PETROLEUM EXPLORATION AND PRODUCTION ACTIVITIES IN SOUTH AFRICA

Mineral and Petroleum Resources Development Act, No 28 of 2002.

Role of Petroleum Agency SA

Under section 71 of the above Act, Petroleum Agency SA has been appointed the designated Agency, with the following responsibilities:

- Promotion and regulation of exploration and production on and offshore
- Receive applications, evaluate and recommend the award of permits and rights
- Review, evaluate and recommend approval of EMPs
- Monitor compliance of licence conditions
- Maintain and add value to the national petroleum exploration and production database
- Acquire reconnaissance data
- Collect all prescribed fees

Permits and rights

The above Act defines the following permits and rights:

- Reconnaissance Permit - 12 months, non-exclusive
- Technical Cooperation Permit - 12 months, exclusive desk-top study, exclusive right to apply for Exploration Right
- Exploration Right - exclusive, transferable, 3 years, renewable for a maximum of 3 periods of 2 years each.
- Production Right - exclusive, transferable, 30 years, renewable.

BOTSWANA COALBED METHANE (CBM) EXPLORATION
Large Potential Resource

PANDE & TEMANE GAS FIELDS
Combined reserves in excess of 5.5 Tcf.
Now operated by Sasol/ENH partnership.

Pande gas field
Temane gas field
Gas pipeline
- Exports 300 million scf/day
- To increase to 370 million scf/day by end 2009

Eskom - Majuba Underground Coal Gasification Project
Trial production started Jan 2007
Planned full production by 2013 is 313 million scf/day (natural gas equivalent)

KUDU GAS FIELD
(Gazprom/Namcor 54%-JVA, Tullow Oil 31%-Operator, ITOCHU 15%)
Discovered in 1974 by a Chevron / Regent /Soekor consortium. The reservoir comprises Barremian (Early Cretaceous) aeolian sandstones with average porosities up to 22 % at 4400 m.

Kudu gas field
Proposed pipeline

PETROSA (100%)

FOREST INTERNATIONAL (OPERATOR) (53.2%)
PETROSA (24%)
ANSCHUTZ (22.8%)
Block 2A: Production Right.
Block 2C: Evaluating deep water oil potential.

IBHUBESI GAS FIELD
Being appraised for development by Forest with 3D seismic and appraisal wells.
This Albian (Early Cretaceous) fluvial play (part of the Orange Delta) extends northwards into Block 1 and upside gas resources are estimated as multi Tcf for the combined area of Blocks 1 and 2A.

BHP BILLITON (OPERATOR) (90%)
GLOBAL OFFSHORE OIL (10%)
Evaluating deep water oil potential.

BHP BILLITON (OPERATOR) (60%)
PETROSA (30%)
SASOL PETROLEUM INTERNATIONAL (10%)
Evaluating shallow water gas potential.

SASOL PETROLEUM INTERNATIONAL

CANADIAN NATURAL RESOURCES - BLOCK 11B/12B
Acquired Seabed logging survey in 2006 and is evaluating deep water potential for oil and gas.

PETROSA - BLOCK 11a
Early Cretaceous shallow marine gas fields currently under appraisal.

E-CE GAS FIELD
(PetroSA 55%, Pioneer 45%):
Originally the Sable oil field, gas is now being produced from this Aptian age deep marine channel sandstone reservoir to supplement the feed to the Mossel Bay plant.

ORIBI / ORYX OIL FIELD
(PetroSA 100%)
In 2007 (4 months) average combined production from Oribi and Oryx was 20000 BOPD - from submarine fan deposits of Albian (Early Cretaceous) age. Production continues at about 4000 BOPD.

PETROSA - BLOCK 9
(With co-venturers Pioneer Natural Resources). Ongoing exploration and production together with appraisal and development of oil and gas fields.

F-A GAS FIELD AND SATELLITES
(PetroSA 100%)
In 2007 these fields produced at an average daily rate of 158 MMscf gas and 4300 bbl condensate. The reservoirs comprise Early Cretaceous shallow marine sandstones at the top of the rift succession.
Separate 91km pipelines convey gas and condensate to the PetroSA GTL synfuels refinery at Mossel Bay where petrol, diesel, kerosene, etc are produced.

Deep tight gas shale play?
Dry gas in fractured carbonaceous Ecca Group shales (Fort Brown Formation) on the flank of a dolerite sill. Tested flow rate of 1.84 million scf/day at 2072 psi, (2563m to 2612) but showed depletion.

ONSHORE APPLICATIONS (Under Evaluation)

ANGLO OPERATIONS
(01ER) - Coalbrook 1

NT ENERGY AFRICA
(75ER) - Welcome Gas: Perdekop
(72ER) - Moonstone Investments 90
(74ER) - Inert Gas : Heilbron

HIGHLAND E&P
(69ER) - Virginia 1&2 Infill

BADIMO
(79ER) - Evander
(80ER) - South Rand
(62ER) - Koppies
(65ER) - Molteno Elliot
(66ER) - Molteno Jamestown
(66ER) - Welkom Project
(71ER) - Bothaville
(77ER) - Kroonstad
(68ER) - Springbok Flats

