

OVERVIEW OF COAL RESOURCES IN SOUTH AFRICA



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South Africa's coalfields – A 2014 perspective - 5 YEARS ON

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5TH SEPTEMBER 2019

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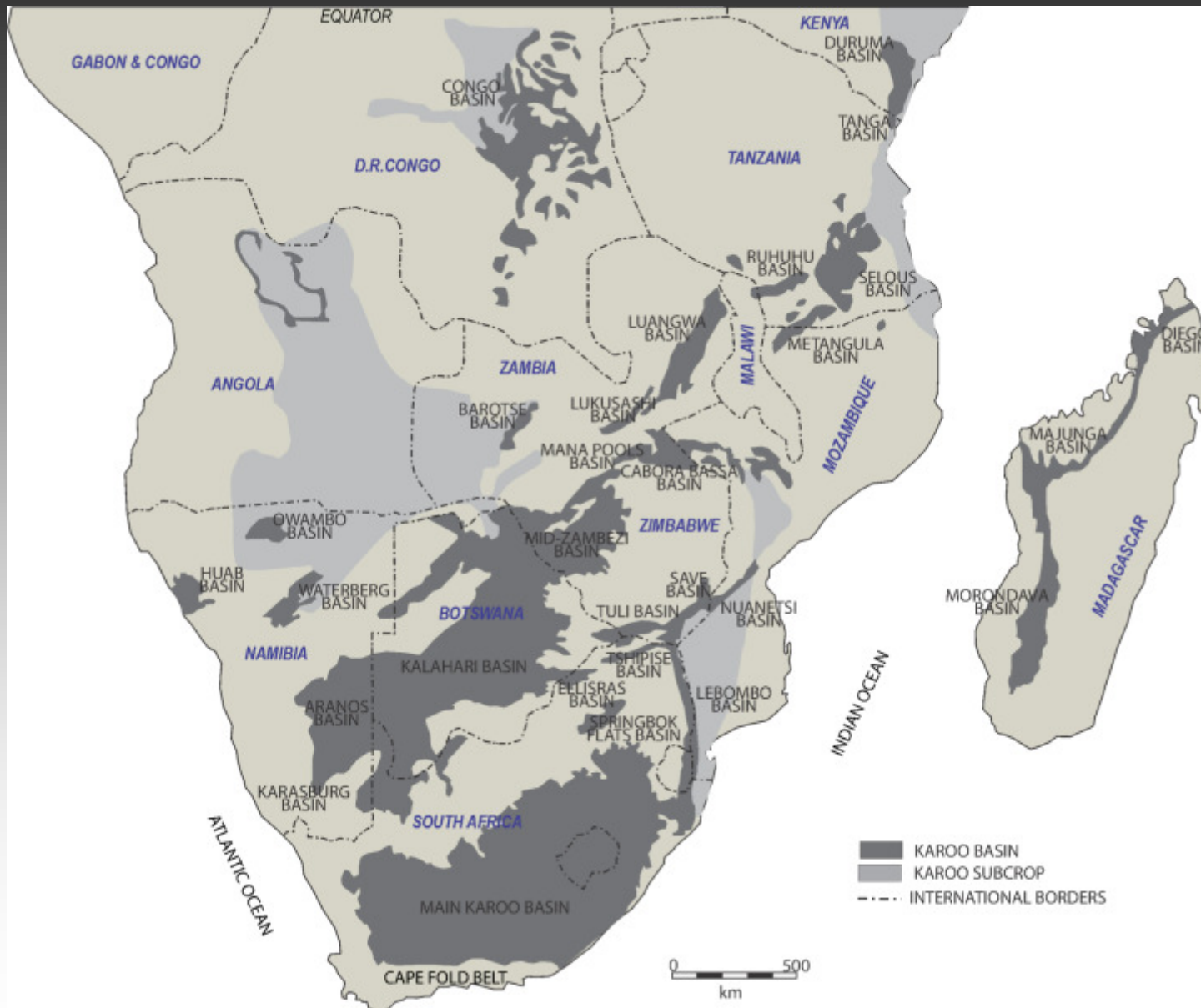
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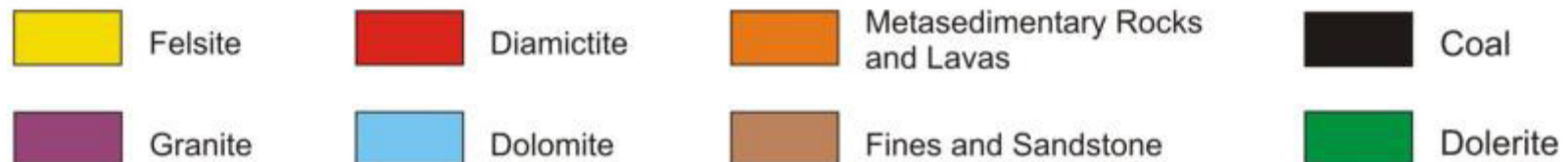
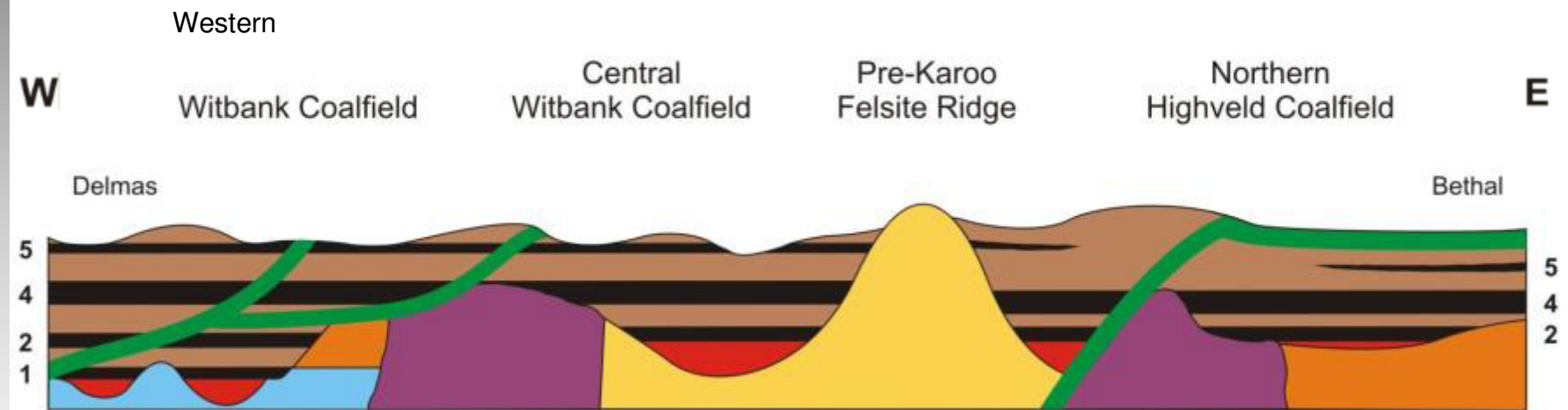
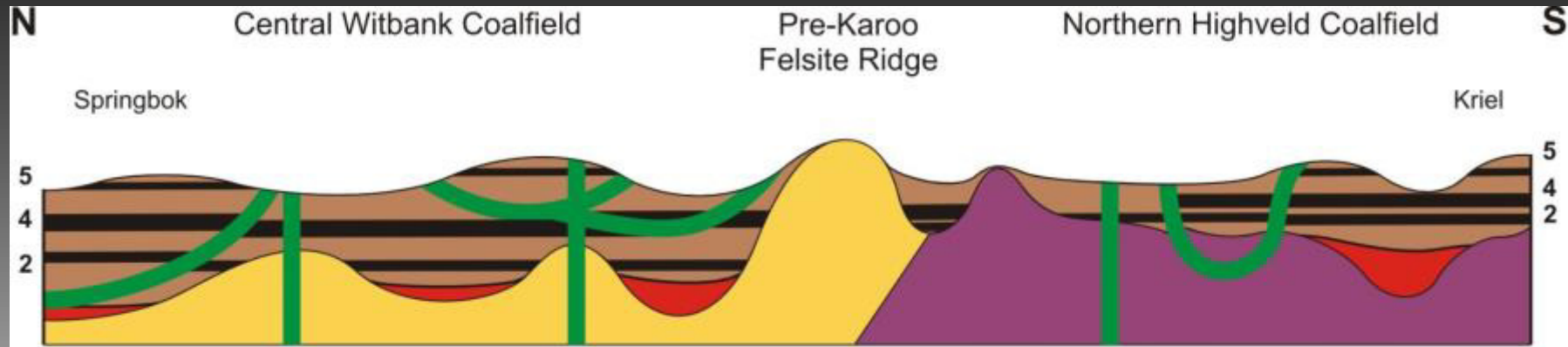
TALK LAYOUT

- KAROO STRATIGRAPHY
- COAL RESOURCES VS RESERVES
- COALFIELDS OF SOUTH AFRICA
 - CENTRAL BASIN (THERMAL AND EXPORT)
 - WATERBERG (SOFT COKING AND THERMAL)
 - NORTHERN FIELDS (HARD COKING AND THERMAL)
 - KWAZULU-NATAL (ANTHRACITE)
 - MOLTENO COALFIELD
- MUSINGS

