

# Report

## Activity 2: Gather area intelligence about Ezamokuhle community



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	<b>Name</b>	<b>Designation</b>	<b>Date</b>
<b>Prepared by</b>	Elizabeth Masekoameng, Anesu Shamu	Air Quality Specialists	28 <sup>th</sup> February 2022
<b>Reviewed by</b>	Fred Goede	Executive Head: Air Quality	6 <sup>th</sup> March 2022
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## Table of Contents

<b>1</b>	<b>BACKGROUND .....</b>	<b>9</b>
1.1	Eskom’s Air Quality Offsets .....	10
1.2	Scope of work.....	10
<b>2</b>	<b>METHODOLOGY .....</b>	<b>11</b>
2.1	Document Collection & Collation .....	12
2.2	Gert Sibande Integrated Development Plan (IDP) .....	14
2.3	Dr Pixley ka Isaka Seme Local Municipality IDP .....	15
2.4	Dr Pixley ka Isaka Seme Local Municipality SDF.....	16
2.5	Census Data .....	17
2.6	Review of Public Participation Reports .....	18
2.7	Review of Media Reports & Articles.....	18
2.8	Review of Previous Studies on Air Quality Offsets.....	19
2.9	Engagements with Locals.....	19
<b>3</b>	<b>STUDY FINDINGS .....</b>	<b>22</b>
3.1	Geographic Profile .....	22
3.2	Political Profile.....	23
3.2.1	Municipal Overview.....	23
3.2.2	Political demarcation.....	24
3.2.3	Ezamokuhle political environment.....	24
3.3	History of Amersfoort Town .....	25
3.4	Population Profile .....	25
3.4.1	Age distribution .....	26
3.4.2	Gender.....	27
3.5	Education Profile .....	28

3.5.1 Municipality-wide Education Profiles.....	28
3.5.2 Ezamokuhle education profile.....	29
3.6 Employment Profiles & Individual Income.....	30
3.6.1 Municipality-wide Employment Profiles.....	30
3.6.2 Ezamokuhle Employment Profile.....	32
3.7 Key Economic Sectors In The Local Municipality & Township.....	33
3.8 Safety & security.....	35
3.8.1 District-wide safety & security issues.....	35
3.8.2 Crime in Ezamokuhle.....	36
3.9 Human Settlements & Infrastructure.....	37
3.9.1 Municipality-wide Infrastructure Overview.....	37
3.9.2 Ezamokuhle Infrastructure.....	39
3.10 Service Delivery Profile.....	45
3.10.1 Waste services.....	45
3.10.2 Water and sanitation.....	46
3.10.3 Electricity.....	47
3.11 Potential Growth Footprint Of The Township.....	47
3.12 Key Community Concerns.....	49
3.12.1 Municipal-wide community concerns.....	49
3.13.2 Ezamokuhle community concerns.....	50
3.13.3. Ezamokuhle concerns regarding offsets.....	50
<b>4 PLANNED ACTIVITIES.....</b>	<b>52</b>
4.1 Potential For Large Developmental Investment In DPKISLM.....	52
4.2 Potential for Development According to GSDM Strategic Objectives.....	53
4.3 Planned Projects For Ezamokuhle As Per GSDM IDP& DPKISLM IDP.....	54
<b>5 SECTOR LANDSCAPE.....</b>	<b>55</b>
5.2 DEFF Regulatory & Policy Landscape.....	55
5.3 Integrated Resource Plan (IRP).....	57

5.4 Other Organizations Implementing Air Quality Offset Projects..... 57

5.5 Community Perceptions ..... 60

**6 EZAMOKUHLE DURING COVID 19 ..... 62**

6.3.1 Overview ..... 62

6.3.2 Covid 19 impacts on Ezamokuhle ..... 62

**7 SWOT ANALYSIS..... 63**

7.3.1 Municipal-wider SWOT Overview ..... 63

7.3.2 SWOT Analysis: Ezamokuhle..... 64

**8 CONCLUSION ..... 67**

**9 ACKNOWLEDGEMENTS ..... 69**

**10 REFERENCES ..... 70**

**ANEXURE 1 ..... 72**

Report Disclaimer ..... 72

Copyright ..... 72

## **LIST OF TABLES**

Table 1: Eskom PMV Activity Schedule	11
Table 2: Previous and current types of documents collected for the purpose of AI gathering	13
Table 3: GSDM IDP information relevant for offset implementation	14
Table 4: DPKISLM IDP information relevant for offset implementation	16
Table 5: Pixley ka Seme Local Municipality SDF information relevant for the offset implementation project	17
Table 6: Historical studies reviewed	19
Table 7: Interview engagement guide	20
Table 8: 2017 Political party seats won in DPKIS LM	23
Table 9: 2021 Political party seats won in DPKIS LM	23
Table 10: Administration units and wards in DPKIS LM	24
Table 11: Demographics of Ezamokuhle	25
Table 12: Employment profile of DPKISLM (Stats SA, 2011)	31
Table 13: Income Profile of DPKISLM (Stats SA 2011)	31
Table 14: Local “township” economic activities in Ezamokuhle	34
Table 15: Number of households living in informal dwellings in GSDM (Stats SA- CS, 2016)	38
Table 16: Descriptions of dwelling types in Ezamokuhle from UAV imagery	42
Table 17: Service delivery profile in DPKISLM	45
Table 18: Community concerns raised at a meeting in Ezamokuhle during DPKISLM IDP development	50
Table 19: NSDP Classification for selected municipalities in Gert Sibande in terms of investment	52
Table 20: Planned projects for Ward 7 and 8 (Ezamokuhle/Amersfoort) as per DPKISLM	55
Table 21: Legislation and policies that have impacts on offsets	56
Table 22: Implementation of offsets by other companies	58
Table 23: SWOT analysis undertaken by GSDM for the IDP	63
Table 24: SWOT analysis for implementing offsets in Ezamokuhle	64

**LIST OF FIGURES**

Figure 1: Area Intelligence Assessment Process Flow	12
Figure 2: Municipalities in Gert Sibande that surround Dr Pixley ka Isaka Seme Municipality	22
Figure 3: Locality map for Ezamokuhle	22
Figure 4: Population pyramid of DPKISLM (Stats SA, 2011)	26
Figure 5: Ratio of males to females in DPKISLM (StatsSA, 2011)	27
Figure 6: Education Profile in DPKISLM (Stats SA-CS, 2011)	29
Figure 7: Level of education for Ezamokuhle adult population (Nkambule 2016)	30
Figure 8: Key economic activities in DPKISLM	33
Figure 9: Perceived level of safety by households in GSDM and DPKISLM	36
Figure 10: Dwelling types in DPKISLM	39
Figure 11: Example of backyard shacks	41
Figure 12: Road conditions in Ezamokuhle	43
Figure 13: Example of illegal dumping activities in Ezamokuhle	46
Figure 14: New developments in Ezamokuhle between 2009 – 2012 (MCOGTA, 2019)	48

**TABLE OF ABBREVIATIONS**

<b>ANC</b>	African National Congress
<b>AQA</b>	Air Quality Act
<b>AQMP</b>	Air Quality Management Plan
<b>ARM</b>	Air Resource Management
<b>BNG</b>	Breaking New Grounds
<b>CBO</b>	Community-Based Organization
<b>DEFF</b>	Department of Environment Forestry and Fisheries
<b>DPKISLM</b>	Dr Pixley ka Isaka Seme Local Municipality
<b>GSDM</b>	Gert Sibande District Municipality
<b>IDP</b>	Integrated Development Plan
<b>KPA</b>	Key Performance Area
<b>LM</b>	Local Municipality
<b>MES</b>	Minimum Emission Standards
<b>NACA</b>	National Association for Clean Air
<b>NDP</b>	Net Domestic Product
<b>NGO</b>	Non-Governmental Organisation
<b>NSDP</b>	National Spatial Development Perspective
<b>PM</b>	Particulate Matter
<b>PMV</b>	Planning, Monitoring and Verification
<b>SDF</b>	Spatial Development Framework
<b>SWOT</b>	Strengths, weaknesses, opportunities, and threats

## 1 BACKGROUND

In 2015, Eskom was granted a postponement of compliance timeframes in accordance with Listed Activities and Minimum Emission Standards (MES) regulations published in terms of section 21 of the Air Quality Act (AQA) (GN 893 of 2013). These regulations list activities that result in atmospheric emissions which may have detrimental impacts on the environment. Said regulations also prescribe emission limits that these listed activities must not exceed. Listed activities must comply with prescribed limits at different timeframes i.e. Existing/old plants (operational before 2010) must comply with old plant standards by 2015 and comply with new/stricter plant standards by 2020. The same regulations (GN 893 of 2013) stipulated (prior to recent amendments) that an existing plant can apply for postponement of compliance timeframes, meaning delaying the timeframe of compliance by sending an application to the National Air Quality Officer.

Eskom embarked on a process to apply for postponements on 1<sup>st</sup> April 2015 compliance timeframe for some of Eskom's MES listed activities. The National Air Quality Officer (NAQO) in concurrence with the Gert Sibande District Municipality licensing authority granted postponements to Eskom and stipulated conditions to be upheld for the period of postponement. A postponement of timeframes to comply with the limits set in the regulation was granted to Eskom in 2015 to allow time for Eskom to invest in technological and other measures to reduce emissions towards meeting the set limits.

One of the conditions of the granted postponements included the requirement to submit and implement an air emissions offset plan to reduce particulate matter pollution in the receiving environment. The condition specifically required that Eskom identifies and implements offset projects that will reduce Particulate Matter (PM) in the ambient / receiving environment.

Environmental offsets are alternative actions (investments or initiatives) implemented to mitigate the residual negative environmental impacts of an industrial activity. An environmental offset is an action(s), designed to compensate for a negative environmental impact of resource use, a discharge, emission or other activity. Specifically in relation to air quality, the Department of Environmental Affairs (DEA) Air Quality Offsets Guideline (Notice 333 of 2016) defines air quality offsets as an intervention, or interventions, specifically implemented to counterbalance the adverse and residual environmental impact of atmospheric emissions in order to deliver a net ambient air quality benefit within, but not limited to, the affected airshed where ambient air quality

standards are being or have the potential to be exceeded and whereby opportunities and need for offsetting exist.

### **1.1 ESKOM'S AIR QUALITY OFFSETS**

In response to the condition above, Eskom is implementing air quality offsets, which are also part of its multi-pronged approach to improving ambient air quality, which includes: reducing emissions at the existing coal-fired fleet; investing in power generation from renewables and nuclear. Eskom's air quality offsets are designed to reduce human exposure to harmful levels of air pollution by reducing emissions from local sources, like domestic coal burning and waste burning. Examples of air quality offsets implemented by Eskom are:

- switching households from coal to cleaner energy sources,
- improving thermal comfort of houses to minimise the need for coal-based heating in winter, and
- improving waste collection and recycling.

Such interventions have the potential to counterbalance the effect of emissions from power stations on the air quality in localities near Eskom's power stations.

### **1.2 SCOPE OF WORK**

As part of implementation of a series of offsets projects, Eskom seeks to undertake continuous project monitoring and verification of the effectiveness of such projects in improving ambient air quality. To this end, Eskom appointed Air Resource Management (Pty) Ltd (*herein referred to as ARM*) to support the Planning, Monitoring and Verification (PMV) services in support of the Phase 1: Lead implementation at: KwaZamokuhle; Ezamokuhle and Sharpeville. To achieve this, Eskom has included sixteen targeted work package Activities (Table 1) for these respective communities.

Table 1: Eskom PMV Activity Schedule

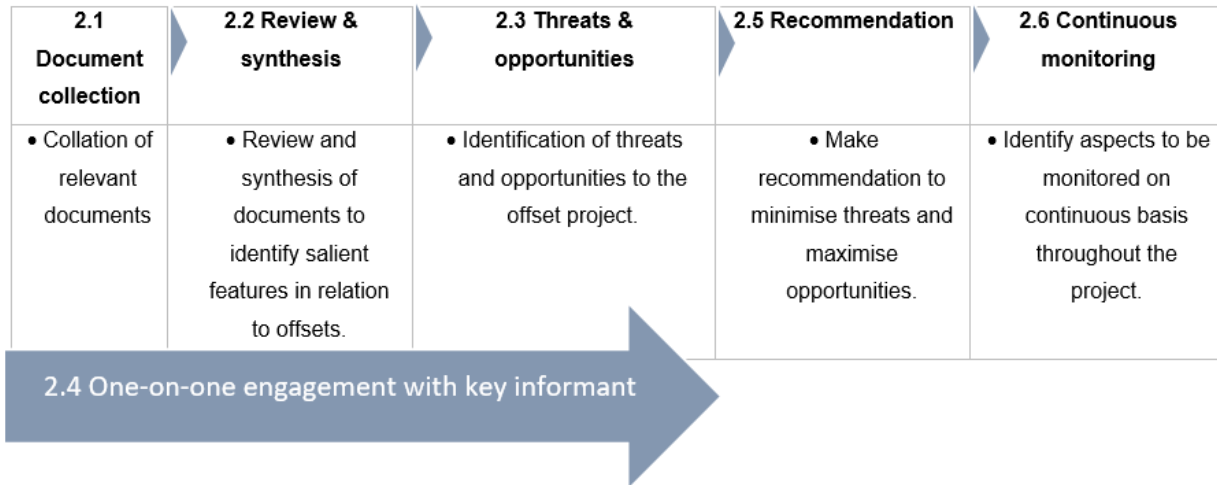
Activities	Kwazamokuhle	Ezamokuhle	Sharpeville
Activity 1: Preliminary air quality assessment		✓	
Activity 2: Gather Area intelligence		✓	
Activity 3: Rapid in situ assessment		✓	
Activity 4: Obtain ethical clearance		✓	
Activity 5: Census	✓	✓	✓
Activity 6: Community source survey		✓	
Activity 7: Fuel source survey		✓	
Activity 8: Household surveys		✓	
Activity 9: Annual (household/community) surveys and monitoring of project effectiveness	✓	✓	✓
Activity 10: Ambient air quality monitoring	✓	✓	✓
Activity 11: Conduct indoor air quality monitoring	✓	✓	
Activity 12: Atmospheric Dispersion Model	✓	✓	✓
Activity 13: Design of Intervention		✓	✓
Activity 14: Development of Database Reporting	✓	✓	✓
Activity 15: Strategic Assistance and offsets methodology	✓	✓	✓
Activity 16: Research and Development	✓	✓	✓

This report is an output of Activity 2: *Gather Area Intelligence* for Ezamokuhle. The purpose of gathering area intelligence is to provide a better understanding of the study area, including environmental and socioeconomic aspects that present threats and opportunities to the successful implementation of offsets. Area intelligence gathering is a continuous process, and an area intelligence (AI) report is produced annually for the duration of the Lead implementation phase (5 years). The 1<sup>st</sup> edition of AI report for this project was produced and submitted in February 2021 and this report is an update or 2<sup>nd</sup> edition of the said report.

