



# Strategic Environmental Assessment for Shale Gas Development in South Africa

*Iziko Museum  
Cape Town  
13 November*

# Workshop programme

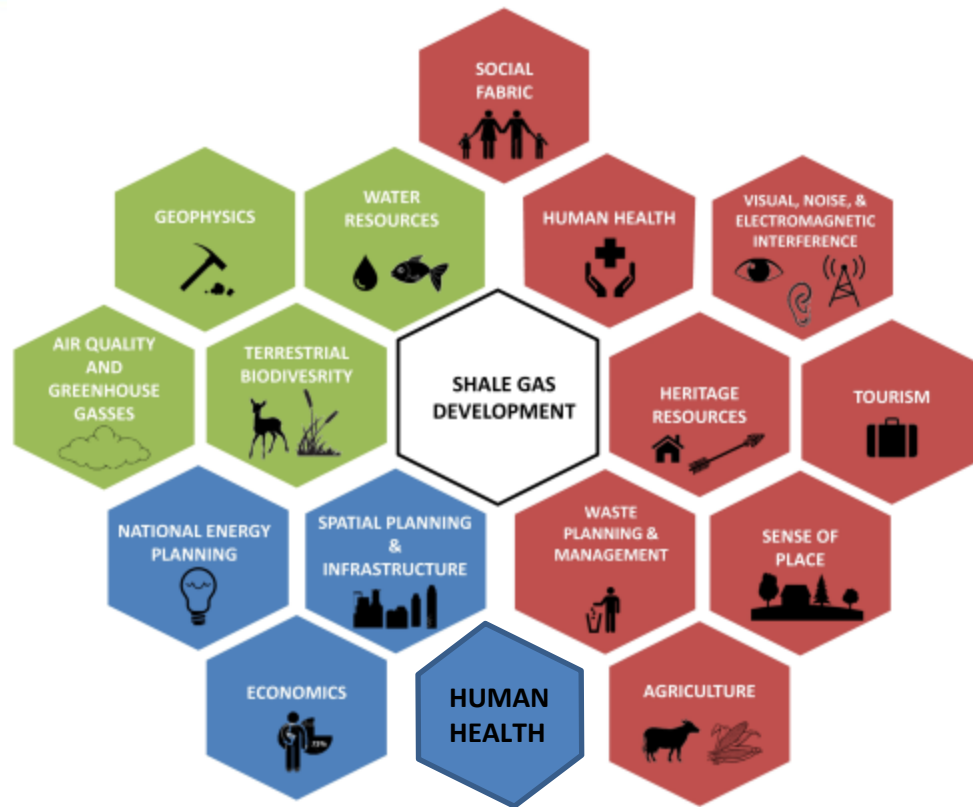
Theme	Time	Discussions
<b>Introduction</b>	10:30-11:00	Introductions and meeting expectations
<b><i>Theme 1: SEA Process</i></b>	11:00-11:45	SEA Process
	11:45-12:30	Questions on SEA Process
<b>Exhibition and break</b>	12:30-13:00	Fracking art exhibition (hosted by Deborah Weber)
	13:00-13:30	Lunch break
<b><i>Theme 2: Scope of Work</i></b>	13:30-13:45	Zero Order Draft (ZOD)
	13:45-14:30	Questions on ZOD (Scope of the Assessment)
<b><i>Theme 3: Scenarios and Activities</i></b>	14:30-14:45	Scenarios and Activities
	14:45-15:20	Questions on the Scenarios and Activities
<b>Closure</b>	15:20-15:30	Closure and additional points of engagement

# Process: Guiding principles

What SEA is not:

- ***An EIA***
  - ***A research project***
  - ***A decision-making body***
  - ***A public relations exercise***
- 
- Adopt the ‘three hallmarks of successful assessment’:
    - **Saliency**
    - **Legitimacy**
    - **Credibility**

# Scope of Strategic Issues



1. Surface and ground water resources
2. Air pollution and GHGs
3. Biodiversity
4. Spatial planning and infrastructure
5. Sense of place
6. Agriculture
7. Social fabric
8. Noise, Visual , Electromagnetic disturbance
9. Energy planning
10. Economic effects
11. Heritage resources
12. Waste
13. Geophysics and seismicity
14. Tourism
15. Human health



# Strategic Environmental Assessment for Shale Gas Development



environmental affairs  
Department  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA