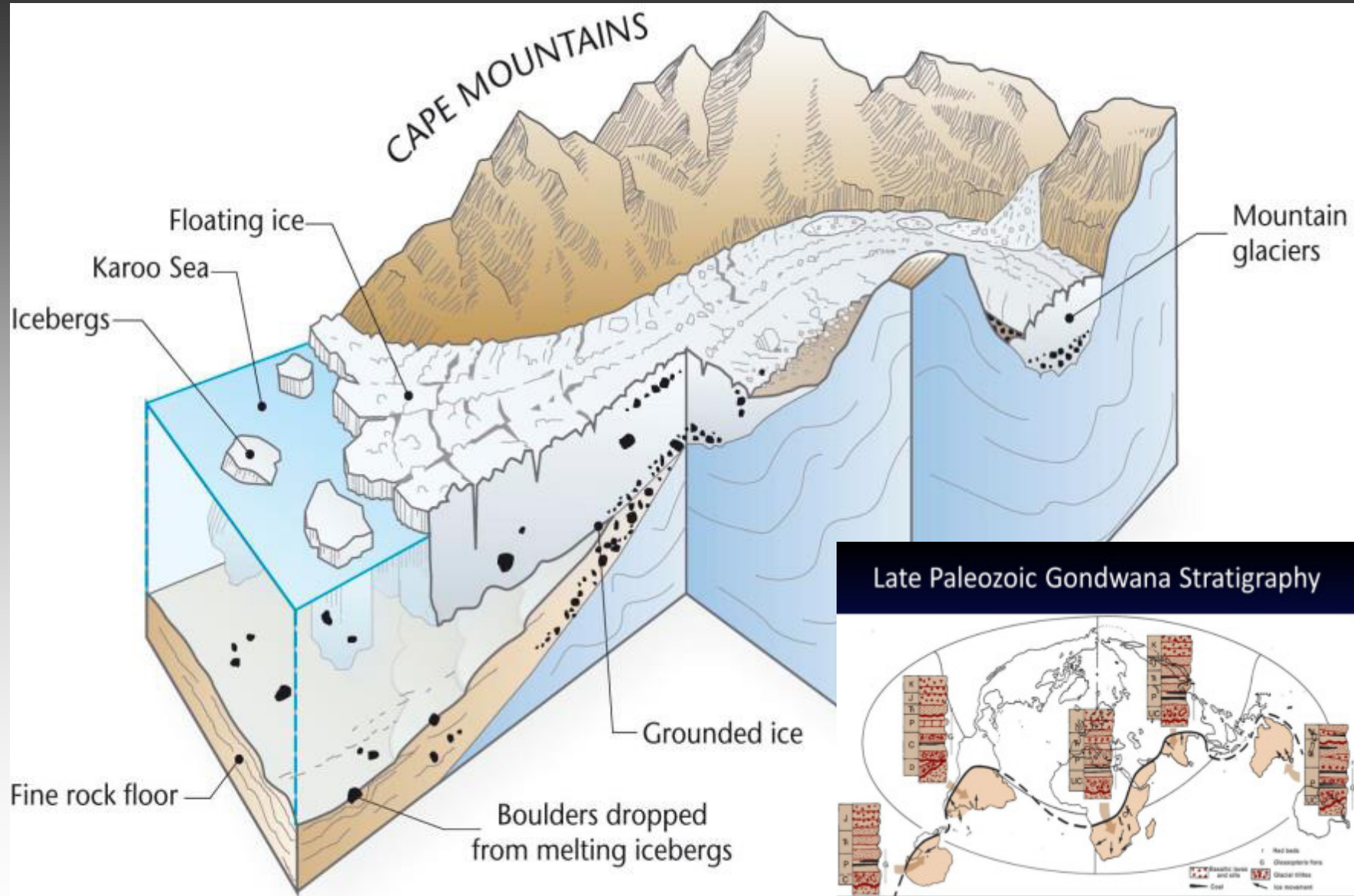
KAROO BASIN STRATIGRAPHY



BASEMENT CONTROL

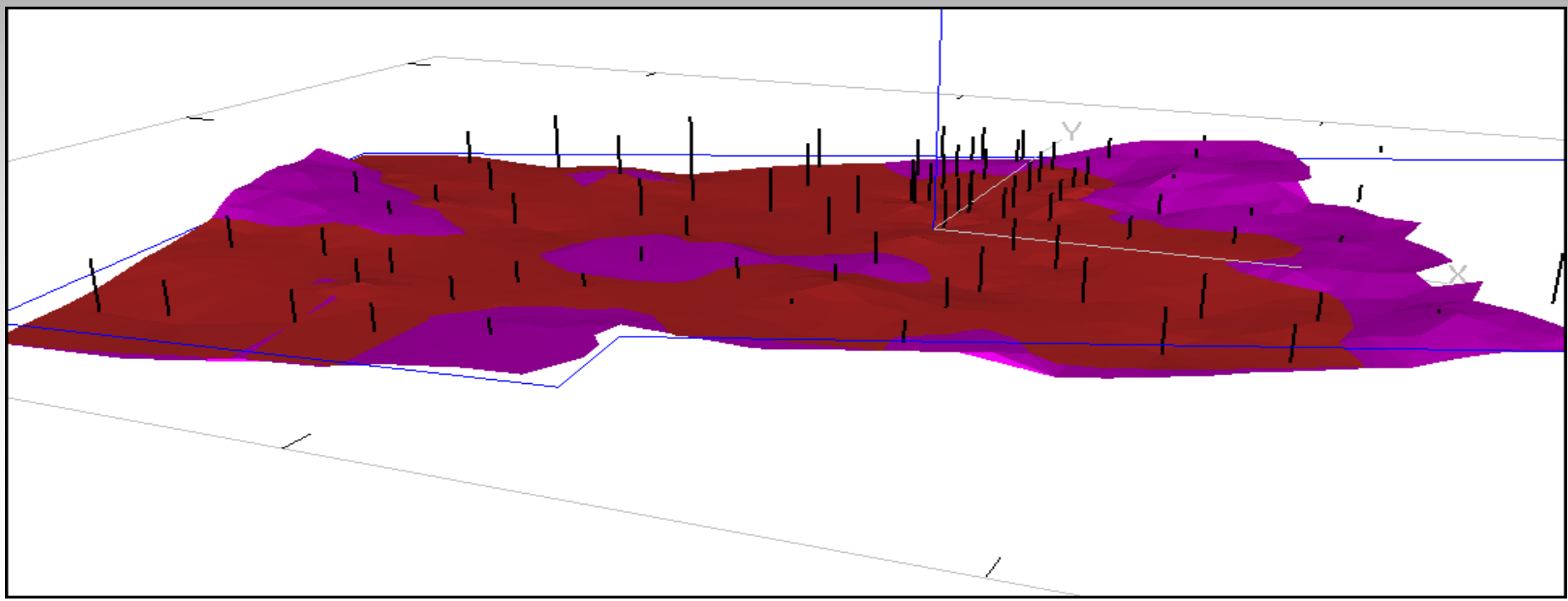
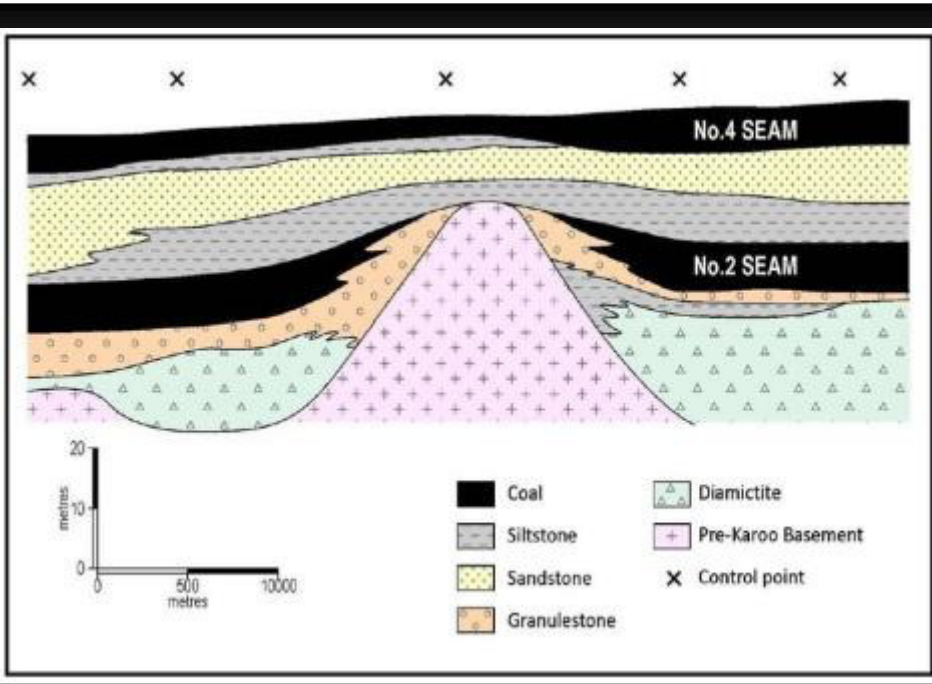