## 2 METHODOLOGY

In accordance with the scope of work and the schedule above, Activity 2: “Gather Area Intelligence” requires collation & evaluation of intelligence information for Ezamokuhle. This includes gathering relevant high level regional, social, and geographical information from current and past studies conducted in Ezamokuhle and local development plans. In the development of

the initial or first edition of AI report (2021), high-level regional and local geographic and social information was obtained from various government plans and a macro assessment of the information obtained was done. The process followed in gathering area intelligence is depicted in Figure 1. The subsequent sections (2.1 to 2.6) provide the details herein.



**Figure 1: Area Intelligence Assessment Process Flow**

For this 2<sup>nd</sup> edition, the same approach used for the first edition was used wherein any new regional and local geographic, social, environmental and government planning documentation was searched, solicited, and reviewed. The aim was to update existing information (geography, population statistics, environment, and socio-economic aspects of Ezamokuhle) and identify any new data that is relevant for offset projects.

### 2.1 DOCUMENT COLLECTION & COLLATION

Search engines were used to search for any updated reports of the same ones used in the 1<sup>st</sup> edition AI report. This included updates to government plans, social and economic statistics, previous studies, and media reports, among others. Table 2 below shows types of documents that were used in the compilation of AI reports and any updates in the current year.

**Table 2: Previous and current types of documents collected for the purpose of AI gathering**

Document name or type	Publication year	Updated version (or new documents) available for 2022 2 <sup>nd</sup> edition AI report
<i>Gert Sibande District Municipality's (GSDM) Integrated Development Plan (2020-2021)(GSDM, 2019).</i>	2019	No
<i>Pixley Ka Seme Local Municipality's (DPKISLM) Integrated Development Plan (IDP)(DPKISLM, 2020)</i>	2020	No
<i>Dr Pixley Ka Isaka Seme SDF review (MCOGTA, 2019)</i>	2019	No
<i>GSDM Waste By-laws (GSDM, 2017)</i>	2017	No
<i>Public participation meeting reports</i>	Various	Yes
<i>Media reports and articles</i>	Various	Yes
<i>Previous studies related to air quality and offsets</i>	Various	Yes

This report contains information based on both 2021 documents and newly identified 2022 documents. Where new data was used for this edition, such is highlighted in the relevant subsections of this methodology chapter.

In all instances, documents collected were reviewed and synthesised to derive their relevance to offsets implementation. The snapshot review considered the following:

- Document objective;
- Salient features as they relate to the offset project; and
- In case of policy and planning documents, key activities planned in Ezamokuhle and surrounds, as they relate to offsets.

The following sections provide an indication of how the information contained in the documents listed above was used for the purpose of intelligence gathering. Only information that is relevant for offsets implementation was considered.

## 2.2 GERT SIBANDE INTEGRATED DEVELOPMENT PLAN (IDP)

The GSDM IDP is a document that outlines the objectives and strategies to guide the allocation and management of resources within the municipality's jurisdictional area. The objective of the IDP is to improve coordination and integration of planning, budgeting and development within the Municipal area. As a five (5) year budgeting, decision-making, strategic planning and development tool, the IDP is used by the Municipality to fulfil its role of 'developmental local governance'. Table 3 summarises salient contents of the IDP that can potentially impact the roll out, implementation, execution or success of air quality offset interventions.

**Table 3: GSDM IDP information relevant for offset implementation**

Section	Relevant section of the IDP	Relevance
1.3.3	SWOT analysis for GSDM municipality.	This was important for identifying opportunities and threats to offsets project implementation projects in the district.
1.3.6	Goals and statements and outcomes.	Important for noting and aligning offsets objectives with IDP goals.
1.3.7	Short term strategies and KPAs: Specific interventions that will be implemented by municipality.	Important for aligning offsets objectives with IDP strategies and KPAs.
1.3.8.	KPA's, Strategic Objectives and Programmes in various areas such as waste management, enterprise development and EPWP.	Important for identifying programmes that may be complementary or antagonistic to Ezamokuhle offsets project.
1.4.4	Community issues raised	Important for understanding pertinent issues commonly raised by communities, with the focus on issues raised in Ezamokuhle or Dr Pixley ka Seme Local Municipality. These can provide insight on issues that may favour or challenge offsets projects in these areas.
<b>Chapter 2</b>	Context: population and statistics: dwellings projections, employment, educations levels, access to services etc.	Important for initial assessment of Quality of Life (QoL) and other socioeconomic indicators that affects offsets implementation and sustainability.

<b>3.2.6.</b>	Municipal Health and Environmental Services: Waste management and air quality and environmental capacity of the municipality	Important for identifying government capacity to support offsets implementation.
<b>3.2.11.</b>	Safety and Security	Important for identifying current security concerns that can threaten the offsets implementation.
<b>3.2.16.</b>	Roads and Transportation	Important for identifying transport-related programmes that may be complementary or antagonistic to offsets projects.
<b>3.2.17.</b>	Gert Sibande IDP Projects	Important for identifying IDP programmes that may be complementary or antagonistic to offsets projects.
<b>3.3.</b>	KPA 3 Service Delivery	Important for identifying service delivery programmes that may be complementary or antagonistic to offsets projects.
<b>3.3.</b>	KPA 3 local economic development	Important for identifying local economic development programmes that may be complementary or antagonistic to offsets projects.
<b>3.3.10.</b>	Expanded Public Works Programme	Important for identifying EPWP programmes that may be complementary or antagonistic to offsets projects.
<b>Chapter 8</b>	Sector department projects: particular focus on social development, environmental, public works, human settlements	Identifying programmes that are complementary or antagonistic to offsets.

### 2.3 DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY IDP

The DPKISLM IDP is an overarching strategic tool that guides and informs the planning and development, and decisions taken regarding planning, management, and development within the Municipality. It is the primary strategic plan that documents the critical development needs of the municipal area (external) and the organisation (internal). Table 4 outlines the salient contents of

the IDP which can potentially impact the roll out, implementation, execution or success of air quality offset interventions.

**Table 4: DPKISLM IDP information relevant for offset implementation**

Section	Relevant section of the IDP	Relevance
2.3.2	Community issues raised	Important for understanding pertinent issues commonly raised by communities, with the focus on issues raised specifically in Ezamokuhle. These can provide insight on issues that may favour or challenge offsets projects in these areas.
3.1 to 3.6	Demographic profile Socioeconomic development	Important for initial assessment of Quality of Life (QoL) aspects and other socioeconomic indicators that affects offsets implementation and sustainability.
3.8	Household data	Nature of household dwellings and product ownership as it affects the significance of particular offsets interventions
4.8.2	Service delivery and infrastructure development	Important for understanding the current service delivery status and challenges in the LM and specific wards that encompass Ezamokuhle
4.8.6.1.3	Capital investment framework	Lists proposed investments in infrastructure projects
4.8.6.2	Human Settlement and Land Administration	Proposed township developments and expansions that may impact on offsets
Chapter 8	IPD sector department projects	Specific projects to be implemented in different local municipalities and wards that have implications for offsets

## 2.4 DR PIXLEY KA ISAKA SEME LOCAL MUNICIPALITY SDF

DPKISLM Spatial Development Framework (SDF) aims to provide the required spatial planning guidelines and focus areas to support the drive towards the creation of equitable and sustainable development opportunities within the district. Table 4 summarises the salient contents of the IDP

which can potentially impact the roll out, implementation, execution or success of air quality offset interventions.

**Table 5: Pixley ka Seme Local Municipality SDF information relevant for the offset implementation project**

Section	Information to be reviewed	Relevance
<b>2.6</b>	Alignment of the LM SDF with GSDM and provincial SDFs	Aligning offsets objectives with SDF strategic objectives.
<b>7.1.1.2.</b>	Secondary Nodes: Amersfoort / Ezamokuhle, Perdekop / Siyazenzela and Wakkerstroom / Esizameleni	Explanation of Ezamokuhle as a secondary node and key economic sectors to be prioritised in the node.
<b>7.1.4.</b>	Future Development and Growth	Future development ambitions of the municipality, including commercialisation of agricultural products and development of housing.
<b>7.3.1.</b>	Applying Densification to DPKIS Local Municipality	How the municipality intends to apply densification strategy to minimise urban sprawl and informal settlements.
<b>7.4.2.</b>	Amersfoort / Ezamokuhle Growth Pattern 2010-2019	Shows how Ezamokuhle township has grown between 2009 and 2019.

## 2.5 CENSUS DATA

ARM collected population statistics data from recently published census documents including:

- i. national census (2011)
- ii. community survey (CS) (2016) and
- iii. subplace (Ezamokuhle Sub Place 863001001) census (2017) published by Stats SA.

From these datasets, the team was able to gather information such as population age distribution, income levels, and service delivery statistics.

## **2.6 REVIEW OF PUBLIC PARTICIPATION REPORTS**

ARM has reviewed various reports that document public participation activities by Eskom and municipalities in Ezamokuhle. These reports provided information on the pertinent issues raised by the community which included:

- challenges faced by the community;
- key priorities for the community and
- issue/s that some community members may raise during the implementation of offsets with a view to mitigate and manage these.

For this 2<sup>nd</sup> edition of the report, we also included information obtained from the meeting with Ezamokuhle community hosted by Eskom on the 22<sup>nd</sup> of September 2021. The purpose of the meeting was to introduce Eskom offset project to the community.

## **2.7 REVIEW OF MEDIA REPORTS & ARTICLES**

Various media reports documented issues in the region which can potentially impact the roll out, implementation, execution or success of air quality offset interventions. These media reports were reviewed to provide better understanding of community dynamics. ARM considered both regional issues and local issues raised in the media. For this we will use the following search words in the google news search:

- Eskom
- Highveld pollution
- Ezamokuhle
- Amersfoort
- Eskom Majuba power station
- Air quality Offsets
- Health impact of air quality
- CER
- Groundworks

## 2.8 REVIEW OF PREVIOUS STUDIES ON AIR QUALITY OFFSETS

ARM reviewed information from previous research studies undertaken in Ezamokuhle to support any information collected in the preceding sections.

**Table 6: Historical studies reviewed**

Author/Forum	Title
<b>Mchunu &amp; Nkambule, (2019)</b>	An evaluation of access to adequate housing: A case study of Ezamokuhle township, Mpumalanga; South Africa.
<b>Nkambule, 2016</b>	A critical analysis of housing Provision, livelihood activities and Social reproduction in urban Communities in South Africa: The case of Ezamokuhle, Mpumalanga.
<b>Eskom (2017,2018)</b>	Eskom Ezamokuhle offset pilot project documents including the report on the health impacts by MRC.
<b>Bondamakora et al (2019)</b>	Air Quality Offsets in South Africa's Low-Income Settlements
<b>Langerman (2019)</b>	Options for residential emission management in South Africa; 2019 DEA NACA Workshop on Emission Reduction Options for South Africa.
<b>NACA Offsets Workshop (2020)</b>	<p>A technical workshop on Air Quality Offsets was hosted at the 2020 NACA Annual Conference.</p> <p>Speakers and organizations at this session included:</p> <ul style="list-style-type: none"> <li>• Mpumalanga Department of Agriculture, Rural Development, Land and Environmental Affairs – Air Quality Management</li> <li>• Eskom</li> <li>• Sasol</li> <li>• North West University</li> <li>• University of Johannesburg</li> <li>• Community organizations</li> </ul>
<b>NACA 2021 Annual Clean Air Conference</b>	ARM's NACA presentations on Eskom's PMV project in Ezamokuhle

## 2.9 ENGAGEMENTS WITH LOCALS

In the compilation of the 1<sup>st</sup> edition AI report, ARM had one-on-one engagement with informants who had key insight & intelligence for Ezamokuhle. The intent of this activity was to gather more

information about unwritten social township dynamics to understand how these dynamics could potentially impact the offset project. The team met with three key informants in Ezamokuhle on 18/03/21. One of our team members who is fluent in Zulu language facilitated the discussion where required.

The names of the persons interviewed remain anonymous but included:

- 1) a member of the local business forum,
- 2) a community development worker and
- 3) a member of community policing forum.

Table 7 outlines the questions that were utilised to guide the discussions with the informants.

