

USER'S GUIDE TO THE DVD

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A) DVD REMARKS

This digital DVD product supplements the printed and digital 'Metallogenic Map of the Republic of South Africa and the Kingdoms of Lesotho and Swaziland', previously published at a scale of 1 : 1 000 000 by the Council for Geoscience (Geological Survey), South Africa, in 2000 / 2001. Most of the map data for this new DVD was electronically produced using information from the SAMINDABA (South African Mineral Deposits Database) and GEODE/GIS databases of the Council for Geoscience. This DVD product is the third in a series of three publications; The first DVD was released in May 2009 and titled 'Digital Metallogenic Map of Precious Metals, Chrome, Diamond and Gemstones in the Republic of South Africa and the Kingdoms of Lesotho and Swaziland'. The second DVD was published early in 2010 and titled 'Digital Metallogenic Map of Industrial Minerals in the Republic of South Africa and the Kingdoms of Lesotho and Swaziland'

A sub-dataset comprising **4 621** mineral deposits (base metallic minerals), was extracted from SAMINDABA to be displayed as various layers. Attribute data for each deposit includes (where available): the mineral commodities; the deposit status; the co-ordinates; size; mine name and/or deposit name; deposit orientation (where applicable), amongst others.

The mineral deposit data can be displayed against a simplified geological background (geological environment and lithology). Six environments - and eighteen main lithology classes are displayed. Geological attribute data also include stratigraphic- and chronostratigraphic names for each class. Structural features such as observed or inferred faults and/or thrusts can also be displayed

Further information on the DVD includes the outlines of various mineral provinces /fields and mineral layers. These mineral provinces/fields and layers can be selected individually for chrome, copper, etc. The outline of the Bushveld Complex, Witwatersrand Basin, Kaapvaal Craton and the southern Limpopo Belt boundaries can also be displayed.

Topographic elements on the DVD include the borders of South Africa, provincial boundaries, roads, railways, rivers, dams and pans. Some **651** cities and towns, are also displayed on a grid of latitude and longitude. All farms (names, boundaries and subdivisions), as well as municipalities and district municipalities, are included.

Additional bonus feature includes a useful mineral map of South Africa (in Adobe Acrobat):

*Simplified Geology, Selected Mines and Mineral Deposits – South Africa., Lesotho and Swaziland
(Scale 1 : 2 000 000)*

The data has been processed using ArcGis 9.3 (Environmental Systems Research Institute Inc - ESRI) and the shape files have been created and compressed using ArcPublisher 9.3 (ESRI). ArcReader 9.3 (GIS viewer) is provided for viewing and printing the data on this DVD. The data is 'read only' and can not be extracted or edited. However ArcReader does allow the user to explore the data on the map and get the information needed. Users can also export or print maps.

It should be noted that the DVD is intended to facilitate mineral exploration reconnaissance, and to stimulate mineral industry development, especially small scale mining. Furthermore, the DVD is an important basic reference for land use planning, environmental management and as an aid to earth science teaching and research. This DVD is also of value to a wider audience, especially secondary schools, universities of technology, and universities that offer courses in geology, geography, mining engineering and mineral studies.

Although user friendly, it is important to learn the basic skills to operate ArcReader. Please study the ArcReader Help in the File Toolbar. This will provide an overview of ArcReader, including the following links as a starting point:

Controlling the look and feel of ArcReader

Panning and zooming on the map

Finding, identifying and accessing data and features

Table of contents, data frames, and layers, etc

The GIS data is organized into one project, namely:

*Digital Metallogenic Map of Base Metallic Minerals in the Republic of South Africa
and the Kingdoms of Lesotho and Swaziland*

Coordinate System: Africa Albers Equal Area Conic
Central Meridian: 24
Standard Parallel 1: -20
Standard Parallel 2: -30
Datum: Cape

B) STRUCTURE OF THE DATABASE

<i>LAYER NAME</i>	<i>ATTRIBUTE TABLE</i>	<i>COMMENTS</i>
Degree Grid	-	Displays degree-lines (latitude/longitude)
Minute Grid	-	Displays 15 minute-lines (latitude/longitude)
Towns & Cities	-	Displays the localities of 651 cities and towns in South Africa
Rivers	-	Displays rivers in South Africa (1: 1 000 000 scale)
Roads	-	Displays roads in South Africa (1: 1 000 000 scale)
Dam, Lake, Pan	-	Displays dams, lakes and pans in South Africa (1 : 1 000 000 scale)
Railways	-	Displays railways in South Africa (1: 1 000 000 scale)
RSA Farms		Obtained from the Surveyor General, Land Affairs
SA District Municipalities		Obtained from the Demarcation Board 2001
Municipalities		Obtained from the Demarcation Board 2001
Provincial Boundaries		Displays the borders of South-Africa and Provinces
BASE METALLIC MINERAL (ALL)		
	UNIQ_REF	Unique Reference-point no. as used on SAMINDABA
	MB_NO	Minerals Bureau number (DME)

