subdivided into three sub-categories which include:

- Institutional globalisation and centralisation;
- Decentralisation; and
- Privatisation.

Although it is not anticipated that any of the above processes will take place, it is important to note that the filling station will be responsible for supplying a valuable service to the community. The filling station owner should ensure that their level of service comply with the standards set by the industry.

It is also important to note here that when operating a filling station, the owner be aware of legislation dealing with health, safety and environmental issues. These include the OHS Act, the COID Act, the NWA, the ECA as well as the NEMA. Other provincial and municipal by-

laws that govern the standards, with which employers have to comply with, should also be taken into consideration.

The OHS Act stipulates the duties of both employers and employees. Section 8 and 9 of the Act stipulates the general duties of an employer, which includes:

- Provide and maintain a working environment that is safe and without risk to the health of employees; and
- Ensure that persons other than the employees are not exposed to health and safety hazards due to his activities.

According to Section 14 of the Act, it is stipulated that employees take reasonable care of themselves and others who may be affected by what he does.

According to the NWA, a person who owns, controls, occupies or uses land on which an activity is / was performed and causes or could cause pollution must take measures to prevent pollution form occurring, continuing or recurring. Should any incidents occur, the responsible person must report it to the DWA, the South African Police Department, the Fire Department and the relevant catchment management agency as soon as possible.

7.6 Social Change Process: Emancipatory and empowerment processes

Emancipatory and empowerment processes refer to those processes that lead to an increase in the ability of local people to affect (contribute to) the decision making that affects their lives. These processes are sub-divided into:

- Democratisation;
- Marginalisation and exclusion; and
- Capacity building.

It is anticipated that a measure of capacity building will take place during the construction and operational phases of the new filling station, as new job opportunities will allow local residents to gain knowledge, networking capacity and an increase in their skills base.

7.6.1 Impact: Capacity building (emancipation and empowerment)

Phase at which impact is relevant: **Construction**
Operation

Description of the impact

Capacity building refers to the conscious increasing of knowledge, networking capability and the skills base amongst local people. It is predicted that the proposed new filling station will add to capacity building in the community, as opportunities exists to create skills development and on-the-job training. This type of skills development should however encompass more skills than merely the technical skills of the construction or the operational phases.

In terms of training, it is required that all employees be trained in the function of their job and must incorporate health, safety, security and environmental aspects. Employees must be trained in emergency procedures, the location of fire fighting and first aid equipment, hazardous substances and work procedures, the reporting of incidents, personal hygiene,

security and personal safety (in the case of robberies or hijackings) and the type of personal protective equipment required as well as the use thereof.

Moreover, it is recommended that the fuel company develop a skills development programme to train unskilled and unemployed local persons in the community, who can be employed at the filling station. This will contribute to the establishment of sustainable human settlements where communities are empowered beyond the construction phase of the filling station.

Significance of the impact

Impact Table 16: Capacity building

Nature	Skills transfer to local employees and capacitating the poor and disadvantaged communities		Impact status	+
Impact source(s)	The potential construction of a new filling station			
Affected stakeholders	Local labourers and construction workers			
Magnitude	*Extent*		**Regional**	3
	Intensity		**Low**	1
	Duration		**Short-term**	1
	Probability		**Possible**	2
Mitigation efficiency	Medium			M
Significance	Mitigation	*Yes* +		M
		No +		L

Proposed mitigation measures:

- Recruit and train local residents to supply unskilled labour during the construction phase,
- Recruit and train local residents to supply skilled labour during the operational phase of the filling station; and
- Train local people in life skills or portable skills where possible.

7.6.2 *Social Impact Assessment Category: Institutional, legal, political and equity impacts*

7.6.2.1 Impact: Impact equity
Phase at which impact is relevant: Operation

Description of the impact

Impact equity is related to the fairness of the distribution of impacts across the community. It must be ensured that the people who will benefit from the construction of a new filling station (the fuel company) must also share in carrying the environmental and social costs. The construction of a new filling station in the area should not only consider the economic benefit it will have for the fuel company, but must consider and contribute to the social, economic and environmental upliftment of the receiving environment. Should the affected communities

feel that they are not benefiting equally from the new filling station, it could cause social conflict and uproar.

It will not only be businesses who will be impacted on, but also local residents in the surrounding area. Even though it is anticipated that local residents will benefit from the proposed development in terms of employment and business development, it is also important to consider other factors such as their social wellbeing and health. It is also important to consider the economic benefits or threats that the business concerns will encounter.

Significance of the impact

Impact Table 17: Impact equity

Nature	Diffused benefit		Impact status	+
Impact source(s)	Impact equity			
Affected stakeholders	Groblersdal community and business owners			
Magnitude	*Extent*		**Regional**	3
	Intensity		**Medium**	3
	Duration		**Long-term**	4
	Probability		**Likely**	3
Mitigation efficiency	Medium			M
Significance	Mitigation	*Yes* +		M
		No -		LM

Proposed mitigation measures:

- Benefits must be ploughed back into the community. The existing community forums can assist in ensuring impact equity, and
- The fuel company must convey the message of shared benefit to the relevant authorities and aid in empowering the community on all levels, starting with providing information on the correct procedures to follow to obtain the required results.

7.6.3 *Social Impact Assessment Category: Gender relations*

Gender gaps are widespread in access to, and control over, resources in economic opportunities, in power and in political voice. Women tend to bear the largest and most direct social impacts, and therefore it is a core social impact issue (Vanclay, 2003:88). Females often struggle to obtain access to and control over resources, economic opportunities, power and political voice.

7.6.3.1 Impact: Gendered division of labour

Phase at which impact is relevant: **Construction**
Operation

Description of the impact

This impact refers to the unequal distribution of workload between men and women in relation to production, in terms of wage labour and other household income strategies. The petroleum industry in general has in the past not lent itself to employment of women. In the construction and to some degree in the operational phase, women will have less opportunity to be employed.

However, with recent developments in the fuel industry and the establishment of convenience stores, opportunities to employ females have increased drastically. Females are now able to be employed as cashiers, accountants, managers and even petrol attendants. The only obstacle that remains is the prejudiced concept of the gendered division of labour that is still prevalent in the cultures and psychologies of humans.

Significance of the impact

Impact Table 18: Gender relations

Nature	Equal gender relations		Impact status	+
Impact source(s)	Gendered division of labour			
Affected stakeholders	Females in general			
Magnitude	*Extent*		**Regional**	3
	Intensity		**Low**	1
	Duration		**Short-term**	1
	Probability		**Possible**	1
Mitigation efficiency	Low - Medium			
Significance	Mitigation	*Yes*	+	
		No	-	L

Proposed mitigation measures:

- Women must have equal employment opportunities,
- Training and skills development should be ensured for women, and
- Salaries of women must be equal to that of men when undertaking the same job.

8 ECONOMIC IMPACT ANALYSIS

In this section, a description, discussion and analysis of the economic impacts that could result from the development of the proposed new filling station is conducted. The analysis will be done for impacts during construction and operational phases.

8.1 Measuring economic impacts

An economic impact model was used to quantify the economic impacts where quantitative data was available for good estimates and the results are included in each impact.

Modelling tools

As was explained in Section 2.1.4, the instrument used to estimate and forecast the impacts of development investments, is the econometric I/O Model. This model contains information on inter-sector relations, including tables that describe, for each sector included in the model, the amount of input the sector requires from other sectors to produce one unit of output.

The I/O technique provides a snapshot of economic production at a given time and as such has numerous application possibilities. The most prominent application of this technique involves modelling the impact of changing production functions on general economic equilibrium.

In instances where it is impossible to quantify the economic impacts, the option utilised is the application of a significance rating approach.

Significance rating approach

Please refer to section 2.4 for a discussion on the significance rating approach.

8.2 Describing Economic Impacts

Economic impacts are those impacts that affect the level of economic activity in a region, either positively or negatively. For instance, if they have a direct or indirect shock on the economic stance of an area, including the residents and businesses thereof by altering employment levels, retail sales, spending patterns etc. The magnitude of the economic impact can depend highly upon the size of the project or investment. If for example the project is big then its impact will be on a larger jurisdiction, the opposite is also true. In this case it can be expected that the impact will be imposed mostly on the study area, which consists of Groblersdal CBD.

To quantify the most likely economic impacts of a new venture; two types of economic impacts can be measured, which are:

- **Direct impacts:** changes in local business activity occurring as a direct or consequence of public or private capital expenditure. In this case, this would mean the construction of the filling station.
- **Indirect impacts:** impacts that come about in a transmission mechanism process. Such impacts result from a particular change in one variable that leads to changes in other variables. For instance, a reduction of filling stations sales could result in a

reduction of workers, which would increase the unemployment rate, which may result in increased crime etc.

8.2.1 *New business sales*

New business sales refers to the value of all inter and intra-sectoral business sales generated in the economy as a consequence of the introduction of the proposed new development. This accounts for all direct, indirect and induced sales benefits. Business sales equates to turnover.

Capital expenditure (CAPEX) refers to the investment in new and additional capacity and includes all expenditure on all items related thereto. The estimated CAPEX for the proposed new filling station development is estimated at about R 6 million.

The capital investment that is budgeted for development of the proposed new filling station is expected to stimulate the local economy. In order to measure the economic stimulation, the changes in economic aspects need to be quantified (Table 12).

Table 12: Annualised impact on business sales during construction

Impact Variable	New Business Sales (R million per Annum)
Direct (i.e. buildings & infrastructure)	8.7
Indirect	11.1
Total	**19.8**

The construction phase of the proposed new filling station will lead to the expansion of business sales for existing businesses located within the area to the value of slightly more than R 19.8 million per annum. Of which R 8.7 million is attributed to direct sales (buildings and infrastructure development) and R 11.1 million is attributed to indirect impacts.

The new business sales are attributed to sales in materials used in construction such as bricks, pipes, concrete etc. That will be purchased in the local area, as well as particular services such as engineers, plumbers, electricians, etc that will be sourced within the vicinity of the proposed site. These changes are measured in terms of new business sales, i.e. new sales that will be generated in the local economy as a direct result of the capital investment in the new development, as illustrated in Table 13.

In other words, during the construction, the capital investment of R 6 million could lead to an increase of total new annual business sales, to the value of R 19.8 million (including direct and indirect impacts).

The total number of new business sales (direct and indirect) during the operational phase of the proposed development, amounts to R 13.8 million (Table 13).

Table 13: Annual impact on new business sales during operation phase

Impact Variable	New Business Sales (R million per Annum)
Direct (i.e. buildings & infrastructure)	6.3
Indirect	7.5
Total	**13.8**

If the proposed development occurs, goods and services bought in the local economy will result in additional turnover, which in turn could result in the need to hire more people, which in turn could create additional household income and as a result additional spending power. Thus, as injection of growth occurs within the local economy, this injection can in turn create further growth (new business sales) within the economy.

As indicated in Table 13, the R 13.8 million new business sales expected during the operation phase is comprised of R 6.3 million from direct impact and R 7.5 million due to the indirect impacts.

Impact Table 19: Significance rating of new business sales

Phase	Probability	Duration	Scale	Sum	Magnitude	Significance
Construction	5 Definite	1 Immediate	3 Regional	9	6 Moderate	54 Low (+)
Operational	5 Definite	4 Long term	3 Regional	12	4 Low	48 Low (+)

The proposed development could increase the standards of living and new business sales, which, even though is a positive impact, can be enhanced. To increase the standards of living locally, the contractors employed should aim to ensure that local or surrounding people are employed where possible, and all the employees should be enticed to spend their income earned locally. This can be achieved by ensuring that the goods and services required by the employees are provided locally (if possible), so that they needn't spend their money elsewhere. This would be the responsibility of local filling station owners in the immediate surroundings. The increase in the population and purchasing power of the proposed development will enable the formation and sustainability of new businesses. The establishment of new businesses in the area will have an additional positive impact in the increased standard of living during operation. The employment of local residents during operation (as far as practically possible) would increase the standard of living of the residents since they would have a higher disposable income and less transportation costs.

8.2.2 *Gross Geographic Product (GGP)*

One of the most important economic indicators used to signify economic growth and value is the GGP. GGP refers to the value of all final goods and products produced during a one-year period within the boundaries of a specific area. The net effect of the construction of the proposed new filling station on increased GGP is illustrated below (Table 14).

Table 14: Annualised GGP impact during the construction phase

Impact Variable	Gross Geographic Product (R million per Annum)
Direct (i.e. buildings & infrastructure)	2.9
Indirect	3.7
Total	**6.6**

The capital investment of R 6 million could lead to an annual increase of total GGP, of R 6.6 million of which R 3.7 million is due to the indirect impacts. Table 15 provides an indication of the impact on GGP during operation.

Table 15: Annualised GGP impacts during the operational phase

Impact Variable	Gross Geographic Product (R million per annum)
Direct (i.e. buildings & infrastructure)	3.6
Indirect	2.7
Total	**6.3**

The total increase in GGP (direct and indirect) during the operational phase of the proposed development amounts to approximately R 6.3 million.

