

PART 3

Specialist Assessments and Additional Impacts



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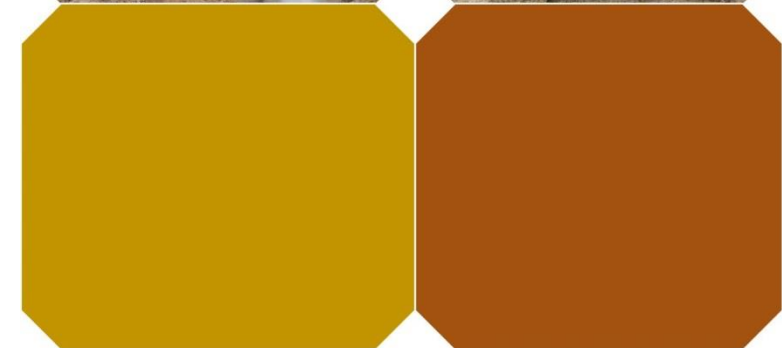
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2

3 3.1 Introduction

4 This section of the report describes the process undertaken for the
5 assessment of the Draft Refined Corridors. This includes assessment
6 undertaken by Specialists and the Project Team. The latter is informed by
7 previous Strategic Environmental Assessments (SEAs) undertaken by the
8 CSIR (such as the Electricity Grid Infrastructure (EGI) SEA in 2016), as
9 well as discussions with various specialists and authorities.

10

11 3.2 Scope of Work and Approach

12 3.2.1 Scope of Work

13 The geographic scope of the assessment was focused on the Draft
14 Refined Corridors (as described in Part 2 of the SEA Report). The scope
15 of the Specialist Assessments considers the construction and operation
16 of EGI, and includes an assessment of social, economic and biophysical
17 opportunities and risks associated with the proposed development. The
18 scope of issues addressed in the SEA was informed by an in-depth review
19 of similar assessments undertaken locally and globally, as well as by
20 engagement with stakeholders and governance groups.

21

22 In order to advance the principles of balance and comprehensiveness,
23 the main specialist topics in the assessment have been addressed by
24 multi-author teams. Each of the Specialist Assessments therefore has
25 multiple authors, which were selected on the basis of their acknowledged
26 expertise, inclusive of appropriate formal qualifications and experience,
27 peer-group recommendations and track record of outputs.

28

29 Each team includes one Integrating Author, several Contributing Authors
30 and in some cases Corresponding Authors. The Integrating Authors were
31 responsible for ensuring that all the components written by Contributing
32 and Corresponding Authors were delivered on time, and were
33 incorporated in a logical manner in each Chapter; and that the scope of
34 the Chapter was addressed. Integrating Authors also reviewed the input
35 from Contributing and Corresponding Authors, and compiled sections of
36 the assessment chapters. They were also responsible for ensuring that
37 comments from experts, project partners, project team members,
38 stakeholders and peer reviewers have been adequately addressed
39 and/or incorporated and documented.

40

41 Contributing Authors were responsible for compiling text, references,
42 tables and graphics for sections of the assessment chapters. These were
43 submitted to their Integrating Authors, based on agreed formats and
44 templates. They also assisted in addressing reviewer comments relating
45 to text they have contributed.

46

47 The Corresponding Authors were also responsible for delivering text,
48 references, tables and graphics to their Integrating Authors. They were
49 also selected to conduct review and provide expert feedback on relevant
50 sections of the assessment reports.

51

52 During the SEA Process, two Multi-Author Workshops were held with the
53 Specialist Teams. The Integrating and Contributing Authors were
54 expected to attend all writing workshops and actively participate in the
55 discussions and decisions taken. The first Multi-Author Workshop took
56 place on 7 December 2017 to inform the Specialist Team of the scope of
57 the project, as well as to discuss and confirm the scope of the specialist
58 assessments and the report structure, and potential alignment between
59 studies, data requirements, gaps, and any concerns raised. The second
60 Multi-Author Workshop was held on 20 April 2018 in order to discuss the
61 first draft reports compiled by the Specialists, as well as to discuss
62 information requirements, gaps and tasks for completion.

63

64 3.2.2 Specialist and Author Team Expertise

65 Table 1 illustrates the Specialist Assessments that have been
66 undertaken as part of this SEA, as well as the associated authors. Table
67 2 includes a description of the Specialist and Author Team expertise.
68 Signed specialist declarations of interest are also included in Appendix A
69 of this chapter.

70

71 3.2.3 Review Process

72 In the EGI Expansion SEA, review of reports, tools and outputs during
73 various stages of the SEA is considered a significant element of the
74 process. These include review by key stakeholders and experts that have
75 in-depth knowledge and insights into the subject of the SEA, as well as
76 review by academic peers and members of the public. These types of
77 reviews promote transparency and enables concerns raised by affected
78 parties to be considered, where applicable. It also ensures that the SEA

79 is relevant and scientifically comprehensive. Academic peer review of
80 specialist chapters compiled for the SEA promotes overall robustness
81 of the process and ensures that scientific credibility is upheld. The
82 overall review processes undertaken for this SEA are described in this
83 section.