**Table 7: Interview engagement guide**

Focus Area	Question
General	<i>Tell us about Ezamokuhle: the type of community, how the place got inhabited and challenges</i>
Political landscape	<i>Which political organisations are dominant in the area? Which community structures (CBOs and NGOs) are dominant? Please share the names of the political structure</i>
Socio-economics	<i>What are the pertinent social challenges faced by the community? Provide examples Is crime a concern (elaborate) What are the key economic activities in the township? Which sectors and firms employ key sources of employment in the area What is the perceived level of crime?</i>
Service delivery	<i>What are the key service delivery challenges faced by the community? (Elaborate) Are all houses fitted with a sewage system (more precise- long drop vs french drain vs sewerage water reticulation system. Only the former should result in significant air quality (odour) issues. How many times does waste get collected and what are the challenges? Are all houses electrified? How much free basic electricity is offered to residents Confirm various sections of 2.6; 3.9 on infrastructure and service delivery</i>
Environmental	<i>What are the pertinent environmental problems that the community is concerned about?</i>

**Activity 2: Gather area intelligence about Ezamokuhle community**



Housing	<i>In 2014 there was a proposed Breaking New Grounds (BNG) development planned near the Roestein section of Ezamokuhle, how far is it in terms of progress?</i>  <i>Was there anything done to rectify the quality of housing in Eza?</i>
Gender	<i>According to GSDM IDP all municipalities should have a gender desk. Is there such a desk?</i>

For this review and compilation of the 2<sup>nd</sup> edition AI report, we had one-on-one interviews with only one of the informants who was more informative during the first interview in 2021. The interview was done telephonically on 27<sup>th</sup> February 2022. The aim was to obtain updates on the political landscape of Ezamokuhle considering the recent local government elections and identify any other socioeconomic changes experienced by the community since our last engagement.

### 3 STUDY FINDINGS

#### 3.1 GEOGRAPHIC PROFILE

Ezamokuhle (meaning ‘to make it beautiful’) is a township located near a town of Amersfoort which is approximately 42km north of Volksrust at the intersection of the N11 highway and the R35 from Bethal. It is located within Dr Pixley Ka Isaka Seme (DPKISLM) of Gert Sibande District Municipality (GSDM), Mpumalanga Province (Figure 2). The township consists of 6 sections (China 2, Roestein, Jabavu, Phumula and Smallville) is bordered by Amersfoort town (which includes China 1) on the south-western side and veld around the remainder of the township.



Figure 2: Municipalities in Gert Sibande that surround Dr Pixley ka Isaka Seme Municipality



Figure 3: Locality map for Ezamokuhle

## 3.2 POLITICAL PROFILE

### 3.2.1 MUNICIPAL OVERVIEW

The ruling party in Mpumalanga is the African National Congress (ANC). At local municipal level, the DPKIS LM council is also led by the ANC. The LM council consists of twenty-one members elected by mixed-member proportional representation. Eleven councillors are elected by first-past-the-post voting in eleven wards, while the remaining ten are chosen from party lists so that the total number of party representatives is proportional to the number of votes received. In the election of 3 August 2016 the African National Congress (ANC) won a majority of seventeen seats on the council.

During the by-election held on 18 October 2017, a ward previously held by the ANC was won by an independent candidate. Political seat composition was reconfigured to what is shown in Table 8 below

**Table 8: 2017 Political party seats won in DPKIS LM**

Party	Wards	PR list	Total seats
African National Congress (ANC)	10	6	16
Democratic Alliance (DA)	0	2	2
Economic Freedom Fighters (EFF)	0	1	1
Independent	1	-	1
Inkata Freedom Party (IFP)	0	1	1
<b>TOTAL</b>	<b>11</b>	<b>10</b>	<b>21</b>

During the August 2021 elections, ANC lost 3 seats, EFF gained 2 more seats. The current political seats composition is shown in Table 9 below.

**Table 9: 2021 Political party seats won in DPKIS LM**

Party	Total seats
African National Congress (ANC)	13
Democratic Alliance (DA)	2
Economic Freedom Fighters (EFF)	3
African People's Movement (APEMO)	1
Forum 4 Service Delivery (F4SD)	1
Inkata Freedom Party (IFP)	1
<b>TOTAL</b>	<b>21</b>

### 3.2.2 POLITICAL DEMARCATION

The DPKIS LM covers an area of comprises of approximately 5227, 98km<sup>2</sup> divided into 11 Wards as per the municipal demarcation, and 4 administrative units as shown in Table 10. Ezamokuhle falls under ward 7 and ward 8.

**Table 10: Administration units and wards in DPKIS LM**

ADMINISTRATION UNIT	WARDS
Perdekop	6
Wakkerstroom	5
Amersfoort	7;8
Daggakraal	9,10,11
Volksrust	1,2,3,4

WARD 7	WARD 8
This ward is located in Amersfoort and made up of Amersfoort town, a portion of Ezamokuhle which is dominated by RDP houses with basic necessities such as water, sanitation and electricity. It also has informal settlements.	The ward is in Amersfoort, comprises of the old portion of Ezamokuhle location. Majuba power station falls under this ward.

### 3.2.3 EZAMOKUHLE POLITICAL ENVIRONMENT

As shown in the previous paragraph, Ezamokuhle comprises of Ward 7 and Ward 8. Both wards were won by ANC candidates in the 2021 local government elections. However, the candidate for Ward 8 withdrew and a new candidate (who may be of a different party) will be elected in the 16<sup>th</sup> March 2022 bi-elections. The relationship between the selected candidate and the community is important because offsets projects and any other community development project is seen as contribution from the councillor. Thus, where councillor-community relations are strained, the acceptance of projects can be affected.

In the previous year, the most dominant political parties in Ezamokuhle were the ANC and EFF with some DA prominence. Following the 2021 local government elections, there are two new entrant parties i.e. African People's Movement (APEMO) and Forum 4 Service Delivery (F4SD) with prominence in Ezamokuhle.

Informants had also indicated earlier that there is some animosity between members of political parties in the area parties which can present a threat to the offsets project. They noted that while the community may see the project as beneficial, political party leaders may sway the community in a different direction (against the project), to prove a point or to drive a particular political agenda. Thus, it is important to ensure that there is buy in from all political parties prior to the implementation of the project. This point was re-emphasised in the recent engagements with one informant.

### 3.3 HISTORY OF AMERSFOORT TOWN

According to Nkambule (2016) and DPKIS LM (2017) IDP, Amersfoort was established in 1888 around a Dutch Reformed Church which was constructed in 1876. The area was first settled in 1876 when two farmers in the area contributed land to the church, after which Reverend Frans Lion Cachet proceeded to construct a Dutch Reformed church. The new (then) village was named after the hometown (in the Netherlands) of the Dutch farmers and the area was officially proclaimed a town in 1888.

Dr. Pixley ka Isaka Seme, one of the founders of the African National Congress, had law offices in Amersfoort and spent time there doing legal and political work for the community at Daggakraal, for the Native Farmers Association, and for the Mswati royal family in Swaziland. Hence the local Municipality DPKIS LM (which includes the towns of Amersfoort, Volksrust, Wakkerstroom, Perdekop and Daggakraal) is named after him.

### 3.4 POPULATION PROFILE

According to Stats SA (2011) sub-place statistical data, Ezamokuhle has a population of 10 293 which is just above 10% of DPKIS LM population (Table 11). There is a total of 2 956 households.

**Table 11: Demographics of Ezamokuhle**

Parameter	DPKIS LM (StatsSA, 2011)	Ezamokuhle (StatsSA, 2011)
<b>Population size</b>	83,235	10,293
<b>Population growth</b>	0.3%	
<b>Number of households</b>	19,838	2,956

<b>Population density (people per square kilometre)</b>	16 persons/ km <sup>2</sup>	1,657.64 persons/ km <sup>2</sup>
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### 3.4.1 AGE DISTRIBUTION

In terms of age distribution, there is currently no data on the age distribution of Ezamokuhle population. However, at local municipality level (DPKIS), it can be deduced that the majority of the population are youth and children (Figure 5). The population pyramid (Figure 5) shows a broad base, indicative of high birth rate, and a narrow tip indicative of a shorter life expectancy. It can also be seen that a large proportion of the population in the area are between the ages of 0 and 30. This is typical of an industrial area where there is an influx of job seekers from the economically and active cohorts into an area.

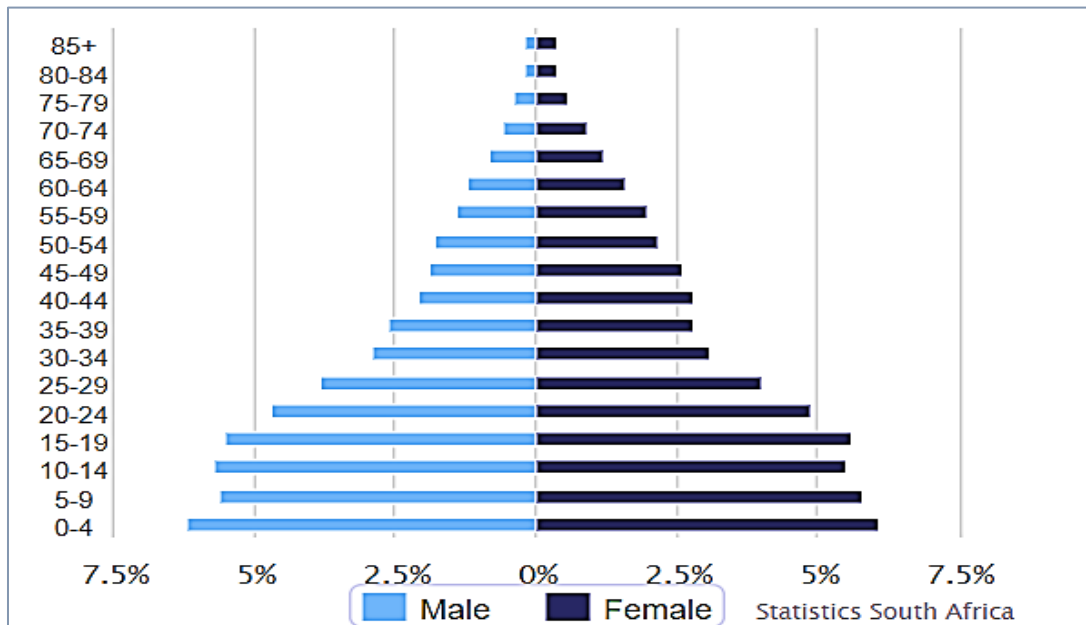
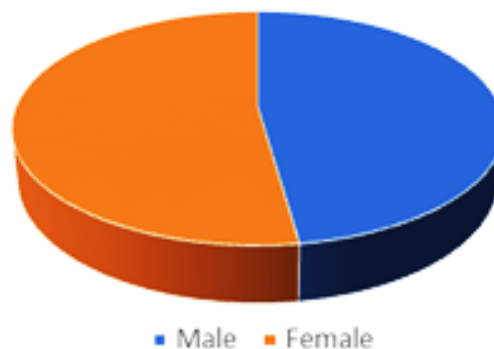


Figure 4: Population pyramid of DPKISLM (Stats SA, 2011)

The shape of the age distribution is an indication of both current and future needs regarding educational provision for younger children, health care for the whole population and vulnerable groups such as the elderly and children, employment opportunities for those in the economic age groups, and provision of social security services such as pension and assistance to those in need.

### 3.4.2 GENDER

In terms of gender distribution, the ratio of females in DPKIS LM is marginally higher than for males (Figure 6). This is an important dimension to note in terms of energy-related offsets because women have a primary role in household energy needs as they are generally responsible for cooking.



**Figure 5: Ratio of males to females in DPKISLM (StatsSA, 2011)**

It is also important to note that GSDM has developed a Gender Mainstreaming Policy which should be cascaded down to all the local municipalities. The district endeavors that gender mainstreaming should be incorporated into all the programs and projects within the District. Of particular relevance to offsets is that the policy notes that lack of access to electricity creates additional labour for women and young girls, also reducing their available time for family and income generating activities. Key issues set out in the policy pertaining to gender include among others the following:

- Ensuring involvement of all sectors and response of their programs to gender mainstreaming;

- Paying more attention to issues affecting women;
- Harnessing the access of economic opportunities to women in the district;
- Mainstreaming of women in the development initiatives of municipalities;
- Prioritising a number of women empowerment issues and find ways of mainstreaming them in all the decision making, planning and budgeting processes of the district;
- Ensuring that men are also involved in gender mainstreaming issues; this will enable them to understand what gender mainstreaming is.

Given the above, there may be political interest in incorporating gender mainstreaming into offsets implementation projects. According to GSDM IDP, the district municipality is to ensure that there are Women's Desks at all the local municipalities to effectively coordinate and facilitate women's issues at local level. In our conversation with local informants, such a desk is not known to exist in DPKISLM. Instead, only the youth desk is known to exist. The offsets implementation teams should be in touch with the desk at DPKISLM to ensure alignment prior to employment of field workers for Eskom's offsets project.

### **3.5 EDUCATION PROFILE**

The level of education is an important indicator of possible future socioeconomic conditions on the community. When the youth is not equipping themselves with education, they are setting themselves up to perpetuate poor living conditions into their futures. Consequently, all poverty-related aspects of energy use (such as the use of cheap and dirty fuels) continue.

#### **3.5.1 MUNICIPALITY-WIDE EDUCATION PROFILES**

Education levels affect income for households, which subsequently affect their choice of energy carriers. According to Stats SA, only 15% of DPKIS LM population have completed secondary education (which means having matric qualification) (Figure 6). What is also alarming is that only 58% of youths aged 15-24 are attending school, while 42% are not attending any form of education (Stats SA, 2016).