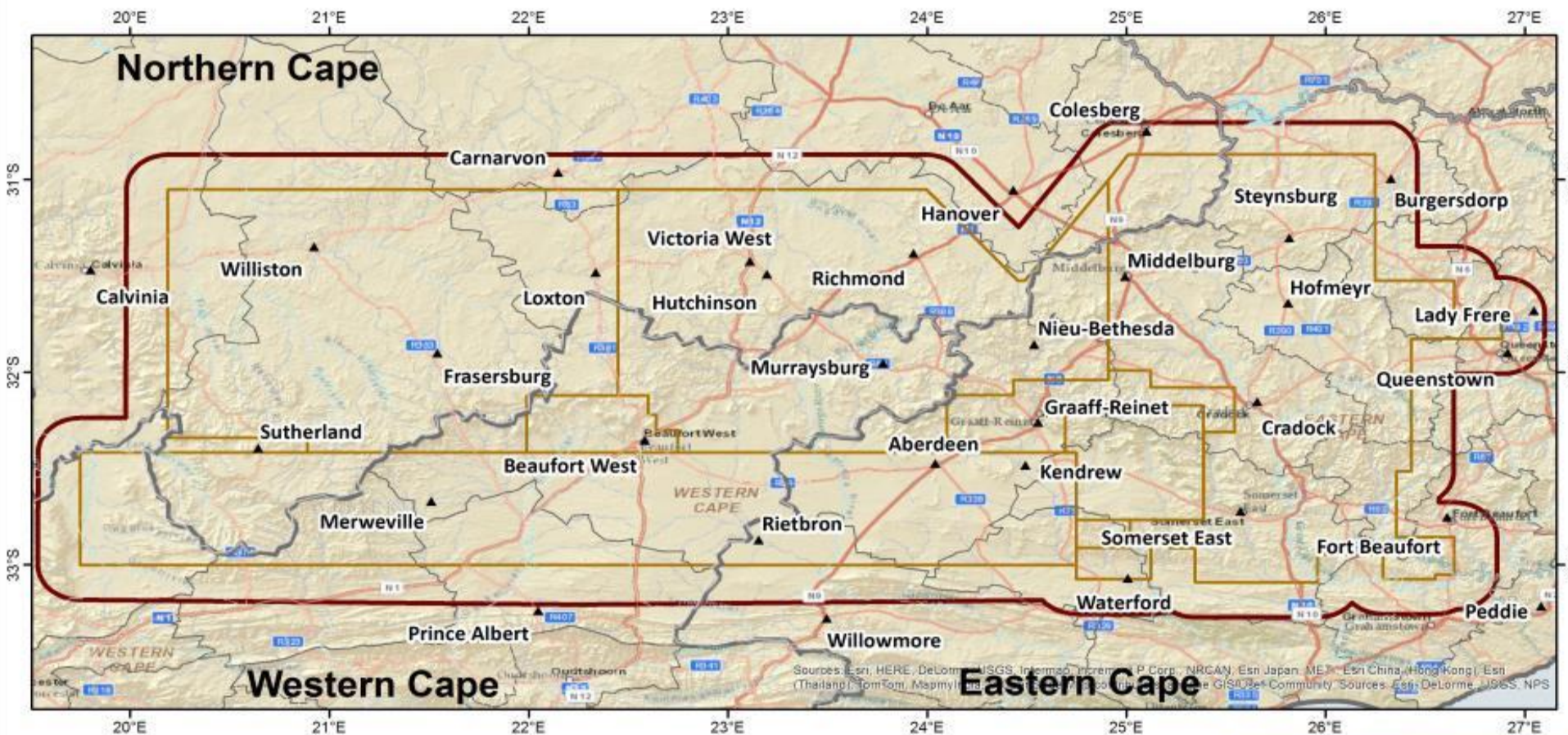
our future through science

SANBI

Biodiversity for Life  
South African National Biodiversity Institute



Council for Geoscience



0 45 90 180 Kilometers

1:2 509 510

## Legend

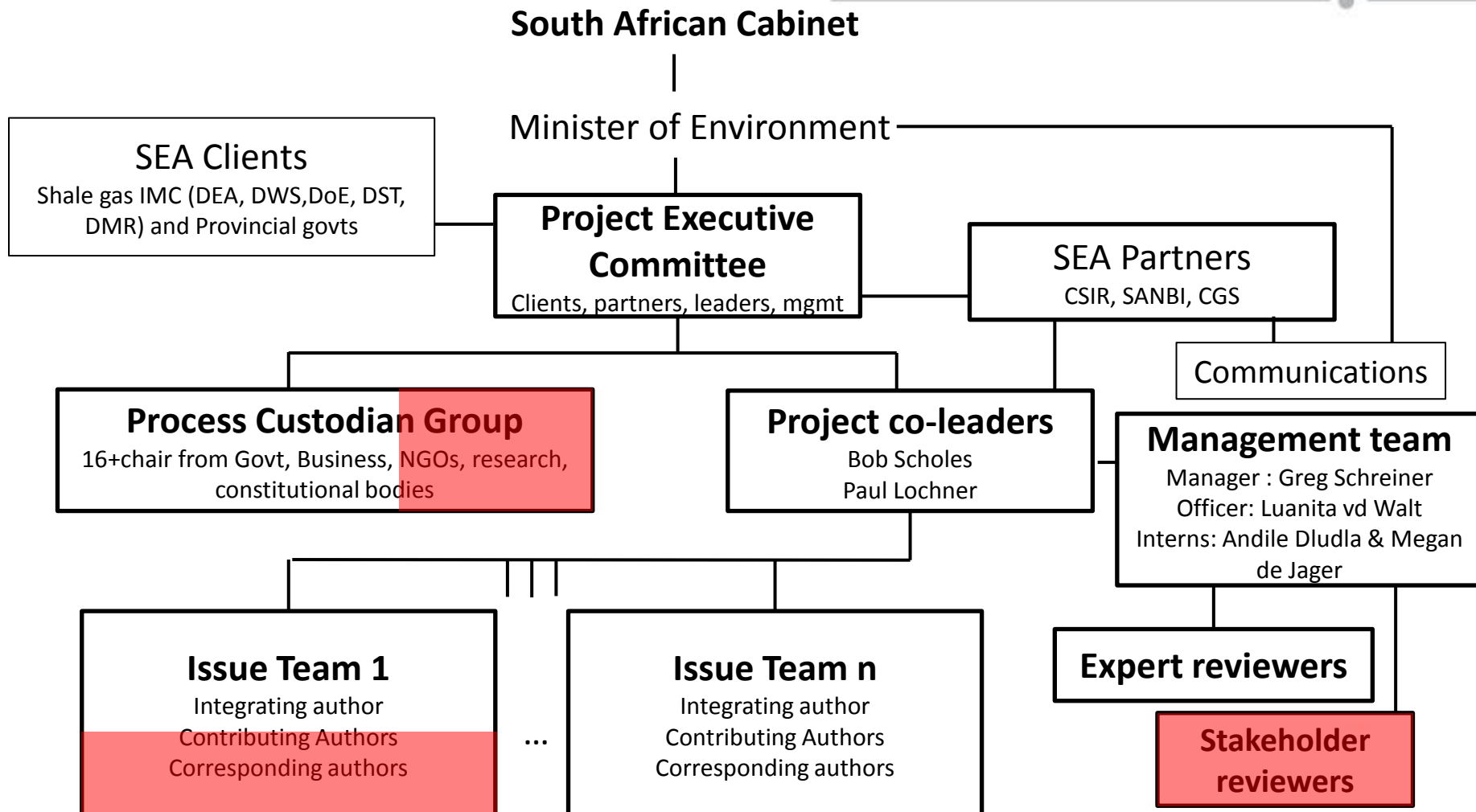
- SEA study area
- Exploration Rights application areas

- Towns
- South African Local Municipalities
- South African Provinces

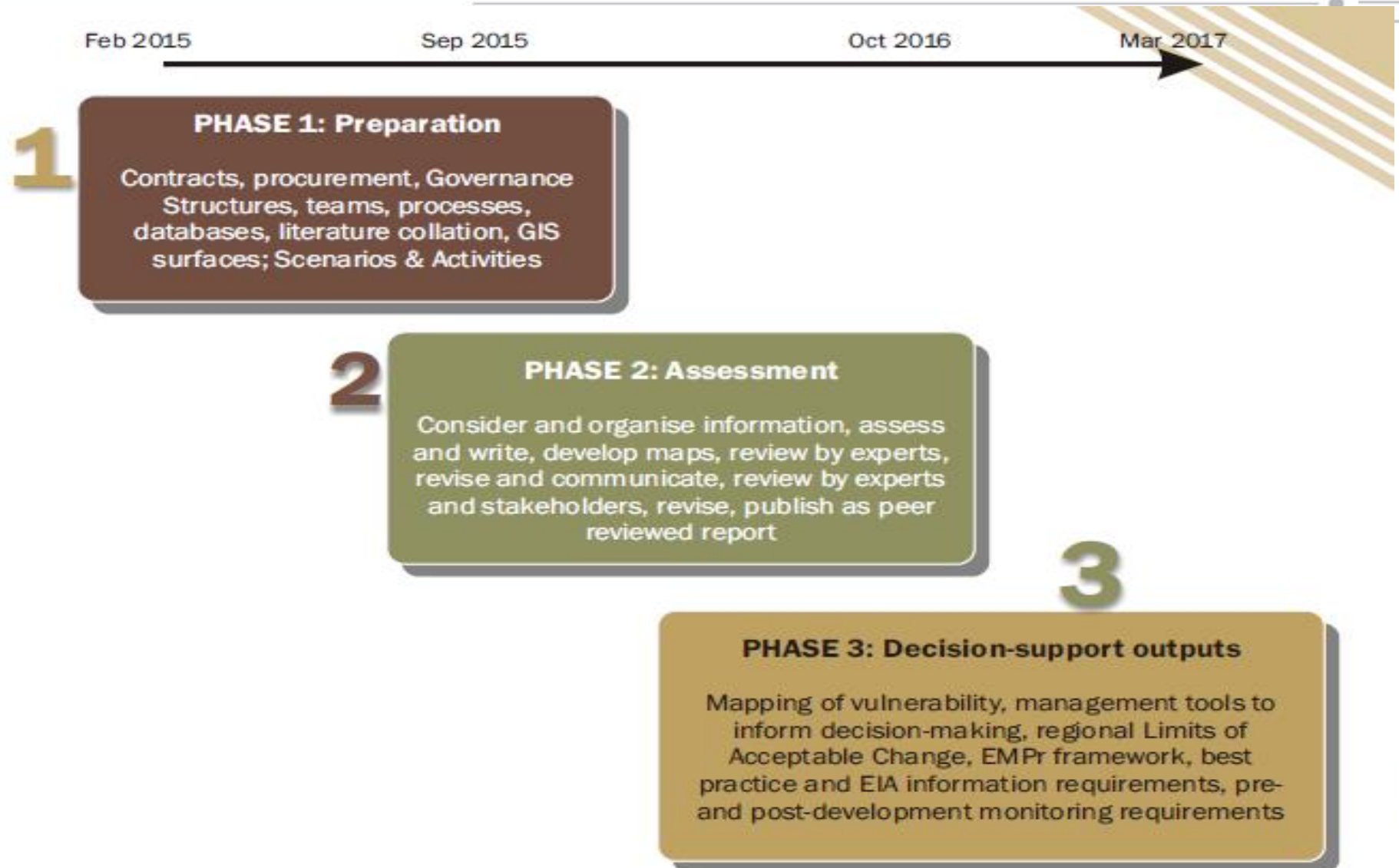
Coordinate System: GCS WGS 1984  
Datum: WGS 1984  
Units: Degree