LATE PALAEOZOIC ICE AGE

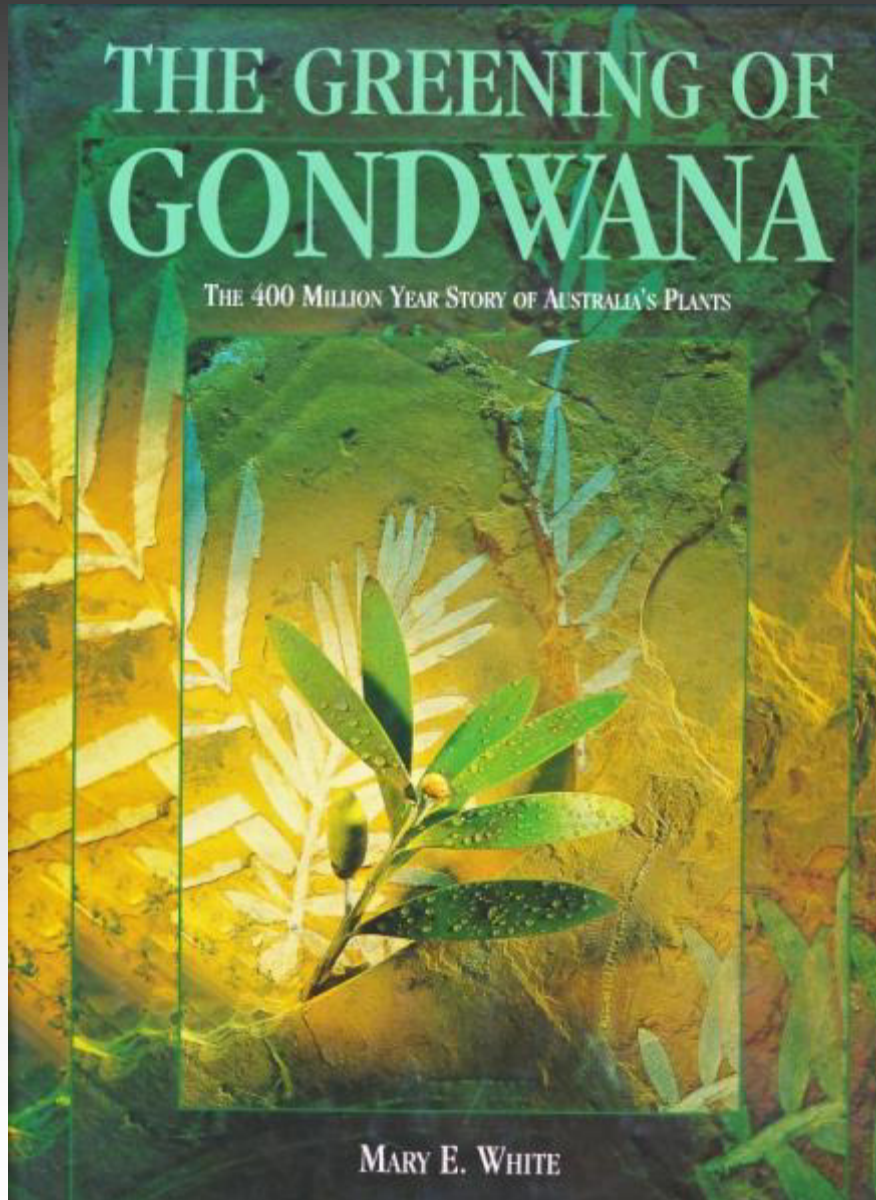


DWYKA GROUP

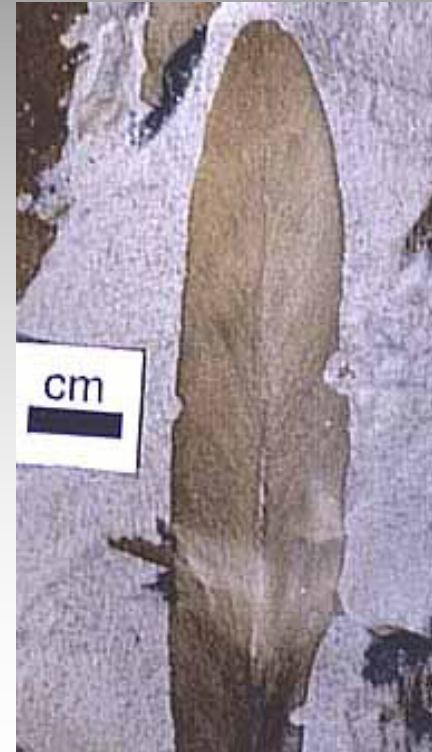
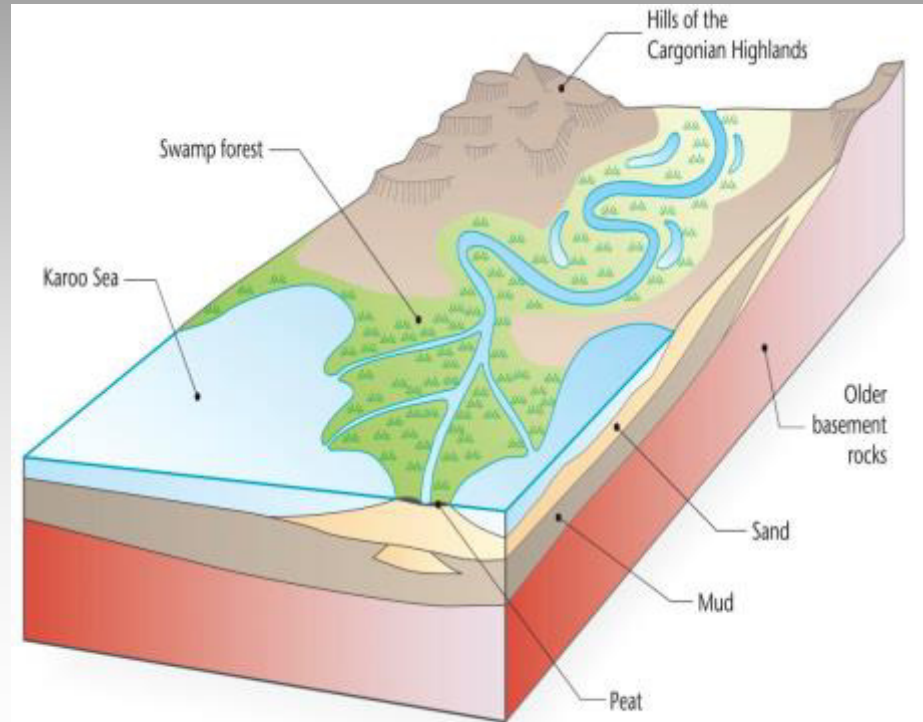




