

Impacts directly associated with the Project are discussed in the preceding sections. In this section the impacts associated with cumulative effects of the Project and other development are described. Evaluation of potential cumulative impacts is an integral element of an impact assessment.

### 11.1 ADMINISTRATIVE REQUIREMENTS

In reference to the scope for an impact assessment, IFC's Performance Standards specify that:

*"Risks and impacts will be analyzed in the context of the project's area of influence. This area of influence encompasses...**areas potentially impacted by cumulative impacts** from further planned development of the project, any existing project or condition, and other project-related developments that are realistically defined at the time the Social and Environmental Assessment is undertaken; and (iv) areas potentially affected by impacts from unplanned but predictable developments caused by the project that may occur later or at a different location."* (IFC 2006).

The overarching piece of legislation governing the EIA process within a South African context (ie NEMA) also requests for the consideration of cumulative impacts within the EIA process.

Cumulative impacts in relation to an activity are defined in the EIA Regulations (Government Notice R543) as meaning *"the impact of an activity that in itself may not be significant, but may become significant when added to the existing and potential impacts eventuating from similar or diverse activities or undertakings in the area"*

### 11.2 APPROACH

Cumulative impact assessment methodologies are not well defined, and therefore no general practice can be adopted to assess potential cumulative impacts. In order to understand the manner in which this Project will contribute to cumulative impacts, an understanding of the baseline environment was developed. This included the identification of existing and proposed projects within the region. A search was undertaken to try to identify all current Basic Assessment or full Scoping and Impact Assessment Applications made in the local and regional context. Furthermore, the DENC was also contacted to provide confirmation of other major developments planned in the region <sup>(1)</sup>.

(1) Note that ERM was requested to submit an application form in terms of the Promotion of Access to Information Act (2000) (PAIA) to source relevant information. Note that this application has been submitted and are awaiting a response.

In order to contextualise the potential cumulative impacts associated with this Project, an administrative review of local and regional policies were undertaken. The purpose of this review was to confirm the key challenges faced by the Local and District Municipality. These key challenges, together with current or future development proposals in the region, were used to inform the identification and assessment of cumulative impacts.

### **11.3** *ASSUMPTIONS AND LIMITATIONS TO CUMULATIVE IMPACTS*

Cumulative effects are difficult to predict as they are the result of complex interactions between multiple projects or activities. Further, prediction of effects of future development has an inherent error in that the fine details of a future development are not generally known and whether a future development actually occurs is dependent on a number of factors. This assessment is thus restricted to consideration of other development that is 'reasonable and foreseeable'.

Lastly, mitigation and management of cumulative effects are frequently beyond the ability of a single action or stakeholder and the mitigations developed in this ESIA have focussed on actions that the Project can take to avoid or control direct project impacts. Management of cumulative effects often requires mitigation in cooperation with other stakeholders or at a government level.

It is assumed that the renewable energy facilities identified in the region will be approved in terms of NEMA and be allowed to proceed with construction and operation.

The summary of local and region challenges faced by the local and district municipality is limited to key considerations that relate to this Project and are not limited to what is identified below.

### **11.4** *BASELINE CONDITIONS*

#### **11.4.1** *Existing and Potential Future Mining Operation*

BMM currently operates the Deeps Mine located near the town of Aggeneys, based on an existing mining right. The existing Deeps Mine currently mines zinc, lead, copper and silver.