84

85 The first draft of each Specialist Assessment chapter was reviewed
86 internally by the SEA Project Team consisting of the Council for
87 Scientific Industrial Research (CSIR) and South African National
88 Biodiversity Institute (SANBI). The chapters were then revised by the
89 specialists based on the initial review comments and the second
90 draft was compiled and sent to the Peer Reviewers and Project
91 Partners for review (i.e. the National Departments of Environmental
92 Affairs, Energy and Public Enterprises, as well as Eskom, iGas and
93 Transnet). Following this, the chapters were revised by the specialists
94 based on the partner and peer review comments, and finalised in a
95 third version for wider public and stakeholder review. The SEA
96 Process is currently at this stage, whereby the Specialist Chapters, as
97 well as Chapters on the background to the SEA have been uploaded
98 on the project website (<https://gasnetwork.csir.co.za/>).

99

100 The expert peer reviewers were identified from existing scientific
101 publications collected throughout the process and through
102 nominations from the SEA Project Team, general stakeholders, Expert
103 Reference Group and the Specialists. A total of 12 peer reviewers,
104 from NGOs, academia and research institutions; and the private
105 sector provided peer review comment. Table 1 also indicates the peer
106 reviewers that have been appointed for the SEA Process.

107

108 The Peer Reviewers were requested to provide their comments in a
109 standardised document making reference to the specific page
110 number and line number when documenting their comments. When
111 the Specialists were re-drafting their third version of the report for
112 public and stakeholder review, they were requested to detail, in the
113 Peer Review Sheets, how the comments have been addressed and
114 incorporated into the Specialist Assessment Chapters. The completed
115 Peer Review Sheets and Specialists Responses are included in
116 Appendix B, and are therefore available in the public domain via the
117 project website (<https://gasnetwork.csir.co.za/>).

118

Table 1: Details of the Specialist Assessment Chapters, Specialist Team and Peer Reviewer Team

Specialist Chapter	Integrating Author	Specialist Section	Contributing Author	Corresponding Author	Peer Reviewer
Integrated Biodiversity and Ecology Assessment (Terrestrial and Aquatic Ecosystems, Species)	Luanita Snyman-Van der Walt, CSIR	Fynbos Biome	<ul style="list-style-type: none"> Dr. David Le Maitre; CSIR 		<ul style="list-style-type: none"> Professor Brian W. van Wilgen; Academic/Researcher (associated with the University of Stellenbosch)
		Savannah and Grassland Biomes	<ul style="list-style-type: none"> Dr. Graham von Maltitz; CSIR Bonolo Mokoatsi; CSIR 		<ul style="list-style-type: none"> Professor Bob Scholes; University of the Witwatersrand Johannesburg
		Indian Ocean Coastal Belt Biome	<ul style="list-style-type: none"> Simon Bundy and Alex Whitehead; SDP Ecological and Environmental Services 		<ul style="list-style-type: none"> Duncan Hay, Catherine Pringle, and Leo Quayle, Institute of Natural Resources
		Succulent and Nama Karoo Biomes	<ul style="list-style-type: none"> Lizande Kellerman; CSIR Simon Todd; 3 Foxes Biodiversity Solutions 		<ul style="list-style-type: none"> Professor Sue J. Milton-Dean; Renu-Karoo Veld Restoration
		Estuaries	<ul style="list-style-type: none"> Dr. Lara Van Niekerk, Carla-Louise Ramjukadh and Steven Weerts,; CSIR 		<ul style="list-style-type: none"> Professor Janine Adams; Nelson Mandela University
		Wetlands and Rivers	<ul style="list-style-type: none"> Gary de Winnaar and Dr. Vere Ross-Gillespie; GroundTruth 		<ul style="list-style-type: none"> Duncan Hay, Catherine Pringle, and Leo Quayle, Institute of Natural Resources Nancy Job; SANBI
		Avifauna	<ul style="list-style-type: none"> Albert Froneman and Chris van Rooyen; Chris Van Rooyen Consulting 		<ul style="list-style-type: none"> Jonathan Booth and Robin Colyn, Birdlife South Africa
		Bats	<ul style="list-style-type: none"> Kate MacEwan; Inkululeko Wildlife Services 		<ul style="list-style-type: none"> Refer to Note 1 below
		Fauna	<ul style="list-style-type: none"> All of the above (Refer to Note 2 below) 	<ul style="list-style-type: none"> Kate MacEwan; Inkululeko Wildlife Services 	
Visual Assessment	Quinton Lawson and Bernard Oberholzer	Visual Impacts			<ul style="list-style-type: none"> Scott Mason, SRK Consulting (South Africa) (Pty) Ltd
Seismicity Assessment	Prof Raymond Durrheim; University of the Witwatersrand	Impacts of Earthquakes, Seismicity and Faults	<ul style="list-style-type: none"> Brassnavy Manzunzu; Council for Geoscience 		<ul style="list-style-type: none"> Dr Alistair Sloan; University of Cape Town
Socio-Economic Assessment - Refer to Note 3 below	Surina Laurie, CSIR	Socio-Economics		<ul style="list-style-type: none"> Tony Barbour; Tony Barbour Environmental Consulting and Research Dr Hugo van Zyl; Independent Economic Researchers 	
Additional Issues (Agriculture, Defence, Civil Aviation, and Heritage) - Refer to Note 4 below	Annick Walsdorff, CSIR Rohaida Abed, CSIR	Agriculture	<ul style="list-style-type: none"> Johann Lanz; Independent Consultant 		
		Defence and Civil Aviation			
		Heritage	<ul style="list-style-type: none"> Fahiema Daniels, SANBI Tsamalo Malebu, SANBI 		