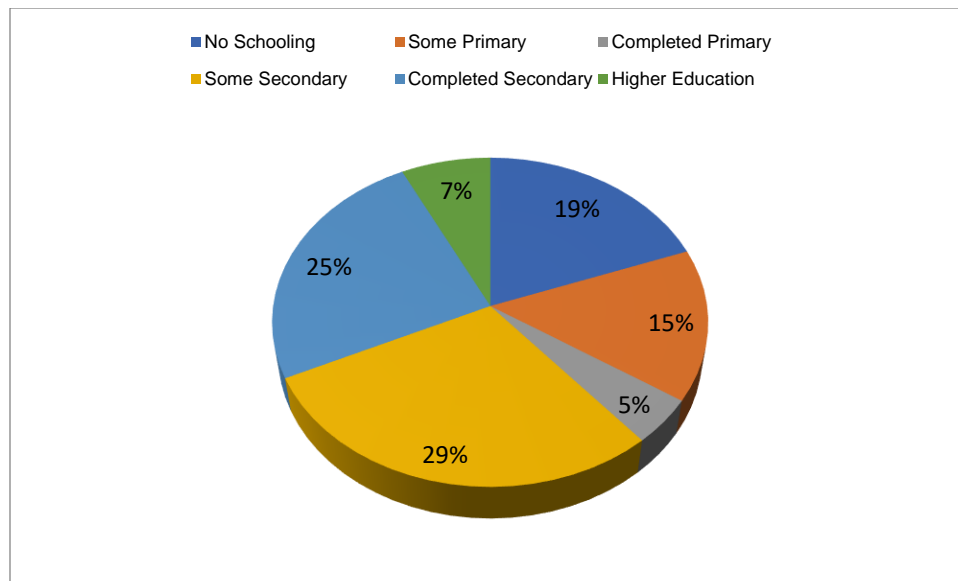
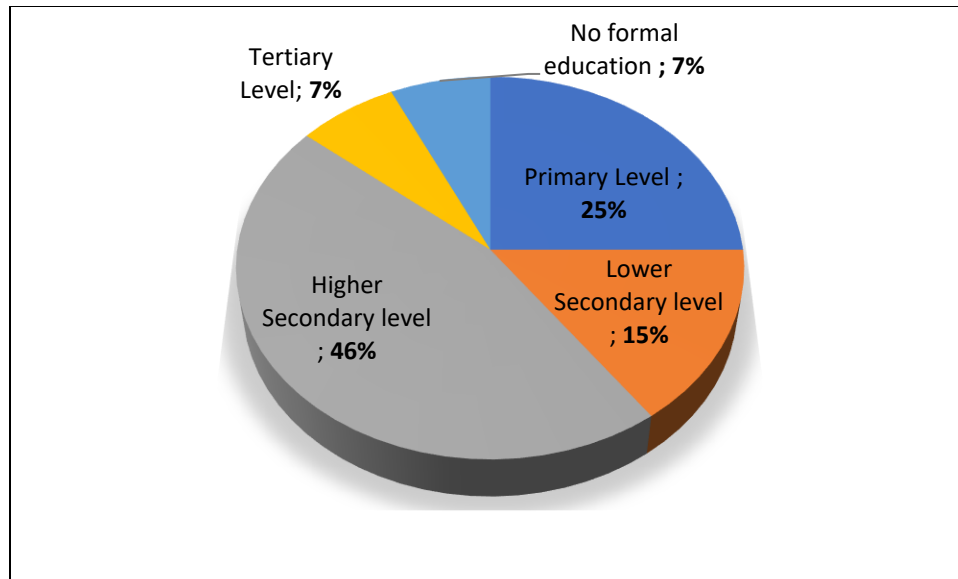


Figure 6: Education Profile in DPKISLM (Stats SA-CS, 2011)

### 3.5.2 EZAMOKUHLE EDUCATION PROFILE

Data on the education profile specific to Ezamokuhle township will be collected as part of household survey to be undertaken in this project. Nonetheless, preliminary 2016 data from a sample of 100 households in an Ezamokuhle case study (Nkambule, 2016) suggest that 25% of the respondents have a primary level education, 15% have a lower secondary level education, 46% a higher secondary level education and 7% have tertiary education; while 7% of the respondents have no formal education whatsoever. The study reported that a significant number of school dropouts were females, and this was because of pregnancies and the difficulties of returning to school after giving birth to a child.



**Figure 7: Level of education for Ezamokuhle adult population (Nkambule 2016)**

These education profiles suggest that socioeconomic conditions in Ezamokuhle are less likely to improve over time. Thus, it is important that offsets implemented in this area should take into account long term sustainability of the interventions. Also, communities with uneducated youth are associated with teenage pregnancies (also supported by our informants as shown in the previous paragraph). Such situations perpetrate poverty whilst increasing population, which consequently threatens the sustainability of offsets.

### 3.6 EMPLOYMENT PROFILES & INDIVIDUAL INCOME

Employment profiles and income levels are indicative of the ability of households to afford their needs, including their ability to afford certain types of energy carriers/fuels. Generally, cleaner sources of energy are relatively expensive, hence low-income households are often found with no choice but to resort to cheaper fuels that are often dirty and polluting.

#### 3.6.1 MUNICIPALITY-WIDE EMPLOYMENT PROFILES

Employment status is an indicator that relates to numerous aspects important in the assessment of quality of life of communities. Table 12 shows employment status of DPKISLM (Stats SA, 2011). The table shows that 21 885 people (44% of the population) were economically active (employed or unemployed looking for a job), and only 28% are actually employed. Approximately 8% are

discouraged work seekers and 47% are economically inactive. According to this dataset, the area (DPKIS LM) has an unemployment rate of more than 70%.

**Table 12: Employment profile of DPKISLM (Stats SA, 2011)**

Employment Status	Number	Percentage
<b>Employed</b>	13 979	28,2 %
<b>Unemployed (looking)</b>	7 906	15.98 %
<b>Discouraged Work Seeker</b>	4 184	8.5%
<b>Not Economically Active</b>	23 383	47.3%

Of the employed portion of the population, the majority (40.8%) are within the R9 601 to R38 200 income bracket. Table 13 shows the percentage of population within different income brackets.

**Table 13: Income Profile of DPKISLM (Stats SA 2011)**

Income per annum	Percentage
No income	15,4%
R1 - R4,800	6,7%
R4,801 - R9,600	10,2%
R9,601 - R19,600	20,4%
R19,601 - R38,200	20,4%
R38,201 - R76,4000	11,1%
R76,401 - R153,800	6,9%
R153,801 - R307,600	5,1%
R307,601 - R614,400	2,7%

R614,001 - R1,228,800	0,6%
R1,228,801 - R2,457,600	0,3%
R2,457,601+	0,2%

### 3.6.2 EZAMOKUHLE EMPLOYMENT PROFILE

The employment profile for Ezamokuhle will be developed as part of Activity 6-8 of this project. Currently, other studies have reported that some 39% of adults in Ezamokuhle were employed and 61% were unemployed (Nkambule 2016). Of those employed, just over half were full-time workers, while the others were either seasonal workers or part-time workers. The full-time workers were located in diverse occupation categories, including professionals (such as electricians, teachers and police officers), farm and domestic workers, taxi drivers and store assistants. The seasonal workers consisted of general workers and farm labourers, and the part-time workers were domestic workers, car washers, Community Workers Programme workers, Expanded Public Works Programme workers and merchandisers in the neighbouring towns of Standerton, Ermelo, Volksrust and on nearby farms.

Many of the people who are employed on a formal basis are working in the nearby Eskom Majuba Power Station. Most jobs there, however, are not permanent as they are part time, temporal and seasonal. During the “shutdown” (a period when equipment and cooling towers used to generate electricity are being serviced) different specialised contractors employ people from Ezamokuhle township on a temporary basis in cleaning and servicing the equipment at Majuba. During the site visit, we noticed Eskom-labelled buses used to transport personnel.

Nkambule’s (2016) study reported that most men and women from Ezamokuhle who work on the farms (for instance weeding), and women who are employed as domestic workers, complain that they face extremely exploitative and discriminatory employment conditions because they work long hours at low pay. They in fact reported that they earn between R1,500 and R1,800 per month. In travelling to and from work, they walk every day in order to minimise travel-related expenditures. The study also indicated that even people who are employed are heavily indebted.

Meanwhile, some households rely on basic income grants from the government (including old age grants, childcare and foster grants). In most cases, these grants are used not only to benefit the registered recipient (for instance, the child recipient) but often the entire household.

Based on the above, it is clear that most households in Ezamokuhle are in the indigent to low-income groups and may not be able to afford high-end clean fuels for their energy needs. This situation is similar to what was found in the Kwazamokuhle pilot where the community is largely indigent (Eskom, 2017). Thus, most of the learnings from the Kwazamokuhle pilot can be transferred to Ezamokuhle, especially those relating to issues of affordability of certain energy carriers.

### 3.7 KEY ECONOMIC SECTORS IN THE LOCAL MUNICIPALITY & TOWNSHIP

The nature of economic activities in an area can influence the type of fuel used by households. For example, communities living next to coal mines tend to use coal as fuel, especially during winter months because coal would be available to them at cheaper price. Similarly, communities living near large plantations are likely to use wood for heating and cooking.

At municipal level, economic activity in DPKIS LM is driven by Trade (~ 20%), Agriculture (19%), Community services (17%) and Construction (13%) as shown in Figure 9.

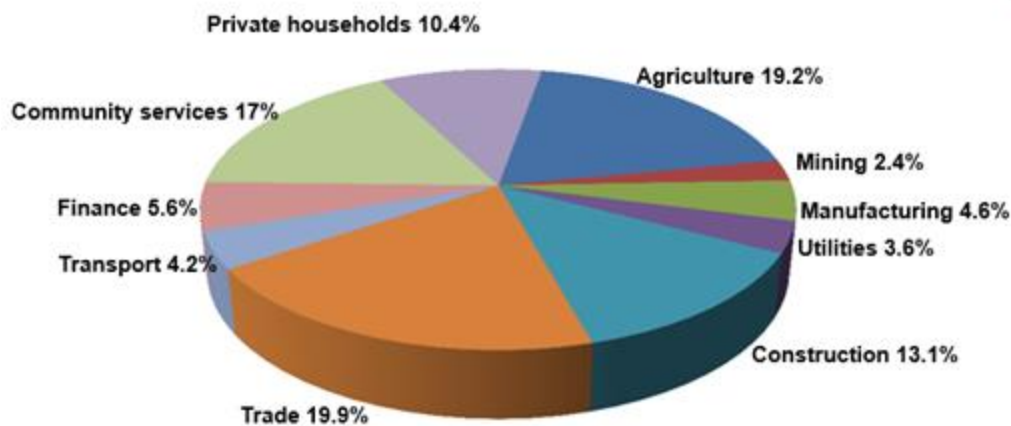


Figure 8: Key economic activities in DPKISLM

However, in Ezamokuhle, drivers of economic activity also include economic activities that are characteristic of what is referred to as township economy. These are highly informal activities and enterprises that are diverse and sometimes using households as sites of production. The following are key economic activities in Ezamokuhle township.

**Table 14: Local “township” economic activities in Ezamokuhle**

<b>Economic activity</b>	<b>Description</b>
<b><i>Taxi industry</i></b>	Some community members are owners and drivers of taxis that commute community members between home, work places and town. These taxis could be noticed in people’s yards.
<b><i>Home-based enterprises</i></b>	<ul style="list-style-type: none"> <li>• Some community members sell merchandise within their yards e.g. sale of livestock and chickens for weddings and funerals, sale of firewood and coal (mainly coal than wood).</li> <li>• Others undertake scrap metal recycling where they collect metals which they store in the yards before they are taken to a designated collection point.</li> <li>• Others own taverns and chisanyamas (braai meat vending) and tuck-shops within their yards.</li> </ul>
<b><i>Nodal enterprises</i></b>	Some community members sell fruits & vegetables, clothes and small electronics at specific nodal points such as taxi ranks and in Amersfoort town.
<b><i>Other</i></b>	There have been reports of income being generated through illegal gambling activities and sex work in the area.

\* Some of these enterprises (like chisanyamas and coal sales) are direct contributors to local air pollution

Community members are complaining that the involvement of locals in these economic activities is dwindling as immigrants are taking over or (in the words of local informants) “stealing” the township business. They said that “immigrants have stolen our Chisanyamas”, they have taken over spaza shops and anything that locals used to trade on as a means of survival. The immigrants are able to do that because they have more buying power than locals and therefore are able to sell things cheaper. The informants expressed great animosity towards immigrants on this issue and explained that there used to be several community uprisings to challenge this but the challenge is that during such uprisings, the police then arrest locals.

These local dynamics are important for consideration in Eskom's offsets because the implementation of offsets may require a shift in micro-economic activities in the community. For example, as offsets aim to shift households from coal to gas, the micro-economic activity may have to shift from coal sales to gas sales. The implications of these for small businesses can be significant considering that gas requires special handling and storage requirements that some merchants may not have. Details on the potential implications of offsets on coal merchants will be revealed as part of activity 7 (Fuel source survey).

### **3.8 SAFETY & SECURITY**

Safety & security is important for offset projects because it limits the type of offsets that can be implemented. For example, installation of alternative energy (such as solar energy installations) as an offset intervention will be limited by the possibility that the panels and other equipment associated with such installations may be stolen. Thus, it is important to understand issues of safety and security in the area before implementing offsets.

#### **3.8.1 DISTRICT-WIDE SAFETY & SECURITY ISSUES**

The GSDM IDP highlights the following as key issues pertaining to Safety and Security in the district at large:

- Poorly designed human settlements which increases the response time;
- RDP houses constructed with minimal or zero consideration of safety and security aspects for the inhabitants or their belongings;
- High number of liquor stores and their location in relation to other community amenities, of which more licenses, are still awaiting approval;
- Poor planning of taxi ranks across the district, with particular emphasis on location of local taxi ranks as compared to long-distance ones;
- Poor lighting in some of the areas coupled with conditions of roads particularly in rural areas;
- Lack of sufficient support by communities to community safety programs;
- Insufficient or lack of support by communities to provide evidence, report crime or information on crime;
- Lack of duty of care by some communities or taking precautions to prevent crime;

GSDM IDP states that GSDM together with the Department of Safety, Security and Liaison are continuously working together in ensuring safe neighbourhoods. The IDP reports that when community members in GSDM were asked about how they feel about their level of safety, DPKIS LM had the lowest number of households that felt very unsafe (Figure 9).

