PetroSA

The Petroleum Oil and Gas Corporation of South Africa (Pty) Ltd

Reg. No.1970/008130/07

PREPARED BY CCA Environmental (January 2007) and EIMS (March 2026	**ENVIRONMENTAL MANAGEMENT**	
CHECKED BY Jessica Courtoreille		REVISION: 1
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ENVIRONMENTAL MANAGEMENT PROGRAMME

SOUTH COAST GAS DEVELOPMENT PROJECT

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LIST OF ABBREVIATIONS

API	American Petroleum Industries
bbl	Barrels
bcf	Billion cubic feet
BOP	Blow Out Prevention
CCA	CCA Environmental (Pty) Ltd
DEAT	Department of Environmental Affairs and Tourism
DME	Department of Minerals and Energy
ECA	Environment Conservation Act
ECO	Environmental Control Officer
EIA	Environmental Impact Assessment
EMC	Environmental Monitoring Committee
EMP	Environmental Management Programme
EMPR	Environmental Management Programme Report
ERF	Employee Relations Forum
GIIP	Gas Initially In Place
GTL	Gas-To-Liquid
I&APs	Interested and Affected Parties
IAS	International Accounting Standard
LOSC	Law of the Sea Convention
MARPOL	International Convention for the Prevention of Pollution from Ships
MCM	Marine and Coastal Management
MEG	Mono-Ethylene Glycol
MMcfd	Million cubic feet per day
MRPDA	Mineral and Petroleum Resources Development Act
NADF	Non-aqueous drilling fluids
NEMA	National Environmental Management Act
NQF	National Qualifications Framework
OHS	Occupational Health and Safety
OIM	Offshore Installation Manager
PAH	Polycyclic aromatic hydrocarbon
PASA	Petroleum Agency of South Africa
PetroSA	The Petroleum Oil and Gas Corporation of South Africa (Pty) Ltd
PV	Present value
ROD	Record of Decision
SAHRA	South African Heritage Resource Agency
SAMSA	South African Maritime Safety Authority
SASAR	South African Search and Rescue
SCG	South Coast Gas
SHEQ	Safety, Health, Environmental management and Quality control

GENERAL INFORMATION

PART 1: GENERAL INFORMATION

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PREFACE

The Petroleum Oil and Gas Corporation of South Africa (Pty) Ltd (PetroSA) proposes to connect seven small reservoirs in order to sustain the current gas supply to their onshore Gas-To-Liquid (GTL) manufacturing plant in Mossel Bay in what is referred to as the South Coast Gas (SCG) Development Project. Gas production from the seven SCG wells would be processed at the F-A platform by means of existing facilities and approved processes / procedures.

In November 2004, PetroSA appointed CCA Environmental (Pty) Ltd (CCA) to act as independent environmental consultants to undertake an Environmental Impact Assessment (EIA) in order to comply with the requirements of the Environment Conservation Act (ECA) (No. 73 of 1989) and to compile an Environmental Management Programme (EMP) to meet the requirements of the Mineral and Petroleum Resources Development Act (MPRDA) (No. 28 of 2002). The EIA for the SCG Development Project was undertaken between November 2004 and August 2006. PetroSA received authorisation in terms of the ECA in November 2006 (see Appendix 1).

This EMP addresses issues in order to ensure that all environmental aspects are carefully considered and monitored during construction and operation of the proposed project. This EMP has been compiled in terms of Section 39 of MPRDA and the compilation of the EMP forms part of the application process for a Production Right as set out in Section 83 of this Act.

Since the proposed SCG Development Project is essentially an extension of the existing operations at the F-A Platform, this EMP should be seen as an addendum to PetroSA's approved Environmental Management Programme Report (EMPR) and should thus be read in conjunction with the approved EMPR.

The EMP has as its basis the Generic Environmental Management Programme Report[1], the conditions listed in the ECA Record of Decision (see Appendix 1) and the recommendations listed in the Environmental Impact Report (dated August 2006) prepared by CCA. It is important to note that the development and implementation of environmental specifications is an on-going process that is iterative in nature. This document is thus the first version of the EMP for the SCG Development Project.

The EMP has been divided in to three parts, namely:

1. Part 1: This section provides general information regarding the proposed project (including background, applicant and responsible person, project description, details of the production right area, timeframes, financial provision, environmental awareness, management of environmental impacts, monitoring and EMP performance assessment, and an undertaking by the Applicant);
2. Part 2: This section presents EMPs for development well drilling, pipe-laying and construction of associated infrastructure, and gas field operation; and
3. Part 3: This section includes the appendices to the EMP.

Revisions to the EMPr undertaken for Revision #01 were undertaken by John von Mayer form EIMS. John von Mayer is an experienced Environmental Scientist with a B.Sc. Honours in Environmental Science and over 15 years of professional experience. John is a registered Environmental Assessment Practitioner and Professional Natural Scientist. His expertise includes environmental impact assessments, project management, and environmental monitoring, with significant experience in the oil and gas, mining and infrastructure sectors. ***EMPr Amendment prepared by Environmental Impact Management Services (Pty) Ltd (EIMS) are based on the 2025 Environmental Audit for this EMPr – Amendments appear in blue text***

Crowther Campbell & Associates and Centre for Marine Studies (1999) Generic Environmental Programme Reports for oil and gas exploration off the coast of South Africa. Petroleum Agency SA, Cape Town, South Africa. 5 Volumes.

1.1 BACKGROUND

One of PetroSA's core business areas is the production of petroleum fuels at their onshore GTL manufacturing plant in Mossel Bay. The feedstock for the GTL process, i.e. natural gas and associated condensate, is produced from the F-A, E-M and associated gas reservoirs situated offshore in Petroleum Licence Block 9 in the Bredasdorp Basin (see Figure 1). The gas is extracted from the reservoirs via several production wells and routed to the onshore plant via the existing F-A production platform. At the F-A platform, located 85 kilometres south of Mossel Bay, the produced gas and condensate is separated before it is exported to the GTL plant through two separate pipelines.

Gas to feed the Mossel Bay GTL plant is currently estimated to last only until 2008 and major investment is needed, as soon as possible, to ensure the life of the plant beyond then. The implementation of the South Coast Gas (SCG) Project is estimated to extend the normal operations of the plant at 200 MMcfd (million cubic feet per day) by four years to 2012.

The SCG development project proposes to connect seven small additional reservoirs in order to sustain the current gas supply to the GTL plant. These reservoirs are situated approximately 100 km south of Mossel Bay (see Figure 1).

1.2 PRODUCTION RIGHT APPLICANT

PetroSA as the applicant for a Production Right will also be the operator of the project.

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1.3 RESPONSIBLE PERSON

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1.4 PROJECT DESCRIPTION

The proposed SCG development project consists of subsea gas production well drilling and the installation of associated production control facilities and infrastructure. The estimated capital cost to bring the project into production is US $330 million.

1.4.1 WELL DRILLING ACTIVITIES

The SCG development project would entail the drilling of six new subsea gas production wells, namely: E-BB3, E-BA4, E-CA2, E-AA3, E-AD2 and E-S7 and re-using the existing E-CE5 well. These wells can be divided into two distinct development areas:

- Six southerly wells: E-CE5, E-BA4, E-CA2, E-AA3, E-AD2 and E-BB3, which would be tied back to the F-A; and
- The E-S7 well tied back to E-M pipeline via a new 13 km pipeline tieback and umbilical.

Locations of these wells are shown on the locality map in Figure 2 and coordinates are provided in below.

Table 3.1: Well location coordinates

Well name	Latitude - South	Longitude - East	Water depth (m)	Hole length (m)
E-CE5	35° 11’ 30.04”	21° 18’ 07.36”	103	3 787
E-BA4	35° 09’ 23.34”	21° 28’ 30.16”	110	2 797
E-CA2	35° 09’ 15.67”	21° 33’ 12.86”	115	2 849
E-AA3	35° 11’ 02.04”	21° 35’ 18.13”	119	2 856
E-AD2	35° 12’ 03.49”	21° 39’ 04.74”	121	2 904
E-BB3	35° 14’ 14.70”	21° 41’ 40.07”	122	2 923
E-S7	34° 52’ 41.31”	21° 49’ 28.56°	98	2 416

Note: All coordinates are presented in WGS 84.

Drilling would be undertaken with a mobile offshore drilling unit commonly known as an “oil rig”. Drilling of these wells started in January 2006 and is expected to be completed within approximately 12 months. PetroSA is currently drilling the wells under PetroSA’s existing Environmental Management Programme Report (EMPR) for prospect well drilling in Block 9. On completion of drilling, a structure of control valves (commonly called a Xmas tree) would be placed on top of each well. The Xmas tree acts as an interface between the well and the pipelines connecting it to the production facilities and controls the flow of fluids from and to the well. PetroSA has indicated that they would install fisher-friendly hinged extension legs on the EBA4 and E-CA2 Xmas trees, which would provide protection against accidental snagging but would not make the Xmas trees over-trawlable.

The gas expected from these wells would consist largely of methane and condensate with a number of minor constituents. A breakdown of the key components of the gas is presented overleaf.

Key components	Composition
Nitrogen	0.2 to 0.4%
CO_2	3 to 4%
Methane	64 to 85%

Ethane	7 to 12%
Propane	3 to 8%
i-Butane	0.5 to 1%
n-Butane	1 to 3%
i-Pentane	0.3 to 1%
n-Pentane	0.4 to 1.3%

1.4.2 PROJECT INFRASTRUCTURE

Following drilling and the installation of Xmas trees, other subsea infrastructure would be installed, including production pipelines, Mono-Ethylene Glycol (MEG) piggyback service pipelines and control umbilicals. In addition to the installation of subsea infrastructure, minor modifications to the F-A platform would be necessary to accommodate the proposed SCG project.

PetroSA proposes to collect gas from the six southern wells via a new sub-sea production pipeline that would connect each well and route the gas from the E-BB3 well location directly to the F-A platform, via a new 44 km pipeline, for processing and onward transportation to the GTL plant in Mossel Bay (Figure 2). In addition to the development of the southern gas fields, the E-S reservoir would be tied-back via the existing E-M pipeline with a new 13 km production pipeline. The total new pipeline length would be approximately 96 km.

The entire length of the production pipeline would be concrete coated in order to provide some measure for its protection. However, this would only protect the pipeline from very occasional or minor accidental impacts by trawling gear. Therefore, PetroSA propose to register a 500 m safety zone on both sides of the production pipeline as defined in the Marine Traffic Act (No. 2 of 1981). PetroSA would ensure that the pipeline route is surveyed and accurately charted with a 500 m safety zone on either side of the production pipeline with the SA Navy Hydrographer.

The MEG piggyback service pipeline would be strap to the main production pipeline in a 3 o'clock position on the southern side in order to provide some protection (the bulk of the trawls are from the north). The umbilical would be protected by two-layered braided armour and similarly placed on the southern side of the production pipeline to provide some protection from accidental trawl board impacts. Concrete mattresses would be used to provide some protection to other seafloor infrastructure such as service line jumpers and pipeline risers.

Minor modifications to the F-A platform would be necessary to accommodate the SCG project. Two additional MEG pumps would be installed to provide sufficient capacity for the supply of MEG to the seven additional wells. Existing production infrastructure would provide sufficient capacity for the SCG project except for some pipework, valves and an additional condensate pump that would be installed. An existing separator would be reused and one cooler converted to a heater. In addition, PetroSA proposes to upgrade the metering on the platform to more accurately record the throughput of gas and condensate.

1.4.3 OPERATION

Gas production from the seven SCG wells would be processed at the F-A platform by means of existing facilities and processes / procedures. The flowrate of gas from the F-A platform to shore is expected to remain unchanged at around 200 MMcfd. Gas production would be separated at the F-A platform and transported to PetroSA's onshore GTL plant through two separate 90 km long existing subsea pipelines.

The Total Gas Initially In Place (GIIP) for all the base case South Coast Gas reservoirs is 389 billion cubic feet (bcf). The most likely production (reserves) for the base case South Coast Gas development amounts to 216 bcf of gas and 5.6 million barrels (bbl) of condensate. This represents an average gas recovery of the GIIP of 56%. The reserves increase to 336 bcf gas and 8.1 million bbl condensate when the additional F-A and E-M tail recovery as a result of the SCG development is included.

All operations and identified impacts at the F-A platform would be managed and monitored in accordance with methodologies set out in PetroSA's integrated management system for Safety, Health, Environmental management and Quality control (SHEQ) for Exploration and Production activities. The integrated SHEQ system includes certification to ISO 9 001 and ISO 14 000 for the F-A platform. The existing relevant PetroSA operating procedures are listed in Appendix 2.

1.4.4 DECOMMISSIONING

On completion of the economic life of the SCG project, the facilities would be decommissioned. The ultimate decommissioning goal is to ensure that all abandoned infrastructure does not have a detrimental effect on the environment. The specific objectives for decommissioning within the defined SCG production right area include:

- Removing all "Xmas trees" and wellheads installed as part of this project with casings cut-off below the seafloor;
- Plugging wells with cement and testing for integrity;
- Removing flow meters from the seafloor;
- Thoroughly flushing and plugging pipelines and umbilicals after which they will be abandoned on the seafloor;
- Abandoning concrete mattresses and concrete blocks (less than 0.5 m high), which were used to stabilise the pipelines, and other overtrawlable structures on the seafloor; and
- Remove safety zones around the pipeline infrastructure so that demersal trawling can resume in the vicinity of the pipeline and SCG well locations.