# Project Governance

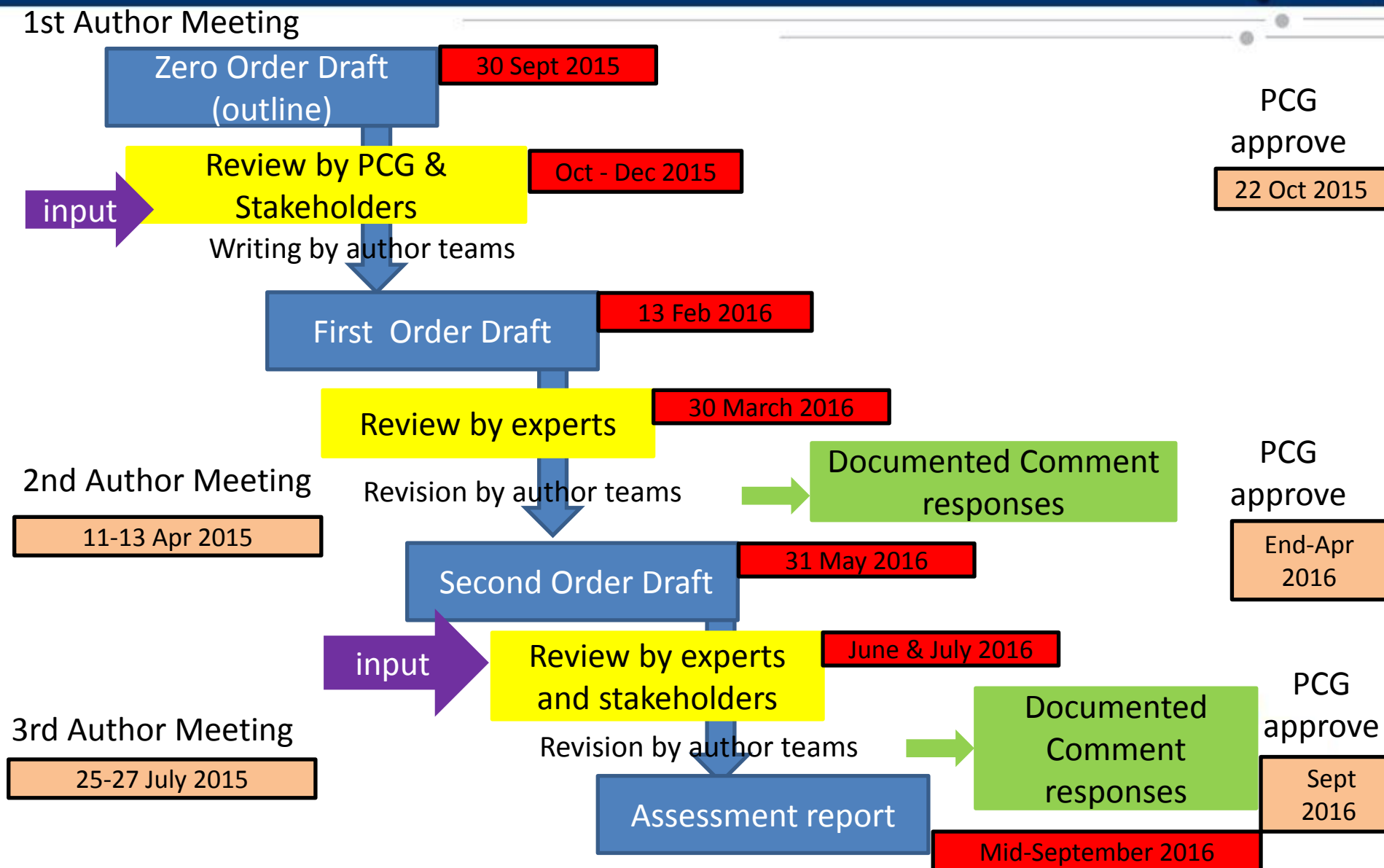


# The 'Full' SEA Process





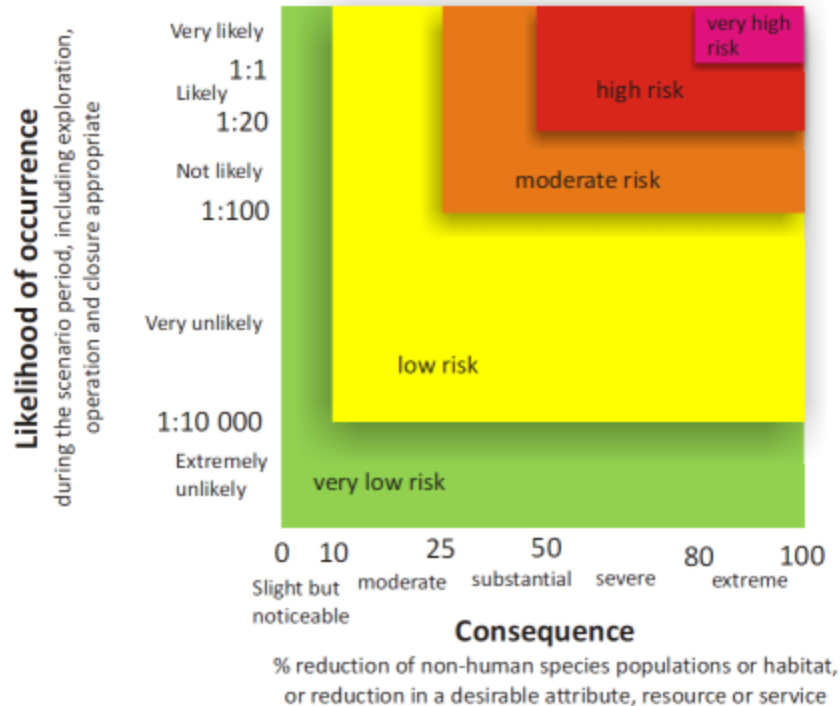
# The 'Assessment' process in detail



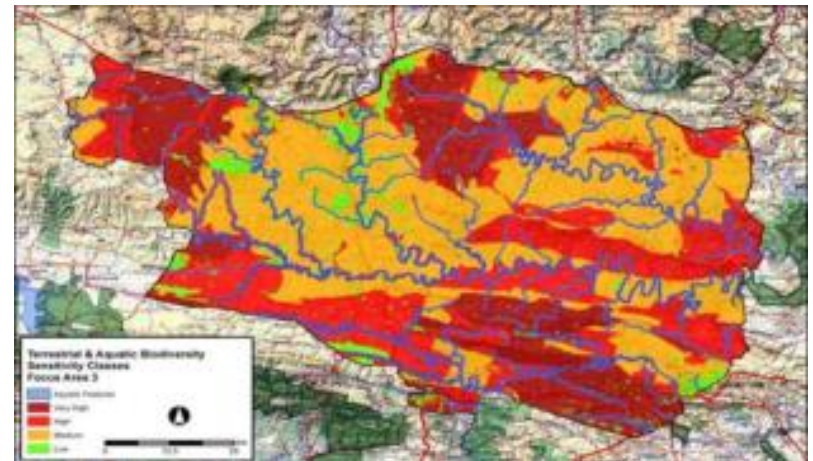


# Risk Assessment for each aspect

## Consequence/likelihood matrix



Risks will be spatially represented  
across development scenarios



# Risk Assessment for each aspect

1. Define the nature of the impact
2. Map substantially different receiving environments
3. Define and list mitigation technologies, rules, institutions
4. Define consequence levels
  - a) What proxy indicators can you use?
  - b) What established norms/standards exist
  - c) Link to levels of acceptable change.
5. For each impact type
  - a) For each scenario
    - 1.) For each unique area
      1. Estimate likelihood over entire scenario, for each unique zone
      2. Collective expert judgement on the consequence level
      3. From 1 and 2 the risk level emerges: test it against your instincts and experience
    - 2.) Repeat 5.1.1 with mitigation as specified in 3
6. Project team will use the tabulated outputs of (5), with the map in (2) to create a risk surface for each impact type
7. Project team will create a composite risk map using the maximum rule applied to the with mitigation surfaces, and another risk map without mitigation.