The result of this potential increase in GGP would be due to an increase in new markets as well as in the number of goods and services bought from local businesses, which could lead to these businesses expanding and as a result requiring additional people to be hired. These multiplier effects could lead to further growth of the economy.

Change in GGP reflects the sum of wage income and corporate profit generated in the study area as a result of an exogenous change in the economy, in this case the development of a new filling station.

According to the study's findings the current GGP contribution made by the trade industry in the EMLM is 19.4%. The potential increase in GGP brought by the proposed filling station can be expected to mostly be due to the stimulation of the trade sector, which is expected to have a much larger share to GGP. The development of the new filling station would improve economic activity in the area and cement Groblersdal as the economic hub of the region.

Impact Table 20: Significance rating of GGP

Phase	Probability	Duration	Scale	Sum	Magnitude	Significance
Construction	5 Definite	1 Immediate	3 Regional	9	6 Moderate	54 Low (+)
Operational	5 Definite	4 Long term	3 Regional	12	4 Low	48 Low (+)

Additional GDP will be created from the capital injection and financial expenditure on the project. Nonetheless measures to stimulate the economy to its maximum potential can be put in place. The development will bring about increased economic stimulation but in order to ensure that the local economy is stimulated to a maximum, the spending undertaken should as far as possible be undertaken locally. The local economy could also be stimulated by increasing the number of local areas residents who obtain jobs, enhancing the opportunities of local businesses to obtain project construction and supply contracts, and encouraging development of local businesses with backward or forward linkages to the project.

8.2.3 *Employment and associated skills transfer*

Total employment reflects the number of additional jobs created by economic growth. This is the most popular measure of economic impact as it is easier to comprehend than large, abstract Rand figures. In spite of this, job counts have two major limitations:

(1) they do not necessary reflect the quality of employment opportunities; and
(2) they cannot be easily compared to the public costs of attracting those jobs (through subsidies, tax breaks or public investments).

Constructing the proposed new filling station will result in direct jobs being created for the construction of the various facilities. A total of 17 workers (80% full time workers and 20% part-time workers) are expected to be directly employed during the construction phase (17 man years) of the proposed new filling station. Indirectly, jobs are also created in industries that provide goods, materials and services. For example, an additional amount of goods used in construction will be required from business and industries related to the construction sector. This could lead to an increased number of jobs being created in these businesses, i.e. in order to increase output (Table 16).

Table 16: Annualised impact on employment during construction phase

Impact Variable	Employment (per Annum)
Direct (i.e. buildings & infrastructure)	17
Indirect	13
Total	**30**

The direct jobs during construction will for the most part be appropriated to building and construction workers, project managers, professional workers such as engineers, architects, etc. The indirect job opportunities will mainly be in the fields of production, manufacturing, sales and administrative occupations. The total number of new jobs created (direct and indirect) as a result of the capital investment of the proposed development, amounts to approximately 30 annual jobs (17 direct and 13 indirect).

It is important to note that the 30 job opportunities during the construction phase represent one person per one full year employment. Of importance is that the effect of these created jobs would be "lost" upon completion of the development, in the sense that it will simply move on to the next construction project and no longer be as a result of the construction of the proposed new filling station.

As a result of the businesses operated in the study area, after the construction phase and the expected increase in annual turnover, it is estimated that the economy will be able to, once the project has reached maturity, sustain the employment opportunities as indicated in Table 17.

Table 17: Annualised employment impact during the operation phase

Impact Variable	Sustainable Employment (per annum)
Direct (i.e. buildings & infrastructure)	24
Indirect	10
Total	**34**

A total increase of 34 employment opportunities is expected during the operation phase. Of this total amount of employment opportunities generated and sustained, 24 jobs would be created as a direct result of the development and 10 jobs would be created as an indirect impact in ancillary industries.

Permanent employment that would be created when the proposed new filling station is at its operational phase would include the employment of fuel attendants, salesman for the shop, general manager, etc. The implication of an additional 34 permanent jobs being created in the local economy; is that multiplier effects could result in additional income being generated in terms of additional household income for the local population. Most of this supplementary income would be spent in the local economy (excluding leakages into the regional economy), which would result in increased turnover for local businesses.

With an increase in employment a definite transfer of skills will occur. The skills transfer will mostly be limited to on the job training, which during the construction phase will be limited to 4 months and during the lifespan or operation of the filling station will be sustained for the duration of the operation phase. Increased skills have a positive impact on the economy, albeit mostly elementary skill acquisition.

It is important to take note that employment opportunities arising from the operation of the filling station could attract more people from outside the local area, due to the fact that the study area has medium to high income groups who would rather be interested in occupying other forms of employment and the level of unemployment in the area is highly insignificant at 1% (Statistics SA, 2001).

Impact Table 21: Significance rating of employment

Phase	Probability	Duration	Scale	Sum	Magnitude	Significance
Construction	5 / Definite	1 / Immediate	3 / Regional	9	6 / Moderate	54 / Low (+)
Operational	5 / Definite	4 / Long term	3 / Regional	12	4 / Low	48 / Low (+)

In order to enhance the positive impact of job creation, it is important to ensure that the creation of employment opportunities lead to employment of local residents as far as possible. Employment opportunities during construction should be targeted at local residents and to people from the surrounding townships. It is also important to decrease the dependency on temporary employment and increased standards of living and income created during the construction phase once construction has terminated.

It is advised that fair employment criteria be used in sourcing employment from the surroundings, a skills survey should be considered or else employment should be undertaken through assistance from the ward councillors and community leaders.

8.2.4 *Impact on existing filling stations*

It was revealed, earlier on in the report, that due to the development of the proposed new filling station, some of the filling stations will experience a loss of sales during the initial operation phase of the proposed filling station. The proposed development of the filling station might have a direct impact on the number of litres sold per month by the existing filling stations. The impact on the existing filling stations that do not share the same direct traffic streams as the proposed site is described in Table 18.

Table 18: Impact on existing filling stations without direct-shared traffic stream

Phase	Operational
Activity	Trading on the new site
Nature of Impact	Slight impact on transient trade
Extent of Impact	Local Area
Duration of Impact	Long term
Intensity of Impact	Low
Probability of Impact	Definite
Significance of impact	Medium

The development of the proposed filling station is envisaged to serve the transit traffic to the east from the CBD and also address the gap for such services that would be created by future envisaged developments as per development plans for the area.

Table 19: Impact on existing filling stations with direct-shared traffic stream

Phase	Operational
Activity	Trading on the new site
Nature of Impact	Medium impact on transient trade
Extent of Impact	Local Area
Duration of Impact	Medium term
Intensity of Impact	Medium
Probability of Impact	Definite
Significance of impact	High

Impact Table 22: Significance rating of impact on surrounding filling stations

Phase	Probability	Duration	Scale	Sum	Magnitude	Significance
Construction	0 None	1 Immediate	2 Local	3	0 Minor	0 None
Operational	5 Definite	3 Medium term	2 Local	10	6 Moderate	60 Moderate (-)

The traffic growth that is expected on the completion of the proposed developments in the area will help to replace the loss of sales that would have been experienced from the development of the proposed filling station. Table 20 represents the loss of sales to be potentially experienced by the respective filling stations in the local market.

The majority of the existing filling stations are currently operating at a relatively low level, which is why many stations have ancillary activities to boost profitability. Many of the stations are old and are in need of upgrading in order to attract clientele. Although the proposed filling station will have an impact on the existing filling stations it is estimated that all the stations will remain feasible due to the ancillary activities. No mitigation is thus required.

Table 20: Expected sales

	Present sales	Expected New sales	Loss of Sales	Percentage of loss
FCM Total Groblersdal	300 000	266 500	33 500	11.17
Brake & Clutch Caltex	420 000	366 400	53 600	12.76
Ener-Gi	230 000	193 300	36 700	15.96
Panorama	170 000	145 300	24 700	14.53
Loskop Valley BP	250 000	225 800	24 200	9.68
Total Valley	260 000	235 100	24 900	9.58
Caltex Hereford Street	200 000	193 600	6 400	3.20
Exel Hereford Street	250 000	234 000	16 000	6.40
Total	2 080 000	1 860 000	220 000	10.6

8.2.5 *Impact on traffic volumes*

Traffic flow will be affected during the construction phase and the operational phase on the roads adjacent to the proposed new filling station. For the duration of the construction phase, a lot of earthwork is expected to take place and this will bring a number of heavy construction vehicles in the area that will then disturb normal traffic flow in the area. No permanent road closures will occur since the proposed project entails the construction of a new filling station on the property adjacent to the road, however, the road adjustment would definitely impact on mobility of traffic which might lead in creating a temporary detour off the main road.

During the operational phase of the proposed new filling station, traffic flowing in and out of the filling station is expected not to have much of an impact on traffic flow though the adjacent roads have a relatively high traffic flow especially during peak hours. Traffic on the negative lane may find it hard to access the site because of the opposing traffic and this might cause traffic flow disturbances. Vehicles on the R33 to the east would have no difficulty accessing the filling station as opposed to the vehicles from the east to the CBD, and vehicles form the eastern part of the industrial area.

The majority of increase in traffic will be a result from the new developments in the area and not necessarily as a result of the proposed new filling station.

Impact Table 23: Significance rating of traffic flow

Phase	Probability	Duration	Scale	Sum	Magnitude	Significance
Construction	5 Definite	1 Immediate	2 Local	8	8 High	64 Moderate (-)
Operational	3 Likely	4 Long term	1 Site	8	4 Low	32 Low (-)

Measures to be considered in order to have minimum negative impact to sites within close proximity of the proposed site in terms of traffic volume include the following:

- Visible signage should be put up for convenient access to the site;
- Access roads to the site should be designed in such a way that traffic flow around the site does not get greatly impaired; and
- Business development adjacent to provincial roads must adhere to building lines and development requirements of the relevant National or Provincial Roads Agency.
- Business development to conform to development conditions as per the Town Planning Scheme or Land Use Management System (LUMS) as applicable.

8.2.6 *Increased standard of living*

It is expected that the proposed new filling station will generate additional employment opportunities and therefore reduce unemployment and generate income. Increased income can be associated with increased buying power in the area and as a consequence raise the standard of living in the area.

Linked to increased purchasing power is the subsequent increase in business opportunities. There can be new developments of businesses sourcing indirectly from the proposed new filling station. Due to increased purchasing power, additional business sales can be expected and the generation of additional turnover will enhance the economy and its people.

In summary, the large revenue that will be initially invested will generate large amounts of revenue due to multiplier effects in the different sectors of the economy. This can be linked to the new business sales that result to increase GGP and finally improved living standards.

Also businesses and employees who are located in close proximity to the proposed new filling station site would benefit since they would have shorter distances to travel to fill up or make purchases from the convenience store and this can be viewed as improved living standards.

It is also anticipated that increased standard of living would result as the filling station will provide quite a high number of employment opportunities due to all the ancillary activities proposed for the site.

Impact Table 24: Significance rating of increased living standards

Phase	Probability	Duration	Scale	Sum	Magnitude	Significance
Construction	5 / Definite	1 / Immediate	3 / Regional	9	6 / Moderate	54 / Low (+)
Operational	5 / Definite	4 / Long term	3 / Regional	12	4 / Low	48 / Low (+)

Increased standards of living can be enhanced similarly to the mitigations provided for new business sales.

8.2.7 *Service provision*

The development of a competitor in any market will lead to better service delivery by other market players in order to capture a larger share of customers in the market.

In this case, the operation of the new filling station will force the existing filling stations to improve on their quality of service provision and this may entail the employment of more staff to service customers in quicker and more efficient ways. In addition it could also lead to the improvement of facilities at the various filling stations.

The proposed new filling station would provide improved service delivery since it is mainly envisaged to service the traffic from the CBD to the east.

Impact Table 25: Significance rating of improved service provision

Phase	Probability	Duration	Scale	Sum	Magnitude	Significance
Operational	3 / Medium	4 / Long term	2 / Local	9	7 / Moderate-high	63 / Moderate (+)

No mitigation is required for this impact.

8.2.8 *Increased government income*

The construction of the infrastructure required for the development of the proposed new filling station will have a positive impact on the economy due to:

- Increased financial spending in the economy related to increased infrastructure investment;

- Civil construction; and
- An increased expenditure by employees.

The local area and its activities (businesses and shops, etc) are expected to be stimulated economically. This will mainly be due to the increased spending expected from the increased salaries and wages paid to employees during the construction and operational phase. This will have a knock-on effect on suppliers of goods and services in other areas as well.

The multiplier, or spin-off effects, associated with this economic contribution (namely capital expenditure, salaries and wages, etc) include additional Gross Domestic Product (GDP) arising from the capital investment, improved standards of living, decreased dependence on pensions, and increased disposable income and ability to purchase additional goods and / or establish other business enterprises.

Change in GDP essentially reflects the sum of wage income and corporate profit generated in the study area as a result of an exogenous change in the economy, in this case the development of the proposed new filling station.

The proposed new filling station will generate income that will be taxed by the government. More relevant to this project, is that the government regulates fuel prices and therefore for any fuel sales made by the filling station, the government will get a share of the income generated.