1.5 OFFSHORE BLOCK AREA AND PRODUCTION RIGHT AREA DETAILS

1.5.1 BLOCK AREA NUMBER AND LOCATION

The SCG area is located within Petroleum Licence Block 9 off the South Coast of South Africa, approximately 100 km south-west of Mossel Bay (see Figure 3). Corner coordinates for the SCG development area are provided below:

		Latitude - South	Longitude - East
Description of the northern area	1	34º 52' 30.4334"	21º 48' 56.0018"
	2	34º 52' 30.4318"	21º 50' 50.0071"
	3	34º 52' 58.4311"	21º 50' 50.0075"
	4	34º 52' 58.4314"	21º 50' 31.0067"
	5	34º 53' 15.4309"	21º 50' 31.0070"
	6	34º 53' 15.4322"	21º 48' 56.0024"

Description of the southern area	1	35º 06' 21.4270"	21º 23' 39.9324"
	2	35º 06' 21.4126"	21º 47' 48.0055"
	3	35º 16' 50.3943"	21º 47' 48.0278"
	4	35º 16' 50.4009"	21º 40' 57.9934"
	5	35º 15' 40.4027"	21º 40' 57.9896"
	6	35º 15' 40.4036"	21º 39' 17.9830"
	7	35º 12' 52.4079"	21º 39' 17.9798"
	8	35º 12' 52.4103"	21º 34' 57.9675"
	9	35º 10' 55.4130"	21º 34' 57.9657"
	10	35º 10' 55.4136"	21º 33' 33.9619"
	11	35º 10' 34.4141"	21º 33' 33.9616"
	12	35º 10' 34.4167"	21º 29' 27.9511"
	13	35º 11' 30.4154"	21º 29' 27.9522"
	14	35º 11' 30.4186"	21º 25' 49.9430"
	15	35º 10' 23.4197"	21º 25' 49.9417"
	16	35º 10' 23.4220"	21º 23' 39.9361"

Note: All coordinates are presented in WGS 84.

1.5.2 SURFACE AREA

Petroleum Licence Block 9: 22 756 km^2
Production Right area: 470.52 km²

1.6 PROPOSED TIMING AND DURATION

1.6.1 CONSTRUCTION PERIOD

The planned well-drilling work schedule is provided below.

WELL	OPERATION	START DATE	END DATE
E-BA4	Drill & suspend	29 Jan 06	14 Mar 06
E-BA4	Re-enter & complete	9 Sep 06	24 Nov 06
E-CA2	Re-enter & complete	12-Aug-06	9-Sep-06
E-AA3	Drill & suspend	14 Mar 06	14 May 06
E-AA3	Re-enter & complete	24 Nov-06	16 Dec-06
E-AD2	Drill & complete	16 Dec-06	5 Feb-07
E-BB3	Drill & complete	14-May-06	12-Aug-06
E-S7	Drill & complete	5 Feb-07	7 Apr-07

Well E-CE5 is currently used as a gas injection well to maintain reservoir pressure at the Sable Field. No well intervention is planned to convert E-CE5 from a gas injector well to a gas producer for the SCG project.

The installation of the production pipeline is expected to start in February 2007 and be completed in March 2007. The umbilical would be laid and infrastructure connected between March and May 2007. Modification to the F-A platform will be completed in June 2007.

1.6.2 PRODUCTION

Planned start of production:	end May 2007
Planned start of full production:	As above
Earliest cessation of production:	2012

1.6.3 DECOMMISSIONING AND REHABILITATION PROGRAMME AND OBJECTIVES

Decommissioning and rehabilitation programme will commence following cessation of production.

1.6.4 FINAL CLOSURE APPLICATION

The earliest final closure application will be in 2012, however, some equipment may be left for future gas production.

1.7 FINANCIAL PROVISION

1.7.1 QUANTUM OF THE FINANCIAL PROVISION

SOUTH COAST GAS DEVELOPMENT REHABILITATION COSTS (18-Dec-06)	
	COST ($)
DRILLING	
MOB/DEMOB	5,500,000
E-S7	6,674,223
E-BA4	6,674,223
E-CA2	6,674,223
E-AA3	6,674,223
E-BB3	6,674,223
E-AD2	6,674,223
TOTAL DRILLING	**45,545,340**
FACILITIES	
MOB/DEMOB DSV	2,250,000
Well disconnection	850,000
Move Mattresses	1,200,000
Relocate/Recover jumpers	925,000
Flush umbilicals and pipelines	1,750,000
Monitor Pipelines	500,000
TOTAL FACILITIES	**7,475,000**
TOTAL REHABILITATION COSTS	**53,020,340**

1.7.2 METHOD OF PROVIDING FINANCIAL PROVISION

The present value (PV) of the estimated abandonment cost is initially recognised as both an asset and a liability (provision).

International Accounting Standard (IAS) 16 provides that the cost of an item of property, plant and equipment includes the cost of dismantling and removing that item and restoring the site on which it is located. In conforming to the above provision, PetroSA capitalises the PV of the estimated abandonment costs as part of the asset and amortises (expenses) it over the estimated useful life of the asset.

A provision equal to the PV of the estimated cost to effect the dismantlement, removal and restoration of the site is raised and referred to as an “abandonment provision”. This provision is raised because a legal obligation exists for PetroSA to rehabilitate the asset to the agreed standard. The provision is always reflected in the

balance sheet at the best estimate of the expenditure required to settle the obligation at each balance sheet date.

The initial amount recognised as the "abandonment provision" is an amount equal to the determined PV of the abandonment costs. A rate equal to the company's weighted average cost of capital annually increases this provision. This annual adjustment of the provision will result in the abandonment provision equalling the cost of dismantling and removing the items of property and restoring the site. The company does not set aside actual cash for the abandonment cost but treats the abandonment provision as a book entry against which the actual expenditure will be written off when incurred.

1.8 MANAGEMENT OF ENVIRONMENTAL IMPACTS

Potential impacts associated with the proposed project were identified and assessed as part of the EIA undertaken by CCA. A summary of the significance of the potential impacts (before and after mitigation) is presented in the table below. Impact management is set out in the EMPs for development well drilling, pipelaying operations and gas field operation (see Part B). These EMPs include all mitigatory measures listed in the Environmental Impact Report (August 2006) prepared by CCA , the conditions of the Record of Decision (dated 22 November 2006) issued by the Department of Environmental Affairs and Tourism (see Appendix 1) and the Generic EMP.

Potential impact		Significance[2] Without mitigation	With mitigation
Normal operation			
Interference with shipping		L - M	**N - L**
Impact on cultural heritage		L	**N**
Impact on benthic communities			
Physical damage		L	**L**
Smothering by cuttings and drilling fluid		L	**L**
Smothering by sediment plume		L	**L**
Biochemical effects	Water based fluids	VL	**VL**
	Non-aqueous drilling fluids	H	**L**
Infrastructural impact on benthic species diversity and numbers		L(+)	**L(+)**
Infrastructural impact on benthic migratory species		L	**L**
Noise impact on marine fauna		L	**L**
Impact on fishing			
Fishing effort		VL	**VL**
Socio-economic cost (i.e. lost revenue)		L	**L**
Direct downstream socio-economic impact: Loss of jobs		VL	**VL**
Indirect downstream socio-economic impact: Families & associated supporting industries		VL	**VL**
Abandoned infrastructure on fishing effort		L	**L**
Interference with nocturnal fauna		N	**N**
Disturbance of fauna by helicopter operations		L - M	**L**
Impact of flaring on birds		N	**N**

Air emissions	L	**N**
Waste		
Sewage	L	**N**
Galley waste	L	**N**
Solid	L	**L**
Detergents	L	**N**
Deck drainage	L	**N**
Machinery space drainage	L	**N**

[2] N = Negligible; VL = Very Low; L = Low; M = Medium; H = High; N/a = Not applicable; (+) = positive impact

Potential impact	Significance[2] Without mitigation	With mitigation
Produce water discharge	N/a	**N/a**
Accidental gas leakage		
Impact on drilling unit and human health	L	**VL**
Impact on water column and sea bottom	VL	**VL**
Impact on atmosphere	N	**N**
Cumulative Impact		
Cumulative impact of hydrocarbon development in the Blues on fishing effort	M	**-**
Cumulative socio-economic cost of hydrocarbon development in the Blues	M	**-**

Note: only those impacts associated with the approved alternative (i.e. Alternative 2) are presented.

1.9 SOCIO-ECONOMIC GOALS AND OBJECTIVES

The goals and objectives presented in this section is a summary of those identified in the Social and Labour Plan, which has been submitted to the Petroleum Agency of South Africa (PASA) as part of the current application process for a Production Right.

The specific goals and objectives for Local Economic Development as a result of the SCG Development Project are as follows:

- Employment: Prolong the life of the refinery, which would have come to an end in 2008, until 2012. The continued supply of gas to the Refinery will sustain about 3 000 jobs per year over the four-year period, through direct and indirect employment.
- SMME Development: The Supplier Development Programme, piloted by PetroSA on behalf of the Department of Minerals and Energy (DME), aims to provide support services to identified black suppliers, such as business skills training, mentoring and coaching, technical support, as well as feasibility and viability study support. PetroSA has also been instrumental in setting up a Supplier Development Agency, which was launched by DME. PetroSA proposes to continue to support and participate in projects identified by the Supplier Development Agency.
- Infrastructure and Community Development: PetroSA propose to undertake the following:
  - ⇒ Revamp one of the existing community halls in Mossel Bay into a wellness centre with the following facilities: gym, AIDS counselling rooms and clinic;
  - ⇒ Renovate a home for the aged;

- ⇒ Establish a sporting facility (football, rugby, hockey, netball and cricket) at Salatiso, Imekhaya and Garden Route Primary School;
- ⇒ Built and equip a library for the Thembalethu community;
- ⇒ Provide the Garden Route Primary School with music instruments such as piano, drums, violins, guitars, flutes and surround sound system;
- ⇒ Build and equip a home for the disabled children; and
- ⇒ Establish a computer and science laboratories at 2 high and 3 primary schools in Thembalethu, George.

- Poverty Eradication: PetroSA propose to
  - ⇒ Renovate an existing building and equip it to accommodate projects such as: cleaning chemicals, shoe making, beadwork, pottery and artifacts;
  - ⇒ Train and empower the Mossel Bay community in reading, numeric and writing skills by providing resources for the project; and
  - ⇒ Contribute money to a poverty eradication project.

The specific goals and objectives for the human resources development programme are as follows:

- Skills Development Plan: PetroSA is committed to a Skills Development Plan, which address all the technical training requirement of the GTL Refinery, as well people development initiatives, unemployed learners and projects such as High Performance Culture. PetroSA will invest money in these interventions. PetroSA also has a Center of Excellence, which provides Learnerships for mainly unemployed learners that are locally (Greater Mossel Bay Area) based. The skills developed at the center include electrical, instrumentation, welding, fitting, turning, boiler making and rigging Learnerships for the chemical industry and is CHIETA accredited.
- Career Progression Plan: PetroSA has initiated the Career Path Project in order to develop, review, benchmark, establish and rollout career pathways. Each career path shows progression steps, which are supported by staged requirements and the acquisition of knowledge, skills and attributes through training, shadowing and exposure.
- Mentorship Plan: Coaching and mentoring is a key Corporate Strategic Objective that supports orchestrated capacity, retention and succession planning.
- Internship and Bursary Plan: PetroSA propose to provide 20 bursaries and 18 interships in the fields of BEng, BSc Engineering (Chemical, Mechanical and Electrical) or BCom (Logistics, Informatics and Accounting).

The specific goals and objectives for downscaling and retrenchment are as follows:

- Employee Relations Forum: PetroSA has established an Employee Relations Forum (ERF), which will continue to act as the Future Forum for the SCG Development Project. The functions of the forum include inter alia:
  - ⇒ To promote discussions between worker representatives (Unions) and company about the future;
  - ⇒ To identify future problems, challenges and possible solutions with regard to productivity and employment;

⇒ To identify production and employment turnaround strategies including redeployment strategies; and

⇒ To implement strategies agreed upon by both company and worker representatives.

- Alternatives: PetroSA proposes to investigate other alternatives to extend the life of the refinery beyond the additional four years the SCG project provides.
- Social Plan: PetroSA will implement their existing Social Plan to assist retrenched employees. The Social Plan, which is divided into two components (namely Social and Psychological Support), aims to assist individuals to counteract the negative effects of retrenchment, enabling them to build selfconfidence, become motivated, identify options available, make informed decisions and put these into action. To achieve this PetroSA proposes to create a Social Plan Budget and set up a Career Transition Centre in Mossel Bay with a satellite in Cape Town to help retrenched employees.

1.10 ENVIRONMENTAL AWARENESS PLAN

Environmental Awareness will be undertaken as part of the normal operational PetroSA Safety Health Environmental and Quality system whereby:

- Environmental training needs are identified by means of a needs analysis;
- An environmental training plan to address the defined needs is developed;
- All environmental training courses to be presented are certified by the National Qualifications Framework (NQF);
- An environmental training register of personnel and courses completed is maintained.

Training media includes induction training for all new employees, SHEQ alerts and toolbox talks as well as external courses according to the employees' job responsibilities.

1.11 MONITORING AND EMP PERFORMANCE ASSESSMENT

Auditing / monitoring at the F-A Platform will be undertaken as at present. Various audits are undertaken as part of PetroSA's current operation. These include:

1. Annual assessment of the Occupational Health and Safety (OHS) Management System based on the requirements of CAP™ and OHSAS 18001 at PetroSA F-A Platform by a registered independent company;
2. Three yearly ISO 14001 certification with annual surveillance audits;
3. Annual certificate of fitness of offshore installation by Lloyd's Register;
4. Annual Department of Minerals & Energy Health & Safety audit;
5. Annual National Key Point Audit by South African Police Service; and
6. Audit of helicopters by CHC Africa (Pty) Ltd (every second year).

Copies of the above mentioned audits are provided in Appendix 3.

It should also be noted that monitoring and performance assessments would also be undertaken during well closure for inclusion in the Close-Out Reports prepared for each well.

1.12 UNDERTAKING BY THE APPLICANT

PetroSA undertakes to comply with the provisions of the Act and Regulations thereto (see Appendix 4).