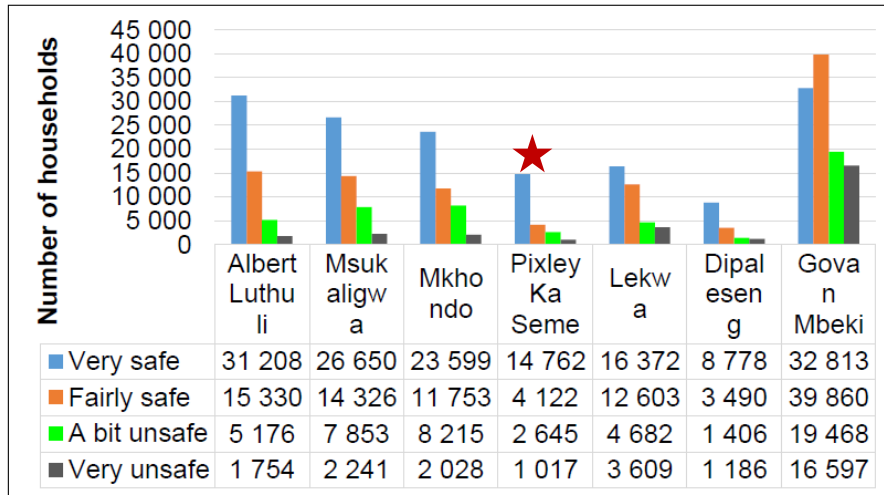


Figure 9: Perceived level of safety by households in GSDM and DPKISLM

Overall, communities in DPKISLM feel the safest compared to all other municipalities in the district.

### 3.8.2 CRIME IN EZAMOKUHLE

A report by Nkambile (2016) indicated that crime is a problem in some sections of Ezamokuhle in particular China 2 and Phumula sections. The major forms of crime seem to be theft and vandalism which should be noted for the implementation of offsets and associated monitoring devices. Residents attributed high levels of crime with the absence of streetlights. One participant was mentioned saying

*“This place is not safe; in order to protect my car, I bought two big lights and I installed one in front of the house and the other one at the back. This makes it hard for the hooligans to tamper with my car or any other property”* (Nkambule 2016)

Theft and vandalism were also highlighted as major crimes during our discussions with informants. They indicated that the high levels of theft (in the form of house break-ins) and

vandalism is associated with drug abuse by youth. They noted the high rate of drug abuse by the so called “*nyaope boys*”. These are youth that abuse the drug called nyaope – which is a mixture of heroin and other odd substances. In order to feed their addiction, they break into other people’s houses and they vandalise community projects in order to derive anything that they can sell. So far, the *nyaope boys* have vandalised a community hall and a stadium on that same account. The informants also attributed the high crime rates with lack of police visibility in the township.

Some residents rely on the indirect lighting coming from their neighbours’ lights and/or the inadequate light from high mast lighting from other sections as a security measure. Respondents also pointed out that the crime rate and associated vandalism increases when there is electricity load shedding. Despite this, most households don’t have burglar bars or secure fencing.

Given the above, it is important that where Eskom’s offsets consider the inclusion of expensive equipment, the safety of such equipment should be taken into consideration. However, given the fact that so far Eskom is only considering installation of ceilings and gas stoves, there should be no safety concerns in this regard.

### **3.9 HUMAN SETTLEMENTS & INFRASTRUCTURE**

The type of human settlements and infrastructure has relevance for offsets in two ways. Firstly, where dirty fuels are used by the community that lives mainly in informal dwellings or shacks, it will not be easy to provide offsets interventions such as ceiling retrofits and provision of alternative energy stoves (e.g. gas stoves). Secondly, infrastructure challenges such as untarred roads can result in dust emissions which contribute to deterioration of air quality, which is counter to the impacts of offsets. In the following sections, the municipality-wide infrastructure and Ezamokuhle infrastructure profiles are provided.

#### **3.9.1 MUNICIPALITY-WIDE INFRASTRUCTURE OVERVIEW**

According to the GSDM IDP, the rate at which human settlements planning and development is taking place in the district is slower than the spread of informal settlements. Furthermore, human settlements planning in the district is mostly reactive than proactive. The majority of established townships are informal settlements that were subsequently formalised (formalizations) as opposed to being planned greenfield developments. In order to address these challenges, the district is supporting municipalities with technical studies to investigate the suitability of

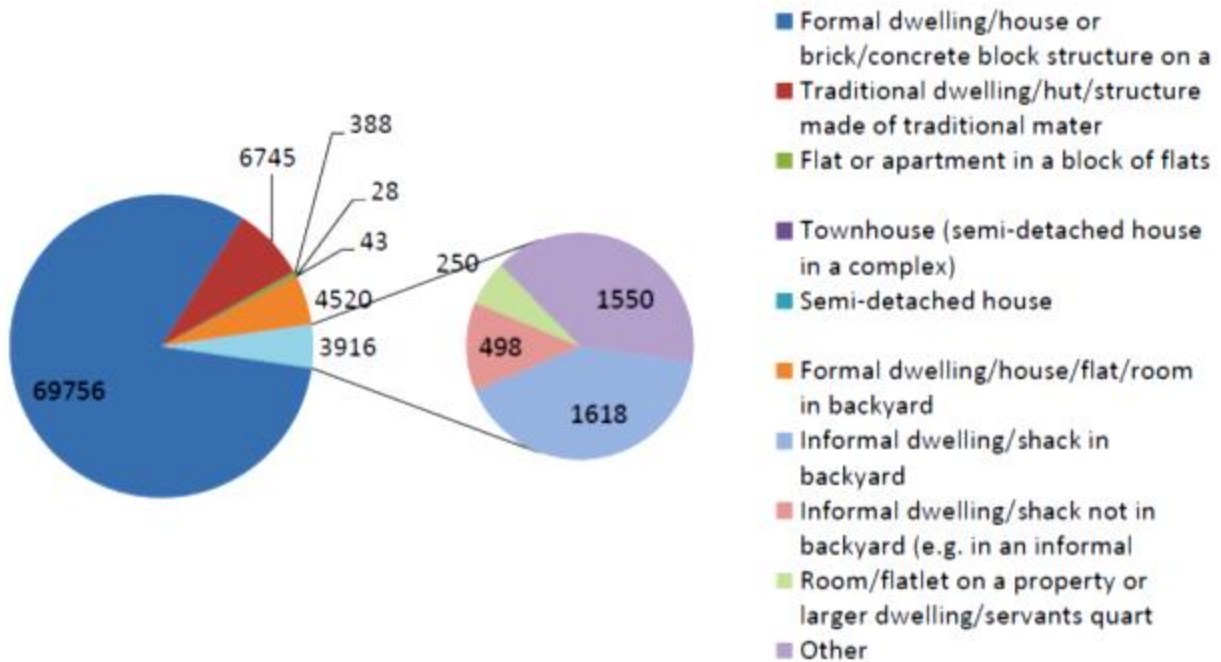
development sites to support the NDP outcome 8 program of transforming human settlements. Table 15 below shows the number of households in the district that are in informal dwellings.

**Table 15: Number of households living in informal dwellings in GSDM (Stats SA- CS, 2016)**

Local Municipal area	Number of households in informal dwellings		Share of total households	
	2011	2016	2011	2016
Chief Albert Luthuli	2 857	5 206	6.0%	9.7%
Msukaligwa	5 715	4 819	14.0%	9.4%
Mkhondo	1 150	1 086	3.1%	2.4%
Dr Pixley Ka Isaka Seme	1 448	578	7.3%	2.6%
Lekwa	7 414	7 129	23.9%	19.1%
Dipaleseng	3 985	3 832	31.5%	25.8%
Govan Mbeki	23 365	22 212	27.9%	20.4%

The district IDP notes that the bulk of the service delivery backlogs across the district coincide with informal settlements. This happens mainly in unplanned areas or land invasions in areas not planned for residential development.

Meanwhile at local municipality level (DPKISLM), according to the 2016 Community Survey statistical data, 81% (69 756 people) reside in a formal dwelling or house made up of bricks/concrete block structure and 8% reside in a traditional dwelling, hut or structure made up of traditional materials whilst 0.4% resides in a flat or apartment located in a block of flats (Figure 10).



**Figure 10: Dwelling types in DPKISLM**

Amersfoort area has seen remarkable progress in the eradication of informal settlements. Phumula section used to be an informal settlement (called Emavarhini, meaning “in the shacks”) until 2013. There are now no informal settlements in Ezamokuhle.

### 3.9.2 EZAMOKUHLE INFRASTRUCTURE

- *Household dwellings & dwelling types*

The type of dwelling/housing structure determines the type of offsets that can be implemented in the area. For example, it has been established in the previous Eskom pilot studies that the majority of offsets interventions cannot be implemented in informal dwelling structures or shacks.

As part of this project (Activity 8 - household survey), the nature of dwellings in Ezamokuhle will be determined. In the meantime, literature and our physical observations (from ARMs rapid in-situ assessment) suggests that Ezamokuhle township comprises mainly of formal housing which

accounts for approximately 97% of the entire housing stock and are detached houses made of brick and cement. Formal housing in Ezamokuhle was built at different points in time with different building materials.

- **Houses built before 1994** under the apartheid regime for civil servants like teachers, prison warders, nurses etc. 4 roomed, asbestos and red bricks. These are located in the Roestein section of Ezamokuhle.
- **Houses built pre-1994 by residents.** These are houses made out of stone and cement. They have non-aesthetic designs but strong built. These are located in Madala site (which is part of Jabavu section).
- **First batch houses built by government post 1994 under the Reconstruction and development programme (RDP).** These are brick and mortar houses with corrugated iron sheet roofing. These houses are one room structures which were not finished according to the original plan as it is believed that government officials squandered the building funds designated for housing. These houses are mainly in Jabavu section.
- **Second batch of houses under the RDP.** These houses are better than the first batch of RDP houses, and they have 2 rooms. They are found mainly in China 1 and China 2 sections.
- **Houses built under the Breaking New Grounds (BNG) programme.** These are 4-roomed houses which represent an improvement to the RDP houses. They generally comply with most building requirements, and they are found in Phumula section of Ezamokuhle.

As indicated, houses built as part of the initial RDP scheme were of poor quality and have cracks in the walls. Some households managed to fix the houses, but most cannot afford to do so. The houses are also exceedingly hot in summer and very cold in winter because the building construction was compromised and the use of metal sheets compounding the problem. The extreme temperature conditions present an opportunity for insulation-based offsets that will negate the use of coal in winter for heating.

- *Backyard shacks*

Many households in Ezamokuhle have established back-yard shacks within their yards Figure 11. The backyard shacks are generally made of corrugated iron sheets but there are also some made

of stick, mud and plastic. Backyard shacks are used for two purposes, namely, shelter and generation income through rent. The study also found that backyard shacks are used to accommodate visitors or guests. They are used as well as a storeroom for, for example, tools and old furniture. Indeed some family members (especially male adult children) establish backyard shacks when they grow up. This is mainly because the living space in smaller RDP houses does not afford space and privacy as children grow older.



**Figure 11: Example of backyard shacks**

As part of Activity 3 (Rapid In-situ assessment) ARM flew an Unmanned Aerial Vehicle (UAV/drone), which provided very nuanced details of the dwelling types in Ezamokuhle. These are presented in Table 16 below.

**Table 16: Descriptions of dwelling types in Ezamokuhle from ARM UAV imagery**

Ward	Zone	RDP houses	Stand-alone RDP Houses	RDP Housing with backyard dwelling	Mud Houses	Self-built Houses	Stand alone Big House	Big Houses with backyard Dwelling	Informal dwellings	Stand-alone informal dwelling	Informal with backyard	Houses with Satellite dish's	TOTAL
China 2	1	328	119	209	1	90	6	84	272	14	258	177	692
	3	276	66	210	1	62	15	57	286	22	286	145	597
Jabavu	9	5	0	5	16	70	2	68	227	18	227	65	318
Phumala	2	213	39	174	2	42	7	35	250	14	250	135	507
Roestein	5	11	0	11	0	132	6	126	119	10	119	59	255
	6	228	74	154	7	139	29	110	268	4	268	78	642
	7	50	10	40	9	210	17	193	144	17	144	75	421
	8	0	0	0	2	58	1	57	95	5	95	19	151
Smallville	4	24	0	24	0	104	3	101	129	6	129	62	257
<b>TOTAL</b>		<b>1138</b>			<b>38</b>	<b>887</b>			<b>2663</b>				<b>4726</b>

Overall, this table suggests that the majority (more than 50%) of formal household dwellings in Ezamokuhle have an additional informal dwelling in their backyards. This is important for offsetting because if both the main house and the informal dwelling are using coal during winter, then providing a household with a gas stove and heater as part of offsets will only solve half of the problem. Similarly, where informal backyard dwellings are burning coal, but the main house is not, the rollout of gas stoves and heaters in the main house will not solve the problem. Hence, it is important that the household survey (Activity 8) is done prior to the full rollout of offset interventions. Alternatively, a detailed household questionnaire must be completed by the household prior to retrofitting or stove swap.

- *Roads and transport system*

Bree street is the main tarred road that gives access into Ezamokuhle. The majority of the other minor roads are gravel but allow access to the stands. During our engagements with local informants, they indicated that while some roads are looks untarred, they are actually tarred roads that are poorly maintained by the municipality. Consequently, the quality of the streets is poor and uncondusive for walking as there are no footpaths or pavements. As shown in Figure 12, when it rains it is hard to walk around because the roads become very muddy. Also, during dry and windy periods, these roads generate dust which can aggravate local pollution /dust levels. Drawing from

the Sharpeville experience, the complications that dust levels on offsets interventions should be understood and considered in implementing offsets (Eskom, 2018).



**Figure 12: Road conditions in Ezamokuhle**

In terms of transport, the main form of transportation used by Ezamokuhle residents is minibus public transport which enables residents to travel to and from Amersfoort town/business district. This transport service also connects residents to other surrounding transport routes to areas such as Eskom Majuba Power Station, Volksrust and Ermelo. The main taxi rank is along Bree Street behind KwaSimelane shopping complex. Despite the fact that there is road transport infrastructure, many people in the study area walk to the CBD (Amersfoort town) in order to save money.

