

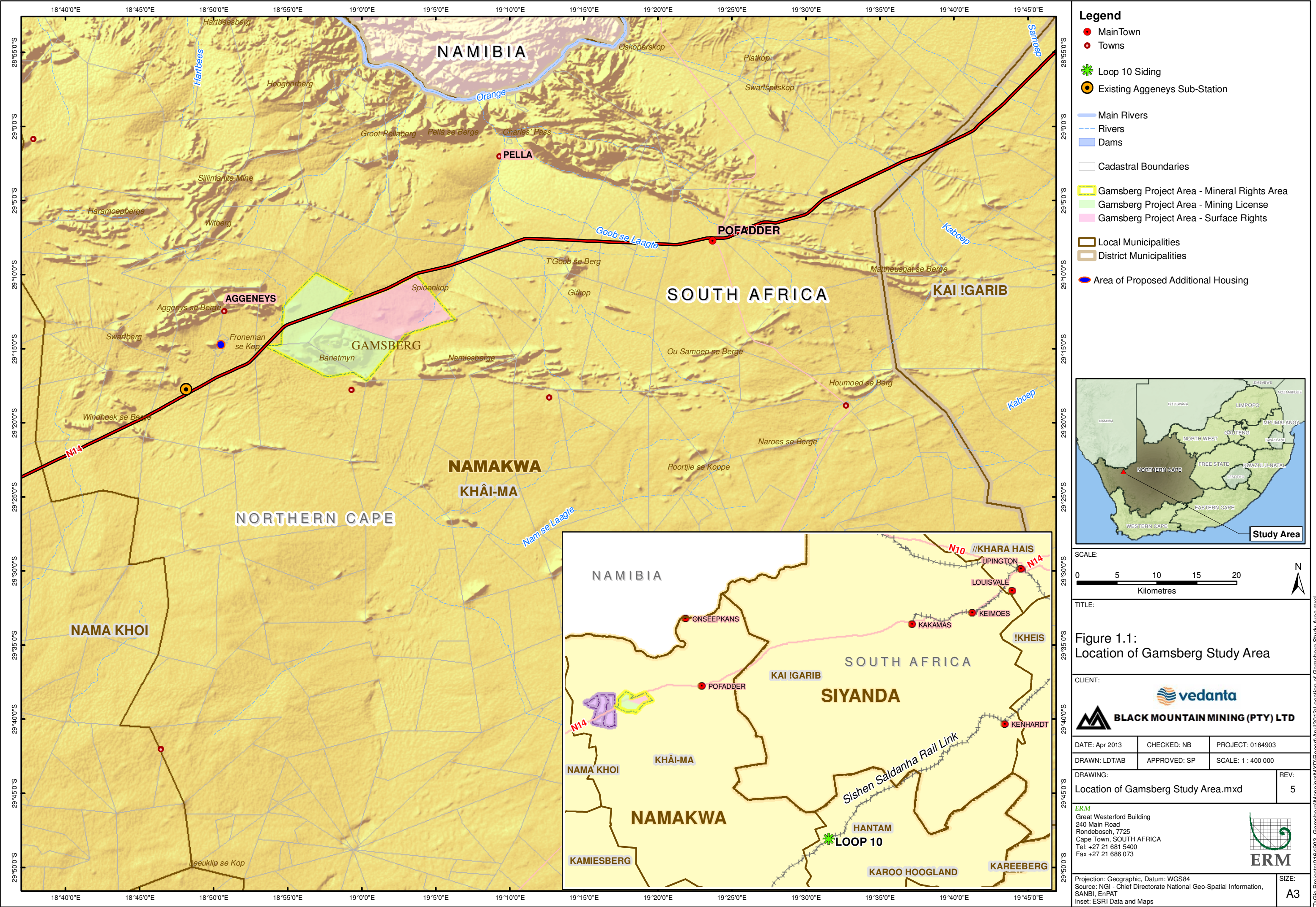
Black Mountain Mining (Pty) Ltd (herein referred to as BMM), part of the global Vedanta mining group, intends to establish a new zinc mine and associated infrastructure 10 km east of the town of Aggeneys, Northern Cape Province. The new Gamsberg zinc mine (hereafter referred to as 'the Project') will include the establishment of a new 10 Million tons per annum (Mtpa) open pit zinc mine (beneficiation volume), in the Gamsberg inselberg, together with a concentrator plant and associated infrastructure. The regional location of the Project and associated transport corridor is presented in *Figure 1.1* below.