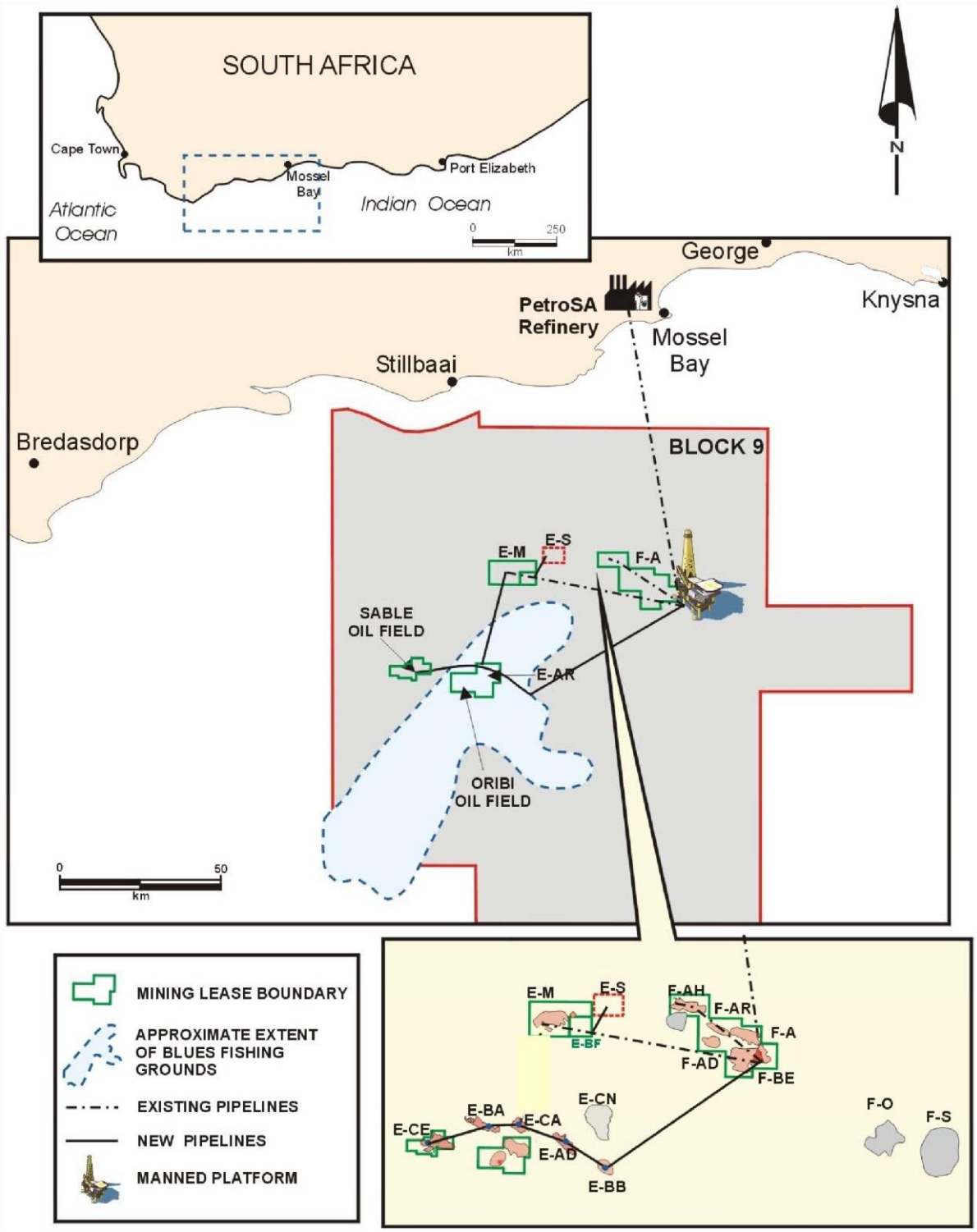
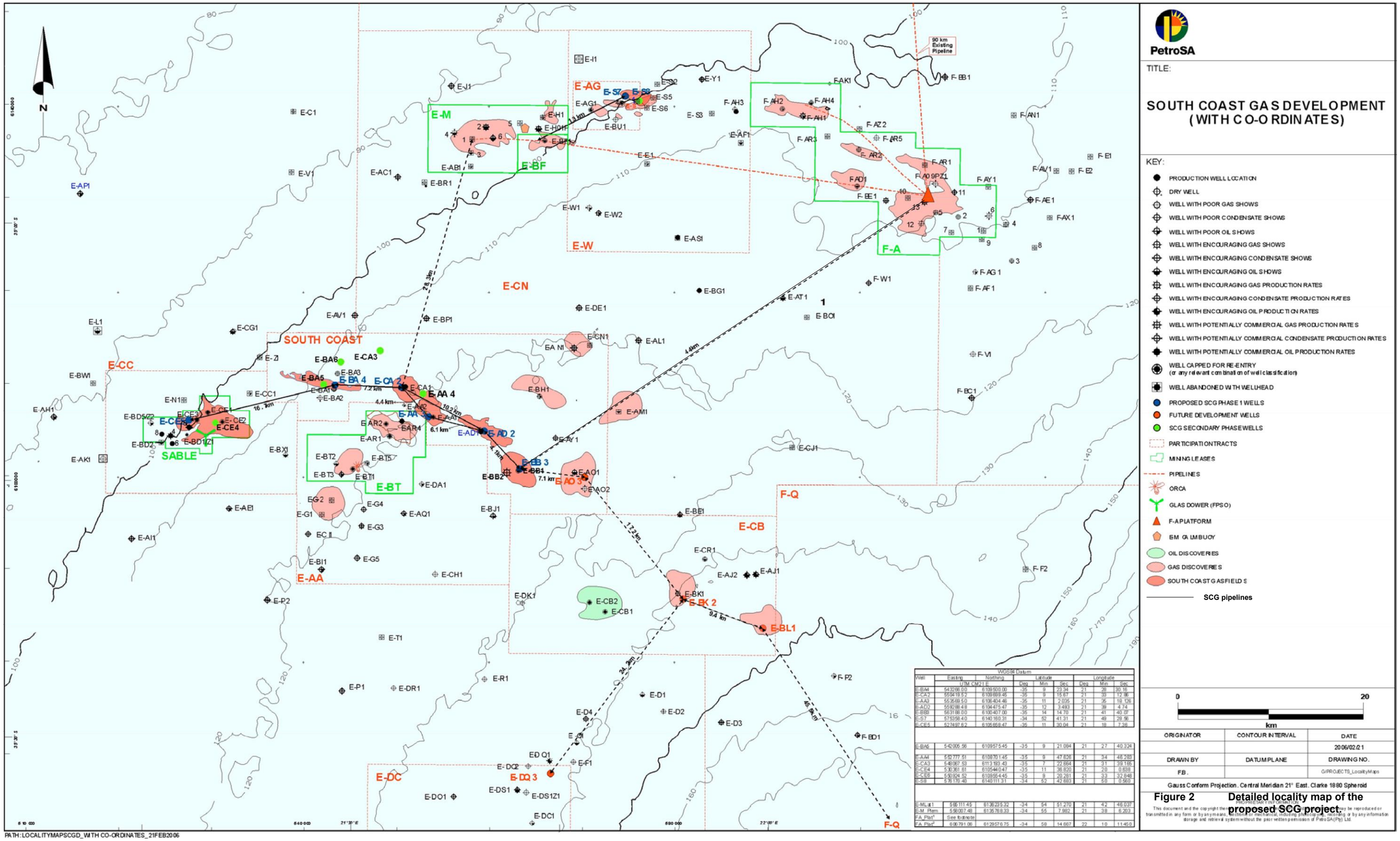


Figure 1: **Locality map of the proposed SCG development.**



Well	Easting	Northing	Latitude			Longitude		
	UTM CM21 E		Deg	Min	Sec	Deg	Min	Sec
E-BA4	5432660.00	6109500.00	-35	9	23.34	21	29	30.16
E-CA2	5559119.52	6108869.45	-35	9	15.97	21	38	12.86
E-AA3	5535689.50	6106404.46	-35	11	2.035	21	35	18.126
E-AO2	5592884.48	6104475.47	-35	12	3.493	21	39	4.74
E-BB3	5631880.00	6100407.00	-35	14	14.70	21	41	40.07
E-S7	5753584.40	6140169.31	-34	52	41.31	21	49	28.56
E-CE5	5274972.62	6105658.47	-35	11	30.04	21	18	7.38
E-BA6	5402005.56	6109575.45	-35	9	21.084	21	27	40.324
E-AA4	5527771.51	6108761.45	-35	8	47.626	21	34	46.288
E-CA3	5480967.53	6113193.43	-35	7	22.864	21	31	39.185
E-CE4	5300361.81	6105440.47	-35	11	36.820	21	28	0.638
E-CE6	5509245.52	6108955.445	-35	9	20.281	21	33	32.848
E-S8	5761704.40	6140111.31	-34	52	42.683	21	58	0.560
E-ML1	5851114.45	6136235.32	-34	54	51.270	21	42	48.037
E-M Prem	5780074.48	6135768.33	-34	55	7.982	21	38	6.203
FA Plat[1]	See footnote							
FA Plat[2]	6007911.06	6129576.75	-34	58	14.667	22	10	11.450

Figure 2 Detailed locality map of the proposed SCG project.

Figure 2 Proposed Production Right Area known as South Coast Gas in relation to other Production Right area