<i>TOPO_NO</i>	1: 50 000 Topo Sheet map number
<i>LONG / LAT</i>	Longitude / Latitude (decimal degrees)
<i>ELEV</i>	Elevation
<i>LOC_UNC</i>	Locality uncertainty
<i>DESCRIPT</i>	Reference point description
<i>COM1 – COM6</i>	Mineral commodity/ies present (first six)
<i>SCALE</i>	Approximate scale of operation
<i>SIZE</i>	Size classification (if any)
<i>DEP_STAT</i>	Deposit status (e.g. mine abandoned, etc)
<i>DEP_NAME</i>	Deposit name (if any)
<i>MINE_NAME</i>	Mine name (if any)
<i>AZIMUTH</i>	Deposit orientation azimuth
<i>FARM_NAME</i>	Farm name & number
<i>REG_DST</i>	Registration district
<i>PROVINCE</i>	Province
<i>MORP_SYM</i>	Morphology / type (e.g. vein, pipe, stratiform, etc.)
<i>MINE_TYPE</i>	Mine type (e.g. opencast, underground or both)
<i>FRST_PROD</i>	Year of first production (if any)
<i>LST_PROD</i>	Year of last production (if any)
<i>CUM_PROD</i>	Cumulative production (if any)
<i>PROD_UNIT</i>	Production unit (if any)
<i>PROD_PRD</i>	Production period (if any)
<i>OWNER</i>	Owner (e.g. company name) (if any)
<i>ADRS1-ADRS3</i>	Adress (if any)
<i>P_CODE</i>	Postal code (if any)
<i>TEL</i>	Telephone number) (if any)
<i>FAX</i>	Fax number (if any)
<i>CELL</i>	Cell number (if any)
<i>HOST_ROCK</i>	Lithology of the host rock (first one) (if any)
<i>LITH_STRAT</i>	Lithostratigraphy of the host rock (if any)
<i>RANK</i>	Lithostratigraphy rank (if any)
<i>FARM_NAME</i>	Farm name & number (first one)
<i>REG_DST</i>	Registration district
<i>PROVINCE</i>	Province
<i>COMMENTS</i>	Comments

ALLUMINIUM (BAUXITE)	same as BASE MATALLIC MINERALS (ALL)
ANTIMONY	same as BASE MATALLIC MINERALS (ALL)
ARSENIC	same as BASE MATALLIC MINERALS (ALL)
BERYLLIUM	same as BASE MATALLIC MINERALS (ALL)
BISMUTH	same as BASE MATALLIC MINERALS (ALL)
COBALT	same as BASE MATALLIC MINERALS (ALL)
CHROME	same as BASE MATALLIC MINERALS (ALL)

COPPER	same as BASE MATALLIC MINERALS (ALL)
HEAVY MINERALS (GENERAL)	same as BASE MATALLIC MINERALS (ALL)
IRON	same as BASE MATALLIC MINERALS (ALL)
LEAD	same as BASE MATALLIC MINERALS (ALL)
LITHIUM	same as BASE MATALLIC MINERALS (ALL)
MANGANESE	same as BASE MATALLIC MINERALS (ALL)
MERCURY	same as BASE MATALLIC MINERALS (ALL)
MOLYBDENUM	same as BASE MATALLIC MINERALS (ALL)
NICKEL	same as BASE MATALLIC MINERALS (ALL)
RARE EARTHS	same as BASE MATALLIC MINERALS (ALL)
RUTILE	same as BASE MATALLIC MINERALS (ALL)
SILICON	same as BASE MATALLIC MINERALS (ALL)
SULPHUR (IN PYRITE)	same as BASE MATALLIC MINERALS (ALL)
TANTALUM / NIOBIUM	same as BASE MATALLIC MINERALS (ALL)
THORIUM	same as BASE MATALLIC MINERALS (ALL)
TIN	same as BASE MATALLIC MINERALS (ALL)
TITANIUM	same as BASE MATALLIC MINERALS (ALL)
TUNGSTEN	same as BASE MATALLIC MINERALS (ALL)
URANIUM	same as BASE MATALLIC MINERALS (ALL)
VANADIUM	same as BASE MATALLIC MINERALS (ALL)
ZINC	same as BASE MATALLIC MINERALS (ALL)
ZIRCONIUM	same as BASE MATALLIC MINERALS (ALL)
ALUMINIUM (BAUXITE) FIELDS	
BERYLLIUM FIELD	
IRON MANGANESE FIELD	
MANGANESE FIELD	
TIN FIELD	
TITANIUM FIELDS	
URANIUM FIELDS	
ANTIMONY LINE	
ARSENIC LINE	