BMM is already in the possession of a mining right and subsequently approved Environmental Management Programme (EMPr). The amended EMPr was approved by the Department of Mineral Resources (DMR) (formerly Department of Minerals and Energy) in 2009. This approval relates to the current underground mining activities being undertaken at Gamsberg, which includes the current authorised extraction volumes and concentrate processing at Black Mountain processing plant (see *Section 1.3* below), as well as surface exploration along the north eastern section of the Gamsberg inselberg.

An integrated Environmental and Social Impact Assessment (ESIA) process is being conducted to authorise listed activities triggered by the Project in terms of the National Environmental Management Act (No. 107 of 1998) (NEMA) (as amended), the Environmental Impact Assessment (EIA) Regulations (2010) and other applicable National laws and regulations, such as the National Environmental Management: Waste Act (59 of 2008) (refer to *Section 2.1* for more detail on the integrated legislation processes being undertaken as part of this ESIA process). This application for authorisation under NEMA was submitted to the Northern Cape Department of Environment and Nature Conservation (DENC) on 27 June 2012 (NC/EIA/NAM/KHAI/AGG/2012/NCP/EIA/0000155/2012).

Similarly, BMM is required to submit an EMPr amendment (DMR Reference Number: NCS 30/5/1/2/2/1/518) for the new proposed zinc mine and associated infrastructure, in terms of the Minerals Resources Petroleum Development Act (No. 28 of 2002) Regulations (GNR. 527 of 23 April 2004). This EMPr will describe how the environmental impacts of the Project will be managed and mitigated and will be largely based on information derived from this ESIA process.

Environmental Resources Management Southern Africa (Pty) Ltd (hereafter referred to as ERM) has been appointed, as an independent company, to undertake the associated ESIA and EMPr amendment processes for the construction, operational and decommissioning phases of the Project.



1.1

PURPOSE OF REPORT

This report has been compiled as part of an ESIA process in accordance with regulatory requirements stipulated in terms of the 2010 EIA Regulations (GNR. 543, 18 June 2010), promulgated in terms of Section 24(5) of the NEMA, as amended.

The information contained in this report, along with comments and inputs received from stakeholders and commenting authorities (including SAHRA, Department of Water Affairs and Department of Mineral Resources) will assist the Northern Cape Department of Environment and Nature Conservation DENC in making an informed decision on the Project.

The identification, prediction and evaluation of the actual and potential environmental and social consequences of this Project are essential to an environmental and social assessment. Furthermore, the potential for mitigation of negative impacts and enhancement of positive impacts (DEAT, 2003) are also fundamental to the ESIA process. It is often possible to introduce measures to avoid, mitigate or compensate for many of the negative impacts of a particular development, provided that these potential impacts are identified early in the planning process. At the same time, it is important to also look at opportunities for enhancement of positive impacts or benefits.

The objectives of this document are to:

- Communicate the findings of the ESIA process, including specialist studies, for the Project and alternatives considered;
- Undertake a robust assessment of potential impacts identified during the Scoping phase;
- Present the Applicant's response to the concerns raised, and subsequent efforts towards mitigating the negative, and enhancing positive impacts;
- Provide reasonable opportunity for Interested and Affected Parties (I&APs) to raise any issues or concerns they may have regarding the Project, anticipated impacts and associated mitigation measures;
- Provide a record of comments and responses received from I&APs during the process, together with responses from the project team; and
- Facilitate an informed, transparent and accountable decision-making process by the relevant authorities.