- Questions on the SEA process?

# Fracking art exhibition by Deborah Weber



Photographer: Margaret Stone, Performer: Deborah Weber, Costume and Stylist: Gina Waldman, Jewelry Design: Michelle Liao, Installation: Elgin Rust. Image Courtesy of the Karoo Disclosure Collective.

## Contents

Summary for Policymakers.....	2
Preface.....	2
Scenarios and Activities of Shale Gas Development in the Karoo.....	3
Effects on National Energy Planning and Energy Security.....	5
Air Quality and the Emission of Greenhouse Gases.....	7
Tremors and Earthquakes.....	10
Water Resources, both on the Surface and Underground.....	13
Impacts on Human Health.....	17
Biodiversity & Ecological Impacts: Landscape Processes, Ecosystems and Species.....	20
Impacts on National and Local Economic Performance.....	23
Electromagnetic Interference with Radioastronomy.....	27
Noise Generated by Shale Gas-related Activities.....	29
Impact on Sense of Place Values.....	31
Impacts on Waste Planning and Management.....	34
Impacts on Land, Infrastructure and Settlement Development.....	37
Impacts on Agriculture.....	40
Impact on Cultural Heritage.....	44
Impacts on Tourism in the Karoo.....	47
Impact on Visual Aesthetics.....	50
Impact on Social Fabric.....	53



# Zero Order Draft – Within-chapter structure

## **Topic n...**

### **1.) Executive Summary**

### **2.) Introduction and Scope**

- 2.1) What is meant by this topic?*
- 2.2) Overview of International Experience*
- 2.3) Special Features of the Karoo Environment*
- 2.4) Relevant Legislation, Regulation and Practice*

### **3.) Key potential Impacts and their Mitigation**

### **4.) Risk Assessment**

- 4.1) How the Risks (and Opportunities where appropriate) are measured*
- 4.2) Limits of Acceptable Change*
- 4.3) Risk Assessment*

### **5.) Best Practice Guidelines and Monitoring Requirements**

- 5.1) Planning*
- 5.2) Construction*
- 5.3) Operations*
- 5.4) De-Commissioning*
- 5.5) Monitoring and Evaluation*

### **6.) Topic on which information is inadequate for decision-making**

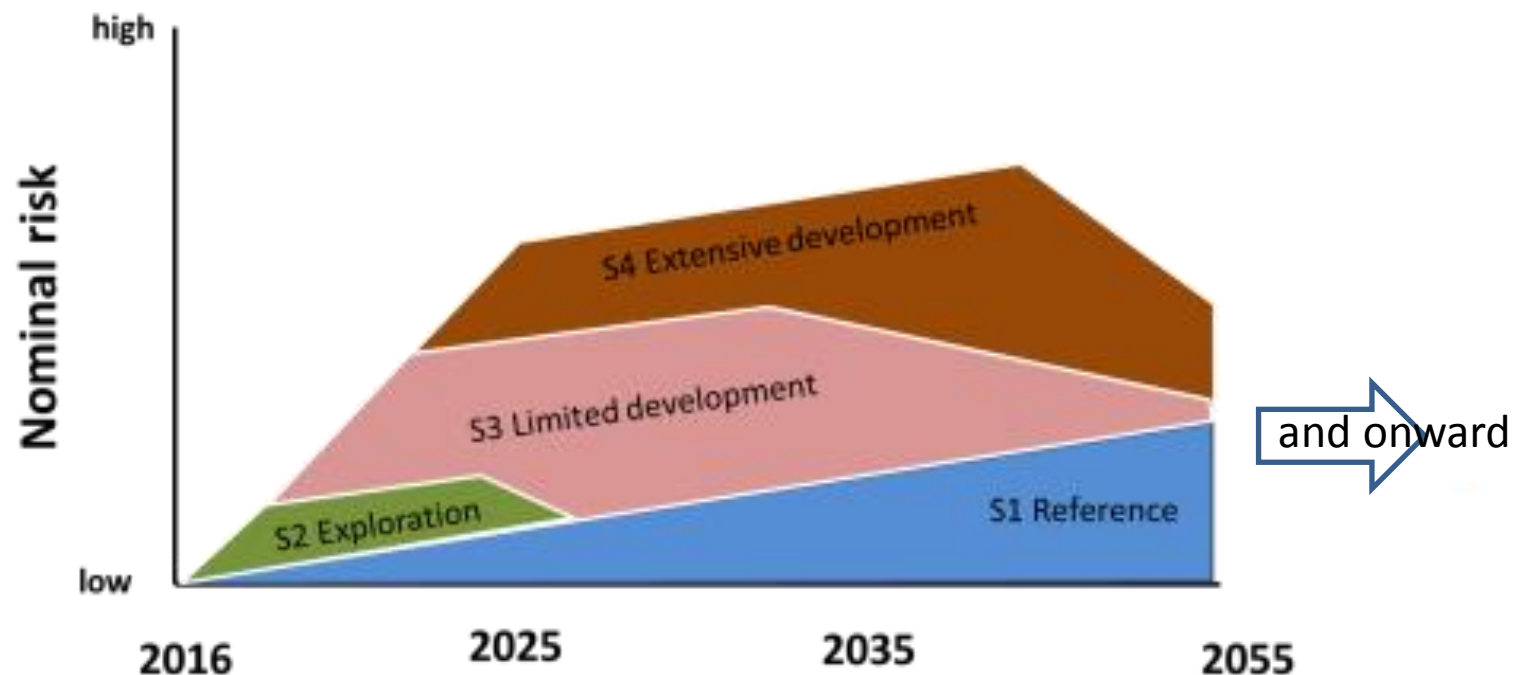
### **7.) References**

- Questions on the Scope of the ZOD?