Local benefits could accrue to the government through an increased tax base and increasing the capacity of the local municipality and other social and service support actions. The increased government income from tax will mostly be as a result of increased economic activity during the operational phase. Increased tax received by the government will be in the form of company tax, Pay as you earn (PAYE), Unemployment Insurance Fund (UIF), rates and taxes, fuel levies, etc.

Quantification of the tax effects that accrue to the National Government and the local municipality's revenue (from rates and taxes) are excluded due to insufficient available information.

Impact Table 26: Significance rating of government income

Phase	Probability	Duration	Scale	Sum	Magnitude	Significance
Construction	5 Definite	2 Short term	3 Regional	10	6 Moderate	60 Moderate (+)
Operational	5 Definite	4 Long term	3 Regional	12	4 Low	48 Low (+)

The increase in government income is a positive impact that is likely to take place due to the proposed development.

Local and national benefits that will accrue to the government during the construction and operation phases are a given and no mitigation is required. It is however important that as much as possible procurement is done within neighbouring areas to increase the impact on local government income.

9 CONCLUSIONS AND RECOMMENDATIONS

Judge J Sachs, in the Constitutional Court Judgement of July 2007 made the following statement[18]:

Running right through the preamble and guiding principles of NEMA is the overarching theme of environmental protection and its relation to social and economic development. Economic sustainability is not treated as an independent factor to be evaluated as a discrete element in its own terms. Its significance for NEMA lies in the extent to which it is interrelated with environmental protection. Sustainable development presupposes accommodation, reconciliation and (in some instances) integration between economic development, social development and environmental protection. It does not envisage social, economic and environmental sustainability as proceeding along three separate tracks, each of which has to be weighed separately and then somehow all brought together in a global analysis. The essence of sustainable development is balanced integration of socio-economic development and environmental priorities and norms. Economic sustainability is thus not part of a check-list that has to be ticked off as a separate item in the sustainable development enquiry. Rather, it is an element that takes on significance to the extent that it implicates the environment. When economic development potentially threatens the environment it becomes relevant to NEMA.

In his view, commercial sustainability only becomes a relevant factor under NEMA when it touches on actual or potential threats to the environment. Thus, if there were a genuine risk that the introduction of a new industry would be ruinous to traditional forms of livelihood, thereby dramatically changing the character of the neighbourhood, which could be a significant socio-economic environmental factor. Similarly, if there were a real prospect of the landscape ending up as a disfigured and polluted graveyard replete with abandoned petrol tanks not easily removed, that would certainly require attention.

Conversely, if some damage to the environment were to be established, the economic sustainability of a proposed economic enterprise could be highly relevant as a countervailing factor in favour of a finding that on balance the development is sustainable.

But there is no evidence, above the level of speculation, that the arrival of a new kid on the block doing the same business in the same way in competition with existing filling stations would give rise to the risk of unacceptable degradation either to the physical environment or to the socio-cultural environment. The objective of NEMA, after all, is to preserve the environment for present and future generations, and not to maintain the profitability of incumbent entrepreneurs.

In summary then, the SEIA for the proposed new filling station in Groblersdal in general revealed that the construction of a new filling station would have a positive impact on the economy, but negative impact on the existing filling stations.

[18] Fuel Retailers Association of Southern Africa v Director-General Environmental Management, Department Of Agriculture, Conservation And Environment, Mpumalanga Province and Others 2007 ZA (CC); 2007 CCT 67/06

On the other hand, development of the proposed new filling station will help to address some of the economic problems faced in the region (i.e. unemployment), and also contribute to enhancing the economy of the area. It seems that, generally, the economy stands to benefit more from the proposed project than to be negatively affected thereby.

The proposed development of a filling station is a venture that can be classified as a relatively small project. As small as it is, the potential benefits that accrue to the economy are of a significant extent.

The anticipated impact (direct and indirect, i.e. including multiplier effects), that will be leveraged in the economy during the construction and operational phases are summarised in Table 21.

Table 21: Significance rating of income leveraged in economy

Variable	Total impact
Construction Phase (Once-off)	
Additional Business Sales	R19,8 million
Additional GGP	R6,6 million
Additional Employment	30 persons
Operational Phase (Sustained Annually)	
Additional Business Sales	R13,8 million
Additional GGP	R6,3 million
Additional Employment	34 persons

The impact on existing filling stations is high in the long term and is not expected to decrease in a near future despite the potential for growth in traffic volumes accruing from possible developments in the area. The negative impact to be experienced, due to loss of fuel sales, is expected to be medium-term in nature. The impact on traffic volumes within the local area during the construction phase is a short-term and of minimal impact, while the impact during the operational phase is close to zero.

The positive impact on the standard of living is expected to be of a long term in nature as this economic impact sources from multiplier effects.

The impact of improved service provision in the filling station market is not guaranteed but it can be expected and if it does occur it will be of long term in nature.

Increased government income due to enhanced economic activity is expected to be of long term in nature and would be of high significance mainly to the local government.

From a social perspective, most of the impacts will occur during the construction and operational phase of the proposed development. The severity of most of these impacts can be reduced, if properly managed and mitigated.

Table 22 summarises some of the key social impacts that will occur as a result of the proposed new filling station, as well as indicate in which phase it is likely to occur.

Table 22: Summary of social impacts

Impacts	Prior to Implementation	Construction	Operation	Decommissioning	Impact rating	
					With mitigation	Without mitigation
In-migration	✓	✓	✓		-	-
Presence of temporary workers	✓	✓			-	-
Waged Labour	✓	✓	✓		+	-
Employment		✓	✓		+	-
Conversion and diversification of land use		✓	✓		+	-
Enhanced transport and accessibility			✓		+	+
Unacceptable social behaviour		✓	✓		-	-
Feelings in relation to the project	✓	✓	✓		-	-
Actual health and fertility	✓	✓	✓		-	-
Perceived health	✓	✓	✓		-	-
Aspirations for the future	✓	✓	✓		-	+
Quality of the physical environment (actual and perceived)		✓	✓		-	-
Aesthetic quality		✓	✓		-	-
Personal safety and hazard exposure (actual and perceived)		✓	✓		-	-
Crime and violence (actual and perceived		✓	✓		-	-
Capacity building (emancipation and empowerment)		✓	✓		+	+
Impact equity			✓		+	-
Gendered division of labour		✓	✓		-	-

The following recommendations are made on the basis of the SEIA study and consultation with the local community.

Based on the impacts identified and the measures that could possibly be implemented to mitigate (or enhance) these impacts, it is suggested that the proposed project proceed under the following conditions:

Interaction with existing community forums

It is recommended that an existing community based organisations and non government organisation in the surrounding area be used to serve as a communication channel between the community and the filling station operator. These organisations should for example include representatives from civil society, Ward Councillors, local business, construction teams and the fuel company. Liaising with such committees will play an important role in executing some and monitoring most of the proposed mitigation measures.

In addition, it is advised that an Environmental Control Officer (ECO) be appointed to ensure contractors conduct themselves in an appropriate way.

Labour recruitment

Labour should, as far as possible, be sourced locally during the construction and operational phases of the project. This will minimise the risk of conflict among local residents and newcomers, and obviate the need for developing temporary housing for construction workers.

Projects such as this often raise the expectations of local people that a large number of jobs will be created. The fuel company / filling station operator should declare its intentions in terms of the amount of jobs that will be created, as soon as possible to dispel any unrealistic expectations.

It is expected that there will be an influx of newcomers in search of employment, therefore it is suggested that labour guidelines be drafted in terms of employing local residents. These labour guidelines should include clauses with regard to ensuring the timely payment of labourers.

Employment criteria should be communicated to the community in advance (e.g. in newspapers)

Furthermore, it is important that the local community should under no circumstances be exploited. If they are employed, they should receive proper contracts in accordance with the Labour Relations Amendment Act, 2002 (12 of 2002).

Crime and violence

The possibility of crime escalating in the study area is always of concern and it is advised that all sectors of the community become involved in community policing. Local Authorities and Ward Councillors should be made aware of the impact that the influx of new people can have on services, such as housing, or the effectiveness of the police in the area.

Construction teams should be clearly identified by wearing uniforms or identification cards that should be exhibited in a visible place on their body.

Local economy

It is strongly recommended that local businesses be supported in sourcing materials or services. Local shops, caterers, transport companies and various other SMMEs should be supported wherever possible. Should it be required, the local Ward Committee member can assist in providing the filling station operator with a list of service providers within the study area.

Consultation

The EMLM must be made aware of the needs of the community and engage in discussions about possible solutions with the relevant parties to ensure that the impacted community will share in the benefits of the project. Community consultation throughout the project is imperative and the community and the filling station operator should work together to obtain the best solution.

Cumulative impacts

The potential in-migration of workers is likely to result in other cumulative impacts, such as conflict with existing community members, social inconveniences and / or problems and pressures on existing infrastructure.

The management and protection of groundwater resources

In addition to the mitigation measures recommended by the EIA Report, the following mitigation measures are suggested:

- The provision of appropriate engineering requirements;
- The implementation of appropriate management systems and controls; and,
- The preparation of suitable emergency plans and procedures.

Abnormal social behaviour

If and where possible, the fuel company should liaise with the local government, local institutions and or existing community programs to assist in the implementation of Health Awareness programs and policies, for example HIV / AIDS Awareness and Policy programmes or education on the risks of alcohol and drug abuse, etc;

10 REFERENCES

Barker, F. 2003. **The South African Labour Market**, 4th edition. Pretoria; Van Schaik.

Becker, D.R., Harris, C.C., Nielsen, E.A. & McLaughlin, W.J. 2004. **A comparison of a technical and participatory application of social impact assessment.** Impact Assessment and Project Appraisal. 22(3): 177-189.

Blue Rock Consulting (Pty) Ltd, 2010. **Proposed Filling Station on Erven 756 and 757: Ext 11 Groblersdal: Geotechnical Site Investigation for input for EIA**

Du Preez, M. & Perold, J. 2005. **Scoping/feasibility study for the development of a new landfill site for the Northern Areas of the Metropolitan Municipality of Johannesburg. Socio-Economic Assessment.** Mawatsan.

Fouché, C.B. & Delport, C.S.L. 2002. **Introduction to the research process.** In De Vos, A.S., Strydom, H., Fouché, C.B. & Delport, C.S.L. 2002. *Research at Grass Roots for the social sciences and human science professions.* Pretoria: Van Schaik Publishers.

Fuel Retailers Association of Southern Africa v Director-General Environmental Management, Department Of Agriculture, Conservation And Environment, Mpumalanga Province and Others 2007 ZA (CC); 2007 CCT 67/06

GDACE, 2002 (March). **EIA administrative guideline for the construction and upgrade of filling stations and associated tank installations.**

Government of the Republic of South Africa and Others v Grootboom and Others 2001 (1) SA 46 (CC); 2000 (11) BCLR 1169 (CC).

Hoyle, R.H., Harris, M.J. & Judd, C.M. 2002. **Research Methods in Social Relations.** USA: Wadsworth.

International Association for Impact assessment. 2003. **Social Impact Assessment: International Principles.** Special Publication Series no.2. IAIA; Fargo.

Interorganisational Committee on Principles and Guidelines for Social Impact Assessment. **US Principles and Guidelines – Principals and guidelines for social impact assessment in the USA** Impact Assessment and Project Appraisal, 21(3):231-250.

Sands, 2003. *Principles of International Environmental Law* 2 ed (Cambridge University Press, Cambridge 2003) 252.

Sogunro, O.A. 2001. **Selecting a Quantitative or Qualitative Research Methodology: An Experience.** Educational Research Quarterly. 26(1): 3-10.

Strydom, H. 2002. **Ethical aspects of research in the social sciences and human service professions.** In De Vos, A.S., Strydom, H., Fouché, C.B. & Delport, C.S.L. 2002. *Research at Grass Roots for the social sciences and human science professions.* Pretoria: Van Schaik Publishers.

Shisaka Development Management Services 2004, as used in the Ekurhuleni Integrated Development Plan 2007-2011.

Vanclay, F. 2003. **Conceptual and methodological advances in Social Impact Assessment.** n Vanclay, F. & Becker, H.A. 2003. *The International Handbook for Social Impact Assessment*. Cheltenham: Edward Elgar Publishing Limited.

Van Schooten, M, Vanclay, F & Slootweg, R. 2003. "Conceptualizing social change processes and social impacts" in Becker, H.A & Vanclay, F. 2003. **The International Handbook of Social Impact Assessment**.Cheltenham, UK. Northhampton, MA, USA.

WSP SA Civil and Structural Engineers (Pty) Ltd, 2010. **Proposed new Filling Station located on Erven 756 and 757 Jan Van Riebeeck Street, Groblersdal - Limpopo Province**. Feasibility and Traffic Engineering Study.

Young Larance, L. 1996. **Fostering Social Capital through NGO Design.** International Social Work, 24(1): 7-18.