IRON LINE

IRON LINE INFERRED

NICKEL LINE

NICKEL COPPER LINE

VANADIUM TITANIUM IRON COPPER – LINE

VANADIUM TITANIUM IRON – LINE

ZINC LINE

ZINC – COPPER LINE

PLATINUM – CHROMITITE REEFS (WESTERN SECTOR)

PLATINUM – CHROMITITE REEFS (EASTERN SECTOR)

BUSHVELD COMPLEX OUTLINE

LIMPOPO BELT (Southern Boundary)

KAAPVAAL BOUNDARY

MAIN GOLD RESOURCE AREAS

MINOR GOLD RESOURCE AREAS

PROVINCIAL BOUNDARIES

GEOLOGICAL STRUCTURES

Displays regional faults and linear features

GEOLOGY – ENVIRONMENT CLASS

Displays 6 main environment classes:

WITHIN-PLATE MAGMATISM refers to magmatic events driven by thermal plumes and not by one plate subducting under another at the edge of tectonic plates.

NON-RIFT RELATED BASIN, PLATFORM OR CONTINENTAL SHELF refers to a shallow depression on stable crust and not bound by normal faults.

RIFT RELATED – SUBSIDENCE BASIN refers to a long narrow continental trough terrane created by lithosphere rupture and graben formation as a result of extensional forces.

POST OROGENIC MAGMATISM is said of a geologic process occurring after a period of orogeny.

POLYCYCLIC DEFORMATION implies that the crust in these terranes formed as a result of multiple tectonic events also known as tectonic overprinting.

MONOCYCLIC DEFORMATION implies that the crust in these terranes formed during a single specific tectonic event and has not been overprinted by later orogenic cycles.

Note: Some of the tectonic subdivisions presented on the map could have intrinsic economic/metallogenic significance.

GEOLOGY/LITHOLOGY	STRATNAME	Displays 18 main lithology classes:
1: 1000 000	CHRONO	Displays chrono-stratigraphic (age) names
(Simplified)	STRATNAME	Main Stratigraphy classified for each class.
	LITH_CLASS	Also displays chronostratigraphic names
GEOLOGY /		
STRATIGRAPHY	As above	

C) EXPLANATION / DEFINITIONS

EXPLANATION OF DEPOSIT / MINE STATUS

This is used to describe the present status of the deposit or mine and to categorise it as one of the following:

Mineral occurrence (occurrence): a naturally occurring commodity, usually in outcrop, on which subsurface exploratory work has or has not been carried out or is in progress, and which has not yet been proved to be economically viable or is very unlikely to become viable in the future.

Mineral deposit: an occurrence at which both surface and subsurface exploratory work has proved that the quality and quantity of the commodity(ies) are such that exploitation has been, or is currently feasible, or is likely to become feasible in the future. This term automatically applies to all producing mines, past and present and these are further classified as follows;

Mine, continuously producing

Mine, intermittently producing

Mine, dormant

Mine, abandoned

Deposit, exploited

Deposit, never exploited

LITHOLOGY (Lith_class)

<p>VOLCANIC AND SEDIMENTARY ROCKS</p>	<p>Silicilastic rocks Carbonate rocks Banded iron-formation Felsic and intermediate rocks Mafic and ultramafic rocks Alkaline and carbonate volcanic rocks</p>
<p>METAMORPHIC ROCKS</p>	<p>Schist (greenschist-amphibolite facies) Granulite (from siliciclastic rocks) Charnockite Granite gneiss Amphibolite, serpentine (metamorphic, mafic and ultramafic rocks) Marble, calc-silicate rocks</p>
<p>PLUTONIC ROCKS</p>	<p>Charnockite (unfoliated) Felsic, intermediate rocks Fine-grained felsic rocks Mafic and ultramafic rocks Fine-grained mafic and ultramafic rocks Alkaline rocks, carbonatites</p>

LITHOSTRATIGRAPHIC UNIT RANK ABBREVIATIONS

Spgrp	Supergroup	Cplx	Complex
Grp	Group	Sui	Suite
Sbgrp	Subgroup	Sbsui	Subsuite
Fm	Formation		
Memb	Member		

SIZE CLASSIFICATION - the size of a deposit per commodity defined by upper and lower limits as stated in the list below. This size includes past production plus resources in tons metal or mineral contained, unless otherwise specified. For example, a deposit with 80 000 tons of gold would fall in the size category between 50 and 100 tons, i.e. size category 5.