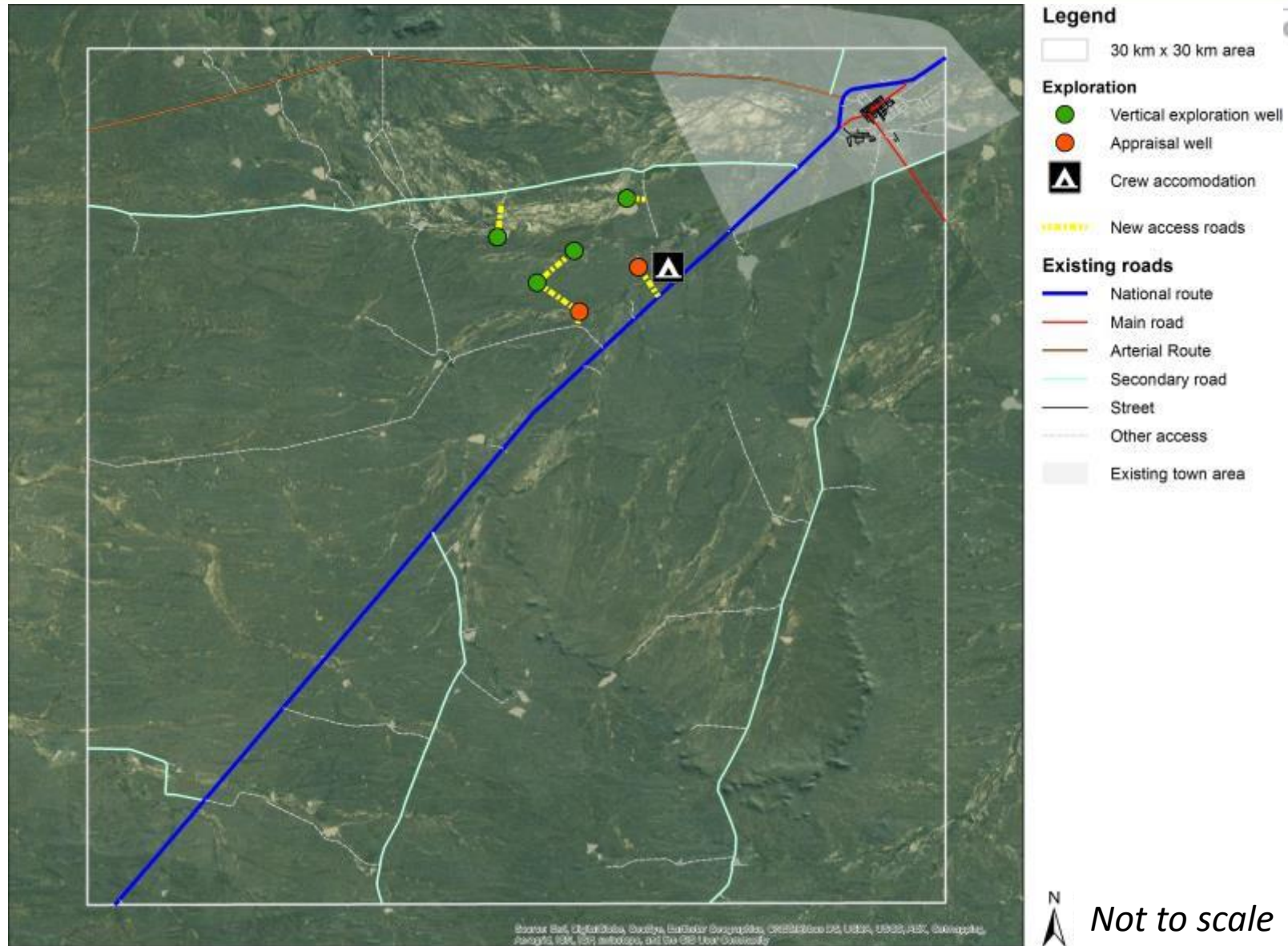
# Scenarios & Activities

- Scenarios

1. No shale gas exploration (counterfactual baseline)
2. Exploration only, then operations terminate
3. Limited production of 5 Tcf, CCGT grid feed
4. Extensive production of 20 Tcf , CCGT grid feed and GTL

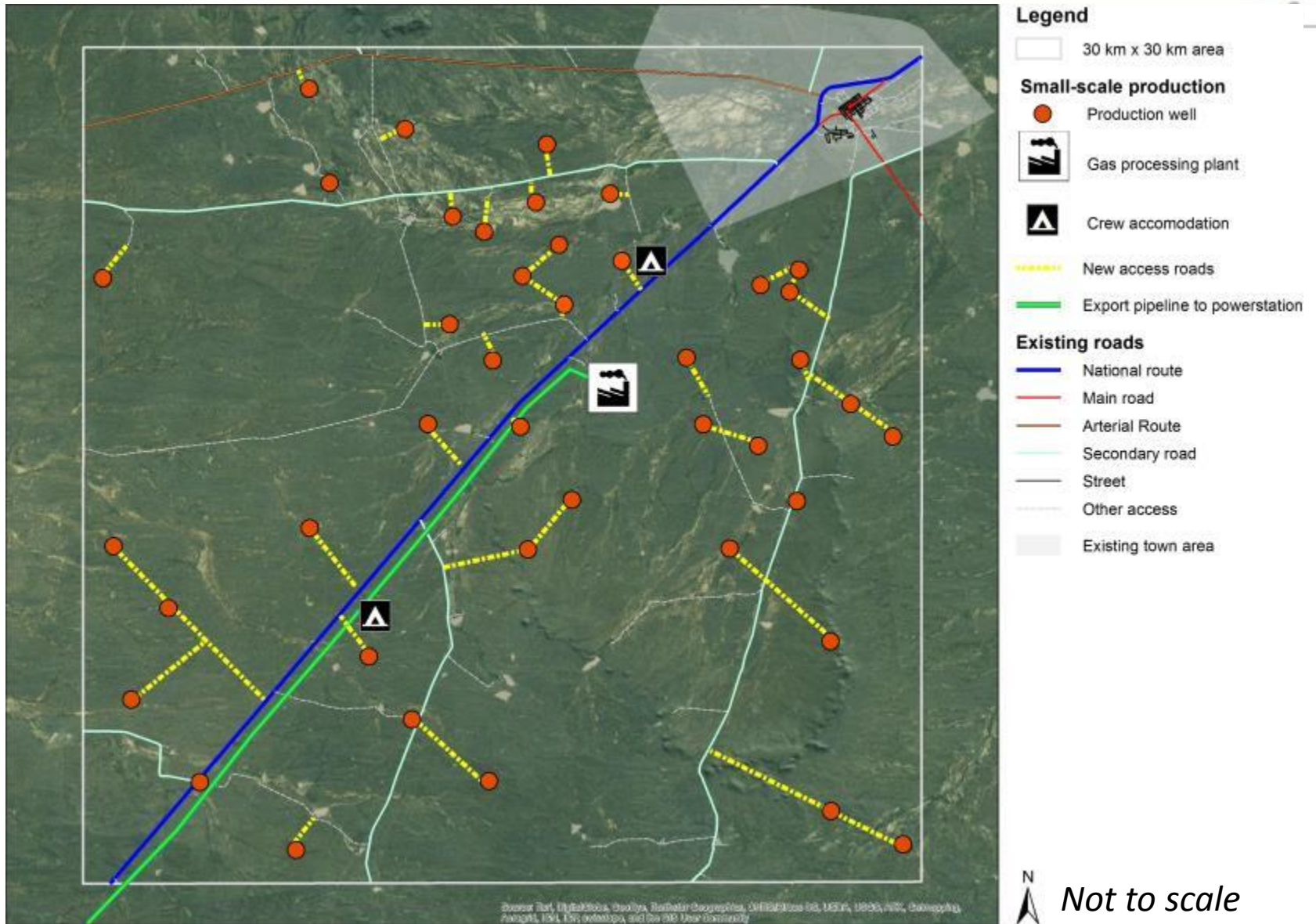


# Exploration only scenario





# Small-scale development (5 Tcf) scenario







- Questions on the Scope of the S&A?

# Public Outreach Programme: Rounds 1 & 2

## Outreach plan for the SEA over Rounds 1 & 2

### Round 1: SEA process and scope of work, 09 - 13 Nov 2015

- Release ZODs for comment on website and to registered stakeholders
- 3 x briefing meetings in EC, NC & WC (public meetings open to all, advertised accordingly)
- 1 x workshop meeting in Cape Town with registered stakeholders, stakeholders requested to send delegates
- Close comments on ZODs, comments to be considered but not responded to individually.

### Round 2: Draft Assessment findings, ~May 2016

- Release draft assessment findings for comment on website
- 3 x briefing meetings in EC, NC & WC (public meetings open to all, advertised accordingly)
- 2 x workshop meetings in Cape Town and Pretoria (proposed) with registered stakeholders, stakeholders requested to send delegates
- Close comments on draft assessment, comments to be responded to individually (where provided appropriately).
- Publish final assessment on website for multiple users



## WHAT ENVIRONMENTAL, SOCIAL AND ECONOMIC ASPECTS WILL BE ASSESSED?

The SEA will assess the material social, economic and biological resources and opportunities of the industry. During the SEA these aspects will be referred to STRATEGIC ISSUES (Figure 2).