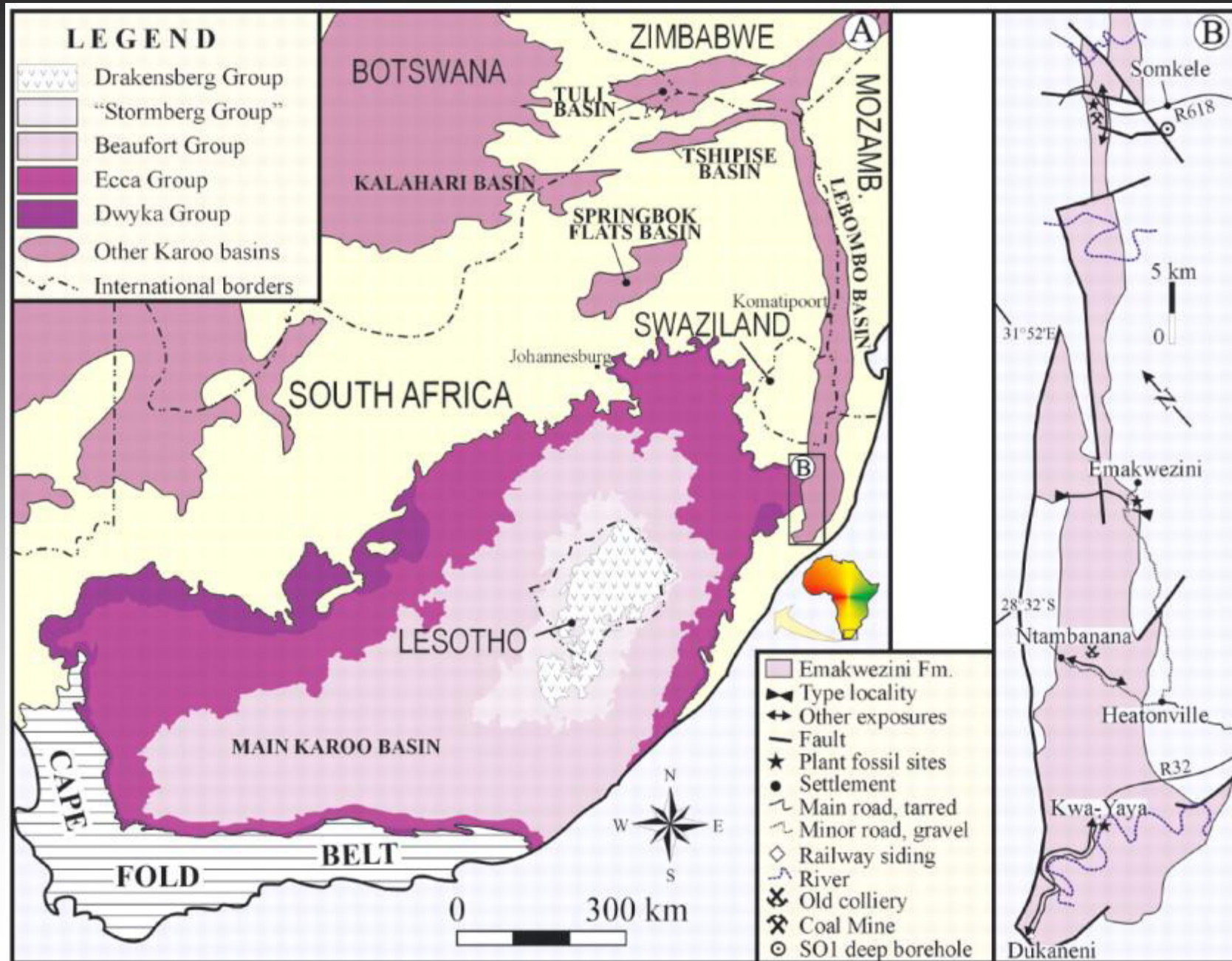
GREENING OF GONDWANA



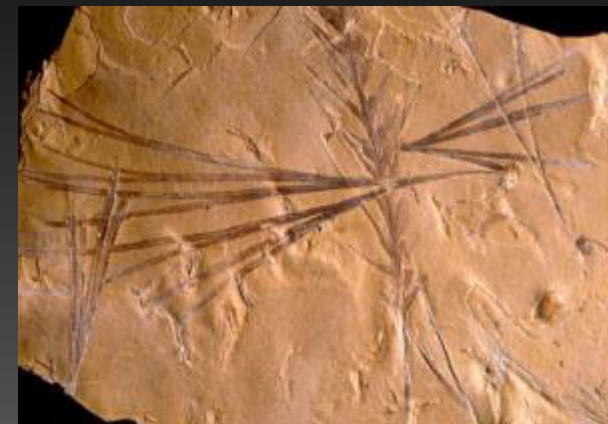
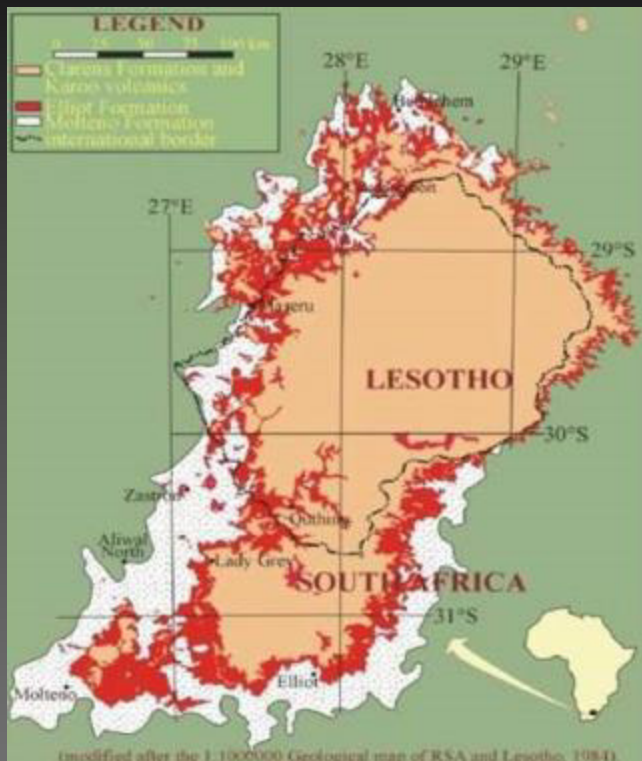
ECCA GROUP