In addition to this, BMM currently has a new order mining right and approved EMPr for the zinc resources located within the Gamsberg inselberg, 10 km east of Aggeneys. BMM are presently mining 60,000 tons per annum (tpa) (metal production) from underground workings at the Gamsberg inselberg. The ore currently mined at the existing underground operation is

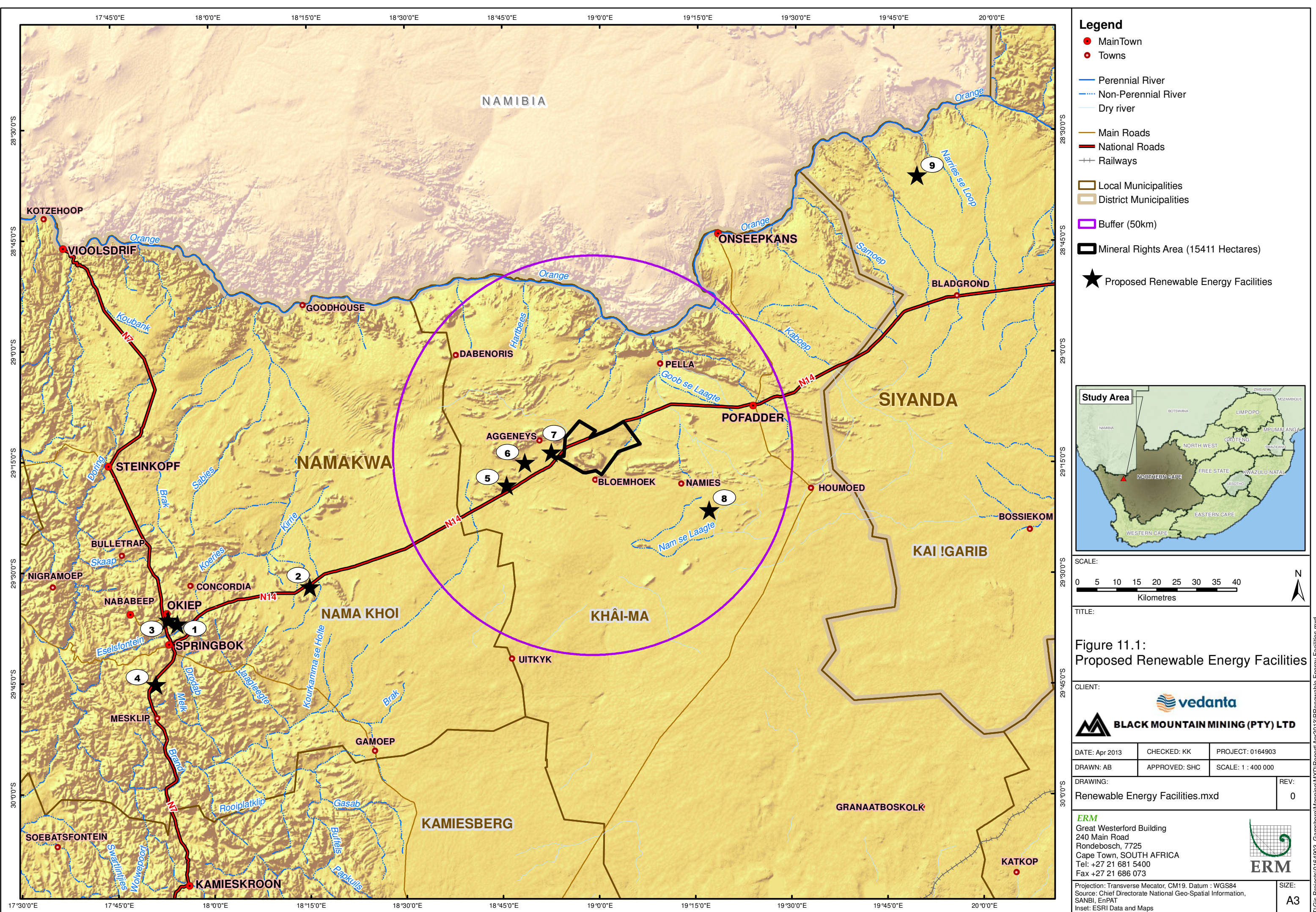
transported to the BMM concentrator plant in Aggeneys where it is processed, together with ore from the Black Mountain Deeps Mine.