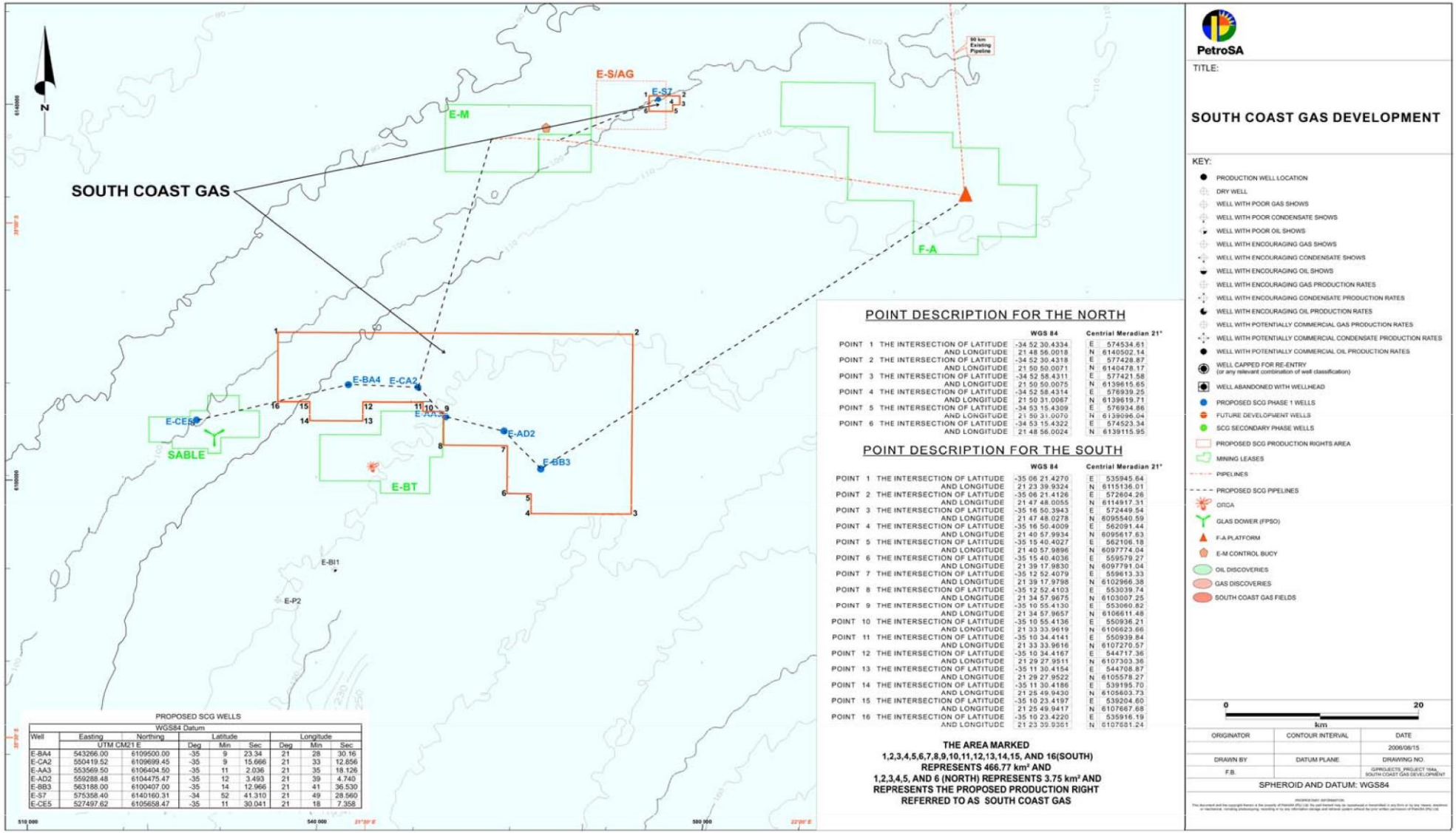


Figure 3 **Proposed Production Right Area known as South Coast Gas.**

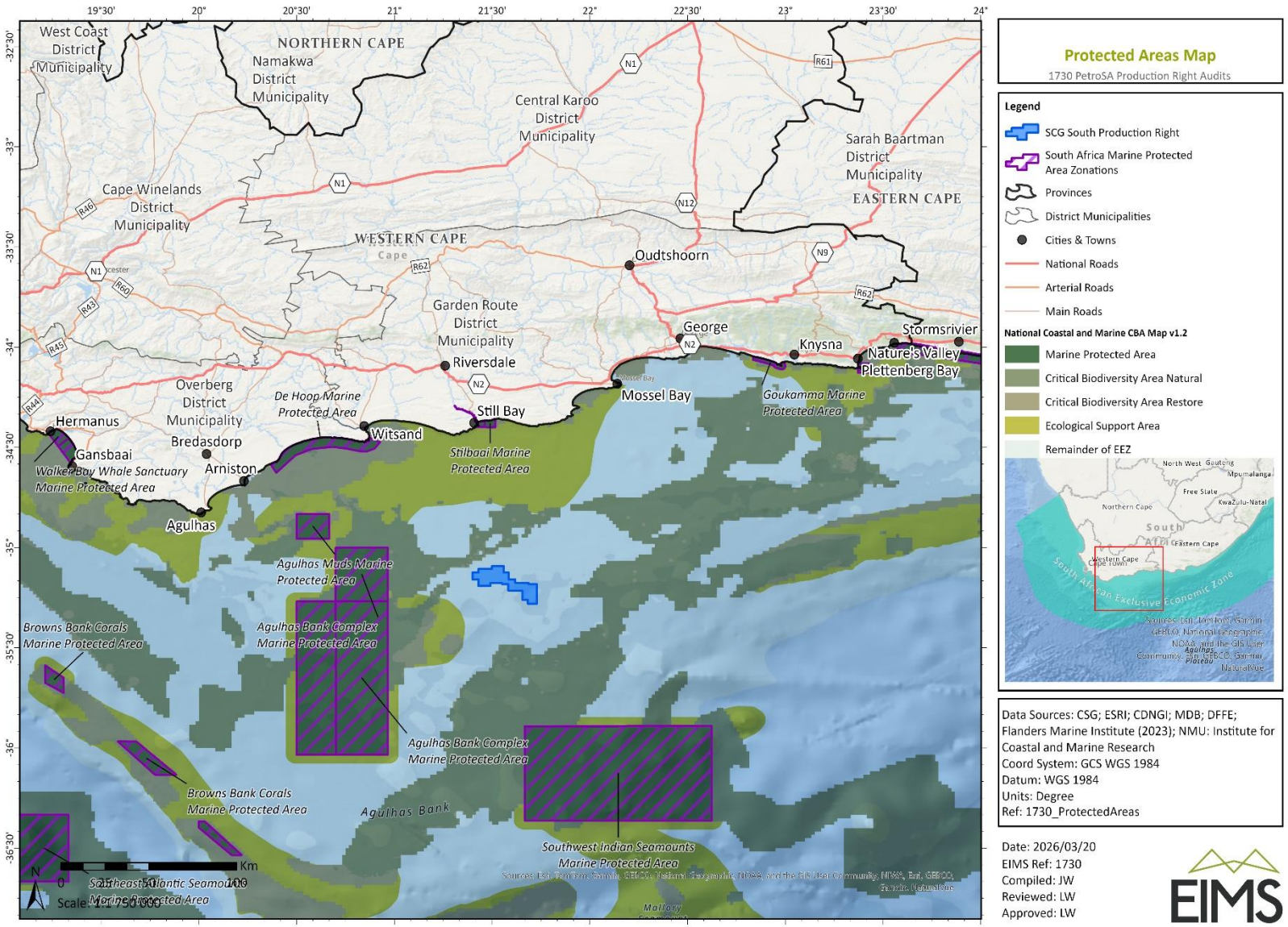


Figure 4 Proposed Production Right Area known as South Coast Gas in relation to marine protected areas.

A. DEVELOPMENT WELL DRILLING B. PIPE PIPE-LAYING AND CONSTRUCTION OF ASSOCIATED INFRASTRUCTURE C. GAS FIELD OPERATION

ENVIRONMENTAL MANAGEMENT PROGRAMME

DEVELOPMENT WELL DRILLING

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NOTE: Exploration well drilling has commenced under PetroSA's approved EMPR (i.e. "EMP for prospect well drilling in Block 9") and environmental notifications to that effect have been issued to PASA prior to the commencement of drilling for each well. These wells, if successful, have been plugged and suspended for later production hook up. Therefore, this EMP relates only to those wells that still need to be drilled when this EMP is approved.

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
1. PRE-ESTABLISHMENT PHASE						
1.1 PRE-OPERATION PLANNING	*Accommodation of needs for environmental monitoring and liaison with fishing industry*	Communicate with fishing operators and vessels regarding exclusion areas around the rig(s) and timing of the operation in order to minimise disruption to the operation and other activities in the area.		PetroSA	Prior to commencement of operation	Provide records of meetings held and copies of all correspondence
1.2 FINANCIAL PROVISION	*Compliance with legislative requirements* PASA requirement (Mineral and Petroleum Resources Development Act 28 of 2002)	Ensure that financial provision is in place to execute the requirements of this EMP.		PetroSA and Drilling Contractor	Prior to commencement of operation	Confirm that financial provision for EMP has been put in place
1.3 PREPARATION FOR EMERGENCIES	*Preparation for any emergency that could result in an environmental impact* ~~DME~~ DMPR, PASA, ~~DEAT~~ DFFE and SAMSA requirements	Are the following emergency plans, equipment and personnel in place to deal with all emergencies: • Company Emergency Response Plan, including MEDIVAC plan; • Company Oil Spill Contingency Plan; • Rig Contractor Emergency Response Plan; • Support Vessel Contractor Emergency Response Plan;		PetroSA and Drilling Contractor	Prior to commencement of operation	Confirm compliance and justify any omissions

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
	Mine Health and Safety Act regulations MARPOL	• Helicopter Operator Emergency Response Plan; • South African Search and Rescue (SASAR) Manual; • The drilling unit's own Oil Pollution Emergency Plan approved by the South African Maritime Safety Authority (SAMSA); • Pollution Safety Certificate(s) for the drilling rig(s), issued by SAMSA; and • Adequate protection and indemnity insurance cover for oil pollution incidents. Note that in case of a major oil spill, emergency responses and/or Oil Pollution Contingency Plan(s) refer to the coastal oil spill contingency plan(s) of ~~DEAT~~ DFFE.				
1.4 APPROVAL OF EMP AND ENVIRONMENTAL NOTIFICATION DOCUMENTS	*Compliance with legislative requirements* ~~DME~~ DMPR, PASA and ~~DEAT~~ DFFE requirements	Ensure that the following documents have been approved: • Scoping Report and Environmental Impact Report for SCG development Project; • EMP report for the Production Rights area; and		PetroSA	Prior to commencement of operation	Provide copy of EMP approval
		Ensure that any alteration or modifications are submitted to PASA ~~and DEAT~~ for approval.		PetroSA	As required	Provide copy of EMP approval
1.5 PRE-MINING WELL SITE SURVEY	*Reduce the risk of an uncontrolled release of gas*	Acquire high-resolution seismic data to detect shallow gas pockets.		PetroSA	Prior to commencement of operation	
~~**1.6 ESTABLISH AN EMC**~~	~~*Compliance with ROD*~~ ~~DEAT requirement~~	~~Establish an Environmental Monitoring Committee (EMC). The EMC shall be comprised of government authorities (local, provincial and national), Non-governmental Organisations, Community-based Organisations, Civil Society and Private Sector. The EMC's role shall be:~~ • ~~Regular and participative monitoring and review of PetroSA's adherence to the ROD, monitoring reports / data during the operation and decommissioning phases, and EIR mitigation measures;~~ • ~~Informing DEAT and other relevant authorities of non-compliance with the ROD;~~		~~PetroSA~~	~~Prior to commencement of operation and throughout operation and decommissioning~~	

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
		• ~~Promoting participation of key stakeholders;~~ • ~~Providing a forum for discussing issues related to the South Coast Gas project and monitoring / review;~~ • ~~Supervision and management of Environmental Control Officer (ECO); and Providing a forum for establishing a fund, as a trade-off, together with the fishing industry.~~				
		~~Report EMC findings to DEAT.~~		~~EMC~~	~~Quarterly~~	
1.7 APPOINT AN ECO	*Compliance with ROD* ~~DEAT~~ DFFE requirement	Appoint an ECO or suitablly qualified person to ensure compliance with ROD conditions, Environmental Impact Report (PSA04SCG/FEIR, dated Aug 06) recommendations and Environmental Management Programme.		PetroSA ~~EMC~~	Prior to commencement of operation	
1.8 ~~DEAT~~ PASA NOTIFICATION	*Compliance with ROD* ~~DEAT~~ DFFE requirement	Notify ~~DEAT~~ PASA of the commencement of well-drilling / construction activities.		PetroSA	One week prior to construction commencing	Provide copy of standard notice notification
2. ESTABLISHMENT PHASE						
2.1 COMPLIANCE WITH ENVIRONMENTAL MANAGEMENT PROGRAMME	*Operator and contractor to commit to adherence to EMP* Mineral & Petroleum Resources Development Act 28 of 2002; ~~DME~~ DMPR Guideline Document and PASA requirement	• Ensure that a copy of the approved EMP report is on board the drilling unit(s) during the operation. • Ensure procedures and systems for compliance are in place. • Appropriately inform the drilling unit's personnel of the purpose and requirements of the EMP. • Ensure correct equipment and personnel are available to meet the requirements of the EMP. • Ensure responsibilities are allocated to personnel. • Operator to commit organisation and contractor to meet the requirements of the EMP.		PetroSA and Offshore Installation Manager (OIM)	Prior to commencement of operation	Ensure that a copy of the EMP report is provided to the OIM and that an acknowledgment of receipt form is signed by the OIM

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
2.2 NOTIFYING OTHER USERS OF THE SEA	*Ensure that other users are aware of the forthcoming drilling programme* Safety of Life at Sea Convention and Maritime Safety Authority Act 5 of 1998	In writing, request the SAN Hydrographic Office (Silvermine) to release Radio Navigation Warnings and Notices to Mariners throughout the well-drilling period.		PetroSA	7 days prior to start	Confirm that notices were sent to relevant parties Provide copy of standard notice and list of those to whom it was sent
		Notify the following interested and affected parties in order to keep them updated on the drilling programme: • Overlapping and neighbouring users with delineated boundaries in the marine petroleum prospecting and mining industries; • South African and foreign fishing vessels, who can be informed through the recognised fishing associations and Marine and Coastal Management Section of ~~DEAT~~ DFFE, examples include the SA Deep Sea Trawling Association and the South East Coast Inshore Fishing Association, although communication with fishing companies and agents is also advised; • Government departments with jurisdiction over marine activities, particularly ~~DEAT~~ DFFE, ~~DME~~ DMPR and PASA; and • SAMSA and local Port Captains. Notice should include dates and durations of drilling, location/s (co-ordinates) and point out the presence of the 500 m exclusions zone around drilling unit. *Note: Contact details are given in Appendix 5.*		PetroSA	2 days prior to start	
2.3 WELL / ANCHOR POSITION TO AVOID ANY OTHER SEABED OBSTACLES / INSTALLATIONS	*Ensure that well / anchor positions will not affect other obstacles / installations on the seabed*	Ensure that no other mining/exploration activity, pipeline or telecommunication cable will be affected by the drilling activities. Ensure that known ammunitions dumping grounds are avoided. Avoid any shipwrecks and any other cultural heritage / archaeological material. Notify the South African Heritage Resource Agency (SAHRA) regarding requirements to disturb any such wrecks or any cultural heritage / archaeological material		PetroSA	Prior to drilling or as required	Copy of permit from SAHRA (if required) Provide copy of notification

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
2.4 RIG INSTALLATION, ANCHOR LAYING AND SUBSEA INFRASTRUCTURE INSTALLATION	*Minimise disturbance to the sea floor*	Ensure that no construction debris or dropped equipment that may be detrimental to environment or other users of the sea is left on the seafloor.		Drilling Contractor	Throughout installation	Provide log of lost objects
2.5 ENSURE INTEGRITY OF ANCHOR SYSTEM	*Reduce environmental risk by minimising risk of failures during operation*	Undertake and/or have in place the following in order to minimise environmental risk: • A hazard identification and risk assessment document; • The Contractor must apply relevant national codes and standards in accordance with good oilfield practice; • The Contractor must operate in accordance with procedures laid down in the vessel's marine operations manual as approved by the relevant classification society; • All anchor chains and anchors must be certified; and • The rig(s) must be maintained to class standard throughout the project.		Drilling Contractor	Prior to and throughout drilling operation	
2.6 ENSURE SEAWORTHINESS OF RIG	*Reduce risk of an offshore incident / accident*	Vessels must be certified for seaworthiness through an appropriate internationally recognised certification programme (e.g. Lloyds Register, Det Norske Veritas).		Drilling Contractor	Prior to and throughout drilling operation	Provide a copy of the vessels sea worthiness certificate
3. OPERATIONAL PHASE			✓			
3.1 ADHERENCE TO THE EMP	*Operate in an environmentally responsible manner*	• Comply fully with the EMP (compliance would mean that all activities were undertaken successfully and details recorded and included in the Close-out Report). • Subscribe to the principles of an internationally acceptable Environmental Management System onboard the drill rig(s) and support vessels. This includes environmental awareness training, waste management, environmental monitoring, record keeping and continuous improvement.		PetroSA and Drilling Contractor	Throughout drilling operation	Provide copies of records

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
	Mineral & Petroleum Resources Development Act 28 of 2002 and ~~draft~~ ~~DME~~ NEMA regulations for auditing	• Ensure all hazardous materials are correctly labelled, stored, packed and sealed with proper markings for shipping.				
		A copy of the EMP must be supplied to all Contractors.		PetroSA	Throughout operation	
3.2 CONTINUE TO COMMUNICATE WITH OTHER USERS OF THE SEA AND RESOURCE MANAGERS	*Promote co-operation and successful multiple use of the sea, including promotion of safe navigation* ~~DME~~ DMPR EMP report requirements ISO 14001 Compliance Maritime Safety Authority Act 5 of 1998	Through normal communication channels, Radio Navigation Warnings and Notices to Mariners, keep the following interested and affected parties updated on the drilling programme: • Overlapping and neighbouring users with delineated boundaries in the marine petroleum prospecting and mining industries; • South African and foreign fishing vessels, who can be informed through the recognised fishing associations and Marine and Coastal Management Section of ~~DEAT~~ DFFE, examples include the SA Deep Sea Trawling Association and the South East Coast Inshore Fishing Association, although communication with fishing companies and agents is also advised; • Government departments with jurisdiction over marine activities, particularly ~~DEAT~~ DFFE, ~~DME~~ DMPR and PASA; and • SAN Hydrographer, SAMSA and local Port Captains.		PetroSA	During compilation of EMP report, as well as during operations as required	
		Take steps to share information and co-operate with other marine users and resource managers in the marine environment generally, to mutual benefit.		PetroSA	During, and on completion of drilling	
		Keep constant watch for approaching vessels during operations and warn by radio and standby vessel, if required.		OIM	Throughout operation	

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
3.3 PREVENTION OF EMERGENCIES	*Minimise the chance of emergency and subsequent damage to the environment occurring* Navigation rights, safety and licensing requirements EMP report requirements	Prevent collisions by ensuring that the drilling unit displays correct signals by day and lights by night (including twilight), by visual radar watch and standby vessel(s). Service equipment regularly, and practice weekly, etc. (refer to Mine Health and Safety Act and regulations).		OIM	Throughout operation	
3.4 DEALING WITH EMERGENCIES	*Minimise damage to the environment by implementing response procedures efficiently* Prevention and Combating of Pollution of the Sea by Oil ~~Act 6 of 1981 (Marine Notices 2 of 1996 and 23 of 1998)~~ The Marine Pollution Act of 1981 ~~DEAT~~ DFFE & SAMSA policy ~~DEAT~~ DFFE Chief Directorate Marine Control: policy guidelines	In the event of an oil spill immediately implement: • the PetroSA Oil Spill Contingency Plan; and • the vessel's Emergency Response Plan. Adhere to obligations regarding other vessels in distress. Implement health and safety procedures (see emergency plans above). Notify SAMSA about wrecked vessels (safety and pollution) and the Department of Finance (salvage, customs, royalties). Give location details to SAN Hydrographer.		OIM	In event of spill	Record of all spills (Spill Record Book), including spill reports; emergency exercise reports; audit reports.