BEAUFORT GROUP



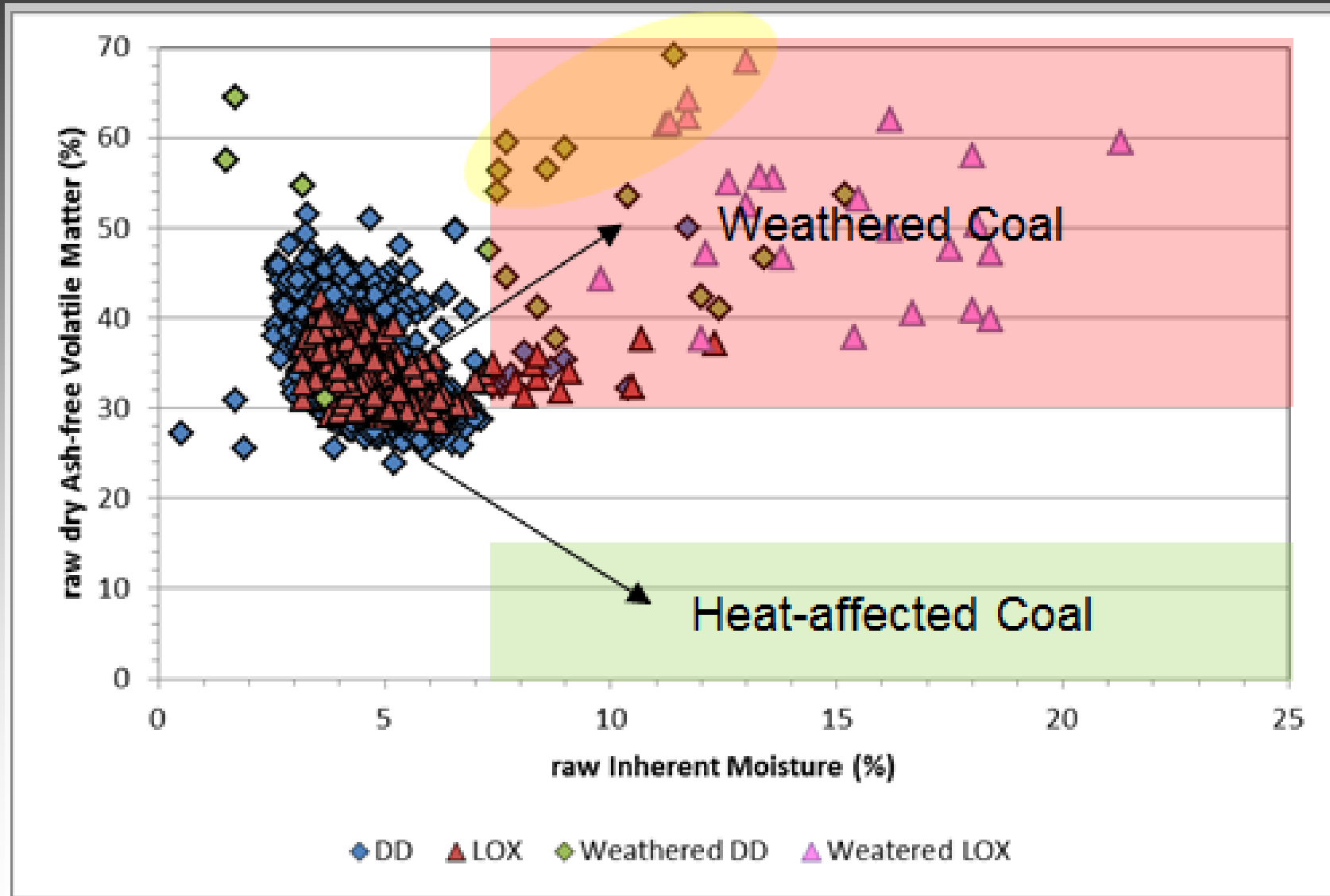
MOLTENO FORMATION



BREAK-UP OF A SUPERCONTINENT



WEATHERED VERSUS HEAT AFFECTED COAL



RESOURCES AND RESERVES

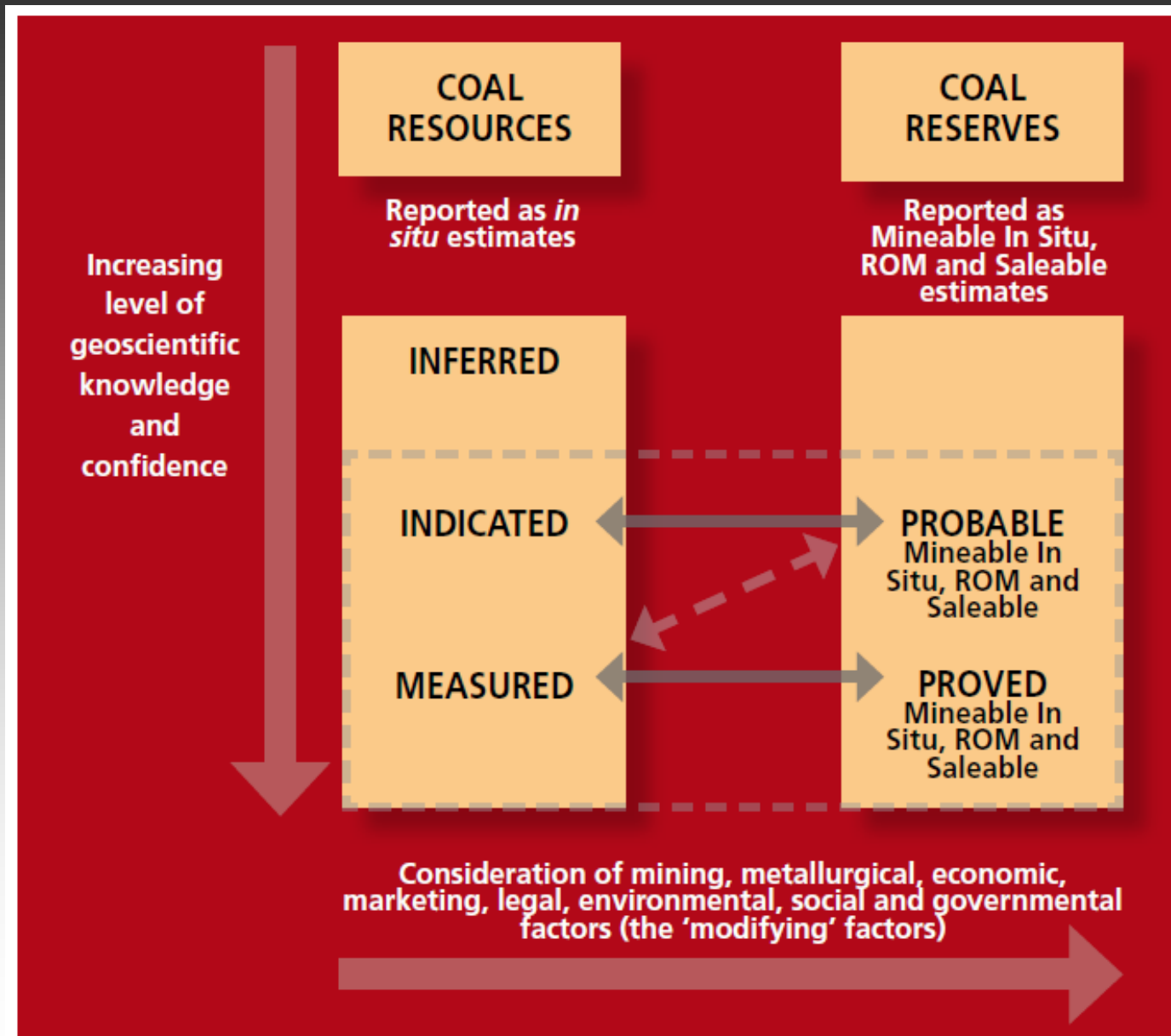
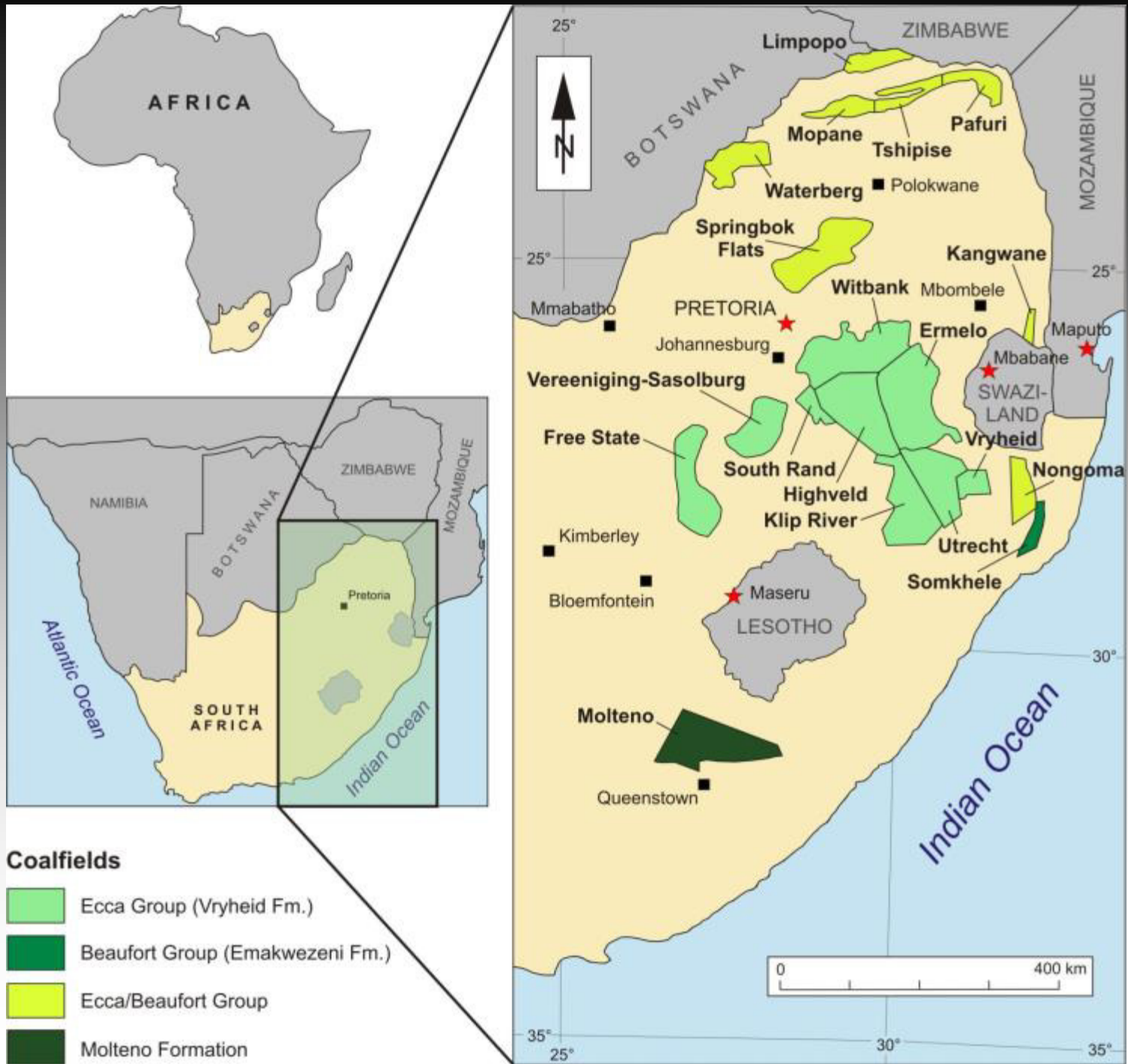
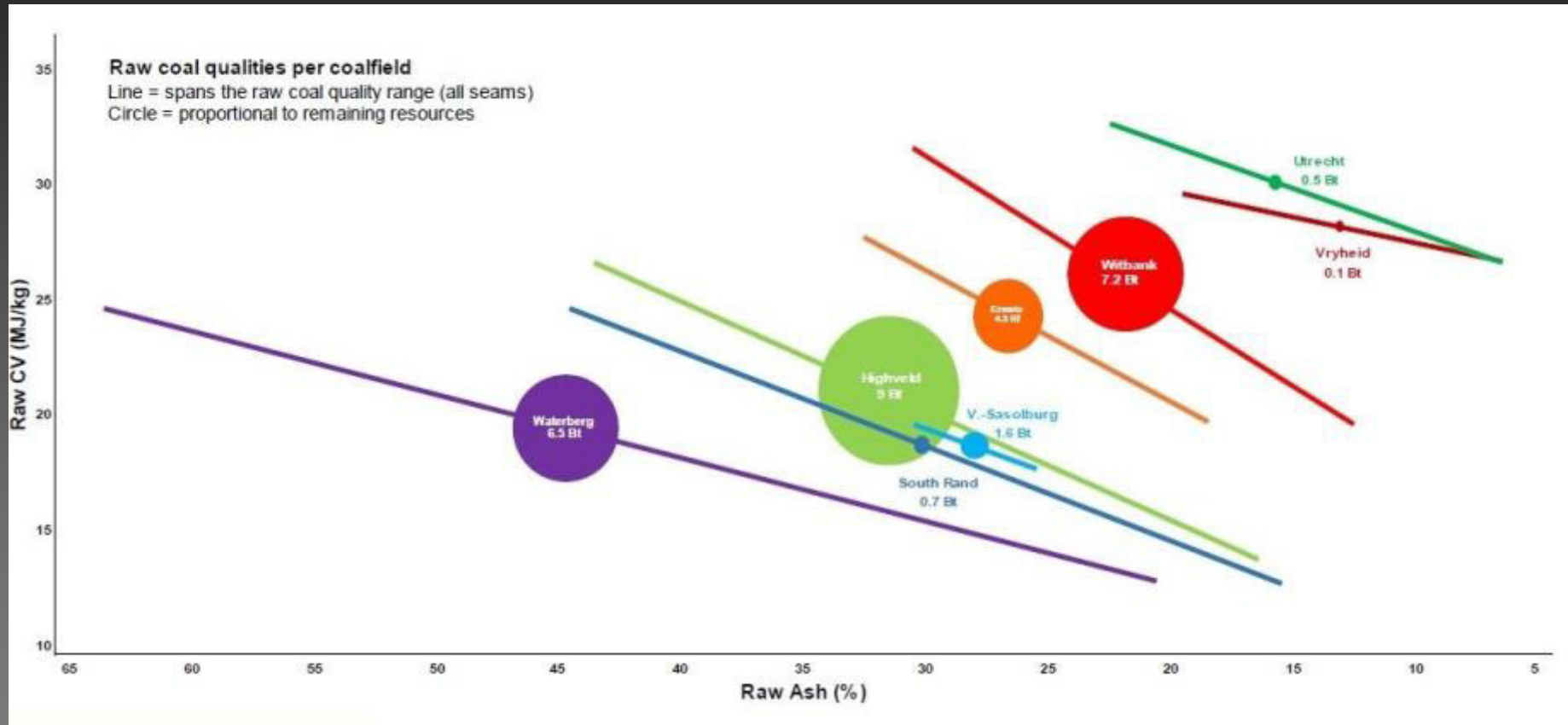


Figure 2: Relationship between Coal Resources and Coal Reserves

SAMREC (2016)