2

Note 1: A detailed assessment of impact on bats as a result of EGI development was not required as it is not expected to be of extreme significance. However the report does discuss potential impacts relating to habitat destruction or disturbance during the construction phase and does provide guidance on the requirements that should be followed in each of the four sensitivity tiers. This high level assessment is deemed suitable for an SEA study of this nature and where necessary the site specific studies will provide more detail.

Note 2: Note that faunal input was provided by the Specialist Contributing Authors for each Biome and Ecosystem Report included in the Integrated Biodiversity and Ecology Assessment (Terrestrial and Aquatic Ecosystems, and Species). This input was reviewed and augmented by Kate MacEwan of Inkululeko Wildlife Services.

Note 3: The Socio-Economic Assessment undertaken for this EGI Expansion SEA is significantly based on the 2016 EGI SEA Socio-Economic Assessment, which has been reviewed by various stakeholders as part of that separate SEA Process.

Note 4: The impact of EGI development on Agriculture, Defence, Civil Aviation and Heritage features is anticipated to be of limited significance. This section is largely based on the 2016 EGI SEA Assessment due to impact similarities and where required additional specialist input was obtained. In addition, in terms of the National Heritage Resources Act (Act 25 of 1999), a Heritage Impact Assessment will need to be done for EGI development during the project specific phase.