#### **11.4.2 Renewable Energy Facilities**

There are four renewable energy projects identified within a 50km radius of the Project site (refer to *Figure 11.1* below). The location of renewable energy facilities is concentrated in close proximity to the Project site, due to the existing Aggeneys substation. From a District perspective, four renewable energy facilities have been identified in and around Springbok. One renewable energy facility was identified east of the town of Onseepkans, close to the Orange River.

In general, the solar energy projects are part of a trend in the wider region and province and are in keeping with the earmarking of a wide strip of land along the N14 as a Solar Corridor in Khai Ma Local and Namakwa District Municipality planning. Although Environmental Authorisations have been issued for many of the proposed renewable projects, there is no certainty on the implementation of the project.







The potential to utilise renewable energy to meet the power requirements for the Gamsberg mine was explored. Due to the volumes and reliability of power supply, renewable energy facilities would not be able to meet the base load power requirements for the Project and was not considered further.

#### 11.4.3 *Proposed Zinc Refinery and Smelter*

During the initial EIA process undertaken, the Gamsberg mine included the construction of a new zinc refinery and smelter. The insecurity and rising cost of power was one of the driving factors to suspend the Project. During the initial phases of the ESIA process, BMM suggested the potential for the construction of a new zinc refinery and smelter, on condition a secure power supply could be assured. Discussions have been initiated with Eskom, however, for purposes of this cumulative impacts section, it is assumed that a new zinc refinery and smelter will be constructed in close proximity to the Gamsberg mine.

#### 11.5 *LOCAL AND REGIONAL POLICY FRAMEWORK*

The local and regional challenges currently being experienced by the local and district government has been divided, based on key planning documents. A brief summary of the some of the key challenges experienced has been identified, based on a review of the following documentation:

- Northern Cape Provincial Growth and Development Strategy (2011)
- Namakwa District Municipality Local Economic Development Strategy (2007)
- Khai Ma Rural Spatial Development Framework Plan (2010)
- Khai Ma Integrated Development Plan (2006-2011)

In light of the above referenced documents, the following is a consolidated list of key challenges currently being faced by the local and district municipality:

**Table 11.1** *Summary of Key Challenges Experienced by Local and District Municipality*

Summary of Challenges Experienced	Applicability to Project
Conservation of critical biodiversity in the region.	Loss of ecological habitat
Improve basic service delivery for water, sanitation, power and housing	While the mine will provide for additional housing and associated services for its employees, some influx of work seekers may place additional strain to existing basic services in Aggeneys and surrounding towns.

Summary of Challenges Experienced	Applicability to Project
Improving access to health, education and living standards	The expected increase in employees (and associated family members) resulting from the Project together with possible influx of work seekers will place additional strain to existing health and education facilities of Aggenys and the surrounding towns.
Decreasing the prevalence rate of TB, HIV and AIDS	The expected influx of people could impact the spread of communicable diseases.
Reducing criminal activities	The influx of migrants may increase criminal activities in the region, if employment is not secured.
Opportunities for employment	The Project will increase the number of employment opportunities in the region.
Strengthen local economic development	The Project will likely increase the expendable income in the region through wages/ salaries, as well as increase potential for growth of local suppliers/ contractors. Lastly, the increase in expendable income may increase the potential for secondary business opportunities in the local market.
Cultural, science and nature tourism	The loss of biodiversity of conservation value, together with increased dust and noise emissions and the visual impact of the mine infrastructure will likely influence sense of place. This may negatively influence tourism
Encourage industrial activities, especially the mining sector as it's the largest contributor to employment in the region	The Project is the construction of a new mine.