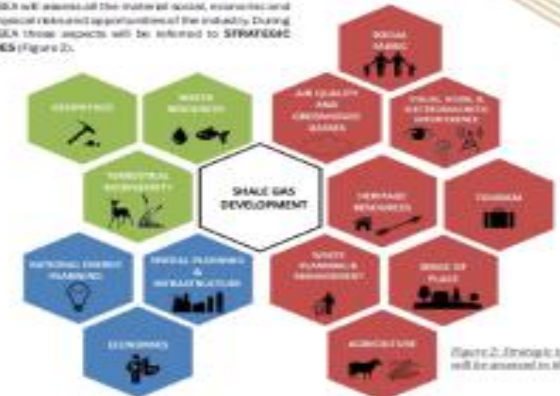


Figure 2: Strategic issues that will be assessed in the SEA.



environmental affairs

Department:  
Environmental Affairs  
REPUBLIC OF SOUTH AFRICA



water & sanitation

Department:  
Water and Sanitation  
REPUBLIC OF SOUTH AFRICA



science  
& technology

Department:  
Science and Technology  
REPUBLIC OF SOUTH AFRICA



mineral resources

Department:  
Mineral Resources  
REPUBLIC OF SOUTH AFRICA



energy

Department:  
Energy  
REPUBLIC OF SOUTH AFRICA

# END

## Thank you

# [www.seasgd.csir.co.za/](http://www.seasgd.csir.co.za/)



**SANBI**  
Biodiversity for Life



Council for Geoscience



# Process: Mission Statement

## **SEA mission:**

*To provide an integrated assessment and decision-making framework to enable South Africa to establish effective policy, legislation and sustainability conditions under which shale gas development could occur.*





# Project Governance Composition

## **Project Executive Committee 'Project management'**

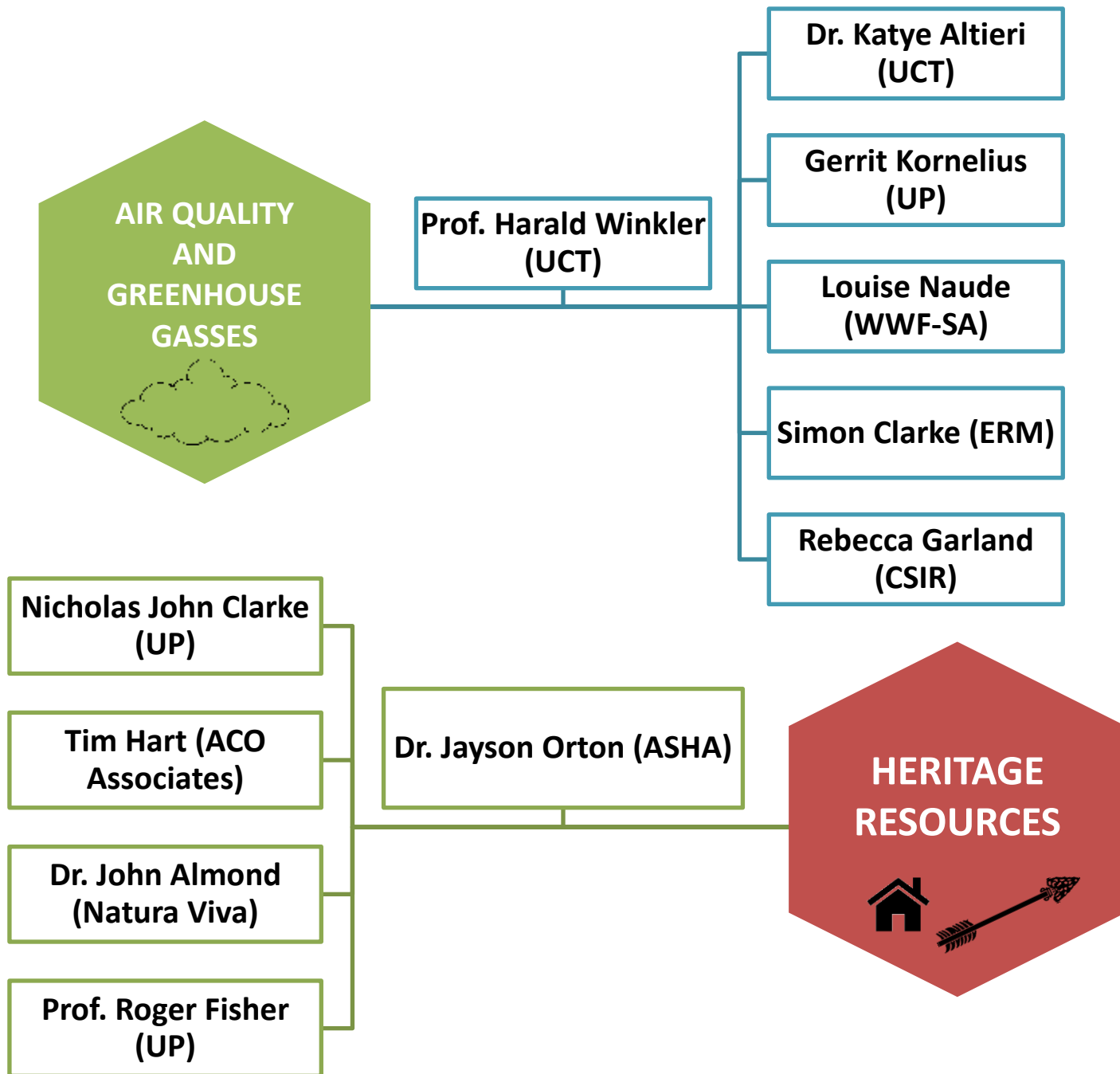
- Department of Environmental Affairs
- Department of Water and Sanitation
- Department of Mineral Resources
- Department of Energy
- Department of Science and Technology
- Department of Agriculture, Forestry and Fisheries
- Provincial Government Eastern Cape
- Provincial Government Western Cape
- Provincial Government Northern Cape
- The Project Team

## **Process Custodians Group 'Process oversight'**

- International Association of Impact Assessment (Chair)
- PetroSA
- Business Unity South Africa
- Onshore Petroleum Agency South Africa
- AgriSA
- Treasure the Karoo Action Group
- South African Faith Communities Environment Institute
- WWF - South Africa
- Nelson Mandela Metropolitan University
- Water research Commission
- Square Kilometre Array
- Human Sciences Research Council
- South African Human Rights Commission
- Department of Environmental Affairs
- Department of Performance Monitoring and Evaluation
- Department of Economic Development
- South African Local Government Agency