	9	8	7	6	5	4	3	2	1	0
Andalusite t						5×10^6	10^6	10^5	10^4	10^3
Asbestos t						10^7	10^6	10^5	5×10^4	10^4
Barite t						10^6	10^5	5×10^4	10^4	5×10^3
CLAY t										
Attapulgate-sepiolite						10^7	10^6	10^5	10^4	5×10^3
Bentonite						10^7	10^6	10^5	10^4	5×10^3
Kaolin						10^6	5×10^5	10^5	5×10^4	10^4
Halloysite							10^5	10^4	10^3	
Flint clay						10^5	5×10^4	10^4	5×10^3	10^3
Fire clay						10^7	10^6	10^5	5×10^4	10^4
Ball clay						10^7	10^6	10^5	5×10^4	10^4
Vermiculite-chlorite						10^7	10^6	10^5	5×10^3	10^3
Illite-montmorillonite						10^7	10^6	10^5	10^4	5×10^3
Corundum t						2×10^4	5×10^3	10^3	5×10^2	10^2
Dimension stone t										
Dolomite						10^8	10^7	10^6	10^5	10^4
Feldspar t						10^6	5×10^5	10^5	5×10^4	10^4
Fluorspar t						5×10^6	5×10^5	5×10^4	10^4	10^3
Foundry sand t										
Beryl kg					10^3	5×10^2	10^2	25	10	1
Garnet kg					10^3	5×10^2	10^2	25	10	1
Verdite kg		5×10^4	10^4		5×10^3	10^3	5×10^2	10^2	25	10
Iceland spar										
Glass sand										
Graphite t						10^6	10^5	10^4	5×10^3	10^3
Gypsum t						10^7	5×10^6	10^6	5×10^5	10^5
Helium t										10^8
Kieselguhr t								10^5	10^4	5×10^3
Kyanite t						5×10^6	10^6	10^5	10^4	10^3

	9	8	7	6	5	4	3	2	1	0
Limestone t						10^8	10^7	10^6	10^5	5×10^4
Lithium (oxide) t						10^5	5×10^4	10^4	5×10^3	10^3
Magnesite t						10^7	10^6	10^5	10^4	5×10^3
Mica t						2×10^5	8×10^4	2×10^4	8×10^3	2×10^3
Nitrate t										10^2
Ochre t								5×10^4	10^4	10^3
ORGANIC FUELS										
Gas m ³						10^{12}	5×10^{11}	10^{11}	5×10^{10}	10^{10}
Oil barrels						3×10^8	16×10^7	3×10^7	16×10^6	3×10^6
Pseudocoal t						10^6	10^5	5×10^4	10^4	10^3
Torbanite										
Coal t			10^{10}	5×10^9	10^9	5×10^8	10^8	5×10^7	10^7	10^7
Peat m ³			10^7	5×10^6	$2,5 \times 10^6$	10^6	5×10^5	25×10^4	5×10^4	5×10^4
Perlite t								10^5	5×10^4	10^4
Phosphate t						10^7	10^6	10^5	10^4	10^3
Pyrophyllite t							10^7	10^6	10^5	10^4
Salt t							10^7	10^6	10^5	10^4
Silica t						10^6	5×10^5	10^5	5×10^4	10^4
Sillimanite t							10^6	10^5	10^4	5×10^3
Soda ash t								10^6	10^5	10^4
Sulphur t							10^7	10^6	10^5	10^4
Talc t							5×10^5	10^5	5×10^4	10^4
Vermiculite t						10^7	10^6	10^5	10^4	10^3
Wollastonite t							10^5	5×10^4	10^4	5×10^3
Zeolite t									10^5	10^4

Size classification adapted after: Preliminary Metallogenic Map of North America - Contributions to the Metallogenic Subcommission for the Geological Map of the World: United States Geological Survey, 1980

NOTES

For more information on mineral deposits and occurrences in the Republic of South Africa, please contact

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