10

Table 2: Specialist and Author Team Expertise

Specialist and Affiliation	Project Role	Biosketch
Integrated Biodiversity and Ecology Assessment (Terrestrial and Aquatic Ecosystems, and Species)		
Luanita Snyman-Van der Walt, CSIR	Integrating Author	Luanita Snyman-Van der Walt commenced work at CSIR in January 2014, after completing a BSc Botany-Zoology-Tourism, a BSc. Honours in Environmental Science, as well as a MSc in Environmental Science at the North West University, Potchefstroom Campus. She is currently pursuing an MSc. in Geographical Information Science at Vrije Universiteit Amsterdam, and is registered as a Professional Natural Scientist with the South African Council for Natural Scientific Professions (SACNASP) (Registration Number 400128/16). Her work at the CSIR involves strategic environmental assessment and management, with a focus on Geographic Information System (GIS) analyses for environmental assessment and decision-making. She has conducted numerous ecological specialist studies and served as project manager for several Environmental Impact Assessments and Basic Assessments across South Africa. She assisted in managing the shale gas development scientific assessment. She also fulfilled the role of Integrating Author for the Biodiversity Assessment of the Gas Pipeline and EGI Expansion SEA. She also provided technical GIS and mapping support on the Strategic Environmental Assessment Aquaculture Development in South Africa.
Dr. David Le Maitre; CSIR	Contributing Author	Dr. David Le Maitre has more than 30 years of research experience in the ecology of Cape fynbos vegetation, as well as fire ecology and management. His work focuses on assessing the hydrological and ecological impacts of invading alien plants and in the dynamics of invasion processes. His area of interests lies in the impacts of invasions on river and wetland systems and the ecosystems services they generate, including river assimilatory capacity; and developing diagnostic tools to assess the impacts of land-use and land management practices on water quality regulation based on the landscape features and water flows. David Le Maitre is a research associate at the Centre for Invasion Biology, Stellenbosch University, and an associate professor extraordinary at the School of Public Management and Planning, at the same university. Le Maitre holds a PhD in plant ecology, specialising in invasion ecology and hydrology from the University of Cape Town.
Dr. Graham von Maltitz; CSIR	Contributing Author	Dr. Graham von Maltitz is a CSIR research group leader for global change and ecosystems dynamics department of the CSIR. He specialises in large, integrated multidisciplinary projects involving the interface between humans and natural resource management in the terrestrial environment. He holds a PhD in ecology from the Nelson Mandela Metropolitan University and has over 30 years of experience in environmental and global change, focused on unique problems associated with resource ecology and management in southern Africa, with a special focus on areas of communal land management. He has worked extensively in the savanna, forest and grassland biomes of southern Africa, focusing particularly on natural resource use within the communal areas. More recently he has focused on the causes and consequences of global change. This included terrestrial feedbacks to climate processes, land use and land-use change as well as biomass-based energy. He has been involved in a number of global science/policy forums and processes, including links with the United Nations Convention to Combat Desertification and the Intergovernmental science-policy Platform on Biodiversity and Ecosystem Services.
Bonolo Mokoatsi; CSIR	Contributing Author	Bonolo Mokoatsi is a GIS analyst and emerging environmental researcher with a B.A. Honours in Geography from the University of Johannesburg. She commenced work at CSIR in April 2018 while pursuing a MSc in Environmental Management. With her MSc research, she aims to support precision agriculture through a non-destructive approach for monitoring crops' seasonal responses to variable-rate fertilizers and irrigation. Her work at CSIR involved GIS support and satellite image processing for multi-disciplinary studies, NEXUS trade-off analyses, environmental assessments and technical reports. She fulfilled the role of GIS specialist for the Biodiversity Assessment of the Gas Pipeline and EGI Expansion SEA. She also provided GIS support for assessing canopy cover versus above-ground biomass in an effort to map the distribution of bush encroachment in the Savannah and Grassland biomes of South Africa. Bonolo also serves as an external marker for the University of South Africa in the subject of GIS and remote sensing.
Simon Bundy; SDP Ecological and Environmental Services	Contributing Author	Simon Bundy has been involved in environmental and development projects and programmes since 1991 at provincial, national and international level, with employment in the municipal, NGO and private sectors, providing a broad overview and understanding of the function of these sectors. Simon Bundy has a core competency in coastal ecological systems, coastal management and botanical issues including the undertaking of EIAs and Specialist Assessments. He has local and international experience, and in South Africa, he has been involved in a number of large scale power projects as well as the development of residential estates, infrastructure and linear developments in KwaZulu-Natal, Eastern Cape and Western Cape, where he has provided both technical support, as well as the undertaking of rehabilitation programmes. From a technical specialist perspective, Simon focuses on coastal ecological systems in the near shore environment and is competent in a large number of ecological methodologies and analytical methods including multivariate analysis and canonical analysis. He is competent in wetland delineation and has formulated ecological coastal set back methodologies for EKZN Wildlife and for the Department of Economic Development Tourism and Environmental Affairs in conjunction with the Oceanographic Research Institute. He has also worked on coastal marine pollution projects for various insurance and salvage companies and has undertaken projects for the Global Environment Fund of the United Nations. He acts as botanical and environmental specialist for Eskom Eastern Region and provides technical support to the IEM division of the CSIR, Stellenbosch. He is a registered Professional Natural Scientist (Ecology – Registration Number: 400093/06) with SACNASP.
Alex Whitehead; SDP Ecological and Environmental Services	Contributing Author	Alex Whitehead is an Ecologist registered with SACNASP (400176/10). He holds a BSc Honours specializing in Ichthyology and Fisheries Science from Rhodes University. He serves as a lead specialist in a number of terrestrial, aquatic and wetland studies. His specialist involvement has been linked with a diverse range of development scenarios, including waste water treatment works, housing estates, industrial estates, bulk infrastructure such as water and power lines, harbours, piers, renewable energy (solar and wind power), dams, and aquaculture and agri-industrial facilities. His specialist fields of interest include aquatic ecology (both freshwater and estuarine, ichthyofauna and invertebrates); wetland delineation and functionality assessments; and terrestrial ecology (fauna and flora). Alex has 13 years of experience, which includes projects undertaken throughout South Africa, as well as in Ghana.
Lizande Kellerman; CSIR	Contributing Author	Lizande Kellerman holds a Bachelor's degree in Zoology and Entomology, with an Honours and Masters in Botany both at the University of Pretoria. She is currently completing her PhD in Conservation Ecology from Stellenbosch University. She is a registered Professional Natural Scientist (Botanical Sciences – Registration Number: 400076/10) with SACNASP. She has more than 10 years' experience in environmental assessment and management studies, primarily in planning, preparing, managing and conducting environmental impact assessments (BA, EIA and SEA), environmental management plans (EMPs), environmental screening studies, fatal flaw assessments, cultivation rights and license applications for air emissions, water use, waste management, mining, bioprospecting and biodiversity permitting for numerous projects in the agricultural (including aquaculture), construction, environmental, mining and renewable energy sectors.
Simon Todd; 3 Foxes Biodiversity Solutions	Contributing Author	Simon Todd has 18 years' experience as a terrestrial ecologist in arid systems and biodiversity assessments. His primary focus includes examining the impacts of land use on biodiversity with the arid ecosystems of South Africa. He is also familiar with the SEA process and has contributed amongst others, to the REDZ SEA, Shale Gas SEA, SKA, as well as the ESKOM EGI SEA. Apart from the above studies, he has also worked extensively across the Nama and Succulent Karoo and has provided specialist ecological assessments for more than 150 different developments. He is the Nama and Succulent Karoo representative on the National Vegetation Map Committee. Simon Todd is a recognised arid-areas ecological expert and is a past chairman of the Arid-Zone Ecology Forum and has 20 years' experience working throughout the country. Simon Todd is registered with the SACNASP (Registration Number: 400425/11).