- *Health care facilities*

There is only one clinic in Ezamokuhle township and a hospital which is found in Amersfoort town called Elliot Ballot Hospital. The clinic is reportedly under-resourced such that, quite often, there is no medication available. This means that people suffering from even basic health problems, for instance cold and flu, are simply turned away without any medical attention (Nkambule, 2016). During the site visit, construction activities for a new private clinic were observed.

- *Education facilities*

There are three schools in Ezamokuhle - Amersfoort Combined Primary School (grade 1 to grade 7), Phumula Primary School (grade 1 to grade 4) and Hlelimfundo High School (grade 8 to grade 12). As indicated earlier, there is a very high dropout rate from school in Ezamokuhle and this perpetuates the poverty conditions in the community.

- *Community hall*

There is one community hall which is next to the local taxi rank in Bree Street, and which is used for public meetings and public events such as weddings and entertainment. Importantly, it was also used as a social grant payment point including for child support grants and old age pensions.

- *Shopping facilities*

There is a well-known shopping complex called kwaSimelane next to Bree Street. It comprises a bottle store, night club, tavern, fast food restaurant and a grocery store. Besides buying groceries here, residents also use the complex as a place for socialising. There are other bottle stores, taverns and spaza shops in different sections of Ezamokuhle.

This shopping complex can become a strong competitor to informal local merchants when, as part of this offset project, households switch from coal (which they normally buy from informal coal merchants) to gas. As the community moves from coal to gas, the local coal merchants may not have capacity to fully transform their business to meet the new needs, making them less competitive in the sale of fuel. This aspect will be investigated as part of the fuel source survey to be undertaken as part of this project.

- *Sports facilities*

There are only two playgrounds found in the study area. One is found between Roestein and Jabavu sections adjacent to the railway line and the mountain. This playground used to be fenced and there were change rooms and toilets, but all these have been vandalised. The other playground is in China 2 next to the taxis' main stop. The playground is not covered with grass; such that when it is windy there is dust and when it is raining the field becomes muddy. Both playgrounds are not well maintained. There is an opportunity via the offsets intervention roll-out to potentially reduce fugitive dust emissions herein.

- *Other*

Other pertinent public facilities are telecommunications and cemeteries. There is telecommunication infrastructure for mobile cell phones for private companies notably Vodacom, Cell C and MTN.

### 3.10 SERVICE DELIVERY PROFILE

As part of this project (Activity 8), Ezamokuhle-specific service delivery profile will be developed. In the meantime, inference can be made to local municipality level service delivery profile which is as follows.

**Table 17: Service delivery profile in DPKISLM**

Services	Total no of HH	No of HH with Access	% of HH with Access	No of HH without Access	% of HH without Access
<b>Census 2011 Statistics</b>					
Water	19838	18430	92	1408	7.1
Sanitation	19838	18826	94	1012	5.1
Electricity	19838	16902	85	2936	15
Refuse Removal	19838	12299	62	7539	38
<b>2016 Community Survey Statistics</b>					
Water	22546	20577	91.3	1969	8.7
Sanitation	22546	22029	97.7	517	2.3
Electricity	22546	20235	89.7	2311	2.3
Refuse Removal	22546	14 933	72.6	5641	27.4
<b>Additional Households between Census 2011 and 2016 Community Survey is 2708</b>					

In Ezamokuhle, almost all households have electricity connected with prepaid meters, as well as taps for water and refuse bins. This was confirmed by our key informants and the details are provided in the subsections that follow.

#### 3.10.1 WASTE SERVICES

In Ezamokuhle, door-to-door garbage removal service is provided twice per week. Nonetheless, in some sections of Ezamokuhle, there was evidence of littering (Figure 13). Also, one case of waste burning was observed during one of the site visit done as part of rapid in-situ assessment. These observations were concerning because both littering and burning of waste are prohibited by the by-law (GSDM, 2017)

Local informants indicated that the reason for littering is that sometimes residents forget to place the bin in front of the house for collection; and since they can't keep a full bin they dump illegally. The other reason is that the municipality only collect domestic waste and that some of the litter could be from garden or other types of waste not collected routinely by council.



**Figure 13: Example of illegal dumping activities in Ezamokuhle**

Although illegal dumping of waste and consequential burning of waste is not a regular occurrence in Ezamokuhle, it presents a low-hanging fruit for offsets because remedial interventions can be implemented quickly and at less cost. Eskom can as part of its holistic approach to offsetting provide skips at one or two dump sites and make arrangements with local municipality to facilitate collection skip collection at regular intervals.

### **3.10.2 WATER AND SANITATION**

According to the DPKISLM IDP (2017-2022), 97% of households in the municipality have access to sanitation. Similarly, in Ezamokuhle, almost all households have access to sanitation. Despite this, toilets in Jabavu and China 2 though were reported to be faulty (Nkambule, 2016). Most of these toilets were not flushing and residents were required to use a bucket of water in order to flush properly. Local informants indicated that the major challenges that are facing with regard to water and sanitation are that:

- The municipality is dragging feet when it comes to fixing of sewage blockages when they occur.
- Sometimes the community experience prolonged water shortages (up to a week) without any explanation from council.

### **3.10.3 ELECTRICITY**

All houses in Ezamokuhle are electrified. Ezamokuhle shares the 500 kVA capacity with Amersfoort and therefore no capacity backlog is recorded for the town. However, lessons from Kwazamokuhle and Sharpville offsets baseline assessments and pilots (Eskom, 2017, 2018) have shown that the availability of electricity does not mean wide use of electricity, especially in winter months. High poverty levels means that most households do not have enough money to buy sufficient electricity to last them all month, especially in winter months when household energy demands are high. It is foreseen that during load shedding, households will revert to domestic coal burning since the infrastructure exists.

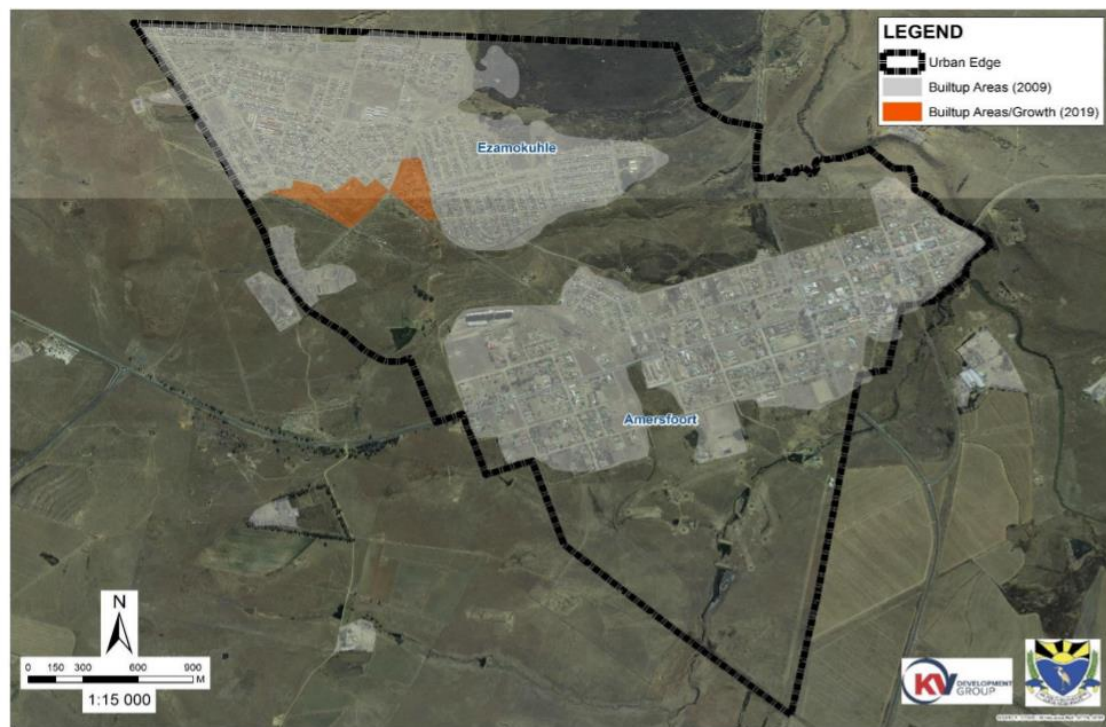
Since most people in Ezamokuhle are unemployed and some do not have any source of income, they qualify for a limited free basic electricity in terms of government indigent policy. The indigent policy provides basic services for people with an income less than R3,500 per month. Our conversation with local informants revealed that most of the indigent people that are supposed to receive free basic electricity are not getting it. The community development worker indicated that even after several attempts to register indigent households for electricity, the households are still not receiving such.

### **3.11 POTENTIAL GROWTH FOOTPRINT OF THE TOWNSHIP**

Development of new areas can, depending on their nature, have an impact on air quality. For example, development of new sections of the township in the absence of proper services can result in an increase in the number of households using dirty fuels, which can negatively impact on air quality and regress the progress made in this regard by air quality offsets interventions. Currently, there is no indication of newly planned settlements near Ezamokuhle. However, drawing from the GSDM IDP, it is known that development can occur informally without any recorded plans (land invasions).

According to DPKIS SDF (2019), these are currently 60 hectares of land available for development in Ezamokuhle/Amersfoort area. These are the stands that according to the SDF should be made available to address the housing backlogs. The local municipality is trying to determine the ownership status to determine if these have to be bought, in the event of private ownership, or can easily sell these off if they are municipality owned.

In the past 10 years there have been new developments that took place in Ezamokuhle, while no new developments occurred in Amersfoort town (Figure 14). The area to the north-west and western parts of Bree Street have experienced a few developments of this period. The pattern looks like it has taken a formal township establishment process.



**Figure 14: New developments in Ezamokuhle between 2009 – 2012 (MCOGTA, 2019)**

According to DPKISLM SDF, Amersfoort and Ezamokuhle probably have the best opportunity to be fully integrated with each other spatially but unfortunately, the floodline between the two towns greatly restricts full integration. The proposal from the IDP is that future expansion of Ezamokuhle should occur on the eastern part of the township, in line with the proposed activity spine with

connection to the N11 road. Other possibilities for future expansion of Amersfoort are in a western direction adjacent to Amersfoort Extension 7 on the western outskirts of the town, but this can only be proposed once the existing vacant stands and densification opportunities in the existing town have been exhausted.

We will continue to monitor any developments regarding informal settlements that may threaten the sustainability of the project. Such developments will be recorded for the duration of the PMV project so that any regress in measured improvements associated with offsets should take into account such developments.

### **3.12 KEY COMMUNITY CONCERNS**

#### **3.12.1 MUNICIPAL-WIDE COMMUNITY CONCERNS**

In implementing offsets in communities, it is important to understand what other community concerns are because such concerns can affect the perceptions and attitude of the community around offsets interventions. At district level, the 2016 Community Survey suggest the 5 leading community concerns in GSDM are as follows:

- a) Lack of safe and reliable water supply.
- b) Lack of/inadequate employment opportunities.
- c) Inadequate roads.
- d) Cost of electricity.
- e) Cost of water.

On 10 April 2019, GSDM held a meeting with community members at DPKISLM, Volksrust Community Hall as part of the GSDM IDP development process. The community raised the following among other issues.

- a) Fast-tracking of the application for land use rights for the mine;
- b) Increment to the budget for the disabled;
- c) Prioritization of local suppliers;
- d) Increment of salaries/wages for ward committees; and
- e) Creation of firms for sustainable jobs.

### 3.13.2 EZAMOKUHLE COMMUNITY CONCERNS

In December 2017, DPKIS LM held a meeting at Ezamokuhle as part of IDP consultation process. A number of issues listed below were raised. The IDP does not provide further details/context on the concerns raised but only presents them as shown in Table 18.

**Table 18: Community concerns raised at a meeting in Ezamokuhle during DPKISLM IDP development**

Theme	Concern
<b>Electricity</b>	<ul style="list-style-type: none"> <li>Electricity to be under the Municipality</li> </ul>
<b>Roads</b>	<ul style="list-style-type: none"> <li>Paving of roads in town and gravelling of untarred roads</li> <li>Upgrading of road along Khanyile street towards the old bridge</li> </ul>
<b>Housing</b>	<ul style="list-style-type: none"> <li>RDP houses</li> <li>RDP rectification – cracking foundation</li> </ul>
<b>Jobs</b>	<ul style="list-style-type: none"> <li>Job opportunities</li> </ul>
<b>Waste management</b>	<ul style="list-style-type: none"> <li>Dumping sites</li> </ul>
<b>Infrastructure</b>	<ul style="list-style-type: none"> <li>Parks</li> <li>Library Ezamokuhle</li> <li>Clinic at Ezamokuhle</li> <li>Extension of clinic</li> <li>Skills Development Centre</li> </ul>
<b>Fire management</b>	<ul style="list-style-type: none"> <li>Fire brigade</li> </ul>
<b>LED</b>	<ul style="list-style-type: none"> <li>LED projects</li> </ul>

Some of the issues raised here are of relevance for offsets. For example, tarring of roads, rectification of RDP houses, and waste. By retrofitting RDP houses, addressing illegal waste dumping and burning, and tarring of roads as part of offsetting, Eskom will be contributing to addressing some of the major community concerns that were raised even without air quality considerations.

### 3.13.3. EZAMOKUHLE CONCERNS REGARDING OFFSETS

On the 22<sup>nd</sup> of September 2021 Eskom held a meeting with Ezamokuhle community at 2 community halls in Ezamokuhle township. The purpose of the meeting was to introduce Eskom's offset project to the community and introduce the various service providers that will be responsible

for implementation and monitoring of the project. Eskom emphasised that the project will employ locals for all unskilled labour requirements. In the same meeting, ARM presented to the community what the PMV component of the project will entail.