Integrated Development Plans (IDP) accessed on www.idp.org.za

Elias Motsoaledi Local Municipality IDP (2008-2009)

Other

Department of Local Government and Housing, Limpopo Spatial Rationale, 2002

Department of Water Affairs (DWA), Settlement database, 2010

Elias Motsoaledi Local Municipality, Spatial Development Framework (SDF), 2007

Quantec, Regional Indicator database, 2010

Legislation

Competition Act [No. 89 of 1998]

Constitution of the Republic of South Africa [No. 108 of 1996]

Environment Conservation Act, 1989 (Act No. 73 of 1989; Regulations 1182; as amended by Regulations 670; May 2002)

Labour Relations Amendment Act, 2002 (12 of 2002)

National Environmental Management Act (NEMA), 1998 (Act No. 107 of 1998)

Promotion of Administrative Justice Act (PAJA), 2000 (Act No. 3 of 2000)

Statistics SA Census Data

Census 2001: Census in brief / Statistics South Africa. Pretoria: Statistics South Africa, 2003

Community Survey 2007: Statistical Release Basic Results Municipalities / Statistics South Africa. Pretoria:

Internet Resources

www.dme.gov.za

www.qauntec.com

www.statssa.gov.za

Report of the World Commission on Environment and Development: *Our Common Future* http://www.un.org/esa/sustdev/documents/docs_key_conferences.htm, link: General Assembly 42nd Session: Report of the World Commission on Environment and Development.

http://www.sa-venues.com/attractionsmpl/groblersdal.php

http://www.nra.co.za/live/content.php?Item_ID=51

http://www.groblersdal.com/index.php?page=envirenment&hl=af

GROBLERSDAL FILLING STATION

PROPOSED NEW FILLING STATION LOCATED ON ERVEN 756 AND 757
JAN VAN RIEBEECK STREET, GROBLERSDAL - LIMPOPO PROVINCE

SERVICES MEMORANDUM

March 2010

Issue 1

WSP SA Civil and Structural Engineers (Pty) Ltd.

UNITED BY OUR DIFFERENCE

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Signature				
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Figures

1. INTRODUCTION

The Gawie Labuschagne Trust approached *WSP SA Civil and Structural Engineers (Pty) Ltd.* (WSP) expressing their intent on building a Filling Station near the intersection of Jan van Riebeeck- and Nywerheid Street. This proposed site is located in Groblersdal Extension 11 stand 756 and 757, Limpopo Province (See **Figure 1** for Locality Plan).

Willem Groenewald from Landmark Planning will submit DFA application. The purpose of this short services memorandum is to confirm the proposed site can be serviced as required by the DFA.

2. CIVIL ENGINEERING SERVICES

2.1 WATER

An existing municipal water pipe (150mm) is running adjacent to Van Riebeeck Street. Water will be attained from this municipal water pipe through a water meter which will be installed by the local municipality.

2.2 SEWER

An existing municipal sewer pipe (160mm) is running adjacent to Van Riebeeck Street. An internal sewer system will collect al the sewerage and connect to the municipal sewer pipe at a single location.

2.3 STORMWATER

The internal strormwater system will collect all the stormwater from the site and discharge into the municipal stormwater channel running adjacent Van Riebeeck Street. A 600mm pipe will be installed under the access to accommodate the stormwater channel as shown on **Figure 2**

2.4 ACCESS

The existing access will be upgraded as shown on **Figure 2** and satisfaction of the local authority.

2.5 ELECTRICITY

The proposed filling station will be located within the urban industrial area of Groblersdal. There is an existing electrical network and the filling station will be serviced by it.

2.6 SOLID WASTE

The proposed filling station will be located within the urban industrial area of Groblersdal. The Waste Management Division of Groblersdal will dispose of the solid waste produced by the filling station.

3. CONCLUSIONS

Therefore concluded the proposed filling station can adequately be serviced as discussed above.

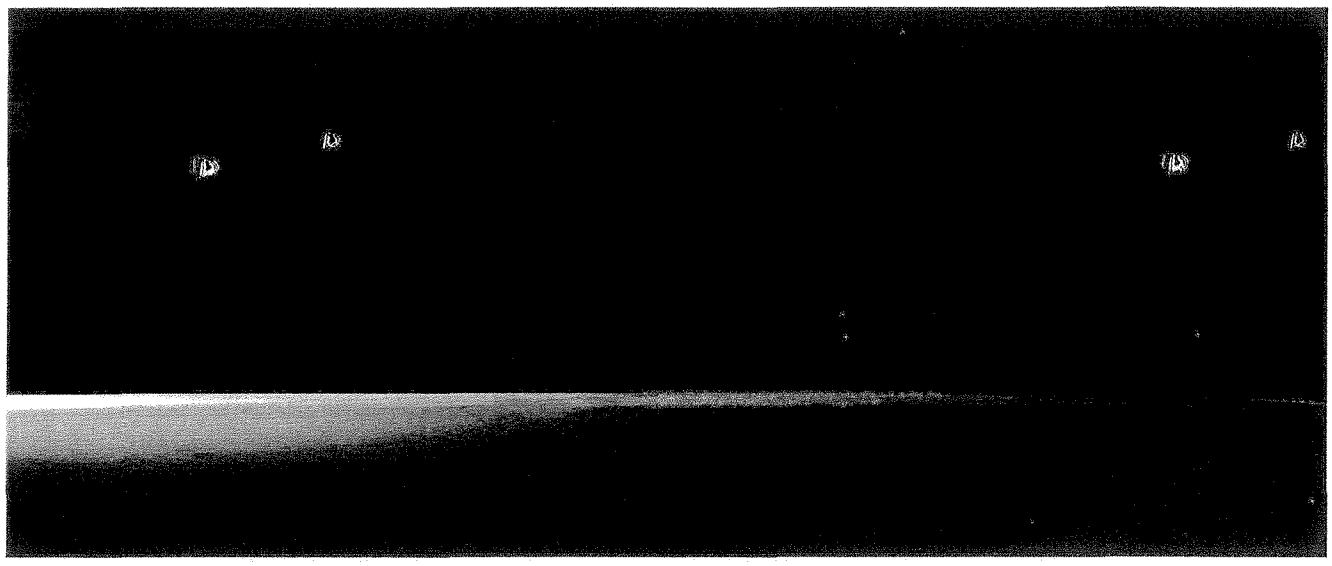
Yours faithfully,

HARM SCHREURS
DIRECTOR: Pr Eng

Figures

Figure 1: Locality Plan

Figure 2: Proposed Access Layout



GROBLERSDAL FILLING STATION

PROPOSED NEW FILLING STATION LOCATED ON ERVEN 756 AND 757
JAN VAN RIEBEECK STREET, GROBLERSDAL - LIMPOPO PROVINCE

TRAFFIC IMPACT STUDY

FEBRUARY 2010

Issue 1

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Annexure

1. DEVELOPMENT INFORMATION

1.1. INTRODUCTION

The Gawie Labuschagne Trust approached *WSP SA Civil and Structural Engineers (Pty) Ltd.* (WSP) expressing their intent on evaluating a site for Filling Station development. An investigation is launched into the possibility of opening and operating a filling station near the intersection of Jan van Riebeeck- and Nywerheid Street. This proposed site is located in Groblersdal Extension 11, Limpopo Province. The evaluation will be for a standard four pump filling station with a canopy covered forecourt, fuel pumps selling diesel and petrol fuels and a convenience store on a site that has enough space to accommodate all such developments.

The purpose of the study is to determine if the proposed site is feasible for operating a filling station and what the impact would be on existing road users and -infrastructure.

1.2. STUDY AREA

The proposed development is located within Groblersdal Extension 11 near the eastern periphery of the town. The actual site for development is located a few dozen meters to the west of the intersection of Jan van Riebeeck- and Nywerheid Street. It is envisaged to erect a filling station on the northern side of Jan van Riebeeck Street that will serve westbound traffic leaving Groblersdal.

The proposed site is located within 2 km of Grobersdal Central Business District (CBD) which is located to the west. Groblersdal is an important hub of activity for all the rural settlements of northern Mpumalanga- and southern Limpopo Province. As a result, a number of important arterials run through Groblersdal that connects it to other towns and cities. The following arterials run through Groblersdal that connects it to other towns and cities. The following arterials are located within the study area:

- Pretoria Road (R25) creates a link between Groblersdal and Bronkhorstspruit from the west. Pretoria Road becomes Jan van Riebeeck Street as it enters Groblersdal.

The R25 splits approximately 3 km outside Groblersdal to create a link to Marble Hall;

- Jan van Riebeeck (R33) is an activity corridor that runs through Groblersdal to link with the rural settlements of Stoffberg to the east;
- The N11 from Middelburg in the south links with Grobblersdal, crosses Jan van Riebeeck and continues north to Marble Hall

The proposed study area is illustrated in a locality map in **Figure 1**.

1.3. DEVELOPMENT INFORMATION

Table 1 presents a summary on the available information for the proposed development.

Table 1: Development/Study Information

Description	Moving Market Factor
Study Type	Traffic Impact Study
Area Name	Groblersdal Extension 11
Road/Intersection	Van Riebeeck Street, near intersection of Van Riebeeck- and Nywerheid Street
Property References: Farm/Erf. Numbers	Erven 756 and 757
Description of Development Study	Evaluation of traffic patterns and site feasibility for filling station development
Other Professionals involved with same application process	Client: *Gawie Labuschagne Trust.* Town Planner: *Landmark Planning* Environmental Consultant: SEF Environmental Consultants
Site Size	9'042 m²
Current Zoning	Industrial 3

2. OBJECTIVES OF THE STUDY

The objectives of the study are to:

- Determine and quantify the impact of the additional traffic expected to be generated by the proposed development on the surrounding road network;
- Propose mitigating measures and upgrades to address any capacity of safety problems that may arise;
- Consider all relevant transport elements and to assess these – this includes non-motorised transport;
- Consider geometric design considerations;
- Consider traffic safety, where relevant;
- Consider and propose a suitable access to the proposed development site;
- Ensure consideration of all relevant future planning in the study area as well as other approved land-uses not yet realised;
- Liaise with the relevant authorities to ensure the reasonable inclusion of all elements deemed relevant or important to this study;
- Provide the necessary information to the applicable authorities to approve this application;
- Provide the necessary information to the applicable authorities and to the applicant to assist with the bulk contribution determination.

3. EXTENT OF STUDY AREA

3.1. EXTENT OF STUDY AREA

The extent of the study area was determined in accordance with the guidelines prescribed by the TCC[1] (2008). According to the guidelines, all internal roads of the proposed development must be included in the study area in conjunction with connections between external and internal roads. The following elements within the study area were selected for assessment:

- All connections between internal and external services (existing or new);
- All proposed new internal roads or improvements to internal roads or transportation infrastructure; and
- All elements of internal roads or the transportation system within the study areas that are likely to be affected by traffic demand and which may not meet required capacity requirements as stipulated in TCC (2008).

Note: not all elements in the study area will necessarily be assessed and only those elements that require assessment will be selected. **Table 2** illustrates the elements of the road network that were investigated for this study.

Table 2: Elements of Road Network Investigated

No.	Element of Road Network	Existing/ Planned	Ownership	Action
1	Access points on Jan van Riebeeck Street	Planned	100% Limpopo Roads Agency	Capacity and/or Traffic Engineering Analysis
2	Internal Roads	Planned	*Gawie Labuschagne Trust*	Capacity and/or Traffic Engineering Analysis

[1] **Transportation Co-ordination Commission (TCC).** 2008. *Policy for Traffic Impact Assessments in Gauteng.* Draft Version 1.0 June 2008. TCC.

3.2. FUTURE ROAD CHANGES

No significant road changes to the road network are planned for the immediate future that would cause a significant diversion of traffic flow past the proposed site. No other significant road changes are expected that would make a significant impact on the feasibility of the proposed filling station when considering its estimated operational life cycle.

4. DATA COLLECTED

4.1. EXISTING TRAFFIC DEMAND AND TRAFFIC GROWTH

Traffic Counts were used to estimate the traffic demand and traffic volume for the study area. A traffic count was conducted by WSP on Monday 21 September 2009 at the proposed site (intersection of Jan van Riebeeck- and Nywerheid Street). Detail of the traffic count is provided in **Annexure A**.

The Average Daily Traffic (ADT) exposed to the site is approximately 12'392 vehicles per day. The ADT at the site is broken down per travelling direction in the following manner:

- 5'500 veh/day travelling eastbound on Jan van Riebeeck Road; and
- 5'600 veh/day travelling westbound on Jan van Riebeeck Road

Precise traffic growth patterns were not analysed and calculated for this report. Traffic growth rates are expected to have slowed down due to the current economic downturn, but obtaining accurate growth rates as a result of this global phenomenon will result in a study on its own.

For the purpose of this study a growth rate of **2.0% per annum** was assumed.

4.2. SUPPORTING INFORMATION

The following supplementary sources of information were considered for the study:

- Other traffic studies that were done in the surrounding area;
- The road network masterplan;
- Public Transport Plan for the area;
- Applicable Access Management framework; and
- The local SDF.