OTHER
(95ER) - Umbono Coal Ermelo
(99ER) - Umbono Coal
(103ER) - Sequence Oil
(104ER) - Umbono CBM
(114ER) - Vibrant Veterans Energy
(115ER) - Vibrant Veterans Energy
(117ER) - Msix
(119ER) - Msix
(120ER) - Msix
(122ER) - Msix
(125ER) - Msix
(127ER) - Msix
(128ER) - Msix
(129ER) - Pacific Breeze Trading
(130ER) - Pacific Breeze Trading
(133ER) - Msix
(138ER) - Msix
(139ER) - Msix
(140ER) - Umbono CBM
(143ER) - Msix
(144ER) - Msix
(145ER) - Msix
(147ER) - Msix
(152ER) - Alumni Trading 234
(155ER) - Serah Oil & Minerals
(170ER) - Zocan
(172ER) - Advavision
(173ER) - Extrispex
(175ER) - Msix
(176ER) - Advasol
(188ER) - Ansaweb
(189ER) - Bayfield
(202ER) - Bundu Gas
(205ER) - Msix
(206ER) - Aberdeen
(209ER) - Misty Falls
(210-214ER) - Gold One Africa
(226ER) - Umbono
(217ER) - Shell
(219ER) - Shell
(220ER) - Shell
(221ER) - Shell
(227ER) - Umbono
(022ER) - Iringi 169
(013TCP) - Falcon Oil & Gas
(037TCP) - Kinetiko Energy
(038TCP) - Kinetiko Energy

ONSHORE RIGHTS

OLD ORDER RIGHTS : (Awaiting Conversion)
ANGLO OPERATIONS
(02ER) - Waterberg 1
(08ER) - Waterberg 2
(07ER) - Waterberg 3
(18ER) - Grootvlei 2

NEW RIGHTS GRANTED:
ANGLO OPERATIONS
(04ER) - Waterberg 8
(22ER) - Waterberg 11
(24ER) - Waterberg 10
(76ER) - Waterberg 12
(03ER) - Grootvlei 1
(25ER) - Coalbrook 2
(191ER) - Anglo Coal

NT ENERGY AFRICA
(06ER) - Inert Gas
(35ER) - Inert Gas
(12ER) - Tully Resources
(13ER) - Welcome Gas
(36ER) - Highveld Gas
(36ER) - Corinda Resources
(49ER) - Moonstone Investments 81
(52ER) - Moonstone Investments 81
(51ER) - Kusasa Commodities
(53ER) - Iringi Investments

HIGHLAND E&P
(20ER) - Ingwe Area
(21ER) - Beatrix
(27ER) - Evander Area
(31ER) - Evander Area
(29ER) - Virginia 1
(32ER) - Virginia 2
(33ER) - Virginia 3
(34ER) - Virginia 4
(64ER) - Virginia 5
(86ER) - Virginia 6
(94ER) - Virginia 7

BADIMO
(38ER) - Amerfoort NWS
(41ER) - Amersfoort Townlands
(56ER) - Amerfoort N Extension

RIVERWALK
(14ER) - Riverwalk

GREATFORCE INVESTMENTS
(84ER) - Springbok Flats

OTHER
(92ER) - Bundu Gas
(96ER) - Tshipise Energy
(97ER) - Tshipise Energy
(98ER) - Tshipise Energy
(101ER) - Coal of Africa
(116ER) - Msix
(124ER) - Msix
(126ER) - Msix
(134ER) - Msix
(141ER) - Richtersveld Mining
(142ER) - Msix
(146ER) - Msix
(148ER) - Msix
(149ER) - Msix
(150ER) - Msix
(171ER) - Extrispex

TCP (Technical Cooperation Permit)
(020TCP) - Statoil/Chesapeake/Sasol
(025TCP) - Moonstone
(026TCP) - Moonstone
(027TCP) - Sasol
(028TCP) - Sasol
(034TCP) - Impact Africa
(023-024TCP) - Sungu Sungu

ONSHORE / OFFSHORE KEY

- PETROLEUM EXPLORATION WELL
- OIL SHOWS
- COAL FIRED POWER STATION
- GAS TURBINE POWER STATION
- POSSIBLE FUTURE GAS PIPELINE
- SEISMIC LINES
- KOEBERG NUCLEAR POWER PLANT
- COAL FIELD
- ONSHORE OPEN ACREAGE
- OFFSHORE OPEN ACREAGE
- AREAS UNDER APPLICATION
- AREAS AWAITING RIGHTS CONVERSION
- TECHNICAL COOPERATION PERMIT
- EXPLORATION RIGHT
- PRODUCTION RIGHT
- MINING LEASE (OIL) - Block 9
- MINING LEASE (GAS) - Block 9

PRODUCTION AND MINING RIGHTS IN BLOCK 9

E-M and E-BF mining leases (PetroSA)
E-M
E-BF
F-A
ORIBI OIL FIELD PetroSA 100%
SOUTH COAST GAS PetroSA 55%, Pioneer 45%
F-A GAS FIELD PetroSA 100%
F-O
E-CE GAS FIELD PetroSA 55%, Pioneer 45%
ORYX OIL FIELD PetroSA 100%
PetroSA EXPLORATION RIGHT (61ER)
20km
100m
200m
500m

UNDER APPLICATION
EXPLORATION RIGHT
PRODUCTION RIGHT
MINING LEASE (OIL)
MINING LEASE (GAS)

200km
200 Isobaths in metres

Visit our website at www.petroleumagencysa.com for more information

This map does not constitute a final authority.
Requests for further details should be addressed to the Chief Executive, Petroleum Agency SA.

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SOUTH AFRICAN AGENCY FOR PROMOTION OF PETROLEUM EXPLORATION AND EXPLOITATION
PETROLEUM AGENCY SA

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