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
	EMP report requirements Law of the Sea Convention (LOSC) Merchant Shipping Act, Customs and Excise Act					
3.5 BLOW OUT PREVENTION DURING WELL DRILLING	*Ensure that the necessary safeguards are in place and avoid any uncontrolled release of drilling fluids and/or oil* Normal oil industry practice Safety design manual	Blow out preventers (BOPs) must be appropriate for the intended use. Fully inspect the BOPs on the rig(s) in accordance with the American Petroleum Industries (API) recommended practices (or equivalent) prior to well drilling. Ensure that all responsible personnel are qualified in accordance with International Well Control Forum requirements or equal. Follow written and internationally established procedures for well control. Identify hazards and put risk control systems in place. Implement monitoring and management to assist in the detection of uncontrolled gas releases.		OIM / Tool pusher	Prior to commencing drilling	

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
3.6 DISPOSAL OF DRILLING MUDS AND CUTTINGS	*Minimise discharges into the sea*	Optimally recycle the mud for use downhole to minimise mud disposal overboard and reduce concentrations of mud chemicals released. Use water-based (rather than the more toxic oil-based drilling muds) where possible and use low toxicity mud additives. *Note that the use of any oil-based mud requires a special application to ~~DME~~ DMPR*. In addition, the following measures should be implemented if nonaqueous drilling fluids (NADF) are used: • The drilling fluid should be centrifuged to remove as much of the finer particles. • Only Synthetic Based Drilling Fluid (OGP Type III) should be used with a low polycyclic aromatic hydrocarbon (PAH) content. • All recovered NADF should be stored on board and taken to shore for treatment and reuse. • NADF cuttings should also be stored on board for onshore disposal or should be treated to reduce to oil-content before discharge into the ocean. Estimate the volume of rock cuttings dumped onto the sea floor before connection of the marine riser pipe. Estimate the volume of cuttings disposed overboard.		Drilling Contractor	During drilling operation	Provide estimates of actual volumes of muds and cuttings disposed.
3.7 WELL TESTING	*Ensure that there are minimal discharges into the sea and minimise product burned*	Use high efficiency flare to maximise combustion of hydrocarbons. Use well control procedures to ensure that there are no discharges to the sea. For each drillstem flow test, provide an estimate of the volume of any oily discharge into the sea and the size of the resulting slick / sheen.		Drilling Contractor	During well testing	Quantity of gas burned

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
3.8 POLLUTION CONTROL AND WASTE MANAGEMENT of products disposed of: into the air (exhausts, CFCs and incinerators), to sea (sewage, food, oils), to land (used oils etc, metals, plastics, glass, etc)	*Minimise pollution, and maximise recycling by implementing and maintain pollution control and waste management procedures at all times.* MARPOL standards (in Marine Pollution Act 2 of 1986) Dumping at Sea Control Act Montreal protocol Water Act EMP report requirements	Implement the PetroSA waste management procedure (EP/SHE/PO/001). Comply with legal requirements for waste management and pollution control (for air and water quality levels at sea), and employ "good housekeeping" and monitoring practices. • General waste: Initiate a waste minimisation system. No disposal overboard. • Galley (food) waste: Dispose overboard after macerating according to MARPOL standard (less than 25 mm size) – prohibited if distance to nearest land is < 3 nautical miles. • Medical waste: Seal in aseptic containers for appropriate disposal ashore. • Neon lights: Crush discarded tubes and send to shore in designated, marked containers. • Metal: Send to shore for recycling or disposal. • Other waste: Send remaining waste to a licensed waste site. Ensure waste disposal is carried out in accordance with appropriate laws and ordinances. • Waste oil: Return used oil to a port with a registered facility for processing or disposal. • Empty oil drums: Not to be filled with chemicals. Send to shore for disposal / recycling. • Empty chemical containers: Mark and seal appropriately and send to shore for disposal / recycling. • CFCs: Limit CFC based fire-fighting or refrigeration equipment. • Wastewater: Comply with MARPOL. • Minor oil spill: Use oil absorbent. • Emissions to the atmosphere: Properly tune and maintain all engines, motors, generators and all auxiliary power to contain the minimum of soot and unburned diesel.		Drilling Contractor	Throughout operations	Provide summary of waste record book / schedule and receipts Report occurrence of minor oil spills and destination of wastes

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
		• Deck drainage: Ensure that weather decks are kept free of spillage. Mop up any spills immediately with biodegradable low toxicity detergents. • Machinery space drainage: Drilling unit and supply vessels must comply with international agreed standards regulated under MARPOL. • Sewage - use approved treatment plants to the MARPOL standard. Record types and volumes of chemical and hazardous substances brought on board (e.g. radioactive devices/materials, neon lights, toner cartridges, etc.) and destination of wastes. Ensure that waste returned to port is disposed of by a licensed waste disposal contractor using an approved landfill site.				
3.9 TRANSPORT, STORAGE AND HANDLING OF RADIOACTIVE DEVICES	*Avoid human and environmental exposure to radioactive material* International Commission on Radiological Protection	Comply with necessary regulations for the transport, storage and handling of radioactive devices. Transport and store radioactive devices in specially designed secured (locked) storage containers. Designate competent person/s in charge and to handle the radioactive devices. Follow strict approved procedures when handling the devices. Wear personal monitoring devices to measure any unusual exposure. Follow radioactive sources procedure. When radioactive sources are to be used, secure the area between and around the storage containers and the floor and only allowed key personnel in the area. Set up incident and emergency reporting procedures for actual or suspected individual over-exposure, theft or loss, logging tools stuck downhole in wells, and release or spillage into the environment. Test the sources every three to six months to document leak levels.		PetroSA / Drilling Contractor / Transport contractor	Throughout operations	Provide results from routine tests on radioactive sources to determine leak levels

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
3.10 EXCLUSION OF OTHER MARINE USERS FROM ACCESS TO THE OPERATIONAL AREA FOR SAFETY REASONS (shipping, including fishing and mining vessels)	*Minimise disruption to other legitimate users of the sea by respecting their rights.* Specialist advice Marine Traffic Act and International Law of the Sea EMP report requirements	Co-operate with other legitimate users of the sea to minimise disruption to other marine activities and marine life.		PetroSA / OIM	Throughout operations	
		Use effective communication channels (see section 2.2) to inform all other potential users about the location, timing, priority of passage and size of exclusion zones (500 m from edge of the rig). To avoid any interference with anchors and anchor chains it is suggested that the Notice to Mariners advises of a stay clear area of 1 500 m from the corners of the drilling unit(s).		PetroSA / OIM	Throughout operations	Record any incidents outside of normal occurrence
3.11 EQUIPMENT LOSS	*Minimise hazards left on the seabed or floating in the water column, and inform relevant parties* Dumping at Sea Control Act 73 of 1980. Mineral & Petroleum Resources Development Act 28 of 2002	Keep a record of lost equipment and all items lost overboard and not recovered. When any items that constitute a seafloor or navigational hazard are lost on the seabed, or in the sea, complete a standard form / record sheet, which records the date and cause of loss, details of equipment type, etc.		Drilling Contractor	Throughout operation	Provide a list of lost equipment and a copy of record sheet
		Pass information to PASA, SAMSA and ~~DME~~ DMPR. Notify SAN Hydrographer, relevant mining companies and fishing associations. SAN Hydrographer will send out Notice to Mariners with this information.		PetroSA		

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
3.12 REFUELLING AT SEA	*Minimise disturbance / damage to marine life.* MARPOL 73/78 (Annex 1); PACOPOSOA (Prevention and Combatting of Pollution of the Sea by Oil Act) Amendment Act 24 of 91, Marine Pollution (Control and Civil Liability) Act 6 of 1981 EMP report requirement	No discharge of any oil whatsoever is permitted within 50 nautical miles of the coast.		Drilling Contractor	Throughout operation	
3.13 USE OF HELICOPTERS for crew changes, servicing, etc.	*Minimise disturbance / damage to marine and coastal life.* Marine Living Resources Act 18 of 1998; Sea Birds and Seal Protection Act 46 of 73, 1963 Air Navigation Regulations	Establish, with pilots, flight paths that do not over-pass Ramsar sites, islands, coastal reserves, bird and seal breeding colonies or bird breeding colonies / sanctuaries on the coast (minimum altitudes of 2000 feet above ground level over nature conservation areas). Extensive coastal flights (parallel to the coast within 1 nautical mile of the shore) are limited on the south coast between the months of June and November to avoid southern right whale nursery areas. Aircraft may not approach to within 300 m of whales. Deviations from set flight plans must be reported.		PetroSA / Helicopter contractor	As required	Submit copy of set flight path

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
4. DEMOBILISATION PHASE						
4.1 WELL COMPLETION	*Ensure that there are no leakages*	Place Xmas trees on the wellheads and ensure they are sealed off.		Drilling Contractor	On completion of well drilling	
4.2 DRILLING UNIT TO LEAVE AREA	*Leave area as it was prior to well drilling*	Ensure that all equipment not required for gas production is retrieved from the seafloor.		Drilling Contractor	On completion of well drilling	Confirm through seabed scan and/or video
4.3 INFORM RELEVANT PARTIES OF COMPLETION OF WELL DRILLING	*Ensure that relevant parties are aware that the drilling campaign is complete*	Inform the SA Navy Hydrographic Office that the rig is off location. Notify fishing operators and vessels through recognised fishing associations (see Section 2.2). Notify PASA and SAMSA ~~and DEAT~~.		PetroSA	Directly after completion of drilling operation	Copies of notification documentation required
4.4 FINAL WASTE DISPOSAL	*Minimise pollution and ensure correct disposal of waste.* ~~Environmental Conservation Act (73 of 89)~~ Environmental Management Act (107 of 1998)	Dispose all waste retained onboard at a licensed waste site using a licensed waste disposal contractor.		Contractor via ship's agent	When vessel is in port	Receipt required from waste contractor
5. MONITORING, COMPLIANCE AUDITING AND THE SUBMISSION OF INFORMATION PHASE						
5.1 PERFORMANCE ASSESSMENT / MONITORING ACTIVITIES AND EFFECTS	*Implement the ongoing monitoring programmes (in conjunction with government if required)*	Undertake appropriate monitoring (as per specific topics), and track performance against objectives and targets. Document all activities and results for internal and external auditing. Encourage monitoring/observation of marine animals, including: • Marine mammals, penguins and turtles sighted from the rig;		PetroSA and Drilling Contractor	Daily throughout operations	Provide all recorded information

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
	Mineral & Petroleum Resources Development Act 28 of 2002 (Regulation 55)	• Record any unusual bird sightings; • Record actual bird reaction to lights and real incidents of injury or death. Ringed or banded birds should be reported to the appropriate scheme (details on ring); Keeping any disorientated seabirds in dark containers (e.g. cardboard boxes) for release during daylight hours • Freeze any dead birds and make available to appropriate museums for research; and • Interaction with other vessels.			The frequency of performance assessments shall be as recommended by the relevant Director: Mineral Development	
5.2 COMPILE WELL DRILLING "CLOSEOUT" REPORT for all activities relating to environmental management	*Ensure corrective action and compliance and contribute towards improvement of EMP implementation* Mineral & Petroleum Resources Development Act 28 of 2002 ~~and performance assessment and monitoring guidelines~~	• An operation specific Close-out Report must be compiled subsequent to completion of each well drilling operation. • Close–out Report must be based on requirements of the monitoring and EMP ~~Performance Assessment~~ audits. • Provide information / records as indicated in the Close-out Report column of the EMP and the model Close-out Report within 90 days of the drilling operation. • Provide copy of report to the relevant regional office of ~~DME~~ DMPR and to PASA. Provide a copy of any video footage that was shot during the course • of the drilling operation to PASA.		PetroSA PetroSA	On completion of well drilling On completion of close-out report	