**Project Team**

**Specialists / Experts  
+  
Stakeholders**





**Dr. Leanne Seeliger  
(US)**

**Dr. David Morris  
(McGregor Museum)**

**Prof. Mike de Jongh  
(UP)**

**Saliem Fakir (WWF-  
SA)**

**Barry Standish (UCT)**

**Prof. Tony Leiman  
(UCT)**

**Dr. Hugo v Zyl  
(Independent Economic  
Researchers)**

**ECONOMICS**





**Dr. Danie Toerien (UFS)**

**Caroline Gelderblom  
(Private)**

**Dr. Melville Saayman  
(NWU)**

**Prof. Gerrie Durand (UP)**

**Prof Michelle Hamer  
(SANBI)**

**Dr Kate Snaddon  
(Freshwater Consulting  
Group)**

**Domitilla Raimondo  
(SANBI)**

**Dr Simon Todd  
(SAEON)**

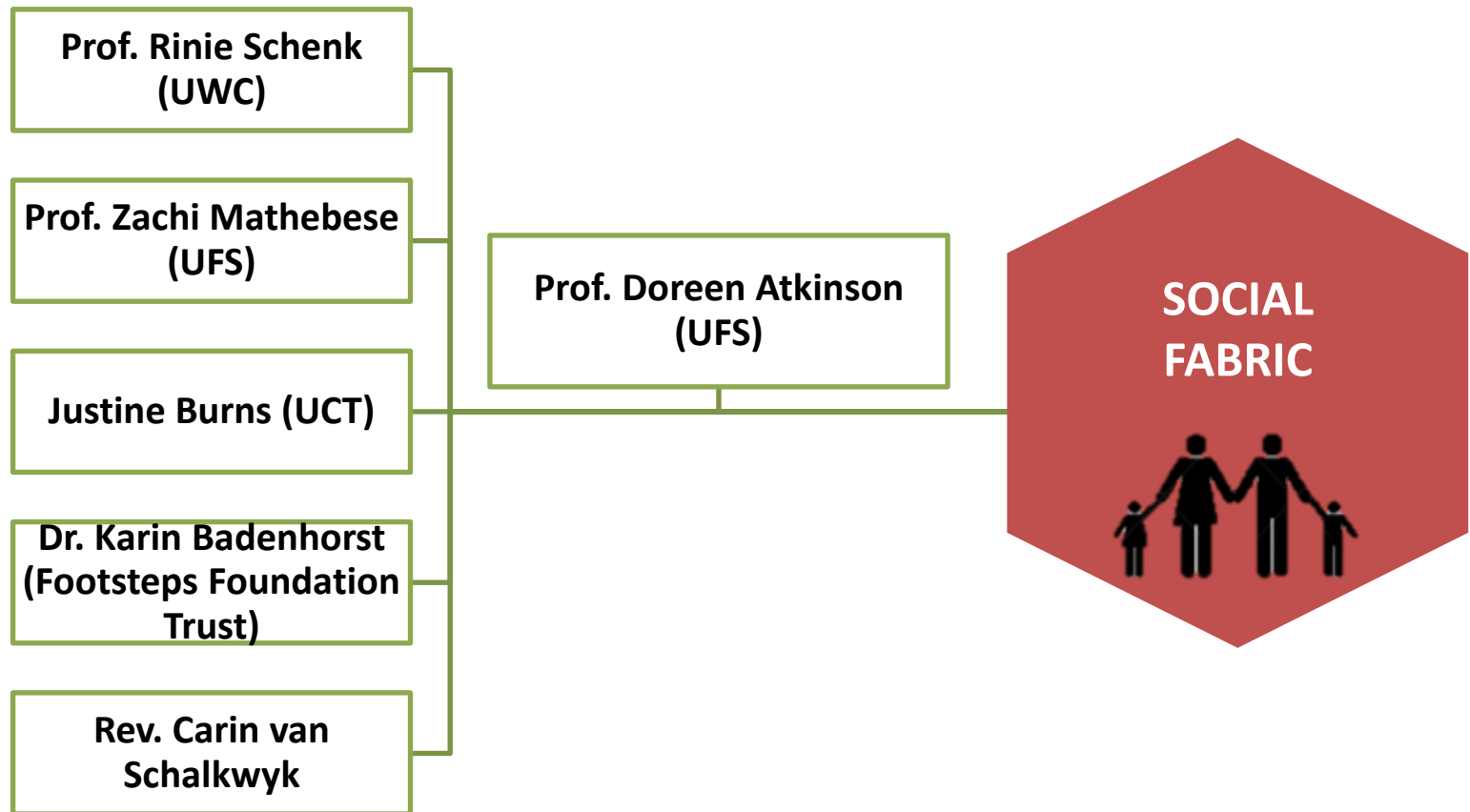
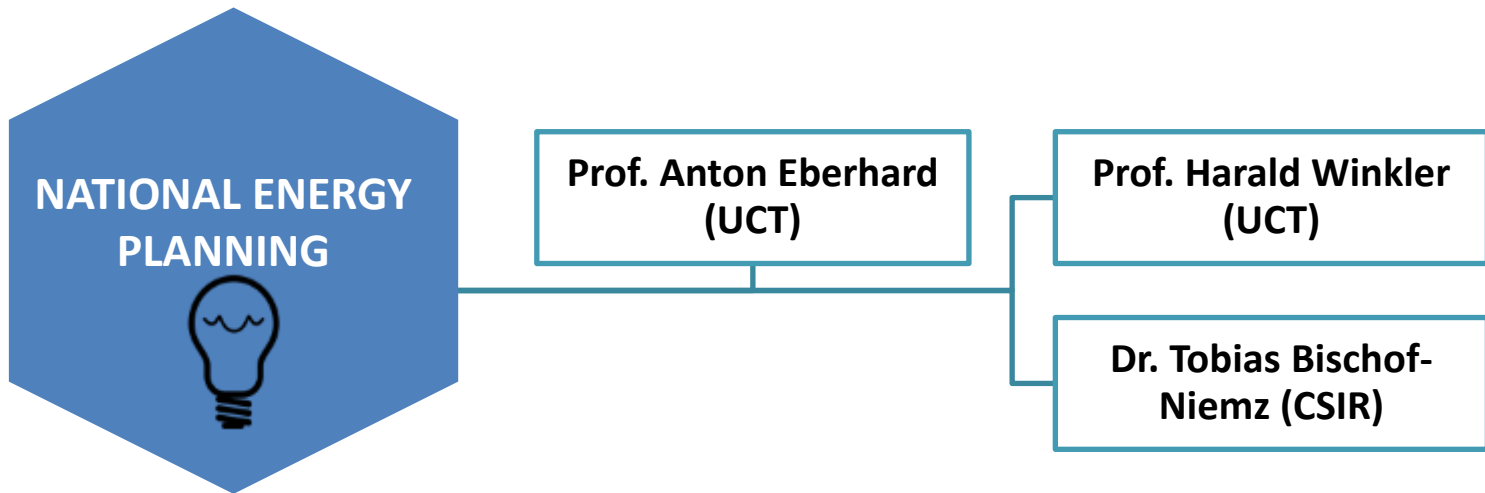
**Fahiema Daniels  
(SANBI)**

**Mandy Driver (SANBI)**

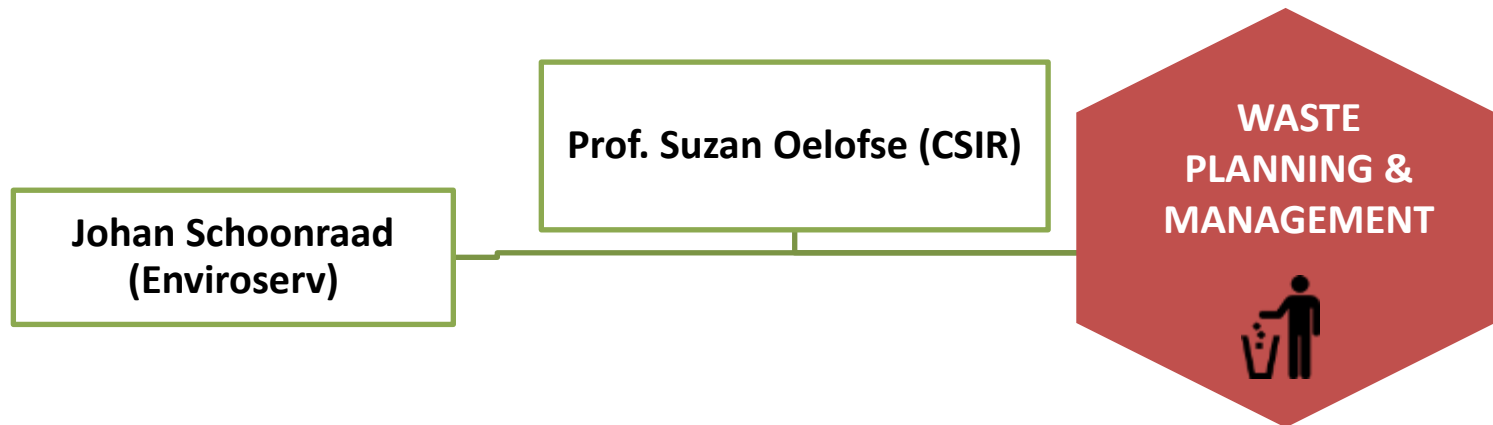
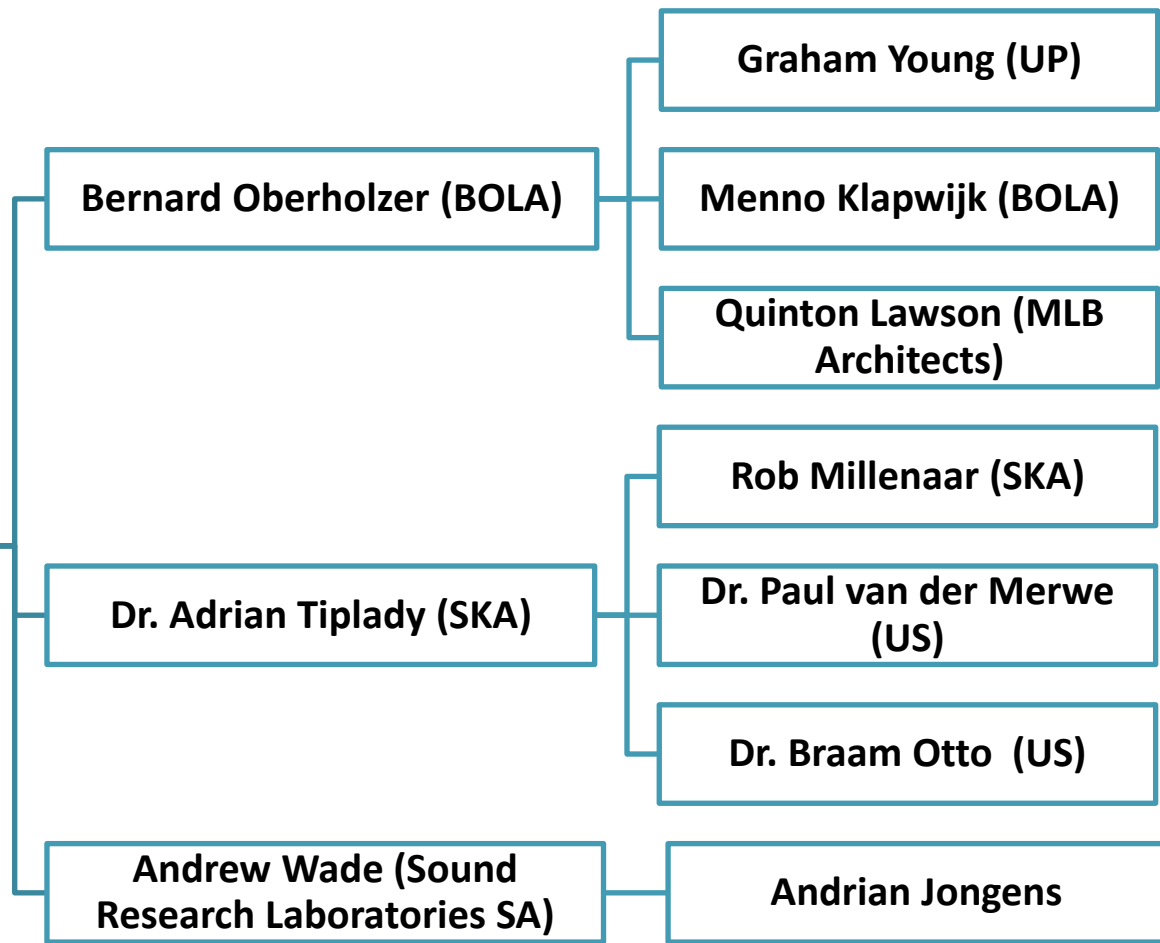
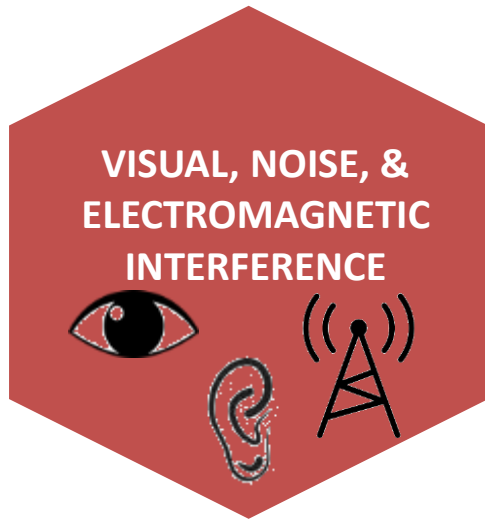
**Dr Stephen Hollness  
(NMMU)**