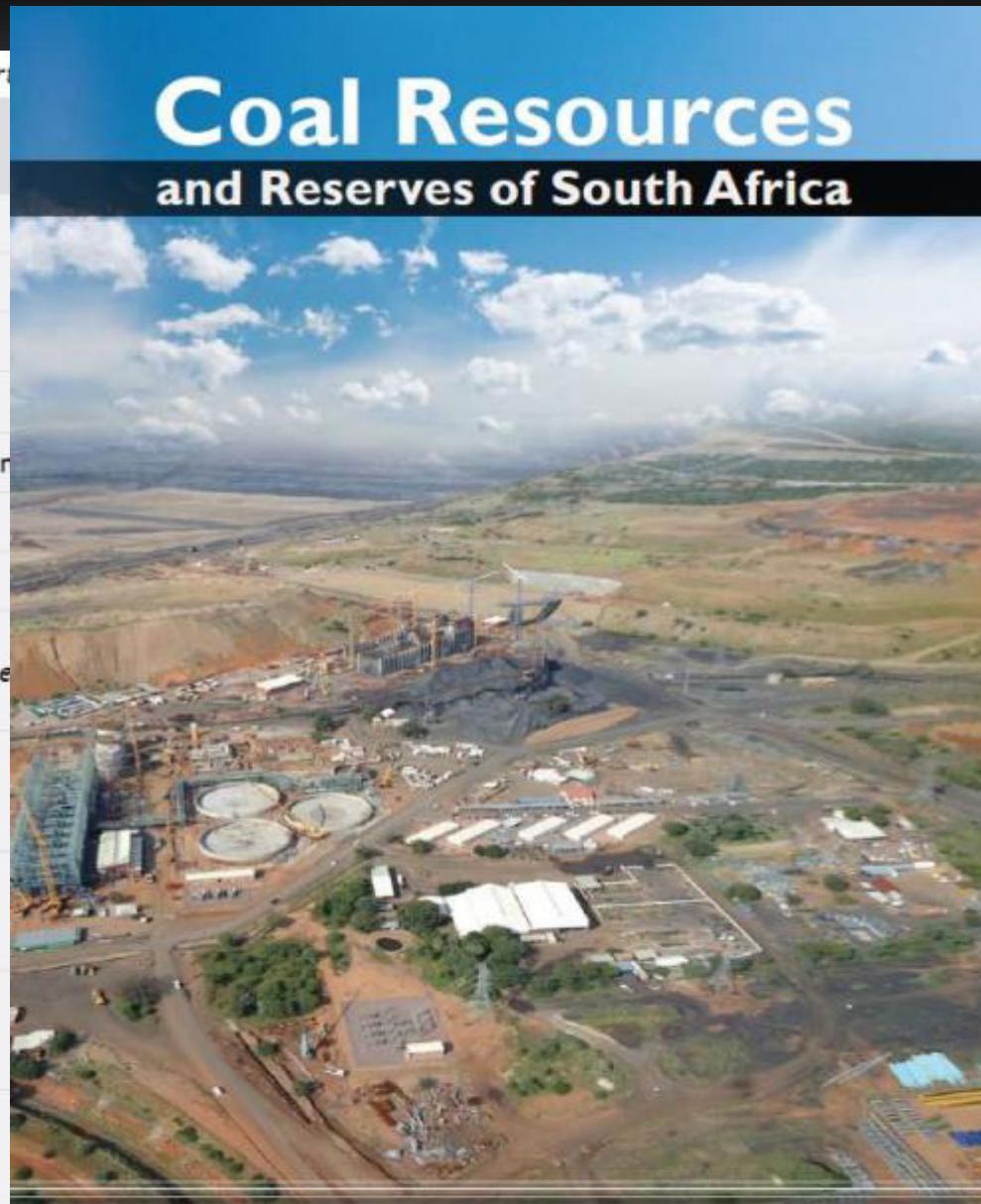
QUALITIES (*IN SITU*) PER COALFIELD



SOURCE: JEFFREY, 2019

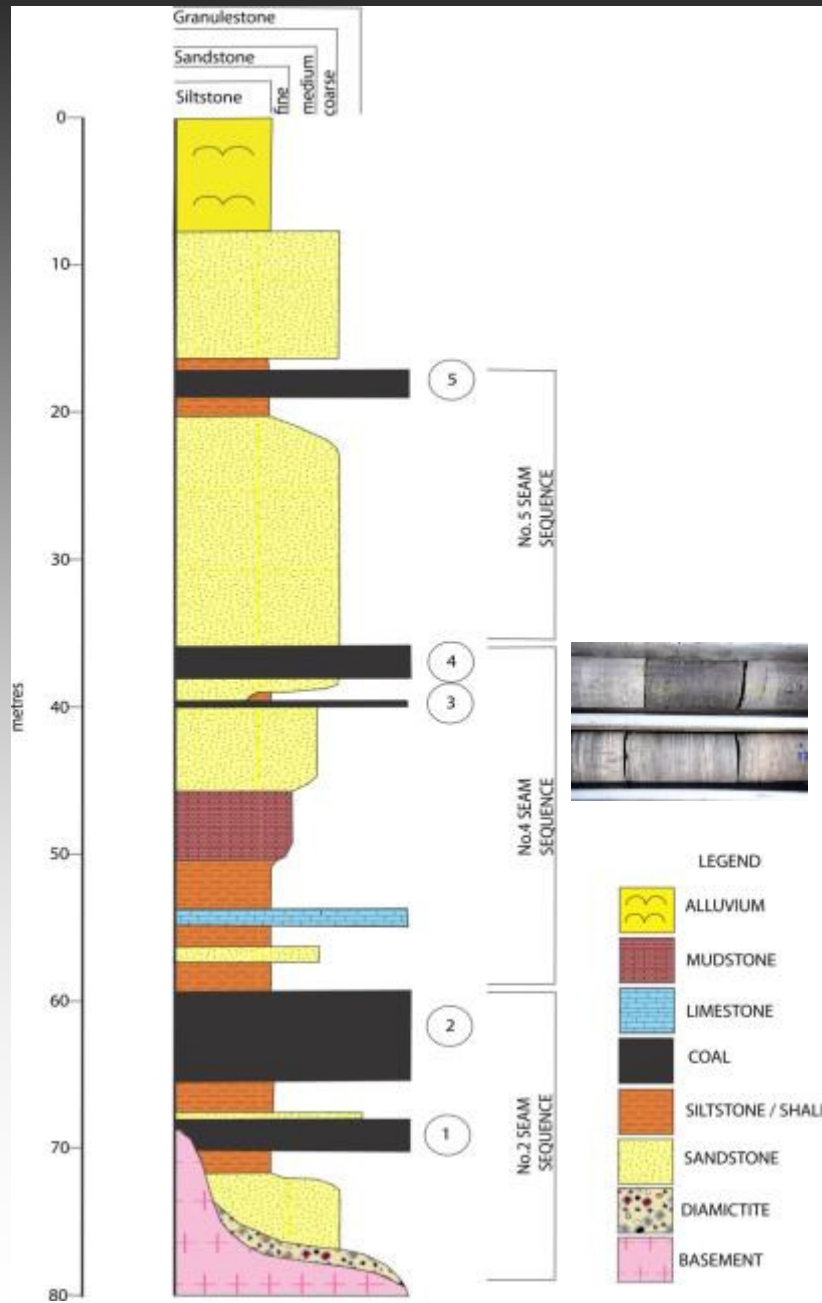
Table 1 Previous reports

Study	Classification (if available)
Department of Mines	Resources
W.J. Wyberg	Resources
Coal Commission	Recoverable*
F.A. Venter	Mineable coal
Mineral Resources Handbook	Coal reserves
D.W. Bishop	Recoverable*
Coal Advisory Board	Bituminous coal**
W.C.J. van Rensburg et al.	Resources
	Recoverable*
Petrick Commission	<i>situ</i> coal resources
	Recoverable*
F.S.J. de Jager	<i>situ</i> coal resources
	Recoverable*
Smith and Whittaker	<i>situ</i> coal resources
	Run of mine
J.H. Bredell	<i>situ</i> coal resources
	recoverable reserves