5. ANALYSIS

5.1. BACKGROUND TRAFFIC

Background traffic is the existing and future traffic on the current road network (TCC, 2008). It does not take into accound the traffic generated by the proposed development. The particulars of background traffic were investigated and the subsequent traffic information is summarised in the traffic count report of **Annexure A.**

5.1.1. REDISTRIBUTION OF BACKGROUND TRAFFIC

The main factor in redistribution of background traffic depends on the percentage of vehicles that will turn in to the proposed filling station. The turn-in percentage (interception rate) is determined by the following factors:

- Convenience (clean new facility and easily accessible);
- Visibility (good-long time to decide whether to use the facility or not);
- The amount of passer-by traffic (fixed, as per traffic count);
- Type of traffic (Transient, Commuter and residential);
- Other nearby filling stations (competitor sites);
- Service provided to public (car wash, convenience shop, A.T.M. etc);
- Good accesses (proper deceleration and acceleration lanes);
- Location (homebound and work bound); and
- Site layout (large enough to have proper site circulation).

The expected interception rates for the proposed development sites are indicated in **Table 4**. Note that traffic is distinguished in two categories: intercepted for fuel or intercepted for shop and comfort stop

Table 3: Expected Interception Rates and Volumes

ADT = ± 17'000 veh/day passing site				
Road and Direction	Current Traffic Volume [veh/day]	Fuel Interception Rate	Shop and Comfort Stop Interception	Intercepted Traffic Volume [veh/day]
Jan van Riebeeck Eastbound	5'500	5.0%	2.5%	412
Jan van Riebeeck Westbound	5'600	1.0%	2.5%	196

The interception rates of **Table 4** are achieved by matching historical analyses of similar traffic flows with expected traffic patterns and facilities once the service station opens for traffic.

Note that an existing median on Jan van Riebeeck Road currently obstructs westbound traffic from entering the proposed site. It is proposed in the site development plan of **Figure 2** that westbound traffic can access the site across the median.

The interception rates correspond conservatively with similar service stations in the surrounding area and similar study areas.

5.2. LATENT DEMAND

Latent demand pertains to traffic that is expected to be generated by adjacent or other developments within the study area that have been approved for development, but have not yet realised. Trips that will be generated from such developments should be taken into account as they will compete for capacity with existing traffic and traffic expected to be generated by the proposed development.

Investigations into the matter have revealed that no significant developments are approved within the study area. For the purpose of this study the effect of latent demand is considered, but an assumption is made that future development will not have a significant impact on the operating conditions of the road infrastructure that forms part of the study area.

5.3. TRIP GENERATION OF PROPOSED DEVELOPMENT

For the purposes of this report, the following two trip types are considered for trip generation:

- Primary trips: These are new trips on the road network as a result of the development (The only applicable primary trips for the proposed station are those of delivery vehicles and workers and it is assumed that no more than 40 primary trips per week would be generated);
- Pass-by trips: These are existing trips on the road network that do not require significant diversion to visit the proposed development site.

Given the nature of the proposed filling station, an insignificant amount of trips will be generated by the proposed developments themselves. **Thus, the proposed filling station is rather seen as an interceptor of trips and not a generator of trips.**

5.4. TRIP DISTRIBUTION AND ASSIGNMENT

Trip Distribution and –Assignment was considered for this study, but is not applicable as trips are intercepted and not generated.

Trip Distribution pertains to the allocation of generated trips to the existing road network in order to allow for the determination of the traffic demand per roadway and turning movement. Developments with land-uses that differ significantly must allow for separate trip distribution of each respective land use.

Traffic assignment involves determining the percentage of traffic that will use specific routes in a network. A traffic assignment is made with consideration of logical routings, available roadway capacity, right-turn movements, travel times and other factors (TCC, 2008).

Based on the previous discussion on trip generation, an assumption is made that an insignificant amount of trips will be generated by the proposed filling station and only pass-by trips are considered.

5.5. MULTIMODAL TRAFFIC DEMAND

Traffic demand for public transport, walking and bicycle modes of transport was considered for this study. A qualitative assessment is made due to the fact that very low demand of multimodal exists in the study area and that the proposed site will generate very little additional multimodal trips.

Qualitative statements on Public Transport and Non-Motorised Transport is presented in subsequent sections of this report (refer to **Chapter 5.10 – 5.11**).

5.6. CAPACITY ANALYSIS

Jan van Riebeeck Road is a median separated dual-carriageway. The capacity of a single lane on Jan van Riebeeck road is assumed at 1'800 veh/h. The ADT for westbound and eastbound traffic on Jan van Riebeeck Road is 5'600 veh/day and 5'500 veh/day respectively. It is concluded that the existing flow of traffic on Jan van Riebeeck Road does not reach the capacity of the road and the consequent operating conditions on the road are favourable.

Since the proposed development does not generate additional trips on the road network it is concluded that the favourable operating conditions will be maintained on Jan van Riebeeck Road despite the operation of the filling station on Erven 756 and 757.

5.7. PARKING AND LOADING

Sufficient parking must be provided for different vehicle types at the proposed filling station. A general guideline is followed that a maximum of 6 parking spaces for passenger cars will be provided for every 100 m^2 of retail space. Parking facilities for Heavy Vehicles (Trucks) are not provided.

Based on the proposed layout of **Figure 2** a qualitative statement can be made that adequate parking facilities are provided at the filling station for different kinds of motorised road users.

Loading facilities for fuel and convenience store stock was considered for this study. Based on the proposed layout of **Figure 2** a qualitative statement can be made that adequate provision for loading of goods will be dealt with in dedicated, demarcated loading zones.

5.8. ACCESS

Several geometric considerations pertaining to access to the sites were investigated for the proposed filling station. **Table 6** presents a summary of geometric considerations that apply for the proposed filling station.

Table 4: Geometric Considerations for Access

Item	Description
Access Spacing	No additional accesses provided to Jan van Riebeeck Road other than specified in **Figure 2**
Sight Distance	Sight distance adequate for design (minimum 240 m for 80 km/h)
Speed Differentials	Effect of speed differentials accommodated for with auxiliary lanes/turn slots for deceleration and acceleration
Gradients	Influence of gradients on vehicle speed taken into account: study area terrain is flat
Delivery Vehicle Path	Taken into consideration, recommended entrance lane width equal to 5.0 m and minimum turning radii of 11.0 m

5.9. TRAFFIC SAFETY

The Bakwena N1 Toll Road is a provincial road maintained and managed by the Limpopo Roads Agency. The road authorities have identified the possible negative impact a filling station can have on the traffic flow past a site. Therefore, a design manual, such as the Gautrans BB2[2] was compiled after proper research and input from

[2] **GAUTRANS**, 2002. *BB2: Guidelines for Filling Stations Accesses*. May 2002 Revised Draft Edition

various experienced traffic engineers to ensure that road safety is not negatively affected when establishing a site.

The proposed site can comply with the minimum standards of the relevant design document. The necessary preceding decelerations lanes and turning lanes at the accesses ensure vehicle ingress and egress to the site will occur safely.

The site is large enough to accommodate the required minimum distances as recommended in the documents. Sight distance, which is a key factor in determining traffic safety at any intersection, is good at the proposed sites due to the geometry of the existing roads.

It is concluded that the impact of the site on the existing traffic past it will not be negatively affected by the proposed filling station traffic. The safety of all road users (current and future) was thoroughly considered in the design of the filling station.

5.10. NON-MOTORISED TRANSPORT

Consideration was given to the needs of non-motorised road users (i.e. pedestrians and cyclists) within the study area. Low volumes of non-motorised road user volumes were encountered.

The only consideration was given to the proposed layout of the sites (refer to **Figure 2**). The layout in **Figure 2** was designed to allow for the minimum points of conflict between motorised road users arriving and departing from the proposed filling station and pedestrians walking to and from the facilities of the proposed site.

5.11. PUBLIC TRANSPORT

The proposed site forms part of long distance taxi and bus routes between Groblersdal, Roossenekal and Stoffberg. Public transport requirements were considered for the proposed filling station. It is assumed that employees of the proposed filling station will be arriving via minibus taxi from rural settlements on the periphery of Groblersdal. The following requirements were considered for the proposed filling station:

- A minibus taxi staging area must be provided at the site. The proposed site's parking facilities is deemed sufficient for these purposes; and
- A bus staging area must be provided with adequate shelter for commuters.

6. CONCLUSIONS

The following conclusions were made with regard to the proposed filling station at Erven 756 and 757:

- Very little additional traffic is expected to be generated by the proposed development and will not impact significantly on the surrounding road network;
- Proposed upgrades and possible mitigation measures are illustrated in **Figure 2**;
- Thorough consideration was given to non-motorised transport and public transport;
- Geometric design considerations were taken into account and summarised in **Table 7**;
- Traffic safety was considered for all road users;
- Suitable accesses, ingress and egress points, were proposed (refer to **Figure 2**); and
- The current and future requirements of all previously mentioned factors were taken into account, especially pertaining to future planning of the surrounding road network and latent developments.

The findings of this study presents the necessary information to Limpopo Roads Agency for approval of a Direct Access Facility on Jan van Riebeeck Street.

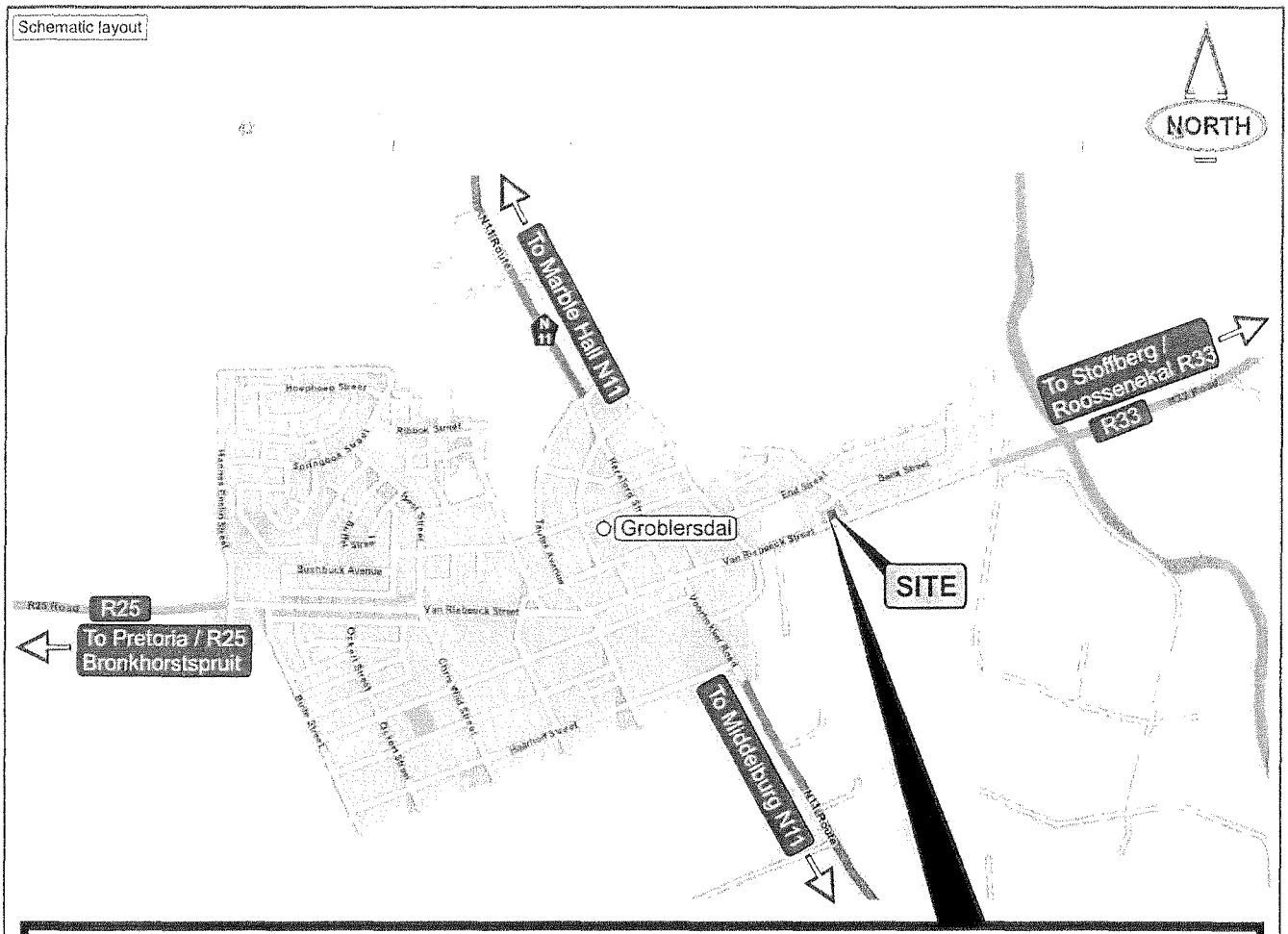
The proposed **Groblersdal Filling Station** located on Erven 756 and 757, Groblersdal Extension 11, have the support from a traffic engineer viewpoint.