**BIODIVERSITY  
& ECOSYSTEMS**

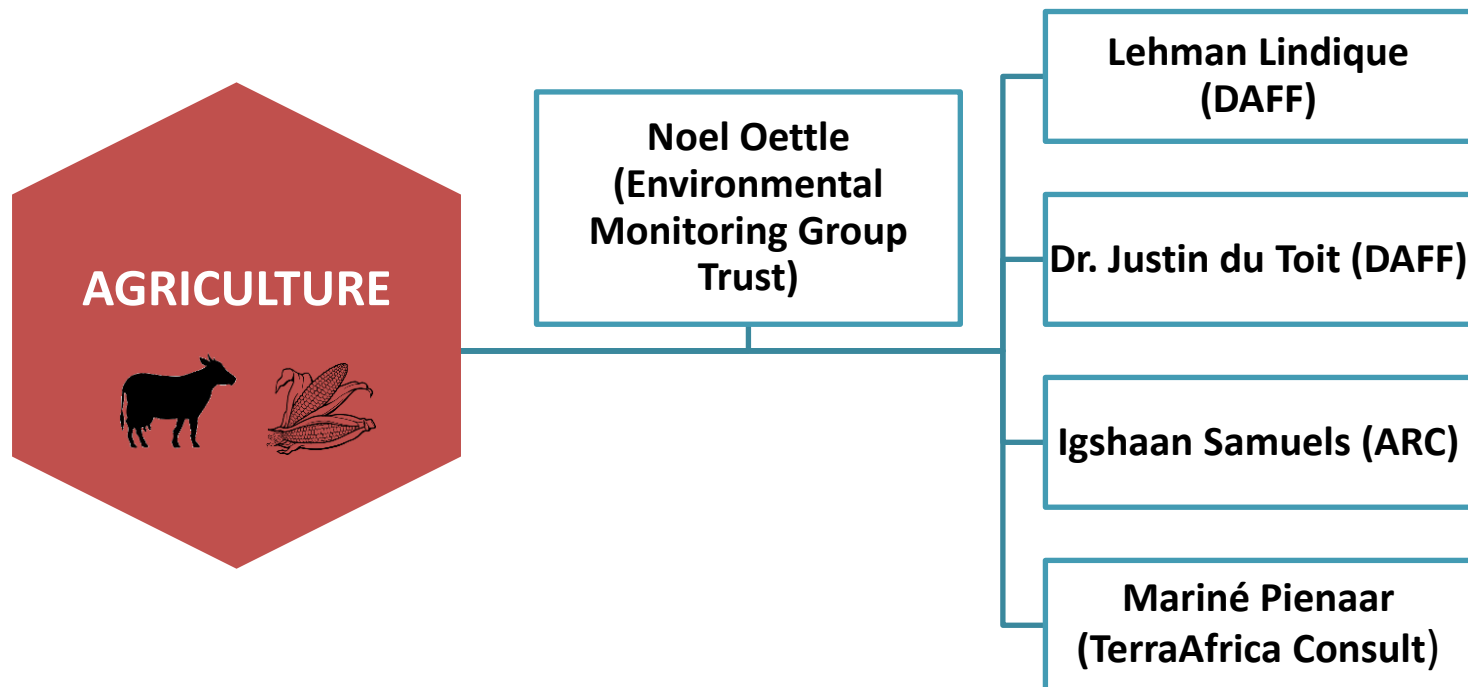












Environmental Impact Assessment	Strategic Environmental Assessment
The exact place and type of the proposed activity is known	The broad type of development is known, but not the details. The region where the activities (usually many) might take place is defined, but not the exact locations or way in which the activities will be done
The developer is the client	The government is the client
The focus is on a list of defined impacts, mostly negative and mostly close to the site of the development	Looks at the ‘big picture’: the cumulative direct and indirect impacts and benefits at regional or greater scale, over the full duration of the effects (including after the activity itself has ceased), for all issues potentially affected
The process is highly prescribed by laws and regulations. Usually done by a small group of consultants, with a public participation step	Recognised by law, but without a strict set of guidelines on how to do it. Best practice is multi-author teams and two rounds of expert and stakeholder review
The purpose is to identify specific impacts in order that they can be minimized through the actions of the developer, under the scrutiny of the environmental authorities. In some instances, the activity may be disallowed. Often it is permitted, subject to a list of requirements for monitoring and reducing environmental impacts and rehabilitation of the site after completion.	The purpose is to identify the collective potential outcomes of a set of related activities, in order to support strategic decision-making by the responsible authorities. The SEA aims to identify ways to maximize the benefits and minimize the negative impacts, determine if there are limits which should not be exceeded, assess the risks, identify areas where the activity may and may not take place and under what conditions, define the standards to be applied and issues to be addressed by EIAs undertaken for the individual activities.