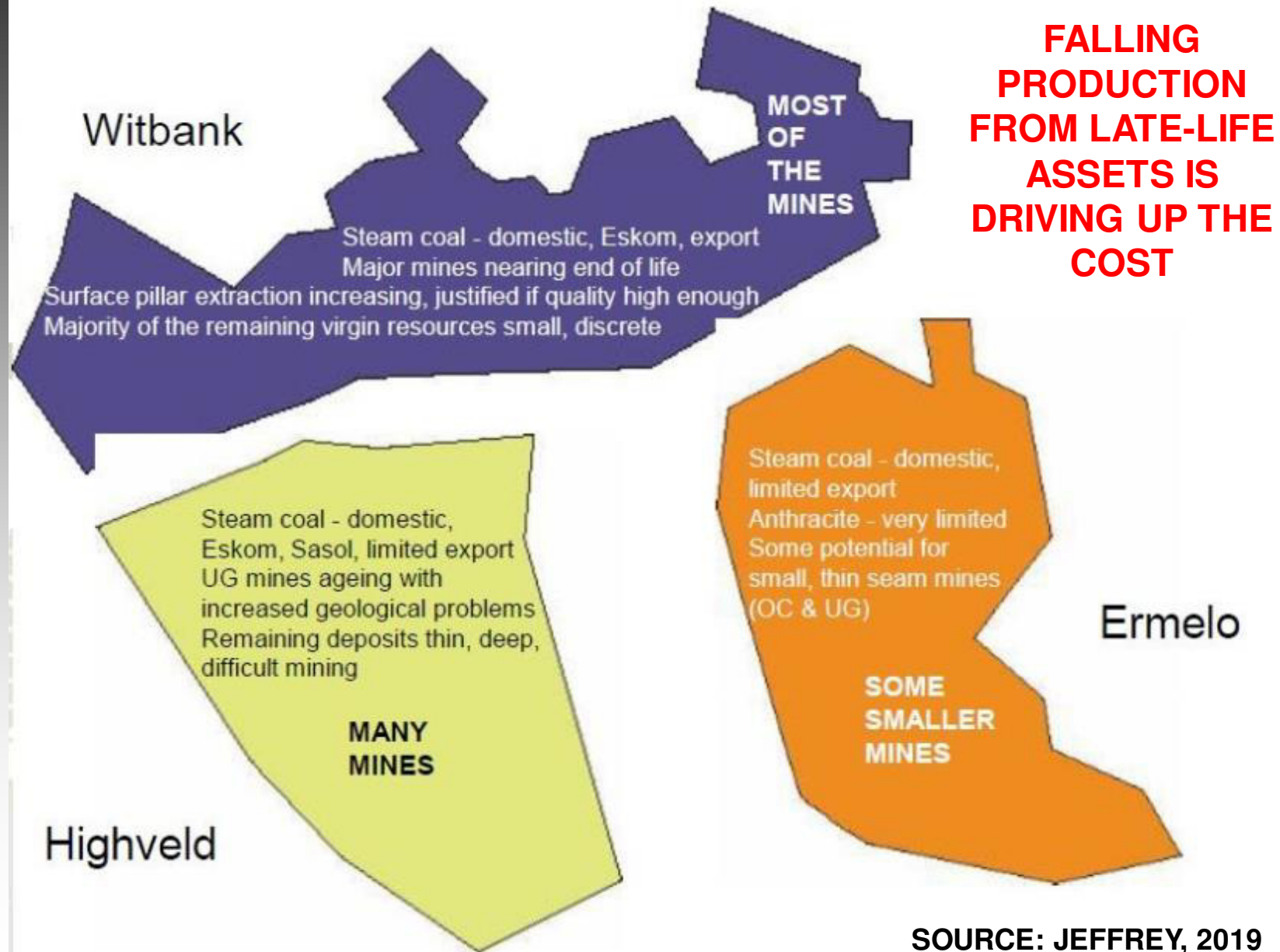


*Recoverable is not clearly defined
 **Interpreted as mineable coal

CENTRAL BASIN

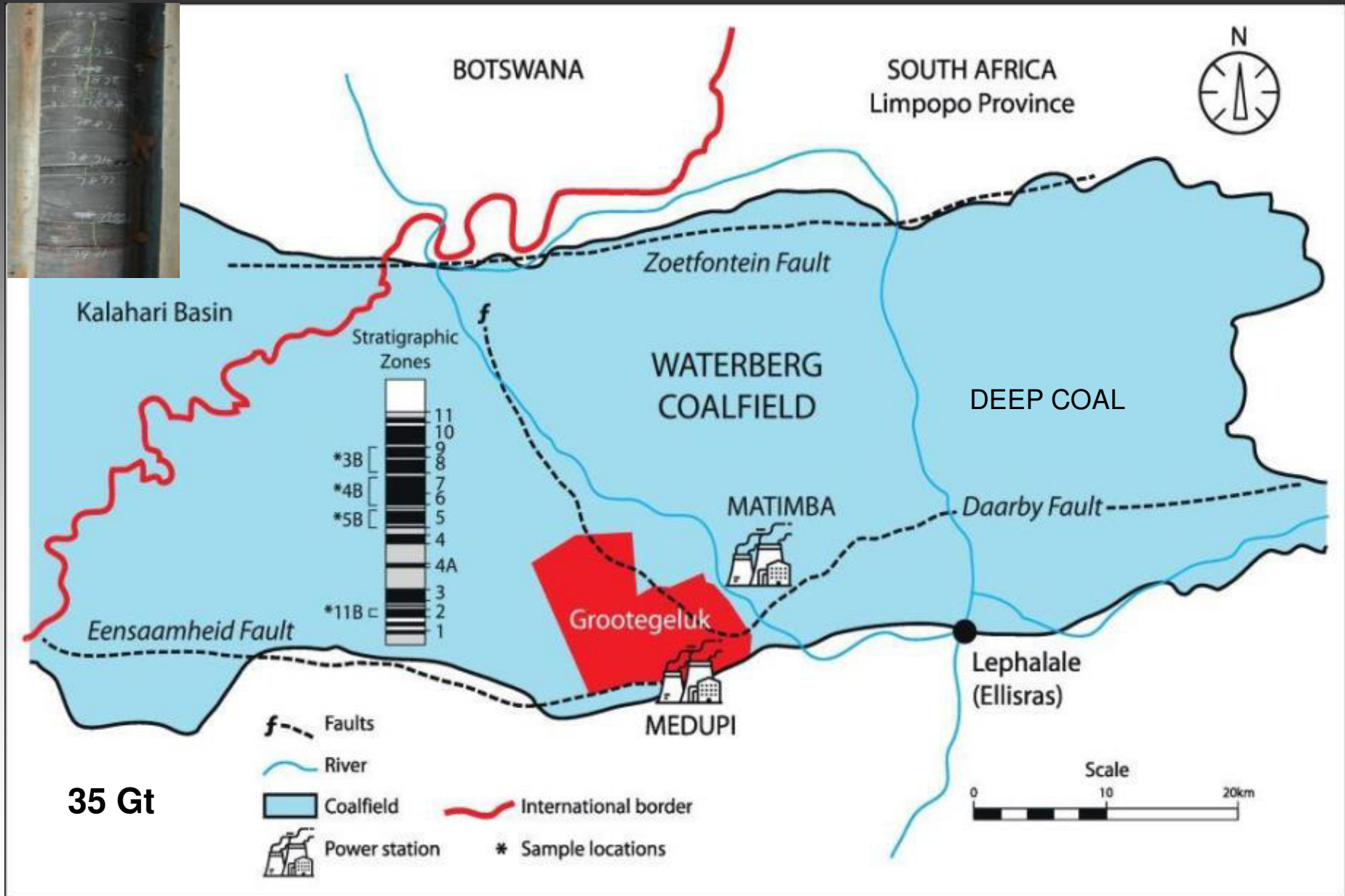


Central Basin Coalfields



SOURCE: JEFFREY, 2019

THE WATERBERG COALFIELD

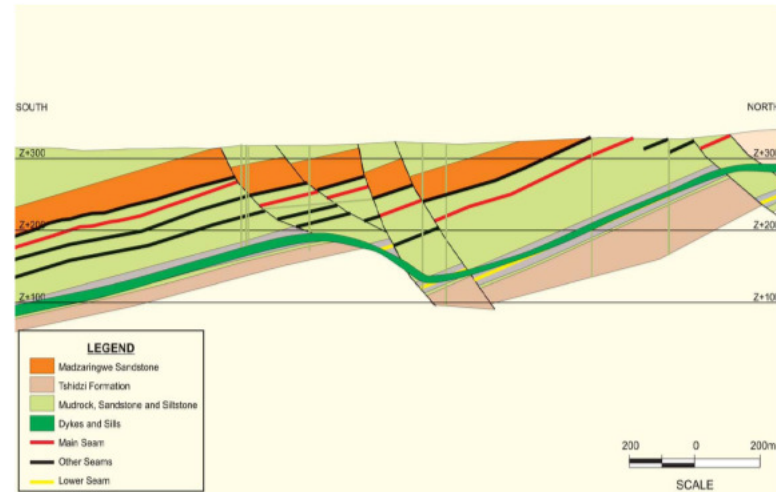
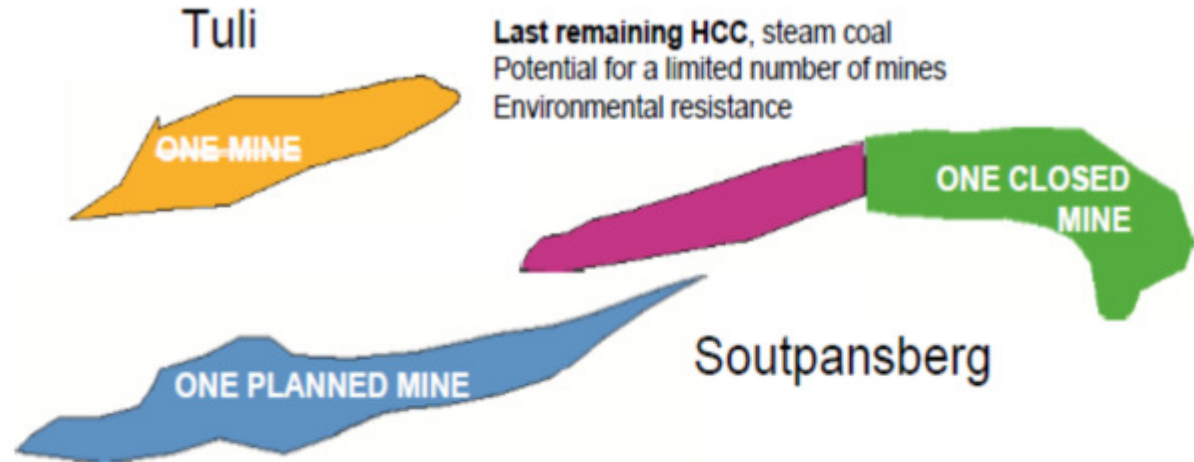


WATERBERG COALFIELD

- **SHALLOW AND DEEP COAL**
- **VERY POOR YIELD (30% - 45%)**
- **LARGE WASHPLANTS REQUIRED**
- **HIGH CAPITAL (R4-R5 BILLION)**
- **FINANCIABILITY IS AN ISSUE**
- **WATER IS AN ISSUE**
- **TECHNICALLY CHALLENGING**
- **LOGISTICS IS EXPENSIVE (R300 - R350/TONNE TO GET COAL TO MARKET)**
- **INITIAL DEVELOPMENTS WERE NOT UNDER A FREE MARKET - ONLY SUBSIDISED PROJECTS ARE OPERATING (GROOTEDELUK)**