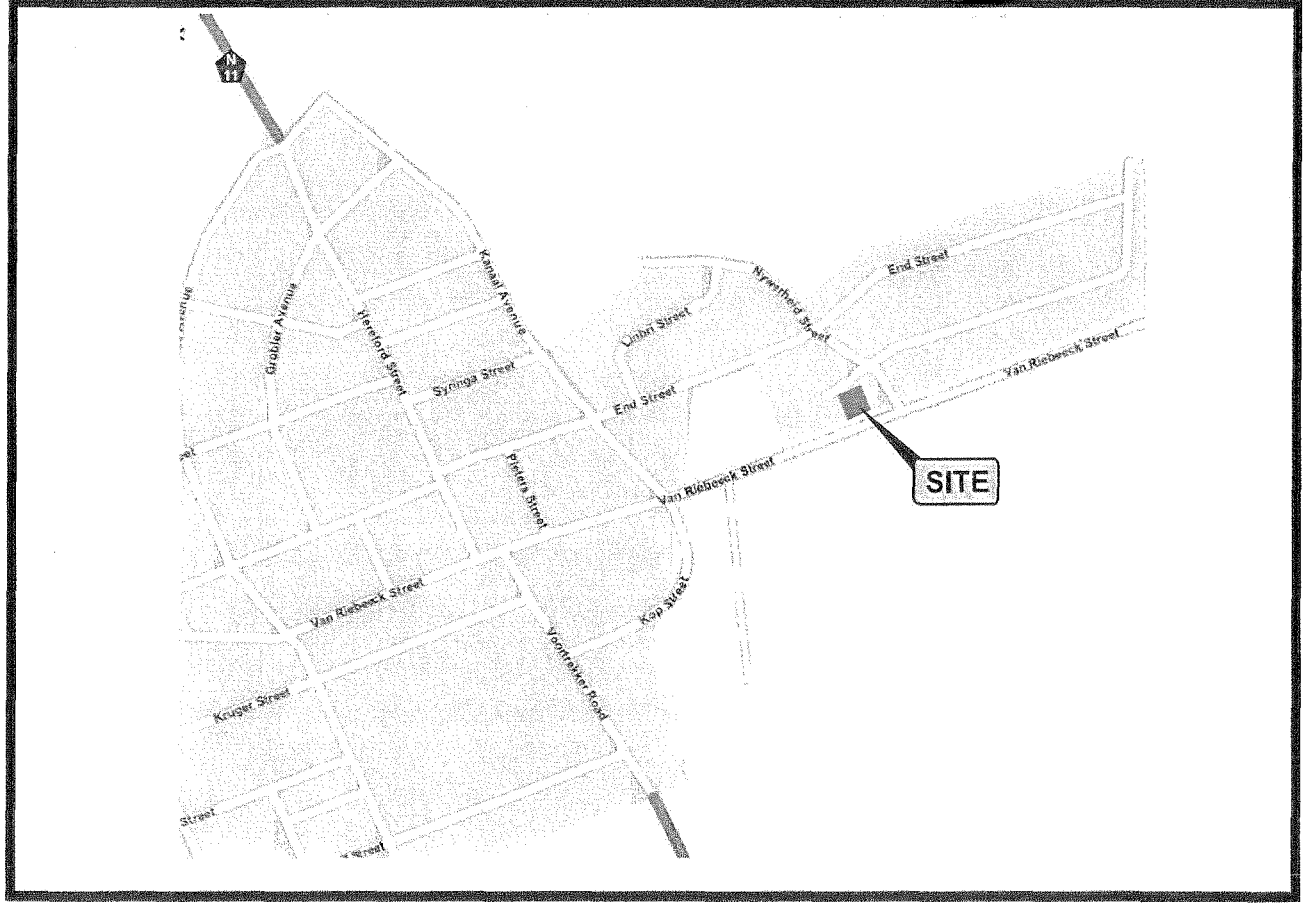
Yours faithfully,

HARM SCHREURS
DIRECTOR: Pr Eng

Figures

Schematic layout



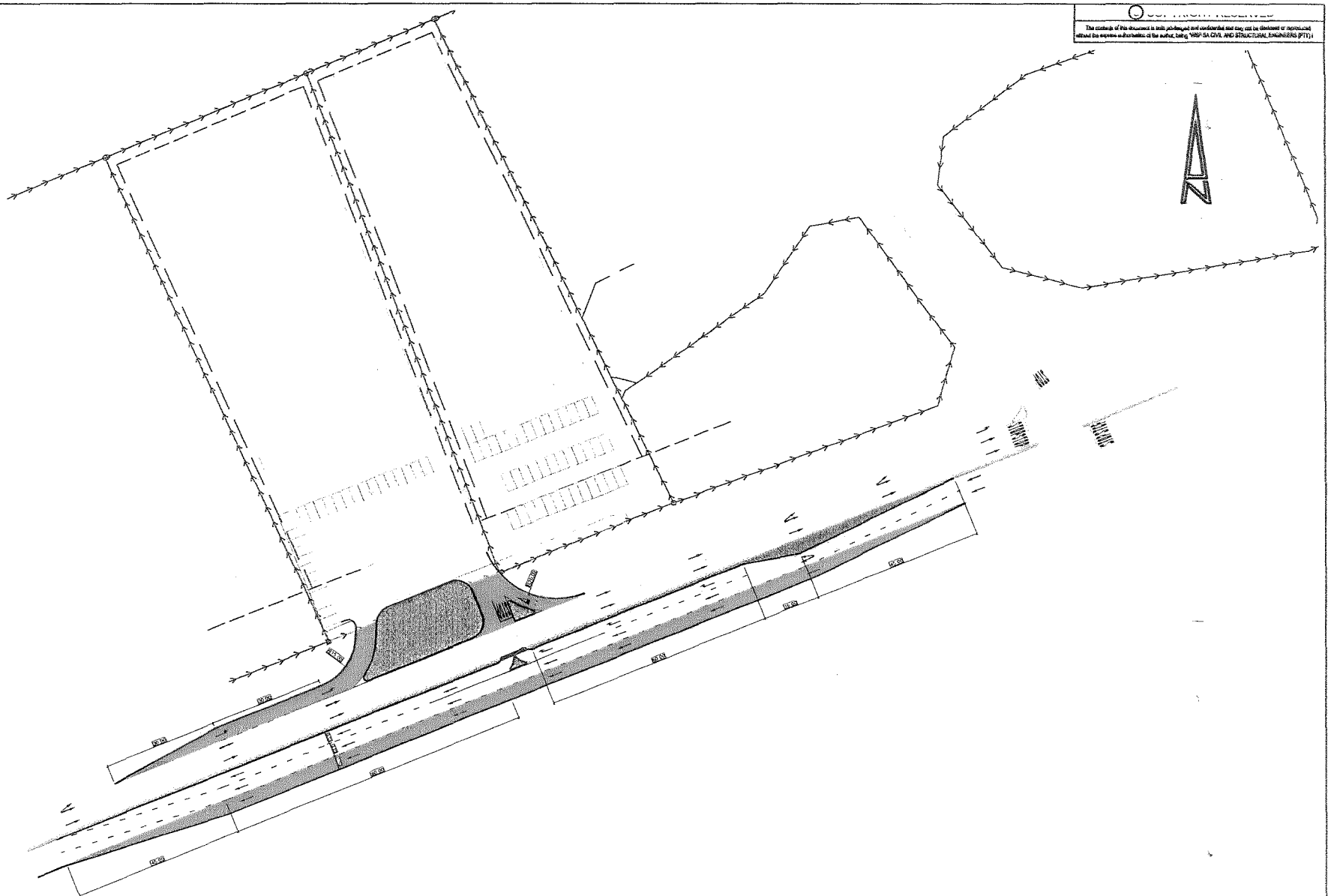


Checked by : H Schreurs Pr Eng

329215 Groblersdal Filling Station Locality Plan 1.cdr

WSP

Project:	Figure:	No.
GROBLERSDAL FILLING STATION	LOCALITY PLAN	1



REV	DATE	BY	DESCRIPTION	CHK	APD
A	-	-	INITIAL ISSUE	-	-

DRAWING STATUS: FOR INFORMATION ONLY

CLIENT: -

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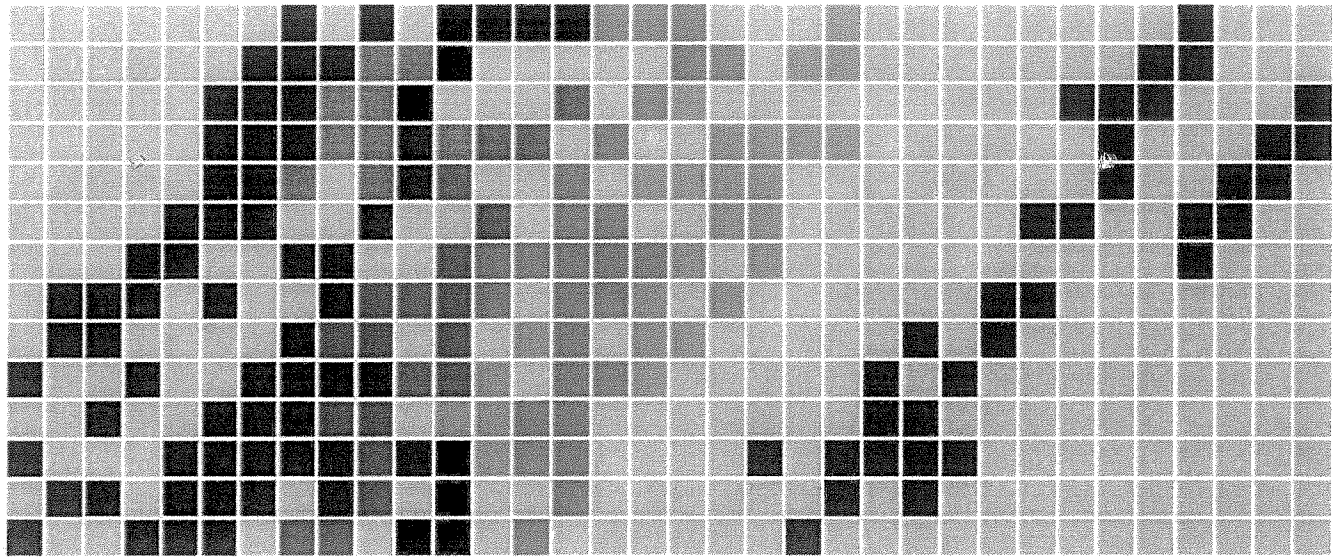
PROJECT: GROBLERSDAL FILLING STATION

TITLE: PROPOSED ACCESS LAYOUT

SCALE:	CHECKED:	APPROVED:
1:1	H SCHREURS	H SCHREURS
DESIGN:	DRAWN:	DATE:
H SCHREURS	M.S MASHAMBA	2010/02/18
PROJECT No:	DRAWING No:	REV:
329215	C1100	-

Annexure

Annexure A: Detail of Traffic Count



GROBLERSDAL FILLING STATION

TRAFFIC COUNT

SEPTEMBER 2009

PREPARED BY:

WSP

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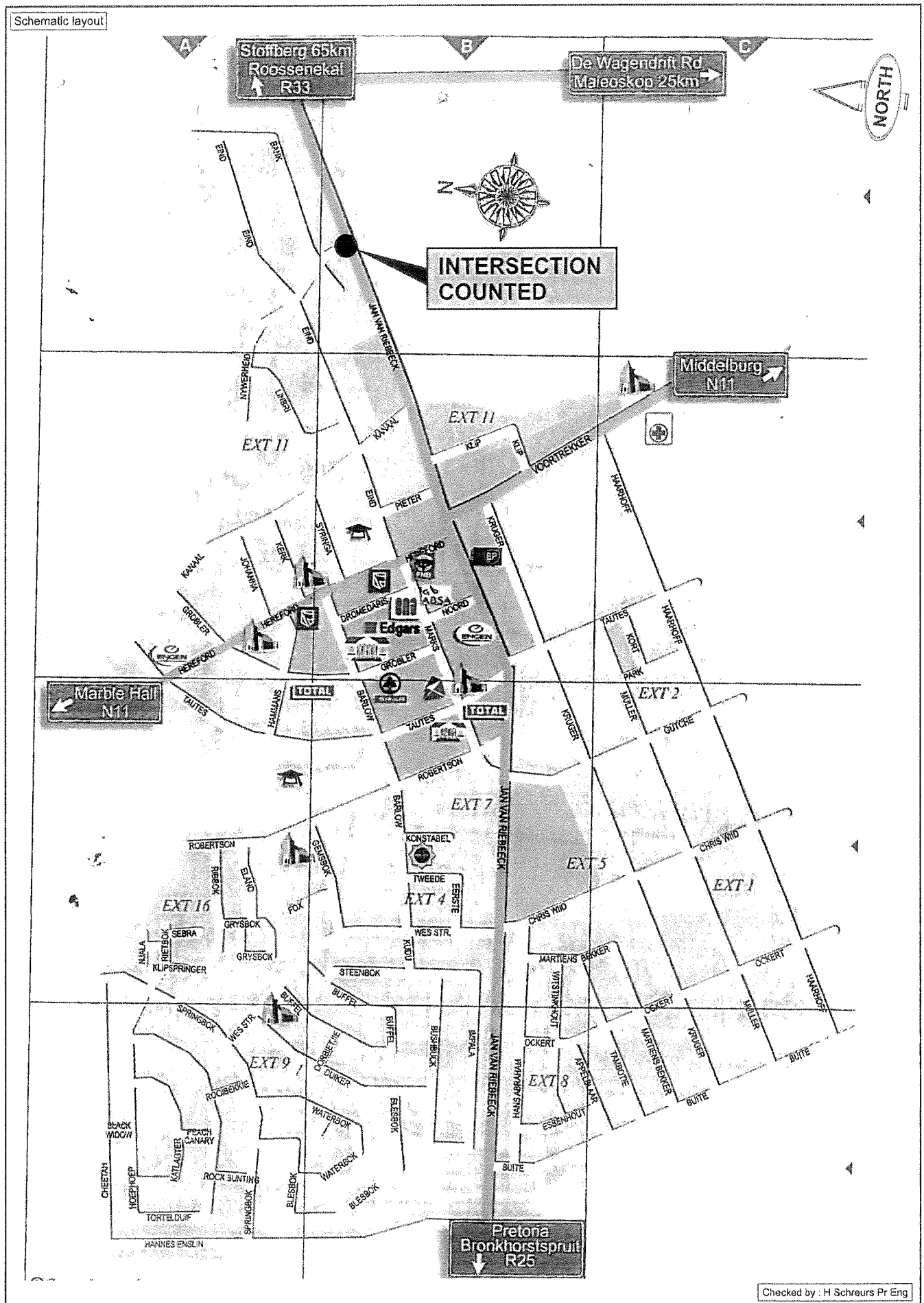
Title:	Groblersdal Filling Station Traffic Count: Traffic Count at the intersection of: Jan van Riebeeck / Nywerheid
Project Team:	H Schreurs Pr Eng Marika Bodde
Project no.:	329215
Date:	September 2009