## 11.6

### CONSIDERATION OF CUMULATIVE ISSUES

Based on the descriptions/ definitions provided above, it is apparent that a number of factors can be considered, when assessing cumulative impacts. However, the focus of this assessment will remain on key significant issues that have been informed by the findings of the impact assessment in *Chapters 9 and 10* and key local and regional challenges as discussed above. The following factors are incorporated into the cumulative impact assessment, which is presented below:

**Table 11.2**      **Summary of Cumulative Considerations**

<b>Project Activities</b>	<b>Element/ Issue to be Impacted</b>	<b>Additional consideration</b>
Construction of infrastructure and day to day activities resulting from mining, renewable and other projects.	Change to the visual aesthetic and overall sense of place may impact tourism potential.	Apart from the physical infrastructure such as waste rock dumps and tailings facilities, solar infrastructure, increase dust generation and traffic volumes will exacerbate the impact.
Ground clearing and preparation for construction for mining, renewable and other projects.	Removal of ecological habitat.	The potential impacts of dust and groundwater drawdown on ecological habitat and the impact of noise on faunal species.
The commencement of mining, renewable and other projects would result in the influx of migrants in search of employment opportunities.	This may impacts bulk municipal services.	The impact of influx will also indirectly impact the spread of communicable diseases and criminal elements.
The development of various mining, renewable and tourism projects Project will result in an increase in expenditure in the region and increased employment.	Increase in capital spending within the region and employment opportunities within the local and district municipal area.	Indirect benefits to local businesses, contractors and service providers.
The development on mining and renewable activities in the area will introduce training and skills developments to employees.	Employees from surrounding communities will be provided with training and skills development.	On the job trainings, prior to construction, would be critical to achieving a high local employment rate.

## **11.7**      **EXPECTED CUMULATIVE IMPACTS**

In light of key challenges faced by the local and district municipality, together with the baseline conditions (including foreseeable developments), each of the aforementioned issues/ elements will be qualitatively assessed below.

### **11.7.1**      ***Impact of Changes to the Visual Aesthetic (including sense of place) on Tourism Potential***

#### *Key Local and District Challenges*

The district and local municipality IDPs and SDFs point out the importance of tourism in the wider area and focus on its future potential. With regard to tourism corridors, the SDF supports the prioritisation of the 'Pofadder-Onseepkans' and 'Pofadder-Witbank' tourism routes for tourism development with Pofadder, Onseepkans and Pella the identified tourism nodes. These tourism routes have been identified as having a high tourism potential.

### *Existing and Foreseeable Developments*

The existing Deeps Mine is located within 15 km of the Project site. The Deeps Mine generates increased traffic volumes on the N14 and Loop 10 Gravel Road. The dust generation of the Deeps Mine is limited, as it's an underground mining operation. Furthermore, the existing underground mining operation at Gamsberg also contributes to the ambient dust and noise levels in the region. Due to the small volumes of product at Gamsberg underground mine, the impact on traffic is minimal <sup>(1)</sup>. The other major developments such as the Gamsberg mine and potential zinc refinery and smelter would also result in similar impacts. Impacts of the specific mining activities at Gamsberg on specific tourism facilities and key tourism areas would be limited, given the project's location relative to these. Visual exposure from the N14 would be high although temporary in nature for passing motorists who would largely still be able to enjoy the key attractions and tourist facilities in the wider area which are relatively far removed and screened from the project.

The proposed renewable energy facilities are likely to result in the impact to the existing visual fabric of the region. There are approximately four renewable energy facilities being proposed near or adjacent to the town of Aggeneys (ie located within 50 km of the Gamsberg inselberg). The changes to the visual fabrics are likely to impact the visual aesthetic of the landscape. Furthermore, the construction of the renewable energy facilities will also contribute to an increase in dust generation (through ground clearing) and traffic flows, thus influencing the sense of place of the region.

The combined effect of the Gamsberg mine and existing/ foreseeable developments will have a cumulative impact on the visual aesthetic and potential subsequently impact tourism potential of the area. The scale of this impact is however uncertain. Future developments will need to consider the local and district planning goals and objectives in establishing a tourism corridor. Local and District Municipality will need to address this issue through screening various development applications against the tourism goals and objectives to ensure that cumulative impacts are considered.