Overall, the community welcomed the project without anyone challenging the need for the project. Community members asked a number of questions for clarity, but the following were relevant questions:

- What happens if a household is using a coal stove in the main house but uses imbawula in the backyard house/shack?
- Whether there will be door-to door registration of participants?
- Whether after the stove is provided, Eskom will provide free or subsidized fuel?
- Whether employment of field workers will only consider the youth (under 35) or everyone eligible for employment.
- Anticipated commencement date of the project

In response to these questions Eskom provided the following clarity:

- Only a coal stove will be swapped, not imbawulas.
- Registration will be through PMO office which will be established.
- Employment of field workers will be transparent.
- There will be no free fuel provided.
- The project is expected to start in 2022.

## 4 PLANNED ACTIVITIES

### 4.1 POTENTIAL FOR LARGE DEVELOPMENTAL INVESTMENT IN DPKISLM

There are currently no big infrastructure investment projects planned in DPKISLM or Ezamokuhle. This is because according to the National Spatial Development Perspective of 1999 (NSDP), DPKISLM is not classified as an area of high economic activity. The NSDP delineates a number of guidelines for infrastructure investment in South Africa. The rationale behind the guidelines is rooted in the argument that instead of investing in physical infrastructure to improve the quality of life of people living in low productivity areas, government should rather invest in people. The logic of the latter argument is that investing in people is a more efficient use of government resources. The argument made is that investing in people potentially results in increased opportunities and choice to relocate to high growth areas. Meanwhile, investing in places can leave people trapped in low growth areas without any guarantee that this will attract new investment into the area. In essence, the NSDP argues that government's social objectives will be best achieved through infrastructure investment in economically sustainable areas with proven development potential.

By applying and contextualising the NSDP in the Mpumalanga Province, and drawing from the Mpumalanga Growth and Development Strategy, the GSDM IDP outlines the following in terms of variations in social need (poverty), economic activity (potential) and environmental sensitivity.

**Table 19: NSDP Classification for selected municipalities in Gert Sibande in terms of investment**

	NSDP Classification	Municipal Name
A	High Levels of Economic Activity (Potential)	Govan Mbeki LM and Lekwa LM
B	High Levels of Poverty Concentrations	Albert Luthuli LM, Mkhondo LM, Pixley Ka Isaka Seme LM, Lekwa LM, Msukaligwa LM, Govan Mbeki LM and Dipaleseng LM
C	Area of Combined Poverty and Economic Activity	Govan Mbeki LM, Lekwa LM, Msukaligwa LM, Albert Luthuli LM Mkhondo LM, Dipaleseng LM and Pixley Ka Isaka Seme LM

In essence, DPKISLM (which is the municipality where Ezamokuhle is located) is not an area of with potential economic activity and therefore government will invest in its people rather than creating big economic development investment.

## 4.2 POTENTIAL FOR DEVELOPMENT ACCORDING TO GSDM STRATEGIC OBJECTIVES

Despite the absence of planned big infrastructure projects, there are planned projects in DPKISLM outlined in GSDM IDP. The GSDM IDP identified strategic objectives, each with key performance areas (KPA). The most relevant in relation to offsets are KPA 2: Basic Services Delivery and Infrastructure Development and KPA 3: Facilitating Local Economic Development. Some of the programmes under these KPAs which are relevant for offsets are:

### *Electricity:*

- Co-ordinate intervention measures in conjunction with LM's and relevant authorities to ensure that all new constructed houses are connected to electricity.
- Assist LM's with planning to provide funding to be allocated on projects that requires bulk electrical infrastructure so as to eradicate the remaining backlogs.

### *Roads*

- Rehabilitation of paved / tarred roads.
- Patching of potholes in all LMs as per approved funded schedules.
- Continuation of road blading and re-gravelling.
- Evaluate merits of incorporating these activities in the EPWP.

### *Waste*

- Coordinate and support programs aimed at implementation of the National Waste strategy.
- Coordinate and facilitate programs to improve waste management services & implementation of waste sector plans.
- Implement integrated Waste Management Plan throughout District.
- Development of a recycling strategy for domestic and agriculture sectors.
- Purchase additional bulk containers and replace old fleet.
- Reduce incidence of illegal dumping through the enforcement of by-laws.

### *Environment*

- Conduct clearing projects in terms of identified invasive flora species.

- Improvement Inter-sectoral collaboration and partnership through the IGR forums.
- Coordinate and facilitate programs to implement environmental sector plans.
- Enforcement of relevant by-laws, specifically illegal dumping.
- Implementation of strict pollution control.
- Monitoring of water quality, air quality management, noise management.
- Conduct awareness campaigns on environmental issues.

Other strategies include the following:

- Providing resources to assist with the capacitation of local business organizations;
- Developing infrastructure and facilitate establishment of appropriate institutional arrangements to facilitate access to markets;
- Developing and implement mentorship and incubation programmes for emerging entrepreneurs;
- Entering into strategic partnerships with private sector in order for local business association to leverage on existing resources e.g. SASOL Enterprise Development programmes, Anglo Zimele, ESKOM SMME Hub; and
- Improve support to SMME's and Cooperatives through among others access to finance.

NOTE: No specific projects are planned regarding air quality and pollution control in the IDP. The section on air quality and pollution control programmes (page 57) is left blank.

#### **4.3 PLANNED PROJECTS FOR EZAMOKUHLE AS PER GSDM IDP& DPKISLM IDP**

Within the district (GSDM) IDP, it is difficult to deduce which projects will be implemented specifically in in Ezamokuhle. For example, the district plan indicated that there is a community hall planned for construction in ward 7 of DPKISLM. Ward 7 consists of both Amersfoort and Ezamokuhle. So it is not clear whether the hall will be built in Amersfoort or Ezamokuhle.

However, from the DPKISLM IDP, specific location of planned projects could be depicted. The following projects (Table 20) are planned for implementation in ward 7 & 8 (of which Ezamokuhle is part of) according to the DPKISLM's 2017 to 2022 IDP.

Table 20: Planned projects for Ward 7 and 8 (Ezamokuhle/Amersfoort) as per DPKISLM

Project title	IDP reference number	Planned year
<ul style="list-style-type: none"> <li>• <b>Construction of internal streets in Ezamokuhle (upgrade from gravel to interlock paving).</b></li> </ul>	IDP/MIG/MP1103/RST/11/15	2020- 2022
<ul style="list-style-type: none"> <li>• <b>Development of sport facilities in Ward 7 &amp; 8.</b></li> </ul>	IDP/MIG/MP1535/CE/304	2017-2020
<ul style="list-style-type: none"> <li>• <b>Provision of water supply to communities in Rural areas and farms (Boreholes).</b></li> </ul>	IDP/MIG/MP1118/W/11/14	2017-2022
<ul style="list-style-type: none"> <li>• <b>Construction of toilets top structures in rural areas.</b></li> </ul>	IDP/MIG/MP1234/S/13/16	2020-2022
<ul style="list-style-type: none"> <li>• <b>Landfill sites in Volksrust and Amersfoort</b></li> </ul>	IDP/MIG/MP1156/S/304	2020-2021
<ul style="list-style-type: none"> <li>• <b>Fencing of municipal facilities</b></li> </ul>	IDP/MIG/MP1535/CF/16/19	2019-2022
<ul style="list-style-type: none"> <li>• <b>Procurement of Machinery in Support of Cooperatives</b></li> </ul>	IDP/MIG/MP1160/S/304	2017-2018

Of the above, only the project on “*Construction of internal streets in Ezamokuhle (upgrade from gravel to interlock paving)*” has potential implications for offsets after project implementation. This is because the improved road infrastructure could result in reduced emissions, thus complementing offsets objectives. Meanwhile, other projects, especially construction projects, may lead to increase in PM levels during their implementation phase – i.e. dust from construction activities. To date, our site visits to Ezamokuhle (as of November 2021) does not suggest commencement of this project.

## 5 SECTOR LANDSCAPE

### 5.2 DEFF REGULATORY & POLICY LANDSCAPE

As indicated in the introduction section of this report, Eskom was granted a postponement of compliance timeframes and required to implement offset interventions. The postponement was granted as per regulations published in terms of section 21 of AQA i.e. Listed Activities and

Minimum Emission Standards. As such, the implementation of offsets is governed by these regulations and other policies and regulations under the AQA. Any developments in such legislation will have an impact on the direction that companies take with regards to offsets. Specifically, the regulations and plans in Table 21 will have a bearing on offsets.

**Table 21: Legislation and policies that have impacts on offsets**

Legislation/policy	Description and Implications for offsets
<p><b>Section 21 MES regulations</b></p>	<p>These regulations set MES and set conditions for postponements, which are the basis for offsetting. The revised regulation ( ) suggest that no postponement will be granted beyond 2025. The implications of these for offsetting are uncertain.</p> <p><i>Implications:</i> Any revisions to MES regulations in light of the court case instituted by Centre for Environmental Rights may result in changes to offsets requirements.</p>
<p><b>Revision of Highveld Priority Area (HPA) Air Quality Management Plan (AQMP).</b></p>	<p>DEFF has initiated a process of reviewing the HPA AQMP. The AQMP will define interventions that public and private entities must implement in order to improve air quality in the HPA.</p> <p><i>Implications:</i> The type of interventions committed to may affect Eskom’s resource and financial prioritisation of offsetting vs other emission reduction interventions, or affect prioritisation of location where offset interventions should be implemented.</p>
<p><b>Priority are regulations</b></p>	<p>The DEFF is developing new regulations for priority areas which aim to ensure that conditions of the AQMP are legally binding.</p> <p><i>Implications:</i> As per HPA AQMP line above.</p>
<p><b>Strategy to Address Air Pollution in Dense Low Income Communities</b></p>	<p>The strategy sets out interventions that government and private sector needs to take in order to improve air quality specifically in low income communities. Offsets are listed in the strategy as one of the means to achieve this objective.</p> <p><i>Implications:</i> The strategy makes provision and recommendations for partnerships between government and private organisations such as</p>

Legislation/policy	Description and Implications for offsets
	Eskom. If implemented properly, such partnerships could yield up-scaling of existing and planned offsets projects.
<b>Carbon offsets regulations</b>	<p>The regulations sets conditions under which carbon tax rebates can be claimed for implementation of certain carbon offsets.</p> <p><i>Implications:</i> Eskom can consider community offsets projects that enable it to claim carbon tax allowance by implementing offsets that can have both AQM and climate change mitigation benefits.</p>

In this second iteration of the Area Intelligence Report, there was no new information that suggests changes in these policies that can affect Eskom's offsets implementation in Ezamokuhle, Kwazamokuhle or Sharpeville. ARM will continue to monitor any developments on these and any other policies that may influence the implementation of offsets as the project continue.

### 5.3 INTEGRATED RESOURCE PLAN (IRP)

South Africa's Integrated Resource Plan highlights the country's intentions to decommission various units of Eskom power stations (Grootvlei, Arnot, Hendrina, Camden, Komati, Acacia and Port Rex) from 2022. This can have implications for Ezamokuhle community because during our discussions with local informants, it was mentioned that coal merchants from Ezamokuhle go as far as Ermelo to collect coal for sale to the community. This means that there are mines near Ermelo, possibly supplying coal to Camden and Amajuba stations, that are also supplying coal to Ezamokuhle coal merchants.

The decommissioning of power stations (like Camden) is therefore likely to result in increased coal availability for community-based coal merchants. This is a threat to offsets because it can lead to much cheaper coal prices which will be more attractive for poor households. When coal is cheap and freely available, the use of offsets interventions such as gas may be compromised.

### 5.4 OTHER ORGANIZATIONS IMPLEMENTING AIR QUALITY OFFSET PROJECTS

Eskom is not the only organisation that has been given a requirement to implement offsets. Based on ARM's knowledge, over 20 facilities were given postponements of MES, and according to the

offset guideline, these companies were supposed to be given a requirement to implement air quality offsets. Currently, it is not clear how many of these industries have been given such a requirement and how many have actually made advances in terms of offset implementation. ARM's investigation shows that there are approximately 8 facilities that have submitted offsets implementation plans that are at various stages of approval by DEFF (Table 22).

**Table 22: Implementation of offsets by other companies**

Company	Location	Details and status
<i>Eskom</i>	Ezamokuhle Kwazamokuhle Sharpsville	<u>Lead implementation phase:</u> <b>Households:</b> insulation and stove provision in Ezamokuhle and Kwazamokuhle <b>Waste management:</b> planned interventions in Sharpsville
<i>Sasol Sasolburg</i>	Zamdela, Amelia and Iraq	<b>Waste:</b> Improvement in waste collection through the introduction of more than 70 waste skips. To date in excess of 10 000 tons have been successfully removed from these areas. <b>Veldfires:</b> Fire fighting vehicle to assist local authorities with veldfires in the Sasolburg region.
<i>Sasol Secunda</i>	Embalanhle	<b>Households:</b> Insulation and stove swap for approx. 1200 homes in Embalanhle <b>Veldfires:</b> Cutting of grass in Embalanhle to reduce grass burning.
<i>Anglo Mortimar</i>	Rustenburg Polokwane	No information found
<i>Terris Chrome Smelter</i>	Waterberg region	No information found
<i>PPC</i>	No information found	No information found
<i>Northern Platinum</i>	No information found	No information found
<i>Impala Platinum</i>	No information found	No information found
<i>Consol</i>	No information found	No information found

This information will be continuously updated as strides are being made to obtain further details. To ARM's knowledge, DEFF was supposed to keep an offsets register which is a compendium of air quality offsets implemented in the country, as well as the implementation status and agent for each offset. Such a register is currently not available to the public.