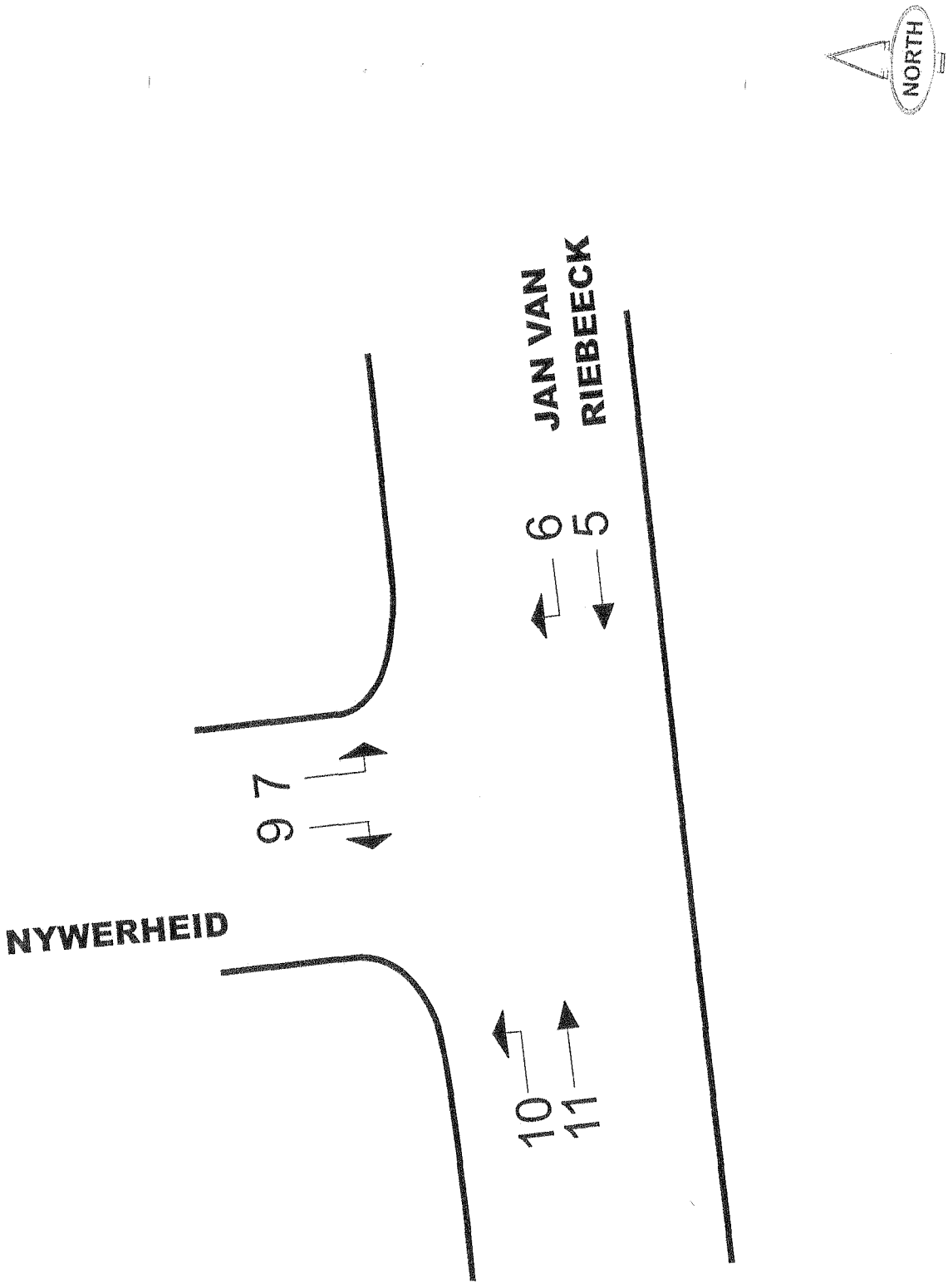


Checked by : H Schreurs Pr Eng

329215_Groblersdal Filling Station_Locality Plan_1.cdr

Project: GROBLERSDAL FILLING STATION	Figure: LOCALITY PLAN	No. 1

Schematic layout



Checked by : H Schreurs Pr Eng

329215_Groblersdal Filling Station_Traffic movement_2.cdr

WSP	Project: GROBLERSDAL FILLING STATION	Figure: TRAFFIC MOVEMENT / No. 2

TRAFFIC COUNT: GROBLERSDAL FILLING STATION
INTERSECTION: JAN VAN RIEBEECK / NYWERHEID
PEAK HOUR PERIOD: 13 HOUR
DATE: MONDAY 21 SEPTEMBER 2009 All VEHICLES

TIME		MOVEMENT NUMBER												
BEGIN		1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
06:00	06:15	0	0	0	0	68	3	3	0	1	1	40	0	116
06:15	06:30	0	0	0	0	70	4	2	0	1	0	32	0	109
06:30	06:45	0	0	0	0	89	4	3	0	0	1	53	0	150
06:45	07:00	0	0	0	0	118	9	6	0	1	4	66	0	204
07:00	07:15	0	0	0	0	179	15	3	0	0	16	95	0	308
07:15	07:30	0	0	0	0	104	10	5	0	7	13	95	0	234
07:30	07:45	0	0	0	0	139	14	7	0	6	16	103	0	285
07:45	08:00	0	0	0	0	140	11	4	0	6	13	75	0	249
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08:30	08:45	0	0	0	0	79	8	6	0	6	9	65	0	173
08:45	09:00	0	0	0	0	75	7	10	0	7	6	53	0	158
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16:15	16:30	0	0	0	0	87	5	16	0	13	13	105	0	239
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18:30	18:45	0	0	0	0	57	3	7	0	2	2	63	0	134
18:45	19:00	0	0	0	0	47	1	2	0	0	1	45	0	96
		0	0	0	0	4335	445	567	0	347	437	4196	0	10327
EST. 24 HR		0	0	0	0	5202	534	680	0	416	524	5035	0	12392

TRAFFIC COUNT: GROBLERSDAL FILLING STATION
INTERSECTION: JAN VAN RIEBEECK / NYWERHEID
PEAK HOUR PERIOD: 13 HOUR
DATE: MONDAY 21 SEPTEMBER 2009 LIGHT

TRAFFIC MOVEMENTS														
TIME														
Start	End	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
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15:45	16:00	0	0	0	0	58	10	7	0	3	15	68	0	161
16:00	16:15	0	0	0	0	55	7	18	0	7	8	72	0	167
16:15	16:30	0	0	0	0	64	3	16	0	11	11	73	0	178
16:30	16:45	0	0	0	0	67	3	11	0	10	12	91	0	194
16:45	17:00	0	0	0	0	60	7	19	0	12	9	101	0	208
17:00	17:15	0	0	0	0	44	3	19	0	8	8	123	0	205
17:15	17:30	0	0	0	0	53	4	18	0	9	3	108	0	195
17:30	17:45	0	0	0	0	54	2	15	0	7	2	79	0	159
17:45	18:00	0	0	0	0	45	1	12	0	8	1	68	0	135
18:00	18:15	0	0	0	0	41	2	15	0	5	0	48	0	111
18:15	18:30	0	0	0	0	42	2	11	0	2	2	39	0	98
18:30	18:45	0	0	0	0	40	1	7	0	1	1	29	0	79
18:45	19:00	0	0	0	0	37	1	2	0	0	0	24	0	64
TOTAL		0	0	0	0	2900	377	467	0	297	379	2850	0	7270
EST. 24 HR		0	0	0	0	3480	452	560	0	356	455	3420	0	8724

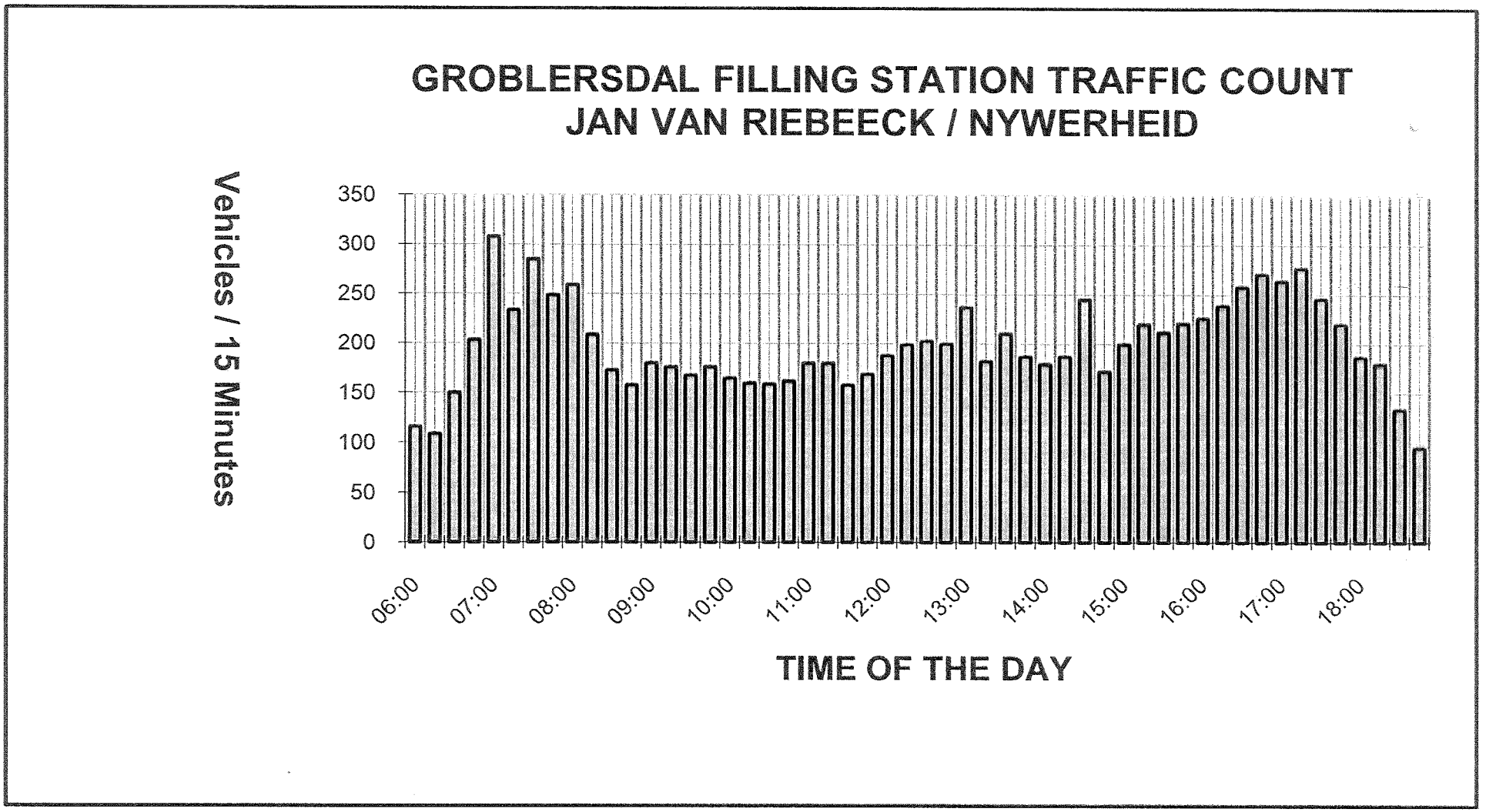
TRAFFIC COUNT: GROBLERSDAL FILLING STATION
INTERSECTION: JAN VAN RIEBEECK / NYWERHEID
PEAK HOUR PERIOD: 13 HOUR
DATE: MONDAY 21 SEPTEMBER 2009 TAXIS