Specialist and Affiliation	Project Role	Biosketch
Dr. Lara Van Niekerk; CSIR	Contributing Author	Dr. Lara van Niekerk joined the CSIR in 1994, where she fulfils a role of Senior Scientist. Lara is part of a core team that developed the ecological flow requirement methods, strategic/operational policies and legislation required for the effective management of South Africa's estuaries. She has been involved in over 50 estuarine freshwater flow requirement studies. Lara is the architect of the SA National Estuarine Management Protocol and related planning guidelines. She led the team of specialists that assessed the ecosystem condition of all South Africa's estuaries as part of the SA National Biodiversity Assessment in 2011 and in the process of refining this for 2018.
Carla-Louise Ramjukadh; CSIR	Contributing Author	Carla-Louise Ramjukadh served as a Candidate Researcher in the Coastal Systems Research Group of the Natural Resources and the Environment (NRE) group in CSIR from 2016 - 2018. She is currently working for the South African Weather Services – Marine Research Institute as a Scientific Researcher. She holds a BSc and BSc Honours in Environmental and Water Science from the University of Western Cape, as well as a MSc in Biological Science from the University of Cape Town. She has been involved in various research projects, including but not limited to, Estuarine Management Plans in the Western Cape Province, effect of climate change in coastal systems, and characterisation of pH in estuarine systems.
Steven Weerts; CSIR	Contributing Author	Steven Weerts joined the CSIR in 2004 as a Senior Scientist, and currently fulfils the role of Research Group Leader for the Coastal Resources Group. He holds a BSc., BSc Honours and MSc from the University of Natal, and the latter from the University of Zululand. He has extensive experience in Marine Ecology and has authored more than 150 contract research and specialist consultancy reports to private and public sectors clients, stakeholders and users. He has also published many scientific publications. He has worked on several Estuary Management Plans, Outfall Monitoring Programmes, and Port Planning projects, and also served as the Integrating Author for the Marine Ecology chapter of the Strategic Environmental Assessment Aquaculture Development in South Africa.
Gary de Winnaar; GroundTruth	Contributing Author	Gary de Winnaar has over ten years of experience in professional consulting services while conducting assessments of aquatic and terrestrial ecosystems, and associated fauna and flora. He has provided specialist input for a range of studies requiring solutions regarding practical and applied terrestrial and aquatic ecology, including abilities to integrate aquatic and terrestrial elements, survey fauna and flora, characterise and map biodiversity features (including sensitive habitats), conduct specialist GIS modelling and mapping, as well as identifying and assessing impacts to biodiversity and the environment. He is particularly interested in the assessment of environmental flows to ensure that biodiversity patterns and processes are supported by sustained water flow. He managed and integrated specialist teams and inputs covering specialist fields such as terrestrial invertebrates, botany, and ecosystem services/resource economics, etc. He is a registered Professional Natural Scientist (Ecological Science – Registration Number: 400454/13) with SACNASP.
Dr. Vere Ross-Gillespie; GroundTruth	Contributing Author	Dr. Vere Ross-Gillespie currently manages the Rivers Division of GroundTruth, where work consists of conducting environmental flow and Instream Flow Requirement studies, biological and water quality monitoring, impact assessments, river ecological surveys, rehabilitation and also research. Vere has eight years of experience in the field of aquatic entomology and freshwater ecology. He is also involved in a wide range of active research projects, both local and internationally. Vere's research interests include Aquatic Ecology, Entomology, Limnology, Climate Change and Biology. Current/recent research projects include Adaptability and Vulnerability of Riverine Biota to Climate Change, the development and application of Periphyton as Indicators of flow and nutrient alterations for the management of water resources. He is a registered Professional Natural Scientist (Ecological Science) with SACNASP.