1.2

BACKGROUND TO THE PROJECT

In 1971, zinc deposits were discovered at Gamsberg by O'okiep Copper Company (Newmont). In 1988, Gold Field bought Newmont's interest in Gamsberg;

however the mine was not developed due to unfavourable market conditions. In the same year (1988), Anglo American Corporation acquired the site and completed subsequent prefeasibility and feasibility investigations in order to explore the viability of mining the zinc deposit. These feasibility investigations included an ESIA, which addressed the open pit mine development and associated infrastructure. The necessary (under the previous Minerals Act, No. 50 of 1991) approvals for the mining right and associated EMPr were obtained in 2001. An amendment (conducted in terms of the Minerals and Petroleum Resources Development Act, No. 28 of 2002) to this EMPr was approved in 2003 to undertake underground mining of a small part of the deposit. This amended EMPr was further expanded in 2005 (under the MPRDA, No. 28 of 2002) to include the current authorised extraction volumes and concentrate processing at the existing BMM Processing Plant in Aggeneys. An additional amendment was made (under the MPRDA, No. 28 of 2002) to the EMPr and an EIA and EMP amendment submitted in 2009 for surface exploration along the north eastern section of Gamsberg, which was subsequently approved.

Vedanta Resource Plc. acquired BMM from Anglo American Corporation in 2011. Apart from the abovementioned mining and EMPr right obtained in terms of the MPRDA, all other approvals obtained previously by Anglo American (ie EIA approval under Environmental Conservation Act, 73 of 1989), have lapsed.

Given the changes to the previous Project description and changes in applicable environmental legislation (refer to *Section 2*), a new ESIA process will be undertaken in order to obtain the necessary authorisation (in terms of NEMA) for the new zinc mine and associated infrastructure. This process will provide a detailed assessment of potential impacts as well as suitable mitigation measures. As mentioned above, an EMPr amendment will also be required in terms of the MPRDA. This will be largely based on the findings from this ESIA process.

In addition to this, ERM will compile and submit an Integrated Water Use License Application (IWULA) for the variety of water uses that have been identified in terms of the National Water Act (No 36 of 1998). Applications in terms of National Environmental Management: Air Quality Act (No 39 of 2008) (NEM:AQA) and National Environmental Management: Waste Act (No. 59 of 2008) (NEM:WA) have also been submitted.

As mentioned before, all legislative processes will be undertaken in an integrated manner, through the ESIA process as indicated in *Chapter 2* in *Figure 2.1* (Integrated Flow Diagram of ESIA Process).

1.3

CURRENT OPERATIONS

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 in 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.

Table 1.1 *Black Mountain's Current Mining Operations in Aggeneys and Gamsberg*

Current Operations	Minerals extracted	Volume of ore extracted (tpa)
Existing Black Mountain Mine: Aggeneys.	Zinc, lead, copper and silver.	Zinc: 64,682 Lead: 74,645 Copper: 10,182 Silver: 54,26
Existing Gamsberg Underground Mine.	Zinc	Zinc: 60,000

1.4 *PROJECT APPLICANT AND PROPERTY DETAILS*

1.4.1 *Property Details*

The Project area is located across four properties, which are owned by BMM. In addition to the open pit zinc mine, associated infrastructure in the form of tailings dam, waste rock dump and a zinc concentrator will be located on the following properties rezoned for this purpose during 2001 (Reference number HRN/FF/1/8 – Namaqua District):

- Bloemhoek 61 Portion 1;
- Gams 60 Portion 1;
- Aroams 57 RE; and
- Gams 60 Portion 4.

In light of associated infrastructure, all directly affected properties are presented below, per project components:

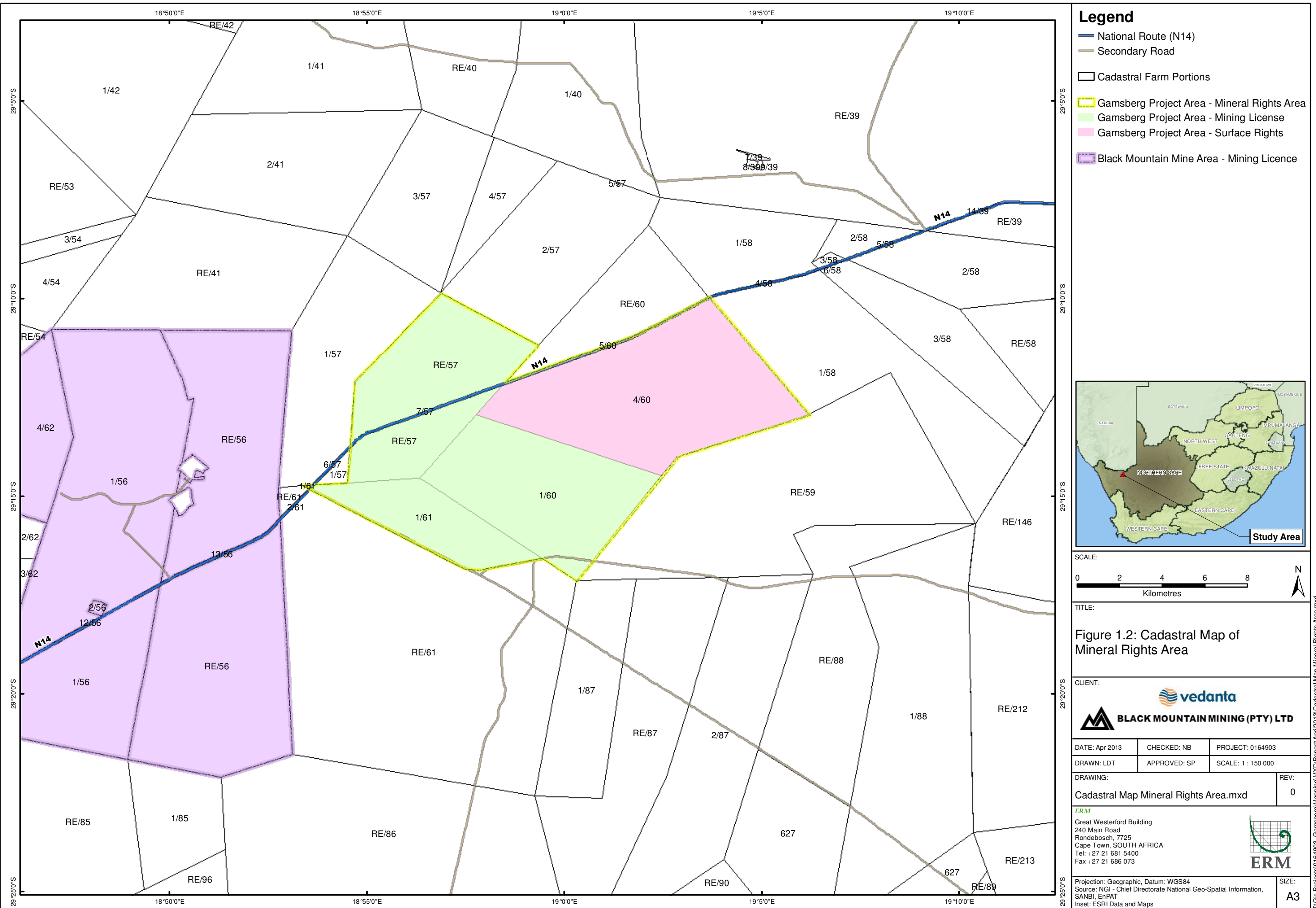
Table 1.2 *Directly Affected Properties*

Project Component	Affected properties
Distribution Line and Associated Sub-stations.	<ul style="list-style-type: none"> • Aroams 57 RE; • Bloemhoek 61 Portion 1; • Gams 60 Portion 1; • Gams 60 Portion 4; • Aroams 57 RE (Registered Servitude: land owned by Black Mountain, servitude owned by Eskom); and • Gams 60 Portion 4 (Registered Servitude: land owned by Black Mountain, servitude owned by Eskom).
Additional Housing.	<ul style="list-style-type: none"> • Aggeneys 56 RE; and • Housing location in Aggeneys.

Project Component	Affected properties
Transport Option 1 (N14 to Port of Saldanha).	<ul style="list-style-type: none"> • N14 National Road (Owned by SANRAL). • N7 National Road (Owned by SANRAL). • R399 Regional Route (Owned by Western Cape Roads Authorities). • Transnet National Ports Authority.
Transport Option 2 (Road to Loop 10, load onto Sishen – Saldanha Railway Line to Port of Saldanha).	<ul style="list-style-type: none"> • Uitkyk 889 Portion 3; • F 197/Portion 15; and • Aroams 57 RE (Proclaimed Road RL (P) 5/2002: land owned by Black Mountain, servitude owned by PD Carstens).