PIPE-LAYING AND CONSTRUCTION OF ASSOCIATED INFRASTRUCTURE

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1. PRE-ESTABLISHMENT PHASE						
1.1 PRE-OPERATION PLANNING	*Accommodation of needs for environmental monitoring and liaison with fishing industry*	Communicate with fishing operators and vessels regarding exclusion areas around the pipe-laying vessel and timing of the operation in order to minimise disruption to the operation and other activities in the area		PetroSA	Prior to commencement of operation	Provide records of meetings held and copies of all correspondence
1.2 FINANCIAL PROVISION	*Compliance with legislative requirements* PASA requirement (Mineral and Petroleum Resources Development Act 28 of 2002)	Ensure that financial provision is in place to execute the requirements of this EMP.		PetroSA	Prior to commencement of operation	Confirm that financial provision for EMP has been put in place
1.3 PREPARATION FOR EMERGENCIES	*Preparation for any emergency that could result in an environmental impact* ~~DME~~ DMPR, PASA, ~~DEAT~~ DFFE and SAMSA requirements Mine Health and Safety Act regulations MARPOL	Ensure the following emergency plans, equipment and personnel are in place to deal with all emergencies: • Company Emergency Response Plan, including MEDIVAC plan; • Company Oil Spill Contingency Plan; • Vessel Contractor Emergency Response Bridging Document; • Helicopter Operator Emergency Response Plan; • South African Search and Rescue (SASAR) Manual; and • Adequate protection and indemnity insurance cover for oil pollution incidents.		PetroSA / Pipe-laying Contractor	Prior to commencement of operation	Confirm compliance and justify any omissions

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
1.4 APPROVAL OF EIA and EMP	*Compliance with legislative requirements* ~~DME~~ DMPR, PASA and ~~DEAT~~ DFFE requirements	Ensure that the following documents have been approved: • Scoping Report and Environmental Impact Report for SCG development Project; and • EMP report for the Production Right area.		PetroSA	Prior to commencement of construction	Provide copy of EMP approval
		Ensure that any alteration or modifications are submitted to PASA ~~and DEAT~~ for approval.		PetroSA	As required	Provide copy of EMP approval
~~**1.5 ESTABLISH AN EMC**~~	~~*Compliance with ROD*~~ ~~DEAT requirement~~	~~Establish an Environmental Monitoring Committee (EMC). The EMC shall be comprised of government authorities (local, provincial and national), Non-governmental Organisations, Community based Organisations, Civil Society and Private Sector. The EMC's role shall be:~~ • ~~Regular and participative monitoring and review of PetroSA's adherence to the ROD, monitoring reports / data during the operation and decommissioning phases, and EIR mitigation measures;~~ • ~~Informing DEAT and other relevant authorities of non-compliance with the ROD;~~ • ~~Promoting participation of key stakeholders;~~ • ~~Providing a forum for discussing issues related to the South Coast Gas project and monitoring / review;~~ • ~~Supervision and management of Environmental Control Officer (ECO); and~~ • ~~Providing a forum for establishing a fund, as a trade-off, together with the fishing industry.~~		~~PetroSA~~	~~Prior to commencement of operation and throughout operation and decommissioning~~	
		~~Report EMC findings to DEAT.~~		~~EMC~~	~~Quarterly~~	
1.6 APPOINT AN ECO	*Compliance with ROD* ~~DEAT~~ DFFE requirement	Appoint an ECO or suitably qualified person to ensure compliance with ROD conditions, Environmental Impact Report (PSA04SCG/FEIR, dated Aug 06) recommendations and Environmental Management Programme.		PetroSA ~~EMC~~	Prior to commencement of operation	

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
1.7 ~~DEAT~~ PASA NOTIFICATION	*Compliance with ROD* ~~DEAT~~ DFFE requirement	Notify ~~DEAT~~PASA of the commencement of pipe-laying / construction activities.		PetroSA	One week prior to construction commencing	Provide copy of standard notice notification
2. ESTABLISHMENT PHASE						
2.1 COMPLIANCE WITH ENVIRONMENTAL MANAGEMENT PROGRAMME	*Operator and contractor to commit to adherence to EMP* Mineral & Petroleum Resources Development Act 28 of 2002; ~~DME~~ DMPR Guideline Document and PASA requirement	• Ensure that a copy of the approved EMP report is on board the pipe-laying vessel during the operation. • Ensure procedures and systems for compliance are in place. • Appropriately inform the pipe-laying and support vessel's personnel of the purpose and requirements of the EMP. • Ensure correct equipment and personnel are available to meet the requirements of the EMP. • Ensure responsibilities are allocated to personnel. • Operator to commit organisation and contractor to meet the requirements of the EMP.		PetroSA and Contractors	Prior to commencement of operation	Ensure that a copy of the EMP report is provided and that an acknowledgment of receipt form is obtained from the vessel(s)
2.2 NOTIFYING OTHER USERS OF THE SEA	*Ensure that other users are aware of the* forthcoming pipelaying programme Safety of Life at Sea Convention and Maritime Safety Authority Act 5 of 1998	In writing, request the SAN Hydrographic Office (Silvermine) to release Radio Navigation Warnings and Notices Mariners throughout the pipe-laying period.		PetroSA	7 days prior to start	Confirm that notices were sent to relevant parties
		Notify the following interested and affected parties in order to keep them updated on the pipe-laying programme: • Overlapping and neighbouring users with delineated boundaries in the marine petroleum prospecting and mining industries; • Government departments with jurisdiction over marine activities, particularly ~~DEAT~~ DFFE, ~~DME~~ DMPR and PASA; • SAMSA and local Port Captains; and		PetroSA	2 days prior to start	Provide copy of standard notice and list of those to whom it was sent

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
		• South African and foreign fishing vessels, who can be informed through the recognised fishing associations and Marine and Coastal Management Section of ~~DEAT~~ DFFE, examples include the SA Deep Sea Trawling Association and the South East Coast Inshore Fishing Association, although communication with fishing companies and agents is also advised. Notice should include dates and durations of pipe-laying, location/s (co-ordinates) and point out the presence of the 500 m safety zone on either side of the pipeline. *Note: Contact details are given in Appendix 5.*				
2.3 PIPE / ANCHOR POSITION TO AVOID ANY OTHER SEABED OBSTACLES / INSTALLATIONS	*Ensure that anchor positions will not affect other obstacles / installations on the seabed*	Ensure that no other mining/exploration activity, pipeline or telecommunication cable will be affected by the pipe-laying activities. Ensure that known ammunitions dumping grounds are avoided. Avoid any shipwrecks and any other cultural heritage material. Notify the South African Heritage Resource Agency (SAHRA) regarding requirements to disturb any such wrecks or any cultural heritage / archaeological material.		PetroSA	Prior to pipelaying or as required	Copy of permit from SAHRA (if required) Provide copy of notification
2.4 PIPE INSTALLATION AND ANCHOR LAYING	*Minimise disturbance to the sea floor*	Ensure that no construction debris or dropped equipment that may be detrimental to environment or other users of the sea is left on the seafloor.		Contractor	Throughout installation	Provide log of lost objects
2.5 ENSURE INTEGRITY OF ANCHOR SYSTEM	*Reduce environmental risk by minimising risk of failures during operation*	Undertake and/or have in place the following in order to minimise environmental risk: • The Contractor must apply relevant national codes and standards in accordance with good oilfield practice; • The Contractor must operate in accordance with procedures laid down in the vessel's marine operations manual as approved by the relevant classification society;		Contractor	Prior to and throughout pipelaying operation	

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
		• All anchor chains and anchors must be certified; and • The pipe-laying vessel must be maintained to class standard throughout the project.				
2.6 ENSURE SEAWORTHINESS OF VESSEL	*Reduce risk of an offshore incident / accident*	Vessels must be certified for seaworthiness through an appropriate internationally recognised certification programme (e.g. Lloyds Register, Det Norske Veritas).		Contractor	Prior to and throughout pipelaying operation	Provide a copy of the vessels sea worthiness certificate
3. OPERATIONAL PHASE						
3.1 ADHERENCE TO THE EMP	*Operate in an environmentally responsible manner* Mineral & Petroleum Resources Development Act 28 of 2002 and ~~draft~~ NEMA regulations for auditing	• Comply fully with the EMP (compliance would mean that all activities were undertaken successfully and details recorded and included in the Close-out Report). • Subscribe to the principles of an internationally acceptable Environmental Management System onboard the pipe-laying vessel and support vessel(s). This includes environmental awareness training, waste management, environmental monitoring, record keeping and continuous improvement. • Ensure all hazardous materials are correctly labelled, stored, packed and sealed with proper markings for shipping.		PetroSA and Contractor	Throughout pipe-laying operation	Provide copies of records
		A copy of the EMP must be supplied to all Contractors.		PetroSA	Throughout pipe-laying operation	
3.2 CONTINUE TO COMMUNICATE WITH OTHER USERS OF THE SEA AND RESOURCE MANAGERS	*Promote co-operation and successful multiple use of the sea, including promotion of safe navigation* ~~DME~~ DMPR EMP report requirements	Through normal communication channels, Radio Navigation Warnings and Notices to Mariners, keep the following interested and affected parties updated on the pipe-laying programme: • Overlapping and neighbouring users with delineated boundaries in the marine petroleum prospecting and mining industries; • South African and foreign fishing vessels, who can be informed through the recognised fishing associations and Marine and Coastal Management Section of ~~DEAT~~ DFFE, examples include the SA Deep Sea Trawling Association and the South East Coast Inshore Fishing Association, although communication with fishing companies and agents is also advised;		PetroSA	During compilation of EMP report, as well as during operations as required	

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	ISO 14001 Compliance Maritime Safety Authority Act 5 of 1998	• Government departments with jurisdiction over marine activities, particularly ~~DEAT~~ DFFE, ~~DME~~ DMPR and PASA; and • SAN Hydrographer, SAMSA and local Port Captains.				
		Take steps to share information and co-operate with other marine users and resource managers in the marine environment generally, to mutual benefit.		PetroSA	During and on completion of pipe-laying	
		Keep constant watch for approaching vessels during operations and warn by radio and standby vessel, where practical.		Contractor	Throughout operation	
3.3 PREVENTION OF EMERGENCIES	*Minimise the chance of emergency and subsequent damage to the environment occurring* Navigation rights, safety and licensing requirements EMP requirements	Prevent collisions by ensuring that the pipe-laying vessel displays correct signals by day and lights by night (including twilight) and by visual radar watch. Service equipment regularly, and practice weekly, etc. (refer to Mine Health and Safety Act and regulations).		Contractor	Throughout operation	
3.4 DEALING WITH EMERGENCIES	*Minimise damage to the environment by implementing response procedures efficiently* ~~DEAT~~ DFFE & SAMSA policy	In the event of an oil spill immediately implement: • the PetroSA Oil Spill Contingency Plan; and • the vessel's Emergency Response Plan. Adhere to obligations regarding other vessels in distress.		Contractor	In event of wreck or spill	Record of all wrecks and spills (Spill Record Book), including spill reports; emergency exercise reports; audit reports.

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	Prevention and Combating of Pollution of the Sea by Oil Act 6 of 1981 (Marine Notices 2 of 1996 and 23 of 1998) ~~DEAT~~ DFFE Chief Directorate Marine Control : policy guidelines EMP report requirements Law of the Sea Convention (LOSC) Merchant Shipping Act, Customs and Excise Act	Implement health and safety procedures (see emergency plans above). Notify SAMSA about wrecked vessels (safety and pollution) and the Department of Finance (salvage, customs, royalties). Give location details to SAN Hydrographer.				

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3.5 POLLUTION CONTROL AND WASTE MANAGEMENT of products disposed of: into the air (exhausts, CFCs and incinerators), to sea (sewage, food, oils), to land (used oils etc, metals, plastics, glass, etc)	*Minimise pollution, and maximise recycling by implementing and maintain pollution control and waste management procedures at all times*. MARPOL standards (in Marine Pollution Act 2 of 1986) Dumping at Sea Control Act Montreal protocol Water Act EMP report requirements	Comply with legal requirements for waste management and pollution control (for air and water quality levels at sea), and employ "good housekeeping" and monitoring practices. • General waste: Initiate a waste minimisation system. No disposal overboard. • Galley (food) waste: Dispose overboard after macerating according to MARPOL standard (less than 25 mm size) – prohibited if distance to nearest land is < 3 nautical miles. • Medical waste: Seal in aseptic containers for appropriate disposal ashore. • Neon lights: Crush discarded tubes and send to shore in designated, marked containers. • Metal: Send to shore for recycling or disposal. • Other waste: Send remaining waste to a licensed waste site. Ensure waste disposal is carried out in accordance with appropriate laws and ordinances. • Waste oil: Return used oil to a port with a registered facility for processing or disposal. • Empty oil drums: Not to be filled with chemicals. Send to shore for disposal / recycling. • Empty chemical containers: Mark and seal appropriately and send to shore for disposal / recycling. • CFCs: Limit CFC based fire-fighting or refrigeration equipment. • Wastewater: Comply with MARPOL. • Minor oil spill: Use oil absorbent. • Emissions to the atmosphere: Properly tune and maintain all engines, motors, generators and all auxiliary power to contain the minimum of soot and unburned diesel. • Deck drainage: Ensure that weather decks are kept free of spillage. Mop up any spills immediately with biodegradable low toxicity detergents.		Pipe-laying Contractor	Throughout operations	Provide summary of waste record book / schedule and receipts Report occurrence of minor oil spills and destination of wastes