Albert Froneman; Chris Van Rooyen Consulting	Contributing Author	Albert Froneman has more than 15 years' experience in the management of avifaunal interactions with industrial infrastructure. He holds a M.Sc. degree in Conservation Biology from the University of Cape Town. He managed the Airports Company South Africa (ACSA) – Endangered Wildlife Trust Strategic Partnership from 1999 to 2008 which has been internationally recognized for its achievements in addressing airport wildlife hazards in an environmentally sensitive manner at ACSA's airports across South Africa. Albert is recognized worldwide as an expert in the field of bird hazard management on airports and has worked in South Africa, Swaziland, Botswana, Namibia, Kenya, Israel, and the USA. He has served as the vice chairman of the International Bird Strike Committee. At present he is consulting to ACSA with wildlife hazard management on all their airports. He is also an accomplished specialist ornithological consultant outside the aviation industry and has completed a wide range of bird impact assessment studies and pre-construction monitoring reports. He was a specialist author on the Avifauna Assessment of the 2016 EGI SEA. Since 2009 Albert has been a registered Professional Natural Scientist (Registration Number 400177/09) with SACNASP, specialising in Zoological Science.
Chris van Rooyen; Chris Van Rooyen Consulting	Contributing Author	Chris van Rooyen has nineteen years' experience in the assessment of avifaunal interactions with industrial infrastructure. He was employed by the Endangered Wildlife Trust as head of the Eskom-EWT Strategic Partnership from 1996 to 2007, which has received international acclaim as a model of co-operative management between industry and natural resource conservation. He is an acknowledged global expert in this field and has consulted in South Africa, Namibia, Botswana, Lesotho, New Zealand, Texas, New Mexico and Florida. He also has extensive project management experience and he has received several management awards from Eskom for his work in the Eskom-EWT Strategic Partnership. He is the author and/or co-author of 17 conference papers, co-author of two book chapters, several research reports and the current best practice guidelines for avifaunal monitoring at wind farm sites. He has completed more than 100 power line assessments; and has to date been employed as specialist avifaunal consultant on more than 30 renewable energy generation projects. He has also conducted numerous risk assessments on existing power lines infrastructure. He also works outside the electricity industry and he has done a wide range of bird impact assessment studies associated with various residential and industrial developments. He was also a specialist author on the Avifauna Assessment of the 2016 EGI SEA.
Kate MacEwan; Inkululeko Wildlife Services	Contributing Author	Kate MacEwan is a SACNASP registered zoologist and environmental scientist and holds a BSc (Honours) in Zoology from Wits University. She has over 20 years of zoological and practical bat conservation experience and wide diversity of contacts with various African bat academics and biologists. Kate is currently the chairperson for the South African Bat Assessment Advisory Panel (SABAAP), and a co-author of both the South African Good Practise Guidelines for Surveying Bats in Wind Farm Developments: 4th Edition (Sowler et al 2016) and the South African Good Practice Guidelines for Operational Monitoring for Bats at Wind Energy Facilities: 1 st Edition (Aronson et al., 2014). Kate is also the co-author on several bat species accounts (including some from Mozambique) in the latest southern African Red Data mammal listings (Child et al. (2016)). She has also served as a specialist author in the Phase 1 Renewable Energy Development Zones SEA, and is also part of the Phase 2 assessment.
Visual Impact Assessment		
Quinton Lawson; Private Consultant	Integrating Author	Quinton Lawson is a professional architect, with more than 20 years' experience in visual assessments, including numerous wind and solar renewable energy projects, and is familiar with some of the strategic areas in the Western Cape, Eastern Cape and Free State. He holds a Bachelor of Architecture from the University of Natal, and is a Professional Member of the South African Council for the Architectural Profession (SACAP) (Registration Number 3686), as well as the South African Institute of Architects (SAIA) (Registration Number 4759). He is visiting lecturer for the University of Cape Town and serves on the Impact Assessment Committee of Heritage Western Cape for the Provincial Government Western Cape. He has also worked on large scale landscape projects on the Eastern Cape, Southern Cape, West Coast and Namaqualand coastlines. He was the specialist author for the Visual Impact Assessment compiled for the EGI SEA in 2016.
Bernard Oberholzer; Bernard Oberholzer Landscape Architects	Integrating Author	Bernard Oberholzer is a landscape architect and environmental planner with over 28 years' experience in visual assessments, particularly for wind and solar energy, as well as gas pipelines and powerlines. He holds a Bachelor of Architecture from the University of Cape Town; and a Master of Landscape Architecture from the University of Pennsylvania. He is a Professional Member of the South African Council for the Landscape Architectural Profession (SACLAP) (Registration Number 87018). He is also a Fellow of the Institute of Landscape