Figure 1.2 below reflects the location of the proposed mining right areas that have been approved by the Department of Mineral Resources (DMR). In addition, it reflects the properties directly adjacent to the Project area.

Apart from the proclaimed road [RL(P)5/2002] and the registered servitude owned by Eskom and Pella Drift Water Board respectively, all remaining properties in the mine area are owned by BMM.



1.4.2

Holder of the Mining Right

Rights to Mineral Resources

BMM currently has a mining right over the Gamsberg zinc ore deposit, which extends across Bloemhoek 61 Portion 1, Gams 60 Portion 1, and Aroams 57 RE. The existing mining right covers a total area of 9,505.7 hectares, which includes the Gamsberg inselberg itself. A new order mining right was submitted during 2006 (Licence number ML003200). A new order mining right was issued to BMM (Anglo Operations Ltd) in August 2008 and then ceded to BMM in September 2008. An illustration of the mining license area, for both the Black Mountain Deeps Mine and the proposed Gamsberg mine, is reflected in *Figure 1.2* above.

1.5

ASSUMPTIONS AND LIMITATIONS

During the compilation of this ESIA Report, the following limitations and assumptions were made:

- Information sourced from secondary sources is correct.
- The scope of the ESIA process is limited to the Gamsberg mine, the associated infrastructure (including concentrator plant, waste rock dumps, tailings dams, internal road network, housing, workshops etc.) and transport options to the Port of Saldanha and Loop 10 siding.
- It is expected that additional storage and transfer facilities at the Port of Saldanha may be required to accommodate the Gamsberg concentrate. However, for purposes of this ESIA, it is assumed that the Port has sufficient capacity to accommodate the additional concentrate and that no upgrades will be required. The decision to exclude future upgrades to the Port of Saldanha from the scope of work relates to the fact that only preliminary design and layout options have been undertaken at this stage. Pending outcomes from further feasibility studies and engagement with the Transnet National Ports Authority, the preferred option to accommodate the increase in zinc exports will be confirmed and this will be subject to a separate environmental application process, if required.
- In terms of the Loop 10 rail siding, it is assumed that the necessary expansions or upgrades will be limited to the existing disturbed area. All baseline information used to assess the impacts associated with the Loop 10 rail siding was taken from previous studies (SHE Cape Environmental cc, 2008) undertaken at the site as well as satellite imagery.
- The report was prepared based on the most up to date project description provided.
- All information received from the applicant and associated engineering consultant team is accurate. It was assumed that the dimensions and footprint

of all project infrastructures are accurate and consistent with the project description.

- Study takes cognisance of the associated works and applications made by the Pella Drift Water Board (PDWB) for a Basic Assessment process to upgrade their water infrastructure.
- It is assumed that any technical and financial motivation for preference of mining techniques was correctly analysed and presented to ERM.
- It is assumed that underground mining will only become more unviable, subsequent to the additional costs for environmental mitigation.
- The business case for open pit mining has excluded the potential costs for environmental mitigation. It is assumed that open pit will remain viable, upon implementation of the environmental mitigation measures.
- Note that the costs associated with biodiversity offsetting have not yet been incorporated into the aforementioned business case. This will be determined, based on findings of the ESIA process (ie defining residual impact).
- The financial analysis of the different mining technique has adopted a future projection of zinc prices, which are subject to variation, based on varying market prices.