TRAFFIC MOVEMENTS														
TIME														
Start	End	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
06:00	06:15	0	0	0	0	14	1	0	0	0	0	6	0	21
06:15	06:30	0	0	0	0	21	1	0	0	0	0	7	0	29
06:30	06:45	0	0	0	0	23	0	0	0	0	0	16	0	39
06:45	07:00	0	0	0	0	30	0	1	0	0	0	18	0	49
07:00	07:15	0	0	0	0	52	1	0	0	0	0	18	0	71
07:15	07:30	0	0	0	0	28	1	1	0	1	1	28	0	60
07:30	07:45	0	0	0	0	36	1	4	0	2	1	31	0	75
07:45	08:00	0	0	0	0	45	2	0	0	2	1	22	0	72
08:00	08:15	0	0	0	0	36	2	1	0	2	3	23	0	67
08:15	08:30	0	0	0	0	31	0	3	0	0	0	34	0	68
08:30	08:45	0	0	0	0	21	1	0	0	0	0	18	0	40
08:45	09:00	0	0	0	0	21	0	1	0	1	0	9	0	32
09:00	09:15	0	0	0	0	23	0	1	0	0	0	13	0	37
09:15	09:30	0	0	0	0	20	1	1	0	0	1	9	0	32
09:30	09:45	0	0	0	0	31	0	1	0	0	0	16	0	48
09:45	10:00	0	0	0	0	28	1	1	0	0	1	11	0	42
10:00	10:15	0	0	0	0	27	1	0	0	1	0	10	0	39
10:15	10:30	0	0	0	0	26	0	0	0	0	1	9	0	36
10:30	10:45	0	0	0	0	24	1	1	0	1	0	10	0	37
10:45	11:00	0	0	0	0	25	0	1	0	0	0	11	0	37
11:00	11:15	0	0	0	0	24	1	2	0	0	1	12	0	40
11:15	11:30	0	0	0	0	21	1	0	0	0	1	13	0	36
11:30	11:45	0	0	0	0	13	0	2	0	0	1	17	0	33
11:45	12:00	0	0	0	0	24	0	0	0	0	0	12	0	36
12:00	12:15	0	0	0	0	14	0	1	0	0	2	16	0	33
12:15	12:30	0	0	0	0	12	0	0	0	0	0	12	0	24
12:30	12:45	0	0	0	0	24	0	0	0	1	2	16	0	43
12:45	13:00	0	0	0	0	28	1	1	0	1	1	8	0	40
13:00	13:15	0	0	0	0	20	0	2	0	1	2	22	0	47
13:15	13:30	0	0	0	0	15	0	2	0	1	0	18	0	36
13:30	13:45	0	0	0	0	24	0	2	0	0	1	21	0	48
13:45	14:00	0	0	0	0	19	0	3	0	0	1	14	0	37
14:00	14:15	0	0	0	0	20	0	1	0	1	0	16	0	38
14:15	14:30	0	0	0	0	24	0	0	0	0	0	19	0	43
14:30	14:45	0	0	0	0	33	0	1	0	1	0	25	0	60
14:45	15:00	0	0	0	0	11	0	0	0	0	1	23	0	35
15:00	15:15	0	0	0	0	20	0	0	0	0	0	17	0	37
15:15	15:30	0	0	0	0	26	2	0	0	0	0	18	0	46
15:30	15:45	0	0	0	0	17	1	2	0	0	0	19	0	39
15:45	16:00	0	0	0	0	21	0	4	0	0	0	23	0	48
16:00	16:15	0	0	0	0	24	0	1	0	1	0	25	0	51
16:15	16:30	0	0	0	0	19	0	0	0	2	2	28	0	51
16:30	16:45	0	0	0	0	20	0	0	0	0	0	32	0	52
16:45	17:00	0	0	0	0	15	0	1	0	0	0	27	0	43
17:00	17:15	0	0	0	0	18	0	0	0	1	0	28	0	47
17:15	17:30	0	0	0	0	17	0	0	0	0	0	49	0	66
17:30	17:45	0	0	0	0	14	0	2	0	1	0	52	0	69
17:45	18:00	0	0	0	0	23	2	0	0	0	0	48	0	73
18:00	18:15	0	0	0	0	17	0	1	0	0	1	45	0	64
18:15	18:30	0	0	0	0	17	0	0	0	0	2	50	0	69
18:30	18:45	0	0	0	0	14	1	0	0	0	1	31	0	47
18:45	19:00	0	0	0	0	9	0	0	0	0	1	19	0	29
TOTAL		0	0	0	0	1179	23	45	0	21	29	1094	0	2391
EST. 24 HR		0	0	0	0	1415	28	54	0	25	35	1313	0	2869

TRAFFIC COUNT: GROBLERSDAL FILLING STATION
INTERSECTION: JAN VAN RIEBEECK / NYWERHEID
PEAK HOUR PERIOD: 13 HOUR

DATE: MONDAY 21 SEPTEMBER 2009 HEAVY VEHICLES

TRAFFIC MOVEMENTS														
TIME														
Start	End	1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
06:00	06:15	0	0	0	0	13	0	3	0	0	0	5	0	21
06:15	06:30	0	0	0	0	7	1	2	0	1	0	1	0	12
06:30	06:45	0	0	0	0	7	0	1	0	0	1	3	0	12
06:45	07:00	0	0	0	0	10	0	0	0	1	0	4	0	15
07:00	07:15	0	0	0	0	13	1	0	0	0	1	3	0	18
07:15	07:30	0	0	0	0	2	1	1	0	1	0	2	0	7
07:30	07:45	0	0	0	0	6	0	0	0	0	0	10	0	16
07:45	08:00	0	0	0	0	4	0	0	0	0	3	1	0	8
08:00	08:15	0	0	0	0	4	3	0	0	2	1	8	0	18
08:15	08:30	0	0	0	0	2	0	3	0	0	0	9	0	14
08:30	08:45	0	0	0	0	3	0	2	0	1	1	6	0	13
08:45	09:00	0	0	0	0	1	0	3	0	0	0	4	0	8
09:00	09:15	0	0	0	0	7	0	0	0	1	0	5	0	13
09:15	09:30	0	0	0	0	7	1	0	0	1	1	4	0	14
09:30	09:45	0	0	0	0	1	1	2	0	1	2	6	0	13
09:45	10:00	0	0	0	0	4	1	3	0	1	0	6	0	15
10:00	10:15	0	0	0	0	2	0	2	0	0	0	4	0	8
10:15	10:30	0	0	0	0	1	1	0	0	0	1	2	0	5
10:30	10:45	0	0	0	0	1	0	1	0	1	0	1	0	4
10:45	11:00	0	0	0	0	2	1	0	0	0	0	2	0	5
11:00	11:15	0	0	0	0	5	2	1	0	0	0	3	0	11
11:15	11:30	0	0	0	0	3	1	1	0	2	1	9	0	17
11:30	11:45	0	0	0	0	4	1	1	0	1	0	5	0	12
11:45	12:00	0	0	0	0	4	1	1	0	2	2	2	0	12
12:00	12:15	0	0	0	0	4	1	1	0	1	1	6	0	14
12:15	12:30	0	0	0	0	3	2	1	0	0	0	4	0	10
12:30	12:45	0	0	0	0	7	0	0	0	1	1	8	0	17
12:45	13:00	0	0	0	0	6	1	2	0	1	0	5	0	15
13:00	13:15	0	0	0	0	11	2	0	0	1	0	8	0	22
13:15	13:30	0	0	0	0	10	1	1	0	1	0	7	0	20
13:30	13:45	0	0	0	0	7	1	4	0	0	2	5	0	19
13:45	14:00	0	0	0	0	3	0	9	0	1	0	9	0	22
14:00	14:15	0	0	0	0	0	0	0	0	0	0	0	0	0
14:15	14:30	0	0	0	0	0	0	0	0	0	0	0	0	0
14:30	14:45	0	0	0	0	8	4	2	0	0	0	9	0	23
14:45	15:00	0	0	0	0	1	0	1	0	0	1	6	0	9
15:00	15:15	0	0	0	0	6	0	0	0	0	2	4	0	12
15:15	15:30	0	0	0	0	6	2	1	0	1	1	8	0	19
15:30	15:45	0	0	0	0	9	2	2	0	0	1	3	0	17
15:45	16:00	0	0	0	0	4	0	0	0	1	1	6	0	12
16:00	16:15	0	0	0	0	4	0	0	0	0	0	4	0	8
16:15	16:30	0	0	0	0	4	2	0	0	0	0	4	0	10
16:30	16:45	0	0	0	0	3	1	1	0	1	1	5	0	12
16:45	17:00	0	0	0	0	12	2	0	0	1	0	5	0	20
17:00	17:15	0	0	0	0	9	0	1	0	0	0	2	0	12
17:15	17:30	0	0	0	0	6	2	0	0	0	0	8	0	16
17:30	17:45	0	0	0	0	4	2	1	0	1	2	8	0	18
17:45	18:00	0	0	0	0	5	0	0	0	1	1	5	0	12
18:00	18:15	0	0	0	0	3	1	1	0	0	1	6	0	12
18:15	18:30	0	0	0	0	4	2	0	0	0	0	7	0	13
18:30	18:45	0	0	0	0	3	1	0	0	1	0	3	0	8
18:45	19:00	0	0	0	0	1	0	0	0	0	0	2	0	3
TOTAL		0	0	0	0	256	45	55	0	29	29	252	0	666
EST. 24 HR		0	0	0	0	307	54	66	0	35	35	302	0	799


GROBLERSDAL FILLING STATION TRAFFIC COUNT
JAN VAN RIEBEECK / NYWERHEID
Vehicles / 15 Minutes
350
300
250
200
150
100
50
0
06:00
07:00
08:00
09:00
10:00
11:00
12:00
13:00
14:00
15:00
16:00
17:00
18:00
TIME OF THE DAY

LANDMARK PLANNING (PTY) LTD

PROPOSED FILLING STATION
GROBLERSDAL EXT 11, ERF 756 & 757
GEOTECHNICAL INVESTIGATION
FOR E I A INPUT

Report No.: 2010-0010-2 April 2010

LANDMARK PLANNING (PTY) LTD

PROPOSED FILLING STATION
GROBLERSDAL EXT 11, ERF 756 & 757
GEOTECHNICAL INVESTIGATION
FOR E I A INPUT

REPORT 2010-0010-2 **APRIL 2010**

PREPARED BY:

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EXECUTIVE SUMMARY

As part of the Environmental Impact Assessment (E I A) for the rezoning of the erven 756 and 757 in Extension 11 of Groblersdal, Blue Rock Consulting (Pty) Ltd was appointed by Landmark Planning (PTY) Ltd, to conduct a geotechnical investigation at the site for the proposed filling station to be erected on portions of the two erven.

The report presents the results of a field investigation comprising the digging logging and sampling of five test pits design purposes as well as assessing the usability of in situ materials for re-use in pavement construction and soil improvement beneath foundations.

There are no outcrops of bedrock at the site and in the surrounding areas. The entire site is underlain by a soil mattress composed of imported sandy gravel that is in the order of 0,3 m to 1,0 m thick and poorly compacted to a loose to medium dense consistency. Medium dense red brown sandy gravel alluvial deposits underlie the mattress in the northern and eastern sections of the site and extend to 2,0 m depths. The alluvial deposits are underlain by medium dense to dense gravelly sands of pedogenic and residual granite origin that extend to beyond 3,2 m depths. The insitu permeability of the soils is high. The depths of hard rock bedrock underlying the pedogenic and residual gravel deposits exceed 3,2 m, the maximum reach of the TLB used for the site investigation. No hard rock bedrock is expected to occur at depths shallower than 4,0 m.

Shallow perched seasonal water tables after prolonged rain are common and extensive seepage of water was encountered between 1,2 m and 1.6 m depths in all test pits excavated on the site. Collapse of sidewalls of deep excavations will occur. Precautions against ponding of surface water and damp are recommended. Run-off surface water should be channelled in lined canals and allowed to accumulate in lined sumps to prevent it from seeping into the permeable soil profile. Due to the presence of a shallow perched groundwater table at the site, it is recommended that the fuel storage tanks be placed in water proof brick or concrete containers that are equipped with water table monitoring equipment to measure the presence and level of any seepage fluids within the container.

The medium dense sandy gravel soils portion of the soil profile is potentially collapsible and/or prone to consolidation settlement but can be used for fill and subgrade layer material provided that the root content is not excessive. In our report we recommend that it be removed from below the footprints of all buildings and access roads and parking areas and replaced with inert material placed in layers suitably compacted for foundations exerting up to 50 kPa founding pressure. Specifications for soil mattresses or improved material below foundations are given in the report. For foundations exerting more than 150 kPa alternatives such as founding on bedrock that is expected to be encountered between 4,0 m and 6,0 m depths or on piles are suggested. Provided that the recommendations are adhered to, the site is geologically suitable for the proposed development.