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		• Machinery space drainage: Pipe-laying vessel and supply vessel(s) must comply with international agreed standards regulated under MARPOL. • Sewage - use approved treatment plants to the MARPOL standard. Record types and volumes of chemical and hazardous substances brought on board (e.g. radioactive devices/materials, neon lights, toner cartridges, etc.) and destination of wastes. Ensure that waste returned to port is disposed of by a licensed waste disposal contractor using an approved landfill site.				
3.6 EXCLUSION OF OTHER MARINE USERS FROM ACCESS TO THE OPERATIONAL AREA FOR SAFETY REASONS (shipping, including fishing and mining vessels)	*Minimise disruption to other legitimate users of the sea by respecting their rights.* Specialist advice Marine Traffic Act and International Law of the Sea EMP report requirements	Co-operate with other legitimate users of the sea to minimise disruption to other marine activities and marine life.		PetroSA / Contractor	Throughout operations	
		Use effective communication channels (see section 2.2) to inform all other potential users about the location, timing, priority of passage and size of safety zone (i.e. 500 m on either side of the pipeline).		PetroSA	Throughout operations	Record any incidents outside of normal occurrence

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3.7 EQUIPMENT LOSS	*Minimise hazards left on the seabed or floating in the water column, and inform relevant parties* Dumping at Sea Control Act 73 of 1980. Mineral & Petroleum Resources Development Act 28 of 2002	Keep a record of lost equipment and all items lost overboard and not recovered. When any items that constitute a seafloor or navigational hazard are lost on the seabed, or in the sea, complete a standard form / record sheet, which records the date and cause of loss, details of equipment type, etc.		Pipe-laying Contractor	Throughout operation	Provide a list of lost equipment and a copy of record sheet
		Pass information to PASA, SAMSA and DME DMPR. Notify SAN Hydrographer, relevant mining companies and fishing associations. SAN Hydrographer will send out Notice to Mariners with this information.		PetroSA		
3.8 REFUELLING AT SEA	*Minimise disturbance / damage to marine life.* MARPOL 73/78 (Annex 1); PACOPOSOA (Prevention and Combatting of Pollution of the Sea by Oil Act) Amendment Act 24 of 91, Marine Pollution (Control and Civil Liability) Act 6 of 1981 EMP report requirement	No discharge of any oil whatsoever is permitted within 50 nautical miles of the coast.		Pipe-laying Contractor	Throughout operation	

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPONSIBILITY:	FREQUENCY / TIMING:	REQUIREMENT FOR CLOSE-OUT REPORT:
3.9 USE OF HELICOPTERS for crew changes, servicing, etc.	*Minimise disturbance / damage to marine and coastal life.* Marine Living Resources Act 18 of 1998; Sea Birds and Seal Protection Act 46 of 73, 1963 Air Navigation Regulations	Establish, with pilots, flight paths that do not over-pass Ramsar sites, islands, coastal reserves, bird and seal breeding colonies or bird breeding colonies / sanctuaries on the coast (minimum altitudes of 2000 feet above ground level over nature conservation areas). Extensive coastal flights (parallel to the coast within 1 nautical mile of the shore) are limited on the south coast between the months of June and November to avoid southern right whale nursery areas. Aircraft may not approach to within 300 m of whales. Deviations from set flight plans must be reported.		PetroSA / Helicopter contractor	As required	Submit copy of set flight path
4. DEMOBILISATION PHASE						
4.1 PIPE-LAYING VESSEL TO LEAVE AREA	*Leave area as it was prior to pipe-laying*	Ensure that all equipment not required for the gas pipeline and associated infrastructure is retrieved from the seafloor.		Pipe-laying Contractor	On completion of pipe-laying	Confirm through seabed scan and/or video
4.2 INFORM RELEVANT PARTIES OF COMPLETION OF PIPE-LAYING	*Ensure that relevant parties* are *aware that the pipe-laying campaign is complete*	Inform the SA Navy Hydrographic Office that the pipe-laying vessel is off location. Notify fishing operators and vessels through recognised fishing associations (see Section 2.2). Notify PASA and, SAMSA ~~and DEAT~~.		PetroSA	Directly after completion of pipe-laying operation	Copies of notification documentation required
4.3 FINAL WASTE DISPOSAL	*Minimise pollution and ensure correct disposal of waste.* ~~Environmental Conservation Act (73 of 89)~~ Environmental Management Act (107 of 1998)	Dispose all waste retained onboard at a licensed waste site using a licensed waste disposal contractor.		Contractor via ship's agent	When vessel is in port	Receipt required from waste contractor

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5. MONITORING, COMPLIANCE AUDITING AND THE SUBMISSION OF INFORMATION PHASE						
5.1 ~~PERFORMANCE ASSESSMENT /~~ AUDITING / MONITORING ACTIVITIES AND EFFECTS	*Implement the ongoing monitoring programmes (in conjunction with government if required)* Mineral & Petroleum Resources Development Act 28 of 2002 (Regulation 55)	Compile monitoring programme and EMP ~~Performance Assessments~~ audits and submit to PASA. Undertake appropriate monitoring (as per specific topics), and track performance against objectives and targets. Document all activities and results for internal and external auditing.		PetroSA and Pipe-laying Contractor	Daily throughout operations The frequency of ~~performance assessments~~ audits shall be as recommended by the relevant regulator or as required by law ~~Director: Mineral Development~~	Provide all recorded information

GAS FIELD OPERATION

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1. PRE-ESTABLISHMENT PHASE							
1.1 PRE-OPERATION PLANNING	*Accommodation of needs for environmental monitoring and liaison with fishing industry*	Communicate with fishing operators and vessels regarding exclusion areas around the platform and safety zone around pipelines, wellheads and related subsea infrastructure, and timing of the operation in order to minimise disruption to the operation and other activities in the area.		PetroSA		Prior to commencement of operation	Provide records of meetings held and copies of all correspondence
1.2 FINANCIAL PROVISION	*Compliance with legislative requirements* PASA requirement (Mineral and Petroleum Resources Development Act 28 of 2002)	Ensure that financial provision is in place to execute the requirements of this EMP.		PetroSA		Prior to commencement of operation	Confirm that financial provision for EMP has been put in place
1.3 PREPARATION FOR EMERGENCIES	*Preparation for any emergency that could result in an environmental impact* DME, Petroleum Agency SA, ~~DEAT~~ DFFE and SAMSA requirements Mine Health and Safety Act regulations MARPOL	Comply with PetroSA's existing emergency plans: • Integrated management system for Safety, Health, Environmental Management and Quality Control (see all PetroSA's procedures in Appendix 2); • F-A Platform Emergency Procedure (PR/EOP/OPS/000/001); • General Onshore Plan for Offshore emergency (EP/SHE/PR/006); • Company Oil Spill Contingency and Response Plan (EP/SHE/PR/001); • Logistics Helicopter Operating Procedure (EP/SHE/PR/002 & PR/EOP/LOG/000/003); and • Environmental Management Plan (EP/SHE/PO/001).		PetroSA	Audit and verify Record of exercises conducted	Prior to commencement of operation	Confirm compliance and justify any omissions

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPON-SIBILITY:	CONTROL MEASURES:	TIMING:	REQUIREMENT FOR CLOSEOUT REPORT:
		Comply with the requirements of the Offshore Installations Permit for the FA Platform. Ensure that equipment will be in place and personnel trained to deal with all emergencies. Adequate protection and indemnity insurance cover for oil pollution incidents.					
1.4 APPROVAL OF EMP	*Compliance with legislative and ROD requirements* DME, PASA and ~~DEAT~~ DFFE requirements	Ensure that ~~DEAT and~~ PASA has approved the EMP document.		PetroSA		Prior to commencement of operation	Provide copy of EMP approval
		Ensure that any alterations or modifications are submitted to PASA ~~and DEAT~~ for approval.		PetroSA		As required	Provide copy of EMP approval
~~**1.5 ESTABLISH AN EMC**~~	~~*Compliance with ROD*~~ ~~DEAT requirement~~	~~Establish an Environmental Monitoring Committee (EMC). The EMC shall be comprised of government authorities (local, provincial and national), Non-governmental Organisations, Community based Organisations, Civil Society and Private Sector. The EMC's role shall be:~~ • ~~Regular and participative monitoring and review of PetroSA's adherence to the ROD, monitoring reports / data during the operation and decommissioning phases, and EIR mitigation measures;~~ • ~~Informing DEAT and other relevant authorities of noncompliance with the ROD;~~ • ~~Promoting participation of key stakeholders;~~		~~PetroSA~~		~~Prior to commencement of operation and throughout operation and decommissioning~~	

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPON-SIBILITY:	CONTROL MEASURES:	TIMING:	REQUIREMENT FOR CLOSEOUT REPORT:
		• ~~Providing a forum for discussing issues related to the South Coast Gas project and monitoring / review;~~ • ~~Supervision and management of Environmental Control Officer (ECO); and~~ • ~~Providing a forum for establishing a fund together with the fishing industry (see Section 3.9).~~					
		~~Report EMC findings to DEAT.~~		~~EMC~~		~~Quarterly~~	
1.6 APPOINT AN ECO	*Compliance with ROD* ~~DEAT~~ DFFE requirement	Appoint an ECO or suitably qualified person to ensure compliance with ROD conditions, Environmental Impact Report (PSA04SCG/FEIR, dated Aug 06) recommendations and Environmental Management Programme.		PetroSA ~~/ EMC~~		Prior to commencement of operation	
1.7 ~~DEAT PASA~~ NOTIFICATION	*Compliance with ROD* ~~DEAT~~ DFFE requirement	Notify ~~DEAT~~PASA of the commencement of construction activities on FA platform		PetroSA		One week prior to construction commencing	Provide copy of standard notice notification
1.8 ESTABLISH A FUND	*Compliance with ROD* DEAT requirement	Establish a fund, jointly administered by the operator and fishing industry representatives, which could contribute to various initiatives in which the fishing industry would normally be expected to play a role (e.g. research efforts).		PetroSA / Fishing industry		Throughout operations	
2. ESTABLISHMENT PHASE							
2.1 COMPLIANCE WITH ENVIRON-MENTAL MANAGEMENT PROGRAMME	*PetroSA to commit to adherence to EMP* Mineral and Petroleum Resources Development Act 28 of 2002 and PASA requirement	Ensure that a copy of the approved EMP is on board the F-A Platform during the operation.		PetroSA	Audit	Prior to commencement of operation	Ensure that a copy of the EMP report is provided to the OIM

PROJECT PHASE AND ACTIVITIES:	ENVIRONMENTAL OBJECTIVES: (and sources of instruction)	AUDITABLE MANAGEMENT ACTIONS TO BE TAKEN TO MEET THE ENVIRONMENTAL MANAGEMENT PROGRAMME REPORT OBJECTIVES:	✓	RESPON-SIBILITY:	CONTROL MEASURES:	TIMING:	REQUIREMENT FOR CLOSEOUT REPORT:
		• Ensure procedures and systems for compliance are in place. • Appropriately inform the F-A Platform's personnel of the purpose and requirements of the EMP. • Ensure correct equipment and personnel are available to meet the requirements of the EMP. • Ensure responsibilities are allocated to personnel in formal environmental responsibility matrix for all aspects of operation.		PetroSA	Audit Minutes of meetings Training records	Throughout operation	
2.2 PREVENTION OF LEAKS	*Minimise the chance of emergency occurring, and subsequent damage to the environment* EMP requirements	Implement an effective pipeline integrity management system		PetroSA		Prior to commencement of operation and on an ongoing basis	
3. OPERATIONAL PHASE							
3.1 ADHERENCE TO THE EMP	*Operate in an environmentally responsible manner* Mineral and Petroleum Resources Development Act 28 of 2002 and ~~draft DME~~ NEMA regulations for auditing	• Comply fully with the EMP (compliance would mean that all activities were undertaken successfully and details recorded and included in the Close-out Report). • Subscribe to the principles of an internationally acceptable Environmental Management System onboard the F-A Platform and support vessels. This includes environmental awareness training, waste management, environmental monitoring, record keeping and continuous improvement. • Comply with the requirements of the Offshore Installations Permit for the FA Platform.		PetroSA	Self audits and Audit	Throughout operation	Copies of records (selfaudit reports)
		A copy of the EMP must be supplied to all Contractors.		PetroSA		Throughout operation	

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3.2 CONTINUE TO COMMUNICATE WITH OTHER USERS OF THE SEA & RESOURCE MANAGERS	*Promote co-operation and successful multiple use of the sea, including promotion of safe navigation* EMP requirements ISO 14001 Compliance Maritime Safety Authority Act 5 of 1998	Use effective communication channels (see section 2.2 above) to inform all other potential users about the location, priority of passage and size of safety and exclusion and safety zones.		PetroSA		Throughout operation	
		Take steps to share information and co-operate with other marine users and resource managers in the marine environment generally to mutual benefit.		PetroSA	Provide copies of all correspondence	Throughout operation	
		Keep constant watch for approaching vessels during operations and warn by any means available (see section 3.3 below).		PetroSA	Incident reports	Throughout operation	Incidents log
3.3 PREVENTION OF EMERGENCIES	*Minimise the chance of emergency occurring, and subsequent damage to the environment* Navigation rights, safety and licensing requirements EMP requirements	Ensure the following systems/procedures are in place on the F-A Platform for prevention, detection, alarm, response and effectively handle emergencies: • Onboard equipment maintenance and certification; • Shutdown systems; and • Hazard identification and risk management.		PetroSA		Throughout operation	
		Routine surveys of subsea equipment, structures and pipelines for detection of changes to the physical condition. Survey programme to comprise of regular external pipeline surveys for potential problems such as scour, unsupported pipe sections, any anchor damage and debris collection. Handle any leaks detected according to existing standard procedures.		PetroSA	Seabed survey	Throughout operation survey every ~~2~~ 5 years or more frequently if warranted	Seabed survey and video footage reports