1.6

DETAILS OF THE ESIA PROJECT TEAM

ERM is a global environmental consulting firm employing over 4,000 specialists in over 140 offices across 40 countries. ERM Southern Africa in turn is one of the largest environmental consulting firms in the region, with extensive experience in South Africa and several other African countries. A list of the ESIA project team is tabulated in *Table 1.3* below, together with the associated qualifications and experience:

Table 1.3 *Expertise of EAPs*

Name	Role in Project	Education/certifications	Experience
Stuart Heather-Clark	Partner in Charge	<ul style="list-style-type: none"> • BSc Civil Engineering – Univ. of Cape Town (1992). • MPhil. Environ Science – Univ. of Cape Town (1996). • EAPSA Certification. 	<p>Stuart Heather-Clark is a Partner in the Impact Assessment and Planning Team within ERM Southern Africa based in Cape Town, South Africa.</p> <p>Stuart has over 17 years of experience in industrial, oil & gas and infrastructure related ESIA and Strategic Environmental Assessments (SEA) throughout Africa. His experience has afforded him a sound understanding of the sustainability issues facing development in Africa. He has been involved in a number of internationally</p>

Tania Swanepoel	Project Manager	<ul style="list-style-type: none"> • BSc Hons (Engineering & Environmental Geology), University of Pretoria, 2000. • BSc Hons (Geology and Geohydrology), University of the Western Cape, 1997. • BSc (Geology, Mathematics) , University of the Western Cape, 1996. • Registered Natural Scientist (Pr Sci Nat). 	<p>funded projects in Cameroon, Ethiopia, Zambia, Tanzania, Angola, Botswana, Namibia, Uganda and Mozambique. All of these projects involved interaction with lenders, developers, local stakeholders, including NGO's, government officials and local communities. Mr Heather-Clark has an in-depth understanding of the Equator Principles and IFC performance Standards. Tania Swanepoel is a Principal Consultant in the Impact Assessment and Planning team based in Cape Town, South Africa.</p> <p>Tania has over 13 years of broad based environmental experience. Her experience includes environmental impact assessments, management plans, public participation, environmental site investigations, pollution risk assessments, remedial system monitoring, geotechnical investigations, groundwater monitoring and rural water supply & sanitation studies.</p>
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1.7 STRUCTURE OF THIS REPORT

The structure of the Draft ESIA Report is described in *Table 1.4* below.

Table 1.4 *Structure of Draft ESIA Report*

Chapter	Description
Chapter 1	Introduction Contains a brief description of the proposed activity and an outline of the report structure.
Chapter 2	Administrative Framework Contains a brief description of the proposed activity and an outline of the report structure.
Chapter 3	Project Description Includes a detailed description of the proposed project activities being considered.
Chapter 4	Summary of Alternatives This Chapter provides a detailed review of the initial alternatives considered and the motivation for the screening and subsequent selection of a preferred alternative for detailed impact assessment. Note that this Chapter also contains a summary of the alternatives considered in the previous EIA process completed in 2001.

Chapter	Description
Chapter 5	Biophysical Receiving Environment Provides a detailed describes of the receiving biophysical baseline environment.
Chapter 6	Socio-economic Receiving Environment Provides a detailed describes of the receiving socio-economic baseline environment.
Chapter 7	Stakeholder Engagement Provides a summary of the stakeholder engagement process that forms part of the ESIA process, in terms of the EIA Regulations (2010) and Government Notice R543.
Chapter 8	Waste Management and Classification Provides a summary of key issues associated with the management of non-hazardous and hazardous wastes generated as a result of the proposed Project.
Chapter 9	Biophysical Impact Assessment Provides a detailed assessment of all potential biophysical impacts identified during the Scoping Phase, together with mitigation measures and expected residual impacts. Lastly, cumulative impacts are also addressed in this Chapter.
Chapter 10	Socio-economic Impact Assessment Provides a detailed assessment of all potential socio-economic impacts identified during the Scoping Phase, together with mitigation measures and expected residual impacts. Lastly, cumulative impacts are also addressed in this Chapter.
Chapter 11	Closure and Post Mining Landuse Provides a summary of closure and rehabilitation goals, including financial provision and suggestions for post mining landuse.
Chapter 12	Summary of Biodiversity Offsetting Process Provides a brief summary of the biodiversity offsetting process that is currently being undertaken. This includes the approach, methodology, assumptions and limitations and way forward.
Chapter 13	Conclusion and Recommendations Summarises the key findings of the ESIA and provides recommendations for the mitigation of potential impacts and the management of the proposed project.
Chapter 14	References Contains a list of references used in compiling the report.