Of the companies above, only a few (Sasol and Eskom) presented the outcomes of their offsets in public. Not much is known about the successes and challenges faced by other companies in the implementation of offsets. From Eskom and Sasol's publications and NACA presentations, the following lessons can be learnt:

Theme	Lessons learnt
Insulation interventions	<ul style="list-style-type: none"> <li>- Poor construction of RDP houses poses challenges for installation of insulation. Retrofits require fixing of roofs.</li> </ul>
Energy source interventions (Cooking and heating)	<ul style="list-style-type: none"> <li>- Gas stoves are generally acceptable by beneficiaries</li> <li>- Kitchen king offers a warmer and lower emission alternative to currently used stoves, <u>however the stove cracks over time, reducing its efficiency in terms of emissions. This makes Kitchen King less value</u> (in terms of air quality improvement) for money.</li> <li>- An electricity subsidy without removing coal stove only increases coal use.</li> </ul>
Sustainability	<ul style="list-style-type: none"> <li>- To ensure sustained use of alternatives, households should not pay more after the intervention for the same domestic energy utility (e.g. for cooking, space heating and water heating) than before the intervention.</li> <li>- Air quality improvements associated with offsets may not be sustained if new informal settlements develop near the area of implementation. This may actually reverse the situation.</li> </ul>
Willingness	<ul style="list-style-type: none"> <li>- Residents were very willing to participate in all interventions (&gt;80%) and did not want their old coal stoves back at the end of the pilot project (Kwazamokuhle pilot).</li> </ul>
General	<ul style="list-style-type: none"> <li>- Dual interventions (e.g. stove swap AND housing insulation) are needed to reduce domestic coal burning.</li> </ul>

- A solution is still needed for households that live in informal dwellings. Sasol has made trials with insulation of 24 serviced informal houses/shacks with polyurethane foam which didn't work due to safety and practicality concerns.

## 5.5 COMMUNITY PERCEPTIONS

Equally important as the scientific robustness of offsets is the acceptability of offsets by users/communities. Given the novelty of air quality offsets, not much has been gathered about offsets from the lens of the community. That notwithstanding, following the implementation of air quality offsets pilot in Kwazamokohle, Eskom and NOVA undertook a follow-up exercise (between October 2016 and March 2017) aimed to understand user opinions about the pilot interventions in 120 households, which comprised of either:

- LPG – basic retrofit
- LPG – full retrofit
- Kitchen King – basic retrofit
- Kitchen King – full retrofit

The impressions gained from the follow-up interviews were that:

- The general mood is positive to very positive, even where there are certain complaints about aspects of the interventions.
- The ceilings are highly appreciated because of the thermal comfort and the reduction in leakages in the roof, although there are many complaints about technical aspects of the ceilings. A few mention that it keeps the dust out.
- The improvement in indoor temperature is attributed to the ceiling and very seldom to the wall cladding.
- There isn't any difference in the enthusiasm of residents whose houses have received only basic retrofit insulation and those who have received full retrofit.
- Although both are seen as positive, there seems to be more enthusiasm for LPG than for the Kitchen King. The LPG stove was regarded as clean and quick, the gas lasts for a long time (in the case of cooking, not heating) and it saves electricity. There is still some fear that LPG is dangerous, and one can run out of gas.

- The general feeling about the Kitchen King is positive, it is a warm stove and the warm water is convenient. There are a variety of problems with one fundamental problem: some Kitchen King stoves have already developed cracks. This is important because the cracks become worse over time and the changed air flow could make the stoves less efficient in terms of emissions.
- After a year (2 winters), maintenance was already required, especially for the ceilings and the Kitchen King stoves.
- LPG could be made more accessible – a local distribution point that accepts all cylinder brands would be welcome.
- There are few indications that residents take ownership of the interventions, implying that individual households do not experience themselves as able to do maintenance.
- There are several indications that residents are, at best, uncertain about who is responsible for maintenance.

In a meeting between Ezamokuhle residents and Eskom to introduce the Lead implementation phase of the project (04 November 2020), residents were generally welcoming of offsets but noted the following:

- **Solar-based interventions:** Community recommended that solar-based interventions must be considered because they have a challenge of not being able to afford gas to fuel gas stoves and heaters. One person mentioned that “*the elderlies cannot use gas and more so, they cannot afford gas that is sufficient to last a month*”. Hence, there was a proposal that offsets interventions should consider combination of gas with solar.
- **Monitoring and evaluation:** Community members also noted that since the previous service providers left the devices, no one came to check if things are still working in order. They mentioned that they were promised free gas supply for 6 months but after 2 months there was no more free gas.

In addition to the above, community expectations in the Eskom Lead Phase and subsequent phases need to be managed.

## 6 EZAMOKUHLE DURING COVID 19

### 6.3.1 OVERVIEW

Covid-19 has negatively impacted citizens on a global scale. It has exposed the deep fault lines and the massive socio-economic divide especially within our vulnerable communities. Covid-19 is not only a global pandemic and a public health crisis; it has also severely affected the South African economy leading to a reduction in household incomes and a rise in the unemployment rate.

### 6.3.2 COVID 19 IMPACTS ON EZAMOKUHLE

In conversation with local informants, it was clear that the Covid 19 pandemic has worsened the socioeconomic conditions of vulnerable communities. They indicated that there are two major socioeconomic ills:

- *The increase in child headed families:*

The COVID 19 period has seen many households losing their primary care givers; leaving some households headed by children. This has far reaching implications in terms of the socioeconomic circumstances of such households.

The high fatality rates in the community was attributed to the lack of compliance by community members to COVID 19 protocols and regulations. Nationally imposed curfews were not adhered to and social distancing was not maintained. Furthermore, during the second wave, police visibility was almost non-existent and therefore people were acting as they please.

- *Increase in teenage pregnancies:*

During Covid 19 lockdowns, there were restrictions on school attendance, which left most teenagers of school going ages unoccupied. According to one informant, this idling phase caused teenagers to engage in activities attributable to the increased rate of teenage pregnancies.

## 7 SWOT ANALYSIS

### 7.3.1 MUNICIPAL-WIDER SWOT OVERVIEW

As part of the Study, a SWOT analysis was undertaken in order to understand different conditions that are favourable or unfavourable for implementation of offsets in Ezamokuhle. At a district level, GSDM had undertaken SWOT analysis as part of their IDP processes. Table 23 outlines the IDP identified SWOTs that are relevant in the context of offsets.

**Table 23: SWOT analysis undertaken by GSDM for the IDP**

SWOT	Description
Strengths	<ul style="list-style-type: none"> <li>• <i>Capacity</i>: DM has a well capacitated organisational structure and filled positions. The DM has also appointed an Air Quality Officer, which means all offsets will be recognized against Eskom's Atmospheric License (AEL)</li> </ul>
Weakness	<ul style="list-style-type: none"> <li>• <i>Capacity</i>: Inability to attract and retain professionals at the local government</li> <li>• <i>Monitoring</i>: lack of monitoring of the work done by and in the municipalities.</li> <li>• <i>Service delivery</i>: Insufficient funds to meet all service delivery requirements. Service delivery related funds and not adequately utilised by municipalities.</li> <li>• <i>Inadequate implementation</i>: Approved policies (including economic growth strategies) are not adequately implemented.</li> <li>• Inadequate integrated human settlement planning: There is no alignment of strategic documents e.g. IDP and SDF; as such human settlement not properly planned to account for long term requirements.</li> </ul>
Opportunities	<ul style="list-style-type: none"> <li>• Political stability which is good for investment.</li> <li>• Education and skills development: Free education.</li> </ul>
Threats	<ul style="list-style-type: none"> <li>• Informal settlements arising from in-migration from rural areas. Informal settlements and illegal developments are outpacing the capacity for meet all demands in a sustainable manner.</li> <li>• Misinterpretation of the "Land Expropriation Without Compensation" Policy: Uncontrolled land grabs.</li> <li>• Loss of revenue by LMs.</li> </ul>

- High unemployment rates and lack of skills among youth and generally poor economic growth.

### 7.3.2 SWOT ANALYSIS: EZAMOKUHLE

For this study, information garnered herein was analysed to determine the SWOT analysis for Ezamokuhle that can potentially impact the roll out, implementation, execution or success of air quality offset interventions. The analysis is presented in Table 24 below with descriptions.

**Table 24: SWOT analysis for implementing offsets in Ezamokuhle**

SWOT	Description
Strengths	<p><i>Dwelling types</i> As indicated in section 3.9 above, the majority of houses in Ezamokuhle are formal. This is favourable for air quality offsets because the proposed interventions such as gas stoves and ceilings would be difficult or unsafe to implement if the houses were made of informal structures.</p> <p><i>Community development workers</i> Ezamokuhle has resident community development workers whose responsibility is to link the community with relevant departments and support projects. These community development workers are best suited to provide guidance on household dynamics throughout the implementation of the offsets project.</p>
Weaknesses	<p><i>Quality of housing:</i> As indicated earlier in section 3.9 above, houses in Ezamokuhle have different structural qualities. Especially houses that were built under the first batch of RDP, have structural defects that may pose a challenge in offset implementation. Based on experience from the pilot in Kwazamokuhle (Eskom, 2017), poor construction of RDP houses makes it difficult to install insulation structures in the houses.</p>
Opportunities	<p><i>Municipal plans to improve roads infrastructure:</i> As indicated in section 4 above, the DPKISLM is planning to upgrade internal streets in Ezamokuhle (from gravel to interlock paving). This can substantially improve PM levels in the township which often masks the efficacy of offsets.</p>
Threats	<p><i>Social unrests:</i> social unrests have been common in South African township areas where there is poor service delivery and competition for jobs and other resources. In</p>

2013 there was social unrest in Ezamokuhle where local residents were protesting against employment of immigrants. A man was quoted saying that “*People from outside take our jobs and we locals, we are left with nothing. If you take a closer look most people working at Eskom Majuba Power Station are not from Amersfoort*”. (Nkambule, 2016). During the engagements with local informants, it was also indicated that community uprisings do occur where community members demonstrate their dissatisfaction with immigrant who are “stealing”/taking over local township businesses.

More often than not, these protest can result in locals anger and vandalism which may have negative impacts on offsets implementation schedules, theft of offsets monitoring equipment, etc.

**Affordability and availability of fuel:** As indicated earlier, Ezamokuhle is a poverty stricken township with high unemployment rates. Thus, with the provision of gas devices, considerations should be made on the affordability of fuel (gas). Lessons from Kwazamokuhle township suggest that households spend approx. R200-R300 per month on coal in winter. Affordability drives energy carrier selection and if the current offsets interventions are not affordable than the current fuels (wood & coal), the interventions may not be sustainable. It is also important that there is local supply of gas.

**Political instability:** The most dominant political parties in Ezamokuhle are ANC and EFF with some DA prominence. The informants indicated that there is some animosity between members of these parties which can present a threat to the offsets project. They noted that while the community may see the project as beneficial, political party leaders may sway the community in a different direction (against the project), in order to prove a point or to drive a particular political agenda. Thus it is important to ensure that there is buy in from all political parties prior to the implementation of the project.

**Theft and vandalism:** Theft and vandalism were highlighted as major crimes during our discussions with informants. They indicated that the high levels of theft (in the form of house break-ins) and vandalism is associated with drug abuse by youth who feed their addiction by stealing anything that looks like they can sell. This means that any equipment and infrastructure designed for offsets intervention should be well secured and guarded against vandalism and theft.

**Informal backyard shacks:** Majority of household stands in Ezamokuhle have two types of dwellings (main house and a backyard shack). The use of coal in these

dwelling types is not fully understood pending the planned household survey. Eskom's offset interventions involve swapping a coal stove (usually from the main house) for a cleaner gas stove. In the event that there is high rate of coal use in these informal shacks (using imbawula rather than coal stove) Eskom's offset interventions may not be able to address emissions from these dwelling units. Which means that only half of the problem will be solved through stove swaps.

*Community-Councillor relations:* In the previous year (2021) there was an indication that the relationship between the previous councillor and the community was strained. One informant insinuated that the councillor is never visible nor available to address the community; instead he only "show up" when there is project like the offsets project so that he can be seen to be doing something. Strained relations between the councillors and the community may negatively affect the acceptance of the project by the community or by some community members

The identified threats will be monitored and reported on regular basis.

## 8 CONCLUSION

This report provides an updated understanding of Ezamokuhle at the township, local municipality and district level. Information is provided for population statistics, socioeconomics, settlement and housing types, infrastructure, service delivery etc., which can be summarised as follows:

Location GSDM, DPKISLM; <b>ward 7&amp;8</b>	Ruling party= <b>ANC</b>	<b>2956</b> <b>households</b>	<b>Population size=</b> <b>10239</b>	<b>~7%</b> higher qualifications
<b>70%</b> <b>unemployment</b> rate	Majority income bracket <b>R9 601 to</b> <b>R38 200 p.a</b>	<b>Basic services=</b> Electricity, sanitation, waste.	<b>Housing</b> type= <b>formal</b>	1618 = <b>Informal</b> <b>Dwelling in</b> <b>Backyard</b>

According to the DPKISLM IDP, the following projects are planned in Ezamokuhle for the period ending 2022:

- Construction of internal streets in Ezamokuhle (upgrade from gravel to interlock paving)
- Development of sport facilities in Ward 7 & 8
- Provision of water supply to communities in rural areas and farms (boreholes)
- Construction of toilet top structures in rural areas
- Landfill sites in Volksrust and Amersfoort
- Fencing of municipal facilities

No other planned projects, either by government or private sector were identified from the IDP. However, during the rapid *insitu* survey, there was a billboard indicating that there is an on-going sewage reticulation upgrade project being undertaken in the area.

A SWOT analysis indicates the following aspects that supports or threatens offsets implementation in the near future:

<p><b>Strengths</b></p> <ul style="list-style-type: none"> <li>• <i>Dwelling type:</i> Most/all households are formal</li> <li>• <i>Presence and visibility of community development workers</i></li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• <i>Quality of houses:</i> Old RDP houses not adequate for insulation offsets. May require fixing.</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Plans by municipality to improve gravel roads</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Social unrest (sporadic)</li> <li>• Affordability of interventions</li> <li>• Political instability</li> <li>• Theft and vandalism</li> <li>• Backyard shacks</li> </ul>

Whilst this report will only be updated annually, it should be noted that ARM is continuously monitoring and reporting on any new developments (legislative, policy, media reports, etc.) that may potentially impact the: roll out; implementation; execution or success of air quality offset interventions promptly to the Eskom PMV Offset Project team.

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## ANEXURE 1

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