Specialist and Affiliation	Project Role	Biosketch
		Architects of SA (ILASA). He authored the Guideline for Involving Visual and Aesthetic Specialists in EIA Processes, and co-authored a heritage and scenic resources study for the Provincial Government, Western Cape. He was the specialist author for the Visual Impact Assessment compiled for the EGI SEA, Shale Gas Scientific Assessment, and SKA Phase 1 SEA Assessment.
Seismicity Assessment		
Professor Raymond J Durrheim; University of the Witwatersrand Johannesburg	Integrating Author	Professor Raymond Durrheim is the South African Research Chair of Exploration, Earthquake and Mining Seismology and holds appointment as a research chair and supervisor at the University of the Witwatersrand School of Geosciences. He is co-director of the AfricaArray research and capacity-building programme and was co-leader of the Japanese-South African collaborative project "Observational studies in South African mines to mitigate seismic risks" (2010-2015). He holds a BSc in Geology and Physics from the University of Stellenbosch; a BSc Honours in Geophysics from the University of Witwatersrand; a MSc in Geophysics from the University of Pretoria, and a PhD in Geophysics from the University of Witwatersrand. Research conducted by Professor Raymond Durrheim may be divided into three categories: (i) investigations of the structure and evolution of the crust and mantle (exploration seismology); (ii) earthquake physics and seismic hazard assessment; and (iii) engineering seismology (particularly related to deep mining).
Brassnavy Manzunzu; Council for Geoscience	Contributing Author	Brassnavy Manzunzu is a seismologist with the Council for Geoscience. He completed a MSc in Geophysics in 2013 and is currently undertaking his PhD at University of Witwatersrand. He joined the Zimbabwe Meteorological Services as a trainee Meteorologist in 2007. In April 2008 he moved to the seismology section where he began his career as a trainee seismologist and eventually fulfilled the position of Seismology Manager. In 2012, he joined the Council for Geoscience as a seismic hazard scientist. He has worked on several projects on seismic hazard in Africa. He has published a number of peer reviewed international journal articles. He has been part of the GEM- sub-Sahara Africa since its inception.
Socio-Economic Assessment		
Surina Laurie, CSIR	Integrating Author	Surina has more than 7 years of experience in environmental assessment and management and is a Senior EAP in the Environmental Management Services (EMS) group of the CSIR with a Masters degree in Environmental Management from the University of Stellenbosch and a Certificate in Environmental Economics from the University of London. She is a Registered Professional Natural Scientist (Registration Number: 400033/15) with the SACNASP. Surina has experience in the management and integration of various types of environmental assessments in South Africa for various sectors, including renewable energy, industry and tourism. She has also been part of advisory teams advising on financing, real estate, corporate, construction, environmental and regulatory aspects for various sponsors, developers and lenders during the DOE's first and second bidding windows in 2012 and 2013. Surina has undertaken several Solar Photovoltaic (PV) and Wind Energy Environmental Assessments (i.e. EIAs, BAs, and Amendment and Appeal Processes) in the Northern Cape, Western Cape and Free State. She also served as the Integrating Author for the Socio-Economics chapter of the Strategic Environmental Assessment Aquaculture Development in South Africa.
Tony Barbour; Tony Barbour Environmental Consulting and Research	Corresponding Author	Tony Barbour holds a master's degree in environmental science and has 23 years' experience in the environmental sector. His experience includes ten years as an environmental consultant in the private sector in South Africa followed by four and a half years at the University of Cape Town's Environmental Evaluation Unit. In 2004 he established his own environmental consulting company, Tony Barbour Environmental Consulting and Research, with a focus on Social Impact Assessment (SIA), Strategic Environmental Assessment (SEA), Independent Review Work, Training and Capacity Building and Environmental Project Management. Tony has conducted over 40 Social Impact Assessments and is the lead author of the Western Cape Provincial Government guidelines on social specialist inputs into EIAs.
Dr Hugo van Zyl; Independent Economic Researchers	Corresponding Author	Dr. Hugo van Zyl holds a PhD in economics from the University of Cape Town and has more than 18 years' experience focusing on the analysis of projects and policies with significant environmental and development implications. Hugo van Zyl is the director of Independent Economic Researchers, focusing on economics impact assessment, project appraisal and applied environmental resource economics. He has been involved in over 60 economic and socio-economic appraisals of infrastructure projects, industrial developments, mixed use developments, mining, energy projects, conservation projects and eco-tourism initiatives throughout southern Africa. The majority of these appraisals have involved the use of economic impact assessment tools and cost-benefit analysis in order to inform decision-making. He has lead, participated in and co-ordinated research in environmental resource economics (including environmental valuation, payments for ecosystem services, policy reform), socio-economic impact assessment, strategic assessment and protected area business planning. From a policy perspective he has provided economic inputs and guidance to national water tariff, air pollution, biodiversity conservation, biofuels, mine closure funding and climate change policy. Dr Van Zyl is also the lead author of the Western Cape Provincial Government guidelines on economic specialist inputs into EIAs. These guidelines have been accepted at a national level and are applied throughout the country.
Additional Issues (Agriculture, Defence, Civil Aviation, and Heritage)		
Annick Walsdorff, CSIR	Integrating Author	Annick Walsdorff is a Principal Environmental Assessment Practitioner in the Environmental Management Services group of the CSIR. She holds a Degree in Chemical Engineering which was obtained with Great Distinction from the Université Libre de Bruxelles in Belgium, and a Masters Degree in Chemical Engineering (Cum Laude) from the University of Stellenbosch. She has more than 16 years' experience in environmental assessment and management and has been involved in several environmental studies of national importance including Preliminary Environmental Assessments, EIAs and Environmental Management Plans (EMPs). She played a key role in the Integrated Environmental Management Plan for the SKA, which currently in the gazetting phase.
Rohaida Abed, CSIR	Integrating Author	Rohaida Abed is an Environmental Assessment Practitioner in the EMS group of the CSIR, based in Durban. She holds a MSc Degree in Environmental Science from the University of KwaZulu-Natal. She has eight years of experience in the Environmental Management field, and has been involved in various transport infrastructure related projects as an Environmental Control Officer. She has also been involved in Basic Assessments (BAs) and EIAs relating to Port infrastructure, Bulk Liquid Storage facilities and Renewable Energy in the capacity of Project Manager. She is a registered Professional Natural Scientist (400247/14) with the SACNASP.
Fahiema Daniels, SANBI	Contributing Author	Fahiema Daniels is a Deputy Director of the Biodiversity Planning Directorate at SANBI. She obtained a BSc (Ecology and Environmental & Geographical Science); BSc Honours (Botany: Plant Ecology); and MSc (Conservation Biology) from the University of Cape Town. Fahiema Daniels plays a key role in supporting biodiversity planning in South Africa by leading spatial analyses for National-scale projects, such as the Electricity Grid Infrastructure SEA, Shale Gas SEA and REDZ SEA. Additional projects include listing of threatened ecosystems; supporting the spatial prioritization for identifying Biodiversity Economy Nodes in South Africa, and developing the spatial layers that feed into the Department of Environmental Affairs Natural Resource Management Land User Incentive tool.
Tsamaelo Malebu, SANBI	Contributing Author	Tsamaelo Malebu is a GIS Specialist in the Biodiversity Information and Planning Directorate of SANBI. He holds a BSc Degree (Environmental Science) and BSc Honours in Ecology, Environment and Conservation from the University of the Witwatersrand. He has supported the 2016 EGI SEA, the development of the South African Mining and Biodiversity Guideline, provided technical support to the GEF funded Grasslands Programme and the identification of Marine Protected Areas as part of the Operation Phakisa Oceans Economy lab.
Johann Lanz; Independent Consultant	Contributing Author	Johann Lanz is registered as a Professional Natural Scientist in the field of Soil Science with SACNASP (Registration Number 400268/12). He holds a BA (English, Environmental & Geographical Science) from the University of Cape Town, a B.Sc. Agriculture (Soil Science, Chemistry) from the University of Stellenbosch, and a M.Sc. (Environmental Geochemistry) from