#### **11.7.2 Removal of Ecological Habitat**

##### *Key Local and District Challenges*

In recognition of the global importance of Succulent Karoo habitat and specifically the "Bushmanland Inselberg Region", the local and regional planning documents promote the protection and on-going conservation of critical biodiversity. The challenge is managing and protecting these areas of ecological importance, while stimulating economic development and growth within the region. Responsible development is required to ensure a balance between conservation and growth within the region.

(1) Note that the existing underground mining operation at Gamsberg will be closed, should this Project be approved.



### *Existing and Foreseeable Developments*

Depending on the viability to explore additional resources, the Deeps Mine may contribute to the further but limited impact to sensitive ecological habitat in the region. Any other mining developments in the region may have similar impacts on biodiversity. The consideration of a new refinery and smelter, which would more than likely be developed in close proximity to the Gamseberg mine may also impact sensitive habitat, depending on the location of the infrastructure. Careful site selection and planning would be required, before a suitable location can be identified.

Similarly, the proposed renewable facilities could potentially result in the loss of ecological habitat. However, it's likely that renewable energy facilities will be located on existing farmlands, which have been previously ploughed and/or used for grazing. As a result, the construction of the proposed renewable energy facilities is unlikely to result in the loss of extensive critically important ecological habitats. However, as no certainty is available on the specific locations, the consideration of critical biodiversity and associated ecological corridors will need to be considered when locating any renewable energy infrastructure, including associated transmission lines.

The Gamsberg mine will result in the need for a biodiversity offset as a result of the impact on irreplaceable and constrained habitat, as well as compensation in lieu of irreplaceable habitat that is not offsetable within the Gamsberg Inselberg. The Gamsberg Inselberg lies at the heart of what is termed the "Bushmanland Inselberg Region", which includes all the large, quartzite-capped inselbergs located in the northern Bushmanland plains in South Africa. The Bushmanland inselbergs effectively comprise an archipelago of rocky islands within a vast expanse of sand. These rocky islands share common floristic affinities that are fundamentally distinct from the surrounding sandy plains. The flora of these inselbergs forms a distinct centre of plant endemism located within the larger Eastern Gariep Centre of Endemism. There are many species endemic to the Bushmanland Inselbergs and the region is defined as a distinct centre of endemism termed the "Bushmanland Inselberg Centre of Endemism". Any further threats to the habitat or ecological linkages of the Bushmanland Inselbergs are likely result in unacceptable impacts on the biodiversity of the area. Future protection of the Gamsberg off-set area together with the remaining inselbergs will be important to mitigate potential future cumulative impacts. This will need to be driven through Local and District Municipality and regional biodiversity and conservation planning.

### **11.7.3 Increased Demand on Municipal Services**

#### *Key Local and District Challenges*

A key challenge to the local and district municipality's is that of service delivery. The provision of basic services such as water, sewerage, power and housing has been an on-going problem in the region. Several of the planning documents for the region have identified basic service delivery as key issues.

#### *Existing and Foreseeable Developments*

Employees of the existing Deeps Mine are mainly located within the town of Aggeneys, however some are living in the surrounding towns of Springbok, Pella, Pofadder and Onseepkans. It is anticipated that all employees for the Gamsberg mine will also be accommodated in Aggeneys. As BMM and potentially future mining activities will provide all basic services to the employees in Aggeneys, no additional strain to municipal service delivery is anticipated from future mining developments.

The proposed renewable energy facilities are likely to provide employment to surrounding communities, which may result in a minor impact to the basic service delivery of the local and district municipality. The potential for employment may however attract migrant labourers into the region, in anticipation of jobs. Although the influx expected for a renewable energy facility is limited, there is likely to be a growing demand for basic services in the area. Similarly, the establishment of additional mining activities, including a potential zinc refinery and smelter could certainly result in a large influx of job seekers into the area. The influx related impacts would certainly increase the pressure on basic services.

The combined effect of the Gamsberg mine and other foreseeable development could have a significant cumulative impact on the local and district Municipality to meet the bulk service requirements, resulting mainly from influx of job seekers. A strategic influx management plan should be developed, together with the major developers in the region to proactively anticipate and manage the impacts of influx, expected in the District.