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		Monitor corrosion on the pipelines for the integrity of the pipes walls.		PetroSA		Throughout operation	Incident log
		Ensure personnel are trained, prepared and designated in a formal structure to prevent, respond to and effectively handle emergencies. See Section 1.3 for PetroSA's existing emergency plans.		PetroSA		Throughout operation	
		Structure must make provision for pollution watch and adequate methods for transfer of fuel and other hazardous materials, according to written approved procedures		PetroSA			
		Implement and maintain a sound procedure for prevention of collisions of the support vessel/s.		PetroSA		Throughout operation	
3.4 DEALING WITH EMERGENCIES	*Minimise damage to the environment by implementing response procedures efficiently* Prevention and Combating of Pollution of the Sea by Oil Act 6 of 1981 (Marine Notices 2 of 1996 and 23 of 1998) ~~DEAT~~ PASA & SAMSA policy ~~DEAT Chief Directorate Marine Control : policy guidelines~~	In the event of an oil spill immediately implement: • Company Emergency Response Plan; and • Company Oil Spill Contingency and Response Plan. • The plan should be aligned to the National Oil Spill Contingency Plan (NOSCP) and updated every five years or sooner if significant changes occur, such as new developments, or emergency incidents that alter the risk of marine pollution. Check and update the contact details in the OSCP every 6 months or on notification by government or other key organisations. Ensure that full record is kept of the incident until recovery		PetroSA	Audits and exercises	Throughout operation	Record of all spills (Spill Record Book), including spill reports; emergency exercise and audit records.
		Adhere to obligations regarding other vessels in distress.		PetroSA	Audits Ships log Record of Notifications	Throughout operation	Incident log

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	EMP requirements Law of the Sea Convention (LOSC) Merchant Shipping Act, Customs and Excise Act	Implement PetroSA's integrated management system for Safety, Health, Environmental Management and Quality Control (see all PetroSA's procedures in Appendix 2) and associated health and safety procedures (see emergency plans in Section 1.3).		PetroSA			
		Notify SAMSA about wrecked vessels (safety and pollution), and the Department of Finance (salvage, customs, royalties). Give location details to SAN Hydrographer.		PetroSA			
3.5 ENSURE INTEGRITY OF F-A PLATFORM AND ITS ANCHOR SYSTEM	*Reduce environmental risk by minimising risk of failures during operation*	The following shall be undertaken and/or in place in order to minimise environmental risk: • An environmental hazard identification and risk assessment document; • Apply relevant national codes and standards in accordance with good gas field practice; • Operate in accordance with procedures laid down in the FA Platform's Operation Manuals (see Appendix 2); • Operate in accordance with Safety Design Manual (Safety Case); • Anchor system design and construction certification; and • The offshore installation shall be maintained allowing a Certificate of Fitness to be in place throughout the project.		PetroSA	Audit	Prior to and throughout operation	

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3.6 DISCHARGE OF PRODUCED WATER	*Minimise pollution by implementing and maintaining produced water discharge standards* Marine Pollution (Control and Civil Liability) Act 6 of 1981 EMP Requirements	• Comply with PetroSA's operating manual for oily / produced water treatment (EP/OPS/PR/034). • Maintain oil in water discharges below 40 ppm (monthly average). Report monthly average >40 ppm to PASA~~, DME, DOT (SAMSA) and DEAT.~~		PetroSA PetroSA	Audit, incident and oil spill reports	Continuous On occasion at month end	Register
3.7 POLLUTION CONTROL AND WASTE MANAGEMENT of products disposed of~~-~~ into the air (exhausts, CFCs and incinerators), to sea (sewage, food, oils), to land (used oils etc, metals, plastics, glass, etc)	*Minimise pollution, and maximise recycling by implementing and maintaining pollution control and waste management procedures at all times.*	Implement the PetroSA waste management procedure (EP/SHE/PO/001). ~~Comply with legal requirements for waste management and pollution control (for air and water quality levels at sea), and employ "good housekeeping" and monitoring practices.~~ • ~~General waste: Initiate a waste minimisation system. No disposal overboard.~~ • ~~Galley (food) waste: Dispose overboard after macerating according to MARPOL standard (less than 25 mm size) – prohibited if distance to nearest land is < 3 nautical miles.~~ • ~~Medical waste: Seal in aseptic containers for appropriate disposal ashore.~~ • ~~Neon lights: Crush discarded tubes and send to shore in designated, marked containers.~~ • ~~Metal: Send to shore for recycling or disposal.~~ • ~~Other waste: Send remaining waste to a licensed waste site~~.		PetroSA	Audits Registers Record Books Daily Reports	Throughout operations	Provide summary of waste record book Report occurrence of minor oil spills and destination of wastes Provide copies of receipts from waste contractor

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	MARPOL standards (in Marine Pollution Act 2 of 1986) Dumping at Sea Control Act Montreal protocol Water Act EMP requirements National Environmental Management: Air Quality Act	• ~~Ensure waste disposal is carried out in accordance with appropriate laws and ordinances.~~ • ~~Waste oil: Return used oil to a port with a registered facility for processing or disposal.~~ • ~~Empty oil drums: Not to be filled with chemicals. Send to shore for disposal / recycling.~~ • ~~Empty chemical containers: Mark and seal appropriately and send to shore for disposal / recycling.~~ • ~~CFCs: Limit use of CFC based fire-fighting or refrigeration equipment.~~ • ~~Wastewater: Comply with MARPOL requirements for ships systems.~~ • ~~Minor oil spill: Use oil absorbent.~~ • ~~Emissions to the atmosphere: Properly tune and maintain main engines and all auxiliary power to contain the minimum of soot and unburned diesel.~~ • ~~Deck drainage: Ensure that weather decks are kept free of spillage. Mop up any spills immediately with biodegradable low toxicity detergents.~~ • ~~Machinery space drainage: FA Platform and supply vessels must comply with international agreed standards regulated under MARPOL.~~ • ~~Sewage - use approved treatment plants to the MARPOL standard.~~ ~~Monitor & record ALL discharges, emissions and loss of containment as daily production statistics and incidents~~. Greenhouse gas emissions must be reported in accordance with the requirements of the National Greehouse Gas Reporting Regulations, published under the National Environmental Management: Air Quality Act.					

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		~~Record types and volumes of chemical and hazardous substances brought on board (e.g. radioactive devices/materials, neon lights, toner cartridges, etc.), and destination of wastes.~~ ~~Ensure that waste returned to port is disposed of by a licensed waste disposal contractor using an approved landfill site.~~					
3.8 EXCLUSION OF OTHER MARINE USERS FROM THE OPERATIONAL AREA - SAFETY REASONS (shipping, including fishing / mining vessels)	*Minimise disruption to other legitimate users of the sea by respecting their rights* Specialist advice Marine Traffic Act and International Law of the Sea EMP requirements	Co-operate with other legitimate users of the sea to minimise disruption to other marine activities and marine life.		PetroSA		Throughout operations	
		Use effective communication channels (see section 2.2 above) to inform all other potential users about the location, timing, priority of passage and size of safety and exclusion and safety zones.		PetroSA		Throughout operations	Record any incidents outside of normal occurrence
		Report trespassing to SAMSA supplying information on vessel and incident (time, etc.).		PetroSA	Ships Log & daily reports		
		Report incidents of collision warnings to marine traffic to the SA Navy's Institute of Marine Technology.		PetroSA	Incident report		
3.9 EQUIPMENT LOSS	*Minimise hazards left on the seabed or floating in the water column, and inform relevant parties* Dumping at Sea Control Act 73 of 1980	Keep a record of all items lost overboard and of lost equipment. Items that may be detrimental to environment or other users of the sea must be retrieved within a time period corresponding to the risk it presents.		PetroSA	Incident report	Throughout operation	Record book
		Complete a standard form, which records the date and cause of loss, details of equipment type, vessel Sea Control location, sea state and weather, and the nature of the seabed, when any items that constitute a seafloor or navigational hazard are lost on the seabed, or in the sea.					

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	Mineral and Petroleum Resources Development Act 28 of 2002	Pass information to PASA, SAMSA and ~~DME~~ DMPR. Notify SAN Hydrographer, relevant mining companies fishing associations. SAN Hydrographer will send out Notice to Mariners with this information.					
3.10 FUEL BUNKERING / REFUELLING AT SEA	*Minimise disturbance / damage to marine life.* MARPOL EMP requirement	No discharge of any oil whatsoever is permitted within 50 nautical miles off the coast.		PetroSA		Throughout operations	
3.11 USE OF HELICOPTERS, for crew changes, servicing, etc.	*Minimise disturbance / damage to marine and coastal life* Sea Birds and Seal Protection Act 46 of 73, 1963 Air Navigation Regulations	Establish, with pilots, flight paths that do not over-pass Ramsar sites, islands, bird and seal breeding colonies or bird breeding colonies on the coast (minimum altitudes of 2000 feet above ground level over nature conservation areas). Extensive coastal flights (parallel to the coast within 1 nautical mile of the shore) are limited on the south coast between the months of June and November to avoid southern right whale nursery areas. Aircraft may not approach to within 300 m of whales. Deviations from set flight plans must be reported.		PetroSA / Helicopter contractor		As required	Submit copy of set flight path
3.12 Well Workovers	*Minimise disturbance / damage to marine and coastal life*	Ensure that all well interventions and workovers at the wellfields are planned and executed under approved procedures that include defined activity scope, verified well barriers, controlled management and disposal of fluids, certified well control equipment (including BOPs), pre- and post-operation ROV seabed surveys, issued navigational notices, and documented environmental monitoring and reporting.		PetroSA		As required	

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4. DECOMMISSIONING AND CLOSURE PHASE							
4.1 SHUTDOWN & DECOMMIS-SIONING	*To ensure that there is no spillage of contents of subsea pipelines*	Prepare procedure for safe decommissioning. Shut down system and decommission F-A Platform as per PetroSA's existing approved EMPR. Flush, clean and seal pipelines and umbilicals.		PetroSA	Written procedures	Before applying for closure of mine	Record of incidents
4.2 CLOSURE OF WELLS	*To ensure that there are no leakages of gas to surface and no abandoned seafloor obstructions.*	Seal South Coast Gas development wells by inserting industry acceptable barriers in the well bore at various levels according to good practice and test for integrity. Remove Xmas trees and wellhead structures. Casing to be cut-off below the level of the seafloor. Record volume of any cement displaced to seafloor.		PetroSA	Seabed survey	Before applying for closure of mine	Provide photographic / video evidence of removal of wellhead or written receipt from waste disposal contractor Provide relevant volumes
4.3 ABANDONMENT	*To ensure that all infrastructure that may be detrimental to the environment or other users of the sea is removed.*	Remove all equipment other than infrastructure to be abandoned (i.e. pipeline, umbilicals, concrete mattresses / blocks less than 0.5 m high and other overtrawlable structures).		PetroSA	Check against incidents log Seabed survey	On completion of gas production activities	Provide photographic / video evidence.

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4.4 INFORM RELEVANT PARTIES OF COMPLETION OF PRODUCTION ACTIVITIES	*Ensure that relevant parties are aware that the gas production has ceased*	Inform the SAN Hydrographic Office regarding the positions of all abandoned infrastructure. Notify fishing operators and vessels through recognised fishing associations. Notify PASA and SAMSA ~~and DEAT~~.		PetroSA		On completion of decommissioning activities	Copies of notification documentation required
4.5 FINAL WASTE DISPOSAL	*Minimise pollution and ensure correct disposal of waste.* ~~Environment Conservation Act (73 of 89)~~ National Environmental Management Act (107 of 1998)	Dispose of all waste retained onboard at a licensed landfill site using an approved waste disposal contractor.		PetroSA		When vessel is in port	Provide copy of receipt from waste contractor
5. MONITORING, COMPLIANCE AUDITING AND THE SUBMISSION OF INFORMATION PHASE							
5.1 MONITORING ACTIVITIES AND EFFECTS	*Implement the ongoing monitoring programmes (in conjunction with government if required)* Mineral and Petroleum Resources Development Act 28 of 2002 ~~and draft regulations for auditing~~ NEMA Auditing requirements EMP requirements	Comply with the existing schedule of monitoring operating parameters and the frequency and method of monitoring (see EMP EP/SHE/PO/001). Document all activities and results for internal and external auditing. Ensure compliance with PetroSA Environmental Management System (ISO 14001). Encourage monitoring/observation of marine animals including: • Marine mammals, penguins and turtles sighted from the F-A Platform; • Record any unusual bird sightings; and • Interaction with other vessels.		PetroSA	Audits	As specified in EP/SHE/PO/001	All recorded information Copies of audit records

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		Monitor the section of pipeline within the Blues fishing ground to obtain an understanding of burial rates, spanning, pipeline deterioration and any damage caused by accidental trawl board impacts.		PetroSA	Seabed survey	Throughout operations	Seabed survey and video footage reports
		Undertake periodic monitoring of the pipeline (in the Blues fishing grounds) for a period after decommissioning until a closure certificate has been obtained from PASA or ~~DME~~ DMPR in order to determine long-term pipeline integrity. If monitoring reveals that the pipeline is posing a threat to fishing activities, investigate a more permanent solution and solutions and implement.		PetroSA		As required	
5.2 FURTHER INVESTIGATIONS	*Reduce potential impact of abandoned pipeline on fishing activities* EMP requirement	Investigate options for increasing the rate of breakdown of the pipeline (e.g. not filling the pipeline with a corrosion inhibitor but rather filling with seawater) in order to speed up the rate of deterioration and thereby reduce the duration of the impact the pipeline (within the Blues fishing ground) could have on the fishing industry.		PetroSA		Operation	
5.3 COMPILE OPERATIONAL PHASE "CLOSEOUT" REPORT for all activities relating to environmental management	*Ensure corrective action and compliance and contribute towards improvement of EMP implementation* Mineral and Petroleum Resources Development Act 28 of 2002 ~~and performance assessment~~ auditing and monitoring guidelines	• Provide information / records as indicated in the Close-out Report column of the EMP and the model Close-out Report within 90 days of the decommissioning. • Close–out Report is to be based on requirements of the monitoring and EMP ~~Performance Assessment~~ audits. • Provide copy of report to the relevant regional office of the ~~DME~~ DMPR and to PASA. • Provide a copy of any video footage that was shot during the course of operations to the PASA and final seabed survey after closure. • A covering letter must formally apply for the issuance of a closure certificate from ~~DME~~ DMPR.		PetroSA		On completion of operations	