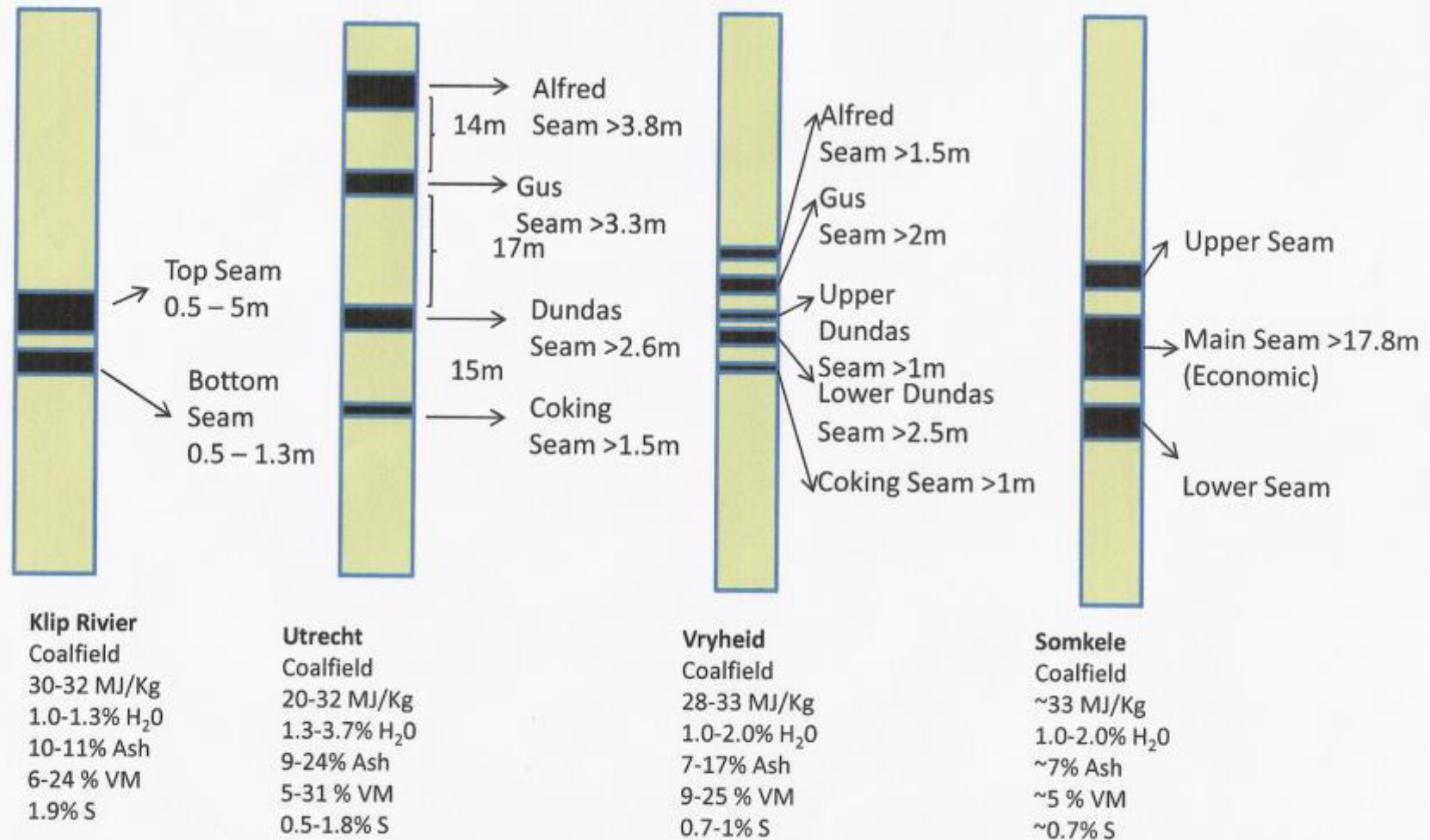
SOUTPANSBERG & LIMPOPO COALFIELDS





GROUPED ANALYSES	ANALYSIS ad	VELE SAMPLE 1	VELE SAMPLE 2	IDEAL VALUES
Proximate	Inh. Moisture%	1,1	1,9	<3
	Ash%	10,0	10,3	<10
	Volatiles%	35,9	35,7	20-35
	Fixed C%	53,1	52,0	>50
Total S%		1,15	1,06	<1,5
Calorific Value MJ/kg		30,97	30,30	-
Coking tests	Swelling Index	5	8	8-9
	Roga Index	85,0	86,8	>45

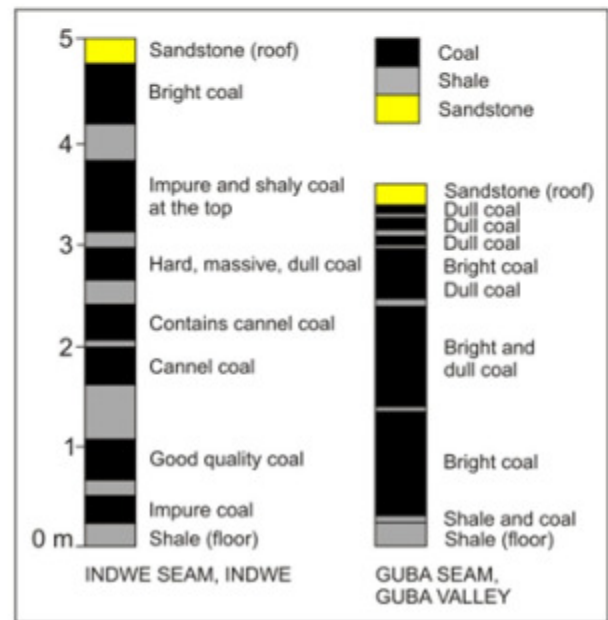
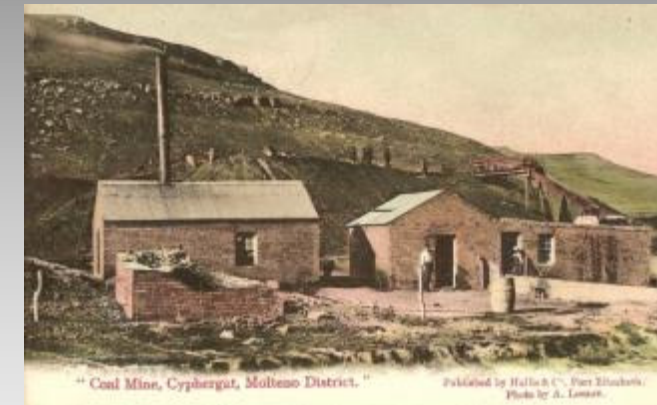
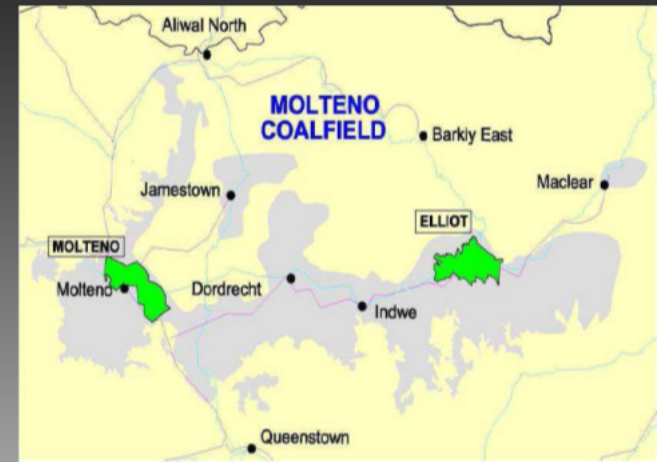
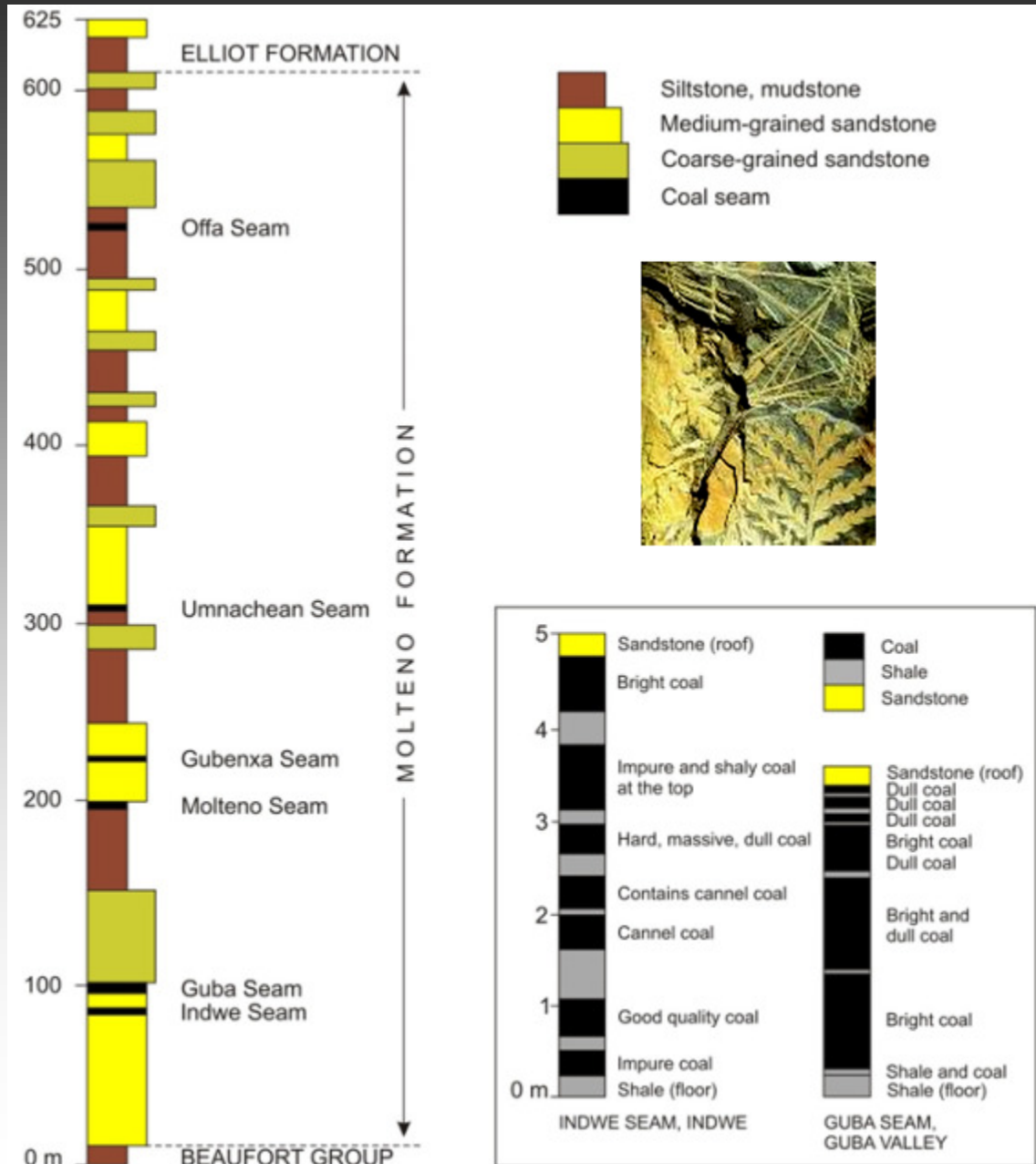
Kwa-Zulu Natal Coalfields





GEOLOGICALLY CHALLENGING

MOLTENO COALFIELD





MUSINGS

**HUGE COAL
RESOURCE
BASE**

**MUCH
SMALLER
RESERVE
BASE**



**SOCIAL
LICENCE**

CHALLENGES

FINANCIAL