### **11.7.4 Project Expenditure**

#### *Key Local and District Challenges*

A key challenge in the region is to encourage industrial activities (specifically mining <sup>(1)</sup>). Related challenges include increasing employment opportunities and strengthen local economic development. These three challenges are closely linked with each other. The encouragement of industrial activities will increase the employment opportunities in the region. Furthermore, industries increased expenditure in the region, thereby introducing additional wages/

(1) Mining has been identified, as it's currently the largest employment sector in the region.

salaries, opportunities for smaller business and contractors, growth opportunities for local suppliers and potential for secondary industries. The additional capital expenditure would also likely assist the region with improving the quality of living in surrounding communities.

#### *Existing and Foreseeable Developments*

The introduction of any new projects into the District will result in increased expenditure in the region, thus having the benefits for smaller business, suppliers and contractors. It would also result in an increase in employment opportunities and potential for secondary businesses. The introduction of increased salaries into the communities would likely result in stronger economic development in the region. Notwithstanding, increased salaries could potentially increase activities related to social ills (drug and alcohol abuse due to increased income), which needs to be acknowledged. The increased benefits are likely to be experienced in a lesser extent for renewable energy projects.

The combined effect of the current and foreseeable projects will have a significant cumulative impact on project expenditure and associated benefits. However, these positive impacts should be enhanced at a local and district level to ensure local communities benefit directly. Stronger measures and commitments are required from the project developers in terms of maximising local employment and downstream economic activities such as supplier, secondary industries etc. Collaborating closely with the local and district municipalities in supporting the objectives of the Integrated Development Plans will be important to maximise these benefits.

### **11.7.5 Training and Skills Development**

#### *Key Local and District Challenges*

A key challenge for the region is to develop opportunities to reduce the high levels of unemployment. It is assumed that low skills levels are a contributing factor to the lack of employment opportunities. Furthermore, the region itself lacks the diversity of activities to increase the employment opportunities available to residents. An increase in the levels of skills present in the community will certainly increase the opportunities for employment as well as strengthen local economic development.

#### *Existing and Foreseeable Developments*

The existing Deeps Mine and other major developments (including Gamsberg mine and refinery and smelter) contribute to the skills base of its employees<sup>(1)</sup> during the operational and decommissioning phases. Development of these skills can be transferred to other industrial activities, which thereby increases the potential for alternative employment opportunities.

(1) Majority of Deeps Mine employees are based in the surrounding region.



The proposed renewable energy facilities are likely to contribute to the surrounding communities through community trusts and employment. This will not only increase the opportunities for employment in the surrounding area, but also diversifies the potential opportunities for alternative means of employment. As the district is characterised with mining, this will ensure that the skills based can be diversified from the mining sector.

The combined effect of the Gamsberg mine and existing/ foreseeable projects are likely to have a significant positive cumulative impact on skills developments. It is important that the project applicant's work together with the local and district municipality to identify the skills gaps present in the District. Furthermore, the project applicants should try to align their corporate social responsibilities with skills development objectives and plans identified by the local and district municipality.

## 11.8

### CONCLUSION

The expected negative cumulative impacts are likely to place additional strain on the existing challenges experienced by the local and district authorities. These challenges include increased conservation of critical biodiversity, improving basic services and decreasing prevalence rates of TB, HIV/ AIDs and criminal elements (expected to be related to impacts of influx). However, current and foreseeable developments are also likely to positively contribute to local economic development, improved employment opportunities and general increase in quality of life. It is evident that the Project would have both positive and negative cumulative effects that are closely inter-related with local and district municipal challenges. The effective on-going management of these cumulative impacts is strongly dependant on the relationship between the individual developers and the local and district municipality. Close cooperation between the various developers and the local authorities in meeting the objectives of the local Economic Development Strategies, Bioregional Plans and Integrated Development Plans is essential to mitigating and managing potential future cumulative impacts.