Specialist and Affiliation	Project Role	Biosketch
		the University of Cape Town. He provides soil specialist study inputs to EIAs, SEAs and EMPRs. These focus on impact assessments and rehabilitation on agricultural land, rehabilitation and re-vegetation of mining and industrially disturbed and contaminated soils, as well as more general aspects of soil resource management. He was also a specialist author on the Agricultural Assessment of the 2016 EGI SEA. He also undertakes soil resource evaluations and mapping for agricultural land use planning and management, and has conducted several recent research projects focused on conservation farming, soil health and carbon sequestration.

1 3.2.4 Terms of Reference and Methodology

2 The Terms of Reference of each Specialist Assessment are detailed in
3 each chapter, however the overall general study requirements are noted
4 below:

- 5
- 6 • Undertake a review of existing literature (including the latest
7 research undertaken both locally and internationally); maps and
8 aerial photographs; and relevant data (if available) to compile a
9 baseline description applicable to each corridor; including a list of
10 species or features that are sensitive to EGI that have been observed
11 and/or are likely to occur in each corridor;
 - 12 • Identification of any additional features of interest or any gaps in
13 information within the corridors not identified in the existing
14 sensitivity analysis, making use of datasets made available through
15 the draft environmental constraints map and additional information
16 sourced by the specialist;
 - 17 • Review and update, where required, the environmental sensitivity for
18 the proposed EGI corridors provided by the CSIR and SANBI and
19 develop/verify the approach for classing each sensitivity feature
20 according to a four-tiered sensitivity rating system i.e. Very High,
21 High, Medium or Low;
 - 22 • Assess the proposed corridors in terms of the potential impacts
23 associated with the construction and operation of EGI on the various
24 environmental features, ecosystems and habitats, and outline
25 proposed management actions to enhance benefits and
26 avoid/reduce/offset negative impacts; and
 - 27 • Provide input to the pre-construction site specific environmental
28 assessment protocol (e.g. additional information and level of
29 assessment is required in each sensitivity category before an
30 authorisation should be considered), Standards and Environmental
31 Management Programme (EMPr).

32
33 The Specialists were requested to adopt the same methodologies and
34 structures used in the 2016 EGI SEA, as the Eastern and Western EGI
35 Corridors are an expansion of the gazetted EGI Corridors as assessed in
36 2016.

37
38

39 3.3 Way Forward

40
41 Stakeholders are encouraged to submit review comments using the
42 Template Spreadsheet provided on the project website
43 (<https://gasnetwork.csir.co.za/>), which requires a specification of the
44 specific page number and line number of the section that needs to be
45 queried or raised for feedback.
46
47 Following this 30 days public review period, the specialist assessments
48 will be updated where relevant and where required, and the proposed
49 energy corridors will be finalised based on inputs from stakeholders.